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Agilent J2126/7A

Transmission Test Sets



Remote Control Manual

Agilent Technologies

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In This Book

This book contains the information required for remote control of the Agilent J2126/7A Transmission Test Set.

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Methods of Remote Control

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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 availeble 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.

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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.

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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

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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?

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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.

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Terminal Input	Comment
:SYST:LOC	Returns the Instrument to local control. The remote indicator is extinguished.

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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. It will not affect fitted hardware or software options or any preferences seetings.

***RST**

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

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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

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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

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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 execution.

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.

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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 on page 7-41.

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.

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2

Common SCPI Command Reference

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Common Command Reference

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

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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 hierarchical structures called "subsystems" that comprise 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

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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 and1.2300E–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.

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Parameter Types	Description
<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 '1110101001' and "Hello World".
<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.

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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

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INSTrument subsystem

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

:INSTrument:SIGNal:STANdard <discrete>

<discrete> =	SDH	Signal Standard = SDH
	SONet	Signal Standard = SONET

Selects the signal standard to work with.

The corresponding query returns the signal standard set.

:INStrument:SIGNal:STANdard?

Returns: <discrete>

: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 during a test period.

The corresponding query returns the coupling state in discrete form as listed above.

:INSTrument:COUPle?

Returns: <discrete>

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Selftest Control

***TST**

This command initiates a selftest with Test Group. It forces the run all-tests/selected-test 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>

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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 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.

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: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

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to a limit of five. The parameter is optional and would default to 1.

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OUTPut subsystem

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.

The corresponding query returns the port interface in discrete form as listed above.

: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.

The corresponding query returns the electrical termination in discrete form as listed above.

:OUTPut:TELecom:TERMination?

Returns: <discrete>

:OUTPut:TELecom:LEVel <discrete>

<discrete> =	DSX	450feet simulated cable
	HIGH	DS3 only

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	FT900	900feet simulated cable
	LOW	DS1 only

Selects the interface output level for the output port.

The corresponding query returns the output level in discrete form as listed above.

: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.

The corresponding query returns the line code in discrete form as listed above.

: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.

The corresponding query returns the wavelength of the optical ouput port in discrete form as listed above.

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: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.

The corresponding query returns the state of the laser in discrete form as listed above.

:OUTPut:TELecom:LASer?

Returns: <boolean>

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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 4	SOURce subsystem - Transmitter Settings	**SDH**
Chapter 5	SOURce subsystem - Transmitter Settings	**SONET**

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

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SOURce subsystem - Transmitter Common Commands

:SOURce:DATA:TELecom:THRu <boolean>

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

Selects/Deselects THRU mode.

The corresponding query returns the THRU mode state as a boolean value 0 or 1.

:SOURce:DATA:TELecom:THRu?

Returns: <boolean>

:SOURce:DATA:TELecom:SOURce?

Returns:	<discrete> =	PDH
		SDH
		SONet

Query the transmitter signal type.

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SOURce subsystem - Clock Function Commands

:SOURce:CLOCk:SOURce <discrete>

<discrete> =	INTernal	Internal
	EXTernal	External
	RECovered	Recovered

Selects the Clock Source for the transmitter.

The corresponding query returns the transmitter clock source in discrete form as listed above.

: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
	R140M	140Mb/s
	R34M	34Mb/s
	R8M	8Mb/s
	R2M	2Mb/s
	RDS3	DS3
	RDS1	DS1

The corresponding query returns the recovered clock source in discrete form as listed above.

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:SOURce:CLOCk:RECovered?

Returns: <discrete>

:SOURce:CLOCk:FORMat <discrete>

<discrete> =	M2CLock	Clock Format
	M2Data	Data Format
	DS1Data	DS1 bit rate

Selects the transmitter External clock sync source format.

The corresponding query returns the External clock sync source format in discrete form as listed above.

:SOURce:CLOCk:FORMat?

Returns: <discrete>

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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.

The corresponding query returns the Pattern Type in discrete form as listed above.

: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.

The corresponding query returns the PRBS pattern in discrete form as listed above.

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

Returns: <discrete>

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

<discrete> =	NINVerted	Pattern not inverted
	INVerted	Pattern Inverted

Sets the polarity of the PRBS pattern of the transmitter.

The corresponding query returns the polarity in discrete form as listed above.

: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.

The corresponding query returns the Transmitter Payload Word type in discrete form as listed above.

: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

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	OCT55	55 octet test pattern (uses Daly pattern as per ANSI TI.403

Selects the transmitter payload preset Word Pattern.

The corresponding query returns the PRBS payload Preset Word pattern in discrete form as listed above.

: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.

The corresponding query returns the Transmitter Payload User Word as an integer.

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

Returns: <numeric>

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SOURce subsystem - Test Functions

:SOURce:DATA:TELecom:TFUNction:DISable

Disables ALL test functions running.There is no corresponding query.

SOURce subsystem - Transmitter Error Test Functions

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

<discrete> =	PHYSical	Physical Errors
	SECTion	Section Errors
	PATH	Path Errors
	TCM	SDH Tandem Connection Monitor Errors
	PDH	PDH errors
	PAYLoad	Payload Errors

Selects the transmit test function Error Group. Selection of PAYLoad results in BIT error type being selected.

The corresponding query returns the Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:ERRor:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

There is no corresponding query.

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SOURce subsystem - Transmitter Alarm Test Functions

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

<discrete> =	PHYSical	Physical 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 SDH, SONet and PDH ERRor commands. Also, :SOURce:DATA:TELecom:ALARm <boolean> should be set to ON to activate the alarm selected.

The corresponding query returns the Alarm Group selected in discrete form as listed above.

:SOURce:DATA:TELecom:ALARm:GROup?

Returns: <discrete>

:SOURce:DATA:TELecom:ALARm <boolean>

<boolean> =	0 or OFF
	1 or ON

Enables and disables Alarm Generation.

The corresponding query returns the Alarm Generation state as 0 or 1.

:SOURce:DATA:TELecom:ALARm?

Returns: <boolean>

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INPut subsystem

The INPut subsytem contains commands that control the characteristics of the instrument's receiver ports.

: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.

The corresponding query returns the line code in discrete form as listed above.

: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

The corresponding query returns the termination level in discrete form as listed above.

:INPut:TELecom:INTerface?

Returns: <discrete>

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: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.

The corresponding query returns the electrical termination type in discrete form as listed above.

: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. The corresponding query returns the Input LEVel in discrete form as listed above

: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. The corresponding query returns the monitor gain in discrete for, as listed above.

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: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.

The corresponding query returns the Monitor equalization state in boolean form.

:INPut:TELecom:EQUalization?

Returns: <boolean>

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SENSe subsystem

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

Chapter 2	SENSe subsystem – Receiver Common Commands	**COMM**
Chapter 4	SENSe subsystem - Receiver Settings	**SDH**
Chapter 5	SENSe subsystem - Receiver Settings	**SONET**

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SENSe subsystem – Receiver Common Commands

: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.

The corresponding query returns the receiver payload data pattern type in discrete form as listed above

: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

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		zero limit

Selects the receiver payload pattern.

The corresponding query returns the PRBS Pattern in discrete form, as listed above

: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.

The corresponding query returns the Receiver Payload Word type in discrete form as listed above.

: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.

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The corresponding query returns the PRBS payload Preset Word pattern in discrete form as listed above.

: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.

The corresponding query returns the User Word as an integer value.

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

Returns: <numeric>

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

<discrete> =	NINVerted	Pattern not inverted
	INVerted	Pattern Inverted

Sets the polarity of the PRBS pattern of the receiver.

The corresponding query returns the polarity in discrete form as listed above.

:SENSe:DATA:TELecom:PATTern:POLarity?

Returns: <discrete>

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SENSe subsystem – Pulse Capture Commands

:SENSe:DATA:TELecom:PMASk:CAPTure

Initiate pulse capture as offered by the Pulse Capture feature

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SENSe subsystem – ITU Analysis Control

:SENSe:DATA:TELecom:M2110 <discrete>

<discrete> =	PALLocation	Path Allocation
	USER	User Defined

Selects the M.2110 threshold control source.

The corresponding query command returns the current control source in discrete form as listed above.

: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.

The corresponding query returns the current M.2110 path under test in discrete form as listed above.

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: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.

The corresponding query returns the current path allocation percentage in numeric form.

:SENSe:DATA:TELecom:M2110:PALLocation?

Returns: <numeric>

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

<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

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0 to 1000	For SESeconds
0 to 100000	For BBECount
0 to 1000	For SEPeriod

Sets the user programmable M.2110 thresholds.

The corresponding query returns the selected M.2110 threshold in numeric form.

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

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.

The corresponding query returns the current M.2120 path under test in discrete form as listed above.

:SENSe:DATA:TELecom:M2110:PATH?

Returns: <discrete>

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

<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.

The corresponding query returns the selected user programmable M.2120 threshold in numeric form.

:SENSe:DATA:TELecom:SPDH:ANALysis:M2120:USER:<Error Type>? <discrete>

Returns: <numeric>

SENSe subsystem - Round Trip Delay Control

:SENSe:DATA:TELecom:RTDelay <boolean>

<boolean> =	0 or OFF	No action
	1 or ON	Start a new round trip delay measurement

Round trip delay measurement start command.

The corresponding query will always return the round trip delay state as 0.

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:SENSe:DATA:TELecom:RTDelay?

Returns: <boolean>

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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

<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

<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

<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

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“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

<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

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Frequency Results

<string> =

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

Pulse Level Results

<string> =

"PMASk:LEVel:VPPKpk"	Peak-peak voltage level
"PMASk:LEVel:VPPos"	Peak positive voltage level
"PMASk:LEVel:VPNeg"	Peak negative voltage level
"PMASk:LEVel:DBPKpk"	Peak-peak dB level
"PMASk:LEVel:DBPos"	Peak positive dB level
"PMASk:LEVel:DBNeg"	Peak negative dB level

Pulse Capture Parametric Results

<string> =

"PMASk:CAPTure:POSitive:VPLevel"	Positive pulse peak level
"PMASk:CAPTure:POSitive:PWSeconds"	Positive pulse width
"PMASk:CAPTure:NEGative:VPLevel"	Negative pulse peak level
"PMASk:CAPTure:NEGative:PWSeconds"	Negative pulse width
"PMASk:CAPTure:RLEVel"	Pos/Neg level ratio
"PMASk:CAPTure:PWRatio"	Pos/Neg width ratio

ITU Analysis Results – M.2110

<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

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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

<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

Round Trip Delay Result

<string> =

"RTDelay:COUNt"	Round Trip Delay

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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

The corresponding query returns the test state as 0 or 1.

: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.

The corresponding query returns the test type in discrete form, as listed above.

: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

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

The corresponding query returns the test duration as described above.

:SENSe:DATA:TELecom:TEST:PERiod?

Returns: <numeric>, <numeric>, <numeric>, <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 is set to TIMed.

The corresponding query returns the test duration as described above.

:SENSe:DATA:TELecom:TEST:STARt?

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

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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.

syst: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.

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: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

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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.

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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 the Status Reporting chapter.

For each of the **<Status Registers>**'s listed in Table 7-1 Status Registers on page 7-2 (excluding the Standard Event Register) the following commands exist:

:STATus:<Status Register>:ENABle <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.

The corresponding query returns the current mask setting.

:STATus:<Status Register>:ENABle?

Returns: <numeric>

:STATus:<Status Register>:PTRansition <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.

The corresponding query returns the current setting.

:STATus:<Status Register>:PTRansition?

Returns: <numeric>

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:STATus:<Status Register>:NTRansition <numeric>

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.

The corresponding query returns the current setting.

:STATus:<Status Register>:NTRansition?

Returns: <numeric>

: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.

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SYSTem Subsystem

:SYSTem:DATE <year>,<month>,<day>

<year> =	<numeric>	2000 to 2035
<month> =	<numeric>	1 to 12
<day> =	<numeric>	1 to 31

Sets the date.

The corresponding query returns the date in numeric form.

:SYSTem:DATE?

Returns: <year>,<month>,<day>

:SYSTem:TIME <hour>,<minute>,<second>

<hour> =	<numeric>	0 to 23
<minute> =	<numeric>	0 to 59
<second> =	<numeric>	0 to 59

Sets the time.

The corresponding query returns the time in numeric form.

:SYSTem:TIME?

Returns: <hour>,<minute>,<second>

: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

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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 Instrumentto the state defined by the Block data.

The corresponding query returns the instrument state in block form.

:SYSTem:CONF?

Returns: #0<block>

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: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.

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Remote Settings

:SYSTem:REMCtrl:MODE <mode>

<mode> = <discrete> 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>

Returns the current 'Command prompt' setting. If it is disabled, returns COMP (computer). If it is enabled, returns TERM (terminal).

:SYSTem:REMCtrl:CONNector <connector>

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

Sets which connector is used for remote control.

:SYSTem:REMCtrl:CONNector?

Returns: <discrete>

Returns the current remote control connector, GPIB, LAN or RS232.

:SYSTem:GPIB:ADDRess <address>

<address> = <numeric> 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 number.

:SYSTem:GPIB:ADDRess?

Returns: <discrete>

Returns the instrument's current address number on GPIB.

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:SYSTem:RS232:BAUDrate <baud>

<baud> = <numeric> 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>

Returns the current RS232 baud rate setting.

:SYSTem:RS232:DATabits <bits>

<bits> = <numeric> 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 that 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>

Returns the current data size.

:SYSTem:RS232:STOPbits <bits>

<bits> = <numeric> 1 or 2

Sets the number of stop bits.

:SYSTem:RS232:STOPbits?

Returns: <numeric>

Returns the current stop bits setting.

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:SYSTem:RS232:PARity <parity>

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

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

:SYSTem:RS232:PARity?

Returns: <discrete>

Returns the current RS232 parity setting.

:SYSTem:RS232:HANDshaking <method>

<method> = Discreet 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>

Returns the current RS232 handshaking method – NONE, RTSC (for RTS/CTS) or XONX (for Xon/Xoff).

:SYSTem:NETWork:IP <address>

<address> = <string> 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>

Returns the instrument's IP address in dotted quad notation – for example, "10.225.0.226"

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:SYSTem:NETWork:MASK <mask>

<mask> = <string> 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>

Returns the IP netmask. This is specified in dotted-quad notation – for example, “255.255.248.0”

:SYSTem:NETWork:GATeway <address>

<address> = <string>

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: <discrete>

Returns the IP address of the default gateway in dotted-quad notation – for example, “10.225.0.1”.

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Logging Commands

:SYSTem:LOGGing:AUTO <boolean>

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

The corresponding query returns the boolean state of the Auto Logging.

:SYSTem:LOGGing:AUTO?

Returns: <boolean>

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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. The bit weightings are shown.

***ESE?**

Returns: <numeric> = 0 to 65535 (bit mask)

Event Status Enable Query - Returns the current mask setting.

***ESR?**

Returns: <numeric> = 0 to 65535 (bit mask)

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

***IDN?**

Returns: <string> = Instrument ID string

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Identification Query - Returns the Manufacture Name, Model Number & Name, Serial Number, Firmware Revision Number as a string.

e.g. "Agilent Technologies, J21nnA PowerPro, GBnnnnnnnn, A.nn.nn".

***LRN?**

Returns: <block> = #0 block data

Learn Query - Returns the instrument settings configuration in block data form.

***OPC**

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

***OPC?**

Returns: <boolean> = Status of Operation Complete

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

***OPT?**

Returns: <string> = opt1[[[, opt2], … optn]]

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

***PSC <numeric>**

<numeric> = 0 to 65535 (bit mask) See IEE 488.2 Section 10.25

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.

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***PSC?**

Returns: <boolean> = Status of PSC flag

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?**

Returns: <numeric> = 0 to 65535 (bit mask)

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

***STB?**

Returns: <numeric> = 0 to 256 (bit mask)

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

***TRG**

Trigger - Not implemented for this instrument.

***TRG?**

Trigger Query - Not implemented for this instrument.

***WAI**

Wait To Continue - Not implemented for this instrument.

***TST**

Run Self Test.

***TST?**

Returns:	<boolean> =	0 = Self Test stopped
		1 = Self Test in progress

Self Test Query

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PDH/DSn SCPI Command Reference

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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.

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OUTPut subsystem

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

<discrete> = INTernal
EXTernal

This command selects the structured PDH transmitter payload location

The corresponding query returns the structured PDH transmitter payload location in discrete form as listed above.

: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.

The corresponding query returns the structured PDH drop interface line code in discrete form as listed above.

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

Returns: <discrete>

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SOURce subsystem - Transmitter Settings

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

Controls the characteristics of the instrument's output ports.

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

Sets the output rate for the instrument output port.

The corresponding query returns the output port rate in discrete form as listed above.

:SOURce:DATA:TELecom:SPDH:RATE?

Returns: <discrete>

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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.

The corresponding query returns the framing rate in discrete form as listed above.

: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.

The corresponding query returns the type in discrete form as listed above.

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

Returns: <discrete>

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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.

The corresponding query returns the test signal timing in discrete form as listed above.

: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.

The corresponding query returns the test signal rate in discrete form as listed above.

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

Returns: <discrete>

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: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.

The corresponding query returns the framing in discrete form as listed above.

: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.

The corresponding query returns the 34 Mb/s tributary in numeric form.

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

Returns: <numeric>

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

<numeric> = 1 to 4

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Selects the Structured PDH transmitter 8 Mb/s tributary.

The corresponding query returns the 8 Mb/s tributary in numeric form.

: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.

The corresponding query returns the 2 Mb/s tributary in numeric form.

: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.

The corresponding query returns the tributary in numeric form.

: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.

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The corresponding query returns the tributary in numeric form.

: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.

The corresponding query returns the timeslot in numeric form.

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

Returns: <numeric>

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

<numeric> 1 to 24

Selects the PDH transmitter DS1 56kb/s timeslot.

The corresponding query returns the timeslot in numeric form.

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

Returns: <numeric>

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

<numeric> 1 to 31 PCM31 & PCM31CRC

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1 to 15 & 17 to 31 PCM30 & PCM30CRC

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

The corresponding query returns the timeslot in numeric form.

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

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 #b10000001000000100000001000000100 or #h40810204 or the decimal equivalent.

The corresponding query returns the timeslots as a numeric value.

: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 #b10000001000000100000000100 or #h810204 or the decimal equivalent.

The corresponding query returns the timeslots as a numeric value.

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: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.

The corresponding query returns the timeslots as a numeric value.

: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.

The corresponding query returns the background pattern type in discrete form as listed above.

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

Returns: <discrete>

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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

The corresponding query returns the signaling bits selected as a numeric value.

: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.

The corresponding query returns the signaling bits selected as a numeric.

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

Returns: <numeric>

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

<string> = 0 to 15 4 bit numeric value

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

The corresponding query returns the signaling bits selected as a numeric value.

: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'.

The corresponding query returns the signaling bits selected as a numeric.

: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’

The corresponding query returns the signaling bits selected as a two character string.

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

Returns: <string>

See also Pattern commands in the Common Commands Section Page 2-1.

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Spare Bits

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

<numeric> = 0 to 7 3 bit numeric value

Set the 140 Mb/s spare bits.

The corresponding query command returns the current 140 Mb/s spare bit values as a numeric value.

: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.

The corresponding query command returns the current 34 Mb/s spare bit value as a numeric value.

: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.

The corresponding query command returns the current 8 Mb/s spare bit as a numeric value.

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

Returns: <numeric>

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: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.

The corresponding query command returns the current 2 Mb/s Spare International bit as a numeric value.

: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.

The corresponding query command returns the current 2 Mb/s E-bits as a numeric value.

: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.

The corresponding query command returns the current 2 Mb/s NFAS Sa bits as a numeric value.

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

Returns: <numeric>

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: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 multiframe.

The corresponding query command returns the current sequence generation state.

: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.

The corresponding query command returns the current 2 Mb/s NFAS Sa sequence pattern in numeric form.

: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.

The corresponding query command returns the currently selected bit.

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: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.

The corresponding query command returns the current 2 Mb/s MFAS spare bit values.

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

Returns: <numeric>

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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.

The corresponding query returns the state of the Inband loop code transmission in the discrete form given above.

: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.

The corresponding query returns the Inband loop code in discrete form.

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

Returns: <discrete>

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: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.

The corresponding query returns the user Inband loop code as a numeric value.

:SOURce:DATA:TELecom:SPDH:INBand:USER?

Returns: <numeric>, <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.

The corresponding query returns the state of this selection in boolean form.

: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.

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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.

The corresponding query returns the state of the Outband loop code transmission in the discrete form given above.

: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. The corresponding query returns the Outband loop code in discrete form.

: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.

The corresponding query command returns the current Outband loop code user word pattern in numeric form.

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: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. The corresponding query command returns the current setting.

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

Returns:	<numeric> =	0	(Indicates continuous)
		1 to 15	(Indicates burst length)

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DS3 FEAC Codes

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

<discrete>	ASTatus	Alarm/Status
	LOOPback	Loopback

Sets the FEAC Code Type.

The corresponding query command returns the current setting in discrete form as listed above.

: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.

The corresponding query command returns the current setting in discrete form as listed above.

: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.

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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.

The corresponding query command returns the current setting.

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

Returns:	<numeric>	0 (indicates continuous)
		1 to 15 (indicates burst length)

: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.

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The corresponding query command returns the current setting.

: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.

The corresponding query command returns the current setting as a numeric value.

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

Returns: <numeric> 0 to 63

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

<discrete>	DS1E1Deactiv	Deactivate DS1/E1 Loopback
	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 LOOPback.

The corresponding query command returns the current setting.

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: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.

The corresponding query command returns the current setting.

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

Returns:	<numeric>	0 (All channels)
		1 to 28 (channel number)

: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. The corresponding query command returns the current setting.

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

Returns: <numeric>,<numeric>

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:SOURce:DATA:TELecom:SPDH:FEAC:LOOPback:TRANsmit <boolean>

<boolean>	O 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 LOOPback.

The corresponding query command returns the current setting.

:SOURce:DATA:TELecom:SPDH:FEAC:LOOPback:TRANsmit?

Returns: <boolean>

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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.

The corresponding query returns the Clock Frequency Offset active state as 0 or 1.

: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.

The corresponding query returns the amount of Clock Frequency Offset in parts per million.

:SOURce:CLOCk:SPDH:FOFFset:OFFSet?

Returns: <numeric>

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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.

The corresponding query returns the Physical Error Type in discrete form as listed above.

: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. The corresponding query command returns the current setting.

: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.

The corresponding query returns the Payload Error Type in discrete form as listed above.

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: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.

The corresponding query command returns the current 140 Mb/s transmit error as listed above. (or NONE if no 140Mb/s errors are selected).

: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.

The corresponding query command returns the current 34 Mb/s transmit error as listed above. (or NONE if no 34Mb/s errors are selected).

: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.

The corresponding query command returns the current 8 Mb/s transmit error as listed above. (or NONE if no 8Mb/s errors are selected).

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: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.

The corresponding query command returns the current 2 Mb/s transmit error as listed above. (or NONE if no 2Mb/s errors are selected).

: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.

The corresponding query command returns the current DS3 transmit error as listed above. (or NONE if no DS3 errors are selected).

:SOURce:DATA:TELecom:SPDH:DS3:ERRor?

Returns: <discrete>

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:SOURce:DATA:TELecom:SPDH:DS1:ERRor <discrete>

<discrete>=	FAS	Frame Errors
	CRC	CRC-6 Errors

Sets a DS1 transmit error.

The corresponding query returns the framing in discrete form as listed above. (or NONE if no DS1 errors are selected).

:SOURce:DATA:TELecom:SPDH:DS1:ERRor?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

There is no corresponding query.

: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.

The corresponding query returns the selected transmitter Error Rate in discrete form, as listed above.

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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.

The corresponding query returns the User Error Rate as a numeric.

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

Returns: <numeric>

:SOURce:DATA:TELecom:SPDH:ERRorRATE:USER:ACTion <boolean>

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

Enables the **USER** defined Error Add rate.

The corresponding query returns the boolean state of the **USER** rate.

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

Returns: <boolean>

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: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.

The corresponding query returns the number of frames errored in discrete form.

: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.

The corresponding query command returns the current setting.

:SOURce:DATA:TELecom:SPDH:ERRor:MFRame:NERRored?

Returns: <numeric>

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SOURce subsystem - Transmitter Alarm Test Functions

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

<discrete> =	LOS	Loss of Signal Alarm

Selects PHYSical Alarms.

The corresponding query returns the PHYSical Alarm selected in discrete form as listed above.

: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.

The corresponding query command returns the current 140 Mb/s transmit alarm as listed above. (or NONE if no 140Mb/s alarm is selected).

: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

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Sets a 34Mb/s transmit alarm.

The corresponding query command returns the current 34 Mb/s transmit alarm as listed above. (or NONE if no 34Mb/s alarm is selected).

: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.

The corresponding query command returns the current 8 Mb/s transmit alarm as listed above. (or NONE if no 8Mb/s alarm is selected).

: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.

The corresponding query command returns the current 2 Mb/s transmit alarm as listed above. (or NONE if no 2Mb/s alarm is selected).

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: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.

The corresponding query command returns the current DS3 transmit alarm as listed above. (or NONE if no DS3 alarm is selected).

: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.

The corresponding query returns the framing in discrete form as listed above. (or NONE if no DS1 alarm is selected).

:SOURce:DATA:TELecom:SPDH:DS1:ALARm?

Returns: <discrete>

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INPut subsystem

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

<discrete> =	INTernal	
	EXTernal	

This command selects the structured PDH transmitter payload location

The corresponding query returns the structured PDH transmitter payload location in discrete form as listed above.

: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.

The corresponding query returns the structured PDH insert interface line code in discrete form as listed above.

:INPut:DATA:TELecom:SPDH:TSIGnal:PAYLoad:CODE?

Returns: <discrete>

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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.

The corresponding query returns the input port rate in discrete form as listed above.

:SENSe:DATA:TELecom:SPDH:RATE?

Returns: <discrete>

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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.

The corresponding query returns the interface frame type in discrete form, as listed above.

: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.

The corresponding query returns the type in discrete form as listed above.

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:SENSe:DATA:TELecom:SPDH:PAYLoad:STRucture?

Returns: <discrete>

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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.

The corresponding query returns the triubutary rate in discrete form as listed above.

: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.

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The corresponding query returns the framing in discrete form as listed above.

:SENSe:DATA:TELecom:SPDH:TSIGnal:FRAMing?

Returns: <discrete>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:M34 <discrete>

<numeric> = 1 to 4

Selects the Structured PDH receiver 34 Mb/s tributary number.

The corresponding query returns the 34 Mb/s tributary number in discrete form.

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

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:M8 <discrete>

<numeric> = 1 to 4

Selects the Structured PDH receiver 8 Mb/s tributary number.

The corresponding query returns the 8 Mb/s tributary number in discrete form.

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

Returns: <numeric>

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:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:M2 <discrete>

<numeric> = 1 to 4

Selects the Structured PDH receiver 2 Mb/s tributary number.

The corresponding query returns the 2 Mb/s tributary number in discrete form.

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

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:DS1 <discrete>

<numeric> = 1 to 4

Selects the Structured PDH receiver DS1 tributary number.

The corresponding query returns the tributary in discrete from as listed above.

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

Returns: <numeric>

:SENSe:DATA:TELecom:SPDH:TSIGnal:TRIButary:DS2 <discrete>

<numeric> = 1 to 7

Selects the Structured PDH receiver DS2 tributary number.

The corresponding query returns the tributary in discrete from as listed above.

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: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.

The corresponding query returns the 64 kb/s timeslot in numeric form.

: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 #b10000001000000100000001000000100 or #h40810204.

The corresponding query returns the NX64 kb/s timeslot as a 31 bit binary string.

: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

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Selects the PDH receiver 56kb/s timeslot.

The corresponding query returns the 56kb/s timeslot in numeric form.

: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.

The corresponding query returns the 64kb/s timeslot in numeric form.

: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 #b100000010000001000000100 or #h810204.

The corresponding query returns the NX64kb/s timeslot as a 24 bit binary string.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K64XN?

Returns: <numeric>

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: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 #b100000010000001000000100 or #h810204.

The corresponding query returns the NX64 kb/s timeslot as a numeric value.

:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K56XN?

Returns: <numeric>

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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. The corresponding query returns the receiver inband Loop Up loop code in discrete form.

: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.

The corresponding query returns the receiver inband Loop Up loop code in numeric form.

:SENSe:DATA:TELecom:SPDH:INBand:LPUP:USER?

Returns: <numeric>, <numeric>

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: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.

The corresponding query returns the receiver inband Loop Down loop code in discrete form.

: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.

The corresponding query returns the receiver inband Loop Down loop code in numeric form.

:SENSe:DATA:TELecom:SPDH:INBand:LPDN:USER?

Returns: <numeric>, <numeric>

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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>

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Structured PDH Analysis Results

:SENSe:DATA? <string>

<string> = "<Result type>:SPDH:<Path Type>:<Type>"

<Result type> =		<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 that G.821 has only BIT as the <Path Type>.

Returns: <numeric>

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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	8 Mb/s Frame Loss
M8:AIS	8Mb/s AIS
M8:RAI	8Mb/s Remote Alarm
M8:MINor	8Mb/s Minor Alarm
M2:LOF	2 Mb/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

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DS1:EXZ	DS1 Excess zeros
DS1:AIS	DS1 AIS
DS1:RAI	DS1 Remote Alarm

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SDH SCPI Command Reference

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SDH Command Reference

This chapter contains detailed information on commands that are used to control the instrument for SDH operation.

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OUTPut subsystem

:OUTPut:TELecom:SDH:PAYLoad:LOCation <discrete>

<discrete> =	INTernal	
	EXTernal	

This command selects the SDH transmitter drop payload location

The corresponding query returns the SDH transmitter drop payload location in discrete form as listed above.

: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 drop interface line code for the SDH payload.

The corresponding query returns the drop interface line code in discrete form as listed above.

:OUTPut:TELecom:SDH:PAYLoad:CODE?

Returns: <discrete>

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SOURce subsystem - Transmitter Settings

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

Controls the characteristics of the instrument's output ports.

<discrete> =	STM64	10Gb/s
	STM16	2.5Gb/s
	STM4	622Mb/s
	STM1	155Mb/s
	STM0	51Mb/s

Sets the output rate for the instrument output port.

The corresponding query returns the output port rate in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:RATE?

Returns: <discrete>

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Mapping Settings

AUG Numbering Selection

:SOURce:DATA:TELecom:SDH:AUG64 <numeric>

<numeric> = 1 AUG-64 number.

Selects the transmitted AUG-64 that is selected for test. Only valid for line rates higher than STM-16.

The corresponding query returns the AUG-64 selected for test in numeric form, as listed above.

: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 for line rates higher than STM-4.

The corresponding query returns the AUG-16 selected for test in numeric form, as listed above.

: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 for line rates higher than STM-1.

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The corresponding query returns the AUG-4 selected for test in numeric form, as listed above.

: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 for line rates higher than STM-0.

The corresponding query returns the AUG-1 selected for test in numeric form, as listed above.

: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.

The corresponding query returns the AU3 selected for test in numeric form, as listed above.

:SOURce:DATA:TELecom:SDH:AU3?

Returns: <numeric>

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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.

The corresponding query returns the Tandem Connection High-Order Path in discrete form as 0 or 1.

: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.

The corresponding query returns the Tandem Connection Low-Order Path in discrete form as 0 or 1.

:SOURce:DATA:TELecom:SDH:TCM:LPATh?

Returns: <boolean>

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AU Layer Selection

:SOURce:DATA:TELecom:SDH:AU:TYPE <discrete>

<discrete> = AU4
AU3
AU4_4C
AU4_16C
AU4_64C

Selects the AU mapping into an STM-N frame.

The corresponding query returns the AU layer in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:AU:TYPE?

Returns: <discrete>

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TU Layer Selection

:SOURce:DATA:TELecom:SDH:TU:TYPE <discrete>

<discrete> = NONE
TU3
TU11
TU12

Selects the TU mapping.

The corresponding query returns the TU layer in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TU:TYPE?

Returns: <discrete>

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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 DS1
	DS3	DS3

This command controls the transmitter SDH payload for single payload cases.

The corresponding query returns the payload in discrete form as listed above.

: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.

The corresponding query returns the active TUG3 in numeric form.

:SOURce:DATA:TELecom:SDH:TUG3?

Returns: <numeric>

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:SOURce:DATA:TELecom:SDH:TUG2 <numeric>

<numeric> =	1 to 7	TUG2 Number

Selects the SDH Transmitter active TUG2 within the selected TUG3 or AU3.

The corresponding query returns the active TUG2 in numeric form.

: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.

The corresponding query returns the active tributary in numeric form.

: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.

The corresponding query returns the Clock Frequency Offset active state as 0 or 1.

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: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.

The corresponding query returns the offset in numeric form.

:SOURce:DATA:TELecom:SDH:PAYLoad:OFFSet?

Returns: <numeric> ppm

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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. The corresponding query returns the type of payload in the background AUs in discrete short form.

: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.

The corresponding query returns the background payload pattern in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TU: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

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USER	User Defined

Selects the structure in a background TUG3. This command is only valid if the selected TUG3 is not the current foreground..

The corresponding query returns the specified TUG3 background structure in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern? <numeric>

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.

The corresponding query returns the specified TUG3 background word pattern.

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern :USER? <numeric>

Returns: <numeric>

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Overhead Overwrite Thru Mode Selection

:SOURce:DATA:TELecom:SDH:THRu:COVerwrite <boolean>

<boolean> = 0 or OFF
1 or ON

Enables or Disables Overhead Overwrite Thru Mode

Overhead Overwrite Thru Mode is only valid when in Thru Mode.

The corresponding query returns the Overhead Overwrite Thru Mode active state as 0 or 1.

:SOURce:DATA:TELecom:SDH:THRu:COVerwrite?

Returns: <boolean>

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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"

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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.

The corresponding query returns the value set of the byte named within the selected STM-1 column.

:SOURce:DATA:TELecom:SDH:OVERhead:DATA? <numeric>, <numeric>, <discrete>

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern <discrete>

<discrete> =	FIXed	Fixed Byte Sequence
	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence
	ASRX	As Received

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 valid when in Overheard Overwrite Thru Mode.

The corresponding query returns the type of pattern being transmitted in overhead byte J0 in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern?

Returns: <discrete>

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: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 for FIXed J0 byte.

The corresponding query returns the fixed byte value of the J0 byte as a numeric.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:FIXed?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B16Crc <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.

The corresponding query returns the value of the J0 sequence as a 15-byte string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B16Ccrc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:OVERhead:J0:PATTern:B64 <string>

Sets the 64-byte sequence of the J0 byte of the regenerator section overhead.

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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.

The corresponding query returns the value of the 64-byte J0 sequence as a string. If the string contains any non-printing characters, ~ is substituted.

: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.

:SOURce:DATA:TELecom:SDH:OVERhead:SBYTe <discrete>

<discrete> =	QUALunknown	(0000)
	G811	(0010)
	SSUA	(0100)
	SSUB	(1000)
	G813	(1011)
	DONTusesync	(1111)
	ASRX	As Received

Selects the SDH SYNC message type (S1 Byte Bits 5 to 8).

ASRX is only valid when in Overheard Overwrite Thru Mode.

The corresponding query returns the Sync Message type in discrete form as listed above. If the SDH SYNC message type is not defined, then the query will return REServed.

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: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 corresponding query returns the byte specified in numeric form, as described above.

:SOURce:DATA:TELecom:SDH:POVerhead:DATA? <discrete>

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern <discrete>

<discrete> =	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence
	ASRX	As Received

Sets the type of sequence to be transmitted within the J1 byte of the foreground high order path overhead.

ASRX is only valid when in Overheard Overwrite Thru Mode.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern?

Returns: <discrete>

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:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B16Crc <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.

The corresponding query returns the value of the J1 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B64 <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.

The corresponding query returns the value of the 64-byte J1 sequence as a string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:POVerhead:J1:PATTern:B64?

Returns: <string>

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: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.

:SOURce:DATA:TELecom:SDH:POVerhead:SLABel <discrete>

<discrete> =	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)
	ASRX	As Received

Sets the value of the path label (C2 Byte) of the foreground high order path overhead.

ASRX is only valid when in Overheard Overwrite Thru Mode.

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The corresponding query returns the value of the C2 byte in discrete short form. If the value of the signal label is not defined, the query will return REServed.

:SOURce:DATA:TELecom:SDH:POVerhead:SLABel?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern <discrete>

<discrete> = 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.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern:B16Crc <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.

The corresponding query returns the value of the N1 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:TCM:APID:PATTern:B16Crc?

Returns: <string>

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: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.

: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.

The corresponding query returns theH4 byte sequence length in discrete form as listed above.

: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 | N2 | K4

<numeric>	0 to 255	Byte Value

Sets the value of the specified VC-3, VC-12 or VC-11 foreground low oreder 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.

The corresponding query returns the byte specified in numeric form as described above.

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:SOURce:DATA:TELecom:SDH:TU:POVerhead:DATA? <discrete><

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern <discrete>

<discrete> =	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.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B16Crc <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.

The corresponding query returns the value of the J1 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B16Crc?

Returns: <string>

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:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B64 <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.

The corresponding query returns the value of the 64-byte J1 sequence as a string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1:PATTern:B64?

Returns: <string>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J1: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.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:C2:SLABel <discrete>

<discrete> =	UNEQuipped	Unequipped (00000000)
	EQUipped	Equipped (00000001)
	TUGStructure	TUG structure (00000010)
	LOCKed	Locked TU (00000011)
	ASYN34	Asynchronous 34 /45 Mb/s (00000100)

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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.

The corresponding query returns the value of the C2 byte in discrete short form. If the value of the signal label is not defined, the query will return REServed.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:C2:SLABel?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:V5:SLABel <discrete>

<numeric> = 0 to 7

Sets the value of the signal label (V5 Byte) of the foreground low order path overhead.

The corresponding query returns the value of the V5 byte in numeric form.

:SOURce:DATA:TELecom:SDH:TU:POVerhead:V5:SLABel?

Returns: <numeric>

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:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern <discrete>

<discrete> =	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.

The corresponding query returns the specified sequence type in discrete form as listed above.

: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 J2 byte. Only relevant for a FIXed J2 byte.

The corresponding query returns the fixed byte value of the J2 byte as a numeric.

:SOURce:DATA:TELecom:SDH:POVERhead:J2:PATTern:FIXed?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:TU:POVerhead:J2:PATTern:B16Crc <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.

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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.

The corresponding query returns the value of the J2 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

: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.

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern <discrete>

<discrete> = 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.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern?

Returns: <discrete>

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:SOURce:DATA:TELecom:SDH:TU:TCM:N1:APID:PATTern:B16Crc <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.

The corresponding query returns the value of the N1 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

: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.

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern <discrete>

<discrete> = 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.

The corresponding query returns the specified sequence type in discrete form as listed above.

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:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:TU:TCM:N2:APID:PATTern:B16Crc <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.

The corresponding query returns the value of the N2 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

: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.

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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 corresponding query returns the Clock Frequency Offset active state as 0 or 1.

: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.

The corresponding query returns the amount of Clock Frequency Offset in parts per million.

:SOURce:CLOCk:SDH:FOFFset:OFFSet?

Returns: <numeric>

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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.

The corresponding query returns the Physical Error Type in discrete form as listed above.

: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 rate control selections are required.

The corresponding query returns the Section Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:SECTion?

Returns: <discrete>

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

<discrete> =	PBIP	Path Bip, B3 Errors

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	HPRei	HP-REI Errors
	LPBip	LP-BIP Errors
	LPRei	LP-REI Errors

Selects Path Error Type to generate. Further rate control selections are required.

The corresponding query returns the Path Error Type in discrete form as listed above.

: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.

The corresponding query returns the TCM Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ERRor:TCM?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

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There is no corresponding query.

: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 (with the exception of EFRame and FRAMe selections) selected by the Error Group Selection commands.

The corresponding query returns the selected transmitter Error Rate in discrete form, as listed above.

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.

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

The corresponding query returns the User Error Rate as a numeric.

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

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:ERRorRATE:USER:ACTion <boolean>

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

Sets the user defined Error Add rate.The corresponding query returns the boolean state of the User Rate.

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

Returns: <boolean>

:SOURce:DATA:TELecom:SDH: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 types EFRame and FRAMe.

The corresponding query returns the selected transmitter Frame Error Rate in discrete form, as listed above.

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

Returns: <discrete>

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: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. Default = 0.

The corresponding query returns the number of errors selected for the APS Threshold in numeric form.

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

Returns: <numeric>

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: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.

The corresponding query returns the APS Threshold error interval in discrete form as listed above.

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

Returns: <discrete>

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SOURce subsystem - Transmitter Alarm Test Functions

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

<discrete> =	LOS	Loss of Signal Alarm

Selects PHYSical Alarms.

The corresponding query returns the PHYSical Alarm selected in discrete form as listed above.

: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.

The corresponding query returns the Section Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ALARm:SECTion?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:ALARm:OOF

Sets the OOF alarm Active.There is no corresponding query

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: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.

The corresponding query returns the Path Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:ALARm:PATH?

Returns: <discrete>

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: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.

The corresponding query returns the TCM Alarm selected in discrete form as listed above.

: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.

The corresponding query returns the Alarm Generation state as 0 or 1.

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:SOURce:DATA:TELecom:ALARm?

Returns: <boolean>

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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 <discrete>

<discrete> =	BURSt	Pointer Burst
	NPOinter	New Pointer Value
	OFFSet	Pointer Offset

Selects the Pointer Test Function.

The corresponding query returns the Pointer Test Function selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:POINter?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:POINter:TYPE <discrete>

<discrete> =	AU	AU Pointer
	TU	TU Pointer

Selects the Pointer Type.

The corresponding query returns the Pointer Type selected in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:POINter:TYPE?

Returns: <discrete>

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:SOURce:DATA:TELecom:SDH:POINter:BURSt:ACTion

Forces the pointer value to change according to the burst size and direction set.

There is no corresponding query.

: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.

The corresponding query returns the Pointer Burst Direction selected in discrete form as listed above.

: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.

The corresponding query returns the Pointer Burst Size set.

:SOURce:DATA:TELecom:SDH:POINter:BURSt:SIZE?

Returns: <numeric>

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:SOURce:DATA:TELecom:SDH:POINter:NEW:ACTion

Forces the pointer value to adopt the New Pointer value and new flag status set.

There is no corresponding query.

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:SOURce:DATA:TELecom:SDH:POINter:NEW:VALue <numeric>

<numeric> = 0 to 782

Selects the New Pointer Value.

The corresponding query returns the New Pointer Value set, in discrete form as listed above.

: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.

The corresponding query returns the New Pointer Flag set, in discrete form as listed above.

: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 corresponding query returns the Pointer Offset Test Function active state as 0 or 1.

:SOURce:DATA:TELecom:SDH:POINter:OFFSet:ACTion?

Returns: <boolean>

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:SOURce:DATA:TELecom:SDH:POINter:OFFSet <discrete>

<discrete> =	SIGNal	Signal offset
	PAYLoad	Payload Offset

Selects the Pointer Offset Type.

The corresponding query returns the Pointer Offset Type selected, in discrete form as listed above.

: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.

The corresponding query returns the Pointer Offset Rate set.

:SOURce:DATA:TELecom:SDH:POINter:OFFSet:RATE?

Returns: <numeric>

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SOURce subsystem - APS Messages

:SOURce:DATA:TELecom:SDH:APSMessages:TOPology <discrete>

<discrete> =	LINear	Linear protection
	RING	Ring protection
	ASRX	As Received

Selects the type of protection topology.

ASRX is only valid when in Overheard Overwrite Thru Mode.

The corresponding query returns the selected protection topology in discrete short form.

:SOURce:DATA:TELecom:SDH:APSMessages:TOPology?

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)

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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 for a LINear topology.

SDHP and SFHP are only valid when :SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture is set to OTN.

The corresponding query returns the selected transmitter SDH APS message type in discrete form, as listed above.

:SOURce:DATA:TELecom:SDH:APSMessages:REQuest?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:CHANnel <numeric>

<numeric> =	0	NULL Channel
	1 to 14	Working Channel
	15	Extra Traffic Channel

Selects the transmitter SDH APS message channel (K1 Byte, Bits 5 to 8).

Only valid for a LINear topology.

Working Channel 2 to 14 and the extra traffic channel are only valid if :SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture is set to OTN.

The corresponding query returns the selected transmitter SDH APS message channel in numeric form.

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: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 for a LINear topology..

The corresponding query returns the APS messages bridged channel as a numeric.

: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 for a LINear topology.

The corresponding query returns the selected transmitter SDH APS message architecture in discrete form, as listed above.

:SOURce:DATA:TELecom:SDH:APSMessages:ARCHitecture?

Returns: <discrete>

:SOURce:DATA:TELecom:SDH:APSMessages:REServed <numeric>

<numeric> =	0	000
	1	001

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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 for a LINear topology.

The corresponding query returns the selected transmitter SDH APS message reserved bits in numeric form.

: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)

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Selects the transmitter Ring APS message to be transmitted (K1 Byte, Bits 1 to 4). Only valid for a RING topology.

The corresponding query returns the selected transmitter SDH APS message type in discrete short form.

: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 for a RING topology.

The corresponding query returns the APS messages destination node as a numeric.

: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 for a RING topology.

The corresponding query returns the APS messages source node as a numeric .

:SOURce:DATA:TELecom:SDH:APSMessages:SNODe?

Returns: <numeric>

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: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 for a RING topology.

The corresponding query returns the Ring APS messages path type in discrete short form.

: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 for a RING topology.

The corresponding query returns the selected transmitter SDH APS message status code as a numeric.

:SOURce:DATA:TELecom:SDH:APSMessages:SCODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SDH:APSMessages:DOWNload

Start transmission of the SDH transmitter APS message.

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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.

The corresponding query returns the selected port in discrete form as listed above.

:SOURce:DATA:TELecom:SDH:IDCC?

Returns: <discrete>

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INPut subsystem

:INPut:TELecom:SDH:PAYLoad:LOCation <discrete>

<discrete> = INTernal
EXTernal

This command selects the SDH insert payload location

The corresponding query returns the SDH insert payload location in discrete form as listed above.

: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 insert interface line code for the SDH payload.

The corresponding query returns the insert interface line code in discrete form as listed above.

:INPut:TELecom:SDH:PAYLoad:CODE?

Returns: <discrete>

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SENSe subsystem - Receiver 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.

The corresponding query returns the rate selected in discrete form as listed above.

:SENSe:DATA:TELecom:SDH:RATE?

Returns: <discrete>

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 for line rates higher than STM16.

The corresponding query returns the AUG-64 selected for test in numeric form, as listed above.

:SENSe:DATA:TELecom:SDH:AUG64?

Returns: <numeric>

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: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 for line rates than STM4.

The corresponding query returns the AUG-16 selected for test in numeric form, as listed above.

: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 for line rates higher than STM1.

The corresponding query returns the AUG-4 selected for test in numeric form, as listed above.

: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 for line rates higher than STM0.

The corresponding query returns the AUG-1 selected for test in numeric form, as listed above.

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:SENSe:DATA:TELecom:SDH:AUG1?

Returns: <numeric>

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Tandem Connection Monitoring (TCM)

: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.

The corresponding query returns the Tandem Connection High-Order Path in discrete form as 0 or 1.

:SENSe:DATA:TELecom:SDH:TCM:HPATh?

Returns: <boolean>

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AU Layer Selection

:SENSe:DATA:TELecom:SDH:AU:TYPE <discrete>

<discrete> = AU4
AU3
AU4_4C
AU4_16C
AU4_64C

Set the AU Mapping into an STM-N frame.

The corresponding query returns the AU type in discrete form as listed above.

:SENSe:DATA:TELecom:SDH:AU:TYPE?

Returns: <discrete>

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TU Layer Selection

:SENSe:DATA:TELecom:SDH:TU:TYPE <discrete>

<discrete> = NONE
TU3
TU11
TU12

Selects the TU mapping for the receiver.

The corresponding query returns the TU layer in discrete form as listed above.

:SENSe:DATA:TELecom:SDH:TU:TYPE?

Returns: <discrete>

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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 DS1
	DS3	DS3

This command controls the receiver SDH payload for single payload cases.

The corresponding query returns the row payload in discrete form as listed above.

: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.

The corresponding query returns the TS0 state as a boolean value.

:SENSe:DATA:TELecom:SDH:PRIMary:TS0?

Returns: <boolean>

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TUG Channel

:SENSe:DATA:TELecom:SDH:TUG3 <numeric>

<numeric> = 1 to 3

Selects the SDH Receiver active TUG3 within the foreground AU4.

The corresponding query returns the active TUG-3 in numeric form.

: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.

The corresponding query returns the TUG2 in numeric form.

: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.

The corresponding query returns the active tributary in numeric form.

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: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 monitored.

The corresponding query returns the STM1 channel number, in numeric form.

:SENSe:DATA:TELecom:SDH:OVERhead:CHANnel?

Returns: <numeric>

:SENSe:DATA:TELecom:SDH:DDCC <discrete>

<discrete> =	NONE	Turns both Off
	RDCC	Regenerator DCC
	MDCC	Multiplexer DCC

Selects the Data Communications channel to be dropped via the DROP port, for DCC test function.

The corresponding query returns the selected DCC, in discrete form as listed above.

:SENSe:DATA:TELecom:SDH:DDCC?

Returns: <discrete>

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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

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Returns: <numeric>

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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 seconds	X	X	X
PUASeconds	Path Unavailable 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)

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Returns: <numeric>

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SDH Optical Power Result

:SENSe:DATA? <string>

<string> = "OPOWer:SDH"

Returns: <numeric> Optical power (dBm)

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>

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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
MSAis	Multiplexer Section AIS
PAIS	Path AIS
MSRDi	Multiplexer Section RDI
HPRDi	HP-RDI
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

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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>

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FETCh subsystem

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

SDH Overhead Bytes

:FETCh:ARRay:DATA:TELecom:SDH:OVERhead:DATA? <numeric>

<numeric> = 1 to 3 STM-0 group

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.

Returns: <numeric>, <numeric>,……<numeric>

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 .

: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.

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: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.

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: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.

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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.

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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

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: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>

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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.

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5

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SONET Command Reference

This chapter contains detailed information on commands that are used to control the instrument for Sonet operation.

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OUTPut subsystem

:OUTPut:TELecom:SONet:PAYLoad:LOCation <discrete>

<discrete> = INTernal
EXTernal

This command selects the SONet transmitter drop payload location

The corresponding query returns the SONet transmitter drop payload location in discrete form as listed above.

: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.

The corresponding query returns the drop interface line code in discrete form as listed above.

:OUTPut:TELecom:SONet:PAYLoad:CODE?

Returns: <discrete>

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SOURce subsystem - Transmitter Settings

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

Controls the characteristics of the instrument's output ports.

<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

Sets the output rate for the instrument output port.

The corresponding query returns the output port rate in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:RATE?

Returns: <discrete>

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Mapping Settings

SPE Layer Selection

:SOURce:DATA:TELecom:SONet:SPE:TYPE <discrete>

<discrete> = STS3C
STS1
STS12C
STS48C
STS192C

Selects the SPE mapping into an STS-N frame.

The corresponding query returns the SPE layer in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:SPE:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:STS3 <numeric>

<numeric> = 1 to 64 STS3 number under test.

Selects the STS-3 number under test. Only valid for line rates higher than STS-3.

This number, when multiplied by three and added to the STS-1 number under test (see the command :SOURce:DATA:TELecom:SONet:STS1) will yield the older style single value STS-1 channel number.

The corresponding query returns the STS-3 selected for test in numeric form, as listed above.

:SOURce:DATA:TELecom:SONet:STS3?

Returns: <numeric>

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:SOURce:DATA:TELecom:SONet:STS1 <numeric>

<numeric> = 1 to 3 STS1 Number

Selects the SONET Transmitter active STS-1 within the STS-3.

The corresponding query returns the active STS-1 in numeric form.

:SOURce:DATA:TELecom:SONet:STS1?

Returns: <numeric>

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VT Layer Selection

:SOURce:DATA:TELecom:SONet:VT:TYPE <discrete>

<discrete> = NONE
VT2
VT15

Selects the VT mapping.

The corresponding query returns the VT layer in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:VT:TYPE?

Returns: <discrete>

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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.

The corresponding query returns the payload in discrete form as listed above.

: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.

The corresponding query returns the active VT Group in numeric form.

:SOURce:DATA:TELecom:SONet:VTGRoup?

Returns: <numeric>

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:SOURce:DATA:TELecom:SONet:VT <numeric>

<numeric> =	1 to 3	Tributary number forVT2
<numeric> =	1 to 4	Tributary number forVT1.5

Selects the SONET Transmitter active VT within the selected VT Group.

The corresponding query returns the active tributary in numeric form.

: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.

The corresponding query returns the Clock Frequency Offset active state as 0 or 1.

:SOURce:DATA:TELecom:SONet:PAYLoad:FOFFset?

Returns: <boolean>

:SOURce:DATA:TELecom:SONet:PAYLoad:OFFSet <numeric>

<numeric> =	-100.0 to +100.0	parts per million

Sets (and enables) the payload frequency offset.

The corresponding query returns the offset in numeric form.

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:SOURce:DATA:TELecom:SONet:PAYLoad:OFFSet?

Returns: <numeric> ppm

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Background Settings

:SOURce:DATA:TELecom:SONet:STS1:BACKground <discrete>

<discrete> =	UNEQuipped	Fixed at 00000000
	AS_FG	As Foreground

Selects the payload in the background (non-test) STS-1s. This command only applies if the interface rate is higher than STS-1.

The corresponding query returns the type of payload in the background STS-1s in discrete short form.

:SOURce:DATA:TELecom:SONet:STS1:BACKground?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:VT: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 VTs within the foreground VT Group.

The corresponding query returns the background payload pattern in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:VT:BACKground:PAYLoad:PATTern ?

Returns: <discrete>

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Overhead Overwrite Thru Mode Selection

:SOURce:DATA:TELecom:SONet:THRu:COVerwrite <boolean>

<boolean> = 0 or OFF
1 or ON

Enables or Disables Overhead Overwrite Thru Mode

Overhead Overwrite Thru Mode is only valid when in Thru Mode.

The corresponding query returns the Overhead Overwrite Thru Mode active state as 0 or 1.

:SOURce:DATA:TELecom:SONet:THRu:COVerwrite?

Returns: <boolean>

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SOURce subsystem - Transmitter Overhead Set up

: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

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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.

The corresponding query returns the value of the byte named within the selected STS-3 column.

:SOURce:DATA:TELecom:SONet:OVERhead:DATA? <numeric>, <numeric>, <discrete>

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern <discrete>

<discrete> =	FIXed	Fixed Byte Sequence
	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence
	ASRX	As Received

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 valid when in Overheard Overwrite Thru Mode.

The corresponding query returns the type of pattern being transmitted in overhead byte J0 in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern?

Returns: <discrete>

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: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 for FIXed J0 byte.

The corresponding query returns the fixed byte value of the J0 byte as a numeric.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:FIXed?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B16Crc <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.

The corresponding query returns the value of the J0 sequence as a 15-byte string. If the string contains any non-printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B16Ccrc?

Returns: <string>

:SOURce:DATA:TELecom:SONet:OVERhead:J0:PATTern:B64 <string>

Sets the 64-byte sequence of the J0 byte of the regenerator section overhead.

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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.

The corresponding query returns the value of the 64-byte J0 sequence as a string. If the string contains any non-printing characters, ~ is substituted.

: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.

:SOURce:DATA:TELecom:SONet:OVERhead:SBYTe <discrete>

<discrete> =	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)
	ASRX	As Received

Selects the SONET SYNC message type (S1 Byte Bits 5 to 8).

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ASRX is only valid when in Overheard Overwrite Thru Mode.

The corresponding query returns the Sync Message type in discrete form as listed above. If the SONET SYNC message type is not defined, then the query will return REServed.

: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 corresponding query returns the byte specified in numeric form, as described above.

:SOURce:DATA:TELecom:SONet:POVerhead:DATA? <discrete>

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern <discrete>

<discrete> =	B16Crc	16 Byte Sequence (with CRC)
	B64	64 Byte Sequence
	ASRX	As Received

Sets the type of sequence to be transmitted within the J1 byte of the foreground high order path overhead.

ASRX is only valid when in Overheard Overwrite Thru Mode.

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The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B16Crc <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.

The corresponding query returns the value of the J1 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B16Crc?

Returns: <string>

:SOURce:DATA:TELecom:SONet:POVerhead:J1:PATTern:B64 <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.

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The corresponding query returns the value of the 64-byte J1 sequence as a string. If the string contains any non-printing characters, ~ is substituted.

: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.

:SOURce:DATA:TELecom:SONet:POVerhead:SLABel <discrete>

<discrete> =	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)
	ASRX	As Received

Sets the value of the path label (C2 Byte) of the foreground high order path overhead.

ASRX is only valid when in Overheard Overwrite Thru Mode.

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The corresponding query returns the value of the C2 byte in discrete short form. If the value of the signal label is not defined, the query will return REServed.

: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.

The corresponding query returns the byte specified in numeric form, as described above.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:DATA? <discrete>

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern <discrete>

<discrete> = 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.

The corresponding query returns the specified sequence type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern?

Returns: <discrete>

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:SOURce:DATA:TELecom:SONet:VT:POVerhead:J2:PATTern:B16Crc <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.

The corresponding query returns the value of the J2 sequence as a 15-byte string. If the string contains any non printing characters, ~ is substituted.

: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.

: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.

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The corresponding query returns theH4 byte sequence length in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POVerhead:H4Sequence?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:DATA <discrete> <numeric>

<discrete> = C2 | G1 | F2 | H4 | Z3 | Z4 | N1 | V5 | Z6 | Z7

<numeric> 0 to 255 Byte Value

Sets the value of the specified VC-3, VC-12 or VC-11 foreground low oreder 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.

The corresponding query returns the byte specified in numeric form as described above.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:DATA? <discrete><

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:VT:POVerhead:V5:SLABel <discrete>

<numeric> = 0 to 7

Sets the value of the signal label (V5 Byte) of the foreground low order path overhead.

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The corresponding query returns the value of the V5 byte in numeric form.

:SOURce:DATA:TELecom:SONet:VT:POVerhead:V5:SLABel?

Returns: <numeric>

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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 corresponding query returns the Clock Frequency Offset active state as 0 or 1.

: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.

The corresponding query returns the amount of Clock Frequency Offset in parts per million.

:SOURce:CLOCk:SONet:FOFFset:OFFSet?

Returns: <numeric>

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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.

The corresponding query returns the Physical Error Type in discrete form as listed above.

: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 selections of error rate is required.

The corresponding query returns the Transport Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ERRor:TRANsport?

Returns: <discrete>

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

<discrete> =	CVP	CV-P (Path B3 BIP) Errors

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REIP	REI-P (Path FEBE) Errors
CVV	CV-V (VT Path BIP) Errors
REIV	REI-V (VT Path FEBE) Errors

Selects Path Error Type to generate. Further selections of error rate is required.

The corresponding query returns the Path Error Type in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ERRor:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:ERRor:SINGle

Injects a single error.

There is no corresponding query.

: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 (with the exception of EFRame and FRAMe selections) selected by the Test Error Group selection commands.

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The corresponding query returns the selected transmitter Error Rate in discrete form, as listed above.

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

: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.

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

The corresponding query returns the User Error Rate as a numeric.

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

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:ERRorRATE:USER:ACTion <boolean>

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

Sets the user defined Error Add rate.

The corresponding query returns the boolean state of the User Rate.

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

Returns: <boolean>

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:SOURce:DATA:TELecom:SONet: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.

The corresponding query returns the selected transmitter Frame Error Rate in discrete form, as listed above.

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

Returns: <discrete>

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The corresponding query returns the user defined Frame Error Add rate in numeric form.

: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. Default = 0.

The corresponding query returns the number of errors selected for the APS Threshold in numeric form.

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

Returns: <numeric>

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: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.

The corresponding query returns the APS Threshold error interval in discrete form as listed above.

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

Returns: <discrete>

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SOURce subsystem - Transmitter Alarm Test Functions

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

<discrete> =	LOS	Loss of Signal Alarm

Selects PHYSical Alarms.

The corresponding query returns the PHYSical Alarm selected in discrete form as listed above.

: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.

The corresponding query returns the Transport Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ALARm:TRANsport?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:ALARm:SEF

Sets the OOF alarm Active.There is no corresponding query

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: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.

The corresponding query returns the Path Alarm selected in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:ALARm:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:ALARm <boolean>

<boolean> =	0 or OFF
	1 or ON

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Enables and disables Alarm Generation.

The corresponding query returns the Alarm Generation state as 0 or 1.

:SOURce:DATA:TELecom:ALARm?

Returns: <boolean>

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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.

The corresponding query returns the Pointer Test Function selected in discrete form as listed above.

: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.

The corresponding query returns the Pointer Type selected in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POINter:TYPE?

Returns: <discrete>

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:SOURce:DATA:TELecom:SONet:POINter:BURSt:ACTion

Forces the pointer value to change according to the burst size and direction.

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.

The corresponding query returns the Pointer Burst Direction selected in discrete form as listed above.

: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.

The corresponding query returns the Pointer Burst Size set.

:SOURce:DATA:TELecom:SONet:POINter:BURSt:SIZE?

Returns: <numeric>

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:SOURce:DATA:TELecom:SONet:POINter:NEW:ACTion

Forces the pointer value to adopt the New Pointer value and new flag status.

There is no corresponding query.

:SOURce:DATA:TELecom:SONet:POINter:NEW:VALue <numeric>

<numeric> = 0 to 782

Selects the New Pointer Value.

The corresponding query returns the New Pointer Value set, in discrete form as listed above.

: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.

The corresponding query returns the New Pointer Flag set, in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POINter:NEW:FLAG?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:OFFSet:ACTion <boolean>

<boolean> =	0 or OFF
	1 or ON

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Enables and Disables the Pointer Offset Test Function.

The corresponding query returns the Pointer Offset Test Function active state as 0 or 1.

: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.

The corresponding query returns the Pointer Offset Type selected, in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:POINter:OFFSet?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:POINter:OFFSe:RATE <numeric>

<numeric> =	-100.0 to +100.0	parts per million

Selects the Pointer Offset Rate.

The corresponding query returns the Pointer Offset Rate set.

:SOURce:DATA:TELecom:SONet:POINter:OFFSet:RATE?

Returns: <numeric>

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SOURce subsystem - APS Messages

:SOURce:DATA:TELecom:SONet:APSMessages:TOPology <discrete>

<discrete> =	LINear	Linear protection
	RING	Ring protection
	ASRX	As Received

Selects the type of protection topology.

ASRX is only valid when in Overheard Overwrite Thru Mode.

The corresponding query returns the selected protection topology in discrete short form.

:SOURce:DATA:TELecom:SONet:APSMessages:TOPology?

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)

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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 for LINear topology.

SDHP and SFHP are only valid when :SOURce:DATA:TELecom:SONet:APSMessages:ARCHitecture is set to OTN.

The corresponding query returns the selected transmitter SONET APS message type in discrete form, as listed above.

:SOURce:DATA:TELecom:SONet:APSMessages:REQuest?

Returns: <discrete>

:SOURce:DATA:TELecom:SONet:APSMessages:CHANnel <numeric>

<numeric> =	0	NULL Channel
	1 to 14	Working Channel
	15	Extra Traffic Channel

Selects the transmitter SONET APS message channel (K1 Byte, Bits 5 to 8).

Only valid for LINear topology.

Working Channels 1 to 14 and the extra traffic channel are only valid if :SOURce:DATA:TELecom:SONet:APSMessages:ARCHitecture is set to OTN.

The corresponding query returns the selected transmitter SONET APS message channel in numeric form, as listed above.

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: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 for LINear topology.

The corresponding query returns the APS messages bridged channel as a numeric.

: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 for LINear topology.

The corresponding query returns the selected transmitter SONET APS message architecture in discrete form, as listed above.

:SOURce:DATA:TELecom:SONet:APSMessages:ARCHitecture?

Returns: <discrete>

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: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 for LINear topology.

The corresponding query returns the selected transmitter SONET APS message reserved bits in numeric form.

: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)

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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 fir RING topology.

The corresponding query returns the selected transmitter SONET APS message type in discrete short form.

: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 for RING topology.

The corresponding query returns the APS messages destination node as a numeric.

: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 for RING topology.

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The corresponding query returns the APS messages source node as a numeric in the range 0 to 15.

: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 for RING topology.

The corresponding query returns the Ring APS messages path type in discrete short form.

: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 for RING topology.

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The corresponding query returns the selected transmitter SONET APS message status code as a numeric in the range 1 to 5.

:SOURce:DATA:TELecom:SONet:APSMessages:SCODe?

Returns: <numeric>

:SOURce:DATA:TELecom:SONet:APSMessages:DOWNload

Start transmission of the SONET transmitter APS message.

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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.

The corresponding query returns the selected port in discrete form as listed above.

:SOURce:DATA:TELecom:SONet:IDCC?

Returns: <discrete>

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INPut subsystem

:INPut:TELecom:SONet:PAYLoad:LOCation <discrete>

<discrete> = INTernal
EXTernal

This command selects the Sonet insert payload location

The corresponding query returns the Sonet insert payload location in discrete form as listed above.

:INPut:TELecom:SDH: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.

The corresponding query returns the insert interface line code in discrete form as listed above.

:INPut:TELecom:SONet:PAYLoad:CODE?

Returns: <discrete>

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SENSe subsystem - Receiver Settings

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

Controls the characteristics of the instrument's input ports.

<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

Sets the output rate for the instrument input port.

The corresponding query returns the input port rate in discrete form as listed above.

:SENSe:DATA:TELecom:SONet:RATE?

Returns: <discrete>

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Mapping Settings

SPE Layer Selection

:SENSe:DATA:TELecom:SONet:SPE:TYPE <discrete>

<discrete> = STS3C
STS1
STS12C
STS48C
STS192C

Set the SPE Mapping into an STS-N frame.

The corresponding query returns the SPE layer in discrete form as listed above.

:SENSe:DATA:TELecom:SONet:SPE:TYPE?

Returns: <discrete>

:SENSe:DATA:TELecom:SONet:STS3 <numeric>

<numeric> = 1 to 64 STS3 number under test

Selects the STS-3 number under test. Only valid for line rates higher than STS-3.

This number, when multiplied by three and added to the STS-1 number under test (see the command :SENSe:DATA:TELecom:SONet:STS1) will yield the older style single value STS-1 channel number.

The corresponding query returns the test STS-3 number.

:SENSe:DATA:TELecom:SONet:STS3?

Returns: <numeric>

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:SENSe:DATA:TELecom:SONet:STS1 <numeric>

<numeric> = 1 to 3 STS1 Number under test

Selects the SONET Receiver active STS-1 within the STS-3.

The corresponding query returns the active STS-1 in numeric form.

:SENSe:DATA:TELecom:SONet:STS1?

Returns: <numeric>

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VT Layer Selection

:SENSe:DATA:TELecom:SONet:VT:TYPE <discrete>

<discrete> =	NONE	
	VT2	
	VT15	

Selects the VT mapping for the receiver.

The corresponding query returns the VT layer in discrete form as listed above.

: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
	FLM2	2 Mb/s floating byte
	FLDS1	DS1 floating byte
	ASDS1	Asynchronous DS1
	DS3	DS3

Selects the Receiver SONET payload for single payload cases.

The corresponding query returns the payload in discrete form as listed above.

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: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.

The corresponding query returns the TS0 state as a boolean value.

:SENSe:DATA:TELecom:SONet:PRIMary:TS0?

Returns: <boolean>

VT Group

:SENSe:DATA:TELecom:SONet:VTGRoup <numeric>

<numeric> = 1 to 7

Selects the SONET Receiver active VT Group within the selected STS-1.

The corresponding query returns the active VT Group in numeric form.

:SENSe:DATA:TELecom:SONet:VTGRoup?

Returns: <numeric>

:SENSe:DATA:TELecom:SONet:VT <numeric>

<numeric> =	1 to 3	tributary number for VT-2
<numeric> =	1 to 4	tributary number for VT-1.5

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Selects the SONET Receiver active VT within the selected VT Group

The corresponding query returns the active VT in numeric form.

:SENSe:DATA:TELecom:SONet:VT?

Returns: <numeric>

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SENSe subsystem - Receiver Overhead Monitor

:SENSe:DATA:TELecom:SONet:OVERhead:CHANnel <numeric>

<discrete> =	1 to 64	STS3 number

Selects the channel from which the overhead bytes will be monitored.

The corresponding query returns the channel number in numeric form.

:SENSe:DATA:TELecom:SONet:OVERhead:CHANnel?

Returns: <numeric>

:SENSe:DATA:TELecom:SONet:DDCC <discrete>

<discrete> =	NONE	Turns both Off
	RDCC	Section DCC
	MDCC	Line DCC

Selects the Data Communications channel to be dropped via the DROP port, for DCC tests.

The corresponding query returns the selected DCC, in discrete form as listed above.

:SENSe:DATA:TELecom:SONet:DDCC?

Returns: <discrete>

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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> =

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<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 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 Optical Power Result

:SENSe:DATA? <string>

<string> = "OPOWer:SONet"

Returns: <numeric> Optical power (dBm)

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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 +veAdj 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 +veAdj Seconds
VT:NCOunt	VT Pointer -ve Adj Count
VT:NSEConds	VT Pointer -ve Adj Seconds
VT:IOFFset	Implied VT Offset

Returns: <numeric>

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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)
AISL	Line AIS (AIS-L)
AISP	Path AIS (AIS-P)
RDIL	Line FERF (RDI-L)
RDIP	Path FERF (RDI-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
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>

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FETCh subsystem

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

SONET Overhead Bytes

:FETCh:ARRay:DATA:TELecom:SONet:OVERhead:DATA <numeric>?

<numeric> = 1 to 3 STS-1 group

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.

Returns: <numeric>, <numeric>,……<numeric>

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.

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:FETCh:ARRay:DATA:TELecom:SONet:POVerhead:DATA?

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.

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

:FETCh:ARRay:DATA:TELecom:SONet:VT:POVerhead:DATA?

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.

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

: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.

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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.

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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.

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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.

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: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 trace byte as a 15 ASCII character string. If the string contains any non printing characters then ~ is substituted.

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Ethernet SCPI Command Reference

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Ethernet Command Reference

This chapter contains detailed information on commands that are used to control the instrument for Ethernet operation.

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OUTPut subsystem

:OUTPut:TELecom:ETHernet:LASer <discrete>

<discrete> =	ON	
	OFF	

This command controls the state of the laser (ON or OFF) on any optical GBIC modules fitted to the 1Gb/s ports (Port 9 or Port 10).

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

The corresponding query returns the state of the laser in discrete form as listed above.

:OUTPut:TELecom:ETHernet:LASer?

Returns: <discrete>

:OUTPut:TELecom:ETHernet:EYEClock <discrete>

<discrete> =	OFF	Output off
	M100	Output for 100Mb/s only
	G1	Output for 1Gb/s only

Selects the eye clock reference frequency corresponding to the specified Ethernet line rate.

The corresponding query returns the eye clock reference frequency in discrete form as listed above.

:OUTPut:TELecom:ETHernet:EYEClock?

Returns: <discrete>

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:OUTPut:TELecom:ETHernet:PORT:SELect <discrete>

<discrete> =	PORT1	10/100Mb/s Port 1
	PORT2	10/100Mb/s Port 2
	PORT3	10/100Mb/s Port 3
	PORT4	10/100Mb/s Port 4
	PORT5	10/100Mb/s Port 5
	PORT6	10/100Mb/s Port 6
	PORT7	10/100Mb/s Port 7
	PORT8	10/100Mb/s Port 8
	PORT9	1Gb/s Port 9
	PORT10	1Gb/s Port 10

This command sets the selected instrument Ethernet port.

The corresponding query returns the selected instrument Ethernet port in discrete form as listed above.

:OUTPut:TELecom:ETHernet:PORT:SELect?

Returns: <discrete>

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SOURce subsystem - Ethernet Port Transceiver Settings

:SOURce:DATA:TELecom:ETHernet:PORT:LRATe <discrete>

<discrete> =	AUTO	10Mb/s or 100Mb/s
	M100	100Gb/s
	M10	10Mb/s

Sets the line rate for the selected instrument port.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

AUTO is only used if auto-negotiation is enabled for the selected instrument port.

The corresponding query returns the port line rate in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:PORT:LRATe?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:PORT:FCONtrol <discrete>

<discrete> =	AUTO	None or Symmetrical Flow Control
	OFF	No Flow Control
	TXRX	Symmetrical Flow Control

Sets the flow control for the selected instrument port.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

AUTO is only used if auto-negotiation is enabled for the selected instrument port.

The corresponding query returns the port flow control in discrete form as listed above.

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SOURce subsystem - Ethernet Port Transceiver Settings

:SOURce:DATA:TELecom:ETHernet:PORT:FCONtrol?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:PORT:DUPLex <discrete>

<discrete> =	AUTO	Full Duplex or Half Duplex
	FULL	Full Duplex
	HALF	Half Duplex

Sets the duplex mode for the selected instrument port.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

AUTO is only used if auto-negotiation is enabled for the selected instrument port.

The corresponding query returns the port duplex mode in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:PORT:DUPLex?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:PORT:BANDwidth <numeric>

<numeric> =	0.0 to 10.0	If negotiated line rate 10 Mb/s
	OR	
	0.0 to 100.0	If negotiated line rate 100 Mb/s
	OR	
	0.0 to 1000.0	If negotiated line rate 1000 Mb/s

Sets the transmitted bandwidth for the selected instrument port.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

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SOURce subsystem - Ethernet Port Stream Settings

The corresponding query returns the set transmitted bandwidth in numeric form.

:SOURce:DATA:TELecom:ETHernet:PORT:BANDwidth?

Returns: <numeric>

:SOURce:DATA:TELecom:ETHernet:PORT:NEGotiation <discrete>

<discrete> = OFF
ON

Enables or disables auto-negotiation for the selected instrument port.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

The corresponding query returns the auto-negotiation state in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:PORT:NEGotiation?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:PORT:NEGotiation:RENegotiate

Causes a re-negotiation, if auto-negotiation enabled, for the selected instrument port.

The port to force re-negotiation on is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

SOURce subsystem - Ethernet Port Stream Settings

:SOURce:DATA:TELecom:ETHernet:STReam:FSIZe <numeric>

<numeric> = 58 to 16384 For 10/100 Mb/s Ports

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OR

58 to 65536 For 1 Gb/s Ports

Sets the transmitted stream frame size for the selected instrument port.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

The corresponding query returns the stream frame size in numeric form.

:SOURce:DATA:TELecom:ETHernet:STReam:FSIZe?

Returns: <numeric>

:SOURce:DATA:TELecom:ETHernet:STReam:ADDRess:SOURce <string>

Sets the transmitted stream source MAC address for the selected instrument port.

The string must be specified in dashed hexadecimal notation and has the following format:

xx-xx-xx-xx-xx-xx

Where 'x' is any hexadecimal digit 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and F.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

The corresponding query returns the stream source MAC address in string form.

:SOURce:DATA:TELecom:ETHernet:STReam:ADDRess:SOURce?

Returns: <string>

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SOURce subsystem - Ethernet Port Stream Settings

:SOURce:DATA:TELecom:ETHernet:STReam:ADDRess:DESTination <string>

Sets the transmitted stream destination MAC address for the selected instrument port.

The string must be specified in dashed hexadecimal notation and has the following format:

xx-xx-xx-xx-xx-xx

Where 'x' is any hexadecimal digit 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and F.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

The corresponding query returns the stream destination MAC address in string form.

:SOURce:DATA:TELecom:ETHernet:STReam:ADDRess:DESTination?

Returns: <string>

:SOURce:DATA:TELecom:ETHernet:STReam:VLAN <discrete>

<discrete> = OFF
ON

Enables or disables VLAN type frames for the selected instrument port.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

The corresponding query returns the VLAN frame type state in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:STReam:VLAN?

Returns: <discrete>

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SOURce subsystem - Ethernet Port Stream Settings

:SOURce:DATA:TELecom:ETHernet:STReam:VLAN:ID <numeric>

<numeric> = 0 to 4095

Sets the transmitted stream VLAN ID for the selected instrument port.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

The corresponding query returns the VLAN ID in numeric form.

:SOURce:DATA:TELecom:ETHernet:STReam:VLAN:ID?

Returns: <numeric>

:SOURce:DATA:TELecom:ETHernet:STReam:VLAN:PRIority <numeric>

<numeric> = 0 to 7

Sets the transmitted stream VLAN priority for the selected instrument port.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

The corresponding query returns the VLAN priority in numeric form.

:SOURce:DATA:TELecom:ETHernet:STReam:VLAN:PRIority?

Returns: <numeric>

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SOURce subsystem - Ethernet Instrument Settings

:SOURce:DATA:TELecom:ETHernet:TEST:ID <discrete>

<discrete> = SET1
SET2

Selects the instrument designation.

If in PRESet mode also re-configures the port source MAC addresses and destination addresses between SET1 and SET2.

The test mode is configured by the command: :SOURce:DATA:TELecom:ETHernet:TEST.

The corresponding query returns the instrument designation in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:TEST:ID?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:TEST <discrete>

<discrete> = PRESet
EXPert

Selects the instrument test mode.

If in PRESet mode also re-configures the port source MAC addresses and destination addresses between SET1 and SET2.

The corresponding query returns the instrument test mode selection in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:TEST?

Returns: <discrete>

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SOURce subsystem - Ethernet Instrument Settings

:SOURce:DATA:TELecom:ETHernet:TEST:TYPE <discrete>

<discrete> =	ENDToend	End to End
	LBACk	Loopback
	LTHRu	Loopthru

Selects the instrument test mode type.

The corresponding query returns the instrument test mode type in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:TEST:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:TEST:LOOPback <discrete>

<discrete> =	OPORt	One Port Loopback
	TPORt	Two Port Loopback

Selects the instrument loopback type.

The corresponding query returns the instrument loopback type in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:TEST:LOOPback?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:TEST:FEMode <discrete>

<discrete> =	LTHRu	Far end ports connected to an instrument in Loopthru mode
	LBACK	Far end ports have cable loopbacks fitted

Selects the far end loopback type.

The corresponding query returns the far end loopback type in discrete form as listed above.

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SOURce subsystem - Ethernet Error Add Settings

:SOURce:DATA:TELecom:ETHernet:TEST:FEMode?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:FRAMe:TYPE <numeric>

<numeric> = 0000 to FFFF Frame Type in hexadecimal

Selects the instrument frame type.

The numeric value should be entered in hexadecimal notation by prefixing the digits with #h, i.e. if the desired value is A080 then enter #hA080.

The corresponding query returns the instrument frame type in numeric form.

:SOURce:DATA:TELecom:ETHernet:FRAMe:TYPE?

Returns: <numeric>

SOURce subsystem - Ethernet Error Add Settings

:SOURce:DATA:TELecom:ETHernet:PORT:ERRor <discrete>

<discrete> = OFF
ON

Enables or disables error injection for the selected instrument port.

The port to configure is identified by the command: :OUTPut:TELecom:ETHernet:PORT:SELect.

The corresponding query returns the error injection state in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:PORT:ERRor?

Returns: <discrete>

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:SOURce:DATA:TELecom:ETHernet:ERRor:SAPorts

Selects all of the instrument Ethernet ports for error injection.

:SOURce:DATA:TELecom:ETHernet:ERRor:CAPorts

Selects none of the instrument Ethernet ports for error injection.

:SOURce:DATA:TELecom:ETHernet:ERRor:TYPE <discrete>

<discrete> =	NTSet	Non-testset frame
	DROP	Dropped frame
	FCSerror	Frame with FCS error
	OOSequence	Frame with out of sequence event

Selects the instrument error injection type.

The corresponding query returns the instrument error injection type in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:ERRor:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:ERRor:INJect

Injects an error of the selected type into the selected instrument Ethernet ports.

There is no corresponding query for this command.

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SOURce subsystem - Ethernet Port Transmitter Control

:SOURce:DATA:TELecom:ETHernet:BANDwidth:RESTore <discrete>

<discrete> =	FAST	Restore 10/100 Mb/s Ports
	GIG	Restore 1 Gb/s Ports
	ALL	Restore All Ports

Restores the transmit rate of the selected instrument input ports.

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:MODE <discrete>

<discrete> =	CONTinuous
	BURSt

Selects the instrument Ethernet transmitter mode.

The corresponding query returns the instrument Ethernet transmitter mode in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:MODE?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:COUPling <discrete>

<discrete> =	OFF
	ON

Selects the instrument Ethernet transmitter coupling mode.

If ON this couples the starting and stopping of the Ethernet transmitter to the Run/Stop key and the measurement period.

If OFF this de-couples the starting and stopping of the Ethernet transmitter to the Run/Stop key and the measurement

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period. A separate control can now be used to start and stop the Ethernet transmitter :SOURce:DATA:TELecom:ETHernet:TRANsmitter:STARt and :SOURce:DATA:TELecom:ETHernet:TRANsmitter:STOP.

The corresponding query returns the instrument Ethernet transmitter coupling mode in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:COUPling?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:STARt

Starts the instrument Ethernet ports transmitting, only applicable if Run/Stop coupling is off.

Run/Stop coupling is configured by the command :SOURce:DATA:TELecom:ETHernet:TRANsmitter:COUPling.

There is no corresponding query for this command.

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:STOP

Stops the instrument Ethernet ports transmitting, only applicable if Run/Stop coupling is off.

Run/Stop coupling is configured by the command :SOURce:DATA:TELecom:ETHernet:TRANsmitter:COUPling.

There is no corresponding query for this command.

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:BURSt:TYPE <discrete>

<discrete> = FRAMes
TIME

Selects the instrument Ethernet transmitter burst type.

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SOURce subsystem - Ethernet Port Transmitter Control

The corresponding query returns the instrument Ethernet transmitter burst type in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:BURSt:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:BURSt:TIME <string>

The string has the following format:

dd-hh-mm-ss

Where

dd - days

hh - hours

mm - minutes

ss - seconds

Sets the duration of the instrument Ethernet transmitter burst.

The corresponding query returns the duration of the instrument Ethernet transmitter burst in string form as above.

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:BURSt:TIME?

Returns: <string>

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:BURSt:FRAMes <numeric>

<numeric> = 0 to 1 000 000 000

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SOURce subsystem - Ethernet RFC2544 Control

Sets the number of frames the instrument Ethernet transmitter burst will contain.

The corresponding query returns the number of frames the instrument Ethernet transmitter burst will contain in numeric form.

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:BURSt:FRAMes?

Returns: <numeric>

:SOURce:DATA:TELecom:ETHernet:TRANsmitter:ENABled?

Returns: <discrete> ON
OFF

This query returns the status of the instrument Ethernet transmitters in discrete form. There is no corresponding command.

If the Ethernet transmitters are in burst mode this query will return ON until all ports have completed the programmed burst duration, then and only then will it return OFF.

SOURce subsystem - Ethernet RFC2544 Control

:SOURce:DATA:TELecom:ETHernet:RFC:STARt

Starts the instrument running an Ethernet RFC 2544 test.

There is no corresponding query for this command.

:SOURce:DATA:TELecom:ETHernet:RFC:STOP

Stops the instrument running an Ethernet RFC 2544 test.

There is no corresponding query for this command.

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:SOURce:DATA:TELecom:ETHernet:RFC:STATus?

Returns: <discrete> STOPped
INITializing
THRoughput
LATency
FLOSs

This query returns the status of the instrument Ethernet RFC test in discrete form.

There is no corresponding command for this query.

SOURce subsystem - Ethernet RFC2544 Settings

:SOURce:DATA:TELecom:ETHernet:RFC:TESTs <discrete>

<discrete> = ALL
THRoughput
LATency
FLOSs

Selects the instrument Ethernet RFC test points to run.

The corresponding query returns the instrument Ethernet transmitter mode in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:RFC:TESTs?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:RFC:PRESet <discrete>

<discrete> = ON

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OFF

Controls whether the instrument runs the Ethernet RFC test points using configured expert mode settings or forces the use of preset mode settings.

The corresponding query returns the state of the preset settings control in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:RFC:PRESet?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:RFC:PATH <discrete>

<discrete> = ON
OFF

Enabels or disables the selected Ethernet RFC test path.

The path to configure is selected using the command :SOURce:DATA:TELecom:ETHernet:RFC:PATH:SELect.

The corresponding query returns the state of the selected Ethernet RFC test path in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:RFC:PATH?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:RFC:SAPath

Selects all of the instrument Ethernet path for RFC testing.

There is no corresponding query for this command.

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:SOURce:DATA:TELecom:ETHernet:RFC:CAPath

Selects none of the instrument Ethernet paths for RFC testing.

There is no corresponding query for this command.

:SOURce:DATA:TELecom:ETHernet:RFC:PATH:TYPE <discrete>

<discrete> =	OPORt	One Port Loopback Paths
	TPORt	Two Port Loopback Paths

Selects the type of instrument Ethernet RFC test paths to run.

The corresponding query returns the type of instrument Ethernet test paths in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:RFC:PATH:TYPE?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:RFC:PATH:SELect <discrete>

		Loopback Type	
		OPORt	TPORt
<discrete> =	PATH1	Port 1 to Port 1	Port 1 to Port 2
	PATH2	Port 2 to Port 2	Port 2 to Port 1
	PATH3	Port 3 to Port 3	Port 3 to Port 4
	PATH4	Port 4 to Port 4	Port 4 to Port 3
	PATH5	Port 5 to Port 5	Port 5 to Port 6
	PATH6	Port 6 to Port 6	Port 6 to Port 5
	PATH7	Port 7 to Port 7	Port 7 to Port 8
	PATH8	Port 8 to Port 8	Port 8 to Port 7
	PATH9	Port 9 to Port 9	Port 9 to Port 10
	PATH10	Port 10 to Port 10	Port 10 to Port 9

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SOURce subsystem - Ethernet RFC2544 Settings

Selects the current instrument Ethernet RFC test path.

The loopback type is set using the command :SOURce:DATA:TELecom:ETHernet:RFC:PATH:TYPE.

The corresponding query returns the currently selected instrument Ethernet test path in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:RFC:PATH:SELect?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:RFC:DURation <discrete>

<discrete> = DEFault
QUICk
USER

Selects the duration of the Ethernet RFC test run.

If USER is specified then the following commands must be used to configure the duration of the RFC 2544 test:

:SOURce:DATA:TELecom:ETHernet:RFC:DURation:THRoughput:PRElim
:SOURce:DATA:TELecom:ETHernet:RFC:DURation:THRoughput:FINal
:SOURce:DATA:TELecom:ETHernet:RFC:DURation:LATency
:SOURce:DATA:TELecom:ETHernet:RFC:DURation:FLOSs
:SOURce:DATA:TELecom:ETHernet:RFC:DURation:TRIals:LATency

The corresponding query returns the type of instrument Ethernet test paths in discrete form as listed above.

:SOURce:DATA:TELecom:ETHernet:RFC:DURation?

Returns: <discrete>

:SOURce:DATA:TELecom:ETHernet:RFC:DURation:THRoughput:PRELim <numeric>

<numeric> = 5 to 9 Seconds

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SOURce subsystem - Ethernet RFC2544 Settings

Selects the duration of the Ethernet RFC preliminary throughput test point.

The corresponding query returns the duration of the preliminary throughput test point in numeric form.

:SOURce:DATA:TELecom:ETHernet:RFC:DURation:THRoughput:PRELim?

Returns: <numeric>

:SOURce:DATA:TELecom:ETHernet:RFC:DURation:THRoughput:FINal <numeric>

<numeric> = 10 to 60 Seconds

Selects the duration of the Ethernet RFC final throughput test point.

The corresponding query returns the duration of the final throughput test point in numeric form.

:SOURce:DATA:TELecom:ETHernet:RFC:DURation:THRoughput:FINal?

Returns: <numeric>

:SOURce:DATA:TELecom:ETHernet:RFC:DURation:LATency <numeric>

<numeric> = 10 to 180 Seconds

Selects the duration of the Ethernet RFC latency test point.

The corresponding query returns the duration of the latency test point in numeric form.

:SOURce:DATA:TELecom:ETHernet:RFC:DURation:LATency?

Returns: <numeric>

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SOURce subsystem - Ethernet RFC2544 Settings

:SOURce:DATA:TELecom:ETHernet:RFC:DURation:FLOSs <numeric>

<numeric> = 10 to 60 Seconds

Selects the duration of the Ethernet RFC frame loss test point.

The corresponding query returns the duration of the frame loss test point in numeric form.

:SOURce:DATA:TELecom:ETHernet:RFC:DURation:FLOSs?

Returns: <numeric>

:SOURce:DATA:TELecom:ETHernet:RFC:DURation:TRIals:LATency <numeric>

<numeric> = 1 to 30

Selects the number of Ethernet RFC latency trials to execute.

The corresponding query returns the number of latency trials to execute in numeric form.

:SOURce:DATA:TELecom:ETHernet:RFC:DURation:TRIals:LATency?

Returns: <numeric>

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INPut subsystem

:INPut:TELecom:ETHernet:PORT:SELect <discrete>

<discrete> =	PORT1	10/100Mb/s Port 1
	PORT2	10/100Mb/s Port 2
	PORT3	10/100Mb/s Port 3
	PORT4	10/100Mb/s Port 4
	PORT5	10/100Mb/s Port 5
	PORT6	10/100Mb/s Port 6
	PORT7	10/100Mb/s Port 7
	PORT8	10/100Mb/s Port 8
	PORT9	1Gb/s Port 9
	PORT10	1Gb/s Port 10

This command sets the selected instrument Ethernet port.

The corresponding query returns the selected instrument Ethernet port in discrete form as above.

:INPut:TELecom:ETHernet:PORT:SELect?

Returns: <discrete>

:INPut:TELecom:ETHernet:STReam:SPORt:SELect <discrete>

<discrete> =	PORT1	10/100Mb/s Port 1
	PORT2	10/100Mb/s Port 2
	PORT3	10/100Mb/s Port 3
	PORT4	10/100Mb/s Port 4
	PORT5	10/100Mb/s Port 5
	PORT6	10/100Mb/s Port 6
	PORT7	10/100Mb/s Port 7

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	PORT8	10/100Mb/s Port 8
	PORT9	1Gb/s Port 9
	PORT10	1Gb/s Port 10

This command sets the selected instrument Ethernet stream port.

The corresponding query returns the selected instrument Ethernet stream port in discrete form as above.

:INPut:TELecom:ETHernet:STReam:SPORt:SELect?

Returns: <discrete>

:INPut:TELecom:ETHernet:STReam:SEND:SELect <discrete>

<discrete> =	SET1	Select Test Set 1 Results
	SET2	Select Test Set 2 Results

This command sets the selected instrument Ethernet stream test set.

The corresponding query returns the selected instrument Ethernet stream test set in discrete form as above.

:INPut:TELecom:ETHernet:STReam:SEND:SELect?

Returns: <discrete>

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SENSe subsystem - Receiver Settings

:SENSe:DATA:TELecom:ETHernet:PORT:BANDwidth <numeric>

<numeric> =	0.0 to 10.0	If negotiated line rate 10 Mb/s
	OR	
	0.0 to 100.0	If negotiated line rate 100 Mb/s
	OR	
	0.0 to 1000.0	If negotiated line rate 1000 Mb/s

Sets the receive rate of the instrument input port.

Only valid if flow control enabled for the selected port.

The corresponding query returns the input port receive rate in numeric form.

:SENSe:DATA:TELecom:ETHernet:PORT:BANDwidth?

Returns: <numeric>

:SENSe:DATA:TELecom:ETHernet:BANDwidth:RESTore <discrete>

<discrete> =	FAST	Restore 10/100 Mb/s Ports
	GIG	Restore 1 Gb/s Ports
	ALL	Restore All Ports

Restores the receive rate of the selected instrument Ethernet input ports.

There is no corresponding query for this command.

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SENSe subsystem - Frame Capture Settings

:SENSe:DATA:TELecom:ETHernet:PORT:CAPTure <discrete>

<discrete> =	ON	Enable frame capture
	OFF	Disable frame capture

Controls the state of frame capture for the selected instrument Ethernet input port.

The port to configure is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

The corresponding query returns the state of frame capture for the selected instrument input port in discrete form as above.

:SENSe:DATA:TELecom:ETHernet:PORT:CAPTure?

Returns: <discrete>

:SENSe:DATA:TELecom:ETHernet:CAPTure <discrete>

<discrete> =	ON	Enable frame capture filtering
	OFF	Disable frame capture filtering

Controls the state of frame capture filtering. If ON frame capture applies the specified frame filter criteria. If OFF frame capture captures any frame.

The corresponding query returns the state of frame capture filtering in discrete form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure?

Returns: <discrete>

:SENSe:DATA:TELecom:ETHernet:CAPTure:SAPorts

Selects frame capture on all the Ethernet ports.

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There is no corresponding query for this command.

:SENSe:DATA:TELecom:ETHernet:CAPTure:CAPorts

Selects frame capture on none of the Ethernet ports.

There is no corresponding query for this command.

:SENSe:DATA:TELecom:ETHernet:CAPTure:STARt

Starts frame capture on the instrument.

There is no corresponding query for this command.

:SENSe:DATA:TELecom:ETHernet:CAPTure:STOP

Stops frame capture on the instrument.

There is no corresponding query for this command.

:SENSe:DATA:TELecom:ETHernet:CAPTure:TYPE <discrete>

<discrete> =	ERRored	Capture FCS errored frames
	NTSet	Capture non-testset frames
	SPECific	Capture specific frames

Selects the type of frame to capture.

The corresponding query returns the type of frame capture in discrete form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:TYPE?

Returns: <discrete>

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:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:SOURce <discrete>

<discrete> = ON
OFF

Controls the state of frame capture filtering on source address.

The corresponding query returns the state of frame capture filtering on source address in discrete form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:SOURce?

Returns: <discrete>

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:SOURce:ADDRess <string>

Sets the source MAC address filter.

The string must be specified in dashed hexadecimal notation and has the following format:

xx-xx-xx-xx-xx-xx

Where 'x' is any hexadecimal digit 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and F.

The corresponding query returns the value of the source MAC address filter in string form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:SOURce:ADDRess?

Returns: <string>

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SENSe subsystem - Frame Capture Settings

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:DESTination <discrete>

<discrete> = ON
OFF

Controls the state of frame capture filtering on destination address.

The corresponding query returns the state of frame capture filtering on destination address in discrete form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:DESTination?

Returns: <discrete>

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:DESTination:TYPE <discrete>

<discrete> = UNICast
BROadcast
MULTIcast

Selects the type of frame capture filtering on destination address.

The corresponding query returns the type of frame capture filtering on destination address in discrete form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:DESTination:TYPE ?

Returns: <discrete>

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:DESTination:ADDRess <string>

Sets the destination MAC address filter. The type of frame capture filtering on destination address must be set to UNIcast for this to take effect, using the command

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SENSe subsystem - Frame Capture Settings

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:DESTination:TYPE .

The string must be specified in dashed hexadecimal notation and has the following format:

xx-xx-xx-xx-xx-xx

Where 'x' is any hexadecimal digit 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and F.

The corresponding query returns the value of the destination MAC address filter in string form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:DESTination:ADDRess?

Returns: <string>

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN <discrete>

<discrete> = ON
OFF

Controls the state of frame capture filtering on VLAN frames.

The corresponding query returns the state of frame capture filtering on VLAN frames in discrete form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN?

Returns: <discrete>

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN:PRIority <discrete>

<discrete> = ON
OFF

Controls the state of frame capture filtering on VLAN priority. Frame capture filtering on VLAN frames must be set

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to ON for this to take effect, using the command :SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN.

The corresponding query returns the state of frame capture filtering on VLAN priority in discrete form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN:PRIority?

Returns: <discrete>

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN:PRIority:LEVel <numeric>

<numeric> = 0 to 7

Sets the VLAN priority filter. Frame capture filtering on VLAN priority must be set to ON for this to take effect, using the command :SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN:PRIority.

The corresponding query returns the value of the VLAN priority filter in numeric form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN:PRIority:LEVel?

Returns: <numeric>

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN:VID <discrete>

<discrete> = ON
OFF

Controls the state of frame capture filtering on VLAN ID. Frame capture filtering on VLAN frames must be set to ON for this to take effect, using the command :SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN.

The corresponding query returns the state of frame capture filtering on VLAN ID in discrete form as above.

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SENSe subsystem - Frame Capture Settings

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN:VID?

Returns: <discrete>

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN:VID:ID <numeric>

<numeric> = 0 to 4095

Sets the VLAN ID filter. Frame capture filtering on VLAN ID must be set to ON for this to take effect, using the command :SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN:VID.

The corresponding query returns the value of the VLAN ID filter in numeric form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:VLAN:VID:ID?

Returns: <numeric>

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:FRAMe <discrete>

<discrete> = ON
OFF

Controls the state of frame capture filtering on frame type.

The corresponding query returns the state of frame capture filtering on frame type in discrete form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:FRAMe?

Returns: <discrete>

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:FRAMe:TYPE <numeric>

<numeric> = 0000 to FFFF Frame Type in hexadecimal

Sets the frame type filter.

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SENSe subsystem - Frame Capture Settings

The numeric value should be entered in hexadecimal notation by prefixing the digits with #h, i.e. if the desired value is A080 then enter #hA080.

Frame capture filtering on Ethernet frame type must be set to ON for this to take effect, using the command :SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:FRAMe.

The corresponding query returns the value of the frame type filter in numeric form as above.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FILTer:FRAMe:TYPE?

Returns: <numeric>

:SENSe:DATA:TELecom:ETHernet:CAPTure:FRAMe <discrete>

<discrete> =	FRAME1	Select first captured frame
	FRAME2	Select second captured frame
	FRAME3	Select third captured frame
	FRAME4	Select fourth captured frame
	FRAME5	Select fifth captured frame
	FRAME6	Select sixth captured frame
	FRAME7	Select seventh captured frame
	FRAME8	Select eighth captured frame

Selects a specific captured frame.

The corresponding query returns the specified captured frame in discrete form.

:SENSe:DATA:TELecom:ETHernet:CAPTure:FRAMe?

Returns: <discrete>

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SENSe subsystem - Result Returning Commands

Ethernet Frame Capture Status

:SENSe:DATA:TELecom:ETHernet:CAPTure:STATus?

Returns: <boolean>

0	Frame Capture idle
1	Frame Capture in progress

Ethernet Number of Frames Captured Result

:SENSe:DATA? <string>

<string> = "ETHernet:CAPTure:NFRames "

Returns: <numeric> Number of frames captured

The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

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Ethernet RFC 2544 Number of Results

:SENSe:DATA? <string>

<string> = "ETHernet:RFC:<Table Type>:<Result Type>"

<Table type> =		<Result Type> =	
		NROWs	NCOLumns
THRoughput	Throughput Test Results	X	
LATency	Latency Test Results	X	
FLOSs	Frame Loss Test Results	X	X

Returns: <numeric> Number of rows / columns in table

The path to monitor is identified by the command :SOURce:DATA:TELecom:ETHernet:RFC:PATH:SELect.

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Ethernet Port Results

:SENSe:DATA? <string>

<string> = "ETHernet:PORT:<Type>:<Result Type>"

<Result type> =		<Type> = TX	<Type> = RX
FCOunt	Frame Count	X	X
FRATe	Frame Rate	X	X
DACTual	Data Rate Actual	X	X
DMINimum	Date Rate Minimum	X	X
DMAXimum	Date Rate Maximum	X	X
FERRors	FCS Error Frames		X
JUMBo	Jumbo Frames		X
RUNT	Runt Frames		X
BROadcast	Broadcast Frames		X
MULTicast	Multi-Cast Frames		X
NTSet	Non-testset Frames		X

Returns: <numeric>

The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

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Ethernet Stream Results

:SENSe:DATA? <string>

<string> = "ETHernet:STReam:<Type>:<Result Type>"

<Result type> =		<Type> = TX	<Type> = RX
FCOunt	Frame Count	X	X
FRATe	Frame Rate	X	X
DACTual	Data Rate Actual	X	X
DMINimum	Date Rate Minimum	X	X
DMAXimum	Date Rate Maximum	X	X
FERRors	FCS Error Frames		X
OOSequence	Out of Sequence Frames		X
LAVerage	Average Latency		X
LMINimum	Minimum Latency		X
LMAXimum	Maximum Latency		X
PARRival	Port of Arrival of Dtream		X
DROPped	Dropped Frame Count		X
ITRansit	Frames in transit Count		X

Returns: <numeric>

The stream to monitor is identified by the commands :INPut:TELecom:ETHernet:STReam:SPORt:SELect and :INPut:TELecom:ETHernet:STReam:SEND:SELect.

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Ethernet Stream Summary Results

:SENSe:DATA:TELecom:ETHernet:STReam:DATA? <string>

<string> is one of the following

PARRival	Stream Port of Arrival
SOURce	Stream Source MAC Address
DESTination	Stream Destination MAC Address
PRIority	Stream VLAN Priority Value
VID	Stream VLAN ID
SIZE	Stream frame size (in bytes)
TYPE	Stream Type (VLAN or NON-VLAN)
STATus	Stream Status (Active or Quiet)

Returns: <string>

The stream to monitor is identified by the commands :INPut:TELecom:ETHernet:STReam:SPORt:SELect and :INPut:TELecom:ETHernet:STReam:SEND:SELect.

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FETCh subsystem

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

Ethernet GBIC Information

:FETCh:STRing:DATA:TELecom:ETHernet:GBIC:TYPE?

Returns: <string>

Returns the currently detected GBIC type in string format.

The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

:FETCh:STRing:DATA:TELecom:ETHernet:GBIC:MODedef?

Returns: <string>

Returns the currently detected GBIC module definition state as per SFF GBIC specification Rev 5.5, September 27, 2000 "Table 8: MOD_DEF(0:2)".

The string is returned as "not present" if no GBIC is fitted.

The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

:FETCh:STRing:DATA:TELecom:ETHernet:GBIC:RATE?

Returns: <string>

Returns the currently detected GBIC rate as per SFF GBIC specification Rev 5.5, September 27, 2000 "Annex D: Module definition "4" GBIC (Serial Identification)".

The string takes the form "1300M bit/sec".

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The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

:FETCh:STRing:DATA:TELecom:ETHernet:GBIC:VENDor?

Returns: <string>

Returns the currently detected GBIC vendor as per SFF GBIC specification Rev 5.5, September 27, 2000 "Annex D: Module definition "4" GBIC (Serial Identification)".

The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

:FETCh:STRing:DATA:TELecom:ETHernet:GBIC:PARTno?

Returns: <string>

Returns the currently detected GBIC part number as per SFF GBIC specification Rev 5.5, September 27, 2000 "Annex D: Module definition "4" GBIC (Serial Identification)".

The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

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Ethernet Port Auto-Negotiation Information

:FETCh:STRing:DATA:TELecom:ETHernet:PORT:NEGotiation:STATus?

Returns: <string>

Returns the currently status of auto-negotiation for the selected instrument port.

Returns "Disabled" if manual configuration for the port has been selected.

The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

:FETCh:STRing:DATA:TELecom:ETHernet:PORT:NEGotiation:FLOW?

Returns: <string>

Returns the currently state of the auto-negotiated flow control for the selected instrument port.

Returns "…." if manual configuration for the port has been selected.

The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

:FETCh:STRing:DATA:TELecom:ETHernet:PORT:NEGotiation:LRATe?

Returns: <string>

Returns the currently state of the auto-negotiated line rate for the selected instrument port.

Returns "…." if manual configuration for the port has been selected.

The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

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:FETCh:STRing:DATA:TELecom:ETHernet:PORT:NEGotiation:DUPLex?

Returns: <string>

Returns the currently state of the auto-negotiated duplex mode rate for the selected instrument port.

Returns "…." if manual configuration for the port has been selected.

The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

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Ethernet RFC 2544 Results

:FETCh:STRing:DATA:TELecom:ETHernet:RFC:THRoughput? <numeric>

<numeric> 1 to Number of Rows

Number of rows is determined from the command :SENSe:DATA? "ETHernet:RFC:THRoughput:NROWs".

Returns: <string>

Returns the current throughput result table entry for the selected instrument path and row.

The string takes the form: "<col 1>,<col 2>,<col 3>,<col 4>,<col 5>"

Where:

<col 1>: Number of values to follow (in numeric format).

If 1 then there is no data in the selected table.

<col 2>: Frame size (in bytes).

<col 3>: Maximum theoretical frame rate (in frames/s).

<col 4>: Achieved frame rate (in frames/s).

<col 5>: Data rate (in Mb/s).

The path to monitor is identified by the command :SOURce:DATA:TELecom:ETHernet:RFC:PATH:SELect.

:FETCh:STRing:DATA:TELecom:ETHernet:RFC:LATency? <numeric>

<numeric> 1 to Number of Rows

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Number of rows is determined from the command :SENSe:DATA? "ETHernet:RFC:LATency:NROWs".

Returns: <string>

Returns the current latency result table entry for the selected instrument path and row.

The string takes the form: "<col 1>,<col 2>,<col 3>,<col 4>"

Where:

<col 1>: Number of values to follow (in numeric format).

If 1 then there is no data in the selected table.

<col 2>: Frame size (in bytes).

<col 3>: Frame rate (in frames/s).

<col 4>: Latency value (in ms).

The path to monitor is identified by the command :SOURce:DATA:TELecom:ETHernet:RFC:PATH:SELect.

:FETCh:STRing:DATA:TELecom:ETHernet:RFC:FLOSs? <numeric>

<numeric> 1 to Number of Columns

Number of columns is determined from the command :SENSe:DATA? "ETHernet:RFC:FLOSs:NCOLumns".

Returns: <string>

Returns the current frame loss result table entry for the selected instrument path and column.

The string takes the form: "<col 1>,<col 2>,<col 3>.. ..<col11>,<col12>"

Where:

<col 1>: Number of values to follow (in numeric format).

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If 1 then there is no data in the selected table.

<col 2>: Frame size (in bytes).

<col 3>: 100% load frame loss (in %).

<col 4>: 90% load frame loss (in %).

<col 5>: 80% load frame loss (in %).

<col 6>: 70% load frame loss (in %).

<col 7>: 60% load frame loss (in %).

<col 8>: 50% load frame loss (in %).

<col 9>: 40% load frame loss (in %).

<col 10>: 30% load frame loss (in %).

<col 11>: 20% load frame loss (in %).

<col 12>: 10% load frame loss (in %).

The path to monitor is identified by the command :SOURce:DATA:TELecom:ETHernet:RFC:PATH:SELect.

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Ethernet Frame Capture Results

:FETCh:STRing:DATA:TELecom:ETHernet:CAPture:DATA? <discrete>

<discrete>

REASon	Reason for capturing frame
TIME	Time of capture of frame
DESTination	Destination MAC address in captured frame
SOURce	Source MAC address in captured frame
VLAN	Type of captured frame (VLAN or non-VLAN)
PRIority	VLAN priority of captured frame
VID	VLAN ID of captured frame
TYPE	Frame type of captured frame
SIZE	Size of captured frame (in bytes)
PLD1	Payload bytes of captured frame (bytes 0 to 3)
PLD2	Payload bytes of captured frame (bytes 4 to 7)
PLD3	Payload bytes of captured frame (bytes 8 to 11)
PLD4	Payload bytes of captured frame (bytes 12 to 15)
PLD5	Payload bytes of captured frame (bytes 16 to 19)
FCSStatus	FCS status of captured frame
IFRame	State of instrument frame check on captured frame

Returns: <string>

Returns the value of the selected captured field.result table entry for the selected instrument path and row.

The port to monitor is identified by the command :INPut:TELecom:ETHernet:PORT:SELect.

The captured frame to monitor is identified by the command :SENSe:DATA:TELecom:ETHernet:CAPTure:FRAMe.

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7

Status Register SCPI Command Reference

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Status Reporting

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Status Reporting

The status reporting capability of the Instrument is provided by the STATus subsystem, its Status Registers and the Status Byte.

Table 7-1 Status Registers

The following status registers are provided and conform to IEEE 488.2:

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 Figure 7-1. For the commands which access and control these registers, see page 2-47 STATus subsystem

Figure 7-1 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.

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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 - 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 en 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

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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.

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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
-	-	-	-	-	-	-	-

DB0-8 Not used, always read as 0
DB9 DATA - DATA Status register summary .
DB10-13 Not used, always read as 0.
DB14 CMW - Command Warning
DB15 Not used, always reads as 0

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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	-	-	-	-

DB0-3 Not used, always reads as 0

DB4 MEAS - Measuring. Currently making a measurement

DB5-12 Not used, always read as 0.

DB13 INST - INSTrument Status register summary .

DB14-15 Not used, always read as 0.

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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
DB8-15 Not used, always read as 0.

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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	ESUM	-	-	-	-	-

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
DB6-10 Not used, always read as 0.
DB11 Reserved
DB12 Not used, always read as 0.
DB13 ESUM - Ethernet Status register summary
DB14 ISUM - ISUM Status register summary
DB15 Not used, always read as 0

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ISUMmary Status Register

Provides summarized alarm indications for each of the conditions, shown below, derived from the front panel bi-color 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
-	-				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 Not used, always read as 0.
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.

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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/SONet Status register summary.

DB1 SDH2/SON2 - SDH2/SONet2 Status register summary.

DB2 SDH3/SON3 - SDH3/SONet3 Status register summary.

DB3 SDH4/SON4 - SDH4/SONet4 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.

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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
CSL	-	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 CSL – Transmitter Clock Synchronization Loss
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.

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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
-	-	-	-	-	-	-	-

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 Not used, always read as 0.
DB14 Not used, always read as 0.
DB15 Not used, always read as 0.

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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
-	-	LPVCAIS	LPTCUNEQ	LPTCODI	LPTCRDI	LPTCIAIS	LPTCLOM

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.

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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 Unequipped.
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 Unequipped
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 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.

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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
CSL	-	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 CSL – Transmitter Clock Synchronization Loss
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

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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
-	-	-	-	-	-	-	-

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 Reserved
DB14 Reserved
DB15 Not used, always read as 0

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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.

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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
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	LOPC	AISC	HPRDIPC	HPRDIPS	HPRDIPP	UNEQP

DB0 UNEQP - High Order Path Unequipped.
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 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.

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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

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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
DB2-4 Not used, always read as 0
DB5 AIS - Alarm Indication Sequence
DB6-9 Not used, always read as 0
DB10 RAI - Remote Alarm
DB11 MIN - Minor Alarm
DB12 Reserved
DB13 Reserved
DB14-15 Not used, always read as 0

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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
DB2-4 Not used, always read as 0
DB5 AIS - Alarm Indication Sequence
DB6-9 Not used, always read as 0
DB10 RAI - Remote Alarm
DB11 MIN - Minor Alarm
DB12 Reserved
DB13 Reserved
DB14-15 Not used, always read as 0

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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
DB2-4 Not used, always read as 0
DB5 AIS - Alarm Indication Sequence
DB6-9 Not used, always read as 0
DB10 RAI - Remote Alarm
DB11 MIN - Minor Alarm
DB12-15 Not used, always read as 0

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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
DB6-9 Not used, always read as 0
DB10 RAI - Remote Alarm
DB11 MIN - Minor Alarm
DB12-15 Not used, always read as 0

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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
DB6-7 Not used, always read as 0
DB8-9 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.

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DS2 Status Register

Provides alarm indications related to the T-Carrier DS2 Signal .

For related commands, see STATus subsystem.

Example: STATus:DS2:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	OOF	-	-

DB0-1 Not used, always read as 0

DB2 OOF - Out Of Frame

DB3-15 Not used, always read as 0.

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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
DB3-4 Not used, always read as 0
DB5 AIS - Alarm Indication Sequence
DB6-9 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

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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)

DB4-15 Not used, always read as 0

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ESUMmary Status Register

Provides summary alarm and status indications related to the Ethernet ports.

For related commands, see STATus subsystem.

Example: STATus:ESUMmary:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	EP10	EP9

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
EP8	EP7	EP6	EP5	EP4	EP3	EP2	EP1

DB0 EP1 – Ethernet Port 1 Status register summary
DB1 EP2 – Ethernet Port 2 Status register summary
DB2 EP3 – Ethernet Port 3 Status register summary
DB3 EP4 – Ethernet Port 4 Status register summary
DB4 EP5 – Ethernet Port 5 Status register summary
DB5 EP6 – Ethernet Port 6 Status register summary
DB6 EP7 – Ethernet Port 7 Status register summary
DB7 EP8 – Ethernet Port 8 Status register summary
DB8 EP9 – Ethernet Port 9 Status register summary
DB9 EP10 – Ethernet Port 10 Status register summary
DB10-15 Not used, always read as 0

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EP1 (Ethernet Port 1) Status Register

Provides alarm indications related to the Ethernet port 1 features.

For related commands, see STATus subsystem.

Example: STATus:EP1:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	PAUSE	LOS

DB0 LOS – Loss Of Signal, Ethernet Link Down

DB1 PAUSE – Pause control in effect

DB2-15 Not used, always read as 0

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EP2 (Ethernet Port 2) Status Register

Provides alarm indications related to the Ethernet port 2 features.

For related commands, see STATus subsystem.

Example: STATus:EP2:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	PAUSE	LOS

DB0 LOS – Loss Of Signal, Ethernet Link Down

DB1 PAUSE – Pause control in effect

DB2-15 Not used, always read as 0

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EP3 (Ethernet Port 3) Status Register

Provides alarm indications related to the Ethernet port 3 features.

For related commands, see STATus subsystem.

Example: STATus:EP3:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	PAUSE	LOS

DB0 LOS – Loss Of Signal, Ethernet Link Down

DB1 PAUSE – Pause control in effect

DB2-15 Not used, always read as 0

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EP4 (Ethernet Port 4) Status Register

Provides alarm indications related to the Ethernet port 4 features.

For related commands, see STATus subsystem.

Example: STATus:EP4:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	PAUSE	LOS

DB0 LOS – Loss Of Signal, Ethernet Link Down

DB1 PAUSE – Pause control in effect

DB2-15 Not used, always read as 0

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EP5 (Ethernet Port 5) Status Register

Provides alarm indications related to the Ethernet port 5 features.

For related commands, see STATus subsystem.

Example: STATus:EP5:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	PAUSE	LOS

DB0 LOS – Loss Of Signal, Ethernet Link Down

DB1 PAUSE – Pause control in effect

DB2-15 Not used, always read as 0

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EP6 (Ethernet Port 6) Status Register

Provides alarm indications related to the Ethernet port 6 features.

For related commands, see STATus subsystem.

Example: STATus:EP6:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	PAUSE	LOS

DB0 LOS – Loss Of Signal, Ethernet Link Down

DB1 PAUSE – Pause control in effect

DB2-15 Not used, always read as 0

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EP7 (Ethernet Port 7) Status Register

Provides alarm indications related to the Ethernet port 7 features.

For related commands, see STATus subsystem.

Example: STATus:EP7:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	PAUSE	LOS

DB0 LOS – Loss Of Signal, Ethernet Link Down

DB1 PAUSE – Pause control in effect

DB2-15 Not used, always read as 0

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EP8 (Ethernet Port 8) Status Register

Provides alarm indications related to the Ethernet port 8 features.

For related commands, see STATus subsystem.

Example: STATus:EP8:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	-	-	PAUSE	LOS

DB0 LOS – Loss Of Signal, Ethernet Link Down

DB1 PAUSE – Pause control in effect

DB2-15 Not used, always read as 0

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EP9 (Ethernet Port 9) Status Register

Provides alarm indications related to the Ethernet port 9 features.

For related commands, see STATus subsystem.

Example: STATus:EP9:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	DINV	TXFLT	PAUSE	LOS

DB0 LOS – Loss Of Signal, Ethernet Link Down

DB1 PAUSE – Pause control in effect

DB2 TXFLT - GBIC Tx Fault

DB3 DINV - GBIC Data Invalid

DB4-15 Not used, always read as 0

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EP10 (Ethernet Port 10) Status Register

Provides alarm indications related to the Ethernet port 10 features.

For related commands, see STATus subsystem.

Example: STATus:EP10:EVENt?

DB15	DB14	DB13	DB12	DB11	DB10	DB9	DB8
-	-	-	-	-	-	-	-

DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
-	-	-	-	DINV	TXFLT	PAUSE	LOS

DB0 LOS – Loss Of Signal, Ethernet Link Down

DB1 PAUSE – Pause control in effect

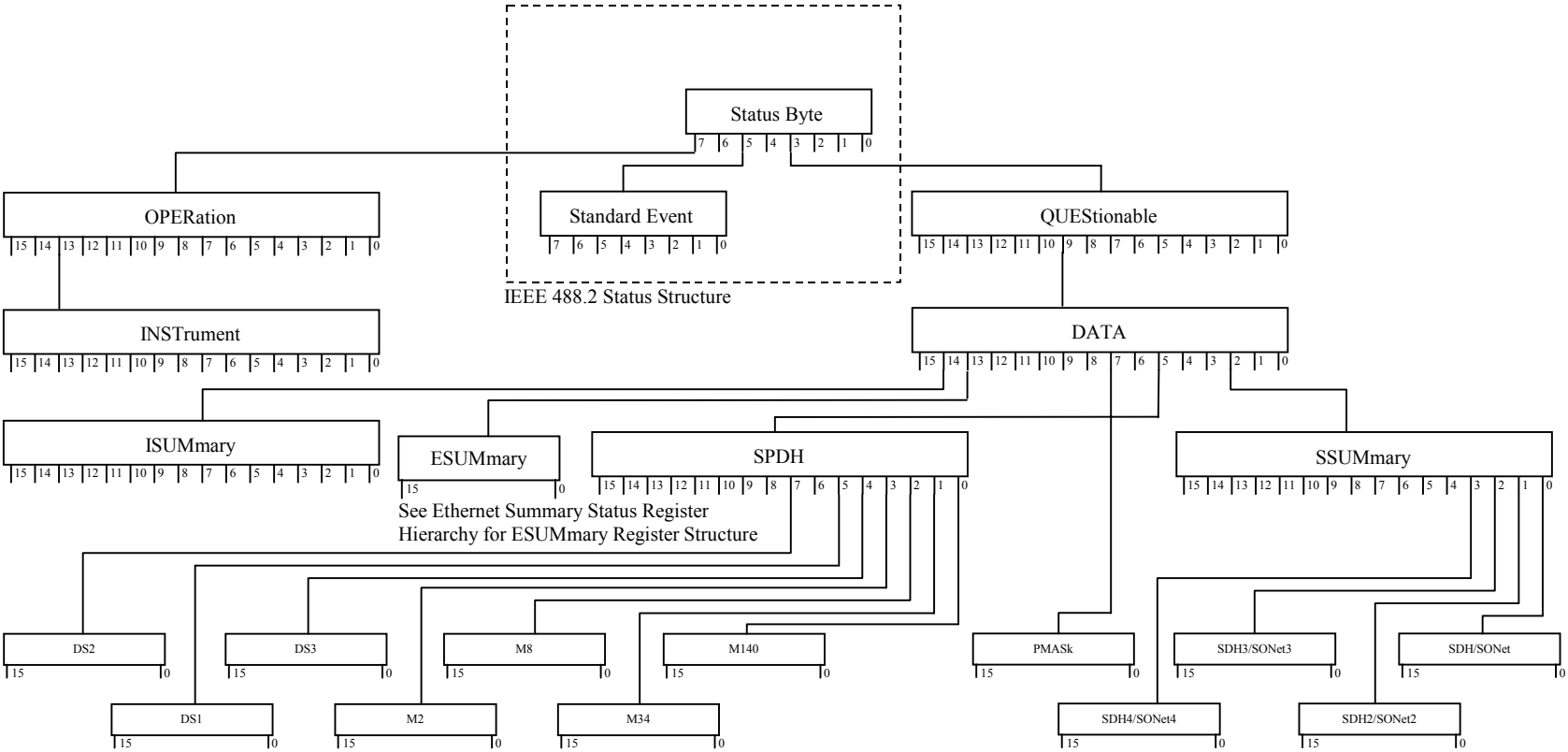
DB2 TXFLT - GBIC Tx Fault

DB3 DINV - GBIC Data Invalid

DB4-15 Not used, always read as 0

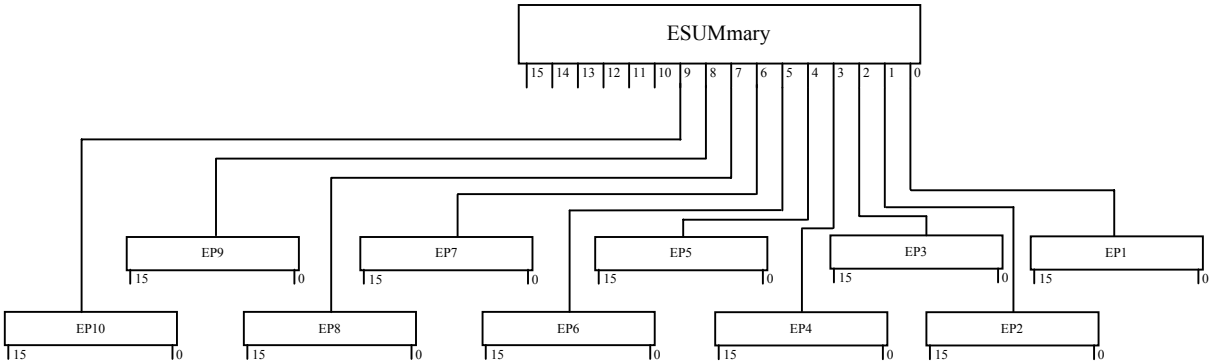
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Status Register Hierarchy



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Status Register Hierarchy - Ethernet Summary



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Programmed Status Reporting

When a condition is detected, a summary bit is generated by the Status Register which detects the condition. This summary bit, in most cases, passes through other Status Registers before affecting the Status Byte. These other Status Registers also generate a summary bit. By setting the Event Enable Register mask in all registers in the chain, the status condition can be reported.

When implementing Status reporting into your programming, consider the following with reference to the Status Registers Relationship diagram in the Status Register Hierarchy.

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 en 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 transitions bit 9.

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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)

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8

General Remote Control Information

SCPI Standard 8-2
GPIB Universal Commands 8-3

General Information

This chapter contains general remote control information. In particular, the background of SCPI and GPIB meta messages.

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SCPI Standard

Standard Commands for Programmable Instruments (SCPI) is a standard of the SCPI Consortium (http://www.scpiconsortium.org) 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

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GPIB Universal Commands

These required commands perform the most basic remote functions over GPIB and are common to all GPIB controllable instruments. They are hardwired via the cabling present in the GPIB connection are often referred to as meta-messages. The “commands” are as follows:-

- DEVICE CLEAR
- SERIAL POLL
- REMOTE ENABLE
- LOCAL LOCKOUT
- GO TO LOCAL

Device Clear

This command will initialize the instrument GPIB hardware.

The command using some forms of the Basic programming language, for example, is:

CLEAR 705 (where 7 is the Bus I/O select code and 05 is the device address).

Serial Poll

A serial poll will retrieve the value of the primary Status Byte (page 7-3). This byte contains useful information about the current state of the instrument.

An example command using some forms of the Basic programming language is:

SPOLL (705)

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Remote Enable

This command instructs the instrument to enter the REMOTE state and be ready to accept configuration commands.

An example command using some forms of the Basic programming language is:

```
REMOTE (705)
```

Local Lockout

This command is not implemented in the instrument at this time.

Local

The Local command returns the instrument from Remote operation to local front panel control. Once received, the instrument will only respond to query commands.

An example command using some forms of the Basic programming language is:

```
LOCAL 705
```


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9

Backwards Compatible SCPI Command Reference

Backwards Compatibility 9-2

Commands Provided for Backward Compatibility 9-4

Earlier Version Features With No SCPI Support 9-53

Workarounds for Incompatible Commands 9-55

Backwards Compatibility

This chapter contains detailed information on commands that were once used in earlier product versions and are provided for backwards compatibility with those versions.

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Backwards Compatibility

As products evolve, differences in the same or similar features and their corresponding SCPI commands will emerge. This chapter documents the compatibility of SCPI commands between this instrument version and any older versions, including the OmniBER 718/719 product family, with respect to compatible features. From this point onwards, they will all be commonly referred to as “earlier product versions”.

Where an instrument feature is not provided in this version of the product then there will obviously be no SCPI in support of that feature. Please refer to the Manuals of your earlier product version for information on the SCPI commands and features provided for that product.

When you migrate your control software to this instrument and review SCPI commands for reuse, you are strongly encouraged to use the new versions of these commands. This will minimize future compatibility issues with your use of SCPI.

Commands listed in this chapter are provided for the support of backwards compatibility. They may not be provided in future versions of this product family and are subject to deprecation.

Note the use of “**|**” throughout this Manual to indicate node or parameter aliasing. For example,

SOURce:DATA:TELEcom:SDH|SONet:PAYLoad

This chapter is structured as follows

1. Commands Provided for Backward Compatibility

These are commands which are identical or similar to the corresponding commands found in earlier instrument versions, but have been added or modified for compatibility.

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Under each command, the “Limitations” subheading will identify any restrictions relevant to the existing instrument functionality. However, it will not attempt to explain missing or unsupported command parameters due to feature reduction. That information should be obtained from the instrument specifications.

Under each command, the “Preferred” subheading will identify the migration path using recommended commands or parameters.

2. Earlier Version Features With No SCPI Support

Commands for features supported in both instruments but NO SCPI support in this instrument.

3. Workarounds for Incompatible Commands

Commands for which there is a workaround in this instrument. 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.

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Commands Provided for Backward Compatibility

For parameter details of backward compatible commands please refer to the SCPI manual for the earlier version of your instrument.

For longer-term support it is recommended that the **Preferred** commands belonging to the command set of this instrument be used where possible.

:FETCh

:FETCh:…:SDH|SONet:TRIButary:… ?

Limitations:

Preferred: This nodename correction is universal throughout this manual.

:FETCh:**SDH**:**TU**:… and

:FETCh:**SONet**:**VT**:…

See also:

:FETCh:ARRay:DATA:TELecom:SDH|SONet:OVERhead? <numeric>,<numeric>,<numeric>

Limitations:

Preferred: :SENSe:DATA:TELecom:SDH|SONet:OVERhead:CHANnel

:FETCh:ARRay:DATA:TELECOM:SDH|SONet:OVERhead:DATA?

See also:

:FETCh:ARRay:DATA:TELecom:SDH|SONet:POVerhead? <numeric>

Limitations:

Preferred: :FETCh:ARRay:DATA:TELECOM:SDH|SONet:POVerhead:DATA?

See also:

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:FETCh:SCALar:DATA:TELecom:SDH|SONet:OVERhead? <numeric>,<numeric>,<discrete>

Preferred: :SENSe:DATA:TELecom:SDH|SONet:OVERhead:CHANnel

:FETCh:SCALar:DATA:TELECOM:SDH|SONet:OVERhead:DATA?

See also:

:FETCh:SCALar:DATA:TELecom:SDH|SONet:POVerhead? <discrete>

Preferred: :FETCh:SCALar:DATA:TELECOM:SDH|SONet:POVerhead:DATA?

See also:

:FETCh:SCALar:DATA:TELecom:SDH|SONet:TRIButary:POVerhead :SLABel

Limitations:

Preferred: :FETCh:SCALar:DATA:TELECOM:SDH|SONet:POVerhead:DATA?

See also:

:FETCh:STRing:DATA:TELecom:SDH|SONet:K1?

Preferred: :FETCh:SCALar:DATA:TELecom:SDH|SONet:OVERhead:K1?

See also:

:FETCh:STRing:DATA:TELecom:SDH|SONet:K2?

Limitations:

Preferred: :FETCh:SCALar:DATA:TELecom:SDH|SONet:OVERhead:K2?

See also:

:FETCh:STRing:DATA:TELecom:SDH|SONet:S1?

Limitations:

Preferred: :FETCh:SCALar:DATA:TELecom:SDH|SONet:OVERhead:S1?

See also:

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:INPut and OUTPut:TELecom

:INPut:TELecom:OC3|OPT1:INTerface <discrete>

:INPut:TELecom:OC12|OPT4:INTerface <discrete>

:INPut:TELecom:OC48|OPT16:INTerface <discrete>

Limitations: Also affects interface state of other OCn or OPTn types
Parameter values not supported MONitor

Preferred: :INPut:TELecom:INTerface

See also:

The corresponding query returns the interface state in discrete form.

:INPut and :OUTput:TELecom:OC3|OPT1:RATE <discrete>

:INPut and :OUTput:TELecom:OC12|OPT4:RATE <discrete>

:OUTPut:TELecom:SDH|SONet:RATE <discrete>

Limitations: Also affects the line rate of other OCn or OPTn types

Preferred: :SOURce and
:SENSe:DATA:TELecom:SDH|SONet:RATE

See also:

The corresponding query returns the line rate in discrete form.

:OUTPut:TELecom:SPDH:RATE <discrete>

Limitations: Affects the line rate of all SPDH types

Preferred: :SOURce:DATA:TELecom:SPDH:RATE

See also:

The corresponding query returns the line rate in discrete form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

:OUTPut:TELecom:OC3|OPT1:LASer <boolean>

:OUTPut:TELecom:OC12|OPT4:LASer <boolean>

:OUTPut:TELecom:OC48|OPT16:LASer <boolean>

Limitations: Affects the LASer state of all OCn and OPTn types

Preferred: :OUTPut:TELecom:LASer

See also:

The corresponding query returns the laser state in boolean form.

:OUTPut:TELecom:OC3|OPT1:WAVelength <discrete>

:OUTPut:TELecom:OC12|OPT4: WAVelength <discrete>

:OUTPut:TELecom:OC48|OPT16: WAVelength <discrete>

Limitations: Affects the wavelength of all OCn and OPTn types

Preferred: :OUTPut:TELecom:WAVelength

See also:

The corresponding query returns the wavelength in discrete form.

:OUTPut:TELecom:SPDH:CODE <discrete>

Limitations: Affects the line code of all SPDH types

Preferred: :OUTPut:TELecom:CODE

See also:

The corresponding query returns the line code in discrete form.

:INPut:TELecom:SPDH:INSert:CODE <discrete>

:OUTPut:TELecom:SPDH:DROP:CODE <discrete>

Limitations:

Preferred: :INPut and
:OUTPut:TELEcom:SPDH:TSIGnal:PAYLoad:CODE

See also:

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The corresponding queries return the drop and insert line code in discrete form.

:OUTPut:TELecom:SPDH:LEVel <discrete>

Limitations:

Preferred: :OUTPut:TELEcom:LEVel

See also:

The corresponding query returns the output level in discrete form.

:INPut and :OUTPut:TELecom:SPDH:BALance <discrete>

Limitations:

Preferred: :INPut and :OUTPut:TELEcom:TERMination

See also:

The corresponding query returns the termination in discrete form.

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:SOURce:CLOCk

:SOURce:CLOCk:SDH|SONet:FOFFset:OFFSet <numeric><suffix>

Limitations: Default suffix now PPM, ratio no longer supported

Preferred: :SOURce:CLOCk:SDH|SONet:FOFFset:OFFSet <numeric>

See also:

The corresponding query returns the clock offset in PPM.

:SOURce:CLOCk:SDH|SONet:FORMat <discrete>

Limitations: Also affects the setting of clock format

Parameter values not supported: K64

Preferred: :SOURce:CLOCk:FORMat <discrete>

See also:

The corresponding query returns the clock format in discrete from.

:SOURce:CLOCk:SDH|SONet:SOURce <discrete>

Limitations: Affects the settings for all clock sources, not just SDH|SONET

Parameter values not supported: RMON0 | RMN1
RMON1 | RMN3
RMON4 | RMN12

Preferred: :SOURce:CLOCk:SOURce
:SOURce:CLOCk:RECovered

See also:

The corresponding query returns the clock source in discrete form.

:SOURce:CLOCk:SPDH:SOURce <discrete>

Limitations: Affects the settings for all clock sources, not just SPDH.

Preferred: :SOURce:CLOCk:SOURce
:SOURce:CLOCk:RECovered

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See also:

The corresponding query returns the clock source in discrete form.

:SOURce:CLOCk:SPDH:FORMat <discrete>

Limitations: Affects the settings for all clock sources, not just SPDH.

Preferred: :SOURce:CLOCk:FORMat

See also:

The corresponding query returns the clock format in discrete form.

:SOURce:CLOCk:SPDH:M2|M8|M34|M140|DS3|DS1:FOFFSet <discrete>

Limitations: All commands affect the same clock offset

Parameter values not supported: PMAX, NMAX

Preferred: :SOURce:CLOCk:SPDH:FOFFset

See also:

The corresponding query returns the clock offset state in discrete form.

:SOURce:CLOCk:SPDH:M2|M8|M34|M140|DS3|DS1:FOFFSet:OFFSet <numeric>

Limitations: All commands affect the same clock offset

Preferred: :SOURce:CLOCk:SPDH:FOFFset:OFFSet

See also:

The corresponding query returns the clock offset value in numeric form.

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:SOURce and :SENSe:DATA:TELecom:

:SOURce and :SENSe:DATA:TELecom:TFUNction<discrete>

Limitations: Parameter values not supported — PDHPayload, 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:MSPMessages:...

:SOURce:DATA:TELecom:SONet:POINter:...

:SOURce:DATA:TELecom:SOURce <discrete> and :SENSe:DATA:TELecom:SENSe <discrete>

Limitations: These commands perform no function.

They are provided solely for backward compatibility.

Preferred:

See also:

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

Limitations: Different parameter types and increased functionality

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:SOURce and :SENSe:DATA:TELecom:SDH|SONet

General Commands

:SOURce and :SENSe:DATA:TELecom:SDH|SONet:TRIButary:…

Limitations:

Preferred: This nodename correction is universal throughout this manual.

:SOURce and :SENSe:DATA:TELecom:**SDH**:**TU**:…

:SOURce and :SENSe:DATA:TELecom:**SONet**:**VT**:…

See also:

The corresponding query commands are also modified.

Error and Alarm Generation

:SOURce:DATA:TELecom:SDH|SONet:ERRor:GROup <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:ERRor:GROup

See also:

The corresponding query returns the error group in discrete form.

:SOURce:DATA:TELecom:SDH|SONet:ALARm <discrete>

Limitations: Parameter values not supported: TULop | LOPV
TUPais | AISV
LPRDi | RDIV
LOMultiframe
TUUNequiped | VTUNequiped

Preferred: :SOURce:DATA:TELecom:ALARm

:SOURce:DATA:TELecom:SDH|SONet:ALARm:….

See also:

The corresponding query returns the Alarm in discrete form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

:SOURce:DATA:TELecom:SDH:ALARm:SOOFrame

Limitations: Affects :SOURce:DATA:TELecom:SDH:ALARm

Preferred: :SOURce:DATA:TELecom:SDH:ALARm: OOF

See also: :SOURce:DATA:TELecom:SDH:ALARm

:SOURce:DATA:TELecom:SONet:ALARm:SSEFrame

Limitations: Affects :SOURce:DATA:TELecom:SONet:ALARm

Preferred: :SOURce:DATA:TELecom:SONet:ALARm: OOF|SEF

See also: :SOURce:DATA:TELecom:SONet:ALARm

:SOURce:DATA:TELecom:SDH|SONet:ALARm:HERDi

Limitations:

Preferred: SOURce:DATA:TELEcom:SDH|SONet:ALARm:PATH

See also:

:SOURce:DATA:TELecom:SDH:ERRor:MSPThreshold:EINTerval <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:ERRor:ASPThreshold: EINTerval

See also:

The corresponding query returns the MSP Threshold:Error Interval in discrete form.

:SOURce:DATA:TELecom:SDH:ERRor:MSPThreshold:NERRors <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:ERRor:ASPThreshold:NERRors

See also:

The corresponding query returns the MSP Threshold Number of Errors in numeric form.

:SOURce:DATA:TELecom:SDH|SONet:ERRor:TYPE <discrete>

Limitations: Parameter values not supported: TCBip | REIV

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TUBip | CVV

Preferred: :SOURce:DATA:TELecom:SDH|SONet:ERRor:….

See also:

The corresponding query returns the Error Type in discrete form.

:SOURce:DATA:TELecom:SDH|SONet:ERRor:RATE <discrete>

Limitations: Parameter value not supported: ONCE

Preferred: :SOURce:DATA:TELecom:ERRor:SINGle

See also:

:SOURce:DATA:TELecom:SDH|SONet:PDHPayload:ERRor:TYPE <discrete>

Limitations: Affects error type for all payloads

Preferred: :SOURce:DATA:TELecom:SPDH:ERRor:…

See also:

The corresponding query returns the Rate in discrete form.

:SOURce:DATA:TELecom:SDH|SONet:PDHPayload:ERRor:RATE <discrete>

Limitations: Affects error rate for all payloads.

Parameter value not supported - ONCE

Preferred: :SOURce:DATA:TELecom:SDH|SONet:ERRor:RATE

:SOURce:DATA:TELecom:SDH|SONet:ERRor:RATE:USER:ACTion

:SOURce:DATA:TELecom:ERRor:SINGle

See also:

The corresponding query returns the Rate in discrete form.

:SOURce:DATA:TELecom:SDH|SONet:PDHPayload:ERRor:RATE:USER <numeric>

Limitations: Affects user error rate for all payloads

Preferred: :SOURce:DATA:TELecom:SDH|SONet:ERRor:RATE:USER

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Backwards Compatibility

Commands Provided for Backward Compatibility

:SOURce:DATA:TELecom:SDH|SONet:ERRor:RATE:USER:ACTion

See also:

The corresponding query returns the User defined Word in numeric form.

Backgrounds

:SOURce:DATA:TELecom:SDH:AU4|AU3|AU4C:BACKground <discrete>

Limitations: Affects the background for all AU types,

Preferred: :SOURce:DATA:TELecom:SDH:AU:BACKground

See also:

The corresponding query returns the background in discrete form.

:SOURce:DATA:TELecom:SDH|SONet:PRIMary:BACKground:PAYLoad:PATTern <discrete>

Limitations: Parameter alias P1100 | B1100, so query always returns B1100

Preferred: :SOURce:DATA:TELecom:SDH|SONet:TU|VT:BACKground:PAYLoad:PATTern

See also:

The corresponding query returns the background pattern in discrete form.

:SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern:UWORd <numeric>, <string>

Limitations: Return type always <numeric>

Preferred: :SOURce:DATA:TELecom:SDH:TUG3:BACKground:PAYLoad:PATTern:USER

See also:

The corresponding query returns the background word in numeric form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

Mappings

:SOURce and :SENSe:DATA:TELecom:SDH:AU4 <numeric>

Limitations:

Preferred: :SOURce and SENSe:DATA:TELecom:SDH:AUG1
:SOURce and SENSe:DATA:TELecom:SDH:AUG4

See also:

The corresponding query returns the AU4 in numeric form.

:SOURce and :SENSe:DATA:TELecom:SDH:AU4C <numeric>

Limitations:

Preferred: :SOURce and SENSe:DATA:TELecom:SDH:AUG4

See also:

The corresponding query returns the AU4C in numeric form.

:SOURce and :SENSe:DATA:TELecom:SONet:STS12c <numeric>

Limitations:

Preferred: :SOURce and SENSe:DATA:TELecom:SONet:STS3

See also:

The corresponding query returns the selected STS12C in numeric form.

:SOURce and :SENSe:DATA:TELecom:SDH|SONet:MAPPing <discrete>

Limitations:

Parameter values not supported: M140
M34
DS3
ATM
IPOS

Preferred: :SOURce and
:SENSe:DATA:TELecom:SDH|SONet:PAYLoad

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See also:

The corresponding query returns the mapping in discrete form.

:SOURce and
:SENSe:DATA:TELecom:SDH|SONet:PAYLoad <discrete>

Limitations: Parameter values not recommended: TU3
TU12 | M2
TU2
TU11 | DS1

Preferred: :SOURce and
:SENSe:DATA:TELecom:SDH|SONet:PAYLoad
:SOURce and
:SENSe:DATA:TELecom:SDH|SONet:VT|TU:TYPE

See also:

The corresponding query returns the Payload type valid with the current instrument.

:SOURce and
:SENSe:DATA:TELecom:SDH|SONet:TRIButary <numeric>

Limitations:

Preferred: :SOURce and
:SENSe:DATA:TELecom:SDH|SONet:TU|VT

See also:

The corresponding query returns the active VT or TU in numeric form.

:SOURce and
:SENSe:DATA:TELecom:SDH|SONet:TRIButary:MAPPing <discrete>

Limitations:

Preferred: :SOURce and
:SENSe:DATA:TELecom:SDH|SONet:PAYLoad

See also:

The corresponding query returns the mapping in discrete form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

:SOURce and
:SENSe:DATA:TELecom:SDH|SONet:PAYLoad:TYPE <discrete>

Limitations:

Preferred: :SOURce and
:SENSe:DATA:TELecom:SPDH:PAYLoad:FRAMing

:INPut and
:OUTPut:TELecom:SDH|SONet:PAYLoad:LOCation

See also:

The corresponding query returns the payload framing in discrete form.

:SOURce and
:SENSe:DATA:TELecom:SDH|SONet:PAYLoad:STRucture
<discrete>

Limitations:

Preferred: :SOURce and
:SENSe:DATA:TELecom:SPDH:PAYLoad:STRucture

See also:

The corresponding query returns the PDH payload structure setting in discrete form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

APS (MSP) Messages

:SOURce:DATA:TELecom:SDH:MSPMessages:…

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:**APSMessages**:….

See also:

The corresponding queries are also so adjusted.

:SOURce:DATA:TELecom:SDH:MSPMessages:BRIDge <string> and :SOURce:DATA:TELecom:SONet:APSMessages :BRIDge <string>

Limitations: Return type always <numeric>

Preferred: Same commands with <numeric> parameter and :APSMessages node

See also:

The corresponding query returns the Messages Bridged channel in numeric form.

:SOURce:DATA:TELecom:SDH:MSPMessages: DNODe <string> and :SOURce:DATA:TELecom:SONet:APSMessages :DNODe <string>

Limitations: Return type always <numeric>

Preferred: Same commands with <numeric> parameter and :APSMessages node

See also:

The corresponding query returns the MSP Messages Destination Node in numeric form.

:SOURce:DATA:TELecom:SDH:MSPMessages: SCODe <discrete> and :SOURce:DATA:TELecom:SONet:APSMessages:SCODe <discrete>

Limitations: Return type always <numeric>

Preferred: Same commands with <numeric> parameter and :APSMessages node

See also:

The corresponding query returns the Messages Type in numeric form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

:SOURce:DATA:TELecom:SDH|SONet:MSPMessages|APSMessages:SNODe <string>

Limitations: Return type always <numeric>

Preferred: Same command with <numeric> parameter and :APSMessages node

See also:

The corresponding query returns the MSP Messages Source Node in numeric form.

Overheads

:SOURce:DATA:TELecom:SDH|SONet:OVERhead:DATA <numeric>,<numeric>,<discrete>,<string>

Limitations: Return type always <numeric>

Preferred: :SOURce:DATA:TELecom:SDH|SONet:OVERhead:DATA <numeric>, <numeric>, <discrete>, <numeric>

See also:

The corresponding query returns the requested overhead data byte in numeric form.

:SOURce:DATA:TELecom:SDH|SONet:OVERhead:DATA:HEXadecimal <numeric>,<numeric>,<discrete>,<string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:OVERhead:DATA

See also:

The corresponding query returns the requested overhead byte in Hexadecimal string format.

:SOURce:DATA:TELecom:SDH|SONet:OVERhead:J0 <string>

Preferred: :SOURce:DATA:TELecom:SDH|SONet:OVERhead:J0:PATTern:B16Crc

:SOURce:DATA:TELecom:SDH|SONet:OVERhead:J0:PATTern:B64

See also:

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Backwards Compatibility

Commands Provided for Backward Compatibility

The corresponding query returns the User defined J0 Pattern in string form.

:SOURce:DATA:TELecom:SDH|SONet:OVERhead:J0:HEXadecimal?

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:OVERhead:J0:PATTern:Array?

See also:

Returns <block>

:SOURce:DATA:TELecom:SDH|SONet:OVERhead:J0:PATTern <discrete>

Limitations:	Older parameter value not supported	TEST
	Older parameter value supported	USER
	New parameter value preferred	B16Crc

The corresponding query returns the J0 pattern type in discrete form.

:SOURce and :SENSe:DATA:TELecom:SDH|SONet:PAYLoad:PATTern <discrete>

Limitations: Affects all Patterns not just SDH and SONet

Preferred: :SOURce and :SENSe:DATA:TELecom:PATTern:TYPe

:SOURce and :SENSe:DATA:TELecom:PATTern:TYPe:PRBS

:SOURce and :SENSe:DATA:TELecom:PATTern:TYPe:WORD

:SOURce and :SENSe:DATA:TELecom:PATTern:TYPe:WORD:PRESet

See also:

The corresponding query returns the Payload Pattern in discrete form.

:SOURce and :SENSe:DATA:TELecom:SDH|SONet:PAYLoad:UWORd <string>

Limitations: Affects all Patterns not just SDH and SONet

Preferred: :SOURce and :SENSe:DATA:TELecom:PATTern:TYPE:WORD:USER

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Backwards Compatibility

Commands Provided for Backward Compatibility

See also:

The corresponding query returns the User defined Word in string form.

:SOURce and :SENSe:DATA:TELecom:SDH|SONet:PRBS:POLarity <discrete>

Limitations: Affects all Patterns not just SDH and SONet.

Parameter NORMal is now an alias of NINVert but the logic is now based on PRBS technology rather than telecom standards.

Query replies with NINV instead of NORM.

Preferred: :SOURce and :SENSe:DATA:TELecom:PATTern:POLarity

See also:

The corresponding query returns the PRBS polarity in discrete form.

Pointers

:SOURce:DATA:TELecom:SDH|SONet:POINter:ACTion

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POINter:NEW:ACTion

See also:

:SOURce:DATA:TELecom:SDH|SONet:POINter:ADJust

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POINter:BURst:ACTion

See also:

:SOURce:DATA:TELecom:SDH|SONet:POINter:DIRection <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POINter:BURSt:DIRection

See also:

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Backwards Compatibility

Commands Provided for Backward Compatibility

The corresponding query returns the Pointer Burst Direction in discrete form.

:SOURce:DATA:TELecom:SDH|SONet:POINter:IDECrement <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POINter:BURSt:SIZE

See also:

The corresponding query returns the Pointer Burst Increment or Decrement Size in numeric form.

:SOURce:DATA:TELecom:SDH|SONet:POINter:NPOinter <discrete>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POINter:NEW:FLAG

See also:

The corresponding query returns the Pointer New Data Flag in discrete form.

:SOURce:DATA:TELecom:SDH|SONet:POINter:OFFSet <discrete>

Limitations:

Older parameter values not supported	TU | VT	
Older parameter values supported	SIGNal	VC4 | SPE
New parameter values preferred	SIGNal	PAYLoad

The corresponding query returns the Pointer Offset type in discrete form.

:SOURce:DATA:TELecom:SDH|SONet:POINter:OFFset:RATE <numeric><suffix>

Limitations: Default suffix now PPM, ratio no longer supported

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POINter:OFFset:RATE <numeric>

See also:

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Backwards Compatibility

Commands Provided for Backward Compatibility

The corresponding query returns the pointer offset rate in PPM.

:SOURce:DATA:TELecom:SDH|SONet:POINter:VALue <numeric>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POINter:NEW:VALue

See also:

The corresponding query returns the New Pointer Value in numeric form.

:SOURce:DATA:TELecom:SDH|SONet:TRIButary:POINter:TRANsmitted?

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POINter:TRANsmitted

See also:

The corresponding query returns the Transmitted Pointer Value in numeric form.

Path Overhead

:SOURce:DATA:TELecom:SDH|SONet:POVerhead:DATA <discrete>,<string>

Limitations: New query return type is <numeric>

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POVerhead:DATA <discrete>, <numeric>

See also:

The corresponding query returns the requested Path Overhead data in numeric form.

:SOURce:DATA:TELecom:SDH|SONet:POVerhead:J1 <string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POVerhead:J1:PATTern:B64

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Backwards Compatibility

Commands Provided for Backward Compatibility

See also:

The corresponding query returns the user defined 64 byte Path Overhead J1 data in string form.

:SOURce:DATA:TELecom:SDH|SONet:POVerhead:J1:HEXadecimal?

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POVerhead:J1:PATTern:Array?

See also:

:SOURce:DATA:TELecom:SDH|SONet:POVerhead:J1:CRC7 <string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POVerhead:J1:PATTern:B16Crc

See also:

The corresponding query returns the user defined 15 Byte Path Overhead J1 CRC 7 data in string form.

:SOURce:DATA:TELecom:SDH|SONet:POVerhead:J1:PATTern <discrete>

Limitations:	Older parameter values not supported	TEST	CRC7Test
	Older parameter values supported	USER	CRC7User
	New parameter values preferred	B64	B16Crc

The corresponding query returns the J1 pattern type in discrete form.

:SOURce:DATA:TELecom:SDH|SONet:POVerhead:SLABel <discrete>

Limitations: Deprecated parameter USER

Preferred: :SOURce:DATA:TELecom:SDH|SONet:POVerhead:DATA

See also:

The corresponding query returns the high path signal label in discrete form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

:SOURce:DATA:TELecom:SDH|SONet:TRIButary:POVerhead:C2:SLABel <discrete>

Limitations: Deprecated parameter USER

Preferred: :SOURce:DATA:TELecom:SDH|SONet:TU|VT:POVerhead:C2:SLABel

and

:SOURce:DATA:TELecom:SDH|SONet:POVerhead:DATA

See also:

The corresponding query returns the low path signal label in discrete form.

:SOURce:DATA:TELecom:SDH|SONet:OVERhead:SBYTe <discrete>

Limitations: Query always returns new parameter values.

Preferred: New preferred parameters SSUA, SSUB, SETS

See also:

The corresponding query returns the S1 byte message in discrete form.

Tandem Connection Monitoring

:SOURce:DATA:TELecom:SDH:TCM:APID:DATA <string>

Limitations:

Preferred: :SOURce:DATA:TELecom:SDH:TCM:APID:PATTERN:B16Crc

See also:

The corresponding query returns the 15 byte User defined Tandem Connection APId message in string form.

: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

The corresponding query returns the TCM Access Point Identifier pattern type in discrete form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

:SOURce and
:SENSe:DATA:TELecom:SDH:TCM:PATH <discrete>

Limitations: Parameter value not supported: LOW

Preferred: :SOURce and :SENSe:DATA:TELecom:SDH:TCM:HPATh

:SOURce and :SENSe:DATA:TELecom:SDH:TCM:LPATh

See also:

The corresponding query returns the Tandem Connection Path in discrete form.

Functions

:SOURce and
:SENSe:DATA:TELecom:SDH|SONet:TFUNction:TYPE <discrete>

Limitations: Accepted but performs no function. Newer instruments do not require Test Function Selection.

Preferred: :SOURce:DATA:TELecom:TFUNction:DISable

See also: :SOURce and :SENSe:DATA:TELecom:TFUNction

:SOURce:DATA:TELecom:SDH|SONet:ALARm

:SOURce:DATA:TELecom:SDH|SONet:ERRor:TYPE

:SOURce:DATA:TELecom:SDH|SONet:ASPMessages:...

:SOURce:DATA:TELecom:SDH|SONet:POINter:...

:SOURce:DATA:TELecom:SDH|SONet:THRumode <discrete>

Limitations: Affects through mode for all, not just SDH and SONET

Preferred: :SOURce:DATA:TELecom:THRu

See also:

The corresponding query returns the Thru Mode state in discrete form.

:SOURce:DATA:TELecom:SDH|SONet:PAYLoad:OFFSet <numeric> <suffix>

Limitations: Suffix no longer supported.

Preferred: Same command, no suffix.

See also: :SOURce:DATA:TELecom:SDH|SONet:PAYLoad:FOFFset

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The corresponding query returns the offset in numeric form.

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:SOURce and :SENSe:DATA:TELecom:PDH

General Commands

:SOURce and :SENSe:DATA:TELecom:PDH:…:TU:…

Limitations:

Preferred: These nodename corrections are universal throughout this manual. TU is a reference to SDH and the more correct TRIButary should be used.

:SOURce and :SENSe:DATA:TELecom:**SPDH**:…:**TRIButary**:…

See also:

The corresponding query commands are also modified.

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

Limitations: Affects through mode for all, not just SPDH

Preferred: :SOURce:DATA:TELecom:THRu

See also:

The corresponding query returns the Thru Mode state in discrete form.

:SOURce and :SENSE:DATA:TELecom:SPDH:PAYLoad:TYPE <discrete>

Limitations:

Preferred: :SOURce and :SENSe:DATA:TELecom:SPDH:PAYLoad:FRAMing

See also:

The corresponding query returns the PDH framing in discrete form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

Structured Test Signal

:SOURce and
:SENSe:DATA:TELecom:SPDH:TSIGnal:MAPPing <discrete>

Limitations:

Preferred: :SOURce and
:SENSe:DATA:TELecom:SPDH:TSIGnal:RATE

See also:

The corresponding query returns the test signal mapping in discrete form.

:SOURce and
:SENSe:DATA:TELecom:SPDH:TSIGnal:PAYLoad <discrete>

Limitations: Query commands will not report drop or insert status – IM2, IDS1, DM2, DDS1

Preferred: :SOURce and
:SENSe:DATA:TELecom:SPDH:TSIGnal:FRAMing

and

:INPut and
:OUTPut:TELEcom:SPDH:TSIGnal:PAYLoad:LOCation

See also:

The corresponding query returns the test signal framing in discrete form.

:SOURce and
:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:M2:K64XN <string>

:SOURce and
:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K64XN <string>

:SOURce and
:SENSe:DATA:TELecom:SPDH:TSIGnal:TSLot:DS1:K56XN <string>

Limitations: Return type always <numeric>

Preferred: Use of <numeric> parameter

See also:

The corresponding queries return the test signal timeslot mapping in numeric form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

Error and Alarm Generation

:SOURce:DATA:TELecom:SPDH:TFUNction:TYPE <discrete>

Limitations: Parameters accepted but perform no function

Preferred: :SOURce:DATA:TELecom:TFUNction:DISable

:SOURce:DATA:TELecom:SPDH:Error:...

See also:

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

Limitations: Parameter value not supported: ONCE

Preferred: :SOURce:DATA:TELecom:ERRor:SINGle

See also:

:SOURce:DATA:TELecom:SPDH:ERRor:TYPE <discrete>

Limitations: Parameters accepted but perform no function

Preferred: :SOURce:DATA:TELecom:SPDH:Error:...

:SOURce:DATA:TELecom:SPDH:…:Error

See also:

:SOURce:DATA:TELecom:PDH:ERRor:FRAMe:NERRored <discrete>

:SOURce:DATA:TELecom:PDH:ERRor:MFRame:NERRored <discrete>

Limitations: Return type always <numeric>

Preferred: Use of <numeric> parameter

See also:

The corresponding queries return the burst error value in numeric form.

:SOURce:DATA:TELecom:SPDH:ERRor:TYPE <discrete>

Limitations: Parameters accepted but perform no function

Preferred: :SOURce:DATA:TELecom:SPDH:Error:...

:SOURce:DATA:TELecom:SPDH:…:Error

See also:

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Backwards Compatibility

Commands Provided for Backward Compatibility

:SOURce:DATA:TELecom:SPDH:M140:ALArm <discrete>

:SOURce:DATA:TELecom:SPDH:M34:ALArm <discrete>

:SOURce:DATA:TELecom:SPDH:M8:ALArm <discrete>

:SOURce:DATA:TELecom:SPDH:M2:ALArm <discrete>

:SOURce:DATA:TELecom:SPDH:DS1:ALArm <discrete>

:SOURce:DATA:TELecom:SPDH:DS3:ALArm <discrete

Limitations:	Older parameter value only applicable for the query command.	NONE
	Older parameter values not supported	LOS FEAC (for DS3)
Preferred	For older parameter LOS - :SOURce:DATA:TELecom:SPDH:ALARm:PHYSical	
	For older parameter FEAC - :SOURce:DATA:TELecom:SPDH:FEAC:…	
See also:		

The corresponding queries return the alarm in discrete form.

Signaling Bits

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

Limitations:	Return type always <numeric>
Preferred:	Use of <numeric> parameter
See also:	

The corresponding query returns the signaling bits bitmap in numeric form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

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

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

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

Limitations: Return type always <numeric>

Preferred: Use of <numeric> parameter

See also:

The corresponding queries return the signaling bits bitmap in numeric form.

DS3 FEAC

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

Limitations: Return type always <numeric>

Preferred: Use of <numeric> parameter

See also:

The corresponding query returns the FEAC code in numeric form.

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

Limitations:

Preferred	New parameter values	DS1E1Deactiv and DS1E1Activ

See also:

The corresponding query returns the FEAC loopback action in discrete form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

Spare Bits

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

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

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

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

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

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

:SOURce:DATA:TELecom:SPDH:M2:SASequence:PATTern <string

:SOURce:DATA:TELecom:SPDH:M2:CASMfm <string

Limitations: Return type always <numeric>

Preferred: Use of <numeric> parameter

See also:

The corresponding queries return the spare bits in numeric form.

DS1 Loopcodes

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

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

:SENSe:DATA:TELecom:SPDH:INBand:LPUP:USER <numeric>, <string>

:SENSe:DATA:TELecom:SPDH:INBand:LPDN:USER <numeric>, <string

Limitations: Return types always <numeric>

Preferred: Use of <numeric> parameters

See also:

The corresponding queries return the bit mask in numeric form.

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Backwards Compatibility

Commands Provided for Backward Compatibility

ITU Analysis Control

:SENSe:DATA:TELecom:SPDH:ANALysis:M2110…

:SENSe:DATA:TELecom:SPDH:ANALysis:M2120…

Limitations:

Preferred: Nodes :SPDH:ANALysis dropped as this is a “common” feature for all telecom types.

:SENSe:DATA:TELEcom:M2110…
:SENSe:DATA:TELEcom:M2120…

See also:

The corresponding query commands are also so modified.

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

Limitations: Feature deleted for parameters K64 and K56

This command only selects the M.2110 path under test. There is a now a separate command for M.2120.

Preferred :SENSe:DATA:TELEcom:M2110:PATH

See also: :SENSe:DATA:TELEcom:M2120:PATH

The corresponding query command is also so modified.

:SENSe:DATA:TELecom:SPDH:ANALysis:M2110:USER:ESECond <discrete>, <numeric>

:SENSe:DATA:TELecom:SPDH:ANALysis:M2110:USER:SESecond <discrete>, <numeric>

:SENSe:DATA:TELecom:SPDH:ANALysis:M2120:USER:ESECond <discrete>, <numeric>

:SENSe:DATA:TELecom:SPDH:ANALysis:M2120:USER:SESecond <discrete>, <numeric

Limitations: Only programs the RX direction user ES and SES thresholds.

Preferred :SENSe:DATA:TELEcom:M2110:USER

:SENSe:DATA:TELEcom:M2120:USER

See also:

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Backwards Compatibility

Commands Provided for Backward Compatibility

The corresponding query commands return the RX direction ES and SES thresholds in numeric form.

Round Trip Delay

:SENSe:DATA:TELecom:SPDH:RTDelay <boolean>

Limitations:

Preferred :SENSe:DATA:TELEcom:RTDelay

See also:

The corresponding query command returns the round trip delay action as a boolean.

Patterns (Out Of Service)

:SOURce and
:SENSe:DATA:TELecom:SPDH:PATTern <discrete>

Limitations: Affects all Patterns not just SPDH

Preferred: :SOURce and :SENSe:DATA:TELecom:PATTern:TYPe

:SOURce and :SENSe:DATA:TELecom:PATTern:TYPe:PRBS

:SOURce and :SENSe:DATA:TELecom:PATTern:TYPe:WORD

:SOURce and :SENSe:DATA:TELecom:PATTern:TYPe:WORD:PRESet

See also:

The corresponding query returns the pattern in discrete form.

:SOURce and
:SENSe:DATA:TELecom:SPDH:PATTern:UWORd <string>

Limitations: Affects all Patterns not just SDH and SONet

Preferred: :SOURce and
:SENSe:DATA:TELecom:PATTern:TYPE:WORD:USER

See also:

The corresponding query returns the User defined Word in string form.

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:SOURce and :SENSe:DATA:TELecom:SPDH:PRBS:POLarity <discrete>

Limitations: Affects all Patterns not just SPDH

Old parameter NORMal is now an alias of NINVert but the logic is now based on PRBS technology rather than telecom standards.

Query replies with NINV instead of NORM.

Preferred: :SOURce and :SENSe:DATA:TELecom:PATTern:POLarity

See also:

The corresponding query returns the PRBS polarity in discrete form.

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:SYSTem:

:SYSTem:CONFiguration <block>

Limitations: Block Data has different format from earlier instrument platforms

Preferred: Only supported in short form - :SYSTem:CONF

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:STATus:

:STATus:<register>:HISTORY

Limitations: Deprecated functionality.

The corresponding query is also deprecated.

:STATus:CHISTORY

Limitations: Deprecated functionality.

:STATus:CHISTORY

Limitations: Deprecated functionality.

:STATUS:<register>:….?

Status register specific details. Unless stated otherwise, status bits which have been deprecated will have their register position *Reserved* to assist in managing compatibility.

INSTrument

Limitations: **DB0 – SMG** – Deprecated

DB1 – LQE – Deprecated

DB7 – DISK – Deprecated

DATA

Limitations: **DB1 – FAS** – Deprecated

DB2,3,10 – SDHn/SONETn – Now summarised into DB2. DB3 and DB10 are released for future use.

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Backwards Compatibility

Commands Provided for Backward Compatibility

ISUMmary

Limitations: Summarises instrument common function LEDs and as such is subject to change.

DB3 – AIS – Deprecated

DB4 – FAR – Deprecated

DB5 – LOP – Deprecated

SDH | SONet

Limitations: **DB0 – LOS** – Deprecated. Use ISUMmary-DB1-LOS

DB6 – PSL – Deprecated. Use ISUMmary-DB13-PSL

DB14 – ERR – Deprecated. Use ISUMmary-DB14-ERR

SDH2 | SONet2

Limitations: **DB7 – ALSC to SIGW** - Bit replaced with monitoring for similar feature – Signal Wizard (SDH).

DB8 – FMU – Deprecated

DB9 – PSI – Deprecated

DB10 – TAS – Deprecated

DB11 – RAS – Deprecated

DB12 – PSA – Deprecated

DB13 – BCL – Deprecated

DB14 – BDL – Deprecated

SDH3 | SONet3

Limitations: **DB8 – FMU_1S** – Deprecated and replaced by TCM status bit

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Backwards Compatibility

Commands Provided for Backward Compatibility

SPDH

Limitations: **DB6 – ALSC**– Deprecated. Use SDH|SONet-DB7-SIGW
DB8 – LOC – Deprecated
DB9 – FMU – Deprecated
DB10 – DPES – Deprecated
DB11 – IPES – Deprecated
DB12 – ILOS – Deprecated
DB13 – PSL – Deprecated. Use ISUMmary-DB13-PSL
DB14 – ERR – Deprecated. Use ISUMmary-DB14-ERR

M140

Limitations: **DB0 – LOS** – Deprecated. Use ISUMmary-DB1-LOS
DB12 – IEFO – Deprecated
DB13 – DEFO – Deprecated

M34

Limitations: **DB0 – LOS** – Deprecated. Use ISUMmary-DB1-LOS
DB12 – IEFO – Deprecated
DB13 – DEFO – Deprecated

M8

Limitations: **DB0 – LOS** – Deprecated. Use ISUMmary-DB1-LOS

M2

Limitations: **DB0 – LOS** – Deprecated. Use ISUMmary-DB1-LOS
DB4 – CRC – Deprecated. Use M2-DB1-LOF

DS3

Limitations: **DB0 – LOS** – Deprecated. Use ISUMmary-DB1-LOS
DB8 – IEFO – Deprecated
DB9 – DEFO – Deprecated

DS1

Limitations: **DB0 – LOS** – Deprecated. Use ISUMmary-DB1-LOS

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:SENSE:DATA? <string>

The following result data handles are supported by this instrument. Future developments should use the preferred results indicated.

Alarm Seconds

Old <string>	Preferred <string>
ASEConds:SDH:LOP	ASEConds:SDH:AULop
ASEConds:SDH|SONet:LOS	ASEConds:LOS
ASEConds:SDH|SONet:PSL	ASEConds:PSL
ASEConds:SDH:PFERf	ASEConds:SDH:HPRDi
ASEConds:SDH:RDI	ASEConds:SDH:HPRDi
ASEConds:SPDH:LOS	ASEConds:LOS
ASEConds:SPDH:PSL	ASEConds:PSL
ASEConds:SPDH:MFM	ASEConds:SPDH:M2:MFM
ASEConds:SPDH:RMFR	ASEConds:SPDH:M2:RMFR
ASEConds:SDH|SONet:HERDi:…	ASEConds:SDH|SONet:ERDI:…

Error Counts

Note that for each ECOunt reference, ERATio is also available.

Old <string>	Preferred <string>
ECOunt:SDH:FEBE	ECOunt:SDH:HPRei
ECOunt:SDH:MFEBe	ECOunt:SDH:MSRei
ECOunt:SDH:REI	ECOunt:SDH:HPRei
ECOunt:SPDH:BIT	ECOunt:BIT
ECOunt:SPDH:CODE	ECOunt:CODE
ECOunt:SPDH:FEBE	ECOunt:SPDH:DS3:FEBE
ECOunt:SPDH:PBITs	ECOunt:SPDH:DS3:PBITs
ECOunt:SPDH:CPBits	ECOunt:SPDH:DS3:CPBits
ECOunt:SPDH:CRC	ECOunt:SPDH:M2:CRC

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Backwards Compatibility

Commands Provided for Backward Compatibility

ECOunt:SPDH:REBE	ECOunt:SPDH:M2:REBE

G.826 Analysis

Old <string>	Preferred <string>
<Result>:SDH|SONet:<Path>:ANALysis	<Result>:SDH|SONet:<Path>:G826
<Result>:SPDH:<Path>:ANALysis	<Result>:SPDH:<Path>:G826
<Path> = FEBE	<Path> = REI
<Path> = MFEBe	<Path> = MSRei
<Path> = TCM:FEBE	<Path> = TCM:REI

Frequency Measurement

Old <string>	Preferred <string>
FREQuency:SPDH	FREQuency
FREQuency:SDH|SONet:GATE1S	
FREQuency:SDH|SONet[:GATE16S]	
FOFPpm:SPDH	FOFPpm
FOFPpm:SDH|SONet[:GATE16S]	
FOFHz:SPDH	FOF
FOFHz:SDH|SONet:GATE1S	
FOFHz:SDH|SONet[:GATE16S]	

Round Trip Delay

Old <string>	Preferred <string>
RTDelay:SPDH:COUNt	RTDelay:COUNt

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Earlier Version Features With No SCPI Support

This section details features present in both the current and earlier instrument versions that no longer have SCPI support in the current version for one reason or another. Please refer to the Remote Control Manual of your earlier instrument version for details.

Trouble Scan

:FETCh:ARRay:DATA:TELecom:SDH|SONet:TSCan?

:SENSe:DATA:TELecom:SDH|SONet:TSCan

:SENSe:DATA:TELecom:TSCan

New operating system with different mechanism.

Floppy Disk Control

:SYSTem:DISK:…
DISk Status Register
Disk action is now a local and not a remote activity.

Keyboard Lock

:SYSTem:KLOCk
New operating system with different mechanism.

Beep On Error

:SYSTem:BEEPer:STATe
New operating system with different mechanism.

Stored Settings

:SYSTem:SSETting:LABel
:SYSTem:SSETting:LOCK
New operating system with different mechanism.

Selftest Wavelength Selection

:SYSTem:SELFtest:WAVelength
Was hardware dependant.

Service Disruption

:SOURce and :SENSe:DATA:TELecom:TFUNction:SDISruption
:SOURce and :SENSe:DATA:TELecom:SPDH:TFUNction:SDISruption
Feature is now always available.

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Backwards Compatibility

Earlier Version Features With No SCPI Support

ITU Analysis Control

:SENSe:DATA:TELecom:SPDH:ANALysis:M2120
:SENSe:DATA:TELecom:SPDH:ANALysis:M2120:MFACtor
Thresholds are now always user programmable.

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Workarounds for Incompatible Commands

This section details commands from earlier instrument versions that cannot be supported in this instrument version but a workaround exists. The workaround is shown in *italics.*

Trace Messages

:FETCh:STRing:DATA:TELecom:SDH|SONET:J0:HEXadecimal?

Use :FETCh:STRing:DATA:TELecom:SDH|SONet:J0?

:FETCh:STRing:DATA:TELecom:SDH|SONet:J1:HEXadecimal?

Use :FETCh:STRing:DATA:TELecom:SDH|SONet:J1?

:SOURce:DATA:TELecom:SDH|SONet:OVERhead:J0:HEX?

Use :SOURce:DATA:TELecom:SDH|SONet:OVERhead:J0?

SOURce:DATA:TELecom:SDH|SONet:POVerhead:J1:HEX?

Use SOURce:DATA:TELecom:SDH|SONet:POVerhead:J1?

:SOURce:DATA:TELecom:SDH|SONet:OVERhead:J0:PATTern <TEST>

:SOURce and :SENSe:DATA:TELecom:SDH|SONet:POVERhead:J1:PATTern <TEST,CRC7Test>

:SENSe:DATA:TELecom:SDH:TCM:APID:PATTern <DEFault, TEST>

Choose an alternative parameter.

Pointer Graph

:FETch:ARRay:DATA:TELEcom:PGRaph?

Use :SENSe:DATA:TELEcom:MRS:… in order to retieve pointer graph data.

Printer and Logging Control

SYSTem:PRINt:… and SYSTEM:LOGGing:…

Use SYSTEM:LOGGing:… but with much reduced functionality

Printer Control

SYSTem:PRINt:…

Use SYSTEM:LOGGing:…

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:SENSe:DATA? <string>

Error Counts and Ratios

Old <string>	Workaround <string>
ECOunt:…:STERm…	*ECOunt:…:LSECond…*
ERATio:…:STERm…	*ERATio:…:LSECond…*

Alarm Seconds

Old <string>	Workaround <string>
ASEConds:SPDH:OOF	*ASEConds:DS1:OOF and ASEConds:DS3:OOF*

ITU G.821

Feature completely revised with respect to the latest version of the standard. A number of old result types no longer exist.

Old <string>	Workaround <string>
<result-old>:SPDH:BIT:ANALysis	*<result-new>:SPDH:BIT:G821*

ITU M.2110

Old <string>	Workaround <string>
<result>:SPDH:ANALysis:M2110	*<result>:<path>:M2110*

ITU M.2120

Old <string>	Workaround <string>
<result>:SPDH:<path>:ANALysis:M2120	*<result>:<path>:M2120*

DS3 FEAC

Old <string>	Workaround <string>
:FETCh:STRing:DATA:TELEcom:SPDH:FEAC?	*:FETCh:SCALar:DATA:TELEcom:SPDH: FEAC?*

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10

SCPI Error Messages

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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.

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- 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.

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−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**

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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**

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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.

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−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.

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−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.

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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's capabilities.
- 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

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Execution Errors [•299, •200]

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**

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Execution Errors [•299, •200]

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

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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**

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Execution Errors [•299, •200]

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 device-specific.

−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 write-protect 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**

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Indicates that a syntactically legal expression program data element could not be executed due to a math error; for example, a divide-by-zero 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

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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

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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**

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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 device-dependent 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.

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−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**

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Execution Errors [•299, •200]

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.

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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.

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−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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