

# SCPI Command Reference Volume 3

## Agilent Technologies E4428C/38C ESG Signal Generators

This guide applies to the following signal generator models:

**E4428C ESG Analog Signal Generator**

**E4438C ESG Vector Signal Generator**

Due to our continuing efforts to improve our products through firmware and hardware revisions, signal generator design and operation may vary from descriptions in this guide. We recommend that you use the latest revision of this guide to ensure you have up-to-date product information. Compare the print date of this guide (see bottom of page) with the latest revision, which can be downloaded from the following website:

*<http://www.agilent.com/find/esg>*



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## 9 Receiver Test Digital Commands (continued)

This chapter provides a continuation of SCPI descriptions for commands dedicated to digital real-time testing using the E4438C ESG Vector Signal Generator. This chapter contains the following sections:

- “3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURce]:RADio:WCDMa:HSPA[:BBG])” on page 668
- “Real Time GPS Subsystem–Option 409 ([:SOURce]:RADio[1]|2|3|4:GPS)” on page 763
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- “Wideband CDMA Base Band Generator Subsystem–Option 400 ([:SOURce]:RADio:WCDMa:TGPP[:BBG])” on page 1020

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## **3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**

The commands in this subsystem support the remote functionality of the Signal Studio for 3GPP W-CDMA HSPA software. For a complete description of terms and HSPA functionality, refer to the software online help. Commands used for configuring the carrier signal and performing general signal generator functions are located in different SCPI command subsystems found within the SCPI Command Reference volumes.

There are two methods to determine the SCPI commands for a setup. One method is to locate each individual command listed in this subsystem and others within the *SCPI Command Reference* volumes. The other method is to use the HSPA software UI. After downloading a UI setup to the ESG, the software lets you export a SCPI file that contains the commands used in the UI setup. Refer to the HSPA software online help for information on this feature.

### **File Overview**

The ESG's memory catalog (signal generator memory) uses several file types, each assigned with a unique syntax to recall the file. This section provides information on using files with SCPI commands.

This subsystem uses the following two command variables to represent two different file types stored in signal generator memory:

"<file name>"      Bit file  
"<user FIR>"      FIR file

For more information on managing and using files, refer to the resources in the following list:

- [“File Name Variables” on page 13](#) for information on the file name syntax
- [Table 1-4 on page 14](#) for a listing of the different file types
- ESG Signal Generator *Programming Guide* for information on downloading bit files
- ESG Signal Generator *User's Guide* for information on creating and editing bit and FIR files using the signal generator

The HSPA software interface downloads user files (bit and FIR file types) to the ESG when **USER** is the software data or filter type selection. You can see these files on the ESG by pressing **Utility > Memory Catalog > Catalog Type** and then selecting the file type, or by using the SCPI commands located in the Memory subsystem. User files are located on the ESG in the following directory path: /USER/<file type directory>/<file name>. Table 9-1 shows the software naming convention for the different files created by the HSPA software.

**Table 9-1 HSPA Software Downloaded File Names**

Link Direction	Data Source	File Name	ESG File Type
Downlink and Uplink	Filter	<project name>-FIR	FIR
Downlink	BCH	<project name>-BCH	Bit
	PICH	<project name>-PICH	
	DCH	<project name>-DCH	
	DPCH	<project name>-DPCH	
	DCH <sub>x</sub> <sup>a</sup>	<project name>-DCH <sub>x</sub> <sup>a</sup>	
	Inter-TTI	<project name>-ITTI <sub>x</sub> <sup>b</sup>	
	HARQ ACK/NACK Pattern	<project name>-DLCPT	
	AMC CQI Pattern	<project name>-DLAPT	
	HS-DSCH	<project name>-DSCH1	
	HS-PDSCH	<project name>-HSPD <sub>x</sub> <sup>b</sup>	
	HS-SCCH	<project name>-HSSCC <sub>x</sub> <sup>b</sup>	
	E-AGCH Absolute Grant Scope	<project name>-EAGCH_AGS	
	E-AGCH Absolute Grant Value	<project name>-EAGCH_AGV	
	E-RGCH	<project name>-ERGCH	
E-HICH	<project name>-EHICH		

**Table 9-1 HSPA Software Downloaded File Names**

Link Direction	Data Source	File Name	ESG File Type
Uplink	DPCCH	<project name>-DPCCH	Bit
	FBI	<project name>-FBI	
	TPC	<project name>-TPC	
	DPDCH	<project name>-DPDCH	
	DCHx <sup>a</sup>	<project name>-DCHx <sup>a</sup>	
	ACK Pattern	<project name>-APAT	
	CQI Pattern	<project name>-CPAT	
	EDPCCH Pattern	<project name>-EDPCCH	
	EDPDCH Pattern	<project name>-EDPDCH	
	EDCH Pattern	<project name>-EDCH	
	EDPDCH (alternate) Pattern	<project name>-EDCHA	
	HARQ ACK Pattern	<project name>-UAPT	
	TFC E-TFCI User Pattern	<project name>-UETT	
	Happy Bit Pattern	<project name>-HBIT	
EXT Pattern	<project name>-EPAT		

a. x is the DCH number (1–6).

b. x is the channel number (1–4) for the HSDPA, the HS-PDSCH and the HS-SCCH.

## Managing ESG Setting Conflicts and Error Messages

The ESG reports setting conflicts as error messages. When a setting conflict occurs, an error number and a brief message appear at the bottom of the ESG display. You can view the full text of the error message in either of two ways: by using the front panel of the ESG, or by executing SCPI commands.

Front Panel      Press **Utility > Error Info**.

SCPI              Execute the SCPI error commands described in the “[System Subsystem \(:SYSTEM\)](#)” on page 154.

For more information on Error messages, refer to the signal generator *Programming Guide* for remote viewing or the signal generator *User's Guide* for front panel viewing.

## :DLINK:APPLY

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:APPLY  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:APPLY?
```

This command applies changes to the channel setup and data for active downlink physical and transport channels, immediately starting the channel coding generation process. A progress bar may appear on the ESG display indicating that the new signal parameters are being applied. Signal parameters are also applied when the modulation format is turned on.

Use the query to determine whether or not execution of this command is required. It returns the following responses:

0	Command execution is not required.
1	Command execution is required.

---

**NOTE** The apply query response is valid only when downlink HSPA format is active.

---

The apply function will not work if there is a conflict with range values and coupled parameters. For example, if all the physical channel codes are not orthogonal to each other, the new settings are not applied to the signal when this command is executed. Resolve any conflicts before reapplying the changes. The ESG reports an error when conflicts occur.

## :DLINK:AWGN:CN

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:AWGN:CN <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:AWGN:CN?
```

This command sets the downlink in-band carrier to noise ratio (C/N) value using AWGN.

**\*RST** 0

**Range** -30 to 30

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:DLINK:AWGN[:STATE]**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:AWGN [ :STATE ] ON | OFF | 0 | 1
```

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:AWGN [ :STATE ] ?
```

This command turns the downlink AWGN on or off.

**\*RST** 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:BBCLock[:SOURCE]**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:BBCLock [ :SOURCE ]
```

```
{ INTERNAL } | EXTERNAL
```

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:BBCLock [ :SOURCE ] ?
```

This command selects the downlink baseband generator chip clock source, which is either internal to the signal generator or applied externally.

**\*RST** INT

**Remarks** When using an external chip clock source, connect the signal to the DATA CLOCK connector on the front panel of the ESG.

**:DLINK:CPICH:CCODE**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:CPICH:CCODE?
```

This query returns the CPICH channelization code, which is always set to zero.

## **:DLINK:CPICH:POWER**

**Supported** E4438C with Option 419

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:CPICH:POWER <val>

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:CPICH:POWER?

This command sets the CPICH power level. The variable <val> is expressed in decibels (dB).

**\*RST** 3.30000000E+000

**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

## **:DLINK:CPICH[:STATE]**

**Supported** E4438C with Option 419

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:CPICH [ :STATE ] ON | OFF | 1 | 0

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:CPICH [ :STATE ] ?

This command turns the CPICH on or off.

**\*RST** 1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

## **:DLINK:DPCH:CCODE**

**Supported** E4438C with Option 419

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:CCODE <val>

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:CCODE?

This command sets the downlink DPCH channel code number.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])

<b>*RST</b>	10
<b>Range</b>	0–511
<b>Remarks</b>	<p>Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.</p> <p>The channel code is coupled with the slot format and all other physical channel codes. If the channel code exceeds the limits of the slot format or if it is not orthogonal with all other physical channel codes, the apply function (downlink apply command) will not work. If any channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.</p>

**:DLINK:DPCH:DATA**

<b>Supported</b>	E4438C with Option 419
	[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DATA PN9   PN15   FIX4   DCH   "<file name>"
	[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DATA?
	This command configures the downlink DPCH data pattern.
DCH	This selects the transport channel as the data source. The DCH selection is not available for a DPCH slot format of 16.
"<file name>"	This represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “File Overview” on page 668 for more information on files.
<b>*RST</b>	PN9
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:DPCH:DATA:FIX4**

<b>Supported</b>	E4438C with Option 419
	[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DATA:FIX4 <val>
	[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DATA:FIX4?
	This command sets the downlink DPCH repeating 4-bit binary data pattern.
	The variable <val> accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.



<b>*RST</b>	0
<b>Range</b>	0–15
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “ <a href="#">DLINK:APPLY</a> ” on page 671.

### **:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:BSIZE**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6  
:BSIZE <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :BSIZE?
```

This command sets the block size for the selected downlink DCH.

<b>*RST</b>	20
<b>Range</b>	0–5000
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “ <a href="#">DLINK:APPLY</a> ” on page 671.  The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the ESG calculates the product of the block size and the number of blocks. If the product of these two parameters exceeds 200,000, the apply function (downlink apply command) will not work.

### **:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:CRC**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :CRC 0 | 8 |  
12 | 16 | 24  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :CRC?
```

This command sets the number of CRC bits for the selected downlink DCH.

<b>*RST</b>	8
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “ <a href="#">DLINK:APPLY</a> ” on page 671.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:DLINK:DPCH:DCH[1]|2|3|4|5|6:CTYPE****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DCH[1]|2|3|4|5|6:CTYPE
HCONv|TCONv|TURBo|NONE
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DCH[1]|2|3|4|5|6:CTYPE?
```

This command sets the coder type for the selected downlink DCH.

HCONv This choice selects the 1/2 rate convolutional encoder.

TCONv This choice selects the 1/3 rate convolutional encoder.

TURBo This choice selects the turbo coder.

NONE This choice selects no coding.

**\*RST** HCON

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

**:DLINK:DPCH:DCH[1]|2|3|4|5|6:DATA****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DCH[1]|2|3|4|5|6:DATA PN9|
PN15|FIX4|"<file name>"
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DCH[1]|2|3|4|5|6:DATA?
```

This command configures the data for the selected downlink DCH.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “[File Overview](#)” on page 668 for more information on files.

**\*RST** PN9

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

### **:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:FIX4**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA:  
FIX4 <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA:FIX4?
```

This command sets the repeating 4-bit binary data pattern for the selected downlink DCH. The variable <val> accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:NBLocks**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :  
NBLocks <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :NBLocks?
```

This command sets the number of data blocks for the selected downlink DCH.

**\*RST** 1

**Range** 0–512

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the ESG calculates the product of the block size and the number of blocks. If the product of these two parameters exceeds 200,000, the apply function (downlink apply command) will not work.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])****:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:RMAtribute****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:RMAtribute &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:RMAtribute?

This command sets the rate matching attribute for the selected downlink DCH.

**\*RST** 1**Range** 1–256**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.**:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:TTI****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:TTI 10 | 20 | 40 | 80

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:TTI?

This command sets the TTI for the selected downlink DCH.

The choices are expressed in millisecond (ms).

**\*RST** 10**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.**:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6[:STATe]****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6[:STATe] ON | OFF | 1 | 0

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6[:STATe] ?

This command turns the selected downlink DCH on or off; DCH1 is always on.

**\*RST**                    DCH 1: 1    DCH 2–6: 0

**Remarks**             Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

The apply command will not work and the ESG will report an error if you turn on a DCH where lower numbered DCHs are off. For example, turning on DCH5 requires turning on DCH2–4. The reverse is true when turning off the DCHs.

### **:DLINK:DPCH:POWer**

**Supported**            E4438C with Option 419

```
[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:POWer <val>  
[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:POWer?
```

This command sets the downlink DPCH power level.

**\*RST**                    –1.02000000E+001

**Range**                 –40 to 0

**Remarks**             Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:DPCH:SFORmat**

**Supported**            E4438C with Option 419

```
[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:SFORmat <val>  
[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:SFORmat?
```

This command configures the downlink DPCH slot format.

**\*RST**                    0

**Range**                 0–16

**Remarks**             Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

The slot format is coupled with the channel code, so a change in one value may require a change in the other. If the channel code exceeds the limits of the slot format or if it is not orthogonal with all other physical channel codes, the apply function (downlink apply command) will not work.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])****:DLINK:DPCH:SSCoffset****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:SSCoffset &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:SSCoffset?

This command sets the downlink DPCH secondary scrambling code offset.

**\*RST** +0**Range** 0–15**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.**:DLINK:DPCH:TFCI****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:TFCI &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:DPCH:TFCI?

This command sets the TFCI 10-bit pattern for the downlink DPCH.

The variable &lt;val&gt; accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** +0**Range** 0–1023**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

Setting the TFCI bits is optional; they describe the type of service in use, for example voice or data.

### **:DLINK:DPCH:TOFFset**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:DPCH:TOFFset <val>  
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:DPCH:TOFFset?
```

This command adjusts the downlink DPCH timing offset.

The variable <val> is expressed in chips.

**\*RST** +0

**Range** 0–149

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

### **:DLINK:DPCH:TPC:NSTeps**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:DPCH:TPC:NSTeps <val>  
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:DPCH:TPC:NSTeps?
```

This command sets the number of steps for the down and up (DUP) or up and down (UDOWn) TPC pattern selections.

**\*RST** +1

**Range** 1–80

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

### **:DLINK:DPCH:TPC:PATtern**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:DPCH:TPC:PATtern UDOWn | DUP | UALL |  
DALL | "<file name>"  
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:DPCH:TPC:PATtern?
```

This command configures the downlink DPCH TPC pattern for increasing or decreasing, or increasing and decreasing the UE power level.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])

UDOWN	The TPC pattern repetitively steps up and down.
DUP	The TPC pattern repetitively steps down and up.
UALL	The TPC pattern consecutively steps up.
DALL	The TPC pattern consecutively steps down.
"<file name>"	This variable represents a TPC pattern file stored in signal generator memory. The pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “ <a href="#">File Overview</a> ” on page 668 for more information on files.
*RST	UDOW
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “ <a href="#">:DLINK:APPLY</a> ” on page 671.  Each step in a TPC pattern signals an increase or decrease of 1 dB in the UE output power level.

**:DLINK:DPCH:TRPosition**

**Supported** E4438C with Option 419

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH:TRPosition?

This query returns the downlink DPCH transport channel position that is always set to FIX.

**:DLINK:DPCH[:STATe]**

**Supported** E4438C with Option 419

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH [ :STATe ] ON | OFF | 1 | 0

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:DPCH [ :STATe ] ?

This command turns the downlink DPCH on or off.

\*RST 1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.



## **:DLINK:EAGCh:AGScope**

**Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:EAGCh:AGScope ALL_0|ALL_1|
"<file name>"
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:EAGCh:AGScope?
```

This command sets an absolute scope pattern.

ALL\_0, ALL\_1 These choices configure an absolute grant scope pattern.

"<file name>" This variable represents an absolute scope pattern value. Create this file either by using the absolute grant scope pattern Data Type Entry window and downloading the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

- absolute grant scope of 1, 0 using a 1-bit pattern, 1, 0. In the file, do not use delimiters between subframes; enter subframe bits as a binary string.

When creating a pattern, you can determine the number of active subframes, up to 1,280, which are numbered from 0 to 1,279. A subframe is active when it contains 1 bit.

**\*RST** ALL\_0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

## **:DLINK:EAGCh:AGValue**

**Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:EAGCh:AGValue
ALL_0|ALL_1|ALL_2|ALL_3|ALL_4|ALL_5|ALL_6|ALL_7|ALL_8|ALL_9|ALL_10|ALL_11|
ALL_12|ALL_13|ALL_14|ALL_15|ALL_16|ALL_17|ALL_18|ALL_19|ALL_20|ALL_21|
ALL_22|ALL_23|ALL_24|ALL_25|ALL_26|ALL_27|ALL_28|ALL_29|ALL_30|ALL_31|
"<file name>"
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:EAGCh:AGValue?
```

This command sets an absolute grant value pattern.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**

ALL\_1 to ALL\_31 These choices configure an absolute grant value pattern.

"<file name>" This variable represents an absolute grant pattern value. Create this file either by using the absolute grant value pattern Data Type Entry window and downloading the file to the ESG or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

- absolute grant value of 0– 31 using an 8-bit pattern, 00000000 to 00011111  
In the file, do not use delimiters between subframes; enter subframe bits as a binary string.

When creating a pattern, you can determine the number of active subframes, up to 1,280, which are numbered from 0 to 1,279. A subframe is active when it contains 8 bits. If a subframe contains at least 1 bit, but less than 8 bits, the apply function (downlink apply command) will not work.

**\*RST** ALL\_0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 671](#).

**:DLINK:EAGCh:CCODE**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EAGCh:CCODE <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EAGCh:CCODE?
```

This command sets the downlink E-AGCH channel code number.

**\*RST** 14

**Range** 0–127

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 671](#).

The channel code is coupled with the slot format and all other physical channel codes. Set the channel code so it does not exceed the limits of the slot format and ensure that all physical channel codes are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

### **:DLINK:EAGCh:ERNTI**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EAGCh:ERNTi <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EAGCh:ERNTi?
```

This command sets E-RNTI (E-DCH Radio Network Temporary Identifier).

**\*RST** 0

**Range** 0–255

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

### **:DLINK:EAGCh:Power**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EAGCh:POWER <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EAGCh:POWER?
```

This command sets the power level for the E-AGCH.

**\*RST** –20.00000000E+000

**Range** –40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

### **:DLINK:EAGCh[:STATe]**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EAGCh [ :STATe ] ON | OFF | 1 | 0  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EAGCh [ :STATe ] ?
```

This command turns the downlink E-AGCH on or off.

**\*RST** 1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

**:DLINK:EHICH:CCODE**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EHICH:CCODE <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EHICH:CCODE?
```

This command sets the downlink E-HICH channel code number.

**\*RST** 5

**Range** 0–127

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

The channel code is coupled with the slot format and all other physical channel codes. Set the channel code so it does not exceed the limits of the slot format and ensure that all physical channel codes are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

**:DLINK:EHICH:INDICATOR**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EHICH:INDICATOR
ALL_1|ALL_0|ALL_M1| "<file name>"
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EHICH:INDICATOR?
```

This command sets a HARQ acknowledgement indicator pattern.

ALL\_<val> These choices configure an HARQ acknowledgement indicator pattern.

"<file name>" This variable represents an HARQ pattern file stored in signal generator memory. Create this file either by using the HARQ pattern Data Type Entry window and downloading the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

HARQ pattern of 1, 0, –1 using at 2-bit pattern: 01, 00, 10.

In the file, do not use delimiters between subframes; enter the subframe bits as a binary string.

When creating a pattern, you can determine the number of active subframes, from 1 to 1,280. The subframes are numbered 0 to 1,279. A subframe is active when it contains 1 bit.

**\*RST** ALL\_1  
**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:EHICH:POWER**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EHICH:POWER <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EHICH:POWER?
```

This command sets the power level for the E-HICH.

**\*RST** -20.00000000E+000

**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:EHICH:SSINDEX**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EHICH:SSINDEX <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EHICH:SSINDEX?
```

This command sets the downlink E-HICH signature sequence index number.

**\*RST** 0

**Range** 0–39

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:EHICH:TOFFSET**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EHICH:TOFFSET <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:EHICH:TOFFSET?
```

This command adjusts the downlink E-HICH timing offset (tE-HICH).

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])

<b>*RST</b>	–17920
<b>Range</b>	–17920, –10240, 5120, 12800, 20480, 28160, 43520, 51200
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:EHICH[:STATE]**

**Supported** E4438C with Option 419

```
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : EHICH [ : STATE ] ON | OFF | 1 | 0
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : EHICH [ : STATE ] ?
```

This command turns the downlink E-HICH on or off.

<b>*RST</b>	1
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:ERGCh:CCODE**

**Supported** E4438C with Option 419

```
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : ERGCh : CCODE <val>
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : ERGCh : CCODE ?
```

This command sets the downlink E-RGCH channel code number.

<b>*RST</b>	6
<b>Range</b>	0–127
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:ERGCh:POWER**

**Supported** E4438C with Option 419

```
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : ERGCh : POWER <val>
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : ERGCh : POWER ?
```

This command sets the power level for the E-ERGCH.

**3GPP W-CDMA HSPA Subsystem—Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**

<b>*RST</b>	−20.00000000E+000
<b>Range</b>	−40 to 0
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:ERGCh:RGValue**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:ERGCh:RGValue
ALL_1|ALL_0|ALL_M1|"<file name>"
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:ERGCh:RGValue?
```

This command sets a relative grant pattern.

ALL\_<val> These choices configure a relative grant value pattern

"<file name>" This variable represents a relative grant value pattern file stored in signal generator memory. Create this file either by using the relative grant value pattern Data Type Entry window and downloading the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

- relative grant value pattern of 1, 0, −1 using at 2-bit pattern: 01, 00, 10. In the file, do not use delimiters between subframes; enter subframe bits as a binary string.

When creating a pattern, you can determine the number of active subframes, from 1 to 1,280. The subframes are numbered 0 to 1,279. A subframe is active when it contains 1 bit.

**\*RST** ALL\_1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:ERGCh:SSINDEX**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:ERGCh:SSINDEX <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:ERGCh:SSINDEX?
```

This command sets the downlink E-RGCH signature sequence index number.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**

<b>*RST</b>	0
<b>Range</b>	0–39
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:ERGCh:TOFFset**

**Supported** E4438C with Option 419

```
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : ERGCh : TOFFset <val>
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : ERGCh : TOFFset ?
```

This command adjusts the downlink E-RGCH timing offset (tE-RGCH).

The variable <val> is expressed in chips.

<b>*RST</b>	–17920
<b>Range</b>	–17920, –10240, 5120, 12800, 20480, 28160, 43520, 51200
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:ERGCh[:STATe]**

**Supported** E4438C with Option 419

```
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : ERGCh [ : STATE ] ON | OFF | 1 | 0
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : ERGCh [ : STATE ] ?
```

This command turns the downlink E-RGCH on or off.

<b>*RST</b>	0
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:FILTer**

**Supported** E4438C with Option 419

```
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : FILTer RNYQuist | NYQuist |
GAUSSian | RECTangle | IS95 | IS95_EQ | IS95_MOD | IS95_MOD_EQ | AC4Fm | UGaussian |
"<user FIR>"
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : DLINK : FILTer ?
```

This command selects the downlink filter type.



IS95	This filter meets the criteria of the IS-95 standard.
IS95_EQ	This filter is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard and is best suited for IS-95 baseband filtering.
IS95_MOD	This filter meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This filter is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
UGGaussian	This is a GSM Gaussian filter with a fixed BbT value of 0.300.
AC4Fm	This is a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
"<user FIR>"	This variable represents any FIR filter file stored in signal generator memory. Refer to <a href="#">“File Overview” on page 668</a> for more information on files.
<b>*RST</b>	RNYQ
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to <a href="#">“:DLINK:APPLY” on page 671</a> .

### **:DLINK:FILTer:ALPHa**

<b>Supported</b>	E4438C with Option 419
	[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:FILTer:ALPHa <val> [ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:FILTer:ALPHa?
	This command sets the downlink Nyquist or root Nyquist filter alpha value.
<b>*RST</b>	+2.20000000E-001
<b>Range</b>	0-1
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to <a href="#">“:DLINK:APPLY” on page 671</a> .  Executing this command while a filter other than Nyquist or root Nyquist is selected changes the parameter value, but it is not used by the signal generator until one of the Nyquist filters is selected.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])****:DLINK:FILTer:BBT**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:FILTer:BBT <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:FILTer:BBT?
```

This command sets the downlink Gaussian filter BbT value.

**\*RST** +5.00000000E-001

**Range** 0–1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

Executing this command while a filter other than the Gaussian filter is selected changes the parameter value, but it is not used by the signal generator until the Gaussian filter is selected.

**:DLINK:FILTer:CHANnel**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:FILTer:CHANnel EVM|ACP
```

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:FILTer:CHANnel?
```

Execute this command to optimize a downlink filter for minimized EVM or for minimized ACP.

**EVM** This choice provides the most ideal passband.

**ACP** This choice improves stopband rejection for the root Nyquist and Nyquist filters.

**\*RST** EVM

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

To change the filter selection, refer to “[:DLINK:FILTer](#)” on page 690.

**:DLINK:HSBurst**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSBurst ON|OFF|1|0
```

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSBurst?
```

This command sets the handling of the off slot periods for the downlink HSDPA channels.

ON 1	This choice turns off the ESG ALC feature and uses DTX during the off slots.
OFF 0	This choice continuously transmits the HSDPA channels filling the off slots with dummy bits.
<b>*RST</b>	0
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:HSDPa:AMC:CQIMapping:UECategory**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:HSDPa:AMC:CQIMapping:
UECategory <val>
```

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:HSDPa:AMC:CQIMapping:UECategory?
```

This command sets the UE category that determines the CQI mapping table per the 3GPP standards.

**\*RST** 5

**Range** 1–12

**Remarks** To use this command's parameter in a setup, you must also set AMC as the feedback selection. Refer to the “:DLINK:HSDPa:FCONtrol” on page 694 for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:HSDPa:AMC:CPATtern**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:HSDPa:AMC:CPATtern ALL_1 | ALL_2 |
ALL_3 | ALL_4 | ALL_5 | ALL_6 | ALL_7 | ALL_8 | ALL_9 | ALL_10 | ALL_11 | ALL_12 | ALL_13 |
ALL_14 | ALL_15 | ALL_16 | ALL_17 | ALL_18 | ALL_19 | ALL_20 | ALL_21 | ALL_22 | ALL_23 |
ALL_24 | ALL_25 | ALL_26 | ALL_27 | ALL_28 | ALL_29 | ALL_30 | "<file_name>"
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:HSDPa:AMC:CPATtern?
```

This command sets a simulated UE CQI pattern that determines HSDPA1's response including the modulation type (QPSK or 16QAM) and the constellation version for 16QAM per the set UE category.

ALL\_1 to ALL\_30 These choices configure a simulated UE ACK response with a single CQI value for 1,280 subframes.

"<file name>" This variable represents a CQI pattern file stored in signal generator memory.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADio:WCDMa:HSPA[:BBG])**

Create this file either by using the AMC CQI pattern Data Type Entry window and downloading the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

- CQI value of 1–30 using an 8-bit pattern, 00000001 to 00011110
- DTX is represented by 11111111

In the file, do not use delimiters between subframes; enter subframe bits as a binary string.

When creating a pattern, you can determine the number of active subframes from 1 to 1,280. The subframes are numbered 0 to 1,279. A subframe is active when it contains 8-bits. If a subframe contains at least 1-bit but less than 8-bits, the apply function (downlink apply command) will not work.

**\*RST** ALL\_21

**Remarks** To use this command's parameter in a setup, you must also set AMC as the feedback selection. Refer to the “[:DLINK:HSDPa:FCONtrol](#)” on page 694 for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

**:DLINK:HSDPa:FCONtrol**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:HSDPa:FCONtrol NONE | HARQ | AMC
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:HSDPa:FCONtrol ?
```

This command sets the HSDPA1 feedback control type.

**NONE** This choice turns off the feedback control.

**HARQ** This choice provides UE feedback using the HARQ process. This selection provides the capability of configuring a simulated UE ACK/NACK response, setting the maximum number of HARQ transmissions, and providing up to eight different RV parameters.

**AMC** This choice provides UE feedback using adaptive modulation coding. This selection provides the capability of configuring a simulated UE CQI response aligned with a UE category input.

**\*RST** NONE

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

## **:DLINK:HSDPa:HARQ:APATtern**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HARQ:APATtern ACK_ALL |  
"<file name>"  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HARQ:APATtern?
```

This command sets a simulated UE ACK/NACK pattern that determines HSDPA1's HARQ response.

**ACK\_ALL** This choice configures 1,280 subframes for a simulated ACK only response.

"<file name>" This variable represents an ACK pattern file stored in signal generator memory. Create this file either by using the HARQ ACK/NACK pattern Data Type Entry window and download the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

- An ACK response is represented by 00.
- A NACK response is represented by 01.
- DTX is represented by 10.

In the file, do not use delimiters between subframes; enter subframe bits as a binary string.

When creating a pattern, you can determine the number of active subframes from 1 to 1,280. The subframes are numbered 0 to 1,279. A subframe is active when it contains 2-bits. If a subframe contains only 1-bit, the apply function (downlink apply command) will not work.

**\*RST** ACK\_ALL

**Remarks** To use this command's parameter in a setup, you must also set HARQ as the feedback selection. Refer to the “[:DLINK:HSDPa:FCONtrol](#)” on page 694 for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:DLINK:HSDPa:HARQ:MNHTrans****Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HARQ:MNHTrans <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HARQ:MNHTrans?
```

This command configures the HSDPA1 maximum number of HARQ transmissions for the HARQ function.

Use the command for UE performance testing or for specifying an arbitrary number of HARQ transmissions. When the software encounters a UE NACK response that is set by the HARQ ACK pattern command (see “[:DLINK:HSDPa:HARQ:APATern](#)” on page 695), the software re-sends the same packet payload until either the maximum number of HARQ transmissions is reached or a simulated ACK response is encountered. Whenever the software re-sends the same packet payload, it also transmits another RV parameter that is configured by the RV sequence command.

**\*RST** 1**Range** 1–8

**Remarks** To use this command's parameter in a setup, you must also set HARQ as the feedback selection. Refer to the “[:DLINK:HSDPa:FCONtrol](#)” on page 694 for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

**:DLINK:HSDPa:HARQ:RVSequence[1]|2|3|4|5|6|7|8****Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HARQ:RVSequence [1] | 2 | 3 | 4 |
5 | 6 | 7 | 8 <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HARQ:RVSequence [1] | 2 | 3 | 4 |
5 | 6 | 7 | 8?
```

This command sets the HSDPA1 RV parameter sequence used with the maximum number of HARQ transmission setting. You can set eight different RV parameters for the RV sequence.

During simulated ACK responses, the software uses the first RV parameter. When the software encounters a simulated NACK response, it sends data using the next RV parameter. The software keeps incrementing to the next RV parameter in the sequence until it receives a simulated ACK response. When the software encounters an ACK response, the RV sequence resets to the first RV parameter.

<b>*RST</b>	0
<b>Range</b>	0–7
<b>Remarks</b>	<p>To use this command's parameter in a setup, you must also set HARQ as the feedback selection. Refer to the “:DLINK:HSDPa:FCONtrol” on page 694 for selecting the feedback type.</p> <p>Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.</p>

### **:DLINK:HSDPa[1] | 2 | 3 | 4:BSINfo**

<b>Supported</b>	E4438C with Option 419
	<pre>[:SOURce]:RADio:WCDMa:HSPA[:BBG]:DLINK:HSDPa[1]   2   3   4:BSINfo &lt;val&gt; [:SOURce]:RADio:WCDMa:HSPA[:BBG]:DLINK:HSDPa[1]   2   3   4:BSINfo?</pre>
	<p>This command sets the HS-DSCH block size. HSDPA1 is the only HSDPA channel configuration that supports the HS-DSCH; however, the block size information parameter is also available for HSDPA2–4 for HS-SCCH coding purposes.</p>
<b>*RST</b>	36
<b>Range</b>	0–63
<b>Remarks</b>	<p>Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.</p>

### **:DLINK:HSDPa[1] | 2 | 3 | 4:HSPDsch:COFFset**

<b>Supported</b>	E4438C with Option 419
	<pre>[:SOURce]:RADio:WCDMa:HSPA[:BBG]:DLINK:HSDPa[1]   2   3   4:HSPDsch: COFFset &lt;val&gt; [:SOURce]:RADio:WCDMa:HSPA[:BBG]:DLINK:HSDPa[1]   2   3   4:HSPDsch:COFFset?</pre>
	<p>This command sets the HS-PDSCH code offset. The code offset is used in determining the HS-PDSCH channel code.</p>
<b>*RST</b>	HSDPA1: 4    HSDPA2: 8    HSDPA3: 9    HSDPA4: 10
<b>Range</b>	1–16
<b>Remarks</b>	<p>Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.</p> <p>Set all physical channel codes orthogonal to each other. For any channel codes that fail this criteria, the apply function (downlink apply command) will not work.</p>

**3GPP W-CDMA HSPA Subsystem—Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:DLINK:HSDPa[1] | 2 | 3 | 4:HSPDSch:DATA****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1] | 2 | 3 | 4:HSPDSch:DATA
PN9 | FIX4 | "<file name>" | DSCH
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1] | 2 | 3 | 4:HSPDSch:DATA?
```

This command configures the HS-PDSCH data type.

**DSCH** This choice is the HS-DSCH selection that is supported on only HSDPA1. Selecting the DSCH choice for HSDPA2–4 will generate an error.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to [“File Overview” on page 668](#) for more information on files.

**\*RST** PN9

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 671](#).

**:DLINK:HSDPa[1] | 2 | 3 | 4:HSPDSch:DATA:FIX4****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1] | 2 | 3 | 4:HSPDSch:DATA:
FIX4 <val>
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1] | 2 | 3 | 4:HSPDSch:DATA:
FIX4?
```

This command sets the HS-PDSCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 671](#).



## **:DLINK:HSDPa:HSPDSch:DSCH:DATA**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HSPDSch:DSCH:DATA  
PN9 | FIX4 | "<file name>"  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HSPDSch:DSCH:DATA?
```

This command defines the HS-DSCH data type for HSDPA1. The HS-DSCH is not supported on HSDPA2–4.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to [“File Overview” on page 668](#) for more information on files.

**\*RST** PN9

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 671](#).

## **:DLINK:HSDPa:HSPDSch:DSCH:DATA:FIX4**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HSPDSch:DSCH:DATA:  
FIX4 <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HSPDSch:DSCH:DATA:FIX4?
```

This command defines the HS-DSCH repeating 4-bit binary data pattern for HSDPA1. The HS-DSCH is not supported on HSDPA2–4.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 671](#).

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:DLINK:HSDPa:HSPDSch:DSCH:IRBSize****Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HSPDSch:DSCH:IRBSize <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HSPDSch:DSCH:IRBSize?
```

This command sets the HS-DSCH IR buffer size per the HARQ process for HSDPA1. The HS-DSCH is not supported on HSDPA2–4.

**\*RST** 9600**Range** 960–28800**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.**:DLINK:HSDPa:HSPDsch:NCODE****Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HSPDsch:NCODE <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa:HSPDsch:NCODE?
```

This command sets number of codes for the HS-PDSCH on HSDPA1. HSDPA2–4 do not support multicodes.

**\*RST** 1**Range** 1–15**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

**:DLINK:HSDPa[1] | 2 | 3 | 4:HSPDsch:POWer****Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [ 1 ] | 2 | 3 | 4 :HSPDsch:
POWer <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [ 1 ] | 2 | 3 | 4 :HSPDsch:POWer?
```

This command sets the HS-PDSCH power level.

The variable <val> is expressed in decibels (dB).

**\*RST**                    -1.02000000E+001  
**Range**                    -40 to 0  
**Remarks**                Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:HSDPa[1]|2|3|4:HSPDsch:SFORmat**

**Supported**                E4438C with Option 419  
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch:SFORmat  
0|1  
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch:SFORmat?

This command sets the HS-PDSCH slot format.

0                            This sets the modulation type to QPSK.  
1                            This sets the modulation type to 16QAM.

**\*RST**                    1  
**Remarks**                Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:HSDPa[1]|2|3|4:HSPDsch[:STATe]**

**Supported**                E4438C with Option 419  
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch[:STATe]  
ON|OFF|1|0  
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch[:STATe]?

This command turns the selected HS-PDSCH on or off.

**\*RST**                    HSDPA1: 1    HSDPA2–4: 0  
**Remarks**                Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

The HS-PDSCH turns on only when the HS-SCCH is on. Turning off the HS-SCCH also turns off the active HS-PDSCH. To turn the HS-SCCH on or off, see “:DLINK:HSDPa[1]|2|3|4[:STATe]” on page 706.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])****:DLINK:HSDPa[1]|2|3|4:HSSCch:CCODE****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1]|2|3|4:HSSCch:CCODE <val>
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1]|2|3|4:HSSCch:CCODE?
```

This command sets the HS-SCCH channel code.

**\*RST** HSDPA1: 4 HSDPA2: 5 HSDPA3: 6 HSDPA4: 7**Range** 1–127**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

**:DLINK:HSDPa[1]|2|3|4:HSSCch:DATA****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1]|2|3|4:HSSCch:DATA
PN9|FIX4|"<file name>"|STD
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:HSDPa[1]|2|3|4:HSSCch:DATA?
```

This command sets the data type for the selected downlink HS-SCCH.

**STD** This choice configures the bit field as defined by the 3GPP standards.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “[File Overview](#)” on page 668 for more information on files.

**\*RST** STD**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

### **:DLINK:HSDPa[1] | 2 | 3 | 4:HSSCch:DATA:FIX4**

**Supported** E4438C with Option 419

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [1] | 2 | 3 | 4 :HSSCch:DATA:  
FIX4 <val>

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [1] | 2 | 3 | 4 :HSSCch:DATA:FIX4?

This command sets the HS-SCCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:HSDPa[1] | 2 | 3 | 4:HSSCch:POWER**

**Supported** E4438C with Option 419

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [1] | 2 | 3 | 4 :HSSCch:  
POWER <val>

[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [1] | 2 | 3 | 4 :HSSCch:POWER?

This command sets the HS-SCCH power level.

The variable <val> is expressed in decibels (dB).

**\*RST** –1.02000000E+001

**Range** –40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**3GPP W-CDMA HSPA Subsystem—Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:DLINK:HSDPa[1]|2|3|4:ITTI****Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [ 1 ] | 2 | 3 | 4 : ITTI <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [ 1 ] | 2 | 3 | 4 : ITTI?
```

This command sets the static inter-TTI pattern value for the selected HSDPA.

The variable <val> is expressed in subframes (one subframe = 2 ms).

**\*RST** 8**Range** 1–16

**Remarks** To use a static pattern, select FIX as the choice for the [:DLINK:HSDPa\[1\]|2|3|4:ITTI:PATTERN](#) command.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

**:DLINK:HSDPa[1]|2|3|4:ITTI:PATTERN****Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [ 1 ] | 2 | 3 | 4 : ITTI : PATTERN
FIX | "<file name>"
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [ 1 ] | 2 | 3 | 4 : ITTI : PATTERN?
```

This command selects which method sets the inter-TTI pattern for the selected HSDPA.

**FIX** This choice enables a static pattern. To configure the pattern, see “[:DLINK:HSDPa\[1\]|2|3|4:ITTI](#)”.

"<file name>" This variable represents an inter-TTI pattern file stored in signal generator memory. Creating and using a file provides the option of having a flexible inter-TTI pattern where you can vary the distance between HS-PDSCH transmissions. To create a file, use one or a combination of the following methods:

- To create a file internal to the software, use the inter-TTI user pattern editor.
- To create a file external to the software, use a text editor.

For more information, see the Signal Studio for 3GPP W-CDMA HSPA software online help.

The file name follows the form <project name>–ITTIx, where 'x' is the HSDPA number from one to four. The inter-TTI pattern must contain at least one bit, or the apply function (downlink apply command) will not work.

**\*RST**                   FIX

**Remarks**               Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:HSDPa:NHPRocess**

**Supported**             E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:HSDPa:NHPRocess <val>  
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:HSDPa:NHPRocess?
```

This command sets the HS-DSCH number of HARQ processes for HSDPA1. For HSDPA2–4, this parameter is fixed at one and is used only for HS-SCCH coding purposes.

**\*RST**                   4

**Range**                 1–8

**Remarks**               Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:HSDPa[1] | 2 | 3 | 4:RVParameter**

**Supported**             E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:HSDPa [1] | 2 | 3 | 4:RVParameter <val>  
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:HSDPa [1] | 2 | 3 | 4:RVParameter?
```

This command sets the HS-DSCH RV parameter. For HSDPA2–4, which do not support an HS-DSCH, this parameter is used only for HS-SCCH coding purposes.

**\*RST**                   0

**Range**                 0–7

**Remarks**               Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:DLINK:HSDPa[1]|2|3|4:UEID****Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [1] | 2 | 3 | 4 :UEID <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [1] | 2 | 3 | 4 :UEID?
```

This command sets the UEID.

**\*RST** HSDPA1: 0 HSDPA2: 1 HSDPA3: 2 HSDPA4: 3**Range** 0–65535**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.**:DLINK:HSDPa[1]|2|3|4[:STATE]****Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [1] | 2 | 3 | 4 [ :STATE ] ON | OFF |
1 | 0
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:HSDPa [1] | 2 | 3 | 4 [ :STATE ] ?
```

This command turns the selected downlink HSDPA channel on or off.

- |         |                                                                                                                                                                     |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ON (1)  | <ul style="list-style-type: none"> <li>• Turns on the HS-SCCH for the selected HSDPA.</li> <li>• Enables turning on the HS-PDSCH for the selected HSDPA.</li> </ul> |
| OFF (0) | <ul style="list-style-type: none"> <li>• Turns off the HS-SCCH for the selected HSDPA.</li> <li>• Turns off the active HS-PDSCH for the selected HSDPA.</li> </ul>  |

**\*RST** HSDPA1: 1 HSDPA2–4: 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

Refer to “:DLINK:HSDPa[1]|2|3|4:HSPDSch[:STATE]” on page 701 for turning the HS-PDSCH on or off.

An HSDPA consists of a HS-SCCH and a HS-PDSCH; the HS-DSCH is supported on only HSDPA1.



**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:CCODE**

**Supported**            E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :CCODE <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :CCODE?
```

This command sets the channel code for the selected downlink OCNS.

<b>*RST</b>	OCNS1: 2	OCNS2: 3	OCNS3: 4	OCNS4: 5
	OCNS5: 6	OCNS6: 7	OCNS7: 8	OCNS8: 9
	OCNS9: 10	OCNS10: 11	OCNS11: 12	OCNS12: 13
	OCNS13: 14	OCNS14: 15	OCNS15: 16	OCNS16: 17

**Range**                1–127

**Remarks**            Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:DATA**

**Supported**            E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :DATA PN9 | PN15
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :DATA?
```

This command configures the data pattern for the selected downlink OCNS.

**\*RST**                    PN9

**Remarks**            Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])****:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:MODulation****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:MODulation&lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:MODulation?

This command sets the modulation for the selected downlink OCNS.

**\*RST** QPSK**Range** QPSK | QAM16**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:POWer****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:POWer &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:POWer?

This command sets the power level for the selected downlink OCNS.

The variable &lt;val&gt; is expressed in units of dB.

**\*RST** OCNS1: -6 OCNS2: -8 OCNS3: -8 OCNS4: -10  
OCNS5: -7 OCNS6: -9 OCNS7-16: -10**Range** -40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SF****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SF&lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SF?

This command sets the spreading factor for the selected downlink OCNS.

**\*RST**                    128

**Range**                    16 | 128

**Remarks**                Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:SSCoffset**

**Supported**                E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:OCNS [ 1 ] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :SSCoffset <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:OCNS [ 1 ] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :SSCoffset?
```

This command sets the secondary scrambling code offset for the selected downlink OCNS.

**\*RST**                    0

**Range**                    0–15

**Remarks**                Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:TOFFset**

**Supported**                E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:OCNS [ 1 ] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :TOFFset <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:OCNS [ 1 ] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :TOFFset?
```

This command adjusts the timing offset for the OCNS.

**\*RST**                    OCNS1: 1      OCNS2: 2      OCNS3: 3      OCNS4: 4  
                           OCNS5: 5      OCNS6: 6      OCNS7: 7      OCNS8: 8  
                           OCNS9: 9      OCNS10: 10    OCNS11: 11    OCNS12: 12  
                           OCNS13: 13    OCNS14: 14    OCNS15: 15    OCNS16: 16

**Range**                    0–149

**Remarks**                Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16[:STATE]****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16[:STATE] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16[:STATE] ?

This command turns the selected OCNS on or off.

**\*RST** 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.**:DLINK:PCCPch:BCH:DATA****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:PCCPch:BCH:DATA PN9 | PN15 | FIX4 | "&lt;file name&gt;"

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:PCCPch:BCH:DATA?

This command sets the BCH data format that is transmitted on the P-CCPCH.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “[File Overview](#)” on page 668 for more information on files.**\*RST** FIX4**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 671.**:DLINK:PCCPch:BCH:DATA:FIX4****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:PCCPch:BCH:DATA:FIX4 &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:PCCPch:BCH:DATA:FIX4?

This command sets the BCH repeating 4-bit binary data pattern.

The variable &lt;val&gt; accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

<b>*RST</b>	0
<b>Range</b>	0–15
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:PCCPch:CCODE**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:PCCPch:CCODE <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:PCCPch:CCODE?
```

This command sets the P-CCPCH channel code.

<b>*RST</b>	+1
<b>Range</b>	0–255
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.  Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

### **:DLINK:PCCPch:POWer**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:PCCPch:POWer <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :DLINK:PCCPch:POWer?
```

This command sets the P-CCPCH power level.

The variable <val> is expressed in decibels (dB).

<b>*RST</b>	–5.30000000E+000
<b>Range</b>	–40 to 0
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])****:DLINK:PCCPch[:STATE]****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:PCCPch[:STATE] ON|OFF|1|0
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:PCCPch[:STATE]?
```

This command turns the P-CCPCH on or off.

**\*RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.**:DLINK:PICH:CCODE****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:PICH:CCODE <val>
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:PICH:CCODE?
```

This command sets the PICH channelization code.

**\*RST** +3**Range** 0–255**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the downlink apply command will not work.

**:DLINK:PICH:DATA****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:PICH:DATA PN9|PN15|FIX4|
"<file name>"
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:PICH:DATA?
```

This command sets the PICH data type.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “File Overview” on page 668 for more information on files.

**\*RST** PN9

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:PICH:DATA:FIX4**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:PICH:DATA:FIX4 <val>  
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:PICH:DATA:FIX4?
```

This command sets the PICH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

### **:DLINK:PICH:POWer**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:PICH:POWer <val>  
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:PICH:POWer?
```

This command sets the PICH power level.

The variable <val> is expressed in decibels (dB).

**\*RST** -8.300000000E+000

**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADio:WCDMa:HSPA[:BBG])**:DLINK:PICH[:STATe]****Supported** E4438C with Option 419

```
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:DLINK:PICH[:STATe] ON|OFF|1|0
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:DLINK:PICH[:STATe]?
```

This command turns the PICH on or off.

**\*RST** 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.**:DLINK:POLarity****Supported** E4438C with Option 419

```
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:DLINK:POLarity NORMal|INVerted|INVert
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:DLINK:POLarity?
```

This command selects the phase polarity of the downlink signal.

**NORMal** This choice selects normal polarity.**INVerted, INVert** These choices perform the same function, inverting the internal Q signal.**\*RST** NORM**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “:DLINK:APPLY” on page 671.**:DLINK:PSCH:POWer****Supported** E4438C with Option 419

```
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:DLINK:PSCH:POWer <val>
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:DLINK:PSCH:POWer?
```

This command sets the PSCH power level.

The variable &lt;val&gt; is expressed in decibels (dB).

**\*RST** -8.30000000E+000**Range** -40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.



### **:DLINK:PSCH[:STATe]**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:PSCH [ :STATe ] ON | OFF | 1 | 0  
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:PSCH [ :STATe ] ?
```

This command turns the PSCH on or off.

**\*RST** 1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “[:DLINK:APPLY](#)” on [page 671](#).

### **:DLINK:SCRamblecode**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:SCRamblecode <val>  
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:SCRamblecode ?
```

This command sets the downlink scramble code number.

**\*RST** +0

**Range** 0–511

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on [page 671](#).

### **:DLINK:SSCH:POWer**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:SSCH:POWer <val>  
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :DLINK:SSCH:POWer ?
```

This command sets the SSCH power level. The variable <val> is expressed in decibels (dB)

**\*RST** –8.30000000E+000

**Range** –40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on [page 671](#).

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:DLINK:SSCH[:STATE]****Supported** E4438C with Option 419[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:SSCH[:STATE] ON|OFF|1|0  
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:SSCH[:STATE]?

This command turns the SSCH on or off.

**\*RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.**:DLINK:TXDiversity****Supported** E4438C with Option 419[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:TXDiversity NONE|OANT1|OANT2  
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:DLINK:TXDiversity?

This command selects the downlink signal transmit diversity mode.

NONE This choice disables the transmit diversity mode.

OANT1 This choice selects the transmit diversity openloop antenna 1 mode.

OANT2 This choice selects the transmit diversity openloop antenna 2 mode.

**\*RST** NONE**Remarks** To configure both antennas (one and two) requires two ESGs.  
Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 671.**:LINK****Supported** E4438C with Option 419[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:LINK DOWN|UP  
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:LINK?

This command sets the uplink or downlink mode.

**\*RST** UP

## **:ULINK:APPLY**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:APPLY  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:APPLY?
```

This command applies changes to the channel setup and data for active physical and transport channels, immediately starting the channel coding generation process. A progress bar may appear on the ESG display indicating that the new signal parameters are being applied. Turning on the HSPA modulation format also applies the signal parameters.

The query response determines whether or not there is a need to execute the command. It returns the following responses:

0	Command execution is not required.
1	Command execution is required.

---

**NOTE** The query response is only valid while the HSPA format is active.

---

When there is a setting conflict (ESG reports an error) with the range values or coupled parameters, or both, executing the uplink apply command does not apply the new changes until the conflicts are resolved. After resolving the setting conflicts, execute the command to apply the new settings.

## **:ULINK:AWGN:CN**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:AWGN:CN <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:AWGN:CN?
```

This command sets the uplink in-band carrier to noise ratio (C/N) value using AWGN.

**\*RST** 0 dB

**Range** -30 to 30 dB

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [:ULINK:APPLY](#)”.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURce]:RADio:WCDMa:HSPA[:BBG])**:ULINK:AWGN[:STATe]**

**Supported** E4438C with Option 419

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:AWGN [ :STATe ] ON | OFF | 0 | 1
```

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:AWGN [ :STATe ] ?
```

This command turns the uplink AWGN on or off.

**\*RST** 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:BBReference:EXTeRnal:MRATe**

**Supported** E4438C with Option 419

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:BBReference:EXTeRnal:MRATe
```

```
X1 | X2 | X4
```

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:BBReference:EXTeRnal:MRATe?
```

This command configures the ESG, so it can accept an external baseband generator clock that is a multiple of the internal 3.84 MHz chip clock.

X1 This sets the ESG to accept an external clock rate identical to the chip clock.

X2 This sets the ESG to accept an external clock rate that is two times the rate of the chip clock.

X4 This sets the ESG to accept an external clock rate that is four times the rate of the chip clock.

**\*RST** X1

**:ULINK:BBReference:EXTeRnal[:SOURce]**

**Supported** E4438C with Option 419

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:BBReference [ :SOURce ] { INTernal } |
```

```
EXTeRnal
```

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:BBReference?
```

This command selects the baseband generator reference source for the radio uplink channel.

**\*RST** INT

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:CRATe**

**Supported** E4438C with Option 419  
 [:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:CRATe <val>  
 [:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:CRATe?

This command sets the chip rate (in units of samples).

**\*RST** 3.840000 Mcps  
**Range** .24000 - 4.224 Mcps

### **:ULINK:DPCCh:CCODE**

**Supported** E4438C with Option 419  
 [:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPCCh:CCODE?

This query returns the channelization code for the uplink DPCCH. The slot format determines the channelization code in accordance with the 3GPP standards.

### **:ULINK:DPCCh:DATA**

**Supported** E4438C with Option 419  
 [:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPCCh:DATA PN9 | PN15 | FIX4 | STD |  
 "<file name>"  
 [:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPCCh:DATA?

This command configures the uplink DPCCH data pattern.

**STD** This sets the DPCCH bit fields according to the 3GPP standards.  
 "<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to [“File Overview” on page 668](#) for more information on files.

**\*RST** STD

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 717](#).

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:ULINK:DPCCh:DATA:FIX4****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPCCh:DATA:FIX4 &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPCCh:DATA:FIX4?

This command sets the uplink DPCCH repeating 4-bit binary data pattern.

The variable &lt;val&gt; accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

**\*RST** 0**Range** 0–15**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.**:ULINK:DPCCh:FBI:PATtern****Supported** E4438C with Option 419[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPCCh:FBI:PATtern PN9|PN15|FIX|  
"<file name>"

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPCCh:FBI:PATtern?

This command configures the uplink DPCCH FBI pattern.

"&lt;file name&gt;" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to “File Overview” on page 668 for more information on files.

**\*RST** FIX**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.**:ULINK:DPCCh:FBI:PATtern:FIX****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPCCh:FBI:PATtern:FIX &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPCCh:FBI:PATtern:FIX?

This command sets the 30-bit FBI pattern for the uplink DPCCH.

The variable &lt;val&gt; accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

**3GPP W-CDMA HSPA Subsystem—Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**

<b>*RST</b>	+0
<b>Range</b>	0–1073741823
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:DPCCh:POWer**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPCCh:POWer <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPCCh:POWer?
```

This command sets the uplink DPCCH power level.

The variable <val> is expressed in decibels (dB)

<b>*RST</b>	–2.69000000E+000
<b>Range</b>	–40 to 0
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:DPCCh:SFORmat**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPCCh:SFORmat <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPCCh:SFORmat?
```

This command sets the uplink DPCCH slot format.

<b>*RST</b>	+0
<b>Range</b>	0–5
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.  The slot format determines the settings for other parameters in accordance with 3GPP standards.

**3GPP W-CDMA HSPA Subsystem—Option 419** ([:SOURCE]:RADio:WCDMa:HSPA[:BBG])**:ULINK:DPCCh:TFCI****Supported** E4438C with Option 419

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPCCh:TFCI &lt;val&gt;

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPCCh:TFCI?

This command sets the uplink DPCCH TFCI 10-bit data pattern.

The variable &lt;val&gt; accepts values in binary, hexadecimal, or decimal format; however, the query returns only decimal values.

**\*RST** +0**Range** 0–1023**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.**:ULINK:DPCCh:TPC:NSteps****Supported** E4438C with Option 419

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPCCh:TPC:NSteps &lt;val&gt;

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPCCh:TPC:NSteps?

This command sets the number of steps for the down and up (DUP) or up and down (UDOWn) TPC pattern selections.

The variable &lt;val&gt; is expressed in decibels (dB).

**\*RST** +1**Range** 1–80**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.**:ULINK:DPCCh:TPC:PATtern****Supported** E4438C with Option 419

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPCCh:TPC:PATtern

UDOWn|DUP|UALL|DALL|"&lt;file name&gt;"

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPCCh:TPC:PATtern?

This command configures the uplink DPCCH TPC pattern for increasing or decreasing, or increasing and decreasing the BTS power level.



**3GPP W-CDMA HSPA Subsystem—Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**

UDOWN	The TPC pattern repetitively steps up and down.
DUP	The TPC pattern repetitively steps down and up.
UALL	The TPC pattern consecutively steps up.
DALL	The TPC pattern consecutively steps down.
"<file name>"	This variable represents a power pattern file stored in signal generator memory. The pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to <a href="#">“File Overview” on page 668</a> for more information on files.
<b>*RST</b>	UDOW
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to <a href="#">“:ULINK:APPLY” on page 717</a> .  Each step in a TPC pattern signals an increase or decrease of 1 dB in the BTS output power level.

**:ULINK:DPCCh[:STATe]**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPCCh [ :STATe ] ON | OFF | 1 | 0
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPCCh [ :STATe ] ?
```

This command turns the uplink DPCCH on or off.

**\*RST** 1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 717](#).

**:ULINK:DPDCh:CCODE**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:CCODE?
```

This query returns the uplink DPDCH channelization code.

The slot format determines the channelization code in accordance with the 3GPP standards. See [“:ULINK:DPDCh:SFORmat” on page 729](#) for setting the slot format.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])****:ULINK:DPDCh:DATA**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:DATA PN9 | PN15 | FIX4 | DCH |
"<file name>"
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:DATA?
```

This command configures the uplink DPDCH data pattern.

**DCH** This choice selects the transport channel as the data source.

**"<file name>"** This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to [“File Overview” on page 668](#) for more information on files.

**\*RST** PN9

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 717](#).

**:ULINK:DPDCh:DATA:FIX4**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:DATA:FIX4 <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:DATA:FIX4?
```

This command sets the uplink DPDCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 717](#).

### **:ULINK:DPDCh:DCH[1]|2|3|4|5|6:BSIZE**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIo:WCDMa:HSPA [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :  
BSIZE <val>
```

```
[ :SOURCE ] :RADIo:WCDMa:HSPA [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :BSIZE?
```

This command sets the block size for the selected uplink DCH.

**\*RST** 20

**Range** 0–5000

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:ULINK:APPLY](#)” on page 717.

The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the ESG calculates the product of the block size and the number of blocks. If the product of these two parameters exceeds 200,000, the apply function (uplink apply command) will not work.

### **:ULINK:DPDCh:DCH[1]|2|3|4|5|6:CRC**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIo:WCDMa:HSPA [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :CRC  
0 | 8 | 12 | 16 | 24
```

```
[ :SOURCE ] :RADIo:WCDMa:HSPA [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :CRC?
```

This command sets the number of CRC bits for the selected uplink DCH.

**\*RST** 8

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:ULINK:APPLY](#)” on page 717.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:CTYPe****Supported** E4438C with Option 419[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:CTYPe  
HCONv | TCONv | TURBo | NONE

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:CTYPe?

This command selects the encoder type for the selected uplink DCH.

HCONv This choice selects the 1/2 rate convolutional encoder.

TCONv This choice selects the 1/3 rate convolutional encoder.

TURBo This choice selects the turbo coder.

NONE This choice selects no coding.

**\*RST** HCON**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.**:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA****Supported** E4438C with Option 419[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA PN9 |  
PN15 | FIX4 | "<file name>"

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA?

This command configures the data for the selected uplink DCH.

"&lt;file name&gt;" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to “File Overview” on page 668 for more information on files.

**\*RST** PN9**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:DPDCh:DCH[1]|2|3|4|5|6:DATA:FIX4**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA  
:FIX4 <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA  
:FIX4?
```

This command sets the repeating 4-bit binary data pattern for the selected uplink DCH.

The variable <val> accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 717](#).

### **:ULINK:DPDCh:DCH[1]|2|3|4|5|6:NBLocks**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :NBLocks  
<val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :NBLocks?
```

This command sets the number of blocks for the selected uplink DCH.

**\*RST** 1

**Range** 0–512

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 717](#).

The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the block size is multiplied by the number of blocks. If the product of these two parameters exceeds 200,000, the uplink apply command will not work.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURce]:RADio:WCDMa:HSPA[:BBG])**:ULINK:DPDCh:DCH[1]|2|3|4|5|6:RMATtribute****Supported** E4438C with Option 419

[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPDCh:DCH[1]|2|3|4|5|6:RMATtribute &lt;val&gt;

[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPDCh:DCH[1]|2|3|4|5|6:RMATtribute?

This command sets the rate matching attribute for the selected uplink DCH.

**\*RST** 1**Range** 1–256**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “:ULINK:APPLY” on [page 717](#).**:ULINK:DPDCh:DCH[1]|2|3|4|5|6:TTI****Supported** E4438C with Option 419

[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPDCh:DCH[1]|2|3|4|5|6:TTI 10|20|40|80

[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPDCh:DCH[1]|2|3|4|5|6:TTI?

This command sets the TTI for the selected uplink DCH.

The choices are expressed in millisecond (ms).

**\*RST** 10**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “:ULINK:APPLY” on [page 717](#).**:ULINK:DPDCh:DCH2|3|4|5|6[:STATe]****Supported** E4438C with Option 419

[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPDCh:DCH2|3|4|5|6[:STATe] ON|OFF|1|0

[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:DPDCh:DCH2|3|4|5|6[:STATe]?

This command turns the selected uplink DCH on or off; DCH1 is always on.

**\*RST** DCH 1: 1 DCH 2– 6: 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

The apply command will not work and the ESG will report an error if you turn on a DCH where lower numbered DCHs are off. For example, turning on DCH5 requires turning on DCH2–4. The reverse is true when turning off the DCHs.

### **:ULINK:DPDCh:POWer**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:POWer <val>  
[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:POWer?
```

This command sets the uplink DPDCH power level.

The variable <val> is expressed in decibels (dB).

**\*RST** +0.00000000E+00

**Range** –40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:DPDCh:SFORmat**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:SFORmat <val>  
[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :ULINK:DPDCh:SFORmat?
```

This command sets the uplink DPDCH slot format.

**\*RST** +2

**Range** 0– 6

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

The slot format determines the settings for other parameters in accordance with the 3GPP standards.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADio:WCDMa:HSPA[:BBG])**:ULink:DPDCh[:STATe]****Supported** E4438C with Option 419

```
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULink:DPDCh[:STATe] ON|OFF|1|0
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULink:DPDCh[:STATe]?
```

This command turns the uplink DPDCH on or off.

**\*RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULink:APPLY” on page 717.**:ULink:FClock:INTERval****Supported** E4438C with Option 419

```
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULink:FClock:INTERval 10|20|40|80|2560
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULink:FClock:INTERval?
```

This command selects the frame clock interval for the synchronization signal.

The frame clock interval is set in milliseconds (ms).

**\*RST** 80**Remarks** Ensure that the selected interval is equal to or longer than the longest transport channel TTI period.

This command is applicable only when FClock is the sync source selection. See “:ULink:SYNC[:SOURCE]” on page 755 for selecting the sync source.

**:ULink:FClock:POLarity****Supported** E4438C with Option 419

```
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULink:FClock:POLarity POSitive|
NEGative
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULink:FClock:POLarity?
```

This command sets the frame clock polarity.

**POSitive** This choice sets the clock gate to trigger when the signal is high.**NEGative** This choice sets the clock gate to trigger when the signal is low.**\*RST** POS**Remarks** This command is applicable only when FClock is the sync source selection. See “:ULink:SYNC[:SOURCE]” on page 755 for selecting the sync source.



## **:ULINK:FILTer**

**Supported** E4438C with Option 419

```
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:FILTer RNYQuist|NYQuist|
GAUSSian|RECTangle|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|
"<user FIR>"
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:FILTer?
```

This command selects the uplink filter type.

IS95	This filter meets the criteria of the IS-95 standard.
IS95_EQ	This filter is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard and is best suited for IS-95 baseband filtering.
IS95_MOD	This filter meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This filter is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
UGGaussian	This is a GSM Gaussian filter with a fixed BbT value of 0.300.
AC4Fm	This is a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
"<user FIR>"	This variable represents any FIR filter file stored in signal generator memory. Refer to <a href="#">“File Overview” on page 668</a> for more information on files.
<b>*RST</b>	RNYQ
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to <a href="#">“:ULINK:APPLY” on page 851</a> .

## **:ULINK:FILTer:ALPHa**

**Supported** E4438C with Option 419

```
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:FILTer:ALPHa <val>
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:FILTer:ALPHa?
```

This command sets the uplink Nyquist or root Nyquist filter alpha value.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADio:WCDMa:HSPA[:BBG])

<b>*RST</b>	+2.20000000E–001
<b>Range</b>	0–1
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Executing this command while a filter other than Nyquist or root Nyquist is selected changes the parameter value, but it is not used by the signal generator until one of the Nyquist filters is selected. Refer to <a href="#">“:ULINK:APPLY” on page 717</a> .

**:ULINK:FILTer:BBT**

<b>Supported</b>	E4438C with Option 419
	[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:FILTer:BBT <val>
	[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:FILTer:BBT?

This command sets the uplink Gaussian filter BbT value.

<b>*RST</b>	+5.00000000E–001
<b>Range</b>	0–1
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to <a href="#">“:ULINK:APPLY” on page 717</a> .  Executing this command while a filter other than the Gaussian filter is selected changes the parameter value, but it is not used by the signal generator until the Gaussian filter is selected.

**:ULINK:FILTer:CHANnel**

<b>Supported</b>	E4438C with Option 419
	[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:FILTer:CHANnel EVM ACP
	[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:FILTer:CHANnel?

This command optimizes an uplink filter for minimized EVM or for minimized ACP.

<b>EVM</b>	This choice provides the most ideal passband.
<b>ACP</b>	This choice improves stopband rejection for the root Nyquist and Nyquist filters.
<b>*RST</b>	EVM
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to <a href="#">“:ULINK:APPLY” on page 717</a> .  To change the filter selection, refer to <a href="#">“:ULINK:FILTer” on page 731</a> .

### **:ULINK:FOFFset**

**Supported** E4438C with Option 419

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:FOFFset <val>  
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:FOFFset?
```

This command sets the CFN starting frame within the SFN by setting a frame offset relative to SFN zero.

**\*RST** 0

**Range** 0–255

**Remarks** The command adds delays to the internal frame counter by specifying the starting frame number count. When the frame offset (FOFFset) is set to 0, the frame number starts at the system sync trigger. When the FOFFset is set to 2, the signal generator triggers two frames after the SFN RST. For additional information, refer to 3GPP TS25.402 for SFN and CFN relationship.

### **:ULINK:HCONfig**

**Supported** E4438C with Option 419

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HCONfig 0|1  
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HCONfig?
```

This command sets HS-DSCH to be configured.

**\*RST** 1

### **:ULINK:HSDPcch:APATtern**

**Supported** E4438C with Option 419

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSDPcch:APATtern NONE|ACK_ALL|  
"<file name>"  
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSDPcch:APATtern?
```

This command sets the HS-DPCCH ACK/NACK transmission pattern for each of the 1280 subframes that make up the pattern.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])

NONE	This choice sets all subframes to DTX.
"<file name>"	<p>This variable represents an ACK pattern file stored in signal generator memory. The file must contain 2,560-bits of data (2-bits per subframe) or the apply function (uplink apply command) will not work.</p> <ul style="list-style-type: none"> <li>• An ACK response is represented by 00.</li> <li>• A NACK response is represented by 01.</li> <li>• DTX is represented by 10.</li> </ul> <p>Enter the 2,560-bits into the file as a binary string.</p> <p>Refer to <a href="#">“File Overview” on page 668</a> for more information on files.</p>
*RST	ACK_ALL
Remarks	Setting the command parameter while the signal is active also requires executing the apply command. Refer to <a href="#">“:ULINK:APPLY” on page 717</a> .

**:ULINK:HSDPcch:APOWer**

Supported	E4438C with Option 419
	[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSDPcch:APOWer <val> [:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSDPcch:APOWer?
	This command sets the HS-DPCCH ACK part power level.
	The variable <val> is expressed in decibels (dB).
*RST	-2.69000000E+000
Range	-40 to 0
Remarks	Setting the command parameter while the signal is active also requires executing the apply command. Refer to <a href="#">“:ULINK:APPLY” on page 717</a> .

**:ULINK:HSDPcch:CCODE**

Supported	E4438C with Option 419
	[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSDPcch:CCODE?
	This query returns the HS-DPCCH channelization code.

### **:ULINK:HSDPcch:CPATtern**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSDPcch:CPATtern NONE |
"<file name>"
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSDPcch:CPATtern?
```

This command sets the HS-DPCCH CQI transmission pattern for each of the 1280 subframes that make up the pattern.

NONE This choice sets all subframes to DTX.

"<file name>" This variable represents a bit file stored in signal generator memory. The file must contain 10,240-bits of data (8-bits per subframe) or the apply function (uplink apply command) will not work.

- A CQI response range is one to thirty using 8-bits, 00000001 to 00011110.
- DTX is represented by 11111111.

Enter the 10,240-bits into the file as a binary string.

Refer to [“File Overview” on page 668](#) for more information on files.

**\*RST** NONE

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 717](#).

### **:ULINK:HSDPcch:CPOWer**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSDPcch:CPOWer <val>
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSDPcch:CPOWer?
```

This command sets the HS-DPCCH CQI part power level.

The variable <val> is expressed in decibels (dB).

**\*RST** -2.69000000E+000

**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 717](#).

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:ULINK:HSDPcch:NPOWer****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSDPcch:NPOWer &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSDPcch:NPOWer?

This command sets the HS-DPCCH NACK part power level. The variable <val> is expressed in decibels (dB).

**\*RST** -2.69000000E+000**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:HSDPcch:SFDelay****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSDPcch:SFDelay &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSDPcch:SFDelay?

This command sets the HS-DPCCH subframe delay. The variable <val> is expressed in units of 256 chips.

**\*RST** 0**Range** 0–150

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:HSDPcch[:STATe]****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSDPcch[:STATe] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSDPcch[:STATe]?

This command turns the HS-DPCCH on or off.

**\*RST** 1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:HSUPa:EDPCch:DATA**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPCch:DATA  
PN9 | FIX4 | STD | "<file name>"  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPCch:DATA?
```

This command sets the data type for the selected downlink E-DPCCH.

**STD** This choice configures the bit field as defined by the 3GPP standards.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function will not work.

**\*RST** STD

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:HSUPa:EDPCch:DATA:FIX4**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPCch:DATA:FIX4 <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPCch:DATA:FIX4?
```

This command sets the data type for E-DPCCH repeating 4-bit binary pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:HSUPa:EDPCch:POWer**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPCch:POWer <val>  
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPCch:POWer?
```

This command sets the E-DPCCH power level. The variable <val> is expressed in decibels (dB).

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])

<b>*RST</b>	–2.69000000E+000
<b>Range</b>	–40 to 0 dB
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:HSUPa:EDPCch[:STATE]**

<b>Supported</b>	E4438C with Option 419
	[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPCch [ :STATE ] ON   OFF   1   0
	[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPCch [ :STATE ] ?

This command turns the E-DPCCH on or off.

<b>*RST</b>	1
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:HSUPa:EDPDch:DATA**

<b>Supported</b>	E4438C with Option 419
	[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPDch:DATA:
	PN9   FIX4   STD   "<file name>"
	[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPDch:DATA?

This command sets the data type for the selected downlink E-DPDCH.

<b>STD</b>	This choice configures the bit field as defined by the 3GPP standards.
<b>"&lt;file name&gt;"</b>	This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function will not work.
<b>*RST</b>	STD

**:ULINK:HSUPa:EDPDch:DATA:FIX4**

<b>Supported</b>	E4438C with Option 419
	[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPDch:DATA:FIX4 <val>
	[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPDch:DATA?

This command sets the data type for E-DPDCH repeating 4-bit binary pattern.



The variable <val> accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

<b>*RST</b>	0
<b>Range</b>	0–15
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:HSUPa:EDPDch:EDCH:DATA**

**Supported** E4438C with Option 419

```
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:EDPDch:DATA PN9|FIX4|STD|
"<file name>"
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:EDPDch:DATA?
```

This command defines the E-DCH data type.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function will not work.

<b>*RST</b>	PN9
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:HSUPa:EDPDch:EDCH:DATA:FIX4**

**Supported** E4438C with Option 419

```
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:EDPDch:EDCH:DATA:FIX4 <val>
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:EDPDch:EDCH:DATA:FIX4?
```

This command sets the E-DPDCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

<b>*RST</b>	0
<b>Range</b>	0–15
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:HSUPa:EDPDch:MCCodes**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPDch:MCCodes
SF256 | SF128 | SF64 | SF32 | SF16 | SF8 | SF4 | SF4SF4 | SF2SF2 | SF4SF4SF2SF2
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:EDPDch:MCCodes?
```

This command sets the maximum channelization codes for E-DPDCH.

SF256	Set the spreading factor to 256 and the number of E-DPDCH to 1
SF128	Set the spreading factor to 128 and the number of E-DPDCH to 1
SF64	Set the spreading factor to 64 and the number of E-DPDCH to 1
SF32	Set the spreading factor to 32 and the number of E-DPDCH to 1
SF16	Set the spreading factor to 16 and the number of E-DPDCH to 1
SF8	Set the spreading factor to 8 and the number of E-DPDCH to 1
SF4	Set the spreading factor to 4 and the number of E-DPDCH to 1
SF4SF4	Set the spreading factor to 4 and the number of E-DPDCH to 2
SF2SF2	Set the spreading factor to 2 and the number of E-DPDCH to 2
SF4SF4SF2SF2	Set the spreading factor to 4 for 2 E-DPDCHs and spreading factor to 2 for 2 E-DPDCHs
<b>*RST</b>	SF4SF4SF2SF2

**Remarks** The maximum channelization codes are used together with the E-DCH configuration, and PL-non-MAX to automatically calculate the physical channel codes according to TS 25.212 (4.8.4.1).

**:ULINK:HSUPa:EDPDch:PLNMax**

**Supported** E4438C with Option 419

```
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:EDPDch:PLNMax <val>
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:EDPDch:PLNMax?
```

This command sets the PL non-max value for the E-DPDCH used in the determination of SF and number of E-DPDCHs as defined in TS 25.212 (4.8.4.1) for compressed mode.

**\*RST** 0.44

**Resolution** 0.04

**Range** 0.44 to 1.0

**:ULINK:HSUPa:EDPDch:POWer**

**Supported** E4438C with Option 419

```
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:EDPDch:POWer <val>
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:EDPCch:POWer?
```

This command sets the E-DPDCH power level. The variable <val> is expressed in decibels (dB).

**\*RST** +0.00000000E+001

**:ULINK:HSUPa:EDPDch:SNPHchs**

**Supported** E4438C with Option 419

```
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:EDPDch:SNPHchs
SF256|SF128|SF64|SF32|SF16|SF8|SF4|SF4SF4|SF2SF2|SF4SF4SF2SF2|AUTO
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:EDPCch:SNPHchs?
```

This command sets the SF and number of E-DPDCHs to configure the physical channel manually. To configure the physical channel as defined in TS 25.212 (4.8.4.1), refer to [“:ULINK:HSUPa:EDPDch:MCCodes” on page 740](#).

SF256	Set the spreading factor to 256 and the number of E-DPDCH to 1
SF128	Set the spreading factor to 128 and the number of E-DPDCH to 1
SF64	Set the spreading factor to 64 and the number of E-DPDCH to 1
SF32	Set the spreading factor to 32 and the number of E-DPDCH to 1
SF16	Set the spreading factor to 16 and the number of E-DPDCH to 1
SF8	Set the spreading factor to 8 and the number of E-DPDCH to 1

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SF4	Set the spreading factor to 4 and the number of E-DPDCH to 1
SF4SF4	Set the spreading factor to 4 and the number of E-DPDCH to 2
SF2SF2	Set the spreading factor to 2 and the number of E-DPDCH to 2
SF4SF4SF2SF2	Set the spreading factor to 4 for 2 E-DPDCHs and spreading factor to 2 for 2 E-DPDCHs
AUTO	Calculate the spreading factor and number of codes automatically from maximum channelization codes, PL non-max, E-TFCI table selection, and E-TFCI index as defined in TS 25.212 (4.8.4.1).
<b>*RST</b>	SF4
Remarks	ULINK:TGAP:PSI[1]:PS can be set ACTIVE only when the :ULINK:HSUPa:EDPDch:SNPHchs is AUTO.

**:ULINK:HSUPa:EDPDch[:STATE]**

**Supported** E4438C with Option 419

```
[ :SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : ULINK : HSUPa : EDPDch [ : STATE ]
[ : SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : ULINK : HSUPa : EDPCch [ : STATE ] ?
```

This command turns the E-DPDCH on or off.

**\*RST** 1

**:ULINK:HSUPa:ETABLE**

**Supported** E4438C with Option 419

```
[ : SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : ULINK : HSUPa : EDPDch : ETABLE 0 | 1
[ : SOURCE ] : RADIO : WCDMA : HSPA [ : BBG ] : ULINK : HSUPa : EDPCch : ETABLE ?
```

This command selects the E-TFCI tables as specified in E-TFCI Table Selection, TS 25.321 Annex B.

**\*RST** 1

**:ULINK:HSUPa:ETFCi**

**Supported**            E4438C with Option 419  
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:ETFCi <val>  
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:ETFCi?

This command sets the E-TFC index 7-bit pattern.

**\*RST**                    41  
**Range**                    0–127 if E-TFCI Table = 0 and TTI = 2 ms  
                              0–125 if E-TFCI Table = 1 and TTI = 2 ms  
                              0–127 if E-TFCI Table = 0 and TTI = 10 ms  
                              0–120 if E-TFCI Table = 1 and TTI = 10 ms

**:ULINK:HSUPa:HARQ:APATtern**

**Supported**            E4438C with Option 419  
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:HARQ:APATtern  
ACK\_ALL|EXtErnal|"<file name>"  
[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:HARQ:APATtern?

This command sets a simulated Node B ACK/NACK pattern that determines HSUPA's HARQ response.

**ACK\_ALL**                This choice configures 1,280 subframes (if TTI=2ms) or 1,280 frames (if TTI=10ms) for a simulated ACK only response. For a long transmission, up to 18000 (sub)frames can be configured.

“<file name>”            This variable represents an ACK pattern file stored in signal generator memory. Create this file either by using the HARQ ACK/NACK pattern Data Type Entry window and download the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

- An ACK response is represented by 0.
- A NACK response is represented by 1.

In the file, do not use delimiters between (sub)frames; enter (sub)frame bits as a binary string. When creating a pattern, you can determine the number of active (sub)frames from 1 to 1,280. The (sub)frames are numbered 0 to 1,279.

**External**                This choice selects specifies an external ACK/NACK pattern.  
**\*RST**                    ACK\_ALL

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])****:ULINK:HSUPa:HARQ:APATtern[:EXternal]:DELay****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:HARQ:APATtern[:EXternal]:DELay &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:HARQ:APATtern[:EXternal]:DELay?

This command sets the amount of time between the head of a transmitted process and the sampling point of the external ACK/NACK signal corresponding with the process.

The variable <val> is expressed in chips with a resolution of 256.

**\*RST** 7680**:ULINK:HSUPa:HARQ:APATtern[:EXternal]:INPut****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:HARQ:APATtern[:EXternal]:INPut ALTP|BGAT|PTR2

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:HARQ:APATtern[:EXternal]:INPut?

This command sets the amount of time between the head of a transmitted process and the sampling point of the external ACK/NACK signal corresponding with the process.

The variable <val> is expressed in chips with a resolution of 256.

ALTP This choice sets the input port of the external signal to ALT PWR IN.

BGAT This choice sets the input port of the external signal to BURST GATE IN.

PTR2 This choice sets the input port of the external signal to PATT TRIG IN 2.

**\*RST** BGAT

### **:ULINK:HSUPa:HARQ:APATtern[:EXTeRnal]:POLarity**

**Supported** E4438C with Option 419

```
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:HARQ:APATtern[:EXTeRnal]:  
POLarity POSitive|NEGative  
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:HARQ:APATtern[:EXTeRnal]:  
POLarity?
```

This command sets the ACK/NACK signal polarity.

**POSitive** This choice sets the pattern signal to ACK when the external signal is low and NACK when the external signal is high.

**NEGative** This choice sets the pattern signal to ACK when the external signal is high and NACK when the external signal is low.

**\*RST** POS

### **:ULINK:HSUPa:HARQ:MNRTrans**

**Supported** E4438C with Option 419

```
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:HARQ:MNRTrans <val>  
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:HARQ:MNRTrans?
```

This command sets the maximum number of retransmissions.

**Range** 0–15

**\*RST** 15

### **:ULINK:HSUPa:HARQ[:MODE]**

**Supported** E4438C with Option 419

```
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:HARQ[:MODE] NONE |  
IREdundancy|CCOMbining  
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:HARQ[:MODE] ?
```

This command sets the HARQ mode to use None, Incremental Redundancy, or Chase Combining for retransmission.

**Incr Redundancy** This choice sends different coded bits instead of the same coded packets, when a NACK is received.

**Chase Combining** This choice provides UE feedback by sending the same coded packet again upon reception of a NACK signal.

**\*RST** NONE

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**:ULINK:HSUPa:HARQ:HBIT**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:HARQ:HBIT
HAPPY|NHAPPY| "<file name>"
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:HARQ:HBIT?
```

This command sets the HSUPA happy bit.

**HAPPY** This choice sets the happy bit to happy.

**NHAPPY** This choice sets the happy bit to not happy.

“<file name>” This variable represents a happy bit pattern file stored in signal generator memory. Create this file either by using the Happy Bit Pattern Data Type Entry window and download the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

- A not happy response is represented by 0.
- A happy response is represented by 1.

**\*RST** HAPPY

**:ULINK:HSUPa:HPROcess**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:HPROcess [0] | 1 | 2 | 3 | 4 | 5 | 6 | 7
[ :STATE ] ON|OFF| 1 | 0
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:HPROcess [0] 1 | 2 | 3 | 4 | 5 | 6 | 7
[ :STATE ] ?
```

This command turns the uplink HSUPA Hybrid ARQ Process on or off for the selected HARQ process.

**1|ON** TX the process #n

**2|OFF** DTX the process #n

**\*RST** 1



### **:ULINK:HSUPa:RSN**

**Supported** E4438C with Option 419

[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSUPa:RSN 0 | 1 | 2 | 3

[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSUPa:RSN?

This command sets the HSUPA retransmission sequence number (RSN) when HARQ mode is not selected.

**\*RST** 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:HSUPa:RVIndex**

**Supported** E4438C with Option 419

[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSUPa:RVIndex 0 | 1 | 2 | 3

[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSUPa:RVIndex?

This command sets the RV control when the HARQ mode is not selected.

**\*RST** 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:HSUPa:TFC:EPATtern[:EXternal]:DElay**

**Supported** E4438C with Option 419

[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSUPa:TFC:EPATtern [ :EXternal ] :  
DElay <val>

[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:HSUPa:TFC:EPATtern [ :EXternal ] :  
DElay?

This command sets the amount of time between the head of a transmitted process and the sampling point of the external signal corresponding with the E-TFCI pattern control.

<val> The variable <val> is expressed in chips with a resolution of 256.

**\*RST** 7680

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])

<b>Range</b>	0 to 153344 (for TTI = 10 ms) 0 to 61184 (for TTI = 2 ms)
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:HSUPa:TFC:EPATtern[:EXtErnal]:INPut**

<b>Supported</b>	E4438C with Option 419
	[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:TFC:EPATtern [ :EXtErnal ] : INPut ALTP BGAT PTR2
	[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:TFC:EPATtern [ :EXtErnal ] : INPut?

This command selects the input port for the external TFC E-TFCI pattern signal.

<b>ALTP</b>	This choice sets the input port of the external signal to ALT PWR IN.
<b>BGAT</b>	This choice sets the input port of the external signal to BURST GATE IN.
<b>PTR2</b>	This choice sets the input port of the external signal to PATT TRIG IN 2.
<b>*RST</b>	BGAT
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:HSUPa:TFC:EPATtern[:EXtErnal]:POLarity**

<b>Supported</b>	E4438C with Option 419
	[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:TFC:EPATtern [ :EXtErnal ] : POLarity POSitive NEGative
	[ :SOURCE ] :RADIo:WCDMA:HSPA [ :BBG ] :ULINK:HSUPa:TFC:EPATtern [ :EXtErnal ] : POLarity?

This command sets the external E-TFCI pattern control signal polarity.

<b>POSitive</b>	This choice sets the pattern signal to MAIN when the external signal is low and ALT when the external signal is high.
<b>NEGative</b>	This choice sets the pattern signal to MAIN when the external signal is high and ALT when the external signal is low.
<b>*RST</b>	POS
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:HSUPa:TFC:EPATtern**

**Supported** E4438C with Option 419

```
[ :SOURce] :RADio:WCDMa:HSPA [ :BBG] :ULINK:HSUPa:TFC:EPATtern
MAIN|EXTeRnal| "<file name>"
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:TFC:EPATtern?
```

This command sets the MAIN and ALT TFC pattern to be used.

**MAIN\_ALL** This choice configures all subframes for a simulated MAIN only response.

**EXT** This choice selects an external signal to control the data pattern.

"<file name>" This variable represents a MAIN/ALT pattern file stored in signal generator memory. Create this file either by using the TFC pattern Data Type Entry window and download the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

- A MAIN response is represented by 0.
- An ALT response is represented by 1

In the file, do not use delimiters between (sub)frames; enter (sub)frame bits as a binary string.

**\*RST** MAIN

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:ULINK:APPLY” on page 717](#).

### **:ULINK:HSUPa:TFC[:ALT]:EDPCch:POWer**

**Supported** E4438C with Option 419

```
[ :SOURce] :RADio:WCDMa:HSPA [ :BBG] :ULINK:HSUPa:TFC [ :ALT] :EDPCch:
POWer <val>
[:SOURce]:RADio:WCDMa:HSPA[:BBG]:ULINK:HSUPa:TFC[:ALT]:EDPCch:POWer?
```

This command sets the E-DPCCH power level of the alternate TFC setting.

The variable <val> is expressed in decibels (dB).

**\*RST** -2.69000000E+000

**Range** -40 to 0

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])****:ULINK:HSUPa:TFC[:ALT]:EDPDch:EDCH:DATA****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TFC[:ALT]:EDPDch:EDCH:DATA
PN9|FIX4|"<file name>"
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TFC[:ALT]:EDPDch:EDCH:DATA?
```

This command defines the alternate E-DCH data type.

**EDCH** This choice selects E-DCH for data.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function will not work.

**\*RST** PN9

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:HSUPa:TFC[:ALT]:EDPDch:EDCH:DATA:FIX4****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TFC[:ALT]:EDPDch:EDCH:DATA:
FIX4 <val>
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TFC[:ALT]:EDPDch:EDCH:DATA:
FIX4?
```

This command defines the E-DCH repeating 4-bit binary data pattern when the alternate TFC setting is used.

The variable <val> accepts values in binary, hexadecimal, or decimal format; however, the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:HSUPa:TFC[:ALT]:EDPDch:POWer**

**Supported** E4438C with Option 419

```
[ :SOURce] :RADio:WCDMa:HSPA [ :BBG] :ULINK:HSUPa:TFC [ :ALT] :EDPDch:
POWer <val>
[ :SOURce] :RADio:WCDMa:HSPA [ :BBG] :ULINK:HSUPa:TFC [ :ALT] :EDPDch:POWer?
```

This command sets the E-DPDCH power level of the alternate TFC setting.

The variable <val> is expressed in decibels (dB).

**\*RST** 0.00000000E+00

**Range** -40 to 0

**:ULINK:HSUPa:TFC[:ALT]EDPDch:SNPHchs**

**Supported** E4438C with Option 419

```
[ :SOURce] :RADio:WCDMa:HSPA [ :BBG] :ULINK:HSUPa:TFC [ :ALT] :EDPDch:SNPHchs
SF256 | SF128 | SF64 | SF32 | SF16 | SF8 | SF4 | SF4SF4 | SF2SF2 | SF4SF4SF2SF2
[ :SOURce] :RADio:WCDMa:HSPA [ :BBG] :ULINK:HSUPa:TFC [ :ALT] :EDPDch:SNPHchs?
```

This command sets the SF and number of E-DPDCHs of the TFC alternate setting.

SF256	Set the spreading factor to 256 and the number of E-DPDCH to 1
SF128	Set the spreading factor to 128 and the number of E-DPDCH to 1
SF64	Set the spreading factor to 64 and the number of E-DPDCH to 1
SF16	Set the spreading factor to 16 and the number of E-DPDCH to 1
SF8	Set the spreading factor to 8 and the number of E-DPDCH to 1
SF4	Set the spreading factor to 4 and the number of E-DPDCH to 1
SF4SF4	Set the spreading factor to 4 and the number of E-DPDCH to 2
SF2SF2	Set the spreading factor to 2 and the number of E-DPDCH to 2
SF4SF4SF2SF2	Set the spreading factor to 4 for 2 E-DPDCHs and the spreading factor to 2 for 2 E-DPDCHs
<b>*RST</b>	SF4

**:ULINK:HSUPa:TFC[:ALT]:ETABle****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TFC[:ALT]:ETABle 0|1
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TFC[:ALT]:ETABle?
```

This command sets the E-TFCI table selection of the TFC alternate setting as shown in the E-TFCI Table Selection, TS 25.321 Annex B.

0 This choice selects Table 0.

1 This choice selects Table 1.

**\*RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.**:ULINK:HSUPa:TFC[:ALT]:ETFCI****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TFC[:ALT]:ETFCI <value>
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TFC[:ALT]:ETFCI?
```

This command sets the E-TFC index 7-bit pattern for the TFC alternate setting. The TTI value controls the E-TFCI value as described in range field below. If a value exceeds its range, the value is clipped to the allowed maximum value for the current configuration.

**\*RST** 41

**Range** 0-127 if E-TFCI Table = 0  
 0-125 if E-TFCI Table = 1 and TTI = 2 ms  
 0-120 if E-TFCI Table = 1 and TTI = 10 ms

**:ULINK:HSUPa:TTI****Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TTI 2|10
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TTI?
```

This command sets the static TTI value for the HSUPA.

**\*RST** 10

### **:ULINK:HSUPa[:STATe]**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIo:WCDMa:HSPA [ :BBG ] :ULINK:HSUPa: [ :STATe ] ON | OFF | 1 | 0  
[ :SOURCE ] :RADIo:WCDMa:HSPA [ :BBG ] :ULINK:HSUPa: [ :STATe ] ?
```

This command turns the uplink HSUPA state to ON | 1 or OFF | 0.

**\*RST** 1

### **:ULINK:NMDPdch**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIo:WCDMa:HSPA [ :BBG ] :ULINK:NMDPdch 0 | 1  
[ :SOURCE ] :RADIo:WCDMa:HSPA [ :BBG ] :ULINK:NMDPdch?
```

This command sets the Nmax-dpdch (maximum number of simultaneous uplink DPDCH).

**\*RST** 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:ULINK:APPLY](#)” on page 717.

### **:ULINK:POLarity**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIo:WCDMa:HSPA [ :BBG ] :ULINK:POLarity NORMAl | INVerted | INVert  
[ :SOURCE ] :RADIo:WCDMa:HSPA [ :BBG ] :ULINK:POLarity?
```

This command selects the phase polarity of the uplink signal.

**NORMAl** This choice selects normal polarity.

**INVerted, INVert** These choices perform the same function, inverting the internal Q signal.

**\*RST** NORM

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:ULINK:APPLY](#)” on page 717.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADio:WCDMa:HSPA[:BBG])**:ULINK:SCRamblecode****Supported** E4438C with Option 419

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:SCRamblecode &lt;val&gt;

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:SCRamblecode?

This command sets the scramble code.

**\*RST** +0**Range** 0–16777215**:ULINK:SDElay****Supported** E4438C with Option 419

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:SDElay &lt;val&gt;

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:SDElay?

This command sets the uplink DPCH delay, measured in slots.

**\*RST** +0**Range** 0–119**Remarks** Calculate the delay between downlink and uplink DPCH, in slots, using the following formulas. Total Delay = (T0) + (TOFFset) + ((SDElay) \* 2560 chips)

- T0 = 1024 chips
- TOFFset is set by “:ULINK:TOFFset” on page 758

Slot Delay = (Total Delay - T0) / 2560

**:ULINK:SFNRst:POLarity****Supported** E4438C with Option 419

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:SFNRst:POLarity POSitive|

NEGative

[:SOURCE]:RADio:WCDMa:HSPA[:BBG]:ULINK:SFNRst:POLarity?

This command sets the polarity of the system frame number reset signal for the uplink synchronization source.



POSitive	This choice sets the signal to trigger when the trigger signal is high.
NEGative	This choice sets the signal to trigger when the trigger signal is low.
<b>*RST</b>	POS
<b>Remarks</b>	This command is applicable only when SFN_RST is the sync source selection. See “:ULINK:SYNC[:SOURCE]” on page 755 for selecting the sync source.

### **:ULINK:SYNC:MODE**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:SYNC:MODE SINGLE | CONTInuous
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:SYNC:MODE?
```

This command selects the uplink frame synchronization triggering mode.

SINGle	The signal generator, once triggered, generates frames based on the reference clock.
CONTInuous	The signal generator continuously aligns the frame timing with the frame sync trigger signal.
<b>*RST</b>	SING

### **:ULINK:SYNC[:SOURCE]**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:SYNC [ :SOURCE ] SFN_RST | FCLock
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:SYNC [ :SOURCE ] ?
```

This command selects the uplink frame synchronization source type.

SFN_RST	The uplink signal triggers on the system frame number reset signal.
FCLock	The uplink signal triggers on the frame clock.
<b>*RST</b>	FCL

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])****:ULINK:TGAP:PSI[1]:CFN****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TGAP:PSI[1]:CFN &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TGAP:PSI[1]:CFN?

This command sets the connection frame number (CFN) for the first radio frame of the first pattern 1.

**\*RST** 0**Range** 0–255**Remarks** In the signal generator, CFN is counted internally, relative to the system sync signal.**:ULINK:TGAP:PSI[1]:D****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TGAP:PSI[1]:D &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TGAP:PSI[1]:D?

This command sets the transmission gap distance. It specifies the number of slots between the starting slots of two consecutive transmission gaps within a transmission gap pattern. A value of 0 indicates that there is only one transmission gap within the transmission gap pattern.

**\*RST** 0**Range** 0, 15–269**:ULINK:TGAP:PSI[1]:L1****Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TGAP:PSI[1]:L1 3|4|5|7|10|14

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TGAP:PSI[1]:L1?

This command specifies the length of the first transmission gap (TGL1). The length is expressed in number of slots.

**\*RST** +7

### **:ULINK:TGAP:PSI[1]:L2**

**Supported** E4438C with Option 419

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK: TGAP: PSI [1] :L2 0 | 3 | 4 | 5 | 7 | 10 | 14  
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK: TGAP: PSI [1] :L2?
```

This command specifies the length of the second transmission gap (TGL2). When the value is set to 0, TGL2=TGL1.

**\*RST** 0

### **:ULINK:TGAP:PSI[1]:PL1**

**Supported** E4438C with Option 419 and Option 400

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK: TGAP: PSI [1] :PL1 <val>  
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK: TGAP: PSI [1] :PL1?
```

This command specifies the duration of the transmission gap pattern length 1 (TGPL1). The pattern length is expressed in number of frames.

**\*RST** +2

**Range** 1–144

### **:ULINK:TGAP:PSI[1]:PRC**

**Supported** E4438C with Option 419

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK: TGAP: PSI [1] :PRC <val>  
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK: TGAP: PSI [1] :PRC?
```

This command sets the transmission gap pattern repetition count. The pattern repetition count (PRC) sets the number of transmission gap patterns within the transmission gap pattern sequence.

**\*RST** 0

**Range** 0–511

**Remarks** A value of 0 indicates that the PRC will continue indefinitely.

### **:ULINK:TGAP:PSI[1]:PS**

**Supported** E4438C with Option 419

```
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK: TGAP: PSI [1] :PS ACTIVE | INACTIVE  
[ :SOURce ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK: TGAP: PSI [1] :PS?
```

This command sets the transmission gap pattern status.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**

ACTive	This choice sets the compressed mode active.
INACTive	This choice sets the compressed mode inactive.
*RST	INAC

**:ULINK:TGAP:PSI[1]:SN**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:TGAP:PSI [1] :SN <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:TGAP:PSI [1] :SN?
```

This command specifies the timeslot number of the first transmission gap within the first radio frame.

\*RST +11

**Range** 0–14

**:ULINK:TOFFset**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:TOFFset <val>
[ :SOURCE ] :RADIO:WCDMA:HSPA [ :BBG ] :ULINK:TOFFset?
```

This command sets the uplink DPCH timing offset (delay), measured in chips.

\*RST 0

**Range** –512 to 2560

**Remarks** The downlink signal timing is provided by the synchronization signal. Calculate the delay between downlink and uplink DPCH, in chips, using the following formulas:

$$\text{Total Delay} = (T0) + (\text{TOFFset}) + ((\text{SDElay}) * 2560 \text{ chips})$$

- T0 = 1024 chips
- SDElay is set by “:ULINK:SDElay” on page 754

$$\text{Chip Delay} = (\text{Total Delay} - T0) \text{ mod } 2560$$

### **:ULINK:TPControl:PATtern**

**Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TPControl:PATtern
"<file name>"|EXTernal
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TPControl:PATtern?
```

This command sets a user pattern that determines the power control response and controls the power of the user's equipment (UE). The increase/decrease direction for UE power level changes is determined by the transmit power control (TPC) pattern.

"<file name>" This choice specifies a user file. 0: DOWN, 1: UP

EXTernal This choice specifies an external TPC pattern.

**\*RST** EXTernal

### **:ULINK:TPControl:PATtern[:EXTernal]:INPut**

**Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TFC:EPATtern[:EXTernal]:
INPut ALTP|BGAT|PTR2
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:HSUPa:TFC:EPATtern[:EXTernal]:
INPut?
```

This command sets the input port of the external Ack/Nack signal.

ALTP This choice sets the input port of the external signal to ALT PWR IN.

BGAT This choice sets the input port of the external signal to BURST GATE IN.

PTR2 This choice sets the input port of the external signal to PATT TRIG IN 2.

**\*RST** PTR2

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to "**:ULINK:APPLY**" on page 717.

### **:ULINK:TPControl:PATtern[:EXTernal]:POLarity**

**Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TPControl[:EXTernal]:POLarity
POSitive|NEGative
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TPControl[:EXTernal]:POLarity?
```

This command sets the external TPC signal polarity.

**3GPP W-CDMA HSPA Subsystem–Option 419** ([:SOURCE]:RADio:WCDMa:HSPA[:BBG])

<b>POSitive</b>	This choice sets the pattern signal to DOWN when the external signal is low and sets the pattern signal to UP when the external signal is high.
<b>NEGative</b>	This choice sets the pattern signal to DOWN when the external signal is high and sets the pattern signal to UP when the external signal is low.
<b>*RST</b>	POS
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**:ULINK:TPControl:POWer:INITial**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:TPControl:POWer:INITial <val>
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:TPControl:POWer:INITial?
```

This command sets the initial power of the transmission power control, in dB (relative to Max Power: 0.00 dB).

**\*RST** +0.00000000E+000

**Range** 0 to –40 dB

**Remarks** If the parameter set by this command is changed while the signal is active, the “:ULINK:APPLY” on page 717 must be executed for the change to occur. The value must be larger than or equal to the minimum transmit power. The power difference between the initial power and the maximum power should be a multiple value of the power step. Initial power is relative to the maximum power (amplitude) set on the signal generator.

**:ULINK:TPControl:POWer:MAXimum**

**Supported** E4438C with Option 419

```
[ :SOURCE ] :RADio:WCDMa:HSPA [ :BBG ] :ULINK:TPControl:POWer:MAXimum?
```

This query returns the maximum power of the transmit power control, relative to Maximum Power, in dB. The value shown for this parameter will always be 0.00 dB, and is a relative value to the maximum amplitude set for the signal generator.

For example, if the signal generator amplitude is set to –20 dBm, the Minimum Power is set to –40 dB, and the Initial Power is set to –10 dB, then the absolute initial power level will be –30 dBm, which is 10 dBm below the signal generator amplitude, and the absolute minimum power will be –60 dBm, which is 40 dBm below the signal generator amplitude.

**\*RST** +0.00000000E+000

### **:ULINK:TPControl:POWer:MINimum**

**Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TPControl:POWer:MINimum <val>
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TPControl:POWer:MINimum?
```

This command sets the initial power of the transmission power control, in dB (relative to Max Power: 0.00 dB).

The minimum power value must be less than or equal to the value used for initial power. Minimum power is decreased in increments determined by the value set for the power step. The power difference between minimum and maximum power should be a multiple of the power step value.

Minimum power is limited by the amplitude set on the signal generator. The signal generator amplitude must be set to -96 dBm or lower for the minimum power to be set to -40 dB.

\*RST - 4.00000000E+001

**Range** - 40 to 0 dB

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

### **:ULINK:TPControl:POWer:STEP**

**Supported** E4438C with Option 419

```
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TPControl:POWer:STEP
DB0_5|DB1_0|DB2_0|DB3_0
[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TPControl:POWer:STEP?
```

This command sets the power control step size. Initial power can only be increased in steps set by the power step command.

\*RST DB0\_5

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 717.

**3GPP W-CDMA HSPA Subsystem–Option 419 ([:SOURCE]:RADIO:WCDMA:HSPA[:BBG])**

**:ULINK:TPControl[:STATE]**

**Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TPControl[:STATE] 1|0|ON|OFF

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG]:ULINK:TPControl[:STATE]?

This command enables or disables the transmission power control.

**\*RST** 0

**[:STATE]**

**Supported** E4438C with Option 419

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG][:STATE] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:HSPA[:BBG][:STATE]?

This command turns the HSPA functionality on or off.

**\*RST** 0

**Remarks** This command only works when there is at least one active physical channel within the selected link.



---

## Real Time GPS Subsystem—Option 409 ([:SOURce]:RADio[1] | 2 | 3 | 4:GPS)

### :DATA

**Supported** E4438C with Option 409

```
[ :SOURce ] :RADio:GPS:DATA PN9 | PN15 | FIX4 | "<user file>"  
[ :SOURce ] :RADio:GPS:DATA?
```

This command sets the data type for the selected data mode.

**\*RST** PN9

**Key Entry** **PN9** **PN15** **FIX4** **User file**

**Remarks** This command is effective only when the data mode is RAW or ENCOded. To set the data mode, refer to “:DMODE”.

### :DMODE

**Supported** E4438C with Option 409

```
[ :SOURce ] :RADio:GPS:DMODE RAW | ENCOded | TLM  
[ :SOURce ] :RADio:GPS:DMODE?
```

This command sets the data mode.

**RAW** This choice modulates data onto the C/A (coarse acquisition) code at 50-bits per second. No parity bits are computed by the signal generator. Every 6 seconds, 300-bits from the source data are transmitted.

**ENCOded** This choice modulates data onto the C/A (coarse acquisition) code at 50-bits per second. The signal generator computes 6 parity bits for every 24 data bits from the selected data source. Every six seconds, 240-bits of the source data are transmitted along with 60 computed parity bits.

**TLM** This choice transmits a standard default navigation data transmission which includes a telemetry word (TLM), a handover word (HOW), and default navigation data. The signal generator transmits an incrementing time-of-week (TOW) as part of the HOW.

**Real Time GPS Subsystem—Option 409 ([:SOURce]:RADio[1] | 2 | 3 | 4:GPS)**

<b>*RST</b>	RAW
<b>Key Entry</b>	<b>Data Mode Raw Enc TLM</b>
<b>Remarks</b>	Since the TLM mode transmits default navigation data, there is no data selection for this mode.  For selecting the data type when RAW or ENCOded is the selection, refer to “:DATA” on page 763.

**:DSHift**

<b>Supported</b>	E4438C with Option 409
	<code>[:SOURce]:RADio:GPS:DSHift &lt;val&gt;</code> <code>[:SOURce]:RADio:GPS:DSHift?</code>
	This command sets the frequency and chip rate offsets to simulate a doppler shift. The variable <val> is expressed in units of hertz (Hz to kHz).
<b>*RST</b>	+0.00000000E+000
<b>Range</b>	–125kHz to 125kHz
<b>Key Entry</b>	<b>Doppler Shift</b>
<b>Remarks</b>	The lower bound of the doppler shift is limited by the frequency set on the signal generator. For example, if the signal generator frequency is set to 100 kHz, then the lower limit of the doppler shift would be 0.00 Hz. The doppler shift can not extend lower than the limitations of the signal generator

**:FILTer**

<b>Supported</b>	E4438C with Option 409
	<code>[:SOURce]:RADio:GPS:FILTer RNYQuist NYQuist GAUSSian RECTangle IS95 IS95_EQ IS95_MOD IS95_MOD_EQ AC4Fm UGGaussian "&lt;user FIR&gt;"</code> <code>[:SOURce]:RADio:GPS:FILTer?</code>
	This command sets the pre-modulation filter type.
IS95	This choice selects a filter that meets the criteria of the IS-95 standard.
IS95_EQ	This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

IS95_MOD	This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.																		
IS95_MOD_EQ	This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection.																		
AC4Fm	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.																		
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.																		
"<user FIR>"	This variable is any filter file that you have stored into memory.																		
<b>*RST</b>	RECT																		
<b>Key Entry</b>	<table border="0" style="width: 100%;"> <tr> <td style="text-align: left;"><b>Root Nyquist</b></td> <td style="text-align: left;"><b>Nyquist</b></td> <td style="text-align: left;"><b>Gaussian</b></td> <td style="text-align: left;"><b>Rectangle</b></td> <td style="text-align: left;"><b>IS-95</b></td> <td style="text-align: left;"><b>IS-95 w/EQ</b></td> </tr> <tr> <td style="text-align: left;"><b>IS-95 Mod</b></td> <td style="text-align: left;"><b>IS-95 Mod w/EQ</b></td> <td style="text-align: left;"><b>APC025 C4FM</b></td> <td style="text-align: left;"><b>UN3/4 GSM Gaussian</b></td> <td></td> <td></td> </tr> <tr> <td colspan="6"><b>User FIR</b></td> </tr> </table>	<b>Root Nyquist</b>	<b>Nyquist</b>	<b>Gaussian</b>	<b>Rectangle</b>	<b>IS-95</b>	<b>IS-95 w/EQ</b>	<b>IS-95 Mod</b>	<b>IS-95 Mod w/EQ</b>	<b>APC025 C4FM</b>	<b>UN3/4 GSM Gaussian</b>			<b>User FIR</b>					
<b>Root Nyquist</b>	<b>Nyquist</b>	<b>Gaussian</b>	<b>Rectangle</b>	<b>IS-95</b>	<b>IS-95 w/EQ</b>														
<b>IS-95 Mod</b>	<b>IS-95 Mod w/EQ</b>	<b>APC025 C4FM</b>	<b>UN3/4 GSM Gaussian</b>																
<b>User FIR</b>																			

**:FILTer:ALPHA**

**Supported**            E4438C with Option 409

```
[ :SOURCE ] :RADio:GPS:FILTer:ALPHA <val>
[ :SOURCE ] :RADio:GPS:FILTer:ALPHA?
```

This command sets the Nyquist or root Nyquist filter’s alpha value.

The filter alpha value can be set to the minimum value (0), maximum value (1), or in between by using fractional numeric values (0.001–0.999).

**\*RST**                    +2.20000000E-001

**Range**                    0.000–1.000

**Key Entry**                **Filter Alpha**

**Remarks**                To change the current filter type, refer to “:FILTer” on page 764.

**:FILTer:BBT**

**Supported** E4438C with Option 409

```
[ :SOURCE ] :RADio:GPS:FILTer:BBT <val>
```

```
[ :SOURCE ] :RADio:GPS:FILTer:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameters.

The filter BbT value can be set to the minimum value (0), the maximum value (1), or in between by using fractional numeric values (0.001–0.999)

**\*RST** +5.00000000E-001

**Range** 0.000–1.000

**Key Entry** **Filter BbT**

**Remarks** This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “[:FILTer](#)” on page 764.

**:FILTer:CHANnel**

**Supported** E4438C with Option 409

```
[ :SOURCE ] :RADio:GPS:FILTer:CHANnel EVM|ACP
```

```
[ :SOURCE ] :RADio:GPS:FILTer:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

**EVM** This choice provides the most ideal passband.

**ACP** This choice improves stopband rejection.

**\*RST** EVM

**Key Entry** **Optimize FIR For EVM ACP**

**Remarks** To change the current filter type, refer to “[:FILTer](#)” on page 764.

## :IQPHase

**Supported** E4438C with Option 409  
[:SOURce]:RADio:GPS:IQPHase NORMal|INVerted  
[:SOURce]:RADio:GPS:IQPHase?

This command sets the I/Q phase for the GPS signal.

**NORMal** This choice selects normal phase polarity.

**INVerted** This choice inverts the internal Q signal.

**\*RST** NORM

**Key Entry** **IQ Phase Normal Invert**

## :PCODE

**Supported** E4438C with Option 409  
[:SOURce]:RADio:GPS:PCODE <val>  
[:SOURce]:RADio:GPS:PCODE?

This command sets the P code power relative to the C/A code power.

**\*RST** -3.00000000E+000

**Range** -40 to 0

**Key Entry** **P Code Pwr**

**Remarks** This command is normally used when the CAP (C/A+P) ranging mode choice is selected. Refer to “:RCODE” for selecting the ranging mode.

## :RCODE

**Supported** E4438C with Option 409  
[:SOURce]:RADio:GPS:RCODE CA|P|CAP  
[:SOURce]:RADio:GPS:RCODE?

This command selects the ranging code for the GPS transmission.

**CA** This choice selects a 1023-bit pseudorandom C/A (coarse acquisition) code that is BPSK modulated onto the L1 (1575.42 MHz) carrier. The C/A code factory set chip rate is 1.023 Mcps using a 10.23 Mcps reference clock.

**Real Time GPS Subsystem—Option 409 ([:SOURCE]:RADio[1] | 2 | 3 | 4:GPS)**

<b>P</b>	This choice selects the precise (P) code which is a very long pseudorandom sequence that is BPSK modulated onto the L2 (1227.6 MHz) carrier. The P code factory set chip rate is 10.23 Mcps using a 10.23 Mcps reference clock.
<b>CAP</b>	This choice permits both the C/A (coarse acquisition) and P (precise) codes to modulate the L1 (1575.42 MHz) carrier simultaneously by providing the P code on the Q component and the C/A code in quadrature on the I component.
<b>*RST</b>	CA
<b>Key Entry</b>	<b>Ranging Code C/A P C/A+P</b>

**:REFClk**

<b>Supported</b>	E4438C with Option 409
	<code>[ :SOURCE ] :RADio:GPS:REFClk INT Ext</code>
	<code>[ :SOURCE ] :RADio:GPS:REFClk?</code>

This command sets the GPS reference clock to either internal or external.

<b>INT</b>	This selection sets the signal generator to use the internal chip clock.
<b>EXT</b>	This selection sets the signal generator to use an external chip clock which is supplied to the DATA CLOCK INPUT connector.
<b>*RST</b>	INT
<b>Key Entry</b>	<b>GPS Ref Clk</b>

**:REFFreq**

<b>Supported</b>	E4438C with Option 409
	<code>[ :SOURCE ] :RADio:GPS:REFFreq &lt;val&gt;&lt;unit&gt;</code>
	<code>[ :SOURCE ] :RADio:GPS:REFFreq?</code>

This command sets the GPS reference clock frequency. If an external source is being used, its frequency must match the value set with this command

<b>*RST</b>	+1.02300000E+007
<b>Range</b>	1kCPS–12.5MCPS
<b>Key Entry</b>	<b>GPS Ref (f0)</b>
<b>Remarks</b>	Changing the GPS reference frequency will change the P and C/A code chip rates.

## :SATid

**Supported** E4438C with Option 409

[:SOURCE]:RADio:GPS:SATid <val>

[:SOURCE]:RADio:GPS:SATid?

This command selects the pseudorandom number (PRN) code used for transmission.

Satellite identification numbers 1–32 are used for GPS satellites. Satellite identification numbers 33–37 are reserved for ground transmitter use in the real-world system.

**\*RST** +1

**Range** 1–37

**Key Entry** **Satellite ID**

## [:STATE]

**Supported** E4438C with Option 409

[:SOURCE]:RADio:GPS[:STATE] ON|OFF|1|0

[:SOURCE]:RADio:GPS[:STATE]?

This command enables or disables the real-time GPS signal.

**\*RST** 0

**Key Entry** **Real-time GPS Off On**

## **Real Time MSGPS Subsystem—Option 409** **([:SOURce]:RADio[1]|2|3|4:MSGPs)**

### **:IQPHase**

**Supported** E4438C with Option 409

[[:SOURce]:RADio:MSGPs:IQPHase NORMAL|INVerted

[[:SOURce]:RADio:MSGPs:IQPHase?

This command sets the I/Q phase for the MSGPS signal.

**NORMAL** This choice selects normal phase polarity.

**INVerted** This choice inverts the internal Q signal.

**\*RST** NORM

**Key Entry** **IQ Phase Normal Invert**

### **:PMODE**

**Supported** E4438C with Option 409

[[:SOURce]:RADio:MSGPs:PMODE RUN|PAUSE

[[:SOURce]:RADio:MSGPs:PMODE?

This command pauses or plays the real-time MSGPS scenario.

**\*RST** RUN

**Key Entry** **Pause/Resume**



## :REFClk

**Supported** E4438C with Option 409

[ :SOURCE ] :RADio:MSGPs:REFClk INTernal | EXTernal

[ :SOURCE ] :RADio:MSGPs:REFClk?

This command sets the MSGPS reference clock to either internal or external.

**INTernal** This selection sets the signal generator to use the internal chip clock.

**EXTernal** This selection sets the signal generator to use an external chip clock which is supplied to the DATA CLOCK INPUT connector.

**\*RST** INT

**Key Entry** **GPS Ref Clk**

## :REFFreq

**Supported** E4438C with Option 409

[ :SOURCE ] :RADio:MSGPs:REFFreq <val><unit>

[ :SOURCE ] :RADio:MSGPs:REFFreq?

This command sets the MSGPS reference clock frequency. If an external reference clock is being used, its frequency must match the value set with this command

**\*RST** +1.02300000E+007

**Range** 1.023Mcps  $\pm 10\%$

**Key Entry** **GPS Ref (f0)**

**Remarks** Changing the GPS reference frequency will change the C/A code chip rate.

## :REStart

**Supported** E4438C with Option 409

[ :SOURCE ] :RADio:MSGPs:REStart

This command sets the real-time MSGPS scenario to the beginning.

**Key Entry** **Restart**

## **:SCENario**

**Supported** E4438C with Option 409

```
[:SOURCE]:RADIO:MSGPS:SCENario "<file_name>"  
[:SOURCE]:RADIO:MSGPS:SCENario?
```

This command selects the real-time MSGPS scenario to play.

**Key Entry**           **Select Scenario**

## **:SCENario:SATellites**

**Supported** E4438C with Option 409

```
[:SOURCE]:RADIO:MSGPS:SCENario:SATellites <val>  
[:SOURCE]:RADIO:MSGPS:SCENario:SATellites?
```

This command sets the number of satellites in view to include in the generated MSGPS signal.

**Key Entry**           **Number of Satellites**

## **:SCENario:STATus**

**Supported** E4438C with Option 409

```
[:SOURCE]:RADIO:MSGPS:SCENario:STATus?
```

This query returns the following information for the currently selected scenario as a comma-separated list:

Scenario date, scenario time, scenario position, scenario length, satellite IDs

**Key Entry**           **Scenario**

## **[:STATe]**

**Supported** E4438C with Option 409

```
[:SOURCE]:RADIO:MSGPS[:STATe] ON|OFF|1|0  
[:SOURCE]:RADIO:MSGPS[:STATe] ?
```

This command enables or disables the real-time MSGPS signal.

**\*RST**                0

**Key Entry**           **Real-time MSGPS Off On**

## **GSM Subsystem–Option 402 ([:SOURce]:RADio:GSM)**

### **:ALPha**

**Supported**            E4438C with Option 402

```
[:SOURce]:RADio:GSM:ALPha <val>
[:SOURce]:RADio:GSM:ALPha?
```

This command changes the Nyquist or root Nyquist filter’s alpha value.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

**\*RST**                    +5.00000000E–001

**Range**                    0.000–1.000

**Key Entry**            **Filter Alpha**

**Remarks**            To change the current filter type, refer to “[:FILTer](#)” on page 786.

### **:BBCLock**

**Supported**            E4438C with Option 402

```
[:SOURce]:RADio:GSM:BBCLock INT[1] |EXT[1]
[:SOURce]:RADio:GSM:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1]                    This choice selects the signal generator internal data clock.

EXT[1]                    This choice selects an external data clock input.

**\*RST**                    INT

**Key Entry**            **BBG Data Clock Ext Int**

**Remarks**            A data clock or continuous symbol sync input must be supplied when external mode is used.

This will be ignored if the external reference is set to EXTERNAL. To change the external reference type, refer to “[:EREFerence](#)” on page 785.

## :BBT

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:BBT <val>
```

```
[ :SOURCE ] :RADIO:GSM:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

**\*RST** +3.00000000E-001

**Range** 0.100–1.000

**Key Entry** **Filter BbT**

**Remarks** This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “:FILTer” on page 786.

## :BRATe

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:BRATe <val>
```

```
[ :SOURCE ] :RADIO:GSM:BRATe?
```

This command sets the bit rate in bits per second (bps–Mbps). The maximum bit rate is dependent on the modulation type and filter as shown in the following tables.

---

**NOTE** When using multiframe, limit the symbol rate to no more than 271 ksps. Although higher rates may work, they are not supported. See “:SRATe” on page 804 for data stated as symbol rates.

---

The IQ digital data stream is shaped by a FIR filter. The filter length and associated latency and frequency response are dependent on the bit rate as shown in the following tables. The signal generator selects a filter length.

For higher bit rates, the FIR filter length may be truncated (if the minimum filter size allows it) which will impact the relative timing of the modulated data, as well as the actual filter response (see the symbol rate command “:SRATe” on page 965). Refer to “:FILTer” on page 786 for information on filter symbol widths.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 789.

When the bit rate is changed, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the bit rate: lower bit rates require more time.

**\*RST** +2.70833333E+005

Range	Modulation Type	Bit Rate Range		
		<i>16 Symbol Wide Filter</i>	<i>32 Symbol Wide Filter</i>	<i>64 Symbol Wide Filter</i>
	BPSK, FSK2, MSK	1bps–50Mbps	1bps–25Mbps	1bps–12.5Mbps
	C4FM, OQPSK, FSK4	2bps–50Mbps	2bps–25Mbps	2bps–12.5Mbps
	OQPSKI95, QPSK			
	P4QPPSK, QPSKIS95			
	GRAYQPSK, QAM4			
	D8PSK, EDGE, FSK8, PSK8	3bps–50Mbps	3bps–25Mbps	3bps–12.5Mbps
	FSK16, PSK16, QAM16	4bps–50Mbps	4bps–25Mbps	4bps–12.5Mbps
	QAM32	5bps–50Mbps	5bps–25Mbps	5bps–12.5Mbps
	QAM64	6bps–50Mbps	6bps–25Mbps	6bps–12.5Mbps
	QAM128	7bps–50Mbps	7bps–25Mbps	7bps–12.5Mbps
	QAM256	8bps–50Mbps	8bps–25Mbps	8bps–12.5Mbps

**Key Entry**                      **Symbol Rate**

**:BURSt:PN9**

**Supported**                      E4438C with Option 402

[ :SOURce ] :RADio:GSM: BURSt : PN9 NORMal | QUICk  
 [ :SOURce ] :RADio:GSM: BURSt : PN9?

This command controls the software PN9 generation.

**NORMal**                      This choice produces a maximum length PN9 sequence.

**QUICk**                      This choice produces a truncated PN9 sequence.

**\*RST**                      NORM

**Key Entry**                      PN9 Mode Normal Quick

Receiver Test Digital Commands (continued)  
**GSM Subsystem—Option 402 (:SOURce):RADio:GSM)**

**Remarks** Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

**:BURSt:SHAPe:FALL:DELay**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:GSM:BURSt:SHAPe:FALL:DELay <val>  
[ :SOURce ] :RADio:GSM:BURSt:SHAPe:FALL:DELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** -11.0625 to 99

**Key Entry** **Fall Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 789. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FDELay” on page 777 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

**:BURSt:SHAPe:FALL:TIME**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:GSM:BURSt:SHAPe:FALL:TIME <val>  
[ :SOURce ] :RADio:GSM:BURSt:SHAPe:FALL:TIME?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +1.00000000E+001

**Range** 0.0625–127.9375

<b>Key Entry</b>	Fall Time
<b>Remarks</b>	<p>The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.</p> <p>To change the modulation type, refer to “:MODulation[:TYPE]” on page 789. Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.</p> <p>“:BURSt:SHAPe:FTIME” on page 778 performs the same function; in compliance with the SCPI standard, both commands are listed.</p> <p>For concept information on burst shaping, refer to the <i>E4428C/38C ESG Signal Generators User’s Guide</i>.</p>

### **:BURSt:SHAPe:FDElay**

<b>Supported</b>	E4438C with Option 402
	<pre>[ :SOURCE ] :RADio:GSM:BURSt:SHAPe:FDElay &lt;val&gt; [ :SOURCE ] :RADio:GSM:BURSt:SHAPe:FDElay?</pre>
	<p>This command sets the burst shape fall delay.</p> <p>The variable &lt;val&gt; is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.</p>
<b>*RST</b>	+0.00000000E+000
<b>Range</b>	–11.0625 to 99
<b>Key Entry</b>	Fall Delay
<b>Remarks</b>	<p>The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.</p> <p>To change the modulation type, refer to “:MODulation[:TYPE]” on page 789. Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.</p> <p>“:BURSt:SHAPe:FALL:DElay” on page 776 performs the same function; in compliance with the SCPI standard, both commands are listed.</p> <p>For concept information on burst shaping, refer to the <i>E4428C/38C ESG Signal Generators User’s Guide</i>.</p>

## :BURSt:SHAPe:FTIME

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:GSM:BURSt:SHAPe:FTIME <val>

[ :SOURCE ] :RADio:GSM:BURSt:SHAPe:FTIME?

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +3.00000000E+000

**Range** 0.0625–127.9375

**Key Entry** Fall Time

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 789. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 776 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

## :BURSt:SHAPe:RDElay

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:GSM:BURSt:SHAPe:RDElay <val>

[ :SOURCE ] :RADio:GSM:BURSt:SHAPe:RDElay?

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate. For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

**\*RST** +0.00000000E+000

**Range** –8.0625 to 99

**Key Entry** Rise Delay



**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 789. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DELay” on page 779 performs the same function; in compliance with the SCPI standard, both commands are listed.

### **:BURSt:SHAPe:RISE:DELay**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:BURSt:SHAPe:RISE:DELay <val>  
[ :SOURCE ] :RADIO:GSM:BURSt:SHAPe:RISE:DELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate. For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

**\*RST** +0.00000000E+000

**Range** -8.0625 to 99

**Key Entry** Rise Delay

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 789. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DELay” on page 778 performs the same function; in compliance with the SCPI standard, both commands are listed.

**:BURSt:SHAPe:RISE:TIME****Supported** E4438C with Option 402

[:SOURCE]:RADIO:GSM:BURSt:SHAPe:RISE:TIME &lt;val&gt;

[:SOURCE]:RADIO:GSM:BURSt:SHAPe:RISE:TIME?

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate. For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

**\*RST** +3.00000000E+000**Range** 0.0625–11.1875**Key Entry** Rise Time**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 789.

Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RTIME” on page 780 performs the same function; in compliance with the SCPI standard, both commands are listed.

**:BURSt:SHAPe:RTIME****Supported** E4438C with Option 402

[:SOURCE]:RADIO:GSM:BURSt:SHAPe:RTIME &lt;val&gt;

[:SOURCE]:RADIO:GSM:BURSt:SHAPe:RTIME?

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate. For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User's Guide*.

**\*RST** +3.00000000E+000**Range** 0.0625–11.1875**Key Entry** Rise Time

**Remarks**                    The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 789. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:TIME” on page 780 performs the same function; in compliance with the SCPI standard, both commands are listed.

### **:BURSt:SHAPe[:TYPE]**

**Supported**                    E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:BURSt:SHAPe[:TYPE] SINE| "<file name>"
[:SOURCE]:RADIO:GSM:BURSt:SHAPe[:TYPE] ?
```

This command specifies the burst shape as either SINE or a user-defined file ("<file name>").

**SINE**                            This choice selects a state that is defined by the burst rise and fall \*RST values, as the default burst shape type.

"<file name>"                This choice selects a user designated file from signal generator memory (non-volatile).

**\*RST**                            SINE

**Key Entry**                    **Sine    User File**

### **:BURSt[:STATe]**

**Supported**                    E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:BURSt[:STATe] ON|OFF|1|0
[:SOURCE]:RADIO:GSM:BURSt[:STATe] ?
```

This command enables or disables the burst function.

**ON (1)**                        This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

**OFF (0)**                        This choice enables the transmission of unframed data.

**GSM Subsystem—Option 402 ([:SOURCE]:RADio:GSM)**

**\*RST** 0  
**Key Entry** Data Format Pattern Framed

**:CHANnel**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:CHANnel EVM|ACP
[ :SOURCE ] :RADio:GSM:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

**EVM** This choice provides the most ideal passband.

**ACP** This choice improves stopband rejection.

**\*RST** ACP

**Key Entry** **Optimize FIR For Evm ACP**

**Remarks** To change the current filter type, refer to “:FILTer” on page 786.

**:DATA**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:DATA PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|
EXT|P4|P8|P16|P32|P64|PRAM
[ :SOURCE ] :RADio:GSM:DATA?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1’s and 0’s, data from an external source, or a user file) for unframed data transmission.

**\*RST** PN23

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>Ext</b>
	<b>4 1’s &amp; 4 0’s</b>	<b>8 1’s &amp; 8 0’s</b>	<b>16 1’s &amp; 16 0’s</b>	<b>32 1’s &amp; 32 0’s</b>				
	<b>64 1’s &amp; 64 0’s</b>	<b>PRAM File</b>						

**Remarks** Refer to “File Name Variables” on page 13 for information on the file name syntax.

## :DATA:PRAM

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:DATA:PRAM "<file_name>"
```

```
[ :SOURCE ] :RADIO:GSM:DATA:PRAM?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for the GSM (Global System for Mobile communication) format.

"<file\_name>" This variable designates the PRAM file in WFM1. Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**Key Entry** **PRAM File**

**Remarks** Selecting this data source forces the burst source to INTERNAL to allow framing control.

The PRAM file must reside in the signal generator’s volatile memory (WFM1) in order to be accessed by this command. For more information on PRAM files, refer to [“:DATA:PRAM:FILE:BLOCK” on page 112](#).

## :DATA:FIX4

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:DATA:FIX4 <val>
```

```
[ :SOURCE ] :RADIO:GSM:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the GSM modulation format.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

## :DEFault

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:DEFault
```

This command returns all of the GSM format parameters to their factory default conditions. It does not affect any other signal generator parameters.

**GSM Subsystem—Option 402 ([:SOURCE]:RADio:GSM)**

**Key Entry**            Restore GSM Factory Default

**:DENCode**

**Supported**            E4438C with Option 402

[ :SOURCE ] :RADio:GSM:DENCode ON|OFF|1|0

[ :SOURCE ] :RADio:GSM:DENCode?

This command enables or disables the differential data encoding function. Once this function is enabled, data bits are encoded prior to modulation; each modulated bit is 1 if the data bit is different from the previous one, or 0 if the data bit is the same as the previous one.

**\*RST**                    1

**Key Entry**            **Diff Data Encode Off On**

**EDATa:DELaY**

**Supported**            E4438C with Option 402

[ :SOURCE ] :RADio:GSM:EDATa:DELaY?

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

**Remarks**            When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

**:EDCLock**

**Supported**            E4438C with Option 402

[ :SOURCE ] :RADio:GSM:EDCLock SYMBol|NORMal

[ :SOURCE ] :RADio:GSM:EDCLock?

This command sets the external data clock use.

**SYMBol**                This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

**NORMal**                This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

**\*RST**                    NORM

**Key Entry**            **Ext Data Clock Normal Symbol**

**Remarks** Both choices have no effect in internal clock mode. Refer to “:BBCLock” on page 773 to select EXT as the data clock type.

### :EREFerence

**Supported** E4438C with Option 402

[ :SOURCE ] :RADIo:GSM:EREFerence INT|EXT

[ :SOURCE ] :RADIo:GSM:EREFerence?

This command selects either an internal or external bit-clock reference for the data generator.

**\*RST** INT

**Key Entry** **BBG Ref Ext Int**

**Remarks** If the EXT choice is selected, the external source’s frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

### :EREFerence:VALue

**Supported** E4438C with Option 402

[ :SOURCE ] :RADIo:GSM:EREFerence:VALue <val>

[ :SOURCE ] :RADIo:GSM:EREFerence:VALue?

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

**\*RST** +1.30000000E+007

**Range** 2.5E5–1E8

**Key Entry** **Ext BBG Ref Freq**

**Remarks** The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to “:EREFerence” on page 785 to select EXT (external source) as the reference for the bit-clock reference.

**:FILTER**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:FILTER RNYQuist|NYQuist|GAUSSian|RECTangle|
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURCE]:RADIO:GSM:FILTER?
```

This command selects the pre-modulation filter type.

- IS95 This choice selects a filter that meets the criteria of the IS-95 standard.
- IS95\_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
- IS95\_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
- IS95\_MOD\_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
- AC4Fm This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
- UGGaussian This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
- "<user FIR>" This variable is any filter file that you have stored into memory.

**\*RST** GAUS

<b>Key Entry</b>	<b>Root Nyquist</b>	<b>Nyquist</b>	<b>Gaussian</b>	<b>Rectangle</b>	<b>IS-95</b>	<b>IS-95 w/EQ</b>
	<b>IS-95 Mod</b>	<b>IS-95 Mod w/EQ</b>	<b>APCO 25 C4FM</b>	<b>UN3/4 GSM Gaussian</b>		
	<b>User FIR</b>					

**Remarks** Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.



## **:IQ:SCALE**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADIO:GSM:IQ:SCALE <val>

[ :SOURCE ] :RADIO:GSM:IQ:SCALE?

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

**\*RST** +100

**Range** 1–200

**Key Entry** **I/Q Scaling**

**Remarks** This command has no effect with MSK or FSK modulation.

## **:MODulation:FSK[:DEVIation]**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADIO:GSM:MODulation:FSK[:DEVIation] <val>

[ :SOURCE ] :RADIO:GSM:MODulation:FSK[:DEVIation]?

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

**\*RST** +4.00000000E+002

**Range** 0–2E7

**Key Entry** **Freq Dev**

**Remarks** To change the modulation type, refer to “:MODulation[:TYPE]” on page 789.

Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

### :MODulation:MSK[:PHASe]

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:MODulation:MSK[:PHASe] <val>  
[ :SOURCE ] :RADio:GSM:MODulation:MSK[:PHASe] ?
```

This command sets the MSK phase deviation value. The variable <val> is in units of degrees

**\*RST** +9.00000000E+001

**Range** 0–100

**Key Entry** Phase Dev

### :MODulation:UFSK

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:MODulation:UFSK "<file name>"  
[ :SOURCE ] :RADio:GSM:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

**Key Entry** **User FSK**

**Remarks** The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. See “:MODulation[:TYPE]” on page 789 to change the current modulation type.

See “File Name Variables” on page 13 for information on the file name syntax.

### :MODulation:UIQ

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:MODulation:UIQ "<file name>"  
[ :SOURCE ] :RADio:GSM:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

**Key Entry** **User I/Q**

**Remarks** The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to “:MODulation[:TYPE]” on page 789 to change the current modulation type.

See “File Name Variables” on page 13 for information on the file name syntax.

**:MODulation[:TYPE]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|
GRAYQPSK|OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|FSK8|
FSK16|C4FM|QAM4|QAM16|QAM32|QAM64|QAM128|QAM256|UIQ|UFSK
[:SOURCE]:RADIO:GSM:MODulation[:TYPE] ?
```

This command sets the modulation type for the GSM personality.

**\*RST** MSK

<b>Key Entry</b>	<b>BPSK</b>	<b>QPSK</b>	<b>IS-95 QPSK</b>	<b>Gray Coded QPSK</b>	<b>OQPSK</b>			
	<b>IS-95 OQPSK</b>	<b><math>\pi/4</math> DQPSK</b>	<b>8PSK</b>	<b>16PSK</b>	<b>D8PSK</b>	<b>MSK</b>	<b>2-Lvl FSK</b>	
	<b>4-Lvl FSK</b>	<b>8-Lvl FSK</b>	<b>16-Lvl FSK</b>	<b>C4FM</b>	<b>4QAM</b>	<b>16QAM</b>	<b>32QAM</b>	
	<b>64QAM</b>	<b>128QAM</b>	<b>256QAM</b>	<b>User I/Q</b>	<b>User FSK</b>			

**:POLarity[:ALL]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:POLarity[:ALL] NORMal|INVerted
[:SOURCE]:RADIO:GSM:POLarity[:ALL] ?
```

This command sets the rotation direction of the phase modulation vector.

**NORMal** This choice selects normal phase polarity.

**INVerted** This choice inverts the internal Q signal.

**\*RST** NORM

**Key Entry** **Phase Polarity Normal Invert**

**Remarks** This command is useful for lower sideband mixing applications.

## :SECondary:RECall

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:GSM:SECondary:RECall

This command recalls the secondary frame configuration, overwriting the current state.

**Key Entry** **Recall Secondary Frame State**

**Remarks** To save a secondary frame state, refer to “:SECondary:SAVE” on page 790.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to “:SECondary[:STATE]” on page 791.

## :SECondary:SAVE

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:GSM:SECondary:SAVE

This command saves the current frame configuration as the secondary frame with the filename GSM\_SECONDARY\_FRAME.

**Key Entry** **Save Secondary Frame State**

**Remarks** To recall the secondary frame state (saved in non-volatile signal generator memory), refer to “:SECondary:RECall” on page 790.

## :SECondary:TRIGger[:SOURCE]

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:GSM:SECondary:TRIGger [ :SOURCE ] KEY | EXT | BUS  
[ :SOURCE ] :RADio:GSM:SECondary:TRIGger [ :SOURCE ] ?

This command selects the type of triggering for the secondary frame.

**KEY** This choice enables triggering by pressing the front panel **Trigger** hardkey.

**EXT** This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to “:TRIGger[:SOURCE]:EXTernal[:SOURCE]” on page 810.

**BUS** This choice enables GPIB triggering using the \*TRG or GET command or LAN and RS-232 triggering using the \*TRG command.

**Key Entry** **Trigger Key Ext Bus**

### **:SECondary[:STATe]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SECondary[:STATe] ON|OFF|1|0
[:SOURCE]:RADIO:GSM:SECondary[:STATe] ?
```

This command enables or disables the ability to switch to the secondary frame.

**\*RST** 0

**Key Entry** **Secondary Frame Off On**

**Remarks** A frame must already be saved as the secondary frame in order to turn the secondary state function on. To save a frame as the secondary frame, refer to [“:SECondary:SAVE” on page 790](#).

### **:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption
PN9|PN15|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption?
```

This command creates and configures an access encrypted data field.

**\*RST** PN9

**Key Entry** **PN9 PN15 FIX4 User File Ext 4 1's & 4 0's 8 1's & 8 0's**  
**16 1's & 16 0's 32 1's & 32 0's 64 1's & 64 0's**

**Remarks** See [“File Name Variables” on page 13](#) for information on the file name syntax.

### **:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption:FIX4**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption:FIX4 <val>
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ENCRyption:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected access timeslot encryption field.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

**:SLOT0|[1]|2|3|4|5|6|7:ACCess:ETAIl**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ETAIl <bit_pattern>
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:ETAIl?
```

This command specifies the extended tail bits (8 bits) field for the selected access timeslot.

**\*RST** #H3A

**Range** #H00–#HFF

**Key Entry** ET

**:SLOT0|[1]|2|3|4|5|6|7:ACCess:SSEQuence**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:SSEQuence <bit_pattern>
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:ACCess:SSEQuence?
```

This command specifies the synchronization sequence bits (41 bits) for the selected access timeslot.

**\*RST** #H096FF335478

**Range** #H0–#H1FFFFFFFF

**Key Entry** SS

**:SLOT0|[1]|2|3|4|5|6|7:ACCess:CUSTom**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSTom PN9|PN15|FIX4|
"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSTom?
```

This command configures the data field for the selected custom timeslot.

**\*RST** PN9

**Key Entry** **PN9** **PN15** **FIX4** **User File** **Ext** **4 1's & 4 0's** **8 1's & 8 0's**  
**16 1's & 16 0's** **32 1's & 32 0's** **64 1's & 64 0's**

**Remarks** See “File Name Variables” on page 13 for information on the file name syntax.

### **:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4 <val>
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:CUSTom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected custom timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

### **:SLOT0|[1]|2|3|4|5|6|7:DUMMy:TSEQuence**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:DUMMy:TSEQuence TSC0|
TSC1|TSC2|TSC3|TSC4|TSC5|TSC6|TSC7|<bit_pattern>
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:DUMMy:TSEQuence?
```

This command changes the 26-bit dummy training sequence (TS) for the selected dummy timeslot.

**\*RST** #H0000000

**Range** <bit\_pattern>: #H0–#H3FFFFFFF

**Key Entry** **TSC0 TSC1 TSC2 TSC3 TSC4 TSC5 TSC6 TSC7**  
**Custom TS**

**Remarks** When normal preset is selected, the preset hexadecimal value for TS reflects the GSM protocol, however you may use this command to enter a new value.

### **:SLOT0|[1]|2|3|4|5|6|7:MULTIslot**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:MULTIslot ON|OFF|1|0
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:MULTIslot?
```

This command turns bursting (ramping) on or off between the selected timeslot and the next higher numbered adjacent timeslot.

ON (1) This choice turns ramping off between timeslots.

OFF (0) This choice turns ramping on between timeslots.

**\*RST**                    0

**Key Entry**            **Multislot Off On**

**SLOT0|[1]|2|3|4|5|6|7:NORMa1:ENCRyption**

**Supported**            E4438C with Option 402

```
[:SOURCE]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMa1:ENCRyption
PN9|PN15|FIX4|"<filename>"|EXT|P4|P8|P16|P32|P64|TCHFS|TCHHS|CS1|CS4|
DMCS1|UMCS1|BCH1|BCH2
[:SOURCE]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMa1:ENCRyption?
```

This command creates and configures an encrypted data field for a normal timeslot.

- PN9                    This choice uses a standard PN9 bit pattern. In the case of TDMA bursted data, a PN9 repeats continuously, running from one timeslot to the matching timeslot in the next frame.
- PN15                This choice uses a standard PN15 bit pattern. In the case of TDMA bursted data, a PN15 repeats continuously, running from one timeslot to the matching timeslot in the next frame.
- FIX4                This choice uses a fixed 4-bit pattern. The selected 4-bit pattern will be repeated as necessary to fill the selected data to set the desired pattern.
- User File            This choice selects a user-supplied file to be used as the bit pattern. In the case of TDMA bursted data, enough bits must be supplied to fill the desired number of timeslots (left over bit are ignored). User files contain 8 data bits per byte.
- EXT                 This choice uses an external user signal as the modulating data stream. Serial data is supplied via the front panel DATA BNC connector.
- P4                    This choice selects a data pattern with 4 1's followed by 4 0's. The selected pattern will be repeated as necessary to fill the selected data area.
- P8                    This choice selects a data pattern with 8 1's followed by 8 0's. The selected pattern will be repeated as necessary to fill the selected data area.
- P16                  This choice selects a data pattern with 16 1's followed by 16 0's. The selected pattern will be repeated as necessary to fill the selected data area.
- P32                  This choice selects a data pattern with 32 1's followed by 32 0's. The selected pattern will be repeated as necessary to fill the selected data area.
- P64                  This choice selects a data pattern with 64 1's followed by 64 0's. The selected pattern will be repeated as necessary to fill the selected data area.
- TCHFS                This choice selects traffic channel with full rate speech (TCH/FS). This channel would be represented by a 26 frame multiframe with an SACCH and IDLE frame.



TCHHS	This choice selects traffic channel with half rate speech (TCH/HS). This is when a complex coding scheme is used that can allow two mobile stations to share the same timeslot. On an ESG this is represented by having one timeslot with a normal burst and user definable training sequence and the same timeslot on an alternate frame using a dummy burst. This represents the situation where TCH/HS is being used in one timeslot and the other timeslot is not being used.
CS-1	This choice selects the CS-1 channel, a packet data traffic channel with block type 1 as per 3GPP standard GSM 05.03.
CS4	This choice selects the CS-4 channel, a packet data traffic channel with block type 4 as per 3GPP standard GSM 05.03.
DMCS1	This choice selects the downlink MCS-1 channel, a packet data traffic channel with block type 5 as per 3GPP standard GSM 05.03.
UMCS1	This choice selects the uplink MCS-1 channel, a packet data traffic channel with block type 5 as per 3GPP standard GSM 05.03.
BCH1	This choice selects a non-combined broadcast channel. BCH1 can only be set in timeslot zero and can be the only multiframe type in a frame. This means that BCH1 will conflict with the following parameters: TCH/FS, TCH/HS, CS-1, CS-4, DMCS-1 and UMCS-1.
BCH2	This choice selects a combined broadcast channel. BCH2 can only be set in timeslot zero and can be the only multiframe type in a frame. This means that BCH2 will conflict with the following parameters: TCH/FS, TCH/HS, CS-1, CS-4, DMCS-1, and UMCS-1.
*RST	PN9
<b>Range</b>	BCH1: 0–65535 BCH2: 0–65535
<b>Key Entry</b>	<b>PN9    PN15    FIX4    User File    Ext    4 1's &amp; 4 0's    8 1's &amp; 8 0's</b> <b>16 1's &amp; 16 0's    32 1's &amp; 32 0's    64 1's &amp; 64 0's    TCH/FS    TCH/HS</b> <b>CS-1    CS-4    Downlink MCS-1    Uplink MCS-1</b>
<b>Remarks</b>	See <a href="#">“File Name Variables”</a> on page 13 for information on the file name syntax.

**GSM Subsystem—Option 402 ([:SOURCE]:RADIO:GSM)****:SLOT0:NORMAL:ENCRyption:BCH1:BCC****Supported** E4438C with Option 416

[:SOURCE]:RADIO:GSM:SLOT0:NORMAL:ENCRyption:BCH1:BCC &lt;val&gt;

[:SOURCE]:RADIO:GSM:SLOT0:NORMAL:ENCRyption:BCH1:BCC?

This command sets the broadcast control code (BCC) which is used to indicate what training sequence is being used by the basestation in the forward channels. This code will allow the mobile station to decode the other channels in the broadcast channel.

**\*RST** 0**Range** 0–7**:SLOT0:NORMAL:ENCRyption:BCH1:CELLid****Supported** E4438C with Option 416

[:SOURCE]:RADIO:GSM:SLOT0:NORMAL:ENCRyption:BCH1:CELLid &lt;val&gt;

[:SOURCE]:RADIO:GSM:SLOT0:NORMAL:ENCRyption:BCH1:CELLid?

This command sets the cell identification. This will identify a cell within a location area.

**\*RST** 0**Range** 0–65535**:SLOT0:NORMAL:ENCRyption:BCH1:LAC****Supported** E4438C with Option 416

[:SOURCE]:RADIO:GSM:SLOT0:NORMAL:ENCRyption:BCH1:LAC &lt;val&gt;

[:SOURCE]:RADIO:GSM:SLOT0:NORMAL:ENCRyption:BCH1:LAC?

This command sets the location area code (LAC). The location area code provides 16 bits to allow the administrator to define a location.

**\*RST** 0**Range** 0–65535

### **:SLOT0:NORMAL:ENCRyption:BCH1:MCC**

**Supported** E4438C with Option 416

[ :SOURCE ] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH1:MCC <val>

[ :SOURCE ] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH1:MCC?

This command sets the mobile country code (MCC). The mobile country code is a 12 bit number used to represent the country where the basestation is located.

**\*RST** 0

**Range** 0–4095

### **:SLOT0:NORMAL:ENCRyption:BCH1:MNC**

**Supported** E4438C with Option 416

[ :SOURCE ] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH1:MNC <val>

[ :SOURCE ] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH1:MNC?

This command sets the mobile network code (MNC). The mobile network code is the individual number a network will be assigned.

**\*RST** 0

**Range** 0–255

**Remarks** Federal regulation mandates that a 3-digit MNC will be used. For the ESG implementation the upper four bits are set to 1111.

### **:SLOT0:NORMAL:ENCRyption:BCH1:PLMN**

**Supported** E4438C with Option 416

[ :SOURCE ] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH1:PLMN <val>

[ :SOURCE ] :RADIo:GSM:SLOT0:NORMAl:ENCRyption:BCH1:PLMN?

This command is used to set the Public Land Mobile Network (PLMN) which is used to indicate the country the phone is in. PLMN is also referred to as the National Country Code (NCC).

**\*RST** 0

**Range** 0–7

**GSM Subsystem—Option 402 ([:SOURCE]:RADIO:GSM)****:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:CS1:DATA****Supported** E4438C with Option 402[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:CS1:DATA  
PN9|PN15

[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:CS1:DATA?

This command sets the bit pattern for the CS1 packet data traffic channel.

**\*RST** PN9**Key Entry** **PN9** **PN15****:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:CS4:DATA****Supported** E4438C with Option 402[:SOURCE]:RADIO[1]|2|3|4:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:CS4  
:DATA PN9|PN15[:SOURCE]:RADIO[1]|2|3|4:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:CS4  
:DATA?

This command selects the encryption field data, if the selected timeslot uses the packet data block type 4 coding scheme.

**\*RST** PN9**Key Entry** **PN9** **PN15****Remarks** Refer to “[SLOT0|\[1\]|2|3|4|5|6|7:NORMAL:ENCRyption](#)” on page 794 for selecting the coding scheme.**:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:DLINK:MCS1:DATA****Supported** E4438C with Option 402[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:DLINK:MCS1:  
DATA PN9|PN15[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:DLINK:MCS1:  
DATA?

This command sets the bit pattern for the downlink MCS1 packet data traffic channel.

**\*RST** PN9**Key Entry** **PN9** **PN15**

### **:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:FIX4**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIo:GSM:SLOT0 | [1] | 2 | 3 | 4 | 5 | 6 | 7 :NORMAl:ENCRyption:FIX4 <val>  
[ :SOURCE ] :RADIo:GSM:SLOT0 | [1] | 2 | 3 | 4 | 5 | 6 | 7 :NORMAl:ENCRyption:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected normal timeslot encryption field.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

### **:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:TCH:FS:DATA**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIo:GSM:SLOT0 | [1] | 2 | 3 | 4 | 5 | 6 | 7 :NORMAl:ENCRyption:TCH:FS:DATA  
PN9 | PN15  
[ :SOURCE ] :RADIo:GSM:SLOT0 | [1] | 2 | 3 | 4 | 5 | 6 | 7 :NORMAl:ENCRyption:TCH:FS:DATA?
```

This command sets the bit pattern for the TCH/FS channel.

**\*RST** PN9

**Key Entry** **PN9 PN15**

### **:SLOT0|[1]|2|3|4|5|6|7:NORMAL:ENCRyption:ULINK:MCS1:DATA**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIo:GSM:SLOT0 | [1] | 2 | 3 | 4 | 5 | 6 | 7 :NORMAl:ENCRyption:ULINK:MCS1:  
DATA PN9 | PN15  
[ :SOURCE ] :RADIo:GSM:SLOT0 | [1] | 2 | 3 | 4 | 5 | 6 | 7 :NORMAl:ENCRyption:ULINK:MCS1:  
DATA?
```

This command sets the bit pattern for the uplink MCS1 packet data traffic channel.

**\*RST** PN9

**Key Entry** **PN9 PN15**

**:SLOT0|[1]|2|3|4|5|6|7:NORMAL:STeal**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:STeal <val>
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:STeal?
```

This command specifies the normal stealing bits for the selected timeslot. The single bit defines the value for both 1-bit fields.

**\*RST** #H0

**Range** #H0–#H1

**Key Entry** **S**

**:SLOT0|[1]|2|3|4|5|6|7:NORMAL:TSEQUence**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:TSEQUence
TSC0|TSC1|TSC2|TSC3|TSC4|TSC5|TSC6|TSC7|<bit_pattern>
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMAL:TSEQUence?
```

This command changes the 26-bit training sequence (TS) for a normal timeslot. The preset hexadecimal value (when normal preset is selected) for TS reflects the GSM protocol, however you can enter a new value by using this command. The hexadecimal values for the 8 training sequence codes are listed below:

**\*RST** #H0000000

**Range** <bit\_pattern>: #H0–#H3FFFFFF

**Key Entry** **TSC0 TSC1 TSC2 TSC3 TSC4 TSC5 TSC6 TSC7**  
**Custom TS**

**Remarks** The preset hexadecimal value (when normal preset is selected) for TS reflects the GSM protocol, however you can enter a new value by using this command.

**:SLOT0|[1]|2|3|4|5|6|7:POWer**

**Supported**            E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:POWer MAIN|DELTA
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:POWer?
```

This command defines the RF output power level for the selected timeslot.

**MAIN**                    This choice specifies RF output as the main power level.

**DELTA**                   This choice specifies RF output as the alternative power level.

**\*RST**                    MAIN

**Key Entry**             **Timeslot Ampl Main Delta**

**:SLOT0|[1]|2|3|4|5|6|7:STATe**

**Supported**            E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:STATe ON|OFF|1|0
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:STATe?
```

This command enables or disables the operating state of the selected timeslot.

**\*RST**                    Timeslot 0: 1      Timeslot 1–7: 0

**Key Entry**             **Timeslot Off On**

**:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCRyption**

**Supported**            E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCRyption PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCRyption?
```

This command creates and configures an encrypted data field for a synchronization timeslot.

**\*RST**                    PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>				
	<b>64 1's &amp; 64 0's</b>							

**Remarks**             Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCryption:FIX4**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCryption:FIX4 <val>
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:ENCryption:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected synchronization timeslot encryption field.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

**:SLOT0|[1]|2|3|4|5|6|7:SYNC:TSEQuence**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:TSEQuence <bit_pattern>
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7:SYNC:TSEQuence?
```

This command customizes the training sequence (TS) for the selected synchronization timeslot. The preset hexadecimal value (when normal preset is selected) for TS reflects the GSM protocol, however you can enter a new value by using this command.

**\*RST** #HB962040F2D45761B

**Range** #H0–#HFFFFFFFFFFFFFFFF

**Key Entry** **TS**

**:SLOT0|[1]|2|3|4|5|6|7[:TYPE]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7[:TYPE] CUSTom|NORMaL|
FCORrection|SYNC|DUMMy|ACCess|NORMAL_ALL
[:SOURCE]:RADIO:GSM:SLOT0|[1]|2|3|4|5|6|7[:TYPE]?
```

This command sets the timeslot type for the selected timeslot.

**\*RST** NORMAL

**Key Entry** **Custom Normal FCorr Sync Dummy Access Normal All**



## **:SOUT**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SOUT FRAME|SLOT|ALL
[:SOURCE]:RADIO:GSM:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

**FRAME** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

**SLOT** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

**ALL** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

**\*RST** FRAME

<b>Key Entry</b>	<b>Begin Frame</b>	<b>Begin Timeslot #</b>	<b>All Timeslots</b>
------------------	--------------------	-------------------------	----------------------

## **:SOUT:OFFSet**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:GSM:SOUT:OFFSet <val>
[:SOURCE]:RADIO:GSM:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number of bits.

**\*RST** +0

**Range** -155 to 155

**Key Entry** **Sync Out Offset**

**Remarks** Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 803](#).

## :SOUT:SLOT

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:GSM:SOUT:SLOT <val>

[ :SOURCE ] :RADio:GSM:SOUT:SLOT?

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

**\*RST** +0

**Range** 0–7

**Key Entry** **Begin Timeslot #**

**Remarks** To change the output of the EVENT1 rear panel connector to SLOT, refer to “:SOUT” on page 803.

## :SRATe

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:GSM:SRATe <val>

[ :SOURCE ] :RADio:GSM:SRATE?

This command sets the transmission symbol rate. Symbol rate is the bit rate divided by the bits per symbol. A change in the symbol rate affects the bit rate. Refer to “:BRATe” on page 774 for information on bit rate.

The variable <val> is expressed in units of symbols per second (sps–Mspm) and the maximum symbol rate depends on the filter. Refer to “:FILTer” on page 786 for minimum filter symbol width.

---

**NOTE** When using multiframe, limit the symbol rate to no more than 271 kspm. Although higher rates may work, they are not supported.

---

The filter may have to be truncated down to 32 or 16 symbols wide to achieve the highest symbol rate. The signal generator’s internal filters are not truncated below their minimum filter length and user-defined FIR filters are not truncated. If the filter cannot be truncated then the symbol rate is limited to the maximum rate of the narrowest filter size possible.

The relative timing of the modulated data, as well as the actual filter response is affected when the filter is truncated.

When the symbol rate changes, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the symbol rate: lower symbol rates require more time.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 789.

**\*RST** +2.70833333E+006

Range	Modulation Type	Symbol Rate Range		
		16 Symbol Wide Filter	32 Symbol Wide Filter	64 Symbol Wide Filter
	BPSK, FSK2, MSK	1sps–50Msp	1sps–25Msp	1sps–12.5Msp
	C4FM, OQPSK, FSK4	2sps–25Msp	2sps–12.5Msp	2sps–6.25Msp
	OQPSKI95, QPSK			
	P4QPPSK, QPSKIS95			
	GRAYQPSK, QAM4			
	D8PSK, EDGE, FSK8, PSK8	3sps–16.666666666 Msp	3sps–8.333333333 Msp	3sps–4.166666666Msp
	FSK16, PSK16, QAM16	4sps–12.5Msp	4sps–6.25Msp	4sps–3.125Msp
	QAM32	5sps–10Msp	5sps–5Msp	5sps–2.5Msp
	QAM64	6sps–8.333333333 Msp	6sps–4.166666666 Msp	6sps–2.083333333 Msp
	QAM128	7sps–7.142857142 Msp	7sps–3.571428572 Msp	7sps–1.785714285 Msp
	QAM256	8sps–6.25Msp	8sps–3.125 Msp	8sps–1.5625 Msp

---

**NOTE** Using I/Q skew will half the minimum number of symbols for the selected filter.

---

**Key Entry**                      **Symbol Rate**

### :TRIGger:EXtErnal:DELay

**Supported**                      E4438C with Option 416

[ :SOURce ] :RADio:GSM:TRIGger:EXtErnal:DELay <val>

[ :SOURce ] :RADio:GSM:TRIGger:EXtErnal:DELay?

This command sets the trigger delay for synchronizing the ESG. The variable <val> is expressed in number of symbols.

**\*RST**                                +0

**Range**                              0–1048575

## **:TRIGger:TYPE**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:TRIGger:TYPE CONTInuous | SINGle | GATE
[ :SOURCE ] :RADIO:GSM:TRIGger:TYPE?
```

This command sets the trigger type.

**CONTInuous** The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to “[:TRIGger:TYPE:CONTInuous\[:TYPE\]](#)” on page 806.

**SINGle** The framed data sequence plays once for every trigger received.

**GATE** An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

**\*RST** CONT

**Key Entry** **Continuous**      **Single**      **Gated**

## **:TRIGger:TYPE:CONTInuous[:TYPE]**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:GSM:TRIGger:TYPE:CONTInuous [ :TYPE ] FREE | TRIGger | RESet
[ :SOURCE ] :RADIO:GSM:TRIGger:TYPE:CONTInuous [ :TYPE ] ?
```

This commands selects the waveform’s response to a trigger signal while using the continuous trigger mode. See “[:TRIGger:TYPE](#)” on page 806 for more information on triggering modes.

The following list describes the waveform’s response to each of the command choices:

**FREE** Turning the ARB format on immediately triggers the waveform. The waveform repeats until the format is turned off or another trigger or waveform is selected.

**TRIGger** The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.

**RESet** The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.

**\*RST** FREE

**Key Entry** **Free Run**      **Trigger & Run**      **Reset & Run**

## **:TRIGger:TYPE:GATE:ACTive**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:GSM:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[ :SOURce ] :RADio:GSM:TRIGger:TYPE:GATE:ACTive?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see “:TRIGger:TYPE” on page 806.

The following list describes the signal generator’s gating behavior for the external trigger signal polarity selections:

LOW	The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).
HIGH	The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).
<b>*RST</b>	HIGH

**Key Entry** Gate Active Low High

## **:TRIGger[:SOURce]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:GSM:TRIGger [ :SOURce ] KEY|EXT|BUS
[ :SOURce ] :RADio:GSM:TRIGger [ :SOURce ] ?
```

This command sets the trigger source.

For more information on triggering, see “:TRIGger:TYPE” on page 806. The following list describes the command choices:

KEY	This choice enables manual triggering by pressing the front-panel <b>Trigger</b> hardkey.
EXT	An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger: <ul style="list-style-type: none"> <li>• The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see “:TRIGger[:SOURce]:EXTernal[:SOURce]” on page 810.</li> </ul>

**GSM Subsystem—Option 402 ([:SOURCE]:RADio:GSM)**

For more information on the connectors and on connecting the cables, see the *E4428C/38C ESG Signal Generators User's Guide*.

- The trigger signal polarity:
  - gating mode, see “:TRIGger:TYPE:GATE:ACTive” on page 807
  - continuous and single modes, see “:TRIGger[:SOURCE]:EXTernal:SLOPe” on page 809
- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:
  - setting the amount of delay, see “:TRIGger[:SOURCE]:EXTernal:DELay” on page 808
  - turning the delay on, see “:TRIGger[:SOURCE]:EXTernal:DELay:STATe” on page 809

**BUS** This choice enables triggering over the GPIB or LAN using the \*TRG or GET commands or the AUXILIARY INTERFACE (RS-232) using the \*TRG command.

**\*RST** KEY

**Key Entry**      **Trigger Key**      **Ext**      **Bus**

**:TRIGger[:SOURCE]:EXTernal:DELay**

**Supported**      E4438C with Option 402

This command sets the number of bits to delay the signal generator's response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See “:TRIGger[:SOURCE]:EXTernal:DELay:STATe” on page 809. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURCE]” on page 807.

**\*RST**      +0

**Range**      0–1048575

**Key Entry**      **Ext Delay Bits**

### **:TRIGger[:SOURCE]:EXtErnal:DELay:FINe**

**Supported** E4438C with Option 416

```
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXtErnal:DELay:FINe <val>  
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXtErnal:DELay:FINe?
```

This command sets the fine trigger delay for synchronizing the ESG.

The fine delay value is added to the coarse delay setting (see “:TRIGger[:SOURCE]:EXtErnal:DELay” on page 808).

The variable <val> is expressed as a fraction of one symbol.

**\*RST** +0.00000000E+000

**Range** 0–1

### **:TRIGger[:SOURCE]:EXtErnal:DELay:STATe**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXtErnal:DELay:STATe ON|OFF|1|0  
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXtErnal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see “:TRIGger[:SOURCE]:EXtErnal:DELay” on page 808, and for more information on configuring an external source, see “:TRIGger[:SOURCE]” on page 807.

**\*RST** 0

**Key Entry** Ext Delay Off On

### **:TRIGger[:SOURCE]:EXtErnal:SLOPe**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXtErnal:SLOPe POSitive|NEGative  
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXtErnal:SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see “:TRIGger:TYPE:GATE:ACTive” on page 807.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

Receiver Test Digital Commands (continued)  
**GSM Subsystem—Option 402 ([:SOURCE]:RADio:GSM)**

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURCE]” on page 807.

**\*RST**                    NEG  
**Key Entry**            **Ext Polarity Neg Pos**

**:TRIGger[:SOURCE]:EXTernal[:SOURCE]**

**Supported**            E4438C with Option 402

```
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXTernal [ :SOURCE ] EPT1 |  
EPT2 | EPTRIGGER1 | EPTRIGGER2  
[ :SOURCE ] :RADio:GSM:TRIGger [ :SOURCE ] :EXTernal [ :SOURCE ] ?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURCE]” on page 807. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User’s Guide*.

The following list describes the command choices:

EPT1	This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.
EPT2	This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
EPTRIGGER1	This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.
EPTRIGGER2	This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
<b>*RST</b>	EPT1
<b>Key Entry</b>	<b>Patt Trig In 1      Patt Trig In 2</b>



**[ :STATe]**

**Supported** E4438C with Option 402

[ :SOURce] :RADio:GSM [ :STATe] ON|OFF|1|0

[ :SOURce] :RADio:GSM [ :STATe] ?

This command enables or disables the GSM modulation format.

**\*RST** 0

**Key Entry** **GSM Off On**

**Remarks** Although the GSM modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

---

## HSDPA over W-CDMA Subsystem—Option 418 ([:SOURce]:RADio:WCDMa:HSDPa[:BBG])

The commands in this subsystem support the remote functionality of the Signal Studio for HSDPA over W-CDMA software. For a complete description of terms and HSDPA functionality, refer to the software online help. Commands used for configuring the carrier signal and performing general signal generator functions are located in different SCPI command subsystems found within the SCPI Command Reference volumes.

There are two methods to determine the SCPI commands for a setup. One method is to locate each individual command listed in this subsystem and others within the *SCPI Command Reference* volumes. The other method is to use the HSDPA software UI. After downloading a UI setup to the ESG, the software lets you export a SCPI file that contains the commands used in the UI setup. Refer to the HSDPA software online help for information on this feature.

### File Overview

The ESG's memory catalog (signal generator memory) uses several file types, each assigned with a unique syntax to recall the file. This section provides information on using files with SCPI commands.

This subsystem uses the following two command variables to represent two different file types stored in signal generator memory:

"<file name>" Bit file

"<user FIR>" FIR file

For more information on managing and using files, refer to the resources in the following list:

- “[File Name Variables](#)” on [page 13](#) for information on the file name syntax
- [Table 1-4 on page 14](#) for a listing of the different file types
- *E4428C/38C ESG Signal Generators Programming Guide* for information on downloading bit files
- *E4428C/38C ESG Signal Generators User's Guide* for information on creating and editing bit and FIR files using the signal generator

---

**NOTE** To create or edit HSDPA files with the ESG, use the table editors located in the Real Time W-CDMA modulation format. Access the bit table editor through the Data field and then select **User File** as the data source. Access the FIR filter table editor through the Filter field and then select **Define User FIR** as the filter type.

---

**HSDPA over W-CDMA Subsystem—Option 418** [:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

The HSDPA software interface downloads user files (bit and FIR file types) to the ESG when **USER** is the software data or filter type selection. You can see these files on the ESG by pressing **Utility > Memory Catalog > Catalog Type** and then selecting the file type, or by using the SCPI commands located in the Memory subsystem. User files are located on the ESG in the following directory path: /USER/<file type directory>/<file name>. [Table 9-2](#) shows the software naming convention for the different files created by the HSDPA software.

**Table 9-2 HSDPA Software Downloaded File Names**

Link Direction	Data Source	File Name	ESG File Type
Downlink and Uplink	Filter	<project name>–FIR	FIR
Downlink	BCH	<project name>–BCH	Bit
	PICH	<project name>–PICH	
	DPCH	<project name>–DPCH	
	DCH <sub>x</sub> <sup>a</sup>	<project name>–DCH <sub>x</sub> <sup>a</sup>	
	Inter-TTI	<project name>–ITTI <sub>x</sub> <sup>b</sup>	
	HARQ ACK/NACK Pattern	<project name>–DLCPT	
	AMC CQI Pattern	<project name>–DLAPT	
	HS-DSCH	<project name>–DSCH1	
	HS-PDSCH	<project name>–HSPD <sub>x</sub> <sup>b</sup>	
	HS-SCCH	<project name>–HSSCC <sub>x</sub> <sup>b</sup>	
Uplink	DPCCH	<project name>–DPCCH	
	FBI	<project name>–FBI	
	TPC	<project name>–TPC	
	DPDCH	<project name>–DPDCH	
	DCH <sub>x</sub> <sup>a</sup>	<project name>–DCH <sub>x</sub> <sup>a</sup>	
	ACK Pattern	<project name>–APAT	
	CQI Pattern	<project name>–CPAT	

a. x is the DCH number (1–6).

b. x is the channel number (1–4) for the HSDPA, the HS-PDSCH and the HS-SCCH.

## Managing ESG Setting Conflicts and Error Messages

The ESG reports setting conflicts as error messages. When a setting conflict occurs, an error number and a brief message appear at the bottom of the ESG display. You can view the full text of the error message in either of two ways: by using the front panel of the ESG, or by executing SCPI commands.

Front Panel            Press **Utility > Error Info**.

SCPI                    Execute the SCPI error commands described in the “[System Subsystem \(:SYSTem\)](#)” on page 154.

For more information on Error messages, refer to the *E4428C/38C ESG Signal Generators Programming Guide* for remote viewing or the *E4428C/38C ESG Signal Generators User’s Guide* for front panel viewing.

### :DLINK:APPLY

**Supported**            E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:APPLY
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:APPLY?
```

This command applies changes to the channel setup and data for active downlink physical and transport channels, immediately starting the channel coding generation process. A progress bar may appear on the ESG display indicating that the new signal parameters are being applied. Signal parameters are also applied when the HSDPA modulation format is turned on.

Use the query to determine whether or not execution of this command is required. It returns the following responses:

```
0                        Command execution is not required.
1                        Command execution is required.
```

---

**NOTE**                The apply query response is valid only when downlink HSDPA format is active.

---

The apply function will not work if there is a conflict with range values and coupled parameters. For example, if all the physical channel codes are not orthogonal to each other, the new settings are not applied to the signal when this command is executed. Resolve any conflicts before reapplying the changes. The ESG reports an error when conflicts occur.

### **:DLINK:AWGN:CN**

**Supported** E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:AWGN:CN <val>  
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:AWGN:CN?
```

This command sets the downlink in-band carrier to noise ratio (C/N) value using AWGN.

**\*RST** 0

**Range** -30 to 30

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.

### **:DLINK:AWGN[:STATe]**

**Supported** E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:AWGN [ :STATe ] ON | OFF | 0 | 1  
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:AWGN [ :STATe ] ?
```

This command turns the downlink AWGN on or off.

**\*RST** 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.

### **:DLINK:BBClock[:SOURce]**

**Supported** E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:BBClock [ :SOURce ] INT | EXT  
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:BBClock [ :SOURce ] ?
```

This command selects the downlink baseband generator chip clock source, which is either internal to the signal generator or applied externally.

**\*RST** INT

**Remarks** When using an external chip clock source, connect the signal to the DATA CLOCK connector on the front panel of the ESG.

**:DLINK:CPICH:CCODE****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:CPICH:CCODE?

This query returns the CPICH channelization code, which is always set to zero.

**:DLINK:CPICH:POWER****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:CPICH:POWER &lt;val&gt;

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:CPICH:POWER?

This command sets the CPICH power level. The variable &lt;val&gt; is expressed in decibels (dB).

**\*RST** 3.30000000E+000**Range** -40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:CPICH[:STATe]****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:CPICH[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:CPICH[:STATe] ?

This command turns the CPICH on or off.

**\*RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:DPCH:CCODE****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:CCODE &lt;val&gt;

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:CCODE?

This command sets the downlink DPCH channel code number.

**\*RST** 10**Range** 0–511

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

**Remarks**                    Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

The channel code is coupled with the slot format and all other physical channel codes. Set the channel code to not exceed limits of the slot format and ensure that all physical channel codes are orthogonal to each other. If any channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

**:DLINK:DPCH:DATA**

**Supported**                    E4438C with Option 418

```
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:DATA PN9|PN15|FIX4|DCH|
"<file name>"
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:DATA?
```

This command configures the downlink DPCH data pattern.

**DCH**                            This selects the transport channel as the data source. The DCH selection is not available for a DPCH slot format of 16.

"<file name>"                This represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “File Overview” on page 812 for more information on files.

**\*RST**                            PN9

**Remarks**                    Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:DPCH:DATA:FIX4**

**Supported**                    E4438C with Option 418

```
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:DATA:FIX4 <val>
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:DATA:FIX4?
```

This command sets the downlink DPCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST**                            0

**Range**                            0–15

**Remarks**                    Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])**:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:BSIZE****Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6
:BSIZE <val>
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:BSIZE?
```

This command sets the block size for the selected downlink DCH.

**\*RST** 20**Range** 0–5000

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.

The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the ESG calculates the product of the block size and the number of blocks. If the product of these two parameters exceeds 200,000, the apply function (downlink apply command) will not work.

**:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:CTYPE****Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6
:CTYPE HCONv|TCONv|TURBo|NONE
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:CTYPE?
```

This command sets the coder type for the selected downlink DCH.

**HCONv** This choice selects the 1/2 rate convolutional encoder.**TCONv** This choice selects the 1/3 rate convolutional encoder.**TURBo** This choice selects the turbo coder.**NONE** This choice selects no coding.**\*RST** HCON

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.



### **:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6 :CRC**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :CRC 0 | 8 |  
12 | 16 | 24  
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :CRC?
```

This command sets the number of CRC bits for the selected downlink DCH.

**\*RST** 8

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[DLINK:APPLY](#)” on page 814.

### **:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6 :DATA**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA PN9 |  
PN15 | FIX4 | "<file name>"  
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA?
```

This command configures the data for the selected downlink DCH.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “[File Overview](#)” on page 812 for more information on files.

**\*RST** PN9

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[DLINK:APPLY](#)” on page 814.

### **:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6 :DATA:FIX4**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA:  
FIX4 <val>  
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :DATA:FIX4?
```

This command sets the repeating 4-bit binary data pattern for the selected downlink DCH.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

<b>*RST</b>	0
<b>Range</b>	0–15
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:NBLocks**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
NBLocks <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :NBLocks?
```

This command sets the number of data blocks for the selected downlink DCH.

<b>*RST</b>	1
<b>Range</b>	0–512
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.  The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the ESG calculates the product of the block size and the number of blocks. If the product of these two parameters exceeds 200,000, the apply function (downlink apply command) will not work.

**:DLINK:DPCH:DCH[1] | 2 | 3 | 4 | 5 | 6:RMATtribute**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
RMATtribute <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
RMATtribute?
```

This command sets the rate matching attribute for the selected downlink DCH.

<b>*RST</b>	1
<b>Range</b>	1–256
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])****:DLINK:DPCH:DCH[1]|2|3|4|5|6:TTI****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:DCH[1]|2|3|4|5|6:TTI 10|20|40|80

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:DCH[1]|2|3|4|5|6:TTI?

This command sets the TTI for the selected downlink DCH.

The choices are expressed in millisecond (ms).

**\*RST** 10**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:DPCH:DCH2|3|4|5|6[:STATE]****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:DCH2|3|4|5|6[:STATE] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:DCH2|3|4|5|6[:STATE]?

This command turns the selected downlink DCH on or off; DCH1 is always on.

**\*RST** DCH 1: 1 DCH 2–6: 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

The apply command will not work and the ESG will report an error if you turn on a DCH where lower numbered DCHs are off. For example, turning on DCH5 requires turning on DCH2–4. The reverse is true when turning off the DCHs.

**:DLINK:DPCH:POWER****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:POWER &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:POWER?

This command sets the downlink DPCH power level.

**\*RST** -1.02000000E+001**Range** -40 to 0

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**

**Remarks**                    Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:DPCH:SFORmat**

**Supported**                    E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:SFORmat <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:SFORmat?
```

This command configures the downlink DPCH slot format.

**\*RST**                         0

**Range**                        0–16

**Remarks**                    Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

The slot format is coupled with the channel code, so a change in one value may require a change in the other. If the channel code exceeds the limits of the slot format or if it is not orthogonal with all other physical channel codes, the apply function (downlink apply command) will not work.

**:DLINK:DPCH:SSCOffset**

**Supported**                    E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:SSCOffset <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:SSCOffset?
```

This command sets the downlink DPCH secondary scrambling code offset.

**\*RST**                         +0

**Range**                        0–15

**Remarks**                    Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

## :DLINK:DPCH:TFCI

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:TFCI <val>  
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:TFCI?
```

This command sets the TFCI 10-bit pattern for the downlink DPCH.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** +0

**Range** 0–1023

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

Setting the TFCI bits is optional; they describe the type of service in use, for example voice or data.

## :DLINK:DPCH:TOFFset

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:TOFFset <val>  
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:DPCH:TOFFset?
```

This command adjusts the downlink DPCH timing offset.

The variable <val> is expressed in chips.

**\*RST** +0

**Range** 0–149

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:DPCH:TPC:NSTeps**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:DPCH:TPC:NSTeps <val>
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:DPCH:TPC:NSTeps?
```

This command sets the number of steps for the down and up (DUP) or up and down (UDOWn) TPC pattern selections.

**\*RST** +1

**Range** 1–80

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:DPCH:TPC:PATtern**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:DPCH:TPC:PATtern UDOWn|DUP|UALL|DALL| "<file name>"
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:DPCH:TPC:PATtern?
```

This command configures the downlink DPCH TPC pattern for increasing or decreasing, or increasing and decreasing the UE power level.

UDOWn The TPC pattern repetitively steps up and down.

DUP The TPC pattern repetitively steps down and up.

UALL The TPC pattern consecutively steps up.

DALL The TPC pattern consecutively steps down.

"<file name>" This variable represents a TPC pattern file stored in signal generator memory. The pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “File Overview” on page 812 for more information on files.

**\*RST** UDOW

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

Each step in a TPC pattern signals an increase or decrease of 1 dB in the UE output power level.

**HSDPA over W-CDMA Subsystem—Option 418** [:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]**:DLINK:DPCH:TRPosition****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH:TRPosition?

This query returns the downlink DPCH transport channel position that is always set to FIX.

**:DLINK:DPCH[:STATE]****Supported** E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH[:STATE] ON|OFF|1|0  
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:DPCH[:STATE]?

This command turns the downlink DPCH on or off.

**\*RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:FILTer****Supported** E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:FILTer RNYQuist|NYQuist|  
GAUSSian|RECTangle|IS95|IS95\_EQ|IS95\_MOD|IS95\_MOD\_EQ|AC4Fm|UGGaussian|  
"<user FIR>"  
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:FILTer?

This command selects the downlink filter type.

IS95 This filter meets the criteria of the IS-95 standard.

IS95\_EQ This filter is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard and is best suited for IS-95 baseband filtering.

IS95\_MOD This filter meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

IS95\_MOD\_EQ This filter is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

UGGaussian This is a GSM Gaussian filter with a fixed BbT value of 0.300.

AC4Fm This is a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])

"<user FIR>" This variable represents any FIR filter file stored in signal generator memory. Refer to “File Overview” on page 812 for more information on files.

**\*RST** RNYQ

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:FILTer:ALPHa**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:FILTer:ALPHa <val>
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:FILTer:ALPHa?
```

This command sets the downlink Nyquist or root Nyquist filter alpha value.

**\*RST** +2.20000000E-001

**Range** 0–1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

Executing this command while a filter other than Nyquist or root Nyquist is selected changes the parameter value, but it is not used by the signal generator until one of the Nyquist filters is selected.

**:DLINK:FILTer:BBT**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:FILTer:BBT <val>
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:FILTer:BBT?
```

This command sets the downlink Gaussian filter BbT value.

**\*RST** +5.00000000E-001

**Range** 0–1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

Executing this command while a filter other than the Gaussian filter is selected changes the parameter value, but it is not used by the signal generator until the Gaussian filter is selected.



## **:DLINK:FILTer:CHANnel**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMa:HSDPa [ :BBG ] :DLINK:FILTer:CHANnel EVM|ACP  
[ :SOURCE ] :RADIo:WCDMa:HSDPa [ :BBG ] :DLINK:FILTer:CHANnel?
```

Execute this command to optimize a downlink filter for minimized EVM or for minimized ACP.

**EVM** This choice provides the most ideal passband

**ACP** This choice improves stopband rejection for the root Nyquist and Nyquist filters.

**\*RST** EVM

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.

To change the filter selection, refer to “[:DLINK:FILTer](#)” on page 825.

## **:DLINK:HSBurst**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMa:HSDPa [ :BBG ] :DLINK:HSBurst ON|OFF|1|0  
[ :SOURCE ] :RADIo:WCDMa:HSDPa [ :BBG ] :DLINK:HSBurst?
```

This command sets the handling of the off slot periods for the downlink HSDPA channels.

**ON|1** This choice turns off the ESG ALC feature and uses DTX during the off slots.

**OFF|0** This choice continuously transmits the HSDPA channels filling the off slots with dummy bits.

**\*RST** 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])**:DLINK:HSDPa:AMC:CQIMapping:UECategory**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa:AMC:CQIMapping:
UECategory <val>
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa:AMC:CQIMapping:UECategory?
```

This command sets the UE category that determines the CQI mapping table per the 3GPP standards.

**\*RST** 5

**Range** 1–12

**Remarks** To use this command's parameter in a setup, you must also set AMC as the feedback selection. Refer to the “:DLINK:HSDPa:FCONtrol” on page 829 for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:HSDPa:AMC:CPATtern**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa:AMC:CPATtern ALL_1 | ALL_2 |
ALL_3 | ALL_4 | ALL_5 | ALL_6 | ALL_7 | ALL_8 | ALL_9 | ALL_10 | ALL_11 | ALL_12 | ALL_13 |
ALL_14 | ALL_15 | ALL_16 | ALL_17 | ALL_18 | ALL_19 | ALL_20 | ALL_21 | ALL_22 | ALL_23 |
ALL_24 | ALL_25 | ALL_26 | ALL_27 | ALL_28 | ALL_29 | ALL_30 | "<file_name>"
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa:AMC:CPATtern?
```

This command sets a simulated UE CQI pattern that determines HSDPA1's response including the modulation type (QPSK or 16QAM) and the constellation version for 16QAM per the set UE category.

**ALL\_<val>** These choices configure a simulated UE ACK response with a single CQI value for 1,280 subframes.

"<file name>" This variable represents a CQI pattern file stored in signal generator memory. Create this file either by using the AMC CQI pattern Data Type Entry window and downloading the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

- CQI value of 1–30 using an 8-bit pattern, 00000001 to 00011110
- DTX is represented by 11111111

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**

In the file, do not use delimiters between subframes; enter subframe bits as a binary string.

When creating a pattern, you can determine the number of active subframes from 1 to 1,280. The subframes are numbered 0 to 1,279. A subframe is active when it contains 8-bits. If a subframe contains at least 1-bit but less than 8-bits, the apply function (downlink apply command) will not work.

**\*RST**

ALL\_21

**Remarks**

To use this command's parameter in a setup, you must also set AMC as the feedback selection. Refer to the “:DLINK:HSDPA:FCONTROL” for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:HSDPA:FCONTROL**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA:FCONTROL NONE | HARQ | AMC
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA:FCONTROL ?
```

This command sets the HSDPA1 feedback control type.

**NONE** This choice turns off the feedback control.

**HARQ** This choice provides UE feedback using the HARQ process. This selection provides the capability of configuring a simulated UE ACK/NACK response, setting the maximum number of HARQ transmissions, and providing up to eight different RV parameters.

**AMC** This choice provides UE feedback using adaptive modulation coding. This selection provides the capability of configuring a simulated UE CQI response aligned with a UE category input.

**\*RST**

NONE

**Remarks**

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814

**:DLINK:HSDPa:HARQ:APATtern****Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa:HARQ:APATtern ACK_ALL |
"<file name>"
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa:HARQ:APATtern?
```

This command sets a simulated UE ACK/NACK pattern that determines HSDPA1's HARQ response.

**ACK\_ALL** This choice configures 1,280 subframes for a simulated ACK only response.

"<file name>" This variable represents an ACK pattern file stored in signal generator memory. Create this file either by using the HARQ ACK/NACK pattern Data Type Entry window and download the file to the ESG, or by using the ESG Real Time W-CDMA table editor to create a bit file with the following bit patterns:

- An ACK response is represented by 00.
- A NACK response is represented by 01.
- DTX is represented by 10.

In the file, do not use delimiters between subframes; enter subframe bits as a binary string.

When creating a pattern, you can determine the number of active subframes from 1 to 1,280. The subframes are numbered 0 to 1,279. A subframe is active when it contains 2-bits. If a subframe contains only 1-bit, the apply function (downlink apply command) will not work.

**\*RST** ACK\_ALL

**Remarks** To use this command's parameter in a setup, you must also set HARQ as the feedback selection. Refer to the "**:DLINK:HSDPa:FCONtrol**" for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to "**:DLINK:APPLY**" on page 814.

**:DLINK:HSDPa:HARQ:MNHTrans****Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa:HARQ:MNHTrans <val>
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa:HARQ:MNHTrans?
```

This command configures the HSDPA1 maximum number of HARQ transmissions for the HARQ function.

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

Use the command for UE performance testing or for specifying an arbitrary number of HARQ transmissions. When the software encounters a UE NACK response that is set by the HARQ ACK pattern command (see “:DLINK:HSDPA:HARQ:APATtern”), the software re-sends the same packet payload until either the maximum number of HARQ transmissions is reached or a simulated ACK response is encountered. Whenever the software re-sends the same packet payload, it also transmits another RV parameter that is configured by the RV sequence command.

**\*RST** 1

**Range** 1–8

**Remarks** To use this command's parameter in a setup, you must also set HARQ as the feedback selection. Refer to the “:DLINK:HSDPA:FCONtrol” on page 829 for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:HSDPA:HARQ:RVSequence[1]|2|3|4|5|6|7|8**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA:HARQ:RVSequence [1] | 2 | 3 | 4 |
5 | 6 | 7 | 8 <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA:HARQ:RVSequence [1] | 2 | 3 | 4 |
5 | 6 | 7 | 8?
```

This command sets the HSDPA1 RV parameter sequence used with the maximum number of HARQ transmission setting. You can set eight different RV parameters for the RV sequence.

During simulated ACK responses, the software uses the first RV parameter. When the software encounters a simulated NACK response, it sends data using the next RV parameter. The software keeps incrementing to the next RV parameter in the sequence until it receives a simulated ACK response. When the software encounters an ACK response, the RV sequence resets to the first RV parameter.

**\*RST** 0

**Range** 0–7

**Remarks** To use this command's parameter in a setup, you must also set HARQ as the feedback selection. Refer to the “:DLINK:HSDPA:FCONtrol” on page 829 for selecting the feedback type.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])****:DLINK:HSDPa[1]|2|3|4:BSInfo****Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1]|2|3|4:BSInfo <val>
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1]|2|3|4:BSInfo?
```

This command sets the HS-DSCH block size. HSDPA1 is the only HSDPA channel configuration that supports the HS-DSCH, however the block size information parameter is also available for HSDPA2–4 for HS-SCCH coding purposes.

**\*RST** 36**Range** 0–63**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:HSDPa[1]|2|3|4:HSPDsch:COFFset****Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch:
COFFset <val>
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch:COFFset?
```

This command sets the HS-PDSCH code offset. The code offset is used in determining the HS-PDSCH channel code.

**\*RST** HSDPA1: 4 HSDPA2: 8 HSDPA3: 9 HSDPA4: 10**Range** 1–15**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

Set all physical channel codes orthogonal to each other. For any channel codes that fail this criteria, the apply function (downlink apply command) will not work.

**:DLINK:HSDPa[1]|2|3|4:HSPDsch:DATA****Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch:DATA PN9|
FIX4|"<file name>"|DSCH
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch:DATA?
```

This command configures the HS-PDSCH data type.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**

<b>DSCH</b>	This choice is the HS-DSCH selection that is supported on only HSDPA1. Selecting the DSCH choice for HSDPA2–4 will generate an error.
"<file name>"	This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “ <a href="#">File Overview</a> ” on page 812 for more information on files.
<b>*RST</b>	PN9
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “ <a href="#">DLINK:APPLY</a> ” on page 814.

**:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSch:DATA:FIX4**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA [ 1 ] | 2 | 3 | 4 :HSPDSch:DATA:
FIX4 <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA [ 1 ] | 2 | 3 | 4 :HSPDSch:DATA:
FIX4?
```

This command sets the HS-PDSCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[DLINK:APPLY](#)” on page 814.

**:DLINK:HSDPA:HSPDSch:DSCH:DATA**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA:HSPDSch:DSCH:DATA PN9 |
FIX4 | "<file name>"
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA:HSPDSch:DSCH:DATA?
```

This command defines the HS-DSCH data type for HSDPA1. The HS-DSCH is not supported on HSDPA2–4.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “[File Overview](#)” on page 812 for more

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])**

information on files.

**\*RST** PN9

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.

**:DLINK:HSDPa:HSPDSch:DSCH:DATA:FIX4**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa:HSPDSch:DSCH:DATA:
FIX4 <val>
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa:HSPDSch:DSCH:DATA:FIX4?
```

This command defines the HS-DSCH repeating 4-bit binary data pattern for HSDPA1. The HS-DSCH is not supported on HSDPA2–4.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.

**:DLINK:HSDPa:HSPDSch:DSCH:IRBSize**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa:HSPDSch:DSCH:IRBSize <val>
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:HSDPa:HSPDSch:DSCH:IRBSize?
```

This command sets the HS-DSCH IR buffer size per the HARQ process for HSDPA1. The HS-DSCH is not supported on HSDPA2–4.

**\*RST** 9600

**Range** 960–28800

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.



### **:DLINK:HSDPA:HSPDSch:NCODE**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA:HSPDSch:NCODE <val>  
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA:HSPDSch:NCODE?
```

This command sets number of codes for the HS-PDSCH on HSDPA1. HSDPA2–4 do not support multicodes.

**\*RST** 1

**Range** 1–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

### **:DLINK:HSDPA[1] | 2 | 3 | 4:HSPDSch:POWER**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA [ 1 ] | 2 | 3 | 4 :HSPDSch:  
POWER <val>  
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA [ 1 ] | 2 | 3 | 4 :HSPDSch:POWER?
```

This command sets the HS-PDSCH power level.

The variable <val> is expressed in decibels (dB).

**\*RST** –1.02000000E+001

**Range** –40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])**:DLINK:HSDPa[1]|2|3|4:HSPDsch:SFORmat****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch:SFORmat 0|1

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch:SFORmat?

This command sets the HS-PDSCH slot format.

0 This sets the modulation type to QPSK.

1 This sets the modulation type to 16QAM.

**\*RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:HSDPa[1]|2|3|4:HSPDsch[:STATe]****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:HSDPa[1]|2|3|4:HSPDsch[:STATe]?

This command turns the selected HS-PDSCH on or off.

**\*RST** HSDPA1: 1 HSDPA2–4: 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

The HS-SCCH must be on for the HS-PDSCH to turn on. Turning off the HS-SCCH also turns off the active HS-PDSCH. See “:DLINK:HSDPa[1]|2|3|4[:STATe]” on page 841 for turning the HS-SCCH on or off.

**:DLINK:HSDPA[1] | 2 | 3 | 4:HSSCch:CCODE**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA [ 1 ] | 2 | 3 | 4 :HSSCch:
CCODE <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA [ 1 ] | 2 | 3 | 4 :HSSCch:CCODE?
```

This command sets the HS-SCCH channel code.

**\*RST** HSDPA1: 4 HSDPA2: 5 HSDPA3: 6 HSDPA4: 7

**Range** 1–127

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.

Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

**:DLINK:HSDPA[1] | 2 | 3 | 4:HSSCch:DATA**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA [ 1 ] | 2 | 3 | 4 :HSSCch:DATA PN9 |
FIX4 | "<file name>" | STD
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:HSDPA [ 1 ] | 2 | 3 | 4 :HSSCch:DATA?
```

This command sets the data type for the selected downlink HS-SCCH.

**STD** This choice configures the bit field as defined by the 3GPP standards.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “[File Overview](#)” on page 812 for more information on files.

**\*RST** STD

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])****:DLINK:HSDPA[1]|2|3|4:HSSCch:DATA:FIX4****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:HSSCch:DATA:FIX4 &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:HSSCch:DATA:FIX4?

This command sets the HS-SCCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** 0**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:HSDPA[1]|2|3|4:HSSCch:POWER****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:HSSCch:POWER &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:HSSCch:POWER?

This command sets the HS-SCCH power level.

The variable <val> is expressed in decibels (dB).

**\*RST** -1.02000000E+001**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**:DLINK:HSDPA[1]|2|3|4:ITTI****Supported** E4438C with Option 418

```
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:ITTI <val>
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:ITTI?
```

This command sets the static inter-TTI pattern value for the selected HSDPA.

The variable <val> is expressed in subframes (one subframe = 2 ms).

**\*RST** 8**Range** 1–16

**Remarks** To use a static pattern, select FIX as the choice for the [:DLINK:HSDPA\[1\]|2|3|4:ITTI:PATTERN](#) command.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “[:DLINK:APPLY](#)” on page 814.

**:DLINK:HSDPA[1]|2|3|4:ITTI:PATTERN****Supported** E4438C with Option 418

```
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:ITTI:
PATTERN FIX|"<file name>"
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:ITTI:PATTERN?
```

This command selects which method sets the inter-TTI pattern for the selected HSDPA.

**FIX** This choice enables a static pattern. To configure the pattern, see “[:DLINK:HSDPA\[1\]|2|3|4:ITTI](#)”.

"<file name>" This variable represents an inter-TTI pattern file stored in signal generator memory. Creating and using a file provides the option of having a flexible inter-TTI pattern where you can vary the distance between HS-PDSCH transmissions. To create a file, use one or a combination of the following methods:

- To create a file internal to the software, use the inter-TTI user pattern editor.
- To create a file external to the software, use a text editor.

For more information, see the Signal Studio for HSDPA over W-CDMA software online help.

The file name follows the form <project name>–ITTIx, where 'x' is the HSDPA number from one to four. The inter-TTI pattern must contain at least one bit, or the apply function (downlink apply command) will not work.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])****\*RST**                   FIX**Remarks**               Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:HSDPA:NHPRocess****Supported**               E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA:NHPRocess <val>  
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA:NHPRocess?

This command sets the HS-DSCH number of HARQ processes for HSDPA1. For HSDPA2–4, this parameter is fixed at one and is used only for HS-SCCH coding purposes.

**\*RST**                   4**Range**                   1–8**Remarks**               Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:HSDPA[1] | 2 | 3 | 4:RVParameter****Supported**               E4438C with Option 418[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:RVParameter <val>  
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1] | 2 | 3 | 4:RVParameter?

This command sets the HS-DSCH RV parameter. For HSDPA2–4, which do not support an HS-DSCH, this parameter is used only for HS-SCCH coding purposes.

**\*RST**                   0**Range**                   0–7**Remarks**               Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**:DLINK:HSDPA[1]|2|3|4:UEID****Supported** E4438C with Option 418

```
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:UEID <val>
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4:UEID?
```

This command sets the UEID.

**\*RST** HSDPA1: 0 HSDPA2: 1 HSDPA3: 2 HSDPA4: 3**Range** 0–65535**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:HSDPA[1]|2|3|4[:STATE]****Supported** E4438C with Option 418

```
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4[:STATE] ON|OFF|
1|0
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:HSDPA[1]|2|3|4[:STATE]?
```

This command turns the selected downlink HSDPA channel on or off.

ON (1)	<ul style="list-style-type: none"> <li>• Turns on the HS-SCCH for the selected HSDPA.</li> <li>• Enables turning on the HS-PDSCH for the selected HSDPA.</li> </ul>
--------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------

OFF (0)	<ul style="list-style-type: none"> <li>• Turns off the HS-SCCH for the selected HSDPA.</li> <li>• Turns off the active HS-PDSCH for the selected HSDPA.</li> </ul>
---------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------

**\*RST** HSDPA1: 1 HSDPA2–4: 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

Refer to “:DLINK:HSDPA[1]|2|3|4:HSPDSch[:STATE]” on page 836 for turning the HS-PDSCH on or off.

An HSDPA consists of a HS-SCCH and a HS-PDSCH, however the HS-DSCH is supported on only HSDPA1.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])****:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16]:CCODE****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16]:CCODE &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16]:CCODE?

This command sets the channel code for the selected downlink OCNS.

<b>*RST</b>	OCNS1: 2	OCNS2: 3	OCNS3: 4	OCNS4: 5
	OCNS5: 6	OCNS6: 7	OCNS7: 8	OCNS8: 9
	OCNS9: 10	OCNS10: 11	OCNS11: 12	OCNS12: 13
	OCNS13: 14	OCNS14: 15	OCNS15: 16	OCNS16: 17

**Range** 1–127**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16]:DATA****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16]:DATA PN9|PN15

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16]:DATA?

This command configures the data pattern for the selected downlink OCNS.

**\*RST** PN9**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.



**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:POWer**

**Supported** E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :POWer <val>
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :POWer?
```

This command sets the power level for the selected downlink OCNS.

The variable <val> is expressed in units of dB.

**\*RST** OCNS1: -6 OCNS2: -8 OCNS3: -8 OCNS4: -10  
OCNS5: -7 OCNS6: -9 OCNS7-16: -10

**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SSCOffset**

**Supported** E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :SSCOffset <val>
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
12 | 13 | 14 | 15 | 16 :SSCOffset?
```

This command sets the secondary scrambling code offset for the selected downlink OCNS.

**\*RST** 0

**Range** 0-15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])****:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:TOFFset****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:TOFFset &lt;val&gt;

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:TOFFset?

This command adjusts the timing offset for the OCNS.

<b>*RST</b>	OCNS1: 1	OCNS2: 2	OCNS3: 3	OCNS4: 4
	OCNS5: 5	OCNS6: 6	OCNS7: 7	OCNS8: 8
	OCNS9: 9	OCNS10: 10	OCNS11: 11	OCNS12: 12
	OCNS13: 13	OCNS14: 14	OCNS15: 15	OCNS16: 16

**Range** 0–149**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATE]****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATE] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATE]?

This command turns the selected OCNS on or off.

**\*RST** 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:PCCPch:BCH:DATA****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:PCCPch:BCH:DATA PN9|PN15|FIX4|&lt;file name&gt;"

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:PCCPch:BCH:DATA?

This command sets the BCH data format that is transmitted on the P-CCPCH.

**HSDPA over W-CDMA Subsystem—Option 418** [:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “File Overview” on page 812 for more information on files.

**\*RST** FIX4

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:PCCPch:BCH:DATA:FIX4**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:PCCPch:BCH:DATA:FIX4 <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:PCCPch:BCH:DATA:FIX4?
```

This command sets the BCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:PCCPch:CCODE**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:PCCPch:CCODE <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:PCCPch:CCODE?
```

This command sets the P-CCPCH channel code.

**\*RST** +1

**Range** 0–255

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

**:DLINK:PCCPch:POWer**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:PCCPch:POWer <val>
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:PCCPch:POWer?
```

This command sets the P-CCPCH power level.

The variable <val> is expressed in decibels (dB).

**\*RST** -5.30000000E+000

**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:PCCPch[:STATe]**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:PCCPch [ :STATe ] ON | OFF | 1 | 0
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:PCCPch [ :STATe ] ?
```

This command turns the P-CCPCH on or off.

**\*RST** 1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:PICH:CCODE**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:PICH:CCODE <val>
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:PICH:CCODE?
```

This command sets the PICH channelization code.

**\*RST** +3

**Range** 0–255

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

Set all physical channel codes so they are orthogonal to each other. If any of the channel codes fail to meet this criteria, the apply function (downlink apply command) will not work.

## **:DLINK:PICH:DATA**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:PICH:DATA PN9 | PN15 | FIX4 |  
"<file name>"  
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:PICH:DATA?
```

This command sets the PICH data type.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to [“File Overview” on page 812](#) for more information on files.

**\*RST** PN9

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 814](#).

## **:DLINK:PICH:DATA:FIX4**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:PICH:DATA:FIX4 <val>  
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :DLINK:PICH:DATA:FIX4?
```

This command sets the PICH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** 0

**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to [“:DLINK:APPLY” on page 814](#).

**:DLINK:PICH:POWer****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:PICH:POWer &lt;val&gt;

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:PICH:POWer?

This command sets the PICH power level.

The variable &lt;val&gt; is expressed in decibels (dB).

**\*RST** -8.300000000E+000**Range** -40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:PICH[:STATe]****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:PICH[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:PICH[:STATe] ?

This command turns the PICH on or off.

**\*RST** 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:POLarity****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:POLarity NORMal|INVerted|INVert

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:DLINK:POLarity?

This command selects the phase polarity of the downlink signal.

**NORMal** This choice selects normal polarity.**INVerted, INVert** These choices perform the same function, inverting the internal Q signal.**\*RST** NORM**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “:DLINK:APPLY” on page 814.

### **:DLINK:PSCH:POWer**

**Supported** E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:PSCH:POWer <val>  
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:PSCH:POWer?
```

This command sets the PSCH power level.

The variable <val> is expressed in decibels (dB).

**\*RST** -8.30000000E+000

**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

### **:DLINK:PSCH[:STATe]**

**Supported** E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:PSCH [ :STATe ] ON | OFF | 1 | 0  
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:PSCH [ :STATe ] ?
```

This command turns the PSCH on or off.

**\*RST** 1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “:DLINK:APPLY” on page 814.

### **:DLINK:SCRamblecode**

**Supported** E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:SCRamblecode <val>  
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :DLINK:SCRamblecode?
```

This command sets the downlink scramble code number.

**\*RST** +0

**Range** 0–511

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.

**:DLINK:SSCH:POWer****Supported** E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:SSCH:POWer &lt;val&gt;

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:SSCH:POWer?

This command sets the SSCH power level. The variable &lt;val&gt; is expressed in decibels (dB)

**\*RST** -8.3000000E+000**Range** -40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:SSCH[:STATe]****Supported** E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:SSCH[:STATe] ON|OFF|1|0

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:SSCH[:STATe]?

This command turns the SSCH on or off.

**\*RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.**:DLINK:TXDiversity****Supported** E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:TXDiversity NONE|OANT1|OANT2

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINK:TXDiversity?

This command selects the downlink signal transmit diversity mode.

**NONE** This choice disables the transmit diversity mode.**OANT1** This choice selects the transmit diversity openloop antenna 1 mode.**OANT2** This choice selects the transmit diversity openloop antenna 2 mode.**\*RST** NONE**Remarks** To configure both antennas (one and two) requires two ESGs.

Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:DLINK:APPLY” on page 814.



**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**:LINK****Supported** E4438C with Option 418

```
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:LINK DOWN|UP
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:LINK?
```

This command sets the uplink or downlink mode.

**\*RST** DOWN**:ULINK:APPLY****Supported** E4438C with Option 418

```
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:APPLY
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:APPLY?
```

This command applies changes to the channel setup and data for active physical and transport channels, immediately starting the channel coding generation process. A progress bar may appear on the ESG display indicating that the new signal parameters are being applied. Turning on the HSDPA modulation format also applies the signal parameters.

The query response determines whether or not there is a need to execute the command. It returns the following responses:

0 Command execution is not required.

1 Command execution is required.

---

**NOTE** The query response is only valid while the HSDPA format is active.

---

When there is a setting conflict (ESG reports an error) with the range values or coupled parameters, or both, executing the uplink apply command does not apply the new changes until the conflicts are resolved. After resolving the setting conflicts, execute the command to apply the new settings.

**:ULINK:AWGN:CN****Supported** E4438C with Option 418

```
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:AWGN:CN <val>
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:AWGN:CN?
```

This command sets the uplink in-band carrier to noise ratio (C/N) value using AWGN.

**\*RST** 0**Range** -30 to 30

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])**

**Remarks**                    Setting the command parameter while the signal is active also requires executing the apply command. Refer to **:ULINK:APPLY**”.

**:ULINK:AWGN[:STATe]**

**Supported**                    E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:AWGN [ :STATe ] ON | OFF | 0 | 1
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:AWGN [ :STATe ] ?
```

This command turns the uplink AWGN on or off.

**\*RST**                         0

**Remarks**                    Setting the command parameter while the signal is active also requires executing the apply command. Refer to **“:ULINK:APPLY” on page 851**.

**:ULINK:BBReference:EXTeRnal:MRATe**

**Supported**                    E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:BBReference:EXTeRnal:MRATe X1 |
X2 | X4
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:BBReference:EXTeRnal:MRATe ?
```

This command configures the ESG, so it can accept an external baseband generator clock that is a multiple of the internal 3.84 MHz chip clock.

X1                            This sets the ESG to accept an external clock rate identical to the chip clock.

X2                            This sets the ESG to accept an external clock rate that is two times the rate of the chip clock.

X4                            This sets the ESG to accept an external clock rate that is four times the rate of the chip clock.

**\*RST**                         X1

**:ULINK:BBReference[:SOURce]**

**Supported**                    E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:BBReference [ :SOURce ] INT [1] |
EXT [1]
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:BBReference [ :SOURce ] ?
```

This command selects the baseband generator reference source for the radio uplink channel.

**\*RST**                         INT

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**:ULINK:DPCCh:CCODE**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:DPCCh:CCODE?
```

This query returns the channelization code for the uplink DPCCH.

The slot format determines the channelization code in accordance with the 3GPP standards. See “:ULINK:DPCCh:SFORmat” on page 856 for setting the slot format.

**:ULINK:DPCCh:DATA**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:DPCCh:DATA PN9 | PN15 | FIX4 |
"<file name>" | STD
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:DPCCh:DATA?
```

This command configures the uplink DPCCH data pattern.

**STD** This sets the DPCCH bit fields according to the 3GPP standards.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to “File Overview” on page 812 for more information on files.

**\*RST** STD

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:DPCCh:DATA:FIX4****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:DATA:FIX4 &lt;val&gt;

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:DATA:FIX4?

This command sets the uplink DPCCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** 0**Range** 0–15

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:DPCCh:FBI:PATtern****Supported** E4438C with Option 418[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:FBI:PATtern PN9|PN15|FIX|  
"<file name>"

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:FBI:PATtern?

This command configures the uplink DPCCH FBI pattern.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to “File Overview” on page 812 for more information on files.

**\*RST** FIX

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**HSDPA over W-CDMA Subsystem—Option 418** [:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]**:ULINK:DPCCh:FBI:PATtern:FIX****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:FBI:PATtern:FIX &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:FBI:PATtern:FIX?

This command sets the 30-bit FBI pattern for the uplink DPCCH.

The variable &lt;val&gt; accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** +0**Range** 0–1073741823**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.**:ULINK:DPCCh:POWer****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:POWer &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:POWer?

This command sets the uplink DPCCH power level.

The variable &lt;val&gt; is expressed in decibels (dB)

**\*RST** –2.69000000E+000**Range** –40 to 0**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:DPCCh:SFORmat****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:SFORmat &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:SFORmat?

This command sets the uplink DPCCH slot format.

**\*RST** +0**Range** 0–5**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

The slot format determines the settings for other parameters in accordance with 3GPP standards.

**:ULINK:DPCCh[:STATe]****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh[:STATe] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh[:STATe]?

This command turns the uplink DPCCH on or off.

**\*RST** 1**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.**:ULINK:DPCCh:TFCI****Supported** E4438C with Option 418

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:TFCI &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:DPCCh:TFCI?

This command sets the uplink DPCCH TFCI 10-bit data pattern.

The variable &lt;val&gt; accepts values in binary, hexadecimal, or decimal format, however the query returns only decimal values.

**\*RST** +0**Range** 0–1023**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**HSDPA over W-CDMA Subsystem—Option 418** [:SOURce]:RADio:WCDMa:HSDPa[:BBG]**:ULINK:DPCCh:TPC:NSTeps****Supported** E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:TPC:NSTeps &lt;val&gt;

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:TPC:NSTeps?

This command sets the number of steps for the down and up (DUP) or up and down (UDOWn) TPC pattern selections.

The variable <val> is expressed in decibels (dB).

**\*RST** +1**Range** 1–80

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:DPCCh:TPC:PATtern****Supported** E4438C with Option 418

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:TPC:PATtern

UDOWn|DUP|UALL|DALL|"&lt;file name&gt;"

[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPCCh:TPC:PATtern?

This command configures the uplink DPCCH TPC pattern for increasing or decreasing, or increasing and decreasing the BTS power level.

UDOWn The TPC pattern repetitively steps up and down.

DUP The TPC pattern repetitively steps down and up.

UALL The TPC pattern consecutively steps up.

DALL The TPC pattern consecutively steps down.

"<file name>" This variable represents a power pattern file stored in signal generator memory. The pattern must contain at least one bit or the apply function (downlink apply command) will not work. Refer to “File Overview” on page 812 for more information on files.

**\*RST** UDOW

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

Each step in a TPC pattern signals an increase or decrease of 1 dB in the BTS output power level.

**:ULINK:DPDCh:CCODE**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPDCh:CCODE?
```

This query returns the uplink DPDCH channelization code.

The slot format determines the channelization code in accordance with the 3GPP standards. See “:ULINK:DPDCh:SFORmat” on page 863 for setting the slot format.

**:ULINK:DPDCh:DATA**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPDCh:DATA PN9 | PN15 | FIX4 | DCH |
"<file name>"
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPDCh:DATA?
```

This command configures the uplink DPDCH data pattern.

**DCH** This choice selects the transport channel as the data source.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to “File Overview” on page 812 for more information on files.

**\*RST** PN9

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:DPDCh:DATA:FIX4**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPDCh:DATA:FIX4 <val>
```

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPDCh:DATA:FIX4?
```

This command sets the uplink DPDCH repeating 4-bit binary data pattern.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** 0

**Range** 0–15



**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:DPDCh:DCH[1]|2|3|4|5|6:BSIZE**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMA:HSDPA [ :BBG ] :ULINK:DPDCh:DCH [1] | 2 | 3 | 4 | 5 | 6 :
BSIZE <val>
```

```
[ :SOURCE ] :RADIo:WCDMA:HSDPA [ :BBG ] :ULINK:DPDCh:DCH [1] | 2 | 3 | 4 | 5 | 6 :BSIZE?
```

This command sets the block size for the selected uplink DCH.

**\*RST** 20

**Range** 0–5000

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the ESG calculates the product of the block size and the number of blocks. If the product of these two parameters exceeds 200,000, the apply function (uplink apply command) will not work.

**:ULINK:DPDCh:DCH[1]|2|3|4|5|6:CRC**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMA:HSDPA [ :BBG ] :ULINK:DPDCh:DCH [1] | 2 | 3 | 4 | 5 | 6 :
CRC 0 | 8 | 12 | 16 | 24
```

```
[ :SOURCE ] :RADIo:WCDMA:HSDPA [ :BBG ] :ULINK:DPDCh:DCH [1] | 2 | 3 | 4 | 5 | 6 :CRC?
```

This command sets the number of CRC bits for the selected uplink DCH.

**\*RST** 8

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:DPDCh:DCH[1]|2|3|4|5|6:CTYPe**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMA:HSDPA [ :BBG ] :ULINK:DPDCh:DCH [1] | 2 | 3 | 4 | 5 | 6 :
CTYPe HCONv | TCONv | TURBo | NONE
```

```
[ :SOURCE ] :RADIo:WCDMA:HSDPA [ :BBG ] :ULINK:DPDCh:DCH [1] | 2 | 3 | 4 | 5 | 6 :CTYPe?
```

This command selects the encoder type for the selected uplink DCH.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**

HCONv	This choice selects the 1/2 rate convolutional encoder.
TCONv	This choice selects the 1/3 rate convolutional encoder.
TURBo	This choice selects the turbo coder.
NONE	This choice selects no coding.
<b>*RST</b>	HCON
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:DPDCh:DCH[1]|2|3|4|5|6:DATA**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:DPDCh:DCH [1] | 2 | 3 | 4 | 5 | 6 :DATA PN9 |
PN15 | FIX4 | "<file name>"
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:DPDCh:DCH [1] | 2 | 3 | 4 | 5 | 6 :DATA?
```

This command configures the data for the selected uplink DCH.

"<file name>" This variable represents a data pattern file stored in signal generator memory. The data pattern must contain at least one bit or the apply function (uplink apply command) will not work. Refer to “File Overview” on page 812 for more information on files.

**\*RST** PN9

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:DPDCh:DCH[1]|2|3|4|5|6:DATA:FIX4**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:DPDCh:DCH [1] | 2 | 3 | 4 | 5 | 6 :DATA :
FIX4 <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:DPDCh:DCH [1] | 2 | 3 | 4 | 5 | 6 :DATA :
FIX4?
```

This command sets the repeating 4-bit binary data pattern for the selected uplink DCH.

The variable <val> accepts values in binary, hexadecimal, or decimal format, however the query returns only binary values.

**\*RST** 0

**Range** 0–15

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURce]:RADio:WCDMa:HSDPa[:BBG])

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:NBLocks**

**Supported** E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
NBLocks <val>
```

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :NBLocks?
```

This command sets the number of blocks for the selected uplink DCH.

**\*RST** 1

**Range** 0–512

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

The number of data bits per DCH cannot exceed 200,000. To maintain this data bit limit, the block size is multiplied by the number of blocks. If the product of these two parameters exceeds 200,000, the apply function (uplink apply command) will not work.

**:ULINK:DPDCh:DCH[1] | 2 | 3 | 4 | 5 | 6:RMATtribute**

**Supported** E4438C with Option 418

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
RMATtribute <val>
```

```
[ :SOURce ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:DPDCh:DCH [ 1 ] | 2 | 3 | 4 | 5 | 6 :
RMATtribute?
```

This command sets the rate matching attribute for the selected uplink DCH.

**\*RST** 1

**Range** 1–256

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “:ULINK:APPLY” on page 851.

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURce]:RADio:WCDMa:HSDPa[:BBG])**:ULINK:DPDCh:DCH[1]|2|3|4|5|6:TTI****Supported** E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPDCh:DCH[1]|2|3|4|5|6:
TTI 10|20|40|80
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPDCh:DCH[1]|2|3|4|5|6:TTI?
```

This command sets the TTI for the selected uplink DCH.

The choices are expressed in millisecond (ms).

**\*RST** 10

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. For more information, refer to “:ULINK:APPLY” on page 851.

**:ULINK:DPDCh:DCH2|3|4|5|6[:STATe]****Supported** E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPDCh:
DCH2|3|4|5|6[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINK:DPDCh:DCH2|3|4|5|6[:STATe]?
```

This command turns the selected uplink DCH on or off; DCH1 is always on.

**\*RST** *DCH 1: 1 DCH 2–6: 0*

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

The apply command will not work and the ESG will report an error if you turn on a DCH where lower numbered DCHs are off. For example, turning on DCH5 requires turning on DCH2–4. The reverse is true when turning off the DCHs.

## :ULINK:DPDCh:POWer

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMA:HSDPa [ :BBG ] :ULINK:DPDCh:POWer <val>  
[ :SOURCE ] :RADIo:WCDMA:HSDPa [ :BBG ] :ULINK:DPDCh:POWer?
```

This command sets the uplink DPDCH power level.

The variable <val> is expressed in decibels (dB).

**\*RST** +0.00000000E+000

**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

## :ULINK:DPDCh:SFORmat

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMA:HSDPa [ :BBG ] :ULINK:DPDCh:SFORmat <val>  
[ :SOURCE ] :RADIo:WCDMA:HSDPa [ :BBG ] :ULINK:DPDCh:SFORmat?
```

This command sets the uplink DPDCH slot format.

**\*RST** +2

**Range** 0– 6

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

The slot format determines the settings for other parameters in accordance with the 3GPP standards.

## :ULINK:DPDCh[:STATe]

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIo:WCDMA:HSDPa [ :BBG ] :ULINK:DPDCh [ :STATe ] ON | OFF | 1 | 0  
[ :SOURCE ] :RADIo:WCDMA:HSDPa [ :BBG ] :ULINK:DPDCh [ :STATe ] ?
```

This command turns the uplink DPDCH on or off.

**\*RST** 1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])****:ULINK:FCLock:INTERval**

**Supported** E4438C with Option 418

```
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:FCLock:INTERval 10|20|40|80|2560
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:FCLock:INTERval?
```

This command selects the frame clock interval for the synchronization signal.

The frame clock interval is set in milliseconds (ms).

**\*RST** 80

**Remarks** Ensure that the selected interval is equal to or longer than the longest transport channel TTI period.

This command is applicable only when FCLock is the sync source selection. See “:ULINK:SYNC[:SOURCE]” on page 872 for selecting the sync source.

**:ULINK:FCLock:POLarity**

**Supported** E4438C with Option 418

```
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:FCLock:POLarity POSitive|
NEGative
[:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]:ULINK:FCLock:POLarity?
```

This command sets the frame clock polarity.

**POSitive** This choice sets the clock gate to trigger when the signal is high.

**NEGative** This choice sets the clock gate to trigger when the signal is low.

**\*RST** POS

**Remarks** This command is applicable only when FCLock is the sync source selection. See “:ULINK:SYNC[:SOURCE]” on page 872 for selecting the sync source.

**HSDPA over W-CDMA Subsystem—Option 418** [:SOURCE]:RADIO:WCDMA:HSDPA[:BBG]**:ULINK:FILTer**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:FILTer RNYQuist | NYQuist |
GAUSSian | RECTangle | IS95 | IS95_EQ | IS95_MOD | IS95_MOD_EQ | AC4Fm | UGGaussian |
" <user FIR > "
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:FILTer?
```

This command selects the uplink filter type.

IS95	This filter meets the criteria of the IS-95 standard.
IS95_EQ	This filter is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard and is best suited for IS-95 baseband filtering.
IS95_MOD	This filter meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
IS95_MOD_EQ	This filter is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
UGGaussian	This is a GSM Gaussian filter with a fixed BbT value of 0.300.
AC4Fm	This is a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
" <user FIR > "	This variable represents any FIR filter file stored in signal generator memory. Refer to <a href="#">“File Overview” on page 812</a> for more information on files.
<b>*RST</b>	RNYQ
<b>Remarks</b>	Setting the command parameter while the signal is active also requires executing the apply command. Refer to <a href="#">“:ULINK:APPLY” on page 851</a> .

**:ULINK:FILTer:ALPHa**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:FILTer:ALPHa <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:FILTer:ALPHa?
```

This command sets the uplink Nyquist or root Nyquist filter alpha value.

**\*RST** +2.20000000E-001

**Range** 0–1

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])**

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Executing this command while a filter other than Nyquist or root Nyquist is selected changes the parameter value, but it is not used by the signal generator until one of the Nyquist filters is selected. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:FILTer:BBT**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:FILTer:BBT <val>
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:FILTer:BBT?
```

This command sets the uplink Gaussian filter BbT value.

**\*RST** +5.00000000E-001

**Range** 0–1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

Executing this command while a filter other than the Gaussian filter is selected changes the parameter value, but it is not used by the signal generator until the Gaussian filter is selected.

**:ULINK:FILTer:CHANnel**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:FILTer:CHANnel EVM|ACP
[ :SOURCE ] :RADio:WCDMa:HSDPa [ :BBG ] :ULINK:FILTer:CHANnel?
```

This command optimizes an uplink filter for minimized EVM or for minimized ACP.

**EVM** This choice provides the most ideal passband.

**ACP** This choice improves stopband rejection for the root Nyquist and Nyquist filters.

**\*RST** EVM

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

To change the filter selection, refer to “:ULINK:FILTer” on page 865.



**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])**:ULINK:FOFFset**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:FOFFset <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:FOFFset?
```

This command sets the CFN starting frame within the SFN by setting a frame offset relative to SFN zero.

**\*RST** 0

**Range** 0–255

**Remarks** The command adds delays to the internal frame counter by specifying the starting frame number count. When the frame offset (FOFFset) is set to 0, the frame number starts at the system sync trigger. When the FOFFset is set to 2, the signal generator triggers two frames after the SFN RST. For additional information, refer to 3GPP TS25.402 for SFN and CFN relationship.

**:ULINK:HSDPcch:APATtern**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:HSDPcch:APATtern NONE | ACK_ALL |
"<file name>"
```

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:HSDPcch:APATtern?
```

This command sets the HS-DPCCH ACK/NACK transmission pattern for each of the 1280 subframes that make up the pattern.

NONE This choice sets all subframes to DTX.

"<file name>" This variable represents an ACK pattern file stored in signal generator memory. The file must contain 2,560-bits of data (2-bits per subframe) or the apply function (uplink apply command) will not work.

- An ACK response is represented by 00.
- A NACK response is represented by 01.
- DTX is represented by 10.

Enter the 2,560-bits into the file as a binary string.

Refer to [“File Overview” on page 812](#) for more information on files.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])**

**\*RST** ACK\_ALL

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:HSDPcch:APOWer**

**Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch:APOWer <val>
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch:APOWer?
```

This command sets the HS-DPCCH ACK part power level.

The variable <val> is expressed in decibels (dB).

**\*RST** -2.69000000E+000

**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:HSDPcch:CCODE**

**Supported** E4438C with Option 418

```
[:SOURCE]RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch:CCODE?
```

This query returns the HS-DPCCH channelization code.

**:ULINK:HSDPcch:CPATtern**

**Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch:CPATtern NONE |
"<file name>"
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch:CPATtern?
```

This command sets the HS-DPCCH CQI transmission pattern for each of the 1280 subframes that make up the pattern.

NONE This choice sets all subframes to DTX.

"<file name>" This variable represents a bit file stored in signal generator memory. The file must contain 10,240-bits of data (8-bits per subframe) or the apply function (uplink apply command) will not work.

- A CQI response range is one to thirty using 8-bits, 00000001 to 00011110.

**HSDPA over W-CDMA Subsystem—Option 418** [:SOURCE]:RADIO:WCDMA:HSDPa[:BBG]

- DTX is represented by 11111111.

Enter the 10,240-bits into the file as a binary string.

Refer to “File Overview” on page 812 for more information on files.

**\*RST** NONE

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:HSDPcch:CPOWer**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPa [ :BBG ] :ULINK:HSDPcch:CPOWer <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPa [ :BBG ] :ULINK:HSDPcch:CPOWer?
```

This command sets the HS-DPCCH CQI part power level.

The variable <val> is expressed in decibels (dB).

**\*RST** -2.69000000E+000

**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:HSDPcch:NPOWer**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPa [ :BBG ] :ULINK:HSDPcch:NPOWer <val>
[ :SOURCE ] :RADIO:WCDMA:HSDPa [ :BBG ] :ULINK:HSDPcch:NPOWer?
```

This command sets the HS-DPCCH NACK part power level. The variable <val> is expressed in decibels (dB).

**\*RST** -2.69000000E+000

**Range** -40 to 0

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:HSDPcch:SFDelay**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPa [ :BBG ] :ULINK:HSDPcch:SFDelay <val>
```

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])**

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch:SFDeLay?

This command sets the HS-DPCCH subframe delay. The variable <val> is expressed in units of 256 chips.

**\*RST** 0**Range** 0–150

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:HSDPcch[:STATe]****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:HSDPcch[:STATe]?

This command turns the HS-DPCCH on or off.

**\*RST** 1

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:POLarity****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:POLarity NORMal|INVerted|INVert

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:POLarity?

This command selects the phase polarity of the uplink signal.

**NORMal** This choice selects normal polarity.

**INVerted, INVert** These choices perform the same function, inverting the internal Q signal.

**\*RST** NORM

**Remarks** Setting the command parameter while the signal is active also requires executing the apply command. Refer to “:ULINK:APPLY” on page 851.

**:ULINK:SCRamblecode****Supported** E4438C with Option 418

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:SCRamblecode &lt;val&gt;

[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:SCRamblecode?

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

This command sets the scramble code.

**\*RST** +0  
**Range** 0–16777215

**:ULINK:SDElay**

**Supported** E4438C with Option 418

[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:SDElay <val>  
 [ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:SDElay?

This command sets the uplink DPCH delay, measured in slots.

**\*RST** +0  
**Range** 0–119  
**Remarks** Calculate the delay between downlink and uplink DPCH, in slots, using the following formulas. Total Delay = (T0) + (TOFFset) + ((SDElay) \* 2560 chips)

- T0 = 1024 chips
- TOFFset is set by “:ULINK:TOFFset” on page 872

Slot Delay = (Total Delay – T0) / 2560

**:ULINK:SFNRst:POLarity**

**Supported** E4438C with Option 418

[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:SFNRst:POLarity POSitive|  
 NEGative  
 [ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] :ULINK:SFNRst:POLarity?

This command sets the polarity of the system frame number reset signal for the uplink synchronization source.

POSitive This choice sets the signal to trigger when the trigger signal is high.

NEGative This choice sets the signal to trigger when the trigger signal is low.

**\*RST** POS

**Remarks** This command is applicable only when SFN\_RST is the sync source selection. See “:ULINK:SYNC[:SOURCE]” on page 872 for selecting the sync source.

**HSDPA over W-CDMA Subsystem—Option 418 ([:SOURCE]:RADio:WCDMa:HSDPa[:BBG])****:ULINK:SYNC:MODE****Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:SYNC:MODE SINGLE|CONTInuous
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:SYNC:MODE?
```

This command selects the uplink frame synchronization triggering mode.

**SINGLE** The signal generator, once triggered, generates frames based on the reference clock.

**CONTInuous** The signal generator continuously aligns the frame timing with the frame sync trigger signal.

**\*RST** SING

**:ULINK:SYNC[:SOURCE]****Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:SYNC[:SOURCE] SFN_RST|FCLock
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:SYNC[:SOURCE]?
```

This command selects the uplink frame synchronization source type.

**SFN\_RST** The uplink signal triggers on the system frame number reset signal.

**FCLock** The uplink signal triggers on the frame clock.

**\*RST** FCL

**:ULINK:TOFFset****Supported** E4438C with Option 418

```
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:TOFFset <val>
[:SOURCE]:RADio:WCDMa:HSDPa[:BBG]:ULINK:TOFFset?
```

This command sets the uplink DPCH timing offset (delay), measured in chips.

**\*RST** +0

**Range** -512 to 2560

**HSDPA over W-CDMA Subsystem—Option 418** ([:SOURCE]:RADIO:WCDMA:HSDPA[:BBG])

- Remarks** The downlink signal timing is provided by the synchronization signal.
- Calculate the delay between downlink and uplink DPCH, in chips, using the following formulas:
- Total Delay = (T0) + (TOFFset) + ((SDElay) \* 2560 chips)
- T0 = 1024 chips
  - SDElay is set by “:ULINK:SDElay” on page 871
- Chip Delay = (Total Delay - T0) mod 2560

**[ :STATe ]**

**Supported** E4438C with Option 418

```
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] [ :STATe ] ON | OFF | 1 | 0
[ :SOURCE ] :RADIO:WCDMA:HSDPA [ :BBG ] [ :STATe ] ?
```

This command turns the HSDPA functionality on or off.

**\*RST** 0

**Remarks** This command only works when there is at least one active physical channel within the selected link.

## NADC Subsystem—Option 402 ([:SOURce]:RADio[:NADC])

### :ALPha

**Supported** E4438C with Option 402

```
[:SOURce]:RADio[:NADC]:ALPha <val>  
[:SOURce]:RADio[:NADC]:ALPha?
```

This command changes the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to a minimum level (0), a maximum level (1), or in between by using fractional numeric values (0.001–0.999).

**\*RST** +3.50000000E–001

**Range** 0.000–1.000

**Key Entry** **Filter Alpha**

**Remarks** This command is effective only after choosing a root Nyquist or Nyquist filter; it does not effect other types of filters. To change the current filter type, refer to [“:FILTer” on page 887](#).

### :BBCLock

**Supported** E4438C with Option 402

```
[:SOURce]:RADio[:NADC]:BBCLock INT[1] | EXT[1]  
[:SOURce]:RADio[:NADC]:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

**INT[1]** This choice selects the signal generator internal data clock.

**EXT[1]** This choice selects an external data clock input.

**\*RST** INT

**Key Entry** **BBG Data Clock Ext Int**

**Remarks** A data clock or continuous symbol sync input must be supplied when external mode is used.



## :BBT

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:BBT <val>
```

```
[:SOURCE]:RADIO[:NADC]:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

**\*RST** +5.00000000E–001

**Range** 0.100–1.000

**Key Entry** Filter BbT

**Remarks** This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters. To change the current filter type, refer to [“:FILTer” on page 887](#).

## :BRATe

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:BRATe <val>
```

```
[:SOURCE]:RADIO[:NADC]:BRATe?
```

This command sets the bit rate in bits per second (bps–Mbps). The maximum bit rate is dependent on the modulation type and filter as shown in the following tables

The IQ digital data stream is shaped by a FIR filter. The filter length and associated latency and frequency response are dependent on the bit rate as shown in the following tables. The signal generator selects a filter length.

For higher bit rates, the FIR filter length may be truncated (if the minimum filter size allows it) which will impact the relative timing of the modulated data, as well as the actual filter response (see the symbol rate command [“:SRATe” on page 965](#)). Refer to [“:FILTer” on page 887](#) for information on filter symbol widths.

To change the modulation type, refer to [“:MODulation\[:TYPE\]” on page 890](#).

When the bit rate is changed, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the bit rate: lower bit rates require more time.

Receiver Test Digital Commands (continued)  
**NADC Subsystem—Option 402 ([:SOURce]:RADio[:NADC])**

**\*RST** +4.86000000E+004

Range	Modulation Type	Bit Rate Range		
		16 Symbol Wide Filter	32 Symbol Wide Filter	64 Symbol Wide Filter
	BPSK, FSK2, MSK	1bps–50Mbps	1bps–25Mbps	1bps–12.5Mbps
	C4FM, OQPSK, FSK4	2bps–50Mbps	2bps–25Mbps	2bps–12.5Mbps
	OQPSKI95, QPSK			
	P4QPPSK, QPSKIS95			
	GRAYQPSK, QAM4			
	D8PSK, EDGE, FSK8, PSK8	3bps–50Mbps	3bps–25Mbps	3bps–12.5Mbps
	FSK16, PSK16, QAM16	4bps–50Mbps	4bps–25Mbps	4bps–12.5Mbps
	QAM32	5bps–50Mbps	5bps–25Mbps	5bps–12.5Mbps
	QAM64	6bps–50Mbps	6bps–25Mbps	6bps–12.5Mbps
	QAM128	7bps–50Mbps	7bps–25Mbps	7bps–12.5Mbps
	QAM256	8bps–50Mbps	8bps–25Mbps	8bps–12.5Mbps

**Key Entry**      **Symbol Rate**

**:BURSt:PN9**

**Supported**      E4438C with Option 402

[ :SOURce ] :RADio [ :NADC ] :BURSt :PN9 NORMal | QUICk  
 [ :SOURce ] :RADio [ :NADC ] :BURSt :PN9?

This command controls the software PN9 generation.

**NORMal**      This choice produces a maximum length PN9 sequence.

**QUICk**      This choice produces a truncated PN9 sequence.

**\*RST**      NORM

**Key Entry**      **PN9 Mode Normal Quick**

**Remarks**      Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

### **:BURSt:SHAPe[:TYPE]**

**Supported**            E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe [ :TYPE ] SINE | "<file name>"
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe [ :TYPE ] ?
```

This command specifies the burst shape as either SINE or a user-defined file ("*<file name>*").

**SINE**                    This choice selects a state that is defined by the burst rise and fall \*RST values, as the default burst shape type.

"*<file name>*"        This choice selects a user designated file from signal generator memory (non-volatile).

**\*RST**                    SINE

**Key Entry**            **Sine    User File**

### **:BURSt:SHAPe:FALL:DElay**

**Supported**            E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :FALL :DElay <val>
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :FALL :DElay?
```

This command sets the burst shape fall delay.

The variable *<val>* is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST**                    +0.00000000E+000

**Range**                    -22.3750 to 99

**Key Entry**            **Fall Delay**

**Remarks**            The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to [“:MODulation\[:TYPE\]” on page 890](#). Refer to [“:SRATE” on page 965](#) for a list of the minimum and maximum symbol rate values.

[“:BURSt:SHAPe:FDElay” on page 878](#) performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

## :BURSt:SHAPe:FALL:TIME

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :BURSt :SHAPe :FALL :TIME <val>  
[ :SOURCE ] :RADio [ :NADC ] :BURSt :SHAPe :FALL :TIME?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +5.00000000E+000

**Range** 0.1250–255.8750

**Key Entry** **Fall Time**

**Remarks** The setting enabled by this command is not affected by signal

generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 890.

Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FTIME” on page 879 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

## :BURSt:SHAPe:FDElay

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :BURSt :SHAPe :FDElay <val>  
[ :SOURCE ] :RADio [ :NADC ] :BURSt :SHAPe :FDElay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** –22.3750 to 99

**Key Entry** **Fall Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 890. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:DELay” on page 877 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

### **:BURSt:SHAPe:FTIME**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:BURSt:SHAPe:FTIME <val>  
[:SOURCE]:RADIO[:NADC]:BURSt:SHAPe:FTIME?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** 0.1250–255.8750

**Key Entry** **Fall Time**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 890. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 878 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

### **:BURSt:SHAPe:RDElay**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :BURSt :SHAPe :RDElay <val>  
[ :SOURCE ] :RADio [ :NADC ] :BURSt :SHAPe :RDElay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** -17.3750 to 99

**Key Entry** **Rise Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 890.  
Refer to “:SRATe” on page 965 for minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DElay” on page 880 performs the same function; in compliance with the SCPI standard, both commands are listed.

Refer to the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

### **:BURSt:SHAPe:RISE:DElay**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :BURSt :SHAPe :RISE :DElay <val>  
[ :SOURCE ] :RADio [ :NADC ] :BURSt :SHAPe :RISE :DElay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** -17.3750 to 99

**Key Entry** **Rise Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 890. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPE:RDElay” on page 880 performs the same function; in compliance with the SCPI standard, both commands are listed.

Refer to the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

### **:BURSt:SHAPE:RISE:TIME**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:BURSt:SHAPE:RISE:TIME <val>  
[:SOURCE]:RADIO[:NADC]:BURSt:SHAPE:RISE:TIME?
```

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +5.00000000E+000

**Range** 0.1250–22.5000

**Key Entry** Rise Time

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 890. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPE:RTIME” on page 882 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

## :BURSt:SHAPe:RTIME

**Supported** E4438C with Option 402

[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :RTIME <val>

[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPe :RTIME?

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +5.00000000E+000

**Range** 0.1250–22.5000

**Key Entry** **Rise Time**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 890. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:TIME” on page 881 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

## :BURSt[:STATe]

**Supported** E4438C with Option 402

[ :SOURce ] :RADio [ :NADC ] :BURSt [ :STATe ] ON | OFF | 1 | 0

[ :SOURce ] :RADio [ :NADC ] :BURSt [ :STATe ] ?

This command enables or disables the burst function.

**ON (1)** This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

**OFF (0)** This choice enables the transmission of unframed data.



**\*RST**                    0  
**Key Entry**            **Data Format Pattern Framed**

**:BURSt:SHAPE[:TYPE]**

**Supported**            E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPE [ :TYPE ] SINE | "<file name>"
[ :SOURce ] :RADio [ :NADC ] :BURSt :SHAPE [ :TYPE ] ?
```

This command specifies the burst shape as either SINE or a user-defined file ("<file name>").

**SINE**                    This choice selects a state that is defined by the burst rise and fall \*RST values, as the default burst shape type.

"<file name>"        This choice selects a user designated file from signal generator memory (non-volatile).

**\*RST**                    SINE

**Key Entry**            **Sine    User File**

**:CHANnel**

**Supported**            E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :CHANnel EVM | ACP
[ :SOURce ] :RADio [ :NADC ] :CHANnel ?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

**EVM**                    This choice provides the most ideal passband.

**ACP**                    This choice improves stopband rejection.

**\*RST**                    ACP

**Key Entry**            **Optimize FIR For EVM ACP**

**Remarks**            To change the current filter type, refer to “:FILTer” on page 887.

**:DATA**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :DATA PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 | "<file name>" |
EXT | P4 | P8 | P16 | P32 | P64 | PRAM
[ :SOURCE ] :RADio [ :NADC ] :DATA?
```

This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file as the data pattern for unframed transmission.

**\*RST** PN23

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>Ext</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>	<b>PRAM File</b>		

**Remarks** Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**:DATA:PRAM**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :DATA:PRAM "<file_name>"
[ :SOURCE ] :RADio [ :NADC ] :DATA:PRAM?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for the NADC (North American Digital Cellular) format.

"<file\_name>" This variable designates the PRAM file in WFM1. Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**Key Entry** **PRAM File**

**Remarks** Selecting this data source forces the burst source to INTernal to allow framing control. The PRAM file must reside in the signal generator's volatile memory (WFM1) in order to be accessed by this command. For more information refer to [“:DATA:PRAM:FILE:BLOCK” on page 112](#)

## **:DATA:FIX4**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :DATA :FIX4 <val>
```

```
[ :SOURCE ] :RADIO [ :NADC ] :DATA :FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the NADC (North American Digital Cellular) modulation format.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

## **:DEFault**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :DEFault
```

This command returns all of the NADC (North American Digital Cellular) modulation format parameters to factory settings. It does not affect any other signal generator parameters.

**Key Entry** **Restore NADC Factory Default**

## **:EDATa:DELay**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :EDATa :DELay?
```

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

**Remarks** When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

## **:EDCLock**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio [ :NADC ] :EDCLock SYMBOL | NORMAl

[ :SOURCE ] :RADio [ :NADC ] :EDCLock?

This command sets the external data clock use.

**SYMBOL** This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

**NORMAl** This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

**\*RST** NORM

**Key Entry** Ext Data Clock Normal Symbol

**Remarks** Both choices have no effect in internal clock mode. Refer to “:BBCLock” on page 874 to select EXT as the data clock type.

## **:EREFerence**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio [ :NADC ] :EREFerence INT | EXT

[ :SOURCE ] :RADio [ :NADC ] :EREFerence?

This command selects either an internal or external bit-clock reference for the data generator.

**\*RST** INT

**Key Entry** BBG Ref Ext Int

**Remarks** If the EXT choice is selected, the external source’s frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, “:EREFerence:VALue” on page 887 to enter the external reference frequency setting.

## **:EREFerence:VALue**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIo [ :NADC ] :EREFerence:VALue <val>  

[ :SOURCE ] :RADIo [ :NADC ] :EREFerence:VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

**\*RST** +1.30000000E+007

**Range** 2.5E5–1E8

**Key Entry** **Ext BBG Ref Freq**

**Remarks** The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to “:EREFerence” on page 886 to select EXT (external source) as the reference for the bit-clock.

## **:FILTer**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIo [ :NADC ] :FILTer RNYQuist | NYQuist | GAUSSian | RECTangle | IS95 |  

IS95_EQ | IS95_MOD | IS95_MOD_EQ | AC4Fm | UGGaussian | "<user FIR>"  

[ :SOURCE ] :RADIo [ :NADC ] :FILTer?
```

This command selects the pre-modulation filter type.

**IS95** This choice selects a filter that meets the criteria of the IS-95 standard.

**IS95\_EQ** This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

**IS95\_MOD** This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

**IS95\_MOD\_EQ** This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

**AC4Fm** This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

**NADC Subsystem—Option 402 ([:SOURce]:RADio[:NADC])**

<b>UGaussian</b>	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
"<user FIR>"	This variable is any filter file that you have stored into memory.
<b>*RST</b>	RNYQ
<b>Key Entry</b>	<b>Root Nyquist      Nyquist      Gaussian      Rectangle      IS-95      IS-95 w/EQ</b> <b>IS-95 Mod      IS-95 Mod w/EQ      APCO 25 C4FM      UN3/4 GSM Gaussian</b> <b>User FIR</b>
<b>Remarks</b>	Refer to <a href="#">“File Name Variables” on page 13</a> for information on the file name syntax.

**:FRATe**

<b>Supported</b>	E4438C with Option 402
	[ :SOURce ] :RADio [ :NADC ] :FRATe FULL   HALF
	[ :SOURce ] :RADio [ :NADC ] :FRATe?

This command toggles between a full- or half-rate traffic channel.

<b>FULL</b>	Selects two equally spaced timeslots of the frame. Since there are six timeslots per frame, timeslots 1, 2, and 3 are paired with timeslots 4, 5, and 6, respectively.
<b>HALF</b>	Selects one timeslot of the frame (6 individual timeslots per frame).
<b>*RST</b>	FULL
<b>Key Entry</b>	<b>Rate Full Half</b>

**:IQ:SCALE**

<b>Supported</b>	E4438C with Option 402
	[ :SOURce ] :RADio [ :NADC ] :IQ:SCALE <val>
	[ :SOURce ] :RADio [ :NADC ] :IQ:SCALE?

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

<b>*RST</b>	+100
<b>Range</b>	1–200
<b>Key Entry</b>	<b>I/Q Scaling</b>
<b>Remarks</b>	This command has no effect with MSK or FSK modulation.

### **:MODulation:FSK[:DEVIation]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :MODulation:FSK [ :DEVIation ] <val>  
[ :SOURce ] :RADio [ :NADC ] :MODulation:FSK [ :DEVIation ] ?
```

This command sets the symmetric FSK frequency deviation value. The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz

**\*RST** +4.00000000E+002

**Range** 0–2E7

**Key Entry** **Freq Dev**

**Remarks** To change the modulation type, refer to “:MODulation[:TYPE]” on page 890.  
Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.  
To set an asymmetric FSK deviation value, refer to the *E4428C/38C ESG Signal Generators User’s Guide for more information.*

### **:MODulation:MSK[:PHASe]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :MODulation:MSK [ :PHASe ] <val>  
[ :SOURce ] :RADio [ :NADC ] :MODulation:MSK [ :PHASe ] ?
```

This command sets the MSK phase deviation value. The variable <val> is expressed in units of degrees.

**\*RST** +9.00000000E+001

**Range** 0–100

**Key Entry** **Phase Dev**

### **:MODulation:UFSK**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :MODulation:UFSK "<file name>"  
[ :SOURce ] :RADio [ :NADC ] :MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

Receiver Test Digital Commands (continued)  
**NADC Subsystem—Option 402 ([:SOURCE]:RADIO[:NADC])**

**Key Entry**            **User FSK**

**Remarks**            The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to “:MODulation[:TYPE]” on page 890 to change the current modulation type.

Refer to “File Name Variables” on page 13 for information on the file name syntax.

**:MODulation:UIQ**

**Supported**            E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:MODulation:UIQ "<file name>"
[:SOURCE]:RADIO[:NADC]:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

**Key Entry**            **User I/Q**

**Remarks**            The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to “:MODulation[:TYPE]” on page 890 to change the current modulation type.

Refer to “File Name Variables” on page 13 for information on the file name syntax.

**:MODulation[:TYPE]**

**Supported**            E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|GRAYQPSK|
OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|FSK8|FSK16|C4FM|
QAM4|QAM16|QAM32|QAM64|QAM128|QAM256|UIQ|UFSK
[:SOURCE]:RADIO[:NADC]:MODulation[:TYPE]?
```

This command sets the modulation type for the NADC personality.

**\*RST**                    P4DQPSK

<b>Key Entry</b>	<b>BPSK</b>	<b>QPSK</b>	<b>IS-95 QPSK</b>	<b>Gray Coded QPSK</b>	<b>OQPSK</b>			
	<b>IS-95 OQPSK</b>	<b><math>\pi/4</math> DQPSK</b>	<b>8PSK</b>	<b>16PSK</b>	<b>D8PSK</b>	<b>MSK</b>	<b>2-Lvl FSK</b>	
	<b>4-Lvl FSK</b>	<b>8-Lvl FSK</b>	<b>16-Lvl FSK</b>	<b>C4FM</b>	<b>4QAM</b>	<b>16QAM</b>	<b>32QAM</b>	
	<b>64QAM</b>	<b>128QAM</b>	<b>256QAM</b>	<b>User I/Q</b>	<b>User FSK</b>			



## :REPeat

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio[:NADC]:REPeat SINGLE|CONTinuous  
[:SOURCE]:RADio[:NADC]:REPeat?
```

This command sets the rotation direction of the phase modulation vector.

**SINGLE** This choice outputs one occurrence of the selected frame.

**CONTinuous** This choice outputs a continuous stream of the selected frame.

**\*RST** SING

**Key Entry** **Frame Repeat Single Cont**

## :POLarity[:ALL]

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio[:NADC]:POLarity[:ALL] NORMal|INVerted  
[:SOURCE]:RADio[:NADC]:POLarity[:ALL]?
```

This command sets the rotation direction of the phase modulation vector.

**NORMal** This choice selects normal phase polarity.

**INVerted** This choice inverts the internal Q signal.

**\*RST** NORM

**Key Entry** **Polarity Normal Invert**

## :SECOndary:RECall

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio[:NADC]:SECOndary:RECall
```

This command recalls the secondary frame configuration, overwriting the current state.

**Key Entry** **Recall Secondary Frame State**

**Remarks** To save a secondary frame state, refer to “[:SECOndary:SAVE]” on page 892.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to “[:SECOndary[:STATE]]” on page 892.

## :SECondary:SAVE

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio [ :NADC ] :SECondary :SAVE

This command saves the current frame configuration as the secondary frame with the filename NADC\_SECONDARY\_FRAME.

**Key Entry** **Save Secondary Frame State**

**Remarks** To recall the secondary frame (saved in non-volatile signal generator memory), refer to “:SECondary:RECall” on page 891.

## :SECondary:TRIGger[:SOURCE]

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio [ :NADC ] :SECondary :TRIGger [ :SOURCE ] KEY | EXT | BUS  
[ :SOURCE ] :RADio [ :NADC ] :SECondary :TRIGger [ :SOURCE ] ?

This command selects the type of triggering for the secondary frame.

**KEY** This choice enables triggering by pressing the front panel **Trigger** hardkey.

**EXT** This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to “:TRIGger[:SOURCE]:EXTernal[:SOURCE]” on page 906.

**BUS** This choice enables GPIB triggering using the \*TRG or GET command or LAN and RS-232 triggering using the \*TRG command.

**Key Entry** **Trigger Key      Ext      Bus**

## :SECondary[:STATE]

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio [ :NADC ] :SECondary [ :STATE ] ON | OFF | 1 | 0  
[ :SOURCE ] :RADio [ :NADC ] :SECondary [ :STATE ] ?

This command enables or disables the ability to switch to the secondary frame.

**\*RST** 0

**Key Entry** **Secondary Frame Off On**

**Remarks**                    A frame must already be saved as the secondary frame in order to turn the secondary state function on.

                                  To save a frame as the secondary frame, refer to “:SECOndary:SAVE” on page 892.

**:SLOT[1] | 2 | 3 | 4 | 5 | 6:DCUStom**

**Supported**                    E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:DCUStom
PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[:SOURCE]:RADIO[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:DCUStom?
```

This command configures the data field for the selected downlink custom timeslot.

**\*RST**                            PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks**                    Refer to “File Name Variables” on page 13 for information on the file name syntax.

**:SLOT[1] | 2 | 3 | 4 | 5 | 6:DCUStom:FIX4**

**Supported**                    E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:DCUStom:FIX4 <val>
[:SOURCE]:RADIO[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:DCUStom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink custom timeslot.

**\*RST**                            #B0000

**Range**                         #B0000–#B1111 or 0–15

**Key Entry**                    **FIX4**

**Remarks**                    FIX4 must already be defined as the data type.

### **:SLOT[1]|2|3|4|5|6:DTCHannel:CDLocator**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :  
CDLocator <bit_pattern>  
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :CDLocator?
```

This command changes the 11-bit coded digital control channel locator (CDL) field.

**\*RST** #H000

**Range** #H0–#H7FF

**Key Entry** **CDL**

**Remarks** The preset hexadecimal value (when normal preset is selected) for CDL reflects the NADC protocol; however, you can enter a new value by using this command.

### **:SLOT[1]|2|3|4|5|6:DTCHannel:CDVCCode**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :  
CDVCCode <bit_pattern>  
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :CDVCCode?
```

This command changes the 12-bit coded digital verification color code (CDVCC).

**\*RST** #H000

**Range** #H0–#HFFF

**Key Entry** **CDVCC**

**Remarks** The preset hexadecimal value (when normal preset is selected) for CDVCC reflects the NADC protocol; however, you can enter a new value by using this command.

### **:SLOT[1]|2|3|4|5|6:DTCHannel:SACChannel**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :  
SACChannel <bit_pattern>  
[ :SOURCE ] :RADIO [ :NADC ] :SLOT [ 1 ] | 2 | 3 | 4 | 5 | 6 :DTCHannel :SACChannel?
```

This command changes the 15-bit slow associated control channel.

**\*RST** #H000

<b>Range</b>	#H0–#HFFF
<b>Key Entry</b>	<b>SACCH</b>
<b>Remarks</b>	The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

**:SLOT[1]|2|3|4|5|6:DTCHannel:SWORd**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel:SWORd <bit_pattern>
[:SOURCE]:RADIO[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel:SWORd?
```

This command sets the 28-bit synchronization word as the active function. This is used for slot synchronization, equalizer training, and timeslot identification.

<b>*RST</b>	#HA91DE4A
<b>Range</b>	#H0–#HFFFFFFF
<b>Key Entry</b>	SYNC

**:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA] PN9|
PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURCE]:RADIO[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA]?
```

This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file as the data pattern for the selected downlink traffic channel timeslot during framed transmission.

<b>*RST</b>	PN9
<b>Key Entry</b>	<b>PN9    PN11    PN15    PN20    PN23    FIX4    User File    EXT</b>
	<b>4 1's &amp; 4 0's    8 1's &amp; 8 0's    16 1's &amp; 16 0's    32 1's &amp; 32 0's</b>
	<b>64 1's &amp; 64 0's</b>

**Remarks** Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

### **:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA]FIX4**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA]:FIX4 <val>  
[:SOURCE]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:DTCHannel[:DATA]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink traffic channel timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

### **:SLOT[1]|2|3|4|5|6:POWER**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:POWER MAIN|DELTA  
[:SOURCE]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:POWER?
```

This command toggles the RF output power level function for the selected timeslot.

**MAIN** This choice specifies RF output as the main power level.

**DELTA** This choice specifies RF output as the alternative power level.

**\*RST** MAIN

**Key Entry** **Timeslot Ampl Main Delta**

### **:SLOT[1]|2|3|4|5|6:STATE**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:STATE ON|OFF|1|0  
[:SOURCE]:RADio[:NADC]:SLOT[1]|2|3|4|5|6:STATE?
```

This command enables or disables the operating state of the selected timeslot.

**\*RST** Timeslot 1: 1 Timeslots 2–6: 0

**Key Entry** **Timeslot Off On**

### **:SLOT[1]|2|3|4|5|6:UCUStom**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:SLOT[1]|2|3|4|5|6:UCUStom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURCE]:RADIO[:NADC]:SLOT[1]|2|3|4|5|6:UCUStom?
```

This command configures the data field for the selected uplink custom timeslot.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>				
	<b>64 1's &amp; 64 0's</b>							

**Remarks** Refer to “[File Name Variables](#)” on page 13 for information on the file name syntax.

### **:SLOT[1]|2|3|4|5|6:UCUStom:FIX4**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:SLOT[1]|2|3|4|5|6:UCUStom:FIX4 <val>
[:SOURCE]:RADIO[:NADC]:SLOT[1]|2|3|4|5|6:UCUStom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink custom timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

### **:SLOT[1]|2|3|4|5|6:UTCHannel:CDVCcode**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel:
CDVCcode <bit_pattern>
[:SOURCE]:RADIO[:NADC]:SLOT[1]|2|3|4|5|6:UTCHannel:CDVCcode?
```

This command changes the 12-bit coded digital verification color code (CDVCC).

**\*RST** #H000

**Range** #H0–#HFFF

**NADC Subsystem—Option 402 ([:SOURCE]:RADio[:NADC])****Key Entry**            **CDVCC**

**Remarks**            The preset hexadecimal value (when normal preset is selected) for CDVCC reflects the NADC protocol, however you can enter a new value by using this command.

**:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel:SACChannel****Supported**            E4438C with Option 402

```
[:SOURCE]:RADio[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel:SACChannel
<bit_pattern>
[:SOURCE]:RADio[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel.

**\*RST**                #H000**Range**                #H0–#HFFF**Key Entry**            **SACCH**

**Remarks**            The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

**:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel:SWORd****Supported**            E4438C with Option 402

```
[:SOURCE]:RADio[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel:SWORd <bit_pattern>
[:SOURCE]:RADio[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel:SWORd?
```

This command sets the 28-bit synchronization word as the active function. This is used for slot synchronization, equalizer training, and timeslot identification.

**\*RST**                #HA91DE4A**Range**                #H0–#HFFFFFFF**Key Entry**            **SYNC****:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel[:DATA]****Supported**            E4438C with Option 402

```
[:SOURCE]:RADio[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel[:DATA] PN9 | PN15 |
FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[:SOURCE]:RADio[:NADC]:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel[:DATA] ?
```



This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file as the data pattern for the selected uplink traffic channel timeslot during framed transmission.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks** Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**:SLOT[1] | 2 | 3 | 4 | 5 | 6:UTCHannel[:DATA]:FIX4**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 | 2 | 3 | 4 | 5 | 6 :UTCHannel [ :DATA ] :FIX4 <val>
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 | 2 | 3 | 4 | 5 | 6 :UTCHannel [ :DATA ] :FIX4 ?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink traffic channel timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

**:SLOT[1] | 2 | 3 | 4 | 5 | 6[:TYPE]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 | 2 | 3 | 4 | 5 | 6 [ :TYPE ] UCUSom | DCUSom | UTCH |
UTCH_ALL | DTCH | DTCH_ALL
[ :SOURce ] :RADio [ :NADC ] :SLOT [ 1 | 2 | 3 | 4 | 5 | 6 [ :TYPE ] ?
```

This command sets the timeslot type for the selected timeslot.

**\*RST** Timeslot 1: UTCH Timeslots 2–6: UCUS

<b>Key Entry</b>	<b>Up Custom</b>	<b>Down Custom</b>	<b>Up TCH</b>	<b>Up TCH All</b>	<b>Down TCH</b>
	<b>Down TCH All</b>				

**:SOUT**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio[:NADC]:SOUT FRAME|SLOT|ALL
[:SOURCE]:RADio[:NADC]:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

**FRAME** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

**SLOT** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

**ALL** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

**\*RST** FRAME

<b>Key Entry</b>	<b>Begin Frame</b>	<b>Begin Timeslot #</b>	<b>All Timeslots</b>
------------------	--------------------	-------------------------	----------------------

**:SOUT:OFFSet**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio[:NADC]:SOUT:OFFSet <val>
[:SOURCE]:RADio[:NADC]:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number of bits.

**\*RST** +0

**Range** -323 to 323

**Key Entry** **Sync Out Offset**

**Remarks** Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 900](#).

## :SOUT: SLOT

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :SOUT :SLOT <val>
```

```
[ :SOURCE ] :RADIO [ :NADC ] :SOUT :SLOT?
```

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

**\*RST** +1

**Range** 1–3

**Key Entry** **Begin Timeslot #**

**Remarks** To change the output of the EVENT1 rear panel connector to SLOT, refer to [“:SOUT” on page 900](#).

## :SRATe

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO [ :NADC ] :SRATe <val>
```

```
[ :SOURCE ] :RADIO [ :NADC ] :SRATe?
```

This command sets the transmission symbol rate. Symbol rate is the bit rate divided by the bits per symbol. A change in the symbol rate affects the bit rate. Refer to [“:BRATe” on page 774](#) for information on bit rate.

The variable <val> is expressed in units of symbols per second (sps–Mps) and the maximum symbol rate depends on the filter. Refer to [“:FILTer” on page 887](#) for minimum filter symbol width.

The filter may have to be truncated down to 32 or 16 symbols wide to achieve the highest symbol rate. The signal generator’s internal filters are not truncated below their minimum filter length and user-defined FIR filters are not truncated. If the filter cannot be truncated then the symbol rate is limited to the maximum rate of the narrowest filter size possible.

The relative timing of the modulated data, as well as the actual filter response is affected when the filter is truncated.

When the symbol rate changes, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the symbol rate: lower symbol rates require more time.

To change the modulation type, refer to [“:MODulation\[:TYPE\]” on page 890](#).

**\*RST** +2.43000000E+004

Receiver Test Digital Commands (continued)  
**NADC Subsystem—Option 402 ([:SOURce]:RADio[:NADC])**

Range	Modulation Type	Symbol Rate Range		
		<i>16 Symbol Wide Filter</i>	<i>32 Symbol Wide Filter</i>	<i>64 Symbol Wide Filter</i>
	BPSK, FSK2, MSK	1sps–50Msps	1sps–25Msps	1sps–12.5Msps
	C4FM, OQPSK, FSK4	2sps–25Msps	2sps–12.5Msps	2sps–6.25Msps
	OQPSKI95, QPSK			
	P4QPPSK, QPSKIS95			
	GRAYQPSK, QAM4			
	D8PSK, EDGE, FSK8, PSK8	3sps–16.666666666 Msps	3sps–8.333333333 Msps	3sps–4.166666666Msps
	FSK16, PSK16, QAM16	4sps–12.5Msps	4sps–6.25Msps	4sps–3.125Msps
	QAM32	5sps–10Msps	5sps–5Msps	5sps–2.5Msps
	QAM64	6sps–8.333333333 Msps	6sps–4.166666666 Msps	6sps–2.083333333 Msps
	QAM128	7sps–7.142857142 Msps	7sps–3.571428572 Msps	7sps–1.785714285 Msps
	QAM256	8sps–6.25Msps	8sps–3.125 Msps	8sps–1.5625 Msps

---

**NOTE** Using I/Q skew will half the minimum number of symbols for the selected filter.

---

**Key Entry**            **Symbol Rate**

**:TRIGger:TYPE**

**Supported**            E4438C with Option 402

[ :SOURce ] :RADio [ :NADC ] :TRIGger:TYPE CONTInuous | SINGle | GATE  
 [ :SOURce ] :RADio [ :NADC ] :TRIGger:TYPE?

This command sets the trigger type.

CONTInuous	The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to “:TRIGger:TYPE:CONTInuous[:TYPE]” on page 903.		
SINGle	The framed data sequence plays once for every trigger received.		
GATE	An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.		
<b>*RST</b>	CONT		
<b>Key Entry</b>	<b>Continuous</b>	<b>Single</b>	<b>Gated</b>

**:TRIGger:TYPE:CONTInuous[:TYPE]**

**Supported**            E4438C with Option 402

```
[ :SOURce] :RADio [:NADC] :TRIGger:TYPE:CONTInuous [:TYPE] FREE | TRIGger | RESet
[:SOURce] :RADio [:NADC] :TRIGger:TYPE:CONTInuous [:TYPE] ?
```

This commands selects the waveform’s response to a trigger signal while using the continuous trigger mode.

For more information on triggering and to select the continuous trigger mode, see “:TRIGger:TYPE” on page 902.

The following list describes the waveform’s response to each of the command choices:

FREE	Turning the ARB format on immediately triggers the waveform. The waveform repeats until you turn the format off, select another trigger, or choose another waveform file.		
TRIGger	The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.		
RESet	The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.		
<b>*RST</b>	FREE		
<b>Key Entry</b>	<b>Free Run</b>	<b>Trigger &amp; Run</b>	<b>Reset &amp; Run</b>

## :TRIGger:TYPE:GATE:ACTive

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :TRIGger :TYPE:GATE:ACTive LOW|HIGH  
[ :SOURCE ] :RADio [ :NADC ] :TRIGger :TYPE:GATE:ACTive?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see “:TRIGger:TYPE” on page 902.

The following list describes the signal generator’s external trigger signal gating behavior for the polarity selections:

LOW	The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).
HIGH	The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).
*RST	HIGH
<b>Key Entry</b>	<b>Gate Active Low High</b>

## :TRIGger[:SOURCE]

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :TRIGger [ :SOURCE ] KEY|EXT|BUS  
[ :SOURCE ] :RADio [ :NADC ] :TRIGger [ :SOURCE ] ?
```

This command sets the trigger source.

For more information on triggering, see “:TRIGger:TYPE” on page 902. The following list describes the command choices:

KEY	This choice enables manual triggering by pressing the front-panel <b>Trigger</b> hardkey.
EXT	An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger: <ul style="list-style-type: none"><li>• The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see “:TRIGger[:SOURCE]:EXTernal[:SOURCE]” on page 906.</li></ul>

For more information on the connectors and on connecting the cables, see the *E4428C/38C ESG Signal Generators User's Guide*.

- The trigger signal polarity:
  - gating mode, see “:TRIGger:TYPE:GATE:ACTive” on page 904
  - continuous and single modes, see “:TRIGger[:SOURce]:EXTernal:SLOPe” on page 906
- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:
  - setting the amount of delay, see “:TRIGger[:SOURce]:EXTernal:DELay” on page 905
  - turning the delay on, see “:TRIGger[:SOURce]:EXTernal:DELay:STATe” on page 906

**BUS** This choice enables triggering over the GPIB or LAN using the \*TRG or GET commands or the AUXILIARY INTERFACE (RS-232) using the \*TRG command.

**\*RST** KEY

<b>Key Entry</b>	<b>Trigger Key</b>	<b>Ext</b>	<b>Bus</b>
------------------	--------------------	------------	------------

## **:TRIGger[:SOURce]:EXTernal:DELay**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] :TRIGger [ :SOURce ] :EXTernal :DELay <val>
[ :SOURce ] :RADio [ :NADC ] :TRIGger [ :SOURce ] :EXTernal :DELay?
```

This command sets the number of bits to delay the ESG's response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See “:TRIGger[:SOURce]:EXTernal:DELay:STATe” on page 906. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 904.

**\*RST** +0

**Range** 0–1048575

**Key Entry** **Ext Delay Bits**

### **:TRIGger[:SOURCE]:EXternal:DELay:STATe**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :TRIGger [ :SOURCE ] :EXternal :DELay :STATe ON | OFF | 1 | 0  
[ :SOURCE ] :RADio [ :NADC ] :TRIGger [ :SOURCE ] :EXternal :DELay :STATe ?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see “:TRIGger[:SOURCE]:EXternal:DELay” on page 905, and for more information on configuring an external source, see “:TRIGger[:SOURCE]” on page 904.

**\*RST** 0

**Key Entry** Ext Delay Off On

### **:TRIGger[:SOURCE]:EXternal:SLOPe**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :TRIGger [ :SOURCE ] :EXternal :SLOPe POSitive | NEGative  
[ :SOURCE ] :RADio [ :NADC ] :TRIGger [ :SOURCE ] :EXternal :SLOPe ?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see “:TRIGger:TYPE:GATE:ACTive” on page 904.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURCE]” on page 904.

**\*RST** POS

**Key Entry** Ext Polarity Neg Pos

### **:TRIGger[:SOURCE]:EXternal[:SOURCE]**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio [ :NADC ] :TRIGger [ :SOURCE ] :EXternal [ :SOURCE ] EPT1 | EJPT2 |  
EPTRIGGER1 | EPTRIGGER2  
[ :SOURCE ] :RADio [ :NADC ] :TRIGger [ :SOURCE ] :EXternal [ :SOURCE ] ?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.



For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 904. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User’s Guide*.

The following list describes the command choices:

EPT1	This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.
EPT2	This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
EPTRIGGER1	This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.
EPTRIGGER2	This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
<b>*RST</b>	EPT1
<b>Key Entry</b>	<b>Patt Trig In 1      Patt Trig In 2</b>

### [ :STATe ]

**Supported**      E4438C with Option 402

```
[ :SOURce ] :RADio [ :NADC ] [ :STATe ] ON | OFF | 1 | 0
[ :SOURce ] :RADio [ :NADC ] [ :STATe ] ?
```

This command enables or disables the NADC modulation format.

**\*RST**      OFF

**Key Entry**      **NADC Off On**

**Remarks**      Although the NADC modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

---

## PDC Subsystem–Option 402 ([:SOURce]:RADio:PDC)

### :ALPha

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:ALPha <val>  
[ :SOURce ] :RADio:PDC:ALPha?
```

This command changes the Nyquist or root Nyquist filter’s alpha value.

The filter alpha value can be set to a minimum level (0), a maximum level (1), or in between by using fractional numeric values (0.001–0.999).

**\*RST** +5.00000000E–001

**Range** 0.000–1.000

**Key Entry** **Filter Alpha**

**Remarks** To change the current filter type, refer to “:FILTer” on page 920.

### :BBCLock

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:BBCLock INT [1] | EXT [1]  
[ :SOURce ] :RADio:PDC:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

**INT[1]** This choice selects the signal generator internal data clock.

**EXT[1]** This choice selects an external data clock input.

**\*RST** INT

**Key Entry** **Ext Data Clock Ext Int**

**Remarks** A data clock or continuous symbol sync input must be supplied when external mode is used.

## :BBT

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:PDC:BBT <val>

[ :SOURCE ] :RADio:PDC:BBT?

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

**\*RST** +5.00000000E–001

**Range** 0.100–1.000

**Key Entry** **Filter BbT**

**Remarks** This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “:FILTer” on page 920.

## :BRATe

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:PDC:BRATe <val>

[ :SOURCE ] :RADio:PDC:BRATe?

This command sets the bit rate in bits per second (bps–Mbps). The maximum bit rate is dependent on the modulation type and filter as shown in the following tables

The IQ digital data stream is shaped by a FIR filter. The filter length and associated latency and frequency response are dependent on the bit rate as shown in the following tables. The signal generator selects a filter length.

For higher bit rates, the FIR filter length may be truncated (if the minimum filter size allows it) which will impact the relative timing of the modulated data, as well as the actual filter response (see the symbol rate command “:SRATe” on page 965). Refer to “:FILTer” on page 920 for information on filter symbol widths.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 923.

When the bit rate is changed, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the bit rate: lower bit rates require more time.

Receiver Test Digital Commands (continued)  
**PDC Subsystem—Option 402 ([:SOURce]:RADio:PDC)**

**\*RST** +4.20000000E+004

Range	Modulation Type	Bit Rate Range		
		16 Symbol Wide Filter	32 Symbol Wide Filter	64 Symbol Wide Filter
	BPSK, FSK2, MSK	1bps–50Mbps	1bps–25Mbps	1bps–12.5Mbps
	C4FM, OQPSK, FSK4	2bps–50Mbps	2bps–25Mbps	2bps–12.5Mbps
	OQPSKI95, QPSK			
	P4QPPSK, QPSKIS95			
	GRAYQPSK, QAM4			
	D8PSK, EDGE, FSK8, PSK8	3bps–50Mbps	3bps–25Mbps	3bps–12.5Mbps
	FSK16, PSK16, QAM16	4bps–50Mbps	4bps–25Mbps	4bps–12.5Mbps
	QAM32	5bps–50Mbps	5bps–25Mbps	5bps–12.5Mbps
	QAM64	6bps–50Mbps	6bps–25Mbps	6bps–12.5Mbps
	QAM128	7bps–50Mbps	7bps–25Mbps	7bps–12.5Mbps
	QAM256	8bps–50Mbps	8bps–25Mbps	8bps–12.5Mbps

**Key Entry**                      **Symbol Rate**

**:BURSt:PN9**

**Supported**                      E4438C with Option 402

[ :SOURce ] :RADio:PDC: BURSt: PN9 NORMAl | QUICk  
 [ :SOURce ] :RADio:PDC: BURSt: PN9?

This command controls the software PN9 generation.

NORMAl                      This choice produces a maximum length PN9 sequence.

QUICk                      This choice produces a truncated PN9 sequence.

**\*RST**                      NORM

**Key Entry**                      **PN9 Mode Normal Quick**

**Remarks**                      Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

## :BURSt:SHAPe:FALL:DELay

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PDC:BURSt:SHAPe:FALL:DELay <val>

[ :SOURce ] :RADio:PDC:BURSt:SHAPe:FALL:DELay?

This command sets the period of time that the start of the burst fall is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** -22.3750 to 99

**Key Entry** **Fall Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 923. Refer to “:SRATe” on page 965 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:FDELay” on page 912 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

## :BURSt:SHAPe:FALL:TIME

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PDC:BURSt:SHAPe:FALL:TIME <val>

[ :SOURce ] :RADio:PDC:BURSt:SHAPe:FALL:TIME?

This command sets the period of time where the burst decreases from full power to minimum power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +1.00000000E+001

**Range** 0.1250–255.8750

**Key Entry** Fall Time

**PDC Subsystem—Option 402 ([:SOURCE]:RADio:PDC)**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 923. Refer to “:SRATE” on page 965 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:FTIME” on page 913 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

**:BURSt:SHAPe:FDElay**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:PDC:BURSt:SHAPe:FDElay <val>

[ :SOURCE ] :RADio:PDC:BURSt:SHAPe:FDElay?

This command sets the period of time that the start of the burst fall is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** –22.3750 to 99

**Key Entry** **Fall Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 923. Refer to “:SRATE” on page 965 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:DElay” on page 911 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

## **:BURSt:SHAPe:FTIME**

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PDC: BURSt: SHAPe: FTIME <val>

[ :SOURce ] :RADio:PDC: BURSt: SHAPe: FTIME?

This command sets the period of time where the burst decreases from full power to minimum power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** 0.1250–255.8750

**Key Entry** **Fall Time**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 923. Refer to “:SRATE” on page 965 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 911 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

## **:BURSt:SHAPe:RDElay**

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PDC: BURSt: SHAPe: RDElay <val>

[ :SOURce ] :RADio:PDC: BURSt: SHAPe: RDElay?

This command sets the period of time that the start of the burst rise is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** –18.3750 to 99

**Key Entry** **Rise Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 923. Refer to “:SRATe” on page 965 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DELay” on page 914 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

### **:BURSt:SHAPe:RISE:DELay**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:BURSt:SHAPe:RISE:DELay <val>  
[ :SOURce ] :RADio:PDC:BURSt:SHAPe:RISE:DELay?
```

This command sets the period of time that the start of the burst rise is delayed.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** –18.3750 to 99

**Key Entry** **Rise Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 923. Refer to “:SRATe” on page 965 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:RDELay” on page 913 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.



## **:BURSt:SHAPe:RISE:TIME**

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PDC:BURSt:SHAPe:RISE:TIME <val>

[ :SOURce ] :RADio:PDC:BURSt:SHAPe:RISE:TIME?

This command sets the period of time where the burst increases from a minimum power to full power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +1.00000000E+001

**Range** 0.1250–22.5000

**Key Entry** **Rise Time**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 923. Refer to “:SRATE” on page 965 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:RTIME” on page 915 performs the same function. In compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

## **:BURSt:SHAPe:RTIME**

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PDC:BURSt:SHAPe:RTIME <val>

[ :SOURce ] :RADio:PDC:BURSt:SHAPe:RTIME?

This command sets the period of time where the burst increases from a minimum power to full power.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +1.00000000E+001

**Range** 0.1250–22.5000

**Key Entry** **Rise Time**

**PDC Subsystem—Option 402 ([:SOURce]:RADio:PDC)**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 923. Refer to “:SRATE” on page 965 for a list of minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:TIME” on page 915 performs the same function. In compliance with the SCPI standard, both commands are listed.

Refer to the *E4428C/38C ESG Signal Generators User’s Guide* for concept information.

**:BURSt:SHAPe[:TYPE]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:BURSt:SHAPe[:TYPE] SINE | "<file name>"
[ :SOURce ] :RADio:PDC:BURSt:SHAPe[:TYPE] ?
```

This command specifies the burst shape as either SINE or a user-defined file ("<file name>").

**SINE** This choice selects a state that is defined by the burst rise and fall \*RST values, as the default burst shape type.

"<file name>" This choice selects a user designated file from signal generator memory.

**\*RST** SINE

**Key Entry** **Sine** **User File**

**:BURSt[:STATe]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:BURSt[:STATe] ON | OFF | 1 | 0
[ :SOURce ] :RADio:PDC:BURSt[:STATe] ?
```

This command enables or disables the burst function.

**ON (1)** This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

OFF (0)                    This choice enables the transmission of unframed data.  
**\*RST**                    0  
**Key Entry**                **Data Format Pattern Framed**

## **:CHANnel**

**Supported**                E4438C with Option 402  
[:SOURCE]:RADIO:PDC:CHANnel EVM|ACP  
[:SOURCE]:RADIO:PDC:CHANnel?

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

EVM                        This choice provides the most ideal passband.  
ACP                         This choice improves stopband rejection.  
**\*RST**                    EVM

**Key Entry**                **Optimize FIR For EVM ACP**

**Remarks**                To change the current filter type, refer to “[:FILTer](#)” on page 920.

## **:DATA**

**Supported**                E4438C with Option 402  
[:SOURCE]:RADIO:PDC:DATA PN9|PN11|PN15|PN20|PN23|FIX4|"<file name>"|  
EXT|P4|P8|P16|P32|P64|PRAM  
[:SOURCE]:RADIO:PDC:DATA?

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for unframed data transmission.

**\*RST**                    PN23  
**Key Entry**                **PN9    PN11    PN15    PN20    PN23    FIX4    User File    Ext**  
**4 1's & 4 0's    8 1's & 8 0's    16 1's & 16 0's    32 1's & 32 0's**  
**64 1's & 64 0's    PRAM File**

**Remarks**                Refer to “[File Name Variables](#)” on page 13 for information on the file name syntax.

## **:DATA:PRAM**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:PDC:DATA:PRAM "<file_name>"
```

```
[ :SOURCE ] :RADIO:PDC:DATA:PRAM?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for the PDC (Personal Digital Cellular) format.

"<file\_name>" This variable designates the PRAM file in WFM1. Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**Key Entry** **PRAM File**

**Remarks** Selecting this data source forces the burst source to INTERNAL to allow framing control.

The PRAM file must reside in the ESG’s volatile memory (WFM1) in order to be accessed by this command. See [“:DATA:PRAM:FILE:BLOCK” on page 112](#).

## **:DATA:FIX4**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:PDC:DATA:FIX4 <val>
```

```
[ :SOURCE ] :RADIO:PDC:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the protocols (modulation type, symbol rate, filter, and burst shape) selected for the PDC format.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

## **:DEFault**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:PDC:DEFault
```

This command returns all of the PDC modulation format parameters to factory settings. It does not affect any other signal generator parameters.

**Key Entry** **Restore PDC Factory Default**

### **:EDATa:DELay**

**Supported** E4438C with Option 402

`[:SOURce]:RADio:PDC:EDATa:DELay?`

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

**Remarks** When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

### **:EDCLock**

**Supported** E4438C with Option 402

`[:SOURce]:RADio:PDC:EDCLock SYMBol | NORMal`

`[:SOURce]:RADio:PDC:EDCLock?`

This command sets the external data clock use.

**SYMBol** This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

**NORMal** This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

**\*RST** NORM

**Key Entry** **Ext Data Clock Normal Symbol**

**Remarks** Both choices have no effect in internal clock mode. Refer to “[:BBCLock](#)” on [page 908](#) to select EXT as the data clock type.

### **:EREFerence**

**Supported** E4438C with Option 402

`[:SOURce]:RADio:PDC:EREFerence INT | EXT`

`[:SOURce]:RADio:PDC:EREFerence?`

This command selects either an internal or external bit-clock reference for the data generator.

**\*RST** INT

**Key Entry** **BBG Ref Ext Int**

Receiver Test Digital Commands (continued)  
**PDC Subsystem—Option 402 ([:SOURCE]:RADio:PDC)**

**Remarks** If the EXT choice is selected, the external source’s frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, “:EREFerence:VALue” on page 920 to enter the external reference frequency setting.

**:EREFerence:VALue**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:EREFerence:VALue <val>  
[ :SOURCE ] :RADio:PDC:EREFerence:VALue?
```

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

**\*RST** +1.30000000E+007

**Range** 2.5E5–1E8

**Key Entry** **Ext BBG Ref Freq**

**Remarks** The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to “:EREFerence” on page 919 to select EXT (external source) as the reference for the bit-clock.

**:FILTer**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:FILTer RNYQuist|NYQuist|GAUSSian|RECTangle|  
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"  
[ :SOURCE ] :RADio:PDC:FILTer?
```

This command selects the pre-modulation filter type.

**IS95** This choice selects a filter that meets the criteria of the IS-95 standard.

**IS95\_EQ** This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

**IS95\_MOD** This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the

	filter specified in the IS-95 standard.
IS95_MOD_EQ	This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
AC4Fm	Selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
UGGaussian	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
"<user FIR>"	This variable is any filter file that you have stored into memory.
<b>*RST</b>	<b>RYNQ</b>
<b>Key Entry</b>	<b>Root Nyquist      Nyquist      Gaussian      Rectangle      IS-95      IS-95 w/EQ</b> <b>IS-95 Mod      IS-95 Mod w/EQ      APCO 25 C4FM      UN3/4 GSM Gaussian</b> <b>User FIR</b>
<b>Remarks</b>	Refer to <a href="#">“File Name Variables” on page 13</a> for information on the file name syntax.

## **:FRATe**

**Supported**      E4438C with Option 402  
[:SOURCE]:RADio:PDC:FRATe FULL|HALF  
[:SOURCE]:RADio:PDC:FRATe?

This command toggles between a full- or half-rate traffic channel.

**FULL**      Selects two equally spaced timeslots of the frame. Since there are six timeslots per frame, timeslots 1, 2, and 3 are paired with timeslots 4, 5, and 6, respectively.

**HALF**      Selects one timeslot of the frame (6 individual timeslots per frame).

**\*RST**      **FULL**

**Key Entry**      **Rate Full Half**

## **:IQ:SCALE**

**Supported**      E4438C with Option 402  
[:SOURCE]:RADio:PDC:IQ:SCALE <val>  
[:SOURCE]:RADio:PDC:IQ:SCALE?

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

**PDC Subsystem—Option 402 ([:SOURce]:RADio:PDC)**

The variable <val> is expressed in units of percent.

<b>*RST</b>	+100
<b>Range</b>	1–200
<b>Key Entry</b>	<b>I/Q Scaling</b>
<b>Remarks</b>	This command has no effect with MSK or FSK modulation.

**:MODulation:FSK[:DEVIation]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:MODulation:FSK[:DEVIation] <val>
```

```
[ :SOURce ] :RADio:PDC:MODulation:FSK[:DEVIation] ?
```

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

**\*RST** +4.00000000E+002

**Range** 0–2E7

**Key Entry** **Freq Dev**

**Remarks** To change the modulation type, refer to “:MODulation[:TYPE]” on page 923.  
 Refer to “:SRATe” on page 965 for minimum and maximum symbol rate values.  
 To set an asymmetric FSK deviation value, refer to the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

**:MODulation:MSK[:PHASe]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:MODulation:MSK[:PHASe] <val>
```

```
[ :SOURce ] :RADio:PDC:MODulation:MSK[:PHASe] ?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

**\*RST** +9.00000000E+001

**Range** 0–100

**Key Entry** **Phase Dev**



## :MODulation:UFSK

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:MODulation:UFSK "<file name>"
```

```
[ :SOURce ] :RADio:PDC:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

**Key Entry** **User FSK**

**Remarks** The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to [“:MODulation\[:TYPE\]” on page 923](#) to change the current modulation type.

Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

## :MODulation:UIQ

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:MODulation:UIQ "<file name>"
```

```
[ :SOURce ] :RADio:PDC:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

**Key Entry** **User I/Q**

**Remarks** The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to [“:MODulation\[:TYPE\]” on page 923](#) to change the current modulation type.

Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

## :MODulation[:TYPE]

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|  
GRAYQPSK|OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|  
FSK2|FSK4|FSK8|FSK16|C4FM|QAM4|QAM16|QAM32|QAM64|QAM128|QAM256|UIQ|UFSK  
[ :SOURce ] :RADio:PDC:MODulation[:TYPE] ?
```

This command sets the modulation type for the PDC personality.

**PDC Subsystem—Option 402 ([:SOURCE]:RADio:PDC)**

<b>*RST</b>	P4DQPSK							
<b>Key Entry</b>	<b>BPSK</b>	<b>QPSK</b>	<b>IS-95 QPSK</b>	<b>Gray Coded QPSK</b>		<b>OQPSK</b>		
	<b>IS-95 OQPSK</b>	$\pi/4$ <b>DQPSK</b>	<b>8PSK</b>	<b>16PSK</b>	<b>D8PSK</b>	<b>MSK</b>	<b>2-Lvl FSK</b>	
	<b>4-Lvl FSK</b>	<b>8-Lvl FSK</b>	<b>16-Lvl FSK</b>	<b>C4FM</b>	<b>4QAM</b>	<b>16QAM</b>	<b>32QAM</b>	
	<b>64QAM</b>	<b>128QAM</b>	<b>256QAM</b>	<b>User I/Q</b>	<b>User FSK</b>			

**:POLarity[:ALL]**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:PDC:POLarity[:ALL] NORMal | INVerted

[ :SOURCE ] :RADio:PDC:POLarity[:ALL] ?

This command sets the rotation direction for of the phase modulation vector.

**NORMal** This choice selects normal phase polarity.

**INVerted** This choice inverts the internal Q signal.

**\*RST** NORM

**Key Entry** **Phase Polarity Normal Invert**

**:SECondary:RECall**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:PDC:SECondary:RECall

This command recalls the secondary frame configuration, overwriting the current state.

**Key Entry** **Recall Secondary Frame State**

**Remarks** To save a secondary frame state, refer to “:SECondary:SAVE” on page 924.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to “:SECondary[:STATE]” on page 925.

**:SECondary:SAVE**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:PDC:SECondary:SAVE

This command saves the current frame configuration as the secondary frame with the filename PDC\_SECONDARY\_FRAME.

**Key Entry** **Save Secondary Frame State**

**Remarks** To recall the secondary frame (saved in non-volatile signal generator memory), refer to “:SECOndary:SAVE” on page 924.

### **:SECOndary:TRIGger[:SOURce]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:SECOndary:TRIGger [ :SOURce ] KEY | EXT | BUS
[ :SOURce ] :RADio:PDC:SECOndary:TRIGger [ :SOURce ] ?
```

This command selects the type of triggering for the secondary frame.

**KEY** This choice enables triggering by pressing the front panel **Trigger** hardkey.

**EXT** This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to “:TRIGger[:SOURce]:EXTErnal[:SOURce]” on page 940.

**BUS** This choice enables GPIB triggering using the \*TRG or GET command or LAN and RS-232 triggering using the \*TRG command.

**Key Entry**      **Trigger Key      Ext      Bus**

### **:SECOndary[:STATe]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:SECOndary [ :STATe ] ON | OFF | 1 | 0
[ :SOURce ] :RADio:PDC:SECOndary [ :STATe ] ?
```

This command enables or disables the ability to switch to the secondary frame.

**\*RST**            0

**Key Entry**      **Secondary Frame Off On**

**Remarks** A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to “:SECOndary[:STATe]” on page 925.

**:SLOT0|[1]|2|3|4|5:DCUStom**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DCUStom PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DCUStom?
```

This command configures the data field for the selected downlink custom timeslot.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks** Refer to “File Name Variables” on page 13 for information on the file name syntax.

**:SLOT0|[1]|2|3|4|5:DCUSTom:FIX4**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DCUSTom:FIX4 <val>
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DCUSTom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink custom timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type. To change the data type, refer to “:SLOT0|[1]|2|3|4|5:DCUStom” on page 926.

**:SLOT0|[1]|2|3|4|5:DTCHannel:CCODE**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DTCHannel:CCODE <bit_pattern>
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DTCHannel:CCODE?
```

This command changes the 8-bit color code (CC). The preset hexadecimal value (when normal preset is selected) for CC reflects the PDC protocol, however you can enter a new value using this command.

**\*RST** #H00

**Range** #H00–#HFF

**Key Entry** CC

### **:SLOT0|[1]|2|3|4|5:DTCHannel:SACChannel**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DTCHannel:SACChannel <bit_pattern>  
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DTCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel (SACCH). The preset hexadecimal value (when normal preset is selected) for SACCH reflects the PDC protocol, however you can enter a new value by executing this command.

**\*RST** #H00000

**Range** #H0–#HFFFFFF

**Key Entry** SACCH

### **:SLOT0|[1]|2|3|4|5:DTCHannel:SWORd**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DTCHannel:SWORd <bit_pattern>  
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DTCHannel:SWORd?
```

This command sets the 20-bit synchronization word as the active function. This is used for the control and traffic physical channels.

**\*RST** #H87A4B

**Range** #H0–#HFFFFFF

**Key Entry** SW

### **:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DTCHannel[:TCHannel] PN9 |  
PN11 | PN15 | PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64  
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DTCHannel[:TCHannel] ?
```

This command configures the data field for the selected downlink traffic channel field.

**PDC Subsystem—Option 402 ([:SOURce]:RADio:PDC)**

**\*RST** PN9

**Key Entry** PN9 PN11 PN15 PN20 PN23 FIX4 User File EXT  
 4 1's & 4 0's 8 1's & 8 0's 16 1's & 16 0's 32 1's & 32 0's  
 64 1's & 64 0's

**Remarks** See “File Name Variables” on page 13 for information on the file name syntax.

**:SLOT0|[1]|2|3|4|5:DTCHannel[:TCHannel]:FIX4**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DTCHannel [ :TCHannel ] :FIX4 <val>
[ :SOURce ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :DTCHannel [ :TCHannel ] :FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink traffic channel timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** FIX4

**Remarks** FIX4 must already be defined as the data type.

**:SLOT0|[1]|2|3|4:POWer**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:DLINK:SLOT0 | [1] | 2 | 3 | 4 :POWer MAIN|DELTA
[ :SOURce ] :RADio:PDC:DLINK:SLOT0 | [1] | 2 | 3 | 4 :POWer?
```

This command toggles the RF output power level function for the selected timeslot.

**MAIN** This choice specifies RF output as the main power level.

**DELTA** This choice specifies RF output as the alternative power level.

**\*RST** MAIN

**Key Entry** Timeslot Ampl Main Delta

**:SLOT0|[1]|2|3|4|5:STATE**

**Supported**            E4438C with Option 402

```
[:SOURce]:RADio:PDC:SLOT0 [1] | 2 | 3 | 4 | 5:STATE ON|OFF|1|0
[:SOURce]:RADio:PDC:SLOT0 [1] | 2 | 3 | 4 | 5:STATE?
```

This command enables or disables the operating state of the selected timeslot.

**\*RST**                    Timeslot 0: 1      Timeslots 1–5: 0

**Key Entry**            **Timeslot Off On**

**:SLOT0|[1]|2|3|4|5:UCUStom**

**Supported**            E4438C with Option 402

```
[:SOURce]:RADio:PDC:SLOT0 [1] | 2 | 3 | 4 | 5:UCUStom PN9|PN11|PN15 |
PN20|PN23|FIX4 | "<file name>" |EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:PDC:SLOT0 [1] | 2 | 3 | 4 | 5:UCUStom?
```

This command configures the data field for the selected uplink custom timeslot.

**\*RST**                    PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>		<b>8 1's &amp; 8 0's</b>		<b>16 1's &amp; 16 0's</b>		<b>32 1's &amp; 32 0's</b>	
			<b>64 1's &amp; 64 0's</b>					

**Remarks**            Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**:SLOT0|[1]|2|3|4|5:UCUStom:FIX4**

**Supported**            E4438C with Option 402

```
[:SOURce]:RADio:PDC:SLOT0 [1] | 2 | 3 | 4 | 5:UCUStom:FIX4 <val>
[:SOURce]:RADio:PDC:SLOT0 [1] | 2 | 3 | 4 | 5:UCUStom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink custom timeslot.

**\*RST**                    #B0000

**Range**                    #B0000–#B1111 or 0–15

**Key Entry**            **FIX4**

**Remarks**            FIX4 must already be defined as the data type.

### **:SLOT0|[1]|2|3|4|5:UTCHannel:CCODE**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UTCHannel:CCODE <bit_pattern>  
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UTCHannel:CCODE?
```

This command changes the 8-bit color code (CC). The preset hexadecimal value (when normal preset is selected) for CC reflects the PDC protocol, however you can enter a new value using this command.

**\*RST** #H00

**Range** #H00–#HFF

**Key Entry** **CC**

### **:SLOT0|[1]|2|3|4|5:UTCHannel:SACChannel**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UTCHannel:SACChannel <bit_pattern>  
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UTCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel (SACCH). The preset hexadecimal value (when normal preset is selected) for SACCH reflects the PDC protocol, however you can enter a new value by executing this command.

**\*RST** #H0000

**Range** #H0–#H7FFF

**Key Entry** **SACCH**

### **:SLOT0|[1]|2|3|4|5:UTCHannel:SWORd**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UTCHannel:SWORd <bit_pattern>  
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UTCHannel:SWORd?
```

This command sets the 20-bit synchronization word as the active function. This is used for the control and traffic physical channels.

**\*RST** #H785B4

**Range** #H0–#HFFFFFF

**Key Entry** **SW**



**:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]**

**Supported**            E4438C with Option 402

```
[:SOURCE]:RADIO:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel] PN9|
PN11|PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURCE]:RADIO:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]?
```

This command sets a pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file as the data pattern type for the uplink traffic channel field.

**\*RST**                    PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks**            Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]:FIX4**

**Supported**            E4438C with Option 402

```
[:SOURCE]:RADIO:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]:FIX4 <val>
[:SOURCE]:RADIO:PDC:SLOT0|[1]|2|3|4|5:UTCHannel[:TCHannel]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink traffic channel timeslot.

**\*RST**                    #B0000

**Range**                 #B0000–#B1111 or 0–15

**Key Entry**            **FIX4**

**Remarks**            FIX4 must already be defined as the data type.

### **:SLOT0|[1]|2|3|4|5:UVOX:CCODE**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UVOX:CCODE <bit_pattern>  
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UVOX:CCODE?
```

This command changes the 8-bit color code (CC). The preset hexadecimal value (when normal preset is selected) for CC reflects the PDC protocol, however you can enter a new value using this command.

**\*RST** #H00

**Range** #H00–#HFF

**Key Entry** **CC**

### **:SLOT0|[1]|2|3|4|5:UVOX:SACChannel**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UVOX:SACChannel <bit_pattern>  
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UVOX:SACChannel?
```

This command changes the 15-bit slow associated control channel (SACCH). The preset hexadecimal value (when normal preset is selected) for SACCH reflects the PDC protocol, however you can enter a new value by executing this command.

**\*RST** #H0000

**Range** #H0–#H7FFF

**Key Entry** **SACCH**

### **:SLOT0|[1]|2|3|4|5:UVOX:SWORD**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UVOX:SWORD <bit_pattern>  
[ :SOURCE ] :RADio:PDC:SLOT0 | [1] | 2 | 3 | 4 | 5 :UVOX:SWORD?
```

This command changes the synchronization word, which is used for slot synchronization, equalizer training, and timeslot identification.

**\*RST** UTCH & UVOX: 785B4 DTCH: 87A4B

**Range** #H0–#HFFFFFF

**Key Entry** **SW**

**Remarks** The \*RST hexadecimal value reflects the value specified by the indicated standard.

## **:SLOT0|[1]|2|3|4|5[:TYPE]**

**Supported** E4438C with Option 402

```
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5[:TYPE] UCUStom|DCUStom|
UTCH|UTCH_ALL|UVOX|DTCH|DTCH_ALL
[:SOURce]:RADio:PDC:SLOT0|[1]|2|3|4|5[:TYPE]?
```

This command sets the timeslot type for the selected timeslot.

**\*RST** UTCH

<b>Key Entry</b>	<b>Up Custom</b>	<b>Down Custom</b>	<b>Up TCH</b>	<b>UP TCH All</b>	<b>Up VOX</b>
	<b>Down TCH</b>	<b>Down TCH All</b>			

## **:SOUT**

**Supported** E4438C with Option 402

```
[:SOURce]:RADio:PDC:SOUT FRAME|SLOT|ALL
[:SOURce]:RADio:PDC:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

**FRAME** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

**SLOT** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

**ALL** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

**\*RST** FRAME

<b>Key Entry</b>	<b>Begin Frame</b>	<b>Begin Timeslot #</b>	<b>All Timeslots</b>
------------------	--------------------	-------------------------	----------------------

## **:SOUT:OFFSet**

**Supported** E4438C with Option 402

```
[:SOURce]:RADio:PDC:SOUT:OFFSet <val>
[:SOURce]:RADio:PDC:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number bits.

**\*RST** +0

Receiver Test Digital Commands (continued)  
**PDC Subsystem—Option 402 ([:SOURce]:RADio:PDC)**

<b>Range</b>	–279 to 279
<b>Key Entry</b>	<b>Sync Out Offset</b>
<b>Remarks</b>	Negative values move the synchronization output signal earlier; positive values move it later.  To change the output of the EVENT1 rear panel connector to SLOT, refer to “:SOUT” on page 933.

**:SOUT:SLOT**

<b>Supported</b>	E4438C with Option 402
	[ :SOURce ] :RADio:PDC:SOUT:SLOT <val>
	[ :SOURce ] :RADio:PDC:SOUT:SLOT?

This command selects the timeslot that will trigger a 1-bit signal at the EVENT 1 rear panel connector.

<b>*RST</b>	+0
<b>Range</b>	0–5
<b>Key Entry</b>	<b>Begin Timeslot #</b>
<b>Remarks</b>	To change the output of the EVENT1 rear panel connector to SLOT, refer to “:SOUT” on page 933.

**:SRATe**

<b>Supported</b>	E4438C with Option 402
	[ :SOURce ] :RADio:PDC:SRATe <val>
	[ :SOURce ] :RADio:PDC:SRATe?

This command sets the transmission symbol rate. Symbol rate is the bit rate divided by the bits per symbol. A change in the symbol rate affects the bit rate. Refer to “:BRATe” on page 774 for information on bit rate.

The variable <val> is expressed in units of symbols per second (sps–MSPS) and the maximum symbol rate depends on the filter. Refer to “:FILTer” on page 920 for minimum filter symbol width.

The filter may have to be truncated down to 32 or 16 symbols wide to achieve the highest symbol rate. The signal generator’s internal filters are not truncated below their minimum filter length and user-defined FIR filters are not truncated. If the filter cannot be truncated then the symbol rate is limited to the maximum rate of the narrowest filter size possible.

The relative timing of the modulated data, as well as the actual filter response is affected when the filter is truncated.

When the symbol rate changes, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the symbol rate: lower symbol rates require more time.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 923.

**\*RST**                    +2.1000000E+004

Range	Modulation Type	Symbol Rate Range		
		<i>16 Symbol Wide Filter</i>	<i>32 Symbol Wide Filter</i>	<i>64 Symbol Wide Filter</i>
	BPSK, FSK2, MSK	1sps–50Msps	1sps–25Msps	1sps–12.5Msps
	C4FM, OQPSK, FSK4	2sps–25Msps	2sps–12.5Msps	2sps–6.25Msps
	OQPSKI95, QPSK			
	P4QPPSK, QPSKIS95			
	GRAYQPSK, QAM4			
	D8PSK, EDGE, FSK8, PSK8	3sps–16.666666666 Msps	3sps–8.333333333 Msps	3sps–4.166666666Msps
	FSK16, PSK16, QAM16	4sps–12.5Msps	4sps–6.25Msps	4sps–3.125Msps
	QAM32	5sps–10Msps	5sps–5Msps	5sps–2.5Msps
	QAM64	6sps–8.333333333 Msps	6sps–4.166666666 Msps	6sps–2.083333333 Msps
	QAM128	7sps–7.142857142 Msps	7sps–3.571428572 Msps	7sps–1.785714285 Msps
	QAM256	8sps–6.25Msps	8sps–3.125 Msps	8sps–1.5625 Msps

---

**NOTE**                    Using I/Q skew will half the minimum number of symbols for the selected filter.

---

**Key Entry**                **Symbol Rate**

## **:TRIGger:TYPE**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:TRIGger:TYPE CONTInuous | SINGle | GATE
[ :SOURCE ] :RADio:PDC:TRIGger:TYPE?
```

This command sets the trigger type.

**CONTInuous** The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to “[:TRIGger:TYPE:CONTInuous\[:TYPE\]](#)” on page 936.

**SINGle** The framed data sequence plays once for every trigger received.

**GATE** An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

**\*RST** CONT

<b>Key Entry</b>	<b>Continuous</b>	<b>Single</b>	<b>Gated</b>
------------------	-------------------	---------------	--------------

## **:TRIGger:TYPE:CONTInuous[:TYPE]**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:TRIGger:TYPE:CONTInuous [ :TYPE ] FREE | TRIGger | RESet
[ :SOURCE ] :RADio:PDC:TRIGger:TYPE:CONTInuous [ :TYPE ] ?
```

This commands selects the waveform’s response to a trigger signal while using the continuous trigger mode.

For more information on triggering and to select the continuous trigger mode, see “[:TRIGger:TYPE](#)” on page 936.

The following list describes the waveform’s response to each of the command choices:

**FREE** Turning the ARB format on immediately triggers the waveform. The waveform repeats until you turn the format off, select another trigger, or choose another waveform file.

**TRIGger** The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.

**RESet** The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.

<b>*RST</b>	FREE		
<b>Key Entry</b>	<b>Free Run</b>	<b>Trigger &amp; Run</b>	<b>Reset &amp; Run</b>

**:TRIGger:TYPE:GATE:ACTive**

**Supported**            E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:TRIGger:TYPE:GATE:ACTive LOW|HIGH
[ :SOURCE ] :RADio:PDC:TRIGger:TYPE:GATE:ACTive?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see “:TRIGger:TYPE” on page 936.

The following list describes the ESG’s gating behavior for the polarity selections:

- |      |                                                                                                                                              |
|------|----------------------------------------------------------------------------------------------------------------------------------------------|
| LOW  | The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state). |
| HIGH | The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state). |

<b>*RST</b>	HIGH
<b>Key Entry</b>	<b>Gate Active Low High</b>

**:TRIGger[:SOURCE]**

**Supported**            E4438C with Option 402

```
[ :SOURCE ] :RADio:PDC:TRIGger [ :SOURCE ] KEY|EXT|BUS
[ :SOURCE ] :RADio:PDC:TRIGger [ :SOURCE ] ?
```

This command sets the trigger source.

For more information on triggering, see “:TRIGger:TYPE” on page 936. The following list describes the command choices:

- |     |                                                                                           |
|-----|-------------------------------------------------------------------------------------------|
| KEY | This choice enables manual triggering by pressing the front-panel <b>Trigger</b> hardkey. |
|-----|-------------------------------------------------------------------------------------------|

- EXT** An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger:
- The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see “[:TRIGger[:SOURce]:EXTErnal[:SOURce]]” on page 940.  
 For more information on the connectors and on connecting the cables, see the *E4428C/38C ESG Signal Generators User’s Guide*.
  - The trigger signal polarity:
    - gating mode, see “[:TRIGger:TYPE:GATE:ACTive]” on page 937
    - continuous and single modes, see “[:TRIGger[:SOURce]:EXTErnal:SLOPe]” on page 939
  - The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:
    - setting the amount of delay, see “[:TRIGger[:SOURce]:EXTErnal:DELay]” on page 938
    - turning the delay on, see “[:TRIGger[:SOURce]:EXTErnal:DELay:STATe]” on page 939
- BUS** This choice enables triggering over the GPIB or LAN using the \*TRG or GET commands or the AUXILIARY INTERFACE (RS-232) using the \*TRG command.

**\*RST** KEY

Key Entry	Trigger Key	Ext	Bus
-----------	-------------	-----	-----

### **:TRIGger[:SOURce]:EXTErnal:DELay**

**Supported** E4438C with Option 402

```
[:SOURce]:RADio:PDC:TRIGger[:SOURce]:EXTErnal:DELay <val>
[:SOURce]:RADio:PDC:TRIGger[:SOURce]:EXTErnal:DELay?
```

This command sets the number of bits to delay the ESG’s response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See “[:TRIGger[:SOURce]:EXTErnal:DELay:STATe]” on page 939. You can set the number of bits either before or after enabling the state.



For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 937.

**\*RST**                    +0  
**Range**                    0–1048575  
**Key Entry**                **Ext Delay Bits**

### **:TRIGger[:SOURce]:EXTErnal:DELAy:STATe**

**Supported**                E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:TRIGger [ :SOURce ] :EXTErnal:DELAy:STATe ON|OFF|1|0  
[ :SOURce ] :RADio:PDC:TRIGger [ :SOURce ] :EXTErnal:DELAy:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see “:TRIGger[:SOURce]:EXTErnal:DELAy” on page 938, and for more information on configuring an external source, see “:TRIGger[:SOURce]” on page 937.

**\*RST**                    0  
**Key Entry**                **Ext Delay Off On**

### **:TRIGger[:SOURce]:EXTErnal:SLOPe**

**Supported**                E4438C with Option 402

```
[ :SOURce ] :RADio:PDC:TRIGger [ :SOURce ] :EXTErnal:SLOPe POSitive|NEGative  
[ :SOURce ] :RADio:PDC:TRIGger [ :SOURce ] :EXTErnal:SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see “:TRIGger:TYPE:GATE:ACTive” on page 937.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 937.

**\*RST**                    NEG  
**Key Entry**                **Ext Polarity Neg Pos**

**:TRIGger[:SOURCE]:EXTernal[:SOURCE]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:PDC:TRIGger[:SOURCE]:EXTernal[:SOURCE] EPT1|EPT2|
EPTRIGGER1|EPTRIGGER2
[:SOURCE]:RADio:PDC:TRIGger[:SOURCE]:EXTernal[:SOURCE]?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURCE]” on page 937. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User’s Guide*.

The following list describes the command choices:

- EPT1 This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.
- EPT2 This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
- EPTRIGGER1 This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.
- EPTRIGGER2 This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.

**\*RST** EPT1

**Key Entry** **Patt Trig In 1** **Patt Trig In 2**

**[:STATe]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:PDC[:STATe] ON|OFF|1|0[:SOURCE]:RADio:PDC[:STATe]?
```

This command enables or disables the PDC modulation format.

**\*RST** OFF

**Key Entry** **PDC Off On**

**Remarks** Although the PDC modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

---

## PHS Subsystem–Option 402 ([:SOURce]:RADio:PHS)

### :ALPha

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ALPha <val>  
[ :SOURce ] :RADio:PHS:ALPha?
```

This command changes the Nyquist or root Nyquist filter’s alpha value.

The filter alpha value can be set to the minimum level (0), the maximum level (1), or in between by using fractional numeric values (0.001–0.999).

**\*RST** +5.00000000E–001

**Range** 0.000–1.000

**Key Entry** **Filter Alpha**

**Remarks** To change the current filter type, refer to “:FILTer” on page 959.

### :BBCLock

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:BBCLock INT [1] | EXT [1]  
[ :SOURce ] :RADio:PHS:BBCLock?
```

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

**INT[1]** This choice selects the signal generator internal data clock.

**EXT[1]** This choice selects an external data clock input.

**\*RST** INT

**Key Entry** **BBG Data Clock Ext Int**

**Remarks** A data clock or continuous symbol sync input must be supplied when external mode is used.

## :BBT

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:BBT <val>  
[ :SOURCE ] :RADio:PHS:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

**\*RST** +5.00000000E–001

**Range** 0.100–1.000

**Key Entry** **Filter BbT**

**Remarks** This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “:FILTer” on page 959.

## :BRATe

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:BRATe <val>  
[ :SOURCE ] :RADio:PHS:BRATe?
```

This command sets the bit rate in bits per second (bps–Mbps). The maximum bit rate is dependent on the modulation type and filter as shown in the following tables

The IQ digital data stream is shaped by a FIR filter. The filter length and associated latency and frequency response are dependent on the bit rate as shown in the following tables. The signal generator selects a filter length.

For higher bit rates, the FIR filter length may be truncated (if the minimum filter size allows it) which will impact the relative timing of the modulated data, as well as the actual filter response (see the symbol rate command “:SRATe” on page 965). Refer to “:FILTer” on page 959 for information on filter symbol widths.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 962.

When the bit rate is changed, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the bit rate: lower bit rates require more time.

**\*RST** +3.8400000E+005

Range	Modulation Type	Bit Rate Range		
		16 Symbol Wide Filter	32 Symbol Wide Filter	64 Symbol Wide Filter
	BPSK, FSK2, MSK	1bps–50Mbps	1bps–25Mbps	1bps–12.5Mbps
	C4FM, OQPSK, FSK4	2bps–50Mbps	2bps–25Mbps	2bps–12.5Mbps
	OQPSKI95, QPSK			
	P4QPPSK, QPSKIS95			
	GRAYQPSK, QAM4			
	D8PSK, EDGE, FSK8, PSK8	3bps–50Mbps	3bps–25Mbps	3bps–12.5Mbps
	FSK16, PSK16, QAM16	4bps–50Mbps	4bps–25Mbps	4bps–12.5Mbps
	QAM32	5bps–50Mbps	5bps–25Mbps	5bps–12.5Mbps
	QAM64	6bps–50Mbps	6bps–25Mbps	6bps–12.5Mbps
	QAM128	7bps–50Mbps	7bps–25Mbps	7bps–12.5Mbps
	QAM256	8bps–50Mbps	8bps–25Mbps	8bps–12.5Mbps

**Key Entry**                      **Symbol Rate**

**:BURSt:PN9**

**Supported**                      E4438C with Option 402

[ :SOURCE ] :RADio:PHS: BURSt:PN9 NORMal | QUICk  
 [ :SOURCE ] :RADio:PHS: BURSt:PN9?

This command controls the software PN9 generation.

**NORMal**                      This choice produces a maximum length PN9 sequence.

**QUICk**                      This choice produces a truncated PN9 sequence.

**\*RST**                      NORM

**Key Entry**                      **PN9 Mode Normal Quick**

**Remarks**                      Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

### **:BURSt:SCRamble:SEED**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:BURSt:SCRamble:SEED <16-bit val>  
[ :SOURce ] :RADio:PHS:BURSt:SCRamble:SEED?
```

This command select a 16-bit scramble seed value for scrambling.

**\*RST** #H3FF

**Range** #H0–#H3FF

**Key Entry** **Scramble Seed**

**Remarks** Although values may be set using this command, it does not active that scramble function.

To enable the scrambling function, refer to “:BURSt:SCRamble[:STATe]” on [page 944](#).

### **:BURSt:SCRamble[:STATe]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:BURSt:SCRamble [ :STATe ] ON | OFF | 1 | 0  
[ :SOURce ] :RADio:PHS:BURSt:SCRamble [ :STATe ] ?
```

This command enables or disables the operating state of the scramble function.

ON (1) This choice scrambles data on the related fields, using the seed setting.

OFF (0) This choice disables the scramble function.

**\*RST** 0

**Key Entry** **Scramble Off On**

**Remarks** To set the seed setting, refer to “:BURSt:SCRamble:SEED” on [page 944](#).

## **:BURSt:SHAPe:FALL:DELay**

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PHS: BURSt:SHAPe:FALL:DELay <val>

[ :SOURce ] :RADio:PHS: BURSt:SHAPe:FALL:DELay?

This command sets the burst shape fall delay.

The variable <val> is expressed in bits.

**\*RST** +0.00000000E+000

**Range** -22.1250 to 99

**Key Entry** **Fall Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 962. Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FDELay” on page 946 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

## **:BURSt:SHAPe:FALL:TIME**

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PHS: BURSt:SHAPe:FALL:TIME <val>

[ :SOURce ] :RADio:PHS: BURSt:SHAPe:FALL:TIME?

This command sets the burst shape fall time.

The variable <val> is expressed in bits.

**\*RST** +4.00000000E+001

**Range** 0.1250–255.8750

**Key Entry** **Fall Time**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 962. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FTIME” on page 947 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

### **:BURSt:SHAPe:FDElay**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:BURSt:SHAPe:FDElay <val>  
[ :SOURce ] :RADio:PHS:BURSt:SHAPe:FDElay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits.

**\*RST** +0.00000000E+000

**Range** –22.1250 to 99

**Key Entry** **Fall Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 962. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:DElay” on page 945 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.



## **:BURSt:SHAPe:FTIME**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:PHS: BURSt:SHAPe:FTIME <val>

[ :SOURCE ] :RADio:PHS: BURSt:SHAPe:FTIME?

This command sets the burst shape fall time.

The variable <val> is expressed in bits.

**\*RST** +4.00000000E+001

**Range** 0.1250–255.8750

**Key Entry** **Fall Time**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 962. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 945 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

## **:BURSt:SHAPe:RDELay**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:PHS: BURSt:SHAPe:RDELay <val>

[ :SOURCE ] :RADio:PHS: BURSt:SHAPe:RDELay?

This command sets the burst shape rise delay.

The variable <val> is expressed in bits.

**\*RST** +0.00000000E+000

**Range** –18.1250 to 99

**Key Entry** **Rise Delay**

**Remarks**            The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 962. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DELay” on page 948 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

### **:BURSt:SHAPe:RISE:DELay**

**Supported**            E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:BURSt:SHAPe:RISE:DELay <val>  
[ :SOURce ] :RADio:PHS:BURSt:SHAPe:RISE:DELay?
```

This command sets the burst shape rise delay.

The variable <val> is expressed in bits.

**\*RST**                    +0.00000000E+000

**Range**                    –18.1250 to 99

**Key Entry**            **Rise Delay**

**Remarks**            The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 962. Refer to “:SRATE” on page 965 for minimum and maximum symbol rate values.

“:BURSt:SHAPe:RDELay” on page 947 performs the same function; in compliance with the SCPI standard, both commands are listed.

See the *E4428C/38C ESG Signal Generators User’s Guide* for concept information.

## **:BURSt:SHAPe:RISE:TIME**

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PHS:BURSt:SHAPe:RISE:TIME <val>

[ :SOURce ] :RADio:PHS:BURSt:SHAPe:RISE:TIME?

This command sets the burst shape rise time. The variable <val> is expressed in bits.

**\*RST** +4.00000000E+001

**Range** 0.1250–22.500

**Key Entry** **Rise Time**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 962. Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values. The command “:BURSt:SHAPe:RTIME” on page 949 performs the same function. See the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

## **:BURSt:SHAPe:RTIME**

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PHS:BURSt:SHAPe:RTIME <val>

[ :SOURce ] :RADio:PHS:BURSt:SHAPe:RTIME?

This command sets the burst shape rise time. The variable <val> is expressed in bits.

**\*RST** +4.00000000E+001

**Range** 0.1250–22.500

**Key Entry** **Rise Time**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 962. Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:TIME” on page 949 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal*

*Generators User's Guide.*

### **:BURSt:SHAPe[:TYPE]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS: BURSt: SHAPe [ :TYPE ] SINE | "<file name>"  
[ :SOURce ] :RADio:PHS: BURSt: SHAPe [ :TYPE ] ?
```

This command specifies the burst shape as either SINE or a user-defined file ("*<file name>*").

**SINE** This choice selects a state that is defined by the burst rise and fall \*RST values, as the default burst shape type.

"*<file name>*" This choice selects a user designated file from signal generator memory (non-volatile).

**\*RST** SINE

**Key Entry** **Sine User File**

### **:BURSt[:STATe]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS: BURSt [ :STATe ] ON | OFF | 1 | 0  
[ :SOURce ] :RADio:PHS: BURSt [ :STATe ] ?
```

This command enables or disables the burst function.

**ON (1)** This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

**OFF (0)** This choice enables the transmission of unframed data.

**\*RST** 0

**Key Entry** **Data Format Pattern Framed**

## **:CHANnel**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:PHS:CHANnel EVM|ACP
[:SOURCE]:RADio:PHS:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

**EVM** This choice provides the most ideal passband.

**ACP** This choice improves stopband rejection.

**\*RST** EVM

**Key Entry** **Optimize FIR For EVM ACP**

**Remarks** To change the current filter type, refer to [“:FILTer” on page 959](#).

## **:DATA**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:PHS:DATA PN9|PN11|PN15|PN20|PN23|FIX4|
"<file name>"|EXT|P4|P8|P16|P32|P64|PRAM
[:SOURCE]:RADio:PHS:DATA?
```

This command sets the data pattern type (pseudo-random number sequence, 4-bit pattern, sequence of 1's and 0's, data from an external source, or a user file) for unframed data transmission.

**\*RST** PN23

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>Ext</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>	<b>PRAM File</b>		

**Remarks** Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

## :DATA:PRAM

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:PHS:DATA:PRAM "<file_name>"
```

```
[ :SOURCE ] :RADIO:PHS:DATA:PRAM?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for the PHS (Personal Handy-phone System) format.

"<file\_name>" This variable designates the PRAM file in WFM1. Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**Key Entry** **PRAM File**

**Remarks** Selecting this data source forces the burst source to INTERNAL to allow framing control.

The PRAM file must reside in the signal generator’s volatile memory (WFM1) in order to be accessed by this command. For more information on PRAM files, refer to [“:DATA:PRAM:FILE:BLOCK” on page 112](#).

## :DATA:FIX4

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:PHS:DATA:FIX4 <val>
```

```
[ :SOURCE ] :RADIO:PHS:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the protocols (modulation type, symbol rate, filter, and burst shape) selected for the PHS format.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

## :DEFault

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:PHS:DEFault
```

This command returns all of the PHS modulation format parameters to factory settings. It does not affect any other signal generator parameters.

**Key Entry**            **Restore PHS Factory Default**

**:DLINK:SLOT[1] | 2 | 3 | 4:CUSTom**

**Supported**            E4438C with Option 402

```
[:SOURce]:RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:CUSTom PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[:SOURce]:RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:CUSTom?
```

This command configures the data field for the selected downlink custom timeslot.

**\*RST**                    PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>				
	<b>64 1's &amp; 64 0's</b>							

**Remarks**            Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**:DLINK:SLOT[1] | 2 | 3 | 4:CUSTom:FIX4**

**Supported**            E4438C with Option 402

```
[:SOURce]:RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:CUSTom:FIX4 <val>
[:SOURce]:RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:CUSTom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink custom timeslot.

**\*RST**                    #B0000

**Range**                    #B0000–#B1111 or 0–15

**Key Entry**            **FIX4**

**Remarks**            FIX4 must already be defined as the data type.

**:DLINK:SLOT[1] | 2 | 3 | 4:POWer**

**Supported**            E4438C with Option 402

```
[:SOURce]:RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:POWer MAIN | DELTA
[:SOURce]:RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:POWer?
```

This command toggles the RF output power level function for the selected timeslot.

**MAIN**                    This choice specifies RF output as the main power level.

Receiver Test Digital Commands (continued)  
**PHS Subsystem—Option 402 ([:SOURCE]:RADio:PHS)**

**DELTA** This choice specifies RF output as the alternative power level.

**\*RST** MAIN

**Key Entry** Timeslot Ampl Main Delta

**:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:CSID**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :SCHannel:CSID <bit_pattern>  
[ :SOURCE ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :SCHannel:CSID?
```

This command changes the 42-bit cell station identification code (CSID) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for CSID reflects the PHS protocol, however you can enter a new value with this command.

**\*RST** #H20200020001

**Range** #H0–#H3FFFFFFFF

**Key Entry** CSID

**:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:IDLE**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :SCHannel:IDLE <bit_pattern>  
[ :SOURCE ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :SCHannel:IDLE?
```

This command changes the 34-bit idle (IDLE) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for IDLE reflects the PHS protocol, however you can enter a new value with this command.

**\*RST** #H000000000

**Range** #H0–#H3FFFFFFFF

**Key Entry** IDLE

**:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:PSID**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :SCHannel:PSID <bit_pattern>  
[ :SOURCE ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :SCHannel:PSID?
```

This command changes the 28-bit personal station identification code (PSID) field in the synchronization channel of the selected downlink timeslot. The normal preset hexadecimal value for PSID reflects the PHS protocol, however you can enter a new value with this command.



**\*RST** #H0000001  
**Range** #H0–#H3FFFFFFF  
**Key Entry** **PSID**

### **:DLINK:SLOT[1] | 2 | 3 | 4:SCHannel:UWORD**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :SCHannel:UWORD <bit_pattern>  
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :SCHannel:UWORD?
```

This command changes the unique word (UW) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

**\*RST** #H50EF2993  
**Range** #H0–#HFFFFFFF  
**Key Entry** **UW**

### **:DLINK:SLOT[1] | 2 | 3 | 4:STATe**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :STATe ON|OFF|1|0  
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :STATe?
```

This command enables or disables the operating state of the selected downlink timeslot.

**\*RST** Timeslot 1: 1 *Timeslots 2–4: 0*  
**Key Entry** **Timeslot Off On**

### **:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel:SACChannel**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :TCHannel:SACChannel  
<bit_pattern>  
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4 :TCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

**\*RST** #H8000  
**Range** #H0–#HFFFF

**Key Entry**            **SA**

**:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel:UWORD**

**Supported**            E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:TCHannel:UWORD <bit_pattern>
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:TCHannel:UWORD?
```

This command changes the unique word (UW) field of the selected downlink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

**\*RST**                    #H3D4C

Range                    #H0–#HFFFF

**Key Entry**            **UW**

**:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel[:TCHannel]**

**Supported**            E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:TCHannel
[:TCHannel] PN9 | PN11 | PN15 | PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 |
P64
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:TCHannel [:TCHannel] ?
```

This command customizes the selected downlink traffic channel timeslot.

**\*RST**                    PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks**            Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**:DLINK:SLOT[1] | 2 | 3 | 4:TCHannel[:TCHannel]:FIX4**

**Supported**            E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:TCHannel [:TCHannel] :FIX4 <val>
[ :SOURce ] :RADio:PHS:DLINK:SLOT [1] | 2 | 3 | 4:TCHannel [:TCHannel] :FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink traffic channel timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type. To change the data type, refer to “:DLINK:SLOT[1]|2|3|4:TCHannel[:TCHannel]” on page 956.

### **:DLINK:SLOT[1]|2|3|4[:TYPE]**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:PHS:DLINK:SLOT [ 1 ] | 2 | 3 | 4 [ :TYPE ] CUSTom | TCH | TCH\_ALL | SYNC  
 [ :SOURCE ] :RADio:PHS:DLINK:SLOT [ 1 ] | 2 | 3 | 4 [ :TYPE ] ?

This command sets the downlink timeslot type for the selected timeslot.

**\*RST** Timeslot 1: TCH Timeslots 2–4: CUST

**Key Entry** **Custom TCH TCH All SYNC**

### **:EDATa:DElay**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:PHS:EDATa:DElay?

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

**Remarks** When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

### **:EDCLock**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:PHS:EDCLock SYMBol | NORMal  
 [ :SOURCE ] :RADio:PHS:EDCLock?

This command sets the external data clock use.

**SYMBol** This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

**NORMal** This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

Receiver Test Digital Commands (continued)  
**PHS Subsystem—Option 402 ([:SOURce]:RADio:PHS)**

<b>*RST</b>	NORM
<b>Key Entry</b>	<b>Ext Data Clock Normal Symbol</b>
<b>Remarks</b>	Both choices have no effect in internal clock mode. Refer to “:BBCLock” on page 941 to select EXT as the data clock type.

**:EREFerence**

<b>Supported</b>	E4438C with Option 402
	<code>[:SOURce]:RADio:PHS:EREFerence INT EXT</code>
	<code>[:SOURce]:RADio:PHS:EREFerence?</code>

This command selects either an internal or external bit-clock reference for the data generator.

<b>*RST</b>	INT
<b>Key Entry</b>	<b>BBG Ref Ext Int</b>
<b>Remarks</b>	If the EXT choice is selected, the external source’s frequency value must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.  Refer to, “:EREFerence:VALue” on page 958 to enter the external reference frequency setting.

**:EREFerence:VALue**

<b>Supported</b>	E4438C with Option 402
	<code>[:SOURce]:RADio:PHS:EREFerence:VALue &lt;val&gt;</code>
	<code>[:SOURce]:RADio:PHS:EREFerence:VALue?</code>

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

<b>*RST</b>	+1.30000000E+007
<b>Range</b>	2.5E5–1E8

**Key Entry**            **Ext BBG Ref Freq**

**Remarks**            The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to “[EREFerence](#)” on page 958 to select EXT (external source) as the reference for the bit-clock.

**:FILTer**

**Supported**            E4438C with Option 402

```
[:SOURce]:RADio:PHS:FILTer RNYQuist|NYQuist|GAUSSian|RECTangle|
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio:PHS:FILTer?
```

This command selects the pre-modulation filter type.

- IS95                    This choice selects a filter that meets the criteria of the IS-95 standard.
- IS95\_EQ                This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
- IS95\_MOD              This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
- IS95\_MOD\_EQ          This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
- AC4Fm                  This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
- UGGaussian            This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
- "<user FIR>"          This variable is any filter file that you have stored into memory.

**\*RST**                    RNYQ

<b>Key Entry</b>	<b>Root Nyquist</b>	<b>Nyquist</b>	<b>Gaussian</b>	<b>Rectangle</b>	<b>IS-95</b>	<b>IS-95 w/EQ</b>
	<b>IS-95 Mod</b>	<b>IS-95 Mod w/EQ</b>	<b>APCO 25 C4FM</b>	<b>UN3/4 GSM Gaussian</b>		
	<b>User FIR</b>					

**Remarks**            Refer to “[File Name Variables](#)” on page 13 for information on the file name syntax.

## **:IQ:SCALe**

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PHS:IQ:SCALe <val>

[ :SOURce ] :RADio:PHS:IQ:SCALe?

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

**\*RST** +100

**Range** 1–200

**Key Entry** **I/Q Scaling**

**Remarks** This command has no effect with MSK or FSK modulation.

## **:MODulation:FSK[:DEVIation]**

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:PHS:MODulation:FSK[:DEVIation] <val>

[ :SOURce ] :RADio:PHS:MODulation:FSK[:DEVIation]?

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

**\*RST** +4.00000000E+002

**Range** 0–2E7

**Key Entry** **Freq Dev**

**Remarks** To change the modulation type, refer to “:MODulation[:TYPE]” on page 962.

Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

## **:MODulation:MSK[:PHASe]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:MODulation:MSK[:PHASe] <val>
```

```
[ :SOURce ] :RADio:PHS:MODulation:MSK[:PHASe] ?
```

This command sets the MSK phase deviation value. The variable <val> is in units of degrees.

**\*RST** +9.00000000E+001

**Range** 0–100

**Key Entry** **Phase Dev**

## **:MODulation:UFSK**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:MODulation:UFSK "<file name>"
```

```
[ :SOURce ] :RADio:PHS:MODulation:UFSK?
```

This command selects a user-defined FSK file from the signal generator memory.

**Key Entry** **User FSK**

**Remarks** The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to [“:MODulation\[:TYPE\]” on page 962](#) to change the current modulation type.

Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

## **:MODulation:UIQ**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:MODulation:UIQ "<file name>"
```

```
[ :SOURce ] :RADio:PHS:MODulation:UIQ?
```

This command selects a user-defined I/Q file from the signal generator memory.

**Key Entry** **User I/Q**

**Remarks** The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to [“:MODulation\[:TYPE\]” on page 962](#) to change the current modulation type.

Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**:MODulation[:TYPE]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:PHS:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|
GRAYQPSK|OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|
FSK8|FSK16|C4FM|QAM4|QAM16|QAM32|QAM64|QAM128|QAM256|UIQ|UFSK
[:SOURCE]:RADio:PHS:MODulation[:TYPE] ?
```

This command sets the modulation type for the PHS personality.

**\*RST** P4DQPSK

<b>Key Entry</b>	<b>BPSK</b>	<b>QPSK</b>	<b>IS-95 QPSK</b>	<b>Gray Coded QPSK</b>	<b>OQPSK</b>			
	<b>IS-95 OQPSK</b>	<b><math>\pi/4</math> DQPSK</b>	<b>8PSK</b>	<b>16PSK</b>	<b>D8PSK</b>	<b>MSK</b>	<b>2-Lvl FSK</b>	
	<b>4-Lvl FSK</b>	<b>8-Lvl FSK</b>	<b>16-Lvl FSK</b>	<b>C4FM</b>	<b>4QAM</b>	<b>16QAM</b>	<b>32QAM</b>	
	<b>64QAM</b>	<b>128QAM</b>	<b>256QAM</b>	<b>User I/Q</b>	<b>User FSK</b>			

**:POLarity[:ALL]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:PHS:POLarity[:ALL] NORMal|INVerted
[:SOURCE]:RADio:PHS:POLarity[:ALL] ?
```

This command sets the rotation direction of the phase modulation vector.

**NORMal** This choice selects normal phase polarity.

**INVerted** This choice inverts the internal Q signal.

**\*RST** NORM

**Key Entry** **Phase Polarity Normal Invert**

**:SECondary:RECall**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:PHS:SECondary:RECall
```

This command recalls the secondary frame configuration, overwriting the current state.

**Key Entry** **Recall Secondary Frame State**

**Remarks** To save a secondary frame state, refer to “:SECondary:SAVE” on page 963.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to “:SECondary[:STATE]” on page 963.



## **:SECondary:SAVE**

**Supported** E4438C with Option 402

`[:SOURCE]:RADio:PHS:SECondary:SAVE`

This command saves the current frame configuration as the secondary frame with the filename `PHS_SECONDARY_FRAME`.

**Key Entry** **Save Secondary Frame State**

**Remarks** To recall the secondary frame (saved in non-volatile signal generator memory), refer to “[:SECondary:RECall](#)” on page 962.

## **:SECondary:TRIGger[:SOURCE]**

**Supported** E4438C with Option 402

`[:SOURCE]:RADio:PHS:SECondary:TRIGger[:SOURCE] KEY|EXT|BUS`  
`[:SOURCE]:RADio:PHS:SECondary:TRIGger[:SOURCE]?`

This command selects the type of triggering for the secondary frame.

**KEY** This choice enables triggering by pressing the front panel **Trigger** hardkey.

**EXT** This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to “[:TRIGger\[:SOURCE\]:EXTernal\[:SOURCE\]](#)” on page 969.

**BUS** This choice enables GPIB triggering using the \*TRG or GET command or LAN and RS-232 triggering using the \*TRG command.

**Key Entry** **Trigger Key Ext Bus**

## **:SECondary[:STATE]**

**Supported** E4438C with Option 402

`[:SOURCE]:RADio:PHS:SECondary[:STATE] ON|OFF|1|0`  
`[:SOURCE]:RADio:PHS:SECondary[:STATE]?`

This command enables or disables the ability to switch to the secondary frame.

**\*RST** 0

**Key Entry** **Secondary Frame Off On**

Receiver Test Digital Commands (continued)  
**PHS Subsystem—Option 402 ([:SOURce]:RADio:PHS)**

**Remarks** A frame must already be saved as the secondary frame in order to turn the secondary state function on.  
To save a frame as the secondary frame, refer to “:SECOndary:SAVE” on page 963.

**:SOUT**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:SOUT FRAME | SLOT | ALL  
[ :SOURce ] :RADio:PHS:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

**FRAME** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

**SLOT** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

**ALL** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

**\*RST** FRAME

**Choices** FRAME SLOT ALL

**:SOUT:OFFSet**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:SOUT:OFFSet <val>  
[ :SOURce ] :RADio:PHS:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number of bits.

**\*RST** +0

**Range** -239 to 239

**Key Entry** **Sync Out Offset**

**Remarks** Negative values move the synchronization output signal earlier; positive values move it later.

To change the output of the EVENT1 rear panel connector to SLOT, refer to “:SOUT” on page 964.

## :SOUT:SLOT

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:SOUT:SLOT <val>  
[ :SOURce ] :RADio:PHS:SOUT:SLOT?
```

This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.

**\*RST** +0

**Range** 1–4

**Key Entry** **Begin Timeslot #**

**Remarks** To change the output of the EVENT1 rear panel connector to SLOT, refer to “:SOUT” on page 964.

## :SRATe

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:SRATe <val>  
[ :SOURce ] :RADio:PHS:SRATe?
```

This command sets the transmission symbol rate. Symbol rate is the bit rate divided by the bits per symbol. A change in the symbol rate affects the bit rate. Refer to “:BRATe” on page 875 for information on bit rate.

The variable <val> is expressed in units of symbols per second (sps–Mps) and the maximum symbol rate depends on the filter. Refer to “:FILTer” on page 959 for minimum filter symbol width.

The filter may have to be truncated down to 32 or 16 symbols wide to achieve the highest symbol rate. The signal generator’s internal filters are not truncated below their minimum filter length and user-defined FIR filters are not truncated. If the filter cannot be truncated then the symbol rate is limited to the maximum rate of the narrowest filter size possible.

The relative timing of the modulated data, as well as the actual filter response is affected when the filter is truncated.

When the symbol rate changes, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the symbol rate: lower symbol rates require more time.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 962.

Receiver Test Digital Commands (continued)  
**PHS Subsystem—Option 402 ([:SOURce]:RADio:PHS)**

\*RST +1.92000000E+004

Range	Modulation Type	Symbol Rate Range		
		16 Symbol Wide Filter	32 Symbol Wide Filter	64 Symbol Wide Filter
	BPSK, FSK2, MSK	1sps–50Msp	1sps–25Msp	1sps–12.5Msp
	C4FM, OQPSK, FSK4	2sps–25Msp	2sps–12.5Msp	2sps–6.25Msp
	OQPSKI95, QPSK			
	P4QPPSK, QPSKI95			
	GRAYQPSK, QAM4			
	D8PSK, EDGE, FSK8, PSK8	3sps–16.666666666 Msp	3sps–8.333333333 Msp	3sps–4.166666666Msp
	FSK16, PSK16, QAM16	4sps–12.5Msp	4sps–6.25Msp	4sps–3.125Msp
	QAM32	5sps–10Msp	5sps–5Msp	5sps–2.5Msp
	QAM64	6sps–8.333333333 Msp	6sps–4.166666666 Msp	6sps–2.083333333 Msp
	QAM128	7sps–7.142857142 Msp	7sps–3.571428572 Msp	7sps–1.785714285 Msp
	QAM256	8sps–6.25Msp	8sps–3.125 Msp	8sps–1.5625 Msp

---

**NOTE** Using I/Q skew will half the minimum number of symbols for the selected filter.

---

**Key Entry**            **Symbol Rate**

**:TRIGger:TYPE**

**Supported**            E4438C with Option 402

[ :SOURce ] :RADio:PHS:TRIGger:TYPE CONTInuous | SINGle | GATE  
 [ :SOURce ] :RADio:PHS:TRIGger:TYPE?

This command sets the trigger type.

**CONTInuous**            The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to “:TRIGger:TYPE:CONTInuous[:TYPE]” on page 967.

**SINGle**                    The framed data sequence plays once for every trigger received.

**GATE**                    An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

**\*RST**                    **CONT**

<b>Key Entry</b>	<b>Continuous</b>	<b>Single</b>	<b>Gated</b>
------------------	-------------------	---------------	--------------

**:TRIGger:TYPE:CONTInuous[:TYPE]**

**Supported**            E4438C with Option 402

[ :SOURce] :RADio:PHS:TRIGger:TYPE:CONTInuous[:TYPE] FREE | TRIGger | RESet  
 [:SOURce] :RADio:PHS:TRIGger:TYPE:CONTInuous[:TYPE] ?

This commands selects the waveform’s response to a trigger signal while using the continuous trigger mode.

For more information on triggering and to select the continuous trigger mode, see “:TRIGger:TYPE” on page 966.

The following list describes the waveform’s response to each of the command choices:

**FREE**                    Turning the ARB format on immediately triggers the waveform. The waveform repeats until you turn the format off, select another trigger, or choose another waveform file.

**TRIGger**                The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.

**RESet**                    The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.

**\*RST**                    **FREE**

<b>Key Entry</b>	<b>Free Run</b>	<b>Trigger &amp; Run</b>	<b>Reset &amp; Run</b>
------------------	-----------------	--------------------------	------------------------

## :TRIGger:TYPE:GATE:ACTive

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:TRIGger:TYPE:GATE:ACTive LOW|HIGH  
[ :SOURCE ] :RADio:PHS:TRIGger:TYPE:GATE:ACTive?
```

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see “:TRIGger:TYPE” on page 966.

The following list describes the ESG’s gating behavior for the polarity selections:

LOW The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).

HIGH The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).

\*RST HIGH

**Key Entry** Gate Active Low High

## :TRIGger[:SOURCE]:EXTErnal:DELAy

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:TRIGger[:SOURCE]:EXTErnal:DELAy <val>  
[ :SOURCE ] :RADio:PHS:TRIGger[:SOURCE]:EXTErnal:DELAy?
```

This command sets the number of bits to delay the ESG’s response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See “:TRIGger[:SOURCE]:EXTErnal:DELAy:STATE” on page 969. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURCE]” on page 970.

\*RST +0

**Range** 0–1048575

**Key Entry** Ext Delay Bits

### **:TRIGger[:SOURce]:EXTErnal:DELAy:STATe**

**Supported**            E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] :EXTErnal:DELAy:STATe ON|OFF|1|0
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] :EXTErnal:DELAy:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see “:TRIGger[:SOURce]:EXTErnal:DELAy” on page 968, and for more information on configuring an external source, see “:TRIGger[:SOURce]” on page 970.

**\*RST**                    0

**Key Entry**            **Ext Delay Off On**

### **:TRIGger[:SOURce]:EXTErnal:SLOPe**

**Supported**            E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] :EXTErnal:SLOPe POSitive|NEGative
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] :EXTErnal:SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see “:TRIGger:TYPE:GATE:ACTive” on page 968.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 970.

**\*RST**                    NEG

**Key Entry**            **Ext Polarity Neg Pos**

### **:TRIGger[:SOURce]:EXTErnal[:SOURce]**

**Supported**            E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] :EXTErnal [ :SOURce ] EPT1|
EPT2|EPTRIGGER1|EPTRIGGER2
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] :EXTErnal [ :SOURce ] ?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 970. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User’s Guide*.

The following list describes the command choices:

EPT1	This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.
EPT2	This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
EPTRIGGER1	This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.
EPTRIGGER2	This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.
*RST	EPT1
<b>Key Entry</b>	<b>Patt Trig In 1      Patt Trig In 2</b>

## :TRIGger[:SOURce]

**Supported**      E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] KEY | EXT | BUS  
[ :SOURce ] :RADio:PHS:TRIGger [ :SOURce ] ?
```

This command sets the trigger source.

For more information on triggering, see “:TRIGger:TYPE” on page 966. The following list describes the command choices:

KEY	This choice enables manual triggering by pressing the front-panel <b>Trigger</b> hardkey.
EXT	An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger: <ul style="list-style-type: none"><li>• The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see “:TRIGger[:SOURce]:EXTernal[:SOURce]” on page 969.</li></ul>

For more information on the connectors and on connecting the cables, see the *E4428C/38C ESG Signal Generators User’s Guide*.



- The trigger signal polarity:
  - gating mode, see “:TRIGger:TYPE:GATE:ACTive” on page 968
  - continuous and single modes, see “:TRIGger[:SOURce]:EXTernal[:SOURce]” on page 969
- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:
  - setting the amount of delay, see “:TRIGger[:SOURce]:EXTernal:DELay” on page 968
  - turning the delay on, see “:TRIGger[:SOURce]:EXTernal:DELay:STATe” on page 969

**BUS** This choice enables triggering over the GPIB or LAN using the \*TRG or GET commands or the AUXILIARY INTERFACE (RS-232) using the \*TRG command.

**\*RST** KEY

<b>Key Entry</b>	<b>Trigger Key</b>	<b>Ext</b>	<b>Bus</b>
------------------	--------------------	------------	------------

### **:ULINK:SLOT[1] | 2 | 3 | 4:CUSTom**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT [ 1 ] | 2 | 3 | 4 :CUSTom PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURce ] :RADio:PHS:ULINK:SLOT [ 1 ] | 2 | 3 | 4 :CUSTom?
```

This command configures the data field for the selected uplink custom timeslot.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>		<b>8 1's &amp; 8 0's</b>		<b>16 1's &amp; 16 0's</b>		<b>32 1's &amp; 32 0's</b>	
	<b>64 1's &amp; 64 0's</b>							

**Remarks** Refer to “File Name Variables” on page 13 for information on the file name syntax.

### **:ULINK:SLOT[1]|2|3|4:CUSTom:FIX4**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :CUSTom:FIX4 <val>  
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :CUSTom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink custom timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

### **:ULINK:SLOT[1]|2|3|4:POWer**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :POWer MAIN|DELTA  
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :POWer?
```

This command toggles the RF output power level function for the selected timeslot.

**MAIN** This choice specifies RF output as the main power level.

**DELTA** This choice specifies RF output as the alternative power level.

**\*RST** MAIN

**Key Entry** **Timeslot Ampl Main Delta**

### **:ULINK:SLOT[1]|2|3|4:SCHannel:CSID**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :SCHannel:CSID <bit_pattern>  
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :SCHannel:CSID?
```

This command changes the 42-bit cell station identification code (CSID) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for CSID reflects the PHS protocol, however you can enter a new value with this command.

**\*RST** #H20200020001

**Range** #H0–#H3FFFFFFFFF

**Key Entry** **CSID**

### **:ULINK:SLOT[1]|2|3|4:SCHannel:IDLE**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :SCHannel:IDLE <bit_pattern>  
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :SCHannel:IDLE?
```

This command changes the 34-bit idle (IDLE) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for IDLE reflects the PHS protocol, however you can enter a new value with this command.

**\*RST** #H00000000

**Range** #H0–#H3FFFFFFFF

**Key Entry** **IDLE**

### **:ULINK:SLOT[1]|2|3|4:SCHannel:PSID**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :SCHannel:PSID <bit_pattern>  
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :SCHannel:PSID?
```

This command changes the 28-bit personal station identification code (PSID) field in the synchronization channel of the selected uplink timeslot. The preset (normal) hexadecimal value for PSID reflects the PHS protocol, however you can enter a new value with this command.

**\*RST** #H0000001

**Range** #H0–#H3FFFFFFFF

**Key Entry** **PSID**

### **:ULINK:SLOT[1]|2|3|4:SCHannel:UWORD**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :SCHannel:UWORD <bit_pattern>  
[ :SOURce ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :SCHannel:UWORD?
```

This command changes the unique word (UW) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

**\*RST** #H050EF2993

**Range** #H0–#H0FFFFFFFF

**Key Entry** **UW**

### **:ULINK:SLOT[1] | 2 | 3 | 4:STATe**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :STATe ON | OFF | 1 | 0  
[ :SOURCE ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :STATe?
```

This command enables or disables the operating state of the selected uplink timeslot.

**\*RST** Timeslot 1: 1 Timeslots 2–4: 0

**Key Entry** Timeslot Off On

### **:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel:SACChannel**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :TCHannel:SACChannel  
<bit_pattern>  
[ :SOURCE ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :TCHannel:SACChannel?
```

This command changes the 15-bit slow associated control channel of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for SACCH reflects the value specified by the standard.

**\*RST** #H8000

**Range** #H0–#HFFFF

**Key Entry** SA

### **:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel:UWORD**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :TCHannel:UWORD <bit_pattern>  
[ :SOURCE ] :RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4 :TCHannel:UWORD?
```

This command changes the unique word (UW) field of the selected uplink timeslot. The preset hexadecimal value (when normal preset is selected) for UW reflects the PHS protocol, however you can enter a new value with this command.

**\*RST** #H3D4C

**Range** #H0–#HFFFF

**Key Entry** UW

### **:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel[:TCHannel]**

**Supported** E4438C with Option 402

```
[:SOURce]:RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4:TCHannel
[:TCHannel] PN9|PN11|PN15|PN20|PN23|FIX4 | "<file name>" | EXT|P4|P8|P16|P32|
P64
[:SOURce]:RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4:TCHannel[:TCHannel] ?
```

This command selects the data pattern for the selected uplink traffic channel timeslot.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks** Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

### **:ULINK:SLOT[1] | 2 | 3 | 4:TCHannel[:TCHannel:FIX4]**

**Supported** E4438C with Option 402

```
[:SOURce]:RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4:TCHannel[:TCHannel]:FIX4 <val>
[:SOURce]:RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4:TCHannel[:TCHannel]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected uplink traffic channel timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

### **:ULINK:SLOT[1] | 2 | 3 | 4[:TYPE]**

**Supported** E4438C with Option 402

```
[:SOURce]:RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4[:TYPE] CUSTom|TCH|TCH_ALL|SYNC
[:SOURce]:RADio:PHS:ULINK:SLOT [1] | 2 | 3 | 4[:TYPE] ?
```

This command sets the uplink timeslot type for the selected uplink timeslot.

**\*RST** Timeslot 1: TCH Timeslots 2–4: CUST

**Key Entry** **Timeslot Type**

**PHS Subsystem—Option 402 ([:SOURce]:RADio:PHS)**

**[ :STATe]**

**Supported** E4438C with Option 402

[ :SOURce] :RADio:PHS [ :STATe] ON|OFF|1|0

[ :SOURce] :RADio:PHS [ :STATe] ?

This command enables or disables the PHS modulation format.

**\*RST** 0

**Key Entry** **PHS Off On**

**Remarks** Although the PHS modulation is enabled with this command, the RF carrier is not modulated unless you also activate the front panel **Mod On/Off** hardkey.

## TETRA Subsystem—Option 402 ([:SOURce]:RADio:TETRa)

### :ALPha

**Supported** E4438C with Option 402

[:SOURce]:RADio:TETRa:ALPha <val>

[:SOURce]:RADio:TETRa:ALPha?

This command changes the Nyquist or root Nyquist filter's alpha value.

The filter alpha value can be set to a minimum level (0), a maximum level (1), or in between by using fractional numeric values (0.001–0.999).

**\*RST** +3.50000000E-001

**Range** 0.000–1.000

**Key Entry** **Filter Alpha**

**Remarks** To change the current filter type, refer to “:FILTer” on page 991.

### :BBCLock

**Supported** E4438C with Option 402

[:SOURce]:RADio:TETRa:BBCLock INT [1] | EXT [1]

[:SOURce]:RADio:TETRa:BBCLock?

This command toggles the data (bit) clock input to the baseband generator board to either internal or external. This command is independent in each mode and works for both non-burst (continuous) and burst modes. This allows for a matrix of selections between burst/non-burst, internal/external data generation, internal/external data clock, and external bit/symbol data clock.

INT[1] This choice selects the signal generator internal data clock.

EXT[1] This choice selects an external data clock input.

**\*RST** INT

**Key Entry** **BBG Data Clock Ext Int**

**Remarks** A data clock or continuous symbol sync input must be supplied when external mode is used.

**TETRA Subsystem—Option 402 ([:SOURCE]:RADIO:TETRA)****:BBT**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:TETRA:BBT <val>
```

```
[ :SOURCE ] :RADIO:TETRA:BBT?
```

This command changes the bandwidth-multiplied-by-bit-time (BbT) filter parameter.

The filter BbT value can be set to the maximum level (1) or in between the minimum level (0.100) and maximum level by using fractional numeric values (0.101–0.999).

**\*RST** +5.00000000E–001

**Range** 0.100–1.000

**Key Entry** Filter BbT

**Remarks** This command is effective only after choosing a Gaussian filter. It does not have an effect on other types of filters.

To change the current filter type, refer to “:FILTER” on page 991.

**:BRATe**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADIO:TETRA:BRATe <val>
```

```
[ :SOURCE ] :RADIO:TETRA:BRATe?
```

This command sets the bit rate in bits per second (bps–Mbps). The maximum bit rate is dependent on the modulation type and filter as shown in the following tables

The IQ digital data stream is shaped by a FIR filter. The filter length and associated latency and frequency response are dependent on the bit rate as shown in the following tables. The signal generator selects a filter length.

For higher bit rates, the FIR filter length may be truncated (if the minimum filter size allows it) which will impact the relative timing of the modulated data, as well as the actual filter response (see the symbol rate command “:SRATe” on page 965). Refer to “:FILTER” on page 991 for information on filter symbol widths. To change the modulation type, refer to “:MODulation[:TYPE]” on page 994.

When the bit rate is changed, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the bit rate: lower bit rates require more time.

**\*RST** +3.60000000E+004



Range	Modulation Type	Bit Rate Range		
		<i>16 Symbol Wide Filter</i>	<i>32 Symbol Wide Filter</i>	<i>64 Symbol Wide Filter</i>
	BPSK, FSK2, MSK	1bps–50Mbps	1bps–25Mbps	1bps–12.5Mbps
	C4FM, OQPSK, FSK4	2bps–50Mbps	2bps–25Mbps	2bps–12.5Mbps
	OQPSKI95, QPSK			
	P4QPPSK, QPSKIS95			
	GRAYQPSK, QAM4			
	D8PSK, EDGE, FSK8, PSK8	3bps–50Mbps	3bps–25Mbps	3bps–12.5Mbps
	FSK16, PSK16, QAM16	4bps–50Mbps	4bps–25Mbps	4bps–12.5Mbps
	QAM32	5bps–50Mbps	5bps–25Mbps	5bps–12.5Mbps
	QAM64	6bps–50Mbps	6bps–25Mbps	6bps–12.5Mbps
	QAM128	7bps–50Mbps	7bps–25Mbps	7bps–12.5Mbps
	QAM256	8bps–50Mbps	8bps–25Mbps	8bps–12.5Mbps

**Key Entry**                      **Symbol Rate**

### **:BURSt:PN9**

**Supported**                      E4438C with Option 402

[ :SOURCE ] :RADio:TETRa: BURSt: PN9 NORMal | QUICk  
 [ :SOURCE ] :RADio:TETRa: BURSt: PN9?

This command controls the software PN9 generation.

NORMal                      This choice produces a maximum length PN9 sequence.

QUICk                      This choice produces a truncated PN9 sequence.

\*RST                      NORM

**Key Entry**                      **PN9 Mode Normal Quick**

**Remarks**                      Use Normal mode for bit-error-rate tests where a maximum length PN9 sequence is required.

**TETRA Subsystem—Option 402 ([:SOURCE]:RADIO:TETRA)****:BURSt:SCRamble:SEED**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:TETRA:BURSt:SCRamble:SEED <32-bit val>
```

```
[:SOURCE]:RADIO:TETRA:BURSt:SCRamble:SEED?
```

This command sets the 32-bit scramble seed value.

**\*RST** #HFFFFFFF

**Range** #H0–#HFFFFFFF

**Key Entry** **Scramble Seed**

**Remarks** Although values may be set using this command, it does not active that scramble function.

Refer to “[:BURSt:SCRamble\[:STATe\]](#)” on page 980 to enable the scrambling function.

**:BURSt:SCRamble[:STATe]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:TETRA:BURSt:SCRamble[:STATe] ON|OFF|1|0
```

```
[:SOURCE]:RADIO:TETRA:BURSt:SCRamble[:STATe]?
```

This command enables or disables the scramble function.

ON (1) This choice scrambles data on the related fields, using the seed setting.

OFF (0) This choice disables the scramble function.

**\*RST** 0

**Key Entry** **Scramble Off On**

**Remarks** To set the seed value, refer to “[:BURSt:SCRamble:SEED](#)” on page 980.

**:BURSt:SHAPE:FALL:DELay**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:TETRA:BURSt:SHAPE:FALL:DELay <val>
```

```
[:SOURCE]:RADIO:TETRA:BURSt:SHAPE:FALL:DELay?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

<b>*RST</b>	+0.00000000E+000
<b>Range</b>	–22.3750 to 99
<b>Key Entry</b>	<b>Fall Delay</b>
<b>Remarks</b>	<p>The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.</p> <p>To change the modulation type, refer to “:MODulation[:TYPE]” on page 994. Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.</p> <p>“:BURSt:SHAPe:FDELay” on page 982 performs the same function; in compliance with the SCPI standard, both commands are listed.</p> <p>For concept information on burst shaping, refer to the <i>E4428C/38C ESG Signal Generators User’s Guide</i>.</p>

### **:BURSt:SHAPe:FALL:TIME**

<b>Supported</b>	E4438C with Option 402
	[:SOURCE]:RADio:TETRa:BURSt:SHAPe:FALL:TIME <val> [:SOURCE]:RADio:TETRa:BURSt:SHAPe:FALL:TIME?
	This command sets the burst shape fall time.
	The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.
<b>*RST</b>	+8.00000000E+000
<b>Range</b>	0.1250–50
<b>Key Entry</b>	<b>Fall Time</b>
<b>Remarks</b>	<p>The setting enabled by this command is not affected by signal generator power-on, preset, or *RST.</p> <p>To change the modulation type, refer to “:MODulation[:TYPE]” on page 994. Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.</p> <p>“:BURSt:SHAPe:FTIME” on page 982 performs the same function; in compliance with the SCPI standard, both commands are listed.</p> <p>For concept information on burst shaping, refer to the <i>E4428C/38C ESG Signal Generators User’s Guide</i>.</p>

**TETRA Subsystem—Option 402 ([:SOURCE]:RADio:TETRa)****:BURSt:SHAPe:FDELaY**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe:FDELaY <val>
```

```
[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe:FDELaY?
```

This command sets the burst shape fall delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** -22.3750 to 99

**Key Entry** **Fall Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 994.

Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:DELaY” on page 980 performs the same

function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

**:BURSt:SHAPe:FTIME**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe:FTIME <val>
```

```
[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe:FTIME?
```

This command sets the burst shape fall time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +8.00000000E+000

**Range** 0.1250–50

**Key Entry** **Fall Time**

**Remarks**                    The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 994. Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:FALL:TIME” on page 981 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

### **:BURSt:SHAPe:RDELay**

**Supported**                    E4438C with Option 402

[ :SOURce ] :RADio:TETRa: BURSt :SHAPe: RDELay <val>

[ :SOURce ] :RADio:TETRa: BURSt :SHAPe: RDELay?

This command sets the burst shape rise delay. The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST**                            +0.00000000E+000

**Range**                            –14.3750 to 99

**Key Entry**                    **Rise Delay**

**Remarks**                    The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 994. Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:DELay” on page 984 performs the same function; in compliance with the SCPI standard, both commands are listed.

See the *E4428C/38C ESG Signal Generators User’s Guide* for concept information.

**:BURSt:SHAPe:RISE:DELay**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe:RISE:DELay <val>

[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe:RISE:DELay?

This command sets the burst shape rise delay.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +0.00000000E+000

**Range** -14.3750 to 99

**Key Entry** **Rise Delay**

**Remarks** The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 994. Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RDELay” on page 983 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

**:BURSt:SHAPe:RISE:TIME**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe:RISE:TIME <val>

[ :SOURCE ] :RADio:TETRa:BURSt:SHAPe:RISE:TIME?

This command sets the burst shape rise time.

The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST** +8.00000000E+000

**Range** 0.1250–22.5000

**Key Entry** **Rise Time**

**Remarks**                    The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 994. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RTIME” on page 985 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

**:BURSt:SHAPe:RTIME**

**Supported**                    E4438C with Option 402

[ :SOURce] :RADio:TETRa: BURSt :SHAPe: RTIME <val>

[ :SOURce] :RADio:TETRa: BURSt :SHAPe: RTIME?

This command sets the burst shape rise time. The variable <val> is expressed in bits. The minimum and maximum values depend upon modulation type and symbol rate.

**\*RST**                            +8.00000000E+000

**Range**                         0.1250–22.5000

**Key Entry**                    **Rise Time**

**Remarks**                    The setting enabled by this command is not affected by signal generator power-on, preset, or \*RST.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 994. Refer to “:SRATE” on page 965 for a list of the minimum and maximum symbol rate values.

“:BURSt:SHAPe:RISE:TIME” on page 984 performs the same function; in compliance with the SCPI standard, both commands are listed.

For concept information on burst shaping, refer to the *E4428C/38C ESG Signal Generators User’s Guide*.

**TETRA Subsystem—Option 402 ([:SOURCE]:RADIO:TETRA)****:BURSt:SHAPE[:TYPE]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:TETRA:BURSt:SHAPE[:TYPE] SINE | "<file name>"
[:SOURCE]:RADIO:TETRA:BURSt:SHAPE[:TYPE] ?
```

This command specifies the burst shape as either SINE or a user-defined file ("<file name>").

**SINE** This choice selects a state that is defined by the burst rise and fall \*RST values as the default burst shape type.

"<file name>" This choice selects a user designated file from signal generator memory (non-volatile).

**\*RST** SINE

**Key Entry** **Sine User File**

**:BURSt[:STATe]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:TETRA:BURSt[:STATe] ON | OFF | 1 | 0
[:SOURCE]:RADIO:TETRA:BURSt[:STATe] ?
```

This command enables or disables the burst function.

**ON (1)** This choice enables the transmission of framed data. If all timeslots which are switched on are up traffic channels or custom, you will be bursting the timeslots that are on; there will be no RF carrier during the off timeslots.

If you have switched on any timeslot that you have configured as a down traffic channel, the RF carrier is not switched off between any of the timeslots. The off timeslots are transmitted as a continuous series of ones for the time period of the off timeslots.

**OFF (0)** This choice enables the transmission of unframed data.

**\*RST** 0

**Key Entry** **Data Format Pattern Framed**



## :CHANnel

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:CHANnel EVM|ACP
[:SOURCE]:RADio:TETRa:CHANnel?
```

This command optimizes the Nyquist and root Nyquist filters to minimize error vector magnitude (EVM) or to minimize adjacent channel power (ACP).

**EVM** This choice provides the most ideal passband.

**ACP** This choice improves stopband rejection.

**\*RST** EVM

**Key Entry** **Optimize FIR For EVM ACP**

**Remarks** To change the current filter type, refer to “:FILTer” on page 991.

## :DATA

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:DATA PN9|PN11|PN15|PN20|PN23|FIX4|
"<file name>"|EXT|P4|P8|P16|P32|P64|PRAM
[:SOURCE]:RADio:TETRa:DATA?
```

This command sets the data pattern for unframed transmission.

**\*RST** PN23

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>Ext</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>				
	<b>64 1's &amp; 64 0's</b>	<b>PRAM File</b>						

**Remarks** Refer to “File Name Variables” on page 13 for information on the file name syntax.

**TETRA Subsystem—Option 402 ([:SOURCE]:RADio:TETRa)****:DATA:PRAM**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:DATA:PRAM "<file_name>"
```

```
[ :SOURCE ] :RADio:TETRa:DATA:PRAM?
```

This command selects a pattern RAM (PRAM) file as the pattern data type for the TETRA (Trans-European Trunked Radio) format.

"<file\_name>" This variable designates the PRAM file in WFM1. Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**Key Entry** **PRAM File**

**Remarks** Selecting this data source forces the burst source to INTERNAL to allow framing control.

The PRAM file must reside in the signal generator’s volatile memory (WFM1) in order to be accessed by this command. For more information on PRAM files, refer to [“:DATA:PRAM:FILE:BLOCK” on page 112](#).

**:DATA:FIX4**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:DATA:FIX4 <val>
```

```
[ :SOURCE ] :RADio:TETRa:DATA:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern for unframed transmission according to the modulation type, symbol rate, filter, and burst shape selected for the TETRA modulation format.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type. To change the data type, refer to [“:DATA” on page 987](#).

## :DEFault

**Supported** E4438C with Option 402

[ :SOURce ] :RADIo:TETRa:DEFault

This command returns all of the TETRA modulation format parameters to factory settings. It does not affect any other signal generator parameters.

**Key Entry** Restore TETRA Factory Default

## :EDATa:DELaY

**Supported** E4438C with Option 402

[ :SOURce ] :RADIo:TETRa:EDATa:DELaY?

This query returns the amount of delay (in symbols) from the external data input to the beginning of the symbol on the I OUT and Q OUT rear panel connectors and the front panel RF OUTPUT connector.

**Remarks** When the format is turned off, the delay value is unchanged; the query will return the same delay value if the format is on or off.

## :EDCLock

**Supported** E4438C with Option 402

[ :SOURce ] :RADIo:TETRa:EDCLock SYMBol | NORMal

[ :SOURce ] :RADIo:TETRa:EDCLock?

This command sets the external data clock use.

**SYMBol** This choice specifies that a continuous symbol clock signal must be provided to the SYMBOL SYNC input connector.

**NORMal** This choice specifies that the DATA CLOCK input connector requires a bit clock. The SYMBOL SYNC input connector requires a (one-shot or continuous) symbol sync signal.

**\*RST** NORM

**Key Entry** Ext Data Clock Normal Symbol

**Remarks** Both choices have no effect in internal clock mode. Refer to “:BBCLock” on [page 977](#) to select EXT as the data clock type.

**TETRA Subsystem—Option 402** ([:SOURce]:RADio:TETRa)**:EREFerence****Supported** E4438C with Option 402

[:SOURce]:RADio:TETRa:EREFerence INT|EXT

[:SOURce]:RADio:TETRa:EREFerence?

This command selects either an internal or external bit-clock reference for the data generator.

**\*RST** INT**Key Entry** **BBG Ref Ext Int****Remarks** If the EXT choice is selected, the external source's frequency value

must be applied to the BASEBAND GEN REF IN rear panel connector. The external reference and external data clock are not applicable at the same time. If both are selected, then the external reference takes precedence.

Refer to, “:EREFerence:VALue” on page 990 to enter the external reference frequency setting.

**:EREFerence:VALue****Supported** E4438C with Option 402

[:SOURce]:RADio:TETRa:EREFerence:VALue &lt;val&gt;

[:SOURce]:RADio:TETRa:EREFerence:VALue?

This command sets the expected bit-clock reference frequency value for an externally applied reference signal.

The variable <val> is expressed in units of hertz (Hz–MHz).

**\*RST** +1.30000000E+007**Range** 2.5E5–1E8**Key Entry** **Ext BBG Ref Freq****Remarks** The value specified by this command is effective only when you are using an external reference applied to the BASEBAND GEN REF IN rear panel connector.

Refer to “:EREFerence” on page 990 to select EXT (external source) as the reference for the bit-clock.

**:FILTer**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:FILTer RNYQuist|NYQuist|GAUSSian|RECTangle|
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURCE]:RADio:TETRa:FILTer?
```

This command selects the pre-modulation filter type.

- IS95 This choice selects a filter that meets the criteria of the IS-95 standard.
- IS95\_EQ This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.
- IS95\_MOD This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.
- IS95\_MOD\_EQ This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.
- AC4Fm This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.
- UGGaussian This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
- "<user FIR>" This variable is any filter file that you have stored into memory.

**\*RST** RNYQ

**Key Entry**

<b>Root Nyquist</b>	<b>Nyquist</b>	<b>Gaussian</b>	<b>Rectangle</b>	<b>IS-95</b>	<b>IS-95 w/EQ</b>
<b>IS-95 Mod</b>	<b>IS-95 Mod w/EQ</b>	<b>APCO 25 C4FM</b>	<b>UN3/4 GSM Gaussian</b>		
<b>User FIR</b>					

**Remarks** Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**TETRA Subsystem—Option 402 ([:SOURCE]:RADio:TETRa)****:IQ:SCALe**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:TETRa:IQ:SCALe <val>

[ :SOURCE ] :RADio:TETRa:IQ:SCALe?

This command sets the amplitude of the I/Q outputs for better adjacent channel power (ACP); lower scaling values equate to better ACP.

The variable <val> is expressed in units of percent.

**\*RST** +65

**Range** 1–200

**Key Entry** **I/Q Scaling**

**Remarks** This command has no effect with MSK or FSK modulation.

**:MODulation:FSK[:DEVIation]**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:TETRa:MODulation:FSK[:DEVIation] <val>

[ :SOURCE ] :RADio:TETRa:MODulation:FSK[:DEVIation]?

This command sets the symmetric FSK frequency deviation value.

The variable <val> is expressed in units of Hertz and the maximum range value equals the current symbol rate value multiplied by four, limited to 20 MHz.

**\*RST** +4.00000000E+002

**Range** 0–2E7

**Key Entry** **Freq Dev**

**Remarks** To change the modulation type, refer to “:MODulation[:TYPE]” on page 994.

Refer to “:SRATe” on page 965 for a list of the minimum and maximum symbol rate values.

To set an asymmetric FSK deviation value, refer to the *E4428C/38C ESG Signal Generators User’s Guide* for more information.

### **:MODulation:MSK[:PHASe]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:MODulation:MSK[:PHASe] <val>  
[ :SOURce ] :RADio:TETRa:MODulation:MSK[:PHASe] ?
```

This command sets the MSK phase deviation value.

The variable <val> is expressed in units of degrees.

**\*RST** +9.00000000E+001

**Range** 0–100

**Key Entry** **Phase Dev**

### **:MODulation:UFSK**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:MODulation:UFSK "<file name>"  
[ :SOURce ] :RADio:TETRa:MODulation:UFSK ?
```

This command selects a user-defined FSK file from the signal generator memory.

**Key Entry** **User FSK**

**Remarks** The user-defined FSK file is held in signal generator memory until the command that selects user FSK as the modulation type is sent. Refer to [“:MODulation\[:TYPE\]” on page 994](#) to change the current modulation type.

Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

### **:MODulation:UIQ**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:MODulation:UIQ "<file name>"  
[ :SOURce ] :RADio:TETRa:MODulation:UIQ ?
```

This command selects a user-defined I/Q file from the signal generator memory.

**Key Entry** **User I/Q**

**TETRA Subsystem—Option 402** ([:SOURce]:RADio:TETRa)

**Remarks** The user-defined I/Q file is held in signal generator memory until the command that selects user I/Q as the modulation type is sent. Refer to “:MODulation[:TYPE]” on page 994 to change the current modulation type.

Refer to “File Name Variables” on page 13 for information on the file name syntax.

**:MODulation[:TYPE]**

**Supported** E4438C with Option 402

```
[:SOURce]:RADio:TETRa:MODulation[:TYPE] BPSK|QPSK|IS95QPSK|
GRAYQPSK|OQPSK|IS95OQPSK|P4DQPSK|PSK8|PSK16|D8PSK|MSK|FSK2|FSK4|
FSK8|FSK16|C4FM|QAM4|QAM16|QAM32|QAM64|QAM128|QAM256|UIQ|UFSK
[:SOURce]:RADio:TETRa:MODulation[:TYPE]?
```

This command sets the modulation type for the TETRA personality.

**\*RST** P4DQPSK

<b>Key Entry</b>	<b>BPSK</b>	<b>QPSK</b>	<b>IS-95 QPSK</b>	<b>Gray Coded QPSK</b>	<b>OQPSK</b>			
	<b>IS-95 OQPSK</b>	<b><math>\pi/4</math> DQPSK</b>	<b>8PSK</b>	<b>16PSK</b>	<b>D8PSK</b>	<b>MSK</b>	<b>2-Lvl FSK</b>	
	<b>4-Lvl FSK</b>	<b>8-Lvl FSK</b>	<b>16-Lvl FSK</b>	<b>C4FM</b>	<b>4QAM</b>	<b>16QAM</b>	<b>32QAM</b>	
	<b>64QAM</b>	<b>128QAM</b>	<b>256QAM</b>	<b>User I/Q</b>	<b>User FSK</b>			

**:POLarity[:ALL]**

**Supported** E4438C with Option 402

```
[:SOURce]:RADio:TETRa:POLarity[:ALL] NORMal|INVerted
[:SOURce]:RADio:TETRa:POLarity[:ALL]?
```

This command sets the rotation direction of the phase modulation vector.

**NORMal** This choice selects normal phase polarity.

**INVerted** This choice inverts the internal Q signal.

**\*RST** NORM

**Key Entry** **Phase Polarity Normal Invert**



## **:SECondary:RECall**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:TETRa:SECondary:RECall

This command recalls the secondary frame configuration, overwriting the current state.

**Key Entry** **Recall Secondary Frame State**

**Remarks** To save a secondary frame state, refer to “:SECondary:SAVE” on page 995.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to “:SECondary[:STATe]” on page 996.

## **:SECondary:SAVE**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:TETRa:SECondary:SAVE

This command saves the current frame configuration as the secondary frame with the file name TETRa\_SECONDARY\_FRAME.

**Key Entry** **Save Secondary Frame State**

**Remarks** To recall the secondary frame (saved in non-volatile signal generator memory), refer to “:SECondary:RECall” on page 995.

## **:SECondary:TRIGger[:SOURCE]**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:TETRa:SECondary:TRIGger [ :SOURCE ] KEY | EXT | BUS  
 [ :SOURCE ] :RADio:TETRa:SECondary:TRIGger [ :SOURCE ] ?

This command selects the type of triggering for the secondary frame.

**KEY** This choice enables triggering by pressing the front panel **Trigger** hardkey.

**EXT** This choice enables triggering using an externally applied signal at the PATT TRIG IN rear panel connector or the PATT TRIG IN 2 pin on the rear panel AUX I/O connector. To select the appropriate connector, refer to “:TRIGger[:SOURCE]:EXTernal[:SOURCE]” on page 1018.

**BUS** This choice enables GPIB triggering using the \*TRG or GET command or LAN and RS-232 triggering using the \*TRG command.

**Key Entry** **Trigger Key    Ext    Bus**

**TETRA Subsystem—Option 402 ([:SOURCE]:RADio:TETRa)****:SECondary[:STATe]****Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SECondary[:STATe] ON|OFF|1|0
[:SOURCE]:RADio:TETRa:SECondary[:STATe]?
```

This command enables or disables the ability to switch to the secondary frame.

**\*RST** 0**Key Entry** **Secondary Frame Off On****Remarks** A frame must already be saved as the secondary frame in order to turn the secondary state function on.

To save a frame as the secondary frame, refer to “[:SECondary:SAVE](#)” on [page 995](#).

**:SLOT[1]|2|3|4:DCCustom****Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCCustom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCCustom?
```

This command configures the downlink continuous custom timeslot data field.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks** Refer to “[File Name Variables](#)” on [page 13](#) for information on the file name syntax.**:SLOT[1]|2|3|4:DCCustom:FIX4****Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCCustom:FIX4 <val>
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCCustom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink continuous custom timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15  
**Key Entry** **FIX4**  
**Remarks** FIX4 must already be defined as the data type.

### **:DCNormal:B1**

**Supported** E4438C with Option 402  
[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DCNormal:B1 <val>  
[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DCNormal:B1?

This command sets the first 14 broadcast bits for the selected downlink continuous normal timeslot.

**\*RST** #H0000  
**Range** #H0–#H3FFF  
**Key Entry** **B1**

### **:DCNormal:B2**

**Supported** E4438C with Option 402  
[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DCNormal:B2 <val>  
[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DCNormal:B2?

This command sets the last 16 broadcast bits for the selected downlink continuous normal timeslot.

**\*RST** #H0000  
**Range** #H0–#HFFFF  
**Key Entry** **B2**

### **:SLOT[1] | 2 | 3 | 4:DCNormal:TSEquence**

**Supported** E4438C with Option 402  
[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DCNormal:  
TSEquence <val>  
[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DCNormal:TSEquence?

This command sets the normal training sequence bits (30-bit mid-amble) for the selected downlink continuous normal timeslot.

**\*RST** #H343A74  
**Range** #H0–#H3FFFFFF  
**Key Entry** **TS**

**TETRA Subsystem—Option 402 ([:SOURce]:RADio:TETRa)**

**Remarks** When 1E90DE is selected, the data fields are scrambled as separate logical channels.

**:SLOT[1] | 2 | 3 | 4:DCNormal[:DATA]**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4:DCNormal [ :DATA ] PN9 | PN11 |
PN15 | PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURce ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4:DCNormal [ :DATA ] ?
```

This command configures the selected downlink continuous normal timeslot data field.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks** Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**:SLOT[1] | 2 | 3 | 4:DCNormal[:DATA]:FIX4**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4:DCNormal [ :DATA ] :FIX4 <val>
[ :SOURce ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4:DCNormal [ :DATA ] :FIX4 ?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink continuous normal timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

### **:SLOT[1]|2|3|4:DCSync:B**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :DCSync:B <val>  
[ :SOURCE ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :DCSync:B?
```

This command sets the broadcast bits for the selected downlink continuous synchronization timeslot.

**\*RST** #H00000000

**Range** #H0–#H3FFFFFFF

**Key Entry** **B**

### **:SLOT[1]|2|3|4:DCSync:FCOR**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :DCSync:FCOR <val>  
[ :SOURCE ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :DCSync:FCOR?
```

This command sets the frequency correction bits for the selected downlink continuous synchronization timeslot.

**\*RST** #HFF0000000000000000FF

**Range** #H0–#HFFFFFFFFFFFFFFFFFFFF

**Key Entry** **FCOR**

### **:SLOT[1]|2|3|4:DCSync:SSB**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :DCSync:SSB <val>  
[ :SOURCE ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :DCSync:SSB?
```

This command sets the synchronization block bits for the selected downlink synchronization continuous timeslot.

**\*RST** #H00000000000000000000000000000000

**Range** #H0–#HFFFFFFFFFFFFFFFFFFFFFFFF

**Key Entry** **SSB**

**TETRA Subsystem—Option 402 ([:SOURCE]:RADio:TETRa)****:SLOT[1]|2|3|4:DCSync:STS****Supported** E4438C with Option 402

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCSync:STS &lt;val&gt;

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCSync:STS?

This command sets the synchronization training sequence for the selected downlink continuous synchronization timeslot.

**\*RST** #H30673A7067**Range** #H0–#H3FFFFFFFF**Key Entry** **STS****:SLOT[1]|2|3|4:DCSync[:DATA]****Supported** E4438C with Option 402

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA] PN9|PN11|

PN15|PN20|PN23FIX4|"&lt;file name&gt;"|EXT|P4|P8|P16|P32|P64

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA]?

This command configures the selected downlink continuous synchronization timeslot data field.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>		<b>8 1's &amp; 8 0's</b>		<b>16 1's &amp; 16 0's</b>		<b>32 1's &amp; 32 0's</b>	
	<b>64 1's &amp; 64 0's</b>							

**Remarks** Refer to “[File Name Variables](#)” on [page 13](#) for information on the file name syntax.

**:SLOT[1]|2|3|4:DCSync[:DATA]:FIX4****Supported** E4438C with Option 402

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA]:FIX4 &lt;val&gt;

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DCSync[:DATA]:FIX4?

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink continuous synchronization timeslot.

**\*RST** #B0000**Range** #B0000–#B1111 or 0–15

**Key Entry**            **FIX4**

**Remarks**            FIX4 must already be defined as the data type.

**:SLOT[1] | 2 | 3 | 4:DDCustom**

**Supported**            E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DDCustom PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DDCustom?
```

This command configures the downlink discontinuous custom timeslot data field.

**\*RST**                    PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>		<b>8 1's &amp; 8 0's</b>		<b>16 1's &amp; 16 0's</b>		<b>32 1's &amp; 32 0's</b>	
			<b>64 1's &amp; 64 0's</b>					

**Remarks**            Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

**:SLOT[1] | 2 | 3 | 4:DDCustom:FIX4**

**Supported**            E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DDCustom:FIX4 <val>
[:SOURCE]:RADio:TETRa:SLOT[1] | 2 | 3 | 4:DDCustom:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink discontinuous custom timeslot.

**\*RST**                    #B0000

**Range**                    #B0000–#B1111 or 0–15

**Key Entry**            **FIX4**

**Remarks**            FIX4 must already be defined as the data type.

**TETRA Subsystem—Option 402 ([:SOURCE]:RADIO:TETRA)****:SLOT[1]|2|3|4:DDNormal:B1****Supported** E4438C with Option 402

[:SOURCE]:RADIO:TETRA:SLOT[1]|2|3|4:DDNormal:B1 &lt;val&gt;

[:SOURCE]:RADIO:TETRA:SLOT[1]|2|3|4:DDNormal:B1?

This command sets the first 14 broadcast bits for the selected downlink discontinuous normal timeslot.

**\*RST** #H0000**Range** #H0–#H3FFF**Key Entry** **B1****:SLOT[1]|2|3|4:DDNormal:B2****Supported** E4438C with Option 402

[:SOURCE]:RADIO:TETRA:SLOT[1]|2|3|4:DDNormal:B2 &lt;val&gt;

[:SOURCE]:RADIO:TETRA:SLOT[1]|2|3|4:DDNormal:B2?

This command sets the last 16 broadcast bits for the selected downlink continuous normal timeslot.

**\*RST** #H0000**Range** #H0–#HFFFF**Key Entry** **B2****:SLOT[1]|2|3|4:DDNormal:TSEquence****Supported** E4438C with Option 402

[:SOURCE]:RADIO:TETRA:SLOT[1]|2|3|4:DDNormal:TSEquence &lt;val&gt;

[:SOURCE]:RADIO:TETRA:SLOT[1]|2|3|4:DDNormal:TSEquence?

This command specifies the normal training sequence bits (30-bit mid-amble) for the selected downlink discontinuous normal timeslot.

**\*RST** #H343A74**Range** #H0–#H3FFFFFFF**Key Entry** **TS****Remarks** When 1E90DE is selected, the data fields are scrambled as separate logical channels.



### **:SLOT[1] | 2 | 3 | 4:DDNormal[:DATA]**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:SLOT [ 1 ] | 2 | 3 | 4 :DDNormal [ :DATA ] PN9 | PN11 |
PN15 | PN20 | PN23 FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[ :SOURCE ] :RADio:TETRa:SLOT [ 1 ] | 2 | 3 | 4 :DDNormal [ :DATA ] ?
```

This command configures the selected downlink discontinuous normal timeslot data field.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks** Refer to “[File Name Variables](#)” on page 13 for information on the file name syntax.

### **:SLOT[1] | 2 | 3 | 4:DDNormal[:DATA]:FIX4**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:SLOT [ 1 ] | 2 | 3 | 4 :DDNormal [ :DATA ] :FIX4 <val>
[ :SOURCE ] :RADio:TETRa:SLOT [ 1 ] | 2 | 3 | 4 :DDNormal [ :DATA ] :FIX4 ?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink discontinuous normal timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**Remarks** FIX4 must already be defined as the data type.

**TETRA Subsystem—Option 402 ([:SOURCE]:RADio:TETRa)****:SLOT[1]|2|3|4:DDSync:B****Supported** E4438C with Option 402

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:B &lt;val&gt;

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:B?

This command sets the broadcast bits for the selected downlink discontinuous synchronization timeslot.

**\*RST** #H00000000**Range** #H0–#H3FFFFFFF**Key Entry** **B****:SLOT[1]|2|3|4:DDSync:FCOR****Supported** E4438C with Option 402

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:FCOR &lt;val&gt;

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:FCOR?

This command sets the frequency correction bits for the selected downlink discontinuous synchronization timeslot.

**\*RST** #HFF0000000000000000FF**Range** #H0–#HFFFFFFFFFFFFFFFFFFFF**Key Entry** **FCOR****:SLOT[1]|2|3|4:DDSync:SSB****Supported** E4438C with Option 402

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:SSB &lt;val&gt;

[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:SSB?

This command sets the synchronization block bits for the selected downlink synchronization discontinuous timeslot.

**\*RST** #H000000000000000000000000**Range** #H0–#HFFFFFFFFFFFFFFFFFFFFFFFF**Key Entry** **SSB**

### **:SLOT[1]|2|3|4:DDSync:STS**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:STS <val>
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:STS?
```

This command sets the synchronization training sequence for the selected downlink discontinuous synchronization timeslot.

**\*RST** #H30673A7067

**Range** #H0–#H3FFFFFFFFF

**Key Entry** STS

### **:SLOT[1]|2|3|4:DDSync[:DATA]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync[:DATA] PN9|PN11|
PN15|PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync[:DATA]?
```

This command configures the selected downlink discontinuous synchronization timeslot data field.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>		<b>8 1's &amp; 8 0's</b>		<b>16 1's &amp; 16 0's</b>		<b>32 1's &amp; 32 0's</b>	
	<b>64 1's &amp; 64 0's</b>							

**Remarks** Refer to [“File Name Variables” on page 13](#) for information on the file name syntax.

### **:SLOT[1]|2|3|4:DDSync[:DATA]:FIX4**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync[:DATA]:FIX4 <val>
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:DDSync[:DATA]:FIX4?
```

This command sets the binary, 4-bit repeating sequence data pattern that is used in the selected downlink discontinuous synchronization timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** FIX4

**TETRA Subsystem—Option 402 ([:SOURce]:RADio:TETRa)**

**Remarks** FIX4 must already be defined as the data type. To change the data type, refer to “:SLOT[1]|2|3|4:DCNormal[:DATA]” on page 998.

**:SLOT[1]|2|3|4:POWer**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :POWer MAIN|DELTA
[ :SOURce ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :POWer?
```

This command toggles the RF output power level function for the selected timeslot.

**MAIN** This choice specifies RF output as the main power level.

**DELTA** This choice specifies RF output as the alternative power level.

**\*RST** MAIN

**Key Entry** Timeslot Ampl Main Delta

**:SLOT[1]|2|3|4:STATe**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :STATe ON|OFF|1|0
[ :SOURce ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :STATe?
```

This command enables or disables the selected timeslot.

**\*RST** Timeslot 1: 1 Timeslot 2-4:

**Key Entry** Timeslot Off On

**Remarks** Continuous timeslots cannot be disabled.

**:SLOT[1]|2|3|4:UC1:TSEQuence**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :UC1:TSEQuence <val>
[ :SOURce ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :UC1:TSEQuence?
```

This command specifies the extended training sequence bits (30-bit mid-amble) for the selected uplink control 1 timeslot.

**\*RST** #H2743A743

**Range** #H0–#H3FFFFFFF

**Key Entry** TS

### **:SLOT[1]|2|3|4:UC1[:DATA]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:UC1[:DATA] PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:UC1[:DATA]?
```

This command configures the selected uplink control 1 data field.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks** Refer to “[File Name Variables](#)” on page 13 for information on the file name syntax.

### **:SLOT[1]|2|3|4:UC1[:DATA]:FIX4**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:UC1[:DATA]:FIX4 <val>
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:UC1[:DATA]:FIX4?
```

This command configures the uplink control 1 data field FIX4 value for the selected timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

### **:SLOT[1]|2|3|4:UC2:TSEquence**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:UC2:TSEquence <val>
[:SOURCE]:RADio:TETRa:SLOT[1]|2|3|4:UC2:TSEquence?
```

This command specifies the extended training sequence bits (30-bit mid-amble) for the selected uplink control 2 timeslot.

**\*RST** #H2743A743

**Range** #H0–#H3FFFFFF

**Key Entry** **TS**

**TETRA Subsystem—Option 402 ([:SOURCE]:RADIO:TETRA)****:SLOT[1] | 2 | 3 | 4:UC2[:DATA]****Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:TETRA:SLOT[1] | 2 | 3 | 4:UC2[:DATA] PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[:SOURCE]:RADIO:TETRA:SLOT[1] | 2 | 3 | 4:UC2[:DATA] ?
```

This command configures the selected uplink control 2 data field.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks** Refer to “File Name Variables” on page 13 for information on the file name syntax.

**:SLOT[1] | 2 | 3 | 4:UC2[:DATA]:FIX4****Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:TETRA:SLOT[1] | 2 | 3 | 4:UC2[:DATA]:FIX4 <val>
[:SOURCE]:RADIO:TETRA:SLOT[1] | 2 | 3 | 4:UC2[:DATA]:FIX4?
```

This command configures the uplink control 2 data field FIX4 value for the selected timeslot.

**\*RST** #B0000**Range** #B0000–#B1111 or 0–15**Key Entry** **FIX4****:SLOT[1] | 2 | 3 | 4:UCStom****Supported** E4438C with Option 402

```
[:SOURCE]:RADIO:TETRA:SLOT[1] | 2 | 3 | 4:UCStom PN9 | PN11 | PN15 |
PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[:SOURCE]:RADIO:TETRA:SLOT[1] | 2 | 3 | 4:UCStom?
```

This command configures the uplink custom data field.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>	<b>8 1's &amp; 8 0's</b>	<b>16 1's &amp; 16 0's</b>	<b>32 1's &amp; 32 0's</b>	<b>64 1's &amp; 64 0's</b>			

**Remarks** See “File Name Variables” on page 13 for information on the file name syntax.

### **:SLOT[1] | 2 | 3 | 4:UCUStom:FIX4**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT [1] | 2 | 3 | 4:UCUStom:FIX4 <val>
[:SOURCE]:RADio:TETRa:SLOT [1] | 2 | 3 | 4:UCUStom:FIX4?
```

This command configures the uplink custom data field to FIX4 (4-bit repeating sequence data pattern).

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

### **:SLOT[1] | 2 | 3 | 4:UNORmal:TSEquence**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT [1] | 2 | 3 | 4:UNORmal:TSEquence <val>
[:SOURCE]:RADio:TETRa:SLOT [1] | 2 | 3 | 4:UNORmal:TSEquence?
```

This command specifies the extended training sequence bits (22-bit mid-amble) for the selected uplink normal timeslot.

**\*RST** #H343A74

**Range** #H0–#H3FFFFFF

**Key Entry** **TS**

**Remarks** When 1E90DE is selected, data fields are scrambled as separate logical channels.

### **:SLOT[1] | 2 | 3 | 4:UNORmal[:DATA]**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SLOT [1] | 2 | 3 | 4:UNORmal[:DATA] PN9 | PN11 |
PN15 | PN20 | PN23 | FIX4 | "<file name>" | EXT | P4 | P8 | P16 | P32 | P64
[:SOURCE]:RADio:TETRa:SLOT [1] | 2 | 3 | 4:UNORmal[:DATA] ?
```

This command configures the selected uplink normal data field.

**\*RST** PN9

<b>Key Entry</b>	<b>PN9</b>	<b>PN11</b>	<b>PN15</b>	<b>PN20</b>	<b>PN23</b>	<b>FIX4</b>	<b>User File</b>	<b>EXT</b>
	<b>4 1's &amp; 4 0's</b>		<b>8 1's &amp; 8 0's</b>		<b>16 1's &amp; 16 0's</b>		<b>32 1's &amp; 32 0's</b>	
			<b>64 1's &amp; 64 0's</b>					

**TETRA Subsystem—Option 402 ([:SOURCE]:RADio:TETRa)**

**Remarks** Refer to “File Name Variables” on page 13 for information on the file name syntax.

**:SLOT[1]|2|3|4:UNORmal[:DATA]:FIX4**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :UNORmal [ :DATA ] :FIX4 <val>
[ :SOURCE ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 :UNORmal [ :DATA ] :FIX4?
```

This command configures the uplink normal data field FIX4 value for the selected timeslot.

**\*RST** #B0000

**Range** #B0000–#B1111 or 0–15

**Key Entry** **FIX4**

**:SLOT[1]|2|3|4[:TYPE]**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 [ :TYPE ] UCUSTom|UC1|UC2 |
UNORmal | DDNormal | DDSync | DCNormal | DCSync | DCCustom | DDCustom
[ :SOURCE ] :RADio:TETRa:SLOT [1] | 2 | 3 | 4 [ :TYPE ] ?
```

This command sets the timeslot type for the selected timeslot.

**\*RST** *Timeslot 1:* UCUS *Timeslot 2-4:* UNOR

**Key Entry** **Up Custom**    **Up Control 1**    **Up Control 2**    **Up Normal**    **Dn Normal Disc**  
**Dn Sync Disc**    **Dn Normal Cont**    **Dn Sync Cont**    **Dn Custom Cont**  
**Dn Custom Disc**

**Remarks** When downlink is selected and the frame is uplink, the following mapping is made to convert the uplink protocols to downlink; an error will be generated.

From	To (Continuous Downlink)	To (Discontinuous Downlink)
UC1	DCCustom	DDCustom
UC2	DCCustom	DDCustom
UCUSTom	DCCustom	DDCustom
UNORmal	DCNormal	DDNormal



When uplink is selected and the frame is downlink, the following mapping is made to convert the downlink protocols to uplink; an error will be generated.

From	To
DCCustom/ DDCustom	UCUSTom
DCNormal/ DDNormal	UNORmal
DCSync/ DDSync	UCUSTom

When continuous downlink protocols are selected, all timeslots must be on, and they cannot be turned off. Any attempts to do so will generate an error.

## **:SOUT**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SOUT FRAME | SLOT | ALL
[:SOURCE]:RADio:TETRa:SOUT?
```

This command sets the synchronization location (within the pattern of data) and the type of output at the EVENT 1 rear panel connector.

**FRAME** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a framed data pattern.

**SLOT** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for a selected timeslot.

**ALL** This choice outputs a 1-bit signal, synchronized to the bit selected by the synchronization output offset command, for all active timeslots.

**\*RST** FRAME

**Key Entry** **Begin Frame**    **Begin Timeslot #**    **All Timeslots**

**Remarks** See “:SOUT:OFFSet” on page 1011 to change the synchronization output offset.

## **:SOUT:OFFSet**

**Supported** E4438C with Option 402

```
[:SOURCE]:RADio:TETRa:SOUT:OFFSet <val>
[:SOURCE]:RADio:TETRa:SOUT:OFFSet?
```

This command sets the offset value for the location of the output synchronization signal on the EVENT1 rear panel connector relative to the beginning of the framed data pattern or timeslot.

The variable <val> is expressed as a number of bits.

**TETRA Subsystem—Option 402 ([:SOURCE]:RADio:TETRa)**

<b>*RST</b>	+0
<b>Range</b>	–509 to 509
<b>Key Entry</b>	<b>Sync Out Offset</b>
<b>Remarks</b>	Negative values move the synchronization output signal earlier; positive values move it later.  To change the output of the EVENT1 rear panel connector to SLOT, refer to “:SOUT” on page 1011.

**:SOUT:SLOT**

<b>Supported</b>	E4438C with Option 402
	[ :SOURCE ] :RADio:TETRa:SOUT:SLOT <val> [ :SOURCE ] :RADio:TETRa:SOUT:SLOT?
	This command selects the timeslot that will trigger a 1-bit output signal at the EVENT 1 rear panel connector.
<b>*RST</b>	+1
<b>Range</b>	1–4
<b>Key Entry</b>	<b>Begin Timeslot #</b>
<b>Remarks</b>	SLOT must be selected as the output signal type for the EVENT 1 rear panel connector.  To change the output of the EVENT1 rear panel connector to SLOT, refer to “:SOUT” on page 1011.

**:SRATe**

<b>Supported</b>	E4438C with Option 001/601 or 002/602
	[ :SOURCE ] :RADio:TETRa:SRATe <val> [ :SOURCE ] :RADio:TETRa:SRATe?
	This command sets the transmission symbol rate. Symbol rate is the bit rate divided by the bits per symbol. A change in the symbol rate affects the bit rate. Refer to “:BRATe” on page 978 for information on bit rate.
	The variable <val> is expressed in units of symbols per second (sps–MSPS) and the maximum symbol rate depends on the filter. Refer to “:FILTer” on page 991 for minimum filter symbol width.
	The filter may have to be truncated down to 32 or 16 symbols wide to achieve the highest symbol rate. The signal generator’s internal filters are not truncated below their minimum filter length and user-defined FIR filters are not truncated. If the filter cannot be truncated then the symbol rate is

limited to the maximum rate of the narrowest filter size possible.

The relative timing of the modulated data, as well as the actual filter response is affected when the filter is truncated.

When the symbol rate changes, the ESG reconfigures the baseband generator. The time required to reconfigure the baseband generator is inversely proportional to the symbol rate: lower symbol rates require more time.

To change the modulation type, refer to “:MODulation[:TYPE]” on page 994.

\*RST +1.80000000E+004

Range	Modulation Type	Symbol Rate Range		
		<i>16 Symbol Wide Filter</i>	<i>32 Symbol Wide Filter</i>	<i>64 Symbol Wide Filter</i>
	BPSK, FSK2, MSK	1sps–50Msps	1sps–25Msps	1sps–12.5Msps
	C4FM, OQPSK, FSK4	2sps–25Msps	2sps–12.5Msps	2sps–6.25Msps
	OQPSKI95, QPSK			
	P4QPPSK, QPSKIS95			
	GRAYQPSK, QAM4			
	D8PSK, EDGE, FSK8, PSK8	3sps–16.666666666 Msps	3sps–8.333333333 Msps	3sps–4.166666666Msps
	FSK16, PSK16, QAM16	4sps–12.5Msps	4sps–6.25Msps	4sps–3.125Msps
	QAM32	5sps–10Msps	5sps–5Msps	5sps–2.5Msps
	QAM64	6sps–8.333333333 Msps	6sps–4.166666666 Msps	6sps–2.083333333 Msps
	QAM128	7sps–7.142857142 Msps	7sps–3.571428572 Msps	7sps–1.785714285 Msps
	QAM256	8sps–6.25Msps	8sps–3.125 Msps	8sps–1.5625 Msps

---

**NOTE** Using I/Q skew will half the minimum number of symbols for the selected filter.

---

**Key Entry**                      **Symbol Rate**

**TETRA Subsystem—Option 402 ([:SOURce]:RADio:TETRa)****:TRIGger:TYPE**

**Supported** E4438C with Option 402

```
[:SOURce]:RADio:TETRa:TRIGger:TYPE CONTInuous|SINGle|GATE
[:SOURce]:RADio:TETRa:TRIGger:TYPE?
```

This command sets the trigger type.

**CONTInuous** The framed data sequence repeats continuously; the sequence restarts every time the previous playback is completed. To customize continuous triggering, refer to [“:TRIGger:TYPE:CONTInuous\[:TYPE\]” on page 1014](#).

**SINGle** The framed data sequence plays once for every trigger received.

**GATE** An external trigger signal interrupts the playback while the gating signal is in the inactive state. Playback resumes when the external control signal returns to the active state. The active state can be set to high or low.

**\*RST** CONT

**Key Entry**      **Continuous**      **Single**      **Gated**

**:TRIGger:TYPE:CONTInuous[:TYPE]**

**Supported** E4438C with Option 402

```
[:SOURce]:RADio:TETRa:TRIGger:TYPE:CONTInuous[:TYPE] FREE|
TRIGger|RESet
[:SOURce]:RADio:TETRa:TRIGger:TYPE:CONTInuous[:TYPE]?
```

This commands selects the waveform’s response to a trigger signal while using the continuous trigger mode.

For more information on triggering and to select the continuous trigger mode, see [“:TRIGger:TYPE” on page 1014](#).

The following list describes the waveform’s response to each of the command choices:

**FREE** Turning the ARB format on immediately triggers the waveform. The waveform repeats until you turn the format off, select another trigger, or choose another waveform file.

**TRIGger** The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously until you turn the format off, select another trigger, or choose another waveform file.

**RESet**                    The waveform waits for a trigger before play begins. When the waveform receives the trigger, it plays continuously. Subsequent triggers reset the waveform to the beginning. For a waveform sequence, this means to the beginning of the first segment in the sequence.

**\*RST**                    FREE

**Key Entry**            **Free Run      Trigger & Run      Reset & Run**

**:TRIGger:TYPE:GATE:ACTive**

**Supported**            E4438C with Option 402

[ :SOURCE ] :RADio:TETRa:TRIGger:TYPE:GATE:ACTive LOW|HIGH  
 [ :SOURCE ] :RADio:TETRa:TRIGger:TYPE:GATE:ACTive?

This command selects the active state (gate polarity) of the gate while using the gating trigger mode.

The LOW and HIGH selections correspond to the low and high states of an external trigger signal. For example, when you select HIGH, the active state occurs during the high of the trigger signal. When the active state occurs, the ESG stops the waveform playback at the last played sample point, then restarts the playback at the next sample point when the inactive state occurs. For more information on triggering and to select gating as the trigger mode, see “:TRIGger:TYPE” on page 1014.

The following list describes the ESG’s gating behavior for the polarity selections:

**LOW**                    The waveform playback stops when the trigger signal goes low (active state) and restarts when the trigger signal goes high (inactive state).

**HIGH**                   The waveform playback stops when the trigger signal goes high (active state) and restarts when the trigger signal goes low (inactive state).

**\*RST**                    HIGH

**Key Entry**            **Gate Active Low High**

**TETRA Subsystem—Option 402 (:SOURce):RADio:TETRa)****:TRIGger[:SOURce]**

**Supported** E4438C with Option 402

[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] KEY | EXT | BUS

[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] ?

This command sets the trigger source.

For more information on triggering, see “:TRIGger:TYPE” on page 1014. The following list describes the command choices:

**KEY** This choice enables manual triggering by pressing the front-panel **Trigger** hardkey.

**EXT** An externally applied signal triggers the waveform. This is the only choice that works with gating. The following conditions affect an external trigger:

- The input connector selected for the trigger signal. You have a choice between the rear-panel PATTERN TRIG IN connector or the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. To make the connector selection, see “:TRIGger[:SOURce]:EXTErnal[:SOURce]” on page 1018.

For more information on the connectors and on connecting the cables, see the *E4428C/38C ESG Signal Generators User’s Guide*.

- The trigger signal polarity:
  - gating mode, see “:TRIGger:TYPE:GATE:ACTive” on page 1015
  - continuous and single modes, see “:TRIGger[:SOURce]:EXTErnal:SLOPe” on page 1018
- The time delay between when the ESG receives a trigger and when the waveform responds to the trigger. There are two parts to setting the delay:
  - setting the amount of delay, see “:TRIGger[:SOURce]:EXTErnal:DELAy” on page 1017
  - turning the delay on, see “:TRIGger[:SOURce]:EXTErnal:DELAy:STATe” on page 1017

**BUS** This choice enables triggering over the GPIB or LAN using the \*TRG or GET commands or the AUXILIARY INTERFACE (RS-232) using the \*TRG command.

**\*RST** KEY

**Key Entry**      **Trigger Key**      **Ext**      **Bus**

## **:TRIGger[:SOURce]:EXTErnal:DELay**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] :EXTErnal:DELay <val>  
[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] :EXTErnal:DELay?
```

This command sets the number of bits to delay the ESG's response to an external trigger.

The bit delay is a delay between when the ESG receives the trigger and when it responds to the trigger. The delay uses the clocks of the bit-clock to time the delay. After the ESG receives the trigger and the set number of delay bits (clocks) occurs, the ESG transmits the data pattern.

The delay occurs after you enable the state. See “:TRIGger[:SOURce]:EXTErnal:DELay:STATe” on page 1017. You can set the number of bits either before or after enabling the state.

For more information on configuring an external trigger source and to select external as the trigger source, see “:TRIGger[:SOURce]” on page 1016.

**\*RST** +0  
**Range** 0–1048575  
**Key Entry** **Ext Delay Bits**

## **:TRIGger[:SOURce]:EXTErnal:DELay:STATe**

**Supported** E4438C with Option 402

```
[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] :EXTErnal:DELay:STATe  
ON|OFF|1|0  
[ :SOURce ] :RADio:TETRa:TRIGger [ :SOURce ] :EXTErnal:DELay:STATe?
```

This command enables or disables the operating state of the external trigger delay function.

For setting the delay time, see “:TRIGger[:SOURce]:EXTErnal:DELay” on page 1017, and for more information on configuring an external source, see “:TRIGger[:SOURce]” on page 1016.

**\*RST** 0  
**Key Entry** **Ext Delay Off On**

**TETRA Subsystem—Option 402 ([:SOURCE]:RADio:TETRa)****:TRIGger[:SOURCE]:EXternal:SLOPe**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:TRIGger [ :SOURCE ] :EXternal:SLOPe POSitive|NEGative
[ :SOURCE ] :RADio:TETRa:TRIGger [ :SOURCE ] :EXternal:SLOPe?
```

This command sets the polarity for an external trigger signal while using the continuous, single triggering mode. To set the polarity for gating, see “**:TRIGger:TYPE:GATE:ACTive**” on page 1015.

The POSitive and NEGative selections correspond to the high (positive) and low (negative) states of the external trigger signal. For example, when you select POSitive, the waveform responds (plays) during the high state of the trigger signal. When the ESG receives multiple trigger occurrences when only one is required, the signal generator uses the first trigger and ignores the rest.

For more information on configuring an external trigger source and to select external as the trigger source, see “**:TRIGger[:SOURCE]**” on page 1016.

**\*RST** NEG

**Key Entry** Ext Polarity Neg Pos

**:TRIGger[:SOURCE]:EXternal[:SOURCE]**

**Supported** E4438C with Option 402

```
[ :SOURCE ] :RADio:TETRa:TRIGger [ :SOURCE ] :EXternal [ :SOURCE ] EPT1 |
EPT2 | EPTRIGGER1 | EPTRIGGER2
[ :SOURCE ] :RADio:TETRa:TRIGger [ :SOURCE ] :EXternal [ :SOURCE ] ?
```

This command selects which PATTERN TRIG IN connection the ESG uses to accept an externally applied trigger signal when external is the trigger source selection.

For more information on configuring an external trigger source and to select external as the trigger source, see “**:TRIGger[:SOURCE]**” on page 1016. For more information on the rear-panel connectors, see the *E4428C/38C ESG Signal Generators User’s Guide*.

The following list describes the command choices:

- |            |                                                                                                                         |
|------------|-------------------------------------------------------------------------------------------------------------------------|
| EPT1       | This choice is synonymous with EPTRIGGER1 and selects the PATTERN TRIG IN rear-panel connector.                         |
| EPT2       | This choice is synonymous with EPTRIGGER2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector. |
| EPTRIGGER1 | This choice is synonymous with EPT1 and selects the PATTERN TRIG IN rear-panel connector.                               |
| EPTRIGGER2 | This choice is synonymous with EPT2 and selects the PATT TRIG IN 2 pin on the rear-panel AUXILIARY I/O connector.       |



**\*RST** EPT1  
**Key Entry** **Patt Trig In 1** **Patt Trig In 2**

**[ :STATe ]**

**Supported** E4438C with Option 402

[ :SOURCE ] :RADio:TETRa [ :STATe ] ON | OFF | 1 | 0

[ :SOURCE ] :RADio:TETRa [ :STATe ] ?

This command enables or disables the TETRA modulation format.

**\*RST** OFF

**Key Entry** TETRA Off On

**Remarks** Although the TETRA modulation is enabled with this command, the  
RF carrier is not modulated unless you also activate the front panel  
**Mod On/Off** hardkey.

---

## Wideband CDMA Base Band Generator Subsystem—Option 400 [:SOURce]:RADio:WCDMa:TGPP[:BBG])

### :BBClock

**Supported** E4438C with Option 400

[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :BBClock INT [1] | EXT [1]

[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :BBClock?

This command selects the baseband generator chip clock source for the radio uplink channel.

**\*RST** INT

**Key Entry** **BBG Chip Clock Ext Int**

**Remarks** Refer to “:BBClock:EXT:RATE” on page 1020 for the EXT clock rate selections.

### :BBClock:EXT:RATE

**Supported** E4438C with Option 400

[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :BBClock:EXT:RATE X1 | X2 | X4

[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :BBClock:EXT:RATE?

This command sets the external clock rate for the baseband generator.

X1 This choice sets an external clock rate that is identical to the chip clock (3.84 MHz).

X2 This choice sets an external clock rate that is two times the rate of the chip clock.

X4 This choice sets an external clock rate that is four times the rate of the chip clock.

**\*RST** X1

**Key Entry** **Ext Clock Rate x1 x2 x4**

**Remarks** This command only applies to uplink.

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:DLINK:APPLY****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:APPLY

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:APPLY?

This command immediately starts the channel coding generation process according to the channel setup and data entered for the downlink physical and transport channels.

**Key Entry** **Apply Channel Setup****Remarks** If pre-computing is required, then a progress bar will appear on the signal generator's display.**:DLINK:AWGN:CN****Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:AWGN:CN &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:AWGN:CN?

This command sets the in band carrier to noise ratio (C/N) value in the AWGN carrier to noise.

**\*RST** -10.2**Range** -20 to 20**Field Entry** C/N value**:DLINK:AWGN:CPOWer****Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:AWGN:CPOWer?

This query returns the carrier power of the RF signal.

**\*RST** 0**Field Entry** C Power

**:DLINK:AWGN:ECNO**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:AWGN:ECNO <val>

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:AWGN:ECNO?

This command sets the Ec/No value of the Ec Ref channel.

The variable <val> is expressed in decibels (dB).

**\*RST** 0

**Range** -30 to 30

**Field Entry** Ec/No value

**:DLINK:AWGN:ECRPower**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:AWGN:ECRPower?

This query returns the carrier noise power in the Ec Ref channel.

**\*RST** 0

**Field Entry** Ec Ref Power

**:DLINK:AWGN:ECRef**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:AWGN:ECRef DPCH1 | DPCH2 | PCCPCH | PICH | CPICH

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:AWGN:ECRef?

This command selects the reference used for the Ec/No value.

DPCH1 This choice selects 1 dedicated physical channel.

DPCH2 This choice selects 2 dedicated physical channel.

PCCPCH This choice selects a primary command control physical channel.

PICH This choice selects a paging indicator channel.

CPICH This choice selects a common pilot channel.

**\*RST** DPCH1

**Key Entry** DPCH + 1 DPCH + 2 PCCPCH PICH CPICH

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**Remarks** White noise is a frequency spectrum that is uniform over a specific frequency band. White noise has equal power per hertz over the specific frequency band.

**:DLINK:AWGN:FNBW**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:AWGN:FNBW?

This query returns the flat noise bandwidth value.

**\*RST** +6.1440000E+006

**:DLINK:AWGN:NPOWER**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:AWGN:NPOWER?

This query returns the in-band noise power portion of the total RF power.

**\*RST** +0

**:DLINK:AWGN:TICPower**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:AWGN:TICPower?

This query returns the total in-channel power (carrier with noise) as defined by the 3GPP standard.

**\*RST** +0

**Field Entry** Total Pwr

**Remarks** The total in-channel power is a sum of carrier power and in-channel noise power. Changing the noise related parameters such as C/N, Eb/No, and Eb Ref will cause a recalculation of the total in-channel power.

The maximum value returned by this query depends on the power option that is installed in the signal generator.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****:DLINK:AWGN[:STATe]**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:AWGN:STATe ON | OFF | 1 | 0

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:AWGN:STATe?

This command enables or disables the additive white gaussian noise (AWGN) physical channel.

**\*RST** 0

**Key Entry** Channel State Off On

**:DLINK:BBClock**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:BBClock INT [1] | EXT [1]

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:BBClock?

This command selects the baseband generator chip clock source for the channel.

**\*RST** INT

**Key Entry** BBG Data Clock Ext Int

**:DLINK:CARB:CMODE:CCODE**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:CARB:CMODE:CCODE <val>

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:CARB:CMODE:CCODE?

This command sets the channel code for the chip ARB based dedicated physical channel (DPCH) in compressed mode.

**\*RST** 6

**Range** 0–511

**Field Entry** Channel Code

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**:DLINK:CARB:CMODE:DATA****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE:DATA PN9 | PN15

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE:DATA?

This command sets the dedicated physical channel (DPCH) data pattern in compressed mode (CM).

**\*RST** PN9**Key Entry** **PN9 PN15**

**Remarks** The data pattern contains one frame of each normal DPCH frame with a chosen slot structure. CM is enabled via spread factor reduction using a single frame method.

**:DLINK:CARB:CMODE:FOFFset****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE:FOFFset &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE:FOFFset?

This command sets the frame offset for the dedicated physical channel (DPCH) in compressed mode.

**\*RST** 0**Range** 0–149**Field Entry** Frame Offset**:DLINK:CARB:CMODE:FSTRuct****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE:FSTRuct A | B

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:CARB:CMODE:FSTRuct?

This command selects the frame structure for the downlink compressed mode.

A This choice maximizes the transmission gap length in a compressed frame.

B This choice optimized for power control during a compressed frame.

**\*RST** A**Key Entry** **A B**

**:DLINK:CARB:CMODE:POWER**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:CARB:CMODE:POWER <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:CARB:CMODE:POWER?
```

This command sets the power for the downlink compressed mode.

The variable <val> is expressed in units of decibels (dB).

**\*RST** +0.00000000E+000

**Range** -40 to 0

**Field Entry** Power

**:DLINK:CARB:CMODE:PRATio**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:CARB:CMODE:PRATio <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:CARB:CMODE:PRATio?
```

This command sets the playback ratio for the downlink compressed mode.

**\*RST** 2

**Range** 0–4096

**Field Entry** Playback Ratio

**Remarks** The value that is set represents the number of normal frames played between each compressed frame.

For example: 1:30

30 represents the un-compressed (normal) DPCH frames. The 30 frames will be played and then 1 compressed DPCH frame. The sequence then repeats.

**:DLINK:CARB:CMODE:SCTYpe**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:CARB:CMODE:SCTYpe NORMal | RIGHT |
LEFT
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:CARB:CMODE:SCTYpe?
```

This command sets the scramble type for the downlink compressed mode.

**NORMal** This choice selects scramble codes 0–8191 (16 x 511 + 15 = 8191).



**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

<b>RIGHT</b>	This choice selects scramble codes 8192–16383 (Normal + 8192).		
<b>LEFT</b>	This choice selects scramble codes 16384–24575 (Normal + 16384).		
<b>*RST</b>	NORM		
<b>Key Entry</b>	<b>Normal</b>	<b>Right</b>	<b>Left</b>

**:DLINK:CARB:CMODE:SFORmat**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:CARB:CMODE:SFORmat <val>
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:CARB:CMODE:SFORmat?
```

This command sets the slot format value for the dedicated physical channel (DPCH) in compressed mode. This value is used for both compressed and uncompressed frames.

<b>*RST</b>	+11
<b>Range</b>	1–15
<b>Field Entry</b>	Slot Format

**:DLINK:CARB:CMODE:SSCodeos**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:CARB:CMODE:SSCodeos <val>
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:CARB:CMODE:SSCodeos?
```

This command sets the secondary scramble code offset for the dedicated physical channel (DPCH) in compressed mode.

<b>*RST</b>	+0
<b>Range</b>	0–15
<b>Field Entry</b>	SecScr Code OS

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])**:DLINK:CARB:CMODE:TFIRST****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:TFIRST &lt;val&gt;

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:TFIRST?

This command sets the first slot at which a gap appears.

**\*RST** 7**Range** 0–7**Field Entry** Tfirst**:DLINK:CARB:CMODE:TGL****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:TGL &lt;val&gt;

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE:TGL?

This command sets the number of slots in the gap.

**\*RST** 7**Range** 1–7**Field Entry** Tgl**:DLINK:CARB:CMODE[:STATE]****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE[:STATE] ON|OFF|1|0

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:CARB:CMODE[:STATE]?

This command enables or disables the downlink dedicated physical channel (DPCH) in compressed mode.

**\*RST** 0**Key Entry** Channel State Off On

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:DLINK:CPICH:CCODE****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CPICH:CCODE?

This query returns the common paging indicator channel (CPICH) channel code value.

**\*RST** +0**Remarks** The channelization code is always expected to be 0.**:DLINK:CPICH:POWer****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CPICH:POWer &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CPICH:POWer?

This command sets the power level for the common paging indicator channel (CPICH). The variable &lt;val&gt; is expressed in units of decibels (dB).

**\*RST** -3.30000000E+000**Range** -40 to 0**Field Entry** Power**:DLINK:CPICH[:STATe]****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CPICH[:STATe]

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CPICH[:STATe]?

This command enables or disables the common paging indicator channel (CPICH).

**\*RST** 1**Key Entry** Channel State Off On

**:DLINK:CRATE**

**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CRATE <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:CRATE?

This command adjusts the chip rate.

The variable <val> is expressed in units of cycle per second (cps).

**\*RST** +3.8400000E+006

**Range** 1000∠4250000

**Field Entry** Chip Rate

**Remarks** The chip rate is equivalent to the spreading rate.

**:DLINK:DPCH[1]:BALance**

**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]:BALance <val>

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]:BALance?

This command sets DPCH1 power while scaling the power of all available OCNS channels in order to maintain a total power of 0 dB.

The variable <val> is expressed in units of decibels (dB).

**Key Entry** **DPCH Channel Balance**

**Remarks** At least one DPCH and one OCNS channel must be on prior to channel balancing. Refer to “[:DLINK:DPCH\[1\]2\[:STATE\]](#)” on page 1037 and “[:DLINK:OCNS\[1\]2|3|4|5|6|7|8|9|10|11|12|13|14|15|16\[:STATE\]](#)” on page 1042.

The command [:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]:BINitalize must be initiated prior to channel balancing.

**:DLINK:DPCH[1]:BINitalize**

**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]:BINitalize

This command initializes the DPCH1 or DPCH2 power of the OCNS channel balancing.

**Remarks** To insure proper balancing, this command must be called before the channel balancing.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**:DLINK:DPCH[1] | 2:ALL[:STATE]**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:ALL[:STATE] ON|OFF | 1 | 0
```

This command enables or disables both of the downlink dedicated physical channels.

**Key Entry** **Channel State Off On**

**Remarks** If the parameter is changed, the apply command must be executed after the change. Refer to “:DLINK:APPLY” on page 1021.

To query the state of the individual channel, refer to “:DLINK:DPCH[1]|2[:STATE]” on page 1037

**:DLINK:DPCH[1] | 2:CCODE**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:CCODE <val>
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:CCODE?
```

This command sets the downlink dedicated physical channel (DPCH) code number.

\*RST DPCH 1: 10 DPCH 2: 11

**Range** 0–511

**Field Entry** Chan Code

**Remarks** The channel code is coupled with the slot format and symbol rate. Refer to “:DLINK:DPCH[1]|2:SLOTformat” on page 1034 and “:DLINK:DPCH[1]|2:SRATE” on page 1034.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**:DLINK:DPCH[1] | 2:DATA**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:DATA PN9 | PN15 | FIX4 |
"<file name>" | TGRA | TGRB
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:DATA?
```

This command configures the data pattern for the downlink dedicated physical channel (DPCH).

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

TGRA	This choice selects transport channel A.
TGRB	This choice selects transport channel B.
"<file name>"	This variable specifies a data pattern that has been stored in memory.
<b>*RST</b>	PN9
<b>Key Entry</b>	<b>PN9    PN15    FIX4    "User File"    Transp Chan A    Transp Chan B</b>
<b>Remarks</b>	The data is now independent, on each of the DPCH channels. The data is limited to PN9 and PN15 when the DPCH is in slot format 16.  If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to " <a href="#">:DLINK:APPLY</a> " on page 1021.

**:DLINK:DPCH[1] | 2:DATA:FIX4**

**Supported**            E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:DPCH [1] | 2:DATA:FIX4 <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:DPCH [1] | 2:DATA:FIX4?
```

This command sets the data type to a FIX4 pattern for the downlink dedicated physical channel (DPCH). While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

**\*RST**                    #B0000

**Range:**                0–15

**Key Entry**            **FIX4**

**Remarks**            If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to "[:DLINK:APPLY](#)" on page 1021.

**:DLINK:DPCH[1] | 2:POWer**

**Supported**            E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:DPCH [1] | 2:DATA:POWer <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:DPCH [1] | 2:DATA:POWer?
```

This command sets the power level for the downlink dedicated physical channel (DPCH). The variable <val> is expressed in units of decibels (dB).

**\*RST**                    -1.02000000E+001

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**Range:** -40 to 0**Field Entry** Power**:DLINK:DPCH[1] | 2:RCSetup****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:RCSetup REF122 | REF64 | REF144 | REF384 | AMR122 | ISDN

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:RCSetup?

This command selects the downlink DCPH reference measurement setup for the transport channel.

REF122	This choice configures the transport channel per the 3GPP TS 34.121 specification for a downlink reference measurement channel with a 12.2 kbps rate.	
REF64	This choice configures the transport channel per the 3GPP TS 34.121 specification for a downlink reference measurement channel with a 64 kbps rate.	
REF144	This choice configures the transport channel per the 3GPP TS 34.121 specification for a downlink reference measurement channel with a 144 kbps rate.	
REF384	This choice configures the transport channel per the 3GPP TS 34.121 specification for a downlink reference measurement channel with a 384 kbps rate.	
AMR122	This choice configures the transport channel per the 3GPP TS 25.944 specification for a downlink reference measurement channel AMR with 12.2 kbps rate.	
ISDN	This choice configures the transport channel as follows: 64 kbps rate, channel 1 with 4 blocks of 640 and channel 2 with 1 block of 148 as per the 3GPP TS 25.944 specification.	

<b>Key Entry</b>	<b>12.2 kbps (34.121)</b>	<b>64 kbps (34.121)</b>
	<b>144 kbps (34.121)</b>	<b>384 kbps (34.121)</b>
	<b>AMR 12.2 (25.944)</b>	<b>UDI ISDN (25.944)</b>

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**:DLINK:DPCH[1] | 2:SLOTformat****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:DATA:SLOTformat <val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:DATA:SLOTformat?
```

This command configures the slot format for the dedicated physical channel (DPCH).

**\*RST** 0**Range:** 0–16**Field Entry** Slot Format

**Remarks** The slot format is coupled with the channel code and symbol rate. The transmit power control (TPC), the transport format combination indicator (TFCI), and the Pilot bits are also set as per specification and not displayed.

For a description of slot formats, see the 3GPP Technical Specifications (TS 25.211 v3.10).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**:DLINK:DPCH[1] | 2:SRATE****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:SRATE?
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:SRATE?
```

This query returns the symbol rate for the downlink dedicated physical channel.

**\*RST** +7.50000000E+003**:DLINK:DPCH[1] | 2:SSCodeos****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:SSCodeos <val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:SSCodeos?
```

This command sets the secondary scrambling code offset for the downlink dedicated physical channel (DPCH).

**\*RST** +0**Range:** 0–15



## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

<b>Field Entry</b>	2nd Scr Offset
<b>Remarks</b>	If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**:DLINK:DPCH[1] | 2:TFCI:PATtern**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:TFCI:PATtern <val>
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:TFCI:PATtern?
```

This command sets a 10-bit pattern for the transport format combination indicator (TFCI) for the dedicated physical channel (DPCH).

While the variable <val> is expressed in binary or decimal formats, the query returns only decimal values.

**\*RST** +0

**Range:** 0–1023

**Field Entry** TFCI Pat

**Remarks** The TFCI is optional and describes the services in use (for example, voice or data). If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**:DLINK:DPCH[1] | 2:TOFFset**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:TOFFset <val>
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:DPCH[1] | 2:TOFFset?
```

This command adjusts the timing offset for the dedicated physical channel (DPCH). The variable <val> is expressed in chips.

**\*RST** +0

**Range:** 0–149

**Field Entry** tDPCH Offset

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****:DLINK:DPCH[1] | 2:TPC:NUMSteps****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:TPC:NUMSteps &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:TPC:NUMSteps?

This command sets the number of steps for increasing/decreasing the user's equipment (UE) power.

**\*RST** +1**Range:** 1–80**Field Entry** TPC Steps**Remarks** The command is used with the transmit power control (TPC) patterns up/down (UDOWN), down/up (DUP), all down(DALL), all up (UALL), external (EXT), or user file ("`<file name>`"). Refer to **“:DLINK:DPCH[1]2:TPC:PATtern”**If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to **“:DLINK:APPLY”** on page 1021.**:DLINK:DPCH[1] | 2:TPC:PATtern****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:TPC:PATtern UDOWN | DUP |

UALL | DALL | EXT | "`<file name>`"

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1] | 2:TPC:PATtern?

This command controls the power of the user's equipment (UE). The increase/decrease direction for UE power level changes is determined by the transmit power control (TPC) pattern.

UDOWN This choice repetitively steps up and down the TPC pattern.

DUP This choice repetitively steps down and up the TPC pattern.

UALL This choice consecutively steps up the TPC pattern.

DALL This choice consecutively steps down the TPC pattern.

EXT This choice specifies an external TPC pattern.

"`<file name>`" This choice specifies a user file.**\*RST** UDOW**Key Entry** All Down All Up Down/Up Up/Down Ext User File

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURce]:RADio:WCDMa:TGPP[:BBG])

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**:DLINK:DPCH[1]|2[:STATe]**

**Supported** E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]|2:ALL[:STATe] ON|OFF|1|0
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINK:DPCH[1]|2:ALL[:STATe]?
```

This command enables or disables the dedicated physical channels (DPCH1 or DPCH2).

**\*RST** DPCH1: 1 DPCH2: 0

**Key Entry** **Channel State Off On**

**Remarks** If the parameter is changed, the apply command must be executed after the change. Refer to “:DLINK:APPLY” on page 1021.

**:DLINK:FILTer**

**Supported** E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINK:FILTer RNYQuist|NYQuist|GAUSSian|
RECTangle|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|
"<user FIR>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINK:FILTer?
```

This command selects the filter type for the downlink configuration.

**IS95** This choice selects a filter that meets the criteria of the IS-95 standard.

**IS95\_EQ** This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

**IS95\_MOD** This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

**IS95\_MOD\_EQ** This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

**UGGaussian** This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

<b>AC4Fm</b>	This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.					
"<user FIR>"	This variable is any filter file that you have stored into memory.					
<b>*RST</b>	RNYQ					
<b>Key Entry</b>	<b>Root Nyquist</b>	<b>Nyquist</b>	<b>Gaussian</b>	<b>Rectangle</b>	<b>IS-95</b>	<b>IS-95 w/EQ</b>
	<b>IS-95 Mod</b>	<b>IS-95 Mod w/EQ</b>	<b>APCO 25 C4FM</b>	<b>UN3/4 GSM</b>	<b>Gaussian</b>	
	<b>User FIR</b>					
<b>Remarks</b>	See <a href="#">“File Name Variables” on page 13</a> for information on the file name syntax.					

**:DLINK:FILTer:ALPHa**

<b>Supported</b>	E4438C with Option 400
	<code>[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:FILTer:ALPHa &lt;val&gt;</code> <code>[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:FILTer:ALPHa?</code>
	Execute this command to change the alpha value for a Nyquist or root Nyquist filter.
<b>*RST</b>	+2.20000000E-001
<b>Range</b>	0-1
<b>Key Entry</b>	<b>Filter Alpha</b>
<b>Remarks</b>	This command is effective only after selection of a root Nyquist or Nyquist filter; it does not affect other types of filters. To change the current filter type, refer to <a href="#">“:DLINK:FILTer” on page 1037</a> .

**:DLINK:FILTer:BBT**

<b>Supported</b>	E4438C with Option 400
	<code>[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:FILTer:BBT &lt;val&gt;</code> <code>[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:FILTer:BBT?</code>
	Execute this command to change the bandwidth-multiplied-by-bit-time filter parameter value.
<b>*RST</b>	+5.00000000E-001
<b>Range</b>	0.0000-1.0
<b>Key Entry</b>	<b>Filter BbT</b>
<b>Remarks</b>	This command is effective only after selecting a Gaussian filter; it does not affect other types of filters. See <a href="#">“:DLINK:FILTer” on page 1037</a> to change the filter type.

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])**:DLINK:FILTer:CHANnel****Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:FILTer:CHANnel EVM|ACP  
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:FILTer:CHANnel?

Execute this command to optimize a filter for minimized error vector magnitude (EVM) or for minimized adjacent channel power (ACP).

**EVM** This choice provides the most ideal passband.**ACP** This choice improves stopband rejection. This feature only applies to root Nyquist and Nyquist filters.**\*RST** EVM**Key Entry** **Optimize FIR For EVM ACP****Remarks** To change the current filter type, refer to “:DLINK:FILTer” on page 1037.**:DLINK:MSYNc****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:MSYNc

This command generates a one shot trigger pulse to synchronize multiple ESGs. This is a command only; there is no query.

**Key Entry** **Multi ESG Sync Trigger****Remarks** The trigger pulse will be generated when the user assigns the DRPS42 signal to any output port.**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:ALL[:STATE]****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:ALL[:STATE] ON|OFF|1|0

This command enables or disables all of the orthogonal channel noise simulator (OCNS) channels.

**\*RST** +0**Key Entry** **Channel State Off On****Remarks** To query the state of the individual channel, refer to “:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATE]” on page 1042.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:CCODE****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:CCODE &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:CCODE?

This command sets the channel code number for the downlink orthogonal channel noise simulator (OCNS).

**\*RST** +24**Range** 0–255**Field Entry** Chan Code

**Remarks** The channel code is coupled with the symbol rate. Refer to “:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:SRATE” on page 1041.

**:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:DATA****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:DATA PN9 | PN15

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:DATA?

This command configures the data pattern for the downlink orthogonal channel noise simulator (OCNS).

**\*RST** PN9**Key Entry** **PN9** **PN15****:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:POWer****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:POWer &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16:POWer?

This command sets the power level for the orthogonal channel noise simulator (OCNS).

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURce]:RADio:WCDMa:TGPP[:BBG])

The variable <val> is expressed in units of decibels (dB).

**\*RST**                    -1.200000000E+001

**Range**                    -40 to 0

**Field Entry**            Power

**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SRATe**

**Supported**            E4438C with Option 400

```
[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
13 | 14 | 15 | 16 :SRATe <val>
```

```
[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
13 | 14 | 15 | 16 :SRATe?
```

This command selects the symbol rate for the orthogonal channel noise simulator (OCNS).

The choices are expressed in units of kilo symbols per second (ksps).

**\*RST**                    +1.50000000E+004

**Key Entry**            **7.5 ksps      15 ksps      30 ksps      60 ksps      120 ksps      240 ksps**  
**480 ksps      960 ksps**

**Remarks**            The symbol rate is coupled with the channel code. Refer to  
“:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:CCODE” on page 1040.

**:DLINK:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16:SSCodeos**

**Supported**            E4438C with Option 400

```
[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
13 | 14 | 15 | 16 :SSCodeos <val>
```

```
[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:OCNS [1] | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
13 | 14 | 15 | 16 :SSCodeos?
```

This command sets the secondary scrambling code offset for the orthogonal channel noise simulator (OCNS).

**\*RST**                    +0

**Range**                    0–15

**Field Entry**            2nd Scr Offset

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16]:TOFFset****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16]:TOFFset <val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16]:TOFFset?
```

This command adjusts the timing offset for the orthogonal channel noise simulator (OCNS) channel.

**\*RST** +0**Range:** 0–149**Field Entry** tOCNS Offset**:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16]:STATE****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16]:STATE ON|OFF|1|0
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OCNS[1|2|3|4|5|6|7|8|9|10|11|12|
13|14|15|16]:STATE?
```

This command enables or disables the orthogonal channel noise simulator (OCNS) channel.

**\*RST** +0**Field Entry** On/Off**:DLINK:OOSTest[:STATE]****Supported** E4438C with Option 400 and 403

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OOSTest[:STATE] ON|OFF|1|0
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OOSTest[:STATE]?
```

This command enables or disables the Out-of-Sync-Test mode.

**\*RST** 0**Key Entry** **Out-of-Sync Test Off On****Remarks** When **Compressed Mode Off On** is set to On, Out-of-Sync Test mode cannot be enabled.

When **Out-of-Sync Test Off On** is set to On, ALC is automatically disabled; when **Out-of-Sync Test Off On** is set to Off, **ALC Off On** is automatically enabled.



## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**:DLINK:OOSTest:DTXGate:POLarity**

**Supported** E4438C with Option 400 and 403

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OOSTest:DTXGate:
POLarity POSitive|NEGative
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:OOSTest:DTXGate:POLarity?
```

This command sets the multiple ESG synchronization trigger signal polarity.

**\*RST** POS

**Key Entry** **DPCH1 DTX-Gate Trigger Polarity Neg Pos**

**:DLINK:PADJust**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PADJust EQUal|SCALE
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PADJust?
```

This command adjusts the code domain power levels of all downlink channels.

**EQUal** This choice will adjust all channel powers to equal power settings.

**SCALE** This choice will scale the channel power levels so that the sum of the powers are equal to 0 dB.

**\*RST** EQU

**Key Entry** **Equal Powers Scale To 0dB**

**:DLINK:PCCPch:BCHData**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:BCHData PN9|PN15|FIX4|
"<file name>"|TRANspch
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:BCHData?
```

This command sets the broadcast channel (BCH) data format that will be transmitted on the physical common control physical channel (PCCPCH).

**TRANspch** This choice selects a dedicated transport channel data pattern.

**"<file name>"** This variable specifies a data pattern that has been stored in memory.

**\*RST** FIX4

**Key Entry** **PN9 PN15 FIX4 User File Transport CH**

**:DLINK:PCCPch:BCHData:FIX4****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:BCHData:FIX4 &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:BCHData:FIX4?

This command sets a fixed 4-bit binary data pattern for the primary common control physical channel (PCCPCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

**\*RST** #B0000**Range** 0–15**Key Entry** **FIX4****:DLINK:PCCPch:CCODE****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:CCODE &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:CCODE?

This command sets the primary common control physical channel (PCCPCH) code to the desired code number.

**\*RST** +1**Range** 0–255**Field Entry** Channel Code**:DLINK:PCCPch:POWer****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:POWer &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch:POWer?

This command sets the power level for the primary common control physical channel (PCCPCH). The variable <val> is expressed in units of decibels (dB).

**\*RST** -5.30000000E+000**Range** -40 to 0**Field Entry** Power

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:DLINK:PCCPch[:STATE]****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch[:STATE] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PCCPch[:STATE] ?

This command enables or disables the primary common control physical channel (PCCPCH).

**\*RST** 1**Key Entry** Channel State Off On**:DLINK:PICH:CCODE****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH:CCODE &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH:CCODE?

This command sets the paging indicator channel (PICH) code to the desired code number.

**\*RST** +3**Range** 0–255**Field Entry** Channel Code**:DLINK:PICH:DATA****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH:DATA PN9|PN15|FIX4|

"&lt;file name&gt;"

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH:DATA?

This command configures the data pattern for the downlink paging indicator channel (PICH).

"&lt;file name&gt;" This variable specifies a data pattern that has been stored in memory.

**\*RST** PN9**Key Entry** **PN9** **PN15** **FIX4** **User File**

### **:DLINK:PICH:DATA:FIX4**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:PICH:DATA:FIX4 <val>

[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:PICH:DATA:FIX4?

This command sets a fixed 4-bit data pattern to be transmitted on a paging indicator channel (PICH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

**\*RST** #B0000

**Range** 0–15

**Key Entry** **FIX4**

### **:DLINK:PICH:PIBits**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:PICH:PIBits?

This query returns the number of bits in the paging indicator field.

**\*RST** +288

**Field Entry** PI Bits

### **:DLINK:PICH:PINDicator**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:PICH:PINDicator?

This query returns the number of paging indicator fields per frame.

**\*RST** +144

**Field Entry** Paging Indicator

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:DLINK:PICH:POWer****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH:POWer &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH:POWer?

This command sets the power level of the paging indicator channel (PICH). The variable <val> is expressed in units of decibels (dB)

**\*RST** -8.300000000E+000**Range** -40 to 0**Field Entry** Power**:DLINK:PICH[:STATe]****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PICH[:STATe]?

This command enables or disables the paging indicator channel (PICH).

**\*RST** 0**Key Entry** Channel State Off On**:DLINK:POLarity****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:POLarity NORMAL|INVerted

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:POLarity?

This command selects the phase polarity of the downlink signal.

NORMAL This choice selects normal polarity.

INVerted This choice inverts the internal Q signal.

**\*RST** NORM**Key Entry** Phase Polarity Normal Invert

**:DLINK:PSCH:POWer**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PSCH:POWer <val>
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PSCH:POWer?
```

This command sets the power level for the primary synchronization physical channel (PSCH).

The variable <val> is expressed in units of decibels (dB).

**\*RST** -8.30000000E+000

**Range** -40 to 0

**Field Entry** Power

**:DLINK:PSCH[:STATe]**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PSCH[:STATe] ON|OFF|1|0
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:PSCH[:STATe]?
```

This command enables or disables the primary synchronization physical channel (PSCH).

**\*RST** 1

**Field Entry** PSCH State

**:DLINK:RPANel:INPut:ALTPower**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:INPut:ALTPower?
```

This query returns the type of signal at the alternate power input (Alt power in AUX I/O connector pin#16) for the dedicated physical channel (DPCH) mode.

**\*RST** NONE

**Remarks** When **Compressed Mode Off On** is set to On, Compressed-mode stop-trigger Compressed-mode stop-trigger signal is assigned to pin 16 of the rear panel AUX I/O connector. For more information about the rear panel AUX I/O connector configuration, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**:DLINK:RPANel:INPut:BBGRef****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:RPANel:INPut:BBGRef?

This query returns the type of signal at the baseband generator reference input (BASEBAND GEN REF IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

**\*RST** CCL

**Remarks** The signal name is baseband generator chip clock (CCL). For more information about the rear panel connector configuration, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:DLINK:RPANel:INPut:BGATe****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:RPANel:INPut:BGATe?

This query returns the type of signal at the gate burst (BURST GATE IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

**\*RST** SFNR

**Remarks** System Frame Number Reset (SFNR) is used for synchronization in a two ESG setup. This signal is used to tell where the frame starts.

**:DLINK:RPANel:INPut:PTRigger1****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:RPANel:INPut:PTRigger1?

This query returns the type of signal at the pattern trigger input 1 (PATT TRIG IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

**\*RST** MSTI

**Remarks** When **Compressed Mode Off On** is set to On, Compressed-mode start-trigger (CSTT) signal is assigned to the rear panel PATT TRIG IN connector; when **Out-of-Sync Test Off On** is set to On, DPCH1 DTX-Gate (DDTX) signal is assigned to the rear panel PATT TRIG IN connector.

Multiple ESG Synchronization Trigger In (MSTI) signal is used to synchronize signals from two ESGs that have different coding to simulate transmit diversity.

**:DLINK:RPANel:INPut:PTRigger2****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:INPut:PTRigger2?

This query returns the type of signal at the pattern trigger input 2 (PATT TRIG IN 2, AUX I/O connector pin#17) for the dedicated physical channel (DPCH) mode.

**\*RST** TPCB**Remarks** Transmit Power Control Bit (TPCB) signal is used to control the DPCH TPC bit.**:DLINK:RPANel:OUTPut:DCLock****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:DCLock
DRPS0|DRPS4|DRPS5|DRPS6|DRPS10|DRPS11|DRPS13|DRPS20|DRPS21|DRPS22|
DRPS23|DRPS24|DRPS25|DRPS26|DRPS28|DRPS30|DRPS32|DRPS33|DRPS34|DRPS35|
DRPS36|DRPS37|DRPS38|DRPS39|DRPS40|DRPS41|DRPS42
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:DCLock?
```

This command assigns a signal to the data clock output at the selected rear panel AUX I/O connector pin#6. Refer to [Table 9-3 on page 1050](#) for command parameters for the variable and output signal names.

**Table 9-3 Downlink Rear Panel Signal (DRPS) Output Type**

Command Parameter	Signal Out
DRPS0	NONE
DRPS4	3.84 MHz chip clock
DRPS5	SFN reset signal
DRPS6	SFN sync pulse
DRPS10	SCH slot pulse
DRPS11	10ms Frame pulse
DRPS13	80ms Frame pulse
DRPS20	DPCH data clock with DTX
DRPS21	DPCCH TPC data clock



**Table 9-3 Downlink Rear Panel Signal (DRPS) Output Type**

<b>Command Parameter</b>	<b>Signal Out</b>
DRPS22	DPCCH TFCI data clock
DRPS23	DPCCH Pilot data clock
DRPS24	DPCH data stream
DRPS25	DPCH TimeSlot pulse
DRPS26	DPCH 10ms Frame Pulse
DRPS28	DPCH data clock
DRPS30	DPDCH data clock w/oDTX
DRPS32	DPCH comp Frm Indicator
DRPS33	DPCH Gap Indicator
DRPS34	PICH data clock
DRPS35	PICH data
DRPS36	PICH TimeSlot pulse
DRPS37	PICH 10ms FramePulse
DRPS38	P-CCPCH data clock
DRPS39	P-CCPCH data
DRPS40	DPCH Chip-ARB-frame-pulse
DRPS41	DPCH TPC-bits-out
DRPS42	Multi-ESG Sync Trigger Out

\*RST

RPS0

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

<b>Key Entry</b>	<b>NONE</b> <b>3.84MHz chip-clk (DRPS4)</b> <b>SFN reset-signal (DRPS5)</b> <b>SFN sync-pulse (DRPS6)</b> <b>SCH slot-pulse (DRPS10)</b> <b>10ms Frame Pulse (DRPS11)</b> <b>80ms Frame Pulse (DRPS13)</b> <b>DPDCH data-clk with DTX (DRPS20)</b> <b>DPCCH TPC data-clk (DRPS21)</b> <b>DPCCH TFC I data-clk (DRPS22)</b> <b>DPCCH Pilot data-clk (DRPS23)</b> <b>DPCH data stream (DRPS24)</b> <b>DPCH TimeSlot pulse (DRPS25)</b> <b>DPCH 10ms Frame-Pulse (DRPS26)</b> <b>DPCH data-clk (0) (DRPS28)</b> <b>DPDCH data-clk withoutDTX (DRPS30)</b> <b>DPCH Compressed Frame Indicator (DRPS32)</b> <b>DPCH Gap Indicator (DRPS33)</b> <b>PICH data-clk (DRPS34)</b> <b>PICH data (DRPS35)</b> <b>PICH TimeSlot Pulse (DRPS36)</b> <b>PICH 10ms FramePulse (DRPS37)</b> <b>P-CCPCH data-clk (DRPS38)</b> <b>P-CCPCH data (DRPS39)</b> <b>DPCH ChipARB FramePulse (DRPS40)</b> <b>DPCH TPC-Bit Out (DRPS41)</b> <b>Mlt-ESG-Sync Trigger-Out (DRPS42)</b>
<b>Remarks</b>	For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the <i>E4428C/38C ESG Signal Generators User's Guide</i> .

**:DLINK:RPANel:OUTPut:DOUT**

**Supported**    E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:DOUT
DRPS0|DRPS4|DRPS5|DRPS6|DRPS10|DRPS11|DRPS13|DRPS20|DRPS21|DRPS22|
DRPS23|DRPS24|DRPS25|DRPS26|DRPS28|DRPS30|DRPS32|DRPS33|DRPS34|DRPS35|
DRPS36|DRPS37|DRPS38|DRPS39|DRPS40|DRPS41|DRPS42
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:DOUT?
```

This command assigns a signal to the data output at the selected rear panel AUX I/O connector pin#7. Refer to [Table 9-3 on page 1050](#) for command parameters and output signal names.

**\*RST**    RPS0

**Key Entry**    Refer to **Key Entry** on [page 1052](#).

**Remarks**    For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**:DLINK:RPANel:OUTPut:EVENT1**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:RPANel :OUTPut :EVENT1
DRPS0 | DRPS4 | DRPS5 | DRPS6 | DRPS10 | DRPS11 | DRPS13 | DRPS20 | DRPS21 | DRPS22 |
DRPS23 | DRPS24 | DRPS25 | DRPS26 | DRPS28 | DRPS30 | DRPS32 | DRPS33 | DRPS34 | DRPS35 |
DRPS36 | DRPS37 | DRPS38 | DRPS39 | DRPS40 | DRPS41 | DRPS42
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:RPANel :OUTPut :EVENT1?
```

This command assigns a signal to the EVENT 1 rear panel output connector. Refer to [Table 9-3 on page 1050](#) for command parameters and output signal names.

**\*RST** RPS0

**Key Entry** Refer to **Key Entry** on [page 1052](#).

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:DLINK:RPANel:OUTPut:EVENT2**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:RPANel :OUTPut :EVENT2
DRPS0 | DRPS4 | DRPS5 | DRPS6 | DRPS10 | DRPS11 | DRPS13 | DRPS20 | DRPS21 | DRPS22 |
DRPS23 | DRPS24 | DRPS25 | DRPS26 | DRPS28 | DRPS30 | DRPS32 | DRPS33 | DRPS34 | DRPS35 |
DRPS36 | DRPS37 | DRPS38 | DRPS39 | DRPS40 | DRPS41 | DRPS42
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:RPANel :OUTPut :EVENT2?
```

This command assigns a signal to the EVENT 2 rear panel output connector. Refer to [Table 9-3 on page 1050](#) for command parameters and output signal names.

**\*RST** RPS0

**Key Entry** Refer to **Key Entry** on [page 1052](#).

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****:DLINK:RPANel:OUTPut:EVENT3****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:EVENT3
DRPS0|DRPS4DRPS5|DRPS6|DRPS10|DRPS11|DRPS13|DRPS20|DRPS21|DRPS22|
DRPS23|DRPS24|DRPS25|DRPS26|DRPS28|DRPS30|DRPS32|DRPS33|DRPS34|DRPS35|
DRPS36|DRPS37|DRPS38|DRPS39|DRPS40|DRPS41|DRPS42
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:EVENT3?
```

This command assigns a signal to the EVENT 3 at the selected rear panel AUX I/O connector pin#19. Refer to [Table 9-3 on page 1050](#) for command parameters and output signal names.

**\*RST** RPS0**Key Entry** Refer to **Key Entry** on [page 1052](#).

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:DLINK:RPANel:OUTPut:EVENT4****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:EVENT4
DRPS0|DRPS4|DRPS5|DRPS6|DRPS10|DRPS11|DRPS13|DRPS20|DRPS21|DRPS22|
DRPS23|DRPS24|DRPS25|DRPS26|DRPS28|DRPS30|DRPS32|DRPS33|DRPS34|DRPS35
DRPS36|DRPS37|DRPS38|DRPS39|DRPS40|DRPS41|DRPS42
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:RPANel:OUTPut:EVENT4?
```

This command assigns a signal to the EVENT 4 at the selected rear panel AUX I/O connector pin#18. Refer to [Table 9-3 on page 1050](#) for command parameters and output signal names.

**\*RST** RPS0**Key Entry** Refer to **Key Entry** on [page 1052](#).

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**:DLINK:RPANel:OUTPut:SSYNc****Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:RPANel:OUTPut:SSYNc
DRPS0|DRPS4|DRPS5|DRPS6|DRPS10|DRPS11|DRPS13|DRPS20|DRPS21|DRPS22|
DRPS23|DRPS24|DRPS25|DRPS26|DRPS28|DRPS30|DRPS32|DRPS33|DRPS34|DRPS35|
DRPS36|DRPS37|DRPS38|DRPS39|DRPS40|DRPS41|DRPS42
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:RPANel:OUTPut:SSYNc?
```

This command assigns a signal to the SYM SYNC OUT at the selected rear panel AUX I/O connector pin#5. Refer to [Table 9-3 on page 1050](#) for command parameters and output signal names.

**\*RST** RPS0**Key Entry** Refer to **Key Entry** on [page 1052](#).**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.**:DLINK:SCH[:STATe]****Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:SCH[:STATe] ON|OFF|1|0
```

This command enables or disables the primary and secondary synchronization channel (SSCH).

**\*RST** 1**Key Entry** **Channel State Off On****Remarks** To query the state of the individual channel, refer to “:DLINK:PSCH[:STATe]” on [page 1048](#) and “:DLINK:SSCH[:STATe]” on [page 1057](#).**:DLINK:SCRamblecode****Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:SCRamblecode <val>
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK:SCRamblecode?
```

This command selects the scramble code number.

**\*RST** +0**Range** 0–511**Field Entry** Scrambling Code

**:DLINK:SDElay****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SDElay &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SDElay?

This command sets the delay of the system frame number (SFN) synchronization when a Multi-ESG-Sync Trigger-In signal is received. The variable <val> is expressed in unit of chips.

**\*RST** +0.00000000E+000**Range** 0–38399**Field Entry** Sync Delay

**Remarks** This function provides the capability of Inter-Cell Soft Handover test as described in TS.34.121 7.7.1 of the 3GPP standard. The test requires two base stations that generate the same signal but have a 10 chip timing offset. The two base stations are simulated by two ESGs and Sync Delay is the synchronization delay between the ESGs.

**:DLINK:SSCH:POWer****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SSCH:POWer &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SSCH:POWer?

This command sets the power level for the secondary synchronization channel (SSCH). The variable <val> is expressed in units of decibels (dB).

**\*RST** –8.30000000E+000**Range** –40 to 0**Field Entry** SSCH Power**:DLINK:SSCH:SSGRoup****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SSCH:SSGRoup?

This command query returns the secondary scramble code group for the secondary synchronization channel (SSCH).

**\*RST** +0**Field Entry** SSCH 2nd Scramble Group

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:DLINK:SSCH[:STATe]****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:SSCH[:STATe] ON|OFF|1|0

This command enables or disables the secondary synchronization channel (SSCH).

**\*RST** 1**Field Entry** SSCH State**:DLINK:TGAP:FSTRUCT****Supported** E4438C with Option 400

[:SOURCE]:RADio[1]|2|3|4:WCDMa:TGPP[:BBG]:DLINK:TGAP:FSTRUCT A|B

[:SOURCE]:RADio[1]|2|3|4:WCDMa:TGPP[:BBG]:DLINK:TGAP:FSTRUCT?

This command selects the compressed frame structure for the transmission gaps.

A The pilot field of the last slot in the transmission gap is transmitted and transmission is turned off during the rest of the transmission gap.

B The TPC field of the first slot and the pilot field of the last slot in the transmission gap are transmitted and transmission is turned off during the rest of the transmission gap.

**\*RST** A**Field Entry** Frame Struct**:DLINK:TGAP:POFFset****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:POFFset &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:POFFset?

This command specifies the amount of power to be increased when the data is being compressed for the transmission gap power offset.

The variable &lt;val&gt; is expressed in units of decibels (dB).

**\*RST** +0.00000000E+000**Range** 0–6**Field Entry** PwrOffs

**:DLINK:TGAP:PSI[1]:CFN**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:TGAP:PSI [ 1 ] :CFN <val>
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:TGAP:PSI [ 1 ] :CFN?
```

This command sets the connection frame number (CFN) for the first radio of the first pattern 1.

**\*RST** 0

**Range** 1–255

**Field Entry** TGCFN

**Remarks** The connection frame number (CFN) is counted internally relative to the system sync signal.

**:DLINK:TGAP:PSI[1]:CMMethod**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:TGAP:PSI [ 1 ] :CMMehtod SF2 | PUNcture
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:TGAP:PSI [ 1 ] :CMMethod?
```

This command selects the compressed mode (CM) method.

**SF2** This choice selects a compressed mode method that reduces the spread factor (SF) by 2. This is done by reducing the spreading factor in half. When the dedicated physical data channel's (DPDCH) symbol rate is 960 kbps, the frame is not compressed because it uses the lowest SF value and cannot be reduced.

**PUNcture** This choice selects a compressed mode method that punctures the convolutional encoder to a lower rate which reduces the number of symbols to be transmitted.

**\*RST** SF2

**Key Entry** **SF2** **Puncture**

**Remarks** To edit the parameters for this command using the ESG front panel keys, highlight the **CM Method** field and select either **SF2** or **Puncture** softkeys.

If the parameter is changed, the apply command must be executed after the change. Refer to “:DLINK:APPLY” on page 1021.



## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

**:DLINK:TGAP:PSI[1]:D****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:D &lt;val&gt;

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:D?

This command sets the transmission gap distance.

**\*RST** +0**Range** 0, 15–269**Field Entry** TGD**Remarks** This command specifies the number of slots between the starting slot of two consecutive transmission gaps within a gap pattern.**:DLINK:TGAP:PSI[1]:L1****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:L1 3|4|5|7|10|14

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:L1?

This command specifies the length of the first transmission gap (TGL1).

The length is expressed in number of slots.

**\*RST** 7**Field Entry** TGL1**:DLINK:TGAP:PSI[1]:L2****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:L2 3|4|5|7|10|14|OMITted

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:L2?

This command specifies the length of the second transmission gap (TGL2).

The length is expressed in number of slots.

**\*RST** OMIT**Field Entry** TGL2**Key Entry** **Omitted****Remarks** When OMITted is selected, TGL2 = TGL1.

**:DLINK:TGAP:PSI[1]:PL1****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PL1 &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PL1?

This command specifies the duration of the transmission gap pattern length 1 (TGPL1).

The variable &lt;val&gt; is expressed in number of frames.

**\*RST** +2**Range** 1–144**Field Entry** TGPL1**:DLINK:TGAP:PSI[1]:PL2****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PL2 &lt;val&gt;|OMITted

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PL2?

This command specifies the duration of the transmission gap pattern length 2 (TGPL2).

The variable is expressed in number of frames.

**\*RST** OMIT**Range** 1–144**Key Entry** **Omitted****Remarks** When OMITted is selected, TGPL2 = TGPL1.**:DLINK:TGAP:PSI[1]:PRC****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PRC &lt;val&gt;|INFIinity

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:PSI[1]:PRC?

This command sets the transmission gap pattern repetition count.

**\*RST** 1**Range** 1–511**Key Entry** **Infinity****Field Entry** TGPRC

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**Remarks** The pattern repetition count (PRC) sets the number of transmission gap patterns within the transmission gap pattern sequence. When INFINITY is selected, the PRC will continue indefinitely.

**:DLINK:TGAP:PSI[1]:PS**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:TGAP:PSI [1] :PS ACTIVE | INACTIVE
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:TGAP:PSI [1] :PS?
```

This command sets the transmission gap pattern status.

ACTIVE This choice activates the compressed mode.

INACTIVE This choice sets the compressed mode to inactive.

\*RST INAC

**Key Entry** **Active** **Inactive**

**:DLINK:TGAP:PSI[1]:SN**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:TGAP:PSI [1] :SN <val>
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:TGAP:PSI [1] :SN?
```

This command specifies the timeslot number of the first transmission gap within the first radio frame.

\*RST +11

**Range** 0–14

**Field Entry** TGSN

**:DLINK:TGAP:RPARAMeter**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:TGAP:RPAMeter DREF11 | DREF12 |
DREF21 | DREF22
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :DLINK:TGAP:RPAMeter?
```

This command sets the downlink reference compressed mode parameters as defined in 3GPP standard.

DREF11 This choice sets the reference parameter to 1.1.

DREF12 This choice sets the reference parameter to 1.2.

DREF21 This choice sets the reference parameter to 2.1.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

DREF22	This choice sets the reference parameter to 2.2.			
*RST	CUST			
<b>Key Entry</b>	<b>DL Reference 1.1</b>	<b>DL Reference 1.2</b>	<b>DL Reference 2.1</b>	<b>DL Reference 2.2</b>
<b>Remarks</b>	The query returns CUSTom when the parameters are set individually.			

**:DLINK:TGAP:SCFN**

<b>Supported</b>	E4438C with Option 400			
	[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:SCFN <val>			
	[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:SCFN?			
	This command sets the stop connection frame number (CFN) when the stop trigger is used.			
	When the stop trigger is received at the signal generator, the compressed mode will finish even if the transmission gap pattern repetition count (TGPRC) is still remaining.			
*RST	+0			
<b>Range</b>	0–255			
<b>Field Entry</b>	SCFN			
<b>Remarks</b>	The compressed mode stop trigger must be executed for this command to work. Refer to, “:DLINK:TGAP:STOP:TRIGger” on page 1063.			

**:DLINK:TGAP:START:TRIGger**

<b>Supported</b>	E4438C with Option 400			
	[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:START:TRIGger			
	This command starts the signal generator compressed pattern transmission. Compressed pattern transmission begins with the specified transmission gap connection frame number (TGCFN).			
<b>Key Entry</b>	<b>Compressed Mode Start Trigger</b>			

**:DLINK:TGAP:START:TRIGger:POLarity**

<b>Supported</b>	E4438C with Option 400			
	[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:START:TRIGger:POLarity			
	POSitive NEGative			
	[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:START:TRIGger:POLarity?			
	This command sets the compressed mode start trigger polarity. The compressed pattern transmission begins when this trigger is received.			

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

POSitive	This choice sets the trigger to start when the trigger signal is high.
NEGative	This choice sets the trigger to start when the trigger signal is low.
<b>*RST</b>	POS
<b>Key Entry</b>	<b>Comp Mode Start Trigger Polarity Pos Neg</b>

**:DLINK:TGAP:STOP:TRIGger**

**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:STOP:TRIGger

This command stops the signal generator compressed pattern transmission. Compressed pattern transmission begins with the specified transmission gap connection frame number (TGCFN).

**Key Entry** **Compressed Mode Stop Trigger**

**:DLINK:TGAP:STOP:TRIGger:POLarity**

**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:STOP:TRIGger:POLarity  
POSitive|NEGative

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP:STOP:TRIGger:POLarity?

This command sets the compressed mode stop trigger polarity. The compressed pattern transmission stops when this trigger is received.

POSitive	This choice sets the trigger to stop when the trigger signal is high.
NEGative	This choice sets the trigger to stop when the trigger signal is low.
<b>*RST</b>	POS
<b>Key Entry</b>	<b>Comp Mode Stop Trigger Polarity Pos Neg</b>

**:DLINK:TGAP[:STATe]**

**Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP[:STATe] 1|0|ON|OFF  
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TGAP[:STATe] ?

This command enables or disables the transmission gap compressed mode.

<b>*RST</b>	0
<b>Key Entry</b>	<b>Compressed Mode On Off</b>

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

**Remarks** When compressed mode is enabled, DPCH2 is automatically disabled and can't be enabled.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**:DLINK:TSETup**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK:TSETup REFSensitivity | MAXinput | ACS | BLOcking | SPURious | INTermod | PERFreq

This command configures the test setup for the downlink channels.

**REFSensitivity** This choice selects reference sensitivity. This is the minimum receiver input power measured at the antenna connector.

**MAXinput** This choice selects maximum input interference. The receiver is stressed with high-levels of interference from unwanted signals.

**ACS** This choice selects adjacent channel selectivity (ACS). This is the receiver ability to receive a wanted signal at the assigned channel frequency with the presence of adjacent signals.  
ACS is the ratio of the receiver filter attenuation (on the assigned channel) to the receive filter attenuation on the adjacent channel(s).

**BLOcking** This choice selects the blocking characteristics. This is a measure of the receiver ability to receive a wanted signal at the assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels.

**SPURious** This choice selects spurious emission power. The emissions are generated or amplified by a receiver.

**INTermod** This choice selects intermodulation. Third order intermodulation (TIO) or higher mixing of the two interfering RF signals signal in the band of the desired channel.

**PERFreq** This choice selects the performance requirement of the dedicated channel. This is a static propagation conditions that is determined by the maximum block error rate (BLER) allowed when the receiver input signal is at a specified Eb/No limit.

<b>Key Entry</b>	<b>Ref Sensitivity</b>	<b>Max Input</b>	<b>ACS</b>	<b>Blocking</b>
	<b>Spurious Response</b>	<b>Intermod</b>	<b>Performance Req</b>	

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:DLINK:TXDV****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TXDV NONE|OANT1|OANT2|OANTO1|OANTO2  
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK:TXDV?

This command selects the transmit diversity mode of the downlink signal.

NONE This choice disables the transmit diversity mode.

OANT1 This choice selects a Transmit Diversity Openloop Antenna 1 mode.

OANT2 This choice selects a Transmit Diversity Openloop Antenna 2 mode.

OANTO1 This choice selects a Transmit Diversity Openloop Antenna 1 mode with the SCH TSTD (Synchronization Channel Transmit Switched Time Diversity) off.

OANTO2 This choice selects a Transmit Diversity Openloop Antenna 2 mode with the SCH TSTD (Synchronization Channel Transmit Switched Time Diversity) off.

**\*RST** NONE**Field Entry** TX Diversity**Key Entry** **None** **OpenLoop Ant1** **OpenLoop Ant2**  
**OpenLoop Ant1 SCH TSTD OFF** **OpenLoop Ant2 SCH TSTD OFF**

**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BLKSize****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BLKSize &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BLKSize?

This command sets the block size (BLKSize) for the selected dedicated transport channel (DCH). The transport channel position affects the behavior of this command as described below.

Transport Channel Mode	Signal Generator Behavior
FLEXible	Changing the block size causes the signal generator to recalculate the block set size. The block size, number of blocks and the block set size values are interdependent as shown in the following formula:  $\text{block size} = \text{block set size} \div \text{number of blocks}$
FIXed	There are two signal generator behaviors in this mode: <ul style="list-style-type: none"> <li>change the block size to zero, and it remains zero regardless of the block set size and number of blocks values</li> <li>change the block size to a value other than zero, and the signal generator recalculates the block size as a quotient of the block set size and the number of blocks (block set size <math>\div</math> number of blocks), ignoring the value entered by the command</li> </ul>

**\*RST** 20**Range** 0–5000**Field Entry** Blk Size

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

For information on the number of blocks and block set size commands, see “:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:NBLocks” on page 1071, and “:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BSSize” on page 1067.

Refer to the “:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:POSITION” command on page 1072 for information on setting the transport channel position.



**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BPFFrame****Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:  
BPFFrame?

This query returns the number of bits per frame for the selected dedicated transport channel (DCH).

**\*RST** 60**Field Entry** Bits/Frame**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BRATe****Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:  
BRATe?

This query returns the block rate for the selected dedicated transport channel (DCH).

**\*RST** 20**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:BSSize****Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:  
BSSize <val>  
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:  
BSSize?This command sets the block set size (BSSize) for the selected dedicated transport channel (DCH).  
The transport channel position affects the behavior of this command as described below.**Transport  
Channel Mode****Signal Generator Behavior**

FLEXible	This command has no effect on the block size value. The block size value changes only when there is a value change in the number of blocks or the block size according to the following formula:
----------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

$$\text{block set size} \geq \text{block size} \times \text{number of blocks}$$

<b>Transport Channel Mode</b>	<b>Signal Generator Behavior</b>
FIXed	<p>Changing the block set size value automatically changes the block size, so that the block set size approximates or is the product of the block size and number of blocks values:</p> $\text{block set size} \geq \text{block size} \times \text{number of blocks}$ <p>The change in the block set size value generates a settings conflict error, which the signal generator corrects when it recalculates the block size value.</p>
*RST	20
Range	0–200000
Field Entry	Blk Set Size
Remarks	<p>Refer to the “:DLINK[:TGRoup [A] B]:DCH[1] 2 3 4 5 6:POSition” command on <a href="#">page 1072</a> for information on setting the transport channel position.</p> <p>For information on the number of blocks and block size commands, see “:DLINK[:TGRoup [A] B]:DCH[1] 2 3 4 5 6:NBLocks” on <a href="#">page 1071</a>, and “:DLINK[:TGRoup [A] B]:DCH[1] 2 3 4 5 6:BLKSize” on <a href="#">page 1066</a>.</p> <p>If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on <a href="#">page 1021</a>.</p>

### **:DLINK[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:CODE**

<b>Supported</b>	E4438C with Option 400
	[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup [A] B]:DCH[1] 2 3 4 5 6:CODE HCONv TCONv TURBo NONE
	[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup [A] B]:DCH[1] 2 3 4 5 6:CODE?
	This command selects the encoder type.
HCONv	This choice selects coding with the 1/2 rate convolutional encoder.
TCONv	This choice selects coding with the 1/3 rate convolutional encoder.
TURBo	This choice selects coding with the turbo coder.
NONE	This choice selects no coding.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

<b>*RST</b>	HCON
<b>Key Entry</b>	<b>1/2 Conv    1/3 Conv    Turbo    None</b>
<b>Remarks</b>	If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:CRC**

**Supported**            E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:
CRC <val>
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:
CRC?
```

This command sets the number of cyclic redundancy check (CRC) bits for the dedicated transport channel (DCH).

<b>*RST</b>	8
<b>Field Entry</b>	CRC Size
<b>Remarks</b>	If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA**

**Supported**            E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:
DATA PN9 | FIX4 | "<file name>"
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:
DATA?
```

This command configures the data for the downlink dedicated transport channel (DCH) selected.

"<file name>" This variable specifies a data pattern that has been stored in memory.

<b>*RST</b>	PN9
<b>Key Entry</b>	<b>PN9    FIX4    "&lt;User File&gt;"</b>
<b>Remarks</b>	If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:EINSErt****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:EINSErt BLER|BER|NONE

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:EINSErt?

This command selects the error insertion mode.

**BLER** This choice selects a block error rate (BLER) mode.**BER** This choice selects a bit error rate (BER) mode.**NONE** This choice selects no BLER or BER mode (no error blocks or bit are inserted)**\*RST** NONE**Key Entry** **BLER** **BER** **None****:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:FIX4****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:FIX4 &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:FIX4?

This command sets a fixed data type to be transmitted on the selected downlink dedicated transport channel (DCH).

While the variable &lt;val&gt; can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

**\*RST** #B0000**Range** 0–15**Key Entry** **FIX4****Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:NBLocks****Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:  
NBLocks <val>[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:  
NBLocks?

This command sets the number of blocks (NBLocks) transmitted by the selected downlink dedicated transport channel (DCH). The transport channel position affects the behavior of this command as described below.

Transport Channel Mode	Signal Generator Behavior
FLEXible	<p>Changing the number of blocks causes the signal generator to recalculate the block set size; <i>block size</i> remains constant. The equation is as follows:</p> $\text{number of blocks} \leq \text{block set size} \div \text{block size}$
FIXed	<p>Changing the number of blocks causes the signal generator to recalculate the block size; <i>block set size</i> remains constant. Changing the number of blocks also causes the ESG to generate a settings conflict error that is corrected when the signal generator recalculates the block size. The equation is as follows:</p> $\text{number of blocks} \leq \text{block set size} \div \text{block size}$
<b>*RST</b>	1
<b>Range</b>	1–64
<b>Field Entry</b>	# of Blocks
<b>Remarks</b>	<p>Refer to the “:DLINK[:TGRoup [A] B]:DCH[1] 2 3 4 5 6:POStion” command on <a href="#">page 1072</a> for information on setting the transport channel position.</p> <p>For information on the block size (BLKSize) and block set size (BSSize) commands, see “:DLINK[:TGRoup [A] B]:DCH[1] 2 3 4 5 6:BLKSize” on <a href="#">page 1066</a> and “:DLINK[:TGRoup [A] B]:DCH[1] 2 3 4 5 6:BSSize” on <a href="#">page 1067</a>.</p> <p>If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLy” on <a href="#">page 1021</a>.</p>

**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:POSITION**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK [ :TGRoup [A] | B ] :DCH [1] | 2 | 3 | 4 | 5 | 6 :
POSITION FLEXible | FIXed
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK [ :TGRoup [A] | B ] :DCH [1] | 2 | 3 | 4 | 5 | 6 :
POSITION?
```

This command selects a position for the data transmitted by the downlink dedicated transport channel (DCH).

The transport position selection, flexible or fixed, determines how the three block settings, block set size, block size, and number of blocks, for the transport channel are determined.

**FLEXible** This choice allows the signal generator to automatically set the block set size. The relationship between block set size, block size, and number of blocks is as follows:  
 $\text{block set size} = \text{number of blocks} \times \text{block size}$

**FIXed** This choice allows a user-defined block set size. The relationship between block set size, block size, and number of blocks is as follows:  
 $\text{block set size} \geq \text{number of blocks} \times \text{block size}$

**\*RST** FLEX

**Key Entry** **Transp Position Flexible Fixed**

**Remarks** For more information on the block parameters, refer to the “:DLINK[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:NBLocks” command on [page 1072](#), the “:DLINK[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BSSize” command on [page 1067](#) and the “:DLINK[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BLKSize” command on [page 1066](#).

**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:PPERcentage**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :DLINK [ :TGRoup [A] | B ] :DCH [1] | 2 | 3 | 4 | 5 | 6 :
PPERcentage?
```

This query returns the percentage of the total bits removed from or added to the fully coded channel.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:RMATCh****Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH [1] | 2 | 3 | 4 | 5 | 6 :  
RMATCh <val>[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH [1] | 2 | 3 | 4 | 5 | 6 :  
RMATCh?

This command sets the rate matching attribute.

**\*RST** 1**Range** 1–256**Field Entry** Rate Match Attr**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6:TTI****Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH [1] | 2 | 3 | 4 | 5 | 6 :  
TTI 10000 | 20000 | 40000 | 80000[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:DLINK[:TGRoup [A] | B]:DCH [1] | 2 | 3 | 4 | 5 | 6 :  
TTI?

This command sets the transmission time interval (TTI) allowed for the dedicated channel (DCH) to transmit.

The choices are expressed in units of milliseconds (msec) where 20000=20 msec.

**\*RST** 10000**Field Entry** TTI**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:DLINK:APPLY” on page 1021.

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:DLINK[:TGRoup [A] | B]:DCH[1] | 2 | 3 | 4 | 5 | 6[:STATe]****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 |
6[:STATe] ON|OFF|1|0
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:DLINK[:TGRoup[A] | B]:DCH[1] | 2 | 3 | 4 | 5 |
6[:STATe] ?
```

This command enables or disables the selected dedicated transport channel (DCH).

**\*RST** DCH 1: 1 DCH 2–6: 0**Key Entry** **TrCH State Off On**

**Remarks** DCH1 reset value cannot be turned off. The channels must be turned on sequentially. If one channel is turned off then all higher numbered channels will automatically be turned off.

If the parameter is changed, the apply command must be executed after the change. Refer to “[:DLINK:APPLY](#)” on page 1021.

**:LINK****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:LINK DOWN|UP
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:LINK?
```

This command sets the uplink or downlink mode.

**\*RST** DOWN**Key Entry** **Link Down Up****:POLarity[:ALL]****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:POLarity[:ALL] NORMal | INVert
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:POLarity[:ALL] ?
```

This command selects the polarity for the Q channel.

**NORMal** This choice selects normal phase polarity.

**INVert** This choice inverts the internal Q signal.

**\*RST** NORM**Key Entry** **Phase Polarity Normal Invert**



**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])**:ULINK:APPLy****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:APPLy

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:APPLy?

This command immediately starts the channel coding generation process according to the channel setup and data for the uplink physical and transport channels.

The query returns a response that determines whether or not the execution of the command is necessary. The response from the query is as follows:

1 This response is returned if the execution of the command is required.

0 This response is returned if the execution of the command is not required.

**\*RST** +0

**Key Entry** **Apply Channel Setup**

**:ULINK:AWGN:CN****Supported** E4438C with Option 400 and 403

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:AWGN:CN &lt;val&gt;

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:AWGN:CN?

This command sets the in band carrier to noise ratio. The noise is the total noise level of the in-channel.

The variable <val> is expressed in units of decibels (dB).

**\*RST** -1.80000000E+001

**Range** -30 to 30

**Field Entry** C/N value

**Remarks** In compressed mode, carrier power means normal frame power. A change in the C/N value will change the Eb/No value and vice versa.

**:ULINK:AWGN:CPOWer**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:AWGN:CPOWer?

This query returns the carrier power level when the additive white gaussian noise (AWGN) is on.

The power value is expressed in units of decibels (dBm/3.84 MHz).

**\*RST** -1.56957537E+002

**Field Entry** C Power

**Remarks** In compressed mode, carrier power means normal frame power.

**:ULINK:AWGN:DRATe**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:AWGN:DRATe?

This query returns the data rate of the Eb reference channel.

**\*RST** +1.22000000E+004

**Field Entry** Ref Data Rate

**:ULINK:AWGN:EBNO**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:AWGN:EBNO <val>

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:AWGN:EBNO?

This command sets the Eb/No ratio. The Eb is defined as the carrier power divided by the bit rate. No is noise power divided by the bandwidth (3.84MHz).

The variable <val> setting is affected by the carrier to noise ratio (C/N) and the data rate. A change to either of these values will affect your Eb/No setting. Use the formula in the range field to determine a correct Eb/No value.

**\*RST** +6.97971394E+000

**Range** Eb/No = C/N x 3.84MHz/Data Rate

**Field Entry** Eb/No value (dB)

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

**:ULINK:AWGN:EBRef**

**Supported** E4438C with Option 400 and 403

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:AWGN:EBRef DPCCh | DPDCh | DCH1 |
DCH2 | DCH3 | DCH4 | DCH5 | DCH6
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:AWGN:EBRef?
```

This command selects the Eb reference and it is used in the Eb/No value.

**DPCCh** This choice selects a dedicated physical control channel.

**DPDCh** This choice selects a dedicated physical data channel.

**DCH1** This choice select dedicated transport channel 1.

**DCH2** This choice select dedicated transport channel 2.

**DCH3** This choice select dedicated transport channel 3.

**DCH4** This choice select dedicated transport channel 4.

**DCH5** This choice select dedicated transport channel 5.

**DCH6** This choice select dedicated transport channel 6.

**\*RST** DCH1

**Key Entry** **DPCCH** **DPDCH** **DCH1** **DCH2**  
**DCH3** **DCH4** **DCH5** **DCH6**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:AWGN:FNBW**

**Supported** E4438C with Option 400 and 403

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:AWGN:FNBW?
```

This query returns the flat noise bandwidth (BW). Flat noise bandwidth is calculated by  $BW=(1.6) \times$  (Chip rate) and the result is close to the 0 dB roll-off point.

**\*RST** +6.14400000E+006

**Field Entry** Flat Noise BW

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****:ULINK:AWGN:NPOWer****Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:AWGN:NPOWer?

This query returns the in-channel noise level when the additive white gaussian noise (AWGN) is on.

The power value is expressed in units of decibels (dBm/3.84 MHz).

**\*RST** -1.38957537E+002**Field Entry** N Power**:ULINK:AWGN:TICPower****Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:AWGN:TICPower?

This query returns the total in-channel power (carrier with noise) as defined by the 3GPP standard.

**Field Entry** TotalPwr**Remarks** The total in-channel power is a sum of carrier power and in-channel noise power. Changing the noise related parameters such as C/N, Eb/No, and Eb Ref will cause a recalculation of the total in-channel power.

The maximum value returned by this query depends on the power option that is installed in the signal generator.

**:ULINK:AWGN[:STATe]****Supported** E4438C with Option 400 and 403

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:AWGN:STATe ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:AWGN:STATe?

This command enables or disables the additive white gaussian noise (AWGN). AWGN can only be turned on when DPCCH is selected as the physical channel. Refer to “:ULINK:PHYSical[1]:TYPE” on page 1100.

**\*RST** 0**Key Entry** Channel State Off On**Remarks** If the parameter is changed, the apply command must be executed after the change. Refer to “:ULINK:APPLY” on page 1075.

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:ULINK:CRATe****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:CRATe &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:CRATe?

This command sets the chip rate for the uplink configuration. The variable <val> is expressed in cycles per second (cps).

**\*RST** +3.8400000E+006**Range** 1E3–4.25E6**Field Entry** Chip Rate**Remarks** The chip rate is equivalent to the spreading rate of the channel.**:ULINK:DPCCh:BETA****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:BETA &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:BETA?

This command sets the beta value for the uplink dedicated physical control channel (DPCCH). The beta value and the power ratio are coupled. When the power ratio is updated, the beta value is converted to the beta ratio (amplitude ratio).

**\*RST** +11**Range** 0–15**Field Entry** Beta**Remarks** After this command is sent, the channel power level for the DPCCH is re-calculated. If the channel power is set directly, the beta value of this command becomes invalid and is reset to –1.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:DPCCh:CCODE****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:CCODE &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:CCODE?

This command sets the channelization code for the uplink dedicated physical control channel (DPCCH).

**\*RST** 0**Range** 0–255**Field Entry** Channel Code

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:DPCCh:DATA****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:DATA PN9 | PN15 | FIX4 |

"&lt;file name&gt;" | STD

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:DATA?

This command configures the data pattern for the uplink dedicated physical control channel (DPCCH).

**STD** This choice sets the DPCCH to use the bits field as defined by the slot format.

"<file name>" This variable specifies a data pattern that has been stored in memory.

**\*RST** STD**Key Entry** **PN9** **PN15** **FIX4** **User File** **3GPP STD**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])**:ULINK:DPCCh:DATA:FIX4**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:DATA:FIX4 <val>
```

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:DATA:FIX4?
```

This command sets the 4-bit data pattern of the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

**\*RST** #B0000

**Range** 0–15

**Key Entry** **FIX4**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:DPCCh:FBI:PATtern**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:FBI:PATtern PN9 | PN15 | FIX |  
"<file name>"
```

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:FBI:PATtern?
```

This command configures the pattern of the feedback information (FBI) for the uplink dedicated physical control channel (DPCCH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

**\*RST** FIX

**Key Entry** **PN9 PN15 FIX User File**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****:ULINK:DPCCh:FBI:PATtern:FIX**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:FBI:PATtern:FIX <val>

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:FBI:PATtern:FIX?

This command sets the 30-bit feedback information (FBI) pattern for the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only decimal values.

**\*RST** +0

**Range** 0–10737418235

**Key Entry** **FIX**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:DPCCh:FBI[:STATe]**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:FBI [ :STATe ] ?

This query returns whether or not the feedback information (FBI) bits are included in the uplink dedicated physical control channel (DPCCH). The FBI is included when a status of one is returned. A zero indicates no FBI.

**\*RST** 0

**Range** N/A

**Field Entry** FBI State



**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:ULINK:DPCCh:POWer**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:POWer <val>

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:POWer?

This command sets the power level for the uplink dedicated physical control channel (DPCCH).

The variable <val> is expressed in units of decibels (dB).

**\*RST** -2.69000000E+000

**Range** -40 to 0

**Field Entry** DPCCH Power

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:DPCCh:RATE**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:RATE?

This query returns the symbol rate for the uplink dedicated physical control channel (DPCCH).

**\*RST** +1.50000000E+004

**Field Entry** Symbol Rate

**:ULINK:DPCCh:SLOTformat**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:SLOTformat <val>

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:SLOTformat?

This command sets the slot format for the uplink dedicated physical control channel (DPCCH). The variable <val> is expressed in unit of bits.

**\*RST** +0

**Range** 0–5

**Field Entry** Slot Format

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:DPCCh:TFCI:PATtern**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:TFCI:PATtern PN9 | PN15 | FIX |
"<file name>"
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:TFCI:PATtern?
```

This command configures the transport format combination indicator (TFCI) bit pattern for the uplink dedicated physical control channel (DPCCH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

**\*RST** FIX

**Key Entry** **PN9 PN15 FIX User File**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:DPCCh:TFCI:PATtern:FIX**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:TFCI:PATtern:FIX <val>
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:DPCCh:TFCI:PATtern:FIX?
```

This command sets the transport format combination indicator (TFCI) 10-bit data pattern for the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only decimal values.

**\*RST** +0

**Range** 0–1023

**Field Entry** TFCI Pattern

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:ULINK:DPCCh:TFCI[:STATe]****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TFCI[:STATe] ?

This query returns the status of the transport format combination indicator (TFCI) for the uplink dedicated physical control channel (DPCCH).

**\*RST** 1**Range** N/A**Field Entry** TFCI State**:ULINK:DPCCh:TPC:NSTeps****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:NSTeps &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:NSTeps?

This command sets the number of steps to increase or decrease the transmit power control (TPC) for the uplink dedicated physical control channel (DPCCH).

The variable <val> is expressed in units of decibels (dB).

**\*RST** +1**Range** 1–80**Field Entry** TPC Pat Steps**Remarks** Refer to “:ULINK:DPCCh:TPC:PATtern” on page 1086.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:DPCCh:TPC:PATtern****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern PN9 | PN15 | FIX4 |
"<file name>" | UDOW | DUP | UALL | DALL
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern?
```

This command configures the transmit power control (TPC) pattern for the uplink dedicated physical control channel (DPCCH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

UDOW This choice repetitively steps up and down the TPC pattern.

DUP This choice repetitively steps down and up the TPC pattern.

UALL This choice consecutively steps up the TPC pattern.

DALL This choice consecutively steps down the TPC pattern.

**\*RST** PN9

**Key Entry** **PN9 PN15 FIX4 "<file name>" Up/Down Down/Up All Up**

**All Down**

**Remarks** Refer to [“:ULINK:DPCCh:TPC:NSTeps” on page 1085](#).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:ULINK:DPCCh:TPC:PATtern:FIX4****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:FIX4 &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:FIX4?

This command sets the transmit power control (TPC) 4 bit data pattern for the uplink dedicated physical control channel (DPCCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

**\*RST** #B0000**Range** 0–15**Field Entry** TPC Pattern

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:DPCCh:TPC:PATtern:TRIGger:POLarity****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:TRIGger:POLarity POSitive|NEGative

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:TRIGger:POLarity?

This command sets the transmit power control (TPC) pattern trigger polarity for the uplink dedicated physical control channel (DPCCH).

**POSitive** This choice sets the pattern signal to trigger when the signal is high.**NEGative** This choice sets the pattern signal to trigger when the signal is low.**\*RST** POS**Key Entry** **TPC Pat Trig Polarity Neg Pos**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:DPCCh:TPC:PATtern:TRIGger[:STATe]**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:
TRIGger[:STATe] ON|OFF|1|0
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPC:PATtern:
TRIGger[:STATe]?
```

This command enables or disables the transmit power control (TPC) pattern trigger state for the uplink dedicated physical control channel (DPCCH).

**\*RST** 0

**Field Entry** TPC UserFile Trig

**Remarks** The TPC pattern trigger input is located on the AUX I/O connector (ALT PWR IN, pin#16). For more information about the rear panel AUX I/O connector, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*. If the parameter is changed, the apply command must be executed after the change. Refer to "[:ULINK:APPLY](#)" on page 1075.

**:ULINK:DPCCh:TPOWer**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPCCh:TPOWer?
```

This query returns the "Total Power" value displayed on the user interface (UI). The power value is the relative power difference between the total in-channel signal power and the active channel reference power (0dB).

**\*RST** +0.00000000E+000

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to "[:ULINK:APPLY](#)" on page 1075.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

**:ULINK:DPCCh[:STATe]****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:DPCCh[:STATe] ON|OFF|1|0

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:DPCCh[:STATe] ?

This command enables or disables the operating state for the uplink dedicated physical control channel (DPCCH).

**\*RST** 1**Field Entry** Channel State

**Remarks** If the parameter is changed, the apply command must be executed after the change. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:DPDCh:BETA****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:DPDCh:BETA &lt;val&gt;

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:DPDCh:BETA?

This command sets the beta value for uplink dedicated physical data channel (DPDCH).

**\*RST** +15**Range** 0–15**Field Entry** Beta

**Remarks** The beta value and power ratio are coupled. After this command is sent, the value of the channel power level of the DPDCH is re-calculated.

If the channel power is set directly, the value of this command becomes invalid and is set to –1.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:DPDCh:CCODE**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:CCODE <val>
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:CCODE?
```

This command sets the channelization code for the uplink dedicated physical data channel (DPDCH). There are commands that are associated with the channelization code and they are the slot format and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-4 on page 1090](#).

**Table 9-4 Channelization Code Maximum Value**

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120
15	4	240
7	5	780
3	6	960

**\*RST** +16

**Range** 0–255

**Field Entry** Channel Code

**Remarks** Refer to “:ULINK:DPDCh:SLOTformat” on page 1094 and “:ULINK:DPDCh:RATE” on page 1092. If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.



## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**:ULINK:DPDCh:DATA**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:DATA PN9 | PN15 | FIX4 |
"<file name>" | TRANspch
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:DATA?
```

This command configures the data pattern of the uplink dedicated physical data channel (DPDCH).

**TRANspch** This choice sets the data that is generated from the transport channel setup.

"<file name>" This variable specifies a data pattern that has been stored in memory.

**\*RST** TRAN

**Key Entry** **PN9 PN15 FIX4 User File Transport CH**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:DPDCh:DATA:FIX4**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:DATA:FIX4 <val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:DATA:FIX4?
```

This command sets the fixed 4-bit binary data for the uplink dedicated physical data channel (DPDCH).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

**\*RST** #B0000

**Range** 0–15

**Field Entry** Data

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:DPDCh:POWer****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:POWer &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:POWer?

This command sets the power level for the uplink dedicated physical data channel (DPDCH).

The variable <val> is expressed in units of decibels (dB).

**\*RST** +0.00000000E+000**Range** -40 to 0**Field Entry** DPDCH Power

**Remarks** The power ratio and the beta value are coupled. After the beta value is specified and sent, the value of the channel power level of the DPDCH is re-calculated.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:DPDCh:RATE****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:RATE &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:RATE?

This command sets the symbol rate for the uplink dedicated physical data channel (DPDCH). There are commands that are associated with the symbol rate and they are the channelization code and the slot format.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-5](#).

**Table 9-5 Channelization Code Maximum Value**

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**Table 9-5 Channelization Code Maximum Value**

Channelization Code	Slot Format	Symbol Rate
63	2	60
31	3	120
15	4	240
7	5	780
3	6	960

The variable <val> is expressed in units of kilo symbols per second (ksps).

**\*RST** +6.00000000E+004

**Range** 15000–960000

**Field Entry** Symbol Rate

**Remarks** Refer to “:ULINK:DPDCh:CCODE” on page 1090 and “:ULINK:DPDCh:RATE” on page 1092. If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:DPDCh:RBER**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :ULINK:DPDCh:RBER?

This query returns inserted error bit rate which is specified by the transport channel cycle length and transport channel error length commands.

Inserted error bit rate is calculated by the following formula:  $\text{TrCH BER ErrLen} / \text{TrCH BER Cycle}$ . Refer to “:ULINK:DPDCh:TBER[:CLENGTH]” on page 1095 and “:ULINK:DPDCh:TBER:ELENGTH” on page 1095.

**\*RST** 0.0

**Field Entry** TrCH BER

**:ULINK:DPDCh:SLOTformat****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:SLOTformat &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:SLOTformat?

This command sets the slot format for the uplink dedicated physical data channel (DPDCH).

There are commands that are associated with the slot format and they are the channelization code and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-6 on page 1094](#).

**Table 9-6 Channelization Code Maximum Value**

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120
15	4	240
7	5	780
3	6	960

**\*RST** +2**Range** 0–6**Field Entry** Slot Format

**Remarks** Refer to “:ULINK:DPDCh:CCODE” on page 1090 and “:ULINK:DPDCh:RATE” on page 1092. If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**:ULINK:DPDCh:TBER[:CLENGTH]****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPDCh:TBER[:CLENGTH] &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPDCh:TBER[:CLENGTH] ?

This command sets the cycle length of the Transport Channel BER insertion of dedicated physical channel (DPCH).

**\*RST** 0**Range** 0–65535**Field Entry** TrCH BER Cycle

**Remarks** A zero in the TrCH BER Cycle field, disables the error insertion function (error rate equals 0%).

**:ULINK:DPDCh:TBER:ELENGTH****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPDCh:TBER:ELENGTH &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:DPDCh:TBER:ELENGTH?

This command sets the error length of the Transport Channel BER.

**\*RST** 0**Range** 0–4095**Field Entry** TrCH BER ErrLen

**Remarks** The Transport Channel BER error length must be smaller than or equal to the Transport Channel BER cycle length.

The TrCH ELEN (transport channel error length) is truncated by the TrCH CLEN (transport channel cycle length) when the TrCH BER cycle length is smaller than TrCH BER length.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****:ULINK:DPDCh:TPOWer****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh:TPOWer?

This query returns the “Total Power” value displayed on the user interface (UI). The power value is the relative power difference between the total in-channel signal power and the active channel reference power (0dB).

**\*RST** +0**:ULINK:DPDCh[:STATe]****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh[:STATe] ON|OFF|1|0

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:DPDCh[:STATe] ?

This command enables or disables the operating state for the uplink dedicated physical data channel (DPDCH).

**\*RST** 1**Field Entry** Channel State

**Remarks** If the parameter is changed, the apply command must be executed after the change. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:FCLock:INTerval****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:FCLock:INTerval FCL10|FCL20|FCL40|FCL80|FCL2560

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:FCLock:INTerval ?

This command selects the frame clock interval supplied to the source.

The frame clock interval is set in units of milliseconds (msec).

**\*RST** FCL80**Key Entry** 10 msec 20 msec 40 msec 80 msec 2560 msec

**Remarks** This command is not used when the sync source is set to ESG. Refer to “:ULINK:SYNC[:SOURCE]” on page 1152.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**:ULINK:FCLOCK:POLARITY**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:FCLOCK:POLARITY POSITIVE|NEGATIVE
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:FCLOCK:POLARITY?
```

This command sets the polarity of the frame clock for the uplink synchronization source.

**POSITIVE** This choice sets the clock gate to trigger when the signal is high.

**NEGATIVE** This choice sets the clock gate to trigger when the signal is low.

**\*RST** POS

**Key Entry** **Frame Clock Polarity Neg Pos**

**Remarks** This command is not used when the sync source is set to ESG. Refer to “:ULINK:SYNC[:SOURCE]” on page 1152.

**:ULINK:FILTER**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:FILTER RNYQUIST|NUQUIST|GAUSSIAN|
RECTANGLE|IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4FM| UGGAUSSIAN|
"<user FIR>"
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:FILTER?
```

This command selects the filter type for the uplink configuration.

**IS95** This choice selects a filter that meets the criteria of the IS-95 standard.

**IS95\_EQ** This choice selects a filter which is a combination of the IS-95 filter (above) and the equalizer filter described in the IS-95 standard. This filter is only used for IS-95 baseband filtering.

**IS95\_MOD** This choice selects a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance) with lower passband rejection than the filter specified in the IS-95 standard.

**IS95\_MOD\_EQ** This choice selects a filter which is a combination of the equalizer filter described in the IS-95 standard and a filter that meets the criteria of the IS-95 error function (for improved adjacent channel performance), with lower passband rejection.

**AC4Fm** This choice selects a predefined Association of Public Safety Communications Officials (APCO) specified compatible 4-level frequency modulation (C4FM) filter.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

<b>UGGaussian</b>	This choice selects a backwards compatible GSM Gaussian filter (Gaussian filter with a fixed BbT value of 0.300) for the ESG E44xxB Option UN3 or UN4.
"<user FIR>"	This variable is any filter file that you have stored into memory.
<b>*RST</b>	RNYQ
<b>Key Entry</b>	<b>Root Nyquist      Nyquist      Gaussian      Rectangle      IS-95      IS-95 w/EQ</b> <b>IS-95 Mod      IS-95 Mod w/EQ      APCO 25 C4FM      UN3/4 GSM Gaussian</b> User FIR
<b>Remarks</b>	Refer to <a href="#">“File Name Variables” on page 13</a> for information on the file name syntax.

**:ULINK:FILTER:ALPHA**

**Supported**      E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FILTER:ALPHA <val>

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FILTER:ALPHA?

This command changes the alpha value for the Nyquist or root Nyquist filter.

**\*RST**      +2.20000000E-001

**Range**      0.000–1.000

**Key Entry**      **Filter Alpha**

**Remarks**      This command is effective only after a root Nyquist or Nyquist filter is selected; it does not affect other types of filters.

To change the current filter type, refer to [“:ULINK:FILTER” on page 1097](#).



**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:ULINK:FILTer:BBT**

**Supported** E4438C with Option 400

[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FILTer:BBT <value>

[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FILTer:BBT?

This command changes the bandwidth-multiplied-by-bit-time filter parameter value for the Gaussian filter.

**\*RST** +5.00000000E-001

**Range** **0.000–1.000**

**Key Entry** **Filter BbT**

**Remarks** This command is effective only after a Gaussian filter is selected; it does not affect other types of filters.

To change the current filter type, refer to “[:ULINK:FILTer]” on page 1097.

**:ULINK:FILTer:CHANnel**

**Supported** E4438C with Option 400

[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FILTer:CHANnel EVM|ACP

[ :SOURce ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:FILTer:CHANnel?

This command optimizes a filter for minimized error vector magnitude (EVM) or for minimized adjacent channel power (ACP).

**EVM** This choice provides the most ideal passband.

**ACP** This choice improves stopband rejection. This feature only applies to root Nyquist and Nyquist filters.

**\*RST** EVM

**Key Entry** **Optimize FIR For EVM ACP**

**Remarks** To change the current filter type, refer to “[:ULINK:FILTer]” on page 1097.

**:ULINK:FOFFset**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:FOFFset <val>
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:FOFFset?
```

This command sets the SFN-CFN frame number offset. The command adds in delays of the internal frame counter by specifying the starting frame number count.

When the FOFFset is set to “0,” the frame number starts at the system sync trigger.

An example of specifying a frame number count: Set the FOFFset to 2. This makes the signal generator to trigger 2 frames after the SFN RST.

**\*RST** 0

**Range** 0–255

**Key Entry** SFN-CFN Frame Offset

**Remarks** For additional information, refer to 3GPP TS25.402 for SFN and CFN relationship.

**:ULINK:PADJust**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PADJust EQUal|SCALE
```

This command adjusts the code domain power levels of all uplink channels.

**EQUal** This choice will adjust all channel powers to equal power settings.

**SCALE** This choice will scale the channel power levels so that the sum of the powers are equal to 0 dB.

**Key Entry** Equal Powers Scale To 0dB

**:ULINK:PHYSical[1]:TYPE**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PHYSical[1]:TYPE PRACH|DPCCCh
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PHYSical[1]:TYPE?
```

This command sets the physical channel type.

**PRACH** This choice selects a physical random access channel type.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**DPCCh** This choice selects a dedicated physical control channel type.

**\*RST** DPCC

**Key Entry** **PRACH DPCC**

**:ULINK:PMODE:TPControl:HOLD**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:HOLD 1|0|ON|OFF
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:HOLD?
```

This command sets the transmission power control of the dedicated physical channel (DPCH).

**ON** This choice enables the power hold mode.

**OFF** This choice disables the power hold mode and enables the dynamic power control

**\*RST** 1

**Key Entry** **Power Hold Off On**

**Remarks** The power hold mode is automatically enabled when the dedicated physical channel (DPCH) **Power Mode Norm TPC** is set to **TPC** (refer to “[:ULINK:PMODE[:SElect]]” on page 1104).

**:ULINK:PMODE:TPControl:POWer:INITial**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:POWer:
```

```
INITial <val>
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:POWer:INITial?
```

This command sets the initial power (in dB; relative to Max Power: 0.00 dB) of the DPCH power control.

**\*RST** +0.00000000E+000

**Range** 0 to -40

**Field Entry** Init Power

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

<b>Remarks</b>	<p>If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.</p> <p>The value of &lt;val&gt; must be smaller or equal to the value use for the command: “:ULINK:PMODE:TPControl:POWER:MINimum” on page 1102. Init Power is relative to Max Power (the amplitude set on the signal generator). For more information refer to “:ULINK:PMODE:TPControl:POWER:MAXimum” on page 1102.</p>
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**:ULINK:PMODE:TPControl:POWER:MAXimum**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:POWER:MAXimum?
```

This query returns the maximum power (in dB; relative to Max Power) of the dedicated physical channel (DPCH).

Max Power is a grayed out field that will always be 0.00 dB. The value of this field is a relative value to the maximum amplitude set for the signal generator. For example, if the signal generator amplitude is set to -20 dBm, the Min Power set to -40 dB, and the Init Power is set to -10 dB, then the absolute initial power level will be -30 dBm (10 dBm below the signal generator amplitude) and the absolute minimum power will be -60 dBm (40 dBm below the signal generator amplitude).

**\*RST** +0.00000000E+000

**Field Entry** Max Power

**Remarks** The value of this query will always be zero. The maximum power is mapped to the actual RF output power.

**:ULINK:PMODE:TPControl:POWER:MINimum**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:POWER:MINimum <val>
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:POWER:MINimum?
```

This command sets the minimum power of the dedicated physical channel (DPCH). The variable <val> is expressed in units of dB.

**\*RST** -4.00000000E+001

**Range** -40 to 0

**Field Entry** Min Power

**Wideband CDMA Base Band Generator Subsystem—Option 400** [:SOURCE]:RADIo:WCDMa:TGPP[:BBG]

<b>Remarks</b>	<p>If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.</p> <p>The minimum power is decreased in increments determined by the value set for the Power Step. Refer to “:ULINK:PMODE:TPControl:POWer:STEP” on page 1103. Minimum power is limited by the amplitude set on the signal generator. The signal generator amplitude must be set to -96 dBm or lower for the minimum power to be set to -40 dB. For more information, refer to “:ULINK:PMODE:TPControl:POWer:MAXimum” on page 1102.</p>
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**:ULINK:PMODE:TPControl:POWer:RESet**

<b>Supported</b>	E4438C with Option 400
	[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:POWer:RESet
	[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:POWer:MINimum?

This command resets the transmit power of the dedicated physical channel (DPCH) to the initial power.

**Key Entry**            **Reset to Initial Power**

<b>Remarks</b>	When the DPCH power mode is changed to TPControl, this command is performed. Refer to “:ULINK:PMODE[:SElect]” on page 1104 to select the power mode. Any time the power mode is changed, the start power is always set to the initial power.
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**:ULINK:PMODE:TPControl:POWer:STEP**

<b>Supported</b>	E4438C with Option 400
	[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:POWer:STEP DB0_5 DB1_0 DB2_0 DB3_0
	[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:POWer:STEP?

This command set the power step of the dedicated physical channel (DPCH) power control. Initial power can only be increased in steps set by the power step.

**\*RST**                DB0\_5

**Key Entry**            Power Step

<b>Remarks</b>	If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.
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**:ULINK:PMODE:TPControl:TRIGger:POLarity****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:TRIGger:  
POLarity POSitive|NEGative

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE:TPControl:TRIGger:POLarity?

This command sets the uplink dedicated physical channel (DCPH) transmit power control signal polarity.

**\*RST** POS**Key Entry** Power Control Signal Polarity Neg Pos**:ULINK:PMODE[:SElect]****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE[:SElect] NORMal|TPControl  
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PMODE[:SElect]?

This command sets the dedicated physical channel (DPCH) power control mode.

**NORMal** This choice selects the normal power mode. Compressed frames are available.

**TPC** This choice selects the TPC power mode. Compressed gaps are not available.

**\*RST** NORM**Key Entry** Power Mode Norm TPC**:ULINK:PRACH:AICH:NUMBER****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:AICH:NUMBER?

This query returns the number of received acquisition indication channel (AICH) trigger during one configured physical random access channel (PRACH) signal generation.

The result value can be queried after the PRACH signal generation is completed and until the next PRACH generation trigger is received.

The signal begins when the PRACH start trigger and ends when the specified number of signals are generated.

To specify a number of PRACHs, refer to “:ULINK:PRACH[:SINGLE]:PREamble:NUMBER” on [page 1134](#).

**\*RST** -1

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**Field Entry**            Number of AICH  
**Remarks**              A -1 status represents a PRACH generation is on going.

**:ULINK:PRACH:AICH:POLarity**

**Supported**            E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:AICH:
POLarity POSition|NEGative
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:AICH:POLarity?
```

This command sets the trigger signal polarity for the acquisition indication channel (AICH).

**POSitive**            This choice sets the signal polarity to trigger when the signal goes high.

**NEGative**            This choice sets the signal polarity to trigger when the signal goes low.

**\*RST**                POS

**Key Entry**            **AICH Trigger Polarity Pos Neg**

**Remarks**            If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#)

**:ULINK:PRACH:AWGN:CN**

**Supported**            E4438C with Option 400 and 403

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:AWGN:CN <val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:AWGN:CN?
```

This command sets the in band carrier to noise ratio.

The variable <val> is expressed in units of decibels (dB).

**\*RST**                -2.25005194E+001

**Range**                -30 to 30

**Field Entry**            C/N value

**Remarks**            A change in the C/N value will change the Eb/No value and vice versa.

**:ULINK:PRACH:AWGN:CPOWer****Supported** E4438C with Option 400 and 403

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH:AWGN:CPOWer?

This query returns the carrier power level when the physical random access channel's (PRACH) additive white gaussian noise (AWGN) is on.

**\*RST** -1.61435521E+002**Field Entry** C Power**:ULINK:PRACH:AWGN:DRATe****Supported** E4438C with Option 400 and 403

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH:AWGN:DRATe?

This query returns the data rate of the Eb reference channel.

**\*RST** +1.22000000E+004**Field Entry** Ref Data Rate**:ULINK:PRACH:AWGN:EBNO****Supported** E4438C with Option 400 and 403

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH:AWGN:EBNO &lt;val&gt;

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH:AWGN:EBNO?

This command sets the Eb/No value. The Eb is defined as carrier divided by the bit rate. No is noise power divided by the bandwidth (3.84 MHz). This ratio is only referred when EREF is CONTrol or DATA.

The variable <val> setting is affected by the carrier to noise ratio (C/N) and the data rate. A change to either of these values will affect your Eb/No setting. Use the formula in the range field to determine a correct Eb/No value.

**\*RST** +4.10000000E+000**Range** Eb/No = C/N x 3.84MHz/DataRate**Field Entry** Eb/No



**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIo:WCDMA:TGPP[:BBG])**:ULINK:PRACH:AWGN:ECNO**

**Supported** E4438C with Option 400 and 403

```
[ :SOURCE ] :RADIo:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:AWGN:ECNO <val>
```

```
[ :SOURCE ] :RADIo:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:AWGN:ECNO?
```

This command sets the  $E_c/N_o$  value. The  $E_c$  is defined as carrier divided by the chip rate.  $N_o$  is the noise power divided by the bandwidth (3.84 MHz). This ratio is only referred when EREF is PREamble.

**\*RST** -2.05000000E+001

**Range** -30 to 30

**Field Entry**  $E_c/N_o$  value

**:ULINK:PRACH:AWGN:EREF**

**Supported** E4438C with Option 400 and 403

```
[ :SOURCE ] :RADIo:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:AWGN:EREF PREamble |  
CONTrol | DATA | RACH
```

```
[ :SOURCE ] :RADIo:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:AWGN:EREF?
```

This command selects the  $E_b$  ( $E_c$ ) reference. It is used for specifying the bit (chip) rate of physical/transport channel.

**PREamble** This choice selects a preamble part as the  $E_c/N_o$  reference.

**CONTrol** This choice selects a message control part as the  $E_b/N_o$  reference.

**DATA** This choice selects a message data part as the  $E_b/N_o$  reference.

**RACH** This choice selects a random access channel as the  $E_b/N_o$  reference.

**\*RST** RACH

**Key Entry** **Preamble** Msg Ctrl Msg Data **RACH TrCH**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH:AWGN:NPOWER**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:AWGN:NPOWER?

This query returns the in-channel noise level when the additive white gaussian noise (AWGN) is on.

**\*RST** -1.38935002E+002

**Field Entry** N Power

**:ULINK:PRACH:AWGN:TICPower**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:AWGN:TICPOWER?

This query returns the in-channel power within the 3.84 MHz bandwidth.

**\*RST**           **DPCH:**   -1.38924800E+002  
                   **Single PRACH:**   -1.38924800E+002  
                   **Multiple PRACH:**   -1.56970651E+002

**Field Entry** TotalPwr

**:ULINK:PRACH:AWGN[:STATe]**

**Supported** E4438C with Option 400 and 403

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:AWGN [ :STATe ] ON | OFF | 1 | 0  
 [ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:AWGN [ :STATe ] ?

This command enables or disables the additive white gaussian noise (AWGN) for the physical random access channel (PRACH). The AWGN can only be turned on when PRACH is selected as the physical channel.

**\*RST** 0

**Key Entry** Channel State Off On

**Remarks** Refer to “:ULINK:PHYSical[1]:TYPE” on page 1100.

If the parameter is changed, the apply command must be executed after the change. Refer to “:ULINK:APPLY” on page 1075.

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**:ULINK:PRACH:MESSAge:CPART:BETA**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:MESSAge:CPART:BETA <val>
```

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:MESSAge:CPART:BETA?
```

This command sets the beta ratio (amplitude ratio) for the physical random access channel (PRACH) message control part. The variable <val> is an integer value.

Changing the control power value (see “:ULINK:PRACH:MESSAge:CPART:POWer” on page 1110 for information on setting PRACH control power) changes the beta to power ratio, and the ESG may not be able to compute a proper control beta value. If this occurs, the query will return a minus one (-1).

**\*RST** +11

**Range** 0–15

**Field Entry** Ctrl Beta

**Remarks** A change to the beta value will also cause a change to the control power setting.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH:MESSAge:CPART:DATA**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:MESSAge:CPART:DATA PN9 |
PN15 | FIX4 | "<file name>" | STD
```

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:MESSAge:CPART:DATA?
```

This command selects the data type to be inserted into the physical random access channel (PRACH) message control part.

**STD** This choice selects a slot format defined in the 3GPP standard.

"<file name>" This variable specifies a data pattern that has been stored in memory.

**\*RST** STD

**Key Entry** **PN9** **PN15** **FIX4** **User File** **3GPP STD**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH:MESSAge:CPARt:DATA:FIX4**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:MESSAge:CPARt:DATA:
FIX4 <val>
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:MESSAge:CPARt:DATA:FIX4?
```

This command sets a fixed 4 bit pattern for use as physical random access channel (PRACH) message part data.

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

**\*RST** #B0000

**Range** 0–15

**Key Entry** **Fix4**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:PRACH:MESSAge:CPARt:POWer**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:MESSAge:CPARt:POWer <val>
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:MESSAge:CPARt:POWer?
```

This command sets the power level for the physical random access channel (PRACH) message control part.

The variable <val> is expressed in units of decibels (dB).

**\*RST** -2.69000000E+000

**Range** -40 to 0

**Field Entry** Ctrl Pwr

**Remarks** Changing the control power changes the beta to power ratio. Refer to [“:ULINK:PRACH:MESSAge:CPARt:BETA” on page 1109](#) for more information.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#)

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:ULINK:PRACH:MESSAge:CPARt:RATE****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:CPARt:RATE?

This query returns the message data part symbol rate for the physical random access channel (PRACH).

**\*RST** +1.50000000E+004**Key Entry** **Symbol Rate**

**Remarks** The symbol rate of 15 kbps is the only supported rate per the 3GPP standards, TS 25.211 v3.10 (2002-03).

**:ULINK:PRACH:MESSAge:CPARt:SLOTformat****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:CPARt:SLOTformat?

This query returns the message control part slot format for the physical random access channel (PRACH).

**\*RST** 0**Range** 0–3**Field Entry** Slot Format

**Remarks** The slot format is a static value set to zero in accordance with the 3GPP standards, TS 25.211 v3.10 (2002-03).

**:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern PN9|PN15|FIX|"&lt;file name&gt;"

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern?

This command selects data type to be inserted into the transport format combination indicator (TFCI) of the message control part located in the physical random access channel (PRACH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

**\*RST** FIX**Key Entry** **PN9** **PN15** **FIX** **User File**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern:FIX****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern:FIX &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRCh:MESSAge:CPARt:TFCI:PATtern:FIX?

This command sets a fixed bit pattern to be inserted into the transport format combination indicator (TFCI).

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only decimal values.

**\*RST** +0**Range** 0–1023**Field Entry** TFCI Pattern

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:ULINK:PRACH:MESSAge:CPARt:TFCI[:STATe]****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:CPARt:TFCI[:STATe]?

This query returns the transport format combination indicator (TFCI) bits to determine if they exist or not in the currently specified slot format. A query returned with a “1” determines a TFCI exists and a “0,” no bits exist.

**\*RST** 1**Field Entry** TFCI State**:ULINK:PRACH:MESSAge:DPARt:BETA****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPARt:BETA &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPARt:BETA?

This command sets the beta ratio (amplitude ratio) for the message data part of the physical random access channel (PRACH).

The variable <val> is an integer value. Changing the data power value (refer to, “:ULINK:PRACH:MESSAge:DPARt:POWer” on page 1115 for more information on setting PRACH data power) changes the beta to power ratio, and the signal generator may not be able to compute a proper data beta value. If this occurs, the query will return a minus one (-1).

**\*RST** +15**Range** 0–15**Field Entry** Data Beta**Remarks** A change to the beta value will also cause a change to the data power setting.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH:MESSAge:DPART:DATA**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:DATA PN9 |
PN15|FIX4|"<file name>"|TRANspch
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:DATA?
```

This command sets the data type to be inserted into physical random access channel (PRACH) message data part.

**TRANspch** This choice sets the data that is generated from the transport channel setup.

"<file name>" This variable specifies a data pattern that has been stored in memory.

**\*RST** TRAN

**Key Entry** **PN9 PN15 FIX4 User File Transport CH**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:PRACH:MESSAge:DPART:DATA:FIX4**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:DATA:
FIX4 <val>
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:DATA:FIX4?
```

This command sets a pseudo-random pattern as output data type in the message data part of the physical random access channel (PRACH).

While the variable <val> is expressed in binary or decimal formats, the query returns only binary values.

**\*RST** #B0000

**Range** 0∠15

**Key Entry** **FIX4**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).



## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**:ULINK:PRACH:MESSAge:DPART:POWer****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:POWer &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:POWer?

This command sets the power level for the physical random access channel (PRACH) message data part.

The variable <val> is expressed in units of decibels (dB).

**\*RST** +0.00000000E+000**Range** -40 to 0**Field Entry** Data Pwr

**Remarks** Changing the data power changes the beta to power ratio. Refer to [“:ULINK:PRACH:MESSAge:DPART:BETA” on page 1113](#) for more information.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#)

**:ULINK:PRACH:MESSAge:DPART:RATE****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:RATE &lt;val&gt;

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:PRACH:MESSAge:DPART:RATE?

This command sets the symbol rate for the message data part of the physical random access channel (PRACH).

There are commands that are associated with the symbol rate and they are the channelization code and the slot format.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-7](#).

**Table 9-7 Channelization Code Maximum Value**

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120

The variable <val> is expressed in units of kilo symbols per second (ksps).

**\*RST** 60

**Range** 15–120

**Field Entry** Symbol Rate

**Remarks** Channel code value is determined by slot format choice. Refer to “:ULINK:PRACH:MESSAge:DPART:SLOTformat” on page 1116 and “:ULINK:PRACH[:SINGLE]:MESSAge:DPART:CCODE” on page 1132.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

### :ULINK:PRACH:MESSAge:DPART:SLOTformat

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK: PRACH:MESSAge:DPART :
SLOTformat <val>
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK: PRACH:MESSAge:DPART :SLOTformat?
```

This command sets the slot format value for the message data part of the physical random access channel (PRACH).

There are commands that are associated with the slot format and they are the channelization code and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceed the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-8](#).

**Table 9-8 Channelization Code Maximum Value**

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120

The variable <val> is expressed in units of kilo symbols per second (ksps).

**\*RST** 2

**Range** 0–3

**Field Entry** Slot Format

**Remarks** Refer to “[:ULINK:PRACH:MESSAge:DPARt:RATE]” on page 1115 and “[:ULINK:PRACH[:SINGLE]:MESSAge:DPARt:CCODE]” on page 1132.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “[:ULINK:APPLY]” on page 1075.

### **[:ULINK:PRACH:MODE[:SElect]]**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MODE[:SElect] SINGLE|MULTI
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MODE[:SElect]?
```

This command sets the channel mode of the physical random access channel (PRACH).

**SINGLE** This choice generates a single PRACH.

**MULTI** This choice generates up to eight PRACHes.

**\*RST** SING

**Key Entry** **PRACH Mode**    **Single**    **Multi**

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:ULINK:PRACH:MULTi:MESSAge:TPOWer****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:MESSAge:TPOWer &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:MESSAge:TPOWer?

This command sets the message total power value in the physical random access channel (PRACH). The total power indicates a power of one PRACH.

**\*RST** -1.54060000E+002**Range** -1.00 to 1.94**Field Entry** Msg Pwr

**Remarks** This value is used only when POWER:MODE is set to TOTAL. Refer to “:ULINK:PRACH:PREAmble:POWer:MODE” on page 1124.

The maximum power for this command is limited by the power of the signal generator (ESG maximum power – 18.06 dBm). If the signal generator power is set to +20 dBm, the maximum value of this command is +1.94 dBm.

**:ULINK:PRACH:MULTi:MESSAge[:STATe]****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:MESSAge[:STATe]

ON|OFF

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:MESSAge[:STATe]?

This command enables or disables the message part of the physical random access channel (PRACH) for the multiple PRACH mode.

**\*RST** ON**Field Entry** Message Part**:ULINK:PRACH:MULTi:NUMBer****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:NUMBer &lt;val&gt;|INFINITY

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:NUMBer?

This command specifies the number of the physical random access channel (PRACH) 80 ms configuration patterns to be transmitted after the PRACH start trigger has been received.

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

<b>INFINITY</b>	This choice means the repeating number will continue while the PRACH mode is selected and the start trigger is ignored.
<b>*RST</b>	1
<b>Range</b>	1–2147447836
<b>Field Entry</b>	Number of 80ms
<b>Remarks</b>	If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH:MULTi:PREamble:NUMBER**

<b>Supported</b>	E4438C with Option 400
	[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:MULTi:PREamble:NUMBER?

This query returns the number of Preambles on the multiple physical random access channel (PRACH) mode. This number is fixed to 1 in the current version.

<b>*RST</b>	1
<b>Field Entry</b>	Num of Pre

**:ULINK:PRACH:MULTi:PREamble:POWER:INITIAL**

<b>Supported</b>	E4438C with Option 400
	[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:MULTi:PREamble:POWER:INITIAL?

This query returns the initial power of PRACH preambles on the multiple physical random access channel (PRACH) mode.

<b>*RST</b>	–1.54060000E+002
<b>Range</b>	–154.06 to 10
<b>Field Entry</b>	Init Pwr
<b>Remarks</b>	For the multiple PRACH mode, the initial power is the same as the maximum power for the PRACH preamble.

**:ULINK:PRACH:MULTi:PREamble:POWer:MAX****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:PREamble:POWer:Max<val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:PREamble:POWer:Max?
```

This command sets the power of the preamble on the multiple physical random access channel (PRACH) mode.

**\*RST** -1.54060000E+002**Range** -1.0 to 1.94**Field Entry** Max Pwr

**Remarks** The maximum power for this command is limited by the power of the signal generator (ESG maximum power – 18.06 dBm). If the signal generator power is set to +20 dBm, the maximum value of this command is +1.94 dBm.

**:ULINK:PRACH:MULTi:PREamble:POWer:RSTep****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:PREamble:POWer:RSTep?
```

This query, for the multiple physical random access channel (PRACH) mode, always returns zero, because power ramping is not supported for the multiple PRACH mode.

**\*RST** +0**Field Entry** Ramp Step**:ULINK:PRACH:MULTi:PREamble:PPM****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:PREamble:PPM <val>
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:PREamble:PPM?
```

This command sets the difference between the preamble and the message control part in the physical random access channel (PRACH).

**\*RST** -4.56000000E+000**Range** -20 to 10**Field Entry** Pp-m

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

**:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:MESSAge:CPART:CCODE****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:MESSAge:CPART:CCODE?

This query returns the channel code of the message control part of physical random access channel (PRACH) on the multiple PRACH mode.

**\*RST** 255**Range** 0–255**Field Entry** CHCode Ctl**Remarks** This command affects the PRACH setting on the multiple PRACH mode only.**:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:MESSAge:DPART:CCODE****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:MESSAge:DPART:CCODE?

This query returns the channel code of the message data part of physical random access channel (PRACH) on the multiple PRACH mode.

**\*RST** 245**Range** 0–255**Field Entry** ChCode Dat**Remarks** This command affects the PRACH setting on the multiple PRACH mode only.**:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:PREAmble:SIGNature****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:PREAmble:SIGNature &lt;val&gt;

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8:PREAmble:SIGNature?

This command sets the signature encoded in the multiple physical random access channel's (PRACH) preamble.

**\*RST**

	Signature
--	-----------

**Wideband CDMA Base Band Generator Subsystem—Option 400 (:SOURce:RADio:WCDMa:TGPP[:BBG])**

UE	1	0
	2	1
	3	2
	4	3
	5	4
	6	5
	7	6
	8	7

**Field Entry** Pre Sig**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).**:ULINK:PRACH:MULTi:UE[1]|2|3|4|5|6|7|8:SPOStion[1]|2|3|4|5|6|7|8[:ASLot]****Supported** E4438C with Option 400

[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1]|2|3|4|5|6|7|8:SPOStion[1]|2|3|4|5|6|7|8[:ASLot] &lt;val&gt;|OFF

[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1]|2|3|4|5|6|7|8:SPOStion[1]|2|3|4|5|6|7|8[:ASLot]?

This command sets each physical random access channel (PRACH) start access slot position within 80ms.

**\*RST**

		Start Access Slot Pos							
		1	2	3	4	5	6	7	8
UE	1	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	2	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	3	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	4	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
UE	5	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	6	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	7	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	8	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF

**Range** 0–59**Field Entry** Start Access Slot Position in 80ms Period**Remarks** This command can only be executed while in the PRACH Mode is set to Multi. Refer to [“:ULINK:PRACH:MODE\[:SElect\]” on page 1117](#).If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).



**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8[:STATe]****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8
[:STATe] 0 | 1 | ON | OFF
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:MULTi:UE[1] | 2 | 3 | 4 | 5 | 6 | 7 | 8
[:STATe] ?
```

This command enables or disables each physical random access channel (PRACH) individually on the multiple PRACH mode.

**\*RST**

		State
UE	1	ON
	2	OFF
	3	OFF
	4	OFF
	5	OFF
	6	OFF
	7	OFF
	8	OFF

**Field Entry** On/Off

**Remarks** This command will not run if the power of all assigned physical random access channels exceed the power of the signal generator.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH:PREamble:POWer:AVERage****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:PREamble:POWer:AVERage?
```

This query returns the average power of preambles that were sent before the acquisition indication channel (AICH) trigger was received.

**\*RST** -999**Field Entry** Preamble power average

**Remarks** The average power value can be queried after the physical random access channel’s (PRACH) signal generation is completed. Refer to “:ULINK:PRACH[:SINGLE]:PREamble:NUMBER” on page 1134.

**:ULINK:PRACH:PREamble:POWer:MODE****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:PREamble:POWer:MODE PPM | TOTAl

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:PREamble:POWer:MODE?

This command sets the message power calculation mode for the physical random access channel (PRACH).

**PPM** This choice calculates the message power based on the power differences between the preamble and the message control part. The difference is specified by the PPM command. This is based on 3GPP standards.

**TOTAl** This choice calculates message power based on power differences between preamble and message total part. The message total power is specified by the MESSage:TPOWer command. Refer to [“:ULINK:PRACH\[:SINGLE\]:MESSAge:TPOWer”](#) on page 1133.

**\*RST** PPM**Key Entry** **PRACH Power Setup Mode Pp-m Total**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY”](#) on page 1075.

**:ULINK:PRACH:RPARAmeter****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:RPARAmeter TB168 | TB360

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:RPARAmeter?

This command sets a set of parameters as defined in 3GPP Standard (TS25.104) Reference Measurement Channel for the uplink (UL) physical random access channel (PRACH).

**TB168** This choice sets the parameters for the transport block size = 168.

**TB360** This choice sets the parameters for the transport block size = 360.

**\*RST** TB168**Key Entry** **TrCh BlkSize 168** **TrCh BlkSize 360**

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**Remarks** When parameters are sets individually, CUSTom is returned for the query.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH:SCRamblecode**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:SCRamblecode <val>
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:SCRamblecode?
```

This command sets the physical random access channel’s (PRACH) scrambling code.

**\*RST** +0

**Range** 0–8191

**Field Entry** PRACH Scrambling Code

**Remarks** The signature data is scrambled against a 4096 chip segment of the 225 complex gold code generator.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH:SDElay**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:SDElay <val>
[ :SOURCE ] :RADIO:WCDMA:TGPP [ :BBG ] :ULINK:PRACH:SDElay?
```

This command sets the number of timeslots to be delayed from the uplink synchronization source. One timeslot is equivalent to 2560 chips.

The variable <val> range is dependent on the Tp-a setting.

**\*RST** +0

<b>Range</b>	Tp-a Setting	<val>
	0	-14 to 119
	7680	-11 to 119
	12800	-9 to 119

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****Key Entry**           **Timeslot Offset**

**Remarks**           The actual amount of timing difference is  
(TOFFset + SDELay \* 2560) – (Tp–a).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

To set the Tp-a value, refer to “:ULINK:PRACH:TPA” on page 1127.

**:ULINK:PRACH:SUBChannel**

**Supported**           E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:SUBChannel <val>
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:SUBChannel?
```

This command sets the sub-channel number to send the first preamble of the physical random access channel’s (PRACH).

**\*RST**                 +0

**Range**               0–11

**Field Entry**         Start Sub-Channel#

**Remarks**           If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH:TOFFset**

**Supported**           E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:TOFFset <val>
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:TOFFset?
```

This command sets additional timing offset for the physical random access channel (PRACH).

The timing offset is to adjust the time distance from the uplink PRACH frame timing which is the downlink’s AICH framing timing minus the Tp–a to the actual uplink PRACH signal frame timing from the signal generator.

The downlink’s AICH frame timing is provided by the synchronization signal. The

The variable <val> is expressed in chips.

**\*RST**                 +0

**Wideband CDMA Base Band Generator Subsystem—Option 400** [:SOURCE]:RADio:WCDMa:TGPP[:BBG]

<b>Range</b>	–512 to 2560
<b>Key Entry</b>	<b>Timing Offset</b>
<b>Remarks</b>	<p>The actual timing offset is the timing difference from the synchronization signal from the signal generator’s RF signal  <math>(TOFFset + SDElay * 2560) - (Tp-a)</math>.</p> <p>If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.</p>

**:ULINK:PRACH:TPA**

<b>Supported</b>	E4438C with Option 400
	[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TPA 0   7680   12800
	[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TPA?
	This command sets the time period (distance) between the physical random access channel’s (PRACH) preamble to the acquisition indication channel’s (AICH) frame.
	The variable <val> is expressed in units of “chip”.
<b>*RST</b>	7680
<b>Key Entry</b>	<b>Base Delay Tp–a</b>
<b>Remarks</b>	<p>The actual timing offset is <math>(TOFFset + SDElay * 2560) - (Tp-a)</math>.</p> <p>If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.</p> <p>This command is not used when the sync source is set to ESG. Refer to “:ULINK:SYNC[:SOURCE]” on page 1152.</p>

**:ULINK:PRACH:TPM**

<b>Supported</b>	E4438C with Option 400
	[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TPM <val>
	[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TPM?
	This command sets the time period between the preamble and the message part.
	The variable <val> is expressed in access slot units.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

<b>*RST</b>	+3
<b>Range</b>	1–15
<b>Field Entry</b>	Tp-m
<b>Remarks</b>	If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to <a href="#">“:ULINK:APPLY” on page 1075</a> .  This command is used for single and multiple physical random access channel (PRACH) modes.

**:ULINK:PRACH:TPOWer**

<b>Supported</b>	E4438C with Option 400
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TPOWer?	
This query returns the total power value of the physical random access channels (PRACH).	
The value is the relative power difference between the total in-channel signal power of the PRACH message part and the active channel reference power (0dB) in the message part.	
<b>*RST</b>	+0
<b>Remarks</b>	This command is used for single and multiple physical random access channel (PRACH) modes.

**:ULINK:PRACH:TPP**

<b>Supported</b>	E4438C with Option 400
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TPP <val>	
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TPP?	
This command sets the time period between the preamble and another preamble before the message part.	
The variable <val> is expressed in access slot units.	
<b>*RST</b>	+3
<b>Range</b>	1–60
<b>Field Entry</b>	Tp-p

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

This command is used for single and multiple physical random access channel (PRACH) modes.

**:ULINK:PRACH:TRIGger**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TRIGger
```

This command specifies the start of the physical random access channel’s (PRACH) pattern.

**Key Entry** **PRACH Trigger**

**Remarks** The PRACH trigger source must be set to “Trigger” before executing this command. Refer to [“:ULINK:PRACH:TRIGger:SOURce” on page 1129](#).

**:ULINK:PRACH:TRIGger:POLarity**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TRIGger:
POLarity POSitive|NEGative
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TRIGger:POLarity?
```

This command sets the trigger polarity of the physical random access channel type (PRACH).

**POSitive** This choice sets the signal to trigger when the trigger signal is high.

**NEGative** This choice sets the signal to trigger when the trigger signal is low.

**\*RST** POS

**Key Entry** **PRACH Trigger Polarity Neg Pos**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:PRACH:TRIGger:SOURce**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TRIGger:
SOURce IMMEDIATE|TRIGger
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH:TRIGger:SOURce?
```

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

This command sets the trigger source of the physical random access channel (PRACH).

**IMMEDIATE** This choice resets the waveform and immediately replays it from the start.

**TRIGGER** This choice plays the waveform after receiving the trigger command.

**\*RST** IMMEDIATE

**Key Entry** **PRACH Trigger Source Immedi Trigger**

**Remarks** Refer to “:ULINK:PRACH:TRIGGER:POLARITY” on page 1129 and “:ULINK:PRACH:TRIGGER” on page 1129 for additional information.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH:TTI**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:TTI 10000 | 20000
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH:TTI ?
```

This command sets the transmission time interval (TTI) period of the message part.

The choices are expressed in units of milliseconds (msec) where 20000=20 msec.

**\*RST** +20000

**Field Entry** TTI

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH[:SINGLE]:MESSAGE[:STATE]**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :MESSAGE [ :STATE ]  
ON | OFF | AICH
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :MESSAGE [ :STATE ] ?
```

This command enables or disables the message part of the physical random access channel (PRACH).

**ON** This choice enables the message part to be generated after the number of preambles are generated. The “Number of Preamble” must be specified.



**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

OFF	This choice does not allow the message part to be generated. Only the preambles are transmitted.
AICH	This choice enables the acquisition indication channel preamble power ramping mode.
*RST	ON
<b>Key Entry</b>	<b>On Off AICH</b>
<b>Remarks</b>	For more information about the rear panel AUX I/O connector, refer to "Signal Generator Overview" in the <i>E4428C/38C ESG Signal Generators User's Guide</i> .  If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to <a href="#">“:ULINK:APPLY” on page 1075</a> .

**:ULINK:PRACH[:SINGLE]:NUMBER**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :NUMBER <val> |
INFinity
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :NUMBER?
```

This command specifies the number of the physical random access channel (PRACH) patterns to repeat after the PRACH start trigger has been received.

INFinity This choice means the repeating number will continue while the PRACH mode is selected and the start trigger is ignored.

\*RST 1

**Range** 1–2147483647

**Field Entry** Number of PRACH

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:PRACH[:SINGLE]:MESSAGE:CPART:CCODE**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :MESSAGE:CPART :
CCODE <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :MESSAGE:CPART :
```

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

CCODE?

This command sets the channelization code for the physical random access channel (PRACH) message control part.

**\*RST** +15

**Range** 0–255

**Field Entry** Channel Code

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH[:SINGLE]:MESSAGE:DPART:CCODE**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :MESSAGE:DPART :CCODE <val>

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :MESSAGE:DPART :CCODE?

This command sets the channelization code for the physical random access channel (PRACH) message data part.

There are commands that are associated with the channelization code and they are the slot format and the symbol rate.

If the slot format is changed, so will the symbol rate. If the symbol rate is changed, so will the slot format. In addition, the channelization code will change. If current channelization code exceeded the new maximum value for the specified slot format or symbol rate, a setting conflict error is generated and the value is clipped to the maximum value. Refer to [Table 9-9](#).

**Table 9-9 Channelization Code Maximum value**

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30
63	2	60
31	3	120

**\*RST** +0

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

<b>Range</b>	0–255
<b>Field Entry</b>	Channel Code
<b>Remarks</b>	Channel code value is determined by slot format choice. Refer to <a href="#">“:ULINK:PRACH:MESSAGE:DPART:SLOTformat”</a> on page 1116 and <a href="#">“:ULINK:PRACH:MESSAGE:DPART:RATE”</a> on page 1115. If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to <a href="#">“:ULINK:APPLY”</a> on page 1075.

**:ULINK:PRACH[:SINGLE]:MESSAGE:TPOWer**

**Supported** E4438C with Option 400

```
[ :SOURCE ] : RADio : WCDMa : TGPP [ : BBG ] : ULINK : PRACH [ : SINGLE ] : MESSAGE :
TPOWer <val>
```

```
[ :SOURCE ] : RADio : WCDMa : TGPP [ : BBG ] : ULINK : PRACH [ : SINGLE ] : MESSAGE : TPOWer?
```

This command sets the message total power value for the single physical random access channel (PRACH) and multiple PRACH modes. The variable <val> is expressed in units of decibels (dB). The RF output power is limited to the signal generator’s specifications

**\*RST** –1.36000000E+002

**Range** –136 to 20

**Field Entry** Msg Pwr

**Remarks** This value is used only when POWER:MODE is set to TOTAL. Refer to [“:ULINK:PRACH:PREamble:POWER:MODE”](#) on page 1124.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY”](#) on page 1075.

**:ULINK:PRACH[:SINGLE]:NUMBer**

**Supported** E4438C with Option 400

```
[ :SOURCE ] : RADio : WCDMa : TGPP [ : BBG ] : ULINK : PRACH [ : SINGLE ] :
NUMBer <val> | INFINity
```

```
[ :SOURCE ] : RADio : WCDMa : TGPP [ : BBG ] : ULINK : PRACH [ : SINGLE ] : NUMBer?
```

This command specifies the number of the physical random access channel (PRACH) patterns to repeat after the PRACH start trigger has been received.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

<b>INFINITY</b>	This choice means the repeating number will continue while the PRACH mode is selected and the start trigger is ignored.
<b>*RST</b>	1
<b>Range</b>	1–2147447836
<b>Field Entry</b>	Number of PRACH
<b>Remarks</b>	If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH[:SINGLE]:PREAmble:NUMBER**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREAmble:
NUMBER <val>|INFINITY
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREAmble:NUMBER?
```

This command specifies the number of preambles to repeat in one physical random access channel (PRACH) pattern.

<b>INFINITY</b>	This choice means the repeating preamble will play continuously while the PRACH mode is selected.
-----------------	---------------------------------------------------------------------------------------------------

<b>*RST</b>	1
-------------	---

<b>Range</b>	1–8388607
--------------	-----------

<b>Field Entry</b>	PRACH Timing Setup: Number of Preamble PRACH Power Setup: Num of Pre
--------------------	-------------------------------------------------------------------------

**:ULINK:PRACH[:SINGLE]:PREAmble:POWER:INITIAL**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREAmble:
POWER:INITIAL?
```

This query returns the initial preamble power from POWER:Max value, RSTeP (ramp step) and PREAmble:NUMBER commands.

<b>*RST</b>	–1.36000000E+002
-------------	------------------

<b>Field Entry</b>	Init Pwr
--------------------	----------

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**:ULINK:PRACH[:SINGLE]:PREamble:POWer:MAX****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:  
POWer:MAX <val>[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:  
POWer:MAX?

This command sets the maximum preamble power for the physical random access channel (PRACH).

In power ramping mode (RSTep is a non-zero value), the preamble power can go up until the acquisition indication channel's (AICH) signal is not received (maximum power).

The variable <val> is expressed in units of decibels (dB).

**\*RST** -1.36000000E+002**Range** -136 to 20**Field Entry** Max Pwr**Remarks** The actual RF output is limited to the signal generator's specifications although the value can be entered up to 20 dBm.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:PRACH[:SINGLE]:PREamble:POWer:RSTep****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:POWer:  
RSTep <val>[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:PRACH[:SINGLE]:PREamble:POWer:  
RSTep?

This command sets the power ramping steps for the single physical random access channel (PRACH) preamble.

The variable <val> is expressed in units of decibels (dB).

**\*RST** 0**Range** 0–10**Field Entry** Ramp Step

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

This command is used for single and multiple physical random access channel (PRACH) modes.

**:ULINK:PRACH[:SINGLE]:PREamble:PPM**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :PREamble:PPM <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :PREamble:PPM?
```

This command sets the power difference between the preamble and the message control part in the single physical random access channel (PRACH).

The variable <val> is expressed in units of decibels (dB).

**\*RST** -4.56032509E+000

**Range** -20 to 10

**Field Entry** Pp-m

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:PRACH[:SINGLE]:PREamble:SIGNature**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :PREamble:
SIGNature <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:PRACH [ :SINGLE ] :PREamble:
SIGNature?
```

This command sets the signature encoded in the single physical random access channel’s (PRACH) preamble.

**\*RST** +0

**Range** 0–15

**Field Entry** Signature

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:RMCHannel**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RMCHannel RMC122 | RMC64 | RMC144 |
RMC384 | UDI64 | AMR122
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RMCHannel?
```

This command configures the uplink reference measurement (RMC) channel by providing a one command access to a typical RMC configuration.

**RMC122** This choice selects a reference measurement channel with a 12.2 kbps rate as per 3GPP TS 25.141.

**RMC64** This choice selects a reference measurement channel with a 64.0 kbps rate as per 3GPP TS 25.141.

**RMC144** This choice selects a reference measurement channel with a 144.0 kbps rate as per 3GPP TS 25.141.

**RMC384** This choice selects a reference measurement channel with a 384.0 kbps rate as per 3GPP TS 25.141.

**UDI64** This choice selects an ISDN unrestricted digital information 1B with a 64.0 kbps rate as per 3GPP TS 25.944.

**ARM122** This choice selects an adaptive multiple rate of 12.2 kbps as per 3GPP TS 25.944.

**\*RST** RMC122

**Key Entry** **RMC122 kbps (25.141)** **RMC64 kbps (25.141)**

**RMC144 kbps (25.141)** **RMC384 kbps (25.141)**

**AMR 122 kbps** **UDI 64 kbps**

**:ULINK:RPANel:DPCH:INPut:ALTPower**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:DPCH:INPut:ALTPower?
```

This query returns the type of signal at the alternate power input (ALT PWR IN, AUX I/O connector pin#16) for the dedicated physical channel (DPCH) mode.

**\*RST** USER

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

**Remarks** The signal name is TPC user file trigger (USER). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:DPCH:INPut:BBGRef**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:DPCH:INPut:BBGRef?

This query returns the type of signal at the baseband generator reference input (BASEBAND GEN REF IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

**\*RST** CCL

**Remarks** The signal name is baseband generator chip clock (CCL). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:DPCH:INPut:BGATe**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:DPCH:INPut:BGATe?

This query returns the type of signal at the gate burst (BURST GATE IN, rear panel connector) for the dedicated physical channel (DPCH) mode.

**\*RST** CSTT

**Remarks** In compressed mode the signal name is compressed mode start trigger (CSST). In power control mode, the signal name is DPCH power control signal (DPCS). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*

**:ULINK:RPANel:DPCH:INPut:PTRigger1**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:DPCH:INPut:PTRigger1?

This query returns the type of signal at the pattern trigger input 1 (PATT TRIG IN 1, rear panel) for the dedicated physical channel (DPCH) mode.

**\*RST** FSYN



**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

**Remarks** The signal name is frame synchronization (FSYN). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:DPCH:INPut:PTRigger2**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:INPut:PTRigger2?
```

This query returns the type of signal at the pattern trigger input 2 (PATT TRIG IN 2, AUX I/O connector pin#17) for the dedicated physical channel (DPCH) mode.

**\*RST** CSPT

**Remarks** The signal name is compress mode stop trigger (CSPT). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:DPCH:OUTPut:DCLock**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:DCLock RPS0 |
RPS1 | RPS2 | RPS3 | RPS4 | RPS5 | RPS6 | RPS7 | RPS8 | RPS9 | RPS10
[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:DCLock?
```

This command assigns a signal to the data clock output at the selected rear panel AUX I/O connector pin#6. Refer to [Table 9-10 on page 1139](#) for command parameters and output signal type.

**Table 9-10 Rear Panel Signal (RPS) Output Type**

Command Parameter	Signal Out
RPS0	None
RPS1	Chip Clock
RPS2	DPDCH raw data
RPS3	DPDCH raw data clock
RPS4	DPCCH raw data
RPS5	DPCCH raw data clock

**Table 9-10 Rear Panel Signal (RPS) Output Type**

Command Parameter	Signal Out
RPS6	10ms frame pulse
RPS7	Trigger sync reply
RPS8	Compressed frame
RPS9	TTI frame pulse
RPS10	CFN #0 frame pulse

**\*RST** RPS1

**Key Entry** NONE (RPS0) Chip Clock (RPS1) DPDCH Raw Data (RPS2)  
 DPDCH Data Raw Clock (RPS3) DPCCH Raw Data (RPS4)  
 DPCCH Raw Data Clock (RPS5) 10 ms Frame Pulse (RPS6)  
 Trigger Sync Reply (RPS7) Compressed Frame (RPS8)  
 TTI Frame Clock (RPS9) CFN #0 Frame Pulse (RPS10)

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

## :ULINK:RPANel:DPCH:OUTPut:DOUT

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:DOUT RPS0 |
RPS1 | RPS2 | RPS3 | RPS4 | RPS5 | RPS6 | RPS7 | RPS8 | RPS9 | RPS10
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:DOUT?
```

This command assigns a signal to the data output at the selected rear panel AUX I/O connector pin#7. Refer to [Table 9-10 on page 1139](#) for command parameters and output signal type.

**\*RST** RPS4

**Key Entry** NONE (RPS0) Chip Clock (RPS1) DPDCH Raw Data (RPS2)  
 DPDCH Data Raw Clock (RPS3) DPCCH Raw Data (RPS4)  
 DPCCH Raw Data Clock (RPS5) 10 ms Frame Pulse (RPS6)  
 Trigger Sync Reply (RPS7) Compressed Frame (RPS8)  
 TTI Frame Clock (RPS9) CFN #0 Frame Pulse (RPS10)

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:DPCH:OUTPut:EVENT1**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:
EVENT1 RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:EVENT1?
```

This command assigns a signal to the EVENT 1 at the rear panel output connector. Refer to [Table 9-10 on page 1139](#) for command parameters and output signal type.

**\*RST** RPS2

<b>Key Entry</b>	<b>NONE (RPS0)</b>	<b>Chip Clock (RPS1)</b>	<b>DPDCH Raw Data (RPS2)</b>
	<b>DPDCH Data Raw Clock (RPS3)</b>		<b>DPCCH Raw Data (RPS4)</b>
	<b>DPCCH Raw Data Clock (RPS5)</b>		<b>10 ms Frame Pulse (RPS6)</b>
	<b>Trigger Sync Reply (RPS7)</b>		<b>Compressed Frame (RPS8)</b>
	<b>Frame Clock (RPS9)</b>		<b>CFN #0 Frame Pulse (RPS10)</b>

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:DPCH:OUTPut:EVENT2**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:
EVENT2 RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:EVENT2?
```

This command assigns a signal to the EVENT 2 at the rear panel output connector. Refer to [Table 9-10 on page 1139](#) for command parameters and output signal types.

**\*RST** RPS3

<b>Key Entry</b>	<b>NONE (RPS0)</b>	<b>Chip Clock (RPS1)</b>	<b>DPDCH Raw Data (RPS2)</b>
	<b>DPDCH Data Raw Clock (RPS3)</b>		<b>DPCCH Raw Data (RPS4)</b>
	<b>DPCCH Raw Data Clock (RPS5)</b>		<b>10 ms Frame Pulse (RPS6)</b>
	<b>Trigger Sync Reply (RPS7)</b>		<b>Compressed Frame (RPS8)</b>

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

	<b>TTI Frame Clock (RPS9)</b>	<b>CFN #0 Frame Pulse (RPS10)</b>
<b>Remarks</b>	For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the <i>E4428C/38C ESG Signal Generators User's Guide</i> .	

**:ULINK:RPANel:DPCH:OUTPut:EVENT3**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:
EVENT3 RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:EVENT3?
```

This command assigns a signal to the EVENT 3 output at the selected rear panel AUX I/O connector pin#19. Refer to [Table 9-10 on page 1139](#) for command parameters and output signal type.

**\*RST** RPS0

<b>Key Entry</b>	<b>NONE (RPS0)</b>	<b>Chip Clock (RPS1)</b>	<b>DPDCH Raw Data (RPS2)</b>
	<b>DPDCH Data Raw Clock (RPS3)</b>	<b>DPCCH Raw Data (RPS4)</b>	
	<b>DPCCH Raw Data Clock (RPS5)</b>	<b>10 ms Frame Pulse (RPS6)</b>	
	<b>Trigger Sync Reply (RPS7)</b>	<b>Compressed Frame (RPS8)</b>	
	<b>TTI Frame Clock (RPS9)</b>	<b>CFN #0 Frame Pulse (RPS10)</b>	

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:DPCH:OUTPut:EVENT4**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:
EVENT4 RPS0|RPS1|RPS2|RPS3|RPS4|RPS5|RPS6|RPS7|RPS8|RPS9|RPS10
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:DPCH:OUTPut:EVENT4?
```

This command assigns a signal to the EVENT 4 output at the selected rear panel AUX I/O connector pin#18. Refer to [Table 9-10 on page 1139](#) for command parameters and output signal type.

**\*RST** RPS0

<b>Key Entry</b>	<b>NONE (RPS0)</b>	<b>Chip Clock (RPS1)</b>	<b>DPDCH Raw Data (RPS2)</b>
	<b>DPDCH Data Raw Clock (RPS3)</b>	<b>DPCCH Raw Data (RPS4)</b>	
	<b>DPCCH Raw Data Clock (RPS5)</b>	<b>10 ms Frame Pulse (RPS6)</b>	

**Wideband CDMA Base Band Generator Subsystem—Option 400** [:SOURCE]:RADio:WCDMa:TGPP[:BBG]

	<b>Trigger Sync Reply (RPS7)</b>	<b>Compressed Frame (RPS8)</b>
	<b>TTI Frame Clock (RPS9)</b>	<b>CFN #0 Frame Pulse (RPS10)</b>
<b>Remarks</b>	For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the <i>E4428C/38C ESG Signal Generators User's Guide</i> .	

**:ULINK:RPANel:DPCH:OUTPut:SSYNc**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:DPCH:OUTPut:SSYNc RPS0 |
RPS1 | RPS2 | RPS3 | RPS4 | RPS5 | RPS6 | RPS7 | RPS8 | RPS9 | RPS10
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:DPCH:OUTPut:SSYNc?
```

This command assigns a signal to SYM SYNC OUT at the selected rear panel AUX I/O connector pin#5. Refer to [Table 9-10 on page 1139](#) for command parameters and output signal type.

**\*RST** RPS6

<b>Key Entry</b>	<b>NONE (RPS0)</b>	<b>Chip Clock (RPS1)</b>	<b>DPDCH Raw Data (RPS2)</b>
	<b>DPDCH Data Raw Clock (RPS3)</b>	<b>DPCCH Raw Data (RPS4)</b>	
	<b>DPCCH Raw Data Clock (RPS5)</b>	<b>10 ms Frame Pulse (RPS6)</b>	
	<b>Trigger Sync Reply (RPS7)</b>	<b>Compressed Frame (RPS8)</b>	
	<b>TTI Frame Clock (RPS9)</b>	<b>CFN #0 Frame Pulse (RPS10)</b>	

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:PRACH:INPut:ALTPower**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:PRACH:INPut:ALTPower?
```

This query returns the signal type at the ALT PWR IN (alternate power in) connector pin for the physical random access channel (PRACH) mode.

**\*RST** NONE

**Field Entry** Alt power in

**Remarks** For more information about the rear panel AUX I/O connector pin configuration, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

**:ULINK:RPANel:PRACH:INPut:BBGRef**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel :PRACH: INPut :BBGRef?

This query returns the type of signal at the baseband generator reference input (BASEBAND GEN REF IN, rear panel connector) for the physical random access channel (PRACH) mode.

**\*RST** CCL

**Remarks** The signal name is baseband generator chip clock (CCL). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:PRACH:INPut:BGATe**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel :PRACH: INPut :BGATe?

This query returns the signal type at the BURST GATE IN connector for the physical random access channel (PRACH) mode.

**\*RST** PSTR

**Field Entry** Burst gate in

**Remarks** The signal name is PRACH start trigger (PSTR). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:PRACH:INPut:PTRigger1**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel :PRACH: INPut :PTRigger1?

This query returns the signal type at the pattern trigger in 1 (PATT TRIG IN) connector for the physical random access channel (PRACH) mode.

**\*RST** FSYN

**Field Entry** Pattern trigger in 1

**Remarks** The signal name is frame synchronization (FSYN). For more information about the rear panel I/O connectors' configuration, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:PRACH:INPut:PTRigger2****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:RPANel:PRACH:INPut:PTRigger2?

This query returns the signal type at the pattern trigger input 2 (PATT TRIG IN 2 AUX I/O connector pin#17) for the physical random access channel (PRACH) mode.

**\*RST** AITR**Field Entry** Pattern trigger in 2

**Remarks** The signal name is AICH trigger (AITR). For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:PRACH:OUTPut:DCLock****Supported** E4438C with Option 400

```
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:RPANel:PRACH:OUTPut:DCLock RPS0 |
RPS1 | RPS6 | RPS7 | RPS11 | RPS12 | RPS13 | RPS14 | RPS15 | RPS16 |
RPS17 | RPS19 | RPS20 | RPS21 | RPS22 | RPS23 | RPS24 | RPS25
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:RPANel:PRACH:OUTPut:DCLock?
```

This command assigns a signal at the data clock output for the selected rear panel AUX I/O connector pin#6.

RPS0 none

RPS1 This choice assigns the chip clock signal.

RPS6 This choice assigns the 10ms frame pulse signal.

RPS7 This choice assigns the trigger sync reply signal.

RPS11 This choice assigns the message-data raw data signal. In the multiple PRACH mode, RPS11 outputs the message-data raw data signal of PRACH#1. If the PRACH#1 is not "on", no signal output is output.

RPS12 This choice assigns the message-data raw clock signal. In the multiple PRACH mode, RPS12 outputs the message-data raw clock signal of PRACH#1. If the PRACH#1 is not "on", no signal output is output.

RPS14 This choice assigns the message-ctrl raw data clock signal. In the multiple PRACH mode, RPS14 outputs the message-control raw data clock signal of PRACH#1. If the PRACH#1 is not "on", no signal output is output.

RPS15 This choice assigns the preamble raw data signal. In the multiple PRACH mode,

	RPS15 outputs the preamble raw data signal of PRACH#1. If the PRACH#1 is not “on”, no signal output is output.
RPS16	This choice assigns the preamble raw data clock signal. In the multiple PRACH mode, RPS16 outputs the preamble raw data clock signal of PRACH#1. If the PRACH#1 is not “on”, no signal output is output.
RPS17	This choice assigns the sub channel timing signal. Sub channel timing is used on the single PRACH mode.
RPS19	This choice assigns the PRACH processing signal. This signal indicates the PRACH is generating.
RPS20	This choice assigns the 80ms frame pulse signal.
RPS21	This choice assigns the preamble pulse signal. This signal indicates the preamble timing of all configured PRACHes. One pulse for one preamble. In the multiple PRACH mode, this output relates to PRACH#1. If the PRACH#1 in not “on”, no signal is output.
RPS22	This choice assigns the message pulse signal. This signal indicates the message part timing of all configured PRACHes. In the multiple PRACH mode, this output relates to PRACH#1. If the PRACH#1 in not “on”, no signal is output.
RPS23	This choice assigns the PRACH pulse signal. This signal indicates the start timing of all configured PRACHes. In the multiple PRACH mode, this output relates to PRACH#1. If the PRACH#1 in not “on”, no signal is output.
RPS24	This choice assigns the ESG synchronization signal. This signal is used for the multiple EAG synchronization on the multiple PRACH mode.
RPS25	This choice assigns the PRACH start trigger echo back signal. The PRACH start trigger echo back signal is used for the multiple ESG connection on the multiple PRACH mode.

**\*RST**

RPS0

**Key Entry**

<b>NONE (RPS0)</b>	<b>Chip Clock (RPS1)</b>	<b>Message-Data Raw Data (RPS11)</b>
<b>10ms Frame Pulse (RPS6)</b>	<b>Trigger Sync Reply (RPS7)</b>	
<b>Message-Data Raw Clock (RPS12)</b>	<b>Message-Control Raw Data (RPS13)</b>	
<b>Message-Control Raw Data Clock(RPS14)</b>		
<b>Preamble Raw Data(RPS15)</b>	<b>Preamble Raw Data Clock(RPS16)</b>	
<b>Sub Channel Timing(RPS17)</b>	<b>PRACH Processing(RPS19)</b>	
<b>80ms Frame Pulse(RPS20)</b>	<b>Preamble Pulse(RPS21)</b>	
<b>Message Pulse(RPS22)</b>	<b>PRACH Pulse(RPS23)</b>	



**Wideband CDMA Base Band Generator Subsystem—Option 400** [:SOURCE]:RADIo:WCDMa:TGPP[:BBG]

	<b>ESG-Sync Sig(RPS24)</b>	<b>Start-Trigger EchoBack(RPS25)</b>
<b>Remarks</b>	For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the <i>E4428C/38C ESG Signal Generators User's Guide</i> .	

**:ULINK:RPANel:PRACH:OUTPut:DOUT**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:PRACH:OUTPut:DOUT RPS0 |
RPS1 | RPS6 | RPS7 | RPS11 | RPS12 | RPS13 | RPS14 | RPS14 | RPS15 | RPS16 | RPS17 | RPS19 |
RPS20 | RPS21 | RPS22 | RPS23 | RPS24 | RPS25
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:PRACH:OUTPut:DOUT?
```

This command assigns a signal to the data output at the selected rear panel AUX I/O connector pin#7.

For parameter descriptions refer to “:ULINK:RPANel:PRACH:OUTPut:DCLock” on page 1145.

**\*RST** RPS0

<b>Key Entry</b>	<b>NONE (RPS0)</b>	<b>Chip Clock (RPS1)</b>	<b>Message-Data Raw Data (RPS11)</b>
	<b>10ms Frame Pulse (RPS6)</b>	<b>Trigger Sync Reply (RPS7)</b>	
	<b>Message-Data Raw Clock (RPS12)</b>	<b>Message-Control Raw Data (RPS13)</b>	
	<b>Message-Control Raw Data Clock(RPS14)</b>		
	<b>Preamble Raw Data(RPS15)</b>	<b>Preamble Raw Data Clock(RPS16)</b>	
	<b>Sub Channel Timing(RPS17)</b>	<b>PRACH Processing(RPS19)</b>	
	<b>80ms Frame Pulse(RPS20)</b>	<b>Preamble Pulse(RPS21)</b>	
	<b>Message Pulse(RPS22)</b>	<b>PRACH Pulse(RPS23)</b>	
	<b>ESG-Sync Sig(RPS24)</b>	<b>Start-Trigger EchoBack(RPS25)</b>	

<b>Remarks</b>	For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the <i>E4428C/38C ESG Signal Generators User's Guide</i> .
----------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**:ULINK:RPANel:PRACH:OUTPut:EVENT1**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:PRACH:OUTPut:EVENT1 RPS0 |
RPS1 | RPS6 | RPS7 | RPS11 | RPS12 | RPS13 | RPS14 | RPS14 | RPS15 | RPS16 | RPS17 | RPS19 |
RPS20 | RPS21 | RPS22 | RPS23 | RPS24 | RPS25
[ :SOURCE ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:PRACH:OUTPut:EVENT1?
```

This command assigns a signal to the EVENT 1 at the selected rear panel connector.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

For parameter descriptions refer to “:ULINK:RPANel:PRACH:OUTPut:DCLock” on page 1145.

<b>*RST</b>	RPS0
<b>Key Entry</b>	<b>NONE (RPS0)      Chip Clock (RPS1)      Message-Data Raw Data (RPS11)</b> <b>10ms Frame Pulse (RPS6)      Trigger Sync Reply (RPS7)</b> <b>Message-Data Raw Clock (RPS12)      Message-Control Raw Data (RPS13)</b> <b>Message-Control Raw Data Clock(RPS14)</b> <b>Preamble Raw Data(RPS15)      Preamble Raw Data Clock(RPS16)</b> <b>Sub Channel Timing(RPS17)      PRACH Processing(RPS19)</b> <b>80ms Frame Pulse(RPS20)      Preamble Pulse(RPS21)</b> <b>Message Pulse(RPS22)      PRACH Pulse(RPS23)</b> <b>ESG-Sync Sig(RPS24)      Start-Trigger EchoBack(RPS25)</b>

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:PRACH:OUTPut:EVENT2**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel :PRACH:OUTPut :EVENT2 RPS0  
 RPS1|RPS6|RPS7|RPS11|RPS12|RPS13|RPS14|RPS14|RPS15|RPS16|RPS17|RPS19|RPS20|RPS21  
 RPS22|RPS23|RPS24|RPS25

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel :PRACH:OUTPut :EVENT2?

This command assigns a signal to the EVENT 2 at the rear panel connector.

For parameter descriptions refer to “:ULINK:RPANel:PRACH:OUTPut:DCLock” on page 1145.

<b>*RST</b>	RPS0
<b>Key Entry</b>	<b>NONE (RPS0)      Chip Clock (RPS1)      Message-Data Raw Data (RPS11)</b> <b>10ms Frame Pulse (RPS6)      Trigger Sync Reply (RPS7)</b> <b>Message-Data Raw Clock (RPS12)      Message-Control Raw Data (RPS13)</b> <b>Message-Control Raw Data Clock(RPS14)</b> <b>Preamble Raw Data(RPS15)      Preamble Raw Data Clock(RPS16)</b> <b>Sub Channel Timing(RPS17)      PRACH Processing(RPS19)</b> <b>80ms Frame Pulse(RPS20)      Preamble Pulse(RPS21)</b> <b>Message Pulse(RPS22)      PRACH Pulse(RPS23)</b>

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

	<b>ESG-Sync Sig(RPS24)</b>	<b>Start-Trigger EchoBack(RPS25)</b>
<b>Remarks</b>	For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the <i>E4428C/38C ESG Signal Generators User's Guide</i> .	

**:ULINK:RPANel:PRACH:OUTPut:EVENT3**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:PRACH:OUTPut:EVENT3 RPS0 |
RPS1 | RPS6 | RPS7 | RPS11 | RPS12 | RPS13 | RPS14 | RPS14 | RPS15 | RPS16 | RPS17 | RPS19 |
RPS20 | RPS21 | RPS22 | RPS23 | RPS24 | RPS25
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:PRACH:OUTPut:EVENT3?
```

This command assigns a signal to the EVENT 3 output at the selected rear panel AUX I/O connector pin#19.

For parameter descriptions refer to “:ULINK:RPANel:PRACH:OUTPut:DCLock” on page 1145.

**\*RST** RPS0

<b>Key Entry</b>	<b>NONE (RPS0)</b>	<b>Chip Clock (RPS1)</b>	<b>Message-Data Raw Data (RPS11)</b>
	<b>10ms Frame Pulse (RPS6)</b>	<b>Trigger Sync Reply (RPS7)</b>	
	<b>Message-Data Raw Clock (RPS12)</b>	<b>Message-Control Raw Data (RPS13)</b>	
	<b>Message-Control Raw Data Clock(RPS14)</b>		
	<b>Preamble Raw Data(RPS15)</b>	<b>Preamble Raw Data Clock(RPS16)</b>	
	<b>Sub Channel Timing(RPS17)</b>	<b>PRACH Processing(RPS19)</b>	
	<b>80ms Frame Pulse(RPS20)</b>	<b>Preamble Pulse(RPS21)</b>	
	<b>Message Pulse(RPS22)</b>	<b>PRACH Pulse(RPS23)</b>	
	<b>ESG-Sync Sig(RPS24)</b>	<b>Start-Trigger EchoBack(RPS25)</b>	

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:PRACH:OUTPut:EVENT4**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:PRACH:OUTPut:EVENT4 4RPS0 |
RPS1 | RPS6 | RPS7 | RPS11 | RPS12 | RPS13 | RPS14 | RPS14 | RPS15 | RPS16 | RPS17 | RPS19 |
RPS20 | RPS21 | RPS22 | RPS23 | RPS24 | RPS25
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RPANel:PRACH:OUTPut:EVENT4?
```

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

This command assigns a signal to the EVENT 4 output at the selected rear panel AUX I/O connector pin#18.

For parameter descriptions refer to “:ULINK:RPANel:PRACH:OUTPut:DCLock” on page 1145.

**\*RST** RPS0

**Key Entry** **NONE (RPS0)** **Chip Clock (RPS1)** **Message-Data Raw Data (RPS11)**  
**10ms Frame Pulse (RPS6)** **Trigger Sync Reply (RPS7)**  
**Message-Data Raw Clock (RPS12)** **Message-Control Raw Data (RPS13)**  
**Message-Control Raw Data Clock(RPS14)**  
**Preamble Raw Data(RPS15)** **Preamble Raw Data Clock(RPS16)**  
**Sub Channel Timing(RPS17)** **PRACH Processing(RPS19)**  
**80ms Frame Pulse(RPS20)** **Preamble Pulse(RPS21)**  
**Message Pulse(RPS22)** **PRACH Pulse(RPS23)**  
**ESG-Sync Sig(RPS24)** **Start-Trigger EchoBack(RPS25)**

**Remarks** For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the *E4428C/38C ESG Signal Generators User's Guide*.

**:ULINK:RPANel:PRACH:OUTPut:SSYNc**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:PRACH:OUTPut:SSYNc RPS0 | RPS1 | RPS6 | RPS7 | RPS11 | RPS12 | RPS13 | RPS14 | RPS14 | RPS15 | RPS16 | RPS17 | RPS19 | RPS20 | RPS21 | RPS22 | RPS23 | RPS24 | RPS25  
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:RPANel:PRACH:OUTPut:SSYNc?

This command assigns a signal to SYM SYNC OUT at the selected rear panel AUX I/O connector pin#5.

For parameter descriptions refer to “:ULINK:RPANel:PRACH:OUTPut:DCLock” on page 1145.

**\*RST** RPS0

**Key Entry** **NONE (RPS0)** **Chip Clock (RPS1)** **Message-Data Raw Data (RPS11)**  
**10ms Frame Pulse (RPS6)** **Trigger Sync Reply (RPS7)**  
**Message-Data Raw Clock (RPS12)** **Message-Control Raw Data (RPS13)**  
**Message-Control Raw Data Clock(RPS14)**  
**Preamble Raw Data(RPS15)** **Preamble Raw Data Clock(RPS16)**  
**Sub Channel Timing(RPS17)** **PRACH Processing(RPS19)**

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

	<b>80ms Frame Pulse(RPS20)</b>	<b>Preamble Pulse(RPS21)</b>
	<b>Message Pulse(RPS22)</b>	<b>PRACH Pulse(RPS23)</b>
	<b>ESG-Sync Sig(RPS24)</b>	<b>Start-Trigger EchoBack(RPS25)</b>
<b>Remarks</b>	For more information about the rear panel connector configurations, refer to "Signal Generator Overview" in the <i>E4428C/38C ESG Signal Generators User's Guide</i> .	

**:ULINK:SCRamblecode**

<b>Supported</b>	E4438C with Option 400
	<code>[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:SCRamblecode &lt;val&gt;</code> <code>[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:SCRamblecode?</code>
	This command sets the uplink scramble code.
<b>*RST</b>	+0
<b>Range</b>	0–16777215
<b>Field Entry</b>	Scrambling Code

**:ULINK:SDElay**

<b>Supported</b>	E4438C with Option 400
	<code>[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:SDElay &lt;val&gt;</code> <code>[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:SDElay?</code>
	This command sets the number of timeslots to be delayed for the dedicated physical channel (DPCH).
<b>*RST</b>	+0
<b>Range</b>	0–119
<b>Key Entry</b>	<b>Timeslot Offset</b>
<b>Remarks</b>	The actual amount of timing offset is $(T0) + (TOFFset) + (SDElay) * 2560$ chips, where $T0 = 1024$ chips.  This command is not used when the sync source is set to ESG. Refer to <a href="#">“:ULINK:SYNC[:SOURCE]” on page 1152</a> .

**:ULINK:SFNRst:POLarity**

<b>Supported</b>	E4438C with Option 400
------------------	------------------------

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SFNRst:POLarity POSitive|NEGative
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SFNRst:POLarity?
```

This command sets the polarity of the system frame number reset signal for the uplink synchronization source.

**POSitive** This choice sets the signal to trigger when the trigger signal is high.

**NEGative** This choice sets the signal to trigger when the trigger signal is low.

**\*RST** POS

**Key Entry** **SFN RST Polarity Neg Pos**

**Remarks** This command is not used when the sync source is set to ESG. Refer to “:ULINK:SYNC[:SOURCE]” on page 1152.

**:ULINK:SYNC:MODE**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SYNC:MODE SINGLE|CONTinuous
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SYNC:MODE?
```

This command selects the uplink frame synchronization triggering mode.

**SINGLE** This choice sets the signal generator, once triggered, to generate frames based on the reference clock.

**CONTinuous** This choice sets the signal generator to continuously align the frame sync trigger signal and the frame timing.

**\*RST** SING

**Key Entry** **Frame Sync Trigger Mode Single Cont**

**:ULINK:SYNC[:SOURCE]**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SYNC[:SOURCE] SFN_RST|FCLock|ESG
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:SYNC[:SOURCE] ?
```

This command selects the uplink frame synchronization source type.

**SFN\_RST** This choice sets the signal to trigger on the system frame number reset signal.

**FCLock** This choice sets the signal to trigger on the frame clock.

**ESG** This choice sets the signal to trigger on the synchronization signal of a primary ESG.

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])**

<b>*RST</b>	<b>FCL</b>				
<b>Key Entry</b>	<b>Sync Source</b>	<b>SFN</b>	<b>FCIk</b>	<b>ESG</b>	

**:ULINK:TGAP:POFFset****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:POFFset &lt;val&gt;|AUTO

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:POFFset?

This command specifies the amount of power to be increased when the data is being compressed for the transmission gap power offset.

**AUTO** This choice sets the power to increase using the gap pattern parameters calculation based on 3GPP standard. When AUTO is selected, the query returns “AUTO” as the value.

The variable <val> is expressed in units of decibels (dB).

**\*RST** AUTO**Range** 0–6**Field Entry** PwrOffs

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK:TGAP:PSI[1]|2|3|4|5|6:CFN****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:CFN &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:CFN?

This command sets the connection frame number (CFN) for the first radio frame of the first pattern 1.

**\*RST** 0**Range** 1–255**Field Entry** TGCFN

**Remarks** In the signal generator, CFN is counted internally relative to the system sync signal.



## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**:ULINK:TGAP:PSI[1]:CMMETHOD****Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:TGAP:PSI[1]:CMMETHOD SF2|HIGHER  
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:TGAP:PSI[1]:CMMETHOD?

This command selects the compressed mode (CM) method.

**SF2** This choice selects a compressed mode method that reduced the spread factor (SF) by 2. This is done by increasing the data rate by reducing the spreading factor in half. When the dedicated physical data channel's (DPDCH) symbol rate is 960 kbps, the frame is not compressed because it uses the lowest SF value and it cannot be reduced.

**HIGHER** This choice selects a higher layer scheduling method. The emulated higher layer scheduling method mode keeps the same physical layer data rate even when a transmission gap is created.

**\*RST** SF2**Key Entry** **SF/2 Higher Layer**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

The ULINK:APPLY command will fail if the CM method is higher layer and DPDCH data is TrCH. CM method should be SF/2 if the DPDCH data is TrCH.

**:ULINK:TGAP:PSI[1]|2|3|4|5|6:D****Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:D  
<val>|UNDEFINED  
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:D?

This command sets the transmission gap distance. The command specifies the number of slots between the starting slots of two consecutive transmission gaps within a transmission gap pattern.

**UNDEFINED** This choice sets one transmission gap. When UNDEFINED is selected, then there is only one transmission gap within the transmission gap pattern.

**\*RST** UND**Range** 15–269**Field Entry** TGD

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****:ULINK:TGAP:PSI[1]|2|3|4|5|6:L1****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6  
:L1 3|4|5|7|10|14

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:L1?

This command specifies the length of the first transmission gap (TGL1). The length is expressed in number of slots.

**\*RST** +7**Field Entry** TGL1**:ULINK:TGAP:PSI[1]|2|3|4|5|6:L2****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6  
:L2 3|4|5|7|10|14|OMITted

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:L2?

This command specifies the length of the second transmission gap (TGL2). When OMITted is selected, TGL2=TGL1.

**\*RST** OMIT**Field Entry** TGL2**:ULINK:TGAP:PSI[1]|2|3|4|5|6:PL1****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:PL1 <val>  
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:PL1?

This command specifies the duration of the transmission gap pattern length 1 (TGPL1). The pattern length is expressed in number of frames.

**\*RST** +2**Range** 1–144**Field Entry** TGPL1

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])**:ULINK:TGAP:PSI[1]|2|3|4|5|6:PL2****Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:PL2 <val>|  
OMITted

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:PL2?

This command specifies the duration of the transmission gap pattern length 2 (TGPL2).

The variable &lt;val&gt; is expressed in number of frames. When OMITted is selected, TGPL2=TGPL1.

**\*RST** OMIT**Range** 1–144**Field Entry** TGPL2**Key Entry** **Omitted****:ULINK:TGAP:PSI[1]|2|3|4|5|6:POWer****Supported** E4438C with Option 400

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:POWer?

This query returns each power level for a compressed slot.

The return string has five real numbers followed by dBm (for normal power) or dB (for before/after gap power) separated by a single space character. When a value does not exist because of a specified compressed pattern (Example: Gap2 does not exist when TGD is “UNDeFined”), it returns “–dB.”

Normal power value represents an actual power level in dBm and relative power is represented in dB.

**:ULINK:TGAP:PSI[1]|2|3|4|5|6:PRC****Supported** E4438C with Option 400[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:PRC <val>|  
INFIinity

[:SOURCE]:RADIo:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1]|2|3|4|5|6:PRC?

This command sets the transmission gap pattern repetition count. The pattern repetition count (PRC) sets the number of transmission gap patterns within the transmission gap pattern sequence.

**\*RST** INF**Range** 1–511**Field Entry** TGPRC

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****Key Entry**           **Infinity****Remarks**           When INFINITY is selected, the PRC will continue indefinitely.**:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:PS****Supported**           E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:PS ACTIVE | INACTIVE

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:PS?

This command sets the transmission gap pattern status.

ACTIVE               This choice sets the compressed mode active.

INACTIVE            This choice sets the compressed mode inactive.

**\*RST**               INAC**Key Entry**           **TGPS Active Inactive****:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:SN****Supported**           E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:SN &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:PSI[1] | 2 | 3 | 4 | 5 | 6:SN?

This command specifies the timeslot number of the first transmission gap within the first radio frame.

**\*RST**               +11**Range**              0–14**Field Entry**        TGSN**:ULINK:TGAP:RPARAMeter****Supported**           E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:RPARAMeter DREF11 | DREF12 | DREF21 | DREF22

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TGAP:RPARAMeter?

This command sets the downlink reference compressed mode parameters as defined in 3GPP Standard TS25.101.

DREF11              This choice sets the reference parameter to 1.1.

DREF12              This choice sets the reference parameter to 1.2.

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

DREF21	This choice sets the reference parameter to 2.1.		
DREF22	This choice sets the reference parameter to 2.2.		
*RST	CUST		
<b>Key Entry</b>	<b>DL Reference 1.1</b>	<b>DL Reference 1.2</b>	<b>DL Reference 2.1</b>
	<b>DL Reference 2.2</b>		
<b>Remarks</b>	The query returns CUSTom when the parameters are set individually.		

**:ULINK:TGAP:SCFN**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TGAP:SCFN <val>

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TGAP:SCFN?

This command sets the stop connection frame number (CFN) when the stop trigger is used.

When the stop trigger is received at the signal generator, the next stop CFN, the compressed mode will finish even if the transmission gap pattern repetition count (TGPRC) is still remaining.

\*RST +0

**Range** 0–255

**Field Entry** SCFN

**Remarks** The compressed mode stop trigger must be used for this command to executed. Refer to “:ULINK:TGAP:STOP:TRIGger” on page 1160.

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

This command is not used when the sync source is set to ESG. Refer to “:ULINK:SYNC[:SOURCE]” on page 1152.

**:ULINK:TGAP[:STATe]**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TGAP [ :STATe ] ON|OFF|1|0

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TGAP [ :STATe ] ?

This command enables or disables the uplink transmission gap pattern.

\*RST 1

**Key Entry                    Compress Mode Off On**

**:ULINK:TGAP:START:TRIGGER**

**Supported**                E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:TGAP:START:TRIGGER

This command starts the compressed mode trigger.

**Key Entry                    Compressed Mode Start Trigger**

**:ULINK:TGAP:START:TRIGGER:POLARITY**

**Supported**                E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:TGAP:START:TRIGGER:  
POLARITY POSITIVE|NEGATIVE

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:TGAP:START:TRIGGER:POLARITY?

This command sets the compressed mode start trigger signal polarity.

POSITIVE                This choice sets the trigger to start when the trigger signal is high.

NEGATIVE                This choice sets the trigger to start when the trigger signal is low.

**\*RST**                    POS

**Key Entry                    Comp Mode Start Trigger Polarity Neg Pos**

**:ULINK:TGAP:STOP:TRIGGER**

**Supported**                E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:TGAP:STOP:TRIGGER

This command stops the compressed mode trigger.

**Key Entry                    Compressed Mode Stop Trigger**

**:ULINK:TGAP:STOP:TRIGGER:POLARITY**

**Supported**                E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:TGAP:STOP:TRIGGER:  
POLARITY POSITIVE|NEGATIVE

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK:TGAP:STOP:TRIGGER:POLARITY?

This command sets the compressed mode stop trigger signal polarity.

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

POSitive	This choice sets the trigger to stop when the trigger signal is high.
NEGative	This choice sets the trigger to stop when the trigger signal is low.
<b>*RST</b>	POS
<b>Key Entry</b>	<b>Comp Mode Stop Trigger Polarity Neg Pos</b>

**:ULINK:TOFFset**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TOFFset <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TOFFset?
```

This command sets additional timing offset for the dedicated physical channel (DPCH). Timing offset is the time delay between the downlink signal and the uplink signal. The downlink signal timing is provided by the synchronization signal.

<b>*RST</b>	+0
<b>Range</b>	–512 to 2560
<b>Key Entry</b>	<b>Timing Offset</b>
<b>Remarks</b>	The actual amount of timing offset is (T0) + (TOFFset) + (SDElay) where T0 = 1024 chips.

**:ULINK:TStatus:COMPRESSED**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TStatus:COMPRESSED?
```

This query returns the status of compressed pattern generation. A “0” response indicates the compressed mode pattern signal is not generating. A “1” response indicates that the compressed mode pattern signal is generating.

<b>*RST</b>	0
-------------	---

**:ULINK:TStatus:RACH**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK:TStatus:RACH?
```

This query returns the status of the physical random access channel (PRACH). A “0” response indicates the PRACH signal is not generating. A “1” response indicates that the PRACH signal is generating.

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**\*RST**                    0

**:ULINK:TStatus:RECeive**

**Supported**            E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TStatus:RECeive?
```

This query returns the frame synchronization signal reception status.

When the frame synchronization signal is received after synchronization configuration, the received value becomes “1.” If the signal is not received, the value is “0.”

**\*RST**                    0

**:ULINK:TStatus:SYNC**

**Supported**            E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:TStatus:SYNC?
```

This query returns the frame synchronization status. A “0” status indicates frame synchronization is fine or no frame synchronization signal is received). A “1” indicates frame synchronization is out sync and the synchronization signal does not match with the signal generator’s timing. The signal generator will generate incorrect data

**\*RST**                    0

**:ULINK:[TGRoup[1]]:DCH[1]|2|3|3|5|6:BLKSize**

**Supported**            E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:BLKSize <val>
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:BLKSize?
```

This command sets the block size for the selected uplink dedicated channel (DCH).

**\*RST**                    DCH1: 244    DCH2: 100    DCH3,4,5,6: 20

**Range**                    0–5000

**Key Entry**              Blk Size

**Remarks**              If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.



## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:BPFRame****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:BPFRame?

This query returns the number of bits per frame for the selected dedicated transport channel (DCH).

**\*RST** DCH1: 490 DCH2: 110 DCH3–6: 60**Field Entry** Bits/Frame**:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:BRATe****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:BRATe?

This query returns the bit rate for the selected dedicated transport channel (DCH)

**\*RST** DCH1: 12200 DCH2: 2500 DCH3–6: 2000**Range** 0–5000**:ULINK[:TGRoup[1]]:DCH[1]|2|3|3|5|6:CODE****Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:CODE HCONv|TCONv|TURBo|NONE  
[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:CODE?

This command sets the encoder type for the uplink dedicated channel (DCH) selected.

**HCONv** This choice selects a coding with the 1/2 rate convolutional encoder.**TCONv** This choice selects a coding with the 1/3 rate convolutional encoder.**TURBo** This choice selects a coding with the turbo coder.**NONE** This choice selects no coding type.**\*RST** DCH1,2: TCONv DCH3,4,5,6: HCONv**Key Entry** 1/2 Conv 1/3 Conv Turbo NONE**Remarks** If the choice, set by this command, is changed while the signal is active, the apply command must be sent to set the change. See “:ULINK:APPLY” on page 1075.

**:ULINK:[TGRoup[1]]:DCH[1]|2|3|3|5|6:CRc****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:CRc 0|8|12|16|24
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:CRc?
```

This command specifies the number of cyclic redundancy code (CRC) bits to be added to each transport channel block.

**\*RST** DCH1: 16 DCH2: 12 DCH3,4,5,6: 8**Field Entry** CRC Size

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK:[TGRoup[1]]:DCH[1]|2|3|3|5|6:DATA****Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:DATA PN9|FIX4|"<file name>"
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:[TGRoup[1]]:DCH[1]|
2|3|4|5|6:DATA?
```

This command configures the data type to be inserted into the selected uplink dedicated channel (DCH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

**\*RST** PN9**Key Entry** **PN9** **FIX4** **User File**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BER:ACTual****Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] |  
2 | 3 | 4 | 5 | 6:DATA:BER:ACTual?

This query returns the actual inserted error ratio in the uplink dedicated channel (DCH) selected.

**\*RST** +0.0000000E+000**Remarks** The actual bit error rate can be different from the specified bit error rate due to the internal bit generation.**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BER:ERRor:BIT****Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:  
DATA:BER:ERRor:BIT?

This query returns the actual error bits inserted in total number of bits.

**\*RST** +0**Field Entry** Error Bits**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BER:TOTal:BIT****Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:  
DATA:BER:TOTal:BIT?

This query returns the total number of bits inserted for the bit error ratio calculation.

**\*RST** 0**Field Entry** Total Bits

**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BER[:VALue]**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6 :
DATA:BER[:VALue] <val>
```

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6 :
DATA:BER[:VALue] ?
```

This command specifies the bit error rate (BER) value to be inserted into the selected uplink dedicated channel (DCH). The variable <val> is expressed in decimal form as a percent ratio (1.0=100%).

**\*RST** 0.0000000+000

**Range** 0.0001–1.0

**Field Entry** BER

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER:ACTual**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] |
2 | 3 | 4 | 5 | 6:DATA:BLER:ACTual?
```

This query returns the actual block error ratio inserted.

**\*RST** 0.0000000E+000

**Remarks** The actual block error rate can be different from the specified block error rate due to the internal bit generation.

**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER:ERRor:BLOCK**

**Supported** E4438C with Option 400

```
[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6 :
DATA:BLER:ERRor:BLOCK?
```

This query returns the number of error blocks inserted.

**\*RST** +0

**Field Entry** Error Blocks

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**:ULINK[:TGRoup[1] | 2:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER:TOTal:BLOCK****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1] | 2:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER:TOTal:BLOCK?

This query returns the error blocks actually inserted in total number of blocks.

**\*RST** +0**Field Entry** Total Blocks**:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER[:VALue]****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER[:VALue] &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1] | 2 | 3 | 4 | 5 | 6:DATA:BLER[:VALue]?

This command specifies the block error rate (BLER) value to be inserted into the selected uplink dedicated channel (DCH).

The variable &lt;val&gt; is expressed in decimal form as a percent ratio (1.0=100%).

**\*RST** +0.00000000E+000**Range** 0.0–1.00**Field Entry** BLER**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#).

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])****:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:DATA:EINSert****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:  
DATA:EINSert BLER|BER|NONE[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:  
DATA:EINSert?

This command selects the error insertion mode.

**BLER** This choice selects a block error rate (BLER) mode.**BER** This choice selects a bit error rate (BER) mode.**NONE** This choice selects no BLER or BER mode (no error blocks or bits inserted).**\*RST** NONE**Key Entry** **BLER** **BER** **None****:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:DATA:FIX4****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:  
DATA:FIX4 <val>[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:  
DATA:FIX4?

This command sets the 4 bit data pattern for the selected uplink dedicated channel (DCH).

While the variable &lt;val&gt; can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

**\*RST** #B0000**Range** 0–15**Key Entry** **FIX4**

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:NBLock****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:NBLock &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:NBLock?

This command specifies the number of transport blocks coded on to the selected dedicated channel (DCH).

**\*RST** +1**Range** 0–4095**Field Entry** Num of Blk**:ULINK[:TGRoup [1]]:DCH[1]|2|3|4|5|6:PPERcentage****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:PPERcentage?

This query returns the percentage of the total bits removed from or added to the fully coded channel.

The value is returned in the unit of percent and a negative value means repetition.

**Field Entry** Puncture**:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:RMATch****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:RMATch &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:RMATch?

This command specifies the rate matching parameters of each dedicated channel (DCH) selected.

**\*RST** DCH1: 2 DCH2: 12 DCH3,4,5,6: 1**Range** 1–256**Field Entry** Rate Match Attr

**:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:TTI****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:  
TTI 10000|20000|40000|80000

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6:TTI?

This command sets the transmission time interval (TTI) period for the dedicated channel (DCH) selected. TTI is the time interval of the amount of data to be transmitted.

The choices are expressed in units of milliseconds (msec) where 20000 = 20 msec.

**\*RST** DCH1: 20000 DCH2: 40000 DCH3,4,5,6: 10000**Field Entry** TTI**Remarks** The data amount equals the block size (BLKsize) times the number of transport blocks (NBlock).**:ULINK[:TGRoup[1]]:DCH[1]|2|3|4|5|6[:STATe]****Supported** E4438C with Option 400[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|  
2|3|4|5|6[:STATe] ON|OFF|1|0[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:DCH[1]|  
2|3|4|5|6[:STATe]?

This command enables or disables the operating state of the dedicated channel (DCH) selected.

**\*RST** DCH1,2: 1 DCH3,4,5,6: 0**Key Entry** TrCH State Off On**:ULINK[:TGRoup[1]]:RACH[1]:BLKSize****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:BLKSize &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:BLKSize?

This command sets the transport block size for the random access channel (RACH) coding where the input data is carried.

**\*RST** +168**Range** 0–5000**Field Entry** Blk Size



**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK[:TGRoup [1]]:RACH[1]:BPFRame**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [1] ] :RACH [1] :BPFRame?

This query returns the bits per frame for the selected random access channel (RACH).

**\*RST** +600

**:ULINK[:TGRoup [1]]:RACH[1]:BRATe**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [1] ] :RACH [1] :BRATe?

This query returns the bit rate for the random access transport channel (RACH).

**\*RST** +8400

**:ULINK[:TGRoup[1]]:RACH[1]:CODE**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [1] ] :RACH [1] :CODE?

This query returns the type of channel coding for error protection.

**\*RST** HCON

**:ULINK[:TGRoup[1]]:RACH[1]:CRC**

**Supported** E4438C with Option 400

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [1] ] :RACH [1] :  
CRC 0 | 8 | 12 | 16 | 24

[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [1] ] :RACH [1] :CRC?

This command specifies the number of cyclic redundancy code (CRC) bits that are to be added to each transport channel block.

**\*RST** +16

**Field Entry** CRC Size

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK[:TGRoup[1]]:RACH[1]:DATA**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [ 1 ] ] :RACH [ 1 ] :DATA PN9 |
FIX4 | "<file name>"
```

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [ 1 ] ] :RACH [ 1 ] :DATA?
```

This command sets the type of data to be inserted into the random access channel (RACH).

"<file name>" This variable specifies a data pattern that has been stored in memory.

**\*RST** PN9

**Key Entry** **PN9** **FIX4** **User File**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:ACTual**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [ 1 ] ] :RACH [ 1 ] :DATA:BER :
ACTual?
```

This query returns the actual error ratio inserted.

**\*RST** +0

**Range** 0–5000

**Key Entry** **Actual BER**

**Remarks** The specified error ratio and actual ratio will not match when the internal bit generation goes into “pre-computing” mode.

**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:ERRor:BIT**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [ 1 ] ] :RACH [ 1 ] :DATA:BER :
ERRor:BIT?
```

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIo:WCDMa:TGPP[:BBG])

This query returns the actual error bits inserted for the total number of bits.

**\*RST** 0

**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER:TOTal:BIT**

**Supported** E4438C with Option 400

[ :SOURce ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [ 1 ] ] :RACH [ 1 ] :DATA:BER:TOTal:BIT?

This query returns the total number of bits inserted for the bit error ratio calculation.

**\*RST** 0

**Remarks** The specified error ratio and actual ratio will not match when the internal bit generation goes into “pre-computing” mode.

**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BER[:VALue]**

**Supported** E4438C with Option 400

[ :SOURce ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [ 1 ] ] :RACH [ 1 ] :DATA:BER [ :VALue ] <val>

[ :SOURce ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [ 1 ] ] :RACH [ 1 ] :DATA:BER [ :VALue ] ?

This command sets the bit error rate value for the random access channel (RACH).

**\*RST** +0.00000000E+000

**Range** 0.0000–1.0

**Field Entry** BER

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:ACTual**

**Supported** E4438C with Option 400

[ :SOURce ] :RADIo:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [ 1 ] ] :RACH [ 1 ] :DATA:BLER:ACTual?

This query returns the actual error ratio inserted.

**\*RST** 0.0000000E+000

**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**

**Remarks** The specified error ratio and actual error ratio will not match when the internal bit generation goes into “pre-computing” mode.

**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:ERROR:BLOCK**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [1] ] :RACH [1] :DATA:
BLER:ERROR:BLOCK?
```

This query returns the actual block errors inserted in the total number of blocks.

**\*RST** +0

**Remarks** The specified error ratio and actual error ratio will not match when the internal bit generation goes into “pre-computing” mode.

**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER:TOTAL:BLOCK**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [1] ] :RACH [1] :DATA:
BLER:TOTAL:BLOCK?
```

This query returns the total blocks inserted for the block error ratio calculation.

**\*RST** +0

**Remarks** The specified error ratio and actual error ratio will not match when the internal bit generation goes into “pre-computing” mode.

**:ULINK[:TGRoup[1]]:RACH[1]:DATA:BLER[:VALue]**

**Supported** E4438C with Option 400

```
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [1] ] :RACH [1] :DATA:
BLER [ :VALue ] <val>
[ :SOURCE ] :RADio:WCDMa:TGPP [ :BBG ] :ULINK [ :TGRoup [1] ] :RACH [1] :DATA:
BLER [ :VALue ] ?
```

This command sets the inserted block error rate value. The variable <val> is expressed in decimal form, but it is a percent ratio (1.0=100%).

**\*RST** 0

**Range** 0.0001–1.0

**Field Entry** BLER

## Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK[:TGRoup[1]]:RACH[1]:DATA:EINSErt**

**Supported** E4438C with Option 400

```
[ :SOURCE ] : RADIo : WCDMA : TGPP [ : BBG ] : ULINK [ : TGRoup [ 1 ] ] : RACH [ 1 ] : DATA :
EINSErt BLER | BER | NONE
[ :SOURCE ] : RADIo : WCDMA : TGPP [ : BBG ] : ULINK [ : TGRoup [ 1 ] ] : RACH [ 1 ] : DATA : EINSErt ?
```

This command selects an error mode or no error insertion.

**BLER** This choice selects block error rate (BLER) mode.

**BER** This choice selects a bit error rate (BER) mode.

**NONE** This choice selects no BLER or BER mode (no error blocks or bits inserted).

**\*RST** NONE

**Key Entry** **BLER** **BER** **None**

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**:ULINK[:TGRoup[1]]:RACH[1]:DATA:FIX4**

**Supported** E4438C with Option 400

```
[ :SOURCE ] : RADIo : WCDMA : TGPP [ : BBG ] : ULINK [ : TGRoup [ 1 ] ] : RACH [ 1 ] : DATA :
FIX4 <val>
[ :SOURCE ] : RADIo : WCDMA : TGPP [ : BBG ] : ULINK [ : TGRoup [ 1 ] ] : RACH [ 1 ] : DATA : FIX4 ?
```

This command sets a fixed 4 bit pattern for use as a data pattern.

While the variable <val> can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

**\*RST** #B0000

**Range** 0–15

**Field Entry** Data

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to “:ULINK:APPLY” on page 1075.

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**:ULINK[:TGRoup[1]]:RACH[1]:NBLOCK****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:NBLOCK &lt;val&gt;

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:NBLOCK?

This command sets the number of transport blocks coded into one random access channel (RACH).

**\*RST** +1**Range** 0–4095**Field Entry** Num of Blk**Remarks** The total input data into one RACH is the block size (BLKsize) multiplied by the number of transport blocks (NBLOCK).

If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY” on page 1075](#)

**:ULINK[:TGRoup [1]]:RACH[1]:PPERcentage****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:PPERcentage?

This query returns the percentage of the total bits removed from or added to the fully coded channel.

**\*RST** -2.12500000E+002**Field Entry** Puncture**:ULINK[:TGRoup[1]]:RACH[1]:RMArch****Supported** E4438C with Option 400

[:SOURCE]:RADio:WCDMa:TGPP[:BBG]:ULINK:RACH[1]:RMArch?

This query returns the rate match parameters of each random access channel (RACH).

**\*RST** +1

**Wideband CDMA Base Band Generator Subsystem—Option 400** ([:SOURCE]:RADIO:WCDMA:TGPP[:BBG])**:ULINK[:TGRoup[1]]:RACH[1]:TTI****Supported** E4438C with Option 400[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:  
TTI 10000|20000

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1]:TTI?

This command sets the transmission time interval (TTI) period for the random access channel (RACH).

The choices are expressed in units of milliseconds (msec) where 20000=20 msec.

**\*RST** 20000**Field Entry** TTI

**Remarks** If the parameter set by this command is changed while the signal is active, the apply command must be executed for the change to occur. Refer to [“:ULINK:APPLY”](#) on page 1075.

**:ULINK[:TGRoup[1]]:RACH[1][:STATe]****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG]:ULINK[:TGRoup[1]]:RACH[1][:STATe]?

This query returns the state of the random access channel (RACH).

**\*RST** 1**[:STATe]****Supported** E4438C with Option 400

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG][:STATe] ON|OFF|1|0

[:SOURCE]:RADIO:WCDMA:TGPP[:BBG][:STATe]?

This command enables or disables W-CDMA functionality.

**\*RST** 0**Key Entry** **W-CDMA Off On**

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**Wideband CDMA Base Band Generator Subsystem—Option 400 ([:SOURCE]:RADio:WCDMa:TGPP[:BBG])**



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