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

Agilent Technologies

Manufacturing Part Number: E4400-90594

Printed in USA

August 2005

Notice

The material contained in this document is provided “as is”, and is subject to being changed, without notice, in future editions.

Further, to the maximum extent permitted by applicable law, Agilent disclaims all warranties, either express or implied with regard to this manual and to any of the Agilent products to which it pertains, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. Agilent shall not be liable for errors or for incidental or consequential damages in connection with the furnishing, use, or performance of this document or any of the Agilent products to which it pertains. Should Agilent have a written contract with the User and should any of the contract terms conflict with these terms, the contract terms shall control.

Questions or Comments about our Documentation?

We welcome any questions or comments you may have about our documentation. Please send us an E-mail at **sources_manuals@am.exch.agilent.com**.

SCPI Command Reference, Volume 1

SCPI Command Reference, Volume 2

Contents

SCPI Command Reference, Volume 3

Contents

Contents

Contents

Contents

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:

GPS Subsystem–Option 409 ([:SOURce]:RADio[1]|2|3|4:GPS)

:DATA

Supported E4438C with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:DATA PN9|PN15|FIX4|"<user file>"
[:SOURce]:RADio[1]|2|3|4: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 only effective when the data mode is RAW or ENCoded. To set the data mode, refer to ":DMODe".

:DMODe

Supported E4438C with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:DMODe RAW|ENCoded|TLM
[:SOURce]:RADio[1]|2|3|4: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-bits of computed parity.

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.

***RST** RAW

Key Entry **Data Mode Raw Enc TLM**

Remarks 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 664.

:DSHift

Supported E4438C with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:DSHift <val>
[:SOURce]:RADio[1]|2|3|4:GPS:DSHift?
```

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).

***RST** +0.00000000E+000

Range –125 to 125

Key Entry **Doppler Shift**

Remarks 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

Supported E4438C with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer RNYQuist|NYQuist|GAUSsian|RECTangle|
IS95|IS95_EQ|IS95_MOD|IS95_MOD_EQ|AC4Fm|UGGaussian|"<user FIR>"
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer?
```

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.
***RST**	RECT
Key Entry	**Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

:FILTer:ALPHa

Supported E4438C with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer:ALPHa <val>
[:SOURce]:RADio[1]|2|3|4: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 665.

:FILTer:BBT

Supported E4438C with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer:BBT <val>
[:SOURce]:RADio[1]|2|3|4: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 665.

:FILTer:CHANnel

Supported E4438C with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:FILTer:CHANnel
[:SOURce]:RADio[1]|2|3|4: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 665.

:IQPHase

Supported E4438C with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:IQPHase NORMal|INVerted
[:SOURce]:RADio[1]|2|3|4: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[1]|2|3|4:GPS:PCODe <val>
[:SOURce]:RADio[1]|2|3|4:GPS:PCODe?
```

This command sets the P code power relative to the C/A code power.

***RST** –3

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[1]|2|3|4:GPS:RCODe CA|P|CAP
[:SOURce]:RADio[1]|2|3|4: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.

P	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.
CAP	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.

***RST** CA

Key Entry **Ranging Code C/A P C/A+P**

:REFClk

Supported E4438C with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:REFClk [INT]|Ext
[:SOURce]:RADio[1]|2|3|4:GPS:REFClk?
```

This command sets the GPS reference clock to either internal or external.

INT	This selection sets the signal generator to use the internal chip clock.
EXT	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[1]|2|3|4:GPS:REFFreq <val><unit>
[:SOURce]:RADio[1]|2|3|4:GPS:REFFreq?
```

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

***RST** +1.02300000E+007

Range 1kCPS–12.5MCPS

Key Entry **GPS Ref (f0)**

Remarks Changing the GPS reference frequency will change the P and C/A code chip rates.

:SATid

Supported E4438C with Option 409

```
[:SOURce]:RADio[1]|2|3|4:GPS:SATid <val>
[:SOURce]:RADio[1]|2|3|4: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[1]|2|3|4:GPS[:STATe] ON|OFF|1|0
[:SOURce]:RADio[1]|2|3|4:GPS[:STATe]?
```

This command enables or disables the real-time GPS signal.

***RST** 0

Key Entry **Real-time GPS 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 684.

: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 683.

: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 684.

: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 702 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 863). Refer to ":FILTer" on page 684 for information on filter symbol widths.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 687.

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		
	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: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

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 687. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FDELay" on page 675 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

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 687. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" on page 676 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:GSM:BURSt:SHAPe:FDELay <val>
[:SOURce]:RADio:GSM: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 –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 687. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 674 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: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 687. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:TIME" on page 674 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 687. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:DELay" on page 677 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 687. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" on page 676 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 <val>
[: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 687. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RTIMe" on page 678 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 <val>
[: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 687. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 678 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.

***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 684.

: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

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: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 110.

: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.

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 671 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 683 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

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

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 687.

Refer to ":SRATe" on page 863 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 687 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 687 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

Key Entry **BPSK** **QPSK** **IS-95 QPSK** **Gray Coded QPSK** **OQPSK** **IS-95 OQPSK** **π/4 DQPSK** **8PSK** **16PSK** **D8PSK** **MSK** **2-Lvl FSK** **4-Lvl FSK** **8-Lvl FSK** **16-Lvl FSK** **C4FM** **4QAM** **16QAM** **32QAM** **64QAM** **128QAM** **256QAM** **User I/Q** **User FSK**

: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 688.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to ":SECondary[:STATe]" on page 689.

: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 688.

: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 708.

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 688.

: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–#H1FFFFFFFFF

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–#H3FFFFFF

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:NORMal:ENCRyption

Supported E4438C with Option 402

```
[:SOURce]:RADio:GSM:SLOT0|[1]|2|3|4|5|6|7:NORMal: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:NORMal: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
Range	BCH1: 0–65535 BCH2: 0–65535
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 TCH/FS TCH/HS CS-1 CS-4 Downlink MCS-1 Uplink MCS-1**
Remarks	See "File Name Variables" on page 13 for information on the file name syntax.

:SLOT0:NORMal:ENCRyption:BCH1:BCC

Supported E4438C with Option 416

```
[:SOURce]:RADio:GSM:SLOT0:NORMal:ENCRyption:BCH1:BCC <val>
[: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 <val>
[: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 <val>
[: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

: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 692 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

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 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

Key Entry **Begin Frame** **Begin Timeslot #** **All Timeslots**

: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 701.

: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 701.

: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 672 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 684 for minimum filter symbol width.

NOTE When using multiframe, limit the symbol rate to no more than 271 ksps. Although higher rates may work, they are not supported.

The filter may have to be truncated down to 32 or 16 symbols wide to acheive 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 687.

***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–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: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 704.
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 704 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 704.

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).

***RST** 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 704. 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 708.

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 705
  - — continuous and single modes, see ":TRIGger[:SOURce]:EXTernal:SLOPe" on page 707
- 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 706
  - — turning the delay on, see ":TRIGger[:SOURce]:EXTernal:DELay:STATe" on page 707

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 707. 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 705.

***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 706).

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 706, and for more information on configuring an external source, see":TRIGger[:SOURce]" on page 705.

***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 705.

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 705.

***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 705. 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: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.

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 9-1 shows the software naming convention for the different files created by the HSDPA software.

Table 9-1 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	
	DCHx[a]	<project name>–DCHx[a]	
	Inter-TTI	<project name>–ITTIx[b]	
	HARQ ACK/NACK Pattern	<project name>–DLCPT	
	AMC CQI Pattern	<project name>–DLAPT	
	HS-DSCH	<project name>–DSCH1	
	HS-PDSCH	<project name>–HSPDx[b]	
	HS-SCCH	<project name>–HSSCCx[b]	
Uplink	DPCCH	<project name>–DPCCH	
	FBI	<project name>–FBI	
	TPC	<project name>–TPC	
	DPDCH	<project name>–DPDCH	
	DCHx[a]	<project name>–DCHx[a]	
	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 152.

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 418418

```
[: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 712.

: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 712.

: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 <val>
[:SOURce]:RADio:WCDMa:HSDPa[: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 712.

: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 712.

:DLINk:DPCH:CCODe

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINk:DPCH:CCODe <val>
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINk:DPCH:CCODe?
```

This command sets the downlink DPCH channel code number.

***RST** 10

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 712.

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 710 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 712.

: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 712.

: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 712.

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 712.

: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 712.

: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 710 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 712.

: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.

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 712.

: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.

***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 712.

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.

***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 712.

: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 712.

: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 712.

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 <val>
[:SOURce]:RADio:WCDMa:HSDPa[: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 712.

: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 712.

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 712.

: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 712.

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 712.

: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 712.

: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 710 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 712.

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 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 712.

: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.

`"<user FIR>"` This variable represents any FIR filter file stored in signal generator memory. Refer to "File Overview" on page 710 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 712.

: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 712.

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 712.

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 712.

To change the filter selection, refer to ":DLINk:FILTer" on page 723.

: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 712.

: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 727 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 712.

: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

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 712.

: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 712

: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 712.

: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.

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 727 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 712.

: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 727 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 712.

: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 712.

: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 712.

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.

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 710 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 712.

: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 712.

: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 710 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 712.

: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 712.

: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 712.

: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 712.

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 712.

: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 712.

: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 712.

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 739 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 712.

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 710 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 712.

: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 <val>
[: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 712.

: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 <val>
[: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 712.

: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 712.

: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.

***RST** FIX

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to ":DLINk:APPLy" on page 712.

: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 712.

: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 712.

: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 712.

: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)	• Turns on the HS-SCCH for the selected HSDPA. • Enables turning on the HS-PDSCH for the selected HSDPA.
OFF (0)	• Turns off the HS-SCCH for the selected HSDPA. • Turns off the active HS-PDSCH for the selected HSDPA.

***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 712.

Refer to ":DLINk:HSDPa[1]|2|3|4:HSPDsch[:STATe]" on page 734 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.

: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 <val>
[: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.

***RST**

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 712.

: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 712.

: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 712.

: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 712.

: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 <val>
[: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.

***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 712.

: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 712.

:DLINk:PCCPch:BCH:DATA

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINk:PCCPch:BCH:DATA PN9|PN15|FIX4|
"<file name>"
[:SOURce]:RADio:WCDMa:HSDPa[: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 710 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 712.

: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 712.

: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 712.

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 712.

: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 712.

: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 712.

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 710 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 712.

: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 712.

:DLINk:PICH:POWer

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINk:PICH:POWer <val>
[:SOURce]:RADio:WCDMa:HSDPa[: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 712.

: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 712.

: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 712.

: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 712.

: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 712.

: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 712.

:DLINk:SSCH:POWer

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:DLINk:SSCH:POWer <val>
[:SOURce]:RADio:WCDMa:HSDPa[: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 712.

: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 712.

: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 712.

: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 HDSPA 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

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 749.

: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

: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 754 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 710 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 749.

:ULINk:DPCCh:DATA:FIX4

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:DPCCh:DATA:FIX4 <val>
[: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 749.

: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 710 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 749.

:ULINk:DPCCh:FBI:PATTern:FIX

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:DPCCh:FBI:PATTern:FIX <val>
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:DPCCh:FBI:PATTern:FIX?
```

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

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

***RST** +0

Range 0–10737418235

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to ":ULINk:APPLy" on page 749.

:ULINk:DPCCh:POWer

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:DPCCh:POWer <val>
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:DPCCh:POWer?
```

This command sets the uplink DPCCH 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 749.

:ULINk:DPCCh:SFORmat

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:DPCCh:SFORmat <val>
[: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 749.

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 749.

:ULINk:DPCCh:TFCI

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:DPCCh:TFCI <val>
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:DPCCh:TFCI?
```

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

The variable `<val>` 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 749.

:ULINk:DPCCh:TPC:NSTeps

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:DPCCh:TPC:NSTeps <val>
[: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 749.

:ULINk:DPCCh:TPC:PATTern

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:DPCCh:TPC:PATTern
UDOWn|DUP|UALL|DALL|"<file name>"
[: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 710 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 749.

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 761 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 710 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 749.

: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

Remarks Setting the command parameter while the signal is active also requires executing the apply command. Refer to ":ULINk:APPLy" on page 749.

: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 749.

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 749.

: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.

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 749.

: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 710 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 749.

: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
Remarks	Setting the command parameter while the signal is active also requires executing the apply command. Refer to ":ULINk:APPLy" on page 749.

: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 749.

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 749.

: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 749.

: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 749.

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 749.

: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 749.

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 749.

: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 770 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 770 for selecting the sync source.

: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 “File Overview” on page 710 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 “:ULINk:APPLy” on page 749.

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

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 749.

: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 749.

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 749.

To change the filter selection, refer to ":ULINk:FILTer" on page 763.

: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 sub-frames 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 710 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 749.

: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 749.

: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 sub-frames 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 710 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 749.

: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 749.

: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 749.

:ULINk:HSDPcch:SFDelay

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:HSDPcch:SFDelay <val>
[: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 749.

: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 749.

: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 749.

:ULINk:SCRamblecode

Supported E4438C with Option 418

```
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:SCRamblecode <val>
[:SOURce]:RADio:WCDMa:HSDPa[:BBG]:ULINk:SCRamblecode?
```

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 770

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 770 for selecting the sync source.

: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

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 769

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 785.

: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 785.

: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 863). Refer to ":FILTer" on page 785 for information on filter symbol widths.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 788.

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** +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 788. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FDELay" 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: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 788. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" 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: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 788. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 775 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 788. Refer to ":SRATe" on page 863 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[: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 788. Refer to ":SRATe" on page 863 for 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.

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 788. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" on page 778 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 788. Refer to ":SRATe" on page 863 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.

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 788. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 779 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 785.

: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

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:[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 110

: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 772 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 785 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 784 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.

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	**Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**
Remarks	Refer to "File Name Variables" on page 13 for information on the file name syntax.

:FRATe

Supported 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.

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[: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.

***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[: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 788.

Refer to ":SRATe" on page 863 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.

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 788 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 788 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

Key Entry **BPSK** **QPSK** **IS-95 QPSK** **Gray Coded QPSK** **OQPSK** **IS-95 OQPSK** **π/4 DQPSK** **8PSK** **16PSK** **D8PSK** **MSK** **2-Lvl FSK** **4-Lvl FSK** **8-Lvl FSK** **16-Lvl FSK** **C4FM** **4QAM** **16QAM** **32QAM** **64QAM** **128QAM** **256QAM** **User I/Q** **User FSK**

: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 790.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to ":SECondary[:STATe]" on page 790.

: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 789.

: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 804.

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 790.

: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

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 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

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: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.

***RST** #HA91DE4A

Range #H0–#HFFFFFFF

Key Entry 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.

***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 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

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 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

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

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 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] UCUStom|DCUStom|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

Key Entry **Up Custom** **Down Custom** **Up TCH** **Up TCH All** **Down TCH** **Down TCH All**

: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

Key Entry **Begin Frame** **Begin Timeslot #** **All Timeslots**

: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 798.

: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 798.

: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 672 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 785 for minimum filter symbol width.

The filter may have to be truncated down to 32 or 16 symbols wide to acheive 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 788.

***RST** +2.43000000E+004

Range

Modulation Type	Symbol Rate Range		
	16 Symbol Wide Filter	*32 Symbol Wide Filter*	*64 Symbol Wide Filter*
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 801.
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[: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 800.

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[: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 800.

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

Key Entry **Gate Active Low High**

: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 800. 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 804.

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 802
  - continuous and single modes, see ":TRIGger[:SOURce]:EXTernal:SLOPe" on page 804
- 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 803
  - turning the delay on, see ":TRIGger[:SOURce]:EXTernal:DELay:STATe" on page 804

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[: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 804. 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 802.

***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 803, and for more information on configuring an external source, see":TRIGger[:SOURce]" on page 802.

***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 802.

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 ESGESG 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 802.

***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 802. 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[: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 818.

: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 818.

: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 863). Refer to ":FILTer" on page 818 for information on filter symbol widths.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 821.

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** +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 821. Refer to ":SRATe" on page 863 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FDELay" on page 810 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

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 821. Refer to ":SRATe" on page 863 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" on page 811 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 821. Refer to ":SRATe" on page 863 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 809 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 821. Refer to ":SRATe" on page 863 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:TIME" on page 809 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 821. Refer to ":SRATe" on page 863 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:DELay" on page 812 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 821. Refer to ":SRATe" on page 863 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" on page 811 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 821. Refer to ":SRATe" on page 863 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RTIMe" on page 813 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**

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 821. Refer to ":SRATe" on page 863 for a list of minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 813 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 818.

: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 110.

: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 806 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**

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 818 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 817 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.
***RST**	RYNQ
Key Entry	**Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**
Remarks	Refer to "File Name Variables" on page 13 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.

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: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 821.

Refer to ":SRATe" on page 863 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 821 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 821 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.

***RST** P4DQPSK

Key Entry **BPSK** **QPSK** **IS-95 QPSK** **Gray Coded QPSK** **OQPSK** **IS-95 OQPSK** **π/4 DQPSK** **8PSK** **16PSK** **D8PSK** **MSK** **2-Lvl FSK** **4-Lvl FSK** **8-Lvl FSK** **16-Lvl FSK** **C4FM** **4QAM** **16QAM** **32QAM** **64QAM** **128QAM** **256QAM** **User I/Q** **User FSK**

: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 822.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to ":SECondary[:STATe]" on page 823.

: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 822.

: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 838.

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 823.

: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

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 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 824.

: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–#HFFFFF

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–#HFFFFF

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.

***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

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 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–#HFFFFF

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

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 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–#HFFFFF

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

Key Entry **Up Custom** **Down Custom** **Up TCH** **UP TCH All** **Up VOX** **Down TCH** **Down TCH All**

: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

Key Entry **Begin Frame** **Begin Timeslot #** **All Timeslots**

: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

Range –279 to 279

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 831.

:SOUT:SLOT

Supported 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.

***RST** +0

Range 0–5

Key Entry **Begin Timeslot #**

Remarks To change the output of the EVENT1 rear panel connector to SLOT, refer to ":SOUT" on page 831.

:SRATe

Supported 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 672 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 818 for minimum filter symbol width.

The filter may have to be truncated down to 32 or 16 symbols wide to acheive 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 821.

***RST** +2.10000000E+004

Range

Modulation Type	Symbol Rate Range		
	16 Symbol Wide Filter	*32 Symbol Wide Filter*	*64 Symbol Wide Filter*
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 834.
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: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 834.

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: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 834.

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]

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 834. 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 838.

  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 835
  — continuous and single modes, see ":TRIGger[:SOURce]:EXTernal:SLOPe" on page 837

- 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 836
  — turning the delay on, see ":TRIGger[:SOURce]:EXTernal:DELay:STATe" on page 837

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 837. 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 835.

***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 836, and for more information on configuring an external source, see":TRIGger[:SOURce]" on page 835.

***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 835.

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 ESGESG 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 835.

***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 835. 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 857.

: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 857.

: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 863). Refer to ":FILTer" on page 857 for information on filter symbol widths.

To change the modulation type, refer to ":MODulation[:TYPE]" on page 860.

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** +3.84000000E+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 842.

: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 842.

: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 860. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FDELay" on page 844 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 860. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" on page 845 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 860. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 843 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 860. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:TIME" on page 843 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 860. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:DELay" on page 846 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 860. Refer to ":SRATe" on page 863 for minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" on page 845 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 860. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values. The command ":BURSt:SHAPe:RTIMe" on page 847 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 860. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" on page 847 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 857.

: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

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: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 110.

: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

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 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.

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–#H3FFFFFFFFF

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–#H3FFFFFFF

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–#H3FFFFFFFF

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–#HFFFFFFFF

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

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 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 854.

: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.

***RST** NORM

Key Entry **Ext Data Clock Normal Symbol**

Remarks Both choices have no effect in internal clock mode. Refer to ":BBCLock" on page 839 to select EXT as the data clock type.

:EREFerence

Supported E4438C with Option 402

```
[:SOURce]:RADio:PHS:EREFerence INT|EXT
[:SOURce]:RADio:PHS: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 856 to enter the external reference frequency setting.

:EREFerence:VALue

Supported E4438C with Option 402

```
[:SOURce]:RADio:PHS:EREFerence:VALue <val>
[:SOURce]:RADio:PHS: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 856 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

Key Entry **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

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 860.

Refer to ":SRATe" on page 863 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 860 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 860 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

Key Entry **BPSK** **QPSK** **IS-95 QPSK** **Gray Coded QPSK** **OQPSK** **IS-95 OQPSK** **π/4 DQPSK** **8PSK** **16PSK** **D8PSK** **MSK** **2-Lvl FSK** **4-Lvl FSK** **8-Lvl FSK** **16-Lvl FSK** **C4FM** **4QAM** **16QAM** **32QAM** **64QAM** **128QAM** **256QAM** **User I/Q** **User FSK**

: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 861.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to ":SECondary[:STATe]" on page 861.

: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 860.

: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 867.

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**

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 861.

: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 862.

: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 862.

: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 773 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 857 for minimum filter symbol width.

The filter may have to be truncated down to 32 or 16 symbols wide to acheive 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 860.

***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–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: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 865.

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: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 864.

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: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 864.

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 867. 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 868.

***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 866, and for more information on configuring an external source, see":TRIGger[:SOURce]" on page 868.

***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 866.

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 ESGESG 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 868.

***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 868. 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**

: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 864. 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 867.

  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 866
  - — continuous and single modes, see ":TRIGger[:SOURce]:EXTernal[:SOURce]" on page 867
- 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 866
  - — turning the delay on, see ":TRIGger[:SOURce]:EXTernal:DELay:STATe" on page 867

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**

: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

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 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** #H000000000

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

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 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**

[: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 889.

: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.

: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 889.

: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 863). Refer to ":FILTer" on page 889 for information on filter symbol widths. To change the modulation type, refer to ":MODulation[:TYPE]" on page 892.

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		
	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: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.

: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** #HFFFFFFFF

Range #H0–#HFFFFFFFF

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 878 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 878.

: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.

***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 892. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FDELay" on page 880 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: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.

***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 892. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FTIMe" on page 880 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: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 892. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:DELay" on page 878 performs the same

function; in compliance withe 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 892. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:FALL:TIME" 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: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 892. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:DELay" on page 882 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 892. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RDELay" 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: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 892. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RTIMe" on page 883 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 892. Refer to ":SRATe" on page 863 for a list of the minimum and maximum symbol rate values.

":BURSt:SHAPe:RISE:TIME" 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[: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 889.

: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

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: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 110.

: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 885.

: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 875 to select EXT as the data clock type.

: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 888 to enter the external reference frequency setting.

:EREFerence:VALue

Supported E4438C with Option 402

```
[:SOURce]:RADio:TETRa:EREFerence:VALue <val>
[: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 888 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 **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

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: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 892.

Refer to ":SRATe" on page 863 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 892 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**

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 892 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

Key Entry **BPSK** **QPSK** **IS-95 QPSK** **Gray Coded QPSK** **OQPSK** **IS-95 OQPSK** **π/4 DQPSK** **8PSK** **16PSK** **D8PSK** **MSK** **2-Lvl FSK** **4-Lvl FSK** **8-Lvl FSK** **16-Lvl FSK** **C4FM** **4QAM** **16QAM** **32QAM** **64QAM** **128QAM** **256QAM** **User I/Q** **User FSK**

: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 893.

A secondary frame is not active until the secondary state is enabled. To activate a secondary frame, refer to ":SECondary[:STATe]" on page 894.

: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 893.

: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 916.

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: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 893.

: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

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 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–#H3FFFFF

Key Entry **TS**

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

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 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–#HFFFFFFFFFFFFFFFFFFFFFFFFFFFF

Key Entry **SSB**

:SLOT[1]|2|3|4:DCSync:STS

Supported E4438C with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DCSync:STS <val>
[: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|"<file name>"|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

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 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 <val>
[: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

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 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.

:SLOT[1]|2|3|4:DDNormal:B1

Supported E4438C with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDNormal:B1 <val>
[: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 <val>
[: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 <val>
[: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|PN23FIX4|"<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

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 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.

:SLOT[1]|2|3|4:DDSync:B

Supported E4438C with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:DDSync:B <val>
[: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–#H3FFFFFF

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 <val>
[: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 <val>
[: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** #H00000000000000000000000000000000

Range #H0–#HFFFFFFFFFFFFFFFFFFFFFFFFFFFF

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–#H3FFFFFFFF

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

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 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**

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 896.

: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

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 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–#H3FFFFF

Key Entry **TS**

: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

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 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:UCUStom

Supported E4438C with Option 402

```
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UCUStom PN9|PN11|PN15|
PN20|PN23|FIX4|"<file name>"|EXT|P4|P8|P16|P32|P64
[:SOURce]:RADio:TETRa:SLOT[1]|2|3|4:UCUStom?
```

This command configures the uplink custom data field.

***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.

: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–#H3FFFFF

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

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 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 909 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.

***RST** +0

Range –509 to 509

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 909.

:SOUT:SLOT

Supported 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.

***RST** +1

Range 1–4

Key Entry **Begin Timeslot #**

Remarks 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 909.

:SRATe

Supported E4438C with Option 001/601or 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 876 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 889 for minimum filter symbol width.

The filter may have to be truncated down to 32 or 16 symbols wide to acheive 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 892.

***RST** +1.80000000E+004

Range

Modulation Type	Symbol Rate Range		
	16 Symbol Wide Filter	*32 Symbol Wide Filter*	*64 Symbol Wide Filter*
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: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 912.
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 912.

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 912.

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]

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 912. 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 916.

  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 913
  — continuous and single modes, see ":TRIGger[:SOURce]:EXTernal:SLOPe" on page 916

- 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 915
  — turning the delay on, see ":TRIGger[:SOURce]:EXTernal:DELay:STATe" on page 915

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 915. 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 914.

***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 915, and for more information on configuring an external source, see":TRIGger[:SOURce]" on page 914.

***RST** 0

Key Entry **Ext Delay Off On**

: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 913.

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 914.

***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 914. 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 918 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.

: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 <val>
[: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**

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.

: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`

: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 <val>
[: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).

RIGHt	This choice selects scramble codes 8192–16383 (Normal + 8192).
LEFT	This choice selects scramble codes 16384–24575 (Normal + 16384).
***RST**	NORM
Key Entry	**Normal** **Right** **Left**

: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.

***RST** +11

Range 1–15

Field Entry `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.

***RST** +0

Range 0–15

Field Entry `SecScr Code OS`

:DLINk:CARB:CMODe:TFIRst

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CARB:CMODe:TFIRst <val>
[: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 <val>
[: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**

: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 <val>`
`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:CPICh:POWer?`

This command sets the power level for the common paging indicator channel (CPICH). The variable `<val>` 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** +3.84000000E+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 935 and ":DLINk:OCNS[1]|2|3|4|5|6|7|8|9|10|11|12|13|14|15|16[:STATe]" on page 940.

The command [:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]:BINitialize must be initiated prior to channel balancing.

:DLINk:DPCH[1]:BINitialize

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]:BINitialize
```

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.

: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 919.

To query the state of the individual channel, refer to ":DLINk:DPCH[1]|2[:STATe]" on page 935

: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 932 and ":DLINk:DPCH[1]|2:SRATe" on page 932.

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 919.

: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).

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.
***RST**	PN9
Key Entry	**PN9 PN15 FIX4 "User File" Transp Chan A Transp Chan B**
Remarks	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 ":DLINk:APPLy" on page 919.

: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 919.

: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

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.

Key Entry

12.2 kbps (34.121)	**64 kbps (34.121)**
144 kbps (34.121)	**384 kbps (34.121)**
AMR 12.2 (25.944)	**UDI ISDN (25.944)**

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 919.

: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 919.

:DLINk:DPCH[1]|2:SRATe

Supported E4438C with Option 400

```
[: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

Field Entry `2nd Scr 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 919.

: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 919.

: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 919.

:DLINk:DPCH[1]|2:TPC:NUMSteps

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:DPCH[1]|2:TPC:NUMSteps <val>
[: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 919.

: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**

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 919.

: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 919.

: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.

AC4Fm — 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.

***RST** — RNYQ

Key Entry — **Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** **User FIR**

Remarks — See "File Name Variables" on page 13 for information on the file name syntax.

:DLINk:FILTer:ALPHa

Supported — E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer:ALPHa <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer:ALPHa?
```

Execute this command to change the alpha value for a Nyquist or root Nyquist filter.

***RST** — +2.20000000E–001

Range — 0–1

Key Entry — **Filter Alpha**

Remarks — 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 ":DLINk:FILTer" on page 935.

:DLINk:FILTer:BBT

Supported — E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer:BBT <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:FILTer:BBT?
```

Execute this command to change the bandwidth-multiplied-by-bit-time filter parameter value.

***RST** — +5.00000000E–001

Range — 0.0000–1.0

Key Entry — **Filter BbT**

Remarks — This command is effective only after selecting a Gaussian filter; it does not affect other types of filters. See ":DLINk:FILTer" on page 935 to change the filter type.

: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 935.

: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 940.

: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 <val>
[: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 939.

: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 <val>
[: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).

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 938.

: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

: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.

: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 adjusts 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 <val>
[: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 <val>
[: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 <val>
[: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

: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 <val>
[: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|
"<file name>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:DATA?
```

This command configures the data pattern for the downlink paging indicator channel (PICH).

`"<file name>"` 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`

:DLINk:PICH:POWer

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:PICH:POWer <val>
[: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|INVverted
[: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*.

: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|DPRS5|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 9-2 on page 948 for command parameters for the variable and output signal names.

Table 9-2 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 9-2 Downlink Rear Panel Signal (DRPS) Output Type

Command Parameter	Signal Out
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

Key Entry **NONE** **3.84MHz chip-clk (DPRS4)** **SFN reset-signal (DPRS5)** **SFN sync-pulse (DRPS6)** **SCH slot-pulse (DPRS10)** **10ms Frame Pulse (DPRS11)** **80ms Frame Pulse (DPRS13)** **DPDCH data-clk with DTX (DPRS20)** **DPCCH TPC data-clk (DRPS21)** **DPCCH TFC I data-clk (DRPS22)** **DPCCH Pilot data-clk (DRPS23)** **DPCH data stream (DRPS24)** **DPCH TimeSlot pulse (DRPS25)** **DPCH 10ms Frame-Pulse (DRPS26)** **DPCH data-clk (0) (DRPS28)** **DPDCH data-clk withoutDTX (DRPS30)** **DPCH Compressed Frame Indicator (DRPS32)** **DPCH Gap Indicator (DRPS33)** **PICH data-clk (DRPS34)** **PICH data (DRPS35)** **PICH TimeSlot Pulse (DRPS36)** **PICH 10ms FramePulse (DRPS37)** **P-CCPCH data-clk (DRPS38)** **P-CCPCH data (DRPS39)** **DPCH ChipARB FramePulse (DRPS40)** **DPCH TPC-Bit Out (DRPS41)** **Mlt-ESG-Sync Trigger-Out (DRPS42)**

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: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 9-2 on page 948 for command parameters and output signal names.

***RST** RPS0

Key Entry Refer to **Key Entry** on page 950.

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: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 9-2 on page 948 for command parameters and output signal names.

***RST** RPS0

Key Entry Refer to **Key Entry** on page 950.

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 9-2 on page 948 for command parameters and output signal names.

***RST** RPS0

Key Entry Refer to **Key Entry** on page 950.

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:EVENt3

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:RPANel:OUTPut:EVENt3
DRPS0|DRPS4DRPS5|DRPS6|DRPS10|DRPS11|DRPS13|DRPS20|DPRS21|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 9-2 on page 948 for command parameters and output signal names.

***RST** RPS0

Key Entry Refer to **Key Entry** on page 950.

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|DPRS4|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 9-2 on page 948 for command parameters and output signal names.

***RST** RPS0

Key Entry Refer to **Key Entry** on page 950.

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: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 9-2 on page 948 for command parameters and output signal names.

***RST** RPS0

Key Entry Refer to **Key Entry** on page 950.

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 946 and ":DLINk:SSCH[:STATe]" on page 955.

: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 <val>
[: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 basestations that generate the same signal but have a 10 chip timing offset. The two basestations 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 <val>
[: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:SSHC:SSGRoup?
```

This command query returns the secondary scramble code group for the secondary synchronization channel (SSCH).

***RST** +0

Field Entry SSCH 2nd Scramble Group

: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 <val>
[: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 <val> 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 919.

:DLINk:TGAP:PSI[1]:D

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:TGAP:PSI[1]:D <val>
[: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 <val>
[: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 <val> 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 <val>|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 <val>|INFinity
[: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

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:RPARameter DREF11|DREF12|
DREF21|DREF22
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:TGAP:RPARameter?
```

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.

DREF22 This choice sets the reference parameter to 2.2.

***RST** CUST

Key Entry **DL Reference 1.1** **DL Reference 1.2** **DL Reference 2.1** **DL Reference 2.2**

Remarks The query returns `CUSTom` when the parameters are set individually.

:DLINk:TGAP:SCFN

Supported 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

Range 0–255

Field Entry `SCFN`

Remarks The compressed mode stop trigger must be executed for this command to work. Refer to, ":DLINk:TGAP:STOP:TRIGger" on page 961.

:DLINk:TGAP:STARt:TRIGger

Supported 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).

Key Entry **Compressed Mode Start Trigger**

:DLINk:TGAP:STARt:TRIGger:POLarity

Supported 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.

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 Pos Neg**

: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.
***RST**	POS
Key Entry	**Comp Mode Stop Trigger Polarity Pos Neg**

: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.

***RST** 0

Key Entry **Compressed Mode On Off**

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 919.

:DLINk:TSETup

Supported E4438C with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:TSETup REFSensitiv|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.

Key Entry **Ref Sensitivity** **Max Input** **ACS** **Blocking** **Spurious Response** **Intermod** **Performance Req**

:DLINk:TXDV

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk:TXDV NONE|OANT1|OANT2|OATO1|OATO2
[: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 <val>
[: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: block size = block set size ÷ number of blocks
FIXed	There are two signal generator behaviors in this mode: • change the block size to zero, and it remains zero regardles of the block set size and number of blocks values • 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 ÷ number of blocks), ignoring the value entered by the command

***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 919.

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 969, and ":DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BSSize" on page 965.

Refer to the ":DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:POSition" command on page 970 for information on setting the transport channel position.

:DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BPFRame

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:DLINk[:TGRoup[A]|B]: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** 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: block set size ≥ block size × number of blocks

Transport Channel Mode	Signal Generator Behavior
FIXed	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: block set size ≥ block size × number of blocks 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.

***RST** 20

Range 0–200000

Field Entry `Blk Set Size`

Remarks Refer to the ":DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:POSition" command on page 970 for information on setting the transport channel position.

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 page 969, and ":DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BLKSize" on page 964.

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 919.

DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:CODE

Supported 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.

***RST** HCON

Key Entry **1/2 Conv** **1/3 Conv** **Turbo** **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 ":DLINk:APPLy" on page 919.

: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).

***RST** 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 ":DLINk:APPLy" on page 919.

: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.

***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 ":DLINk:APPLy" on page 919.

: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 <val>
[: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 `<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 919.

: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	Changing the number of blocks causes the signal generator to recalculate the block set size; *block size* remains constant. The equation is as follows: number of blocks ≤ block set size ÷ block size
FIXed	Changing the number of blocks causes the signal generator to recalculate the block size; *block set size* 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: number of blocks ≤ block set size ÷ block size

***RST** 1

Range 1–64

Field Entry `# of Blocks`

Remarks Refer to the ":DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:POSition" command on page 970 for information on setting the transport channel position.

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 page 964 and ":DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BSSize" on page 965.

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 919.

: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:
block set size = number of blocks × 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:
block set size ≥ number of blocks × 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 970, the ":DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BSSize" command on page 965 and the ":DLINk[:TGRoup [A]|B]:DCH[1]|2|3|4|5|6:BLKSize" command on page 964.

: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.

: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 919.

: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 919.

: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 919.

: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**

: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 <val>
[: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)`

: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 973.

: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) x (Chip rate) and the result is close to the 0 dB roll-off point.

***RST** +6.14400000E+006

Field Entry `Flat Noise BW`

: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 998.

***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 973.

:ULINk:CRATe

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:CRATe <val>
[: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** +3.84000000E+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 <val>
[: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 973.

:ULINk:DPCCh:CCODe

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:CCODe <val>
[: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 973.

:ULINk:DPCCh:DATA

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:DATA PN9|PN15|FIX4|
"<file name>"|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 973.

: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 973.

: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 973.

: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 973.

: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`

: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 973.

: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

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 973.

: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 973.

: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 973.

: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 <val>`
`[: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 984.

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 973.

: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 983.

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 973.

:ULINk:DPCCh:TPC:PATTern:FIX4

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPCCh:TPC:PATTern:FIX4 <val>
[: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 973.

: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 973.

: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 973.

: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 973.

: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 973.

:ULINk:DPDCh:BETA

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:BETA <val>
[: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 973.

: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 9-3 on page 988.

Table 9-3 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 992 and ":ULINk:DPDCh:RATE" on page 990. 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 973.

: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 973.

: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 973.

:ULINk:DPDCh:POWer

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:POWer <val>
[: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 973.

:ULINk:DPDCh:RATE

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:RATE <val>
[: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 9-4.

Table 9-4 Channelization Code Maximum Value

Channelization Code	Slot Format	Symbol Rate
255	0	15
127	1	30

Table 9-4 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 988 and ":ULINk:DPDCh:RATE" on page 990. 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 973.

: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: TrCH BER ErrLen/TrCH BER Cycle. Refer to ":ULINk:DPDCh:TBER[:CLENgth]" on page 993 and ":ULINk:DPDCh:TBER:ELENgth" on page 993.

***RST** 0.0

Field Entry TrCH BER

:ULINk:DPDCh:SLOTformat

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:SLOTformat <val>
[: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 9-5 on page 992.

Table 9-5 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 988 and ":ULINk:DPDCh:RATE" on page 990. 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 973.

:ULINk:DPDCh:TBER[:CLENgth]

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:DPDCh:TBER[:CLENgth] <val>
[: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 <val>
[: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.

: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 973.

: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 1053.

: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 1053.

: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.

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	**Root Nyquist** **Nyquist** **Gaussian** **Rectangle** **IS-95** **IS-95 w/EQ** **IS-95 Mod** **IS-95 Mod w/EQ** **APCO 25 C4FM** **UN3/4 GSM Gaussian** User FIR
Remarks	Refer to "File Name Variables" on page 13 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 995.

: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 995.

: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 995.

: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|DPCCh
[: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.

DPCCh This choice selects a dedicated physical control channel type.

***RST** DPCC

Key Entry **PRACH** **DPCCH**

: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 1002).

: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`

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 973.

The value of <val> must be smaller or equal to the value use for the command: ":ULINk:PMODe:TPControl:POWer:MINimum" on page 1000. `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 1000.

: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`

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 973.

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 1001. 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 1000.

:ULINk:PMODe:TPControl:POWer:RESet

Supported 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**

Remarks When the DPCH power mode is changed to TPControl, this command is performed. Refer to ":ULINk:PMODe[:SELect]" on page 1002 to select the power mode. Any time the power mode is changed, the start power is always set to the initial power.

:ULINk:PMODe:TPControl:POWer:STEP

Supported 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`

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 973.

: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 1034.

***RST** –1

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 973

: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 <val>`
`[: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`

: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 Ec/No value. The Ec is defined as carrier divided by the chip rate. No 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 `Ec/No 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 Eb (Ec) reference. It is used for specifying the bit (chip) rate of physical/transport channel.

PREamble This choice selects a preamble part as the Ec/No reference.

CONTrol This choice selects a message control part as the Eb/No reference.

DATA This choice selects a message data part as the Eb/No reference.

RACH This choice selects a random access channel as the Eb/No 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 973.

: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 998.

If the parameter is changed, the apply command must be executed after the change. Refer to ":ULINk:APPLy" on page 973.

: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 1008 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 973.

: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 973.

: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 973.

: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 1007 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 973

: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:PRACh:MESSage:CPARt:TFCI:PATTern

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:TFCI:
PATTern PN9|PN15|FIX|"<file name>"
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh: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 973.

:ULINk:PRACh:MESSage:CPARt:TFCI:PATTern:FIX

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:CPARt:TFCI:PATTern:
FIX <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh: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 973.

: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 <val>`
`[: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 1013 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 973.

: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 973.

: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 973.

:ULINk:PRACh:MESSage:DPARt:POWer

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:POWer <val>
[: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 1011 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 973

:ULINk:PRACh:MESSage:DPARt:RATE

Supported E4438C with Option 400

`[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MESSage:DPARt:RATE <val>`
`[: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 9-6.

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

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 1015 and ":ULINk:PRACh[:SINGle]:MESSage:DPARt:CCODe" on page 1032.

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 973.

: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 9-7.

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** 2

Range 0–3

Field Entry `Slot Format`

Remarks Refer to ":ULINk:PRACh:MESSage:DPARt:RATE" on page 1014 and ":ULINk:PRACh[:SINGle]:MESSage:DPARt:CCODe" on page 1032.

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 973.

: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**

:ULINk:PRACh:MULTi:MESSage:TPOWer

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MULTi:MESSage:TPOWer <val>
[: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 1023.

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 <val>|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.

INFinity — This choice means the repeating number will continue while the PRACH mode is selected and the start trigger is ignored.

***RST** 1

Range 1–2147447836

Field Entry `Number of 80ms`

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 973.

:ULINk:PRACh:MULTi:PREamble:NUMBer

Supported 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.

***RST** 1

Field Entry `Num of Pre`

:ULINk:PRACh:MULTi:PREamble:POWer:INITial

Supported 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.

***RST** –1.54060000E+002

Range –154.06 to 10

Field Entry `Init Pwr`

Remarks 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`

: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 <val>`
`[: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
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 973.

:ULINk:PRACh:MULTi:UE[1]|2|3|4|5|6|7|8:SPOSition[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:
SPOSition[1]|2|3|4|5|6|7|8[:ASLot] <val>|OFF
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:PRACh:MULTi:UE[1]|2|3|4|5|6|7|8:
SPOSition[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
	5	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
UE	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 1016.

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 973.

: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 973.

: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 1034.

: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 1033.

***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 973.

: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**

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 973.

: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 973.

: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

Range

Tp-a Setting	<val>
0	-14 to 119
7680	-11 to 119
12800	-9 to 119

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 973.

To set the Tp-a value, refer to ":ULINk:PRACh:TPA" on page 1026.

: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 973.

: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

Range –512 to 2560

Key Entry **Timing Offset**

Remarks The actual timing offset is the timing difference from the synchronization signal from the signal generator's RF signal
(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 973.

:ULINk:PRACh:TPA

Supported 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".

***RST** 7680

Key Entry **Base Delay Tp–a**

Remarks The actual timing offset 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 973.

This command is not used when the sync source is set to ESG. Refer to ":ULINk:SYNC[:SOURce]" on page 1053.

:ULINk:PRACh:TPM

Supported 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.

***RST** +3

Range 1–15

Field Entry `Tp-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 973.

This command is used for single and multiple physical random access channel (PRACH) modes.

:ULINk:PRACh:TPOWer

Supported 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.

***RST** +0

Remarks This command is used for single and multiple physical random access channel (PRACH) modes.

:ULINk:PRACh:TPP

Supported 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.

***RST** +3

Range 1–60

Field Entry `Tp-p`

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 973.

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 1029.

: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 973.

: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?
```

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 1029 and ":ULINk:PRACh:TRIGger" on page 1028 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 973.

: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 973.

: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.

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

Key Entry **On** **Off** **AICH**

Remarks 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 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 973.

: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 973.

: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:
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 973.

: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 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

***RST** +0

Range 0–255

Field Entry Channel Code

Remarks Channel code value is determined by slot format choice. Refer to ":ULINk:PRACh:MESSage:DPARt:SLOTformat" on page 1015 and ":ULINk:PRACh:MESSage:DPARt:RATE" on page 1014.
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 973.

: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 1023.

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 973.

: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 1–2147447836

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 973.

: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.

INFinity — This choice means the repeating preamble will play continuously while the PRACH mode is selected.

***RST** 1

Range 1–8388607

Field Entry 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.

***RST** –1.36000000E+002

Field Entry `Init Pwr`

: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 973.

: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

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 973.

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 973.

: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`

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 973.

: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

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

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 9-9 on page 1039 for command parameters and output signal type.

Table 9-9 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS0	None

Table 9-9 Rear Panel Signal (RPS) Output Type

Command Parameter	Signal Out
RPS1	Chip Clock
RPS2	DPDCH raw data
RPS3	DPDCH raw data clock
RPS4	DPCCH raw data
RPS5	DPCCH raw data clock
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 9-9 on page 1039 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)**

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 9-9 on page 1039 for command parameters and output signal type.

***RST** RPS2

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)** **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: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 9-9 on page 1039 for command parameters and output signal types.

***RST** RPS3

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: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 9-9 on page 1039 for command parameters and output signal type.

***RST** RPS0

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: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 9-9 on page 1039 for command parameters and output signal type.

***RST** RPS0

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: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 9-9 on page 1039 for command parameters and output signal type.

***RST** RPS6

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: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*.

: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 **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: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 1045.

***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: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.

For parameter descriptions refer to ":ULINk:RPANel:PRACh:OUTPut:DCLock" on page 1045.

***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: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 1045.

***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: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 1045.

***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: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?
```

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 1045.

***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 1045.

***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:SCRamblecode

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SCRamblecode <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SCRamblecode?
```

This command sets the uplink scramble code.

***RST** +0

Range 0–16777215

Field Entry Scrambling Code

:ULINk:SDELay

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SDELay <val>
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:SDELay?
```

This command sets the number of timeslots to be delayed for the dedicated physical channel (DPCH).

***RST** +0

Range 0–119

Key Entry **Timeslot Offset**

Remarks 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 ":ULINk:SYNC[:SOURce]" on page 1053.

:ULINk:SFNRst:POLarity

Supported E4438C with Option 400

```
[: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 1053.

: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.

***RST** FCL

Key Entry **Sync Source** **SFN** **FClk** **ESG**

:ULINk:TGAP:POFFset

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:TGAP:POFFset <val>|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 973.

: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 <val>
[: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.

: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 973.

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

: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

: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 <val> 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>|
INFinity
[: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

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 <val>
[: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.

DREF21 This choice sets the reference parameter to 2.1.

DREF22 This choice sets the reference parameter to 2.2.

***RST** CUST

Key Entry **DL Reference 1.1** **DL Reference 1.2** **DL Reference 2.1** **DL Reference 2.2**

Remarks 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 1060.

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 973.

This command is not used when the sync source is set to ESG. Refer to ":ULINk:SYNC[:SOURce]" on page 1053.

: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:STARt: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.

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.

***RST** POS

Key Entry **Comp Mode Stop Trigger Polarity Neg Pos**

: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.

***RST** +0

Range –512 to 2560

Key Entry **Timing Offset**

Remarks 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.

***RST** 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.

***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 973.

: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 973.

: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 973.

: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 973.

: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 973.

: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]|2:DCH[1]|2|3|4|5|6:DATA:BLER:ERRor:BLOCk

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]|2: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

: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] <val>
[: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 `<val>` 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 973.

: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 `<val>` can be entered in binary, hexadecimal, or decimal formats, the query returns only binary values.

***RST** #B0000

Range 0–15

Key Entry **FIX4**

: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 <val>
[: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 <val>
[: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 <val>
[: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`

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 973.

: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`

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 973.

: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 973.

: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?
```

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 973.

: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

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

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 973.

: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 973.

: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 973.

:ULINk[:TGRoup[1]]:RACH[1]:NBLock

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk[:TGRoup[1]]:RACH[1]:NBLock <val>
[: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 973

: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]:RMATch

Supported E4438C with Option 400

```
[:SOURce]:RADio:WCDMa:TGPP[:BBG]:ULINk:RACH[1]:RMATch?
```

This query returns the rate match parameters of each random access channel (RACH).

***RST** +1

: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 973.

: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**

A

B

C

D

E

F

G

Index

H

I

M

N

0

Q

R

S

T

U

V

W

Index