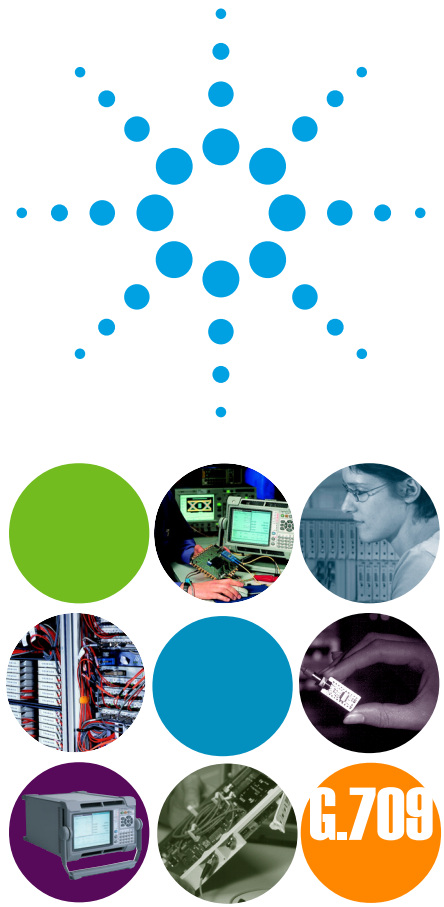
Agilent OmniBER OTN Family

OmniBER OTN
communications
performance analyzer

Remote Control Manual



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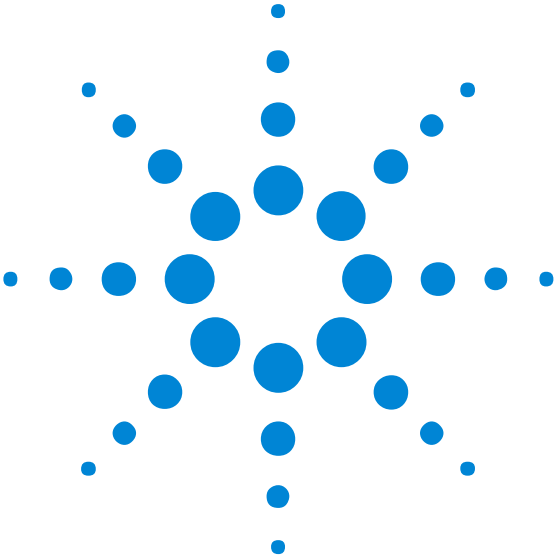

Agilent J7231B
OmniBER OTN

Remote Control Manual

Agilent Technologies

Notices

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Warning Symbols Used on the Instrument

The apparatus is marked with this symbol when the user should refer to the instruction manual in order to prevent risk of harm to the operator and to protect the apparatus against damage.

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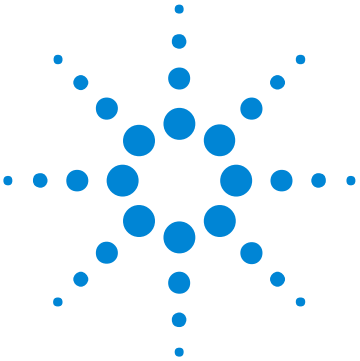


1
Methods of Remote Control

Introduction

The Instrument can be remotely controlled in one of four ways, each of which is configured via the Remote Control Setup dialog which is available from the main menu.

GPIB	Provides a parallel interface that allows the connection of other devices to the system for example: Frequency Counter; Printer; Signal Generator. Allows great flexibility in communicating data and controlling data and provides one of the easiest methods of constructing automatic systems. If long distance communication is required, suitable GPIB Extenders must be connected within the test system at both ends of the communication link.
RS-232-C	Provides a serial interface that can be connected directly to the RS-232-C port of a terminal or computer. Only the controller and the Instrument can be connected within the system. If long distance communication is required, the Instrument can be connected directly to the RS-232-C port of a Modem and controlled via a telephone line.
LAN	Provides a parallel interface that allows the connection of other instruments and controllers to the system

for example: workstations; other instruments; other test sets that have a LAN interface.

Connecting the Instrument via GPIB

The following points should be considered when connecting the Instrument via GPIB:

- Operating distances
- Communication with the system controller

Operating Distances

1. The total length of GPIB cable must not exceed 2 meters (6 feet) * the number of devices in the system.
2. The total length of GPIB cable, used to interconnect all devices in the system, must not exceed 20 meters (65 feet).

Operating distances can be increased by using GPIB Extenders.

Communication with the System Controller

Each device in the system must have a unique address to allow the controller to access each one individually. Any address in the range 0 to 30 can be selected.

Connecting the Instrument via RS-232-C

Remote control via RS-232-C requires that the Instrument RS 232-C interface settings match those of the controller.

The Instrument acts as a DTE (Data Terminal Equipment).

Table 1-1 Instrument RS-232-C port connections

Instrument Pin #	Signal	Input/Output
1	DCD	Input
2	RXD	Input
3	TXD	Output
4	DTR	Output
5	GND	GND
6	DSR	Input
7	RTS	Output
8	CTS	Input
9	N/A	N/A

Connecting the Instrument via LAN

Obtain the following information from your LAN System Administrator before connecting to the LAN:

- IP address (Example 156.144.180.205)
- Subnet Mask (Example 255.255.248.000).
- Default Gateway IP Address (Example 156.144.176.100).

The PORT NUMBER has a default value of 5001. A unique MAC ADDRESS is assigned to the Instrument at the time of shipment.

Now configure the Instrument to accept the IP address, Subnet Mask, Default Gateway IP Address and new Port Number as required.

Connect the Instrument LAN interface to the LAN network.

Command Prompt

Available for LAN and RS-232-C.

The Command Prompt mode allows the instrument to be controlled interactively and provides the following features:

- When connection is established the Instrument responds with a prompt string.
- Characters sent to the Instrument are echoed back to the terminal. If a command in wrongly entered then the Status Byte (STB) is flagged as follows:

  STB: [EEQ]

  This shows that the EEQ bit is set, indicating a message in the error/event queue. This can be retrieved using the command SYST:ERR?

Controlling the Instrument

The simplest way to verify the connection and become familiar with remote RS-232-C operation is to send a few commands and observe their effect. In this example using a terminal we will

- Take the Instrument under remote control
- Initialize the Instrument
- Read the contents of the error register
- Start a test period
- Add errors
- Obtain the result (Option dependent)
- Return the Instrument to local operation

Table 1-2 Example sequence of SCPI commands

Terminal Input	Comment
:SYST:REM	Takes the Instrument under remote control. An indicator will light.
*RST	Default settings, registers cleared.
:SYST:ERR?	The SCPI Error Message and number can be read, even in local operation mode. (+0, "No error")
:SENS:DATA:TEL:TEST:TYPE MAN	Selects a manual test period.
:SENS:DATA:TEL:TEST ON	Starts the manual test period.
:SOUR:DATA:TEL:ERR:SING	Adds a single bit error.
:SOUR:DATA:TEL:ERR:SING	Adds a single bit error.
:SOUR:DATA:TEL:ERR:SING	Adds a single bit error.
:SENS:DATA:TEL:TEST OFF	Halts the manual test period.

:SENS:DATA? "ECO:BIT"	Returns the bit error count in numeric form, in this example 3.
:SYST:LOC	Returns the Instrument to local control. The remote indicator is extinguished.

To Initialize the Instrument

Regardless of the current set up, the following command will initialize the Instrument. It sets the Instrument to the factory default settings and clears all registers. It will halt any applications currently running.

*RST

It is recommended that you do not rely on default settings but program each setting to what you require.

Remote Control Hints & Tips

This section gives some Hints & Tips on how to control the Instrument via remote control. Before writing any program to control the Instrument it may help to manually go through the steps required to set up the desired configuration. The order in which you should send the corresponding SCPI commands will usually follow the order in which you set up the Instrument from the Front Panel.

Default Settings

In general, default settings should not be assumed. It is recommended that each instrument setting should be explicitly programmed to the desired value.

Also commands that affect higher level settings such as Signal Rate or Payload Type should be sent before commands to set up lower level settings e.g. Pattern. This is because, in some cases, higher level setting changes can affect the values of lower settings.

Instrument Coupling

If you wish to set the Instrument Transmitter and Receiver to the same settings then you can save time by selecting Transmitter/Receiver Coupling. Depending upon the direction of coupling set (ie Tx to Rx or Rx to Tx), programming either the Receiver or the Transmitter will cause the coupled Transmitter or Receiver to be similarly programmed.

To turn coupling on use the command
:INSTrument:COUPle

Error Checking

It is recommended that, when sending SCPI commands to the Instrument, you also periodically send the SYSTem:ERRor? command to check for any Remote Control Errors reported by the instrument.

This command returns 0, "No Error" if there are no errors in the error queue. If the SYSTem:ERRor? command is sent after every set up command then it makes debugging any reported

errors much easier since you will know exactly which command caused the error.

The actual error queue within the Instrument can be cleared by sending the *CLS command.

Command Completion

When programming the instrument over RS-232-C, it is important to realize that a buffer exists in the Instrument between the RS-232-C port and the SCPI parser.

The effect of this is that even if the Instrument accepts the last character of a command, it cannot be assumed that it will immediately be executed - there could be several commands ahead of this one waiting in the buffer.

If you need to know when a command, or sequence of commands has been accepted by the instrument, follow them with a query command. When the response to the query command is returned, then you know that all commands prior to that have been executed.

Suitable query commands to use are *OPC? or SYSTem:ERRor? (which also gives the additional benefit of error checking as described above).

Note that this effect does not apply with GPIB. When GPIB is used to remotely control the Instrument then, after the last character of a SCPI command has been accepted by the instrument, its execution is imminent. However, it is still good practice to send SYSTem:ERRor? after each command in order to check for error free completion.

Set up Delays

Even after the Instrument has accepted a SCPI command it may take some time for it to execute the requested operation (e.g. payload change, single error add). It is therefore recommended that at least 250 ms is allowed after the command has completed before expecting the instrument operation to occur. One way of determining if such delays exist is to perform the desired operation manually using the Instrument's Front Panel and checking if there is any noticeable delay in execu-

tion.

Status Registers

Status registers in general are only updated every 100 ms by the Instrument. Therefore you should avoid reading them any faster than that since, although it does not do any harm if they are read faster, it means that less processing power will be available to update the display.

If you need to detect a status register bit that is momentarily changing state, avoid using the condition register in the hope of catching both states. Instead it is much better to program the PTRansition and NTRansition registers to catch the event of interest, and then use the event register to monitor for the event.

For example, say you wished to detect when the K1 and K2 bytes in the Multiplex Section Line Overhead of a STM-1/STS-3 signal have changed. There is a K1K2 bit defined (DB6) in the SDH2/SONet2 Status Register that is set when these bytes change value.

However, if you monitored the SDH2/SONet2 status register simply by sending the STATus:SDH2:CONDition? or STATus:SON2:CONDition? command then it is very likely that you would miss any transition in the K1K2 bit.

A better method is as follows.

1. Set transition filter to pass positive transitions in K1K2 (DB6)

   :STATus:SDH2:PTR 64;NTR 0

2. Periodically read SDH2 event register.

   :STATus:SDH2:EVENt?

3. Periodically read SONet2 event register

   :STATus:SONet2:EVENt?

4. Check for K1K2 (DB6) being set.

Using this technique you will detect any changes in the K1 and

K2 bytes.

If you needed to monitor a number of status bits then using this method would not be ideal since it would have the disadvantage of having to regularly read a number of status registers. A general rule is to minimize the number of status register reads required and, to achieve this, use can be made of the Summary registers. For details on how to use the Summary registers and also the SRQ mechanism (GPIB only) see "Programmed Status Reporting".

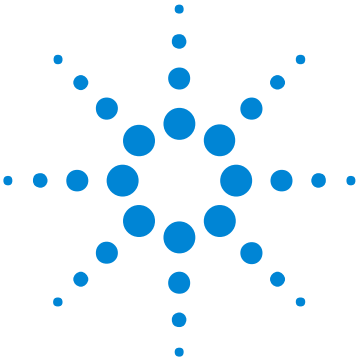
Test Period Control

There are a number of status register bits that can be used to indicate the state of the Instrument's measurement system.

When you send the start Test Period command to the Instrument you should check the MEAS bit (DB4) in the OPERation status register. This is because the Instrument takes a finite period of time to start the Test Period. When the MEAS bit is set to one it means that the Instrument is in the Test Period.

If it is required to retrieve Last second results while the Instrument is in the Test Period then the STP bit (DB6) in the INSTrument status register can be used to determine when last second results can be read i.e. when the first last second test period has completed.

The EOT bit (DB2) in the INSTrument status register can be used to determine when the Instrument Test Period period is complete.



2
Common Commands

This chapter contains general information on SCPI commands, and detailed information on the commands that are common for all types of instrument operation.

SCPI Command Format

Instrument functions such as making measurements, retrieving data, and querying status, are performed by stringing together SCPI "nodes" into commands. The SCPI commands are based on a hierarchical structure called a "subsystem" that comprises a top level "root" node and one or more lower-level nodes and their parameters as follows:

:INPut:TELecom:CODE <CMI> or <AMI> or <HDB3>

:INPut is the root node
:TELecom is a second level node
:CODE is a third level node
CMI, AMI and HDB3 are parameters of the third-level:CODE node.

Command Syntax

Commands are shown as a mix of upper and lowercase characters.

Commands can be abbreviated for shorter program line lengths. The uppercase characters define the abbreviated form of the command.

Commands are formed by linking the root node with lower-level nodes. A colon (:) is used to link nodes. If the command requires a parameter, a space must separate the lowest level node and the parameter. If there is more than one parameter, a comma (,) is used to separate the parameters.

Examples of typical commands and their abbreviated form are shown below:

:INPut:TELecom:CODE AMI	full form
:INP:TEL:CODE AMI	abbreviated form
:SOURce:DATA:TELecom:PATTern PRBS23	full form
:SOUR:DATA:TEL:PATT PRBS23	abbreviated form

SCPI Long Form Command Headers

The general rule for SCPI long form command nodes that are greater than four characters in length is as follows:

Abbreviated short form mnemonics - the first four characters from the long form mode are used unless the fourth character is a vowel. In such cases, the vowel is dropped and only the first three characters are used.

If the node is four characters long then all four characters are used, irrespective of whether the fourth character is a vowel or not.

Linking Command Statements

Command statements can be linked using semicolons (;). For example:
:INPut:TELecom:CODE
AMI;:SOURce:DATA:TELecom:PATTern PRBS23

Parameters

In this manual, parameters are shown in angled brackets < >. There are five parameter types used in commands as listed in table 2-1.

Table 2-1 Parameter Types

Parameter Types	Description
<numeric>	All commonly used decimal numbers including optional signs, decimal points, and scientific notation. Examples are 123, 123E2, -123, -1.23E2, .123, .123E2 and 1.2300E-01. Special cases include MINimum and MAXimum. A numeric parameter can also be specified in hex, octal, and/or binary. Examples are #H7B, #Q173 and

	#B11110111.
<boolean>	A single binary condition that is either true or false. Examples are ON, OFF, 1 and 0.
<discrete>	Values that are represented by a string of alphanumeric characters. Examples are INTernal and EXTernal.
<string>	Any set of ASCII characters enclosed within single quotes or double quotes. Examples are '1111111111111111' and "0000000000000000".
<block>	Used to transfer large quantities of related data. Blocks can be sent as definite length blocks (#<numeric><numeric>) or indefinite length blocks (#0).

Occasionally, a command may use more than one parameter of the same type. When this occurs, the order of the parameters used in the command will map to the order of the individual parameter descriptions.

Standard Query Method

In this manual, commands that can be used to both set and query values use a standard format. These commands will be marked with the text:
"This command has an equivalent query which is defined using the standard query method."

To query one of these commands, call the command in the same way as the set method but append a "?" at the end of the command name and before any parameters.

You will pass all parameters to the command as before except the last one as this will be the return value of the query. E.g. ABCD:EFGHij <1>, <2>, <3> -> ABCD:EFGHij? <1>, <2> and returns <3>

Examples:

:SOURce:CLOCk:SOURce <discrete> set command becomes :SOURce:CLOCk:SOURce? and returns the value <discrete>

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern <numeric>, <discrete> set command becomes :SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern? <numeric> and returns the value <discrete>.

Remote Control Commands

The remote control commands in this manual have been grouped into Sections that relate to instrument functions. These have then been split into Subsystems.

The Subsystems used in the Instrument are listed in table 2-2.

Table 2-2 SCPI Subsystems

Instrument Functions	Subsystem
To control SIGNAL OUT port	:OUTPut
To control instrument coupling.	:INSTrument
To control the transmitter data.	:SOURce
To control the SIGNAL IN port.	:INPut
To control the receiver results and graphics	:SENSe
To obtain results directly accumulated by the instrument.	:FETCh
To control the instrument misc. functions eg data setting.	:SYSTem
To control Status Reporting.	:STATus

INSTrument subsystem

The INSTrument subsystem is used to control the coupling between the transmitter and the receiver.

:INSTrument:COUPle <discrete>

<discrete> =	OFF	Independent
	TXRX	Coupled Tx to Rx
	RXTX	Coupled Rx to Tx

After a reset the receiver and transmitter coupling will be OFF. If the instrument is testing and the receiver and transmitter are coupled, changing certain transmitter settings will generate an error because the coupled receiver setting cannot be changed because of testing lock.

:INSTrument:COUPle?

Returns: <discrete>

Selftest Control

*TST

This command initiates a selftest with Test Group. It forces the run all-tests/selectedtest selection to all-tests. The selftest will stop when the first of the three events below occurs:

- Five selftest errors have been detected
- The complete run of all selftests have completed
- The command INSTrument:TEST:STOP is received

:INSTrument:TEST:STOP

Causes the selftest to terminate after the current subtest completes. This command is ignored if the instrument is already self-testing.

Selftest Results

:INSTrument:TEST:FAIL:NUMBer?

Returns: <numeric>

Returns the number of failures in the last selftest run.

:INSTrument:TEST:FAIL:DATE? <numeric>

<numeric> = 1 to 5 Number of error detected

Returns: <numeric>

Returns the date of failure of the selected error detected in the last selftest run. The range of <numeric> is 1 to the number of failures in the last selftest run, up to a limit of five. The parameter is optional and would default to 1.

:INSTrument:TEST:FAIL:TIME? <numeric>

<numeric> = 1 to 5 Number of error detected

Returns: <numeric>

Returns the time of failure of the selected error detected in the last selftest run. The range of <numeric> is 1 to the number of failures in the last selftest run, up to a limit of five. The parameter is optional and would default to 1.

:INSTrument:TEST:FAIL:INSTrument:TEST? <numeric>

<numeric> = 1 to 5 Number of error detected

Returns: <string>

Returns a string describing the test of the selected error detected in the last self-test run. The range of <numeric> is 1 to the number of failures in the last self-test run, up to a limit of five. The parameter is optional and would default to 1.

:INSTrument:TEST:FAIL:SUBTest? <numeric>

<numeric> = 1 to 5 Number of error detected

Returns: <string>

Returns a string describing the subset of the selected error detected in the last selftest run. The range of <numeric> is 1 to the number of failures in the last selftest run, up to a limit of five. The parameter is optional and would default to 1.

:INSTrument:TEST:FAIL:DESCription? <numeric>

<numeric> = 1 to 5 Number of error detected

Returns: <string>

Returns a string describing the failure of the selected error detected in the last selftest run. The range of <numeric> is 1 to the number of failures in the last selftest run, up to a limit of five. The parameter is optional and would default to 1.

:INSTrument:TEST:FAIL:CODE? <numeric>

<numeric> = 1 to 5 Number of error detected

Returns: <numeric>

Returns the failure code of the selected error detected in the last selftest run. The range of <numeric> is 1 to the number of failures in the last selftest run, up to a limit of five. The parameter is optional and would default to 1.

OUTPut subsystem - Common Commands

The OUTPut subsytem contains commands that control the characteristics of the instrument's output ports.

:OUTPut:TELecom:INTerface <discrete>

<discrete> =	ELECtrical	Electrical Interface
	OPTical	Optical Interface

Selects the output port interface as either electrical or optical.

:OUTPut:TELecom:INTerface?

Returns: <discrete>

:OUTPut:TELecom:TERMination <discrete>

<discrete> =	UNB75	75 ohm unbalanced line
	BAL100	100 ohm balanced line
	BAL120	120 ohm balanced line

Selects the electrical termination of the output port.

:OUTPut:TELecom:TERMination?

Returns: <discrete>

:OUTPut:TELecom:LEVel <discrete>

<discrete> =	DSX	450feet simulated cable
	HIGH	DS3 only
	FT900	900feet simulated cable
	LOW	DS1 only

Selects the interface output level for the output port.

:OUTPut:TELecom:LEVel?

Returns: <discrete>

:OUTPut:TELecom:CODE <discrete>

<discrete> =	NRZ	optical only
	CMI	140Mb/s only
	B3ZS	DS3
	HDB3	34Mb/s,8Mb/s,2Mb/s
	B8ZS	DS1
	AMI	DS1

Selects the interface line code for the output port.

:OUTPut:TELecom:CODE?

Returns: <discrete>

:OUTPut:TELecom:WAVelength <discrete>

<discrete> =	NM1310	1310nm wavelength
	NM1550	1550nm wavelength

Selects the optical wave;length of the output port.

:OUTPut:TELecom:WAVelength?

Returns: <discrete>

:OUTPut:TELecom:LASer <boolean>

<boolean> =	OFF	Select Laser Off
	ON	Select Laser On

Controls the state of the laser (ON or OFF) on the Optical module.

:OUTPut:TELecom:LASer?

Returns: <boolean>

SOURce subsystem

The SOURce subsystem contains commands that allow the transmitter settings to be set. The commands within the SOURce subsystem have been arranged as follows:

Chapter 2	SOURce subsystem - Transmitter Common Commands	COMMON
Chapter 3	SOURce subsystem - Transmitter OTN Settings Commands	OTN
	SOURce subsystem - Transmitter OTN Overhead Setup Commands	OTN
	SOURce subsystem - Transmitter Error Test Function	OTN
	SOURce subsystem - Transmitter Alarm Test Functions	OTN
	SOURce subsystem - Transmitter Frequency Offset Commands	OTN
Chapter 4	SOURce subsystem - Transmitter SDH Settings Commands	SDH
	SOURce subsystem - Transmitter SDH Overhead Set Up	SDH

	SOURce subsystem - Transmitter Error Test Functions	SDH
	SOURce subsystem - Transmitter Alarm Test Functions	SDH
	SOURce subsystem - Pointer Adjust Test Functions	SDH
	SOURce subsystem - Frequency Offset Test Functions	SDH
Chapter 5	SOURce subsystem - Transmitter SONET Settings Commands	SONET
	SOURce subsystem - Transmitter SONET Overhead Set Up	SONET
	SOURce subsystem - SONET Error Test Functions	SONET
	SOURce subsystem - Transmitter Alarm Test Functions	SONET
	SOURce subsystem - Pointer Adjust Test Functions	SONET
	SOURce subsystem -	SONET

	Frequency Offset Test Functions	
Chapter 6	SOURce subsystem - Transmitter UNFRamed Settings Commands	UNFRAMED
	SOURce subsystem - Transmitter Error Test Function Commands	UNFRAMED
	SOURce subsystem - Frequency Offset Test Function	UNFRAMED

Where commands are applicable to more than one category these are included in all the applicable categories.

SOURce subsystem - Transmitter Common Commands

:SOURce:DATA:TELecom:MODE <discrete>

<discrete> =	OTN	OTN Mode
	SDH	SDH Mode
	SONet	SONET Mode
	PDH	PDH Mode
	UNFRamed	Unframed Mode

Selects the transmitter mode.

:SOURce:DATA:TELecom:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:THRU <boolean>

<boolean> =	OFF	Select Normal Mode
	ON	Select Thru Mode

Selects/Deselects THRU mode.

:SOURce:DATA:TELecom:THRU?

Returns: <boolean>

:SOURce:DATA:TELecom:SOURce?

<discrete> = PDH | SDH | SONet

Query the transmitter signal type.

SOURce subsystem - Clock Function Commands

:SOURce:CLOCk:SOURce <discrete>

<discrete> =	INTernal	Internal
	EXTernal	External
	RECovered	Recovered

Selects the Clock Source for the transmitter.

:SOURce:CLOCk:SOURce?

Returns: <discrete>

:SOURce:CLOCk:RECovered <discrete>

<discrete> =	RSTM0 | RSTS1	52Mb/s Electrical Rx
	ROPT0 | ROC1	52Mb/s Optical Rx
	RSTM1 | RSTS3	155Mb/s Electrical Rx
	ROPT1 | ROC3	155Mb/s Optical Rx
	ROPT4 | ROC12	622Mb/s Optical Rx
	ROPT16 |ROC48	2.4Gb/s Optical Rx
	ROPT64 |ROC192	9.6Gb/s Optical Rx
	ROTU1	2.66Gb/s Optical Rx
	ROTU2	10.71Gb/s Optical Rx
	R140M	140Mb/s
	R34M	34Mb/s
	R8M	8Mb/s
	R2M	2Mb/s
	RDS3	DS3
	RDS1	DS1

:SOURce:CLOCk:RECovered?

Returns: <discrete>

:SOURce:CLOCk:FORMat <discrete>

<discrete> =	M10Clock	10MHz Reference Clock
	M2CLock	Clock Format
	M2Data	Data Format
	DS1Data	DS1 bit rate

Selects the transmitter External clock sync source format.

:SOURce:CLOCk:FORMat?

Returns: <discrete>

SOURce subsystem - Pattern Commands

:SOURce:DATA:TELecom:PATTern:TYPE <discrete>

<discrete> =	PRBS	Select PRBS Pattern
	WORD	Select Word Pattern

Selects the transmitter payload Pattern Type, pseudo random sequence or a word type pattern.

:SOURce:DATA:TELecom:PATTern:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:PATTern:TYPE:PRBS <discrete>

<discrete> =	PRBS9	2^9 - 1
	PRBS11	2^11- 1
	PRBS15	2^15 - 1
	PRBS20	2^20 - 1
	PRBS23	2^23 - 1
	PRBS31	2^31 - 1
	QRSS	2^20 - 1 with 14 consecutive zero limit

Selects the Transmitter Payload Pattern. Used if :SOURce:DATA:TELecom:PATTern:TYPE <discrete> is set to PRBS.

:SOURce:DATA:TELecom:PATTern:TYPE:PRBS?

Returns: <discrete>

:SOURce:DATA:TELecom:PATTern:POLarity <discrete>

<discrete> =	NINVerted	Pattern Non-Inverted

	INVerted	Pattern Inverted

Sets the polarity of the PRBS pattern of the transmitter.

:SOURce:DATA:TELecom:PATTern:POLarity?

Returns: <discrete>

:SOURce:DATA:TELecom:PATTern:TYPE:WORD <discrete>

<discrete> =	PRESet	Selects a preset word
	USER	Selects user word

Selects the transmitter Payload Word Pattern type as either a preset word or a user generated word. This command is used if :SOURce:DATA:TELecom:PATTern:TYPE <discrete> is set to WORD.

:SOURce:DATA:TELecom:PATTern:TYPE:WORD?

Returns: <discrete>

:SOURce:DATA:TELecom:PATTern:TYPE:WORD:PRESet <discrete>

<discrete> =	ALL0	All zeros
	ALL1	All ones
	B1010	Word 1010
	B1000	Word 1000
	STRess	3-in-24 stress pattern
	B1IN8	1-in-8 test pattern
	B2IN8	2-in-8 test pattern
	OCT55	55 octet test pattern (uses Daly pattern as per ANSI TI.403

Selects the transmitter payload preset Word Pattern. This command is used when :SOURce:DATA:TELecom:PATTern:TYPE:WORD <discrete> is set to PRE-Set.

:SOURce:DATA:TELecom:PATTern:TYPE:WORD:PRESet?

Returns: <discrete>

:SOURce:DATA:TELecom:PATTern:TYPE:WORD:USER <numeric>

<numeric> = 0 to 65535 Payload user word

Sets the Transmitter Payload User Word Pattern, Hex and binary patterns can be entered using the #h and #b forms, width of word is 16 bits.

This command is used when :SOURce:DATA:TELecom:PATTern:TYPE:WORD <discrete> is set to USER.

:SOURce:DATA:TELecom:PATTern:TYPE:WORD:USER?

Returns: <numeric>

SOURce subsystem - Test Functions

:SOURce:DATA:TELecom:TFUNction:DISable

Disables ALL test functions running.

SOURce subsystem - Transmitter Error Test Functions

:SOURce:DATA:TELecom:ERRor:GROup <discrete>

<discrete> =	PHYSical	Physical Errors
	OTN	OTN Errors
	SECTion	Section Errors
	PATH	Path Errors
	TCM	SDH Tandem Connection Monitor Errors
	PDH	PDH errors
	PATTern	Pattern Errors

Selects the transmit test function Error Group. Further selection of the specific alarm is required using the OTN, SDH, SONet or PDH ALARm commands. Selection of PATTern results in BIT error type being selected.

:SOURce:DATA:TELecom:ERRor:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

SOURce subsystem - Transmitter Alarm Test Functions

:SOURce:DATA:TELecom:ALARm:GROup <discrete>

<discrete> =	PHYSical	Physical Alarms
	OTN	OTN Alarms
	SECTion	Section Alarms
	PATH	Path Alarms
	TCM	SDH Tandem Connection Mode Alarms
	PDH	PDH Alarms

Selects Alarm Group. Further selections from the group alarms must be made using OTN, SDH, SONet and PDH ERRor commands. Also, :SOURce:DATA:TELecom:ALARm <boolean> should be set to ON to activate the alarm selected.

:SOURce:DATA:TELecom:ALARm:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:ALARm <boolean>

<boolean> =	0 or OFF
	1 or ON

Enables and disables Alarm Generation.

:SOURce:DATA:TELecom:ALARm?

Returns: <boolean>

Alarm Stress Control

:SOURce:DATA:TELecom:ALARm:STRess:TYPE <discrete>

<discrete> =	NONE	
	PULSe	
	SEQuence	
	SINGle	

Selects the Alarm Stress type for the currently selected alarm. The valid Alarm Stress types depend on the currently selected alarm. Changing the selected alarm forces the Alarm Stress type to NONE. If an Alarm Stress sequence is running then using this command terminates that sequence.

:SOURce:DATA:TELecom:ALARm:STRess:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:ALARm:STRess:PULSe

Causes the currently selected alarm to be pulsed using the currently set P duration. Valid only when :SOURce:DATA:TELecom:ALARm:STRess:TYPE selection is PULSe.

:SOURce:DATA:TELecom:ALARm:STRess:PULSe:DURation <numeric>

<numeric> =	0 to 64	P phase duration in frames
	0 to 1100	LOS alarm in 0.1 microsecond intervals
	0 to 500	OTN LOF, OOF, LOM, OOM in frames

Sets duration of the alarm pulse.

:SOURce:DATA:TELecom:ALARm:STRess:PULSe:DURation?

Returns: <numeric>

:SOURce:DATA:TELecom:ALARm:STRess:SEQuence <boolean>

<boolean> =	0 or OFF	Stop running the Alarm

		Stress sequence
	1 or On	Run the Alarm Stress sequence.

Enables and disables Alarm Stress sequence generation.

Valid only when :SOURce:DATA:TELecom:ALARm:STRess:TYPE selection is SEQuence.
The Alarm Stress Sequence state will be forced to OFF on receipt of the :SOURce:DATA:TELecom:ALARm:STRess:TYPE command or if the currently selected alarm is changed.

:SOURce:DATA:TELecom:ALARm:STRess:SEQuence?

Returns: <boolean>

:SOURce:DATA:TELecom:ALARm:STRess:SEQuence:PDURation <numeric>

<numeric> =	0 to 64	P phase duration in frames
	0 to 500	OTN LOF, OOF, LOM, OOM in frames

Sets P phase duration of the alarm sequence.

:SOURce:DATA:TELecom:ALARm:STRess:SEQuence:PDURation?

Returns: <numeric>

:SOURce:DATA:TELecom:ALARm:STRess:SEQuence:NDURation <numeric>

<numeric> =	1 to 64	N phase duration
	0 to 500	OTN LOF, OOF, LOM, OOM in frames

Sets N phase duration of the alarm sequence.

:SOURce:DATA:TELecom:ALARm:STRess:SEQuence:NDURation?

Returns: <numeric>

:SOURce:DATA:TELecom:ALARm:STRess:SEQuence:MDURation <numeric>

<numeric> =	1 to 64	M phase duration
	0 to 500	OTN LOF, OOF, LOM, OOM in frames

Sets M phase duration of the alarm sequence.

:SOURce:DATA:TELecom:ALARm:STRess:SEQuence:MDURation?

Returns: <numeric>

:SOURce:DATA:TELecom:ALARm:STRess:SINGle

Causes the appropriate action to generate a single alarm instance for the currently selected alarm. Not valid for all alarm types. Valid only when :SOURce:DATA:TELecom:ALARm:STRess:TYPE selection is SINGle.

There is no corresponding query.

INPut subsystem - Common Commands

:INPut:TELecom:CODE <discrete>

<discrete> =	NRZ	
	CMI	140Mb/s only
	B3ZS	DS3
	HDB3	34Mb/s,8Mb/s,2Mb/s
	B8ZS	DS1
	AMI	8Mb/s,2Mb/s,DS1

Selects the line code interface for the receiver.

:INPut:TELecom:CODE?

Returns: <discrete>

:INPut:TELecom:INTerface <discrete>

<discrete> =	ELECtrical	Electrical Interface
	OPTical	Optical Interface

Selects the port interface as either Electrical or Optical

:INPut:TELecom:INTerface?

Returns: <discrete>

:INPut:TELecom:TERMination <discrete>

<discrete> =	UNB75	75 Ohm unbalanced
	BAL100	100 Ohm balanced
	BAL120	120 Ohm balanced

Selects the electrical termination of the input port.

:INPut:TELecom:TERMination?

Returns: <discrete>

:INPut:TELecom:LEVel <discrete>

<discrete> =	TERMinate	mode is Termination
	MONitor	mode is Monitor

Sets the Receiver Port as a Termination or a Monitor.

:INPut:TELecom:LEVel?

Returns: <discrete>

:INPut:TELecom:GAIN <discrete>

<discrete> =	DB20	All rates
	DB26	All rates
	DB30	DS1,2Mb/s,8Mb/s

Selects the Monitor Gain for the Receiver.
Only valid when :INPut:TELecom:MODE is set to MONitor.

:INPut:TELecom:GAIN?

Returns: <discrete>

:INPut:TELecom:EQUalization <boolean>

<boolean> =	OFF
	ON

Selects the Monitor equalization for the receiver.
Only valid when:INPut:TELecom:MODE is set to MONitor.

:INPut:TELecom:EQUalization?

Returns: <boolean>

SENSe subsystem

The SENSe subsystem contains the commands that control the Receiver. These have been arranged in the following manner:

Chapter 2	SENSe subsystem - Pattern Commands	COMM
	SENSe subsystem - Test Timing	COMM
	SENSe subsystem - Result Returning Commands	COMM
Chapter 3	SENSe subsystem - Receiver OTN Settings Commands	OTN
	SENSe subsystem - Receiver Overhead Monitor Commands	OTN
	SENSe subsystem - Result Returning Commands	OTN
Chapter 4	SENSe subsystem - Receiver SDH Settings	SDH
	SENSe subsystem - Receiver SDH Test Function Commands	SDH
	SENSe subsystem - Result Returning Commands	SDH

Chapter 5	SENSe subsystem - Receiver SONET Settings	SONET
	SENSe subsystem - Receiver SONET Test Function Commands	SONET
	SENSe subsystem - Result Returning Commands	SONET
Chapter 6	SOURce subsystem - Transmitter UNFRamed Settings Commands	UNFRAMED

SENSe subsystem - Receiver Common Commands

:SENSe:DATA:TELecom:MODE <discrete>

<discrete> =	OTN	OTN Mode
	SDH	SDH Mode
	SONet	SONET Mode
	PDH	PDH Mode
	UNFRamed	Unframed Mode

Selects the receiver mode.

:SENSe:DATA:TELecom:MODE?

Returns: <discrete>

:SENSe:DATA:TELecom:SENSe?

Returns: <discrete> = PDH | SDH | SONET

Query the receiver signal type.

SENSe subsystem - Pattern Commands

:SENSe:DATA:TELecom:PATTern:TYPE <discrete>

<discrete> =	PRBS	Pseudo-Random Bin. Pattern
	WORD	Word Pattern
	LIVE	Live Traffic

Selects the receiver payload pattern type.

:SENSe:DATA:TELecom:PATTern:TYPE?

Returns: <discrete>

:SENSe:DATA:TELecom:PATTern:TYPE:PRBS <discrete>

<discrete> =	PRBS9	2^9 - 1
	PRBS11	2^11- 1
	PRBS15	2^15 - 1
	PRBS20	2^20 - 1
	PRBS23	2^23 - 1
	PRBS31	2^31 - 1
	QRSS	2^20 - 1 with 14 consecutive zero limit

Selects the receiver payload pattern when :SENSe:DATA:TELecom:PATTern:TYPE <discrete> is set to PRBS.

:SENSe:DATA:TELecom:PATTern:TYPE:PRBS?

Returns: <discrete>

:SENSe:DATA:TELecom:PATTern:TYPE:WORD <discrete>

<discrete> =	PRESet	Selects a preset word
	USER	Selects user word

Selects the receiver Payload Word Pattern type as either a preset word or a user generated word. This command is used if is set to WORD.

:SENSe:DATA:TELecom:PATTern:TYPE:WORD?

Returns: <discrete>

:SENSe:DATA:TELecom:PATTern:TYPE:WORD:PRESet <discrete>

<discrete> =	ALL0	All zeros
	ALL1	All ones
	B1010	Word 1010
	B1000	Word 1000
	STRess	3-in-24 stress pattern
	B1IN8	1-in-8 pattern
	B2IN8	2-in-8 pattern
	OCT55	55 octet test pattern (uses Daly pattern as per ANSI TI.403)

Selects the receiver payload preset Word Pattern.

This command is used when :SENSe:DATA:TELecom:PATTern:TYPE:WORD <discrete> is set to PRESet.

:SENSe:DATA:TELecom:PATTern:TYPE:WORD:PRESet?

Returns: <discrete>

:SENSe:DATA:TELecom:PATTern:TYPE:WORD:USER <numeric>

<numeric> =	0 to 65535	User Word Pattern

Sets the Receiver Payload User Word Pattern in the range 0 to 65535. The prefix of #b or #h can be used to specify binary or hex respectively, width of the user word is 16 bits.

This command is used when :SENSe:DATA:TELecom:PATTern:TYPE:WORD <discrete> is set to USER.

:SENSe:DATA:TELecom:PATTern:TYPE:WORD:USER?

Returns: <numeric>

:SENSe:DATA:TELecom:PATTern:POLarity <discrete>

<discrete> =	NINVerted	Pattern Non-Inverted
	INVerted	Pattern Inverted

Sets the polarity of the PRBS pattern of the receiver.

:SENSe:DATA:TELecom:PATTern:POLarity?

Returns: <discrete>

SENSe Subsystem - Data Capture Common Commands

The following commands are used for configuring Data Capture for OTN, SDH and SONET. When a trigger selection other than Manual is set, the specific trigger is set using commands specified in the appropriate chapter.

:SENSe:DATA:TELecom:DCAPture:DATA <discrete>

<discrete> =	OTN	Capture OTN Data
	SECTion	Capture SDH SOH Data
	TRANsport	Capture SONET TOH Data
	PATH	Capture SDH/SONET POH Data

Selects the data to be captured. To capture SDH/SONET, the receiver must be configured to receive the appropriate payload.

:SENSe:DATA:TELecom:DCAPture:DATA?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:SELect <discrete>

<discrete> =	MANual	Manual trigger
	PRE	Pre-trigger capture
	CENTered	Centre-trigger capture
	POST	Post-trigger capture

Selects the type of trigger for Data Capture.

:SENSe:DATA:TELecom:DCAPture:TRIGger:SELect?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:TYPE <discrete>

<discrete> =	ERRor	Error Triggers
	ALARm	Alarm Triggers

Selects the trigger type for Data Capture as either error triggers or alarm triggers.

:SENSe:DATA:TELecom:DCAPture:TRIGger:TYPE?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture <discrete>

<discrete> =	STOP	Stops data capture
	STARt	Starts data capture

Stops and starts the Data Capture test function.

:SENSe:DATA:TELecom:DCAPture?

Returns: <discrete>

SENSe subsystem - ITU Analysis Control

:SENSe:DATA:TELecom:M2110 <discrete>

<discrete> =	PALLocation	Path Allocation
	USER	User Defined

Selects the M.2110 threshold control source.

:SENSe:DATA:TELecom:M2110?

Returns: <discrete>

:SENSe:DATA:TELecom:M2110:PATH <discrete>

<discrete> =	SECTion	Multiplex Section

RSECtion	Regenerator Section
HIGH	High Order Path
HTCM	High Order TCM Path
LOW	Low Order Path
LTCM	Low Order TCM Path
M140	140 Mb/s path
M34	34 Mb/s path
M8	8 Mb/s path
M2	2 Mb/s path
DS3	DS3 path
DS1	DS1 path

Selects the path under test by the M.2110 analysis function.

:SENSe:DATA:TELecom:M2110:PATH?

Returns: <discrete>

:SENSe:DATA:TELecom:M2110:PALLocation <numeric>

<numeric> = 0.5 to 63.0 % - Percentage

Sets the M.2110 path allocation percentage.

:SENSe:DATA:TELecom:M2110:PALLocation?

Returns: <numeric>

:SENSe:DATA:TELecom:M2110:USER:[Error Type] <discrete>, <discrete>, <numeric>

<discrete> = [Error Type]

ESEConds:TRANsmit	Error Seconds (Tx)
SESeconds:TRANsmit	Severely Errored Seconds (Tx)

	BBECount:TRANsmit	Background Block Error Count (Tx)
	ESEConds:RECeive	Error Seconds (Rx)
	SESeconds:RECeive	Severely Errored Seconds (Rx)
	BBECount:RECeive	Background Block Error Count (Rx)
<discrete> =	S1M15	S1, 15 Minutes
	S2M15	S2, 15 Minutes
	S1H1	S1, 1 Hour
	S2H1	S2, 1 Hour
	S1H2	S1, 2 Hours
	S2H2	S2, 2 Hours
	S1D1	S1, 24 Hours
	S2D1	S2 24 Hours
	BISOD7	BISO, 7 Days
<numeric> =	0 to 100000	For ESEConds
	0 to 1000	For SESeconds
	0 to 100000	For BBECount
	0 to 1000	For SEPeriod

Sets the user programmable M.2110 thresholds.

:SENSe:DATA:TELecom:M2110:USER:[Error? Type], <discrete>, <discrete>

<discrete> =	[Error Type]	
	ESEConds:TRANsmit	Error Seconds (Tx)
	SESeconds:TRANsmit	Severely Errored Seconds (Tx)
	BBECount:TRANsmit	Background Block Error Count (Tx)
	ESEConds:RECeive	Error Seconds (Rx)

	SESeconds:RECeive	Severely Errored Seconds (Rx)
	BBECount:RECeive	Background Block Error Count (Rx)
<discrete> =	S1M15	S1, 15 Minutes
	S2M15	S2, 15 Minutes
	S1H1	S1, 1 Hour
	S2H1	S2, 1 Hour
	S1H2	S1, 2 Hours
	S2H2	S2, 2 Hours
	S1D1	S1, 24 Hours
	S2D1	S2 24 Hours
	BISOD7	BISO, 7 Days

Returns: <numeric>

:SENSe:DATA:TELecom:M2120:PATH <discrete>

<discrete> =	SECTion	Multiplex Section
	RSECtion	Regenerator Section
	HIGH	High Order Path
	HTCM	High Order TCM Path
	LOW	Low Order Path
	LTCM	Low Order TCM Path
	M140	140 Mb/s path
	M34	34 Mb/s path
	M8	8 Mb/s path
	M2	2 Mb/s path
	DS3	DS3 path
	DS1	DS1 path

Selects the path under test by the M.2120 analysis function.

:SENSe:DATA:TELecom:M2120:PATH?

Returns: <discrete>

:SENSe:DATA:TELecom:M2120:USER:[Error Type] <discrete>, <discrete>, <numeric>

<discrete> =	[Error Type]	
	ESEConds:TRANsmit	Error Seconds (Tx)
	SESeconds:TRANsmit	Severely Errored Seconds (Tx)
	BBECount:TRANsmit	Background Block Error Count (Tx)
	ESEConds:RECeive	Error Seconds (Rx)
	SESeconds:RECeive	Severely Errored Seconds (Rx)
	BBECount:RECeive	Background Block Error Count (Rx)
<discrete> =	T1	15 Minute period
	T2	24 Hour period
<numeric> =	0 to 1E3	T1 threshold for ES/SES
	0 to 1E6	T2 threshold for ES/SES
	0 to 1E9	T1 threshold for BBE
	0 to 1E14	T2 threshold for BBE

Sets the user programmable M.2120 Error Seconds thresholds.

:SENSe:DATA:TELecom:M2120:USER:[Error? Type], <discrete>, <discrete>

<discrete> =	[Error Type]	
	ESEConds:TRANsmit	Error Seconds (Tx)
	SESeconds:TRANsmit	Severely Errored Seconds (Tx)

	BBECount:TRANsmit	Background Block Error Count (Tx)
	ESEConds:RECeive	Error Seconds (Rx)
	SESeconds:RECeive	Severely Errored Seconds (Rx)
	BBECount:RECeive	Background Block Error Count (Rx)
<discrete> =	T1	15 Minute period
	T2	24 Hour period

Returns: <numeric>

SENSe subsystem - Signal Wizard Commands

The following commands are used to control the Signal Wizard application. Please consult the relevant chapters for OTN, SDH and SONET specific commands.

:SENSe:DATA:TELecom:SIGWizard:INIT

Prepares Signal Wizard for Operation. This command is required before any signal wizard operations are requested.

:SENSe:DATA:TELecom:SIGWizard:STOP

Stops all Signal Wizard operations.

:SENSe:DATA:TELecom:SIGWizard:STATe?

Returns: <discrete> = OFF | SSC

Indicates the current state of Signal Wizard: off or Structure Scope active.

:SENSe:DATA:TELecom:SIGWizard:SETup:RX

Terminate Signal Wizard and setup receiver.

:SENSe:DATA:TELecom:SIGWizard:SETup:TX

Terminate Signal Wizard and setup transmitter.

:SENSe:DATA:TELecom:SIGWizard:SETup:TXRX

Terminate Signal Wizard and setup transmitter and receiver.

SSC - Structure Scope

:SENSe:DATA:TELecom:SIGWizard:SSCope:STARt <string>

<string> = "Current"

Start the Structure Scope phase, for the given port. The port name should be exactly as given by PORTdetails. At the moment, the only parameter supported by this command is "Current".

:SENSe:DATA:TELecom:SIGWizard:SSCope:STOP

Stop the Structure Scope phase.

:SENSe:DATA:TELecom:SIGWizard:SSCope:TIME?

Returns: <time>

Returns the time elapsed since the Structure Scope phase was started.

:SENSe:DATA:TELecom:SIGWizard:SSCope:RESet

Resets all alarm and status history indicators.

:SENSe:DATA:TELecom:SIGWizard:SSCope:AUTS <discrete>

<discrete> = ON

OFF

Enable or disable auto acknowledge of Structure Changes. If this is off then it will be necessary to check for and acknowledge structure changes to see any changes to the data. If a structure change is not acknowledged on starting Structure Scope all results are likely to be invalid.

:SENSe:DATA:TELecom:SIGWizard:SSCope:SCHNg?

Returns: <discrete> TRUE | FALSE

Indicates whether there is an outstanding structure change. Will always be false if AUTS is on.

:SENSe:DATA:TELecom:SIGWizard:SSCope:ACKS

Acknowledges an outstanding structure change.

:SENSe:DATA:TELecom:SIGWizard:SSCope:STANdard?

Returns: <string> Eg. "OTN", "SDH"

Returns the telecom standard detected on the chosen port.

FETCh Subsystem - Data Capture Results Commands

The following commands return results relating to Data Capture and are common to OTN, SDH and SONET.

:FETCh:SCALar:DATA:TELecom:DCAPture:MINFrame?

Returns: <numeric>

Returns the minimum frame index of the captured data.

:FETCh:SCALar:DATA:TELecom:DCAPture:MAXFrame?

Returns: <numeric>

Returns the maximum frame index of the captured data.

:FETCh:STRing:DATA:TELecom:DCAPture:TIME?

Returns: <string>

Returns the timestamp of when data capture was triggered in string format. The timestamp has the format "HH:MM:SS". If data capture has not been triggered, the timestamp will be returned as "--:--:--".

SENSe subsystem - Common Result Commands

Common results relate to those application measurements which are not specifically tied to either SONET, SDH, PDH or similar measurement domains. All commands return a <numeric> unless shown otherwise.

:SENSe:DATA? <string>
Where <string> is defined for the various common results

Time Based Results

:SENSE:DATA? <string>

<string> =

"ETIMe"	Elapsed time
"ASEConds:LOS"	Loss of Signal
"ASEConds:CSL"	Clock Synch Loss
"ASEConds:PLOSs"	Power Loss
"ASEConds:PSL"	Pattern Sync Loss

Total Results

:SENSE:DATA? <string>

<string> =

"ECOunt:BIT"	Bit Error Count
"ERATio:BIT"	Bit Error Ratio
"ECOunt:CODE"	Code Error Count
"ERATio:CODE"	Code Error Ratio
"ECOunt:BPViolation"	Bi-polar Violation error count
"ERATio:BPViolation"	Bi-polar Violation error ratio

Last Second Results

:SENSE:DATA? <string>

<string> =

"ECOunt:LSECond:BIT"	Bit Error Count for Last Second
"ERATio:LSECond:BIT"	Bit Error Ratio for Last Second

"ECOunt:LSECond:CODE"	Code Error Count for Last Second
"ERATio:LSECond:CODE"	Code Error Ratio for Last Second
"ECOunt:LSECond:BPViolation"	Bi-polar Violation error count for Last Second
"ERATio:LSECond:BPViolation"	Bi-polar Violation error ratio for Last Second

Service Disruption Results

:SENSE:DATA? <string>

<string> =

"SDTest:COUNt:LONG"	Longest error burst
"SDTest:COUNt:SHORt"	Shortest error burst
"SDTest:COUNt:LAST "	Last error burst

Returns: <numeric>, <numeric>

Where;
<numeric> =
0 Result is invalid due to receiver configuration
1 Result is valid
2 Result is out of range

<numeric> =
Result in Milliseconds

Optical Power Result

:SENSE:DATA? <string>

<string> = "OPOWer"

Returns: <numeric> Optical power (dBm)

Frequency Results

:SENSE:DATA? <string>

<string> =

"FREQuency"	Receiver clock frequency in Hz

"FOFPpm"	Receiver clock offset in ppm
"FOF"	Receiver offset frequency in Hz.

ITU Analysis Results - M.2110

:SENSE:DATA? <string>

<string> = "<Result Type>:<Path Type>:M2110"

<Result Type> is one of the following

MIN15	15 Minute BIS Result
HOUR1	1 Hour BIS Result
HOUR2	2 Hour BIS Result
HOUR24	24 Hour BIS Result
DAY7	7 day BIS Result

<Path Type> is one of the following

TRANsmit	Transmit Analysis
RECeive	Receive Analysis

Returns: <string> "WAIT", "PASS", "FAIL" or "-?- "

ITU Analysis Results - M.2120

:SENSE:DATA? <string>

<string> = "<Result Type>:<Path Type>:M2120"

<Result Type> is one of the following

TR1:ES	ES 15 Minute Threshold Report
TR1:SES	SES 15 Minute Threshold Report
TR1:BBE	BBE 15 Minute Threshold Report
TR2:ES	ES 24 Hour Threshold Report
TR2:SES	SES 24 Hour Threshold Report
TR2:BBE	BBE 24 Hour Threshold Report

<Path Type> is one of the following

TRANsmit	Transmit Analysis
RECeive	Receive Analysis

SENSe subsystem - Test Timing

:SENSe:DATA:TELecom:TEST <boolean>

<boolean> =	0 or OFF	Stop the current test period
	1 or ON	Start a new test period

Start/Stop the test

:SENSe:DATA:TELecom:TEST?

Returns: <boolean>

:SENSe:DATA:TELecom:TEST:TYPE <discrete>

<discrete> =	MANual	Manual Test period
	SINGle	Single Test period
	TIMed	Timed Test period

Selects the type of test period. If SING is selected, the duration is set using :SENSe:DATA:TELecom:TEST:PERiod <numeric>, <numeric>, <numeric>, <numeric>

If TIMed is selected the duration is set using :SENSe:DATA:TELecom:TEST:PERiod <numeric>, <numeric>, <numeric>, <numeric> and the start time with :SENSe:DATA:TELecom:TEST:STARt <numeric>, <numeric>, <numeric>, <numeric>, <numeric>.

:SENSe:DATA:TELecom:TEST:TYPE?

Returns: <discrete>

:SENSe:DATA:TELecom:TEST:PERiod <numeric>, <numeric>, <numeric>, <numeric>

<numeric> =	1 to 99	Days
<numeric> =	0 to 23	Hours
<numeric> =	0 to 59	Minutes
<numeric> =	0 to 59	Seconds

Sets the duration of the test period. Is only valid when :SENSe:DATA:TELecom:TEST:TYPE <discrete> is set to SINGle.

:SENSe:DATA:TELecom:TEST:PERiod? <numeric>, <numeric>, <numeric>

<numeric> =	1 to 99	Days
<numeric> =	0 to 23	Hours
<numeric> =	0 to 59	Minutes

Returns: <numeric>

:SENSe:DATA:TELecom:TEST:STARt <numeric>, <numeric>, <numeric>, <numeric>, <numeric>

<numeric> =		Year
<numeric> =	1 to 12	Month
<numeric> =	0 to 31	Day
<numeric> =	0 to 23	Hour
<numeric> =	0 to 59	Min

Sets the start of the test period. Is only valid when :SENSe:DATA:TELecom:TEST:TYPE <discrete> is set to TIMed.

:SENSe:DATA:TELecom:TEST:STARt? <numeric>, <numeric>, <numeric>, <numeric>

<numeric> =		Year
<numeric> =	1 to 12	Month
<numeric> =	0 to 31	Day
<numeric> =	0 to 23	Hour

Returns: <numeric>

SENSe subsystem - Measurement Record System

:SENSe:DATA:TELecom:MRS:CATalog?

Returns:
<numeric1>,
[<string>,<numeric2>,<DATE>,<TIME>,
[<string>,<numeric2>,<DATE>,<TIME>,
.....
[<string>,<numeric2>,<DATE>,<TIME>]].....]
<numeric1> = Number of stored sessions
<string> = Session name
<numeric2> = Memory Usage (%)
<DATE> = YYYY,MM,DD Date
<TIME> = HH,MM,SS Time (24-hr)

Returns a catalogue of stored sessions as seen on the Session Manager display.

:SENSe:DATA:TELecom:MRS:RANGe? <string>

<string> =	Session name	As supplied by the ":CATalog" command

Returns: <numeric>, <numeric>

<numeric> = Start time Start time of session as measured from epoch.

<numeric> = Stop time Stop time of session as measured from epoch.

Returns the time range of data available for a particular MRS store.

:SENSe:DATA:TELecom:MRS:DEFinitions? <string>

<string> =	Session name	As supplied by the ":CATalog" command

Returns: <numeric>,<string>,< string >,...,< string >
<numeric> = Number of following Data Names
<string> = Data name

Returns the in-context Data name mnemonics representing errors and alarms, as used in a particular MRS session, identified by its Session name. Examples are "BIT" or "SDH_AU_BIP".

:SENSe:DATA:TELecom:MRS:DATA? <string>, <string>, <numeric>, <numeric>, <numeric>, <numeric>

<string> =	Session name	As supplied by the ":CATalog" command
<string> =	Data name	As supplied by the ":DEFinitions" command
<numeric> =	0 to N	Number of seconds (from epoch) into the period where samples should be queried from
<numeric> =	N to M	Number of seconds (from epoch) into the period where samples should be queried to
<numeric> =	1 or 60 or 720 or 3600	Number of seconds between samples (resolution).
<numeric> =	0	long format
	1	run length encoded

Format = long format
Returns:
<numeric1> [<numeric>,<numeric>,...,<numeric>]
<numeric1> = 0 to n Number of data points being returned.
<numeric> = 0 to N Data value

Format = run length encoded
Returns: <numeric1> [<numeric2>,<numeric3>, <numeric2>,<numeric3> ,...,
<numeric2>,<numeric3>]
<numeric1> = 1 to n Number of run length encoded data pairs.
<numeric2> = 0 to p Number of occurances
<numeric3> = 0 to q Data value

Returns the number of data points, and then the data values for the identified Session name, its Data name and the time range for which data is available.

:SENSe:DATA:TELecom:MRS:DELete <string>

<string> =	Session name	As supplied by the ":CATalog" command

Deletes the specified Session.

:SENSe:DATA:TELecom:MRS:REName <string>, <string>

<string> =	Session name	Session to rename as supplied by the ":CATalog" command
<string> =	Session name	New Session name

Renames an existing Session name.

STATus subsystem

This subsystem controls the status reporting registers. SCPI defined status registers QUEStionable, OPERation and INSTrument are provided. For detailed information on status reporting refer to Chapter 8 of this manual.

For each of the [Status Registers]'s listed in "Status Registers" (excluding the Standard Event Register) the following commands exist:

:STATus:[Status Register]:ENABle <numeric>

<numeric> =

Sets the Event Enable register mask which allows true conditions in the Event register to be reported in the [Status Register]'s summary bit. If a bit is 1 in the Event Enable register and its associated event bit makes the transition to true, a positive transition will occur in the [Status Register]'s summary bit.

:STATus:[Status Register]:ENABle?

Returns: <numeric>

:STATus:[Status Register]:PTRansition <numeric>

<numeric> =

Sets the positive Transition Filter. Setting a bit in the positive Transition filter shall cause a 0 to 1 transition in the corresponding bit of the [Status Register]'s Condition register to cause a 1 to be written in the corresponding bit of the [Status Register]'s Event register.

:STATus:[Status Register]:PTRansition?

Returns: <numeric>

:STATus:[Status Register]:NTRansition

Sets the negative Transition filter. Setting a bit in the negative Transition Filter shall cause a 1 to 0 transition in the corresponding bit of the [Status Register]'s Condition register to cause a 1 to be written in the corresponding bit of the [Status Register]'s Event register.

:STATus:[Status Register]:NTRansition?

Returns: NTRansition

:STATus:[Status Register]:EVENt?

Returns: <numeric>

Returns the contents of the Event register associated with the [Status Register]. Reading this register clears its contents.

:STATus:[Status Register]:CONDition?

Returns: <numeric>

Returns the contents of the Condition register associated with the [Status Register]. Reading this register does not clear its contents.

SYSTem Subsystem

:SYSTem:DATE <numeric>, <numeric>, <numeric>

<numeric> = 2000 to 2035 year

<numeric> = 1 to 12 month

<numeric> = 1 to 31 day

Sets the date.

:SYSTem:DATE? <numeric>, <numeric>

<numeric> = 2000 to 2035 year

<numeric> = 1 to 12 month

Returns: <numeric>

:SYSTem:TIME <numeric>, <numeric>, <numeric>

<numeric> = 0 to 23 hour

<numeric> = 0 to 59 minute

<numeric> = 0 to 59 second

Sets the time.

:SYSTem:TIME? <numeric>, <numeric>

<numeric> = 0 to 23 hour

<numeric> = 0 to 59 minute

Returns: <numeric>

:SYSTem:LOCal

Set the Instrument to Local (keyboard) control. This command should only be used with LAN and RS232 connections. GPIB host controllers have different methods for performing this action (for example, the LOCAL command in HP-BASIC).

:SYSTem:REMote

Set the Instrument to Remote control. This command is required only from LAN and RS232 connections. GPIB host controllers have different methods for performing this action (for example, the REMOTE command in HP-BASIC).

:SYSTem:PRESet

This command resets the instrument state. It performs the same task as *RST.

:SYSTem:SERial?

Returns: <string>

The serial number is returned as a string in the form "GBnnnnnnnn". GB signifies the country of origin (Great Britain).

:SYSTem:CONF <block>

<block> = #0 type Block

Sets the Instrument to the state defined by the Block data.

:SYSTem:CONF?

Returns: <block>

:SYSTem:VERSion?

Returns: <string> = YYYY.V

Returns the revision state of the SCPI remote control.

The revision state is returned in the form YYYY.V. YYYY signifies the year and V

signifies the revision number.

:SYSTem:ERRor?

Returns: <numeric>,<string>

Requests the Instrument remote control Error status. The error status is returned as a numeric value and a string containing a description of the error.

Remote Settings

:SYSTem:REMCtrl:MODE <discrete>

<discrete> = <mode> TERMinal or COMPuter

This setting changes the 'Command prompt' setting. If set to TERM then the command prompt setting is turned on. If set to COMP then command prompt setting is turned off.

:SYSTem:REMCtrl:MODE?

Returns: <discrete>

:SYSTem:REMCtrl:CONNector <discrete>

<discrete> = <connector> GPIB, LAN or RS232

Sets which connector is used for remote control.

:SYSTem:REMCtrl:CONNector?

Returns: <discrete>

:SYSTem:GPIB:ADDRess <numeric>

<numeric> = <address> GPIB address

Changes the address that the instrument uses on GPIB. The instrument will respond to the host controller when it is addressed using the new address num-

ber.

:SYSTem:GPIB:ADDRess?

Returns: <numeric>

:SYSTem:RS232:BAUDrate <numeric>

<numeric> = <baud> Desired baud rate

Changes the baud rate used for RS232 communications. Note that only the following baud rates are valid: 110, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400. Attempt to set any other baud rate will cause an 'argument out of range' error.

:SYSTem:RS232:BAUDrate?

Returns: <numeric>

:SYSTem:RS232:DATabits <numeric>

<numeric> = <bits> 7 or 8

Sets the data size to 7 or 8 bytes. Attempt to set it to any other value will cause an 'argument out of range' error.

NOTE

Remote control commands/queries that take/respond with block data may not work as expected if the data size is set to 7 bits. This is because block data uses 8-bit data.

:SYSTem:RS232:DATabits?

Returns: <numeric>

:SYSTem:RS232:STOPbits <numeric>

<numeric> = <bits> 1 or 2

Sets the number of stop bits.

:SYSTem:RS232:STOPbits?

Returns: <numeric>

:SYSTem:RS232:PARity <discrete>

<discrete> = <parity> NONE, EVEN or ODD

Sets the RS232 parity method to NONE, EVEN or ODD.

:SYSTem:RS232:PARity?

Returns: <discrete>

:SYSTem:RS232:HANDshaking <discrete>

<discrete> = <method> NONE, RTSCts or XONXoff

Sets the handshaking method. NONE indicates that no handshaking will be used. RTSCts uses the RS232 lines RTS and CTS to perform handshaking ('hardware handshaking'); this requires a correctly-wired 7-wire RS232 cable. XONXoff uses Xon/Xoff characters to perform handshaking ('software handshaking').

:SYSTem:RS232:HANDshaking?

Returns: <discrete>

:SYSTem:NETWork:IP <string>

<string> = <address> New IP addresses

This changes the instrument's IP address. The address must be specified in standard 'dotted-quad' notation - for example, "10.225.0.226". If this is set to "0.0.0.0" then the IP address is cleared and the instrument will not attempt to connect to the network.

:SYSTem:NETWork:IP?

Returns: <string>

:SYSTem:NETWork:MASK <string>

<string> =	<mask>	New netmask

Sets the IP netmask. This must be specified in dotted-quad notation - for example, "255.255.248.0"

:SYSTem:NETWork:MASK?

Returns: <string>

:SYSTem:NETWork:GATeway <string>

<string> =	<address>	

Sets the IP address of your network's default gateway. This address must be specified in dotted-quad notation - for example, "10.225.0.1". If your network does not have a default gateway, set this to "0.0.0.0".

:SYSTem:NETWork:GATeway?

Returns: <string>

Logging Commands

:SYSTem:LOGGing:AUTO <boolean>

<boolean> =	OFF	Select Auto Logging Off
	ON	Select Auto Logging On

:SYSTem:LOGGing:AUTO?

Returns: <boolean>

:SYSTem:LOGGing:INTerval <discrete>

<discrete> = OFF
MIN15
MIN30
MIN60
USER

:SYSTem:LOGGing:INTerval?

Returns: <discrete>

:SYSTem:LOGGing:DESTination <discrete>

<discrete> = DEBug
FILE
FLOPpy
PRINter

Selects the logging destination for results logging

:SYSTem:LOGGing:DESTination?

Returns: <discrete>

:SYSTem:LOGGing:RESults <discrete>

<discrete> = DEBug
FILE
FLOPpy
PRINter

:SYSTem:LOGGing:RESults?

Returns: <discrete>

SYSTem Subsystem - Trigger Output Common Commands

Transmitter Trigger Output Commands

:SYSTem:TRIGger:TRANsmit <discrete>

<discrete> =	NONE	No Trigger
	FRAMe	Start of Frame
	ERRor	Specified by Error Add
	ALARm	Specified by Alarm Add

Specifies when to generate a transmitter trigger output.

When FRAMe is selected, a further selection of network standard should be selected by :SYSTem:TRIGger:TRANsmit:FRAMe.

When ERRor or ALARm are specified, a trigger output is generated when an error or alarm is added using the appropriate test function.

:SYSTem:TRIGger:TRANsmit?

Returns: <discrete>

:SYSTem:TRIGger:TRANsmit:FRAMe <discrete>

<discrete> =	OTN	Start of OTN frame
	SDH	Start of SDH frame
	SONet	Start of SONET frame

Selects the frame type which will generate a trigger output.

For example, when SDH is being transmitted as the payload for OTN, a trigger can be output at the start of either the OTN frame or the SDH frame.

:SYSTem:TRIGger:TRANsmit:FRAMe?

Returns: <discrete>

Receiver Trigger Output Commands

:SYSTem:TRIGger:RECeive <discrete>

<discrete> =	NONE	No Trigger
	FRAMe	Start of Frame
	ERRor	Specified by Error Add
	ALARm	Specified by Alarm Add

Specifies when to generate a receiver trigger output.

When FRAMe is selected, a further selection of network standard should be selected by :SYSTem:TRIGger:RECeiver:FRAMe.
When ERRor or ALARm are specified, a trigger output is generated when an error or alarm is generated at the receiver.

:SYSTem:TRIGger:RECeive?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:FRAMe <discrete>

<discrete> =	OTN	Start of OTN frame
	SDH	Start of SDH frame
	SONet	Start of SONET frame

Selects the frame type which will generate a trigger output.

For example, when the instrument is receiving OTN with an SDH payload, a trigger can be output at the start of either the OTN frame or the SDH frame.

:SYSTem:TRIGger:RECeive:FRAMe?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ERRor:STANdard <discrete>

<discrete> =	OTN	OTN Errors
	SECTion	SDH Section Overhead Errors
	TCM	SDH TCM Errors
	TRANsport	SONET Tranport Overhead Errors
	PATH	SDH/SONET Path Overhead Errors

Selects error group when :SYSTem:TRIGger:RECeive <discrete> is set to ERRor. A further selection is required to set the specific error for trigger output.

:SYSTem:TRIGger:RECeive:ERRor:STANdard?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:STANdard <discrete>

<discrete> =	OTN	OTN Alarms
	SECTion	SDH Section Overhead Alarms
	TCM	SDH TCM Alarms
	VCAT	SDH Virtual Concatenation Alarms
	TRANsport	SONET Tranport Overhead Alarms
	PATH	SDH/SONET Path Overhead Alarms

Selects alarm group when :SYSTem:TRIGger:RECeive <discrete> is set to ALARm. A further selection is required to set the specific alarm for trigger output.

:SYSTem:TRIGger:RECeive:ALARm:STANdard?

Returns: <discrete>

IEEE Common Capabilities

*CLS

Clear Status - Clears all status registers and the error queue.

*ESE <numeric>

<numeric> =	1	Operation Complete
	2	Request Control
	4	Query Error
	8	Device Dependent Error
	16	Execution Error
	32	Command Error
	64	User Request
	128	Power On

Event Status Enable - Sets the mask of the Event Status Register.

*ESE?

<numeric> =	0 to 65535	Current Mask

Event Status Enable Query - Returns the current mask setting.

*ESR?

<numeric> =	0 to 65535	Event Status Reg Status

Event Status Register Query - Returns the state of the Event Status Register in numeric form.

*IDN?

<string> =

Identification Query - Returns the Manufacture Name, Model Number & Name, Serial Number, Firmware Revision Number as a string. For Example:-
"Agilent Technologies, J21nA PowerPro, GBnnnnnnnn, A.nn.nn" GB signifies the country of origin (Great Britain).

*LRN?

<#0 block> =

Learn Query - Returns the instrument settings configuration in <#0 Block> form.

*OPC

Operation Complete - Masks the OPC bit in the Event Status Register when all pending operations have completed.

*OPC?

<boolean> = Status of Operation Complete

Operation Complete Query - Returns a 1 when all pending operations have completed.

*OPT?

<string> =

Option Identification Query - Returns the Options fitted in the instrument as a comma separated list of option numbers.

*PSC <numeric>

Sets the value of the Power On Status Clear flag. Controls the automatic clearing of SRQ Enable register, Standard ESR & Parallel Poll Enable register after power on. See IEE 488.2 Section 10.25.

*PSC?

<boolean> =

Returns the status of the PSC flag.

*RCL <numeric>

<numeric> = 0 to 4

Recall Stored Settings - Sets the instrument to a set of previously stored settings.

*RST

Set the instrument to its Default settings.

*SAV <numeric>

<numeric> = 0 to 4

Save Stored Settings - Stores the current instrument settings.

*SRE <numeric>

<numeric> =	8	QUES Status Summary
	16	Message Available
	32	Event Status Summary
	64	Request Service
	128	OPER Status Summary

Service Request Enable - Sets the status byte mask.

*SRE?

<numeric> = 0 to 65535

Service Request Enable Query - Returns the current mask setting in numeric form.

*STB?

<numeric> = 0 to 65535

Status Byte Query - Returns the value of the status byte in numeric form.

*TRG

Trigger - Not implemented on This instrument

*TRG?

Trigger Query - Not implemented on This instrument

*WAI

Wait To Continue - Not implemented on the This instrument

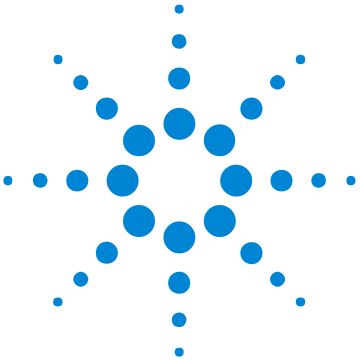
*TST

Initiate Self Test

*TST?

<boolean> = 1 = selftest in progress

Self Test Query



3
OTN Command Reference

OTN Command Reference

This chapter contains detailed information on the SCPI (Standard Commands for Programming Instruments) and IEEE 488.2 common commands you will use when writing programs to control your Instrument for OTN operation.

Please also refer to chapter 2 Common Commands for general information on SCPI command formats and for a list of commands.

SOURce subsystem - Transmitter OTN Settings Commands

:SOURce:DATA:TELecom:OTN:RATE <discrete>

<discrete> =	OTU2	10.71Gb/s
	OTU1	2.66Gb/s

Sets the output rate for the instrument output port.

:SOURce:DATA:TELecom:OTN:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:SCRambling <boolean>

<boolean> =	0 or OFF	OTN Scrambling Off
	1 or ON	OTN Scrambling On

Enables or Disables OTN Scrambling.

:SOURce:DATA:TELecom:OTN:SCRambling?

Returns: <boolean>

:SOURce:DATA:TELecom:OTN:FEC <boolean>

<boolean> =	0 or OFF	OTN Forward Error Correction Off
	1 or ON	OTN Forward Error Correction On

Enables or Disables OTN Forward Error Correction (FEC).

:SOURce:DATA:TELecom:OTN:FEC?

Returns: <boolean>

:SOURce:DATA:TELecom:OTN:MAPPing <discrete>

<discrete> =	ASYNchronous	Asynchronous mapping
	SYNChronous	Synchronous mapping

Sets the mapping used for transmission.

:SOURce:DATA:TELecom:OTN:MAPPing?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:PAYLoad <discrete>

<discrete> =	SDH	SDH Payload
	SONet	SONET Payload
	NULLclient	NULL Client Payload
	TEST	Test Payload

Selects the OTN payload.

:SOURce:DATA:TELecom:OTN:PAYLoad?

Returns: <discrete>

SOURce subsystem - Transmitter OTN Overhead Setup Commands

Lists the settings for the commands associated with the TRANSMIT OVERHEAD SET UP display. The following commands are only available when an OTN transmit signal rate is active.

Overhead Byte Setup

:SOURce:DATA:TELecom:OTN:OVERhead:DEFault

Sets all overhead bytes to their default value.

:SOURce:DATA:TELecom:OTN:OVERhead:DATA <discrete>, <numeric>

<discrete> = FAS_1 | FAS_2 | FAS_3 | FAS_4 | FAS_5 | FAS_6 |SM_3 | GCC0_1 | GCC0_2 | TCMACT |TCM6_1 | TCM6_3 | TCM5_1 | TCM5_3 | TCM4_1 |TCM4_3 | TCM3_1 | TCM3_3 | TCM2_1 | TCM2_3 |TCM1_1 | TCM1_3 | FTFL | PM_3 | EXP_1 |EXP_2 | GCC1_1 | GCC1_2 | GCC2_1| GCC2_2 |APSPCC_1 | APSPCC_2 | APSPCC_3 |APSPCC_4

<numeric> = 0 to 255 Byte Value

Sets the value of the selected transmitter section overhead byte. The required byte is specified by 2 command parameters.

The first parameter identifies the specific byte. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names are shown in the table above. The second method is to use an "Xrrcc" notation, where rr is the numerical value of the row in the OTN overhead and cc is the numerical value of the column in the OTN overhead. This method allows access to any byte in the OTN overhead.

The second command parameter is the new value that will be transmitted in the specified byte. This value can be specified in hex, octal or decimal format.

:SOURce:DATA:TELecom:OTN:OVERhead:DATA? <discrete>

<discrete> = FAS_1 | FAS_2 | FAS_3 | FAS_4 | FAS_5 | FAS_6

|SM_3 | GCC0_1 | GCC0_2 | TCMACT |TCM6_1 |
TCM6_3 | TCM5_1 | TCM5_3 | TCM4_1 |TCM4_3 |
TCM3_1 | TCM3_3 | TCM2_1 | TCM2_3 |TCM1_1 |
TCM1_3 | FTFL | PM_3 | EXP_1 |EXP_2 | GCC1_1 |
GCC1_2 | GCC2_1| GCC2_2 |APSPCC_1 | APSPCC_2 |
APSPCC_3 |APSPCC_4

Returns: <numeric>

:SOURce:DATA:TELecom:OTN:OVERhead:PM:SAPI:B15 <string>

<string> =

Sets the 15-byte SAPI field that is used for Path Monitoring (PM).

:SOURce:DATA:TELecom:OTN:OVERhead:PM:SAPI:B15?

Returns: <string>

:SOURce:DATA:TELecom:OTN:OVERhead:PM:DAPI:B15 <string>

<string> =

Sets the 15-byte DAPI field that is used for Path Monitoring (PM).

:SOURce:DATA:TELecom:OTN:OVERhead:PM:DAPI:B15?

Returns: <string>

:SOURce:DATA:TELecom:OTN:OVERhead:PM:OPSPec:B32 <string>

<string> =

Sets the 32-byte Operator Specific field that is used for Path Monitoring (PM).

:SOURce:DATA:TELecom:OTN:OVERhead:PM:OPSPec:B32?

Returns: <string>

:SOURce:DATA:TELecom:OTN:OVERhead:SM:SAPI:B15 <string>

<string> =

Sets the 15-byte SAPI field that is used for Section Monitoring (SM).

:SOURce:DATA:TELecom:OTN:OVERhead:SM:SAPI:B15?

Returns: <string>

:SOURce:DATA:TELecom:OTN:OVERhead:SM:DAPI:B15 <string>

<string> =

Sets the 15-byte DAPI field that is used for Section Monitoring (SM).

:SOURce:DATA:TELecom:OTN:OVERhead:SM:DAPI:B15?

Returns: <string>

:SOURce:DATA:TELecom:OTN:OVERhead:SM:OPSPec:B32 <string>

<string> =

Sets the 32-byte Operator Specific field that is used for Section Monitoring (SM).

:SOURce:DATA:TELecom:OTN:OVERhead:SM:OPSPec:B32?

Returns: <string>

:SOURce:DATA:TELecom:OTN:OVERhead:PTYPe <discrete>

<discrete> =	EXPerimental	Experimental Mapping
	ASYNc	Asynchronous STMMapping
	BITSync	Bit synchronousSTM-N Mapping
	ATM	ATM Mapping

GFP	GFP Mapping
BSOCtet	Bit Stream (with octet timing)
BSNoctet	Bit Stream (without octet timing)
NULLtest	NULL test signal mapping
PRBStest	PRBS test signal mapping
USER	User defined value

Sets the value of the Payload Type (PT) byte. When USER is selected, the value of the PT byte is specified using the :SOURce:DATA:TELecom:OTN:OVERhead:PTYPe:USER <numeric> command.

:SOURce:DATA:TELecom:OTN:OVERhead:PTYPe?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:OVERhead:PTYPe:USER <numeric>

<numeric> = 0 to +255 PT Byte Value

Sets the value of the Payload Type (PT) byte to a user defined value.

:SOURce:DATA:TELecom:OTN:OVERhead:PTYPe:USER?

Returns: <numeric>

Overhead Sequence Setup

:SOURce:DATA:TELecom:OTN:SEQuence:OHBYte <discrete>

<discrete> = FAS | MFAS | SM_1 | SM_3 | GCC0 | TCMact | TCM6_1 | TCM6_3 | TCM5_1 | TCM5_3 | TCM4_1 | TCM4_3 | TCM3_1 | TCM3_3 | TCM2_1 | TCM2_3 | TCM1_1 | TCM1_3 | FTFL | PM_1 | PM_3 | EXP GCC1 | GCC2 | APSPcc | Xrrcc

Selects the overhead channel into which the overhead sequence is to be in-

serted.

The channel may be specified by the channel name (if it exists) or by an 'Xrrcc' notation.'Xrrcc' specifies a particular overhead byte using a two-digit row (rr) and two-digit column (cc). If the byte is part of a
larger channel, then the complete channel is selected. For example, if the user specified 'X0313' then the EXP channel will be accepted.

The following channels cannot be selected for Overhead Sequence generation: SM Byte 2, Tandem Connection Monitoring 1 - 6 (Byte 2), PM Byte 2, Justification Control bytes.

:SOURce:DATA:TELecom:OTN:SEQuence:OHBYte?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:SEQuence:DEFault

Restores all sequence variables to their default values.

:SOURce:DATA:TELecom:OTN:SEQuence:INCRement

Resets the sequence repeat counts and data values and inserts incrementing values.

:SOURce:DATA:TELecom:OTN:SEQuence:FCOunt <numeric>, <numeric>

<numeric> =	1 to 256	Sequence Element Index
<numeric> =	0 to 65535	Sequence Element Repeat Count

Selects the number of frames in which the element data (specified by the element index) is to be transmitted.

:SOURce:DATA:TELecom:OTN:SEQuence:FCOunt? <numeric>

<numeric> =	1 to 256	Sequence Element Index

Returns: <numeric>

:SOURce:DATA:TELecom:OTN:SEQuence:DATA <numeric>, <string>

<numeric> = 1 to 256

<string> = See Below

Sets the Sequence data pattern for the designated element to the hexadecimal value contained in the string. The number of hexadecimal characters is dependent on the overhead channel selected by :SOURce:DATA:TELecom:OTN:SEQuence:OHBYte <discrete>. Two hexadecimal characters are required per byte, for example:

TCMACT - 1 byte "00" to "FF"
FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

:SOURce:DATA:TELecom:OTN:SEQuence:DATA? <numeric>

<numeric> = 1 to 256

Returns: <string>

:SOURce:DATA:TELecom:OTN:SEQuence:MODE <discrete>

<discrete> =	SINGle	Single Run
	REPeat	Repeat Run

Selects whether to run a sequence once or repeatedly.

:SOURce:DATA:TELecom:OTN:SEQuence:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:SEQuence <discrete>

<discrete> =	STOP	Stop current sequence
	STARt	Start new sequence

Stops or starts a Single or Repeat run Sequence.

:SOURce:DATA:TELecom:OTN:SEQuence?

Returns: <discrete>

SOURce subsystem - Transmitter Error Test Function

:SOURce:DATA:TELecom:OTN:ERRor:GROup <discrete>

<discrete> =	PHYSical	Physical Errors
	OTN	OTN Errors
	SECTion	SDH Section Overhead Errors
	TRANsport	SONET Transport Overhead Errors
	PATH	SDH/SON Path Errors
	TCM	SDH Tandem Connection Monitor Errors
	PATTern	Pattern Errors

Selects OTN transmit test function Error Group. Further selection of :SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete> is required. Selection of PATTern results in BIT error type being selected.

:SOURce:DATA:TELecom:OTN:ERRor:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:OTN <discrete>

<discrete> =	FRAMe	Frame Error
	MFAS	MFAS Error
	TBIP8	OTU BIP8 Error
	TBEI	OTU BEI Error
	DBIP8	ODU BEI Error
	DBEI	ODU BEI Error
	UFEC	Uncorrectable FEC Error

Selects OTN Error Type to generate. Further selection of

:SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete> is required.

:SOURce:DATA:TELecom:OTN:ERRor:OTN?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:SECTion <discrete>

<discrete> =	FRAMe	A1A2 Frame Errors
	RSBip	RS-BIP, B1 Errors
	MSBip	MS-BIP, B2 Errors
	MSRei	MS-REI Errors

Selects Section Error Type to generate. Further selection of :SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete> is required.

:SOURce:DATA:TELecom:OTN:ERRor:SECTion?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:TRANsport <discrete>

<discrete> =	FRAMe	A1A2 frame errors
	CVS	CV-S (Section B1 BIP) Errors
	CVL	CV-L (Line B2 BIP) Errors
	REIL	REI-L (Line FEBE) Errors

Selects Transport Error Type to generate. Further selection of :SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete> is required.

:SOURce:DATA:TELecom:OTN:ERRor:TRANsport?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:PATH <discrete>

<discrete> =	PBIP	SDH Path Bip, B3 Errors
	HPRei	SDH HP-REI Errors
	CVP	SONET Path Bip Errors
	REIP	SONET REI-P Errors

Selects Path Error Type to generate. Further selection of :SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete> is required.

:SOURce:DATA:TELecom:OTN:ERRor:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:TCM <discrete>

<discrete> =	TCIec	TCM Incoming Error Count
	TCRei	TCM REI
	OEI	TCM Outgoing Error Indication

Selects TCM Error Type to generate. Further selection of :SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete> is required.

:SOURce:DATA:TELecom:OTN:ERRor:TCM?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:PATTern <discrete>

<discrete> = BIT

Selects Pattern Error Type to generate. Further selection of:SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete> is required.

:SOURce:DATA:TELecom:OTN:ERRor:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

:SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete>

<discrete> =	NONE	Errors Off
	EALL	Error All
	APSThreshold	APS Threshold (MS Bit only)
	E_3	Line rate dependent
	E_4	Line rate dependent
	E_5	Line rate dependent
	E_6	
	E_7	
	E_8	
	E_9	
	USER	User defined error rate

Selects the transmitter Error Rate of the error type selected by the Error Group Selection Functions.

NOTE

If this query returns USER, then :SOURce:DATA:TELecom:OTN:ERRor:RATE:USER <numeric>? must be used to discover the currently injected error rate.

:SOURce:DATA:TELecom:OTN:ERRor:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:RATE:USER <numeric>

<numeric> =	9.9E-9 to 1.1E-3	mantissa resolution 0.1, ex-

ponent resolution 1

Sets the user defined Error Add rate.

:SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete> must be set to USER

NOTE

The maximum user defined error rate is dependent on both error type and line rate.

:SOURce:DATA:TELecom:OTN:ERRor:RATE:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:OTN:ERRor:RATE:USER:ACTion <boolean>

<boolean> =	0 or OFF	
	1 or ON	User Value set as Error Rate

Sets the user defined Error Add rate specified by :SOURce:DATA:TELecom:OTN:ERRor:RATE:USER <numeric>.

:SOURce:DATA:TELecom:OTN:ERRor:RATE:USER:ACTion?

Returns: <boolean>

:SOURce:DATA:TELecom:OTN:ERRor:RATE:FRAMe <discrete>

<discrete> =	NONE	Errors Off
	ONE	1 in 4
	TWO	2 in 4
	THRee	3 in 4
	FOUR	4 in 4

Selects the transmitter Frame Error Rates of the error type EFRame and FRAMe.

:SOURce:DATA:TELecom:OTN:ERRor:RATE:FRAMe?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ERRor:APSThreshold:NERRors <numeric>

<numeric> =	0 to 640	for STM-0
	0 to 1920	for STM-1
	0 to 7680	for STM-4
	0 to 30720	for STM-16
	0 to 122880	for STM-64

Sets the number of errors for the APS Threshold when :SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete> is set to APSThreshold. Default = 0.

:SOURce:DATA:TELecom:OTN:ERRor:APSThreshold:NERRors?

Returns: <numeric>

:SOURce:DATA:TELecom:OTN:ERRor:APSThreshold:EINTerval <discrete>

<discrete> =	MS10	10 milliseconds
	MS100	100 milliseconds
	S1	1 second
	S10	10 seconds
	S100	100 seconds
	S1000	1,000 seconds

Sets the interval between APS Threshold errors when :SOURce:DATA:TELecom:OTN:ERRor:RATE <discrete> is set to APSThreshold .

:SOURce:DATA:TELecom:OTN:ERRor:APSThreshold:EINTerval?

Returns: <discrete>

3 OTN Command Reference

SOURce subsystem - Transmitter Alarm Test Functions

:SOURce:DATA:TELecom:OTN:ALARm:GROup <discrete>

<discrete> =	PHYSical	Physical Alarms
	OTN	OTN Alarms
	SECTion	SDH Section Overhead Alarms
	TRANsport	SONET Transport Overhead Alarms
	PATH	SDH/SONET Path Overhead Alarms
	TCM	SDH Tandem Connection Monitor Alarms

Selects Alarm Group. Further selections from the group alarms must be made using :SOURce:DATA:TELecom:OTN:ALARm:PHYSical <discrete>, :SOURce:DATA:TELecom:OTN:ALARm:OTN <discrete> ...etc, and finally :SOURce:DATA:TELecom:ALARm <boolean> should be set to ON to activate the alarm selected.

:SOURce:DATA:TELecom:OTN:ALARm:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:PHYSical <discrete>

<discrete> =	LOS	Loss of Signal Alarm

Selects PHYSical Alarms.

:SOURce:DATA:TELecom:OTN:ALARm:PHYSical?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:OTN <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	LOM	Loss of Multiframe
	OOM	Out of Multiframe
	TAIS	OTU-AIS
	IAE	OTU-IAE
	TBDI	OTU-BDI
	DAIS	ODU-AIS
	OCI	ODU-OCI
	LCK	ODU-LCK
	DBDI	ODU-BDI

Selects OTN-Specific Alarms. OOF and OOM alarms are transmitted using the commands :SOURce:DATA:TELecom:OTN:ALARm:OOF and :SOURce:DATA:TELecom:OTN:ALARm:PHYSical <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:OTN?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:SECTion <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	MSAis	MS-AIS alarm indication signal
	MSRDi	MS-RDI remote defect indication

Selects Section Overhead alarms.

:SOURce:DATA:TELecom:OTN:ALARm:SECTion?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:TRANsport <discrete>

<discrete> =	LOF	Loss of Frame
	SEF	Severely Errored Frame
	AISL	AIS-L alarm indication signal
	RDIL	RDI-L remote defect indication

Selects Transport Alarms.

:SOURce:DATA:TELecom:OTN:ALARm:TRANsport?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:PATH <discrete>

<discrete> =	PAIS	SDH Path AIS
	AULop	SDH AU-LOP Loss of AU pointer
	HPRDi	SDH HP-RDI remote defect indication
	AISP	SONET Path AIS
	LOPP	SONET LOP-P Alarm
	HPRDi	SONET RDI-P Alarm
	PUNequipped	SDH/SONET Path Unequipped

Selects Path Alarms.

:SOURce:DATA:TELecom:OTN:ALARm:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:TCM <discrete>

<discrete> =	TCRDi	TCM remote defect indication
	ODI	outgoing defect indication
	TCOom	TCM loss of multi-frame alignment
	IAIS	Incoming alarm indication signal
	VCAis	VC alarm indication signal
	TCUNeq	TCM unequiped

Selects Tandem Connection Mode Alarms.

:SOURce:DATA:TELecom:OTN:ALARm:TCM?

Returns: <discrete>

:SOURce:DATA:TELecom:OTN:ALARm:HERDi <discrete>

<discrete> =	OFF	HI Path RDI no defect, nonenhanced
	PAYLoad	HI Path RDI payload enhanced
	SERVer	HI Path RDI server defect enhanced
	CONNection	HI Path RDI connection enhanced

Selects HI Path Enhanced RDI Alarm state.

:SOURce:DATA:TELecom:OTN:ALARm:HERDi?

Returns: <discrete>

:SOURce:DATA:TELecom:ALARm <boolean>

<boolean> = 0 or OFF

1 or ON

Enables and disables Alarm Generation.

:SOURce:DATA:TELecom:ALARm?

Returns: <boolean>

:SOURce:DATA:TELecom:OTN:ALARm:OOF

Sets the OOF alarm Active.

:SOURce:DATA:TELecom:OTN:ALARm:OOM

Sets the OOM alarm Active.

SOURce subsystem - Transmitter Frequency Offset Commands

:SOURce:CLOCk:OTN:FOFFset <boolean>

<boolean> = 0 or OFF

1 or On

Enables or disables the Clock Frequency Offset. The amount of Offset is set using :SOURce:CLOCk:OTN:FOFFset:OFFSet <numeric>.

:SOURce:CLOCk:OTN:FOFFset?

Returns: <boolean>

:SOURce:CLOCk:OTN:FOFFset:OFFSet <numeric>

<numeric> =	-90.00 to+90.00	ppm for all rates
	-100.00 to+100.00	ppm for OTU-1

Sets the amount of Clock Frequency Offset when Frequency Offset is enabled by setting :SOURce:CLOCk:OTN:FOFFset <boolean> to ON.

:SOURce:CLOCk:OTN:FOFFset:OFFSet?

Returns: <numeric>

:SOURce:CLOCk:OTN:FOFFset:OPU <boolean>

<boolean> = 0 or OFF

1 or ON

Enables or disables the OPU Clock Frequency Offset. The amount of Offset is set using :SOURce:CLOCk:OTN:FOFFset:OPU:OFFSet <numeric>.

:SOURce:CLOCk:OTN:FOFFset:OPU?

Returns: <boolean>

:SOURce:CLOCk:OTN:FOFFset:OPU:OFFSet <numeric>

<numeric> = -90.00 to +90.00 ppm for all rates

Sets the amount of OPU Clock Frequency Offset when Frequency Offset is enabled by setting :SOURce:CLOCk:OTN:FOFFset:OPU <boolean> to ON.

:SOURce:CLOCk:OTN:FOFFset:OPU:OFFSet?

Returns: <numeric>

SOURce subsystem - Transmitter GCC Insert Commands

:SOURce:DATA:TELecom:OTN:IGCC <discrete>

<discrete> =	NONE	Turns GCC Insertion Off
	GCC0	Insert OTU GCC0
	GCC1	Insert ODU GCC1
	GCC2	Insert ODU GCC2

Selects the General Communications Channel to be inserted for GCC test function.

:SOURce:DATA:TELecom:OTN:IGCC?

Returns: <discrete>

SENSe subsystem - Receiver OTN Settings Commands

:SENSe:DATA:TELecom:OTN:RATE <discrete>

<discrete> =	OTU2	10.71Gb/s
	OTU1	2.66Gb/

Sets the input rate for the instrument input port.

:SENSe:DATA:TELecom:OTN:RATE?

Returns: <discrete>

:SENSe:DATA:TELecom:OTN:SCRambling <boolean>

<boolean> =	0 or OFF	OTN Scrambling Off
	1 or ON	OTN Scrambling On

Enables or Disables OTN Scrambling.

:SENSe:DATA:TELecom:OTN:SCRambling?

Returns: <boolean>

:SENSe:DATA:TELecom:OTN:FEC <boolean>

<boolean> =	0 or OFF	OTN Forward Error Correction Off
	1 or ON	OTN Forward Error Correction On

Enables or Disables OTN Forward Error Correction (FEC).

:SENSe:DATA:TELecom:OTN:FEC?

Returns: <boolean>

:SENSe:DATA:TELecom:OTN:MAPPing <discrete>

<discrete> =	ASYNchronous	Asynchronous mapping
	SYNChronous	Synchronous mapping

Sets the mapping as asynchronous or synchronous.

:SENSe:DATA:TELecom:OTN:MAPPing?

Returns: <discrete>

:SENSe:DATA:TELecom:OTN:PAYLoad <discrete>

<discrete> =	SDH	SDH Payload
	SONet	SONET Payload
	NULLclient	NULL Client Payload
	TEST	Test Payload

Selects the OTN payload.

:SENSe:DATA:TELecom:OTN:PAYLoad?

Returns: <discrete>

SENSe subsystem - Receiver GCC Drop Commands

:SENSe:DATA:TELecom:OTN:DGCC <discrete>

<discrete> =	NONE	Turns GCC Drop Off
	GCC0	Drop OTU GCC0
	GCC1	Drop ODU GCC1
	GCC2	Drop ODU GCC2

Selects the General Communications Channel to be dropped for GCC test function.

:SENSe:DATA:TELecom:OTN:DGCC?

Returns: <discrete>

SENSe subsystem - Data Capture Commands

The following commands are used to configure data capture for OTN. General commands for data capture are found in the Common Commands chapter.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:OTN <discrete>

<discrete> =	FRAMe	FAS Error
	MFAS	MFAS Error
	TBIP8	OTU BIP8 Error
	TBEI	OTU BEI Error
	DBIP8	ODU BIP8 Error
	DBEI	ODU BEI Error
	CFEC	Correctable FEC Errors
	UFEC	Uncorrectable FEC Errors

Selects OTN error for triggering data capture.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:OTN?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:OTN <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	LOM	Loss of Multiframe
	OOM	Out of Multiframe
	TAIS	OTU-AIS
	IAE	OTU-IAE
	TBDI	OTU-BDI
	DAIS	ODU-AIS
	OCI	ODU-OCI

LCK	ODU-LCK
DBDI	ODU-BDI

Selects OTN alarm for triggering data capture.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:OTN?

Returns: <discrete>

SENSe subsystem - Receiver Overhead Monitor Commands

:SENSe:DATA:TELecom:OTN:OCAPture:OHBYte <discrete>

<discrete> = FAS | MFAS | SM_1 | SM_3 | GCC0 | TCMact | TCM6_1 | TCM6_3 | TCM5_1 | TCM5_3 | TCM4_1 | TCM4_3 | TCM3_1 | TCM3_3 | TCM2_1 | TCM2_3 | TCM1_1 | TCM1_3 | FTFL | PM_1 | PM_3 | EXP GCC1 | GCC2 | APSPcc | Xrrcc

Selects the overhead channel to be captured.

The channel may be specified by the channel name (if it exists) or by an 'Xrrcc' notation. 'Xrrcc' specifies a particular overhead byte using a two-digit row (rr) and two-digit column (cc). If the byte is part of a larger channel, then the complete channel is selected. For example, if the user specifies 'X0313' then the EXP channel will be accepted.

The following channels cannot be selected for Overhead Capture: SM Byte 2, Tandem Connection Monitoring 1 - 6 (Byte 2), PM Byte 2, Justification Control bytes.

:SENSe:DATA:TELecom:OTN:OCAPture:OHBYte?

Returns: <discrete>

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:SELection <discrete>

<discrete> =	MANual	Manual trigger
	PRE	Pre-trigger capture
	CENTered	Centre-trigger capture
	POST	Post-trigger capture

Selects the type of trigger for Overhead Capture.

When MANual trigger is selected, capture is started using the :SENSe:DATA:TELecom:OTN:OCAPture command. PRE-trigger capture will capture up to 255 elements before the trigger pattern (:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:PATTern).

CENTered capture captures elements either side of the trigger pattern. POST capture captures up to 255 elements after the trigger pattern.

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:SELection?

Returns: <discrete>

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:POLarity <discrete>

<discrete> =	ON	Triggers when capture data MATCHES trigger pattern
	ONNot	Triggers when capture data DOES NOT MATCH trigger-pattern

Selects whether the trigger will start capture on data matching the trigger pattern or not matching the trigger pattern.

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:POLarity?

Returns: <discrete>

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:PATTern <string>

<string> = See Below

Sets the overhead capture trigger pattern as a string of hexadecimal digits. The number of hexadecimal characters is dependent on the overhead channel selected by
:SENSe:DATA:TELecom:OTN:OCAPture:OHBYte <discrete>.

Two hexadecimal characters are required per byte, for example:
TCMACT - 1 byte "00" to "FF"
FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:PATTern?

Returns: <string>

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:MASK <string>

<string> = See Below

Sets the mask for the overhead capture trigger as a string of hexadecimal characters. Allows certain bits of the trigger pattern to masked. The number of hexadecimal characters is dependent on the overhead channel selected by :SENSe:DATA:TELecom:OTN:OCAPture:OHBYte <discrete>.

:SENSe:DATA:TELecom:OTN:OCAPture:TRIGger:MASK?

Returns: <string>

:SENSe:DATA:TELecom:OTN:OCAPture <discrete>

<discrete> =	STOP	Stop current capture
	STARt	Start new capture

Stops or starts overhead sequence capture.

:SENSe:DATA:TELecom:OTN:OCAPture?

Returns: <discrete>

SENSe Subsystem - Signal Wizard OTN Frame Layer

The following commands will only return meaningful results when an OTN frame has been detected on the selected port.

:SENSE:DATA:TELecom:SIGWizard:OTN:RATe?

Returns: <string> Eg "OTU2"

Returns the OTN signal rate detected.

:SENSE:DATA? "SIGWizard:OTN:OTUnit"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the OTU error/alarm indicator.

:SENSE:DATA? "SIGWizard:OTN:ODUnit"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the ODU error/alarm indicator.

:SENSE:DATA? "SIGWizard:OTN:CFEC"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the corrected FEC error indicator.

:SENSE:DATA? "SIGWizard:OTN:UFEC"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the uncorrected FEC error indicator.

SENSe subsystem - Result Returning Commands

OTN Last second Results

:SENSE:DATA? <string>

<string> = "ECOunt:OTN:LSECond:<error>" <error> is one of the following

FRAMe	Frame error count
MFRame	MFAS error count
CFEC	Correctable FEC error count
UFEC	Uncorrectable FEC error count

<string> = "ERATio:OTN:LSECond:<error>" <error> is one of the following

FRAMe	Frame error ratio
MFRame	MFAS error ratio
CFEC	Correctable FEC error ratio
UFEC	Uncorrectable FEC error ratio

Returns: <numeric>

OTU Last second Results

:SENSE:DATA? <string>

<string> = "ECOunt:OTU:LSECond:<error>" <error> is one of the following

BIP8	OTU BIP8 error count
BEI	BEI error count

<string> = "ERATio:OTU:LSECond:<error>" <error> is one of the following

BIP8	OTU BIP8 error ratio
BEI	BEI error ratio

Returns: <numeric>

ODU Last second Results

:SENSE:DATA? <string>

<string> = "ECOunt:ODU:LSECond:<error>" <error> is one of the following

BIP8	ODU BIP8 error count
BEI	BEI error count

<string> = ERATio:ODU:LSECond:<error>" <error> is one of the following

BIP8	ODU BIP8 error ratio
BEI	BEI error ratio

Returns: <numeric>

OTN Total Results

:SENSE:DATA? <string>

<string> = "ECOunt:OTN:<error>" <error> is one of the following

FRAMe	Frame error count
MFRame	MFAS error count
CFEC	Correctable FEC error count
UFEC	Uncorrectable FEC error count

<string> = "ERATio:OTN:<error>" <error> is one of the following

FRAMe	Frame error ratio
MFRame	MFAS error ratio
CFEC	Correctable FEC error ratio
UFEC	Uncorrectable FEC error ratio

Returns: <numeric>

OTU Total Results

:SENSE:DATA? <string>

<string> = "ECOunt:OTU:<error>" <error> is one of the following

BIP8	OTU BIP8 error count
BEI	BEI error count

<string> = "ERATio:OTU:<error>" <error> is one of the following

BIP8	OTU BIP8 error ratio
BEI	BEI error ratio

Returns: <numeric>

ODU Total Results

:SENSE:DATA? <string>

<string> = "ECOunt:ODU:<error>" <error> is one of the following

BIP8	ODU BIP8 error count
BEI	BEI error count

<string> = "ERATio:ODU:<error>" <error> is one of the following

BIP8	ODU BIP8 error ratio
BEI	BEI error ratio

Returns: <numeric>

OTN Alarm Seconds Results

:SENSE:DATA? <string>

<string> = "ASEConds:OTN:<alarm>" <alarm> is one of the following

LOF	Loss Of Frame
OOF	Out Of Frame
LOM	Loss of Multi-Frame
OOM	Out Of Multi-Frame

Returns: <numeric>

OTU Alarm Seconds Results

:SENSE:DATA? <string>

<string> = "ASEConds:OTU:<alarm>" <alarm> is one of the following

AIS	Alarm Indication Signal
BDI	Backward Defect Indication
IAE	Incoming Alignment Error

Returns: <numeric>

ODU Alarm Seconds Results

:SENSE:DATA? <string>

<string> = "ASEConds:ODU:<alarm>" <alarm> is one of the following

AIS	Alarm Indication Signal
OCI	Open Connection Indication
LCK	Locked
BDI	Backward Defect Indication

Returns: <numeric>

Implied Payload Offset Result

:SENSE:DATA? <string>

<string> = "OTN:OPU:IOFFset"

Returns: <numeric>

FETCh subsystem

The FETCh subsystem is used to retrieve data directly accumulated by the instrument.

OTN Overhead Monitor

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:DATA?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the OTN overhead as a comma seperated list of 64 integer numerical values in the range 0 to 255.

The values are arranged as shown
<row1 col1>,<row1 col2>,<row1 col3>.....<row1 col16>,
<row2 col1>.....
.....<row3 col16>,
<row4 col1>,<row4 col2>,<row4 col3>....<row4 col16>

:FETCh:SCALar:DATA:TELecom:OTN:OVERhead:DATA? <discrete>

<discrete> = FAS_1 | FAS_2 | FAS_3 | FAS_4 | FAS_5 | FAS_6 | SM_3 | GCC0_1 | GCC0_2 | TCMACT | TCM6_1 | TCM6_3 | TCM5_1 | TCM5_3 | TCM4_1 | TCM4_3 | TCM3_1 | TCM3_3 | TCM2_1 | TCM2_3 | TCM1_1 | TCM1_3 | FTFL | PM_3 | EXP_1 | EXP_2 | GCC1_1 | GCC1_2 | GCC2_1| GCC2_2 | APSPCC_1 | APSPCC_2 | APSPCC_3 | APSPCC_4

Returns: <numeric>

Returns the value of a single named byte of the OTN overhead. The required byte is specified by 1 command parameter.

The parameter identifies the specific byte. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names is shown in the table above. The second method is to use an "Xrrcc" notation, where rr is the numerical value of the row in the OTN overhead and cc is the numerical value of the column in the OTN overhead. For example, X0204 references the TCMACT byte. This method allows access to any byte in the OTN

overhead.

OTN Overhead Trace Messages

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:PM:SAPI?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Path Monitoring SAPI bytes as an array of 16 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:PM:DAPI?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Path Monitoring DAPI bytes as an array of 16 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:PM:OPSPec?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Path Monitoring Operator Specific bytes as an array of 32 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:SM:SAPI?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Section Monitoring SAPI bytes as an array of 16 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:SM:DAPI?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Section Monitoring DAPI bytes as an array of 16 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:OTN:OVERhead:SM:OPSPec?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the Section Monitoring Operator Specific bytes as an array of 32 numeric values. Each numeric is in the range 0 to 255.

:FETCh:STRing:DATA:TELecom:OTN:PM:SAPI?

Returns: <string>

Returns the value of the Path Monitoring SAPI field as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:OTN:PM:DAPI?

Returns: <string>

Returns the value of the Path Monitoring DAPI field as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:OTN:PM:OPSPec?

Returns: <string>

Returns the value of the Path Monitoring Operator Specific field as a 32 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:OTN:SM:SAPI?

Returns: <string>

Returns the value of the Section Monitoring SAPI field as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:OTN:SM:DAPI?

Returns: <string>

Returns the value of the Section Monitoring DAPI field as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:OTN:SM:OPSPec?

Returns: <string>

Returns the value of the Section Monitoring Operator Specific field as a 32 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:SCALar:DATA:TELecom:OTN:OVERhead:PTYPe?

Returns: <numeric>

Returns the value of the Payload Type byte as an integer.

OTN Data Capture

:FETCh:SCALar:DATA:TELecom:OTN:DCAPture:OHData? <numeric>, <discrete>

<numeric> = Frame Index

<discrete> = Overhead Byte Name

Returns: <numeric>

Returns the value of the specified overhead byte within the captured frame.

:FETCh:SCALar:DATA:TELecom:OTN:DCAPture:DATA? <numeric>, <numeric>, <numeric>

<numeric> = Frame Index.

<numeric> = Row Index (Min = 1, Max = 4)

<numeric> = Column Index (Min = 1, Max = 4080)

Returns: <numeric>

Returns the value of the specified byte anywhere within and an OTN frame.

:FETCh:ARRay:DATA:TELecom:OTN:DCAPture:DATA? <numeric>, <numeric>, <numeric>

<numeric> = Frame Index.

<numeric> = Start Column

<numeric> = End Column

Returns: <numeric>,<numeric>...<numeric>

Returns a comma separated list of byte values from the specified start column through to the specified end column.

<start_column, row1>, <start_column, row2>, <start_column, row3>, <start_column, row4>,
<start_column+1, row1>, <start_column+1, row2>, <start_column+1, row3>, <start_column+1, row4>,
.....
<end_column, row1>, <end_column, row2>, <end_column, row3>, <end_column, row4>

OTN Overhead Sequence Capture

:FETCh:SCALar:DATA:TELecom:OTN:OCAPture:MINelement?

Returns: <numeric>

Returns the minimum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:OTN:OCAPture:MAXelement?

Returns: <numeric>

Returns the maximum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:OTN:OCAPture:FCOunt? <numeric>

<numeric> = Element Index

Returns: <numeric>

Returns the capture repeat count of the specified element in numeric form. Individual elements may be captured up to 65535 times before a new element is entered into the captured sequence.

The sequence element index (numeric parameter) can be in the range -255 to +255 depending on the trigger selection.

The element which triggered sequence capture (the element that met the trigger criteria) is specified by index 0. Since 256 elements may be captured, pre-trigger can capture elements indexed -255 to 0 whilst post-trigger capture can capture elements indexed 0 to +255.

:FETCh:STRing:DATA:TELecom:OTN:OCAPture:DATA? <numeric>

<numeric> = Element Index.

Returns: <string>

Returns the capture data of the specified element in string form. The data is represented by hexadecimal characters. The number of characters depends on the selected capture channel.

:FETCh:ARRay:DATA:TELecom:OTN:OCAPture? <numeric>

<numeric> = Number of elements to return.

Returns: <array>

Returns an array with the number of entries determined by <numeric> and seperated by CR/LF.

Each entry consists of an alphanumeric string and a numeric seperated by commas. The alphanumeric string provides the hexadecimal value of the captured data. The length of the string depends upon the overhead channel selected for capture, two hexadecimal characters/overhead byte. The numeric indicates in-

dicates the number of frames for which the captured data existed.

If this command is issued when a capture is being performed, some entries will contain no data. In this case 9.91E+37 is returned.

FETCh Subsystem - Signal Wizard OTN Frame Layer

The following commands will only return meaningful results when an OTN frame has been detected on the selected port.

:FETCh:SCALar:DATA:TELecom:SIGWizard:OTN:PAYLoad?

Returns: <numeric>

Returns the value of the OTN PT byte.

:FETCh:STRing:DATA:TELecom:SIGWizard:OTN:TTI?

Retruns: <string>

Returns the contents of the TTI SAPI trace messages.

SYSTem Subsystem - Trigger Output OTN Commands

:SYSTem:TRIGger:RECeive:ERRor:OTN <discrete>

<discrete> =	FRAMe	FAS Error
	MFAS	MFAS Error
	TBIP8	OTU BIP8 Error
	TBEI	OTU BEI Error
	DBIP8	ODU BIP8 Error
	DBEI	ODU BEI Error
	CFEC	Correctable FEC Errors
	UFEC	Uncorrectable FEC Errors

Selects OTN error for trigger output when :SYSTem:TRIGger:RECeive:ERRor:STANdard <discrete> is set to OTN.

:SYSTem:TRIGger:RECeive:ERRor:OTN?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:OTN <discrete>

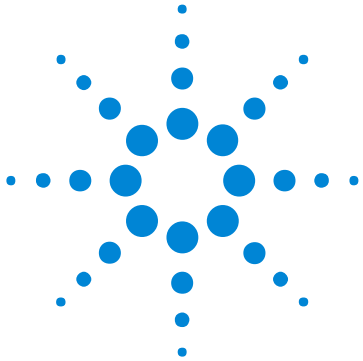
<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	LOM	Loss of Multiframe
	OOM	Out of Multiframe
	TAIS	OTU-AIS
	IAE	OTU-IAE
	TBDI	OTU-BDI
	DAIS	ODU-AIS
	OCI	ODU-OCI
	LCK	ODU-LCK

DBDI ODU-BDI

Selects OTN alarm for trigger output when
:SYSTem:TRIGger:RECeive:ALARm:STANdard <discrete> is set to OTN.

:SYSTem:TRIGger:RECeive:ALARm:OTN?

Returns: <discrete>



4

PDH/DSn Command Reference

This chapter contains detailed information on commands that are used to control the instrument for PDH/DSn operation. This will also cover those cases when such signals are carried as SDH/Sonet payloads.

OUTPut subsystem

:OUTPut:TELecom:SPDH:TSIGnal:PAYLoad:LOCation <discrete>

<discrete> = INTernal
EXTernal

This command selects the structured PDH transmitter payload location.

:OUTPut:TELecom:SPDH:TSIGnal:PAYLoad:LOCation?

Returns: <discrete>

:OUTPut:TELecom:SPDH:TSIGnal:PAYLoad:CODE <discrete>

<discrete> =	HDB3	2Mb/s
	B8ZS	DS1
	AMI	DS1

Selects the structured PDH drop interface line code for the output port.

:OUTPut:TELecom:SPDH:TSIGnal:PAYLoad:CODE?

Returns: <discrete>

SOURce subsystem - Transmitter Settings

:SOURce:DATA:TELecom:SPDH:RATE <discrete>

<discrete> =	M140	140Mb/s
	DS3	44Mb/s
	M34	34Mb/s
	M8	8Mb/s
	M2	2Mb/s
	DS1	1.544Mb/s

Controls the characteristics of the instrument's output ports.

Sets the output rate for the instrument output port.

:SOURce:DATA:TELecom:SPDH:RATE?

Returns: <discrete>

Payload Commands

:SOURce:DATA:TELecom:SPDH:PAYLoad:FRAMing <discrete>

<discrete> =	UNFRamed	No Framing
	FRAMed	8, 34 and 140Mb/s
	PCM30	2Mb/s only
	PCM31	2Mb/s only
	PCM30CRC	2Mb/s only
	PCM31CRC	2Mb/s only
	D4	DS1 only
	ESF	DS1 only
	SLC96	DS1 only
	M13	DS3 only

	CBIT	DS3 only
	NOFBit	DS1 floating byte only

Selects the Structured PDH transmitter interface framing rate.

:SOURce:DATA:TELecom:SPDH:PAYLoad:FRAMing?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:PAYLoad:STRucture <discrete>

<discrete> =	UNSTructured	All rates
	STRuctured	All framed formats

Selects whether or not the PDH signal is to have any further structure or not.

:SOURce:DATA:TELecom:SPDH:PAYLoad:STRucture?

Returns: <discrete>

SOURce subsystem - Transmitter Test Signal Set up

:SOURce:DATA:TELecom:SPDH:TSIGnal:TIMing <discrete>

<discrete> =	INTernal	34 Mb/s
	MUX	8 Mb/s
	RDS3	2 Mb/s

Sets the Test Signal Timing.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TIMing?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:TSIGnal:RATE <discrete>

<discrete> =	M34	34 Mb/s
	M8	8 Mb/s
	M2	2 Mb/s
	M2K64	2Mb/s with 64kb/s
	DS1	DS1
	DS1K56	DS1 with 56kb/s
	DS1K64	DS1 with 64kb/s

Selects the Structured PDH transmitter test signal rate.

:SOURce:DATA:TELecom:SPDH:TSIGnal:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:TSIGnal:FRAMing <discrete>

<discrete> =	UNFRamed	2, 8 & 34 Mb/s
	FRAMed	8 & 34 Mb/s

PCM30	2 Mb/s
PCM31	2 Mb/s
PCM30CRC	2 Mb/s
PCM31CRC	2 Mb/s
D4	DS1
ESF	DS1
SLC96	DS1

Selects the Structured PDH transmitter test signal framing.

:SOURce:DATA:TELecom:SPDH:TSIGnal:FRAMing?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:TSIGnal:TRIButary:M34 <numeric>

<numeric> = 1 to 4

Selects the Structured PDH transmitter 34 Mb/s tributary.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TRIButary:M34?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSIGnal:TRIButary:M8 <numeric>

<numeric> = 1 to 4

Selects the Structured PDH transmitter 8 Mb/s tributary.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TRIButary:M8?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSIGnal:TRIButary:M2 <numeric>

<numeric> = 1 to 4

Selects the Structured PDH transmitter 2 Mb/s tributary.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TRIButary:M2?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSIGnal:TRIButary:DS1 <numeric>

<numeric> = 1 to 4

Selects the Structured PDH transmitter DS1 tributary.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TRIButary:DS1?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSIGnal:TRIButary:DS2 <numeric>

<numeric> = 1 to 7

Selects the Structured PDH transmitter DS2 tributary.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TRIButary:DS2?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K56 <numeric>

<numeric> = 1 to 24

Selects the PDH transmitter DS1 56kb/s timeslot.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K56?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K64 <numeric>

<numeric> = 1 to 24

Selects the PDH transmitter DS1 56kb/s timeslot.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K64?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:M2:K64 <numeric>

<numeric> =	1 to 31	PCM31 & PCM31CRC
	1 to 15 & 17 to 31	PCM30 & PCM30CRC

Selects the PDH transmitter single 2 Mb/s 64kb/s timeslot.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:M2:K64?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:M2:K64Xn <numeric>

<numeric> = 0 to 2147483647 31 bit value

Selects multiple 2Mb/s Nx64kb/s timeslots as a numeric bit mask. E.g. to select timeslots 1,8,15,22,29 use #b10000001000000100000010000000100 or #h40810204 or the decimal equivalent.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:M2:K64Xn?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K64Xn <numeric>

<numeric> = 0 to 16777215 24 bit value

Selects multiple DS1 Nx64kb/s timeslots as a numeric bit mask. E.g. to select

timeslots 1,8,15,22 use #b10000001000000100000100 or #h810204 or the decimal equivalent.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K64Xn?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K56Xn <numeric>

<numeric> =	0 to 16777215	24 bit numeric value

Selects multiple DS1 Nx56kb/s timeslots as a numeric bit mask. E.g. to select timeslots 1,8,15,22 use #b10000001000000100000100 or #h810204 or the decimal equivalent.

:SOURce:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K56Xn?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSIGnal:BACKground <discrete>

<discrete> =	AIS	Alarm Indication Sequence
	PRBS9	2^9-1 PRBS
	AS_FG	As foreground pattern

Selects the pattern to fill the non test signal tributaries.

:SOURce:DATA:TELecom:SPDH:TSIGnal:BACKground?

Returns: <discrete>

SOURce subsystem - Transmitter Overhead Set up

Signaling Bits

:SOURce:DATA:TELecom:SPDH:TSLot:SIGNaling:DATA:M2 <numeric>

<numeric> = 0 to 15 4 bit signaling value

Selects the ABCD signaling bits for 2Mb/s CAS framing to be transmitted. May be expressed as an integer, hex or binary using the prefixes #h and #b

:SOURce:DATA:TELecom:SPDH:TSLot:SIGNaling:DATA:M2?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSLot:SIGNaling:DATA:DS1:D4 <numeric>

<numeric> = 0 to 3 2 bit value

Selects AB the signaling bits for DS1 D4 framing to be transmitted.

:SOURce:DATA:TELecom:SPDH:TSLot:SIGNaling:DATA:DS1:D4?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSLot:SIGNaling:DATA:DS1:ESF <numeric>

<numeric> = 0 to 15 4 bit numeric value

Selects ABCD the signaling bits for DS1 ESF framing to be transmitted.

:SOURce:DATA:TELecom:SPDH:TSLot:SIGNaling:DATA:DS1:ESF?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSLot:SIGNaling:DATA:DS1:NOFBit <numeric>

<numeric> = 0 to 15 4 bit numerical value

Selects ABCD the signaling bits for DS1 'No Frame Bit' framing to be transmitted. In this case, the framing bit position associated with the mapping will be set to '0'.

:SOURce:DATA:TELecom:SPDH:TSLot:SIGNaling:DATA:DS1:NOFBit?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:TSLot:SIGNaling:DATA:DS1:SLC96 <string>

<string> = 2 character string comprising 'A', '1', or '0'

Selects the signaling bits for DS1 SLC96 framing to be transmitted. To select alternating for either bit use the character 'A'.

:SOURce:DATA:TELecom:SPDH:TSLot:SIGNaling:DATA:DS1:SLC96?

Returns: <string>

Spare Bits

:SOURce:DATA:TELecom:SPDH:M140:SPARe <numeric>

<numeric> = 0 to 7 3 bit numeric value

Set the 140 Mb/s spare bits.

:SOURce:DATA:TELecom:SPDH:M140:SPARe?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:M34:SPARe <numeric>

<numeric> = 0 to 1 single bit value

Set the 34Mb/s spare bit.

:SOURce:DATA:TELecom:SPDH:M34:SPARe?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:M8:SPARe <numeric>

<numeric> = 0 to 1 single bit value

Set the 8 Mb/s spare bit.

:SOURce:DATA:TELecom:SPDH:M8:SPARe?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:M2:SI <numeric>

<numeric> = 0 to 1 single bit value

Set the 2 Mb/s Spare International bit, valid for non-CRC4 multiframe.

:SOURce:DATA:TELecom:SPDH:M2:SI?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:M2:SIE <numeric>

<numeric> = 0 to 3 2 bit value

Set the 2 Mb/s E-bits, valid for CRC4 multiframe.

:SOURce:DATA:TELecom:SPDH:M2:SIE?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:M2:NFAS <numeric>

<numeric> = 0 to 31 5 bit value

Set the 2 Mb/s NFAS Sa bits 4 to 8. The command will generate an error if the Sa sequence is active.

:SOURce:DATA:TELecom:SPDH:M2:NFAS?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:M2:SASequence <boolean>

<boolean> = 0 or OFF

1 or On

Set the 2 Mb/s NFAS Sa sequence generation ON or OFF, valid for CRC4 multi-frame.

:SOURce:DATA:TELecom:SPDH:M2:SASequence?

Returns: <boolean>

:SOURce:DATA:TELecom:SPDH:M2:SASequence:PATTern <numeric>

<numeric> = 0 to 255 8 bit value

Set the 2 Mb/s NFAS Sa sequence pattern. The command will generate an error if the Sa sequence is active.

:SOURce:DATA:TELecom:SPDH:M2:SASequence:PATTern?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:M2:SASequence:BIT <numeric>

<numeric> = 4 to 8

Select the bit in the 2 Mb/s NFAS timeslot into which the Sa sequence will be inserted. The command will generate an error if the Sa sequence is active.

:SOURce:DATA:TELecom:SPDH:M2:SASequence:BIT?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:M2:CASMfm <numeric>

<numeric> =	0 to 7	3 bit value

Set the 2 Mb/s MFAS spare bits 5, 7 and 8.

:SOURce:DATA:TELecom:SPDH:M2:CASMfm?

Returns: <numeric>

DS1 Loop Codes

:SOURce:DATA:TELecom:SPDH:INBand <discrete>

<discrete> =	OFF	Transmission of the Inband loop code is disabled.
	BURSt	Transmission of the Inband loop code is enabled.

Enables or disables transmission of the Inband loop code. When BURSt is selected, the Inband loop code is transmitted for a nominal 8 seconds.

:SOURce:DATA:TELecom:SPDH:INBand?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:INBand:CODE <discrete>

<discrete> =	LINact	Activate Line
	LINDeact	Deactivate Line
	PAYact	Activate Payload
	PAYDeact	Deactivate Payload
	NETact	Activate Network
	NETDeact	Deactivate Network

	USER	User Loop Code

Selects the Structured PDH transmitter Inband loop code.

:SOURce:DATA:TELecom:SPDH:INBand:CODE?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:INBand:USER <numeric>, <numeric>

<numeric> =	1 to 8	Number of bits
<numeric> =	0 to 255	max 8 bit value

Sets the variable bit length user loop code. The first numeric parameter specifies the number of bits in the loop code to be in the range 1 to 8 bits. The second numeric parameter specifies the loop code and is range checked against the number of bits specified in the first parameter.

:SOURce:DATA:TELecom:SPDH:INBand:USER? <numeric>

<numeric> =	1 to 8	Number of bits

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:INBand:FBIT <boolean>

<boolean> =	0 or OFF	Leave a gap for FBIT
	1 or On	Overwrites loop code

Selects whether the Framing Bit overwrites the loop code or not. This selection is only offered when framing is enabled.

:SOURce:DATA:TELecom:SPDH:INBand:FBIT?

Returns: <boolean>

:SOURce:DATA:TELecom:SPDH:OUTBand <discrete>

<discrete> =	OFF	Inband loop code Tx disabled.
	ON	Inband loop code Tx enabled.
	BURSt	Inband loop code Tx enabled.

Enables or disables transmission of the Outband loop code. When the Outband burst length is set to Continuous (see below), the ON selection enables transmission and OFF disables transmission. When the Outband burst length is set to BURSt, the Outband loop code is transmitted for the specified burst count.

:SOURce:DATA:TELecom:SPDH:OUTBand?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:OUTBand:CODE <discrete>

<discrete> =	LINact	Activate Line
	LINDeact	Deactivate Line
	PAYact	Activate Payload
	PAYDeact	Deactivate Payload
	NETact	Activate Network
	UNIDeact	Deactivate Universal
	USER	User Loop Code

Selects the Structured PDH transmitter Outband loop code.

:SOURce:DATA:TELecom:SPDH:OUTBand:CODE?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:OUTBand:USER <numeric>

<numeric> =	0 to 63	6 bit value

Sets the Outband loop code user word pattern.

:SOURce:DATA:TELecom:SPDH:OUTBand:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:OUTBand:BURSt <numeric>

<numeric> =	0	Set code continuous
	1 to 15	Set burst length

Sets the transmitter Outband loop code burst length. If set to 0 then the Outband loop code burst will be switched to continuous. Any other value (1 to 15) will set the alarm burst length to that value.

:SOURce:DATA:TELecom:SPDH:OUTBand:BURSt?

Returns: <numeric>

DS3 FEAC Codes

:SOURce:DATA:TELecom:SPDH:FEAC:CODE:TYPE <discrete>

<discrete> =	ASTatus	Alarm/Status
	LOOPback	Loopback

Sets the FEAC Code Type.

:SOURce:DATA:TELecom:SPDH:FEAC:CODE:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:FEAC <discrete>

<discrete> =	OFF	No Action
	ON	Alarm burst set to continuous

	BURSt	Transmit selected burst length

Sets the transmitter FEAC action. If set to 'ON' the alarm burst will be switched to continuous. If 'BURSt' then the alarm burst length set up will be transmitted.

:SOURce:DATA:TELecom:SPDH:FEAC?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:FEAC:BURSt <numeric>

<numeric> =	0	Set to continuous code
	1 to 15	Set burst length

Sets the transmitter FEAC alarm burst length.

Only valid if :SOURce:DATA:TELecom:SPDH:FEAC:CODE:TYPE is set to ASTatus.

If set to 0 then the alarm burst will be switched to continuous. Any other value (1 to 15) will set the alarm burst length to that value.

:SOURce:DATA:TELecom:SPDH:FEAC:BURSt?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:FEAC:MESSage <discrete>

<discrete> =	EFSD3	DS3 Equip Fail SA
	LOSD3	DS3 Loss Of Signal
	OOFD3	DS3 Out Of Frame
	ARDS3	DS3 Ais Received
	IRDS3	DS3 Idle Received
	EFND3	DS3 Equip Fail NSA
	EFNCommon	Common Equip Fail NSA
	MDS1Loss	Multi DS1 loss

EFSD1	DS1 Equip Fail SA
SDS1Loss	Single DS1 Loss
EFND1	DS1 Equip Fail NSA
NLUD3	DS3 Niu Loop Up
NLDD3	DS3 Niu Loop Down
USER	User defined

Sets the FEAC Message. If USER is selected, the FEAC is setup using the :SOURce:DATA:TELecom:SPDH:FEAC:CODE value. Only valid if :SOURce:DATA:TELecom:SPDH:FEAC:CODE:TYPE is set to ASTatus.

:SOURce:DATA:TELecom:SPDH:FEAC:MESSage?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:FEAC:CODE <numeric>

<numeric> =	0 to 63	6 bit numeric value

Sets the user configurable section of the FEAC code. Only valid if :SOURce:DATA:TELecom:SPDH:FEAC:CODE:TYPE is set to ASTatus.

:SOURce:DATA:TELecom:SPDH:FEAC:CODE?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:FEAC:LOOPback:ACTion <discrete>

<discrete> =	DS1E1Deactiv	Deactivate DS1/E1 Loop-back
	DS1E1Activ	Activate DS1/E1 Loopback
	DS3Deactiv	Deactivate DS3 Loopback
	DS3Activ	Activate DS3 Loopback

Sets the transmitter FEAC loopback action.
Only valid if :SOURce:DATA:TELecom:SPDH:FEAC:CODE:TYPE is set to LOOP-back.

:SOURce:DATA:TELecom:SPDH:FEAC:LOOPback:ACTion?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:FEAC:LOOPback:MESSage <numeric>

<numeric> =	0	For all channels
	1 to 28	Channel number

Only valid if :SOURce:DATA:TELecom:SPDH:FEAC:CODE:TYPE is set to LOOPback.

If set to 0 then ALL will be selected. Any other value (1 to 28) will set the DS1 channel for loopback to that value.

:SOURce:DATA:TELecom:SPDH:FEAC:LOOPback:MESSage?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:FEAC:LOOPback:BURSt <numeric>, <numeric>

<numeric> =	1 to 15	FEAC loopback command durations
<numeric> =	1 to 15	FEAC loopback message durations

Only valid if :SOURce:DATA:TELecom:SPDH:FEAC:CODE:TYPE is set to LOOPback.

:SOURce:DATA:TELecom:SPDH:FEAC:LOOPback:BURSt? <numeric>

<numeric> =	1 to 15	FEAC loopback command durations

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:FEAC:LOOPback:TRANsmit <boolean>

<boolean> =	0 or OFF	Idle
	1 or On	Transmit FEAC Loopback message in a butst

This command will cause the FEAC Loopback message to be transmitted.

Only valid if :SOURce:DATA:TELecom:SPDH:FEAC:CODE:TYPE is set to LOOP-back.

:SOURce:DATA:TELecom:SPDH:FEAC:LOOPback:TRANsmit?

Returns: <boolean>

SOURce subsystem - Clock Offset Test Function

:SOURce:CLOCk:SPDH:FOFFset <boolean>

<boolean> = 0 or OFF
1 or On

Enables or disables the Clock Frequency Offset.

:SOURce:CLOCk:SPDH:FOFFset?

Returns: <boolean>

:SOURce:CLOCk:SPDH:FOFFset:OFFSet <numeric>

<numeric> = -100 to +100 Parts per million

Sets the amount of Clock Frequency Offset.

:SOURce:CLOCk:SPDH:FOFFset:OFFSet?

Returns: <numeric>

SOURce subsystem - Transmitter Error Test Functions

:SOURce:DATA:TELecom:SPDH:ERRor:PHYSical <discrete>

<discrete> =	EFRame	Entire Frame or data errors
	CODE	Line/Code/BPV errors
	EXZeros	Excess Zeros

Selects Physical Error Type to generate. Further error rate selections are required.

:SOURce:DATA:TELecom:SPDH:ERRor:PHYSical?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:ERRor:EXZeros:NUMBer <numeric>

<numeric> = 3 to 16

Sets the number of DS3/DS1 Excess zeros sent.

:SOURce:DATA:TELecom:SPDH:ERRor:EXZeros:NUMBer?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:ERRor:PAYLoad <discrete>

<discrete> = BIT

Selects Payload Error Type to generate. Further error rate selections are required.

:SOURce:DATA:TELecom:SPDH:ERRor:PAYLoad?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:M140:ERRor <discrete>

<discrete> =	FAS	Frame Errors

Set a 140 Mb/s transmit error.

:SOURce:DATA:TELecom:SPDH:M140:ERRor?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:M34:ERRor <discrete>

<discrete> =	FAS	Frame Errors

Sets a 34Mb/s transmit error.

:SOURce:DATA:TELecom:SPDH:M34:ERRor?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:M8:ERRor <discrete>

<discrete> =	FAS	Frame Errors

Set an 8 Mb/s transmit error.

:SOURce:DATA:TELecom:SPDH:M8:ERRor?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:M2:ERRor <discrete>

<discrete> =	FAS	Frame Errors
	EBIT	E-Bit errors
	CRC	CRC-4 errors

Set a 2 Mb/s transmit error.

:SOURce:DATA:TELecom:SPDH:M2:ERRor?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:DS3:ERRor <discrete>

<discrete> =	FAS	Frame Errors
	MFAS	Multiframe errors
	FASMfas	Frame and Multiframe Errors
	FEBE	FEBE Errors
	PBITs	P bit Errors
	CPBits	CP bit Errors

Sets a DS3 transmit error.

:SOURce:DATA:TELecom:SPDH:DS3:ERRor?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:DS1:ERRor <discrete>

<discrete> =	FAS	Frame Errors
	CRC	CRC-6 Errors

Sets a DS1 transmit error.

:SOURce:DATA:TELecom:SPDH:DS1:ERRor?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

:SOURce:DATA:TELecom:SPDH:ERRor:RATE <discrete>

<discrete> =	NONE	Errors off

EALL	Error All
E_3	1E-3 Error rate
E_4	1E-4 Error rate
E_5	1E-5 Error rate
E_6	1E-6 Error rate
E_7	1E-7 Error rate
E_8	1E-8 Error rate
E_9	1E-9 Error rate
USER	User error rate

Selects the transmitter Error Rate of the error type selected.

NOTE If this query returns USER, then :SOURce:DATA:TELecom:SPDH:ERRor:RATE:USER? must be used to discover the currently injected error rate.

:SOURce:DATA:TELecom:SPDH:ERRor:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:ERRor:RATE:USER <numeric>

<numeric> =	9.9E-9 to 1.1E-3	mantissa resolution 0.1, exponent resolution 1

Sets the USER defined Error Add rate.

NOTE The maximum user defined error rate is dependent on both error type and line rate.

:SOURce:DATA:TELecom:SPDH:ERRor:RATE:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:ERRor:RATE:USER:ACTion <boolean>

<boolean> =	0 or OFF	
	1 or On	User Value set as Error Rate

Enables the USER defined Error Add rate.

:SOURce:DATA:TELecom:SPDH:ERRor:RATE:USER:ACTion?

Returns: <boolean>

:SOURce:DATA:TELecom:SPDH:ERRor:FRAMe:NERRored <numeric>

<numeric> =	1 to 6	Frame number

Frame Error Add only. Selects the number of frames to be errored in the Structured PDH transmitter.

:SOURce:DATA:TELecom:SPDH:ERRor:FRAMe:NERRored?

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:ERRor:MFRame:NERRored <numeric>

<numeric> =	1 to 4	Number of DS3 Multiframe

Sets the number of DS3 multi-frames to error.

:SOURce:DATA:TELecom:SPDH:ERRor:MFRame:NERRored?

Returns: <numeric>

SOURce subsystem - Transmitter Alarm Test Functions

Further commands (including Alarm Stress) can be found in the 'Transmitter Alarm Test Functions' section of the 'Common Commands' chapter.

:SOURce:DATA:TELecom:SPDH:ALARm:PHYSical <discrete>

<discrete> =	LOS	Loss of Signal Alarm

Selects PHYSical Alarms.

:SOURce:DATA:TELecom:SPDH:ALARm:PHYSical?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:M140:ALARm <discrete>

<discrete> =	AIS	Alarm Indication Signal
	LOFRame	Loss Of Framing
	RAI	Remote Alarm Indication

Set a 140 Mb/s transmit alarm.

:SOURce:DATA:TELecom:SPDH:M140:ALARm?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:M34:ALARm <discrete>

<discrete> =	AIS	Alarm Indication Signal
	LOFRame	Loss Of Framing
	RAI	Remote Alarm Indication

Sets a 34Mb/s transmit alarm.

:SOURce:DATA:TELecom:SPDH:M34:ALARm?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:M8:ALARm <discrete>

<discrete> =	AIS	Alarm Indication Signal
	LOFRame	Loss Of Framing
	RAI	Remote Alarm Indication

Set an 8 Mb/s transmit alarm.

:SOURce:DATA:TELecom:SPDH:M8:ALARm?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:M2:ALARm <discrete>

<discrete> =	AIS	Alarm Indication Signal
	LOFRame	Loss Of Framing
	RAI	Remote Alarm Indication
	RMFR	Remote Multiframe Alarm
	CMFL	CAS Multiframe Loss

Set a 2 Mb/s transmit alarm. RMFR and CMFL are only valid when timeslot-16 CAS multiframe has been selected.

:SOURce:DATA:TELecom:SPDH:M2:ALARm?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:DS3:ALARm <discrete>

<discrete> =	AIS	Alarm Indication Signal
	OOFRame	Out Of Framing
	RAI	Remote Alarm Indication
	IDLE	Idle

Sets a DS3 transmit alarm.

:SOURce:DATA:TELecom:SPDH:DS3:ALARm?

Returns: <discrete>

:SOURce:DATA:TELecom:SPDH:DS1:ALARm <discrete>

<discrete> =	AIS	Alarm Indication Signal
	OOFRame	Out Of Framing
	RAI	Remote Alarm Indication

Sets a DS1 transmit alarm.

:SOURce:DATA:TELecom:SPDH:DS1:ALARm?

Returns: <discrete>

INPut subsystem

:INPut:TELecom:SPDH:TSIGnal:PAYLoad:LOCation <discrete>

<discrete> = INTernal
EXTernal

This command selects the structured PDH transmitter payload location.

:INPut:TELecom:SPDH:TSIGnal:PAYLoad:LOCation?

Returns: <discrete>

:INPut:TELecom:SPDH:TSIGnal:PAYLoad:CODE <discrete>

<discrete> =	HDB3	2Mb/s
	B8ZS	DS1
	AMI	DS1

Selects the structured PDH insert interface line code for the input port.

:INPut:TELecom:SPDH:TSIGnal:PAYLoad:CODE?

Returns: <discrete>

SENSe subsystem - Receiver Settings

:SENSe:DATA:TELecom:SPDH:RATE <discrete>

<discrete> =	M140	140Mb/s
	DS3	44Mb/s
	M34	34Mb/s
	M8	8Mb/s
	M2	2Mb/s
	DS1	1.544Mb/s

Sets the rate of the instrument input port.

:SENSe:DATA:TELecom:SPDH:RATE?

Returns: <discrete>

Payload Commands

:SENSe:DATA:TELecom:SPDH:PAYLoad:FRAMing <discrete>

<discrete> =	UNFRamed	No framing
	FRAMed	8, 34 & 140 Mb/s
	PCM30	2 Mb/s Only
	PCM31	2 Mb/s Only
	PCM30CRC	2 Mb/s Only
	PCM31CRC	2 Mb/s Only
	D4	DS1 only
	ESF	DS1 only
	SLC96	DS1 only
	M13	DS3 only
	CBIT	DS3 only

	NOFBit	Ds1 floating Byte only

Selects the Structured PDH receiver interface rate framing.

:SENSe:DATA:TELecom:SPDH:PAYLoad:FRAMing?

Returns: <discrete>

:SENSe:DATA:TELecom:SPDH:PAYLoad:STRucture <discrete>

<discrete> =	UNSTructured	All rates
	STRuctured	All framed formats

Selects whether or not the PDH receiver is to have any further structure or not.

:SENSe:DATA:TELecom:SPDH:PAYLoad:STRucture?

Returns: <discrete>

SENSe subsystem - Receiver Test Signal Set Up

:SENSe:DATA:TELecom:SPDH:TSIGnal:RATE <discrete>

<discrete> =		
	M34	34 Mb/s
	M8	8 Mb/s
	M2	2 Mb/s
	M2K64	2Mb/s with 64kb/s
	DS1	DS1
	DS1K56	DS1 with 56kb/s
	DS1K64	DS1 with 64kb/s

Selects the Structured PDH receiver triubutary rate.

:SENSe:DATA:TELecom:SPDH:TSIGnal:RATE?

Returns: <discrete>

:SENSe:DATA:TELecom:SPDH:TSIGnal:FRAMing <discrete>

<discrete> =		
	UNFRamed	2, 8 & 34 Mb/s
	FRAMed	8 & 34 Mb/s
	PCM30	2 Mb/s
	PCM31	2 Mb/s
	PCM30CRC	2 Mb/s
	PCM31CRC	2 Mb/s
	D4	DS1
	ESF	DS1
	SLC96	DS1

Selects the Structured PDH receiver triubutary framing.

:SENSe:DATA:TELecom:SPDH:TSIGnal:FRAMing?

Returns: <discrete>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:M34 <numeric>

<numeric> = 1 to 4

Selects the Structured PDH receiver 34 Mb/s tributary number.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:M34?

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:M8 <numeric>

<numeric> = 1 to 4

Selects the Structured PDH receiver 8 Mb/s tributary number.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:M8?

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:M2 <numeric>

<numeric> = 1 to 4

Selects the Structured PDH receiver 2 Mb/s tributary number.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:M2?

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:DS1 <numeric>

<numeric> = 1 to 4

Selects the Structured PDH receiver DS1 tributary number.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:DS1?

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:DS2 <numeric>

<numeric> = 1 to 7

Selects the Structured PDH receiver DS2 tributary number.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:DS2?

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:M2:K64 <numeric>

<numeric> =	1 to 31	PCM31 & PCM31CRC
	1 to 15 & 17 to 31	PCM30 & PCM30CRC

Selects the Structured PDH receiver 64 kb/s timeslot.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:M2:K64?

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:M2:K64Xn <numeric>

<numeric> =	0 to 2147483647	31 bit value

Selects the NX64 kb/s timeslots of the 2Mb/s number. a '1' in the nth position signifies selection of timeslot n. A '0' signifies deselection e.g. to select timeslots 1,8,15,22,29 #b10000001000000100000010000000100 or #h40810204.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:M2:K64Xn?

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K56 <numeric>

<numeric> = 1 to 24 Any framing

Selects the PDH receiver 56kb/s timeslot.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K56?

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K64 <numeric>

<numeric> = 1 to 24 Any framing

Selects the PDH receiver 64kb/s timeslot.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K64?

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K64Xn <numeric>

<numeric> = 0 to 16777215 24 bit value

Selects the NX64 kb/s timeslots of the DS1 signal. a '1' in the nth position signifies selection of timeslot n. A '0' signifies deselection e.g. to select timeslots 1,8,15,22 #b10000001000000100000000100 or #h810204.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K64Xn?

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K56Xn <numeric>

<numeric> = 0 to 16777215 24 bit value

Selects the 56XN kb/s timeslots of the DS1 signal. a '1' in the nth position signifies selection of timeslot n. A '0' signifies deselection e.g. to select timeslots

1,8,15,22 #b10000001000000100000100 or #h810204.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K56Xn?

Returns: <numeric>

DS1 Loop Codes

:SENSe:DATA:TELecom:SPDH:INBand:LPUP:CODE <discrete>

<discrete> =	LINact	Activate Line
	PAYact	Activate Payload
	NETact	Activate Network
	USER	User Loop Code

Selects the expected Structured PDH receiver inband Loop Up loop code.

:SENSe:DATA:TELecom:SPDH:INBand:LPUP:CODE?

Returns: <discrete>

:SENSe:DATA:TELecom:SPDH:INBand:LPUP:USER <numeric>, <numeric>

<numeric> = 1 to 8

<numeric> = 0 to 255 8 bit value

Sets the expected Structured PDH receiver inband Loop Up loop code, variable bit length user loop code.

The first numeric parameter specifies the number of bits in the loop code to be in the range 1 to 8 bits. The second numeric parameter specifies the loop code and is range checked against the number of bits specified in the first parameter.

:SENSe:DATA:TELecom:SPDH:INBand:LPUP:USER? <numeric>

<numeric> = 1 to 8

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:INBand:LPDN:CODE <discrete>

<discrete> =	LINDeact	Deactivate Line
	PAYDeact	Deactivate Payload
	NETDeact	Deactivate Network
	USER	User Loop Code

Selects the expected Structured PDH receiver inband Loop Down loop code.

:SENSe:DATA:TELecom:SPDH:INBand:LPDN:CODE?

Returns: <discrete>

:SENSe:DATA:TELecom:SPDH:INBand:LPDN:USER <numeric>, <numeric>

<numeric> = 1 to 8

<numeric> = 0 to 255 8 bit value

Sets the expected Structured PDH receiver inband Loop Down loop code, variable bit length user loop code.

The first numeric parameter specifies the number of bits in the loop code to be in the range 1 to 8 bits.

The second numeric parameter specifies the loop code and is range checked against the number of bits specified in the firat parameter.

:SENSe:DATA:TELecom:SPDH:INBand:LPDN:USER? <numeric>

<numeric> = 1 to 8

Returns: <numeric>

SENSe subsystem - Result Returning Commands

Structured PDH Error Results

:SENSE:DATA? <string>

<string> = "<Return Type>:SPDH:LSECond:<error>" for last second results

<string> = "<Return Type>:SPDH:<error>" for total results

<Return Type> is one of the following

ECOunt	For returning Error Count
ERATio	For returning Error Ratios

<error> is one of the following

M2:FAS	2Mb/s FAS error
M8:FAS	8Mb/s FAS error
M34:FAS	34Mb/s FAS error
M140:FAS	140Mb/s FAS error
DS3:FEBE	DS3 FEBE error
DS3:PBITs	DS3 P-BITs error
DS3:CPBits	DS3 CP-Bits error
DS1:FAS	DS1 Frame error
DS3:FAS	DS3 Frame error
M2:CRC	2Mb/s CRC4 error
DS1:CRC	DS1 CRC6 error
M2:REBE	2Mb/s EBit error

Returns: <numeric>

Structured PDH Analysis Results

:SENSE:DATA? <string>

<string> = "<Result type>:SPDH:<Path Type>:<Type>"

		<Type> =		
<Result type> =		G821	G826	M2100

ESEConds	Error Seconds	X	X	X
SESeconds	Severely Errored Seconds	X	X	X
EBCount	Errored block count		X	
BBECount	Background block error count		X	
ESRatio	Error Second Ratio	X	X	
SESRatio	Severely Errored Second Ratio	X	X	
BBERatio	Background Block Error ratio		X	
UASeconds	Unavailable seconds	X	X	X
PUASeconds	Path Unavailable seconds		X	X

<Path type> =

M140:TRANsmit	Transmit 140Mb/s
M140:RECeive	Receive 140Mb/s
M34:TRANsmit	Transmit 34Mb/s
M34:RECeive	Receive 34Mb/s
M8:TRANsmit	Transmit 8Mb/s
M8:RECeive	Receive 8Mb/s
M2:TRANsmit	Transmit 2Mb/s

M2:RECeive	Receive 2Mb/s
DS1:TRANsmit	Transmit DS1
DS1:RECeive	Receive DS1
DS3:TRANsmit	Transmit DS3
DS3:RECeive	Receive DS3
BIT	Bit errors (Out Of Service)

NOTE G.821 has only BIT as the <Path Type>.

Returns: <numeric>

Structured PDH Alarm Seconds Results

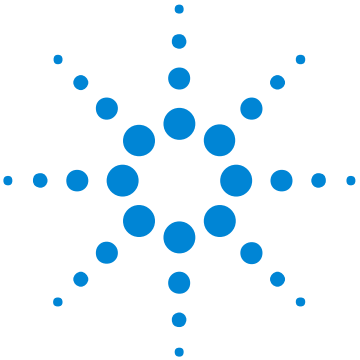
:SENSE:DATA? <string>

<string> = "ASEConds:SPDH:<Alarm>"

<Alarm> is one of the following

M140:LOF	140 Mb/s Frame Loss
M140:AIS	140Mb/s AIS
M140:RAI	140Mb/s Remote Alarm
M140:MINor	140Mb/s Minor Alarm
M34:LOF	34 Mb/s Frame Loss
M34:AIS	34Mb/s AIS
M34:RAI	34Mb/s Remote Alarm
M34:MINor	34Mb/s Minor Alarm
M8:LOF	8Mb/s Frame Loss
M8:AIS	8Mb/s AIS
M8:RAI	8Mb/s Remote Alarm
M8:MINor	8Mb/s Minor Alarm
M2:LOF	2Mb/s Frame Loss
M2:AIS	2Mb/s AIS
M2:RAI	2Mb/s Remote Alarm
M2:MINor	2Mb/s Minor Alarm
M2:MFM	2Mb/s CAS Multiframe Loss
M2:RMFR	2Mb/s Remote Multiframe Alarm
DS3:OOF	DS3 Out Of Frame
DS3:EXZ	DS3 Excess zeros
DS3:AIS	DS3 AIS
DS3:RAI	DS3 Remote Alarm
DS3:IDLE	DS3 Idle
DS3:FMM	DS3 Frame Mismatch

DS3:MFM	DS3 Multiframe Loss
DS2:OOF	DS2 Out Of Frame
DS1:OOF	DS1 Out Of Frame
DS1:EXZ	DS1 Excess zeros
DS1:AIS	DS1 AIS
DS1:RAI	DS1 Remote Alarm



5
SDH Command Reference

SDH Command Reference

This chapter contains detailed information on the SCPI (Standard Commands for Programming Instruments) and IEEE 488.2 common commands you will use when writing programs to control your Instrument for SDH operation.

Please also refer to chapter 2 Common Commands for general information on SCPI command formats and for a list of commands.

OUTPut subsystem

:OUTPut:TELecom:SDH:PAYLoad:LOCation <discrete>

<discrete> =	INTernal	
	EXTernal	

This command selects the SDH insert payload location.

:OUTPut:TELecom:SDH:PAYLoad:LOCation?

Returns: <discrete>

:OUTPut:TELecom:SDH:PAYLoad:CODE <discrete>

<discrete> =	CMI	140Mb/s only
	B3ZS	DS3
	HDB3	34Mb/s, 8Mb/s, 2Mb/s
	B8ZS	DS1
	AMI	DS1

Selects the insert interface line code for the SDH payload.

:OUTPut:TELecom:SDH:PAYLoad:CODE?

Returns: <discrete>

INPut subsystem

:INPut:TELecom:SDH:PAYLoad:LOCation <discrete>

<discrete> = INTernal
EXTernal

This command selects the SDH drop payload location.

:INPut:TELecom:SDH:PAYLoad:LOCation?

Returns: <discrete>

:INPut:TELecom:SDH:PAYLoad:CODE <discrete>

<discrete> =	CMI	140Mb/s only
	B3ZS	DS3
	HDB3	34Mb/s, 8Mb/s, 2Mb/s
	B8ZS	DS1
	AMI	DS1

Selects the drop interface line code for the SDH payload.

:INPut:TELecom:SDH:PAYLoad:CODE?

Returns: <discrete>

SOURce subsystem - Transmitter Settings

:SOURce:DATA:TELecom:SDH:RATE <discrete>

<discrete> =	STM64	10Gb/s
	STM16	2.5Gb/s
	STM4	622Mb/s
	STM1	155Mb/s
	STM0	51Mb/s

Controls the characteristics of the instrument's output ports.

Sets the output rate for the instrument output port.

:SOURce:DATA:TELecom:SDH:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:THRumode:COVerwrite <boolean>

<boolean> =	0 or OFF
	1 or On

Controls the overhead overwrite thru mode feature.

Enables or disables overhead overwrite. Thru mode must be enabled for this to be set.

:SOURce:DATA:TELecom:SDH:THRumode:COVerwrite?

Returns: <boolean>

Mapping Settings

:SOURce:DATA:TELecom:SDH:AU:STRucture <discrete>

<discrete> = MIXed

PRESet

Sets the type of mapping structure to be generated. In preset mode, the mappings will be the same size of the foreground except for AU4_2C, AU4_3C and AU4_8C where the background mappings are all AU4.

:SOURce:DATA:TELecom:SDH:AU:STRucture?

Returns: <discrete>

Mixed Mappings Settings

The following commands are only applicable in Mixed Mapping mode.

:SOURce:DATA:TELecom:SDH:AU:MIXed:RESet <discrete>

<discrete> = AU4

AU3

Resets the Mixed mappings to it's default state with all channels AU3 or AU4, and the first channel as the foreground channel.

:SOURce:DATA:TELecom:SDH:AU:MIXed:FOReground <numeric>

<numeric> =	1 to 192	Foreground channel number

Selects the foreground channel. The number is the number of AU-3 from the first channel.

This value can be obtained using the following formula:
(AUG16# - 1)*48 + (AUG4#-1)*12 + (AUG1# - 1) * 4 + AU-3#

Only the channel numbers of mappings that have actually been defined may be selected.

:SOURce:DATA:TELecom:SDH:AU:MIXed:FOReground?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:AU:MIXed:TYPE <numeric>, <discrete>

<numeric> =	1 to 192	Channel number
<discrete> =	AU3	Channel Size
	AU4	
	AU4_2C	
	AU4_3C	
	AU4_4C	
	AU4_8C	
	AU4_16C	
	AU4_64C	

Selects the size of the given channel. The Channel number is as for :MIXed:FOReground.

Only valid if the given channel already exists, and the given size is a valid size for the given start position.

:SOURce:DATA:TELecom:SDH:AU:MIXed:TYPE? <numeric>

<numeric> =	1 to 192	Channel number

Returns: <discrete>

AUG Numbering Selection

The following commands are only applicable in Preset Mapping mode.

:SOURce:DATA:TELecom:SDH:AUG64 <numeric>

<numeric> =	1	AUG-64 number.

Selects the transmitted AUG-64 that is selected for test.

Only valid if :SOURce:DATA:TELecom:SDH:RATE <discrete> is set to a rate higher than STM-16.

:SOURce:DATA:TELecom:SDH:AUG64?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:AUG16 <numeric>

<numeric> = 1 to 4 AUG-16 number.

Selects the transmitted AUG-16 that is selected for test.

Only valid if :SOURce:DATA:TELecom:SDH:RATE <discrete> is set to a rate higher than STM-4.

:SOURce:DATA:TELecom:SDH:AUG16?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:AUG4 <numeric>

<numeric> = 1 to 4 AUG-4 number.

Selects the transmitted AUG-4 that is selected for test.

Only valid if :SOURce:DATA:TELecom:SDH:RATE <discrete> is set to a rate higher than STM-1.

:SOURce:DATA:TELecom:SDH:AUG4?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:AUG1 <numeric>

<numeric> = 1 to 4 AUG-1 number.

Selects the transmitted AUG that is selected for test.

Only valid if :SOURce:DATA:TELecom:SDH:RATE <discrete> is set to a rate higher than STM-0.

:SOURce:DATA:TELecom:SDH:AUG1?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:AU3 <numeric>

<numeric> =	1 to 3	AU3 number

Selects the transmitted AU3 that is selected for test. Only valid for line rates higher than STM-0.

:SOURce:DATA:TELecom:SDH:AU3?

Returns: <numeric>

Tandem Connection Monitoring (TCM)

:SOURce:DATA:TELecom:SDH:TCM:HPATh <boolean>

<boolean> =	OFF	High-Order (HO) TCM Path Off
	ON	High-Order (HO) TCM Path On

Enables and Disables the High-Order Tandem Connection Path.

:SOURce:DATA:TELecom:SDH:TCM:HPATh?

Returns: <boolean>

:SOURce:DATA:TELecom:SDH:TCM:LPATh <boolean>

<boolean> =	OFF	Low-Order (LO) TCM Path Off
	ON	Low-Order (LO) TCM Path

On

Enables and Disables the Low-Order Tandem Connection Path.

:SOURce:DATA:TELecom:SDH:TCM:LPATh?

Returns: <boolean>

AU Layer Selection

:SOURce:DATA:TELecom:SDH:AU:TYPE <discrete>

<discrete> = AU3
AU4
AU4_2C
AU4_3C
AU4_4C
AU4_8C
AU4_16C
AU4_64C

Selects the AU mapping into an STM-N frame.

:SOURce:DATA:TELecom:SDH:AU:TYPE?

Returns: <discrete>

TU Layer Selection

:SOURce:DATA:TELecom:SDH:TU:TYPE <discrete>

<discrete> = NONE
TU3
TU11
TU12

Selects the TU mapping.

:SOURce:DATA:TELecom:SDH:TU:TYPE?

Returns: <discrete>

Payload Layer Selection

:SOURce:DATA:TELecom:SDH:PAYLoad <discrete>

<discrete> =	BULK	Bulk Filled
	M140	140 Mb/s
	M34	34 Mb/s
	ASM2	Asynchronous
	FLM2	2 Mb/s floating byte
	FLDS1	DS1 floating byte
	ASDS1	Asynchronous DS3
	DS3	DS3
	GFPLaps	GFP/LAPS

This command controls the transmitter SDH payload for single payload cases.

:SOURce:DATA:TELecom:SDH:PAYLoad?

Returns: <discrete>

TUG Channel

:SOURce:DATA:TELecom:SDH:TUG3 <numeric>

<numeric> =	1 to 3	TUG3 Number

Selects the SDH Transmitter active TUG3 within the foreground AU4.

:SOURce:DATA:TELecom:SDH:TUG3?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:TUG2 <numeric>

<numeric> = 1 to 7 TUG2 Number

Selects the SDH Transmitter active TUG2 within the selected TUG3 or AU3.

:SOURce:DATA:TELecom:SDH:TUG2?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:TU <numeric>

<numeric> = 1 to 3 Tributary Number for TU-12

1 to 4 Tributary Number for TU-11

Selects the SDH Transmitter active TU within the selected TUG2.

:SOURce:DATA:TELecom:SDH:TU?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:PAYLoad:FOFFset <boolean>

<boolean> = 0 or OFF

1 or On

Enables or disables the SDH Payload Clock Frequency Offset.

:SOURce:DATA:TELecom:SDH:PAYLoad:FOFFset?

Returns: <boolean>

:SOURce:DATA:TELecom:SDH:PAYLoad:OFFSet <numeric>

<numeric> = -100.0 to +100.0 Parts per Million

Sets (and enables) the payload frequency offset.

:SOURce:DATA:TELecom:SDH:PAYLoad:OFFSet?

Returns: <numeric>

Background Settings

:SOURce:DATA:TELecom:SDH:AU:BACKground <discrete>

<discrete> =	UNEQuipped	Fixed at 00000000
	AS_FG	As Foreground

Selects the payload in the background (non test) AUs.

:SOURce:DATA:TELecom:SDH:AU:BACKground?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:BACKground:PAYLoad:PATTern <discrete>

<discrete> =	PRBS9	2^9-1
	PRBS15	2^15-1
	B1100	word 1100

Selects the background payload pattern for TUs within the foreground TUG2.

:SOURce:DATA:TELecom:SDH:TU:BACKground:PAYLoad:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:PRIMary:BACKground:PAYLoad:PATTern <discrete>

<discrete> =	PRBS9	2^9-1
	PRBS15	2^15-1

	NUMBered	framed TU12 or TU11
	B1100	word 1100

Selects the background payload pattern for TUs within the foreground TUG3 or AU3.

:SOURce:DATA:TELecom:SDH:PRIMary:BACKground:PAYLoad:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern <numeric>, <discrete>

<numeric> =	1 to 3	TUG3 to be configured
<discrete> =	TU11	TU-3 structure
	TU12	TU-12 structure
	USER	User Defined

Selects the structure in a background TUG3. This command is only valid if the selected TUG3 is not the current foreground.

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern? <numeric>

<numeric> =	1 to 3	TUG3 to be configured

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern:USER <numeric>, <numeric>

<numeric> =	1 to 3	TUG3 to be configured
<numeric> =	0 to 256	8 bit pattern

Sets the User Pattern to be transmitted in the specified background TUG3. This command is only valid if the TUG3 selected is not the current foreground.

The 8-bit numeric value can be entered using #b for binary representation, #h for hexadecimal or just as a decimal number.

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern:USER ? <numeric>

<numeric> = 1 to 3 TUG3 to be configured

Returns: <numeric>

SOURce subsystem - Transmitter Overhead Set up

:SOURce:DATA:TELecom:SDH:OVERhead:DEFault

Sets all overhead bytes to their default value

:SOURce:DATA:TELecom:SDH:OVERhead:DATA <numeric>, <numeric>, <discrete>, <numeric>

<numeric> =	1 to 64	STM-1 Number
<numeric> =	1 to 3	Column Number
<discrete> =	A1 | A2 | E1 | F1 | D1 | D2 | D3 | K1 | H1 | K2 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | S1 | M0 | M1 | E2 | X11 | X12 | X13 | X21 | X22 | X23 | X31 | X32 | X33 | X41 | X42 | X43 | X51 | X52 | X53 | X61 | X62 | X63 | X71 | X72 | X73 | X81 | X82 | X83 | X91 | X92 | X93 |	
<numeric> =	0 to 255	Byte Value

Sets the value of the selected transmitter section overhead byte. The required byte is specified by 4 command parameters.

The first parameter, STM-1 Number, identifies an STM-1 within the signal. The acceptable range for this parameter will depend on the selected transmit signal rate. For the STM-0 signal rate only 1 is valid.

The second parameter identifies a set of columns within the selected STM-1. A Value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of 3 selects Columns 3,6 & 9. For the STM-0 signal rate only 1 is valid.

The third parameter identifies the specific byte in the selected set of columns. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names is shown in the table above. The second method is to use an "Xrc" notation, where r is the numerical value of the bytes row in the transport overhead and c is the numerical value of the bytes column in the transport overhead. This method allows access to ANY byte in the selected STM-1 / Column set.

The fourth command parameter is the new value that will be transmitted in the specified byte. This value can be specified in hex, octal or decimal format.

:SOURce:DATA:TELecom:SDH:OVERhead:DATA? <numeric>, <numeric>, <discrete>

<numeric> =	1 to 64	STM-1 Number
<numeric> =	1 to 3	Column Number
<discrete> =	A1 | A2 | E1 | F1 | D1 | D2 | D3 | K1 | H1 | K2 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | S1 | M0 | M1 | E2 | X11 | X12 | X13 | X21 | X22 | X23 | X31 | X32 | X33 | X41 | X42 | X43 | X51 | X52 | X53 | X61 | X62 | X63 | X71 | X72 | X73 | X81 | X82 | X83 | X91 | X92 | X93 |	

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	FIXed	Fixed Byte Sequence
	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of pattern that is to be transmitted in the J0 byte of the STM regenerator section overhead. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames. Default is FIXed. ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:FIXed <numeric>

<numeric> = 0 to 255 Byte Value

Sets the fixed byte value of the J0 byte. Only relevant when :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern <discrete>is set to FIXed.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:FIXed?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the J0 byte of the regenerator section overhead. The command parameter is a 15 character long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern <discrete> is set to B16Crc.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B64 <string>

<string> =

Sets the 64-byte sequence of the J0 byte of the regenerator section overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long. The pattern repeats every 64 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern

<discrete>is set to B64.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:ARRay?

Returns: <block>

Returns the J0 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern <discrete>.

:SOURce:DATA:TELecom:SDH:OVERhead:SBYTe <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	QUALunknown	(0000)
	G811	(0010)
	SSUA	(0100)
	SSUB	(1000)
	G813	(1011)
	DONTusesync	(1111)

Selects the SDH SYNC message type (S1 Byte Bits 5 to 8). ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SDH:OVERhead:SBYTe?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POVerhead:DATA <discrete>, <numeric>

<discrete> =	C2 | G1 | F2 | H4 | F3 | K3 | N1	
<numeric> =	0 to 255	Byte Value

Sets the value of the specified VC-4-64c, VC-4-16c, VC-4-4c, VC-4, VC-3 foreground high order path overhead byte.

The N1 byte can only be set when the command :SOURce:DATA:TELecom:SDH:TCM:HPATh <boolean> is set to FALSE.

:SOURce:DATA:TELecom:SDH:POVerhead:DATA? <discrete>

<discrete> = C2 | G1 | F2 | H4 | F3 | K3 | N1

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of sequence to be transmitted within the J1 byte of the foreground high order path overhead.

ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the J1 byte of the foreground high order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS

or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern <discrete> is set to B16Crc.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B64 <string>

<string> =

Sets the 64-byte sequence of the J1 byte of the foreground high order path overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long. The pattern repeats every 64 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern <discrete> is set to B64.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:ARRay?

Returns: <block>

Returns the high order J1 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern <discrete>.

:SOURce:DATA:TELecom:SDH:POVerhead:SLABel <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	UNEQuipped	Unequipped (00000000)
	EQUipped	Equipped (00000001)
	TUGStructure	TUG structure (00000010)
	LOCKed	Locked TU (00000011)
	ASYN34	Asynchronous 34 /45 Mb/s (00000100)
	ASYN140	Asynchronous 140 Mb/s (00010010)
	ATM	ATM (00010011)
	DQDB	DQDB (00010100)
	FDDI	FDDI (00010101)
	PPPScram	PPP Scrambling On (00010110)
	SDL1	SDL1 (00010111)
	LAPS	LAPS (00011000)
	SDL2	SDL2 (00011001)
	GBE10	10Gbs Ethernet (00011010)
	PPPNoscram	PPP Scrambling Off (11001111)
	BULK	Bulk Filled (11111110)
	VCAis	VCAIS (11111111)

Sets the value of the path label (C2 Byte) of the foreground high order path overhead.

ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SDH:POVerhead:SLABel?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	B16Crc	16 Byte Sequence (with CRC)

Sets the type of sequence to be transmitted within the N1 byte of the foreground high order path overhead.

ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the N1 byte of the foreground high order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SDH:TCM:APID:PATTern <discrete> is set to B16Crc, and :SOURce:DATA:TELecom:SDH:TCM:HPATh <boolean> is set to TRUE.

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern:ARRay?

Returns: <block>

Returns the high order TCM trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:TCM:APID:PATTern <discrete>.

:SOURce:DATA:TELecom:SDH:POVerhead:H4Sequence <discrete>

<discrete> =	LONG	Long Sequence
	SHORt	Short Sequence
	COC1	COC1 Sequence

Sets the H4 Path overhead byte sequence length when :SOURce:DATA:TELecom:SDH:TU <numeric> is set to TU11 or TU12.

:SOURce:DATA:TELecom:SDH:POVerhead:H4Sequence?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:DATA <discrete>, <numeric>

<discrete> = C2 | G1 | F2 | H4 | F3 | K3 | N1 | V5 | J2 | N2 | K4

<numeric> =	0 to 255	Byte Value

Sets the value of the specified VC-3, VC-12 or VC-11 foreground low order path overhead byte to the value specified by <numeric>.

For V5, a bitmask of 00111111 is applied to the value of <numeric> since the BIP-2 cannot be set.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:DATA? <discrete>

<discrete> = C2 | G1 | F2 | H4 | F3 | K3 | N1 | V5 | J2 | N2 | K4

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of sequence to be transmitted within the J1 byte of the foreground low order path overhead.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the J1 byte of the foreground low order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern <discrete> is set to B16Crc.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B64 <string>

<string> =

Sets the 64-byte sequence of the J1 byte of the foreground low order path overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long. The pattern repeats every 64 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern <discrete> is set to B64.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:ARRay?

Returns: <block>

Returns the high order J1 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern <discrete>.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:C2:SLABel <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	UNEQuipped	Unequipped (00000000)
	EQUipped	Equipped (00000001)
	TUGStructure	TUG structure (00000010)
	LOCKed	Locked TU (00000011)
	ASYN34	Asynchronous 34 /45 Mb/s (00000100)
	ASYN140	Asynchronous 140 Mb/s (00010010)
	ATM	ATM (00010011)
	DQDB	DQDB (00010100)
	FDDI	FDDI (00010101)

PPPScram	PPP Scrambling On (00010110)
SDL1	SDL1 (00010111)
LAPS	LAPS (00011000)
SDL2	SDL2 (00011001)
GBE10	10Gbs Ethernet (00011010)
PPPNoscram	PPP Scrambling Off (11001111)
BULK	Bulk Filled (11111110)
VCAis	VCAIS (11111111)

Sets the value of the path label (C2 Byte) of the foreground low order path overhead.

ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:C2:SLABel?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:V5:SLABel <numeric>

<numeric> = 0 to 7

Sets the value of the signal label (V5 Byte) of the foreground low order path overhead.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:V5:SLABel?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	FIXed	Fixed Byte Value

B16Crc		16 Byte Sequence (with CRC)

Sets the type of sequence to be transmitted within the J2 byte of the foreground low order path overhead.

ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POVerhead:J2:PATTern:FIXed <numeric>

<numeric> =	0 to 255	Byte Value

Sets the fixed byte value of the J0 byte. Only relevant when :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern <discrete>is set to FIXed.

:SOURce:DATA:TELecom:SDH:POVerhead:J2:PATTern:FIXed?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the J2 byte of the foreground low order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by
character in subsequent frames.

Only valid when
:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern <discrete> is set to B16Crc.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern:ARRay?

Returns: <block>

Returns the high order J2 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern <discrete>.

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	B16Crc	16 Byte Sequence (with CRC)

Sets the type of sequence to be transmitted within the N1 byte of the foreground low order path overhead.

ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the N1 byte of the foreground low order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every

16 characters and is transmitted character by character in subsequent frames.

Only valid when
:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern <discrete> is set to B16Crc, and
:SOURce:DATA:TELecom:SDH:TCM:LPATh <boolean> is set to TRUE.

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern:ARRay?

Returns: <block>

Returns the high order TCM trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern <discrete>.

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	B16Crc	16 Byte Sequence (with CRC)

Sets the type of sequence to be transmitted within the N2 byte of the foreground low order path overhead.

ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the N2 byte of the foreground low order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when
:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern <discrete> is set to B16Crc, and
:SOURce:DATA:TELecom:SDH:TCM:LPATh <boolean> is set to TRUE.

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern:ARRay?

Returns: <block>

Returns the high order TCM trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern <discrete>.

Overhead Sequences Commands

:SOURce:DATA:TELecom:SDH:SEQuence:CHANnel:SELect <numeric>

<numeric> = 1 to 64 AU number

Selects the STM-1 Channel from which the overhead sequence will be generated.

:SOURce:DATA:TELecom:SDH:SEQuence:CHANnel:SELect?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:SEQuence:OHBYte <discrete>

<discrete> = A1A2 | BNDA1A2 | E1 | F1 | D1D3 | K1K2 | H1 | D4D12 | S1 | M0 | M1 | J1 | E2 | C2 | G1 | F2 | H4 | F3 | K3 | N1 | H1H2_1 | H1H2_2 | H1H2_3 | H3_1 | H3_2 | H3_3 | Xrc

Selects the overhead channel to be used to transmit a sequence. "A1A2" selects Channel Associated A1A2 while "BNDA1A2" selects A1A2 Boundary.

A byte/channel may also be selected by using an 'Xrc' notation where 'r' specifies the row of the required byte and 'c' specifies the column.

For example, specifying 'X24' will select the 4th byte on the 2nd row of the specified STM-1 structure.

:SOURce:DATA:TELecom:SDH:SEQuence:OHBYte?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:SEQuence:DEFault

Restores all sequence variables to their default values.

:SOURce:DATA:TELecom:SDH:SEQuence:INCRement

Resets the sequence repeat counts and data values and inserts incrementing values.

:SOURce:DATA:TELecom:SDH:SEQuence:FCOunt <numeric>, <numeric>

<numeric> =	1 to 256	Sequence Element Index
<numeric> =	0 to 65535	Sequence Element Repeat Count

For the selected sequence element specifies the number of frames in which the element data is to be transmitted.

:SOURce:DATA:TELecom:SDH:SEQuence:FCOunt? <numeric>

<numeric> = 1 to 256 Sequence Element Index

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:SEQuence:DATA <numeric>, <string>

<numeric> = 1 to 256 Element Index

<string> = See Below Element Data

Sets the sequence data pattern for the designated element to the hexadecimal value contained in the string. The number of hexadecimal characters is dependent on the overhead channel selected by
:SOURce:DATA:TELecom:SDH:SEQuence:OHBYte <discrete>.

Two hexadecimal characters are required per byte, for example:
TCMACT - 1 byte "00" to "FF"
FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

:SOURce:DATA:TELecom:SDH:SEQuence:DATA? <numeric>

<numeric> = 1 to 256 Element Index

Returns: <string>

:SOURce:DATA:TELecom:SDH:SEQuence:MODE <discrete>

<discrete> = SINGle Single Run

REPeat Repeat Run

Selects whether to run a sequence once or repeatedly.

:SOURce:DATA:TELecom:SDH:SEQuence:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:SEQuence <discrete>

<discrete> = STOP Stop current sequence

STARt	Start new sequence

Stops or starts a Single or Repeat run Sequence.

:SOURce:DATA:TELecom:SDH:SEQuence?

Returns: <discrete>

SOURce subsystem - Clock Offset Test Function

:SOURce:CLOCk:SDH:FOFFset <boolean>

<boolean> = 0 or OFF

1 or ON

Enables or disables the Clock Frequency Offset. The amount of Offset is set using :SOURce:CLOCk:SDH:FOFFset:OFFSet <numeric> <numeric>.

:SOURce:CLOCk:SDH:FOFFset?

Returns: <boolean>

:SOURce:CLOCk:SDH:FOFFset:OFFSet <numeric>

<numeric> = -100 to +100 parts per million

Sets the amount of Clock Frequency Offset when Frequency Offset is enabled.

:SOURce:CLOCk:SDH:FOFFset:OFFSet?

Returns: <numeric>

SOURce subsystem - Transmitter Error Test Functions

:SOURce:DATA:TELecom:SDH:ERRor:PHYSical <discrete>

<discrete> =	EFRame	Entire Frame or data errors
	CODE	Line/Code/BPV errors

Selects Physical Error Type to generate. Further rate control selections are required.

:SOURce:DATA:TELecom:SDH:ERRor:PHYSical?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:SECTion <discrete>

<discrete> =	FRAMe	A1A2 Frame Errors
	RSBip	RS-BIP, B1 Errors
	MSBip	MS-BIP, B2 Errors
	MSRei	MS-REI Errors

Selects Section Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> <discrete> is required.

:SOURce:DATA:TELecom:SDH:ERRor:SECTion?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:PATH <discrete>

<discrete> =	PBIP	Path Bip, B3 Errors
	HPRei	HP-REI Errors
	LPRei	LP-REI Errors
	LPBip	LP-BIP Errors

Selects Path Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> <discrete> is required.

:SOURce:DATA:TELecom:SDH:ERRor:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:TCM <discrete>

<discrete> =	TCIec	TCM Incoming Error Count
	TCRei	TCM REI
	OEI	TCM Outgoing Error Indication
	LPIec	LP TCM Incoming Error Count
	LPRei	LP TCM REI
	LPOei	LP TCM Outgoing Error Indication
	LPN2Bip	LP TCM N2 BIP Error

Selects TCM Error Type to generate. Further rate control selections are required.

:SOURce:DATA:TELecom:SDH:ERRor:TCM?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

:SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete>

<discrete> =	NONE	Errors Off
	EALL	Error All

APSThreshold	APS Threshold (MS Bit only)
E_3	1E-3 Error rate
E_4	1E-4 Error rate
E_5	1E-5 Error rate
E_6	1E-6 Error rate
E_7	1E-7 Error rate
E_8	1E-8 Error rate
E_9	1E-9 Error rate
USER	User defined error rate

Selects the transmitter Error Rate of the error type selected by the Error Group Selection Functons.

NOTE

If this query returns USER, then :SOURce:DATA:TELecom:SDH:ERRor:RATE:USER? must be used to discover the currently injected error rate.

:SOURce:DATA:TELecom:SDH:ERRor:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ERRor:RATE:USER <numeric>

<numeric> =	9.9E-9 to 1.1E-3	mantissa resolution 0.1, exponent resolution 1

Sets the user defined Error Add rate.
:SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> must be set to USER

NOTE

The maximum user defined error rate is dependent on both error type and lime rate.

:SOURce:DATA:TELecom:SDH:ERRor:RATE:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:ERRor:RATE:USER:ACTion <boolean>

<boolean> =	OFF	
	ON	User Value set as Error Rate

Sets the user defined Error Add rate specified by :SOURce:DATA:TELecom:SDH:ERRor:RATE:USER <numeric>.

:SOURce:DATA:TELecom:SDH:ERRor:RATE:USER:ACTion?

Returns: <boolean>

:SOURce:DATA:TELecom:SDH:ERRor:APSThreshold:NERRors <numeric>

<numeric> =	0 to 640	for STM-0
	0 to 1920	for STM-1
	0 to 7680	for STM-4
	0 to 30720	for STM-16
	0 to 122880	for STM-64

Sets the number of errors for the APS Threshold when :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> <discrete> is set to APSThreshold. Default = 0.

:SOURce:DATA:TELecom:SDH:ERRor:APSThreshold:NERRors?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:ERRor:APSThreshold:EINTerval <discrete>

<discrete> =	MS10	10 milliseconds
	MS100	100 milliseconds
	S1	1 second

S10	10 seconds
S100	100 seconds
S1000	1,000 seconds
S10000	10,000 seconds

Sets the interval between APS Threshold errors when :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> <discrete> is set to APSThreshold .

:SOURce:DATA:TELecom:SDH:ERRor:APSThreshold:EINTerval?

Returns: <discrete>

SOURce subsystem - Transmitter Alarm Test Functions

Further commands (including Alarm Stress) can be found in the 'Transmitter Alarm Test Functions' section of the 'Common Commands' chapter.

:SOURce:DATA:TELecom:SDH:ALARm:PHYSical <discrete>

<discrete> =	LOS	Loss of Signal Alarm

Selects PHYSical Alarms.

:SOURce:DATA:TELecom:SDH:ALARm:PHYSical?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ALARm:SECTion <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	MSAis	MS-AIS alarm indication signal
	MSRDi	MS-RDI remote defect indication

Selects Section Alarms.

:SOURce:DATA:TELecom:SDH:ALARm:SECTion?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ALARm:OOF

Sets the OOF alarm Active.There is no corresponding query

:SOURce:DATA:TELecom:SDH:ALARm:PATH <discrete>

<discrete> =	PAIS	Path AIS
	AULop	AU-LOP Loss of AU pointer
	HPRDi	HP-RDI remote defect indication
	PUNequipped	Path Unequipped
	PAYLoad	High order path RDI payload enhanced
	SERVer	High order path RDI server defect enhanced
	CONNection	High order path RDI connection enhanced
	LOM	H4 Loss of Multiframe
	LPAis	Low Order Path AIS
	LPLop	Low Order Path Loss of Pointer
	LPUNequipped	Low Order Path Unequipped
	LPRDi	Low order path RDI
	LPRFi	Low Order Path RFI
	LPPayload	Low order path RDI payload enhanced
	LPServer	Low order path RDI server defect enhanced
	LPConnection	Low order path RDI connection enhanced

Selects Path Alarms.

:SOURce:DATA:TELecom:SDH:ALARm:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ALARm:TCM <discrete>

<discrete> =	TCRDi	TCM remote defect indication
	ODI	outgoing defect indication
	TCOom	TCM loss of multi-frame alignment
	IAIS	Incoming alarm indication signal
	VCAis	VC alarm indication signal
	TCUNequipped	TCM unequiped
	LPRDi	LP TCM remote defect indication
	LPODi	LP Outgoing defect indication
	LPOom	LP TCM loss of multi-frame alignment
	LPIais	LP Incoming alarm indication signal
	LPVCais	LP VC alarm indication signal
	LPUNequipped	LP TCM unequiped

Selects Tandem Connection Mode Alarms.

:SOURce:DATA:TELecom:SDH:ALARm:TCM?

Returns: <discrete>

:SOURce:DATA:TELecom:ALARm <boolean>

<boolean> =	0 or OFF
	1 or ON

Enables and disables Alarm Generation.

:SOURce:DATA:TELecom:ALARm?

Returns: <boolean>

SOURce subsystem - Pointer Adjust Test Functions

:SOURce:DATA:TELecom:SDH:POINter:TRANsmitted?

Returns: <numeric>

Returns the actual pointer value being transmitted.

:SOURce:DATA:TELecom:SDH:POINter <boolean>

<boolean> =	BURSt	Pointer Burst
	NPOinter	New Pointer Value
	OFFSet	Pointer Offset

Selects the Pointer Test Function.

:SOURce:DATA:TELecom:SDH:POINter?

Returns: <boolean>

:SOURce:DATA:TELecom:SDH:POINter:TYPE <discrete>

<discrete> =	AU	AU Pointer
	TU	TU Pointer

Selects the Pointer Type.

:SOURce:DATA:TELecom:SDH:POINter:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POINter:BURSt:ACTion

Forces the pointer value to change according to the burst size and direction set using the following commands
:SOURce:DATA:TELecom:SDH:POINter:BURSt:DIRection <discrete> and
:SOURce:DATA:TELecom:SDH:POINter:BURSt:SIZE <numeric>

To use this function the command :SOURce:DATA:TELecom:SDH:POINter <discrete> should be set to BURSt.

:SOURce:DATA:TELecom:SDH:POINter:BURSt:DIRection <discrete>

<discrete> =	INCRement	Increment Pointer Value
	DECRement	Decrement Pointer Value
	ALTernate	Burst placed in opposite direction to last burst

Selects the Pointer Burst Direction.

:SOURce:DATA:TELecom:SDH:POINter:BURSt:DIRection?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POINter:BURSt:SIZE <numeric>

<numeric> = 1 to 10

Selects the Pointer Burst Size.

:SOURce:DATA:TELecom:SDH:POINter:BURSt:SIZE?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:POINter:NEW:ACTion

Forces the pointer value to adopt the New Pointer value and new flag status, set using the following commands

:SOURce:DATA:TELecom:SDH:POINter:NEW:VALue <numeric> and :SOURce:DATA:TELecom:SDH:POINter:NEW:FLAG <discrete>.

To use this function the command :SOURce:DATA:TELecom:SDH:POINter <discrete> should be set to NEW.

:SOURce:DATA:TELecom:SDH:POINter:NEW:VALue <numeric>

<numeric> = 0 to 782

Selects the New Pointer Value.

:SOURce:DATA:TELecom:SDH:POINter:NEW:VALue?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:POINter:NEW:FLAG <discrete>

<discrete> =	NNDF	No New Data Flag
	NDF	New Data Flag

Selects whether a New Pointer Data Flag is generated.

:SOURce:DATA:TELecom:SDH:POINter:NEW:FLAG?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POINter:OFFSet:ACTion <boolean>

<boolean> = 0 or OFF

1 or ON

Enables and Disables the Pointer Offset Test Function. The type of Offset and offset rate are set using the following commands:

:SOURce:DATA:TELecom:SDH:POINter:OFFSet <discrete> and
:SOURce:DATA:TELecom:SDH:POINter:OFFSet:RATE <numeric>

To use this function the command :SOURce:DATA:TELecom:SDH:POINter <discrete> should be set to OFFSet and :SOURce:CLOCk:FOFFset:ACTive should be set to OFF.

:SOURce:DATA:TELecom:SDH:POINter:OFFSet:ACTion?

Returns: <boolean>

:SOURce:DATA:TELecom:SDH:POINter:OFFSet <discrete>

<discrete> =	SIGNal	Signal offset
	PAYLoad	Payload Offset

Selects the Pointer Offset Type.

:SOURce:DATA:TELecom:SDH:POINter:OFFSet?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POINter:OFFSet:RATE <numeric>

<numeric> =	-100.0 to +100.0	parts per million

Selects the Pointer Offset Rate.

:SOURce:DATA:TELecom:SDH:POINter:OFFSet:RATE?

Returns: <numeric>

SOURce subsystem - APS Messages

:SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	LINear	Linear protection
	RING	Ring protection

Selects the type of protection topology.

ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SDH:APSMessages:TOPology?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:TOPology:TYPE <discrete>

<discrete> =	PASSive	Passive
	AUNidir	Active unidirectional
	ABIDir	Active bidirectional

Selects the behaviour of the transmitted K1K2 bytes as being passive or active (unidirectional or bidirectional).

:SOURce:DATA:TELecom:SDH:APSMessages:TOPology:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:REQuest <discrete>

<discrete> =	NREQuest	No Request (0000)
	DNRevert	Do Not Revert (0001)
	RREQuest	Reverse Request (0010)
	THRee	Not Used (0011)

EXERcise	Exercise (0100)
FIVE	Not Used (0101)
LWTRestore	Wait To Restore (0110)
SEVen	Not Used (0111)
MSWitch	Manual Switch (1000)
NINE	Not Used (1001)
SDLPriority	Signal Degrade Low Priority (1010)
SDHPriority	Signal Degrade High Priority (1011)
SFLPriority	Signal Fair Low Priority (1100)
SFHPriority	Signal Fair High Priority (1101)
FSWitch	Forced Switch (1110)
LOPRotection	Lockout Of Protection (1111)

Selects the transmitter SDH APS message to be transmitted (K1 Byte, Bits 1 to 4). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete> is set to LIN.

SDHP and SFHP are only valid when :SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture <discrete> is set to OTN.

:SOURce:DATA:TELecom:SDH:APSMessages:REQuest?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:CHANnel <numeric>

<numeric> =	0	NULL Channel
	1	Working Channel 1
	2	Working Channel 2

3	Working Channel 3
4	Working Channel 4
5	Working Channel 5
6	Working Channel 6
7	Working Channel 7
8	Working Channel 8
9	Working Channel 9
10	Working Channel 10
11	Working Channel 11
12	Working Channel 12
13	Working Channel 13
14	Working Channel 14
15	Extra Traffic Channel

Selects the transmitter SDH APS message channel (K1 Byte, Bits 5 to 8).

Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete> is set to LIN.

Working Channel 2 to 14 extra traffic channels are only valid if :SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture <discrete> is set to OTN.

:SOURce:DATA:TELecom:SDH:APSMessages:CHANnel?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:BRIDge <numeric>

<numeric> = 0 to 15

Selects the SDH transmitter Linear APS message bridged channel (K2 Byte, Bits 1 to 4). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete> is set to LIN.

:SOURce:DATA:TELecom:SDH:APSMessages:BRIDge?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture <discrete>

<discrete> =	OTONe	1+1
	OTN	1:N

Selects the SDH transmitter Linear APS architecture (K2 Byte, Bit 5). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete> is set to LIN.

:SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:REServed <numeric>

<numeric> =	0	000
	1	001
	2	010
	3	011
	4	100
	5	101

Selects the SDH transmitter Linear APS messages reserved bits (K2 Byte, Bits 6 to 8) in numeric form. Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete> is set to LIN.

:SOURce:DATA:TELecom:SDH:APSMessages:REServed?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:RCODe <discrete>

<discrete> =	NREQuest	No Request (0000)
	RRRing	Reverse Request - Ring (0001)
	RRSPan	Reverse Request - Stan (0010)
	ERINg	Exerciser - Ring (0011)
	ESPan	Exerciser - Stan (0100)
	RWTRestore	Wait to Restore (0101)
	MSRing	Manual Switch - Ring (0110)
	MSSPan	Manual Switch - Stan (0111)
	SDRing	Signal Degrade - Ring (1000)
	SDSPan	Signal Degrade - Stan (1001)
	SDPRotection	Signal Degrade - Protection (1010)
	SFRing	Signal Fair - Ring (1011)
	SFSPan	Signal Fair - Stan (1100)
	FSRing	Forced Switch Ring (1101)
	FSSPan	Forced Switch - Stan(1110)
	LOPRotection	Lockout Of Protection (1111)

Selects the transmitter Ring APS message to be transmitted (K1 Byte, Bits 1 to 4). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete> is set to RING.

:SOURce:DATA:TELecom:SDH:APSMessages:RCODe?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:DNODe <numeric>

<numeric> = 0 to 15

Selects the SDH transmitter Ring APS message destination node (K1 Byte, Bits 5 to 8). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete> is set to RING.

:SOURce:DATA:TELecom:SDH:APSMessages:DNODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:SNODe <numeric>

<numeric> = 0 to 15

Selects the SDH transmitter Ring APS message source node (K2 Byte, Bits 1 to 4) . Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete> is set to RING.

:SOURce:DATA:TELecom:SDH:APSMessages:SNODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:PCODe <discrete>

<discrete> =	SHORt	Short path
	LONG	Long path

Selects the SDH transmitter Ring APS message path type (K2 bit 5). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete> is set to RING.

:SOURce:DATA:TELecom:SDH:APSMessages:PCODe?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:SCODe <numeric>

<numeric> =	0	Idle (000)
	1	Bridged (001)
	2	Bridged & Switched (010)

3	011
4	100
5	101

Selects the SDH transmitter Ring APS messages status code (K2 Byte, Bits 6 to 8). Only valid if :SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete> is set to RING.

:SOURce:DATA:TELecom:SDH:APSMessages:SCODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:DOWNload

Start transmission of the SDH transmitter APS message.

SOURce subsystem - DCC Insertion

:SOURce:DATA:TELecom:SDH:IDCC <discrete>

<discrete> =	NONE	Turns both Off
	RDCC	Regenerator DCC
	MDCC	Multiplexer DCC

Selects the Data Communication Channel Insert port for DCC Test functions.

:SOURce:DATA:TELecom:SDH:IDCC?

Returns: <discrete>

SENSe subsystem - Receiver SDH Settings

:SENSe:DATA:TELecom:SDH:RATE <discrete>

<discrete> =	STM64	10Gb/s
	STM16	2.5Gb/s
	STM4	622Mb/s
	STM1	155Mb/s
	STM0	51Mb/s

Sets the input rate for the instrument input port.

:SENSe:DATA:TELecom:SDH:RATE?

Returns: <discrete>

SDH Mapping settings

:SENSe:DATA:TELecom:SDH:AUG64 <numeric>

<numeric> =	1	AUG-64 number

Selects the received AUG-64 that is selected for test.

Only valid if :SENSe:DATA:TELecom:SDH:RATE <discrete> is set a rate higher then STM16.

:SENSe:DATA:TELecom:SDH:AUG64?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:AUG16 <numeric>

<numeric> =	1 to 4	AUG-16 number

Selects the received AUG-64 that is selected for test.

Only valid if :SENSe:DATA:TELecom:SDH:RATE <discrete> is set a rate higher then STM4.

:SENSe:DATA:TELecom:SDH:AUG16?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:AUG4 <numeric>

<numeric> = 1 to 4 AUG-4 number

Selects the received AUG-4 that is selected for test.

Only valid if :SENSe:DATA:TELecom:SDH:RATE <discrete> is set a rate higher then STM1.

:SENSe:DATA:TELecom:SDH:AUG4?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:AUG1 <numeric>

<numeric> = 1 to 4 AUG-1 number

Selects the received AUG-1 that is selected for test.

Only valid if :SENSe:DATA:TELecom:SDH:RATE <discrete> is set a rate higher then STM0.

:SENSe:DATA:TELecom:SDH:AUG1?

Returns: <numeric>

Tandem Connection Monitoring (TCM) - SDH Only

:SENSe:DATA:TELecom:SDH:TCM:HPATh <boolean>

<boolean> = OFF High-Order (HO) TCM Path Off

ON	High-Order (HO) TCM Path On

Enables and Disables the High-Order Tandem Connection Path.

:SENSe:DATA:TELecom:SDH:TCM:HPATh?

Returns: <boolean>

AU Layer Selection

:SENSe:DATA:TELecom:SDH:AU:TYPE <discrete>

<discrete> = AU3
AU4
AU4_2C
AU4_3C
AU4_4C
AU4_8C
AU4_16C
AU4_64C

Set the AU Mapping into an STM-N frame.

:SENSe:DATA:TELecom:SDH:AU:TYPE?

Returns: <discrete>

TU Layer Selection

:SENSe:DATA:TELecom:SDH:TU:TYPE <discrete>

<discrete> = NONE
TU3
TU11

TU12

Selects the TU mapping for the receiver.

:SENSe:DATA:TELecom:SDH:TU:TYPE?

Returns: <discrete>

Payload Layer Selection

:SENSe:DATA:TELecom:SDH:PAYLoad <discrete>

<discrete> =	BULK	Bulk Filled
	M140	140 Mb/s
	M34	34 Mb/s
	ASM2	Asynchronous
	FLM2	2 Mb/s floating byte
	FLDS1	DS1 floating byte
	ASDS1	Asynchronous DS3
	DS3	DS3

This command controls the receiver SDH payload for single payload cases.

:SENSe:DATA:TELecom:SDH:PAYLoad?

Returns: <discrete>

:SENSe:DATA:TELecom:SDH:PRIMary:TS0 <boolean>

<boolean> =	0 or OFF	Data in TS0
	1 or On	Signalling in TS0

Determines the content of TS0 as either Data or Signalling.

:SENSe:DATA:TELecom:SDH:PRIMary:TS0?

Returns: <boolean>

TUG Channel

:SENSe:DATA:TELecom:SDH:TUG3 <numeric>

<numeric> = 1 to 3

Selects the SDH Receiver active TUG3 within the foreground AU4.

:SENSe:DATA:TELecom:SDH:TUG3?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:TUG2 <numeric>

<numeric> = 1 to 7

Selects the SDH Receiver active TUG2 within the selected TUG3 or AU3.

:SENSe:DATA:TELecom:SDH:TUG2?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:TU <numeric>

<numeric> =	1 to 3	Tributary Number for TU-12
	1 to 4	Tributary Number for TU-11

Selects the SDH Transmitter active TU within the selected TUG2.

:SENSe:DATA:TELecom:SDH:TU?

Returns: <numeric>

SENSe subsystem - Receiver Overhead Monitor

:SENSe:DATA:TELecom:SDH:OVERhead:CHANnel <numeric>

<numeric> =	1 to 64	AU number

Selects the STM-1 Channel from which the overhead bytes will be captured.

:SENSe:DATA:TELecom:SDH:OVERhead:CHANnel?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:DDCC <discrete>

<discrete> =	NONE	Turns both Off
	RDCC	Regenerator Section DCC
	MDCC	Multiplexer Section DCC

Selects the Data Communications channel to be dropped via the DROP port, for DCC test function.

:SENSe:DATA:TELecom:SDH:DDCC?

Returns: <discrete>

Trace Identifier Mismatch Commands

:SENSe:DATA:TELecom:SDH:OVERhead:J0:TIM <boolean>

<boolean> =	0 or OFF	RS-TIM alarm is disabled
	1 or On	RS-TIM alarm is enabled

Specifies whether to monitor the J0 byte for the RS-TIM alarm. This is determinded by comparing the incoming J0 trace message with the expected message configured by the commands detailed below.

:SENSe:DATA:TELecom:SDH:OVERhead:J0:TIM?

Returns: <boolean>

:SENSe:DATA:TELecom:SDH:OVERhead:J0:TIM:PATTern <discrete>

<discrete> =	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of pattern that is expected in the J0 byte of the STM regenerator section overhead.

:SENSe:DATA:TELecom:SDH:OVERhead:J0:TIM:PATTern?

Returns: <discrete>

:SENSe:DATA:TELecom:SDH:OVERhead:J0:TIM:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the expected J0 byte of the regenerator section overhead.

The command parameter is a 15 character long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long.

:SENSe:DATA:TELecom:SDH:OVERhead:J0:TIM:PATTern:B16Crc?

Returns: <string>

:SENSe:DATA:TELecom:SDH:OVERhead:J0:TIM:PATTern:B64 <string>

<string> =

Sets the 64-byte sequence of the expected J0 byte of the regenerator section overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long.

:SENSe:DATA:TELecom:SDH:OVERhead:J0:TIM:PATTern:B64?

Returns: <string>

:SENSe:DATA:TELecom:SDH:POVerhead:J1:TIM <boolean>

<boolean> =	0 or OFF	HP-TIM alarm is disabled
	1 or On	HP-TIM alarm is enabled

Specifies whether to monitor the J1 byte for the HP-TIM alarm. This is determinded by comparing the incoming J1 trace message with the expected message configured by the commands detailed below.

:SENSe:DATA:TELecom:SDH:POVerhead:J1:TIM?

Returns: <boolean>

:SENSe:DATA:TELecom:SDH:POVerhead:J1:TIM:PATTern <discrete>

<discrete> =	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of pattern that is expected in the J1 byte of the STM path overhead.

:SENSe:DATA:TELecom:SDH:POVerhead:J1:TIM:PATTern?

Returns: <discrete>

:SENSe:DATA:TELecom:SDH:POVerhead:J1:TIM:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the expected J1 byte of the path overhead. The

command parameter is a 15 character long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long.

:SENSe:DATA:TELecom:SDH:POVerhead:J1:TIM:PATTern:B16Crc?

Returns: <string>

:SENSe:DATA:TELecom:SDH:POVerhead:J1:TIM:PATTern:B64 <string>

<string> =

Sets the 64-byte sequence of the expected J1 byte of the path overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long.

:SENSe:DATA:TELecom:SDH:POVerhead:J1:TIM:PATTern:B64?

Returns: <string>

SENSe subsystem - Data Capture Commands

The following commands are used to configure data capture for SDH. General commands for data capture are found in the Common Commands chapter.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SDH:SECTion <discrete>

<discrete> =	FRAMe	A1A2 Error
	RSBip	RS BIP (B1) Error
	MSBip	MS BIP (B2) Error
	MSRei	MS REI Error

Selects SDH Section Overhead error for triggering data capture.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SDH:SECTion?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SDH:PATH <discrete>

<discrete> =	PBIP	Path BIP (B3) Error
	HPRei	HP REI Error
	TCIec	TCM IEC Error
	TCRei	TCM REI Error
	OEI	TCM OEI Error

Selects SDH Path Overhead error for triggering data capture.

TCM errors are only valid when the appropriate SDH Tandem Connection Monitoring functionality is enabled.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SDH:PATH?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SDH:SECTion <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	MSAis	MS AIS
	MSRDi	MS RDI
	PTAD	Pointer Activity
	K1K2	K1K2 Change

Selects SDH alarm for triggering Section Overhead data capture.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SDH:SECTion?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SDH:PATH <discrete>

<discrete> =	HPRDi	HP-RDI
	PUNequipped	HP-UNEQ
	VCAis	TCM VC-AIS
	TCRDi	TCM TC-RDI
	ODI	TCM TC-ODI
	TCOom	TCM TC-OOM
	IAIS	TCM TC-IAIS

Selects SDH alarm for triggering Path Overhead data capture.

TCM alarms are only valid when the appropriate SDH Tandem Connection Monitoring functionality is enabled.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SDH:PATH?

Returns: <discrete>

SENSe subsystem - Receiver SDH Overhead Monitor Commands

:SENSe:DATA:TELecom:SDH:OCAPture:CHANnel:SELect <numeric>

<numeric> = 1 to 64 AU number

Selects the STM-1 Channel from which the overhead sequence will be captured.

:SENSe:DATA:TELecom:SDH:OCAPture:CHANnel:SELect?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:OCAPture:OHBYte <discrete>

<discrete> = A1A2 | BNDA1A2 | E1 | F1 | D1D3 | K1K2 | H1 | D4D12 | S1 | M0 | M1 | J1 | E2 | C2 | G1 | F2 | H4 | F3 | K3 | N1 | H1H2_1 | H1H2_2 | H1H2_3 | H3_1 | H3_2 | H3_3 | Xrc

Selects the overhead channel to be captured.

A byte/channel may also be selected by using an 'Xrc' notation where 'r' specifies the row of the required byte and 'c' specifies the column.

For example, specifying 'X24' will select the 4th byte on the 2nd row of the specified STM-1 structure.

:SENSe:DATA:TELecom:SDH:OCAPture:OHBYte?

Returns: <discrete>

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:SELection <discrete>

<discrete> =	MANual	Manual Trigger
	PRE	Pre-Capture Trigger
	CENTered	Centered-Capture Trigger
	POST	Post-Capture Trigger

Selects the type of trigger for Overhead Capture.

When MANual trigger is selected, capture is started using the :SENSe:DATA:TELecom:SDH:OCAPture command. PRE-trigger capture will capture up to 255 elements before the trigger pattern. CENTered capture captures elements either side of the trigger pattern. POST capture captures up to 255 elements after the trigger pattern.

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:SELection?

Returns: <discrete>

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:POLarity <discrete>

<discrete> =	ON	Triggers when capture data MATCHES trigger pattern
	ONNot	Triggers when capture data DOES NOT MATCH trigger pattern

Selects whether the trigger will start capture on data matching the trigger pattern or not matching the trigger pattern.

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:POLarity?

Returns: <discrete>

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:PATTern <string>

<string> = See Below

Sets the overhead capture trigger pattern as a string of hexadecimal digits. The number of hexadecimal characters is dependent on the overhead channel selected by :SENSe:DATA:TELecom:SDH:OCAPture:OHBYte <discrete>. Two hexadecimal characters are required per byte, for example:

TCMACT - 1 byte "00" to "FF"
FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:PATTern?

Returns: <string>

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:MASK <string>

<string> = See Below

Sets the mask for the overhead capture trigger as a string of hexadecimal characters. Allows certain bits of the trigger pattern to masked. The number of hexadecimal characters is dependent on the overhead channel selected by :SENSe:DATA:TELecom:SDH:OCAPture:OHBYte <discrete>.

:SENSe:DATA:TELecom:SDH:OCAPture:TRIGger:MASK?

Returns: <string>

:SENSe:DATA:TELecom:SDH:OCAPture <discrete>

<discrete> =	STOP	Stop current current
	STARt	Start new capture

Stops or starts overhead sequence capture.

:SENSe:DATA:TELecom:SDH:OCAPture?

Returns: <discrete>

SENSe Subsystem - Signal Wizard SDH Frame Layer

The following commands will only be relevant when a valid SDH frame or a valid SDH payload in an OTN frame has been detected on the selected input port.

:SENSe:DATA:TELecom:SIGWizard:SDH:RATe?

Returns: <string> Eg. "STM-64"

Returns the line rate of the detected signal

:SENSE:DATA? "SIGWizard:SDH:AIS"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the AIS alarm.

:SENSE:DATA? "SIGWizard:SDH:B1"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the B1 error indicator.

:SENSE:DATA? "SIGWizard:SDH:B2"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the B2 error indicator.

:SENSE:DATA? "SIGWizard:SDH:RDI"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the RDI alarm.

:SENSE:DATA? "SIGWizard:SDH:REI"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the REI alarm.

AU - AU Layer

The following commands will only return valid values in a valid SDH signal carrying supported mappings has been detected on the selected port.

In the AU level AU channels are referred to in two ways:

1. The standard AUG-64, AUG-4 etc...
2. A logical offset from the start of the frame (in AU-3s equivalents). This is counted in slices so we have all the AU3#1s as 0-64 (for STM64), followed by the AU3#2s as 65+.

The two approaches to channel selection are fully interchangable.

:SENSe:DATA:TELecom:SIGWizard:AU:AUG64 <numeric>

<numeric> = 1-1

Sets the AUG-64 that all following commands will focus on.

:SENSe:DATA:TELecom:SIGWizard:AU:AUG64?

Returns: <numeric>

:SENSe:DATA:TELecom:SIGWizard:AU:AUG16 <numeric>

<numeric> = 1-4

Sets the AUG-16 that all following commands will focus on.

:SENSe:DATA:TELecom:SIGWizard:AU:AUG16?

Returns: <numeric>

:SENSe:DATA:TELecom:SIGWizard:AU:AUG4 <numeric>

<numeric> = 1-4

Sets the AUG-4 that all following commands will focus on.

:SENSe:DATA:TELecom:SIGWizard:AU:AUG4?

Returns: <numeric>

:SENSe:DATA:TELecom:SIGWizard:AU:AUG1 <numeric>

<numeric> = 1-4

Sets the AUG-1 that all following commands will focus on.

:SENSe:DATA:TELecom:SIGWizard:AU:AUG1?

Returns: <numeric>

:SENSe:DATA:TELecom:SIGWizard:AU:AU3 <numeric>

<numeric> = 1-4

Sets the AUG-3 that all following commands will focus on.

:SENSe:DATA:TELecom:SIGWizard:AU:AU3?

Returns: <numeric>

:SENSe:DATA:TELecom:SIGWizard:AU:CHANnel <numeric>

<numeric> = 1-192

Sets the start of the channel the following commands will focus on. All following commands act on the currently selected channel.

:SENSe:DATA:TELecom:SIGWizard:AU:STARt?

Returns: <Numeric>

Returns the start of the currently selected channel.

:SENSe:DATA:TELecom:SIGWizard:AU:SIZE?

Returns: <Numeric>

Returns the size (in AU-3 equivalents) of the currently selected channel.

AU - AU Layer [SENSe:DATA?]

:SENSE:DATA? "SIGWizard:AU:STATe"

Returns: <discrete>= OK | ERR | HIST | AIS | ILLegal | UNEQ | TRANS

:SENSE:DATA? "SIGWizard:AU:AIS"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the AIS alarm.

:SENSE:DATA? "SIGWizard:AU:LOP"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the LOP alarm.

:SENSE:DATA? "SIGWizard:AU:B3"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the B3 error indicator.

:SENSE:DATA? "SIGWizard:AU:REI"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the REI alarm.

:SENSE:DATA? "SIGWizard:AU:RDI"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the RDI alarm.

SENSe subsystem - Result Returning Commands

SDH Error Results

:SENSE:DATA? <string>

<string> = "<Return Type>:SDH:LSECond:<error>" for last second results

<string> = "<Return Type>:SDH:<error>" for total results

<Return Type> is one of the following

ECOunt	For returning Error Counts
ERATio	For returning Error Ratios

<error> is one of the following

FRAMe	Frame errors
RSBip	RS B1 BIP errors
MSBip	MS B2 BIP errors
MSRei	MS REI errors.
PBIP	AU B3 BIP errors
HPRei	HP-REI errors
TRIB:PBIP	TU Path BIP errors
TRIB:REI	LP REI errors
TCM:PIEC	TCM PIEC errors
TCM:REI	TCM REI errors
TCM:OEI	TCM OEI errors
TCM:ERR	TCM Error errors.
TCM:TU:PIEC	TCM LP PIEC errors
TCM:TU:REI	TCM LP REI errors
TCM:TU:OEI	TCM LP OEI errors
TCM:TU:ERR	TCM LP Error errors
TCM:TU:BIPN2	TCM LP N2 BIP errors

Returns: <numeric>

SDH Analysis Results

:SENSE:DATA? <string>

<string> = "<Result type>:SDH:<Path Type>:<Type>"

		<Type> =		
<Result type> =		G828	G826	M2101 | M21011
ESEConds	Error Seconds	X	X	X
SESeconds	Severely Errored Seconds	X	X	X
SEPeriod	Severely Errored Period	X		
EBCount	Errored block count	X	X	
BBECount	Background block error count	X	X	X
ESRatio	Error Second Ratio	X	X	
SESRatio	Severely Errored Second Ratio	X	X	
SEPI	Severely Errored Period Intensity	X		
BBERatio	Background Block Error ratio	X	X	
UASeconds	Unavailable	X	X	X

	seconds			
PUASeconds	Path Unavail-able seconds	X	X	X

<Path type> =

RSBip	RSOH B1 block errors
MSBip	MSOH B2 block errors
MSRei	MSOH REI block errors
PBIP	HO Path B3 block errors
REI	HO Path REI block errors
TU:BIP	Low path BIP
TU:REI	LP-REI
TCM:PIEC	HO TC Path IEC block errors
TCM:REI	HO TC Path REI block errors
TCM:TU:IEC	LO TC path IEC block errors
TCM:TU:REI	LO TC path REI block errors
BIT	Bit errors (Out Of Service)

Returns: <numeric>

SDH Pointer Activity Results

:SENSE:DATA? <string>

<string> = "PACTivity:SDH:<type>" where <type> is one of the following

PVALue	AU Pointer value
NDFSeconds	AU Pointer NDF seconds
MNDFseconds	AU Pointer MNDF seconds
PCOunt	AU Pointer +ve Adj Count
PSEConds	AU Pointer +ve Adj Seconds
NCOunt	AU Pointer -ve Adj Count
NSEConds	AU Pointer -ve Adj Seconds
IOFFset	Implied VC4 Offset
TU:PVALue	TU Pointer value
TU:NDFSeconds	TU Pointer NDF seconds
TU:MNDFseconds	TU Pointer MNDF seconds
TU:PCOunt	TU Pointer +ve Adj Count
TU:PSEConds	TU Pointer +ve Adj Seconds
TU:NCOunt	TU Pointer -ve Adj Count
TU:NSEConds	TU Pointer -ve Adj Seconds
TU:IOFFset	Implied TU VC Offset

Returns: <numeric>

SDH Alarm Seconds Results

:SENSE:DATA? <string>

<string> = "ASEConds:SDH:<alarm>"

<alarm> is one of the following

LOF	Loss Of Frame
OOF	Out Of Frame
AULop	Loss Of Pointer
RSTim	Regenerator Section Trace Identifier Mismatch (RS-TIM)
MSAis	Multiplexer Section AIS
PAIS	Path AIS
MSRDi	Multiplexer Section RDI
HPRDi	HP-RDI
HPTim	High-Order Path Trace Identifier Mismatch (HP-TIM)
PUNeq	Path Unequipped
AISC	Concat AIS alarm
LOPC	Concat LOP alarm
K1K2	K1K2 byte change
H4MF	H4 loss of multi-frame
TU:PUNeq	Tributary Path Unequipped
TU:RFI	
TU:LOP	TU Loss of Pointer
TU:PAIS	TU Path AIS
TU:RDI	LP-RDI
TU:P1P0	P1P0
OPSL	Overhead Pattern Sync Loss

Enhanced RDI :

ERDI:PAYLoad	High order path Enhanced RDI Payload
ERDI:SERVer	High order path Enhanced RDI Server
ERDI:CONNection	High order path Enhanced RDI Connection
ERDI:TU: PAYLoad	Low order path Enhanced RDI Payload
ERDI:TU: SERVer	Low order path Enhanced RDI Server

ERDI:TU:CONNection	Low order path Enhanced RDI Connection

Tandem Connection Monitoring :

TCM:OOM	High path Loss of multiframe
TCM:IAIS	High path Incoming AIS
TCM:RDI	High path Remote Defect Indication
TCM:ODI	High path Outgoing Defect Indication
TCM:UNEQ	High path Unequal Indication
TCM:VCAis	High path VC alarm indication signal
TCM:TU:OOM	Low path Loss of multiframe
TCM:TU:IAIS	Low path Incoming AIS
TCM:TU:RDI	Low path Remote Defect Indication
TCM:TU:ODI	Low path Outgoing Defect Indication
TCM:TU:UNEQ	Low path Unequal Indication
TCM:TU:VCAis	Low path VC alarm indication signal

Returns: <numeric>

FETCh subsystem

The FETCh subsystem is used to retrieve data directly accumulated by the instrument.

SDH Data Capture Results

:FETCh:ARRay:DATA:TELecom:SDH:DCAPture:DATA? <numeric>, <numeric>, <numeric>

<numeric> = Frame Index.

<numeric> = STM-1 Number (Min = 1, Max = 64)

<numeric> = STM-0 Number (Min = 1, Max = 3)

Returns: <numeric>, <numeric>...<numeric>

Returns comma separated byte values for the specified columns of the selected frame. A STM-0 value of 1 will return the byte values for columns 1, 4 and 7 of the selected STM-1; a value of 2 will return the byte values for columns 2, 5 and 8 of the selected STM-1; while a value of 3 will return columns 3, 6 and 9 of the selected STM-1.

For example, if the STM-0 value is 2 for a specified STM-1, the bytes are returned as follows:

<col(2), row(1)>, <col(2), row(2)>, <col(2), row(3)>,...<col(2), row(9)>,
<col(5), row(1)>, <col(5), row(2)>, <col(5), row(3)>,...<col(5), row(9)>,
<col(8), row(1)>, <col(8), row(2)>, <col(8), row(3)>,...<col(8), row(9)>

:FETCh:ARRay:DATA:TELecom:SDH:DCAPture:PDATa? <numeric>

<numeric> = Frame Index.

Returns: <numeric>, <numeric>...<numeric>

Returns the byte values of the Path Overhead from the specified frame.

:FETCh:SCALar:DATA:TELecom:SDH:DCAPture:DATA? <numeric>, <numeric>, <numeric>, <discrete>

<numeric> = Frame Index.

<numeric> = STM-1 Number (Min = 1, Max = 64)

<numeric> = STM-0 Number (Min = 1, Max = 3)

<discrete> = Section Overhead Byte Name

Returns: <numeric>

Returns the value of a specific Section Overhead byte within the STM-0 frame.

:FETCh:SCALar:DATA:TELecom:SDH:DCAPture:PDATa? <numeric>, <discrete>

<numeric> = Frame Index.

<discrete> = Path Overhead Byte Name

Returns: <numeric>

Returns the value of a specific Path Overhead byte in a captured frame.

SDH Overhead Bytes

:FETCh:ARRay:DATA:TELecom:SDH:OVERhead:DATA? <numeric>

<numeric> = 1 to 3 STM-0 group

Returns: <numeric>, <numeric>,.....<numeric>

The parameter identifies a set of columns within the selected STM-1. A Value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of 3 selects Columns 3,6 & 9.

Returns the value of the selected section overhead as a comma seperated list of 27 integer numerical values in the range 0 to 255.

The values are arranged as shown

<row1 col1>,<row1 col2>,<row1 col3>....<row1 col9>

<row2 col1>,<row2 col2>,<row2 col3>....<row2 col9>
<row3 col1>.....<row8 col9>
<row9 col1>,<row9 col2>,<row9 col3>.. ..<row9 col9>

The channel to be monitored is identified by the command :SENSe:DATA:TELecom:SDH:OVERhead:CHANnel <numeric>.

:FETCh:ARRay:DATA:TELecom:SDH:POVerhead:DATA?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the high order path overhead bytes as an array of 9 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:SDH:TU:POVerhead:DATA?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the low order path overhead bytes as an array of 9 numeric values. Each numeric is in the range 0 to 255.

:FETCh:SCALar:DATA:TELecom:SDH:OVERhead:DATA? <numeric>, <discrete>

<numeric> = 1 to 3 Column number

<discrete> = A1 | A2 | J0/Z0 | E1 | F1 | D1 | D2 | D3 | H1 | H2 | H3 | K1 | K2 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | S1 | M0 | M1 | E2 | B1 | B2 | X11 | X12 | X13 | X21 | X22 | X23 | X31 | X32 | X33 | X41 | X42 | X43 | X51 | X52 | X53 | X61 | X62 | X63 | X71 | X72 | X73 | X81 | X82 | X83 | X91 | X92 | X93

Returns: <numeric>

Returns the value of a single named byte of the selected transmitter section overhead. The required byte is specified by 2 command parameters.

The first parameter identifies a set of columns within the selected STM-1. A value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of 3 selects Columns 3,6 & 9. For the STM-0 signal rate, only 1 is valid.

The second parameter identifies the specific byte in the selected set of columns. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names is shown in the table above. The second method is to use an "Xrc" notation, where r is the numerical value of the bytes row in the transport overhead and c is the numerical value of the bytes column in the transport overhead.

This method allows access to ANY byte in the selected STM-1 / Column set.

:FETCh:SCALar:DATA:TELecom:SDH:POVerhead:H4Sequence?

Returns: <discrete> = LONG | SHORt | C0C1 | UNKNown

Obtains the length of the H4 byte sequence.

:FETCh:SCALar:DATA:TELecom:SDH:POVerhead:DATA? <discrete>

<discrete> = C2 | G1 | F2 | H4 | F3 | K3 | N1 | B3 | J1

Returns: <numeric>

Returns the value of a single named byte of the selected foreground high order path overhead byte.

:FETCh:SCALar:DATA:TELecom:SDH:TU:POVerhead:DATA? <discrete>

<discrete> = C2 | G1 | F2 | H4 | F3 | K3 | N1 | B3 | J1 | V5 | J2 | N2 | K4

Returns: <numeric>

Returns the value of a single named byte of the selected foreground low order path overhead byte.

SDH Labelled Overhead Bytes

:FETCh:SCALar:DATA:TELecom:SDH:OVERhead:K1?

Returns: <numeric>

Returns the value of the K1 APS signalling overhead byte.

:FETCh:SCALar:DATA:TELecom:SDH:OVERhead:K2?

Returns: <numeric>

Returns the value of the K2 APS signalling overhead byte.

:FETCh:SCALar:DATA:TELecom:SDH:OVERhead:S1?

Returns: <numeric>

Returns the value of the S1 Synchronisation Status overhead byte.

SDH Overhead Trace Messages

:FETCh:ARRay:DATA:TELecom:SDH:TCM:APID?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the high order TC-APId as a comma seperated list of integers. Each integer is in the range 0 to 255. There is no block header.

:FETCh:ARRay:DATA:TELecom:SDH:J0?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the STM-N regenerator overhead J0 byte as a comma seperated list of integer numeric values. Each number is in the range 0 to 255. There is no block header.

:FETCh:ARRay:DATA:TELecom:SDH:J1?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the high order J1 path trace byte as a comma seperated list of integer numeric values. Each number is in the range 0 to 255. There is no block header.

:FETCh:ARRay:DATA:TELecom:SDH:TU:J1?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the low order J1 path trace byte as a comma seperated list of integer numeric values. Each number is in the range 0 to 255. There is no block header.

:FETCh:ARRay:DATA:TELecom:SDH:TU:J2?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the low order J2 path trace byte as a comma seperated list of integer numeric values. Each number is in the range 0 to 255. There is no block header.

:FETCh:STRing:DATA:TELecom:SDH:J0?

Returns: <string>

Returns the value of the high order J0 path trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:SDH:J1?

Returns: <string>

Returns the value of the high order J1 path trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:SDH:TU:J1?

Returns: <string>

Returns the value of the low order J1 path trace byte as 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:SDH:TU:J2?

Returns: <string>

Returns the value of the low order J2 path trace byte as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:SDH:TCM:APID?

Returns: <string>

Returns the value of the high order TCM APID trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:SDH:TU:TCM:N1:APID?

Returns: <string>

Returns the value of the low order N1 TCM APID trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:STRing:DATA:TELecom:SDH:TU:TCM:N2:APID?

Returns: <string>

Returns the value of the low order N2 TCM APID trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

SDH Overhead Sequence Capture Results

:FETCh:SCALar:DATA:TELecom:SDH:OCAPture:MINelement?

Returns: <numeric>

Returns the minimum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:SDH:OCAPture:MAXelement?

Returns: <numeric>

Returns the maximum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:SDH:OCAPture:FCOunt? <numeric>

<numeric> = Element Index

Returns: <numeric>

Returns the capture repeat count of the specified element in numeric form. Individual elements may be captured up to 65535 times before a new element is entered into the captured sequence.

The sequence element index (numeric parameter) can be in the range -255 to +255 depending on the trigger selection.

The element which triggered sequence capture (the element that met the trigger criteria) is specified by index 0. Since 256 elements may be captured, pre-trigger can capture elements indexed -255 to 0 whilst post-trigger capture can capture elements indexed 0 to +255.

:FETCh:STRing:DATA:TELecom:SDH:OCAPture:DATA? <numeric>

<numeric> = Element Index.

Returns: <string>

Returns the capture data of the specified element in string form. The data is represented by hexadecimal characters. The number of characters depends on the selected capture channel.

:FETCh:ARRay:DATA:TELecom:SDH:OCAPture? <numeric>

<numeric> = Number of elements to return.

Returns: <array>

Returns an array with the number of entries determined by <numeric> and seperated by CR/LF.

Each entry consists of an alphanumeric string and a numeric seperated by commas. The alphanumeric string provides the hexadecimal value of the captured data. The length of the string depends upon the overhead channel selected for capture, two hexadecimal characters/overhead byte. The numeric indicates indicates the number of frames for which the captured data existed.

If this command is issued when a capture is being performed, some entries will contain no data. In this case 9.91E+37 is returned.

FETCh Subsystem - Signal Wizard SDH Frame Layer

The following commands will only be relevant when a valid SDH frame or a valid SDH payload in an OTN frame has been detected on the selected input port.

:FETCh:SCALar:DATA:TELecom:SIGWizard:SDH:S1

Returns: <numeric>

Returns the value of the S1 byte.

:FETCh:STRing:DATA:TELecom:SIGWizard:SDH:TRACe?

Returns: <string>

Returns the contents of the J0 Trace Message.

AU - AU Layer

The following commands will only return valid values in a valid SDH signal carrying supported mappings has been detected on the selected port.

In the AU level AU channels are referred to in two ways:

1. The standard AUG-64, AUG-4 etc...
2. A logical offset from the start of the frame (in AU-3s equivalents). This is counted in slices so we have all the AU3#1s as 0-64 (for STM64), followed by the AU3#2s as 65+.

The two approaches to channel selection are fully interchangable.

:FETCh:ARRay:DATA:TELecom:SIGWizard:AU:OVERview?

Returns: <block data> 4 numeric values for each channel:
Channel Start

Size (AU3s)

State (0 = Ok, 1 = Error, 2 = Historical Error, 3 = AIS, 4 = Illegal, 5 = Un-equipped, 6 = Transient)

1 = Has TU substructure

:FETCh:ARRay:DATA:TELecom:SIGWizard:AU:FAULts?

Returns: <block data>

An array of the Channel Start values of all channels that are not in OK state.

:FETCh:SCALar:DATA:TELecom:SIGWizard:AU:C2?

Returns: <numeric>

Returns the value of the C2 byte.

:FETCh:STRing:DATA:TELecom:SIGWizard:AU:TRACe:LIST?

Returns: <string>

Returns the J1 Trace Message.

:FETCh:STRing:DATA:TELecom:SIGWizard:AU:TRACe:SEARch? <string>

<string> = Search String

Returns: <block data> Numerics

Returns an array of all the channel start positions for all J1 Trace messages containg the search string.

SYSTem Subsystem - SDH Trigger Output Commands

:SYSTem:TRIGger:RECeive:ERRor:SDH:SECTion <discrete>

<discrete> =	FRAMe	A1A2 Error
	RSBip	RS BIP (B1) Error
	MSBip	MS BIP (B2) Error
	MSRei	MS REI Error

Selects SDH Section Overhead error for trigger output when :SYSTem:TRIGger:RECeive:ERRor:STANdard <discrete> is set to SOH.

:SYSTem:TRIGger:RECeive:ERRor:SDH:SECTion?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ERRor:SDH:PATH <discrete>

<discrete> =	PBIP	Path BIP (B3) Error
	HPRei	HP REI Error

Selects SDH Path Overhead error for trigger output when :SYSTem:TRIGger:RECeive:ERRor:STANdard <discrete> is set to POH.

:SYSTem:TRIGger:RECeive:ERRor:SDH:PATH?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ERRor:SDH:TCM <discrete>

<discrete> =	TCIec	TCM IEC Error
	TCRei	TCM REI Error
	OEI	OEI Error

Selects SDH Tandem Connection Monitoring error for trigger output when :SYSTem:TRIGger:RECeive:ERRor:STANdard <discrete> is set to TCM.

:SYSTem:TRIGger:RECeive:ERRor:SDH:TCM?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:SDH:SECTion <discrete>

<discrete> =	LOF	Loss of Frame
	OOF	Out of Frame
	MSAis	MS AIS
	MSRDi	MS RDI
	PTAD	Pointer Activity
	K1K2	K1K2 Change

Selects SDH Section Overhead alarm for trigger output when :SYSTem:TRIGger:RECeive:ALARm:STANdard <discrete> is set to SOH.

:SYSTem:TRIGger:RECeive:ALARm:SDH:SECTion?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:SDH:PATH <discrete>

<discrete> =	PAIS	AU-AIS
	AISC	AU-AIS-C
	HPRDi	HP-RDI
	AULop	AU-LOP
	LOPC	AU-LOP-C
	PUNequipped	HP-UNEQ

Selects SDH Path Overhead alarm for trigger output when :SYSTem:TRIGger:RECeive:ALARm:STANdard <discrete> is set to POH.

:SYSTem:TRIGger:RECeive:ALARm:SDH:PATH?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:SDH:TCM <discrete>

<discrete> =	VCAis	VC-AIS
	TCRDi	TC-RDI
	ODI	TC-ODI
	TCOom	TC-OOM
	IAIS	TC-IAIS

Selects SDH Tandem Connection Monitoring alarm for trigger output when :SYSTem:TRIGger:RECeive:ALARm:STANdard <discrete> is set to TCM.

:SYSTem:TRIGger:RECeive:ALARm:SDH:TCM?

Returns: <discrete>

6
SONET Command Reference

OUTPut subsystem

:OUTPut:TELecom:SONet:PAYLoad:LOCation <discrete>

<discrete> =	INTernal	
	EXTernal	

This command selects the SONet insert payload location.

:OUTPut:TELecom:SONet:PAYLoad:LOCation?

Returns: <discrete>

:OUTPut:TELecom:SONet:PAYLoad:CODE <discrete>

<discrete> =	CMI	140Mb/s only
	B3ZS	DS3
	HDB3	34Mb/s, 8Mb/s, 2Mb/s
	B8ZS	DS1
	AMI	DS1

Selects the drop interface line code for the SONET payload.

:OUTPut:TELecom:SONet:PAYLoad:CODE?

Returns: <discrete>

INPut subsystem

:INPut:TELecom:SONet:PAYLoad:LOCation <discrete>

<discrete> = INTernal
EXTernal

This command selects the SONET drop payload location.

:INPut:TELecom:SONet:PAYLoad:LOCation?

Returns: <discrete>

:INPut:TELecom:SONet:PAYLoad:CODE <discrete>

<discrete> =	CMI	140Mb/s only
	B3ZS	DS3
	HDB3	34Mb/s, 8Mb/s, 2Mb/s
	B8ZS	DS1
	AMI	DS1

Selects the insert interface line code for the SONET payload.

:INPut:TELecom:SONet:PAYLoad:CODE?

Returns: <discrete>

SOURce subsystem - Transmitter Settings

:SOURce:DATA:TELecom:SONet:RATE <discrete>

<discrete> =	OC192	10Gb/s
	OC48	2.5Gb/s
	OC12	622Mb/s
	OC3	155Mb/s optical
	STS3	155Mb/s electrical
	OC1	52Mb/s optical
	STS1	52Mb/s electrical

Controls the characteristics of the instrument's output ports.

Sets the output rate for the instrument output port.

:SOURce:DATA:TELecom:SONet:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:THRumode:COVerwrite <boolean>

<boolean> =	0 or OFF	
	1 or On	

Controls the overhead overwrite thru mode feature.

Enables or disables overhead overwrite. Thru mode must be enabled for this to be set.

:SOURce:DATA:TELecom:SONet:THRumode:COVerwrite?

Returns: <boolean>

Mapping Settings

:SOURce:DATA:TELecom:SONet:SPE:STRucture <discrete>

<discrete> = MIXed

PRESet

Sets the type of mapping structure to be generated. In preset mode the mappings will be the same size of the foreground except for STS_6C, STS_9C and STS_24C.

:SOURce:DATA:TELecom:SONet:SPE:STRucture?

Returns: <discrete>

Mixed Mappings Settings

The following commands are only available in Mixed Mapping mode.

:SOURce:DATA:TELecom:SONet:STS:MIXed:RESet <discrete>

<discrete> = STS1

STS3

Resets the Mixed mappings to it's default state with all channels STS-1 or STS-3c, and the first channel as the foreground channel.

:SOURce:DATA:TELecom:SONet:STS:MIXed:FOReground <numeric>

<numeric> = 1 to 192 Foreground channel number

Selects the foreground channel. The number is the number of STS-1 from the first channel.

The foreground channel number can be calculated using the following formula: (STS-3# -1) * 3 + STS-1#

Only the channel numbers of mappings that have actually been defined may be selected.

:SOURce:DATA:TELecom:SONet:STS:MIXed:FOReground?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:STS:MIXed:TYPE <numeric>, <discrete>

<numeric> =	1 to 192	Channel number
<discrete> =	STS1	Channel Size
	STS3	
	STS6	
	STS9	
	STS12	
	STS24	
	STS48	
	STS192	

Selects the size of the given channel.

The Channel number is as for :MIXed:FOReground.

Only valid if the given channel already exists, and the given size is a valid size for the given start position.

:SOURce:DATA:TELecom:SONet:STS:MIXed:TYPE? <numeric>

<numeric> =	1 to 192	Channel number

Returns: <discrete>

SPE Layer Selection

:SOURce:DATA:TELecom:SONet:SPE:TYPE <discrete>

<discrete> =	STS1
	STS3C

STS6C

STS9C

STS12C

STS24C

STS48C

STS192C

Selects the SPE mapping into an STS-N frame.

:SOURce:DATA:TELecom:SONet:SPE:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:STS3 <numeric>

<numeric> = 1 to 64 STS3 number under test.

Selects the transmitted STS-3 that is selected for test.

Only valid if :SOURce:DATA:TELecom:SONet:RATE <discrete> is set to a rate higher than STS-3.

:SOURce:DATA:TELecom:SONet:STS3?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:STS1 <numeric>

<numeric> = 1 to 3 STS1 Number

Selects the SONET Transmitter active STS-1 within the STS-3.

:SOURce:DATA:TELecom:SONet:STS1?

Returns: <numeric>

VT Layer Selection

:SOURce:DATA:TELecom:SONet:VT:TYPE <discrete>

<discrete> =	NONE	
	VT2	
	VT15	

Selects the VT mapping.

:SOURce:DATA:TELecom:SONet:VT:TYPE?

Returns: <discrete>

Payload Layer Selection

:SOURce:DATA:TELecom:SONet:PAYLoad <discrete>

<discrete> =	BULK	Bulk Filled
	M140	140 Mb/s
	M34	34 Mb/s
	ASM2	Asynchronous
	FLM2	2 Mb/s floating byte
	FLDS1	DS1 floating byte
	ASDS1	Asynchronous DS1
	DS3	DS3

This command controls the transmitter SONET payload for single payload cases.

:SOURce:DATA:TELecom:SONet:PAYLoad?

Returns: <discrete>

VT Group

:SOURce:DATA:TELecom:SONet:VTGRoup <numeric>

<numeric> =	1 to 7	VT Group

Selects the SONET Transmitter active VT Group within the foreground STS1.

:SOURce:DATA:TELecom:SONet:VTGRoup?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:VT <numeric>

<numeric> =	1 to 3	Tributary number for VT2
	1 to 4	Tributary number for VT1.5

Selects the SONET Transmitter active VT within the selected VT Group.

:SOURce:DATA:TELecom:SONet:VT?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:PAYLoad:FOFFset <boolean>

<boolean> =	0 or OFF	
	1 or On	

Enables or disables the SONET Payload Clock Frequency Offset.

:SOURce:DATA:TELecom:SONet:PAYLoad:FOFFset?

Returns: <boolean>

:SOURce:DATA:TELecom:SONet:PAYLoad:OFFSet <numeric>

<numeric> =	-100.0 to +100.0 [Suffix 'PPM']	Parts per Million

Sets the amount of payload frequency offset.

:SOURce:DATA:TELecom:SONet:PAYLoad:OFFSet?

Returns: <numeric>

Background Settings

:SOURce:DATA:TELecom:SONet:STS1:BACKground <discrete>

<discrete> =	UNEQuipped	Fixed at 00000000
	AS_FG	As Foreground

Selects the background payload pattern for VTs within the foreground VT Group.

:SOURce:DATA:TELecom:SONet:STS1:BACKground?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:STS1:BACKground:PAYLoad:PATTern <discrete>

<discrete> =	PRBS9	2^9-1
	PRBS15	2^15-1
	QRSS	2^20-1, 14-zero limited
	B1100	word 1100

Selects the background payload pattern for STS1s within the foreground VT Group.

:SOURce:DATA:TELecom:SONet:STS1:BACKground:PAYLoad:PATTern?

Returns: <discrete>

SOURce subsystem - Transmitter SONET Overhead Set Up

Lists the settings for the commands associated with the TRANSMIT OVERHEAD SET UP display. The following commands are only available when an SONET transmit signal rate is active.

:SOURce:DATA:TELecom:SONet:OVERhead:DEFault

Sets all overhead bytes to their default value.

:SOURce:DATA:TELecom:SONet:OVERhead:DATA <numeric>, <numeric>, <discrete>, <numeric>

<numeric> = 1 to 16 STS-3 Number

<numeric> = 1 to 3 Column Number

<discrete> = A1 | A2 | E1 | F1 | D1 | D2 | D3 | K1 | K2 | H1 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | S1/Z1 | M0/M1 | Z2 | E2 | X11 | X12 | X13 | X21 | X22 | X23 | X31 | X32 | X33 | X41 | X42 | X43 | X51 | X52 | X53 | X61 | X62 | X63 | X71 | X72 | X73 | X81 | X82 | X83 | X91 | X92 | X93 |

<numeric> = 0 to 255 Byte Value

Sets the value of the selected transmitter section overhead byte. All overhead bytes in the transmitted signal can be configured. The required byte is specified by 4 command parameters.

The first parameter, STS-3 Number, identifies an STS-3 within the signal. The acceptable range for this parameter will depend on the selected transmit signal rate. For the STS-1 signal rate only 1 is valid.

The second parameter identifies a set of columns within the selected STS-3. A Value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of 3 selects Columns 3,6 & 9. For the STS-1 signal rate only 1 is valid.

The third parameter identifies the specific byte in the selected set of columns. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names is shown in the table above. The

second method is to use an "Xrc" notation, where r is the numerical value of the bytes row in the transport overhead and c is the numerical value of the bytes column in the transport overhead. This method allows access to ANY byte in the selected STS-3 / Column set.

The fourth command parameter is the new value that will be transmitted in the specified byte. This value can be specified in hex, octal or decimal format.

:SOURce:DATA:TELecom:SONet:OVERhead:DATA? <numeric>, <numeric>, <discrete>

<numeric> =	1 to 16	STS-3 Number
<numeric> =	1 to 3	Column Number
<discrete> =	A1 | A2 | E1 | F1 | D1 | D2 | D3 | K1 | K2 | H1 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | S1/Z1 | M0/M1 | Z2 | E2 | X11 | X12 | X13 | X21 | X22 | X23 | X31 | X32 | X33 | X41 | X42 | X43 | X51 | X52 | X53 | X61 | X62 | X63 | X71 | X72 | X73 | X81 | X82 | X83 | X91 | X92 | X93 |	

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	FIXed	Fixed Byte Sequence
	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of pattern that is to be transmitted in the J0 byte of the STS regenerator section overhead. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames. Default is FIXed. ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:FIXed <numeric>

<numeric> = 0 to 255 Byte Value

Sets the fixed byte value of the J0 byte. Only relevant when :SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern <discrete> is set to FIXed.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:FIXed?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the J0 byte of the regenerator section overhead. The command parameter is a 15 character long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern <discrete> is set to B16Crc.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B64 <string>

<string> =

Sets the 64-byte sequence of the J0 byte of the regenerator section overhead.

If the string is not 64 characters long the instrument will either append NULLS

or truncate the string and terminate with a CR/LF to make it 64 characters long. The pattern repeats every 64 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern <discrete> is set to B64.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:ARRay?

Returns: <block>

Returns the J0 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using:SOURce:DATA:TELecom:SONet:OVERhead:J0: PATTern <discrete>.

:SOURce:DATA:TELecom:SONet:OVERhead:SBYTe <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	SYNChronized	(0000) Synchronized - traceability unknown
	STR1	(0001) Stratum 1 traceable
	STR2	(0111) Stratum 2 traceable
	TRANsit	(0100) Transit
	STR3	(1010) Stratum 3 traceable
	STRE3	(1101) Stratum 3E
	SONet	(1100) SONET minimum clock traceable
	NETWork	(1110) Network synchronization
	DONTusesync	(1111)

Selects the SONET SYNC message type (S1 Byte Bits 5 to 8). ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SONet:OVERhead:SBYTe?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POVerhead:DATA <discrete>, <numeric>

<discrete> = C2 | G1 | F2 | H4 | Z3 | Z4 | N1

<numeric> = 0 to 255 Byte Value

Sets the value of the specified STS-3, STS-12c, STS-48c and STS-192c foreground high order path overhead byte.

The N1 byte can only be set when the command :SOURce:DATA:TELecom:SDH:TCM:HPATh <boolean> is set to FALSE.

:SOURce:DATA:TELecom:SONet:POVerhead:DATA? <discrete>

<discrete> = C2 | G1 | F2 | H4 | Z3 | Z4 | N1

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of sequence to be transmitted within the J1 byte of the foreground high order path overhead.

ASRX is only when thru mode is enabled.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the J1 byte of the foreground high order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern <discrete> is set to B16Crc.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B64 <string>

<string> =

Sets the 64-byte sequence of the J1 byte of the foreground high order path overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long. The pattern repeats every 64 characters and is transmitted character by character in subsequent frames.

Only available when :SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern <discrete> is set to B64.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:ARRay?

Returns: <block>

Returns the high order J1 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern <discrete>.

:SOURce:DATA:TELecom:SONet:POVerhead:SLABel <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	UNEQuipped	Unequipped (00000000)
	EQUipped	Equipped (00000001)
	VTSTructure	VT Structure STS-1 SPE (00000010)
	LOCKed	Locked VT (00000011)
	DS3asyn	Asynchronous DS3 (00000100)
	DS4Naasyn	Asynchronous DS4NA (00010010)
	ATM	ATM (00010011)
	DQDB	DQDB (00010100)
	FDDI	FDDI (00010101)
	HDLC	HDLC(00010110)
	BULK	Bulk Filled (11111110)

Sets the value of the path label (C2 Byte) of the foreground high order path overhead.

ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SONet:POVerhead:SLABel?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:DATA <discrete>, <numeric>

<discrete> = C2 | G1 | F2 | H4 | Z3 | Z4

<numeric> = 0 to 255 Byte Value

Sets the value of the specified STS-3, STS-12c, STS-48c and STS-192c foreground low order path overhead byte.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:DATA? <discrete>

<discrete> = C2 | G1 | F2 | H4 | Z3 | Z4

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	B16Crc	16 Byte Sequence (with CRC)

Sets the type of sequence to be transmitted within the J2 byte of the foreground low order path overhead.

ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the J2 byte of the foreground low order path overhead. The command parameter is a 15 characters long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

Only valid when :SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern <discrete> is set to B16Crc.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern:ARRay?

Returns: <block>

Returns the low order J1 trace message as an array of numeric values. The number of numeric values returned depends on the pattern type set using :SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern <discrete>.

:SOURce:DATA:TELecom:SONet:POVerhead:H4Sequence <discrete>

<discrete> =	LONG	Long Sequence
	SHORt	Short Sequence
	COC1	COC1 Sequence

Sets the H4 Path overhead byte sequence length.

:SOURce:DATA:TELecom:SONet:POVerhead:H4Sequence?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:DATA <discrete>, <numeric>

<discrete> = C2 | G1 | F2 | H4 | Z3 | Z4

<numeric> = 0 to 255 Byte Value

Sets the value of the specified STS-3, STS-12c, STS-48c and STS-192c foreground low order path overhead byte.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:DATA? <discrete>

<discrete> = C2 | G1 | F2 | H4 | Z3 | Z4

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:V5:SLABel <numeric>

<numeric> = 0 to 7

Sets the value of the signal label (V5 Byte) of the foreground low order path overhead.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:V5:SLABel?

Returns: <numeric>

Overhead Sequences Commands

:SOURce:DATA:TELecom:SONet:SEQuence:STS1 <numeric>

<numeric> = 1 to 3 STS-1 number

Selects the STS-1 Channel from which the overhead sequence will be generated.

:SOURce:DATA:TELecom:SONet:SEQuence:STS1?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:SEQuence:STS3:SELect <numeric>

<numeric> = 1 to 64 STS-3 number

Selects the STS-3 Channel from which the overhead sequence will be generated.

:SOURce:DATA:TELecom:SONet:SEQuence:STS3:SELect?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:SEQuence:OHBYte <discrete>

<discrete> = A1A2 | BNDA1A2 | E1 | F1 | D1D3 | K1K2 | H1 | D4D12 | S1 | M0 | M1 | J1 | E2 | C2 | G1 | F2 | H4 | F3 | K3 | N1 | H1H2 | H3

Xrc

Selects the overhead channel to be used to transmit a sequence.

A byte/channel may also be selected by using an 'Xrc' notation where 'r' specifies the row of the required byte and 'c' specifies the column.

For example, specifying 'X24' will select the 4th byte on the 2nd row of the specified STS-3 structure.

:SOURce:DATA:TELecom:SONet:SEQuence:OHBYte?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:SEQuence:DEFault

Restores all sequence variables to their default values.

:SOURce:DATA:TELecom:SONet:SEQuence:INCRement

Resets the sequence repeat counts and data values and inserts incrementing values.

:SOURce:DATA:TELecom:SONet:SEQuence:FCOunt <numeric>, <numeric>

<numeric> =	1 to 256	Sequence Element Index
<numeric> =	0 to 65535	Sequence Element Repeat Count

For the selected sequence element specifies the number of frames in which the element data is to be transmitted.

:SOURce:DATA:TELecom:SONet:SEQuence:FCOunt? <numeric>

<numeric> =	1 to 256	Sequence Element Index

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:SEQuence:DATA <numeric>, <string>

<numeric> =	1 to 256	Element Index
<string> =	See Below	Element Data

Sets the sequence data pattern for the designated element to the hexadecimal value contained in the string. The number of hexadecimal characters is dependent on the overhead channel selected by :SOURce:DATA:TELecom:SONet:SEQuence:OHBYte <discrete>.

Two hexadecimal characters are required per byte, for example:

TCMACT - 1 byte "00" to "FF"
FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

:SOURce:DATA:TELecom:SONet:SEQuence:DATA? <numeric>

<numeric> =	1 to 256	Element Index

Returns: <string>

:SOURce:DATA:TELecom:SONet:SEQuence:MODE <discrete>

<discrete> =	SINGle	Single Run
	REPeat	Repeat Run

Selects whether to run a sequence once or repeatedly.

:SOURce:DATA:TELecom:SONet:SEQuence:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:SEQuence <discrete>

<discrete> =	STOP	Stop current sequence
	STARt	Start new sequence

Stops or starts a Single or Repeat run Sequence.

:SOURce:DATA:TELecom:SONet:SEQuence?

Returns: <discrete>

SOURce subsystem - Clock Offset Test Function

:SOURce:CLOCk:SONet:FOFFset <boolean>

<boolean> = 0 or OFF

1 or ON

Enables or disables the Clock Frequency Offset. The amount of Offset is set using :SOURce:CLOCk:SONet:FOFFset:OFFSet <numeric> <numeric>.

:SOURce:CLOCk:SONet:FOFFset?

Returns: <boolean>

:SOURce:CLOCk:SONet:FOFFset:ACTive?

Returns: <boolean>

:SOURce:CLOCk:SONet:FOFFset:OFFSet <numeric>

<numeric> = -100 to +100 parts per million

Sets the amount of Clock Frequency Offset when Frequency Offset is enabled.

:SOURce:CLOCk:SONet:FOFFset:OFFSet?

Returns: <numeric>

SOURce subsystem - Transmitter Error Test Functions

:SOURce:DATA:TELecom:SONet:ERRor:PHYSical <discrete>

<discrete> =	EFRame	Entire frame or data errors
	CODE	Line/code/BPV errors

Selects Physical Error Type to generate. Further selections of error rate is required.

:SOURce:DATA:TELecom:SONet:ERRor:PHYSical?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ERRor:TRANsport <discrete>

<discrete> =	FRAMe	A1A2 frame errors
	CVS	CV-S (Section B1 BIP) Errors
	CVL	CV-L (Line B2 BIP) Errors
	REIL	REI-L (Line FEBE) Errors

Selects Transport Error Type to generate. Further selection of :SOURce:DATA:TELecom:SONet:ERRor:RATE <discrete> is required.

:SOURce:DATA:TELecom:SONet:ERRor:TRANsport?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ERRor:PATH <discrete>

<discrete> =	CVP	CV-P (Path B3 BIP) Errors
	REIP	REI-P (Path FEBE) Errors
	REIV	REI-V (VT Path FEBE) Errors
	CVV	CV-V (VT Path BIP) Errors

Selects Path Error Type to generate. Further selection of :SOURce:DATA:TELecom:SONet:ERRor:RATE <discrete> is required.

:SOURce:DATA:TELecom:SONet:ERRor:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

:SOURce:DATA:TELecom:SONet:ERRor:RATE <discrete>

<discrete> =	NONE	Errors Off
	EALL	Error All
	APSThreshold	APS Threshold (MS Bit only)
	E_3	1E-3 Error rate
	E_4	1E-4 Error rate
	E_5	1E-5 Error rate
	E_6	1E-6 Error rate
	E_7	1E-7 Error rate
	E_8	1E-8 Error rate
	E_9	1E-9 Error rate
	USER	User defined error rate

Selects the transmitter Error Rate of the error type selected by the Test Error Group selection commands.

NOTE If this query returns USER, then :SOURce:DATA:TELecom:SONet:ERRor:RATE <discrete>? must be used.

:SOURce:DATA:TELecom:SONet:ERRor:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ERRor:RATE:USER <numeric>

<numeric> =	9.9E-9 to 1.7E-3	mantissa resolution 0.1, exponent resolution 1

Sets the user defined Error Add rate.
:SOURce:DATA:TELecom:SONet:ERRor:RATE <discrete> must be set to USER.

NOTE The maximum user defined error rate is dependent on both error type and line rate.

:SOURce:DATA:TELecom:SONet:ERRor:RATE:USER:ACTion <boolean>

<boolean> =	OFF	
	ON	User Value set as Error Rate

Sets the user defined Error Add rate specified by
:SOURce:DATA:TELecom:SONet:ERRor:RATE:USER <numeric>.

:SOURce:DATA:TELecom:SONet:ERRor:RATE:USER:ACTion?

Returns: <boolean>

:SOURce:DATA:TELecom:SONet:ERRor:RATE:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:ERRor:APSThreshold:NERRors <numeric>

<numeric> =	0 to 640	for STS-1
	0 to 1920	for STS-3
	0 to 7680	for STS-12
	0 to 30720	for STS-48

	0 to 122880	for STS-192

Sets the number of errors for the APS Threshold when :SOURce:DATA:TELecom:SONet:ERRor:RATE <discrete> is set to APSThreshold. Default = 0.

:SOURce:DATA:TELecom:SONet:ERRor:APSThreshold:NERRors?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:ERRor:APSThreshold:EINTerval <discrete>

<discrete> =	MS10	10 milliseconds
	MS100	100 milliseconds
	S1	1 second
	S10	10 seconds
	S100	100 seconds
	S1000	1,000 seconds
	S10000	10,000 seconds

Sets the interval between APS Threshold errors when :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete> <discrete> is set to APSThreshold .

:SOURce:DATA:TELecom:SONet:ERRor:APSThreshold:EINTerval?

Returns: <discrete>

SOURce subsystem - Transmitter Alarm Test Functions

Further commands (including Alarm Stress) can be found in the 'Transmitter Alarm Test Functions' section of the 'Common Commands' chapter.

:SOURce:DATA:TELecom:SONet:ALARm:PHYSical <discrete>

<discrete> =	LOS	Loss of Signal Alarm

Selects Physical Alarms.

:SOURce:DATA:TELecom:SONet:ALARm:PHYSical?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ALARm:TRANsport <discrete>

<discrete> =	LOF	Loss of Frame
	SEF	Severely Errored Frame
	AISL	AIS-L alarm indication signal
	RDIL	RDI-L remote defect indication

Selects Transport Alarms.

:SOURce:DATA:TELecom:SONet:ALARm:TRANsport?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ALARm:SEF

Sets the OOF alarm Active.There is no corresponding query

:SOURce:DATA:TELecom:SONet:ALARm:PATH <discrete>

<discrete> =	AISP	Path AIS
	LOPP	LOP-P Loss of pointer
	RDIP	RDI-P remote defect indication
	PUNequipped	Path Unequipped
	PAYLoad	HI Path RDI payload enhanced
	SERVer	HI Path RDI server defect enhanced
	CONNection	HI Path RDI connection enhanced
	LOM	H4 Loss of Multiframe
	AISV	Low Order Path AIS
	LOPV	VT Loss of Pointer
	VTUNequipped	Low Order Path Unequipped
	RDIV	Low order path RDI
	RFIV	Low Order Path RFI
	VTPayload	Low order path RDI payload enhanced
	VTServer	Low order path RDI server defect enhanced
	VTConnection	Low order path RDI connection enhanced

Selects Path Alarms.

:SOURce:DATA:TELecom:SONet:ALARm:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:ALARm <boolean>

<boolean> = 0 or OFF

1 or ON

Enables and disables Alarm Generation.

:SOURce:DATA:TELecom:ALARm?

Returns: <boolean>

SOURce subsystem - Pointer Adjust Test Functions

:SOURce:DATA:TELecom:SONet:POINter:TRANsmitted?

Returns: <numeric>

Returns the actual pointer value being transmitted.

:SOURce:DATA:TELecom:SONet:POINter <discrete>

<discrete> =	BURSt	Pointer Burst
	NPOinter	New Pointer Value
	OFFSet	Pointer Offset

Selects the Pointer Test Function.

:SOURce:DATA:TELecom:SONet:POINter?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:TYPE <discrete>

<discrete> =	SPE	SPE Pointer
	VT	VT Pointer

Selects the Pointer Type.

:SOURce:DATA:TELecom:SONet:POINter:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:BURSt:ACTion

Forces the pointer value to change according to the burst size and direction set using the following commands
:SOURce:DATA:TELecom:SONet:POINter:BURSt:DIRection <discrete> and
:SOURce:DATA:TELecom:SONet:POINter:BURSt:SIZE <numeric>.

To use this function the command :SOURce:DATA:TELecom:SONet:POINter <discrete> should be set to BURSt.

There is no corresponding query.

:SOURce:DATA:TELecom:SONet:POINter:BURSt:DIRection <discrete>

<discrete> =	INCRement	Increment Pointer Value
	DECRement	Decrement Pointer Value
	ALTernate	Burst placed in opposite direction to last burst

Selects the Pointer Burst Direction.

:SOURce:DATA:TELecom:SONet:POINter:BURSt:DIRection?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:BURSt:SIZE <numeric>

<numeric> = 1 to 10

Selects the Pointer Burst Size.

:SOURce:DATA:TELecom:SONet:POINter:BURSt:SIZE?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:POINter:NEW:ACTion

Forces the pointer value to adopt the New Pointer value and new flag status, set using the following commands
:SOURce:DATA:TELecom:SONet:POINter:NEW:VALue <numeric> and
:SOURce:DATA:TELecom:SONet:POINter:NEW:FLAG <discrete>.

To use this function the command :SOURce:DATA:TELecom:SONet:POINter <discrete> should be set to NEW.

:SOURce:DATA:TELecom:SONet:POINter:NEW:VALue <numeric>

<numeric> = 0 to 782

Selects the New Pointer Value.

:SOURce:DATA:TELecom:SONet:POINter:NEW:VALue?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:POINter:NEW:FLAG <discrete>

<discrete> =	NNDF	No New Data Flag
	NDF	New Data Flag

Selects whether a New Pointer Data Flag is generated.

:SOURce:DATA:TELecom:SONet:POINter:NEW:FLAG?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:OFFSet:ACTion <boolean>

<boolean> = 0 or OFF

1 or ON

Enables and Disables the Pointer Offset Test Function. The type of Offset and offset rate are set using the following commands:

:SOURce:DATA:TELecom:SONet:POINter:OFFSet <discrete> and
:SOURce:DATA:TELecom:SONet:POINter:OFFSe:RATE <numeric>

To use this function the command :SOURce:DATA:TELecom:SONet:POINter <discrete> should be set to OFFSet and :SOURce:CLOCk:SONet:FOFFset <boolean> should be set to OFF.

:SOURce:DATA:TELecom:SONet:POINter:OFFSet:ACTion?

Returns: <boolean>

:SOURce:DATA:TELecom:SONet:POINter:OFFSet <discrete>

<discrete> =	SIGNal	Signal offset
	PAYLoad	Payload Offset

Selects the Pointer Offset Type.

:SOURce:DATA:TELecom:SONet:POINter:OFFSet?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:OFFSet:RATE <numeric>

<numeric> =	-100.0 to +100.0	parts per million

Selects the Pointer Offset Rate.

:SOURce:DATA:TELecom:SONet:POINter:OFFSet:RATE?

Returns: <numeric>

SOURce subsystem - APS Messages

:SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete>

<discrete> =	ASRX	As Received (Thru mode only)
	LINear	Linear protection
	RING	Ring protection

Selects the type of protection topology.

ASRX is only applicable when thru mode is enabled.

:SOURce:DATA:TELecom:SONet:APSMessages:TOPology?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:TOPology:TYPE <discrete>

<discrete> =	PASSive	Passive
	AUNidir	Active unidirectional
	ABIDir	Active bidirectional

Selects the behaviour of the transmitted K1K2 bytes as being passive or active (unidirectional or bidirectional).

:SOURce:DATA:TELecom:SONet:APSMessages:TOPology:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:REQuest <discrete>

<discrete> =	NREQuest	No Request (0000)
	DNRevert	Do Not Revert (0001)
	RREQuest	Reverse Request (0010)
	THRee	Not Used (0011)

EXERcise	Exercise (0100)
FIVE	Not Used (0101)
LWTRestore	Wait To Restore (0110)
SEVen	Not Used (0111)
MSWitch	Manual Switch (1000)
NINE	Not Used (1001)
SDLPriority	Signal Degrade Low Priority (1010)
SDHPriority	Signal Degrade High Priority (1011)
SFLPriority	Signal Fail Low Priority (1100)
SFHPriority	Signal Fail High Priority (1101)
FSWitch	Forced Switch (1110)
LOPRotection	Lockout Of Protection (1111)

Selects the transmitter SONET APS message to be transmitted (K1 Byte, Bits 1 to 4).

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete> is set to LIN.

SONetPriority and SFHPriority are only valid when :SOURce:DATA:TELecom:SONet:APSMessages:ARCHitecture <discrete> is set to OTN.

:SOURce:DATA:TELecom:SONet:APSMessages:REQuest?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:CHANnel <numeric>

<numeric> =	0	NULL Channel
	1	Working Channel 1

2	Working Channel 2
3	Working Channel 3
4	Working Channel 4
5	Working Channel 5
6	Working Channel 6
7	Working Channel 7
8	Working Channel 8
9	Working Channel 9
10	Working Channel 10
11	Working Channel 11
12	Working Channel 12
13	Working Channel 13
14	Working Channel 14
15	Extra Traffic Channel

Selects the transmitter SONET APS message channel (K1 Byte, Bits 5 to 8).

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete> is set to LIN.

Working Channels 1 to 14 are only valid if :SOURce:DATA:TELecom:SONet:APSMessages:ARCHitecture <discrete> is set to OTN.

:SOURce:DATA:TELecom:SONet:APSMessages:CHANnel?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:BRIDge <numeric>

<numeric> = 0 to 15

Selects the SONET transmitter Linear APS message bridged channel (K2 Byte, Bits 1 to 4).

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete>

is set to LIN.

:SOURce:DATA:TELecom:SONet:APSMessages:BRIDge?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:ARCHitecture <discrete>

<discrete> =	OTONe	1+1
	OTN	1:N

Selects the SONET transmitter Linear APS architecture (K2 Byte, Bit 5).

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete> is set to LIN.

:SOURce:DATA:TELecom:SONet:APSMessages:ARCHitecture?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:REServed <numeric>

<numeric> =	0	000
	1	001
	2	010
	3	011
	4	100
	5	101

Selects the SONET transmitter Linear APS messages reserved bits (K2 Byte, Bits 6 to 8) in numeric form.

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete> is set to LIN.

:SOURce:DATA:TELecom:SONet:APSMessages:REServed?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:RCODe <discrete>

<discrete> =	NREQuest	No Request (0000)
	RRRing	Reverse Request - Ring (0001)
	RRSPan	Reverse Request - Stan (0010)
	ERINg	Exerciser - Ring (0011)
	ESPan	Exerciser - Stan (0100)
	RWTRestore	Wait to Restore (0101)
	MSRing	Manual Switch - Ring (0110)
	MSSPan	Manual Switch - Span (0111)
	SDRing	Signal Degrade - Ring (1000)
	SDSPan	Signal Degrade - Span (1001)
	SDPRotection	Signal Degrade - Protection (1010)
	SFRing	Signal Fail - Ring (1011)
	SFSPan	Signal Fail - Stan (1100)
	FSRing	Forced Switch Ring (1101)
	FSSPan	Forced Switch - Stan(1110)
	LOPRotection	Lockout Of Protection (1111)

Selects the transmitter Ring APS message to be transmitted (K1 Byte, Bits 1 to 4).

Only valid :SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete> is set to RING.

:SOURce:DATA:TELecom:SONet:APSMessages:RCODe?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:DNODe <numeric>

<numeric> = 0 to 15

Selects the SONET transmitter Ring APS message destination node (K1 Byte, Bits 5 to 8).

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete> is set to RING.

:SOURce:DATA:TELecom:SONet:APSMessages:DNODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:SNODe <numeric>

<numeric> = 0 to 15

Selects the SONET transmitter Ring APS message source node (K2 Byte, Bits 1 to 4).

Only valid :SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete> is set to RING.

:SOURce:DATA:TELecom:SONet:APSMessages:SNODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:PCODe <discrete>

<discrete> =	SHORt	Short path
	LONG	Long path

Selects the SONET transmitter Ring APS message path type (K2 bit 5).

Only valid if :SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete> is set to RING.

:SOURce:DATA:TELecom:SONet:APSMessages:PCODe?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:SCODe <numeric>

<numeric> =	0	Idle (000)
	1	Bridged (001)
	2	Bridged & Switched (010)
	3	011
	4	100
	5	101

Selects the SONET transmitter Ring APS messages status code (K2 Byte, Bits 6 to 8).

Only valid :SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete> is set to RING.

:SOURce:DATA:TELecom:SONet:APSMessages:SCODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:DOWNload

STart transmission of the SONET transmitter APS message.

SOURce subsystem - DCC Insertion

:SOURce:DATA:TELecom:SONet:IDCC <discrete>

<discrete> =	NONE	Turns both Off
	RDCC	Section DCC
	MDCC	Line DCC

Selects the Data Communication Channel Insert port for DCC Test functions.

:SOURce:DATA:TELecom:SONet:IDCC?

Returns: <discrete>

SENSe subsystem - Receiver Settings

:SENSe:DATA:TELecom:SONet:RATE <discrete>

<discrete> =	OC192	10Gb/s
	OC48	2.5Gb/s
	OC12	622Mb/s
	OC3	155Mb/s optical
	STS3	155Mb/s electrical
	OC1	52Mb/s optical
	STS1	52Mb/s electrical

Controls the characteristics of the instrument's input ports.

Sets the output rate for the instrument input port.

:SENSe:DATA:TELecom:SONet:RATE?

Returns: <discrete>

Mapping Settings

:SENSe:DATA:TELecom:SONet:STS3 <numeric>

<numeric> =	1 to 64	STS-3 Number under test

Selects the STS-3 number under test. Only valid if :SENSe:DATA:TELecom:SONet:RATE is set a rate higher than STS3.

:SENSe:DATA:TELecom:SONet:STS3?

Returns: <numeric>

SPE Layer Selection

:SENSe:DATA:TELecom:SONet:SPE:TYPE <discrete>

<discrete> = STS1
STS3C
STS6C
STS9C
STS12C
STS24C
STS48C
STS192C

Set the SPE Mapping into an STS-N frame.

:SENSe:DATA:TELecom:SONet:SPE:TYPE?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:STS3 <numeric>

<numeric> = 1 to 64 STS-3 Number under test

Selects the STS-3 number under test. Only valid if :SENSe:DATA:TELecom:SONet:RATE is set a rate higher than STS3.

:SENSe:DATA:TELecom:SONet:STS3?

Returns: <numeric>

:SENSe:DATA:TELecom:SONet:STS1 <numeric>

<numeric> = 1 to 3 STS1 Number

Selects the SONET Receiver active STS-1 within the STS-3.

:SENSe:DATA:TELecom:SONet:STS1?

Returns: <numeric>

VT Layer Selection

:SENSe:DATA:TELecom:SONet:VT:TYPE <discrete>

<discrete> =	NONE	
	VT2	
	VT15	

Selects the VT mapping for the receiver.

:SENSe:DATA:TELecom:SONet:VT:TYPE?

Returns: <discrete>

Payload Layer Selection

:SENSe:DATA:TELecom:SONet:PAYLoad <discrete>

<discrete> =	BULK	Bulk Filled
	M140	140 Mb/s
	M34	34 Mb/s
	ASM2	Asynchronous 2Mb/s
	FLM2	2Mb/s floating Byte
	ASDS1	Asynchronous DS1
	FLDS1	DS1 Floating Byte
	DS3	DS3

Selects the Receiver SONET payload for single payload cases.

:SENSe:DATA:TELecom:SONet:PAYLoad?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:PRIMary:TS0 <boolean>

<boolean> =	0 or OFF	Data in TS0
	1 or ON	Signalling in TS0

Determines the content of TS0 as either Data or Signalling.

:SENSe:DATA:TELecom:SONet:PRIMary:TS0?

Returns: <boolean>

VT Group

:SENSe:DATA:TELecom:SONet:VTG <numeric>

<numeric> = 1 to 7

Selects the SONET Receiver active VT Group within the selected STS-1.

:SENSe:DATA:TELecom:SONet:VTG?

Returns: <numeric>

:SENSe:DATA:TELecom:SONet:VT <numeric>

<numeric> =	1 to 3	tributary number for VT-2
	1 to 4	tributary number for VT-1.5

Selects the SONET Receiver active VT within the selected VT Group.

:SENSe:DATA:TELecom:SONet:VT?

Returns: <numeric>

SENSe subsystem - Receiver Overhead Monitor

:SENSe:DATA:TELecom:SONet:OVERhead:CHANnel <numeric>

<numeric> =	1 to 64	STS3 number

Selects the channel from which the overhead bytes will be captured.

:SENSe:DATA:TELecom:SONet:OVERhead:CHANnel?

Returns: <numeric>

:SENSe:DATA:TELecom:SONet:DDCC <discrete>

<discrete> =	NONE	Turns both Off
	RDCC	Section DCC
	MDCC	Line Section DCC

Selects the Data Communications channel to be dropped via the DROP port, for DCC tests.

:SENSe:DATA:TELecom:SONet:DDCC?

Returns: <discrete>

Trace Identifier Mismatch Commands

:SENSe:DATA:TELecom:SONet:OVERhead:J0:TIM <boolean>

<boolean> =	0 or OFF	TIM-S alarm is disabled
	1 or On	TIM-S alarm is enabled

Specifies whether to monitor the J0 byte for the TIM-S alarm. This is determinded by comparing the incoming J0 trace message with the expected message configured by the commands detailed below.

:SENSe:DATA:TELecom:SONet:OVERhead:J0:TIM?

Returns: <boolean>

:SENSe:DATA:TELecom:SONet:OVERhead:J0:TIM:PATTern <discrete>

<discrete> =	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of pattern that is expected in the J0 byte of the STM regenerator section overhead.

:SENSe:DATA:TELecom:SONet:OVERhead:J0:TIM:PATTern?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:OVERhead:J0:TIM:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the expected J0 byte of the regenerator section overhead.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long.

:SENSe:DATA:TELecom:SONet:OVERhead:J0:TIM:PATTern:B16Crc?

Returns: <string>

:SENSe:DATA:TELecom:SONet:OVERhead:J0:TIM:PATTern:B64 <string>

<string> =

Sets the 64-byte sequence of the expected J0 byte of the regenerator section overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long.

:SENSe:DATA:TELecom:SONet:OVERhead:J0:TIM:PATTern:B64?

Returns: <string>

:SENSe:DATA:TELecom:SONet:POVerhead:J1:TIM <boolean>

<boolean> =	0 or OFF	TIM-P alarm is disabled
	1 or On	TIM-P alarm is enabled

Specifies whether to monitor the J1 byte for the TIM-P alarm. This is determinded by comparing the incoming J1 trace message with the expected message configured by the commands detailed below.

:SENSe:DATA:TELecom:SONet:POVerhead:J1:TIM?

Returns: <boolean>

:SENSe:DATA:TELecom:SONet:POVerhead:J1:TIM:PATTern <discrete>

<discrete> =	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence

Sets the type of pattern that is expected in the J1 byte of the STM path overhead.

:SENSe:DATA:TELecom:SONet:POVerhead:J1:TIM:PATTern?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:POVerhead:J1:TIM:PATTern:B16Crc <string>

<string> =

Sets the 16-byte sequence of the expected J1 byte of the path overhead. The command parameter is a 15 character long string. The instrument automatically appends an E.164 CRC character to make up a 16 character sequence.

If the string is not 15 characters long the instrument will either append NULLS or truncate the string to make it 15 characters long.

:SENSe:DATA:TELecom:SONet:POVerhead:J1:TIM:PATTern:B16Crc?

Returns: <string>

:SENSe:DATA:TELecom:SONet:POVerhead:J1:TIM:PATTern:B64 <string>

<string> =

Sets the 64-byte sequence of the expected J1 byte of the path overhead.

If the string is not 64 characters long the instrument will either append NULLS or truncate the string and terminate with a CR/LF to make it 64 characters long.

:SENSe:DATA:TELecom:SONet:POVerhead:J1:TIM:PATTern:B64?

Returns: <string>

SENSe subsystem - Data Capture Commands

The following commands are used to configure data capture for SONET. General commands for data capture are found in the Common Commands chapter.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SONet:TRANsport <discrete>

<discrete> =	FRAMe	A1A2 Error
	CVS	CVS Error
	CVL	CVL Error
	REIL	REI-L Error

Selects SONET Transport Overhead error for triggering data capture.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SONet:TRANsport?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SONet:PATH <discrete>

<discrete> =	CVP	CVP
	REIP	REI-P Error

Selects SONET Path Overhead error for triggering data capture.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ERRor:SONet:PATH?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SONet:TRANsport <discrete>

<discrete> =	LOF	Loss of Frame
	SEF	Severely Errored Frame
	AISL	AIS-L

	RDIL	RDI-L
	PTAD	Pointer Activity
	K1K2	K1K2 Change

Selects SONET alarm for triggering Transport Overhead data capture.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SONet:TRANsport?

Returns: <discrete>

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SONet:PATH <discrete>

<discrete> =	RDIP	RDI-P
	PUNequipped	UNEQ-P

Selects SONET alarm for triggering Path Overhead data capture.

:SENSe:DATA:TELecom:DCAPture:TRIGger:ALARm:SONet:PATH?

Returns: <discrete>

SENSe subsystem - Receiver SONET Overhead Monitor Commands

:SENSe:DATA:TELecom:SONet:OCAPture:STS1 <numeric>

<numeric> = 1 to 3 STS-1 number

Selects the STS-1 Channel from which the overhead sequence will be captured.

:SENSe:DATA:TELecom:SONet:OCAPture:STS1?

Returns: <numeric>

:SENSe:DATA:TELecom:SONet:OCAPture:STS3:SELect <numeric>

<numeric> = 1 to 64 STS-3 number

Selects the STS-3 Channel from which the overhead sequence will be captured.

:SENSe:DATA:TELecom:SONet:OCAPture:STS3:SELect?

Returns: <numeric>

:SENSe:DATA:TELecom:SONet:OCAPture:OHBYte <discrete>

<discrete> = A1A2 | BNDA1A2 | E1 | F1 | D1D3 | K1K2 | H1 | D4D12 | S1 | M0 | M1 | J1 | E2 | C2 | G1 | F2 | H4 | F3 | K3 | N1 | H1H2 | H3

Xrc

Selects the overhead channel to be captured.

A byte/channel may also be selected by using an 'Xrc' notation where 'r' specifies the row of the required byte and 'c' specifies the column.

For example, specifying 'X24' will select the 4th byte on the 2nd row of the specified STS-3 structure.

:SENSe:DATA:TELecom:SONet:OCAPture:OHBYte?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:SELection <discrete>

<discrete> =	MANual	Manual Trigger
	PRE	Pre-Capture Trigger
	CENTered	Centered-Capture Trigger
	POST	Post-Capture Trigger

Selects the type of trigger for Overhead Capture.

When MANual trigger is selected, capture is started using the :SENSe:DATA:TELecom:SONet:OCAPture command. PRE-trigger capture will capture up to 255 elements before the trigger pattern. CENTered capture captures elements either side of the trigger pattern. POST capture captures up to 255 elements after the trigger pattern.

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:SELection?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:POLarity <discrete>

<discrete> =	ON	Triggers when capture data MATCHES trigger pattern
	ONNot	Triggers when capture data DOES NOT MATCH trigger pattern

Selects whether the trigger will start capture on data matching the trigger pattern or not matching the trigger pattern.

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:POLarity?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:PATTern <string>

<string> = See Below

Sets the overhead capture trigger pattern as a string of hexadecimal digits. The number of hexadecimal characters is dependent on the overhead channel selected by :SENSe:DATA:TELecom:SDH:OCAPture:OHBYte <discrete>.

Two hexadecimal characters are required per byte, for example:
TCMACT - 1 byte "00" to "FF"
FAS - 6 bytes "000000000000" to "FFFFFFFFFFFF"

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:PATTern?

Returns: <string>

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:MASK <string>

<string> = See Below

Sets the mask for the overhead capture trigger as a string of hexadecimal characters. Allows certain bits of the trigger pattern to masked. The number of hexadecimal characters is dependent on the overhead channel selected by :SENSe:DATA:TELecom:SDH:OCAPture:OHBYte <discrete>.

:SENSe:DATA:TELecom:SONet:OCAPture:TRIGger:MASK?

Returns: <string>

:SENSe:DATA:TELecom:SONet:OCAPture <discrete>

<discrete> =	STOP	Stop current current
	STARt	Start new capture

Stops or starts overhead sequence capture.

:SENSe:DATA:TELecom:SONet:OCAPture?

Returns: <discrete>

SENSe Subsystem - Signal Wizard SONET Frame Layer

The following commands will only be relevant when a valid SONET frame or a valid SONET payload in an OTN frame has been detected on the selected input port.

:SENSe:DATA:TELecom:SIGWizard:SONet:RATe?

Returns: <string> Eg. "OC-192"

Returns the line rate of the detected signal

:SENSE:DATA? "SIGWizard:SONet:AIS"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the AIS alarm.

:SENSE:DATA? "SIGWizard:SONet:CVS"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the CV-S error indicator.

:SENSE:DATA? "SIGWizard:SONet:CVL"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the CV-L error indicator.

:SENSE:DATA? "SIGWizard:SONet:RDI"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the RDI alarm.

:SENSE:DATA? "SIGWizard:SONet:REI"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the REI alarm.

STS - STS Layer

The following commands will only return valid values in a valid SONET signal carrying supported mappings has been detected on the selected port.

In the STD level STS channels are referred to in two ways:

1. The standard STS-3, STS-1 etc...
2. A logical offset from the start of the frame (in STS-1 equivalents). This is counted in slices so we have all the STS-1#1s as 0 64 (for OC-192), followed by the STS- 1#2s as 65+.

The two approaches to channel selection are fully interchangable.

:FETCh:ARRay:DATA:TELecom:SIGWizard:STS:OVERview?

Returns: <block data>
4 numeric values for each channel:

Channel Start

Size (STS-1s)

State (0 = Ok, 1 = Error, 2 = Historical Error, 3 = AIS, 4 = Illegal, 5 = Unequipped, 6 = Transient)

1 = Has TU substructure

:FETCh:ARRay:TELecom:SIGWizard:STS:FAULts?

Returns: <block data>

An array of the Channel Start values of all channels that are not in OK state.

:SENSe:DATA:TELecom:SIGWizard:STS:STS3 <numeric>

<numeric> = 1-64

Sets the STS-3 that all following commands will focus on.

:SENSe:DATA:TELecom:SIGWizard:STS:STS3?

Returns: <numeric>

:SENSe:DATA:TELecom:SIGWizard:STS:STS1 <numeric>

<numeric> = 1-3

Sets the AUG-3 that all following commands will focus on.

:SENSe:DATA:TELecom:SIGWizard:STS:STS1?

Returns: <numeric>

:SENSe:DATA:TELecom:SIGWizard:STS:CHANnel <numeric>

<numeric> = 1-192

Sets the start of the channel the following commands will focus on.

All following commands act on the currently selected channel.

:SENSe:DATA:TELecom:SIGWizard:STS:STARt?

Returns: <Numeric>

Returns the start of the currently selected channel.

:SENSe:DATA:TELecom:SIGWizard:STS:SIZE?

Returns: <Numeric>

Returns the size (in AU-3 equivalents) of the currently selected channel.

STS - STS Layer [SENSe:DATA?]

:SENSE:DATA? "SIGWizard:STS:STATe"

Returns: <discrete>= OK | ERR | HIST | AIS | ILLegal | UNEQ

| TRANS

:SENSE:DATA? ":SIGWizard:STS:AIS"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the AIS alarm.

:SENSE:DATA? "SIGWizard:STS:LOP"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the LOP alarm.

:SENSE:DATA? ":SIGWizard:STS:CVP"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the CV-P error indicator.

:SENSE:DATA? "SIGWizard:STS:REI"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the REI alarm.

:SENSE:DATA? "SIGWizard:STS:RDI"

Returns: <discrete>= OK | ERR | HIST | TRAN | UNK

Returns the state of the RDI alarm.

:FETCh:SCALar:DATA:TELecom:SIGWizard:STS:C2?

Returns: <numeric>

Returns the value of the C2 byte.

:FETCh:STRing:DATA:TELecom:SIGWizard:STS:TRACe:LIST?

Returns: <string>

Returns the J1 Trace Message.

:FETCh:STRing:DATA:TELecom:SIGWizard:STS:TRACe:SEARch? <string>

<string> = Search String

Returns: <block data> Numerics

Returns an array of all the channel start positions for all J1 Trace messages containg the search string.

SENSe subsystem - Result Returning Commands

SONET Error Results

:SENSE:DATA? <string>

<string> = "<Return Type>:SONet:LSECond:<error>" for last second results

<string> = "<Return Type>:SONet:<error>" for total results

<Return Type> is one of the following

ECOunt	For returning Error Counts
ERATio	For returning Error Ratios

<error> is one of the following

FRAMe	Frame error count
CVS	Section B1 BIP error count
CVL	Line B2 BIP error count
REIL	REI-L error count
CVP	Path B3 BIP error count
REIP	REI-P error count
CVIec	CV-IEC error count
TRIB:CVV	VT Path BIP errr count
TRIB:REIV	VT FEBE error count

Returns: <numeric>

SONET Analysis Results

:SENSE:DATA? <string>

<string> = "<Result type>:SONet:<Path Type>:<Type>"

		<Type> =		
<Result type> =		G828	G826	M2101 | M21011
ESEConds	Error Seconds	X	X	X
SESeconds	Severely Er-	X	X	X

	rored Seconds			
SEPeriod	Severely Errored Period	X		
EBCount	Errored block count	X	X	
BBECount	Background block error count	X	X	X
ESRatio	Error Second Ratio	X	X	
SESRatio	Severely Errored Second Ratio	X	X	
SEPI	Severely Errored Period Intensity	X		
BBERatio	Background Block Error ratio	X	X	
UASeconds	Unavailable seconds	X	X	X
PUASeconds	Path Unavailable seconds	X	X	X

<Path type> =

CVS	RSOH B1 block errors
CVL	MSOH B2 block errors

REIL	MSOH REI block errors
CVP	HO Path B3 block errors
REIP	HO Path REI block errors
CVV	Low path BIP
REIV	LP-REI
BIT	Bit errors (Out Of Service)

Returns: <numeric>

SONET Pointer Activity Results

:SENSE:DATA? <string>

<string> = "PACTivity:SONet:<type>" where <type> is one of the following

PVALue	SPE Pointer value
NDFSeconds	SPE Pointer NDF seconds
MNDFseconds	SPE Pointer MNDF seconds
PCOunt	SPE Pointer +ve Adj Count
PSEConds	SPE Pointer +ve Adj Seconds
NCOunt	SPE Pointer -ve Adj Count
NSEConds	SPE Pointer -ve Adj Seconds
IOFFset	Implied SPE Offset
VT:PVALue	VT Pointer value
VT:NDFSeconds	VT Pointer NDF seconds
VT:MNDFseconds	VT Pointer MNDF seconds
VT:PCOunt	VT Pointer +ve Adj Count
VT:PSEConds	VT Pointer +ve Adj Seconds
VT:NCOunt	VT Pointer -ve Adj Count
VT:NSEConds	VT Pointer -ve Adj Seconds
VT:IOFFset	Implied VT Offset

Returns: <numeric>

SONET Alarm Seconds Results

:SENSE:DATA? <string>

<string> = "ASEConds:SONet:<alarm>" where <alarm> is one of the following

LOF	Loss Of Frame
SEF	Severely Errored Frame Defect
LOPP	Loss Of Pointer (LOP-P)
TIMS	Section Trace Identifier Mismatch

	(TIM-S)
AISL	Line AIS (AIS-L)
AISP	Path AIS (AIS-P)
RDIL	Line FERF (RDI-L)
RDIP	Path FERF (RDI-P)
TIMP	Path Trace Identifier Mismatch (TIM-P)
K1K2	K1K2 byte change
PUNeq	Path Unequipped
AISC	concat AIS alarm
LOPC	concat LOP alarm
VT:LOPV	VT Loss of Pointer (LOP-V)
VT:AISV	VT Path AIS (AIS-V)
VT:RDIV	VT Path FERF (RDI-V)
VT:P1P0	P1P0 frame Synchronization loss
VT:OPSL	Overhead Pattern Sync Loss
PDIP	PDI-P Alarm

Enhanced RDI :

ERDI:PAYLoad	High order path Enhanced RDI Payload
ERDI:SERVer	High order path Enhanced RDI Server
ERDI:CONNection	High order path Enhanced RDI Connection
ERDI:VT: PAYLoad	Low order path Enhanced RDI Payload
ERDI:VT: SERVer	Low order path Enhanced RDI Server
ERDI:VT:CONNection	Low order path Enhanced RDI Connection

Returns: <numeric>

FETCh subsystem

The FETCh subsystem is used to retrieve data directly accumulated by the instrument.

SONET Data Capture

:FETCh:ARRay:DATA:TELecom:SONet:DCAPture:DATA? <numeric>, <numeric>, <numeric>

<numeric> = Frame Index.

<numeric> = STS-3 Number (Min = 1, Max = 64)

<numeric> = STS-1 Number (Min = 1, Max = 3)

Returns: <numeric>, <numeric>,...<numeric>

Returns comma separated byte values for the specified columns of the selected STS-3. A STS-1 value of 1 will return the byte values for columns 1, 4 and 7 of the selected STS-3; a value of 2 will return the byte values for columns 2, 5 and 8 of the selected STS-3; while a value of 3 will return columns 3, 6 and 9 of the selected STS-3.

For example, if the STS-1 value is 2 for a specified STS-3, the bytes are returned as follows:

<col(2), row(1)>, <col(2), row(2)>, <col(2), row(3)>,...<col(2), row(9)>,
<col(5), row(1)>, <col(5), row(2)>, <col(5), row(3)>,...<col(5), row(9)>,
<col(8), row(1)>, <col(8), row(2)>, <col(8), row(3)>,...<col(8), row(9)>

:FETCh:ARRay:DATA:TELecom:SONet:DCAPture:PDATa? <numeric>

<numeric> = Frame Index.

Returns: <numeric>, <numeric>,...<numeric>

Returns the byte values of the Path Overhead from the specified frame.

:FETCh:SCALar:DATA:TELecom:SONet:DCAPture:DATA? <numeric>, <numeric>, <numeric>, <numeric>

<numeric> = Frame Index.

<numeric> = STS-3 Number (Min = 1, Max = 64)

<numeric> = STS-1 Number (Min = 1, Max = 3)

<numeric> = Transport Overhead Byte Name

Returns: <numeric>

Returns the value of a specific Transport Overhead byte within the STS-1 frame.

:FETCh:SCALar:DATA:TELecom:SONet:DCAPture:PDATa? <numeric>, <discrete>

<numeric> = Frame Index.

<discrete> = Path Overhead Byte Name

Returns: <numeric>

Returns the value of a specific Path Overhead byte in a captured frame.

SONET Overhead Bytes

:FETCh:ARRay:DATA:TELecom:SONet:OVERhead:DATA? <numeric>

<numeric> = 1 to 3 STS-1 group

Returns: <numeric>, <numeric>,.....<numeric>

The parameter identifies a set of columns within the selected STS-3. A Value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of 3 selects Columns 3,6 & 9.

Returns the value of the selected section overhead as a comma seperated list of 27 integer numerical values in the range 0 to 255.

The values are arranged as shown
<row1 col1>,<row1 col2>,<row1 col3>.. ..<row1 col9>
<row2 col1>,<row2 col2>,<row2 col3>.. ..<row2 col9>

<row3 col1>.....<row8 col9>
<row9 col1>,<row9 col2>,<row9 col3>.. ..<row9 col9>

The channel to be monitored is identified by the command :SENSe:DATA:TELecom:SONet:OVERhead:CHANnel <numeric>.

:FETCh:ARRay:DATA:TELecom:SONet:POVerhead:DATA?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the high order path overhead bytes as an array of 9 numeric values. Each numeric is in the range 0 to 255.

:FETCh:ARRay:DATA:TELecom:SONet:VT:POVerhead:DATA?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the low order path overhead bytes as an array of 9 numeric values. Each numeric is in the range 0 to 255.

:FETCh:SCALar:DATA:TELecom:SONet:OVERhead:DATA? <numeric>, <discrete>

<numeric> = 1 to 3 Column Number

<discrete> = A1 | A2 | J0/Z0 | E1 | F1 | D1 | D2 | D3 | H1 | H2 | H3 | K1 | K2 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | S1/Z1 | M0/M1 | Z2 | E2 | B1 | B2 | X11 | X12 | X13 | X21 | X22 | X23 | X31 | X32 | X33 | X41 | X42 | X43 | X51 | X52 | X53 | X61 | X62 | X63 | X71 | X72 | X73 | X81 | X82 | X83 | X91 | X92 | X93 |

Returns: <numeric>

Returns the value of a single named byte of the selected transmitter section overhead. The required byte is specified by 2 command parameters.

The first parameter identifies a set of columns within the selected STS-1. A

Value of 1 selects columns 1,4 & 7, a value of 2 selects Columns 2,5 & 8, and a value of 3 selects Columns 3,6 & 9. For the SPE-0 signal rate only 1 is valid.

The second parameter identifies the specific byte in the selected set of columns. There are two ways of specifying this byte. The first is to use standard names where these are valid. The set of valid names is shown in the table above. The second method is to use an "Xrc" notation, where r is the numerical value of the bytes row in the transport overhead and c is the numerical value of the bytes column in the transport overhead.

This method allows access to ANY byte in the selected STM-1 / Column set.

:FETCh:SCALar:DATA:TELecom:SONet:POVerhead:DATA? <discrete>

<discrete> = C2 | G1 | F2 | H4 | Z3 | Z4
| N1 | J1 | B3

Returns: <numeric>

Returns the value of a single named byte of the foreground high order path overhead byte.

:FETCh:SCALar:DATA:TELecom:SONet:VT:POVerhead:DATA? <discrete>

<discrete> = C2 | G1 | F2 | H4 | Z3 | Z4
| N1 | J1 | B3

Returns: <numeric>

Returns the value of a single named byte of the foreground low order path overhead byte.

SONET Labelled Overhead Bytes

:FETCh:SCALar:DATA:TELecom:SONet:OVERhead:K1?

Returns: <numeric>

Returns the value of the K1 APS signalling overhead byte.

:FETCh:SCALar:DATA:TELecom:SONet:OVERhead:K2?

Returns: <numeric>

Returns the value of the K2 APS signalling overhead byte.

:FETCh:SCALar:DATA:TELecom:SONet:OVERhead:S1?

Returns: <numeric>

Returns the value of the S1 Synchronisation Status overhead byte.

SONET Overhead Trace Messages

:FETCh:ARRay:DATA:TELecom:SONet:J0?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the STS-N regenerator overhead J0 byte as a comma seperated list of integer numericvalues. Each number is in the range 0 to 255. There is no block header.

:FETCh:STRing:DATA:TELecom:SONet:J0?

Returns: <string>

Returns the value of the section overhead J0 byte as a 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:ARRay:DATA:TELecom:SONet:J1?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the high order J1 path trace byte as a comma seperated list of 64 numbers if CRC7 is not detected, 15 numbers if CRC7 is detected. Each number is in the range 0 to 255. There is no block header.

:FETCh:STRing:DATA:TELecom:SONet:J1?

Returns: <string>

Returns the value of the high order J1 path trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:ARRay:DATA:TELecom:SONet:VT:J1?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the low order J1 path trace byte as a comma seperated list of 64 numbers if CRC7 is not detected, 15 numbers if CRC7 is detected. Each number is in the range 0 to 255. There is no block header.

:FETCh:STRing:DATA:TELecom:SONet:VT:J1?

Returns: <string>

Returns the value of the low order J1 path trace byte as a, 64 ASCII character string if CRC7 is not detected, 15 ASCII character string if CRC7 is detected. If the string contains any non printing characters then ~ is substituted.

:FETCh:ARRay:DATA:TELecom:SONet:VT:J2?

Returns: <numeric>, <numeric>,.....<numeric>

Returns the value of the low order J2 path trace byte as a comma seperated list of 15 numbers. Each number is in the range 0 to 255. There is no block header.

:FETCh:STRing:DATA:TELecom:SONet:VT:J2?

Returns: <string>

Returns the value of the low order J2 path ace byte as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

SONET Overhead Sequence Capture Commands

:FETCh:SCALar:DATA:TELecom:SONet:OCAPture:MINelement?

Returns: <numeric>

Returns the minimum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:SONet:OCAPture:MAXelement?

Returns: <numeric>

Returns the maximum element index of the captured sequence.

:FETCh:SCALar:DATA:TELecom:SONet:OCAPture:FCOunt? <numeric>

<numeric> = Element Index

Returns: <numeric>

Returns the capture repeat count of the specified element in numeric form. Individual elements may be captured up to 65535 times before a new element is entered into the captured sequence.

The sequence element index (numeric parameter) can be in the range -255 to +255 depending on the trigger selection.

The element which triggered sequence capture (the element that met the trigger criteria) is specified by index 0. Since 256 elements may be captured, pre-trigger can capture elements indexed -255 to 0 whilst post-trigger capture can capture elements indexed 0 to +255.

:FETCh:STRing:DATA:TELecom:SONet:OCAPture:DATA? <numeric>

<numeric> = Element Index.

Returns: <string>

Returns the capture data of the specified element in string form. The data is represented by hexadecimal characters. The number of characters depends on the selected capture channel.

:FETCh:ARRay:DATA:TELecom:SONet:OCAPture? <numeric>

<numeric> = Number of elements to return.

Returns an array with the number of entries determined by <numeric> and seperated by CR/LF.

Each entry consists of an alphanumeric string and a numeric seperated by commas. The alphanumeric string provides the hexadecimal value of the captured data. The length of the string depends upon the overhead channel selected for capture, two hexadecimal characters/overhead byte. The numeric indicates indicates the number of frames for which the captured data existed.

If this command is issued when a capture is being performed, some entries will contain no data. In this case 9.91E+37 is returned.

FETCh Subsystem - Signal Wizard SONET Frame Layer

The following commands will only be relevant when a valid SONET frame or a valid SONET payload in an OTN frame has been detected on the selected input port.

:FETCh:SCALar:DATA:TELecom:SIGWizard:SONet:S1?

Returns: <numeric>

Returns the value of the S1 byte.

:FETCh:STRing:DATA:TELecom:SIGWizard:SONet:TRACe?

Returns: <string>

Returns the contents of the J0 Trace Message.

STS - STS Layer

The following commands will only return valid values in a valid SONET signal carrying supported mappings has been detected on the selected port.

In the STD level STS channels are referred to in two ways:

1. The standard STS-3, STS-1 etc...
2. A logical offset from the start of the frame (in STS-1 equivalents). This is counted in slices so we have all the STS-1#1s as 0 64 (for OC-192), followed by the STS- 1#2s as 65+.

The two approaches to channel selection are fully interchangable.

:FETCh:ARRay:DATA:TELecom:SIGWizard:STS:OVERview?

Returns: <block data>
4 numeric values for each channel:

Channel Start

Size (STS-1s)

State (0 = Ok, 1 = Error, 2 = Historical Error, 3 = AIS, 4 = Illegal, 5 = Un-equipped, 6 = Transient)

1 = Has TU substructure

:FETCh:ARRay:DATA:TELecom:SIGWizard:STS:FAULts?

Returns: <block data>

An array of the Channel Start values of all channels that are not in OK state.

:FETCh:SCALar:DATA:TELecom:SIGWizard:STS:C2?

Returns: <numeric>

Returns the value of the C2 byte.

:FETCh:STRing:DATA:TELecom:SIGWizard:STS:TRACe:LIST?

Returns: <string>

Returns the J1 Trace Message.

:FETCh:STRing:DATA:TELecom:SIGWizard:STS:TRACe:SEARch? <string>

<string> = Search String

Returns: <block data> Numerics

Returns an array of all the channel start positions for all J1 Trace messages containg the search string.

SYSTem Subsystem - SONET Trigger Output Commands

:SYSTem:TRIGger:RECeive:ERRor:SONet:TRANsport <discrete>

<discrete> =		
	FRAMe	A1A2 Error
	CVS	CVS Error
	CVL	CVL Error
	REIL	REI-L Error

Selects SONET Transport Overhead error for trigger output when :SYSTem:TRIGger:RECeive:ERRor:STANdard <discrete> is set to TOH.

:SYSTem:TRIGger:RECeive:ERRor:SONet:TRANsport?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ERRor:SONet:PATH <discrete>

<discrete> =		
	CVP	CVP
	REIP	REI-P Error

Selects SONET Path Overhead error for trigger output when :SYSTem:TRIGger:RECeive:ERRor:STANdard <discrete> is set to POH.

:SYSTem:TRIGger:RECeive:ERRor:SONet:PATH?

Returns: <discrete>

:SYSTem:TRIGger:RECeive:ALARm:SONet:TRANsport <discrete>

<discrete> =		
	LOF	Loss of Frame
	SEF	Severely Errored Frame
	AISL	AIS-L
	RDIL	RDI-L
	PTAD	Pointer Activity

	K1K2	K1K2 Change

Selects SONET Transport Overhead alarm for trigger output when :SYSTem:TRIGger:RECeive:ALARm:STANdard <discrete> is set to TOH.

:SYSTem:TRIGger:RECeive:ALARm:SONet:TRANsport?

Returns: <discrete>

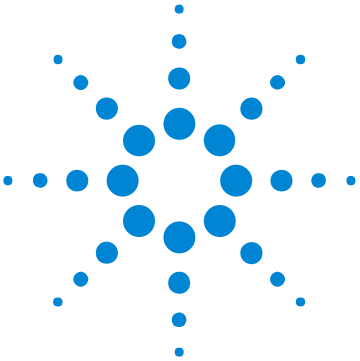
:SYSTem:TRIGger:RECeive:ALARm:SONet:PATH <discrete>

<discrete> =	AISP	AIS-P
	AISC	AIS-C
	RDIP	RDI-P
	LOPP	LOP-P
	LOPC	LOP-C
	PUNequipped	UNEQ-P

Selects SONET Path Overhead alarm for trigger output when :SYSTem:TRIGger:RECeive:ALARm:STANdard <discrete> is set to POH.

:SYSTem:TRIGger:RECeive:ALARm:SONet:PATH?

Returns: <discrete>



7
Unframed Command Reference

Unframed Command Reference

This chapter contains detailed information on the SCPI (Standard Commands for Programming Instruments) and IEEE 488.2 common commands you will use when writing programs to control your Instrument for Unframed operation.

Please also refer to chapter 2 Common Commands for general information on SCPI command formats and for a list of commands.

SOURce subsystem - Transmitter UNFRamed Settings Commands

:SOURce:DATA:TELecom:UNFRamed:RATE <discrete>

<discrete> =	F10G7	10.71Gb/s
	F10G	9.95Gb/s
	F2G7	2.66Gb/s
	F2G5	2.48Gb/s
	F622M	622.08Mb/s
	F155M	155.52Mb/s
	F52M	51.84Mb/s

Sets the output rate for the instrument input port.

:SOURce:DATA:TELecom:UNFRamed:RATE?

Returns: <discrete>

SOURce subsystem - Transmitter Error Test Function Commands

:SOURce:DATA:TELecom:UNFRamed:ERRor:GROup <discrete>

<discrete> = PATTern Pattern Errors

Selects UNFRamed transmit test function Error Group. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete>
<discrete> is required. Selection of PAYLoad results in BIT error type being selected.

:SOURce:DATA:TELecom:UNFRamed:ERRor:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:UNFRamed:ERRor:PATTern <discrete>

<discrete> = BIT

Selects Pattern Error Type to generate. Further selection of :SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete>
<discrete> is required.

:SOURce:DATA:TELecom:UNFRamed:ERRor:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE <discrete>

<discrete> = NONE Errors Off
E_3
E_4
E_5

E_6

E_7

E_8

E_9

USER User defined error rate

Selects the transmitter Error Rate of the error type selected by the Error Group Selection Functons.

NOTE If this query returns USER, then :SOURce:DATA:TELecom:SDH:ERRor:RATE:USER? must be used to discover the currently injected error rate.

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE?

Returns: <discrete>

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE:USER <numeric>

<numeric> = 9.9E-9 to 1.1E-3 mantissa resolution 0.1, exponent resolution 1

Sets the user defined Error Add rate.
:SOURce:DATA:TELecom:SDH:ERRor:RATE <discrete>must be set to USER

NOTE The maximum user defined error rate is dependent on both error type and line rate.

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE:USER:ACTion <boolean>

<boolean> = 0 or OFF

1 or ON	User Value set as Error Rate

Sets the user defined Error Add rate specified by :SOURce:DATA:TELecom:UNFRamed:ERRor:RATE:USER <numeric>.

:SOURce:DATA:TELecom:UNFRamed:ERRor:RATE:USER:ACTion?

Returns: <boolean>

SOURce subsystem - Frequency Offset Test Function

:SOURce:CLOCk:UNFRamed:FOFFset <boolean>

<boolean> = 0 or OFF

1 or ON

Enables or disables the Clock Frequency Offset. The amount of Offset is set using :SOURce:CLOCk:UNFRamed:FOFFset:OFFSet <numeric>.

:SOURce:CLOCk:UNFRamed:FOFFset?

Returns: <boolean>

:SOURce:CLOCk:UNFRamed:FOFFset:OFFSet <numeric>

<numeric> = -90.00 to +90.00 ppm for all rates

Sets the amount of Clock Frequency Offset when Frequency Offset is enabled by setting :SOURce:CLOCk:UNFRamed:FOFFset <boolean> to ON.

:SOURce:CLOCk:UNFRamed:FOFFset:OFFSet?

Returns: <numeric>

SENSe subsystem - Receiver UNFRamed Settings Commands

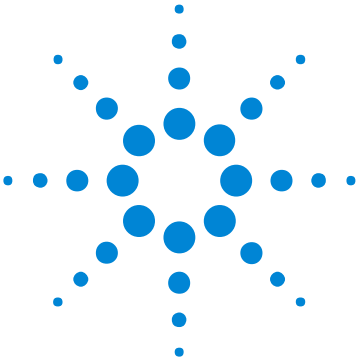
:SENSe:DATA:TELecom:UNFRamed:RATE <discrete>

<discrete> =	F10G7	10.71Gb/s
	F10G	9.95Gb/s
	F2G7	2.66Gb/s
	F2G5	2.48Gb/s
	F622M	622.08Mb/s
	F155M	155.52Mb/s
	F52M	51.84Mb/s

Sets the input rate for the instrument input port.

:SENSe:DATA:TELecom:UNFRamed:RATE?

Returns: <discrete>



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Jitter Command Reference

Jitter Command Reference

This chapter contains detailed information on the SCPI (Standard Commands for Programming Instruments) and IEEE 488.2 common commands you will use when writing programs to control your Instrument for Jitter operation.

Please also refer to chapter 2 Common Commands for general information on SCPI command formats and for a list of commands.

SOURce subsystem - Transmitter Jitter Commands

Jitter

:SOURce:DATA:TELecom:JITTer:TYPE <discrete>

<discrete> =	OFF	Jitter/Wander Disabled
	JITTer	Jitter Enabled
	WANDer	Wander Enabled

Selects the operating mode. Jitter or Wander may be enabled/disabled.

:SOURce:DATA:TELecom:JITTer:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:JITTer:MODulation <discrete>

<discrete> =	INTernal
	EXTernal

Selects the source of the jitter modulation signal. If INTernal is selected, then the modulation frequency and amplitude can be set on the instrument. If EXTernal modulation is selected, frequency and amplitude are determined by the supplied signal.

:SOURce:DATA:TELecom:JITTer:MODulation?

Returns: <discrete>

:SOURce:DATA:TELecom:JITTer:FREQuency <numeric>

<numeric> =	1.0 .. 80000000.0	Frequency in Hz

Sets the jitter modulation frequency in Hz. The frequency range available is dependent upon the line rate in use.

:SOURce:DATA:TELecom:JITTer:FREQuency?

Returns: <numeric>

:SOURce:DATA:TELecom:JITTer:AMPLitude <numeric>

<numeric> = 0.01 .. 10000.0 Amplitude in UI

Sets the jitter modulation amplitude in UI. The absolute maximum value is dependant upon the line rate and jitter frequency.

:SOURce:DATA:TELecom:JITTer:AMPLitude?

Returns: <numeric>

Wander

:SOURce:DATA:TELecom:WANDer:FREQuency <numeric>

<numeric> = 10.0 .. 10000000 .0 Micro Hertz

Sets the wander modulation frequency in micro Hz.

:SOURce:DATA:TELecom:WANDer:FREQuency?

Returns: <numeric>

:SOURce:DATA:TELecom:WANDer:AMPLitude <numeric>

<numeric> = 0.01 .. 1000000.0 UI

Sets the wander modulation amplitude. The absolute maximum value is dependant upon line rate and modulation frequency.

Any values exceeding the allowed ranges will result in the amplitude being set to the maximum permitted value for that frequency.

:SOURce:DATA:TELecom:WANDer:AMPLitude?

Returns: <numeric>

Tolerance

:SOURce:DATA:TELecom:TOLerance:ENABled?

Returns <boolean>

Returns 1 if jitter tolerance is ready to start using the current instrument settings. If 0 is returned, jitter tolerance will not be able to start until the instrument is set up correctly.

:SOURce:DATA:TELecom:TOLerance:TYPE <discrete>

<discrete> = JITTer
WANDer

Sets the tolerance type to jitter or wander.

:SOURce:DATA:TELecom:TOLerance:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:TOLerance:MODE <discrete>

<discrete> = AUTO
SPOT
FAST
SWEep

Sets the tolerance mode.

:SOURce:DATA:TELecom:TOLerance:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:TOLerance:MASK <discrete>

<discrete> =	G783A	G.783 Type A
	G783B	G.783 Type B
	G825_1M5	G.825 1.5Mb/s
	G825_2M	G.825 2Mb/s
	G8251	G.8251
	GR253R	GR.253 requirement
	GR253O	GR.253 objective
	G812_I	G.812 Type I (Wander only)
	G812_II_III	G.812 Type II/III (Wander only)
	G813	G.813 (Wander only)
	USER	User selectable mask

Selects the mask for tolerance. If USER is selected, a further selection must be made using SOURce:DATA:TELecom:TOLerance:MASK:USER <string>.

The line rates at which each of the jitter masks may be selected are shown below:

	52Mb/s	155Mb/s	622Mb/s	2.5Gb/s	10Gb/s	10.7Gb/s
G783A		X	X	X	X	
G783B		X	X	X	X	
G825_1M5		X	X	X	X	
G825_2M		X	X	X	X	
G8251						X
GR253R	X	X	X	X	X	

GR2530	X	X	X	X	X	

:SOURce:DATA:TELecom:TOLerance:MASK?

Returns: <discrete>

:SOURce:DATA:TELecom:TOLerance:MASK:USER <numeric>

<numeric> = 1 .. 10

Selects the user mask for tolerance, if USER has been selected using SOURce:DATA:TELecom:TOLerance:MASK. The <numeric> parameter is used to specify the mask number of the user mask you wish to use.

:SOURce:DATA:TELecom:TOLerance:MASK:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:TOLerance:POINts <numeric>

<numeric> = 1 .. 100

Sets the number of frequency points at which testing takes place in auto/fast tolerance and jitter sweep modes.

:SOURce:DATA:TELecom:TOLerance:POINts?

Returns: <numeric>

:SOURce:DATA:TELecom:TOLerance:SETTling <numeric>

<numeric> = 0.1 .. 99.9 seconds

Set the settling time in seconds between each amplitude/frequency point in auto tolerance/fast tolerance/sweep modes. This delay allows the system time to settle before performing the measurement.

:SOURce:DATA:TELecom:TOLerance:SETTling?

Returns: <numeric>

:SOURce:DATA:TELecom:TOLerance:GATE <numeric>

<numeric> = 0.1 .. 99.9 seconds

Set the time in seconds spent gating at each amplitude/frequency point in auto tolerance/fast tolerance/sweep modes.

:SOURce:DATA:TELecom:TOLerance:GATE?

Returns: <numeric>

:SOURce:DATA:TELecom:TOLerance:FREQuency:DEFault

Sets the mask frequency limits to the default settings for the mask in auto tolerance/fast tolerance/sweep modes.

:SOURce:DATA:TELecom:TOLerance:FREQuency:STARt <numeric>

<numeric> = 1.0 .. 80000000.0 Hertz

Sets the start frequency limit for the selected mask in auto tolerance/ fast tolerance/sweep modes. The frequency range available is dependant upon the line rate and mask in use. The value entered as the start frequency should always be less than that entered for the stop frequency.

:SOURce:DATA:TELecom:TOLerance:FREQuency:STARt?

Returns: <numeric>

:SOURce:DATA:TELecom:TOLerance:FREQuency:STOP <numeric>

<numeric> = 1.0 .. 80000000.0 Hertz

Sets the stop frequency limit for the selected mask in auto tolerance/ fast tolerance/sweep modes. The frequency range available is dependant upon the line rate and mask in use. The value entered as the stop frequency must be greater than that entered for the start frequency.

:SOURce:DATA:TELecom:TOLerance:FREQuency:STOP?

Returns: <numeric>

:SOURce:DATA:TELecom:TOLerance <boolean>

<boolean> =	0 or OFF	Stop tolerance
	1 or On	Start tolerance

Starts or stops tolerance mode.

:SOURce:DATA:TELecom:TOLerance?

Returns: <boolean>

:SOURce:DATA:TELecom:TOLerance:STATus?

Returns: <string>

Returns a string description of the current state of the tolerance application.

The format of the strings which can be returned are detailed below:

Fast Tolerance Mode

"Not running"

"Initialising"

"Test Point <point> Configuring Hardware Freq(Hz) <freq> Amp UI <amp>"

"Test Point <point> Waiting for Hardware to Settle Freq(Hz) <freq> Amp UI <amp>"

"Test Point <point> Settling Freq(Hz) <freq> Amp UI <amp>"

"Test Point <point> Gating Freq(Hz) <freq> Amp UI <amp>"

"Test Point <point> Recovery Freq(Hz) <freq> Amp UI <amp>"

"Test Point <point> Calculating Result Freq(Hz) <freq> Amp UI <amp>"

Auto Tolerance Mode

"Not running"

"Initialising"

"Test Point <point> Configuring Hardware Freq(Hz) <freq>"

"Test Point <point> Waiting for Hardware to Settle Freq(Hz) <freq>"

"Test Point <point> Settling Freq(Hz) <freq>"

"Test Point <point> Gating Freq(Hz) <freq>"

"Test Point <point> Recovery Freq(Hz) <freq>"

"Test Point <point> Calculating Result Freq(Hz) <freq>"

Jitter Spot Tolerance

"Spot Freq(Hz) <freq> Amp(UI) <amp>"

Wander Spot Tolerance

"Spot Freq(uHz) <freq> Amp(UI) <amp>"

:SOURce:DATA:TELecom:TOLerance:JITTer:FREQuency <numeric>

<numeric> = 10.0 .. 80000000.0 Hertz

Sets the spot frequency for jitter tolerance testing in spot mode.

:SOURce:DATA:TELecom:TOLerance:JITTer:FREQuency?

Returns: <numeric>

:SOURce:DATA:TELecom:TOLerance:JITTer:AMPLitude?

Returns: <numeric>

Returns the amplitude in UI of the jitter being transmitted at the set frequency when in jitter spot tolerance mode.

:SOURce:DATA:TELecom:TOLerance:WANDer:FREQuency <numeric>

<numeric> =	10.0 .. 10000000.0	Micro Hertz

Sets the spot frequency for wander tolerance testing in spot mode.

:SOURce:DATA:TELecom:TOLerance:WANDer:FREQuency?

Returns: <numeric>

:SOURce:DATA:TELecom:TOLerance:WANDer:AMPLitude?

Returns: <numeric>

Returns the amplitude in UI of the wander being transmitted at the set frequency when in wander spot tolerance mode.

:SOURce:DATA:TELecom:TOLerance:ERRor:MODE <discrete>

<discrete> =	BERPenalty	BER Penalty
	EONSet	Onset of Errors

Selects the error criteria to be used by the auto/fast tolerance feature.

:SOURce:DATA:TELecom:TOLerance:ERRor:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:TOLerance:ERRor:SOURce <numeric>

<numeric> =	B1	B1
	B2	B2

B3	B3
TCIec	TC-IEC
TCOei	TC-OEI
N2BIp	N2 BIP
TCERr	TC-ERR
BIT	Bit Errors
OTUB8	OTU-BIP8
ODUB8	ODU-BIP8
UFEC	Uncorrectable FEC Blocks
ANY	Any Errors

Set the error source for auto/fast tolerance.

:SOURce:DATA:TELecom:TOLerance:ERRor:SOURce?

Returns: <numeric>

:SOURce:DATA:TELecom:TOLerance:ERRor:COUNt <numeric>

<numeric> = 1 .. 1000000

Set the number of bit errors that constitute an error for the tolerance gating period when in BER Penalty mode.

:SOURce:DATA:TELecom:TOLerance:ERRor:COUNt?

Returns: <numeric>

:SOURce:DATA:TELecom:TOLerance:ERRor:SEConds <numeric>

<numeric> = 1 .. 99

Set the number of errored seconds which constitutes an error for the tolerance gating period when in Onset Of Errors mode. The maximum value permitted is limited to the length of the gating period.

:SOURce:DATA:TELecom:TOLerance:ERRor:SEConds?

Returns: <numeric>

:SOURce:DATA:TELecom:TOLerance:AUTO:SAVE <string>, <string>, <boolean>

<string> =		Up to 8 Alphanumeric character filename
<string> =		Up to 3 Alphanumeric character file extension
<boolean> =	0 or OFF	If file exists will not overwrite
	1 or On	Will overwrite automatically

Saves auto tolerance results information to the floppy disk using the specified filename.

:SOURce:DATA:TELecom:TOLerance:FAST:SAVE <string>, <string>, <boolean>

<string> =		Up to 8 Alphanumeric character filename
<string> =		Up to 3 Alphanumeric character file extension
<boolean> =	0 or OFF	If file exists will not overwrite
	1 or On	Will overwrite automatically

Saves fast tolerance results information to the floppy disk using the specified filename.

Transfer Function

:SOURce:DATA:TELecom:TRANsfer:ENABled?

Returns <boolean>

Returns 1 if jitter transfer is ready to start using the current instrument settings. If 0 is returned, jitter transfer will not be able to start until the instrument is set up correctly.

:SOURce:DATA:TELecom:TRANsfer:LOCK <boolean>

<boolean> = 0 or OFF

Unlocks the instrument settings.

Jitter transfer automatically locks the instrument settings after a successful calibration run, to prevent calibration data from being accidentally lost (which would happen if any TX/RX setting were changed).

Once you have finished using jitter transfer, the lock must be released to revert to normal instrument operation.

:SOURce:DATA:TELecom:TRANsfer:LOCK?

Returns: <boolean>

:SOURce:DATA:TELecom:TRANsfer:MASK:INPut <discrete>

<discrete> =	G783A	G.783 Type A
	G783B	G.783 Type B
	G825_1M5	G.825 1.5Mb/s
	G825_2M	G.825 2Mb/s
	G8251	G.8251
	GR253R	GR.253 requirement
	GR253O	GR.253 objective
	USER	User selectable mask

Selects the input mask for transfer function testing. If USER is selected, a fur-

ther selection must be made using
SOURce:DATA:TELecom:TRANsfer:MASK:INPut:USER <string>.

The line rates at which each of the jitter masks may be selected are shown below:

	52Mb/s	155Mb/s	622Mb/s	2.5Gb/s	10Gb/s	10.7Gb/s
G783A		X	X	X	X	
G783B		X	X	X	X	
G825_1M5		X	X	X	X	
G825_2M		X	X	X	X	
G8251						X
GR253R	X	X	X	X	X	
GR253O	X	X	X	X	X	

:SOURce:DATA:TELecom:TRANsfer:MASK:INPut?

Returns: <discrete>

:SOURce:DATA:TELecom:TRANsfer:MASK:INPut:USER <numeric>

<numeric> = 1 .. 10

Selects the user mask to be used as the input mask for transfer function testing, if USER has been selected using
SOURce:DATA:TELecom:TRANSfer:MASK:INPUT. The <numeric> parameter is used to specify the mask number of the user mask you wish to use.

:SOURce:DATA:TELecom:TRANsfer:MASK:INPut:USER?

Returns: <numeric>

:SOURce:DATA:TELecom:TRANsfer:MASK:PASS <discrete>

<discrete> =	G8251ODCR	G8251 ODCr Pass
	G783A	G.783 Type A Pass
	G783B	G.783 Type B Pass
	GR253	GR253-CORE Pass

Selects the pass mask for transfer function testing.

The line rates at which each of the jitter masks may be selected are shown below:

	52Mb/s	155Mb/s	622Mb/s	2.5Gb/s	10Gb/s	10.7Gb/s
G8251ODCR						X
G783A		X	X	X	X	
G783B		X	X	X	X	
GR253	X	X	X	X	X	

:SOURce:DATA:TELecom:TRANsfer:MASK:PASS?

Returns: <discrete>

:SOURce:DATA:TELecom:TRANsfer:MASK:PASS:OFFSet <numeric>

<numeric> =	-2.00 .. 2.00	dB

Sets the adjustment to be added to the pass mask.

:SOURce:DATA:TELecom:TRANsfer:MASK:PASS:OFFSet?

Returns: <numeric>

:SOURce:DATA:TELecom:TRANsfer:POINts <numeric>

<numeric> = 1 .. 100

Sets the number of frequency points at which jitter transfer is tested.

:SOURce:DATA:TELecom:TRANsfer:POINts?

Returns: <numeric>

:SOURce:DATA:TELecom:TRANsfer:SETTling <numeric>

<numeric> = 5.0 .. 30.0

Set the delay in seconds between each jitter transfer modulation frequency and amplitude setting. This delay allows the system time to settle before performing the measurement.

:SOURce:DATA:TELecom:TRANsfer:SETTling?

Returns: <numeric>

:SOURce:DATA:TELecom:TRANsfer:GATE <numeric>

<numeric> = 5.0 .. 30.0

Set the data acquisition time in seconds at each jitter transfer point.

:SOURce:DATA:TELecom:TRANsfer:GATE?

Returns: <numeric>

:SOURce:DATA:TELecom:TRANsfer:FREQuency:DEFault

Sets the mask frequency limits for transfer testing to the default settings for the selected input and pass masks.

:SOURce:DATA:TELecom:TRANsfer:FREQuency:STARt <numeric>

<numeric> = 1.0 .. 80000000.0 Hertz

Sets the start frequency limit for the selected input mask. The frequency range available is dependant upon the line rate and input mask in use. The value entered as the start frequency must always be less than that entered for the stop frequency, using the SOURce:DATA:TELecom:TRANsfer:FREQuency:STOP command.

:SOURce:DATA:TELecom:TRANsfer:FREQuency:STARt?

Returns: <numeric>

:SOURce:DATA:TELecom:TRANsfer:FREQuency:STOP <numeric>

<numeric> = 1.0 .. 80000000.0 Hertz

Sets the stop frequency limit for the selected input mask. The frequency range available is dependant upon the line rate and input mask in use. The value entered as the stop frequency should always be greater than that entered for the start frequency, using the SOURce:DATA:TELecom:TRANsfer:FREQuency:STARt command.

:SOURce:DATA:TELecom:TRANsfer:FREQuency:STOP?

Returns: <numeric>

:SOURce:DATA:TELecom:TRANsfer:MODE <discrete>

<discrete> = CALibration Calibration Run

MEASure Measurement Run

Selects the transfer mode.

The MEASure mode can only be selected once the calibration run has completed

successfully.

:SOURce:DATA:TELecom:TRANsfer:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:TRANsfer:CALibrate?

Returns:
INV Calibration Invalid
VAL Calibration Valid

Returns the validity of the jitter transfer calibration.

:SOURce:DATA:TELecom:TRANsfer <boolean>

<boolean> =	0 or OFF	Stop transfer function
	1 or On	Start transfer function

Starts/stops jitter transfer mode.

:SOURce:DATA:TELecom:TRANsfer?

Returns: <boolean>

:SOURce:DATA:TELecom:TRANsfer:STATus?

Returns: <string>

Returns a string description of the current state of the transfer function application.

The format of the strings which can be returned are detailed below:

"Not running"
"Initialising"
"Test Point <point> Configuring Hardware Freq(Hz) <freq> Amp UI <amp>"
"Test Point <point> Waiting for JUL Alarm to Clear Freq(Hz) <freq> Amp UI <amp>"

"Test Point <point> Settling Freq(Hz) <freq> Amp UI <amp>"
"Test Point <point> Settling Freq(Hz) <freq> Amp UI <amp>"
"Test Point <point> Calculating Result Freq(Hz) <freq> Amp UI <amp>"

:SOURce:DATA:TELecom:TRANsfer:SAVE <string>, <string>, <boolean>

<string> =		Up to 8 Alphanumeric character string filename
<string> =		Up to 3 Alphanumeric character file extension
<boolean> =	0 or OFF	If file exists will not overwrite
	1 or On	Will overwrite automatically

Saves transfer results information to the floppy disk using the specified filename.

User Masks

:SOURce:DATA:TELecom:JITTer:UMASk:COPY:PRESet <numeric>, <discrete>, <discrete>

<numeric> =	1 .. 10	Destination User Mask number
<discrete> =	G783A	Preset Mask to copy from
	G783B	
	G825_1M5	
	G825_2M	
	G8251	
	GR253R	
	GR253O	
<discrete> =	M52	Line rate to specify variant of preset mask.

M155

M622

G2_5

G10

G10_7

Copies a preset mask into the user mask slot specified by the numeric parameter. An error will be returned if the user mask is currently being used by jitter tolerance or transfer.

The details of the mask variants available for each mask are shown below:

	52Mb/s M52	155Mb/s M155	622Mb/s M622	2.5Gb/s G2_5	10Gb/s G10	10.7Gb/s G10_7
G783A		X	X	X	X	
G783B		X	X	X	X	
G825_1 M5		X	X	X	X	
G825_2 M		X	X	X	X	
G8251						X
GR253R	X	X	X	X	X	
GR253O	X	X	X	X	X	

If a line rate is specified for which there is no available variant of the given mask, then an error will be returned.

:SOURce:DATA:TELecom:JITTer:UMASk:COPY:USER <numeric>, <numeric>

<numeric> = 1 .. 10 Destination User Mask

		number
<numeric> =	1 .. 10	Source User Mask number

Copies one user mask into another user mask. If an attempt is made to copy a mask to itself, or an attempt to copy from a mask with no points defined is made, an error will be returned. Also, an error will be returned if the user mask is currently being used by jitter tolerance or transfer.

:SOURce:DATA:TELecom:JITTer:UMASk:SHIFt <numeric>, <numeric>

<numeric> =	1 .. 10	User Jitter Mask number
<numeric> =	-100 .. 100	Amount to shift (%)

Allows all points on a specified user mask to be shifted up or down by a specified percentage. An error will be returned if the mask is currently being used by jitter tolerance or transfer.

:SOURce:DATA:TELecom:JITTer:UMASk:ENTRy <numeric>, <string>, <numeric>, <numeric>, <numeric>

<numeric> =	1 .. 10	User Jitter Mask number
<string> =		Label to be applied to mask (max 15 characters)
<numeric> =	2 .. 15	Number of points
<numeric> =	1.0 .. 80000000.0	Frequency in Hz (repeatable parameter)
<numeric> =	0.010 .. 1000000	Amplitude in UI (repeatable parameter)

Generates a user mask, specified in terms of frequency/amplitude pairs. The number of frequency/amplitude pairs can vary, depending on the number of points required in the mask.

Up to 15 points may be entered. The last two numeric parameters indicate parameters that may appear 2 or more times. In this case at least two frequency/

amplitude pairs must be specified, and the optional parameters can be used to specify up to a total of 15 frequency/ amplitude pairs for up to 15 points on the mask.

An error will be returned if the specified user mask is currently being used by jitter tolerance or transfer.

:SOURce:DATA:TELecom:JITTer:UMASk:ENTRy? <numeric>

<numeric> = 1 .. 10 User Jitter Mask number

The number of user-defined corner points on the specified user mask is returned, followed by the label of the user mask, then the actual frequency/amplitude values themselves. If there are no points on the mask then a dummy point with frequency 0 and amplitude 0 will be returned.

Returns:
<string> User mask label
<numeric> Number of points
<numeric>, <numeric> Frequency/Amplitude values (up to 15 points)

SENSe subsystem Receiver Jitter Settings

:SENSe:DATA:TELecom:JITTer:TYPE <discrete>

<discrete> =	OFF	
	JITTer	
	WANDer	

Selects the jitter/wander measurement type.

:SENSe:DATA:TELecom:JITTer:TYPE?

Returns: <discrete>

:SENSe:DATA:TELecom:JITTer:RANGe <discrete>

<discrete> =	UI0_8	0.8 UI Superfine range
	UI3	3 UI Fine range
	UI30	30 UI Medium range
	UI64	64 UI Extended range 52Mb/s and 155Mb/s
	UI256	256 UI Extended range 622 Mb/s
	UI2500	2500 UI Extended range 2.5Gb/s
	UI10000	10,000 UI Extended range 10Gb/s and 10.7Gb/s

Selects the jitter measurement range. Range UI0_8, UI3 and UI30 (Superfine, Fine and Medium) are available at all line rates.

:SENSe:DATA:TELecom:JITTer:RANGe?

Returns: <discrete>

:SENSe:DATA:TELecom:JITTer:PTHReshold <numeric>

<numeric> =	0.05 to 0.8 step 0.005	0.8UI range
	0.05 to 3 step 0.01	3UI range
	0.5 to 30 step 0.1	30UI range
	1.0 to 64 step 0.1	64UI range
	5.0 to 256 step 1.0	256UI range
	10.0 to 2500 step 5.0	2500UI range
	10.0 to 10000 step 10.0	10000UI range

Selects the jitter hits measurement threshold for positive hits in UI. The limits and step size are determined by the range setting selected using SENSe:DATA:TELecom:JITTer:RANGe.

:SENSe:DATA:TELecom:JITTer:PTHReshold?

Returns: <numeric>

:SENSe:DATA:TELecom:JITTer:NTHReshold <numeric>

<numeric> =	0.05 to 0.8 step 0.005	0.8UI range
	0.05 to 3 step 0.01	3UI ranger
	0.5 to 30 step 0.1	30UI range
	1.0 to 64 step 0.1	64UI range
	5.0 to 256 step 1.06	256UI range
	10.0 to 2500 step 5.00	2500UI range
	10.0 to 10000 step 10.00	10000UI rangeI

Selects the jitter hits measurement threshold for negative hits in UI. The limits and step size are determined by the range setting selected using SENSe:DATA:TELecom:JITTer:RANGe.

:SENSe:DATA:TELecom:JITTer:NTHReshold?

Returns: <numeric>

:SENSe:DATA:TELecom:JITTer:FILTer:HPASs <boolean>

<boolean> = 0 or OFF
1 or On

Sets the high pass filters on or off.

:SENSe:DATA:TELecom:JITTer:FILTer:HPASs?

Returns: <boolean>

:SENSe:DATA:TELecom:JITTer:FILTer:LPASs <boolean>

<boolean> = 0 or OFF
1 or On

Sets low pass filter on or off.

:SENSe:DATA:TELecom:JITTer:FILTer:LPASs?

Returns: <boolean>

:SENSe:DATA:TELecom:JITTer:DOUT <discrete>

<discrete> =		
	OFF	Filters off
	LP	LP filter
	HP_HZ100	100Hz HP filter
	HP_HZ500	500Hz HP filter
	HP_KHZ1	1kHz HP filter
	HP_KHZ5	5kHz HP filter
	HP_KHZ10	10kHz HP filter
	HP_KHZ12	12 kHz HP filter
	HP_KHZ20	20kHz HP filter

HP_KHZ65	65kHz HP filter
HP_KHZ250	250kHz HP filter
HP_MHZ1	1MHz HP filter
HP_KHZ50	50kHz HP filter
HP_MHZ4	4MHz HP filter
BP_HZ100	LP + 100Hz HP filter
BP_HZ500	LP + 500Hz HP filter
BP_KHZ1	LP + 1kHz HP filter
BP_KHZ5	LP + 5kHz HP filter
BP_KHZ10	LP + 10kHz HP filter
BP_KHZ12	LP + 12 kHz HP filter
BP_KHZ20	LP + 20kHz HP filter
BP_KHZ65	LP + 65kHz HP filter
BP_KHZ250	LP + 250kHz HP filter
BP_MHZ1	LP + 1MHz HP filter
BP_KHZ50	LP + 50kHz HP filter
BP_MHZ4	LP + 4MHz HP filter

Sets the demodulated jitter output filter path. This must correspond to a valid setting given the filter setup as defined using the :SENSe:DATA:TELecom:JITTer:FILTer:HPASs and :SENSe:DATA:TELecom:JITTer:FILTer:LPASs commands.

:SENSe:DATA:TELecom:JITTer:DOUT?

Returns: <discrete>

SENSe subsystem Result Returning Commands

Jitter Alarm Seconds Results

:SENSE:DATA? <string>

Result =
"JITTer:UNLock:SEConds" Jitter unlock
"JITTer:OOR:SEConds" Jitter out of range

Jitter Hits Results (Single Filter)

:SENSE:DATA? <string>

Result =
"JITTer:HITS:COUNt:POSitive:<filter>" Positive hit count for total measurement period
"JITTer:HITS:COUNt:NEGative:<filter>" Negative hit count for total measurement period
"JITTer:HITS:COUNt:POSitive:LSECond:<filter>" Positive hit count for last second of measurement period
"JITTer:HITS:COUNt:NEGative:LSECond:<filter>" Negative hit count for last second of measurement period
"JITTer:HITS:SEConds:<filter>" Hit seconds
"JITTer:HITS:FSEConds:<filter>" Hit free seconds

<filter> =	OFF	Filters off
	LPASs	LP filter
	HPASs:HZ100	100Hz HP filter
	HPASs:HZ500	500Hz HP filter
	HPASs:KHZ1	1kHz HP filter
	HPASs:KHZ5	5kHz HP filter
	HPASs:KHZ10	10kHz HP filter
	HPASs:KHZ12	12kHz HP filter
	HPASs:KHZ20	20kHz HP filter

HPASs:KHZ50	50kHz HP filter
HPASs:KHZ65	65kHz HP filter
HPASs:KHZ250	250kHz HP filter
HPASs:MHZ1	1MHz HP filter
HPASs:MHZ4	4MHz HP filter
BPASs:HZ100	LP + 100Hz HP filter
BPASs:HZ500	LP + 500Hz HP filter
BPASs:KHZ1	LP + 1kHz HP filter
BPASs:KHZ5	LP + 5kHz HP filter
BPASs:KHZ10	LP + 10kHz HP filter
BPASs:KHZ12	LP + 12kHz HP filter
BPASs:KHZ20	LP + 20kHz HP filter
BPASs:KHZ50	LP + 50kHz HP filter
BPASs:KHZ65	LP + 65kHz HP filter
BPASs:KHZ250	LP + 250kHz HP filter
BPASs:MHZ1	LP + 1MHz HP filter
BPASs:MHZ4	LP + 4MHz HP filter

The line rates at which each result can be retrieved are shown in the table below:

	52Mb/s	155Mb/s	622Mb/s	2.5Gb/s	10Gb/s	10.7Gb/s
Filters Off	X	X	X	X	X	X
LP filter	X	X	X	X	X	X

100Hz HP	X					
500Hz HP		X				
1kHz HP			X			
5kHz HP				X		
10kHz HP					X	X
12kHz HP	X	X	X	X	X	X
20kHz HP	X				X	X
50kHz HP					X	X
65kHz HP		X				
250kHz HP			X			
1MHz HP				X		
4MHz HP					X	X

Jitter Hits Results (All Filters)

:SENSE:DATA? <string>

<string> =

"JIT- Positive Jitter hit count for all filters

Ter:HITS:COUNt:POSitive:AFILters"	for total measurement period
"JIT-	Negative Jitter hit count for all filters
Ter:HITS:COUNt:NEGative:AFILters"	for total measurement period
"JIT-	Positive Jitter hit count for all filters
Ter:HITS:COUNt:POSitive:LSECond:	for last second of measurement pe-
AFILters"	riod
"JIT-	Negative Jitter hit count for all filters
Ter:HITS:COUNt:NEGative:LSECond:	for last second of measurement pe-
AFILters"	riod
"JITTer:HITS:SEConds:AFILters"	Jitter hit seconds results for all fil-
	ters
"JITTer:HITS:FSEConds:AFILters"	Jitter hit free seconds results for all
	filters

The above jitter hit results for all filters commands return comma separated lists detailing up to 5 results (depending on line rate and receiver filter selection settings) in the format:

<numeric>, {<string>, <numeric>}

where:

<numeric> =	Number of results being returned
<string> =	Filter names (up to 5)
<numeric> =	Result values (up to 5)

If the number of results being returned is 0, this indicates an invalid configuration e.g. Jitter is not selected on the receiver settings page.

The filter names that can appear in the returned comma separated list are detailed below:

OFF	Filters off
LPAS	Low pass filter
HPAS:HZ100	100Hz High pass filter
HPAS:HZ500	500Hz High pass filter
HPAS:KHZ1	1kHz High pass filter
HPAS:KHZ5	5kHz High pass filter
HPAS:KHZ10	10kHz High pass filter
HPAS:KHZ12	12kHz High pass filter
HPAS:KHZ20	20kHz High pass filter
HPAS:KHZ50	50kHz High pass filter
HPAS:KHZ65	65kHz High pass filter
HPAS:KHZ250	250kHz High pass filter
HPAS:MHZ1	1MHz High pass filter

HPAS:MHZ4	4MHz High pass filter
BPAS:HZ100	Low pass filter + 100Hz High pass filter
BPAS:HZ500	Low pass filter + 500Hz High pass filter
BPAS:KHZ1	Low pass filter + 1kHz High pass filter
BPAS:KHZ5	Low pass filter + 5kHz High pass filter
BPAS:KHZ10	Low pass filter + KHZ10 High pass filter
BPAS:KHZ12	Low pass filter + KHZ12 High pass filter
BPAS:KHZ20	Low pass filter + KHZ20 High pass filter
BPAS:KHZ50	Low pass filter + 50kHz High pass filter
BPAS:KHZ65	Low pass filter + 65kHz High pass filter
BPAS:KHZ250	Low pass filter + 250kHz High pass filter
BPAS:MHZ1	Low pass filter + 1MHz High pass filter
BPAS:MHZ4	Low pass filter + 4MHz High pass filter

Jitter Hits Results (ITU-T filter terminology)

:SENSE:DATA? <string>

<string> =

"JITTer:HITS:COUNt:POSitive:F1F4"	Positive hit count for total measurement period for f1-f4 bandwidth.
"JITTer:HITS:COUNt:POSitive:F3F4"	Positive hit count for total measurement period for f3-f4 bandwidth.
"JITTer:HITS:COUNt:POSitive:HPF4"	Positive hit count for total measurement period for HP-f4 bandwidth.
"JITTer:HITS:COUNt:NEGative:F1F4"	Negative hit count for total measurement period for f1-f4 bandwidth.
"JITTer:HITS:COUNt:NEGative:F3F4"	Negative hit count for total measurement period for f3-f4 bandwidth.
"JITTer:HITS:COUNt:NEGative:HPF4"	Negative hit count for total measure-

	ment period for HP-f4 bandwidth.
JITTer:HITS:COUNt:POSitive:LSECond:F1F4	Positive hit count for last second of measurement period for f1-f4 bandwidth.
"JITTer:HITS:COUNt:POSitive:LSECond:F3F4"	Positive hit count for last second of measurement period for f3-f4 bandwidth.
"JITTer:HITS:COUNt:POSitive:LSECond:HPF4"	Positive hit count for last second of measurement period for HP-f4 bandwidth.
"JITTer:HITS:COUNt:NEGative:LSECond:F1F4"	Negative hit count for last second of measurement period for f1-f4 bandwidth.
"JITTer:HITS:COUNt:NEGative:LSECond:F3F4"	Negative hit count for last second of measurement period for f3-f4 bandwidth.
"JITTer:HITS:COUNt:NEGative:LSECond:HPF4"	Negative hit count for last second of measurement period for HP-f4 bandwidth.
"JITTer:HITS:SEConds:F1F4"	Hit seconds for f1-f4 bandwidth.
"JITTer:HITS:SEConds:F3F4"	Hit seconds for f3-f4 bandwidth.
"JITTer:HITS:SEConds:HPF4"	Hit seconds for HP-f4 bandwidth.
"JITTer:HITS:FSEConds:F1F4"	Hit free seconds for f1-f4 bandwidth.
"JITTer:HITS:FSEConds:F3F4"	Hit free seconds for f3-f4 bandwidth.
"JITTer:HITS:FSEConds:HPF4"	Hit free seconds HP-f4 bandwidth.

Retrieval of the results detailed above can only be carried out if the High Pass and Low Pass filters are enabled. This is done using
:SENSe:DATA:TELecom:JITTer:FILTer:HPASs and
:SENSe:DATA:TELecom:JITTer:FILTer:LPASs.

The line rates at which each result can be retrieved are shown in the table below:

	52Mb/s	155Mb/s	622Mb/s	2.5Gb/s	10Gb/s	10.7Gb/s
f1-f4		X	X	X	X	X
f3-f4		X	X	X	X	X
HP-f4		X	X	X		

Jitter Hits Results (GR-253 filter terminology)

:SENSE:DATA? <string>

<string> =

"JITTer:HITS:COUNt:POSitive:B1B3"	Positive hit count for total measurement period for B1-B3 bandwidth.
"JITTer:HITS:COUNt:POSitive:B2B3"	Positive hit count for total measurement period for B2-B3 bandwidth.
"JITTer:HITS:COUNt:POSitive:HPB3"	Positive hit count for total measurement period for HP-B3 bandwidth.
"JITTer:HITS:COUNt:NEGative:B1B3"	Negative hit count for total measurement period for B1-B3 bandwidth.
"JITTer:HITS:COUNt:NEGative:B2B3"	Negative hit count for total measurement period for B2-B3 bandwidth.
"JITTer:HITS:COUNt:NEGative:HPB3"	Negative hit count for total measurement period for HP-B3 bandwidth.
"JITTer:HITS:COUNt:POSitive:LSECond:B1B3"	Positive hit count for last second of measurement period for B1-B3 bandwidth.
"JITTer:HITS:COUNt:POSitive:LSECond:B2B3"	Positive hit count for last second of measurement period for B2-B3 bandwidth.
"JITTer:HITS:COUNt:POSitive:LSECond:HPB3"	Positive hit count for last second of measurement period for HP-B3 bandwidth.
"JITTer:HITS:COUNt:NEGative:LSECond:B1B3"	Negative hit count for last second of measurement period for B1-B3 bandwidth.
"JITTer:HITS:COUNt:NEGative:LSECond:B2B3"	Negative hit count for last second of measurement period for B2-B3 bandwidth.
"JITTer:HITS:COUNt:NEGative:LSECond:HPB3"	Negative hit count for last second of measurement period for HP-B3 bandwidth.
"JITTer:HITS:SEConds:B1B3"	Hit seconds for B1-B3 bandwidth.
"JITTer:HITS:SEConds:B2B3"	Hit seconds for B2-B3 bandwidth.
"JITTer:HITS:SEConds:HPB3"	Hit seconds for HP-B3 bandwidth.
"JITTer:HITS:FSEConds:B1B3"	Hit free seconds for B1-B3 bandwidth.
"JITTer:HITS:FSEConds:B2B3"	Hit free seconds for B2-B3 band-

	width.
"JITTer:HITS:FSEConds:HPB3"	Hit free seconds HP-B3 bandwidth.

Retrieval of the results detailed above can only be carried out if the High Pass and Low Pass filters are enabled. This is done using
:SENSe:DATA:TELecom:JITTer:FILTer:HPASs and
:SENSe:DATA:TELecom:JITTer:FILTer:LPASs.

The line rates at which each result can be retrieved are shown in the table below:

	52Mb/s	155Mb/s	622Mb/s	2.5Gb/s	10Gb/s	10.7Gb/s
B1-B3	X	X	X	X	X	
B2-B3	X	X	X	X	X	
HP-B3	X	X	X	X	X	

Jitter Amplitude Results (Single Filter)

:SENSE:DATA? <string>

<string> = "JITTer:<measurement>:<filter>"

<measurement>=

PPEak	+ve peak total
NPEak	-ve peak total
PKPK	Peak to Peak total
RMS	RMS total
PPEak:LSECond	+ve peak last second
NPEak:LSECond	-ve peak last second
PKPK:LSECond	Peak to Peak last second
RMS:LSECond	RMS last second

<filter>=

OFF	Filters off
LPASs	LP filter
HPASs:HZ100	100Hz HP filter
HPASs:HZ500	500Hz HP filter
HPASs:KHZ1	1kHz HP filter
HPASs:KHZ5	5kHz HP filter

HPASs:KHZ10	10kHz HP filter
HPASs:KHZ12	12kHz HP filter
HPASs:KHZ20	20kHz HP filter
HPASs:KHZ50	50kHz HP filter
HPASs:KHZ65	65kHz HP filter
HPASs:KHZ250	250kHz HP filter
HPASs:MHZ1	1MHz HP filter
HPASs:MHZ4	4MHz HP filter
BPASs:HZ100	LP + 100Hz HP filter
BPASs:HZ500	LP + 500Hz HP filter
BPASs:KHZ1	LP + 1kHz HP filter
BPASs:KHZ5	LP + 5kHz HP filter
BPASs:KHZ10	LP + 10kHz HP filter
BPASs:KHZ12	LP + 12kHz HP filter
BPASs:KHZ20	LP + 20kHz HP filter
BPASs:KHZ50	LP + 50kHz HP filter
BPASs:KHZ65	LP + 65kHz HP filter
BPASs:KHZ250	LP + 250kHz HP filter
BPASs:MHZ1	LP + 1MHz HP filter
BPASs:MHZ4	LP + 4MHz HP filter

The line rates at which each result can be retrieved are shown in the table below:

	52Mb/s	155Mb/s	622Mb/s	2.5Gb/s	10Gb/s	10.7Gb/s
Filters Off	X	X	X	X	X	X
LP filter	X	X	X	X	X	X
100Hz HP	X					
500Hz HP		X				
1kHz HP			X			
5kHz HP				X		
10kHz					X	X

HP						
12kHz HP	X	X	X	X	X	X
20kHz HP	X				X	X
50kHz HP					X	X
65kHz HP		X				
250kHz HP			X			
1MHz HP				X		
4MHz HP					X	X

Jitter Amplitude Results (All Filters)

:SENSE:DATA? <string>

<string> =

"JITTer:PKPK:AFILters"	Pk-to-pk jitter for all filters
"JITTer:PKPK:LSECond:AFILters"	Pk-to-pk last second jitter for all filters
"JITTer:RMS:AFILters"	RMS jitter for all filters
"JITTer:RMS:LSECond:AFILters"	RMS last second jitter for all filters

The above jitter amplitude results for all filters commands return comma separated lists detailing up to 5 results (depending on line rate and receiver filter selection settings) in the format:

<numeric>, {<string>, <numeric>}

where

<numeric> =	Number of results being returned
<string> =	Filter names (up to 5)
<numeric> =	Result values (up to 5)

If the number of results being returned is 0, this indicates an invalid configuration e.g. Jitter is not selected on the receiver settings page.

The filter names that can appear in the returned comma separated list are detailed below:

OFF	Filters off
LPAS	Low pass filter
HPAS:HZ100	100Hz High pass filter
HPAS:HZ500	500Hz High pass filter
HPAS:KHZ1	1kHz High pass filter
HPAS:KHZ5	5kHz High pass filter
HPAS:KHZ10	10kHz High pass filter
HPAS:KHZ12	12kHz High pass filter
HPAS:KHZ20	20kHz High pass filter
HPAS:KHZ50	50kHz High pass filter
HPAS:KHZ65	65kHz High pass filter
HPAS:KHZ250	250kHz High pass filter
HPAS:MHZ1	1MHz High pass filter
HPAS:MHZ4	4MHz High pass filter
BPAS:HZ100	Low pass filter + 100Hz High pass filter
BPAS:HZ500	Low pass filter + 500Hz High pass filter
BPAS:KHZ1	Low pass filter + 1kHz High pass filter
BPAS:KHZ5	Low pass filter + 5kHz High pass filter
BPAS:KHZ10	Low pass filter + KHZ10 High pass filter
BPAS:KHZ12	Low pass filter + KHZ12 High pass filter
BPAS:KHZ20	Low pass filter + KHZ20 High pass filter
BPAS:KHZ50	Low pass filter + 50kHz High pass filter
BPAS:KHZ65	Low pass filter + 65kHz High pass filter
BPAS:KHZ250	Low pass filter + 250kHz High pass filter

BPAS:MHZ1	Low pass filter + 1MHz High pass filter
BPAS:MHZ4	Low pass filter + 4MHz High pass filter

Jitter Amplitude Results (ITU-T filter terminology)

:SENSE:DATA? <string>

<string> =

"JITTer:PPEak:F1F4"	+ve peak total for f1-f4 bandwidth.
"JITTer:PPEak:F3F4"	+ve peak total for f3-f4 bandwidth.
"JITTer:PPEak:HPF4"	+ve peak total for HP-f4 bandwidth.
"JITTer:NPEak:F1F4"	-ve peak total for f1-f4 bandwidth.
"JITTer:NPEak:F3F4"	-ve peak total for f3-f4 bandwidth.
"JITTer:NPEak:HPF4"	-ve peak total for HP-f4 bandwidth.
"JITTer:PKPK:F1F4"	Peak to Peak total for f1-f4 bandwidth.
"JITTer:PKPK:F3F4"	Peak to Peak total for f3-f4 bandwidth.
"JITTer:PKPK:HPF4"	Peak to Peak total for HP-f4 bandwidth.
"JITTer:RMS:F1F4"	RMS total for f1-f4 bandwidth.
"JITTer:RMS:F3F4"	RMS total for f3-f4 bandwidth.
"JITTer:RMS:HPF4"	RMS total for HP-f4 bandwidth.
"JITTer:PPEak:LSECond:F1F4"	+ve peak last second for f1-f4 bandwidth.
"JITTer:PPEak:LSECond:F3F4"	+ve peak last second for f3-f4 bandwidth.
"JITTer:PPEak:LSECond:HPF4"	+ve peak last second for HP-f4 bandwidth.
"JITTer:NPEak:LSECond:F1F4"	-ve peak last second for f1-f4 bandwidth.
"JITTer:NPEak:LSECond:F3F4"	-ve peak last second for f3-f4 bandwidth.
"JITTer:NPEak:LSECond:HPF4"	-ve peak last second for HP-f4 bandwidth.
"JITTer:PKPK:LSECond:F1F4"	Peak to Peak last second for f1-f4 bandwidth.
"JITTer:PKPK:LSECond:F3F4"	Peak to Peak last second for f3-f4 bandwidth.
"JITTer:PKPK:LSECond:HPF4"	Peak to Peak last second for HP-f4

bandwidth.

"JITTer:RMS:LSECond:F1F4" RMS last second for f1-f4 bandwidth.

"JITTer:RMS:LSECond:F3F4" RMS last second for f3-f4 bandwidth.

"JITTer:RMS:LSECond:HPF4" RMS last second for HP-f4 bandwidth.

The line rates at which each result can be retrieved are shown in the table below:

	52Mb/s	155Mb/s	622Mb/s	2.5Gb/s	10Gb/s	10.7Gb/s
f1-f4		X	X	X	X	X
f3-f4		X	X	X	X	X
HP-f4		X	X	X		

Jitter Amplitude Results (GR-253 filter terminology)

:SENSE:DATA? <string>

<string> =

"JITTer:PPEak:B1B3" +ve peak total for B1-B3 bandwidth.

"JITTer:PPEak:B2B3" +ve peak total for B2-B3 bandwidth.

"JITTer:PPEak:HPB3" +ve peak total for HP-B3 bandwidth.

"JITTer:NPEak:B1B3" -ve peak total for B1-B3 bandwidth.

"JITTer:NPEak:B2B3" -ve peak total for B2-B3 bandwidth.

"JITTer:NPEak:HPB3" -ve peak total for HP-B3 bandwidth.

"JITTer:PKPK:B1B3" Peak to Peak total for B1-B3 bandwidth.

"JITTer:PKPK:B2B3" Peak to Peak total for B2-B3 bandwidth.

"JITTer:PKPK:HPB3" Peak to Peak total for HP-B3 bandwidth.

"JITTer:RMS:B1B3" RMS total for B1-B3 bandwidth.

"JITTer:RMS:B2B3" RMS total for B2-B3 bandwidth.

"JITTer:RMS:HPB3" RMS total for HP-B3 bandwidth.

"JITTer:PPEak:LSECond:B1B3" +ve peak last second for B1-B3 bandwidth.

"JITTer:PPEak:LSECond:B2B3" +ve peak last second for B2-B3 bandwidth.

"JITTer:PPEak:LSECond:HPB3" +ve peak last second for HP-B3 band-

width.

"JITTer:NPEak:LSECond:B1B3" -ve peak last second for B1-B3 bandwidth.

"JITTer:NPEak:LSECond:B2B3" -ve peak last second for B2-B3 bandwidth.

"JITTer:NPEak:LSECond:HPB3" -ve peak last second for HP-B3 bandwidth.

"JITTer:PKPK:LSECond:B1B3" Peak to Peak last second for B1-B3 bandwidth.

"JITTer:PKPK:LSECond:B2B3" Peak to Peak last second for B2-B3 bandwidth.

"JITTer:PKPK:LSECond:HPB3" Peak to Peak last second for HP-B3 bandwidth.

"JITTer:RMS:LSECond:B1B3" RMS last second for B1-B3 bandwidth.

"JITTer:RMS:LSECond:B2B3" RMS last second for B2-B3 bandwidth.

"JITTer:RMS:LSECond:HPB3" RMS last second for HP-B3 bandwidth.

The line rates at which each result can be retrieved are shown in the table below:

	52Mb/s	155Mb/s	622Mb/s	2.5Gb/s	10Gb/s	10.7Gb/s
B1-B3	X	X	X	X	X	
B2-B3	X	X	X	X	X	
HP-B3	X	X	X	X	X	

Wander Alarm Seconds Results

:SENSE:DATA? <string>

<string> =

"WANDer:UNLock:SEConds" Wander unlock

Wander Results

:SENSE:DATA? <string>

<string> =

"WANDer:TIERror:UI"	Wander time interval error
"WANDer:TIERror:NSEConds"	Wander time interval error nanoseconds
"WANDer:PPEak:UI"	+ve peak Wander
"WANDer:PPEak:NSEConds"	+ve peak Wander nanoseconds
"WANDer:NPEak:UI"	-ve peak Wander
"WANDer:NPEak:NSEConds"	-ve peak Wander nanoseconds
"WANDer:PKPK:UI"	pk-to-pk Wander
"WANDer:PKPK:NSEConds"	pk-to-pk Wander nanoseconds
"WANDer:FREQuency:OFFSet"	Wander implied frequency offset
"WANDer:FREQuency:DRIFt"	Frequency drift

FETCh subsystem

The FETCh subsystem is used to retrieve data directly accumulated by the instrument.

:FETCh:ARRay:DATA:TELecom:ATOLerance:DATA?

Returns: <array-1> <array-2> | <array-n> EOI

<array> = <numeric>, <numeric>, <numeric>, <numeric>, <numeric>, <boolean>

Where:
<numeric> = Point number
<numeric> = Frequency (Hz)
<numeric> = Mask Amplitude (UI).
<numeric> = Result (UI)
<numeric> = Margin (UI)
<boolean> = 0 (fail) or 1 (pass)

Returns the auto tolerance results as shown. The number of array rows, n, depends upon the number of points selected at the beginning of the measurement.

:FETCh:ARRay:DATA:TELecom:FTOLerance:DATA?

Returns: <array-1> <array-2> | <array-n> EOI

<array> = <numeric>, <numeric>, <numeric>, <boolean>

Where:
<numeric> = Point number
<numeric> = Frequency (Hz)
<numeric> = Mask Amplitude (UI).
<boolean> = 0 (fail) or 1 (pass)

Returns the fast tolerance results as shown. The number of array rows, n, depends upon the number of points selected at the beginning of the measurement.

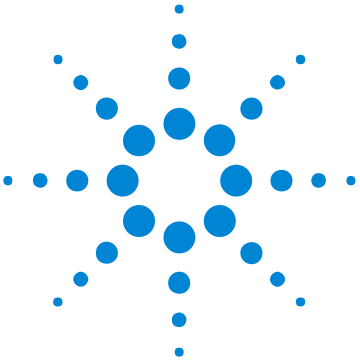
:FETCh:ARRay:DATA:TELecom:TRANsfer:DATA?

Returns: <array-1> <array-2> | <array-n> EOI

<array> = <numeric>, <numeric>, <numeric> , <numeric>, <numeric>, <boolean>

Where:
<numeric> = JTF point number
<numeric> = Frequency (Hz)
<numeric> = Pass Mask value (dB)
<numeric> = JTF result (dB)
<numeric> = Margin (dB)
<boolean> = 0 (fail) or 1 (pass)

Returns the jitter transfer results in numerical form as shown. The number of array rows , n, depends upon the number of points selected at the beginning of the measurement.



9
Status Reporting

Status Reporting

The status reporting capability of the Instrument is provided by the STATus subsystem, its Status Registers and the Status Byte.

The following status registers are provided and conform to IEEE 488.2:

Table 7-1 Status Registers

Status Register	Description
Standard Event	This register is accessed using the command *ESR?
QUEStionable	Defined by SCPI.
OPERation	Defined by SCPI.
INSTrument	Monitors general instrument status.
DATA	Monitors specific instrument status.
Various	A number of status registers offering specific status monitoring capability.

General Status Register

The status registers conform to IEEE 488.2 and each comprises four registers as shown in Table 8-2. For the commands which access and control these registers, see "STATus subsystem".

Table 8-2 General Status Register

Condition Register	Monitors the defined Status conditions. There is no latching of conditions in this register, it is updated in real time.

Transition Filter	Determines whether positive or negative transitions (true or false) in the Condition Register set the Event Register.
Event Register	Latches the transient states that occur in the Condition Register as specified by the Transition Filter.
Event Enable Register	Masks the Event register, determining which of its bits set the summary bit in the Status Byte.

Status Byte

*STB? or a serial port - Returns the value of the Status Byte in numeric form.
*SRE <numeric> - Sets the Status Byte mask.
*SRE? - Returns the current mask setting in numeric form.

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
OPER	RQS	ESR	MAV	QUES	-	-	-

DB0	Not used, always read as 0.
DB1	Not used, always read as 0.
DB2	Not used, always read as 0.
DB3	QUES - QUEStionable Status register summary . Indicates that a bit has been set in the QUEStionable Status register.
DB4	MAV - Message Available. Remains set until err output messages are read from the Instrument.

DB5	ESR - Event Status register summary . Indicates that a bit has been set in the Event Status register.
DB6	RQS - Request Service. Set when an SRQ is generated for whatever reason. Cleared by SPOLL or *STB?
DB7	OPER - OPERation Status register summary . Indicates that a bit has been set in the OPERation Status register

Standard Event Status Register

*ESR? - Returns the Standard Event Status Register value in numeric form.
*ESE <numeric> - Sets the event enable register mask.
*ESE? - Returns the current mask setting.

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
PWR	URQ	CME	EXE	DDE	QUE	RQC	OPC

DB0	OPC - OPERation Complete
DB1	RQC - Request Control.
DB2	QUE - Query Error
DB3	DDE - Device Dependent Error.
DB4	EXE - Execution Error.
DB5	CME - Command Error.
DB6	URQ - User Request.
DB7	PWR - Power On.

QUEStionable Status Register

Provides a summary of the DATA Status register.
For related commands, see "STATus subsystem"
Example: STATus:QUEStionable:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	CMW	-	-	-	-	DATA	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	-

DB0	Not used, always read as 0
DB1	Not used, always read as 0
DB2	Not used, always read as 0
DB3	Not used, always read as 0
DB4	Not used, always read as 0
DB5	Not used, always read as 0
DB6	Not used, always read as 0
DB7	Not used, always read as 0
DB8	Not used, always read as 0
DB9	DATA - DATA Status register summary .
DB10	Not used, always read as 0
DB11	Not used, always read as 0
DB12	Not used, always read as 0
DB13	Not used, always read as 0

DB14	CMW - Command Warning
DB15	Not used, always read as 0

OPERation Status Register

Provides a summary of the INSTrument Status register, and reports when a measurement is being made.
For related commands, see "STATus subsystem"
Example: STATus:OPERation:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	INST	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	MEAS	-	-	-	-

DB0	Not used, always reads as 0
DB1	Not used, always reads as 0
DB2	Not used, always reads as 0
DB3	Not used, always reads as 0
DB4	MEAS - Measuring. Currently making a measurement
DB5	Not used, always reads as 0
DB6	Not used, always reads as 0
DB7	Not used, always reads as 0
DB8	Not used, always reads as 0
DB9	Not used, always reads as 0
DB10	Not used, always reads as 0

DB11	Not used, always reads as 0
DB12	Not used, always reads as 0
DB13	INST - INSTrument Status register summary .
DB14	Not used, always reads as 0
DB15	Not used, always reads as 0

INSTrument Status Register

Reports the instrument Status.
For related commands, see "STATus subsystem".
Example: STATus:INSTrument:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	STP	STC	-	-	EOT	-	-

DB0	Reserved.
DB1	Reserved.
DB2	EOT - End Of Test period.
DB3	Not used, always read as 0
DB4	Not used, always read as 0
DB5	STC - Self Test complete.
DB6	STP - Last second period complete.
DB7	Reserved
DB8	Not used, always read as 0

DB9	Not used, always read as 0
DB10	Not used, always read as 0
DB11	Not used, always read as 0
DB12	Not used, always read as 0
DB13	Not used, always read as 0
DB14	Not used, always read as 0
DB15	Not used, always read as 0

DATA Status Register

Summarizes the alarm status registers shown.
For related commands, see "STATus subsystem".
Example: STATus:DATA:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	ISUM	-	ONTS	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
PMAS	-	SPDH	-	-	SSUM	-	-

DB0	Not used, always read as 0.
DB1	Reserved
DB2	SSUM - SDH / SONET Status register summary
DB3	Not used, always read as 0.
DB4	Reserved
DB5	SPDH - SPDH Status register summary

DB6	Reserved
DB7	PMASk - Pulse capture status register summary
DB8	Not used, always read as 0.
DB9	Not used, always read as 0.
DB10	Not used, always read as 0.
DB11	Reserved
DB12	OTNS - OTN Status Register Summary
DB13	Not used, always read as 0.
DB14	ISUM - ISUM Status register summary
DB15	Not used, always read as 0.

ISUMmary Status Register

Provides summarized alarm indications for each of the conditions, shown below, derived from the common major LEDs. Use this register to determine the Status of the instrument independent of its configuration. For related commands, see "STATus subsystem".
Example: STATus:ISUMmary:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	ERR	PSL	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	CSL	-	-	-	FRM	LOS	PLO

DB0	PLO - Power Loss.

DB1	LOS - Loss of Signal
DB2	FRM - Frame Alarm (LOF / OOF)
DB3	Reserved.
DB4	Reserved.
DB5	Reserved.
DB6	CSL - Transmitter Clock Synchronization Loss
DB7	Reserved.
DB8	Reserved.
DB9	Not used, always read as 0.
DB10	Not used, always read as 0.
DB11	Not used, always read as 0.
DB12	Not used, always read as 0.
DB13	PSL - Pattern sync loss
DB14	ERR - Errors detected
DB15	Not used, always read as 0.

SSUMmary Status Register

Provides summary alarm indications related to the SDH/ SONET Signal.
For related commands, see "STATus subsystem"
Example: STATus:SSUMmary:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0

-	-	-	-	SDH4/ SON4	SDH3/ SON4	SDH2/ SON2	SDH/ SON

DB0	SDH/SON - SDH Status register summary.
DB1	SDH2/SON2 - SDH2/SON2 Status register summary.
DB2	SDH3/SON3 - SDH3/SON3 Status register summary.
DB3	SDH4/SON4 - SDH4/SON4 Status register summary.
DB4	Not used, always read as 0.
DB5	Not used, always read as 0.
DB6	Not used, always read as 0.
DB7	Not used, always read as 0.
DB8	Not used, always read as 0.
DB9	Not used, always read as 0.
DB10	Not used, always read as 0.
DB11	Not used, always read as 0.
DB12	Not used, always read as 0.
DB13	Not used, always read as 0.
DB14	Not used, always read as 0.
DB15	Not used, always read as 0.

SDH Status Register

Provides primary alarm indications related to the SDH Signal .

For related commands, see "STATus subsystem".
Example: STATus:SDH:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	LPRDI	TUAIS	TULOP	HPRDI	MSRDI	H4LOM

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	AUAIS	MSAIS	LOP	OOF	LOF	-

DB0	Reserved.
DB1	LOF - Loss Of Frame
DB2	OOF - Out Of Frame
DB3	LOP - Loss Of Pointer
DB4	MSAIS - Multiplexer Section AIS
DB5	AUAIS - AU AIS.
DB6	Reserved.
DB7	Reserved.
DB8	H4LOM
DB9	MSRDI - Multiplexer Section RDI.
DB10	HPRDI - High Order Path RDI.
DB11	TULOP - TU Loss Of Pointer
DB12	TUAIS - TU AIS
DB13	LPRDI - Low Order Path RDI.
DB14	Reserved.
DB15	Not used, always read as 0.

SDH2 Status Register

Provides miscellaneous SDH monitoring.
For related commands, see "STATus subsystem".
Example: STATus:SDH2:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	HPTIM	RSTIM	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
SIGW	K1K2	TMNDF	TNDF	TPADJ	MNDF	NDF	PADJ

DB0	PADJ - AU Pointer Adjust.
DB1	NDF - AU Pointer New Data Flag.
DB2	MNDF - AU Pointer Missing New Data Flag.
DB3	TPADJ - TU Pointer Adjust.
DB4	TNDF - TU Pointer New Data Flag.
DB5	TMNDF - TU Pointer Missing New Data Flag.
DB6	K1K2 - K1K2 change.
DB7	SIGW - SDH Signal Wizard in progress
DB8	Reserved
DB9	Reserved
DB10	Reserved
DB11	Reserved

DB12	Reserved
DB13	RSTIM - Regenerator Section Trace Identifier Mismatch
DB14	HPTIM - High-Order Path Trace Identifier Mismatch
DB15	Not used, always read as 0.

SDH3 Status Register

Provides SDH TCM monitoring.
For related commands, see "STATus subsystem".
Example: STATus:SDH3:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	LPV-CAIS	LPT-CUNEQ	LPT-CODI	LPTCRDI	LPTCI-AIS	LPT-CLOM

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	VCAIS	TCUNEQ	TCODI	TCRDI	TCIAIS	TCLOM	P1P0

DB0	P1P0 LOM.
DB1	TCLOM - TCM Loss of Multiframe.
DB2	TCIAIS - TCM Incoming AIS.
DB3	TCRDI - TCM Remote Defect Indication.
DB4	TCODI - TCM Outgoing Defect Indication.
DB5	TCUNEQ - TCM Unequipped.

DB6	VCAIS - VC-AIS.
DB7	Not used, always read as 0.
DB8	LPTCLOM - Low order path TCM Loss of Multiframe
DB9	LPTCIAIS - Low order path TCM Incoming AIS
DB10	LPTCRDI - Low order path TCM Remote Defect Indication
DB11	LPTCODI - Low order path TCM Outgoing Defect Indication
DB12	LPTCUNEQ - Low order path TCM Unequipped
DB13	LPVCAIS - Low order path VC-AIS
DB14	Reserved
DB15	Not used, always read as 0.

SDH4 Status Register

Provides miscellaneous SDH monitoring. For related commands, see "STATus subsystem".
Example: STATus:SDH4:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	LPRFI	LPRDIC	LPRDIS

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
LPRDIP	LPUNEQ	LOPC	AISC	HPRDIC	HPRDIS	HPRDIP	HPUNEQ

DB0	HPUNEQ - High Order Path Un-equipped.
DB1	HPRDIP - High Order Enhanced RDI-P
DB2	HPRDIS - High Order Enhanced RDI-S
DB3	HPRDIC - High Order Enhanced RDI-C
DB4	AISC - Concatenated AIS
DB5	LOPC - Concatenated LOP
DB6	LPUNEQ - Low order path Un-equipped
DB7	LPRDIP - Low order path RDI Payload
DB8	LPRDIS - Low order path RDI Server
DB9	LPRDIC - Low order path RDI Connection
DB10	LPRFI - Low order path RFI
DB11	Reserved
DB12	Not used, always read as 0.
DB13	Not used, always read as 0.
DB14	Not used, always read as 0.
DB15	Not used, always read as 0.

SONet Status Register

Provides primary alarm indications related to the SONET Signal.
For related commands, see "STATus subsystem".
Example: STATus:SONet:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	RDIV	AISV	LOPV	RDIP	RDIL	H4LOM

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	AISP	AISL	LOPP	SEF	LOF	-

DB0	Reserved.
DB1	LOF - Loss Of Frame
DB2	SEF - Severely Errored Frame Defect
DB3	LOPP - Loss Of Pointer (LOP-P).
DB4	AISL - Line AIS (AIS-L)
DB5	AISP - Path AIS (AIS-P).
DB6	Reserved.
DB7	Reserved.
DB8	H4LOM
DB9	RDIL - Line FERF (RDI-L).
DB10	RDIP - Path FERF (RDI-P).
DB11	LOPV - VT Loss Of Pointer (LOP-V).
DB12	AISV - VT Path AIS (AIS-V).
DB13	RDIV - VT Path FERF. (RDI-V).
DB14	Reserved.
DB15	Not used, always read as 0

SONet2 Status Register

Provides miscellaneous SONET monitoring.
For related commands, see "STATus subsystem".
Example: STATus:SONet2:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	TIMP	TIMS	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
SIGW	K1K2	TMNDF	TNDF	TPADJ	MNDF	NDF	PADJ

DB0	PADJ - SPE Pointer Adjust.
DB1	NDF - SPE Pointer New Data Flag
DB2	MNDF - SPE Pointer Missing New Data Flag
DB3	TPADJ - VT Pointer Adjust
DB4	TNDF - VT Pointer New Data Flag
DB5	TMNDF - VT Pointer Missing New Data Flag.
DB6	K1K2 - K1K2 change
DB7	SIGW - Sonet Signal Wizard in progress
DB8	Reserved
DB9	Reserved
DB10	Reserved
DB11	Reserved
DB12	Reserved

DB13	TIMS - Section Trace Identifier Mismatch
DB14	TIMP - Path Trace Identifier Mismatch
DB15	Not used, always read as 0

SONet3 Status Register

Provides miscellaneous SONET monitoring. For related commands, see "STATus subsystem".
Example: STATus:SONet3:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	P1P0

DB0	P1P0 - P1P0 LOM.
DB1	Reserved
DB2	Reserved
DB3	Reserved
DB4	Reserved
DB5	Reserved
DB6	Reserved
DB7	Not used, always read as 0.
DB8	Reserved
DB9	Reserved

DB10	Reserved
DB11	Reserved
DB12	Reserved
DB13	Reserved
DB14	Reserved
DB15	Not used, always read as 0.

SONet4 Status Register

Provides miscellaneous SONET monitoring.
For related commands, see "STATus subsystem".
Example: STATus:SONet4:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	PDIP	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	LOPC	AISC	HPRDIPC	HPRDIPS	HPRDIPP	UNEQP

DB0	UNEQP - High Order Path Un-equipped.
DB1	HPRDIPP - High Order Enhanced RDI-P
DB2	HPRDIPS - High Order Enhanced RDI-S
DB3	HPRDIPC - High Order Enhanced RDI-C
DB4	AISC - Concatenated AIS

DB5	LOPC - Concatenated LOP
DB6	Reserved
DB7	Reserved
DB8	Reserved
DB9	Reserved
DB10	Not used, always read as 0.
DB11	PDI-P - Payload Defect Indicator
DB12	Not used, always read as 0.
DB13	Not used, always read as 0.
DB14	Not used, always read as 0.
DB15	Not used, always read as 0.

OTNSummary Status Register

Provides summary alarm indications related to the OTN Signal .
For related commands, see "STATus subsystem".
Example: STATus:OTNSummary:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	ODU	OTU	OTN

DB0	OTN Status Register Summary
DB1	OTU Status Register Summary
DB2	ODU Status Register Summary

DB3	Not used, always read as 0.
DB4	Not used, always read as 0.
DB5	Not used, always read as 0.
DB6	Not used, always read as 0.
DB7	Not used, always read as 0.
DB8	Not used, always read as 0.
DB9	Not used, always read as 0.
DB10	Not used, always read as 0.
DB11	Not used, always read as 0.
DB12	Not used, always read as 0.
DB13	Not used, always read as 0.
DB14	Not used, always read as 0.
DB15	Not used, always read as 0.

OTN Status Register

Provides primary alarm indications related to the OTN Signal .
For related commands, see "STATus subsystem"
Example: STATus:OTN:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	FECOFF	LOM	OOM	OOF	LOF	-

DB0	Reserved.

DB1	LOF - Loss Of Frame
DB2	OOF - Out Of Frame
DB3	OOM - Out of Multiframe
DB4	LOM - Loss of Multiframe
DB5	FECOFF - FEC All Zeroes
DB6	Not used, always read as 0.
DB7	Not used, always read as 0.
DB8	Not used, always read as 0.
DB9	Not used, always read as 0.
DB10	Not used, always read as 0.
DB11	Not used, always read as 0.
DB12	Not used, always read as 0.
DB13	Not used, always read as 0.
DB14	Not used, always read as 0.
DB15	Not used, always read as 0.

OTUNit Status Register

Provides primary alarm indications related to the OTN OTU Signal .
For related commands, see STATus subsystem
Example: STATus:OTUNit:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0

-	-	-	-	-	IAE	BDI	AIS

DB0	AIS - Alarm Indication Signal
DB1	BDI - Backwards Defect Indicator
DB2	IAE - Incoming Alignment Error
DB3	Not used, always read as 0.
DB4	Not used, always read as 0.
DB5	Not used, always read as 0.
DB6	Not used, always read as 0.
DB7	Not used, always read as 0.
DB8	Not used, always read as 0.
DB9	Not used, always read as 0.
DB10	Not used, always read as 0.
DB11	Not used, always read as 0.
DB12	Not used, always read as 0.
DB13	Not used, always read as 0.
DB14	Not used, always read as 0.
DB15	Not used, always read as 0.

ODUNit Status Register

Provides primary alarm indications related to the OTN ODU Signal .
For related commands, see STATus subsystem.
Example: STATus:ODUNit:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	LCK	OCI	BDI	AIS

DB0	AIS - Alarm Indication Signal
DB1	BDI - Backwards Defect Indicator
DB2	OCI - Open Connection Indication
DB3	LCK - Locked Indication
DB4	Not used, always read as 0.
DB5	Not used, always read as 0.
DB6	Not used, always read as 0.
DB7	Not used, always read as 0.
DB8	Not used, always read as 0.
DB9	Not used, always read as 0.
DB10	Not used, always read as 0.
DB11	Not used, always read as 0.
DB12	Not used, always read as 0.
DB13	Not used, always read as 0.
DB14	Not used, always read as 0.
DB15	Not used, always read as 0.

SPDH Status Register

Provides alarm indications related to the Structured PDH Signal .
For related commands, see "STATus subsystem".
Example: STATus:SPDH:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
DS2	-	DS1	DS3	M2	M8	M34	M140

DB0	M140 - M140 Status register summary
DB1	M34 - M34 Status register summary
DB2	M8 - M8 Status register summary
DB3	M2 - M2 Status register summary
DB4	DS3 - DS3 Status register summary
DB5	DS1 - DS1 Status register summary
DB6	Reserved
DB7	DS2 - DS2 Status register summary
DB8	Reserved
DB9	Reserved
DB10	Reserved
DB11	Reserved
DB12	Reserved
DB13	Reserved
DB14	Reserved
DB15	Not used, always read as 0

M140 Status Register

Provides alarm indications related to the Structured PDH 140 Mb/s Signal .
For related commands, see "STATus subsystem".
Example: STATus:M140:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	MIN	RAI	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	AIS	-	-	-	LOF	-

DB0	Reserved.
DB1	LOF - Loss Of Frame
DB2	Not used, always read as 0
DB3	Not used, always read as 0
DB4	Not used, always read as 0
DB5	AIS - Alarm Indication Sequence
DB6	Not used, always read as 0
DB7	Not used, always read as 0
DB8	Not used, always read as 0
DB9	Not used, always read as 0
DB10	RAI - Remote Alarm
DB11	MIN - Minor Alarm
DB12	Reserved.
DB13	Reserved.

DB14	Not used, always read as 0
DB15	Not used, always read as 0

M34 Status Register

Provides alarm indications related to the Structured PDH 34 Mb/s Signal .
For related commands, see "STATus subsystem".
Example: STATus:M34:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	MIN	RAI	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	AIS	-	-	-	LOF	-

DB0	Reserved.
DB1	LOF - Loss Of Frame
DB2	Not used, always read as 0
DB3	Not used, always read as 0
DB4	Not used, always read as 0
DB5	AIS - Alarm Indication Sequence
DB6	Not used, always read as 0
DB7	Not used, always read as 0
DB8	Not used, always read as 0
DB9	Not used, always read as 0
DB10	RAI - Remote Alarm
DB11	MIN - Minor Alarm

DB12	Reserved.
DB13	Reserved.
DB14	Not used, always read as 0
DB15	Not used, always read as 0

M8 Status Register

Provides alarm indications related to the Structured PDH 8 Mb/s Signal .
For related commands, see "STATus subsystem.
Example: STATus:M8:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	MIN	RAI	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	AIS	-	-	-	LOF	-

DB0	Reserved.
DB1	LOF - Loss Of Frame
DB2	Not used, always read as 0
DB3	Not used, always read as 0
DB4	Not used, always read as 0
DB5	AIS - Alarm Indication Sequence
DB6	Not used, always read as 0
DB7	Not used, always read as 0
DB8	Not used, always read as 0
DB9	Not used, always read as 0

DB10	RAI - Remote Alarm
DB11	MIN - Minor Alarm
DB12	Not used, always read as 0
DB13	Not used, always read as 0
DB14	Not used, always read as 0
DB15	Not used, always read as 0

M2 Status Register

Provides alarm indications related to the Structured PDH 2 Mb/s Signal .
For related commands, see "STATus subsystem".
Example: STATus:M2:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	MIN	RAI	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	AIS	-	CAS	RMFR	LOF	-

DB0	Reserved.
DB1	LOF - Loss Of Frame
DB2	RMFR - Remote Multiframe Alarm.
DB3	CAS - CAS Multiframe Loss
DB4	Reserved.
DB5	AIS - Alarm Indication Sequence
DB6	Not used, always read as 0
DB7	Not used, always read as 0

DB8	Not used, always read as 0
DB9	Not used, always read as 0
DB10	RAI - Remote Alarm
DB11	MIN - Minor Alarm
DB12	Not used, always read as 0
DB13	Not used, always read as 0
DB14	Not used, always read as 0
DB15	Not used, always read as 0

DS3 Status Register

Provides alarm indications related to the T-Carrier DS3 Signal .

For related commands, see "STATus subsystem".

Example: STATus:DS3:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	FMM	IDLE	EXZ	-	RAI	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	AIS	MFM	-	OOF	-	-

DB0	Reserved.
DB1	Not used, always read as 0
DB2	OOF - Out Of Frame
DB3	Not used, always read as 0
DB4	MFM - Multiframe Loss
DB5	AIS - Alarm Indication Sequence

DB6	Not used, always read as 0
DB7	Not used, always read as 0
DB8	Reserved.
DB9	Reserved.
DB10	RAI - Remote Alarm. (FERF)
DB11	Not used, always read as 0
DB12	EXZ - Excess Zeros
DB13	IDLE - Idle
DB14	FMM - Frame Mismatch
DB15	Not used, always read as 0

DS2 Status Register

Provides alarm indications related to the T-Carrier DS2 Signal
.
For related commands, see "STATus subsystem".
Example: STATus:DS2:EVENt3F

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	OOF	-	-

DB0	Not used, always read as 0
DB1	Not used, always read as 0
DB2	OOF - Out Of Frame
DB3	Not used, always read as 0

DB4	Not used, always read as 0
DB5	Not used, always read as 0
DB6	Not used, always read as 0
DB7	Not used, always read as 0
DB8	Not used, always read as 0
DB9	Not used, always read as 0
DB10	Not used, always read as 0
DB11	Not used, always read as 0
DB12	Not used, always read as 0
DB13	Not used, always read as 0
DB14	Not used, always read as 0
DB15	Not used, always read as 0

DS1 Status Register

Provides alarm indications related to the T-Carrier DS1 Signal .

For related commands, see "STATus subsystem".

Example: STATus:DS1:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
LPDN	LPUP	IDLE	EXZ	-	RAI	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	AIS	-	-	OOF	-	-

DB0	Reserved.
DB1	Not used, always read as 0

DB2	OOF - Out Of Frame
DB3	Not used, always read as 0
DB4	Not used, always read as 0
DB5	AIS - Alarm Indication Sequence
DB6	Not used, always read as 0
DB7	Not used, always read as 0
DB8	Not used, always read as 0
DB9	Not used, always read as 0
DB10	RAI - Remote Alarm. (FERF).
DB11	Not used, always read as 0
DB12	EXZ - Excess Zeros
DB13	IDLE - Idle
DB14	DS1 Inband Loop Up code detected
DB15	DS1 Inband Loop Down code detected

PMASk Status Register

Provides alarm indications related to the Pulse Capture and mask comparison feature.
For related commands, see "STATus subsystem".
Example: STATus:PMASk:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	PNEG	PPOS	PCM	PCT

DB0	PCT - Pulse capture timeout
DB1	PCM - Pulse capture and pulse fitting complete
DB2	PPOS - Successful positive pulse fit, (wait for PCM)
DB3	PNEG - Successful negative pulse fit, (wait for PCM)
DB4	Not used, always read as 0
DB5	Not used, always read as 0
DB6	Not used, always read as 0
DB7	Not used, always read as 0
DB8	Not used, always read as 0
DB9	Not used, always read as 0
DB10	Not used, always read as 0
DB11	Not used, always read as 0
DB12	Not used, always read as 0
DB13	Not used, always read as 0
DB14	Not used, always read as 0
DB15	Not used, always read as 0

JITTer Status Register

Provides alarm indications related to Jitter Measurement. For related commands, see "STATus subsystem".

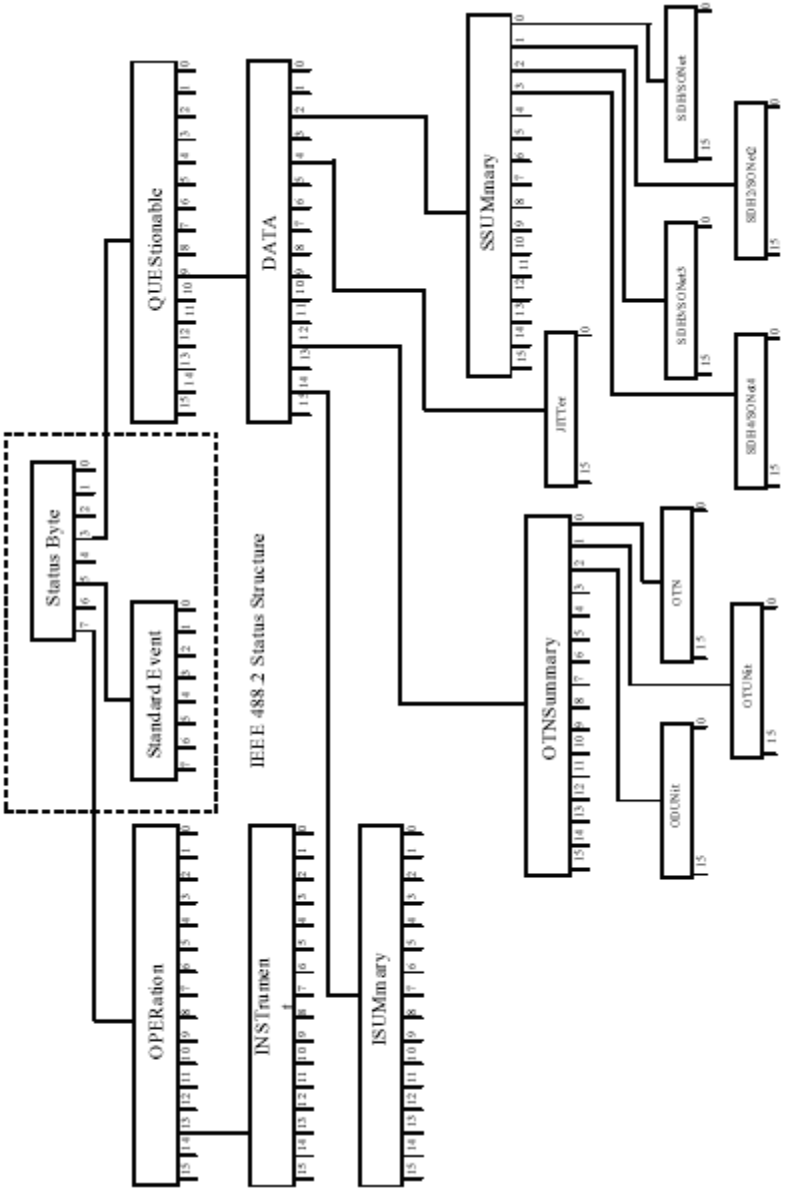
Example: STATus:JITTer:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	JTF	-	-	-	JAT	-	TSET

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	JOVR	-	-	-	JHT	JSL

DB0	JSL Jitter Unlock.
DB1	JHT Jitter Hits.
DB2	Not used, always read as 0.
DB3	Not used, always read as 0.
DB4	Not used, always read as 0.
DB5	JOVR Jitter out of range.
DB6	Not used, always read as 0.
DB7	Not used, always read as 0.
DB8	TSET Jitter transmitter settling.
DB9	Not used, always read as 0.
DB10	JAT Jitter Autotolerance in progress.
DB11	Not used, always read as 0.
DB12	Not used, always read as 0.
DB13	Not used, always read as 0.
DB14	JTF Jitter Transfer in progress.
DB15	Not used, always read as 0.

Status Register Hierarchy



Programmed Status Reporting

When a condition is detected, a summary bit is generated by the Status Register which detects the condition. The summary bit in most cases passes through other Status Registers before affecting the Status Byte. These other Status Registers also generate a summary bit. Ttherefore to report a condition requires the setting of the Event Enable Register mask in all registers in the chain.

When implementing Status reporting into your programming, consider the following with reference to the Status Registers Relationship diagram.

Programming Interrupts

1) Define which conditions you went reported. To do this, set the Event Enable Register mask of the Status Register that first detects the defined conditions. Set the Event Enable Register mask of err subsequent Status Registers between the reporting Status Register and the Status Byte. Using an example from the SDH Status Register:

LOS + LOF

:STAT:SDH:ENAB 3	Set the SDH event enable register to summarize for LOF(2) + LOS (1)
:STAT:SDH:PTR 3;NTR 0	Transition filter passes positive transitions bits 0 and 1.
:STAT:DATA:ENAB 4	Set the DATA event enable register to summarize for SDH(4)
:STAT:DATA:PTR 4;NTR 0	Transition filter passes positive transitions bit 2.
:STAT:QUES:ENAB 512	Set the QUES event enable register to summarize for DATA(512)
:STAT:QUES:PTR 512;NTR 0	Transition filter passes positive tran-

sitions bit 9.

2) If you are implementing a service request/serial port OPERation, set the mask of the Status Byte, for example:

*SRE 40	QUES summary + Standard Event summary

The Status Byte register will initiate a service request (RQS) when either of the masked conditions are detected.

Interpreting Interrupts

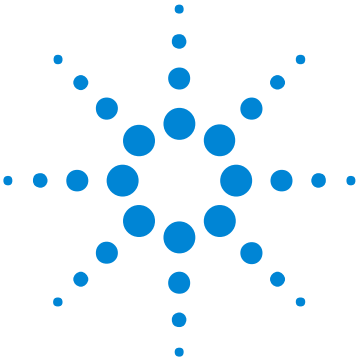
1) Check the content of the Status Byte register using the service request/serial port OPERation (SPOLL) or by issuing the *STB? common capabilities command, for example:

*STB?	Returns 8 - QUES summary

2) If a condition has been detected, determine which Status Register is responsible for issuing the summary bit, then use the appropriate STATus commands to interrogate the appropriate registers, for example:

:STAT:QUES:EVEN?	Returns 512 - DATA summary
:STAT:DATA:EVEN?	Returns 4 - SDH summary
:STAT:SDH:EVEN?	Returns 3 - LOF (2) + LOS (1)

The following program example is written in Rocky Mountain Basic and utilizes a combination of SRQ and Status Register filtering.



10
Backwards Compatibility

Backwards Compatibility

When developing test programs for the OmniBER OTN, it is possible to reduce development time by adapting existing test programs you may have written for the OmniBER 718. This chapter documents the compatibility of the SCPI (Standard Commands for Programmable Instruments) commands between the OmniBER OTN and the OmniBER 718.

Please refer to the preceding chapters for information on SCPI command formats and for a list of commands for the OmniBER OTN.

Please also refer to the OmniBER 718 Remote Control manual for information on the SCPI commands supported by that product.

There is a high degree of functional compatibility between the SCPI commands supported by the OmniBER OTN and OmniBER 718. That is to say, for features supported in both products, e.g. BER testing at 2.5 Gb/s, most commands are identical.

However, due to differences in functionality there are some differences in the operation and the inter-dependencies of commands. When reviewing commands used with OmniBER 718 instrument for reuse with the OmniBER OTN you are encouraged to migrate to the new, 'preferred', commands (This will minimize future compatibility issues with test programs).

Commands listed in this chapter as being provided for backwards compatibility may not be provided in future versions of the OmniBER OTN.

This chapter is structured as follows

1. Commands Provided for Backward Compatibility

These are commands which are identical to the OmniBER 718 command, but have been added to the OmniBER OTN command set to make the OTN compatible.

There will be another, slightly different, 'preferred' command

in the OmniBER OTN that will perform the same function.

2. OmniBER 718 Features/Commands Not Supported

This section lists OmniBER 718 commands for features, and therefore SCPI commands, which are NOT supported in the OmniBER OTN e.g. ATM and POS.

3. OmniBER 718 features with no SCPI support

Commands for features supported in both instruments but NO SCPI support in OmniBER OTN.

4. Workarounds for Incompatible Commands

Commands for which there is a workaround in the OmniBER OTN. For example, some commands are common between the two instruments but support different parameters. In these instances there is usually (at least) one parameter which is also common.

5. Backwards Compatibility for Enhanced Testing Upgrade Commands

This section details features and commands that are not available at initial release, but are expected to be provided with Enhanced Testing Upgrade J7265A option 500.

Commands Provided for Backward Compatibility

For parameter details of the backward compatible commands please refer to the SCPI manual for your OmniBER 718 instrument.

For longer-term support it is recommended that the preferred commands belonging to the command set of your OmniBER OTN be used where possible.

As a result of changes to international standards and functional differences between the OmniBER OTN and the OmniBER 718 instruments, some parameter values for older commands may be unavailable in the OmniBER OTN and visa-versa. Please refer to the appropriate instrument manuals to determine the functionality available.

In addition, some SCPI commands provided in the OmniBER OTN reuse a command header from earlier OmniBER 718 but have a limited functional or parameter overlap. Where practical, backwards compatibility has been provided. Again, the preferred commands or parameter values are recommended for future use.

:FETCh

:FETCh:ARRay:DATA:TELecom:SDH:OVERhead?
<numeric>,<numeric>,<numeric>

Limitations:	Instrument should be in remote control mode
Preferred:	:SENSe:DATA:TELecom:SDH:OVERhead:CHANnel :FETCh:ARRay:DATA:TELECOM:SDH:OVERhead:DATA?
See also:	

:FETCh:ARRay:DATA:TELecom:SDH:POVerhead? <numeric>

Limitations:

Preferred: :FETCh:ARRay:DATA:TELECOM:SDH:POVerhead:DATA?

See also:

:FETCh:ARRay:DATA:TELecom:SONet:OVERhead? <numeric>,<numeric>,<numeric>

Limitations: Instrument should be in remote control mode

Preferred: :SENSe:DATA:TELecom:SONet:OVERhead:CHANnel
:FETCh:ARRay:DATA:TELECOM:SONet:OVERhead:DATA?

See also:

:FETCh:ARRay:DATA:TELecom:SONet:POVerhead? <numeric>

Limitations:

Preferred: :FETCh:ARRay:DATA:TELECOM:SONet:POVerhead:DATA?

See also:

:FETCh:SCALar:DATA:TELecom:SDH:OVERhead? <numeric>,<numeric>,<discrete>

Limitations:	Instrument should be in remote control mode
Preferred:	:SENSe:DATA:TELecom:SDH:OVERhead:CHANnel :FETCh:SCALar:DATA:TELECOM:SDH:OVERhead:DATA?
See also:	

:FETCh:SCALar:DATA:TELecom:SDH:POVerhead? <discrete>

Limitations:	
Preferred:	:FETCh:SCALar:DATA:TELECOM:SDH:POVerhead:DATA?
See also:	

:FETCh:SCALar:DATA:TELecom:SONet:OVERhead? <numeric>,<numeric>,<discrete>

Limitations:	Instrument should be in remote control mode
Preferred:	:SENSe:DATA:TELecom:SONet:OVERhead:CHANnel :FETCh:SCALar:DATA:TELECOM:SONet:OVERhead:DATA?
See also:	

:FETCh:SCALar:DATA:TELecom:SONet:POVerhead? <discrete>

Limitations:

Preferred: :FETCh:SCALar:DATA:TELECOM:SONet:POVerhead:DATA?

See also:

:FETCh:STRing:DATA:TELecom:SDH:K1?

Limitations:

Preferred: :FETCh:SCALar:DATA:TELecom:SDH:OVERhead:K1?

See also:

:FETCh:STRing:DATA:TELecom:SDH:K2?

Limitations:

Preferred: :FETCh:SCALar:DATA:TELecom:SDH:OVERhead:K2?

See also:

:FETCh:STRing:DATA:TELecom:SDH:S1?

Limitations:

Preferred: :FETCh:SCALar:DATA:TELecom:SDH:OVERhead:S1?

See also:

:FETCh:STRing:DATA:TELecom:SONet:K1?

Limitations:

Preferred: :FETCh:SCALar:DATA:TELecom:SONet:OVERhead:K1?

See also:

:FETCh:STRing:DATA:TELecom:SONet:K2?

Limitations:

Preferred: :FETCh:SCALar:DATA:TELecom:SONet:OVERhead:K2?

See also:

:FETCh:STRing:DATA:TELecom:SONet:S1?

Limitations:

Preferred: :FETCh:SCALar:DATA:TELecom:SONet:OVERhead:S1?

See also:

:FETCh:ARRay:DATA:TELecom:JITTer:ATOLerance?

Limitations:

Preferred: :FETCh:ARRay:DATA:TELecom:TOLerance:DATA?

See also:

:FETCh:ARRay:DATA:TELecom:JITTer:ATOLerance:DATA?

Limitations:

Preferred: :FETCh:ARRay:DATA:TELecom:TOLerance:DATA?

See also:

:FETCh:ARRay:DATA:TELecom:JITTer:TRANsfer?

Limitations:

Preferred: :FETCh:ARRay:DATA:TELecom:TRANsfer:DATA?

See also:

:INPut:TELecom

:INPut:TELecom:OC3:INTerface <discrete>

Limitations: Also affects interface state of other OC types
Parameter values not supported
MONitor

Preferred: :INPut:TELecom:INTerface

See also: :INPut:TELecom:OC12:INTerface
:INPut:TELecom:OC48:INTerface
:INPut:TELecom:OPT1:INTerface
:INPut:TELecom:OPT4:INTerface
:INPut:TELecom:OPT16:INTerface

This command is queriable using the standard query method.

:INPut:TELecom:OC3:RATE <discrete>

Limitations:	Also affects RATE of other OC types
Preferred:	:SENSe:DATA:TELecom:SDH:RATE
See also:	:INPut:TELecom:OC12:RATE :INPut:TELecom:OC48:RATE

This command is queriable using the standard query method.

:INPut:TELecom:OC12:INTerface <discrete>

Limitations:	Also affects interface state of other OC types Parameter values not supported MONitor
Preferred:	:INPut:TELecom:INTerface
See also:	:INPut:TELecom:OC3:INTerface :INPut:TELecom:OC48:INTerface :INPut:TELecom:OPT1:INTerface :INPut:TELecom:OPT4:INTerface :INPut:TELecom:OPT16:INTerface

This command is queriable using the standard query method.

:INPut:TELecom:OC12:RATE <discrete>

Limitations:	Also affects RATE of other OC types
Preferred:	:SENSe:DATA:TELecom:SDH:RATE
See also:	:INPut:TELecom:OC3:RATE

:INPut:TELecom:OC48:RATE

This command is queriable using the standard query method.

:INPut:TELecom:OC48:INTerface <discrete>

Limitations:	Also affects interface state of other OC types Parameter values not supported MONitor
Preferred:	:INPut:TELecom:INTerface
See also:	:INPut:TELecom:OC3:INTerface :INPut:TELecom:OC12:INTerface :INPut:TELecom:OPT1:INTerface :INPut:TELecom:OPT4:INTerface :INPut:TELecom:OPT16:INTerface

This command is queriable using the standard query method.

:INPut:TELecom:OC48:RATE <discrete>

Limitations:	Also affects RATE of other OC types
Preferred:	:SENSe:DATA:TELecom:SDH:RATE
See also:	:INPut:TELecom:OC3:RATE :INPut:TELecom:OC12:RATE

This command is queriable using the standard query method.

:INPut:TELecom:OPT1:INTerface <discrete>

Limitations:	Also affects interface state of other OC types Parameter values not supported

MONitor

Preferred: :INPut:TELecom:INTerface

See also: :INPut:TELecom:OC3:INTerface
:INPut:TELecom:OC12:INTerface
:INPut:TELecom:OC48:INTerface
:INPut:TELecom:OPT4:INTerface
:INPut:TELecom:OPT16:INTerface

This command is queriable using the standard query method.

:INPut:TELecom:OPT1:RATE <discrete>

Limitations: Also affects rate of other OPT types

Preferred: :SENSe:DATA:TELecom:SONet:RATE

See also: :INPut:TELecom:OPT4:RATE
:INPut:TELecom:OPT16:RATE

This command is queriable using the standard query method.

:INPut:TELecom:OPT4:INTerface <discrete>

Limitations: Also affects interface state of other OC types
Parameter values not supported
MONitor

Preferred: :INPut:TELecom:INTerface

See also: :INPut:TELecom:OC3:INTerface
:INPut:TELecom:OC12:INTerface
:INPut:TELecom:OC48:INTerface
:INPut:TELecom:OPT1:INTerface
:INPut:TELecom:OPT16:INTerface

This command is queriable using the standard query method.

:INPut:TELecom:OPT4:RATE <discrete>

Limitations:	Also affects rate of other OPT types
Preferred:	:SENSe:DATA:TELecom:SONet:RATE
See also:	:INPut:TELecom:OPT1:RATE :INPut:TELecom:OPT16:RATE

This command is queriable using the standard query method.

:INPut:TELecom:OPT16:INTerface <discrete>

Limitations:	Also affects interface state of other OC types Parameter values not supported MONitor
Preferred:	:INPut:TELecom:INTerface
See also:	:INPut:TELecom:OC3:INTerface :INPut:TELecom:OC12:INTerface :INPut:TELecom:OC48:INTerface :INPut:TELecom:OPT1:INTerface :INPut:TELecom:OPT4:INTerface

This command is queriable using the standard query method.

:INPut:TELecom:OPT16:RATE <discrete>

Limitations:	Also affects rate of other OPT types
Preferred:	:SENSe:DATA:TELecom:SONet:RATE
See also:	:INPut:TELecom:OPT1:RATE

:INPut:TELecom:OPT4:RATE

This command is queriable using the standard query method.

:OUTPut:TELecom

:OUTPut:TELecom:OC3:LASer <boolean>

Limitations:	Also affects the LASer state of other OC and OPT types
Preferred:	:OUTPut:TELecom:LASer
See also:	:OUTPut:TELecom:OC12:LASer :OUTPut:TELecom:OC48:LASer :OUTPut:TELecom:OPT1:LASer :OUTPut:TELecom:OPT4:LASer :OUTPut:TELecom:OPT16:LASer

This command is queriable using the standard query method.

:OUTPut:TELecom:OC3:RATE <discrete>

Limitations:	Also affects the wavelength of other OC types
Preferred:	:SOURce:DATA:TELecom:SDH:RATE
See also:	:OUTPut:TELecom:OC12:RATE :OUTPut:TELecom:OC48:RATE :OUTPut:TELecom:SDH:RATE

This command is queriable using the standard query method.

:OUTPut:TELecom:OC3:WAVelength <discrete>

Limitations:	Also affects the wavelength of other

	OC and OPT types
Preferred:	:OUTPut:TELecom:WAVelength
See also:	:OUTPut:TELecom:OC12:WAVelength :OUTPut:TELecom:OC48:WAVelength :OUTPut:TELecom:OPT1:WAVelength :OUTPut:TELecom:OPT4:WAVelength :OUTPut:TELecom:OPT16:WAVelength

This command is queriable using the standard query method.

:OUTPut:TELecom:OC12:LASer <boolean>

Limitations:	Also affects the LASer state of other OC and OPT types
Preferred:	:OUTPut:TELecom:LASer
See also:	:OUTPut:TELecom:OC3:LASer :OUTPut:TELecom:OC48:LASer :OUTPut:TELecom:OPT1:LASer :OUTPut:TELecom:OPT4:LASer :OUTPut:TELecom:OPT16:LASer

This command is queriable using the standard query method.

:OUTPut:TELecom:OC12:RATE <discrete>

Limitations:	Also affects the wavelength of other OC types
Preferred:	:SOURce:DATA:TELecom:SDH:RATE
See also:	:OUTPut:TELecom:OC3:RATE :OUTPut:TELecom:OC48:RATE

:OUTPut:TELecom:SDH:RATE

This command is queriable using the standard query method.

:OUTPut:TELecom:OC12:WAVelength <discrete>

Limitations:	Also affects the wavelength of other OC and OPT types
Preferred:	:OUTPut:TELecom:WAVelength
See also:	:OUTPut:TELecom:OC3:WAVelength :OUTPut:TELecom:OC48:WAVelength :OUTPut:TELecom:OPT1:WAVelength :OUTPut:TELecom:OPT4:WAVelength :OUTPut:TELecom:OPT16:WAVelength

This command is queriable using the standard query method.

:OUTPut:TELecom:OC48:LASer <boolean>

Limitations:	Also affects the LASer state of other OC and OPT types
Preferred:	:OUTPut:TELecom:LASer
See also:	:OUTPut:TELecom:OC3:LASer :OUTPut:TELecom:OC12:LASer :OUTPut:TELecom:OPT1:LASer :OUTPut:TELecom:OPT4:LASer :OUTPut:TELecom:OPT16:LASer

This command is queriable using the standard query method.

:OUTPut:TELecom:OC48:RATE <discrete>

Limitations:	Also affects the wavelength of other OC types
Preferred:	:SOURce:DATA:TELecom:SDH:RATE
See also:	:OUTPut:TELecom:OC3:RATE :OUTPut:TELecom:OC12:RATE :OUTPut:TELecom:SDH:RATE

This command is queriable using the standard query method.

:OUTPut:TELecom:OC48:WAVelength <discrete>

Limitations:	Also affects the wavelength of other OC and OPT types
Preferred:	:OUTPut:TELecom:WAVelength
See also:	:OUTPut:TELecom:OC3:WAVelength :OUTPut:TELecom:OC12:WAVelength :OUTPut:TELecom:OPT1:WAVelength :OUTPut:TELecom:OPT4:WAVelength :OUTPut:TELecom:OPT16:WAVelength

This command is queriable using the standard query method.

:OUTPut:TELecom:OPT1:LASer <boolean>

Limitations:	Also affects the LASer state of other OC and OPT types
Preferred:	:OUTPut:TELecom:LASer
See also:	:OUTPut:TELecom:OC3:LASer :OUTPut:TELecom:OC12:LASer

:OUTPut:TELecom:OC48:LASer
:OUTPut:TELecom:OPT4:LASer
:OUTPut:TELecom:OPT16:LASer

This command is queriable using the standard query method.

:OUTPut:TELecom:OPT1:RATE <discrete>

Limitations:	Also affects the wavelength of other OPT types
Preferred:	:SOURce:DATA:TELecom:SONet:RATE
See also:	:OUTPut:TELecom:OPT4:RATE :OUTPut:TELecom:OPT4:RATE :OUTPut:TELecom:SONet:RATE

This command is queriable using the standard query method.

:OUTPut:TELecom:OPT1:WAVelength <discrete>

Limitations:	Also affects the wavelength of other OC and OPT types
Preferred:	:OUTPut:TELecom:WAVelength
See also:	:OUTPut:TELecom:OC3:WAVelength :OUTPut:TELecom:OC12:WAVelength :OUTPut:TELecom:OC48:WAVelength :OUTPut:TELecom:OPT4:WAVelength :OUTPut:TELecom:OPT16:WAVelength

This command is queriable using the standard query method.

:OUTPut:TELecom:OPT4:LASer <boolean>

Limitations:	Also affects the LASer state of other OC and OPT types
Preferred:	:OUTPut:TELecom:LASer
See also:	:OUTPut:TELecom:OC3:LASer :OUTPut:TELecom:OC12:LASer :OUTPut:TELecom:OC48:LASer :OUTPut:TELecom:OPT1:LASer :OUTPut:TELecom:OPT16:LASer

This command is queriable using the standard query method.

:OUTPut:TELecom:OPT4:RATE <discrete>

Limitations:	Also affects the wavelength of other OPT types
Preferred:	:SOURce:DATA:TELecom:SONet:RATE
See also:	:OUTPut:TELecom:OPT1:RATE :OUTPut:TELecom:OPT16:RATE :OUTPut:TELecom:SONet:RATE

This command is queriable using the standard query method.

:OUTPut:TELecom:OPT4:WAVelength <discrete>

Limitations:	Also affects the wavelength of other OC and OPT types
Preferred:	:OUTPut:TELecom:WAVelength
See also:	:OUTPut:TELecom:OC3:WAVelength :OUTPut:TELecom:OC12:WAVelength :OUTPut:TELecom:OC48:WAVelength

	:OUTPut:TELecom:OPT1:WAVelength :OUTPut:TELecom:OPT16:WAVelength

This command is queriable using the standard query method.

:OUTPut:TELecom:OPT16:LASer <boolean>

Limitations:	Also affects the LASer state of other OC and OPT types
Preferred:	:OUTPut:TELecom:LASer
See also:	:OUTPut:TELecom:OC3:LASer :OUTPut:TELecom:OC12:LASer :OUTPut:TELecom:OC48:LASer :OUTPut:TELecom:OPT1:LASer :OUTPut:TELecom:OPT4:LASer

This command is queriable using the standard query method.

:OUTPut:TELecom:OPT16:RATE <discrete>

Limitations:	Also affects the wavelength of other OPT types
Preferred:	:SOURce:DATA:TELecom:SONet:RATE
See also:	:OUTPut:TELecom:OPT1:RATE :OUTPut:TELecom:OPT4:RATE :OUTPut:TELecom:SONet:RATE

This command is queriable using the standard query method.

:OUTPut:TELecom:OPT16:WAVelength <discrete>

Limitations:	Also affects the wavelength of other

	OC and OPT types
Preferred:	:OUTPut:TELecom:WAVelength
See also:	:OUTPut:TELecom:OC3:WAVelength :OUTPut:TELecom:OC12:WAVelength :OUTPut:TELecom:OC48:WAVelength :OUTPut:TELecom:OPT1:WAVelength :OUTPut:TELecom:OPT4:WAVelength

This command is queriable using the standard query method.

:OUTPut:TELecom:SDH:RATE <discrete>

Limitations:	Also affects the wavelength of OC types
Preferred:	:SOURce:DATA:TELecom:SDH:RATE
See also:	:OUTPut:TELecom:OC3:RATE :OUTPut:TELecom:OC12:RATE :OUTPut:TELecom:OC48:RATE

This command is queriable using the standard query method.

:OUTPut:TELecom:SONet:RATE <discrete>

Limitations:	Also affects the wavelength of OPT types
Preferred:	:SOURce:DATA:TELecom:SONet:RATE
See also:	:OUTPut:TELecom:OPT1:RATE :OUTPut:TELecom:OPT4:RATE :OUTPut:TELecom:OPT16:RATE

This command is queriable using the standard query method.

:OUTPut:TELecom:JITTer <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:JITTer:TYPE
:SOURce:DATA:TELecom:TOLerance:INITialize
:SOURce:DATA:TELecom:TRANsfer:INITialize
:SOURce:DATA:TELecom:TOLerance:EXIT
:SOURce:DATA:TELecom:TRANsfer:EXIT

See also:

The corresponding query returns the jitter modulation operating mode in discrete form.

:OUTPut:TELecom:JITTer:AUTotol <boolean>

Limitations:

Preferred: :SOURce:DATA:TELecom:TOLerance

See also:

The corresponding query returns the current status of jitter tolerance mode.

:OUTPut:TELecom:JITTer:TRANsfer <boolean>

Limitations:

Preferred: :SOURce:DATA:TELecom:TRANsfer

See also:

The corresponding query returns the current status of jitter transfer mode.

:OUTPut:TELecom:JITTer:TRANsfer:CALibrate?

Limitations:

Preferred: :SOURce:DATA:TELecom:TRANsfer:CALibrate?

See also:

Returns <discrete>

:OUTPut:TELecom:JITTer:WANDer <boolean>

Limitations:

Preferred: :SOURce:DATA:TELecom:JITTer:TYPE

See also:

The corresponding query returns the current wander generation state in boolean form.

:SOURce:CLOCk

:SOURce:CLOCk:SDH:FOFFset:OFFSet <numeric><suffix>

Limitations: Default suffix now PPM, ratio no longer supported

Preferred: :SOURce:CLOCk:SDH:FOFFset:OFFSet <numeric>

See also:

This command is queriable using the standard query method.

:SOURce:CLOCk:SDH:FORMat <discrete>

Limitations:	Also affects the setting of SONET clock format Parameter values not supported: K64
Preferred:	:SOURce:CLOCk:FORMat <discrete>
See also:	:SOURce:CLOCk:SONet:FORMat

This command is queriable using the standard query method.

:SOURce:CLOCk:SDH:SOURce <discrete>

Limitations:	Also affects the settings for SONet clock source Parameter values not supported: RMON0, RMON1, RMON4
Preferred:	:SOURce:CLOCk:SOURce :SOURce:CLOCk:RECovered
See also:	:SOURce:CLOCk:SONet:SOURce

This command is queriable using the standard query method.

:SOURce:CLOCk:SONet:FOFFset:OFFSet <numeric> <suffix>

Limitations:	Default suffix now PPM, ratio no longer supported
Preferred:	:SOURce:CLOCk:SONet:FOFFset:OFFSet <numeric>
See also:	

This command is queriable using the standard query method.

:SOURce:CLOCk:SONet:FORMat <discrete>

Limitations:	Also affects the setting of SDH clock format Parameter values not supported: K64
Preferred:	:SOURce:CLOCk:FORMat <discrete>
See also:	:SOURce:CLOCk:SDH:FORMat

This command is queriable using the standard query method.

:SOURce:CLOCk:SONet:SOURce <discrete>

Limitations:	Also affects the settings for SDH clock source Parameter values not supported: RMN1, RMN3, RMN12
Preferred:	:SOURce:CLOCk:SOURce :SOURce:CLOCk:RECovered
See also:	:SOURce:CLOCk:SDH:SOURce

This command is queriable using the standard query method.

:SOURce:DATA:TELecom

:SOURce:DATA:TELecom:TFUNction<discrete>

Limitations:	Parameter values not supported PDH-Payload, PDH, SDISruption, ATM, POS Values accepted but perform no function SDH, SONet

Preferred:	:SOURce:DATA:TELecom:TFUNction:DISable Test Function selection commands
See also:	:SOURce:DATA:TELecom:SONet:ALARm :SOURce:DATA:TELecom:SONet:ERRor:TYPE :SOURce:DATA:TELecom:SONet:MSP Messages:... :SOURce:DATA:TELecom:SONet:POINter:...

:SOURce:DATA:TELecom:SOURce <discrete>

Limitations:	This command performs no function. It is provided solely for backward compatibility. Parameter values not supported: PDH, SDH, SONet
Preferred:	
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH

:SOURce:DATA:TELecom:SDH:ALARm <discrete>

Limitations:	Parameter values not supported: TU-Lop, TUPais, LPRDi, LOMultiframe,

	TUUNequiped
Preferred:	:SOURce:DATA:TELecom:ALARm :SOURce:DATA:TELecom:SDH:ALARm :GROup :SOURce:DATA:TELecom:SDH:ALARm :PHYSical :SOURce:DATA:TELecom:SDH:ALARm :SECTion :SOURce:DATA:TELecom:SDH:ALARm :PATH :SOURce:DATA:TELecom:SDH:ALARm :TCM :SOURce:DATA:TELecom:SDH:ALARm :HERDi
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:ALARm:SOOFrame

Limitations:	Affects :SOURce:DATA:TELecom:SDH:ALARm settings
Preferred:	:SOURce:DATA:TELecom:SDH:ALARm :OOF
See also:	:SOURce:DATA:TELecom:SDH:ALARm

:SOURce:DATA:TELecom:SDH:AU3:BACKground <discrete>

Limitations:	Affects the background for all AU types,

Preferred: :SOURce:DATA:TELecom:SDH:AU:BACKground

See also: :SOURce:DATA:TELecom:SDH:AU4:BACKground
:SOURce:DATA:TELecom:SDH:AU4C:BACKground

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:AU4 <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:AUG1
:SOURce:DATA:TELecom:SDH:AUG4

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:AU4:BACKground <discrete>

Limitations: Affects the background for all AU types,

Preferred: :SOURce:DATA:TELecom:SDH:AU:BACKground

See also: :SOURce:DATA:TELecom:SDH:AU3:BACKground
:SOURce:DATA:TELecom:SDH:AU4C:BACKground

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:AU4C <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:AUG4

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:AU4C:BACKground <discrete>

Limitations: Affects the background for all AU types,

Preferred: :SOURce:DATA:TELecom:SDH:AU:BACKground

See also: :SOURce:DATA:TELecom:SDH:AU3:BACKground
:SOURce:DATA:TELecom:SDH:AU4:BACKground

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:ERRor:MSPThreshold:EINTerval <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:ERRor:ASPThreshold:EINTerval

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:ERRor:MSPThreshold:NERRors <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:ERRor:ASPThreshold:NERRors

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:ERRor:TYPE <discrete>

Limitations: Parameter values not supported: TCBip, TUBip

Preferred: :SOURce:DATA:TELecom:SDH:ERRor:GROup
:SOURce:DATA:TELecom:SDH:ERRor:SECTion
:SOURce:DATA:TELecom:SDH:ERRor:PATH
:SOURce:DATA:TELecom:SDH:ERRor:TCM
:SOURce:DATA:TELecom:SDH:ERRor:PATTern
:SOURce:DATA:TELecom:SDH:ERRor:PDH
:SOURce:DATA:TELecom:SDH:ERRor:DSN

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MAPPing <discrete>

Limitations: Also affects SONet mapping

Parameter values not supported:
M140, M34, DS3, ATM, IPOS

Preferred: :SOURce:DATA:TELecom:SDH:PATTern

See also: :SOURce:DATA:TELecom:SONet:MAPPing

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MSPMessages:ARCHitecture <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MSPMessages:BRIDge <string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:BRIDge

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MSPMessages:CHANnel <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:CHANnel

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MSPMessages:DNODe <string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:DNODe

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MSPMessages:PCODe <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:PCODe

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MSPMessages:RCODe <discrete>

Limitations: Also affects the Linear topology setting of :SOURce:DATA:TELecom:SDH:MSPMessages:REQuest

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:RCODe

See also: :SOURce:DATA:TELecom:SDH:MSPMessages:REQuest

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MSPMessages:REQuest <discrete>

Limitations:	Also affects the Ring topology setting of :SOURce:DATA:TELecom:SDH:MSPMessages:RCODe
Preferred:	:SOURce:DATA:TELecom:SDH:APSMessages:REQuest
See also:	:SOURce:DATA:TELecom:SDH:MSPMessages:RCODe

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MSPMessages:REServed <numeric>

Limitations:	Also affects the Ring topology setting of :SOURce:DATA:TELecom:SDH:MSPMessages:SCODe
Preferred:	:SOURce:DATA:TELecom:SDH:APSMessages:REServed
See also:	:SOURce:DATA:TELecom:SDH:MSPMessages:SCODe

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MSPMessages:SCODe <discrete>

Limitations:	Also affects the Linear topoogy setting of

:SOURce:DATA:TELecom:SDH:MSPMessages:REServed

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:SCODe

See also: :SOURce:DATA:TELecom:SDH:MSPMessages:REServed

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MSPMessages:SNODe <string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:SNODe

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:MSPMessages:TOPology <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:APSMessages:TOPology

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:OVERhead:DATA <numeric>,<numeric>,<discrete>,<string>

Limitations: New query return type is <numeric>

Preferred: :SOURce:DATA:TELecom:SDH:OVERh

ead:DATA <numeric>, <numeric>, <discrete>, <numeric>

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:OVERhead:DATA:HEXadecimal <numeric>,<numeric>,<discrete>,<string>

Limitations: Affects the overhead data for SONET also

Preferred: :SOURce:DATA:TELecom:SDH:OVERhead:DATA

See also: :SOURce:DATA:TELecom:SONet:OVERhead:DATA:HEXadecimal

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:OVERhead:J0 <string>

Limitations: Affects the J0 string for SONET also

Preferred: :SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B16Crc

See also: :SOURce:DATA:TELecom:SONet:OVERhead:J0

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:HEXadecimal?

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:OVERh

ead:J0:PATTern:Array?

See also:

Returns <block>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern <discrete>

Limitations: Older parameter value not supported
TEST
Older parameter value supported
USER
New parameter value preferred
B16Crc

Preferred:

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:PAYLoad <discrete>

Limitations: Parameter values not supported:
M140, TU3 or M34, TU12 or M2, TU2, TU11 or DS1

Preferred: :SOURce:DATA:TELecom:SDH:PAYLoad
:SOURce:DATA:TELecom:SDH:TU

See also: :SOURce:DATA:TELecom:SDH:PAYLoad

Note: This command has been reused in newer OmniBER instruments and has a slightly different functionality. Backward compatibility has been retained by processing the older <discrete> values. However, the corresponding query returns

the Payload type valid with the OmniBER OTN instrument.

:SOURce:DATA:TELecom:SDH:PAYLoad:PATTern <discrete>

Limitations:	Affects all Payload Patterns not just SDH
Preferred:	:SOURce:DATA:TELecom:PATTern:TYPe :SOURce:DATA:TELecom:PATTern:TYPe:PRBS :SOURce:DATA:TELecom:PATTern:TYPe:WORD :SOURce:DATA:TELecom:PATTern:TYPe:WORD:PRESet
See also:	:SOURce:DATA:TELecom:SONet:PAYLoad:PATTern

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:PAYLoad:UWORd <string>

Limitations:	Affects User Word for SONET also
Preferred:	:SOURce:DATA:TELecom:PATTern:TYPE:WORD:USER
See also:	:SOURce:DATA:TELecom:SONet:PAYLoad:PATTern:UWORd

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:POINter:ACTion

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:POINter:NEW:ACTion

See also:

:SOURce:DATA:TELecom:SDH:POINter:ADJust

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:POINter:BURst:ACTion

See also:

:SOURce:DATA:TELecom:SDH:POINter:DIRection <discrete>

Limitations: Also affects SONET pointer

Preferred: :SOURce:DATA:TELecom:SDH:POINter:BURSt:DIRection

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:POINter:IDECrement <numeric>

Limitations: Also affects SONET pointer

Preferred: :SOURce:DATA:TELecom:SDH:POINter:BURSt:SIZE

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:POINter:NPOinter <discrete>

Limitations:	Also affects SONET pointer
Preferred:	:SOURce:DATA:TELecom:SDH:POINter:NEW:FLAG
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:POINter:OFFSet <discrete>

Limitations:	Affects SONet setting also Older parameter values not supported TU Older parameter values supported SIGNal, VC4 New parameter values preferred SIGNal, PAYLoad
Preferred:	
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:POINter:OFFset:RATE <numeric><suffix>

Limitations:	Default suffix now PPM, ratio no longer supported
Preferred:	:SOURce:DATA:TELecom:SDH:POINter:OFFset:RATE <numeric>
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:POINter:VALue <numeric>

Limitations:	Also affects SONET pointer
Preferred:	:SOURce:DATA:TELecom:SDH:POINter:NEW:VALue
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:POVerhead:DATA <discrete>,<string>

Limitations:	New query return type is <numeric>
Preferred:	:SOURce:DATA:TELecom:SDH:POVerhead:DATA <discrete>, <numeric>
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:POVerhead:J1 <string>

Limitations:	Also affects SONET J1 string
Preferred:	:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B64
See also:	:SOURce:DATA:TELecom:SONet:POVerhead:J1

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:CRC7 <string>

Limitations:	Also affects SONET J1 CRC7 string

Preferred:	:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B16Crc
See also:	:SOURce:DATA:TELecom:SONet:POVerhead:J1:CRC7

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern <discrete>

Limitations:	Affects SONet setting also Older parameter values not supported TEST, CRC7Test Older parameter values supported USER, CRC7User New parameter values preferred B64, B16Crc
Preferred:	
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:PRBS:POLarity <discrete>

Limitations:	Affects polarity of all PRBS patterns not just SDH
Preferred:	n:PO Lar- :SOURce:DATA:TELecom:PATTerity
See also:	:SOURce:DATA:TELecom:SONet:PRBS:POLarity

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:TCM:APID:DATA <string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:TCM:APID:PATTERN:B16Crc

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern <discrete>

Limitations:
Older parameter values not supported
DEFault, TEST
Older parameter value supported
USER
New parameter value preferred
B16Crc

Preferred:

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:TCM:PATH <discrete>

Limitations: Parameter value not supported: LOW

Preferred: :SOURce:DATA:TELecom:SDH:TCM:HPATh
:SOURce:DATA:TELecom:SDH:TCM:LPATh

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:TFUNction:TYPE <discrete>

Limitations:	Accepted but performs no function. Newer OmniBER instruments do not require Test Function Selection
Preferred:	See earlier OmniBER commands listed in 'See also' below. :SOURce:DATA:TELecom:TFUNction:DISable
See also:	:SOURce:DATA:TELecom:TFUNction :SOURce:DATA:TELecom:SDH:ALARm :SOURce:DATA:TELecom:SDH:ERRor:TYPE :SOURce:DATA:TELecom:SDH:MSPMessages:... :SOURce:DATA:TELecom:SDH:POINter:...

:SOURce:DATA:TELecom:SDH:THRumode <discrete>

Limitations:	Affects through mode for all telecom types not just SDH
Preferred:	:SOURce:DATA:TELecom:THRu
See also:	:SOURce:DATA:TELecom:SONet:THRumode

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SDH:SEQuence:DATA <discrete>,<string>

Limitations:	Sequence element now specified by <numeric>. A discrete parameter of A-E will be mapped to 1-5.
Preferred:	:SOURce:DATA:TELecom:SDH:SEQuence:DATA <numeric>,<string>
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet

:SOURce:DATA:TELecom:SONet:ALARm <discrete>

Limitations:	Parameter values not supported: LOPV, AISV, RDIV, LOMultiframe, VTUNequiped
Preferred:	:SOURce:DATA:TELecom:ALARm :SOURce:DATA:TELecom:SONet:ALARm:GROup :SOURce:DATA:TELecom:SONet:ALARm:PHYSical :SOURce:DATA:TELecom:SONet:ALARm:TRANsport :SOURce:DATA:TELecom:SONet:ALARm:PATH
See also:	:SOURce:DATA:TELecom:SDH:ALARm

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:ALARm:SSEFrame

Limitations:	Affects :SOURce:DATA:TELecom:SONet:ALARm settings
Preferred:	:SOURce:DATA:TELecom:SONet:ALARm:SEF
See also:	:SOURce:DATA:TELecom:SONet:ALARm

:SOURce:DATA:TELecom:SONet:ERRor:TYPE <discrete>

Limitations:	Parameter values not supported: REIV, CVV
Preferred:	:SOURce:DATA:TELecom:SONet:ERRor:GROup :SOURce:DATA:TELecom:SONet:ERRor:TRANsport :SOURce:DATA:TELecom:SONet:ERRor:PATH :SOURce:DATA:TELecom:SONet:ERRor:PATTern :SOURce:DATA:TELecom:SONet:ERRor:PDH :SOURce:DATA:TELecom:SONet:ERRor:DSN
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:MAPPing <discrete>

Limitations:	Also affects SDH mapping Parameter values not supported: M140, M34, DS3, ATM, IPOS
Preferred:	:SOURce:DATA:TELecom:SONet:PAYLoad
See also:	:SOURce:DATA:TELecom:SDH:MAPPing

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:APSMessages:BRIDge <string>

Limitations:	New return type <numeric>
Preferred:	:SOURce:DATA:TELecom:SONet:APSMessages:BRIDge <numeric>
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:APSMessages:DNODe <string>

Limitations:	New return type <numeric>
Preferred:	:SOURce:DATA:TELecom:SONet:APSMessages:DNODe <numeric>
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:APSMessages:SCODe <discrete>

Limitations:	New return type <numeric>
Preferred:	:SOURce:DATA:TELecom:SONet:APS Messages:SCODe <numeric>
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:APSMessages:SNODe <string>

Limitations:	New return type <numeric>
Preferred:	:SOURce:DATA:TELecom:SONet:APS Messages:SNODe <numeric>
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:OVERhead:DATA <numeric>,<numeric>,<discrete>,<string>

Limitations:	New return type is <numeric>
Preferred:	:SOURce:DATA:TELecom:SONet:OVE Rhead:DATA <numeric>, <numeric>, <discrete>, <numeric>
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:OVERhead:DATA:HEXadecimal <numeric>, <numeric>, <discrete>, <string>

Limitations:	Affects the overhead data for SDH also

Preferred:	:SOURce:DATA:TELecom:SONet:OVERhead:DATA
See also:	:SOURce:DATA:TELecom:SDH:OVERhead:DATA:HEXadecimal

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:OVERhead:J0 <string>

Limitations:	Affects the J0 string for SONET also
Preferred:	:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B16Crc
See also:	:SOURce:DATA:TELecom:SDH:OVERhead:J0

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:HEXadecimal?

Limitations:	
Preferred:	:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:Array?
See also:	

Returns <block>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern <discrete>

Limitations:	Older parameter value not supported TEST Older parameter value supported

	USER New parameter value preferred B16Crc
Preferred:	
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:PAYLoad <discrete>

Limitations:	Parameter values not supported: M140, TU3 or M34, TU12 or M2, TU2, TU11 or DS1
Preferred:	:SOURce:DATA:TELecom:SONet:PAYLoad :SOURce:DATA:TELecom:SONet:TU
See also:	:SOURce:DATA:TELecom:SONet:PAYLoad

Note: This command has been reused in newer OmniBER instruments and has a slightly different functionality. Backward compatibility has been retained by processing the older <discrete> values. However, the corresponding query returns the Payload type valid with the OmniBER OTN instrument.

:SOURce:DATA:TELecom:SONet:PAYLoad:UWORd <string>

Limitations:	Affects User Word for SDH also
Preferred:	:SOURce:DATA:TELecom:PATTern:TYPE:WORD:USER
See also:	:SOURce:DATA:TELecom:SDH:PAYLoad:PATTern:UWORd

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:PDHPayload:ERRor:RATE <discrete>

Limitations:	Affects error rate for all payloads
Preferred:	:SOURce:DATA:TELecom:SONet:ERRor:RATE :SOURce:DATA:TELecom:SONet:ERRor:RATE:USER:ACTion
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:PDHPayload:ERRor:RATE:USER <numeric>

Limitations:	Affects user error rate for all payloads
Preferred:	:SOURce:DATA:TELecom:SONet:ERRor:RATE:USER :SOURce:DATA:TELecom:SONet:ERRor:RATE:USER:ACTion
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:POINter ACTion

Limitations:	
Preferred:	:SOURce:DATA:TELecom:SONet:POINter:NEW:ACTion
See also:	

:SOURce:DATA:TELecom:SONet:POINter:ADJust

Limitations:

Preferred: :SOURce:DATA:TELecom:SONet:POINter:BURst:ACTion

See also:

:SOURce:DATA:TELecom:SONet:POINter:DIRection <discrete>

Limitations: Also affects SDH pointer

Preferred: :SOURce:DATA:TELecom:SONet:POINter:BURSt:DIRection

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:POINter:IDECrement <numeric>

Limitations: Also affects SDH pointer

Preferred: :SOURce:DATA:TELecom:SONet:POINter:BURSt:SIZE

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:POINter:NPOinter <discrete>

Limitations: Also affects SDH pointer

Preferred: :SOURce:DATA:TELecom:SONet:POINter:NEW:FLAG

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:POINter:OFFSet <discrete>

Limitations:	Affects SDH setting also Older parameter values not supported VT Older parameter values supported SIGNal, SPE New parameter values preferred SIG-Nal, PAYLoad
Preferred:	
See also:	

:SOURce:DATA:TELecom:SONet:POINter:OFFSet:RATE <numeric><suffix>

Limitations:	Default suffix now PPM, ratio no longer supported
Preferred:	:SOURce:DATA:TELecom:SONet:POINter:OFFset:RATE <numeric>
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:POINter:VALue <numeric>

Limitations:	Also affects SDH pointer
Preferred:	:SOURce:DATA:TELecom:SONet:POINter:NEW:VALue

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:POVerhead:J1 <string>

Limitations:	Also affects SDH J1 string
Preferred:	:SOURce:DATA:TELecom:SONet:POVerhead:J1: PATTern:B64
See also:	:SOURce:DATA:TELecom:SDH:POVerhead:J1

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:CRC7 <string>

Limitations:	Also affects SDH J1 CRC7 string
Preferred:	:SOURce:DATA:TELecom:SONet:POVerhead:J1: PATTern:B16Crc
See also:	:SOURce:DATA:TELecom:SDH:POVerhead:J1:CRC7

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:HEXadecimal?

Limitations:	
Preferred:	:SOURce:DATA:TELecom:SONet:POVerhead:J1: PATTern:Array?

See also:

Returns <block>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern <discrete>

Limitations:	Affects SDH setting also Older parameter values not supported TEST, CRC7Test Older parameter values supported USER, CRC7User New parameter values preferred B64, B16Crc
Preferred:	
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:PRBS:POLarity <discrete>

Limitations:	Affects polarity of all PRBS patterns not just SONet
Preferred:	:SOURce:DATA:TELecom:PATTern:POLarity
See also:	:SOURce:DATA:TELecom:SDH:PRBS:POLarity

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:STS12c <numeric>

Limitations:

Preferred:	:SOURce:DATA:TELecom:SONet:STS3
See also:	

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:TFUNction:TYPE <discrete>

Limitations:	Accepted but performs no function. Newer OmniBER instruments do not require Test Function Selection
Preferred:	See earlier OmniBER commands listed in 'See also' below. :SOURce:DATA:TELecom:TFUNction:DISable
See also:	:SOURce:DATA:TELecom:TFUNction :SOURce:DATA:TELecom:SONet:ALARm :SOURce:DATA:TELecom:SONet:ERRor:TYPE :SOURce:DATA:TELecom:SONet:MSP Messages:... :SOURce:DATA:TELecom:SONet:POINter:...

:SOURce:DATA:TELecom:SONet:THRumode <discrete>

Limitations:	Also affects through mode for other telecom types
Preferred:	:SOURce:DATA:TELecom:THRu
See also:	:SOURce:DATA:TELecom:SDH:THRum

ode

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:SONet:SEQuence:DATA <discrete>,<string>

Limitations: Sequence element now specified by <numeric>. A discrete parameter of A-E will be mapped to 1-5.

Preferred: :SOURce:DATA:TELecom:SONet:SEQuence:DATA <numeric>,<string>

See also:

This command is queriable using the standard query method.

:SOURce:DATA:TELecom:JITTer:

:SOURce:DATA:TELecom:JITTer:MASK <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:TOLerance:INITialize
:SOURce:DATA:TELecom:TOLerance:MODE
:SOURce:DATA:TELecom:TOLerance:EXIT

See also:

The corresponding query returns the selected jitter mask mode in discrete form.

SOURce:DATA:TELecom:JITTer:MASK:TYPE <discrete>

Limitations: Parameter values not supported:

G823
QHIGh
QLOW
G824
GR499CAT1
GR499CAT2
G825
GR253

Preferred: :SOURce:DATA:TELecom:TOLerance:MASK

See also:

The corresponding query returns the selected mask in discrete form.

:SOURce:DATA:TELecom:JITTer:MASK:TYPE:USER <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:TOLerance:MASK:USER

See also:

The corresponding query returns the selcted jitter user mask in numeric form.

:SOURce:DATA:TELecom:JITTer:ATOLerance:DELay <numeric>

Limitations: Minimum value now 0.1.

Preferred: :SOURce:DATA:TELecom:TOLerance:SETTling

See also:

The corresponding query returns the tolerance delay time in numeric form.

:SOURce:DATA:TELecom:JITTer:ATOLerance:DWELl <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:TOLerance:GATE

See also:

The corresponding query returns the tolerance dwell time in numeric form.

:SOURce:DATA:TELecom:JITTer:ATOLerance:ERRor:TYPE <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:TOLerance:ERRor:CRITeria
:SOURce:DATA:TELecom:TOLerance:ERRor:SOURce

See also:

The corresponding query returns the selected tolerance error type in discrete form.

:SOURce:DATA:TELecom:JITTer:ATOLerance[:ERRor]:THReshold <numeric>

Limitations: Minimum value is now 1.

Preferred: :SOURce:DATA:TELecom:TOLerance:ERRor:COUNt

See also:

The corresponding query returns the tolerance error threshold

value in numeric form.

:SOURce:DATA:TELecom:JITTer:ATOLerance:POINts <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:TOLerance:POINts

See also:

The corresponding query returns the number of frequency points for tolerance testing in numeric form.

:SOURce:DATA:TELecom:JITTer:TRANsfer:MODE <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:TRANsfer:MODE

See also:

The corresponding query returns the selected jitter transfer mode in discrete form.

:SOURce:DATA:TELecom:JITTer:TRANsfer:POINts <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:TRANsfer:POINts

See also:

The corresponding query returns the number of frequency points for jitter transfer testing in numeric form.

:SOURce:DATA:TELecom:JITTer:TRANsfer:DELay <numeric>

Limitations: Maximum delay time is now 30 seconds.

Preferred: :SOURce:DATA:TELecom:TRANsfer:SETTling

See also:

The corresponding query returns the jitter transfer delay time in numeric form.

:SOURce:DATA:TELecom:JITTer:TRANsfer:DWELl <numeric>

Limitations: Maximum dwell time is now 30 seconds.

Preferred: :SOURce:DATA:TELecom:TRANsfer:GATE

See also:

The corresponding query returns the jitter transfer dwell time in numeric form.

:SOURce:DATA:TELecom:JITTer:TRANsfer:MASK:INPut <discrete>

Limitations: Parameter values not supported:
QLOW
QHIGh
G823
GR253A
GR253B
G824
GR499CAT1
GR499CAT2

Preferred: :SOURce:DATA:TELecom:TRANsfer:MASK:INPut

See also:

The corresponding query returns the selected transfer input mask in discrete form.

:SOURce:DATA:TELecom:JITTer:TRANsfer:MASK:INPut:USER <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:TRANsfer:MASK:INPut:USER

See also:

The corresponding query returns the selected user mask in numeric form.

:SOURce:DATA:TELecom:JITTer:TRANsfer:MASK:PASS <discrete>

Limitations: Parameter values not supported:
G823
GR253
G823HIQ
G823LOQ
G824
GR499CAT1
GR499CAT2
NONE

Preferred: :SOURce:DATA:TELecom:TRANsfer:MASK:PASS

See also:

The corresponding query returns the selected jitter transfer pass mask in discrete form.

:SOURce:DATA:TELecom:JITTer:TRANsfer:MASK:PASS:ADJust <boolean>

Limitations:

Preferred:

See also: SOURce:DATA:TELecom:JITTer:TRANSfer:MASK:PASS:ADJust:OFFSet

The corresponding query is also affected. If pass mask adjustment is set to 0dB, then pass mask adjustment is returned as OFF, otherwise it is returned as ON.

:SOURce:DATA:TELecom:JITTer:TRANsfer:MASK:PASS:ADJust:OFFSet <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:TRANsfer:MASK:PASS:OFFSet

See also:

The corresponding query returns the pass mask adjustment value in numeric form.

:SOURce:DATA:TELecom:JITTer:WANDer:MASK <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:TOLerance:INITialize
:SOURce:DATA:TELecom:TOLerance:TYPE
:SOURce:DATA:TELecom:TOLerance:

MODE
:SOURce:DATA:TELecom:TOLerance:EXIT

See also:

The corresponding query returns the selected wander mask state in discrete form.

:SOURce:DATA:TELecom:JITTer:WANDer:FREQuency <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:WANDer:FREQuency
:SOURce:DATA:TELecom:TOLerance:WANDer:FREQuency

See also:

The corresponding query returns the wander modulation or spot frequency in numeric form.

:SOURce:DATA:TELecom:JITTer:WANDer:AMPLitude <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:WANDer:AMPLitude <numeric>

See also:

The corresponding query returns the wander modulation amplitude in numeric form.

:SOURce:DATA:TELecom:JITTer:UMASk:LOCK <boolean>

Limitations:

Preferred: No equivalent feature using new command set. User Mask locking/ unlocking is handled automatically when using the new command set.

See also:

The corresponding query returns the current jitter user mask editing lock setting in boolean form.

:SOURce:DATA:TELecom:JITTer:UMASk:LABel <numeric>,<string>

Limitations:

Preferred:

See also:

The corresponding query returns the label of the given user mask in string form.

:SENSe:DATA

See Separate Section Below

:SENSe:DATA:TELecom

:SENSe:DATA:TELecom:TFUNction

Limitations: Parameter values not supported PDH-Payload, PDH, SDISruption, ATM, POS
Values accepted but perform no function SDH, SONet

Preferred: :SOURce:DATA:TELecom:TFUNction:DISable
Test Function selection commands

See also: :SOURce:DATA:TELecom:SONet:ALARm
:SOURce:DATA:TELecom:SONet:ERRor:TYPE
:SOURce:DATA:TELecom:SONet:MSP Messages:...
:SOURce:DATA:TELecom:SONet:POINter:...

:SENSe:DATA:TELecom:TEST:PERiod <numeric><suffix>

Limitations: Different parameter types and increased functionality

Preferred:

See also:

:SENSe:DATA:TELecom:SDH

:SENSe:DATA:TELecom:SDH:AU4 <numeric>

Limitations:

Preferred: :SENSe:DATA:TELecom:SDH:AUG1
:SENSe:DATA:TELecom:SDH:AUG4

See also:

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SDH:AU4C <numeric>

Limitations:

Preferred:	:SENSe:DATA:TELecom:SDH:AUG4
See also:	

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SDH:MAPPing <discrete>

Limitations:	Also affects SONet mapping Parameter values not supported: M140, M34, DS3, ATM, IPOS
Preferred:	:SENSe:DATA:TELecom:SDH:PAYLoad
See also:	:SENSe:DATA:TELecom:SONet:MAPPing

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SDH:PAYLoad <discrete>

Limitations:	Parameter values not supported: M140, TU3 or M34, TU12 or M2, TU2, TU11 or DS1
Preferred:	:SENSe:DATA:TELecom:SDH:PAYLoad :SENSe:DATA:TELecom:SDH:TU
See also:	:SENSe:DATA:TELecom:SDH:PAYLoad

Note: This command has been reused in newer OmniBER instruments and has a slightly different functionality. Backward compatibility has been retained by processing the older <discrete> values. However, the corresponding query returns the Payload type valid with the OmniBER OTN instrument.

:SENSe:DATA:TELecom:SDH:PAYLoad:PATTern <discrete>

Limitations:	Affects all Payload Patterns not just SDH
Preferred:	:SENSe:DATA:TELecom:PATTern:TYPe :SENSe:DATA:TELecom:PATTern:TYPe:PRBS :SENSe:DATA:TELecom:PATTern:TYPe:WORD :SENSe:DATA:TELecom:PATTern:TYPe:WORD:PRESet
See also:	:SENSe:DATA:TELecom:SONet:PAYLoad:PATTern

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SDH:PAYLoad:UWORd <string>

Limitations:	Also affects the Rx User Word for SONET
Preferred:	:SENSe:DATA:TELecom:PATTern:TYPE:WORD:USER
See also:	:SENSe:DATA:TELecom:SONet:PAYLoad:PATTern:UWORd

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SDH:PRBS:POLarity <discrete>

Limitations:	Affects polarity of all PRBS patterns

	not just SDH
Preferred:	:SENSe:DATA:TELecom:PATTern:POLarity
See also:	:SENSe:DATA:TELecom:SONet:PRBS:POLarity

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SDH:TCM:PATH <discrete>

Limitations:	Parameter value not supported: LOW
Preferred:	:SENSe:DATA:TELecom:SDH:TCM:APID:HPATh :SENSe:DATA:TELecom:SDH:TCM:APID:LPATh
See also:	

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SDH:TFUNction:TYPE <discrete>

Limitations:	Only acts to disable Test Functions Parameter values not supported OCAPture, DDCC, PGRaph, OBERTest
Preferred:	
See also:	:SENSe:DATA:TELecom:TFUNction

:SENSe:DATA:TELecom:SONet

:SENSe:DATA:TELecom:SONet:MAPPing <discrete>

Limitations:	Also affects SONet mapping Parameter values not supported: M140, M34, DS3, ATM, IPOS
Preferred:	:SENSe:DATA:TELecom:SONet:PAYLoad
See also:	:SENSe:DATA:TELecom:SDH:MAPPing

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SONet:PAYLoad <discrete>

Limitations:	Parameter values not supported: M140, TU3 or M34, TU12 or M2, TU2, TU11 or DS1
Preferred:	:SENSe:DATA:TELecom:SONet:PAYLoad :SENSe:DATA:TELecom:SONet:TU
See also:	:SENSe:DATA:TELecom:SONet:PAYLoad

Note: This command has been reused in newer OmniBER instruments and has a slightly different functionality. Backward compatibility has been retained by processing the older <discrete> values. However, the corresponding query returns the Payload type valid with the OmniBER OTN instrument.

:SENSe:DATA:TELecom:SONet:PAYLoad:PATTern <discrete>

Limitations:	Affects all Payload Patterns not just SONET
Preferred:	:SENSe:DATA:TELecom:PATTern:TYP

	e :SENSe:DATA:TELecom:PATTern:TYPe:PRBS :SENSe:DATA:TELecom:PATTern:TYPe:WORD :SENSe:DATA:TELecom:PATTern:TYPe:WORD:PRESet
See also:	:SENSe:DATA:TELecom:SDH:PAYLoad:PATTern

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SONet:PAYLoad:UWORd <string>

Limitations:	Also affects the Rx User Word for SONET
Preferred:	:SENSe:DATA:TELecom:PATTern:TYPE:WORD:USER
See also:	:SENSe:DATA:TELecom:SDH:PAYLoad:PATTern:UWORd

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SONet:PRBS:POLarity <discrete>

Limitations:	Affects polarity of all PRBS patterns not just SONET
Preferred:	:SENSe:DATA:TELecom:PATTern:POLarity
See also:	:SENSe:DATA:TELecom:SDH:PRBS:POLarity

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SONet:STS12c <numeric>

Limitations:

Preferred: :SENSe:DATA:TELecom:SONet:STS3

See also:

This command is queriable using the standard query method.

:SENSe:DATA:TELecom:SONet:TFUNction:TYPE <discrete>

Limitations: Only acts to disable Test Functions
Parameter values not supported
OCAPture, DDCC, PGRaph, OBERTest

Preferred:

See also: :SENSe:DATA:TELecom:TFUNction

:SENSe:DATA:TELecom:JITTer

:SENSe:DATA:TELecom:JITTer:FILTer <discrete>

Limitations: Setting any HP filter on using this command will set-up all HP filter paths.

Preferred: :SENSe:DATA:TELecom:JITTer:FILTer:HPASs
:SENSe:DATA:TELecom:JITTer:FILTer:LPASs

See also:

The corresponding query returns the selected jitter filter in discrete form. The query will not be able to return a value unless the command above has been used to select the jitter measurement filter.

:SYSTem

:SYSTem:CONFiguration

Limitations: Block Data has different format
Only supported in short form - SYSTem:CONF

Preferred:

See also:

:SYSTem:TRIGGer

Limitations:

Preferred: :SYSTem:TRIGger:TRANsmit
:SYSTem:TRIGger:TRANsmit:FRAMe
:SYSTem:TRIGger:RECeive
:SYSTem:TRIGger:RECeive:FRAMe
:SYSTem:TRIGger:RECeive:ERRor
:SYSTem:TRIGger:RECeive:ERRor:OTN
:SYSTem:TRIGger:RECeive:ERRor:SDH
:SECTion
:SYSTem:TRIGger:RECeive:ERRor:SDH
:PATH
:SYSTem:TRIGger:RECeive:ERRor:SDH
:TCM
:SYSTem:TRIGger:RECeive:ERRor:SON
et:TRANsport

:SYSTem:TRIGger:RECeive:ERRor:SONet:PATH
:SYSTem:TRIGger:RECeive:ALARm
:SYSTem:TRIGger:RECeive:ALARm:OTN
:SYSTem:TRIGger:RECeive:ALARm:SDH:SECTion
:SYSTem:TRIGger:RECeive:ALARm:SDH:PATH
:SYSTem:TRIGger:RECeive:ALARm:SDH:TCM
:SYSTem:TRIGger:RECeive:ALARm:SONet:TRANsport
:SYSTem:TRIGger:RECeive:ALARm:SONet:PATH

See also:

Results Provided for Backward Compatibility

The following results are supported in the OmniBER OTN instruments but not recommended. Future developments should use the preferred results indicated.

ASEConds:SDH:LOP

Limitations:

Preferred: ASEConds:SDH:AULop

See also:

ASEConds:SDH:LOS

Limitations:

Preferred: ASEConds:LOS

See also:

ASEConds:SDH:PFERf

Limitations:

Preferred: ASEConds:SDH:HPRDi

See also:

ASEConds:SDH:RDI

Limitations:

Preferred: ASEConds:SDH:HPRDi

See also:

ASEConds:SONet:LOS

Limitations:

Preferred: ASEConds:LOS

See also:

ECOunt:SDH:FEBE

Limitations:

Preferred: ECOunt:SDH:HPRei

See also:

ECOunt:SDH:MFEBe

Limitations:

Preferred: ECOunt:SDH:MSRei

See also:

ECOunt:SDH:REI

Limitations:

Preferred: ECOunt:SDH:HPRei

See also:

ERATio:SDH:FEBE

Limitations:

Preferred: ERATio:SDH:HPRei

See also:

ERATio:SDH:MFEBe

Limitations:

Preferred: ERATio:SDH:MSRei

See also:

ERATio:SDH:REI

Limitations:

Preferred: ERATio:SDH:HPRei

See also:

COUNt:JITTer:HITS

Limitations:

Preferred: JITTer:HITS:COUNt:POSitive:<filter>
JITTer:HITS:COUNt:NEGative:<filter>
JITTer:HITS:COUNt:POSitive:AFILters
JITTer:HITS:COUNt:NEGative:AFILters

See also:

SEConds:JITTer:HITS

Limitations:

Preferred: JITTer:HITS:SEConds:<filter>
JITTer:HITS:SEConds:AFILters

See also:

FSEConds:JITTer:HITS

Limitations:

Preferred: JITTer:HITS:FSEConds:<filter>
JITTer:HITS:FSEConds:AFILters

See also:

PEAK:JITTer:POSitive

Limitations:

Preferred: JITTer:PPEak:<filter>

See also:

PEAK:JITTer:NEGative

Limitations:

Preferred: JITTer:NPEak:<filter>

See also:

PEAK:JITTer:PKPK

Limitations:

Preferred: JITTer:PKPK:<filter>
JITTer:PKPK:AFILters

See also:

RMS:JITTer

Limitations:

Preferred: JITTer:RMS:<filter>
JITTer:RMS:AFILters

See also:

COUNt:JITTer:WANDer:TIERror

Limitations:

Preferred: WANDer:TIERror:UI

See also:

COUNt:JITTer:WANDer:SEConds:TIERror

Limitations:

Preferred: WANDer:TIERror:NSEConds

See also:

PEAK:JITTer:WANDer:POSitive

Limitations:

Preferred: WANDer:PPEak:UI

See also:

PEAK:JITTer:WANDer:SEConds:POSitive

Limitations:

Preferred: WANDer:PPEak:NSEConds

See also:

PEAK:JITTer:WANDer:NEGative

Limitations:

Preferred: WANDer:NPEak:UI

See also:

PEAK:JITTer:WANDer:SEConds:NEGative

Limitations:

Preferred: WANDer:NPEak:NSEConds

See also:

PEAK:JITTer:WANDer:PKPK

Limitations:

Preferred: WANDer:PKPK:UI

See also:

PEAK:JITTer:WANDer:SEConds:PKPK

Limitations:

Preferred: WANDer:PKPK:NSEConds

See also:

FOFPpm:JITTer:WANDer:IMPLied

Limitations:

Preferred: WANDer:FREQuency:OFFSet

See also:

DRIFt:JITTer:WANDer

Limitations:

Preferred: WANDer:FREQuency:DRIFt

See also:

G.826 ANALysis Results

SENSe:DATA? Results naming has been changed to allow for standards of analysis other then G.826, (e.g G.828). Consequently, SENSe:DATA? results generated in accordance with G.826 should be accessed using the preferred notation:
:SENSe:DATA? <string>
where <string> = "<Result Type>:SDH|SONet:<Path Type>:G826"

The older notation is supported but not recommended for future use:

:SENSe:DATA? <string>
where <string> = "<Result Type>:SDH|SONet:<Path Type>:ANALysis"

<Result Type> is one of the following:

ESEConds	SESeconds	BBECountEBCount
ESRatio	SESRatio	BBERatio
UASeconds	PUASeconds	

<Path Type> is one of the following:

SDH:

RSBip	MSBip	MSRei	PBIP
REI	TCM:PIEC	TCM:REI	

SONet:

CVL	CVP	CVS
REIL	REIP	

The following <Path Type> are also supported but not recommended for future use:

SDH:

FEBE	MFEFe	TCM:FEBE

OmniBER 718 Features/Commands Not Supported

This section details commands that are not supported in the OmniBER OTN instrument. Please refer to the OmniBER 718 remote control manual for details of the commands indicated.

For a command ending in "<>" , this indicates that all parameters of a single command are relevant. For a command ending in ":" , this indicates that all commands starting with this root are relevant. For a command where a single parameter is indicated "<parameter>", only this parameter is relevant.

Alarm Scan

The 37718 Alarm Scan feature is superceded by the Signal Wizard feature.

FETCh:ARRay:DATA:TELecom:SDH:ASCan?
FETCh:ARRay:DATA:TELecom:SONet:ASCan?
SENSe:DATA:TELecom:SDH:ASCan<>
SENSe:DATA:TELecom:SDH:ASCan:
SENSe:DATA:TELecom:SONet:ASCan<>
SENSe:DATA:TELecom:SDH:ASCan:
SENSe:DATA:TELecom:SPDH:ASCan<>

ATM

SENSe:DATA:TELecom:ATM:
SOURce:DATA:TELecom:ATM:
SOURce:DATA:TELecom:TFUNction<ATM>
SOURce:DATA:TELecom:SDH:MAPPing <ATM>
SOURce:DATA:TELecom:SONet:MAPPing <ATM>
SENSe:DATA:TELecom:TFUNction <ATM>
SENSe:DATA:TELecom:SONet:MAPPing <ATM>

Packet over SONET

SENSe:DATA:TELecom:IPOS:
SOURce:DATA:TELecom:IPOS:
SOURce:DATA:TELecom:TFUNction<POS>
SOURce:DATA:TELecom:SDH:MAPPing <IPOS>
SOURce:DATA:TELecom:SONet:MAPPing <IPOS>
SENSe:DATA:TELecom:TFUNction <POS>
SENSe:DATA:TELecom:SONet:MAPPing <IPOS>

Jitter

SOURce:DATA:TELecom:JITTer:EXTernal:AMPLitude?
SOURce:DATA:TELecom:JITTer:RANGe
SOURce:DATA:TELecom:JITTer:MASK:TYPE:MRANge
SOURce:DATA:TELecom:JITTer:ERANge
SOURce:DATA:TELecom:JITTer:SETTings
SOURce:DATA:TELecom:JITTer:UMASk:POINts
SOURce:DATA:TELecom:JITTer:UMASk:AMPLitude[:MULTiple]
SOURce:DATA:TELecom:JITTer:UMASk:AMPLitude:SINGle
SOURce:DATA:TELecom:JITTer:UMASk:FREQuency[:MULTiple]
SOURce:DATA:TELecom:JITTer:UMASk:FREQuency:SINGle
SOURce:DATA:TELecom:JITTer:UMASK:GENerator[:PARameters]
SOURce:DATA:TELecom:JITTer:UMASK:GENerator:ACTion
SENSe:DATA:TELecom:JITTer:HP1
SENSe:DATA:TELecom:JITTer:THReshold

Pointer Sequences

SOURce:DATA:TELecom:SDH:POINter:G783<>
SOURce:DATA:TELecom:SDH:POINter:G783:
SOURce:DATA:TELecom:SONet:POINter:T1105:
SOURce:DATA:TELecom:SONet:POINter:T1105<>

Optical Stress Test

SOURce:DATA:TELecom:SDH:STESt:
SOURce:DATA:TELecom:SONet:STESt:

Suppression of results

SENSe:DATA:TELecom:SDH:MSRei<>
SENSe:DATA:TELecom:SONet:REIL<>
SENSe:DATA:TELecom:SDH:MSAis<>
SENSe:DATA:TELecom:SONET:MSAis<>

Short term gating

A short term period is not settable - counts and ratios in the last second are available instead.

SENSe:DATA:TELecom:STERm:PERiod<>

Protected Monitor points

OUTPut:TELecom:OC12:INTerface?
OUTPut:TELecom:OC3:INTerface?
OUTPut:TELecom:OC48:INTerface?
OUTPut:TELecom:OPT16:INTerface?
OUTPut:TELecom:OPT1:INTerface?
OUTPut:TELecom:OPT4:INTerface?
:INPut:TELecom:OC3:INTerface <MONitor>
:INPut:TELecom:OC12:INTerface <MONitor>
:INPut:TELecom:OC48:INTerface <MONitor>
:INPut:TELecom:OPT1:INTerface <MONitor>
:INPut:TELecom:OPT4:INTerface <MONitor>
:INPut:TELecom:OPT16:INTerface <MONitor>
SOURce:CLOCk:SDH:SOURce <RMON0,RMON1,RMON4>
SOURce:CLOCk:SONet:SOURce <RMN1,RMN3,RMN12>

64kbit/s external clock format

:SOURce:CLOCk:SDH:FORMat <K64>
:SOURce:CLOCk:SONet:FORMat <K64>

Overhead BER

SENSe:DATA:TELecom:SDH:OBERtest:
SENSe:DATA:TELecom:SONet:OBERtest:
SOURce:DATA:TELecom:SDH:OBERtest:
SOURce:DATA:TELecom:SDH:OBERtest<>
SOURce:DATA:TELecom:SONet:OBERtest:
SOURce:DATA:TELecom:SONet:OBERtest<>
SENSe:DATA:TELecom:SDH:TFUNction:TYPE <OBERTest>
SENSe:DATA:TELecom:SONet:TFUNction:TYPE <OBERTest>

Thru mode payload overwrite

:SOURce:DATA:TELecom:SDH:THRumode:PAYLoad:OVERwrite:
:SOURce:DATA:TELecom:SONet:THRumode:PAYLoad:OVERwrite:

Other commands

SYSTem:WINDow<>

This command is not applicable to the OmniBER OTN Graphical User Interface.

OmniBER 718 SENSe:DATA Results Not Supported

(Feature not in OmniBER OTN)
The following results or groups of results from OmniBER 718 instruments are not supported in the OmniBER OTN:

ATM

ASEConds:IPOS:
ECOunt:IPOS:
ERATio:IPOS:
SDTest:IPOS:

Packet over SONET

ASEConds:IPOS:
ECOunt:IPOS:
ERATio:IPOS:
SDTest:IPOS:

Jitter

PEAK:JITTer:STERm:POSitive
PEAK:JITTer:STERm:NEGative
PEAK:JITTer:STERm:PKPK
RMS:JITTer:STERm
PEAK:JITTer:WANDer:PK15
PEAK:JITTer:WANDer:SEConds:PK15
PEAK:JITTer:WANDer:PK24
PEAK:JITTer:WANDer:SEConds:PK24
SLIPs:JITT:WANDer:FRAMe
SLIPs:JITT:WANDer:BIT

Overhead BER

ASEConds:SDH:OPSL
ASEConds:SONet:OPSL
ECOunt:SONet:OVERhead
ECOunt:SDH:OVERhead

OmniBER 718 features with no SCPI support

This section details features present in the OmniBER OTN and OmniBER 718 that no longer have SCPI support in the OmniBER OTN. Please refer to the OmniBER 718 remote control manual for details of the commands indicated.

Trouble Scan

FETCh:ARRay:DATA:TELecom:SDH:TSCan?
FETCh:ARRay:DATA:TELecom:SONet:TSCan?
SENSe:DATA:TELecom:SDH:TSCan
SENSe:DATA:TELecom:SONet:TSCan
SENSe:DATA:TELecom:TSCan

Printer Control

SYSTem:PRINt:

Floppy Disk Control

SYSTem:DISK:

Keyboard lock

SYSTem:KLOCk

Beep on error

SYSTem:BEEPer:STATe

Stored Settings label

SYSTem:SSETting:LABel
SYSTem:SSETting:LOCK

Selftest Wavelength selection

SYSTem:SELFtest:WAVelength

Workarounds for Incompatible OmniBER 718 Commands

This section details commands that are not supported in the OmniBER OTN instrument but a workaround exists.

J0/J1/TCM Trace messages

FETCh:STRing:DATA:TELecom:SDH:J0:HEXadecimal?
Use FETCh:STRing:DATA:TELecom:SDH:J0?

FETCh:STRing:DATA:TELecom:SDH:J1:HEXadecimal?
Use FETCh:STRing:DATA:TELecom:SDH:J1?

FETCh:STRing:DATA:TELecom:SONet:J0:HEXadecimal?
Use FETCh:STRing:DATA:TELecom:SONET:J0?

FETCh:STRing:DATA:TELecom:SONet:J1:HEXadecimal?
Use FETCh:STRing:DATA:TELecom:SONET:J1?

SOURce:DATA:TELecom:SDH:OVERhead:J0:HEX?
Use SOURce:DATA:TELecom:SDH:OVERhead:J0?

SOURce:DATA:TELecom:SDH:POVerhead:J1:HEX?
Use SOURce:DATA:TELecom:SDH:POVerhead:J1?

SOURce:DATA:TELecom:SONET:OVERhead:J0:HEX?
Use SOURce:DATA:TELecom:SONET:OVERhead:J0?

SOURce:DATA:TELecom:SONET:POVerhead:J1:HEX?
Use SOURce:DATA:TELecom:SONET:POVerhead:J1?

SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern <TEST>
SOURce:DATA:TELecom:SDH:POVERhead:J1:PATTern <TEST>
SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern <TEST>
SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern<TEST, CRC7Test>
SENSe:DATA:TELecom:SDH:POVerhead:J1:PATTern <TEST,CRC7Test>
SENSe:DATA:TELecom:SDH:TCM:APID:PATTern <DEFault, TEST>
SENSe:DATA:TELecom:SONet:OVERhead:J0:PATTern <TEST>

SENSe:DATA:TELecom:SONet:POVerhead:J1:PATTern <TEST, CRC7Test>
Choose an alternative parameter.

Frequency offset not settable in %

SOURce:CLOCk:SDH:FOFFset:OFFSet <numeric><PCT>
SOURce:DATA:TELecom:SONet:POINter:OFFSet:RATE <numeric><PCT>
Set offset in ppm

Overhead Sequences

:SOURce:DATA:TELecom:SDH:SEQuence:OHBYte Z1/Z2
:SOURce:DATA:TELecom:SDH:SEQuence:COLumn <numeric>
:SENSe:DATA:TELecom:SDH:OCAPture:OHBYte Z1/Z2
:SENSe:DATA:TELecom:SDH:OCAPture:COLumn <numeric>
Instead of Z1/Z2, use Xrc (for example, X92) notation to specify the overhead sequence channel.

Overhead Sequences

:SOURce:DATA:TELecom:SDH:SEQuence:DATA<>
:SOURce:DATA:TELecom:SONet:SEQuence:DATA<>
Use numeric 1 to 256 instead of A,B,C,D,E
:SOURce:DATA:TELecom:SDH:SEQuence:ORDer
:SOURce:DATA:TELecom:SONet:SEQuence:ORDer
Repeat elements in sequence data to generate required repetition

Jitter

SOURce:DATA:TELecom:JITTer:MASK:TYPE <G823,QHIGh,QLOW,G824,GR499CAT1,GR499CAT2,G825,GR253>
Choose an alternative parameter, or use SOURce:DATA:TELecom:TOLerance:MASK and its new parameters.

SOURce:DATA:TELecom:JITTer:TRANsfer:MASK:INPut <QLOW,QHIGh,G823,GR253A,GR253B,G824,GR499CAT1,GR499CAT2>
Choose an alternative parameter, or use SOURce:DATA:TELecom:TRANsfer:MASK:INPut and its new

parameters.

SOURce:DATA:TELecom:TRANsfer:MASK:PASS <G823,GR253,G823HIQ,G823LOQ,G824,GR499CAT1,GR499CAT2,NONE>
Choose an alternative parameter, or use SOURce:DATA:TELecom:TRANsfer:MASK:PASS and its new parameters.

SOURce:DATA:TELecom:JITTer:UMASk:POINts
SOURce:DATA:TELecom:JITTer:UMASk:AMPLitude[:MULTiple]
SOURce:DATA:TELecom:JITTer:UMASk:AMPLitude:SINGle
SOURce:DATA:TELecom:JITTer:UMASk:FREQuency[:MULTiple]
SOURce:DATA:TELecom:JITTer:UMASk:FREQuency:SINGle
SOURce:DATA:TELecom:JITTer:UMASk:GENerator[:PARameters]
SOURce:DATA:TELecom:JITTer:UMASk:GENerator:ACTion
Use the new user mask entry command SOURce:DATA:TELecom:JITTer:UMASk:ENTry

SENSe:DATA:TELecom:JITTer:RANGe <UI1_6,UI16,UI64>
Use one of the new parameters specific to OmniBER OTN.

SENSe:DATA:TELecom:JITTer:THReshold <numeric>
Use SENSe:DATA:TELecom:JITTer:PTHReshold and SENSe:DATA:TELecom:JITTer:NTHReshold

Workarounds for Incompatible OmniBER 718 SENSe:DATA Results

Frequency measurement

FOFHz:SDH[:GATE16S]
FOFHz:SONet[:GATE16S]
Use FOF

FOFPpm:SDH[:GATE16S]
FOFPpm:SONet[:GATE16S]
Use FOFPpm

FREQuency:SDH:GATE1S
FREQuency:SONet:GATE1S
FREQuency:SDH[:GATE16S]
FREQuency:SONet[:GATE16S]
Use FREQuency

Short term results

STERm

ECOunt:SDH:STERm:
Use ECOunt:SDH:LSECond:

ECOunt:SONet:STERm:
Use ECOunt:SONET:LSECond:

ECOunt:STERm:BIT
Use ECOunt:LSECond:BIT

ERATio:SDH:STERm:
Use ERATio:SDH:LSECond:

ERATio:SONet:STERm:
Use ERATio:SONET:LSECond:

ERATio:STERm:BIT
Use ERATio:LSECond:BIT

PEAK:JITTer:STERm:POSitive
Use JITTer:PPEak:LSECond:<filter>

PEAK:JITTer:STERm:NEGative
Use JITTer:NPEak:LSECond:<filter>

PEAK:JITTer:STERm:PKPK
Use JITTer:PKPK:LSECond:<filter>

RMS:JITTer:STERm
Use JITTer:RMS:LSECond:<filter>

Backwards Compatibility of STATus commands

This section summarizes differences between the STATus commands of the OmniBER OTN and the OmniBER 718.

Commands

The following generic commands are common to both OmniBER 718 and OmniBER OTN instruments:

:STATus:<register>:CONDition?
:STATus:<register>:ENABle
:STATus:<register>:ENABle?
:STATus:<register>:EVENt?
:STATus:<register>:NTRansition
:STATus:<register>:NTRansition?
:STATus:<register>:PTRansition
:STATus:<register>:PTRansition?

The following commands are not supported with the OmniBER OTN instruments:
:STATus:<register>:HISTory
:STATus:<register>:HISTory?

Non Supported Registers

As a result in the difference in functionality the following status registers used in OmniBER 718 instruments are not provided in the OmniBER OTN instruments:

ATM Status Register	IPOS Status Register
JITTer Status Register	SPDH Status Register
M140 Status Register	M34 Status Register
M8 Status Register	M2 Status Register
DS3 Status Register	DS2 Status Register
DS1 Status Register	

The addition of functionality to the OmniBER OTN has necessitated the addition of STATus registers to handle the need for

additional status bits. This has also resulted in some rationalization of the status bits relative to the OmniBER 718 product.

INSTrument Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
DISK	-	-	-	-	-	LQE	SMG

DATA Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	IPOS	SDH3	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	ATM	-	JITT	SDH2	-	FAS	-

DB3 & DB10: SDHn|SONETn registers are now summarised into DB2.

ISUMmary Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	IPOS

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
ATM	-	LOP	FAR	AIS	-	-	-

SDH|SONet Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	ERR	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	PSL	-	-	-	-	-	LOS

DB0, DB6 & DB14 workaround: use OmniBER OTN status bits in ISUMmary register

SDH2 | SONet2 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	BDL	BCL	PSA	RAS	TAS	PSI	FMU

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
ALSC	-	-	-	-	-	-	-

SDH3 | SONet3 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	FMU_1S

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	-

DB8 workaround: use OmniBER OTN TCM status bit

SPDH Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8

-	ERR	PSL	ILOS	IPES	DPES	FMU	LOC

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	ALSC	-	-	-	-	-	-

M140 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	DEFO	IEFO	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	LOS

M34 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	DEFO	IEFO	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	LOS

M8 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	LOS

M2 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	CRC	-	-	-	LOS

DS3 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	DEFO	IEFO

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	LOS

DS1 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	LOS

Reused Registers

Please refer to the appropriate instrument SCPI manuals for details of the STATus registers.

The following diagrams of the OmniBER 718 STATus registers provide an indication the reuse:

Bits marked with an asterisk (*) indicate STATus bits reused in the OmniBER OTN.

Bits marked with an asterisk (#) indicate STATus bits with different use in the OmniBER OTN.

DATA Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	ISUM *	-	-	IPOS	SDH3	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	ATM	SPDH *	JITT	SDH2	SDH *	FAS	-

DB2: This bit has been renamed but provides a similar combined SDH/SONET register summary on OmniBER 718 instruments.

ISUMmary Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	ERR *	PSL *	-	-	-	-	IPOS

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
ATM	-	ATM	FAR	AIS	LOF *	LOS *	PLO *

DB2: Provides a Frame Alarm (LOF / OOF) indication on Om-

niBER 718 instruments.

SDH Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	ERR	LPRDI *	TUAIS *	TULOP *	HPRDI *	MSRDI *	H4 *

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
CSL *	PSL	AUAIS *	MSAIS *	LOP *	OOF *	LOF *	LOS

SDH2 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	BDL	BCL	PSA	RAS	TAS	PSI	FMU *

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
ALSC #	K1K2 *	TMNDF *	TNDF *	TPADJ *	MNDF *	NDF *	PADJ *

DB7: This bit provides an indication of Signal Wizard in Progress (SIGW) on OmniBER 718 instruments.

SDH3 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	FMU_1 S

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0

-	-	-	TCODI *	TCRDI *	TCIAIS *	TCLOM *	P1P0 *

SONet Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	ERR	RDIV *	AISV *	LOPV *	RDIP *	RDIL *	H4 *

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
CSL *	PSL	AISP *	AISL *	LOPP *	SEF *	LOF *	LOS

SONet2 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	BDL	BCL	PSA	RAS	TAS	PSI	FMU *

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
ALSC *	K1K2 *	TMNDF *	TNDF *	TPADJ *	MNDF *	NDF *	PADJ *

SONet3 Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	FMU_1 S

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	-	P1P0 *

JITTer Status Register

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	JTF *	-	-	-	JAT *	JSWP	TSET *

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
ORCL	XCL	JOVR *	-	-	WSL	JHT *	JSL *

Backwards Compatibility for Enhanced Testing Upgrade Commands

The following commands are not available at initial release, but are expected to be provided with Enhanced Testing Upgrade, (J7265A option 500)

Pointer Graph

FETCh:ARRay:DATA:TELecom:SDH:PGRaph?
FETCh:ARRay:DATA:TELecom:SONet:PGRaph?
SENSe:DATA:TELecom:SDH:PGRaph:
SENSe:DATA:TELecom:SONet:PGRaph:
SENSe:DATA:TELecom:SONet:TFUNction:TYPE <PGRaph>
SENSe:DATA:TELecom:SDH:TFUNction:TYPE <PGRaph>

Service Disruption

SENSe:DATA:TELecom:TFUNction:SDISruption<>
SOURce:DATA:TELecom:TFUNction:SDISruption<>

VT/TU mappings

SOURce:DATA:TELecom:SDH:TUG3:BACKground:
SOURce:DATA:TELecom:SONet:STS12c:BACKground<>
SOURce:DATA:TELecom:SONet:STS3:BACKground<>
SENSe:DATA:TELecom:SDH:PRIMary:
SENSe:DATA:TELecom:SONet:PRIMary:
SOURce:DATA:TELecom:SDH:PRIMary:
SOURce:DATA:TELecom:SONet:PRIMary:
FETCh:SCALar:DATA:TELecom:SDH:TRIButary:
FETCh:SCALar:DATA:TELecom:SONet:TRIButary:
FETCh:STRing:DATA:TELecom:SDH:TRIButary:
FETCh:STRing:DATA:TELecom:SONet:TRIButary:
SENSe:DATA:TELecom:SDH:TRIButary:
SENSe:DATA:TELecom:SONet:TRIButary:
SOURce:DATA:TELecom:SDH:TRIButary:
SOURce:DATA:TELecom:SONet:TRIButary:
FETCh:SCALar:DATA:TELecom:SDH:POVerhead:H4Sequence<
>
FETCh:SCALar:DATA:TELecom:SONet:POVerhead:H4Sequenc
e<>
FETCh:STRing:DATA:TELecom:SDH:TCM:APID?
SENSe:DATA:TELecom:SDH:PAYLoad:STRucture<>
SENSe:DATA:TELecom:SDH:PAYLoad:TYPE<>

SENSe:DATA:TELecom:SONet:PAYLoad:STRucture<>
SENSe:DATA:TELecom:SONet:PAYLoad:TYPE<>
SENSe:DATA:TELecom:SDH:TCM:PATH<LOW>
SOURce:DATA:TELecom:SDH:TCM:PATH<LOW>
SENSe:DATA:TELecom:SONet:TRIButary<>
SENSe:DATA:TELecom:SONet:TRIButary:
SOURce:DATA:TELecom:SDH:PAYLoad:OFFSet<>
SOURce:DATA:TELecom:SDH:PAYLoad:STRucture<>
SOURce:DATA:TELecom:SDH:PAYLoad:TYPE<>
SOURce:DATA:TELecom:SDH:PDHPayload:ERRor:TYPE<>
SOURce:DATA:TELecom:SDH:POVerhead:H4Sequence<>
SOURce:DATA:TELecom:SONet:PAYLoad:OFFSet<>
SOURce:DATA:TELecom:SONet:PAYLoad:STRucture<>
SOURce:DATA:TELecom:SONet:PAYLoad:TYPE<>
SOURce:DATA:TELecom:SONet:PDHPayload:ERRor:TYPE<>
SOURce:DATA:TELecom:SONet:POVerhead:H4Sequence<>
SOURce:DATA:TELecom:SONet:TRIButary<>
SOURce:DATA:TELecom:SONet:TRIButary:
SOURce:DATA:TELecom:SONet:ALARm <LOPV, AISV, RDIV, LOMultiframe, VTUNequiped>
SOURce:DATA:TELecom:SONet:ERRor:TYPE <REIV, CVV>
SOURce:DATA:TELecom:SONet:MAPPing <M140, M34, DS3>
SOURce:DATA:TELecom:SONet:PAYLoad <M140, TU3, M34, TU12, M2, TU2, TU11, DS1>
SOURce:DATA:TELecom:SDH:MAPPing <M140, M34, DS3>
SENSe:DATA:TELecom:SDH:PAYLoad < M140, TU3, M34, TU12, M2, TU2, TU11, DS1>
SENSe:DATA:TELecom:SDH:POINter:OFFSet <TU>
SENSe:DATA:TELecom:SONet:MAPPing <M140, M34, DS3>
SENSe:DATA:TELecom:SONet:PAYLoad < M140, TU3, M34, TU12, M2, TU2, TU11, DS1>
SENSe:DATA:TELecom:SONet:POINter:OFFSet <VT>
SOURce:DATA:TELecom:SDH:TCM:APID:PATTern <DEFAULT, TEST>

SONET/SDH Electrical Interfaces

INPut:TELecom:SDH:GAIN<>
INPut:TELecom:SONet:GAIN<>
OUTPut:TELecom:SDH:LEVel<>
OUTPut:TELecom:SONet:LEVel
SENSe:DATA:TELecom:SENSe <SDH or SONet>
SOURce:DATA:TELecom:SOURce <SDH or SONet>

PDH/DSn

FETCh:ARRay:DATA:TELecom:SPDH:
FETCh:SCALar:DATA:TELecom:SPDH:
FETCh:STRing:DATA:TELecom:SPDH:
INPut:TELecom:SPDH:
OUTPut:TELecom:SPDH:
SENSe:DATA:TELecom:SPDH:
SOURce:CLOCk:SPDH:
SOURce:DATA:TELecom:SPDH:
SENSe:DATA:TELecom:SENSe <PDH>
SOURce:DATA:TELecom:SOURce <PDH>
SOURce:DATA:TELecom:TFUNction<PDH, PDHPayload, SDIS-ruption>
SOURce:DATA:TELecom:SDH:ALARm <TULop, TUPais, LPRDi, LOMultiframe, TUUNequiped>
SOURce:DATA:TELecom:SDH:ERRor:TYPE <TCBip,TUBip>
SOURce:DATA:TELecom:SDH:MAPPing <M140,M34,DS3>
SOURce:DATA:TELecom:SDH:PAYLoad <M140, TU3, M34, TU12, M2, TU2, TU11, DS1>
SENSe:DATA:TELecom:TFUNction < PDH, PDHPayload, SDIS-ruption >

External clock level

SOURce:CLOCk:SDH:LEVel<>
SOURce:CLOCk:SONet:LEVel<>

Stored Measurement Graphics

SENSe:DATA:TELecom:SMG<>
SENSe:DATA:TELecom:SMG:

Thru mode overhead overwrite

SOURce:DATA:TELecom:SDH:THRumode:COVerwrite<>
SOURce:DATA:TELecom:SONet:THRumode:COVerwrite<>

Active APS

SOURce:DATA:TELecom:SDH:MSPMessages:TOPology:
SOURce:DATA:TELecom:SONet:APSMessages:TOPology:

Logging

SYSTem:LOGGing:DEVice

Backwards Compatibility for Enhanced Testing Upgrade

The following SENSe DATA? Results are not available at initial release, but are expected to be provided with Enhanced Testing Upgrade, (J7265A option 500)

VT/TU Mappings

TRIB:

ASEConds:SDH:TRIB:
BBECount:SDH:TRIB:<>:ANALysis
BBERatio:SDH:TRIB:<>:ANALysis
EBCount:SDH:TRIB:<>:ANALysis
EBCount:SONet:TRIB:<>:ANALysis
ECOunt:SDH:TRIB:
ECOunt:SONet:TRIB:
ERATio:SDH:TRIB:
ERATio:SONet:TRIB:
ESEConds:SDH:TRIB:<>:ANALysis
ESEConds:SONet:TRIB:<>:ANALysis
ESRatio:SDH:TRIB<>:ANALysis
ESRatio:SONet:TRIB:<>:ANALysis
PACTivity:SDH:TRIButary:
PACTivity:SONet:TRIButary:
PUASeconds:SDH:TRIB:<>:ANALysis
PUASeconds:SONet:TRIB:<>:ANALysis
SESRatio:SDH:TRIB:<>:ANALysis
SESRatio:SONet:TRIB:<>:ANALysis
SESeconds:SDH:TRIB:<>:ANALysis
SESeconds:SONet:TRIB:<>:ANALysis
UASeconds:SDH:TRIB:<>:ANALysis
UASeconds:SONet:TRIB:<>:ANALysis

SDH:

ASEConds:SDH:H4MF

SONet:

ASEConds:SONet:H4MF

PDH/DSn

SPDH:

ASEConds:SPDH:
BBECount:SPDH:<>:<>:ANALysis:G826
BBERatio:SPDH:<>:<>:ANALysis:G826
DAY7:SPDH:ANALysis:M2110
DMINutes:SPDH:<>:ANALysis
DMINutes:SPDH:<>:FAS:ANALysis
EBCount:SPDH:<>:<>:ANALysis:G826
ECOunt:SPDH:
EFSeconds:SPDH:<>:ANALysis
EFSeconds:SPDH:<>:FAS:ANALysis
ERATio:SPDH:
ESEConds:SPDH:BIT:ANALysis
ESEConds:SPDH:BIT:RECeive:ANALysis:G826
ESEConds:SPDH:<>:ANALysis
ESEConds:SPDH:<>:RECeive:ANALysis:G826
ESEConds:SPDH:<>:TRANsmit:ANALysis:G826
ESEConds:SPDH:<>:FAS:ANALysis
ESRatio:SPDH:<>:RECeive:ANALysis:G826
ESRatio:SPDH:<>:TRANsmit:ANALysis:G826
FOFHz:SPDH
FOFPpm:SPDH
FREQuency:SPDH
HOUR1:SPDH:ANALysis:M2110
HOUR24:SPDH:ANALysis:M2110
HOUR2:SPDH:ANALysis:M2110
MIN15:SPDH:ANALysis:M2110
PDMinutes:SPDH:<>:ANALysis
PDMinutes:SPDH:<>:FAS:ANALysis
PEFSeconds:SPDH:<>:ANALysis
PEFSeconds:SPDH:<>:FAS:ANALysis
PESD:SPDH:BIT:ANALysis
PESeconds:SPDH:<>:ANALysis
PESeconds:SPDH:<>:FAS:ANALysis
PSESeconds:SPDH:<>:ANALysis
PSESeconds:SPDH:<>:FAS:ANALysis
PUASeconds:SPDH:<>:ANALysis
PUASeconds:SPDH:<>:RECeive:ANALysis:G826
PUASeconds:SPDH:<>:TRANsmit:ANALysis:G826
PUASeconds:SPDH:<>:FAS:ANALysis
RTDelay:SPDH:COUNt
SESRatio:SPDH:<>:RECeive:ANALysis:G826

SESRatio:SPDH:<>:TRANsmit:ANALysis:G826
SESeconds:SPDH:<>:ANALysis
SESeconds:SPDH:<>:RECeive:ANALysis:G826
SESeconds:SPDH:<>:TRANsmit:ANALysis:G826
SESeconds:SPDH:<>:FAS:ANALysis
UASeconds:SPDH:<>:ANALysis
UASeconds:SPDH:<>:RECeive:ANALysis:G826
UASeconds:SPDH:<>:FAS:ANALysis

PDH:

ECOunt:PDH:CRC

G.821 analysis

Other:

DMINutes:BIT:ANALysis
EFSeconds:BIT:ANALysis
ESEConds:BIT:ANALysis
PDMinutes:BIT:ANALysis
PEFSeconds:BIT:ANALysis
PESeconds:BIT:ANALysis
PSESeconds:BIT:ANALysis
PUASeconds:BIT:ANALysis
SESeconds:BIT:ANALysis
UASeconds:BIT:ANALysis

G.826 analysis of bit errors and TCM errors and OEI

BBECount:SDH:BLKBit:ANALysis
BBECount:SDH:TCM:ERR:ANALysis
BBECount:SDH:TCM:OEI:ANALysis
BBECount:SONet:BLKBit:ANALysis
BBERatio:SDH:BLKBit:ANALysis
BBERatio:SDH:TCM:ERR:ANALysis
BBERatio:SDH:TCM:OEI:ANALysis
BBERatio:SONet:BLKBit:ANALysis
EBCount:SDH:BLKBit:ANALysis
EBCount:SDH:TCM:ERR:ANALysis
EBCount:SDH:TCM:OEI:ANALysis
EBCount:SONet:BLKBit:ANALysis
ESEConds:SDH:BLKBit:ANALysis
ESEConds:SDH:TCM:ERR:ANALysis
ESEConds:SDH:TCM:OEI:ANALysis

ESEConds:SONet:BLKBit:ANALysis
ESRatio:SDH:BLKBit:ANALysis
ESRatio:SDH:TCM:ERR:ANALysis
ESRatio:SDH:TCM:OEI:ANALysis
ESRatio:SONet:BLKBit:ANALysis
PUASeconds:SDH:TCM:ERR:ANALysis
SESRatio:SDH:BLKBit:ANALysis
SESRatio:SDH:TCM:ERR:ANALysis
SESRatio:SDH:TCM:OEI:ANALysis
SESRatio:SONet:BLKBit:ANALysis
SESeconds:SDH:BLKBit:ANALysis
SESeconds:SDH:TCM:ERR:ANALysis
SESeconds:SDH:TCM:OEI:ANALysis
SESeconds:SONet:BLKBit:ANALysis
UASeconds:SDH:BLKBit:ANALysis
UASeconds:SDH:TCM:ERR:ANALysis
UASeconds:SDH:TCM:OEI:ANALysis
UASeconds:SONet:BLKBit:ANALysis

M.2100/M.2101 Analysis

M2100:

ESEConds:SPDH:<>:<>:ANALysis:M2100
SESeconds:SPDH:<>:<>:ANALysis:M2100
UASeconds:SPDH:<>:<>:ANALysis:M2100

M2101:

ESEConds:SDH:<>:<>:ANALysis:M2101
SESeconds:SDH:<>:<>::ANALysis:M2101
SESeconds:SONet:<>:<>:ANALysis:M2101
UASeconds:SDH:<>:<>:ANALysis:M2101
UASeconds:SONet:<>:<>:ANALysis:M2101

M2120:

TR1:SPDH:RECeive:ANALysis:M2120
TR1:SPDH:TRANsmit:ANALysis:M2120
TR2:SPDH:RECeive:ANALysis:M2120
TR2:SPDH:TRANsmit:ANALysis:M2120

11
General Information

General Information

This chapter contains general remote control information.

- SCPI Overview - Gives a brief overview of the SCPI Standard.
- GPIB Universal Commands - Describes the GPIB Universal commands.

SCPI Overview

Standard Commands for Programmable Instruments (SCPI) is a standard of the SCPI Consortium that provides guidelines for remote programming commands for instruments. The goal of SCPI is to reduce Automatic Test Equipment (ATE) program development time. It accomplishes this by providing a consistent programming environment for instrument control and data usage. This programming environment uses defined programming messages, instrument responses, and data formats across all SCPI instruments, regardless of manufacturer.

SCPI is based on two IEEE standards:

- ANSI/IEEE Standard 488.1-1987, IEEE Standard Digital Interface for Programmable Instrumentation
- ANSI/IEEE Standard 488.2-1987, IEEE Standard Codes, Formats, Protocols, and Common Commands. For use with ANSI/IEEE Standard 488.1-1987, IEEE Standard Digital Interface for Programmable Instrumentation

GPIB Universal Commands

The Required Commands perform the most basic remote functions over GPIB and are common to all GPIB controllable instruments. The commands are as follows:-

- DEVICE CLEAR
- SERIAL POLL
- REMOTE ENABLE
- LOCAL LOCKOUT
- GO TO LOCAL

Device Clear (CLEAR)

This command will initialize the instrument GPIB hardware.

The command format using HP 200/300 Series Basic, for example is:

CLEAR 705 (where 7 is the Bus I/O select code and 05 is the device address).

Serial Poll (SPOLL)

A serial poll will retrieve the value of the primary status byte. This byte contains useful information about the current state of the instrument.

for example:

SPOLL(705) (where 7 is the Bus I/O select code and 05 is the device address).

Remote Enable (REMOTE)

The Remote command instructs the instrument to enter the REMOTE state and be ready to accept instructions via GPIB.

When the Instrument receives this command it illuminates the front panel REMOTE indicator.

for example:

REMOTE 705 (where 7 is the Bus I/O select code and 05 is the device address).

Local Lockout (LOCAL LOCKOUT)

It is recommended that the Local Lockout command is sent after the Remote command. This disables the front panel local key preventing the return to local mode and thus any interference to the instrument settings. It should always be preceded by the REMOTE command.

for example:

LOCAL LOCKOUT 7 (will configure all the instruments on the bus to the Local Lockout condition.)

NOTE If the instrument has been set to the LOCAL LOCKOUT condition, then the front panel LOCAL key is disabled. The instrument can only be returned to LOCAL operation by the controller sending the LOCAL command or by cycling power to the instrument.

Local (LOCAL)

The Local command returns the instrument from Remote operation to local front panel control.

for example:

LOCAL 7 or LOCAL 705 (where 7 is the Bus I/O select code and 05 is the device address).

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SCPI Error Messages

SCPI Error Messages

The system-defined error/event numbers are chosen on an enumerated ("1 of N") basis. The SCPI defined error/event numbers and the error description portions of the ERRor query response are listed here. The first error/event described in each class (for example, -100, -200, -300, -400) is a "generic" error. In selecting the proper error/event number to report, more specific error/event codes are preferred, and the generic error/event is used only if the others are inappropriate.

No Error

This message indicates that the device has no errors.

No Error

The queue is completely empty. Every error/event in the queue has been read or the queue was purposely cleared by power-on, *CLS, etc.

Command Errors [-199, -100]

An < error/event number > in the range [-199, -100] indicates that an IEEE 488.2 syntax error has been detected by the instrument's parser. The occurrence of any error in this class should cause the command error bit (bit 5) in the event status register (IEEE 488.2, section 11.5.1) to be set. One of the following events has occurred:

- An IEEE 488.2 system error has been detected by the parser. That is, a controller-to-device message was received which is in violation of the IEEE 488.2 standard. Possible violations include a data element which violates the device listening formats or whose type is unacceptable to the device.
- An unrecognized header was received. Unrecognized headers include incorrect device-specific headers and incorrect or not implemented IEEE 488.2 common commands.
- A Group Execute Trigger (GET) was entered into the input buffer inside of an IEEE 488.2 < PROGRAM MESSAGE >.

Events that generate command errors shall not generate execution errors, device-specific errors, or query errors.

-100 **Command error**

This is the generic syntax error for devices that cannot detect more specific errors. This code indicates only that a Command Error as defined in IEEE 488.2, 11.5.1.1.4 has occurred.

-101 **Invalid character**

A syntactic element contains a character which is invalid for that type; for example, a header containing an ampersand, SET UP&. This error might be used in place of errors -114, -121, -141, and perhaps some others.

-102 **Syntax error**

An unrecognized command or data type was encountered; for example, a string was received when the device does

not accept strings.

-103 **Invalid separator**

The parser was expecting a separator and encountered an illegal character; for example, the semicolon was omitted after a program message unit, *ESE 1:OUTP1:TEL:RATE 140 Mb/s

-104 **Data type error**

The parser recognized a data element different than one allowed; for example, numeric or string data was expected but block data was encountered.

-105 **GET not allowed**

A Group Execute Trigger was received within a program message (see IEEE 488.2, 7.7).

-108 **Parameter not allowed**

More parameters were received than expected for the header; for example, the *RCL common command only accepts one parameter, so receiving *RCL 0,1 is not allowed.

-109 **Missing parameter**

Fewer parameters were received than required for the header; for example, the *ESE common command requires one parameter, so receiving *ESE is not allowed.

-110 **Command header error**

An error was detected in the header. This error message should be used when the device cannot detect the more specific errors described for errors -111 through -119.

-111 **Header separator error**

A character which is not a legal header separator was encountered while parsing the header; for example, no white space followed the header, thus *ESE1 is an error.

-112 **Program mnemonic too long**

The header contains more that twelve characters (see IEEE 488.2, 7.6.1.4.1).

-113 **Undefined header**

The header is syntactically correct, but it is undefined by this specific device; for example, *XYZ is not defined for any device.

-114 **Header suffix out of range**

Indicates that a non-header character has been encountered in what the parser expects is a header element.

-120 **Numeric data error**

This error, as well as errors -121 through -129, are generated when parsing a data element which appears to be numeric, including the non-decimal numeric types. This particular error message should be used if the device cannot detect a more specific error.

-121 **Invalid character in number**

An invalid character for the data type being parsed was encountered; for example, an alpha in a decimal numeric or a "9" in octal data.

-123 **Exponent too large**

The magnitude of the exponent was larger than 32000 (see IEEE 488.2, 7.7.2.4.1).

-124 **Too many digits**

The mantissa of a decimal numeric data element contained more than 255 digits excluding leading zeros (see IEEE 488.2, 7.7.2.4.1).

-128 **Numeric data not allowed**

A legal numeric data element was received, but the device does not accept one in this position for the header.

-130 **Suffix error**

This error, as well as errors -131 through -139, are generated when parsing a suffix. This particular error message should be used if the device cannot detect a more specific error.

-131 **Invalid suffix**

The suffix does not follow the syntax described in IEEE

488.2, 7.7.3.2, or the suffix is inappropriate for this device.

-134 **Suffix too long**

The suffix contained more than 12 characters (see IEEE 488.2, 7.7.3.4).

-138 **Suffix not allowed**

A suffix was encountered after a numeric element which does not allow suffixes.

-140 **Character data error**

This error, as well as errors -141 through -149, are generated when parsing a character data element. This particular error message should be used if the device cannot detect a more specific error.

-141 **Invalid character data**

Either the character data element contains an invalid character or the particular element received is not valid for the header.

-144 **Character data too long**

The character data element contains more than twelve characters (see IEEE 488.2, 7.7.1.4).

-148 **Character data not allowed**

A legal character data element was encountered where prohibited by the device.

-150 **String data error**

This error, as well as errors -151 through -159, are generated when parsing a string data element. This particular error message should be used if the device cannot detect a more specific error.

-151 **Invalid string data**

A string data element was expected, but was invalid for some reason (see IEEE 488.2, 7.7.5.2); for example, an END message was received before the terminal quote character.

-158 **String data not allowed**

A string data element was encountered but was not

allowed by the device at this point in parsing.

-160 **Block data error**

This error, as well as errors -161 through -169, are generated when parsing a block data element. This particular error message should be used if the device cannot detect a more specific error.

-161 **Invalid block data**

A block data element was expected, but was invalid for some reason (see IEEE 488.2, 7.7.6.2); for example, an END message was received before the length was satisfied.

-168 **Block data not allowed**

A legal block data element was encountered but was not allowed by the device at this point in parsing.

-170 **Expression error**

This error, as well as errors -171 through -179, are generated when parsing an expression data element. This particular error message should be used if the device cannot detect a more specific error.

-171 **Invalid expression**

The expression data element was invalid (see IEEE 488.2, 7.7.7.2); for example, unmatched parentheses or an illegal character.

-178 **Expression data not allowed**

A legal expression data was encountered but was not allowed by the device at this point in parsing.

-180 **Macro error**

This error, as well as errors -181 through -189, are generated when defining a macro or executing a macro. This particular error message should be used if the device cannot detect a more specific error.

-181 **Invalid outside macro definition**

Indicates that a macro parameter placeholder ($<number) was encountered outside of a macro definition.

-183 **Invalid inside macro definition**

Indicates that the program message unit sequence, sent with a *DDT or *DMC command, is syntactically invalid (see 10.7.6.3).

-184 **Macro parameter error**

Indicates that a command inside the macro definition had the wrong number or type of parameters.

Execution Errors [-299, -200]

An < error/event number > in the range [-299, -200 indicates that an error has been detected by the instrument's execution control block. The occurrence of any error in this class should cause the execution error bit (bit 4) in the event status register (IEEE 488.2, section 11.5.1) to be set. One of the following events has occurred:

- A < PROGRAM DATA > element following a header was evaluated by the device as outside of its legal input range or is otherwise inconsistent with the device
- A valid program message could not be properly executed due to some device condition.

Execution errors shall be reported by the device after rounding and expression evaluation operations have taken place. Rounding a numeric data element, for example, shall not be reported as an execution error. Events that generate execution errors shall not generate Command Errors, device-specific errors, or Query Errors.

-200 **Execution error**

This is the generic syntax error for devices that cannot detect more specific errors. This code indicates only that an Execution Error as defined in IEEE 488.2, 11.5.1.1.5 has occurred.

-201 **Invalid while in local**

Indicates that a command is not executable while the device is in local due to a hard local control (see IEEE 488.2, 5.6.1.5); for example, a device with a rotary switch receives a message which would change the switches state, but the device is in local so the message can not be executed.

-202 **Settings lost due to rtl**

Indicates that a setting associated with a hard local control (see IEEE 488.2, 5.6.1.5) was lost when the device changed to LOCS from REMS or to LWLS from RWLS.

-210 **Trigger error**

-211 **Trigger ignored**

Indicates that a GET, *TRG, or triggering signal was received and recognized by the device but was ignored because of device timing considerations; for example, the device was not ready to respond. Note: a DT0 device always ignores GET and treats *TRG as a Command Error.

-212 **Arm ignored**

Indicates that an arming signal was received and recognized by the device but was ignored.

-213 **Init ignored**

Indicates that a request for a measurement initiation was ignored as another measurement was already in progress.

-214 **Trigger deadlock**

Indicates that the trigger source for the initiation of a measurement is set to GET and subsequent measurement query is received. The measurement cannot be started until a GET is received, but the GET would cause an INTERRUPTED error.

-215 **Arm deadlock**

Indicates that the arm source for the initiation of a measurement is set to GET and subsequent measurement query is received. The measurement cannot be started until a GET is received, but the GET would cause an INTERRUPTED error.

-220 **Parameter error**

Indicates that a program data element related error occurred. This error message should be used when the device cannot detect the more specific errors described for errors -221 through -229.

-221 **Setting conflict**

Indicates that a legal program data element was parsed but could not be executed due to the current device state (see IEEE 488.2, 6.4.5.3 and 11.5.1.1.5.)

-222 **Data out of range**

Indicates that a legal program data element was parsed but could not be executed because the interpreted value was outside the legal range as defined by the device (see IEEE 488.2, 11.5.1.1.5.)

-223 **Too much data**

Indicates that a legal program data element of block, expression, or string type was received that contained more data than the device could handle due to memory or related device-specific requirements.

-224 **Illegal parameter value**

Used where exact value, from a list of possibles, was expected.

-230 **Data corrupt or stale**

Possibly invalid data; new reading started but not completed since last access.

-231 **Data questionable**

Indicates that measurement accuracy is suspect.

-240 **Hardware error**

Indicates that a legal program command or query could not be executed because of a hardware problem in the device. Definition of what constitutes a hardware problem is completely device-specific. This error message should be used when the device cannot detect the more specific errors described for errors -241 through -249.

-241 **Hardware missing**

Indicates that a legal program command or query could not be executed because of missing device hardware; for example, an option was not installed. Definition of what constitutes missing hardware is completely device-specific.

-250 **Mass storage error**

Indicates that a mass storage error occurred. This error message should be used when the device cannot detect the more specific errors described for errors -251 through

-259.

-251 **Missing mass storage**

Indicates that a legal program command or query could not be executed because of missing mass storage; for example, an option that was not installed. Definition of what constitutes missing mass storage is device-specific.

-252 **Missing media**

Indicates that a legal program command or query could not be executed because of a missing media; for example, no disk. The definition of what constitutes missing media is device-specific.

-253 **Corrupt media**

Indicates that a legal program command or query could not be executed because of corrupt media; for example, bad disk or wrong format. The definition of what constitutes corrupt media is device-specific.

-254 **Media full**

Indicates that a legal program command or query could not be executed because the media was full; for example, there is no room on the disk. The definition of what constitutes a full media is device-specific.

-255 **Directory full**

Indicates that a legal program command or query could not be executed because the media directory was full. The definition of what constitutes a full media directory is device-specific.

-256 **File name not found**

Indicates that a legal program command or query could not be executed because the file name on the device media was not found; for example, an attempt was made to read or copy a nonexistent file. The definition of what constitutes a file not being found is devicespecific.

-257 **File name error**

Indicates that a legal program command or query could not

be executed because the file name on the device media was in error; for example, an attempt was made to copy to a duplicate file name. The definition of what constitutes a file name error is device-specific.

-258 **Media protected**

Indicates that a legal program command or query could not be executed because the media was protected; for example, the writeprotect tab on a disk was present. The definition of what constitutes protected media is device-specific.

-260 **Expression error**

Indicates that an expression program data element related error occurred. This error message should be used when the device cannot detect the more specific errors described for errors -261 through -269.

-261 **Math error in expression**

Indicates that a syntactically legal expression program data element could not be executed due to a math error; for example, a divide-byzero was attempted. The definition of math error is device-specific.

-270 **Macro error**

Indicates that a macro-related execution error occurred. This error massage should be used when the device cannot detect the more specific errors described for errors -271 through -279.

-271 **Macro syntax error**

Indicates that a syntactically legal macro program data sequence, according to IEEE 488.2, 10.7.2, could not be executed due to a syntax error within the macro definition (see IEEE 488.2, 10.7.6.3.)

-272 **Macro execution error**

Indicates that a syntactically legal macro program data sequence could not be executed due to some error in the macro definition (see IEEE 488.2, 10.7.6.3.)

-273 **Illegal macro label**

Indicates that the macro label defined in the *DMC command was a legal string syntax but could not be accepted by the device (see IEEE 488.2, 10.7.3 and 10.7.6.2); for example, the label was too long, the same as a common command header, or contained invalid header syntax.

-274 **Macro parameter error**

Indicates that the macro definition improperly used a macro parameter placeholder (see IEEE 488.2, 10.7.3).

-275 **Macro definition too long**

Indicates that a syntactically legal macro program data sequence could not be executed because the string or block contents were too long for the device to handle (see IEEE 488.2, 10.7.6.1).

-276 **Macro recursion error**

Indicates that a syntactically legal macro program data sequence could not be executed because the device found it to be recursive (see IEEE 488.2, 10.7.6.6).

-277 **Macro redefinition not allowed**

Indicates that a syntactically legal macro label in the *DMC command could not be executed because the macro label was already defined (see IEEE 488.2, 10.7.6.4).

-278 **Macro header not found**

Indicates that a syntactically legal macro label in the *GMC? query could not be executed because the header was not previously defined.

-280 **Program error**

Indicates that a downloaded program-related execution error occurred. This error message should be used when the device cannot detect the more specific errors described for errors -281 through -289.

NOTE A downloaded program is used to add algorithmic capability to a device. The syntax used in the program and the mechanism for downloading a program is device-specific.

-281 **Cannot create program**
Indicates that an attempt to create a program was unsuccessful. A reason for the failure might include not enough memory.

-282 **Illegal program name**
The name used to reference a program was invalid; for example, redefining an existing program, deleting a nonexistent program, or in general, referencing a nonexistent program.

-283 **Illegal variable name**
An attempt was made to reference a nonexistent variable in a program.

-284 **Program currently running**
Certain operations dealing with programs may be illegal while the program is running; for example, deleting a running program might not be possible.

-285 **Program syntax error**
Indicates that a syntax error appears in a downloaded program. The syntax used when parsing the downloaded program is device specific.

-286 **Program runtime error**

Query Errors [-399, -300]

An < error/event number > in the range [-399, -300] indicates that the instrument has detected an error which is not a command error, a query error, or an execution error; some device operations did not properly complete, possibly due to an abnormal hardware or firmware condition. These codes are also used for self-test response errors. The occurrence of any error in this class should cause the device-specific error bit (bit 3) in the event status register (IEEE 488.2, section 11.5.1) to be set. The meaning of positive error codes is devicedependent and may be enumerated or bit mapped; the <error message> string for positive error codes is not defined by SCPI and available to the device engineer. Note that the string is not optional; if the designer does not wish to implement a string for a particular error, the null string should be sent (for example 42," "). The occurrence of any error in this class should cause the device-specific error bit (bit 3) in the event status register (IEEE 488.2, section 11.5.1) to be set. Events that generate device-specific errors shall not generate command errors, execution errors, or query errors; see the other error definitions in this section.

-300 **Device-specific error**

This is the generic device-dependent error for devices that cannot detect more specific errors. This code indicates only that a Device-Dependent Error as defined in IEEE 488.2, 11.5.1.1.6 has occurred.

-310 **System error**

Indicates that some error, termed "system error" by the device has occurred. This code is device dependent.

-311 **Memory error**

Indicates that an error was detected in the device's memory. The scope of this error is device-dependent.

-312 **PUD memory lost**

Indicates that the protected user data saved by the *PUD command has been lost.

-313 **Calibration memory lost**

Indicates that nonvolatile calibration data used by the

*CAL? command has been lost.

-314 **Save/Recall memory lost**

Indicates that the nonvolatile data saved by the *SAV? command has been lost.

-315 **Configuration memory lost**

Indicates that the nonvolatile data saved by the device has been lost. The meaning of this error is device-specific.

-330 **Self-test failed**

-350 **Queue overflow**

A specific code entered into the queue in lieu of the code that caused the error. This code indicates that there is no room in the queue and an error occurred but was not recorded.

-360 **Communication error**

This is the generic communication error for devices that cannot detect the more specific errors described for errors -361 through -363.

-361 **Parity error in program message**

Parity bit not correct when data received for example, on a serial port (for example, a baud rate mismatch).

-362 **Framing error in program message**

A stop bit was not detected when data was received for example, on a serial port.

-363 **Input buffer overrun**

Software or hardware input buffer on serial port overflows with data caused by improper or nonexistent pacing.

Query Errors [-499, -400]

An < error/event number > in the range [-499, -400] indicates that the output queue control of the instrument has detected a problem with the message exchange protocol described in IEEE 488.2, chapter 6. The occurrence of any error in this class should cause the query error bit (bit 2) in the event status register (IEEE 488.2, section 11.5.1) to be set. These errors correspond to message exchange protocol errors described in IEEE 488.2, section 6.5. One of the following is true:

- An attempt is being made to read data from the output queue when no output is either present or pending;
- Data in the output queue has been lost.

Events that generate query errors shall not generate command errors, execution errors, or device-specific errors; see the other error definitions in this section.

-400 **Query error**

This is the general query error for devices that cannot detect more specific errors. This code indicates only that a Query Error as defined in IEEE 488.2, 11.5.1.1.7 and 6.3 has occurred.

-410 **Query INTERRUPTED**

Indicates that a condition causing an INTERRUPTED Query error occurred (see IEEE 488.2, 6.3.2.3); for example, a query followed by DAB or GET before a response was completely sent.

-420 **Query UNTERMINATED**

Indicates that a condition causing an UNTERMINATED Query error occurred (see IEEE 488.2, 6.3.2.2); for example, the device was addressed to talk and an incomplete program message was received.

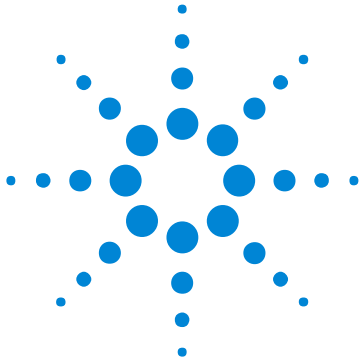
-430 **Query DEADLOCKED**

Indicates that a condition causing a DEADLOCKED Query error occurred (see IEEE 488.2, 6.3.1.7); for example, both input buffer and output buffer are full and the device

cannot continue.

-440 **Query UNTERMINATED after indefinite response**

Indicates that a query was received in the same program message after a query requesting an indefinite response was executed (see IEEE 488.2, 6.5.7.5.7.)



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Agilent Technologies