

Remote Control
Manual

HP 37718A
Communications
Performance Analyzer

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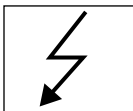
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The product is marked with this symbol to indicate that hazardous voltages are present



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The product is marked with this symbol to indicate that a laser is fitted. The user should refer to the laser safety information in the Calibration Manual.

HP Part Number 37718-90005

Printed in U.K. September 1998

**HP 37718A Communications
Performance Analyzer**

In This Book

This manual contains all the information necessary for remote control of the HP 37718A Communications Performance Analyzer.

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Methods of Remote Control

Methods of Remote Control

Methods of Remote Control

The HP 37718A can be remotely controlled in one of four ways:

- | | |
|-----------------|---|
| HP-IB | 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 HP-IB 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 HP 37718A can be connected within the system. If long distance communication is required, the HP 37718A can be connected directly to the RS-232-C port of a Modem and carried over a telephone line. |
| LAN | Provides a parallel interface that allows the connection of other instruments and controllers to the system for example: workstations; other HP 37718A's; other test sets that have a LAN interface. |
| DNA | Provides control via a Front Panel displayed on a PC connected to a LAN. Other test sets that have the Virtual Remote capability can be connected to the LAN and controlled via the same PC. <i>See HP E4540A Manual, HP part number E4540-90004.</i> |

Methods of Remote Control

Connecting the HP 37718A to HP-IB

The following points should be considered when connecting the HP 37718A to HP-IB:

- Operating distances
- Communication with the system controller

Operating Distances

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

Operating distances can be increased by using HP-IB Extenders, HP 37204A or HP 37201A:

Up to 1250 meters use HP 37204A.

Over 1250 meters use two HP 37201A and two suitable Modems.

Communication with the System Controller

Each device in the system must have a unique address to allow the controller to access each one individually. On the HP 37718A the address is set on the OTHER display under REMOTE CONTROL:

To set the HP-IB Address press OTHER; REMOTE CONTROL and set the display as shown opposite. Address 5 has been selected but any Address in the range 0 to 30 can be selected.

Methods of Remote Control

Connecting the HP 37718A to RS-232-C

Two methods of controlling the HP 37718A via RS-232-C are available:

| | |
|-----------------|---|
| Terminal | Simple method of control on a command by command basis. |
| Computer | More extensive method of control allows programs to be run. |

Terminal Mode

Terminal mode is provided to allow the HP 37718A to be controlled by a "dumb" terminal and provides the following features:

When connection is established via RS-232-C the HP 37718A responds with a "prompt".

Any command sent to the HP 37718A is echoed back to the terminal to provide a local record.

If a mistake is made in the command, the appropriate SCPI Error Message and the "entered" command is returned to the terminal to provide a local record.

A command history buffer is provided with a capacity of 20 commands. This allows frequently used commands to be retransmitted without having to retype the command:

To list the history buffer contents type: **!l** (lower case L)

To retransmit the last Command sent type :

To retransmit a previously sent command type : **!n** where n = the commands listed number.

When REMOTE CONTROL PORT [RS232] is selected on the OTHER REMOTE CONTROL display the HP 37718A acts as DCE (Data Communications Equipment). Dumb terminals act as DTE (Data Terminal Equipment). This makes connection of the HP 37718A to a dumb terminal straightforward as shown in Table 1-1.

RS-232-C cable HP Part Number 5060-4461 will provide this connection.

Methods of Remote Control

Table 1-1

HP 37718A to RS-232-C Terminal

| 37718A Pin # | Signal | Terminal Pin # | Signal |
|--------------|--------------------|----------------|--------------------|
| 2 | Transmit Data (TX) | 2 | Transmit Data (TX) |
| 3 | Receive Data (RX) | 3 | Receive Data (RX) |
| 5 | Signal Ground | 7 | Signal Ground |

RS-232-C cable HP Part Number 24542U will provide this connection.

Connection via a Modem

Full Modem control is not possible and the Modem should be configured to force DSR, CD, CTS and DTR true.

Since Modems are always configured as DCE (Data Communications Equipment), the same as the HP 37718A, a crossover is required in the three wire connection as shown in Table 1-2.

Table 1-2

HP 37718A to Modem

| 37718A Pin # | Signal | Modem Pin # | Signal |
|--------------|--------------------|-------------|--------------------|
| 2 | Transmit Data (TX) | 3 | Receive Data (RX) |
| 3 | Receive Data (RX) | 2 | Transmit Data (TX) |
| 5 | Signal Ground | 7 | Signal Ground |

RS-232-C cable HP Part Number 24542M will provide this connection.

Methods of Remote Control

Computer Mode

Computer mode is provided to allow the HP 37718A to be controlled by a RS-232-C computer allowing programs to be run. Unlike Terminal mode commands are not echoed back and SCPI Error Messages are not returned unless the appropriate query command is issued.

When REMOTE CONTROL PORT [RS232] is selected on the OTHER REMOTE CONTROL display the HP 37718A acts as DCE (Data Communications Equipment). The Computer should be configured to act as DTE (Data Terminal Equipment). This makes connection of the HP 37718A to a computer straightforward as shown in Table 1-3.

Table 1-3

HP 37718A to RS-232-C Computer

| 37718A Pin # | Signal | Computer Pin # | Signal |
|--------------|--------------------|----------------|--------------------|
| 2 | Transmit Data (TX) | 2 | Transmit Data (TX) |
| 3 | Receive Data (RX) | 3 | Receive Data (RX) |
| 5 | Signal Ground | 7 | Signal Ground |

RS-232-C cable HP Part Number 24542U will provide this connection.

Connection via a Modem



Full Modem control is not possible and the Modem should be configured to force DSR, CD, CTS and DTR true.

Since Modems are always configured as DCE (Data Communications Equipment), the same as the HP 37718A, a crossover is required in the three wire connection as shown in Table 1-2.

Communication with the Terminal/Computer

Remote control via RS-232-C requires that the HP 37718A RS-232-C interface settings match those of the terminal/computer. These settings are made on the OTHER display under REMOTE CONTROL.

Methods of Remote Control

Using  ,  and the display softkeys set REMOTE CONTROL PORT [RS232]. Set CONTROLLER TYPE, XON/XOFF, SPEED, PARITY and STOP BITS to match the settings on your terminal/ computer.

.

Methods of Remote Control

Controlling the HP 37718A

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 HP 37718A under remote control
- Initialize the HP 37718A
- Read the contents of the error register
- Start a test period
- Add errors
- Obtain the result (Option dependent)
- Return the HP 37718A to local operation

NOTE

Set REMOTE CONTROL to RS232 and CONTROLLER TYPE to [TERMINAL] on the OTHER REMOTE CONTROL display and connect the TRANSMIT PDH OUT port to the RECEIVE PDH IN port (on the PDH modules) for the duration of this exercise.

Table 1-4

HP 37718A to RS-232-C Computer

| Terminal Input | Comment |
|----------------------------------|---|
| :SYST:REM | Takes the HP 37718A under remote control. On the instrument the indicator above LOCAL is lit. |
| *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. On the instrument the indicator above RUN/STOP is lit. |

Methods of Remote Control

Table 1-4

HP 37718A to RS-232-C Computer

| Terminal Input | Comment |
|---------------------------------|--|
| :SOUR:DATA:TEL:ERR :BIT ONCE | Adds a single bit error. |
| :SOUR:DATA:TEL:ERR :BIT ONCE | Adds a single bit error. |
| :SOUR:DATA:TEL:ERR :BIT ONCE | Adds a single bit error. |
| :SENS:DATA:TEL:TEST OFF | Halts the manual test period. On the instrument the indicator above RUN/STOP is extinguished. |
| :SENS:DATA? "ECO:SPDH :BIT" | Structured PDH -Returns the bit error count in numeric form, in this example 3. |
| :SYST:LOC | Returns the HP 37718A to local control. On the instrument the indicator above LOCAL is extinguished. |

Methods of Remote Control

Connecting the HP 37718A to a LAN

Two methods of controlling the HP 37718A via a LAN are available:

Terminal Simple method of control on a command by command basis.

Computer More extensive method of control allows programs to be run.

The following information should be obtained from the LAN System Administrator before connecting to the LAN:

- Internet address (Example 015.144.180.205)
- Subnet Mask (Example 255.255.248.0).
- Default Gateway IP Address (Example 15.144.176.1).

The PORT NUMBER and MAC ADDRESS are assigned to the HP 37718A at the time of shipment.

Connect the HP 37718A LAN interface to the LAN network.

The HP 37718A must now be configured to accept the IP address, Subnet Mask and Default Gateway IP Address.

Press **OTHER**, **REMOTE CONTROL**
and set up the display as shown opposite.

The HP 37718A can be configured to accept the IP address, Subnet Mask and Default Gateway IP Address in one of two ways:

Methods of Remote Control

Current Settings

The IP Address, Subnet Mask and Gateway IP Address will adopt the current settings.

The Port Number and MAC Address are displayed for information.

New Settings (BOOTP)

To use BOOTP your system administrator must set up a BOOTP server on the network.



When YES is selected the power must be cycled on the HP 37718A to allow for a change of settings.



When power is restored the HP 37718A will issue BOOTP requests until it receives a reply from a suitably configured BOOTP server.

The Settings of IP Address, Subnet Mask and Gateway IP Address will be adopted as the Current Settings.

Methods of Remote Control

New Settings (Keyboard Entry)

Use **DECREASE DIGIT**   and **INCREASE DIGIT** to set the IP Address, Subnet Mask and Gateway IP Address.

Use  and  to move between the IP Address, Subnet Mask and Gateway IP Address.

The New Settings will not become active until the power is cycled (power off/ power on) on the HP 37718A.

The entered New settings are checked to ensure they conform to the relationships that should exist between the IP Address, Subnet Mask and Gateway IP Address. If the entered data contravenes these relationships, the HP 37718A will change the data to more sensible values.

Configuration

The HP 37718A can only accept one tcp connection at a time and it cannot establish an outgoing call. The connection has to be directed to port 5001.

For Example (from a UNIX system):

```
telnet <IP address> 5001
```

If ping <IP address> is issued (from a UNIX system), commands issued will be echoed at the local end of the connection.

Controlling the HP 37718A

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

- Take the HP 37718A under remote control
- Initialize the HP 37718A
- Read the contents of the error register
- Start a test period
- Add errors
- Obtain the result (Option dependent)
- Return the HP 37718A to local operation

Methods of Remote Control

NOTE

Connect the PDH OUT port to the PDH IN port for the duration of this exercise.

Table 1-5 HP 37718A to RS-232-C Computer

| Terminal Input | Comment |
|-------------------------------|--|
| :SYST:REM | Takes the HP under remote control. On the instrument the indicator above LOCAL is lit. |
| *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. On the instrument the indicator above RUN/STOP is lit. |
| :SOUR:DATA:TEL:ERR :BIT ONCE | Adds a single bit error. |
| :SOUR:DATA:TEL:ERR :BIT ONCE | Adds a single bit error. |
| :SOUR:DATA:TEL:ERR :BIT ONCE | Adds a single bit error. |
| :SENS:DATA:TEL:TEST OFF | Halts the manual test period. On the instrument the indicator above RUN/STOP is extinguished. |
| :SENS:DATA? "ECO:SPDH :BIT" | Structured PDH -Returns the bit error count in numeric form, in this example 3. |
| :SYST:LOC | Returns the HP 37718A to local control. On the instrument the indicator above LOCAL is extinguished. |

Methods of Remote Control

To Initialize the HP 37718A

Regardless of the current setup the following command will initialize the HP 37718A. It sets the HP 37718A to the factory default settings and clears all registers.

*RST

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

Remote Control Hints & Tips

Remote Control Hints & Tips

The following section gives some Hints & Tips on how to control the HP 37718A via remote control. Before writing any program to control the HP 37718A it may help to manually go through the steps required to setup 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 HP 37718A's Front Panel. This can be seen in the Application Examples listed in the Manual. These could be used as a starting point in order to find the SCPI commands that correspond to particular HP 37718A Front Panel settings.

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 HP 37718A Transmitter and Receiver to the same settings then you can save time by selecting Transmitter/Receiver Coupling and then programming the Receiver only.

To turn coupling on use the :INSTRument:COUPlE RTTX command.

Error Checking

It is recommended that, when sending SCPI commands to the HP 37718A, you also periodically send the SYSTem:ERRor? command to check for any Remote Control Errors reported by the instrument. This command returns 0, "No Error" if there are no errors in the error queue. If the SYSTem:ERRor? command is sent after every setup 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 HP 37718A can be cleared by sending the *CLS command.

Remote Control Hints & Tips

Command Completion

When programming the instrument over RS-232, it is important to realize that a buffer (of 128 bytes) exists in the HP 37718A between the RS-232 port and the SCPI parser.

The effect of this is that even if the HP 37718A 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 `SYST: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 HP 37718A 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 a `SYSTem:ERRor?` after each command in order to check for error free completion.

Setup Delays

Even after the HP 37718A 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 200ms is allowed after the command has completed before expecting the instrument operation to occur. One way of determining if such delays exist is to perform the desired operation manually using the HP 37718A's Front Panel and checking if there is any noticeable delay in execution.

Status Registers

Status registers in general are only updated every 100ms by the HP 37718A. 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.

Remote Control Hints & Tips

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 had 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 STATue:SON2:ConDition? command then it is very likely that you would miss any transition in the K1K2 bit.

A better method is as follows.

| | |
|--|----------------------------------|
| Set transition filter to pass positive transitions in K1K2 (DB6) | : STATus : SDH2 : PTR 64 ; NTR 0 |
| | : STATus : SON2 : PTR 64 ; NTR 0 |
| Periodically read SDH2/SON2 event register. | : STATus : SDH2 : EVENT ? |
| Check for K1K2 (DB6) being set. | : STATus : SON2 : EVENT ? |

Using this technique you will detect any changes in the K1 and K2 bytes.

If you needed to monitor a number of status bits then using this method would not be ideal since it would have the disadvantage of having to regularly read a number of status registers. A general rule is to minimize the number of status register reads required and, to achieve this, use can be made of the Summary register. For details on how to use the Summary register and also the SRQ mechanism see Programmed Status Reporting on page 6- 27.

Gating Control

There are a number of status register bits that can be used to indicate the state of the HP 37718A's measurement system.

When you send the start gating command to the HP 37718A you should check the MEAS bit (DB4) in the OPERation status register. This is because the HP 37718A takes a finite period of time (the actual length of time can be affected by factors such as whether Stored Measurement Graphics is selected or not) to start gating. When the MEAS bit is set to one it means that the HP 37718A is gating.

If it is required to retrieve Short Term results while the HP 37718A is gating then the STP bit (DB6) in the INSTRument status register can be used to determine when short term results can read i.e. when the first short term test period has completed.

The EOT bit (DB2) in the INSTRument status register can be used to determine when the HP 37718A gating period is complete.

Remote Control Hints & Tips

Frequency Offsets

If the HP 37718A Transmitter's PDH signal rate or frequency offset is changed it will take some time for the Internal VCXO's to settle. This is indicated on the HP 37718A's Front Panel by a flashing status message. The state of the VCXO's can also be checked by monitoring the LOC Bit (DB8) in the SPDH Status Register.

User Locks

User locks are a mechanism used within the HP 37718A to prevent the user selecting a particular instrument feature when some other selection takes priority. An example of this would be if you tried to modify the value of a SDH/SONET Overhead byte using the :SOURCE:DATA:TELEcom:SDH:OVERhead:DATA or :SOURCE:DATA:TELEcom:SONet:OVERhead:DATA command at the same time as a sequence was being generated in the same byte. If you tried to do this manually via the HP 37718A's Front PANEL than a status message warns you that this operation is not possible. If you tried to do it via remote control then a "-200, Execution Error" would result. The solution is to switch of the particular feature (in this example sequence generation) that has priority before sending the command.

SCPI Command Format, see page 2-2.

Remote Control Commands, see page 2- 5.

Instrument Options, see page 2-6.

INSTRument subsystem, see page 2-7.

SOURce subsystem, see page 2-8.

SOURce subsystem - Transmitter Common Commands, see page 2-9.

INPut subsystem, see page 2- 12.

SENSE subsystem, see page 2-13.

SENSE subsystem - Receiver Common Commands, see page 2- 15.

SENSE subsystem - Test Timing, see page 2-17.

SENSE subsystem - Analysis Control, see page 2-19.

SENSE subsystem - Trouble Scan Results, see page 2-21.

SENSE subsystem - Configuring Graphics,see page 2- 24.

SENSE subsystem - Managing Graphics Stores, see page 2- 26.

SENSE subsystem - Retrieving Graphics Store Data, see page 2-28.

SENSE subsystem - Retrieving Data for a Single Graph, see page 2- 30.

SENSE subsystem -Obtaining Graphics End of Measurement Results, see page 2-32.

STATus Subsystem, see page 2- 37.

SYSTem Subsystem, see page 2-40.

IEEE common capabilities, see page 2- 56.

Common Commands

This chapter contains general information on SCPI commands, and detailed information on the commands that are common for all types of instrument operation, i.e. PDH, SDH, SONET and Jitter.

Common Commands

SCPI Command Format

SCPI Command Format

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

:INPut:TELEcom:SPDH:CODE <CMI> or <AMI> or <HDB3>

:INPut is the root node

:TELEcom is a second level node

:SPDH is a third level node

:CODE is a fourth level node

CMI, AMI and HDB3 are parameters of the fourth-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.

An example of typical commands and their abbreviated form are shown below :

| | |
|--|--------------------|
| :INPut:TELEcom:SPDH:CODE AMI | full Form |
| :INP:TEL:SPDH:CODE AMI | abbreviated form |
| :SOURce:DATA:TELEcom:SPDH:PAYLoad:PATTer n PRBS23 | - full form |
| :SOUR:DATA:TEL:SPDH:PAYL:PATT PRBS23 | - abbreviated form |

Common Commands
SCPI Command Format

SCPI Long Form Command Headers

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

- Abbreviated short form mnemonics - the first four characters from the long form command header 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 command 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:SPDH:CODE AMI;:SOURce:DATA:TELEcom:SPDH:  
PAYLoad: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. |
| <Discrete> | Values that are represented by a string of alphanumeric characters.Examples are INTernal and EXTernal. |

Common Commands
SCPI Command Format

Table 2-1

Parameter Types

| Parameter Types | Description |
|-----------------|---|
| <String> | Any set of ASCII characters enclosed within single quotes or double quotes. Examples are '1111111111111111' and "0000000000000000". |
| <Block> | Used to transfer large quantities of related data. Blocks can be sent as definite length blocks (#<numeric><numeric>) or indefinite length blocks (#0). |

Common Commands
Remote Control Commands

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 HP 37718A are listed in table 2-2.

STM-1/STS-1

Table 2-2

SCPI Subsystems

| Instrument Functions | Subsystem |
|--|------------------|
| To control SIGNAL OUT port, STM-0/STS-1, STM-1/STS-3 OUT port/ Optical OUT port . | :OUTPut |
| To control instrument coupling. | :INSTrument |
| To control the transmitter. | :SOURce |
| To control the SIGNAL IN port, STM-0/STS-1, STM-1/STS-3 IN port/ Optical IN port. | :INPut |
| To control the receiver, results and graphics | :SENSe |
| To obtain results directly accumulated by the instrument. | :FETCh |
| To control the instrument OTHER functions. | :SYSTem |
| To control Status Reporting. | :STATus |

Instrument Options

The HP 37718A Communications Performance Analyzer is a modular product allowing a wide range of test options to be fitted. SCPI commands with the following node names need the appropriate options to be fitted.

SPDH - needs structured PDH option

SDH - needs SDH option

SONET - needs SONET option

JITTER - needs Jitter option

Commands are not valid unless the correct option has been fitted e.g.

:SOURCE:DATA:TELEcom:SONet:VTGRoup <numeric> only works if option 002 is fitted.

Common Commands
INSTrument subsystem

INSTrument subsystem

The INSTrument subsystem is used to control the coupling between the transmitter and the receiver as provided on the OTHER SETTINGS CONTROL display.

:INSTrument:COUPlE <mode>

| | | |
|--------------|------|-------------|
| <discrete> = | OFF | Independent |
| | RTTX | Coupled |

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

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

:INSTrument:COUPlE?

Returns : <discrete>

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

Chapter 3

SOURce subsystem - Transmitter Structured PDH Commands



SOURce subsystem - Transmitter SPDH Test Signal Settings Commands



SOURce subsystem - Transmitter SPDH Test Function Commands



Chapter 4

SOURce subsystem - Transmitter SDH Settings Commands



SOURce subsystem - Transmitter SDH OVERHEAD SETUP



SOURce subsystem - Transmitter SDH Test Function Commands



Chapter 5

SOURce subsystem - Transmitter SONET Settings Commands



SOURce subsystem - Transmitter SONET OVERHEAD SETUP



:SOURce subsystem - Transmitter SONET Test Function Commands



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

SOURce subsystem - Transmitter Common Commands

SOURce subsystem - Transmitter Common Commands

:SOURce:DATA:TELEcom:SOURce <discrete>

| | | |
|--------------|-------|-------------------------|
| <discrete> = | PDH | PDH Outputs |
| | SDH | STM- 0/STM-1 Electrical |
| | SONet | STS-1/STS-3 electrical |
| | OPT16 | STM-0/STM-1/STM-4/STM16 |
| | OC48 | OC-1/OC-3/OC-12/OC-48 |

Selects the output port. The output characteristics of each port are controlled by the :OUTPut subsystem.

Recommended use: This command selects which transmitter output port is in use, and also selects the TRANSMITTER OUTPUT selection on the transmitter page. The parameters refer to the physical ports on the instrument but do not select the interface rate.

After this command has been used to select the applicable port and interface, the interface rate commands should be used to set the required line rate. See the Associated Commands.

Associated Commands: For each parameter of this command, the command to set the interface rate is listed here.

(SPDH) :OUTPut:TELEcom:SPDH:RATE <discrete>

(SDH) :OUTPut:TELEcom:SDH:RATE <discrete>

(SONET) :OUTPut:TELEcom:SONET:RATE <discrete>

(OPT16) :OUTPut:TELEcom:OPT16:RATE <discrete>

(OC48) :OUTPut:TELEcom:OC48:RATE <discrete>

:SOURce:DATA:TELEcom:SOURce?

Returns : <discrete>

:SOURce:DATA:TELEcom:TFUNction <discrete>

Common Commands

SOURce subsystem - Transmitter Common Commands

| | | |
|--------------|-------------|---------------------------------|
| <discrete> = | NONE | Test function off |
| | SDH | |
| | SONet | |
| | PDHPayload | requires an SDH or SONET option |
| | PDH | |
| | SDISruption | Service Disruption |

Selects the transmitter test function source.

The corresponding query returns the transmitter test function source in discrete form as shown above.

:SOURce:DATA:TELEcom:TFUNCTION?

Returns: <discrete>

:SOURce:DATA:TELEcom:ERRor:BIT <discrete>

| | | |
|--------------|------|------------------|
| <discrete> = | NONE | Off |
| | ONCE | Single Error Add |
| | RATE | 1E-3 |

Selects the required bit error add rate.

This command is retained for backwards compatibility only. The recommended commands are:

- :SOURce:DATA:TELEcom:SDH:ERRor:TYPE <discrete> and :SOURce:DATA:TELEcom:SDH:ERRor:RATE <discrete> for SDH errors.
- :SOURce:DATA:TELEcom:SONet:ERRor:TYPE <discrete> and :SOURce:DATA:TELEcom:SONet:ERRor:RATE <discrete> for SONET errors.
- :SOURce:DATA:TELEcom:SDH:PDHPayload:ERRor:RATE <discrete> and :SOURce:DATA:TELEcom:SDH:PDHPayload:ERRor:RATE <discrete> for SDH PDH payload errors.
- :SOURce:DATA:TELEcom:SONet:PDHPayload:ERRor:TYPE <discrete> and :SOURce:DATA:TELEcom:SPDH:ERRor:TYPE <discrete> for SONET PDH

INPut subsystem

INPut subsystem

This subsystem controls the characteristics of the instrument's input ports.

:INPut:TELEcom:LEVel <discrete>

<discrete> = TERMinate
 MONitor

Sets the input level for the SPDH or SDH or SONET electrical input port when that port is selected by :SENSe:DATA:TELEcom:SENSe <discrete> , type= SDH or SONET or PDH.

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

:INPut:TELEcom:LEVel?

Returns : <discrete>

SENSe subsystem

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

Chapter 3

SENSe subsystem - Receiver Structured PDH Settings



SENSe subsystem - Receiver SPDH Test Signal Settings Commands



SENSe subsystem - Receiver SPDH Test Function Commands



Chapter 4

SENSe subsystem - Receiver SDH Settings



SENSe subsystem - Receiver SDH Test Function Commands



SENSe subsystem - Receiver SONET Settings



SENSe subsystem - Receiver SONET Test Function Commands



Chapter 2

SENSe subsystem - Test Timing



SENSe subsystem - Analysis Control



Chapter 3

SENSe subsystem - Alarm Scan Control



Chapter 4

SENSe subsystem - SDH Tributary Scan Control



SENSe subsystem - SONET Tributary Scan Control



Common Commands

SENSe subsystem

Chapter 3

SENSe subsystem - SPDH Round Trip Delay Control

Results

PDH TRIP DELAY

Chapter 4

SENSe subsystem - Result Returning Commands

Results

SDNET

Chapter 2

SENSe subsystem - Trouble Scan Results

Results

SENSe subsystem - Result Returning Commands

SENSe subsystem - Configuring Graphics

SENSe subsystem - Managing Graphics Stores

SENSe subsystem - Retrieving Graphics Store Data

SENSe subsystem - Retrieving Data for a Single Graph

SENSe subsystem -Obtaining Graphics End of Measurement Results

SENSe subsystem - Receiver Common Commands

SENSe subsystem - Receiver Common Commands

:SENSe:DATA:TELEcom:SENSe <discrete>

| | | |
|--------------|-------|----------------------------------|
| <discrete> = | PDH | SPDH (Option 010 or 011) |
| | SDH | SDH Electrical (STM-0, STM-1) |
| | SONet | STS-1/STS-3 |
| | OPT16 | STM-0/STM-1/STM-4/STM-16 Optical |
| | OC48 | OC-1/OC-3/OC-12/OC-48 |

Selects the input port. The input characteristics of each port are controlled by the INPut subsystem.

Recommended use: This command selects which receiver input port is in use, and also selects the top level field on the receiver page. The parameters refer to the physical ports on the instrument but do not select the interface rate. After this command has been used to select the applicable port and interface, the interface rate commands should be used to set the required line rate. See the Associated Commands.

Associated Commands: For each parameter of this command, the command to set that interface's rate is listed here.

(PDH) option (010 or 011) :INPut:TELEcom:SPDH:RATE <discrete>

(SDH) :INPut:TELEcom:SDH:RATE <discrete>

(SONet) :INPut:TELEcom:SONet:RATE <discrete>

(OPT16) :INPut:TELEcom:OPT16:RATE <discrete>

(OC48) :INPut:TELEcom:OC48:RATE <discrete>

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

:SENSe:DATA:TELEcom:SENSe?

Returns : <discrete>

Common Commands

SENSe subsystem - Receiver Common Commands

:SENSe:DATA:TELEcom:TEST <boolean>

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

Start/Stop the test as **RUN/STOP**.

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

:SENSe:DATA:TELEcom:TEST?

Returns : <boolean>

:SENSe:DATA:TELEcom:TFUNction <discrete>

| | | |
|-------------|-------------|--------------------|
| <discrete>= | NONE | |
| | SDH | |
| | SONet | |
| | SDISruption | Service Disruption |

Sets the Receiver test function.

The corresponding query returns the receiver test function in discrete form as listed above.

:SENSe:DATA:TELEcom:TFUNction?

Returns: <discrete>

SENSe subsystem - Test Timing

SENSe subsystem - Test Timing

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

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

Selects the type of test period. If SING or TIM is selected, the duration is set using :SENS:DATA:TEL:TEST:PER. If TIM is selected, the start time is selected using :SENS:DATA:TEL:TEST:STAR.

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

:SENSe:DATA:TELEcom:TEST:TYPE?

Returns : <discrete>

:SENSe:DATA:TELEcom:TEST:PERiod <numeric>, <suffix>

| | | |
|-------------|---------|---------|
| <numeric> = | 1 to 99 | |
| <suffix> = | d | Days |
| <suffix> = | h | Hours |
| <suffix> = | m | Minutes |
| <suffix> = | s | Seconds |

Sets the duration of the test period. Is only valid when :SENS:DATA:TEL:TEST:TYPE SING or TIM is selected.

The corresponding query returns the test duration.

:SENSe:DATA:TELEcom:TEST:PERiod?

Returns : <period> <numeric>,<suffix>

Common Commands

SENSe subsystem - Test Timing

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

| | | |
|-------------|--------------|--------|
| <numeric> = | 1970 to 2069 | Year |
| <numeric> = | 1 to 12 | Month |
| <numeric> = | 1 to 31 | Day |
| <numeric> = | 0 to 23 | Hour |
| <numeric> = | 0 to 59 | Minute |

Sets the test period start time when :SENS:DATA:TEL:TEST:TYPE <TIM> is selected.

The corresponding query returns the test period start time in numeric form.

:SENSe:DATA:TELEcom:TEST:STARt?

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

:SENSe:DATA:TELEcom:STERm:PERiod <numeric>,<suffix>

| | | |
|-------------|----------|---------|
| <numeric> = | 1 to 100 | |
| <suffix> = | s | Seconds |

Sets the short term results calculation period.

The corresponding query returns the short term results period.

:SENSe:DATA:TELEcom:STERm:PERiod?

Returns :

| | |
|-----------|---|
| <numeric> | |
| <suffix> | s |

SENSe subsystem - Analysis Control

SENSe subsystem - Analysis Control

:SENSe:DATA:TELecom:TEST:SUSPend <boolean>

<boolean> = 0 or OFF G821 Analysis
 1 or ON Suspend test during Signal Loss

Sets the state of Analysis Control.

The corresponding query returns the state of Analysis Control as 0 or 1.

:SENSe:DATA:TELecom:TEST:SUSPend?

Returns : <boolean>

Common Commands

SENSe subsystem - Result Returning Commands

SENSe subsystem - Result Returning Commands

Common Results

:SENSe:DATA? <"ETIME">

| | | |
|----------|-------------------|--------------------------|
| Result = | "ETIME" | Returns the elapsed Time |
| | "ASECconds:PLOSs" | Power loss |
| | "ASECconds:PSL" | Pattern Sync Loss |

SENSe subsystem - Trouble Scan Results

SENSe subsystem - Trouble Scan Results

:SENSe:DATA:TELEcom:TSCan:TYPE?

| | | | |
|----------|------------|------|-----------------|
| Returns: | <discrete> | NTR | No Trouble |
| | | ADET | Alarms Detected |
| | | ERR | Errors Detected |

Returns the Trouble Scan state.

:SENSe:DATA:TELEcom:TSCan:ERRors?

| | | |
|-------------|------------------------|---|
| Returns: | <numeric>,<result > | |
| <numeric> = | 0 to 4 | Number of Troublescan error messages |
| <discrete> | See Table below | Error name and number of errors |

Returns the number of active Trouble Scan error messages. If no error messages are active, returns 0. If error message is active, returns the type of error and the error count separated by a comma e.g

2

FAS140 ERR, 6

BIT ERROR, 1

This indicates that 2 trouble scan error messages are active and 6 140 Mb/s frame errors and 1 bit error have occurred.

Common Commands

SENSE subsystem - Trouble Scan Results

Trouble Scan Results and Priority

SDH

RS B1 BIP
MS B2 BIP
PATH B3 BIP
VC3 PATH BIP
TU2 BIP
TU12 BIP
A1A2 FRAME
MS FEBE/MS-REI
PATH FEBE/HP-REI
PATH IEC /HP-IEC
VC3 PATH FEBE
TU2 FEBE
TU12 FEBE
BIT

SONET

CV-S (B1)
CV-L (B2)
CV-P (B3)
CV-V (V5)
A1A2 FRAME
CV-IEC
(DSn near-end
errors except BIT)
REI-L
REI-P
REI-V
BIT
(DSn far-end
errors)

SPDH

CRC
BIT
CODE
FAS 140M
FAS 34M
FAS 8M
FAS 2M
REBE

Common System Commands

SENSe subsystem - Configuring Graphics,
SENSe subsystem - Managing Graphics Stores,
SENSe subsystem - Retrieving Graphics Store Data,
SENSe subsystem - Retrieving Data for a Single Graph,
SENSe subsystem -Obtaining Graphics End of Measurement Results,
STATus Subsystem,
SYSTem Subsystem,
IEEE common capabilities

SENSe subsystem - Configuring Graphics

SENSe subsystem - Configuring Graphics

:SENSe:DATA:TELEcom:SMG <discrete>

| | | |
|------------|----------------|----------------------|
| <discrete> | OFF | Graphics Off |
| = | | |
| | ON or T1Second | 1 Second resolution |
| | T1Minutes | 1 Minute resolution |
| | T15Minutes | 15 Minute resolution |
| | T1Hour | 1 Hour resolution |

Sets the resolution of the stored measurement graphics (SMG).

The corresponding query returns the SMG resolution in discrete short form.

:SENSe:DATA:TELEcom:SMG?

Returns: <discrete>

:SENSe:DATA:TELEcom:SMG:RESolution <discrete>

| | | |
|-------------|----------|--------------------------------|
| <storage> = | COMPRESS | Storage capacity 20,000 Events |
| | FULL | Storage capacity 10,000 Events |

Sets the resolution of the graphics storage.

The corresponding query returns the storage resolution in discrete short form.

:SENSe:DATA:TELEcom:SMG:RESolution?

Returns: <discrete>

:SENSe:DATA:TELEcom:SMG:STORe <discrete>

| | | |
|--------------|----------|-------------------------|
| <location> = | INTernal | Graphics store location |
| | DISK | Disk storage |

Selects the storage location for the stored measurement graphics (SMG).

Common Commands

SENSe subsystem - Configuring Graphics

The corresponding query returns the storage location in discrete short form.

:SENSe:DATA:TELEcom:SMG:STORe?

Returns: <discrete>

SENSe subsystem - Managing Graphics Stores

SENSe subsystem - Managing Graphics Stores

:SENSe:DATA:TELEcom:SMG:CATalog?

Returns: <store-number>,<graph-type>,<year>,<month>,<day>,
<hour>,<minute>,<length>,<sample-size>

| | | |
|------------------|-----------|---|
| <store-number> = | <numeric> | -9 to 0 |
| <graph-type> = | <numeric> | 0 or 1 (1 - Demo; 0 -Graph) |
| <year> = | <numeric> | 1970 to 2069 |
| <month> = | <numeric> | 1 to 12 |
| <day> = | <numeric> | 1 to 31 |
| <hour> = | <numeric> | 0 to 23 |
| <minute> = | <numeric> | 0 to 59 |
| <length> = | <numeric> | 1 to n, number of samples in use. |
| <sample-size> = | <numeric> | 1, 60, 900 or 3600. Number of seconds per sample. |

Requests a catalogue of the SMG store data. A record is described above is produced for each SMG store being used. The final record is followed by EOI.

:SENSe:DATA:TELEcom:SMG:SIZE?

| | | |
|-----------------|-----------|------------|
| <size> = | <numeric> | 70200 |
| <stores-used> = | <numeric> | 0 to 70200 |

Requests the capacity of the graphics store and the number of store locations in use. The store size is a constant for a given instrument.

In the HP 37718A <size> is 70200 indicating that the maximum storage capacity is 70200 samples at the current resolution. <stores-used> indicates the number of samples currently allocated.

:SENSe:DATA:TELEcom:SMG:DELeTe <numeric>

| | |
|-----------|---------|
| <store> = | -9 to 0 |
|-----------|---------|

Common Commands

SENSe subsystem - Managing Graphics Stores

Deletes the given store.

:SENSe:DATA:TELEcom:SMG:DELeTe:ALL

Deletes all stores.

:SENSe:DATA:TELEcom:SMG:SINFormation? <numeric>

This command returns details of the specified SMG store

Returns: <Sample Size>,<Resolution>,<Date/Time>, <Duration>

| | | |
|---------------|--------------|--|
| <Sample Size> | <numeric> | 1, 60, 900 or 3600. seconds per sample |
| <Resolution> | COMP FULL | Compressed Format Full Resolution |
| <Time/Date> | <numeric> | Start Time & Date for store |
| <Duration> | <numeric> | Store Duration in seconds |

SENSe subsystem - Retrieving Graphics Store Data

SENSe subsystem - Retrieving Graphics Store Data

The data used to construct all the bar graphs within a given store location can be extracted from the instrument and processed in a PC.

Each bar graph is identified by a label. To obtain the labels use:

:SENSe:DATA:TELEcom:SMG:LABeLs? <numeric>

| | | |
|-------------|---------|-------------------------|
| <numeric> = | -9 to 0 | Graphics Store Location |
| | -10 | Disk Storage |

Returns all possible graph labels from the given SMG store even if some of those graphs are not applicable to the particular instrument configuration at the time the measurement was made.

A SMG graph is defined as:

- An error source Bar graph - Data from which the error source graph is constructed
- Alarm Bar graph - an 8 bit binary string recording the state of a group of alarms

Returns: <numeric>,<labels>

<numeric> Number of graph labels being returned

<labels> List of alphanumeric strings separated by commas.

The data for all graphs can be obtained using one of two commands:

:SENSe:DATA:TELEcom:SMG:HDATA:NORMal? <numeric>

| | | |
|-------------|---------|-------------------------|
| <numeric> = | -9 to 0 | Graphics Store Location |
| | -10 | Disk Storage |

Returns a series of numerics (error source bar graph) and 8 bit binary strings (alarm bar graph), separated by commas. All results are returned even if some of those graphs are not applicable to the particular instrument configuration at the time the measurement was made.

Common Commands

SENSe subsystem - Retrieving Graphics Store Data

One complete record is returned for each SMG measurement sample in the selected store location. The position of the data within this record corresponds to the labels obtained using :SENSe:DATA:TELEcom:SMG:LABels? <numeric>

:SENSe:DATA:TELEcom:SMG:HDATA:PACKed? <numeric>

| | | |
|-------------|---------|-------------------------|
| <numeric> = | -9 to 0 | Graphics Store Location |
| | -10 | Disk Storage |

Returns a series of numerics, (Number of unchanged samples, error source bar graph data, alarm bar graph data), separated by commas. All results are returned even if some of those graphs are not applicable to the particular instrument configuration at the time the measurement was made.

One complete record is returned for each SMG measurement sample in the selected store location unless the data in consecutive samples is the same. In that case only one record is returned and the first numeric value in each record indicates the number of SMG measurement samples in which the data was unchanged.

The position of the data within this record corresponds to the labels obtained using :SENSe:DATA:TELEcom:SMG:LABels? <numeric>

If an alarm string, whose value is other than "00000000", is returned, this indicates an alarm has occurred. To identify which alarm has occurred obtain the Alarm Labels using:

:SENSe:DATA:TELEcom:SMG:ALABels? <numeric>,<numeric>

| | | |
|-----------------------------------|---------|-------------------------|
| <numeric> = (first parameter) | -9 to 0 | Graphics Store Location |
| | -10 | Disk Storage |
| <numeric> = (second parameter) | | Graph number |

Requests the Alarm labels from the selected SMG store and graph.

| | | |
|----------|---------------------|---|
| Returns: | <numeric> | Number of graph labels being returned |
| | {<string>,<string>} | List of alphanumeric strings separated by commas. The first label returned corresponds to the most significant bit (MSB) of the alarm string. |

SENSe subsystem - Retrieving Data for a Single Graph

SENSe subsystem - Retrieving Data for a Single Graph

The data associated with each individual graph may be obtained using one of the following commands:

:SENSe:DATA:TELEcom:SMG:EDATa? <numeric>,<numeric>

<numeric> = -9 to 0 Graphics Store Location
(first parameter)

 -10 Disk Storage

<numeric> = Graph number
(second parameter)

Returns: <numeric> = 0 to 20,000 Number of events to follow
(first result)

<numeric> = 1 to 86,400,000 Seconds since start of test
(second result)

<numeric> = <numeric> Error Count or Alarm
(third result) Value

Returns the number of events that contributed to the graph, the time elapsed since the start of the graph and the error count or alarm value.

:SENSe:DATA:TELEcom:SMG:VDATa? <numeric>,<numeric>

<numeric> = -9 to 0 Graphics Store Location
(first parameter)

 -10 Disk Storage

<numeric> = Graph number
(second parameter)

Common Commands

SENSe subsystem - Retrieving Data for a Single Graph

| | | | |
|----------|--------------------------------|-----------------------|---|
| Returns: | <numeric> = (first result) | 0 to 20,000 | Number of events to follow |
| | <numeric> = (second result) | 1 to 2,147,483,647 | Seconds since January 1 st 1970 |
| | <numeric> = (third result) | <numeric> | Error Count or Alarm Value |

Returns the number of events that contributed to the graph, the time elapsed since January 1st 1970 and the error count or alarm value.

NOTE

PCs calculate time based on January 1st 1970.

:SENSe:DATA:TELEcom:SMG:TINformation? <numeric>,<numeric>

| | | | |
|----------|-----------------------------------|--------------|---|
| | <numeric> = (first parameter) | -9 to 0 | Graphics Store Location |
| | | -10 | Disk Storage |
| | <numeric> = (second parameter) | | Graph number |
| Returns: | <numeric> = (first result) | 0 1 | Graph not valid Graph valid |
| | <numeric> = (second result) | 0 to 20,000 | Number of events to follow |
| | <numeric> = (third result) | ALAR HIST | Alarm Bar Graph Error Source Bar Graph |

Returns the validity of the graph, the number of events that have contributed to the graph and the type of graph.

SENSe subsystem -Obtaining Graphics End of Measurement Results

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

| | | |
|---|--------------------------|-------------------------------|
| <numeric> = (first parameter) | -9 to 0 | Graphics Store Location |
| <numeric> = (second parameter - result selection) | -10 | Disk Storage |
| | <"ASEConds:PWL"> | Power Loss seconds |
| | <"ECount:SPDH:BIT"> | SPDH bit error count |
| | <"ECount:SPDH:CODE"> | SPDH code error count |
| | <"ECount:SPDH:M2:FAS"> | SPDH 2 Mb/s FAS error count |
| | <"ECount:SPDH:M8:FAS"> | SPDH 8 Mb/s FAS error count |
| | <"ECount:SPDH:M34:FAS"> | SPDH 34 Mb/s FAS error count |
| | <"ECount:SPDH:M140:FAS"> | SPDH 140 Mb/s FAS error count |
| | <"ECount:SPDH:PBITS"> | SPDH P Parity error count |
| | <"ECount:SPDH:CPBits"> | SPDH CP Parity error count |
| | <"ECount:SPDH:DS3:FAS"> | SPDH DS3 FAS error count |
| | <"ECount:SPDH:DS1:FAS"> | SPDH DS1 FAS error count |
| | <"ECount:SPDH:CRC"> | SPDH CRC6 error count |
| | <"ECount:SPDH:REBE"> | SPDH FAS REBE error count |
| | <"ECount:SPDH:FEBE"> | DS3 FEBE error count |
| | <"ERATio:SPDH:BIT"> | SPDH bit error ratio |
| | <"ERATio:SPDH:CODE"> | SPDH code error ratio |
| | <"ERATio:SPDH:M2:FAS"> | SPDH 2 Mb/s FAS error ratio |
| | <"ERATio:SPDH:M8:FAS"> | SPDH 8 Mb/s FAS error ratio |
| | <"ERATio:SPDH:M34:FAS"> | SPDH 34 Mb/s FAS error ratio |

Common Commands

SENSE subsystem -Obtaining Graphics End of Measurement Results

| | |
|--------------------------------------|--------------------------------|
| <"ERATio:SPDH:M140:FAS"> | SPDH 140 Mb/s FAS error ratio |
| <"ERATio:SPDH:PBITs"> | SPDH P Parity error ratio |
| <"ERATio:SPDH:CPBits"> | SPDH CP Parity error ratio |
| <"ERATio:SPDH:DS3:FAS"> | SPDH DS3 FAS error ratio |
| <"ERATio:SPDH:DS1:FAS"> | SPDH DS1 FAS error ratio |
| <"ERATio:SPDH:CRC"> | SPDH CRC error ratio |
| <"ERATio:SPDH:REBE"> | SPDH REBE error ratio |
| <"ERATio:SPDH:FEBE"> | DS3 FEBE error ratio |
| <"ASEConds:SPDH:LOS"> | Loss of Signal seconds |
| <"ASEConds:SPDH:M2:LOF"> | Loss of frame seconds 2 Mb/s |
| <"ASEConds:SPDH:M8:LOF"> | Loss of frame seconds 8 Mb/s |
| <"ASEConds:SPDH:M34:LOF"> | Loss of frame seconds 34 Mb/s |
| <"ASEConds:SPDH:M140:LOF"> | Loss of frame seconds 140 Mb/s |
| <"ASEConds:SPDH:DS1:OOF"> | Out of frame seconds DS1 |
| <"ASEConds:SPDH:DS2:OOF"> | Out of frame seconds DS2 |
| <"ASEConds:SPDH:DS3:OOF"> | Out of frame seconds DS3 |
| <"ASEConds:SPDH:DS3:EXZ"> | DS3 Excess zeros |
| <"ASEConds:SPDH:DS1:EXZ"> | DS1 Excess zeros |
| <"ASEConds:SPDH:DS3:IDLE"> | DS3 Idle |
| <"ASEConds:SPDH:MFM"> | M' frame loss seconds |
| <"ASEConds:SPDH:AIS"> | AIS seconds |
| <"ASEConds:SPDH:RAI"> | Remote loss seconds |
| <"ASEConds:SPDH:RMFR"> | Remote m' frame loss seconds |
| <"ASEConds:SPDH:PSL"> | Pattern sync loss seconds |
| <"TR1:SPDH:TRANsmit:ANALysis:M2120"> | 15 minute TX threshold report |
| <"TR1:SPDH:RECeive:ANALysis:M2120"> | 15 minute RX threshold report |
| <"TR2:SPDH:TRANsmit:ANALysis:M2120"> | 24 hour TX threshold report |
| <"TR2:SPDH:RECeive:ANALysis:M2120"> | 24 hour RX threshold report |

Common Commands

SENSE subsystem -Obtaining Graphics End of Measurement Results

| | |
|--|------------------------------|
| <"ECOunt:SDH:FRAMe"> | SDH Frame error count |
| <"ECOunt:SDH:RSBip"> | B1 RS BIP error count |
| <"ECOunt:SDH:MSBip"> | MS B2 BIP error count |
| <"ECOunt:SDH:MFEBe"> or <"ECOunt:SDH:MSRei"> | MS FEBE/MS REI error count |
| <"ECOunt:SDH:PBIP"> | Path B3 BIP error count |
| <"ECOunt:SDH:FEBe"> or <"ECOunt:SDH:REI"> | Path FEBE/HP-REI error count |
| <"ECOunt:SDH:PIEC"> | Path IEC error count |
| <"ECOunt:SDH:TRIB:FEBe"> or <"ECOunt:SDH:TRIB:REI"> | TU FEBE/LP-REI error count |
| <"ECOunt:SDH:TRIB:PBIP"> | TU path BIP error count |
| <"ERATio:SDH:FRAMe"> | SDH Frame error ratio |
| <"ERATio:SDH:RSBip"> | B1 RS BIP error ratio |
| <"ERATio:SDH:MSBip"> | MS B2 BIP error ratio |
| <"ERATio:SDH:MFEBe"> or <"ERATio:SDH:MSRei"> | MS FEBE/RS-REI error ratio |
| <"ERATio:SDH:PBIP"> | Path B3 BIP error ratio |
| <"ERATio:SDH:FEBe"> or <"ERATio:SDH:REI"> | Path FEBE/HP-REI error ratio |
| <"ERATio:SDH:PIEC"> | Path IEC error ratio |
| <"ERATio:SDH:TRIB:FEBe"> or <"ERATio:SDH:TRIB:REI"> | TU FEBE/LP-REI error ratio |
| <"ERATio:SDH:TRIB:PBIP"> | TU path BIP error ratio |
| "PACTivity:SDH:NDFSeconds" | AU Pointer NDF seconds |
| "PACTivity:SDH:MNDFseconds" | AU Pointer MNDF seconds |
| "PACTivity:SDH:PCOunt" | AU Pointer +ve Adj Count |
| "PACTivity:SDH:NCOunt" | AU Pointer -ve Adj Count |
| "PACTivity:SDH:TRIButary:NDFSeconds" | TU Pointer NDF seconds |
| "PACTivity:SDH:TRIButary:MNDFseconds" | TU Pointer MNDF seconds |

Common Commands

SENSe subsystem -Obtaining Graphics End of Measurement Results

| | |
|---|-----------------------------------|
| "PACTivity:SDH:TRIButary:PCOut" | TU Pointer +ve Adj Count |
| "PACTivity:SDH:TRIButary:NCOunt" | TU Pointer -ve Adj Count |
| <"ASEConds:SDH:PLOSs"> | Power loss seconds |
| <"ASEConds:SDH:LOS"> | Loss of signal seconds |
| <"ASEConds:SDH:LOF"> | Loss of frame seconds |
| <"ASEConds:SDH:OOF"> | Out of frame seconds |
| <"ASEConds:SDH:H4MF"> | H4 multiframe loss seconds |
| <"ASEConds:SDH:LOP"> | Loss of pointer seconds |
| <"ASEConds:SDH:MSAis"> | MS AIS seconds |
| <"ASEConds:SDH:PAIS"> | Path AIS seconds |
| <"ASEConds:SDH:PSLoss"> | Pattern Sync Loss seconds |
| <"ASEConds:SDH:MSFerf"> or <"ASEConds:SDH:MSRDi"> | MS FERF/MS-RDI seconds |
| <"ASEConds:SDH:K1K2"> | K1K2 change seconds |
| <"ASEConds:SDH:PFERf"> or <"ASEConds:SDH:RDI"> | STM Path FERF/HP-RDI seconds |
| <"ASEConds:SDH:OPSL"> | Overhead Pattern Sync Loss |
| <"ASEConds:SDH:TRIB:LOP"> | TU Loss of pointer seconds |
| <"ASEConds:SDH:TRIB:PAIS"> | TU Path AIS seconds |
| <"ASEConds:SDH:TRIB:PFERf"> or <"ASEConds:SDH:TRIB:RDI"> | TU Path FERF/LP-RDI seconds |
| <"ECOunt:SONet:FRAMe"> | SONET Frame error count |
| <"ECOunt:SONet:CVS"> | CV-S (Section B1 BIP) error count |
| <"ECOunt:SONet:CVL"> | CV-L (Section B2 BIP) error count |
| <"ECOunt:SONet:REIL"> | REI-L (Line FEBE) error count |
| <"ECOunt:SONet:CVP"> | CV-P (Path B3 BIP) error count |
| <"ECOunt:SONet:REIP"> | REI-P (Path FEBE) error count |
| <"ECOunt:SONet:CVIec"> | CV-IEC error count |
| <"ECOunt:SONet:TRIB:REIV"> | REI-V (VT FEBE) error count |

SENSE subsystem -Obtaining Graphics End of Measurement Results

| | |
|---|---------------------------------------|
| <"ECOut:SONet:TRIB:CVV"> | CV-V (VT path BIP) error count |
| <"ERATio:SONet:FRAMe"> | SONET Frame error ratio |
| <"ERATio:SONet:CVS"> | CV-S (Section B1 BIP) error ratio |
| <"ERATio:SONet:CVL"> | CV-L (Line B2 BIP) error ratio |
| <"ERATio:SONet:REIL"> | REI-L (Line FEBE) error ratio |
| <"ERATio:SONet:CVP"> | CV-P (Path B3 BIP) error ratio |
| <"ERATio:SONet:REIP"> | REI-P (Path FEBE) error ratio |
| <"ERATio:SONet:CVIec"> | CV-IEC error ratio |
| <"ERATio:SONet:TRIB:REIV"> | REI-V (VT FEBE) error ratio |
| <"ERATio:SONet:TRIB:CVV"> | CV-V (VT path BIP) error ratio |
| "PACTivity:SONet:NDFSeconds" | SPE Pointer NDF seconds |
| "PACTivity:SONet:MNDFseconds" | SPE Pointer MNDF seconds |
| "PACTivity:SONet:PCOut" | SPE Pointer +ve Adj Count |
| "PACTivity:SONet:NCOunt" | SPE Pointer -ve Adj Count |
| "PACTivity:SONet:TRIButary:NDFSeconds" | VT Pointer NDF seconds |
| "PACTivity:SONet:TRIButary:MNDFseconds" | VT Pointer MNDF seconds |
| "PACTivity:SONet:TRIButary:PCOut" | VT Pointer +ve Adj Count |
| "PACTivity:SONet:TRIButary:NCOunt" | VT Pointer -ve Adj Count |
| <"ASEConds:SONet:PLOSS"> | Power loss seconds |
| <"ASEConds:SONet:LOS"> | Loss of signal seconds |
| <"ASEConds:SONet:LOF"> | Loss of frame seconds |
| <"ASEConds:SONet:SEF"> | Severely Errored Frame Defect seconds |
| <"ASEConds:SONet:H4MF"> | H4 multiframe loss seconds |
| <"ASEConds:SONet:LOPP"> | LOP-P (Loss of pointer) seconds |
| <"ASEConds:SONet:AISL"> | AIS-L (Line AIS) seconds |
| <"ASEConds:SONet:AISP"> | AIS-P (Path AIS) seconds |
| <"ASEConds:SONet:PSLoss"> | Pattern Sync Loss seconds |
| <"ASEConds:SONet:RDIL"> | RDI-L (Line FERF) seconds |

Common Commands

STATus subsystem

| | |
|------------------------------|------------------------------------|
| <"ASEConds:SONet:K1K2"> | K1K2 change seconds |
| <"ASEConds:SONet:RDIP"> | RDI-P (Path FERF) seconds |
| <"ASEConds:SONet:OPSL"> | Overhead Pattern Sync Loss |
| <"ASEConds:SONet:TRIB:LOPV"> | LOP-V (VT Loss of pointer) seconds |
| <"ASEConds:SONet:TRIB:AISV"> | AIS-V (VT Path AIS) seconds |
| <"ASEConds:SONet:TRIB:RDIV"> | RDI-V (VT Path FERF) seconds |
| <"COUNT:JITT:HITS"> | Jitter Hit count |
| <"SLIPs:JITT:WANDer:FRAMe"> | estimated frame slips |
| <"SLIPs:JITT:WANDer:BIT"> | estimated bit slips |

STATus subsystem

This subsystem controls the status reporting registers. SCPI defined status registers QUEStionable, OPERation and INSTRument are provided. In addition instrument defined status registers DATA, FAS, SPDH, SDH, SDH2, SON, SON2 and JITT are provided. For detailed information on status reporting refer to Section 7 of this manual.

:STATus:CHIStory

Clear the contents of all History registers, and the front panel led history.

:STATus:PRESet

Sets all Status registers to the default state.

Common Commands

STATus subsystem

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

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

<numeric>

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

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>

: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>

SYSTEM Subsystem

SYSTEM Subsystem

:SYSTEM:WINDOW<type>

Selects the display type, Single or Multiple. Selection of SINGLE results in faster remote operation.

| | | |
|----------|----------|---------------------------------|
| <type> = | SINGLE | Selects single window display |
| | MULTIPLE | Selects multiple window display |

The corresponding query returns the display type.

:SYSTEM:WINDOW?

Returns : <type>

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

| | | |
|-----------|-----------|--------------|
| <year> = | <numeric> | 1970 to 2069 |
| <month> = | <numeric> | 1 to 12 |
| <day> = | <numeric> | 1 to 31 |

Sets the date within the OTHER TIME & DATE function.

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 within the OTHER TIME & DATE function.

Common Commands

SYSTem Subsystem

The corresponding query returns the time in numeric form.

:SYSTem:TIME?

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

:SYSTem:TRIGger <trig_source>

Where <trig_source> = NONE
 TXFRame
 RXFRame
 RSBIP
 MSBIP
 PBIP

:SYSTem:KLOCK <boolean>

<boolean> = 0 or OFF Keyboard unlocked
 1 or ON Keyboard locked

Selects the state of the OTHER KEYBOARD LOCK function.

The corresponding query returns the state of KEYBOARD LOCK as 0 or 1.

:SYSTem:KLOCK?

Returns : <boolean>

:SYSTem:LOCAL

Set the HP 37718A to Local (keyboard) control.

:SYSTem:REMOte

Set the HP 37718A to Remote control.

:SYSTem:PRESet

Sets the instrument to the same state as the front panel reset key (power). This command is similar to *RST but differs in that it duplicates the action of the front panel power on/off key.

Common Commands

SYSTEM Subsystem

:SYSTEM:SERial?

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 HP 37718A to the state defined by the Block data.

The corresponding query returns the instrument state in block form.

:SYSTEM:CONF?

Returns : #0<block>

:SYSTEM:VERSion?

Requests 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.

Returns : <version> = YYYY.V

:SYSTEM:ERRor?

Requests the HP 37718A remote control Error status.

The error status is returned as a numeric value and a string containing a description of the error.

Returns : <numeric>,<string>

:SYSTEM:PRINt

The current results are logged to the selected printer.

:SYSTEM:PRINt:AUTO <boolean>

<boolean> = 0 or OFF
1 or ON

Common Commands

SYSTem Subsystem

Determines whether the selected results are logged to the selected logging device. If OFF is selected results can only be logged using :SYSTem:PRINt. If ON is selected further selection of :SYSTem:PRINt:PERiod <period> is required.

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

:SYSTem:PRINt:AUTO?

Returns : <boolean>

:SYSTem:PRINt:PERiod <period>

| | | |
|------------|-------|-------------------------------|
| <period> = | OFF | Log at end of test |
| | MIN10 | Log at 10 minute intervals |
| | HR1 | Log at 1 hour intervals |
| | HR24 | Log at 24 hour intervals |
| | USER | User defined Logging interval |

Determines the interval at which the results are logged to the selected logging device. If anything other than OFF is selected further selection of :SYSTem:PRINt:RESults <type> is required. If USER is selected further selection of :SYSTem:PRINt:UPERiod <numeric>,<discrete> is required.

The corresponding query returns the logging interval in discrete form, as listed above.

:SYSTem:PRINt:PERiod?

Returns : <period>

:SYSTem:PRINt:UPERiod <numeric>,<discrete>

| | | |
|--------------|---------|-------------------|
| <numeric> = | 1 to 99 | |
| <discrete> = | HR | Hours (1 - 99) |
| | MIN | Minutes (10 - 99) |

Sets the USER defined logging period in the range 10 to 99 minutes or 1 to 99 hours.

The corresponding query returns the User defined period in numeric, discrete form, as listed above.

Common Commands

SYSTEM Subsystem

:SYSTEM:PRINT:UPERiod?

Returns : <numeric>,<discrete>

:SYSTEM:PRINT:RESults <type>

| | | |
|----------|--------|------------------------|
| <type> = | ALL | Print All results |
| | SElect | Print selected results |

Determines which results are logged to the selected logging device. If SEL is selected further selections of :SYSTEM:PRINT:CONTent <content> , :SYSTEM:PRINT:WHEN <select> and :SYSTEM:PRINT:SPAN <content> are required.

The corresponding query returns the logged results selection in discrete form, as listed above.

:SYSTEM:PRINT:RESults?

Returns : <type>

:SYSTEM:PRINT:CONTent <content>

| | | |
|-------------|----------|--------------------------------|
| <content> = | ERATio | Error Ratio results |
| | ANALysis | Analysis results |
| | BOTH | Error Ratio & Analysis results |

In conjunction with :SYSTEM:PRINT:SPAN <content> determines the type of selected results to be logged to the selected logging device.

The corresponding query returns the result content in discrete form, as listed above.

:SYSTEM:PRINT:CONTent?

Returns : <content>

Common Commands

SYSTem Subsystem

:SYSTem:PRINt:SPAN <content>

| | | |
|-------------|------------|-----------------------------|
| <content> = | PERiod | Period results |
| | CUMulative | Cumulative results |
| | BOTH | Period & Cumulative results |

In conjunction with :SYSTem:PRINt:CONTent <content> determines the type of selected results to be logged to the selected logging device.

Common Commands

SYSTem Subsystem

The corresponding query returns the result content in discrete form, as listed above.

:SYSTem:PRINt:SPAN?

Returns : <content>

:SYSTem:PRINt:WHEN <select>

| | | |
|------------|--------|----------------------------------|
| <select> = | ALWays | Logged at specified interval |
| | ECOut | Logged if bit error count is > 0 |

Determines the conditions for logging results when :SYSTem:PRINt:RESults <type> is set to <SEL>.

The corresponding query returns the logging conditions in discrete form, as listed above.

:SYSTem:PRINt:WHEN?

Returns : <select>

:SYSTem:PRINt:MODE <mode>

| | | |
|----------|------------|-------------------------|
| <mode> = | NORMAl | Normal print format |
| | COMPRESSED | Compressed print format |

Only valid when RS232 or Parallel printer is selected. Determines the column width of the printed results.

The corresponding query returns the print mode in discrete form, as listed above.

:SYSTem:PRINt:MODE?

Returns : <mode>

:SYSTem:SELFtest:WAVElength <discrete>

| | | |
|--------------|--------|--------|
| <discrete> = | NM1310 | 1310nm |
| | NM1550 | 1550nm |

Selects the relevant optical output port to be used during selftest. Only valid for dual wavelength options (option 106/206).

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

Common Commands

SYSTEM Subsystem

:SYSTEM:PRINT:ESEConds <boolean>

<boolean> = 0 or OFF
1 or ON

Determines whether occurrences of error seconds are logged on the selected logging device. The corresponding query returns the error second logging state as 0 or 1.

:SYSTEM:PRINT:ESEConds?

Returns : <boolean>

:SYSTEM:LOGGing:DEvice <type>

| | | |
|----------|----------|-------------------------------|
| <type> = | INTernal | Internal printer (option 602) |
| | HPIB | HPIB external printer |
| | RS232 | RS-232-C external printer |
| | DISK | Internal Disc Drive |
| | PARallel | Centronics external printer |

Selects the logging device for results logging.

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

:SYSTEM:LOGGing:DEvice?

Returns : <type>

:SYSTEM:PRINT:DEMAND <mode>

| | | |
|----------|----------|---|
| <mode> = | RESults | Print results snapshot |
| | OVERhead | Print overhead snapshot |
| | OCAPture | Print overhead capture results |
| | PGRaph | Print pointer graph |
| | TRIBscan | Print SDH/SONET tributary scan |
| | SDUMp | Copies the current display to the internal disc drive |
| | ALMScan | Print alarm scan information |

Common Commands

SYSTEM Subsystem

Selects the Log on Demand item to be printed.

The corresponding query returns the log on demand item selected in discrete short form.

:SYSTEM:PRINT:DEMAND?

Returns: <mode>

:SYSTEM:PRINT:SDUMP:DESTINATION <destination>

| | | |
|--------------|------|--|
| Destination= | LID | Send screen dump information to in-lid printer |
| | DISK | Send screen dump information to floppy disk |

Selects the destination of screen dump information.

The corresponding query returns the current selection

:SYSTEM:PRINT:SDUMP:COMPRESSION <boolean>

| | | |
|-------------|----------|---|
| <boolean> = | 0 or OFF | Deselect compression of screen dump information |
| | 1 or ON | Select compression of screen dump information |

:SYSTEM:DISK:FORMAT

Format a Disk.

:SYSTEM:DISK:Label <string>

Label the disk with a string of up to 11 alphanumeric characters e.g. "SiteB 28/5"

The corresponding query returns the filename as a string.

:SYSTEM:DISK:Label?

Returns : <string>

:SYSTEM:DISK:SAVE <extension>,<filename>,<overwrite>

Common Commands

SYSTEM Subsystem

| | | |
|---------------|-----|-----------------------------|
| <extension> = | CNF | Instrument Configuration |
| | SMG | Stored Measurement Graphics |
| | PRN | Data Logging |

<filename> = Up to 8 Alphanumeric character string

| | | |
|---------------|---|-----------------------------------|
| <overwrite> = | 0 | If file exists will not overwrite |
| | 1 | Will overwrite automatically |

Saves required information to disk. If PRN is selected further selection of :SYSTEM:DISK:SAVE:MODE <discrete> is required.

:SYSTEM:DISK:SAVE:MODE <discrete>

| | | |
|--------------|-----------|-------------------------|
| <discrete> = | APPend | Add to file |
| | OVERwrite | Overwrite existing file |

Designates the position within the file to which the results are saved if the file type is PRN.

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

:SYSTEM:DISK:SAVE:MODE?

Returns : <discrete>

:SYSTEM:DISK:RECall <extension>,<filename>,<confirm>

| | | |
|---------------|-----|-----------------------------|
| <extension> = | CNF | Instrument Configuration |
| | SMG | Stored Measurement Graphics |

<filename> = Up to 8 Alphanumeric character string

| | | |
|-------------|---|---|
| <confirm> = | 0 | If Option structure is different from stored configuration will not recall. |
| | 1 | Will recall stored configuration automatically. |

Common Commands

SYSTem Subsystem

Recalls stored measurement graphics or instrument configuration from Disk to instrument.

:SYSTem:DISK:FILE;COPY:CNF
<to>,<store>,<directory>,<filename>,<overwrite>

| | | |
|-----------|--------|--------------------------|
| <to> = | DISK | Copy to Disk |
| | MEMory | Copy to Instrument store |
| <store> = | 1 to 4 | Instrument store number |

<directory> = Up to 256 Alphanumeric character string

<filename> = Up to 8 Alphanumeric character string

<overwrite> = 0 **Copying to Disk:** If file exists will not overwrite.

Copying to Instrument: If Option structure is different from stored configuration will not copy.

1 **Copying to Disk:** Will copy automatically.

Copying to Instrument: Will copy automatically.

Copy instrument configuration from Disk to instrument store or from instrument store to Disk. When TO = MEMory OVERWRITE must be 1.

:SYSTem:DISK:FILE:COPY:SMG:FORMat <type>

| | | |
|----------|--------|--------------------------|
| <type> = | NORMal | Normal SMG format |
| | CSV | Comma Separated Variable |

Sets the format of the SMG data to be copied to Disk. This should be set before the :SYST:DISK:FILE:COPY:SMG command is issued.

:SYSTem:DISK:FILE:COPY:SMG:FORMat?

Returns : <discrete>

:SYSTem:DISK:FILE:COPY:SMG
<store>,<directory>,<filename>,<overwrite>

Common Commands

SYSTEM Subsystem

<store> = -9 to 0 Instrument store number

<directory> = Up to 256 Alphanumeric character string

<filename> = Up to 8 Alphanumeric character string

<overwrite> = 0 If file exists will not overwrite

1 Will overwrite automatically

Copy stored measurement graphics from instrument store to Disk. Set :SYSTEM:DISK:FILE:COPY:SMG:FORMat <type> to NORM or CSV before issuing this command.

:SYSTEM:DISK:FILE:DELEte <filename>

<filename> = Up to 12 Alphanumeric character string including extension

:SYSTEM:DISK:DIRectory:DELEte

Delete current directory.

:SYSTEM:DISK:FILE:REName <from_filename>,<to_dir>, <filename>,<overwrite>

<from_filename> = Up to 12 Alphanumeric character string including extension

<to_dir> = Up to 256 Alphanumeric character string

<to_filename> = Up to 12 Alphanumeric character string including extension

<overwrite> = 0 If file exists will not overwrite

1 Will overwrite automatically

Rename file. Cannot rename directories.

:SYSTEM:DISK:DIRectory:CREate <filename>

<filename> Up to 8 Alphanumeric character string

Create a directory.

Common Commands

SYSTEM Subsystem

:SYSTEM:DISK:DIRectory? <extension>,<format>

| | | |
|---------------|-------------|---|
| <extension> = | ALL | List all files |
| | CNF | List only files with CNF extension |
| | SMG | List only files with SMG extension |
| | PRN | List only files with PRN extension |
| <format> = | SHORT | List file name only |
| | LONG | List file name, file size, date & time modified |
| | DESCRiption | list file name, file description |

Returns directory list.

:SYSTEM:DISK:PWD?

Returns : <string>

Returns directory name.

:SYSTEM:DISK:FREE?

Returns : <numeric>

Returns free space on disk in bytes.

:SYSTEM:DISK:CD <string>

| | | |
|---------------|------------|---------------------------------|
| <directory> = | "dir_name" | Up to 8 alphanumeric characters |
| | ".." | CD to parent directory |
| | "\" | CD to root directory |

Change directory.

:SYSTEM:COMMunicate:SERial:BAUD <rate>

| | |
|----------|------|
| <rate> = | 300 |
| | 600 |
| | 1200 |
| | 1800 |

Common Commands

SYSTem Subsystem

2400

4800

9600

Determines the speed (Baud Rate) at which the RS-232-C remote control and printer interface operates.

The corresponding query returns the Baud Rate in numeric form as listed above.

:SYSTem:COMMunicate:SERial:BAUD?

Returns : <rate>

:SYSTem:COMMunicate:SERial:MODE <type>

| | | |
|----------|----------|---------------------------|
| <type> = | COMPUter | RS-232-C computer control |
| | TERMinal | RS-232-C terminal control |

Determines the type of controller to be used on the RS-232-C remote control interface.

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

:SYSTem:COMMunicate:SERial:MODE?

Returns : <type>

:SYSTem:COMMunicate:SERial:PARity <type>

| | |
|----------|------|
| <type> = | ODD |
| | EVEN |
| | ZERO |
| | ONE |

Determines the type of parity to be used on the RS-232-C remote control interface.

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

:SYSTem:COMMunicate:SERial:PARity?

Returns : <type>

Common Commands

SYSTEM Subsystem

:SYSTEM:SSETting:LABEL <numeric>,<title>

<numeric> = 1 to 9 Stored Setting number

<title> = String 1 to 24 ASCII characters

Titles the Store Setting location with the contents of the string.

The corresponding query returns the title of the selected Stored Setting location as a string.

:SYSTEM:SSETting:LABEL? <numeric>

Returns : <string> 1 to 24 ASCII characters

:SYSTEM:BEEPer:STATe <boolean>

<boolean> = 0 or OFF Beep Off

 1 or ON Beep On

Selects the state of the OTHER BEEP ON ERROR function.

The corresponding query returns the state of the BEEP ON ERROR function as 0 or 1.

:SYSTEM:BEEPer:STATe?

Returns : <boolean>

Common Commands
IEEE common capabilities

IEEE common capabilities

***CLS**

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

***ESE <numeric>**

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

| | | |
|-------------|-----|------------------------|
| <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 |

***ESE?**

Event Status Enable Query - Returns the current mask setting.

***ESR?**

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

***IDN?**

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

"HEWLETT-PACKARD, COMMUNICATIONS PERFORMANCE ANALYZER, GBnnnnnnnn, A.nn.nn" GB signifies the country of origin (Great Britain).

***LRN?**

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

Common Commands

IEEE common capabilities

*OPC

Operation Complete - Masks the OPC bit in the Event Status Register.

*OPC?

Operation Complete Query - Returns a 1 when the OPC bit in the Event Status Register is set to 1 (true).

*OPT?

Option Identification Query - Returns the Option and Plug-in state of the instrument:

| Option/Plug-In Fitted | Returned Result |
|---|-----------------|
| None | 0 |
| SDH (ITU-T) | 001 |
| SONET/SDH (ANSI/ITU-T) | 002 |
| 2.5 Gb/s, 1310 nm, BER analysis | 104 |
| 2.5 Gb/s, 1550 nm, BER analysis | 105 |
| 2.5 Gb/s, 1310/1550 nm, BER analysis | 106 |
| 2.5 Gb/s 1310 nm, BER analysis, jitter test | 204 |
| 2.5 Gb/s 1550 nm, BER analysis, jitter test | 205 |
| 2.5 Gb/s, 1310/1550 nm, BER analysis, jitter test | 206 |
| RS-232-C, GP-IB and LAN remote control interfaces | 601 |
| 80-column in-lid graphics printer | 602 |

If more than one Option/Plug-In combination is fitted a complete list is returned with each list item separated by a comma :

*PSC <numeric>

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

*PSC?

Returns the status of the PSC flag.

Common Commands

IEEE common capabilities

***RCL <numeric>**

Recall Stored Settings - Sets the instrument to a set of previously stored settings. Numeric is in the range 0 to 9 and determines which set of stored settings is recalled.

***RST**

Set the instrument to the Default settings listed.

***SAV <numeric>**

Save Stored Settings - Stores the current instrument settings. Numeric is in the range 1 to 9 and determines the store location.

***SRE <numeric>**

Service Request Enable - Sets the status byte mask.

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

***SRE?**

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

***STB?**

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

***TRG**

Trigger - Not implemented on HP 37718A .

***TRG?**

Trigger Query - Not implemented on HP 37718A .

***WAI**

Wait To Continue - Not implemented on the HP 37718A.

Common Commands
IEEE common capabilities

***TST**

Initiate Self Test

***TST?**

Self Test Query

Common Commands
IEEE common capabilities

OUTPut subsystem, see page 3- 3.

SOURce subsystem - Transmitter Structured PDH Commands, see page 3- 7.

SOURce subsystem - Transmitter SPDH Test Signal Settings Commands, see page 3- 17.

SOURce subsystem - Transmitter SPDH Test Function Commands, see page 3- 25.

INPut subsystem, see page 3-39.

SENSe subsystem - Receiver Structured PDH Settings, see page 3-43.

SENSe subsystem - Receiver SPDH Test Signal Settings Commands, see page 3- 46.

SENSe subsystem - Receiver SPDH Test Function Commands, see page 3- 52.

SENSe subsystem - Analysis Control, see page 3- 53.

SENSe subsystem - Alarm Scan Control, see page 3-58.

SENSe subsystem - SPDH Round Trip Delay Control, see page 3- 59.

SENSe subsystem - Result Returning Commands, see page 3-60.

FETCh subsystem, see page 3- 77.

PDH Command Reference

PDH Command Reference

This chapter contains detailed information on the SCPI (Standard Commands for Programming Instruments) and IEEE 488.2 common commands you will use when writing programs to control your HP 37718A for PDH operation.

Please also refer to chapter 2 Common Commands for general information on SCPI command formats and for a list of commands that are common to PDH, SDH, SONET, or Jitter operation; they are as follows:

SCPI Command Format

Remote Control Commands

Instrument Options

INSTRument subsystem

SOURce subsystem

SOURce subsystem - Transmitter Common Commands

INPut subsystem

SENSe subsystem

SENSe subsystem - Receiver Common Commands

SENSe subsystem - Test Timing

SENSe subsystem - Analysis Control

SENSe subsystem - Trouble Scan Results

SENSe subsystem - Configuring Graphics,

SENSe subsystem - Managing Graphics Stores

SENSe subsystem - Retrieving Graphics Store Data

SENSe subsystem - Retrieving Data for a Single Graph

SENSe subsystem - Obtaining Graphics End of Measurement Results

STATus Subsystem

SYSTem Subsystem

IEEE common capabilities

OUTPut subsystem

OUTPut subsystem

This subsystem controls the characteristics of the instrument's output ports.

:OUTPut:TELEcom:SPDH:RATE <discrete>

| | | |
|------------|------|-------------|
| <discrete> | M140 | 140Mb/s |
| | M34 | 34Mb/s |
| | M8 | 8Mb/s |
| | M2 | 2Mb/s |
| | DS1 | 1.544 Mb/s |
| | DS3 | 44.736 Mb/s |

Sets the output rate for the PDH electrical output port. This command is only valid when :SOURCE:DATA:TELEcom:SOURce <discrete> is set to PDH .

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

:OUTPut:TELEcom:SPDH:RATE?

Returns : <discrete>

:OUTPut:TELEcom:SPDH:CODE <discrete>

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

Selects the Structured PDH interface line code for the transmitter.

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

OUTPut subsystem

:OUTPut:TELEcom:SPDH:CODE?

Returns : <discrete>

:OUTPut:TELEcom:SPDH:DROP:CODE <discrete>

| | | |
|--------------|------|------------|
| <discrete> = | AMI | 2Mb/s, DS1 |
| | HDB3 | 2Mb/s only |
| | B8ZS | DS1 only |

Selects the Structured PDH drop port interface line code for the receiver.

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

:OUTPut:TELEcom:SPDH:DROP:CODE?

Returns: <discrete>

:OUTPut:TELEcom:SPDH:LEVel <discrete>

| | | |
|--------------|-------|----------|
| <discrete> = | DSX | |
| | HIGH | DS3 only |
| | FT900 | |
| | LOW | DS1 only |

Sets the DS3/DS1 output level. The corresponding query command returns the current setting.

:OUTPut:TELEcom:SPDH:LEVel?

Returns <discrete>

:OUTPut:TELEcom:SPDH:BALance <discrete>

| | | |
|--------------|------------|----------------|
| <discrete> = | UNBalanced | 75Ω Unbalanced |
| | BALanced | 120Ω Balanced |

PDH Command Reference

OUTPut subsystem

Selects the Structured PDH transmitter termination level. 120 Ω Balanced is only allowed when :OUTPut:TELEcom:SPDH:RATE <discrete> is set to M2 .

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

:OUTPut:TELEcom:SPDH:BALance?

Returns : <discrete>

:OUTPut:TELEcom:SPDH:STATe <boolean>

<boolean> = 0 or OFF
1 or ON

Disable or enable the transmitter output, equivalent to generating or disabling Loss Of Signal. Disabling the output is only permitted when

:SENSe:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to ERRor.

The corresponding query command returns the current state of the output.

NOTE

Issuing command :OUTPut:TELEcom:SPDH:STATe <boolean> has the effect of disabling any active SPDH alarm. Similarly, issuing any SPDH alarm command, for example, :SOURce:DATA:TELEcom:SPDH:M140:ALARm <discrete> has the effect of automatically enabling the transmitter output.

:OUTPut:TELEcom:SPDH:STATe?

Returns: <boolean>

OUTPut subsystem

SOURce subsystem -Transmitter Structured PDH Commands

:SOURce:CLOCK:SPDH:M34:FOFFset:OFFSet <numeric>, <discrete>

| | | |
|--------------|-----------------------|---------------------|
| <numeric> = | -100 to +100 | parts per million |
| | -0.000100 to 0.000100 | percentage or ratio |
| <discrete> = | PPM | parts per million |
| | PCT | Percentage |

Sets the USER frequency offset for the Structured PDH transmitter 34.368 MHz clock if :SOURce:CLOCK:SPDH:M34:FOFFset <discrete> is set to USER . If Ratio is chosen as the means of specifying offset then no <discrete> parameter is required.

The corresponding query returns the USER 34.368 MHz clock offset in parts per million.

:SOURce:CLOCK:SPDH:M34:FOFFset:OFFSet?

Returns : <numeric>

:SOURce:CLOCK:SPDH:M140:FOFFset <discrete>

| | | |
|--------------|------|-----------------------|
| <discrete> = | NONE | Off |
| | PMAX | CCITT maximum +15 ppm |
| | NMAX | CCITT maximum -15 ppm |
| | USER | ± 100 ppm |

Selects the Structured PDH transmitter (Option 010 only) 139.264 MHz clock offset type. If USER is selected, the amount of offset is set using

:SOURce:CLOCK:SPDH:M140:FOFFset:OFFSet <numeric>, <discrete>.

The corresponding query returns the Structured PDH 139.264 MHz clock offset type in discrete form as listed above.

:SOURce:CLOCK:SPDH:M140:FOFFset?

Returns : <discrete>

SOURce subsystem -Transmitter Structured PDH Commands

| | |
|-------|------------------|
| P1000 | word 1000 |
| UWORD | 16 bit user word |

Selects the Structured PDH transmitter data pattern. If UWORD is selected the word is set using :SOURce:DATA:TELEcom:SPDH:UWORD <string>.

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

:SOURce:DATA:TELEcom:SPDH:PATtern?

Returns : <discrete>

:SOURce:DATA:TELEcom:SPDH:UWORD <string>

Sets the Structured PDH transmitter user word pattern in the range "000000000000000" to "1111111111111111".

The corresponding query returns the user word pattern as a string as listed above.

:SOURce:DATA:TELEcom:SPDH:UWORD?

Returns : <string>

:SOURce:DATA:TELEcom:SPDH:PRBS:POLarity <discrete>

| | | |
|--------------|----------|------------------|
| <discrete> = | INVerted | CCITT conformity |
| | NORMal | Non CCITT |

Sets the polarity of the PRBS pattern of the Structured PDH transmitter.

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

:SOURce:DATA:TELEcom:SPDH:PRBS:POLarity?

Returns: <discrete>

:SOURce:DATA:TELEcom:SPDH:PAYLoad:TYPE <discrete>

| | | |
|--------------|----------|-------------------|
| <discrete> = | UNFRamed | No Framing |
| | FRAMed | 8, 34 and 140Mb/s |

SOURce subsystem -Transmitter Structured PDH Commands

| | |
|----------|--------------------|
| PCM30 | 2Mb/s only |
| PCM31 | 2Mb/s only |
| PCM30CRC | 2Mb/s only |
| PCM31CRC | 2Mb/s only |
| D4 | DS1 only (Opt 011) |
| ESF | DS1 only (Opt 011) |
| SLC96 | DS1 only (Opt 011) |
| M13 | DS3 only (Opt 011) |
| CBIT | DS3 only (Opt 011) |

Selects the Structured PDH transmitter interface rate framing.

Note that this command is not backwards compatible. To set the payload to be structured, use the command

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

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

:SOURce:DATA:TELEcom:SPDH:PAYLoad:TYPE?

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.

:SOURce:DATA:TELEcom:SPDH:PAYLoad:STRucture?

Returns: <discrete>

SOURce subsystem -Transmitter Structured PDH Commands

:SOURce:DATA:TELEcom:SPDH:TSLot:SIGNaling:DATA:M2 <string>

<string> = 4 bit string

Selects the signaling bits for 2Mb/s CAS framing to be transmitted.

The corresponding query returns the signaling bits selected as a 4 bit binary string.

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

Returns: <string>

**SOURce subsystem - Transmitter SPDH Test Signal Settings
Commands**

| | |
|-------|------------------------------|
| D4 | DS1 (Option 011 only) |
| ESF | DS1 (Option 011 only) |
| SLC96 | DS1 (Option 011 only) |
| IDS1 | Insert DS1 (Option 011 only) |

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:PAYLoad?

Returns : <discrete>

:SOURce:DATA:TELEcom:SPDH:TSIGnal:TRIButary:M34 <discrete>

<discrete> = TRIB1
 TRIB2
 TRIB3
 TRIB4

Selects the Structured PDH transmitter 34 Mb/s tributary test signal.

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

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

Returns : <discrete>

:SOURce:DATA:TELEcom:SPDH:TSIGnal:TRIButary:M8 <discrete>

<discrete> = TRIB1
 TRIB2
 TRIB3
 TRIB4

PDH Command Reference

**SOURce subsystem - Transmitter SPDH Test Signal Settings
Commands**

Selects the Structured PDH transmitter 8 Mb/s tributary test signal.

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

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

Returns : <discrete>

:SOURce:DATA:TELEcom:SPDH:TSIGnal:TRIButary:M2 <discrete>

<discrete> = TRIB1
 TRIB2
 TRIB3
 TRIB4

Selects the Structured PDH transmitter 2 Mb/s tributary test signal.

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

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

Returns : <discrete>

:SOURce:DATA:TELEcom:SPDH:TSIGnal:TRIButary:DS1 <discrete>

<discrete> = TRIB1
 TRIB2
 TRIB3
 TRIB4

Selects the Structured PDH transmitter DS1 tributary test signal. This command applies to Option 011 only. The corresponding query returns the tributary in discrete form as listed above.

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

Returns: <discrete>

**SOURce subsystem - Transmitter SPDH Test Signal Settings
Commands**

:SOURce:DATA:TELEcom:SPDH:TSIGnal:TRIButary:DS2 <discrete>

| | |
|--------------|-------|
| <discrete> = | TRIB1 |
| | TRIB2 |
| | TRIB3 |
| | TRIB4 |
| | TRIB5 |
| | TRIB6 |
| | TRIB7 |

Selects the Structured PDH transmitter DS2 tributary test signal. This command applies to Option 011 only.

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

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

Returns: <discrete>

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

| | | |
|-----------|---------|-------------|
| <numeric> | 1 to 24 | Any framing |
|-----------|---------|-------------|

Selects the PDH transmitter 56kb/s timeslot. Option 011 only.

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

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

Returns: <numeric>

PDH Command Reference

**SOURce subsystem - Transmitter SPDH Test Signal Settings
Commands**

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

<numeric> 1 to 24 Any framing

Selects the PDH transmitter 56kb/s timeslot. Applies to Option 011 only.

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

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

Returns: <numeric>

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

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

Selects the PDH transmitter 64kb/s timeslot.

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

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

Returns: <numeric>

:SOURce:DATA:TELEcom:SPDH:TSIGnal:TSLot:M2:K64XN <string>

<string> = 31 bit string

Selects the 64XN kb/s timeslots of the 2mb/s test signal. a "1" in the nth position signifies selection of timeslot n. A "0" signifies deselection e.g. to select timeslots 1,8,15,22,29 "100000010000001000000100000010".

The corresponding query returns the 64XNkb/s timeslot as a 31 bit binary string.

:SOURce:DATA:TELEcom:SPDH:TSIGnal:TSLot:M2:K64XN?

**SOURce subsystem - Transmitter SPDH Test Signal Settings
Commands**

Returns: <string>

:SOURce:DATA:TELEcom:SPDH:TSIGnal:TSLot:DS1:K64XN <string>

<string> = 24 bit string

Selects the 64XN 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 "10000001000000100000010". Applies to Option 011 only.

The corresponding query returns the 64XNkb/s timeslot as a 24 bit binary string.

:SOURce:DATA:TELEcom:SPDH:TSIGnal:TSLot:DS1:K64XN?

Returns: <string>

:SOURce:DATA:TELEcom:SPDH:TSIGnal:TSLot:DS1:K56XN <string>

<string> = 24 bit string

Selects the 56XN kb/s timeslots. a "1" in the nth position signifies selection of timeslot n. A "0" signifies deselection e.g. to select timeslots 1,8,15,22 "10000001000000100000010". Applies to Option 011 only.

The corresponding query returns the 56XNkb/s timeslot as a 24 bit binary string.

:SOURce:DATA:TELEcom:SPDH:TSIGnal:TSLot:DS1:K56XN?

Returns: <string>

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

<discrete> = AIS Alarm Indication Sequence

PDH Command Reference

**SOURce subsystem - Transmitter SPDH Test Signal Settings
Commands**

| | |
|-------|------------------------|
| 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>

:SOURce:DATA:TELEcom:SPDH:TSLot:SIGNaling:DATA:DS1:D4 <string>

<string> = 2 bit string

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

The corresponding query returns the signaling bits selected as a 2 bit binary string.
Applies to option 011 only.

:SOURce:DATA:TELEcom:SPDH:TSLot:SIGNaling:DATA:DS1:ESF

Returns: <string>

**:SOURce:DATA:TELEcom:SPDH:TSLot:SIGNaling:DATA:DS1:ESF
<string>**

<string> = 4 bit string (Option 011 only)

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

Applies to option 011 only.

The corresponding query returns the signaling bits selected as a 4 bit binary string.

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

Returns: <string>

**SOURce subsystem - Transmitter SPDH Test Signal Settings
Commands**

**:SOURce:DATA:TELEcom:SPDH:TSLot:SIGNaling:DATA:DS1:SLC96
<string>**

<string> = 2 character string (Option 011 only)

Selects the signaling bits for DS1 SLC96 framing to be transmitted.
Applies to option 011 only.

Note that to select 'alternating' for either bit use the character 'A'

The corresponding query returns the signaling bits selected as a 2 character string,
where 'A' means alternating.

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

Returns: <string>

See also:

:SOURce:DATA:TELEcom:SPDH:PATtern <discrete>

:SOURce:DATA:TELEcom:SPDH:UWORd <string>

:SOURce:DATA:TELEcom:SPDH:PRBS:POLarity <discrete>

SOURce subsystem - Transmitter SPDH Test Function Commands

See also common commands:

:SOURce:DATA:TELEcom:TFUNction <discrete>

:SOURce:DATA:TELEcom:TFUNction:SDISruption <boolean>

<boolean>= OFF
 ON

Selects the Structured PDH transmitter special service disruption mode. This command is only valid if Option 011 is fitted and the test function is set to service disruption with :SOURce:DATA:TELEcom:TFUNction <discrete>.

The corresponding query returns the special service disruption mode setting in discrete form as listed above.

:SOURce:DATA:TELEcom:TFUNction:SDISruption?

Returns: <boolean>

:SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete>

<discrete> = ERRor Errors & Alarms
 SBITs Spare Bits

Sets the Structured PDH transmitter test function type.

The corresponding query returns the current Structured PDH test function type as listed above.

:SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE?

Returns: <discrete>

SOURce subsystem - Transmitter SPDH Test Function Commands

:SOURce:DATA:TELEcom:SPDH:ERRor:TYPE <discrete>

| | | |
|--------------|---------|--|
| <discrete> = | BIT | Bit Errors |
| | CODE | Code Errors |
| | FAS | Frame Errors |
| | MFAS | MFAS Errors (DS3 with Option 011 only) |
| | FASMfas | Frame & MFAS Errors (DS3 with Option 011 only) |
| | CRC | CRC-4 for 2M, CRC-6 for DS1 (Option 011 only) |
| | EXZ | Excess zeros (DSn with Option 011 only) |
| | FEBE | FEBE Errors (DS3 with Option 011 only) |
| | REBE | REBE Errors |
| | PBITs | P bit Errors (DS3 with Option 011 only) |
| | CPBits | CP bit errors (DS3 with Option 011 only) |

Selects the Structured PDH transmitter error add type. Bit errors are injected at the test rate. FAS errors are injected at the line rate. The corresponding query returns the error add type in discrete form.

:SOURce:DATA:TELEcom:SPDH:ERRor:TYPE?

Returns : <discrete>

:SOURce:DATA:TELEcom:SPDH:ERRor:RATE <discrete>

| | | |
|--------------|------|-----------------|
| <discrete> = | NONE | Errors off |
| | 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 |

SOURce subsystem - Transmitter SPDH Test Function Commands

| | |
|------|------------------------------|
| USER | User error rate (Option 011) |
| ONCE | Add single error |

Sets the SPDH Error Add rate of the error type selected by :SOURce:DATA:TELEcom:SPDH:ERRor:TYPE <discrete> . ONCE will add a single error if the current rate is NONE. This command is applicable when :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to PDH. Setting a preset rate will also force the user rate to be the same value.

Associated commands:

:SOUR:DATA:TEL:SPDH:ERR:RATE:USER

The corresponding query returns the error add rate in discrete form. Note that if this query returns USER, then :SOUR:DATA:TEL:SPDH:ERR: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> 0.1E-3 to 9.9E-9 mantissa resolution 0.1,
exponent resolution 1

This command is only applicable when Option 011 is fitted. Sets the user defined SPDH Error Add rate. Note that if :SOURce:DATA:TELEcom:SPDH:ERRor:RATE <discrete> is not already set to USER, then this command will automatically set it to USER.

Associated commands:

:SOURce:DATA:TELEcom:SPDH:ERRor:RATE <discrete>

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

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

SOURce subsystem - Transmitter SPDH Test Function Commands

Returns: <numeric>

:SOURce:DATA:TELEcom:SPDH:ERRor:FRAMe:NERRored <discrete>

| | | |
|--------------|-------|----------------------------|
| <discrete> = | ONE | 1 frame |
| | TWO | 2 frames |
| | THRee | 3 frames |
| | FOUR | 4 frames |
| | FIVE | 5 frames (Option 011 only) |
| | SIX | 6 frames (Option 011 only) |

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 : <discrete>

:SOURce:DATA:TELEcom:SPDH:ERRor:MFRame:NERRored <discrete>

| | | |
|--------------|-------|---------------------------|
| <discrete> = | ONE | 1 DS3 Multiframe errored |
| | TWO | 2 DS3 Multiframes errored |
| | THRee | 3 DS3 Multiframes errored |
| | FOUR | 4 DS3 Multiframes errored |

This command applies to Option 011 only. 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 : <discrete>

SOURce subsystem - Transmitter SPDH Test Function Commands

:SOURce:DATA:TELEcom:SPDH:ERRor:EXZ:NUMBer <numeric>

<numeric> = 3 to 16

Sets the number of DS3/DS1 excess zeros sent (Option 011 only). The corresponding query command returns the current setting.

:SOURce:DATA:TELEcom:SPDH:ERRor:EXZ:NUMBer?

Returns : <numeric>

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

| | | |
|--------------|-------|------------------------------------|
| <discrete> = | OFF | No Action |
| | ON | Alarm burst switched to continuous |
| | BURSt | Selected burst length transmitted |

Sets the transmitter FEAC action (Option 011 only). Only valid if :SENSe:DATA:TELEcom:TFUNction <discrete> is set to SPDH and :SOURce:DATA:TELEcom:SPDH:DS3:ALARm <discrete> is set to FEAC . If set to 'ON' then 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.

:SOURce:DATA:TELEcom:SPDH:FEAC?

Returns <discrete>

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

<numeric> = 0 to 15

Sets the transmitter FEAC alarm burst length (Option 011 only). Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to SPDH and :SOURce:DATA:TELEcom:SPDH:DS3:ALARm <discrete> is set to FEAC. 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 subsystem - Transmitter SPDH Test Function Commands

:SOURce:DATA:TELEcom:SPDH:FEAC:BURSt?

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

:SOURce:DATA:TELEcom:SPDH:FEAC:CODE <string>

<string> = "nnnnnn" (n = 0,1)

Sets the user configurable section of the FEAC code (Option 011 only). Range "000000" to "111111". The corresponding query command returns the current setting.

:SOURce:DATA:TELEcom:SPDH:FEAC:CODE?

Returns : <string> = "000000" to "111111"

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

| | | |
|--------------|--------------|-------------------------|
| <discrete> = | DS1Deactivat | Deactivate DS1 Loopback |
| | DS1Activat | Activate DS1 Loopback |
| | DS3Deactivat | Deactivate DS3 Loopback |
| | DS3Activat | Activate DS3 Loopback |

Sets the transmitter FEAC loopback action (Option 011 only). Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to SPDH and :SOURce:DATA:TELEcom:SPDH:DS3:ALARM <discrete> is set to FEAC. The corresponding query command returns the current setting.

:SOURce:DATA:TELEcom:SPDH:FEAC:LOOPback:ACTion?

Returns : <discrete>

:SOURce:DATA:TELEcom:SPDH:FEAC:LOOPback:MESSage <numeric>

<numeric> = 0 to 28 Sets the transmitter FEAC DS1 channel for loopback

SOURce subsystem - Transmitter SPDH Test Function Commands

This command only applies when Option 011 is fitted. Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to SPDH and :SOURce:DATA:TELEcom:SPDH:DS3:ALARm <discrete> is set to FEAC. 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 (Indicates ALL)
 1 to 28 (Indicates channel number)

**:SOURce:DATA:TELEcom:SPDH:FEAC:LOOPback:BURSt
 <numeric>,<numeric>**

<numeric> = 1 to 15 Sets the FEAC loopback command durations
 <numeric> = 1 to 15 Sets the FEAC loopback message durations

This command only applies when Option 011 is fitted. Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to SPDH and :SOURce:DATA:TELEcom:SPDH:DS3:ALARm <discrete> is set to FEAC. The corresponding query command returns the current setting.

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

Returns : <numeric>,<numeric>

:SOURce:DATA:TELEcom:SPDH:M140:ALARm <discrete>

| | | |
|--------------|---------|-------------------------|
| <discrete> = | NONE | |
| | LOS | Loss of Signal |
| | AIS | Alarm Indication Signal |
| | LOFrame | Loss Of Framing |
| | RAI | Remote Alarm Indication |

Set a 140 Mb/s transmit alarm. Command node :M139 can be used in place of :M140. Activating an alarm is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload,

SOURce subsystem - Transmitter SPDH Test Function Commands

and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to ERRor.

The corresponding query command returns the current 140 Mb/s transmit alarm as listed above.

:SOURce:DATA:TELEcom:SPDH:M140:ALARm?

Returns: <discrete>

:SOURce:DATA:TELEcom:SPDH:M34:ALARm <discrete>

| | | |
|--------------|---------|-------------------------|
| <discrete> = | NONE | |
| | LOS | Loss of Signal |
| | AIS | Alarm Indication Signal |
| | LOFrame | Loss Of Framing |
| | RAI | Remote Alarm Indication |

Sets a 34Mb/s transmit alarm. Activating an alarm is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to ERRor.

The corresponding query command returns the current 34 Mb/s transmit alarm as listed above.

:SOURce:DATA:TELEcom:SPDH:M34:ALARm?

Returns: <discrete>

:SOURce:DATA:TELEcom:SPDH:M8:ALARm <alarm>

| | | |
|--------------|---------|-------------------------|
| <discrete> = | NONE | |
| | LOS | Loss of Signal |
| | AIS | Alarm Indication Signal |
| | LOFrame | Loss Of Framing |
| | RAI | Remote Alarm Indication |

SOURce subsystem - Transmitter SPDH Test Function Commands

Set an 8 Mb/s transmit alarm. Activating an alarm is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to ERRor.

The corresponding query command returns the current 8 Mb/s transmit alarm as listed above.

:SOURce:DATA:TELEcom:SPDH:M8:ALARm?

Returns: <discrete>

:SOURce:DATA:TELEcom:SPDH:M2:ALARm <discrete>

| | | |
|--------------|---------|-------------------------|
| <discrete> = | NONE | |
| | LOS | Loss of Signal |
| | 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. Activating an alarm is only permitted when :SOURce:DATA:TELEcom:TFUNction is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:TFUNction:TYPE is set to ERRor.

The corresponding query command returns the current 2 Mb/s transmit alarm as listed above.

:SOURce:DATA:TELEcom:SPDH:M2:ALARm?

Returns: <discrete>

:SOURce:DATA:TELEcom:SPDH:DS3:ALARm <discrete>

| | | |
|-----------|------|-------------------------|
| <alarm> = | NONE | |
| | LOS | Loss of signal |
| | AIS | Alarm Indication Signal |

SOURce subsystem - Transmitter SPDH Test Function Commands

| | |
|---------|-------------------------|
| OOFrame | Out Of Framing |
| RAI | Remote Alarm Indication |
| FEAC | FEAC alarm |
| IDLE | Idle |

Applies to Options 011 only. Sets a DS3 transmit alarm. Activating an alarm is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to ERRor.

The corresponding query command returns the current DS3 transmit alarm as listed above.

:SOURce:DATA:TELEcom:SPDH:DS3:ALARm?

Returns: <discrete>

:SOURce:DATA:TELEcom:SPDH:DS1:ALARm <discrete>

| | | |
|--------------|---------|-------------------------|
| <discrete> = | NONE | |
| | LOS | Loss of Signal |
| | AIS | Alarm Indication Signal |
| | OOFrame | Out Of Framing |
| | RAI | Remote Alarm Indication |

Applies to Option 011 only. Sets a DS1 transmit alarm. Activating an alarm is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to ERRor.

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

:SOURce:DATA:TELEcom:SPDH:DS1:ALARm?

Returns: <discrete>

:SOURce:DATA:TELEcom:SPDH:M140:SPARe <string>

<string> = "000" to "111"

SOURce subsystem - Transmitter SPDH Test Function Commands

Set the 140 Mb/s spare bits. This action is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to SBITs. Command node :M139 can be used in place of :M140.

The corresponding query command returns the current 140 Mb/s spare bit values.

:SOURce:DATA:TELEcom:SPDH:M140:SPARe?

Returns: <string>

:SOURce:DATA:TELEcom:SPDH:M34:SPARe <string>

<string> = "0" to "1"

Set the 34Mb/s spare bit. This action is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to SBITs.

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

:SOURce:DATA:TELEcom:SPDH:M34:SPARe?

Returns: <string>

:SOURce:DATA:TELEcom:SPDH:M8:SPARe <string>

<string> = "0" to "1"

Set the 8 Mb/s spare bit. This action is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to SBITs.

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

:SOURce:DATA:TELEcom:SPDH:M8:SPARe?

Returns: <string>

:SOURce:DATA:TELEcom:SPDH:M2:SI <string>

SOURce subsystem - Transmitter SPDH Test Function Commands

<string> = "0" to "1"

Set the 2 Mb/s Spare International bit, valid for non-CRC4 multiframe. This action is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to SBITs.

The corresponding query command returns the current 2 Mb/s Spare International bit.

:SOURce:DATA:TELEcom:SPDH:M2:SI?

Returns: <string>

:SOURce:DATA:TELEcom:SPDH:M2:SIE <string>

<string> = "00" to "11"

Set the 2 Mb/s E-bits, valid for CRC4 multiframe. This action is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to SBITs.

The corresponding query command returns the current 2 Mb/s E-bits.

:SOURce:DATA:TELEcom:SPDH:M2:SIE?

Returns: <string>

:SOURce:DATA:TELEcom:SPDH:M2:NFAS <string>

<string> = "00000" to "11111"

Set the 2 Mb/s NFAS Sa bits 4 to 8. This action is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to SBITs. The command will generate an error if the Sa sequence is active.

The corresponding query command returns the current 2 Mb/s NFAS Sa bit values.

:SOURce:DATA:TELEcom:SPDH:M2:NFAS?

SOURce subsystem - Transmitter SPDH Test Function Commands

Returns: <string>

If the Sa sequence is active, the underlying user-defined value of the affected bit is returned rather than the "X" that appears on the instrument display.

: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 sequence that is generated is controlled by :SASequence:PATtern and the bit that it is inserted into is controlled by :SASequence:BIT. This action is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to SBITS.

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 <string>

<string> = "00000000" to "11111111"

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.

:SOURce:DATA:TELEcom:SPDH:M2:SASequence:PATtern?

Returns: <string>

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

<numeric> = 4 to 8

SOURce subsystem - Transmitter SPDH Test Function Commands

Set 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.

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

Returns: <numeric>

:SOURce:DATA:TELEcom:SPDH:M2:CASMfm <string>

<string> = "000" to "111"

Set the 2 Mb/s MFAS spare bits 5, 7 and 8. This action is only permitted when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to PDH or PDHPayload, and :SOURce:DATA:TELEcom:SPDH:TFUNction:TYPE <discrete> is set to SBITs.

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

:SOURce:DATA:TELEcom:SPDH:M2:CASMfm?

Returns: <string>

INPut subsystem

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

:INPut:TELEcom:SPDH:CODE?

Returns : <discrete>

:INPut:TELEcom:SPDH:INsert:CODE <discrete>

| | | |
|--------------|------|------------|
| <discrete> = | AMI | 2Mb/s, DS1 |
| | HDB3 | 2Mb/s only |
| | B8ZS | DS1 only |

Selects the Structured PDH insert port interface line code for the transmitter.

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

:INPut:TELEcom:SPDH:INsert:CODE?

Returns: <discrete>

:INPut:TELEcom:SPDH:BALance <discrete>

| | | |
|--------------|------------|------------------------|
| <discrete> = | UNBalanced | 75 Ω unbalanced |
| | BALanced | 120 Ω balanced |

Selects the Structured PDH receiver termination levels. BALanced is only valid when :INPut:TELEcom:SPDH:RATE <discrete> is set to M2.

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

:INPut:TELEcom:SPDH:BALance?

Returns : <discrete>

:INPut:TELEcom:SPDH:GAIN <discrete>

| | | |
|--------------|------|-----------|
| <discrete> = | DB20 | All rates |
|--------------|------|-----------|

PDH Command Reference
INPut subsystem

SENSe subsystem - Receiver Structured PDH Settings

The corresponding query returns the user word pattern as a string.

:SENSe:DATA:TELEcom:SPDH:UWORD?

Returns : <string>

:SENSe:DATA:TELEcom:SPDH:PRBS:POLarity <discrete>

| | | |
|--------------|----------|-----------|
| <discrete> = | NORMAL | Non CCITT |
| | INVERTed | CCITT |

Selects the Structured PDH receiver PRBS pattern polarity.

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

:SENSe:DATA:TELEcom:SPDH:PRBS:POLarity?

Returns : <discrete>

:SENSe:DATA:TELEcom:SPDH:PAYLoad:TYPE <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 |

SENSe subsystem - Receiver SPDH Test Signal Settings Commands

| | |
|-------|----------|
| D4 | DS1 |
| ESF | DS1 |
| SLC96 | DS1 |
| DDS1 | Drop DS1 |

Selects the Structured PDH receiver test signal framing.

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

:SENSe:DATA:TELEcom:SPDH:TSIGnal:PAYLoad?

Returns : <discrete>

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

<discrete> =
TRIB1
TRIB2
TRIB3
TRIB4

Selects the Structured PDH receiver 34 Mb/s tributary test signal.

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

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

Returns : <discrete>

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

<discrete> =
TRIB1
TRIB2
TRIB3
TRIB4

Selects the Structured PDH receiver 8 Mb/s tributary test signal.

SENSe subsystem - Receiver SPDH Test Signal Settings Commands

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

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

Returns : <discrete>

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

<discrete> = TRIB1
 TRIB2
 TRIB3
 TRIB4

Selects the Structured PDH receiver 2 Mb/s tributary test signal.

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

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

Returns : <discrete>

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

<discrete> = TRIB1
 TRIB2
 TRIB3
 TRIB4

Selects the Structured PDH receiver DS1 tributary test signal.

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

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

Returns: <discrete>

SENSe subsystem - Receiver SPDH Test Signal Settings Commands

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

| | |
|--------------|-------|
| <discrete> = | TRIB1 |
| | TRIB2 |
| | TRIB3 |
| | TRIB4 |
| | TRIB5 |
| | TRIB6 |
| | TRIB7 |

Selects the Structured PDH receiver DS2 tributary test signal.

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

:SENSe:DATA:TELEcom:SPDH:TSIGnal:TRIButary:DS2?

Returns: <discrete>

SENSe subsystem - Receiver SPDH Test Signal Settings Commands

In the following block of commands where an optional node has been added, the command replaces the original command which had no optional node.

: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 <string>

<string> = 31 bit binary string

Selects the 64XN kb/s timeslots of the 2Mb/s test signal. a "1" in the nth position signifies selection of timeslot n. A "0" signifies deselection e.g. to select timeslots 1,8,15,22,29 "1000000100000010000001000000100".

The corresponding query returns the 64XN kb/s timeslot as a 31 bit binary string.

:SENSe:DATA:TELEcom:SPDH:TSIGnal:TSLot:M2:K64XN?

Returns : <string>

:SENSe:DATA:TELEcom:SPDH:TSIGnal:TSLot:DS1:K56 <numeric>

<numeric> 1 to 24 Any framing

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 subsystem - Receiver SPDH Test Signal Settings Commands

: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 <string>

<string> = 24 bit string

Selects the 64XN 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 "100000010000001000000100".

The corresponding query returns the 64XNkb/s timeslot as a 24 bit binary string.

:SENSe:DATA:TELEcom:SPDH:TSIGnal:TSLot:DS1:K64XN? <string>

Returns: <string>

:SENSe:DATA:TELEcom:SPDH:TSIGnal:TSLot:DS1:K56XN <string>

<string> = 24 bit string

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 "100000010000001000000100".

The corresponding query returns the 64XN kb/s timeslot as a 24 bit binary string.

:SENSe:DATA:TELEcom:SPDH:TSIGnal:TSLot:DS1:K56XN? <string>

Returns: <string>

SENSe subsystem - Receiver SPDH Test Function Commands

:SENSe:DATA:TELecom:TFUNction:SDISruption <discrete>

<discrete>= OFF

ON

Sets the receiver service disruption mode.

The corresponding query returns the service disruption mode setting in discrete form as listed above.

:SENSe:DATA:TELecom:TFUNction:SDISruption?

Returns: <discrete>

SENSe subsystem - Analysis Control

simultaneously, but only one path is measured and analysed for M.2110 and M.2120. This command selects that path.

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

:SENSe:DATA:TELEcom:SPDH:ANALysis:M2110:PATH?

Returns: <discrete>

:SENSe:DATA:TELEcom:SPDH:ANALysis:M2110 :PALlocation <numeric>

<numeric> = 0.3 to 63 Percentage

Sets the Structured PDH M2110 path allocation percentage.

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

:SENSe:DATA:TELEcom:SPDH:ANALysis:M2110: PALlocation?

Returns : <numeric>

:SENSe:DATA:TELEcom:SPDH:ANALysis:M2110:USER: ESECond <discrete>, <numeric>

| | | |
|--------------|----------|----------------|
| <discrete> = | S1H2 | S1, 2 Hours |
| | S2H2 | S2, 2 Hours |
| | S1D1 | S1, 24 Hours |
| | S2D1 | S2 24 Hours |
| | S1D7 | S1, 7 Days |
| | S1M15 | S1, 15 Minutes |
| | S2M15 | S2, 15 Minutes |
| | S1H1 | S1, 1 Hour |
| | S2H1 | S2, 1 Hour |
| <numeric> = | 0 to 720 | S1H2 & S2H2 |

PDH Command Reference

SENSe subsystem - Analysis Control

0 to 8640 S1D1 & S2D1

0 to 60480 S1D7

Sets the Structured PDH user programmable M.2110 Error Second thresholds. The corresponding query returns the selected M.2110 Error Second threshold in numeric form.

:SENSe:DATA:TELEcom:SPDH:ANALysis:M2110:USER: ESECond?
<discrete>

Returns : <numeric>

:SENSe:DATA:TELEcom:SPDH:ANALysis:M2110:USER: SESecond
<discrete>, <numeric>

| | | |
|--------------|------------|----------------|
| <discrete> = | S1H2 | S1, 2 Hours |
| | S2H2 | S2, 2 Hours |
| | S1D1 | S1, 24 Hours |
| | S2D1 | S2, 24 Hours |
| | S1D7 | S1, 7 Days |
| | S1M15 | S1, 15 Minutes |
| | S2M15 | S2, 15 Minutes |
| | S1H1 | S1, 1 Hour |
| | S2H1 | S2, 1 Hour |
| <numeric> = | 0 to 720 | S1H2 & S2H2 |
| | 0 to 8640 | S1D1 & S2D1 |
| | 0 to 60480 | S1D7 |

Sets the Structured PDH user programmable M.2110 Severely Errored Seconds thresholds.

The corresponding query returns the selected user programmable M.2110 Severely Errored Seconds threshold in numeric form.

SENSe subsystem - Alarm Scan Control

SENSe subsystem - Alarm Scan Control

:SENSe:DATA:TELEcom:SPDH:ASCan <boolean>

| | | |
|-------------|----------|-----------------------------|
| <boolean> = | 0 or OFF | Stop the current alarm scan |
| | 1 or ON | Start a new alarm scan |

Option 010 only. Start/Stop the structured PDH alarm scan. The corresponding query returns the alarm scan state as 0 or 1.

:SENSe:DATA:TELEcom:SPDH:ASCan?

Returns : <boolean> 0 or 1

SENSe subsystem - SPDH Round Trip Delay Control

SENSe subsystem - SPDH Round Trip Delay Control

:SENSe:DATA:TELecom:SPDH:RTDelay <boolean>

<boolean> = 0 or OFF Stop the round trip delay measurement

1 or ON Start a new round trip delay measurement

Start/Stop the structured PDH round trip delay measurement.

The corresponding query returns the round trip delay state as 0 or 1.

:SENSe:DATA:TELecom:SPDH:RTDelay?

Returns : <boolean> 0 or 1

SENSe subsystem - Result Returning Commands

Frequency Results (SPDH)

:SENSe:DATA? <"result">

| | | |
|----------|------------------|-----------------------------|
| Result = | "FREQuency:SPDH" | RX SPDH clock frequency |
| | "FOFPpm:SPDH" | RX SPDH clock offset in ppm |
| | "FOFHz:SPDH" | RX SPDH clock offset in Hz |

Structured PDH Short Term Results

:SENSe:DATA?<"result">

| | | |
|----------|------------------------------|----------------------------|
| Result = | "ECOunt:SPDH:STERm:BIT" | Bit error count |
| | "ERATio:SPDH:STERm:BIT" | Bit error ratio |
| | "ECOunt:SPDH:STERm:CODE" | Code error count |
| | "ERATio:SPDH:STERm:CODE" | Code error ratio |
| | "ECOunt:SPDH:STERm:M2:FAS" | 2 Mb/s FAS error count |
| | "ERATio:SPDH:STERm:M2:FAS" | 2 Mb/s FAS error ratio |
| | "ECOunt:SPDH:STERm:M8:FAS" | 8 Mb/s FAS error count |
| | "ERATio:SPDH:STERm:M8:FAS" | 8 Mb/s FAS error ratio |
| | "ECOunt:SPDH:STERm:M34:FAS" | 34 Mb/s FAS error count |
| | "ERATio:SPDH:STERm:M34:FAS" | 34 Mb/s FAS error ratio |
| | "ECOunt:SPDH:STERm:EMBip" | PDH M34 EM-BIP error count |
| | "ERATio:SPDH:STERm:EMBip" | PDH M34 EM-BIP error count |
| | "ECOunt:SPDH:STERm:M140:FAS" | 140 Mb/s FAS error count |

PDH Command Reference

SENSe subsystem - Result Returning Commands

| | |
|------------------------------|----------------------------------|
| "ERATio:SPDH:STERm:M140:FAS" | 140 Mb/s FAS error ratio |
| "ECOut:SPDH:STERm:FEBE" | PDH FEBE error count |
| "ERATio:SPDH:STERm:FEBE" | PDH FEBE error ratio |
| "ECOut:SPDH:STERm:PBITs" | PDH DS3 P-BITs error count |
| "ERATio:SPDH:STERm:PBITs" | PDH DS3 P-BITs error ratio |
| "ECOut:SPDH:STERm:CPBits" | PDH DS3 CP-Bits error count |
| "ERATio:SPDH:STERm:CPBits" | PDH DS3 CP-Bits error ratio |
| "ECOut:SPDH:STERm:DS1:FAS" | PDH Frame short term error count |
| "ERATio:SPDH:STERm:DS1:FAS" | PDH Frame short term error ratio |
| "ECOut:SPDH:STERm:DS3:FAS" | PDH Frame short term error count |
| "ERATio:SPDH:STERm:DS3:FAS" | PDH Frame short term error ratio |
| "ECOut:SPDH:STERm:CRC" | CRC error count |
| "ERATio:SPDH:STERm:CRC" | CRC error ratio |
| "ECOut:SPDH:STERm:REBE" | REBE error count |
| "ERATio:SPDH:STERm:REBE" | REBE error ratio |

Structured PDH Cumulative Results

:SENSe:DATA? <"result">

| | |
|---------------------------|------------------------|
| Result = "ECOut:SPDH:BIT" | Bit error count |
| "ERATio:SPDH:BIT" | Bit error ratio |
| "ECOut:SPDH:CODE" | Code error count |
| "ERATio:SPDH:CODE" | Code error ratio |
| "ECOut:SPDH:M2:FAS" | 2 Mb/s FAS error count |
| "ERATio:SPDH:M2:FAS" | 2 Mb/s FAS error ratio |
| "ECOut:SPDH:M8:FAS" | 8 Mb/s FAS error count |

SENSe subsystem - Result Returning Commands

| | |
|------------------------|--|
| "ERATio:SPDH:M8:FAS" | 8 Mb/s FAS error ratio |
| "ECOunt:SPDH:M34:FAS" | 34 Mb/s FAS error count |
| "ERATio:SPDH:M34:FAS" | 34 Mb/s FAS error ratio |
| "ECOunt:SPDH:EMBip" | PDH M34 EM-BIP error count |
| "ERATio:SPDH:EMBip" | PDH M34 EM-BIP error count |
| "ECOunt:SPDH:M140:FAS" | 140 Mb/s FAS error count |
| "ERATio:SPDH:M140:FAS" | 140 Mb/s FAS error ratio |
| "ECOunt:SPDH:FEBE" | PDH / DS _n FEBE error count |
| "ERATio:SPDH:FEBE" | PDH / DS _n FEBE error ratio |
| "ECOunt:SPDH:PBITs" | DS3 P-BITs error count |
| "ERATio:SPDH:PBITs" | PDH DS3 P-BITs error ratio |
| "ECOunt:SPDH:CPBits" | DS3 CP-Bits error count |
| "ERATio:SPDH:CPBits" | DS3 CP-Bits error ratio |
| "ECOunt:SPDH:DS1:FAS" | DS1 Frame error count |
| "ERATio:SPDH:DS1:FAS" | DS1 Frame error ratio |
| "ECOunt:SPDH:DS3:FAS" | DS3 Frame error count |
| "ERATio:SPDH:DS3:FAS" | DS3 Frame error ratio |
| "ECOunt:SPDH:REBE" | REBE error count |
| "ERATio:SPDH:REBE" | REBE error ratio |
| "ECOunt:SPDH:CRC" | CRC error count |
| "ERATio:SPDH:CRC" | CRC error ratio |

Structured PDH and Payload G.821 Analysis Results

:SENSe:DATA? <"result">

Result = "ECOunt:SPDH:BIT" Error Count
 "ESEConds:SPDH:BIT:ANALysis" Error Seconds

PDH Command Reference

SENSe subsystem - Result Returning Commands

| | |
|--------------------------------|----------------------------|
| "PESeconds:SPDH:BIT:ANALysis" | % Error Seconds |
| "PESD:SPDH:BIT:ANALysis" | % Error Seconds (Annex D) |
| "EFSeconds:SPDH:BIT:ANALysis" | Error Free Seconds |
| "PEFSeconds:SPDH:BIT:ANALysis" | % Error Free Seconds |
| "SESeconds:SPDH:BIT:ANALysis" | Severely Errored Seconds |
| "PSESeconds:SPDH:BIT:ANALysis" | % Severely Errored Seconds |
| "UASeconds:SPDH:BIT:ANALysis" | Unavailable Seconds |
| "PUASeconds:SPDH:BIT:ANALysis" | % Unavailable Seconds |
| "DMINutes:SPDH:BIT:ANALysis" | Degraded Minutes |
| "PDMINutes:SPDH:BIT:ANALysis" | % Degraded Minutes |
| "ESEConds:SPDH:CODE:ANALysis" | Code-errored seconds |

Structured PDH 140 Mb/s G.826 Analysis Results

:SENSe:DATA? <"result">

| | |
|--|-----------------------------|
| Result = "ESEConds:SPDH:M140:TRANsmit:ANALysis:G826" | TX Errored Seconds |
| "SESeconds:SPDH:M140:TRANsmit:ANALysis:G826" | TX Severely Errored Seconds |
| "UASeconds:SPDH:M140:TRANsmit:ANALysis:G826" | TX Unavailable Seconds |
| "PUASeconds:SPDH:M140:TRANsmit:ANALysis:G826" | TX Path Unavailable Seconds |
| "ESRatio:SPDH:M140:TRANsmit:ANALysis:G826" | TX Errored Second Ratio |

SENSe subsystem - Result Returning Commands

| | |
|--|-------------------------------------|
| "SESRatio:SPDH:M140:TRANsmit:ANALysis:G826" | TX Severely Errored Second Ratio |
| "ESEConds:SPDH:M140:RECeive:ANALysis:G826" | RX Errored Seconds |
| "SESECONDS:SPDH:M140:RECeive:ANALysis:G826" | RX Severely Errored Seconds |
| "UASeconds:SPDH:M140:RECeive:ANALysis:G826" | RX Unavailable Seconds |
| "PUASeconds:SPDH:M140:RECeive:ANALysis:G826" | RX Path Unavailable Seconds |
| "ESRatio:SPDH:M140:RECeive:ANALysis:G826" | RX Errored Second Ratio |
| "SESRatio:SPDH:M140:RECeive:ANALysis:G826" | RX Severely Errored Second Ratio |

Structured PDH 34 Mb/s G.826 Analysis Results

:SENSe:DATA? <"result">

| | |
|---|-------------------------------------|
| Result = "ESEConds:SPDH:M34:TRANsmit:ANALysis:G826" | TX Errored Seconds |
| "SESECONDS:SPDH:M34:TRANsmit:ANALysis:G826" | TX Severely Errored Seconds |
| "UASeconds:SPDH:M34:TRANsmit:ANALysis:G826" | TX Unavailable Seconds |
| "PUASeconds:SPDH:M34:TRANsmit:ANALysis:G826" | TX Path Unavailable Seconds |
| "ESRatio:SPDH:M34:TRANsmit:ANALysis:G826" | TX Errored Second Ratio |
| "SESRatio:SPDH:M34:TRANsmit:ANALysis:G826" | TX Severely Errored Second Ratio |
| "ESEConds:SPDH:M34:RECeive:ANALysis:G826" | RX Errored Seconds |
| "SESECONDS:SPDH:M34:RECeive:ANALysis:G826" | RX Severely Errored Seconds |

SENSe subsystem - Result Returning Commands

| | |
|---|----------------------------------|
| "UASeconds:SPDH:M34:RECeive:ANALysis:G826" | RX Unavailable Seconds |
| "PUASeconds:SPDH:M34:RECeive:ANALysis:G826" | RX Path Unavailable Seconds |
| "ESRatio:SPDH:M34:RECeive:ANALysis:G826" | RX Errored Second Ratio |
| "SESRatio:SPDH:M34:RECeive:ANALysis:G826" | RX Severely Errored Second Ratio |

Structured PDH 8 Mb/s G.826 Analysis Results

:SENSe:DATA? <"result">

| | |
|--|----------------------------------|
| Result = "ESECONDS:SPDH:M8:TRANsmIT:ANALysis:G826" | TX Errored Seconds |
| "SESECONDS:SPDH:M8:TRANsmIT:ANALysis:G826" | TX Severely Errored Seconds |
| "UASECONDS:SPDH:M8:TRANsmIT:ANALysis:G826" | TX Unavailable Second Counts |
| "PUASECONDS:SPDH:M8:TRANsmIT:ANALysis:G826" | TX Path Unavailable Seconds |
| "ESRatio:SPDH:M8:TRANsmIT:ANALysis:G826" | TX Errored Second Ratio |
| "SESRatio:SPDH:M8:TRANsmIT:ANALysis:G826" | TX Severely Errored Second Ratio |
| "ESECONDS:SPDH:M8:RECeive:ANALysis:G826" | RX Errored Seconds |
| "SESECONDS:SPDH:M8:RECeive:ANALysis:G826" | RX Severely Errored Seconds |
| "UASECONDS:SPDH:M8:RECeive:ANALysis:G826" | RX Unavailable Seconds |
| "PUASECONDS:SPDH:M8:RECeive:ANALysis:G826" | RX Path Unavailable Seconds |

SENSe subsystem - Result Returning Commands

| | |
|--|----------------------------------|
| "ESRatio:SPDH:M8:RECeive:ANALysis:G826" | RX Errored Second Ratio |
| "SESRatio:SPDH:M8:RECeive:ANALysis:G826" | RX Severely Errored Second Ratio |

Structured PDH 2 Mb/s G.826 Analysis Results

:SENSe:DATA? <"result">

| | |
|---|----------------------------------|
| Result = "EBCount:SPDH:M2:TRANsmit:ANALysis:G826" | TX Errored Block Count |
| "ESEConds:SPDH:M2:TRANsmit:ANALysis:G826" | TX Errored Seconds |
| "SESeconds:SPDH:M2:TRANsmit:ANALysis:G826" | TX Severely Errored Seconds |
| "UASeconds:SPDH:M2:TRANsmit:ANALysis:G826" | TX Unavailable Seconds |
| "PUASeconds:SPDH:M2:TRANsmit:ANALysis:G826" | TX Path Unavailable Seconds |
| "BBECount:SPDH:M2:TRANsmit:ANALysis:G826" | TX Background Block Error Count |
| "ESRatio:SPDH:M2:TRANsmit:ANALysis:G826" | TX Errored Second Ratio |
| "SESRatio:SPDH:M2:TRANsmit:ANALysis:G826" | TX Severely Errored Second Ratio |
| "BBERatio:SPDH:M2:TRANsmit:ANALysis:G826" | TX Background Block Error Ratio |
| "EBCount:SPDH:M2:RECeive:ANALysis:G826" | RX Errored Block Count |
| "ESEConds:SPDH:M2:RECeive:ANALysis:G826" | RX Errored Seconds |
| "SESeconds:SPDH:M2:RECeive:ANALysis:G826" | RX Severely Errored Seconds |
| "UASeconds:SPDH:M2:RECeive:ANALysis:G826" | RX Unavailable Seconds |
| "PUASeconds:SPDH:M2:RECeive:ANALysis:G826" | RX Path Unavailable Seconds |
| "BBECount:SPDH:M2:RECeive:ANALysis:G826" | RX Background Block Error Count |
| "ESRatio:SPDH:M2:RECeive:ANALysis:G826" | RX Errored Second Ratio |

SENSe subsystem - Result Returning Commands

| | |
|--|----------------------------------|
| "SESRatio:SPDH:M2:RECeive:ANALysis:G826" | RX Severely Errored Second Ratio |
| "BBERatio:SPDH:M2:RECeive:ANALysis:G826" | RX Background Block Error Ratio |

Structured PDH DS1 G.826 Analysis Results

:SENSe:DATA? <"result">

| | |
|---|----------------------------------|
| Result = "ESEConds:SPDH:DS1:TRANsmit:ANALysis:G826" | TX Errored Seconds |
| "SESeconds:SPDH:DS1:TRANsmit:ANALysis:G826" | TX Severely Errored Seconds |
| "UASeconds:SPDH:DS1:TRANsmit:ANALysis:G826" | TX Unavailable Seconds |
| "PUASeconds:SPDH:DS1:TRANsmit:ANALysis:G826" | TX Path Unavailable Seconds |
| "ESRatio:SPDH:DS1:TRANsmit:ANALysis:G826" | TX Errored Second Ratio |
| "SESRatio:SPDH:DS1:TRANsmit:ANALysis:G826" | TX Severely Errored Second Ratio |
| "EBCount:SPDH:DS1:RECeive:ANALysis:G826" | RX Errored Block Count |
| "ESEConds:SPDH:DS1:RECeive:ANALysis:G826" | RX Errored Seconds |
| "SESeconds:SPDH:DS1:RECeive:ANALysis:G826" | RX Severely Errored Seconds |
| "UASeconds:SPDH:DS1:RECeive:ANALysis:G826" | RX Unavailable Seconds |
| "PUASeconds:SPDH:DS1:RECeive:ANALysis:G826" | RX Path Unavailable Seconds |
| "BBECount:SPDH:DS1:RECeive:ANALysis:G826" | RX Background Block Error Count |
| "ESRatio:SPDH:DS1:RECeive:ANALysis:G826" | RX Errored Second Ratio |

SENSe subsystem - Result Returning Commands

| | |
|---|-------------------------------------|
| "SESRatio:SPDH:DS1:RECeive:ANALysis:G826" | RX Severely Errored Second Ratio |
| "BBERatio:SPDH:DS1:RECeive:ANALysis:G826" | RX Background Block Error Ratio |

Structured PDH DS3 G.826 Analysis Results

:SENSe:DATA? <"result">

| | |
|--|-------------------------------------|
| Result = "EBCount:SPDH:DS3:TRANsmit:ANALysis:G826" | TX Errored Block Count |
| "ESEConds:SPDH:DS3:TRANsmit:ANALysis:G826" | TX Errored Seconds |
| "SESeconds:SPDH:DS3:TRANsmit:ANALysis:G826" | TX Severely Errored Seconds |
| "UASeconds:SPDH:DS3:TRANsmit:ANALysis:G826" | TX Unavailable Seconds |
| "PUASeconds:SPDH:DS3:TRANsmit:ANALysis:G826" | TX Path Unavailable Seconds |
| "BBECount:SPDH:DS3:TRANsmit:ANALysis:G826" | TX Background Block Error Count |
| "ESRatio:SPDH:DS3:TRANsmit:ANALysis:G826" | TX Errored Second Ratio |
| "SESRatio:SPDH:DS3:TRANsmit:ANALysis:G826" | TX Severely Errored Second Ratio |
| "BBERatio:SPDH:DS3:TRANsmit:ANALysis:G826" | TX Background Block Error Ratio |
| "EBCount:SPDH:DS3:RECeive:ANALysis:G826" | RX Errored Block Count |
| "ESEConds:SPDH:DS3:RECeive:ANALysis:G826" | RX Errored Seconds |
| "SESeconds:SPDH:DS3:RECeive:ANALysis:G826" | RX Severely Errored Seconds |
| "UASeconds:SPDH:DS3:RECeive:ANALysis:G826" | RX Unavailable Seconds |
| "PUASeconds:SPDH:DS3:RECeive:ANALysis:G826" | RX Path Unavailable Seconds |
| "BBECount:SPDH:DS3:RECeive:ANALysis:G826" | RX Background Block Error Count |

SENSe subsystem - Result Returning Commands

| | |
|---|-------------------------------------|
| "ESRatio:SPDH:DS3:RECeive:ANALysis:G826" | RX Errored Second Ratio |
| "SESRatio:SPDH:DS3:RECeive:ANALysis:G826" | RX Severely Errored Second Ratio |
| "BBERatio:SPDH:DS3:RECeive:ANALysis:G826" | RX Background Block Error Ratio |

Structured PDH M.2100 Analysis Results

:SENSe:DATA? <"result">

| | |
|---|--------------------------------|
| Result = "ESECONDS:SPDH:M140:TRANsmit:ANALysis:M2100" | TX error seconds |
| "ESECONDS:SPDH:M140:RECeive:ANALysis:M2100" | RX error seconds |
| "SESECONDS:SPDH:M140:TRANsmit:ANALysis:M2100" | TX severely errored seconds |
| "SESECONDS:SPDH:M140:RECeive:ANALysis:M2100" | RX severely errored seconds |
| "UASECONDS:SPDH:M140:TRANsmit:ANALysis:M2100" | TX unavailable seconds |
| "UASECONDS:SPDH:M140:RECeive:ANALysis:M2100" | RX unavailable seconds |
| "ESECONDS:SPDH:M34:TRANsmit:ANALysis:M2100" | TX error seconds |
| "ESECONDS:SPDH:M34:RECeive:ANALysis:M2100" | RX error seconds |
| "SESECONDS:SPDH:M34:TRANsmit:ANALysis:M2100" | TX severely errored seconds |
| "SESECONDS:SPDH:M34:RECeive:ANALysis:M2100" | RX severely errored seconds |
| "UASECONDS:SPDH:M34:TRANsmit:ANALysis:M2100" | TX unavailable seconds |
| "UASECONDS:SPDH:M34:RECeive:ANALysis:M2100" | RX unavailable seconds |
| "ESECONDS:SPDH:M8:TRANsmit:ANALysis:M2100" | TX error seconds |
| "ESECONDS:SPDH:M8:RECeive:ANALysis:M2100" | RX error seconds |

SENSe subsystem - Result Returning Commands

| | |
|--|-----------------------------|
| "SESeconds:SPDH:M8:TRANsmit:ANALysis:M2100" | TX severely errored seconds |
| "SESeconds:SPDH:M8:RECeive:ANALysis:M2100" | RX severely errored seconds |
| "UASeconds:SPDH:M8:TRANsmit:ANALysis:M2100" | TX unavailable seconds |
| "UASeconds:SPDH:M8:RECeive:ANALysis:M2100" | RX unavailable seconds |
| "ESEConds:SPDH:M2:TRANsmit:ANALysis:M2100" | TX error seconds |
| "ESEConds:SPDH:M2:RECeive:ANALysis:M2100" | RX error seconds |
| "SESeconds:SPDH:M2:TRANsmit:ANALysis:M2100" | TX severely errored seconds |
| "SESeconds:SPDH:M2:RECeive:ANALysis:M2100" | RX severely errored seconds |
| "UASeconds:SPDH:M2:TRANsmit:ANALysis:M2100" | TX unavailable seconds |
| "UASeconds:SPDH:M2:RECeive:ANALysis:M2100" | RX unavailable seconds |
| "ESEConds:SPDH:DS1:TRANsmit:ANALysis:M2100" | TX error seconds |
| "ESEConds:SPDH:DS1:RECeive:ANALysis:M2100" | RX error seconds |
| "SESeconds:SPDH:DS1:TRANsmit:ANALysis:M2100" | TX severely errored seconds |
| "SESeconds:SPDH:DS1:RECeive:ANALysis:M2100" | RX severely errored seconds |
| "UASeconds:SPDH:DS1:TRANsmit:ANALysis:M2100" | TX unavailable seconds |
| "UASeconds:SPDH:DS1:RECeive:ANALysis:M2100" | RX unavailable seconds |
| "ESEConds:SPDH:DS3:TRANsmit:ANALysis:M2100" | TX error seconds |
| "ESEConds:SPDH:DS3:RECeive:ANALysis:M2100" | RX error seconds |
| "SESeconds:SPDH:DS3:TRANsmit:ANALysis:M2100" | TX severely errored seconds |

PDH Command Reference

SENSe subsystem - Result Returning Commands

| | |
|--|-----------------------------|
| "SESeconds:SPDH:DS3:RECeive:ANALysis:M2100" | RX severely errored seconds |
| "UASeconds:SPDH:DS3:TRANsmit:ANALysis:M2100" | TX unavailable seconds |
| "UASeconds:SPDH:DS3:RECeive:ANALysis:M2100" | RX unavailable seconds |

Structured PDH M.2110 Analysis Results

:SENSe:DATA? <"result">

| | |
|--------------------------------------|-----------------------------|
| Result = "MIN15:SPDH:ANALysis:M2110" | M.2110 15 minute BIS Result |
| "HOUR1:SPDH:ANALysis:M2110" | M.2110 1 hour BIS Result |
| "HOUR2:SPDH:ANALysis:M2110" | M.2110 2 hour BIS Result |
| "HOUR24:SPDH:ANALysis:M2110" | M.2110 24 hour BIS Result |
| "DAY7:SPDH:ANALysis:M2110" | M.2110 7 day BIS Result |

Structured PDH M.2120 ANALysis Results

:SENSe:DATA? <"result">

| | |
|---|-------------------------------|
| Result = TR1:SPDH:TRANsmit:ANALysis:M2120 | 15 minute TX threshold report |
| TR2:SPDH:TRANsmit:ANALysis:M2120 | 24 hour TX threshold report |
| TR1:SPDH:RECeive:ANALysis:M2120 | 15 minute RX threshold report |
| TR2:SPDH:RECeive:ANALysis:M2120 | 24 hour RX threshold report |

Structured PDH 2 Mb/S FAS Error Analysis Results

:SENSe:DATA? <"result">

| | |
|---------------------------------|---------------|
| Result = "ECOunt:SPDH:M2:FAS" | Error count |
| "ESEConds:SPDH:M2:FAS:ANALysis" | Error Seconds |

SENSe subsystem - Result Returning Commands

| | |
|-----------------------------------|----------------------------|
| "PESeconds:SPDH:M2:FAS:ANALysis" | % Error Seconds |
| "EFSeconds:SPDH:M2:FAS:ANALysis" | Error Free Seconds |
| "PEFSeconds:SPDH:M2:FAS:ANALysis" | % Error Free Seconds |
| "SESeconds:SPDH:M2:FAS:ANALysis" | Severely Errored Seconds |
| "PSESeconds:SPDH:M2:FAS:ANALysis" | % Severely Errored Seconds |
| "UASeconds:SPDH:M2:FAS:ANALysis" | Unavailable Seconds |
| "PUASeconds:SPDH:M2:FAS:ANALysis" | % Unavailable Seconds |
| "DMINutes:SPDH:M2:FAS:ANALysis" | Degraded Minutes |
| "PDMinutes:SPDH:M2:FAS:ANALysis" | % Degraded Minutes |
| "ESEConds:SPDH:CODE:ANALysis" | Code errored seconds |

Structured PDH 8 Mb/S FAS Error Analysis Results

:SENSe:DATA? <"result">

| | | |
|----------|-----------------------------------|----------------------------|
| Result = | "ECOunt:SPDH:M8:FAS" | Error count |
| | "ESEConds:SPDH:M8:FAS:ANALysis" | Error Seconds |
| | "PESeconds:SPDH:M8:FAS:ANALysis" | % Error Seconds |
| | "EFSeconds:SPDH:M8:FAS:ANALysis" | Error Free Seconds |
| | "PEFSeconds:SPDH:M8:FAS:ANALysis" | % Error Free Seconds |
| | "SESeconds:SPDH:M8:FAS:ANALysis" | Severely Errored Seconds |
| | "PSESeconds:SPDH:M8:FAS:ANALysis" | % Severely Errored Seconds |
| | "UASeconds:SPDH:M8:FAS:ANALysis" | Unavailable Seconds |
| | "PUASeconds:SPDH:M8:FAS:ANALysis" | % Unavailable Seconds |
| | "DMINutes:SPDH:M8:FAS:ANALysis" | Degraded Minutes |
| | "PDMinutes:SPDH:M8:FAS:ANALysis" | % Degraded Minutes |
| | "ESEConds:SPDH:CODE:ANALysis" | Code errored seconds |

SENSe subsystem - Result Returning Commands

Structured PDH 34 Mb/S FAS Error Analysis Results

:SENSe:DATA? <"result">

| | | |
|----------|------------------------------------|----------------------------|
| Result = | "ECOut:SPDH:M34:FAS" | Error count |
| | "ESEConds:SPDH:M34:FAS:ANALysis" | Error Seconds |
| | "PESeconds:SPDH:M34:FAS:ANALysis" | % Error Seconds |
| | "EFSeconds:SPDH:M34:FAS:ANALysis" | Error Free Seconds |
| | "PEFSeconds:SPDH:M34:FAS:ANALysis" | % Error Free Seconds |
| | "SESeconds:SPDH:M34:FAS:ANALysis" | Severely Errored Seconds |
| | "PSESeconds:SPDH:M34:FAS:ANALysis" | % Severely Errored Seconds |
| | "UASeconds:SPDH:M34:FAS:ANALysis" | Unavailable Seconds |
| | "PUASeconds:SPDH:M34:FAS:ANALysis" | % Unavailable Seconds |
| | "DMINutes:SPDH:M34:FAS:ANALysis" | Degraded Minutes |
| | "PDMINutes:SPDH:M34:FAS:ANALysis" | % Degraded Minutes |
| | "ESEConds:SPDH:CODE:ANALysis" | Code errored seconds |

Structured PDH 140 Mb/S FAS Error Analysis Results

:SENSe:DATA? <"result">

| | | |
|----------|-------------------------------------|----------------------------|
| Result = | "ECOut:SPDH:M140:FAS" | Error count |
| | "ESEConds:SPDH:M140:FAS:ANALysis" | Error Seconds |
| | "PESeconds:SPDH:M140:FAS:ANALysis" | % Error Seconds |
| | "EFSeconds:SPDH:M140:FAS:ANALysis" | Error Free Seconds |
| | "PEFSeconds:SPDH:M140:FAS:ANALysis" | % Error Free Seconds |
| | "SESeconds:SPDH:M140:FAS:ANALysis" | Severely Errored Seconds |
| | "PSESeconds:SPDH:M140:FAS:ANALysis" | % Severely Errored Seconds |
| | "UASeconds:SPDH:M140:FAS:ANALysis" | Unavailable Seconds |

SENSe subsystem - Result Returning Commands

| | |
|-------------------------------------|-----------------------|
| "PUASeconds:SPDH:M140:FAS:ANALysis" | % Unavailable Seconds |
| "DMINutes:SPDH:M140:FAS:ANALysis" | Degraded Minutes |
| "PDMinutes:SPDH:M140:FAS:ANALysis" | % Degraded Minutes |
| "ESEConds:SPDH:CODE:ANALysis" | Code errored seconds |

Structured PDH CRC Error Analysis Results

:SENSe:DATA? <"result">

| | | |
|----------|--------------------------------|----------------------------|
| Result = | "ECOunt:PDH:CRc" | Error Count |
| | "ESEConds:SPDH:CRc:ANALysis" | Error Seconds |
| | "PESeconds:SPDH:CRc:ANALysis" | % Error Seconds |
| | "EFSeconds:SPDH:CRc:ANALysis" | Error Free Seconds |
| | "PEFSeconds:SPDH:CRc:ANALysis" | % Error Free Seconds |
| | "SESeconds:SPDH:CRc:ANALysis" | Severely Errored Seconds |
| | "PSESeconds:SPDH:CRc:ANALysis" | % Severely Errored Seconds |
| | "UASeconds:SPDH:CRc:ANALysis" | Unavailable Seconds |
| | "PUASeconds:SPDH:CRc:ANALysis" | % Unavailable Seconds |
| | "DMINutes:SPDH:CRc:ANALysis" | Degraded Minutes |
| | "PDMinutes:SPDH:CRc:ANALysis" | % Degraded Minutes |
| | "ESEConds:SPDH:CODE:ANALysis" | Code errored seconds |

Structured PDH REBE Error Analysis Results

:SENSe:DATA? <"result">

| | | |
|----------|--------------------------------|-----------------|
| Result = | "ECOunt:SPDH:REBE" | Error Count |
| | "ESEConds:SPDH:REBE:ANALysis" | Error Seconds |
| | "PESeconds:SPDH:REBE:ANALysis" | % Error Seconds |

SENSe subsystem - Result Returning Commands

| | |
|---------------------------------|----------------------------|
| "EFSeconds:SPDH:REBE:ANALysis" | Error Free Seconds |
| "PEFSeconds:SPDH:REBE:ANALysis" | % Error Free Seconds |
| "SESeconds:SPDH:REBE:ANALysis" | Severely Errored Seconds |
| "PSESeconds:SPDH:REBE:ANALysis" | % Severely Errored Seconds |
| "UASeconds:SPDH:REBE:ANALysis" | Unavailable Seconds |
| "PUASeconds:SPDH:REBE:ANALysis" | % Unavailable Seconds |
| "DMINutes:SPDH:REBE:ANALysis" | Degraded Minutes |
| "PDMINutes:SPDH:REBE:ANALysis" | % Degraded Minutes |
| "ESEConds:SPDH:CODE:ANALysis" | Code errored seconds |

Structured PDH Alarm Seconds Results

:SENSe:DATA? <"result">

| | | |
|----------|--------------------------|----------------------|
| Result = | "ASEConds:SPDH:LOS" | Loss Of Signal |
| | "ASEConds:SPDH:M2:LOF" | 2 Mb/s Frame Loss |
| | "ASEConds:SPDH:M8:LOF" | 8 Mb/s Frame Loss |
| | "ASEConds:SPDH:M34:LOF" | 34 Mb/s Frame Loss |
| | "ASEConds:SPDH:M140:LOF" | 140 Mb/s Frame Loss |
| | "ASEConds:SPDH:DS1:OOF" | DS1 Out Of Frame |
| | "ASEConds:SPDH:DS3:OOF" | DS3 Out Of Frame |
| | "ASEConds:SPDH:OOF" | DS1/DS3 Out of Frame |
| | "ASEConds:SPDH:DS3:EXZ" | DS3 Excess zeros |
| | "ASEConds:SPDH:DS1:EXZ" | DS1 Excess zeros |
| | "ASEConds:SPDH:DS3:IDLE" | DS3 Idle |
| | "ASEConds:SPDH:DS3:FMM" | DS3 Frame Mismatch |
| | "ASEConds:SPDH:FERF" | FERF |
| | "ASEConds:SPDH:AIS" | AIS |
| | "ASEConds:SPDH:MFM" | Multiframe Loss |

PDH Command Reference

SENSe subsystem - Result Returning Commands

| | |
|----------------------|-------------------------|
| "ASEConds:SPDH:RAI" | Remote Alarm |
| "ASEConds:SPDH:RMFR" | Remote Multiframe Alarm |
| "ASEConds:SPDH:PSL" | Pattern Sync Loss |

Structured PDH Round Trip Delay Results

:SENSe:DATA? <"result">

Result = "RTDelay:SPDH:COUNT" Round Trip Delay

FETCh subsystem

FETCh subsystem

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

:FETCh:SCALAr:DATA:TELEcom:PDH:SPARe?

Returns : <string>

Returns spare bit result as a string.

:FETCh:SCALAr:DATA:TELEcom:PDH:NFASe?

Returns : <string>

Returns NFAS word as a string.

:FETCh:SCALAr:DATA:TELEcom:PDH:CAS?

Returns : <string>

Returns CAS word as a string.

:FETCh:STRing:DATA:TELEcom:SPDH:FEAC?

Returns: <numeric>

Returns the currently detected FEAC code as a 6 bit binary string.

:FETCh:STRing:DATA:TELEcom:SPDH:FEAC:TEXT?

Returns: <string>

PDH Command Reference

FETCh subsystem

Returns the currently detected FEAC code decoded as the message types defined in ANSI T1.107-1995. Note that two additional codes which are undefined by the ANSI spec have been decoded as follows:

| Code | Message |
|-------------------|---------------|
| 00010010 11111111 | NIU Loop Up |
| 00100100 11111111 | NIU Loop Down |

:FETCh:STRing:DATA:TELEcom:SPDH:FEAC:LAST?

Returns: <numeric>

Returns the last detected non-idle FEAC code as a 6 bit binary string.

:FETCh:STRing:DATA:TELEcom:SPDH:FEAC:LAST:TEXT?

Returns: <string>

Returns the last detected non-idle FEAC code decoded as the message types defined in ANSI T1.107-1995. Note that two additional codes which are undefined by the ANSI spec have been decoded as follows

| Code | Message |
|-------------------|---------------|
| 00010010 11111111 | NIU Loop Up |
| 00100100 11111111 | NIU Loop Down |

:FETCh:SCALar:DATA:TELEcom:SPDH:TSLot:SIGNaling? <numeric>

<numeric> = 1 - 31 Timeslot number
1 to 24 Timeslot Number (DS1 Signalling Bits)

Returns: <string>

Returns the signalling bits for the specified timeslot as a string.

PDH Command Reference

FETCh subsystem

:FETCh:ARRay:DATA:TELEcom:SPDH:ASCan:M140?

Returns : <numeric>

Retained for backwards compatibility. Returns a number indicating the status of the 140 Mb/s Alarm Scan. For new developments the command :FETCh:ARRay:DATA:TELEcom:SPDH:ASCan? is recommended.

:FETCh:ARRay:DATA:TELEcom:SPDH:ASCan:M34?

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

Retained for backwards compatibility. Returns 4 numbers, separated by commas, indicating the status of the 34 Mb/s Alarm Scan. For new developments the command :FETCh:ARRay:DATA:TELEcom:SPDH:ASCan? is recommended.

:FETCh:ARRay:DATA:TELEcom:SPDH:ASCan:M8?

Returns (each of <numeric>,<numeric>,<numeric>,<numeric>
rows 1 to 4):

Retained for backwards compatibility. Returns 4 rows of 4 numbers, separated by commas, indicating the status of the 8 Mb/s Alarm Scan. For new developments the command :FETCh:ARRay:DATA:TELEcom:SPDH:ASCan? is recommended.

:FETCh:ARRay:DATA:TELEcom:SPDH:ASCan:M2?

Returns (each of <numeric>,<numeric>,<numeric>,<numeric>
rows 1 to 16):

Retained for backwards compatibility. Returns 16 rows of 4 numbers separated by commas, indicating the status of the 2 Mb/s Alarm Scan. For new developments the command :FETCh:ARRay:DATA:TELEcom:SPDH:ASCan? is recommended.

:FETCh:ARRay:DATA:TELEcom:SPDH:ASCan?

Returns (each of one or <numeric>{,<numeric>}
more rows):

PDH Command Reference

FETCh subsystem

The results returned are those for the last FULL scan. Results from partial scans are not available. If no full scan has been completed since the instrument was powered up, this command will return -1.

If data is available it is returned as a set of string arrays. The arrays are separated by a CR/LF pair. The arrays consist of comma separated numerics, one for each scanned tributary. The numeric is a boolean flag which is used as follows.

| Value | State |
|-------|----------------------|
| 0 | No Problems detected |
| 1 | Alarms Detected |

For specific signal structures, the format of the returned strings are shown below:

1) 140Mb/s Interface Rate, Structured, 2Mb/s Test Signal

Each level of the structure scanned returns its results in one array apart from the fourth level, in this case 2Mb/s, where its results are split into 4 arrays.

| | |
|---------|--|
| 140Mb/s | 0 |
| 34Mb/s | 0,0,1,0 |
| 8Mb/s | 0,1,0,1,1,0,0,1,1,1,1,0,0,0,0,0 |
| 2Mb/s | 1,1,1,0,0,1,0,0,0,0,0,1,1,1,1,0 0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0 1,1,1,1,0,0,1,0,0,0,1,1,1,1,0,0 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0 |

2) STM-1 Interface Rate, DS3 Payload, Structured, Nx64kb/s Test Signal

When there are less than four levels in the structure, each levels results are returned in one array.

| | |
|-----|---|
| DS3 | 0 |
| DS2 | 0,0,1,0,1,1,1 |
| DS1 | 0,1,0,1,1,0,0,1,1,1,1,0,0,0,0,0,1,0,1,1,1,0,0,0,0,0,1,1 |

SDH SCPI Command Reference

OUTPut subsystem, see page 4- 4.

SOURce subsystem - Transmitter SDH Settings Commands, see page 4- 7.

SDH Mapping Settings, see page 4-11.

SOURce subsystem - Transmitter SDH OVERHEAD SETUP, see page 4- 22.

SOURce subsystem - Transmitter SDH Test Function Commands, see page 4-34.

INPut subsystem, see page 4- 61.

SENSe subsystem - Receiver SDH Settings, see page 4- 63.

SENSe subsystem - Receiver SDH Test Function Commands, see page 4-72.

SENSe subsystem - Alarm Scan Control, see page 4-79.

SENSe subsystem - SDH Tributary Scan Control, see page 4- 81.

SENSe subsystem -Optical Power Measurement Settings, see page 4- 83.

SENSe subsystem - Result Returning Commands, see page 4- 84.

FETCh subsystem, see page 4- 97.

SDH Command Reference

SDH Command Reference

SDH Command Reference

This chapter contains detailed information on the SCPI (Standard Commands for Programming Instruments) and IEEE 488.2 common commands you will use when writing programs to control your HP 37718A for SDH operation.

Please also refer to chapter 2 Common Commands for general information on SCPI command formats and for a list of commands that are common to PDH, SDH, SONET or Jitter operation; they are as follows:

SCPI Command Format

Remote Control Commands

Instrument Options

INSTRument subsystem

SOURce subsystem

SOURce subsystem - Transmitter Common Commands

INPut subsystem

SENSe subsystem

SENSe subsystem - Receiver Common Commands

SENSe subsystem - Test Timing

SENSe subsystem - Analysis Control

SENSe subsystem - Trouble Scan Results

SENSe subsystem - Configuring Graphics

SENSe subsystem - Managing Graphics Stores

SENSe subsystem - Retrieving Graphics Store Data

SENSe subsystem - Retrieving Data for a Single Graph

SENSe subsystem - Obtaining Graphics End of Measurement Results

STATus Subsystem

SYSTem Subsystem

IEEE common capabilities

OUTPut subsystem

OUTPut subsystem

This subsystem controls the characteristics of the instrument's output ports.

:OUTPut:TELEcom:SDH:RATE <discrete>

| | | |
|--------------|------|------------------|
| <discrete> = | STM0 | STM-0 Electrical |
| | STM1 | STM-1 Electrical |

Is only valid when :SOURce:DATA:TELEcom:SOURce <discrete> is set to <SDH>.

:OUTPut:TELEcom:SDH:RATE?

Returns: <discrete>

:OUTPut:TELEcom:SDH:LEVel <discrete>

| | | |
|--------------|------|--------------------------|
| <discrete> = | XCON | 450 feet simulated cable |
| | HIGH | 0 feet simulated cable |
| | LOW | 900 feet simulated cable |

Selects the signal level for the STM-0 output.

The corresponding query returns the STM-0 signal level in discrete short form.

:OUTPut:TELEcom:SDH:LEVel?

Returns: <discrete>

:OUTPut:TELEcom:OPT16:RATE <discrete>

| | | |
|--------------|-------|----------------|
| <discrete> = | STM0 | STM-0 Optical |
| | STM1 | STM-1 Optical |
| | STM4 | STM-4 Optical |
| | STM16 | STM-16 Optical |

SOURce subsystem - Transmitter SDH Settings Commands

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

:SOURce:CLOCK:SDH:LEVel?

Returns : <discrete>

:SOURce:CLOCK:SDH:FORMat <discrete>

| | | |
|--------------|---------|------------------|
| <discrete> = | CLOCK | Clock Format |
| | DATA | Data Format |
| | K64 | 64kb/s data |
| | DS1Bits | DS1 bit rate |
| | M10Ref | 10 MHz Reference |

Selects the transmitter SDH EXT MTS clock sync source format.

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

:SOURce:CLOCK:SDH:FORMat?

Returns : <discrete>

:SOURce:CLOCK:SDH:FOFFset <boolean>

| | |
|-------------|----------|
| <boolean> = | 0 or OFF |
| | 1 or ON |

Enables/disables the SDH Frequency Offset. The amount of Offset is set using :SOURce:CLOCK:SDH:FOFFset:OFFSet <numeric>,<suffix>:.

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

:SOURce:CLOCK:SDH:FOFFset?

Returns : <boolean> 0 or 1

:SOURce:CLOCK:SDH:FOFFset:OFFSet <numeric>,<suffix>

SOURce subsystem - Transmitter SDH Settings Commands

| | |
|------|-------------------------|
| TU2 | Overwrite TU-2 payload |
| TU12 | Overwrite TU-12 payload |
| TU11 | Overwrite TU-11 payload |

Selects the type of thru-mode payload to overwrite.

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

:SOURce:DATA:TELEcom:SDH:THRumode:POVerwrite?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:THRumode:COVerwrite <boolean>

| | | |
|-------------|----------|------------------------|
| <boolean> = | 0 or OFF | Overhead Overwrite Off |
| | 1 or ON | Overhead Overwrite On |

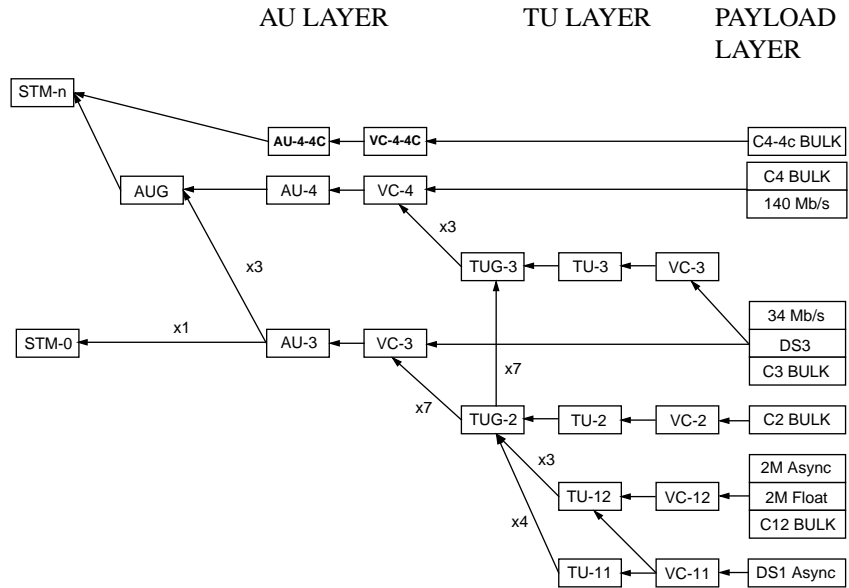
Enables/disables section overhead overwrite.

The corresponding query returns the section overhead overwrite state in discrete form as listed above.

:SOURce:DATA:TELEcom:SDH:THRumode:COVerwrite?

Returns : <boolean>

SDH Mapping Settings



:SOURCE:DATA:TELEcom:SDH:AU4 <numeric>

<numeric> = 1 to 16 AU-4 number.

Only valid if :OUTPUT:TELEcom:OPT16:RATE <discrete> is set to a rate higher than STM-1. Selects the transmitted STM-1 AU-4 that is selected for test.

The corresponding query returns the STM-1 AU-4 selected for test in numeric form, as listed above.

:SOURCE:DATA:TELEcom:SDH:AU4?

Returns : <numeric>

:SOURCE:DATA:TELEcom:SDH:AU4C <numeric>

<numeric> = 1 to 4 AU-4-4C number.

SOURce subsystem - Transmitter SDH Settings Commands

:SOURce:DATA:TELEcom:SDH:TRIButary:MAPPING <discrete>

| | | |
|--------------|---------------|------------------------------|
| <discrete> = | ASYNc or ASM2 | Asynchronous 2 Mb/s |
| | FBYTe or FLM2 | 2 Mb/s Floating Byte |
| | M34 or ASM34 | Asynchronous 34 Mb/s |
| | DS1 or ASDS1 | Asynchronous 1.544Mb/s DS1 |
| | DS3 or ASDS3 | Asynchronous 44.736 Mb/s DS3 |
| | BULK | Bulk Filled |

Selects the transmitter low order mapping. Only valid if

:SOURce:DATA:TELEcom:SDH:PAYLoad <discrete> is set to <TU3>, <TU12> or <TU11>.

The corresponding query returns the low order mapping in discrete short form.

:SOURce:DATA:TELEcom:SDH:TRIButary:MAPPING?

Returns: <discrete>

TUG Channel

:SOURce:DATA:TELEcom:SDH:TUG3 <numeric>

<numeric> = 1 to 3 TUG3 Number

Selects the SDH Transmitter active TUG3 within the AU4.

The corresponding query returns the active TUG3 in numeric form.

:SOURce:DATA:TELEcom:SDH:TUG3?

Returns : <numeric>

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

<numeric> = 1 to 7 TUG2 Number

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

The corresponding query returns the active TUG2 in numeric form.

:SOURce:DATA:TELEcom:SDH:TUG2?

SOURce subsystem - Transmitter SDH Settings Commands

Note: This command is not backwards compatible. To set the framing type to be structured use the command :SOURce:DATA:TELEcom:SDH:PAYLoad:STRUcture <discrete>.

Only valid if a Structured PDH transmitter is fitted.

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

:SOURce:DATA:TELEcom:SDH:PAYLoad:TYPE?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:PAYLoad:STRUcture <discrete>

| | | |
|--------------|--------------|--------------------|
| <discrete> = | UNSTRUctured | All rates |
| | STRUctured | All framed formats |

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

The corresponding query returns the transmitter PDH payload structure setting in discrete form as listed above.

:SOURce:DATA:TELEcom:SDH:PAYLoad:STRUcture?

Returns: <discrete>

:SOURce:DATA:TELEcom:SDH:PAYLoad:PATtern <discrete>

| | | |
|--------------|--------|--|
| <discrete> = | PRBS9 | 2^9-1 |
| | PRBS11 | $2^{11}-1$ |
| | PRBS15 | $2^{15}-1$ |
| | PRBS20 | $2^{20}-1$ |
| | PRBS23 | $2^{23}-1$ |
| | QRSS | $2^{20}-1$ with 14 consecutive zero limit (DS1 only) |
| | AZERo | All Zeros |
| | AONE | All Ones |

SOURce subsystem - Transmitter SDH Settings Commands

| | |
|--------|--|
| STRESS | 3-in-24 stress pattern (DS1 only) (requires option 011) |
| P1010 | Word 1010 |
| P1000 | Word 1000 |
| UWORD | 16 Bit User Word |

Selects the transmitter SDH payload data pattern.

See: :SOURce:DATA:TELEcom:SDH:PAYLoad:TYPE <discrete>. If UWORD is selected, the word pattern is set using :SOURce:DATA:TELEcom:SDH:PAYLoad:UWORD <string>.

The corresponding query returns the transmitter SDH payload data pattern in discrete form, as listed above.

:SOURce:DATA:TELEcom:SDH:PAYLoad:PATtern?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:PAYLoad:UWORD <string>

Sets the SDH transmitter user word pattern in the range "0000000000000000" to "1111111111111111"

The corresponding query returns the user word pattern as a string.

:SOURce:DATA:TELEcom:SDH:PAYLoad:UWORD?

Returns : <string>

:SOURce:DATA:TELEcom:SDH:PRBS:POLarity <discrete>

<discrete> = INVerted
 NORMal

Selects the PRBS pattern polarity.

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

:SOURce:DATA:TELEcom:SDH:PRBS:POLarity?

SOURce subsystem - Transmitter SDH Settings Commands

Returns: <discrete>

:SOURce:DATA:TELEcom:SDH:PAYLoad:OFFSet <numeric>

| | | |
|-------------|-----------------------|-------------------|
| <numeric> = | -100 to +100 | Parts per Million |
| | -0.000100 to 0.000100 | % or Ratio |
| <suffix> = | PPM | Parts per Million |
| | PCT | Percentage |

Sets the 140, 34, 2 Mb/s, DS3 or DS1 payload frequency offset in parts per million (ppm).

The corresponding query returns the offset in numeric form.

:SOURce:DATA:TELEcom:SDH:PAYLoad:OFFSet?

Returns: <numeric> ppm

:SOURce:DATA:TELEcom:SDH:TRIButary:CONCatenate <numeric>, <numeric>

| | | |
|--------------------------------|--------|-------------------|
| <numeric> = (first parameter) | 0 | Concatenation Off |
| | 2 | TU2-2C |
| | 3 | TU2-3C |
| | 4 | TU2-4C |
| | 5 | TU2-5C |
| | 6 | TU2-6C |
| <numeric> = (second parameter) | 1 to 6 | TU2-2C selected |
| | 1 to 5 | TU2-3C selected |
| | 1 to 4 | TU2-4C selected |

SOURce subsystem - Transmitter SDH Settings Commands

| | |
|--------|-----------------|
| 1 to 3 | TU2-5C selected |
|--------|-----------------|

| | |
|--------|-----------------|
| 1 to 2 | TU2-6C selected |
|--------|-----------------|

Selects the TU2 concatenation (first parameter) and starting at TU (second parameter).

The corresponding query returns the TU2 concatenation and starting at TU in numeric form as listed above.

:SOURce:DATA:TELEcom:SDH:TRIButary:CONCatenate?

Returns : <numeric>,<numeric>

Background Settings**:SOURce:DATA:TELEcom:SDH:AU3:BACKground <discrete>**

| | | |
|--------------|------------|-------------------|
| <discrete> = | UNEQuipped | Fixed at 00000000 |
| | AS_FG | As Foreground |

Selects the payload in the background (non test) AU-3s. This command only applies if the selected mapping is AU3.

The corresponding query returns the type of payload in the background AU-3s in discrete short form.

:SOURce:DATA:TELEcom:SDH:AU3:BACKground?

Returns: <discrete>

:SOURce:DATA:TELEcom:SDH:AU4:BACKground <discrete>

| | | |
|--------------|------------|-------------------|
| <discrete> = | UNEQuipped | Fixed at 00000000 |
| | AS_FG | As Foreground |

Selects the payload in the background (non test) AU-4s. This command only applies if the selected mapping is AU4.

The corresponding query returns the type of payload in the background AU-4s in discrete short form.

:SOURce:DATA:TELEcom:SDH:AU4:BACKground?

Returns: <discrete>

SOURce subsystem - Transmitter SDH Settings Commands

:SOURce:DATA:TELEcom:SDH:AU4C:BACKground <discrete>

| | | |
|--------------|------------|-------------------|
| <discrete> = | UNEQuipped | Fixed at 00000000 |
| | AS_FG | As Foreground |

Selects the payload in the background (non test) AU-4-4Cs. This command only applies if the selected mapping is AU4_4C.

The corresponding query returns the type of payload in the background AU-4-4Cs in discrete short form.

:SOURce:DATA:TELEcom:SDH:AU4C:BACKground?

Returns: <discrete>

:SOURce:DATA:TELEcom:SDH:PRIMary:BACKground:PAYLoad:PATtern <discrete>

| | | |
|--------------|----------|---------------------------|
| <discrete> = | PRBS9 | 2^9-1 |
| | PRBS11 | $2^{11}-1$ |
| | PRBS15 | $2^{15}-1$ |
| | NUMBered | (TU2 or framed TU12/TU11) |
| | P1100 | word 1100 |

Selects the background payload pattern for TUs within the foreground TUG3 or AU3.

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

:SOURce:DATA:TELEcom:SDH:PRIMary:BACKground:PAYLoad :PATtern?

Returns: <discrete>

:SOURce:DATA:TELEcom:SDH:TUG3:BACKground:PAYLoad:PATtern <numeric> <discrete>

| | | |
|-------------|--------|------------------------|
| <numeric> = | 1 to 3 | TUG 3 to be configured |
| <discrete> | TU3 | TU-3 structure |
| | TU12 | TU-12 structure |
| | UWORD | User Defined |

SOURce subsystem - Transmitter SDH Settings Commands

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>

<numeric> = 1 to 3 TUG 3 Number

:SOURce:DATA:TELEcom:SDH:TUG3:BACKground:PAYLoad:PATtern:UWORD <numeric> <string>

<numeric> = 1 to 3 TUG 3 to be configured

<string> 8 bit 00000000 to 11111111

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 corresponding query returns the background word pattern in the TUG 3 selected by numeric.

:SOURce:DATA:TELEcom:SDH:TUG3:BACKground:PAYLoad:PATtern:UWORD? <numeric>

<numeric> = 1 to 3 TUG 3 Number

SOURce subsystem - Transmitter SDH OVERHEAD SETUP**SOURce subsystem - Transmitter SDH OVERHEAD SETUP**

Lists the settings for the commands associated with the TRANSMIT OVERHEAD SETUP display.

:SOURce:DATA:TELEcom:SDH:OVERhead:DEFault

Sets all overhead bytes to their default value:

| Byte | Value | Byte | Value | Byte | Value | Byte | Value |
|------|----------|------|----------|-------|----------|------|----------|
| A1 | 11110110 | A2 | 00101000 | C1/J0 | 00000001 | B1 | xxxxxxxx |
| E1 | 00000000 | F1 | 00000000 | D1 | 00000000 | D2 | 00000000 |
| D3 | 00000000 | E2 | 00000000 | H1 | xxxx10xx | H2 | xxxxxxxx |
| H3 | xxxxxxxx | B2 | xxxxxxxx | K1 | 00000000 | K2 | 00000000 |
| D4 | 00000000 | D5 | 00000000 | D6 | 00000000 | D7 | 00000000 |
| D8 | 00000000 | D9 | 00000000 | D10 | 00000000 | D11 | 00000000 |
| D12 | 00000000 | Z1 | 00000000 | Z2/M1 | 00000000 | J1 | Default |
| B3 | xxxxxxxx | C2 | 00000001 | G1 | 00000000 | F2 | 00000000 |
| H4 | 00000000 | F3 | 00000000 | K3 | 00000000 | N1 | 00000000 |

:SOURce:DATA:TELEcom:SDH:OVERhead:DATA <numeric>, <numeric>, <discrete>, <string>

<numeric> = STM-1 Number: range 1 to 16
(first parameter)

<numeric> = Column Number: range 1 to 3
(second parameter)

<discrete> = A1|A2|C1/J0|Z0|E1|F1|D1|D2|D3|H1|K1|
K2|D4|D5|D6|D7|D8|D9|D10|D11
D12|Z1|Z2/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

<string> = "00000000" to "11111111"

SOURce subsystem - Transmitter SDH OVERHEAD SETUP

Sets the binary value for the selected transmitter section overhead byte. All overhead bytes in the transmitted signal can be configured. The required byte is specified by 3 command parameters

The first parameter, STM-1 Number, identifies an STM-1 within the signal. Obviously, 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 a "Xrc" notation, where r is the numerical value of the bytes row in the transport overhead and c is the numerical value of the bytes column in the transport overhead. This method allows access to ANY byte in the selected STM-1 / Column set.

The fourth command parameter is a 8 character string representing the binary value which should be transmitted in the specified byte.

Where a set of H1 and H2 bytes in the overhead represent an active pointer, only the SS bits in H2 can be set. In this case the fourth parameter is still specified as an 8 bit string but has the unsettable bits set to 'x'. For example, to set bits 2 and 3 to '11' send the value 'xxxx11xx'.

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

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

Returns : <string>

:SOURce:DATA:TELEcom:SDH:OVERhead:DATA:HEXadecimal <numeric>, <numeric>, <discrete>, <string>

<numeric> = STM-1 Number: range 1 to 16
(first parameter)

<numeric> = Column Number: range 1 to 3
(second parameter)

SOURce subsystem - Transmitter SDH OVERHEAD SETUP

```

<discrete> =      A1|A2|J0|Z0|E1|F1|D1|D2|D3|H1|K1
                   K2|D4|D5|D6|D7|D8|D9|D10|D11
                   D12|Z1|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|

<string> =        "00" to "FF"

```

Sets the hexadecimal value for the selected transmitter transport overhead byte. All overhead bytes in the transmitted signal can be configured. The required byte is specified by 3 command parameters

The first parameter, STM-1 Number, identifies an STM-1 within the signal. Obviously, 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 a "Xrc" notation, where r is the numerical value of the bytes row in the transport overhead and c is the numerical value of the bytes column in the transport overhead. This method allows access to ANY byte in the selected STM-1 / Column set.

The fourth command parameter is a 2 character string representing the hex value which should be transmitted in the specified byte.

Where a set of H1 and H2 bytes in the overhead represent an active pointer, only the SS bits in H2 can be set. In this case the fourth parameter is still specified as an 2 bit string but has the unsetting nibble set to 'x' and the nibble containing the SS bits set to a value which assumes that the other 2 bits are zero. For example, to set bits 2 and 3 to '11' send the value 'xC'.

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

:SOURce:DATA:TELEcom:SDH:OVERhead:DATA:HEXadecimal?
<numeric>, <numeric>, <discrete>

SOURce subsystem - Transmitter SDH OVERHEAD SETUP

Returns: <string>

:SOURce:DATA:TELEcom:SDH:POVerhead:DATA <discrete>,<string>

<discrete> = C2|G1|F2|H4|Z3/F3|Z4/K3|Z5/N1

<string> = "xx00xxx0" to "xx11xxx1"

Sets the binary value of the specified VC-4-NC/VC-4/VC-3 POH overhead byte. Only bits 3, 4 and 8 of V5 can be set but an 8 bit string must be sent with the unsettable bits set to x. To set bits 3, 4 and 8 to "1" send "xx11xxx1".

The corresponding query returns the value of the specified STM-1 path overhead byte as a string, as described above.

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

Returns: <string>

: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) |
| | DQDB | DQDB (00010100) |
| | FDDI | FDDI (00010101) |
| | BULK | Bulk Filled (11111110) |
| | VCAis | VCAIS |
| | USER | User Defined |

Sets the value of the HP path label (C2 Byte) if foreground payload choice is VC-4 into an AU-4 or VC-3 into an AU-3, or VC-4-NC POH. To update the USER byte

SOURce subsystem - Transmitter SDH OVERHEAD SETUP

value use the `:SOURce:DATA:TELEcom:SDH:POVerhead:DATA <discrete>`, `<string>` command.

The corresponding query returns the value of the C2 byte in discrete short form.

:SOURce:DATA:TELEcom:SDH:POVerhead:SLABel?

Returns: `<discrete>`

:SOURce:DATA:TELEcom:SDH:POVerhead:J1:PATtern <discrete>

| | | |
|---------------------------------|----------|--------------------|
| <code><discrete> =</code> | DEFault | 64 NULL characters |
| | TEST | HP37718A.... |
| | USER | User Defined |
| | CRC7Test | HP: - GB00000000 |
| | CRC7User | User Defined |

Sets the type of pattern that is to be transmitted in the J1 byte of the STM-1 path overhead. The pattern repeats every 64 characters (16 chars in CRC7 case) and is transmitted byte by byte in subsequent frames.

The corresponding query returns the type of pattern being transmitted in STM-1 path overhead byte J1 in discrete form as listed above.

:SOURce:DATA:TELEcom:SDH:POVerhead:J1:PATtern?

Returns : `<discrete>`

:SOURce:DATA:TELEcom:SDH:POVerhead:J1 <string>

Sets the user defined pattern that is to be transmitted in the J1 byte of the STM-1 path overhead. The pattern should be 64 characters long, terminated with CR/LF. If less than 64 characters are input, the instrument will pad with the required number of NULL characters and terminate with CR/LF. The pattern repeats every 64 characters and is transmitted byte by byte in subsequent frames.

The corresponding query returns the value of the user defined pattern as a string, as defined above. If the string contains any non printing characters, ~ is substituted.

If CRC7 was returned in response to

`:SOURce:DATA:TELEcom:SDH:POVerhead:J1:PATtern?` , this query command is not valid.

SOURce subsystem - Transmitter SDH OVERHEAD SETUP**:SOURce:DATA:TELEcom:SDH:POVerhead:J1?**

Returns : <string>

:SOURce:DATA:TELEcom:SDH:POVerhead:J1:CRC7 <string>

This command sets the CRC7 based user defined string that is to be transmitted using the J1 byte and configures the instrument to use this string. The string can be up to 15 characters in length; remaining characters are set to NULLs. A frame marker byte with CRC7 is added to this string.

The string is transmitted byte by byte in subsequent frames. The string repeats every 16 characters. The corresponding query returns the current value of the string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELEcom:SDH:POVerhead:J1:CRC7?

Returns : <string>

:SOURce:DATA:TELEcom:SDH:POVerhead:J1:HEXadecimal?

Returns : <block>

Returns a 64 byte block of data. Each byte represents the hexadecimal value of an ASCII character of STM-1 path overhead byte J1 in the range "00" to "FF". The 64 hexadecimal numbers are preceded by the header "#264".

If CRC7 was returned in response to

:SOURce:DATA:TELEcom:SDH:POVerhead:J1:PATtern?, this query command is not valid.

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:DATA <discrete>,<string>

<discrete>= C2|G1|F2|H4|F3|K3|N1|N2|K4

Sets the value of the specified TU-3, TU-12 or TU-11 path overhead byte to the value specified by string (in the range "00000000" to "11111111"). The byte is specified by the first parameter. The value of J1 is set by

:SOURce:DATA:TELEcom:SDH:POVerhead:J1 <string> and

:SOURce:DATA:TELEcom:SDH:POVerhead:J1:PATtern <discrete>.

The corresponding query returns the byte specified by type in string form, as described above.

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:DATA? <discrete>

SOURce subsystem - Transmitter SDH OVERHEAD SETUP

Returns: <string>

:SOURce:DATA:TELEcom:SDH:OVERhead:J0:PATtern <discrete>

| | | |
|--------------|-------|------------------|
| <discrete> = | FIXed | Fixed Byte |
| | TEST | HP: - GB00000000 |
| | USER | User Defined |

Sets the type of pattern that is to be transmitted in the J0 byte of the STM-1 regenerator section overhead. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames. Default = FIX.

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

:SOURce:DATA:TELEcom:SDH:OVERhead:J0:PATtern?

Returns: <discrete>

:SOURce:DATA:TELEcom:SDH:OVERhead:J0 <string>

Sets the user defined pattern that is to be transmitted in the J0 byte of the regenerator overhead. The pattern should be 15 characters long. The instrument automatically appends a E.164 CRC character to make up a 16 character sequence. If less than 15 characters are input, the instrument will pad with the required number of NULL characters. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

The corresponding query returns the value of the user defined pattern as a string, as defined above. If the string contains any non printing characters, ~ is substituted.

If FIXed was returned in response

to: SOURce:DATA:TELEcom:SDH:OVERhead:J0:PATtern?, this query command is not valid.

:SOURce:DATA:TELEcom:SDH:OVERhead:J0?

Returns: <string>

:SOURce:DATA:TELEcom:SDH:OVERhead:J0:HEXadecimal?

Returns: <block>

Returns a 15 byte block of data. Each byte represents the hexadecimal value of an ASCII character "00" to "FF". The 15 hexadecimal numbers are preceded by the

SOURce subsystem - Transmitter SDH OVERHEAD SETUP**:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:J1?**

Returns : <string>

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:J1:CRC7 <string>

This command sets the CRC7 based user defined string that is to be transmitted using the J1 byte of the TU3 path overhead, and configures the instrument to use this string. The string can be up to 15 characters in length; remaining characters are set to NULLs. A frame marker byte with CRC7 is added to this string. The string is transmitted byte by byte in subsequent frames. The string repeats every 16 characters. The corresponding query returns the current value of the string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:J1:CRC7?

Returns : <string>

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:J1:HEXadecimal?

Returns : <block>

Returns a 64 byte block of data. Each byte represents the hexadecimal value of an ASCII character of TU3 byte J1 in the range "00" to "FF". The 64 hexadecimal numbers are preceded by the header "#264".

If CRC7T or CRC7U was returned in response to

:SOURce:DATA:TELEcom:SDH:POVerhead:J1:PATtern?, this query command is not valid.

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:J2:PATtern <discrete>

| | | |
|--------------|---------|--------------------|
| <discrete> = | DEFault | 15 NULL characters |
| | TEST | HP: - GB00000000 |
| | USER | User Defined |
| | FIXed | Fixed Byte |

Sets the type of pattern that is to be transmitted in the J2 byte of the VC-2 or VC-12 path overhead. The pattern repeats every 16 characters and is transmitted byte by byte in subsequent frames.

SOURce subsystem - Transmitter SDH OVERHEAD SETUP

The corresponding query returns the type of pattern being transmitted in VC-2 or VC-12 path overhead byte J2 in discrete form as listed above.

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:J2:PATtern?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:J2 <string>

Sets the user defined pattern that is to be transmitted in the J2 byte of the VC-2 or VC-12 path overhead. The pattern should be 15 characters long. If less than 15 characters are input, the instrument will pad with the required number of NULL characters and a frame marker byte with CRC7 is added to the string. The pattern repeats every 16 characters and is transmitted byte by byte in subsequent frames.

The corresponding query returns the value of the user defined pattern as a string, as defined above. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:J2?

Returns : <string>

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:J2:HEXadecimal?

Returns : <block>

Returns a 16 byte block of data. Each byte represents the hexadecimal value of an ASCII character of VC-2 or VC12 byte J2 in the range "00" to "FF". The 15 hexadecimal numbers are preceded by the header "#215".

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:J2:FIXed <string>

<string> = "00000000" to "11111111"

Sets the user defined fixed byte that is to be transmitted in the J2 byte of the VC-2 or VC-12 path overhead. The value is a binary string.

The corresponding query returns the value of the user defined fixed byte as a binary string, as defined above.

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:J2:FIXed?

Returns : <string>

SOURce subsystem - Transmitter SDH OVERHEAD SETUP

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:V5:SLABel
<numeric>

<numeric> = 0 to 7

Sets the VC-2, VC-12 or VC-11 signal label (Byte V5) value.
 The corresponding query returns the signal label value in numeric form.

:SOURce:DATA:TELEcom:SDH:TRIButary:POVerhead:V5:SLABel?

Returns : **<numeric> 0 to 7**

:SOURce:DATA:TELEcom:SDH:TRIButary: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) |
| | ASYN140 | Asynchronous 140 Mb/s (00010010) |
| | ATM | ATM (00010011) |
| | DQDB | DQDB (00010100) |
| | FDDI | FDDI (00010101) |
| | BULK | Bulk Filled (11111110) |
| | VCAis | VCAIS |
| | USER | User Defined |

Sets the LP Path Signal Label (C2 byte) if foreground payload TU-3 into an VC-4 is selected.

The corresponding query returns the C2 byte value in discrete short form.

:SOURce:DATA:TELEcom:SDH:TRIButary:POV:C2:SLABel?

Returns: **<discrete>**

SOURce subsystem - Transmitter SDH Test Function Commands

| | |
|-------|-------------------|
| TWO | Frame Errors only |
| THRee | Frame Errors only |
| FOUR | Frame Errors only |

Selects the transmitter SDH Error rate of the error type selected by :SOURce:DATA:TELEcom:SDH:ERRor:TYPE <discrete>. This command is applicable when :SOURce:DATA:TELEcom:SOURce <discrete> is set to SDH.

If bit errors are to be added to the PDH payload then :SOURce:DATA:TELEcom:SOURce <discrete> must be set to "PDH.

Associated commands:

:SOURce:DATA:TELEcom:SDH:ERRor:RATE <discrete>

The corresponding query returns the selected transmitter SDH error rate in discrete form, as listed above. Note that if this query returns USER, then :SOUR:DATA:TEL:SDH:ERR: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> 0.1E-3 to 9.9E-9 mantissa resolution 0.1,
exponent resolution 1

Sets the user defined SDH Error Add rate. Note that if :SOURce:DATA:TELEcom:SDH:ERRor:RATE <discrete> is not already set to USER, then this command will automatically set it to USER.

Associated commands:

:SOURce:DATA:TELEcom:SDH:ERRor:RATE <discrete>

SOURCE subsystem - Transmitter SDH Test Function Commands**:SOURCE:DATA:TELEcom:SDH:ERROR:MSPThreshold:NERRors?**

Returns : <numeric>

:SOURCE:DATA:TELEcom:SDH:ERROR:MSPThreshold: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 MSP Threshold errors when

:SOURCE:DATA:TELEcom:SDH:ERROR:RATE <discrete> is set to "MSPT" .

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

:SOURCE:DATA:TELEcom:SDH:ERROR:MSPThreshold:EINterval?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SDH:ALARm <discrete>

| | | |
|--------------|-------|--------------------------|
| <discrete> = | NONE | Alarms Off |
| | LOS | Loss of Signal |
| | LOF | Loss of Frame |
| | OOF | Out of Frame |
| | MSAis | Multiplexer Section AIS |
| | MSRDf | Multiplexer Section FERF |
| | LOP | Loss of Pointer |
| | PAIS | Path AIS |

SOURce subsystem - Transmitter SDH Test Function Commands

| | |
|--------------|----------------------|
| HPRD | Path FERF |
| PUNequipped | Path Unequipped |
| TULop | TU Loss of Pointer |
| TUPais | TU Path AIS |
| LPRD | TU Path FERF |
| LOMframe | Multiframe (H4) Loss |
| TUUNequipped | TU Path Unequipped |

Selects the TX Test Function alarm type when
:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to "ERR".
 The corresponding query returns the SDH alarm type in discrete form as listed above.

:SOURce:DATA:TELEcom:SDH:ALARm?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:ALARm:SOOFrAmE

Generates a single Out Of Frame alarm.

:SOURce:DATA:TELEcom:SDH:POINter <discrete>

| | | |
|--------------|----------|---------------------|
| <discrete> = | BURSt | Adds bursts |
| | NPOinter | New Pointer |
| | OFFSet | Adds offset in ppm |
| | G783 | Adds G.783 sequence |

Selects the Pointer adjustment type when
:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to "POIN".
 The corresponding query returns the pointer adjustment type in discrete form as listed above.

SOURce subsystem - Transmitter SDH Test Function Commands**:SOURce:DATA:TELEcom:SDH:POINter?**

Returns : <discrete>

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

| | |
|--------------|----|
| <discrete> = | AU |
| | TU |

Selects the TX pointer type when

:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to "POIN".

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

:SOURce:DATA:TELEcom:SDH:POINter:TYPE?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:POINter:DIRection <discrete>

| | |
|--------------|-----------|
| <discrete> = | INCRement |
| | DECRement |
| | ALTErnate |

Selects the direction of the pointer burst adjustment when

:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to "POIN"

and :SOURce:DATA:TELEcom:SDH:POINter <discrete> is set to "BURS".

The corresponding query returns the pointer burst direction in discrete form as listed above.

:SOURce:DATA:TELEcom:SDH:POINter:DIRection?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:POINter:IDECrement <numeric>

| | | |
|-------------|---------|-----------------------------|
| <numeric> = | 1 to 10 | TU-3, AU-3, AU-4, AU-4Nc |
| | 1 to 5 | TU-2, TU-12, TU-11 |

SOURce subsystem - Transmitter SDH Test Function Commands

Selects the number of places by which the pointer is to be incremented or decremented when :SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to "POIN" and :SOURce:DATA:TELEcom:SDH:POINter <discrete> is set to "BURS" .

The corresponding query returns the number of places in numeric form.

:SOURce:DATA:TELEcom:SDH:POINter:IDECrement?

Returns : <numeric>

:SOURce:DATA:TELEcom:SDH:POINter:TRANsmitted?

Returns: <numeric>

Returns the currently transmitted value of the AU pointer in numeric form.

:SOURce:DATA:TELEcom:SDH:POINter:ACTion

Forces the new pointer value defined by :SOURce:DATA:TELEcom:SDH:POINter:VALue <numeric> to be adopted.

:SOURce:DATA:TELEcom:SDH:POINter:VALue <numeric>

<numeric> = 0 to 782

Selects the AU New Pointer value when :SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to "POIN" and :SOURce:DATA:TELEcom:SDH:POINter <discrete> is set to "NPO".

The corresponding query returns the new pointer value in numeric form as listed above.

:SOURce:DATA:TELEcom:SDH:POINter:VALue? <numeric>

Returns : <numeric>

:SOURce:DATA:TELEcom:SDH:TRIButary:POINter:TRANsmitted?

Returns: <numeric>

Returns the currently transmitted value of the TU pointer in numeric form.

SOURce subsystem - Transmitter SDH Test Function Commands

| | |
|-------------|--|
| WCANcelled | Periodic with cancelled (c) |
| DOUBle | Periodic alternate double (d) |
| RSINgle | Repeating single (e) |
| RBURst | Repeating burst (f) |
| RPTRansient | Repeating phase transient |
| PNORmal | Periodic normal (g/h) |
| PADDED | Periodic added (g/h) |
| PCANcelled | Periodic cancelled (g/h) |
| SINgle | (Obsolete) Set according to value of G783:SINgle |

Selects the G.783 Pointer sequence adjustment type when

:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to "POIN" and :SOURce:DATA:TELEcom:SDH:POINter <discrete> is set to "G783" .This command is only valid if an SDH option is fitted.

The corresponding query returns the G.783 adjustment type in discrete form as listed above.

:SOURce:DATA:TELEcom:SDH:POINter:G783?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:POINter:G783:SINgle <discrete>

| | | |
|--------------|------------|---------------------------|
| <discrete> = | APOLarity | Periodic alternate single |
| | WCANcelled | With Cancelled |
| | WADDED | With Added |

(Obsolete) Set the type of G.783 pointer sequence when :SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to "POIN" and :SOURce:DATA:TELEcom:SDH:POINter <discrete> is set to "G783" and :SOURce:DATA:TELEcom:SDH:POINter:G783 <discrete> :is set to "SING".

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

SOURce subsystem - Transmitter SDH Test Function Commands**:SOURce:DATA:TELEcom:SDH:POINter:G783:SINGle?**

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:POINter:G783:PATtern <discrete>

| | | |
|--------------|------------|--------------|
| <discrete> = | CONTInuous | No pattern |
| | P873 | 87:3 pattern |
| | P261 | 26:1 pattern |

Selects the pattern of the G.783 pointer sequence when

:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to "POIN"
 and :SOURce:DATA:TELEcom:SDH:POINter <discrete> is set to "G783" and
 :SOURce:DATA:TELEcom:SDH:POINter:G783 <discrete> is set to "PNOR",
 "PADD" or "PCAN".

The corresponding query returns the G.783 pattern in discrete form as listed above.

:SOURce:DATA:TELEcom:SDH:POINter:G783:PATtern?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:POINter:G783:POLarity <discrete>

| | |
|--------------|----------|
| <discrete> = | NEGative |
| | POSitive |

Selects the polarity of the G.783 pointer sequence when

:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to "POIN"
 and :SOURce:DATA:TELEcom:SDH:POINter <discrete> is set to "G783" and
 :SOURce:DATA:TELEcom:SDH:POINter:G783 <discrete> is set to "SING".
 Default = "NEG".

The corresponding query returns the G.783 polarity in discrete form as listed above.

:SOURce:DATA:TELEcom:SDH:POINter:G783:POLarity?

Returns : <discrete>

SOURce subsystem - Transmitter SDH Test Function Commands

:SOURce:DATA:TELEcom:SDH:POINter:G783:INTerval <numeric> <suffix>

| | | |
|-------------|---------|--------------|
| <numeric> = | numeric | See text |
| <suffix> = | MS | milliseconds |
| | S | seconds |

Selects the interval between G.783 adjustments.

(AU-4, AU-4-NC, AU-3, TU-3) Range is 7.5ms, 10ms, 20ms, 30ms, 34ms, 40ms to 100ms in 10ms steps. 100 ms to 1s in 100ms steps. 1s, 2s, 5s and 10s.

(TU-2, TU-12, TU-11) Range is 200ms, 500ms, 1s, 2s, 5s and 10s.

The corresponding query returns the G.783 interval as listed above.

The default suffix unit is seconds.

:SOURce:DATA:TELEcom:SDH:POINter:G783:INTerval?

Returns : <numeric><suffix>

:SOURce:DATA:TELEcom:SDH:POINter:G783:SEQuence <discrete>

| | | |
|--------------|------------|--|
| <discrete> = | STOP | Stop the current G.783 pointer sequence |
| | STARt | Start a G.783 pointer sequence |
| | INITialize | Start a G.783 pointer sequence preceded by initialization and cooldown |

Stops/Starts the G.783 pointer sequence.

The corresponding query returns the sequence start state in discrete form as listed above. See also STAT:SDH2.

:SOURce:DATA:TELEcom:SDH:POINter:G783:SEQuence?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:SEQuence <discrete>

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

SOURce subsystem - Transmitter SDH Test Function Commands

Starts/Stops a Single or Repeat run Sequence.

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

:SOURce:DATA:TELEcom:SDH:SEQuence?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:SEQuence:MODE <discrete>

| | | |
|--------------|--------|------------|
| <discrete> = | SINGLE | Single Run |
| | REPeat | Repeat Run |

Selects the type of SEQUENCE when

:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <SEQ>.

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

:SOURce:DATA:TELEcom:SDH:SEQuence:MODE?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:SEQuence:CHANnel <discrete>

| | | |
|--------------|---|----------------------|
| <discrete> = | A1A2 C1/J0 Z0 E1 F1 D1D3 | Regenerator Overhead |
| | K1K2 D4D12 S1 Z1_1 Z1_2 Z1_3 Z2_4/M1 Z2_5 Z2_6 M1 E2 | Multiplexer Overhead |
| | J1 C2 G1 F2 H4 Z3/F3 Z4/K3 Z5/N1 | Path Overhead |

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

:SOURce:DATA:TELEcom:SDH:SEQuence:CHANnel?

Returns : <discrete>

SOURce subsystem - Transmitter SDH Test Function Commands

Selects STM-1 number for channels that occur in more than one STM-1:

The corresponding query returns the STM-1 number in numeric form.

:SOURce:DATA:TELEcom:SDH:SEQuence:CHANnel:SElect?

Returns: <numeric>

:SOURce:DATA:TELEcom:SDH:SEQuence:DATA <discrete>,<string>

<discrete> = A | B | C | D | E

<string> = "00" to "FFFFFFFFFFFFFFFFFFFF"

Sets the Sequence data pattern for the designated block to the hexadecimal value contained in the string. The number of hexadecimal characters is dependent on the overhead byte or bytes selected. Two hexadecimal characters are required per byte, for Example:

E1 - 1 byte "00" to "FF"

D4D12 - 9 bytes "000000000000000000" to "FFFFFFFFFFFFFFFFFFFF"

The corresponding query returns the hexadecimal value of the designated block as a string.

:SOURce:DATA:TELEcom:SDH:SEQuence:DATA? <discrete>

Returns : <string>

:SOURce:DATA:TELEcom:SDH:SEQuence:ORDer <discrete>, <discrete>, <discrete>, <discrete>, <discrete>

<discrete> = A | B | C | D | E

Selects the order of transmission for the blocks of data used in the Sequence.

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

:SOURce:DATA:TELEcom:SDH:SEQuence:ORDer?

Returns : <discrete>, <discrete>, <discrete>, <discrete>, <discrete>

SOURce subsystem - Transmitter SDH Test Function Commands

:SOURce:DATA:TELEcom:SDH:SEQuence:FCOunt <numeric>, <numeric>

<numeric> = 1 to 5 Block number
(first parameter)

<numeric> = 0 to 64000 Frame count
(second parameter)

Selects the number of frames in which the block of data, designated by the block_no, is to be transmitted.

The corresponding query returns the frame_count in numeric form.

:SOURce:DATA:TELEcom:SDH:SEQuence:FCOunt? <numeric>

Returns : <numeric> Frame count

:SOURce:DATA:TELEcom:SDH:STESSt:SPATtern <discrete>

<discrete> = AZERos All Zero's pattern

 AONes All Ones pattern

 G958 G.958 sequence

Selects the pattern used in the Optical stress test when

:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <STES>.

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

:SOURce:DATA:TELEcom:SDH:STESSt:SPATtern?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:STESSt:BLENght <numeric>

<numeric> = 2 to 85 Bytes for STM-0

 2 to 259 Bytes for STM-1

 2 to 1042 Bytes for STM-4

 2 to 4174 Bytes for STM-16

SOURce subsystem - Transmitter SDH Test Function Commands

| | |
|-------------|-------------------------------------|
| SDLPriority | Signal Degrade Low Priority (1010) |
| SDHPriority | Signal Degrade High Priority (1011) |
| SFLPriority | Signal Fail Low Priority (1100) |
| SFHPriority | Signal Fail High Priority (1101) |
| FSWitch | Forced Switch (1110) |
| LOPRotectio | Lockout Of Protection (1111) |

Selects the transmitter SDH MSP message to be transmitted (K1 Byte, Bits 1 to 4). Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to <SDH> and :SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to MSPM. SDHP and SFHP are only valid when :SOURce:DATA:TELEcom:SDH:MSPMessages:ARCHitecture <discrete> is set to OTN.

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

:SOURce:DATA:TELEcom:SDH:MSPMessages:REQuest?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:MSPMessages:CHANnel <numeric>

| | | |
|-------------|---|-------------------|
| <numeric> = | 0 | NULL Channel |
| | 1 | Working Channel 1 |
| | 2 | Working Channel 2 |
| | 3 | Working Channel 3 |
| | 4 | Working Channel 4 |
| | 5 | Working Channel 5 |
| | 6 | Working Channel 6 |
| | 7 | Working Channel 7 |
| | 8 | Working Channel 8 |

SOURce subsystem - Transmitter SDH Test Function Commands

| | |
|----|-----------------------|
| 9 | Working Channel 9 |
| 10 | Working Channel 10 |
| 11 | Working Channel 11 |
| 12 | Working Channel 12 |
| 13 | Working Channel 13 |
| 14 | Working Channel 14 |
| 15 | Extra Traffic Channel |

Selects the transmitter SDH MSP message channel (K1 Byte, Bits 5 to 8). Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to SDH and :SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to MSPM>

Working Channel 1 to 14 are only valid if :SOURce:DATA:TELEcom:SDH:MSPMessages:ARCHitecture <discrete> is set to OTN.

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

:SOURce:DATA:TELEcom:SDH:MSPMessages:CHANnel?

Returns : <numeric>

:SOURce:DATA:TELEcom:SDH:MSPMessages:BRIDge <string>

<string> = "0000" to "1111"

Selects the SDH transmitter Linear MSP message bridged channel (K2 Byte, Bits 1 to 4). Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to <SDH> and :SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to MSPM or :SOURce:DATA:TELEcom:SDH:MSPMessages:TOPology <discrete> is set to LIN The corresponding query returns the MSP messages bridged channel as a string as listed above.

:SOURce:DATA:TELEcom:SDH:MSPMessages:BRIDge?

Returns : <string>

SOURce subsystem - Transmitter SDH Test Function Commands

:SOURce:DATA:TELEcom:SDH:MSPMessages:ARCHitecture <discrete>

| | | |
|--------------|-------|-----|
| <discrete> = | OTONe | 1+1 |
| | OTN | 1:N |

Selects the SDH transmitter Linear MSP architecture (K2 Byte, Bit 5). Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to <SDH> and :SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to MSPM or :SOURce:DATA:TELEcom:SDH:MSPMessages:TOPology <discrete> is set to LIN.

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

:SOURce:DATA:TELEcom:SDH:MSPMessages:ARCHitecture?

Returns : <discrete>

:SOURce:DATA:TELEcom:SDH:MSPMessages:REServed <numeric>

| | | |
|-------------|---|-----|
| <numeric> = | 0 | 000 |
| | 1 | 001 |
| | 2 | 010 |
| | 3 | 011 |
| | 4 | 100 |
| | 5 | 101 |

Selects the SDH transmitter Linear MSP messages reserved bits (K2 Byte, Bits 6 to 8) in numeric form. Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to <SDH> and :SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to MSPM or :SOURce:DATA:TELEcom:SDH:MSPMessages:TOPology <discrete> is set to LIN.

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

:SOURce:DATA:TELEcom:SDH:MSPMessages:REServed?

Returns: <numeric>

SOURce subsystem - Transmitter SDH Test Function Commands

:SOURce:DATA:TELEcom:SDH:MSPMessages:RCODE <discrete>

| | | |
|--------------|--------------|------------------------------------|
| <discrete> = | NREQuest | No Request (0000) |
| | RRRING | Reverse Request - Ring (0001) |
| | RRSPan | Reverse Request - Span (0010) |
| | ERINg | Exerciser - Ring (0011) |
| | ESPan | Exerciser - Span (0100) |
| | WTRestore | 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 - Span (1100) |
| | FSRing | Forced Switch Ring (1101) |
| | FSSPan | Forced Switch - Span(1110) |
| | LOPRotectioN | Lockout Of Protection (1111) |

Selects the transmitter Ring MSP message to be transmitted (K1 Byte, Bits 1 to 4). Only valid if :SOURce:DATA:TELEcom:TFUNctioN <discrete> is set to <SDH> and :SOURce:DATA:TELEcom:SDH:TFUNctioN:TYPE <discrete> is set to MSPM and :SOURce:DATA:TELEcom:SDH:MSPMessages:ARCHitecture <discrete> is set to OT>.

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

:SOURce:DATA:TELEcom:SDH:MSPMessages:RCODE?

Returns: <discrete>

:SOURce:DATA:TELEcom:SDH:MSPMessages:DNODE <string>

<string> = "0000" to "1111"

Selects the SDH transmitter Ring MSP message destination node (K1 Byte, Bits 5 to 8). Only valid if :SOURce:DATA:TELEcom:TFUNctioN <discrete> is set to <SDH> and :SOURce:DATA:TELEcom:SDH:TFUNctioN:TYPE <discrete> is set to MSPM

SOURce subsystem - Transmitter SDH Test Function Commands

and :SOURce:DATA:TELEcom:SDH:MSPMessages:TOPology <discrete> is set to RING.

The corresponding query returns the MSP messages destination node as a string as listed above.

:SOURce:DATA:TELEcom:SDH:MSPMessages:DNODE?

Returns: <string>

:SOURce:DATA:TELEcom:SDH:MSPMessages:SNODE <string>

<string> = "0000" to "1111"

Selects the SDH transmitter Ring MSP message source node (K2 Byte, Bits 1 to 4). Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to <SDH> and :SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to MSPM and :SOURce:DATA:TELEcom:SDH:MSPMessages:TOPology <discrete> is set to RING.

The corresponding query returns the MSP messages source node as a string as listed above.

:SOURce:DATA:TELEcom:SDH:MSPMessages:SNODE?

Returns: <string>

:SOURce:DATA:TELEcom:SDH:MSPMessages:PCODE <discrete>

| | | |
|--------------|-------|------------|
| <discrete> = | SHORT | Short path |
| | LONG | Long path |

Selects the SDH transmitter Ring MSP message path type (K2 bit 5). Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to <SDH> and :SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to MSPM and :SOURce:DATA:TELEcom:SDH:MSPMessages:TOPology <discrete> is set to RING. The corresponding query returns the Ring MSP messages path type in discrete short form.

:SOURce:DATA:TELEcom:SDH:MSPMessages:PCODE?

Returns: <discrete>

SOURce subsystem - Transmitter SDH Test Function Commands**:SOURce:DATA:TELEcom:SDH:MSPMessages:SCODE <discrete>**

| | | |
|--------------|------------|--------------------------|
| <discrete> = | IDLE | Idle (000) |
| | BRIDged | Bridged (001) |
| | BASWitched | Bridged & Switched (010) |
| | P001 | 011 |
| | P100 | 100 |
| | P101 | 101 |

Selects the SDH transmitter Ring MSP messages status code (K2 Byte, Bits 6 to 8). Only valid if :SOURce:DATA:TELEcom:TFUNction <discrete> is set to <SDH> and :SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to MSPM and :SOURce:DATA:TELEcom:SDH:MSPMessages:TOPology <discrete> is set to RING or LIN.

The corresponding query returns the selected transmitter SDH MSP message status code in discrete form as listed above.

:SOURce:DATA:TELEcom:SDH:MSPMessages:SCODE?

Returns: <discrete>

:SOURce:DATA:TELEcom:SDH:MSPMessages:DOWNload

Start transmission of the SDH transmitter MSP message. Only valid if

:SOURce:DATA:TELEcom:TFUNction <discrete> is set to <SDH> and

:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to MSPM.

:SOURce:DATA:TELEcom:SDH:IDCC <discrete>

| | | |
|--------------|------|-----------------|
| <discrete> = | RDCC | Regenerator DCC |
| | MDCC | Multiplexer DCC |

Selects the Data Communication Channel Insert port when

:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <IDCC> .

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

:SOURce:DATA:TELEcom:SDH:IDCC?

Returns : <discrete>

SOURce subsystem - Transmitter SDH Test Function Commands

:SOURce:DATA:TELEcom:SDH:IDCC:POLarity <discrete>

<discrete> = NORMal

Selects the polarity of the DCC Insert port and the DCC Drop port when
:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <IDCC> .

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

:SOURce:DATA:TELEcom:SDH:IDCC:POLarity?

Returns <discrete>

:SOURce:DATA:TELEcom:SDH:OBERTest:CHANnel <discrete>

| | | |
|--------------|-------------------------|----------------------|
| <discrete> = | C1 J0 Z0 E1 F1 D1 D2 D3 | Regenerator Overhead |
| | K1 K2 D4 D5 D6 D7 | Multiplexer Overhead |
| | D8 D9 D10 D11 D12 | Multiplexer Overhead |
| | S1 Z1 M1 E2 | Multiplexer Overhead |
| | J1 C2 G1 F2 H4 Z3/F3 | Path Overhead |
| | Z4/K3 Z5/N1 | |

Selects the TX overhead byte used for the overhead BER test when
:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <OBER> .

The corresponding query returns the overhead byte identity in discrete form as listed above.

:SOURce:DATA:TELEcom:SDH:OBERTest:CHANnel?

Returns <discrete>

:SOURce:DATA:TELEcom:SDH:OBERTest:COLumn <numeric>

<numeric> 1 to 3

Sets the column number of the Section Overhead byte currently selected for the overhead bit transmitter error rate test function. This command is only valid if
:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <OBER> .

SOURce subsystem - Transmitter SDH Test Function Commands

The column are 1 for 1,4,7; 2 for 2,5,8 and 3 for 3,6,9. When in SONET, the column refers to the STS-1 within the currently selected STS-3.

The corresponding query returns the column number in numeric form as described above.

:SOURce:DATA:TELEcom:SDH:OBERTest:COLumn?

Returns: <numeric>

:SOURce:DATA:TELEcom:SDH:OBERTest:CHANnel:SElect <numeric>

<numeric> = 1-16

Selects STM-1 number for channels that occur in more than one STM-1.

The corresponding query returns the STM-1 number in numeric form.

:SOURce:DATA:TELEcom:SDH:OBERTest:CHANnel:SElect?

Returns: <numeric>

:SOURce:DATA:TELEcom:SDH:OBERTest <discrete>

<discrete> = ONCE Single error

Injects a single overhead BER error when

:SOURce:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <OBER>

INPut subsystem

INPut subsystem

This subsystem controls the characteristics of the instrument's input ports.

:INPut:TELEcom:SDH:RATE <discrete>

| | | |
|--------------|------|------------------|
| <discrete> = | STM0 | STM-0 Electrical |
| | STM1 | STM-1 Electrical |

Is only valid when the SDH Module is fitted and :SENSe:DATA:TELEcom:SENSe <discrete> is set to SDH.

The corresponding query returns the SDH rate in discrete short form.

:INPut:TELEcom:SDH:RATE?

Returns : <discrete>

:INPut:TELEcom:SDH:GAIN <discrete>

| | | |
|--------------|------|------------|
| <discrete> = | DB20 | 20 dB Gain |
| | DB26 | 26 dB Gain |

Selects the Monitor gain for the SDH receiver. Only valid when :INPut:TELEcom:LEVel <discrete> is set to MON.

The corresponding query returns the Monitor gain in discrete short form.

:INPut:TELEcom:SDH:GAIN?

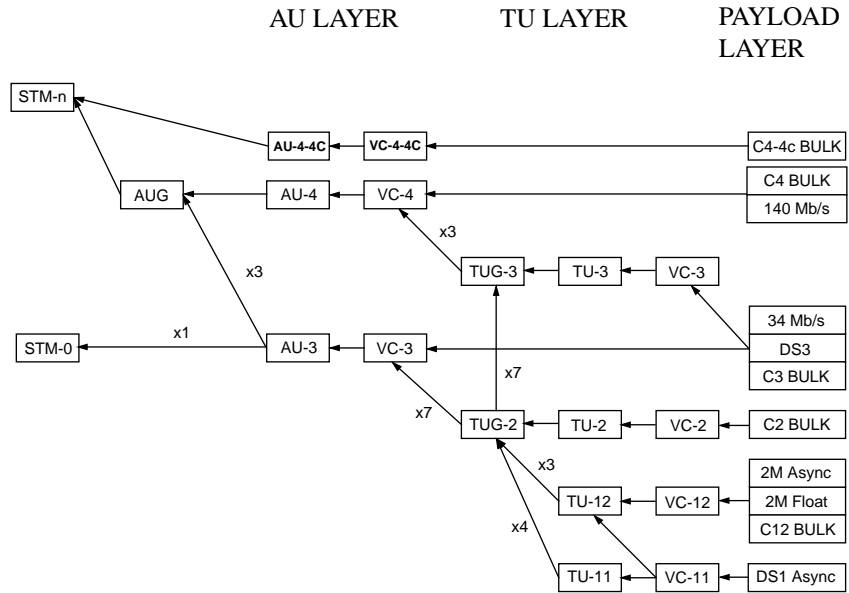
Returns: <discrete>

:INPut:TELEcom:OPT16:RATE <discrete>

| | | |
|--------------|-------|----------------|
| <discrete> = | STM0 | STM-0 Optical |
| | STM1 | STM-1 Optical |
| | STM4 | STM-4 Optical |
| | STM16 | STM-16 Optical |

SENSe subsystem - Receiver SDH Settings

SDH Mapping settings



:SENSe:DATA:TELEcom:SDH:AU4 <numeric>

<numeric> = <numeric> 1 to 16 AU-4 under test

Selects the AU-4 within an STM-N for test. Only valid if
 :INPut:TELEcom:OPT16:RATE <discrete> is set a rate higher than <STM1>.
 The corresponding query returns the test AU-4 number.

:SENSe:DATA:TELEcom:SDH:AU4?

Returns : <numeric>

SENSe subsystem - Receiver SDH Settings

:SENSe:DATA:TELEcom:SDH:AU3 <numeric>

<numeric> = <numeric> 1 to 3 AU-3 under test

Selects the AU-3 within an AUG for test. Only valid if the selected mapping is AU-3.

The corresponding query returns the test AU-3 number.

:SENSe:DATA:TELEcom:SDH:AU3?

Returns : <numeric>

:SENSe:DATA:TELEcom:SDH:AU4C <numeric>

<numeric> = <numeric> 1 to 4 AU-4 under test

Selects the AU-4-4C within an STM-16 for test. Only valid if :INPut:TELEcom:OPT16:RATE <discrete> is set to <STM16> and selected mapping is AU-4-4C.

The corresponding query returns the test AU-4-4C number.

:SENSe:DATA:TELEcom:SDH:AU4C?

Returns : <numeric>

AU Layer Selection

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

**<discrete> = AU4
AU3
AU4_4C
AU4_16C**

Set the AU mapping into an STM-N frame.

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

SDH Command Reference
SENSe subsystem - Receiver SDH Settings

:SENSe:DATA:TELEcom:SDH:AU:TYPE?

Returns: <discrete>

TU Layer Selection

:SENSe:DATA:TELEcom:SDH:PAYLoad <discrete>

| | | |
|--------------|-------------|----------|
| <discrete> = | VC4 or M140 | 140 Mb/s |
| | VC3 | STM-0 |
| | TU3 or M34 | 34 Mb/s |
| | TU12 or M2 | 2 Mb/s |
| | TU2 | VC-2 |
| | TU11 or DS1 | TU-11 |
| | VC4_4C | VC-4-4C |
| | VC4_16C | VC-4-16C |

This command selects the SDH receiver mapping

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

:SENSe:DATA:TELEcom:SDH:PAYLoad?

Returns : <discrete>

Payload Layer Selection

:SENSe:DATA:TELEcom:SDH:MAPPING <discrete>

| | | |
|--------------|------|----------------------------|
| <discrete> = | M140 | 140 Mb/s - AU-4 (C-4 only) |
| | M34 | 34 Mb/s - VC-3 (C-3 only) |
| | DS3 | DS3 - VC-3 (C-3 only) |
| | BULK | Bulk Filled (C-4 or C-3) |

Selects the Receiver SDH payload for single payload cases. Only valid if :SENSe:DATA:TELEcom:SDH:PAYLoad <discrete> is set to <VC3> or <VC4>.

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

SENSe subsystem - Receiver SDH Settings**:SENSe:DATA:TELEcom:SDH:MAPPING?**

Returns: <discrete>

:SENSe:DATA:TELEcom:SDH:TRIButary:MAPPING <discrete>

| | | |
|--------------|------------------|------------------------------|
| <discrete> = | ASYNc or ASM2 | 2 Mb/s |
| | FBYTe or FLM2 | 2 Mb/s Floating Byte |
| | M34 or ASM34 | 34 Mb/s |
| | DS1 or ASDS1 | Asynchronous 1.544 Mb/s DS1 |
| | DS3 or ASDS3 | Asynchronous 44.736 Mb/s DS3 |
| | BULK | Bulk Filled |

Selects the low order mapping. Only valid if

:SENSe:DATA:TELEcom:SDH:PAYLoad <discrete> is set to <TU3>, <TU12> or <TU11>.

The corresponding query returns the low order mapping in discrete short form.

:SENSe:DATA:TELEcom:SDH:TRIButary:MAPPING?

Returns: <discrete>

:SENSe:DATA:TELEcom:SDH:PRIMary:TS0 <boolean>

| | | |
|-------------|----------|------------------|
| <boolean> = | 0 or OFF | Data in TS0 |
| | 1 or ON | Signaling in TS0 |

Determines the content of TS0 as Data/Signaling.

The corresponding query returns the TS0 state in numeric form.

:SENSe:DATA:TELEcom:SDH:PRIMary:TS0?

Returns : <boolean> 0 or 1

SDH Command Reference
SENSe subsystem - Receiver SDH Settings

TUG Channel

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

<numeric> = 1 to 3

Selects the SDH Receiver active TUG3 within the AU4.

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

:SENSe:DATA:TELEcom:SDH:TUG2?

Returns : <numeric>

:SENSe:DATA:TELEcom:SDH:TRIButary <numeric>

<numeric> = 1 to 3 Tributary number for TU-12

1 to 4 Tributary number for TU-11

Selects the SDH Receiver active TU within the selected TUG2.

The corresponding query returns the receiver test tributary in numeric form.

:SENSe:DATA:TELEcom:SDH:TRIButary?

Returns : <numeric>

SENSe subsystem - Receiver SDH Settings

STRuctured

All framed formats

Determines whether the receiver is to expect any structure in the PDH payload.

The corresponding query returns the receiver structure setting in discrete form as listed above.

:SENSe:DATA:TELEcom:SDH:PAYLoad:STRucture?

Returns: <discrete>

:SENSe:DATA:TELEcom:SDH:PAYLoad:PATtern <discrete>

| | | |
|--------------|--------|---|
| <discrete> = | PRBS9 | 2^9-1 |
| | PRBS11 | $2^{11}-1$ |
| | PRBS15 | $2^{15}-1$ |
| | PRBS20 | $2^{20}-1$ |
| | QRSS | $2^{20}-1$ with 14 consecutive zero limit (DS1 only) |
| | PRBS23 | $2^{23}-1$ |
| | AZERo | All Zero's |
| | AONE | All One's |
| | STRess | 3-in-24 stress pattern (DS1 only) (requires option 011) |
| | P1010 | Word 1010 |
| | P1000 | Word 1000 |
| | UWORD | 16 Bit User Word |
| | LIVE | Live Traffic |

Selects the receiver SDH payload data pattern. If UWORD is selected, the word pattern is set using :SENSe:DATA:TELEcom:SDH:PAYLoad:UWORD <string>

SENSe subsystem - Receiver SDH Settings

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

:SENSe:DATA:TELEcom:SDH:PAYLoad:PATtern?

Returns : <discrete>

:SENSe:DATA:TELEcom:SDH:PAYLoad:UWORD <string>

Sets the receiver user word pattern in the range "0000000000000000" to "1111111111111111".

The corresponding query returns the user word pattern as a string.

:SENSe:DATA:TELEcom:SDH:PAYLoad:UWORD?

Returns : <string>

:SENSe:DATA:TELEcom:SDH:PRBS:POLarity <discrete>

<discrete> = NORMAL
 INVERTed

Selects the PRBS pattern polarity.

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

:SENSe:DATA:TELEcom:SDH:PRBS:POLarity?

Returns : <discrete>

**:SENSe:DATA:TELEcom:SDH:TRIButary:CONCatenate
<numeric>,<numeric>**

| | | |
|-------------------------------|---|-------------------|
| <numeric> = (first parameter) | 0 | Concatenation Off |
| | 2 | TU2-2C |
| | 3 | TU2-3C |
| | 4 | TU2-4C |

SDH Command Reference

SENSe subsystem - Receiver SDH Settings

| | | |
|-----------------------------------|--------|-----------------|
| | 5 | TU2-5C |
| | 6 | TU2-6C |
| <numeric> = (second parameter) | 1 to 6 | TU2-2C selected |
| | 1 to 5 | TU2-3C selected |
| | 1 to 4 | TU2-4C selected |
| | 1 to 3 | TU2-5C selected |
| | 1 to 2 | TU2-6C selected |

Selects the TU2 concatenation level (first parameter) and starting at the TU (second parameter).

The corresponding query returns the TU2 concatenation and starting TU in numeric form as listed above.

:SENSe:DATA:TELEcom:SDH:TRIButary:CONCatenate?

Returns : <numeric>,<numeric>

SENSe subsystem - Receiver SDH Test Function Commands**:SENSe:DATA:TELEcom:SDH:OCAPture:CHANnel <discrete>**

```

<discrete> =  A1A2 | C1/J0 | Z0 | E1 | F1 |          RS Overhead
                D1D3

                H1H2 | K1K2 | D4D12 | S1 |          MS Overhead
                Z1_1|Z1_2 | Z1_3 | Z2_4 | Z2_5 |
                M1 | Z2-5 | Z2_6 | E2

                J1 | C2 | G1 | F2 | H4 | Z3/F3 |      Path Overhead
                Z4/K3 | Z5/N1

```

Selects the overhead byte or bytes to be captured. Is only valid when :SENSe:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <OCAP>. Z0 is only valid when a rate higher than STM-1 is selected.

The corresponding query returns the overhead byte or bytes currently selected, in discrete form as listed above.

:SENSe:DATA:TELEcom:SDH:OCAPture:CHANnel?

Returns : <discrete>

:SENSe:DATA:TELEcom:SDH:OCAPture:OHBYte <discrete>

```

<discrete> =  A1A2 | J0 | Z0 | E1 | F1 | D1D3|      Regenerator Overhead
                BNDA1A2|X22|X23|X32|X33

                H1H2 | K1K2 | D4D12 | S1 | Z1      Multiplexer Overhead
                | Z2 | M1 | E2

                J1 | C2 | G1 | F2 | H4 | F3 | K3 |   Path Overhead
                N1

```

Selects the overhead byte or bytes to be captured. Is only valid when :SENSe:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <OCAP>. Z0 is only valid when STM-4 is selected.

BNDA1A2 selects the 6 middle A1A2 boundary bytes

The corresponding query returns the byte(s) to be captured in discrete form as listed above.

:SENSe:DATA:TELEcom:SDH:OCAPture:OHBYte?

SENSe subsystem - Receiver SDH Test Function Commands

Returns: <discrete>

:SENSe:DATA:TELEcom:SDH:OCAPture:COLumn <numeric>

<numeric> = 1 to 9

Selects the Section overhead column from which to capture. This only applies to Z1 and Z2.

The corresponding query returns the column to be captured in numeric form.

:SENSe:DATA:TELEcom:SDH:OCAPture:COLumn?

<numeric>= 1 to 9

:SENSe:DATA:TELEcom:SDH:OCAPture:CHANnel:SElect <numeric>

<numeric> = 1-16

Only valid if a rate higher than STM-1 is selected.

The corresponding query returns the STM-1 number in numeric form.

:SENSe:DATA:TELEcom:SDH:OCAPture:CHANnel:SElect?

Returns: <numeric>

:SENSe:DATA:TELEcom:SDH:OCAPture:TRIGger <discrete>

<discrete> = OFF
ON
ONN On Not

Selects the Overhead Capture Trigger mode. If OFF is selected, capture begins immediately. If ON is selected, capture begins when the received data matches the pattern defined by :SENSe:DATA:TELEcom:SDH:OCAPture:TRIGger:PATtern <string>. If ONN is selected, capture begins when the received data does not match the pattern defined by :SENSe:DATA:TELEcom:SDH:OCAPture:TRIGger:PATtern <string>.

SENSe subsystem - Receiver SDH Test Function Commands

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

:SENSe:DATA:TELEcom:SDH:OCAPture:TRIGger?

Returns : <discrete>

:SENSe:DATA:TELEcom:SDH:OCAPture:TRIGger:PATtern <string>

Sets the Overhead Capture Trigger Pattern to the hexadecimal value contained in the string. The number of hexadecimal characters in the string is dependent on the overhead byte or bytes selected.

Two hexadecimal characters are required per byte, for example:

E1 - 1 Byte - "00" to "FF"

D4D12 - 9 Bytes - "000000000000000000" to "FFFFFFFFFFFFFFFFFFFF"

Is only valid when :SENSe:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <OCAP> and :SENSe:DATA:TELEcom:SDH:OCAPture:TRIGger <discrete> is set to <ON> or <ONN>

The corresponding query returns the Trigger Pattern selected, as a string as described above.

:SENSe:DATA:TELEcom:SDH:OCAPture:TRIGger:PATtern?

Returns : <string>

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

| | | |
|--------------|------|-------------------------|
| <discrete> = | RDCC | Regenerator Section DCC |
| | MDCC | Multiplexer Section DCC |

Selects the DataCommunications channel to be dropped via the rear panel DROP port. Is only valid when :SENSe:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <DDCC>.

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

:SENSe:DATA:TELEcom:SDH:DDCC?

Returns : <discrete>

SENSe subsystem - Receiver SDH Test Function Commands

:SENSe:DATA:TELEcom:SDH:DDCC:POLarity <discrete>

<discrete> = NORMal

Selects the DCC DROP byte polarity. Is only valid when
:SENSe:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <DDCC>.

NOTE

This will also change the TX DCC insert port polarity

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

:SENSe:DATA:TELEcom:SDH:DDCC:POLarity?

Returns <discrete>

:SENSe:DATA:TELEcom:SDH:PGRaph:PTYPE <discrete>

<discrete> = AU4
 AU3
 TU3
 TU2
 TU12
 TU11
 AU4_4C
 AU4_16C

Selects the type of pointer to be captured for pointer graph.

The corresponding query returns the type of pointer, in discrete short form.

:SENSe:DATA:TELEcom:SDH:PGRaph:PTYPE?

Returns: <discrete>

:SENSe:DATA:TELEcom:SDH:PGRaph:CINterval <discrete>

<discrete> = SEC1 1 second interval
 SEC5 5 second interval

SENSe subsystem - Receiver SDH Test Function Commands

| | |
|-------|--------------------|
| SEC20 | 20 second interval |
| MIN1 | 1 minute interval |
| MIN5 | 5 minute interval |
| MIN20 | 20 minute interval |

Selects the pointer graph capture interval.

The corresponding query returns the pointer graph capture interval, in discrete form as listed above.

:SENSe:DATA:TELEcom:SDH:PGRaph:CINTerval?

Returns: <discrete>

:SENSe:DATA:TELEcom:SDH:OBERTest:CHANnel <discrete>

<discrete> = C1/J0 | Z0 | E1 | F1 | D1 | D2 | RS Overhead
D3 |
K1 | K2 | D4 | D5 | D6 | D7 | D8 | MS Overhead
D9 | D10 | D11 | D12 | S1 | M1 |
E2 |
J1 | C2 | G1 | F2 | H4 | Z3/F3 | Path Overhead
Z4/K3 | Z5/N1

Selects the overhead byte used for the overhead BER test. Is only valid when :SENSe:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <OBER>. Z0 is only valid when a rate above STM-1 is selected.

The corresponding query returns the Overhead byte name in discrete form as listed above.

:SENSe:DATA:TELEcom:SDH:OBERTest:CHANnel?

Returns <discrete>

:SENSe:DATA:TELEcom:SDH:OBERTest:COLumn <numeric>

<numeric>= 1 to 3 1,4,7; 2,5,8 or 3,6,9

Sets the column in the Section overhead of the channel for the receiver overhead BER test function. This command is only valid if

SDH Command Reference

SENSe subsystem - Receiver SDH Test Function Commands

:SENSe:DATA:TELEcom:SDH:TFUNction:TYPE <discrete> is set to <OBER>. In SONET mode, the column is the STS-1 number within the currently selected STS-3.

The corresponding query returns the column in numeric form as listed above

SENSe:DATA:TELEcom:SDH:OBERtest:COLumn?

Returns: <numeric>

:SENSe:DATA:TELEcom:SDH:OBERtest:CHANnel:SElect <numeric>

<numeric> = 1-16

Selects STM-1 number for channels that occur in more than one STM-1.

The corresponding query returns the STM-1 number in numeric form.

:SENSe:DATA:TELEcom:SDH:OBERtest:CHANnel:SElect?

Returns: <numeric>

SENSe subsystem - Alarm Scan Control

:SENSe:DATA:TELEcom:SDH:ASCan:MODE <discrete>

| | | |
|--------------|-----------|----------------------------------|
| <discrete> = | AUTomatic | Automatic receiver configuration |
| | RSETtings | Fixed receiver configuration |

Selects the SDH alarm scan mode.

The corresponding query returns the alarm scan mode in discrete short form.

:SENSe:DATA:TELEcom:SDH:ASCan:MODE?

Returns: <discrete>

:SENSe:DATA:TELEcom:SDH:ASCan:BIP <discrete>

| | | |
|--------------|--------|---------------------------------|
| <discrete> = | OFF | Fail if Alarm |
| | GTE0 | Fail if alarm or any BIP error |
| | GTEE_6 | Fail if alarm or BIP ER > 10E-6 |
| | GTEE_3 | Fail if alarm or BIP ER > 10E-3 |

Selects the SDH alarm scan BIP error threshold.

The corresponding query returns the alarm scan BIP error threshold in discrete short form.

:SENSe:DATA:TELEcom:SDH:ASCan:BIP?

Returns: <discrete>

:SENSe:DATA:TELEcom:SDH:ASCan <boolean>

| | | |
|-------------|----------|-----------------------------|
| <boolean> = | 0 or OFF | Stop the current alarm scan |
| | 1 or ON | Start a new alarm scan |

Start/Stop the SDH alarm scan.

The corresponding query returns the alarm scan state as 0 or 1.

SDH Command Reference

SENSe subsystem - Alarm Scan Control

:SENSe:DATA:TELEcom:SDH:ASCan?

Returns: <boolean>

SENSe subsystem - SDH Tributary Scan Control

:SENSe:DATA:TELEcom:SDH:TSCan:PERiod <numeric> <suffix>

| | | |
|-------------|---------|---------|
| <numeric> = | 1 to 99 | |
| <suffix> = | d | Days |
| | h | Hours |
| | m | Minutes |
| | s | Seconds |

Sets the test duration for each tributary.

The corresponding query returns the test duration for each tributary.

:SENSe:DATA:TELEcomSDH:TSCan:PERiod?

Returns: <numeric>,<suffix>

:SENSe:DATA:TELEcom:SDH:TSCan:BIP <discrete>

| | | |
|--------------|--------|------------------------|
| <discrete> = | GT0 | Fail if any BIP error |
| | GTEE_6 | Fail if BIP ER > 10E-6 |
| | GTEE_3 | Fail if BIP ER > 10E-3 |

Selects the SDH tributary scan BIP error threshold.

The corresponding query returns the alarm scan BIP error threshold in discrete short form.

:SENSe:DATA:TELEcom:SDH:TSCan:BIP?

Returns: <discrete>

:SENSe:DATA:TELEcom:SDH:TSCan <boolean>

| | | |
|-------------|----------|---------------------------------|
| <boolean> = | 0 or OFF | Stop the current tributary scan |
| | 1 or ON | Start a new tributary scan |

Start/Stop the SDH tributary scan.

SDH Command Reference

SENSe subsystem - SDH Tributary Scan Control

The corresponding query returns the alarm scan state as 0 or 1.

:SENSe:DATA:TELEcom:SDH:TSCan?

Returns: <boolean>

SENSe subsystem - Optical Power Measurement Settings

:SENse:DATA:TELEcom:SDH:WAVelength <discrete>

| | | |
|--------------|--------|---------|
| <discrete> = | NM1310 | 1310 nm |
| | NM1550 | 1550 nm |

Selects the wavelength of the input optical signal on the Optical module, for use as part of the optical power measurement calculation.

The corresponding query returns the input optical wavelength in discrete form, as listed above.

:SENse:DATA:TELEcom:SDH:WAVelength?

Returns : <discrete>

SENSe subsystem - Result Returning Commands

| SDH |
|------------------|
| RS B1 BIP |
| MS B2 BIP |
| PATH B3 BIP |
| VC3 PATH BIP |
| TU2 BIP |
| TU12 BIP |
| A1A2 FRAME |
| MS FEBE/MS-REI |
| PATH FEBE/HP-REI |
| PATH IEC /HP-IEC |
| VC3 PATH FEBE |
| TU2 FEBE |
| TU12 FEBE |
| BIT |

Frequency Results (PDH, SPDH and SDH)

:SENSe:DATA? <"result">

| | |
|--------------------------|----------------------------|
| Result = "FREQuency:SDH" | RX SDH clock frequency |
| "FOFPpm:SDH" | RX SDH clock offset in ppm |
| "FOFHZ:SDH" | RX SDH clock offset in Hz |

SDH Short Term Results

:SENSe:DATA? <"result">

| | |
|-----------------------------------|-----------------------|
| Result = "ECOunt:SDH:STERm:FRAMe" | Frame error count |
| "ERATio:SDH:STERm:FRAMe" | Frame error ratio |
| "ECOunt:SDH:STERm:RSBip" | RS B1 BIP error count |
| "ERATio:SDH:STERm:RSBip" | RS B1 BIP error ratio |
| "ECOunt:SDH:STERm:MSBip" | MS B2 BIP error count |

SDH Command Reference

SENSe subsystem - Result Returning Commands

| | |
|--|----------------------------|
| "ERATio:SDH:STERm:MSBip" | MS B2 BIP error ratio |
| "ECOut:SDH:STERm:MFEBE" or "ECOut:SDH:STERm:MSRei" | MS FEBE/MS REI error count |
| "ERATio:SDH:STERm:MFEBE" or "ERATio:SDH:STERm:MSRei" | MS FEBE/MS REI error ratio |
| "ECOut:SDH:STERm:PBIP" | Path B3 BIP error count |
| "ERATio:SDH:STERm:PBIP" | Path B3 BIP error ratio |
| "ECOut:SDH:STERm:FEBE" or "ECOut:SDH:STERm:REI" | FEBE/REI error count |
| "ERATio:SDH:STERm:FEBE" or "ERATio:SDH:STERmREI" | FEBE/REI error ratio |
| "ECOut:SDH:STERm:PIEC" | PIEC error count |
| "ERATio:SDH:STERm:PIEC" | PIEC error ratio |
| "ECOut:SDH:STERm:TRIB:PBIP" | TU path BIP error count |
| "ERATio:SDH:STERm:TRIB:PBIP" | TU path BIP error ratio |
| "ECOut:SDH:STERm:TRIB:FEBE" or "ECOut:SDH:STERm:TRIB:REI" | TU FEBE/LP REI error count |
| "ERATio:SDH:STERm:TRIB:FEBE" or "ERATio:SDH:STERm:TRIB:REI" | TU FEBE/LP REI error ratio |

SDH Cumulative Results

:SENSe:DATA? <"result">

| | | |
|----------|--------------------|-----------------------|
| Result = | "ECOut:SDH:FRAMe" | Frame error count |
| | "ERATio:SDH:FRAMe" | Frame error ratio |
| | "ECOut:SDH:RSBip" | RS B1 BIP error count |
| | "ERATio:SDH:RSBip" | RS B1 BIP error ratio |
| | "ECOut:SDH:MSBip" | MS B2 BIP error count |
| | "ERATio:SDH:MSBip" | MS B2 BIP error ratio |

SDH Command Reference

SENSe subsystem - Result Returning Commands

| | |
|--|----------------------------|
| "ECOUNT:SDH:MFEBe" or "ECOUNT:SDH:MSRei" | MS FEBE/MS REI error count |
| "ERATIO:SDH:MFEBe" or "ERATIO:SDH:MSRei" | MS FEBE/MS REI error ratio |
| "ECOUNT:SDH:PBIP" | Path B3 BIP error count |
| "ERATIO:SDH:PBIP" | Path B3 BIP error ratio |
| "ECOUNT:SDH:FEBE" or "ECOUNT:SDH:REI" | FEBE/REI error count |
| "ERATIO:SDH:FEBE" or "ERATIO:SDH:REI" | FEBE/REI error ratio |
| "ECOUNT:SDH:PIEC" | PIEC error count |
| "ERATIO:SDH:PIEC" | PIEC error ratio |
| "ECOUNT:SDH:TRIB:PBIP" | TU path BIP error count |
| "ERATIO:SDH:TRIB:PBIP" | TU path BIP error ratio |
| "ECOUNT:SDH:TRIB:FEBE" or "ECOUNT:SDH:TRIB:REI" | TU FEBE/LP REI error count |
| "ERATIO:SDH:TRIB:FEBE" or "ERATIO:SDH:TRIB:REI" | TU FEBE/LP REI error ratio |
| "ECOUNT:SDH:OVERhead" | Overhead error count |

SDH RS B1 BIP Analysis Results

:SENSe:DATA? <"result">

| | | |
|---------|--------------------------------|-------------------------------|
| Result= | "ESECONDS:SDH:RSBip:ANALYSIS" | Error Seconds |
| | "SESECONDS:SDH:RSBip:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SDH:RSBip:ANALYSIS" | Errored block count |
| | "BBECOUNT:SDH:RSBip:ANALYSIS" | Background block error count |
| | "ESRATIO:SDH:RSBip:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SDH:RSBip:ANALYSIS" | Severely Errored Second Ratio |

SENSe subsystem - Result Returning Commands

| | |
|--------------------------------|------------------------------|
| "BBERatio:SDH:RSBip:ANALysis" | Background Block Error ratio |
| "UASeconds:SDH:RSBip:ANALysis" | Unavailable seconds |

SDH MS B2 BIP Analysis Results

:SENSe:DATA? <"result">

| | | |
|---------|---------------------------------|-------------------------------|
| Result= | "ESECONDS:SDH:MSBip:ANALysis" | Error Seconds |
| | "SESeconds:SDH:MSBip:ANALysis" | Severely Errored Seconds |
| | "EBCount:SDH:MSBip:ANALysis" | Errored block count |
| | "BBECount:SDH:MSBip:ANALysis" | Background block error count |
| | "ESRatio:SDH:MSBip:ANALysis" | Error Second Ratio |
| | "SESRatio:SDH:MSBip:ANALysis" | Severely Errored Second Ratio |
| | "BBERatio:SDH:MSBip:ANALysis" | Background Block Error ratio |
| | "UASeconds:SDH:MSBip:ANALysis" | Unavailable seconds |
| | "PUASeconds:SDH:MSBip:ANALysis" | Path Unavailable seconds |

SDH Path MS FEBE Analysis Results

:SENSe:DATA? <"result">

| | | |
|---------|---|------------------------------|
| Result= | "ESECONDS:SDH:MFEBE:ANALysis" or "ESECONDS:SDH:MSREI:ANALysis" | Error Seconds |
| | "SESeconds:SDH:MFEBE:ANALysis" or "SESeconds:SDH:MSREI:ANALysis" | Severely Errored Seconds |
| | "EBCount:SDH:MFEBE:ANALysis" or "EBCount:SDH:MSREI:ANALysis" | Errored block count |
| | "BBECount:SDH:MFEBE:ANALysis" or "BBECount:SDH:MSREI:ANALysis" | Background block error count |
| | "ESRatio:SDH:MFEBE:ANALysis" or "ESRatio:SDH:MSREI:ANALysis" | Error Second Ratio |

SENSe subsystem - Result Returning Commands

| | |
|--|-------------------------------|
| "SESRatio:SDH:MFEBe:ANALysis" or "SESRatio:SDH:MSRei:ANALysis" | Severely Errored Second Ratio |
| "BBERatio:SDH:MFEBe:ANALysis" or "BBERatio:SDH:MSREI:ANALysis" | Background Block Error ratio |
| "UASeconds:SDH:MFEBe:ANALysis" or "UASeconds:SDH:MSRei:ANALysis" | Unavailable seconds |
| "PUASeconds:SDH:MFEBe:ANALysis" or "PUASeconds:SDH:MSRei:ANALysis" | Path Unavailable seconds |

SDH Path B3 BIP Analysis Results

:SENSe:DATA? <"result">

| | |
|--------------------------------------|-------------------------------|
| Result= "ESECONDS:SDH:PBIP:ANALysis" | Error Seconds |
| "SESeconds:SDH:PBIP:ANALysis" | Severely Errored Seconds |
| "EBCount:SDH:PBIP:ANALysis" | Errored block count |
| "BBECount:SDH:PBIP:ANALysis" | Background block error count |
| "ESRatio:SDH:PBIP:ANALysis" | Error Second Ratio |
| "SESRatio:SDH:PBIP:ANALysis" | Severely Errored Second Ratio |
| "BBERatio:SDH:PBIP:ANALysis" | Background Block Error ratio |
| "UASeconds:SDH:PBIP:ANALysis" | Unavailable seconds |
| "PUASeconds:SDH:PBIP:ANALysis" | Path Unavailable seconds |

SDH Path FEBE Analysis Results

:SENSe:DATA? <"result">

| | |
|--|--------------------------|
| Result= "ESECONDS:SDH:FEBe:ANALysis" or "ESECONDS:SDH:REI:ANALysis" | Error Seconds |
| "SESeconds:SDH:FEBe:ANALysis" or "SESeconds:SDH:REI:ANALysis" | Severely Errored Seconds |

SDH Command Reference

SENSe subsystem - Result Returning Commands

| | |
|--|-------------------------------|
| "EBCount:SDH:FEBe:ANALysis" or "EBCount:SDH:REI:ANALysis" | Errored block count |
| "BBECount:SDH:FEBe:ANALysis" or "BBECount:SDH:REI:ANALysis" | Background block error count |
| "ESRatio:SDH:FEBe:ANALysis" or "ESRatio:SDH:REI:ANALysis" | Error Second Ratio |
| "SESRatio:SDH:FEBe:ANALysis" or "SESRatio:SDH:REI:ANALysis" | Severely Errored Second Ratio |
| "BBERatio:SDH:FEBe:ANALysis" or "BBERatio:SDH:REI:ANALysis" | Background Block Error ratio |
| "UASeconds:SDH:FEBe:ANALysis" or "UASeconds:SDH:REI:ANALysis" | Unavailable seconds |
| "PUASeconds:SDH:FEBe:ANALysis" or "PUASeconds:SDH:REI:ANALysis" | Path Unavailable seconds |

SDH Path IEC Analysis Results

:SENSe:DATA? <"result">

| | | |
|---------|-------------------------------|-------------------------------|
| Result= | "ESECONDS:SDH:PIEC:ANALysis" | Error Seconds |
| | "SESeconds:SDH:PIEC:ANALysis" | Severely Errored Seconds |
| | "EBCount:SDH:PIEC:ANALysis" | Errored block count |
| | "BBECount:SDH:PIEC:ANALysis" | Background block error count |
| | "ESRatio:SDH:PIEC:ANALysis" | Error Second Ratio |
| | "SESRatio:SDH:PIEC:ANALysis" | Severely Errored Second Ratio |
| | "BBERatio:SDH:PIEC:ANALysis" | Background Block Error ratio |
| | "UASeconds:SDH:PIEC:ANALysis" | Unavailable seconds |

SDH Tributary Path BIP Analysis Results

:SENSe:DATA? <"result">

SDH Command Reference

SENSe subsystem - Result Returning Commands

| | | |
|---------|-------------------------------------|-------------------------------|
| Result= | "ESECONDS:SDH:TRIB:PBIP:ANALYSIS" | Error Seconds |
| | "SECONDS:SDH:TRIB:PBIP:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SDH:TRIB:PBIP:ANALYSIS" | Errored block count |
| | "BBECOUNT:SDH:TRIB:PBIP:ANALYSIS" | Background block error count |
| | "ESRATIO:SDH:TRIB:PBIP:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SDH:TRIB:PBIP:ANALYSIS" | Severely Errored Second Ratio |
| | "BBERATIO:SDH:TRIB:PBIP:ANALYSIS" | Background Block Error ratio |
| | "UASECONDS:SDH:TRIB:PBIP:ANALYSIS" | Unavailable seconds |
| | "PUASECONDS:SDH:TRIB:PBIP:ANALYSIS" | Path Unavailable seconds |

SDH Tributary Path FEBE Analysis Results

:SENSe:DATA? <"result">

| | | |
|----------|--|-------------------------------|
| Result = | "ESECONDS:SDH:TRIB:FEBE:ANALYSIS" or "ESECONDS:SDH:TRIB:REI:ANALYSIS" | Error Seconds |
| | "SECONDS:SDH:TRIB:FEBE:ANALYSIS" or "SECONDS:SDH:TRIB:REI:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SDH:TRIB:FEBE:ANALYSIS" or "EBCOUNT:SDH:TRIB:REI:ANALYSIS" | Errored block count |
| | "BBECOUNT:SDH:TRIB:FEBE:ANALYSIS" or "BBECOUNT:SDH:TRIB:REI:ANALYSIS" | Background block error count |
| | "ESRATIO:SDH:TRIB:FEBE:ANALYSIS" or "ESRATIO:SDH:TRIB:REI:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SDH:TRIB:FEBE:ANALYSIS" or "SESRATIO:SDH:TRIB:REI:ANALYSIS" | Severely Errored Second Ratio |
| | "BBERATIO:SDH:TRIB:FEBE:ANALYSIS" or "SESRATIO:SDH:TRIB:REI:ANALYSIS" | Background Block Error ratio |

SDH Command Reference

SENSe subsystem - Result Returning Commands

| | |
|---|--------------------------|
| "UASeconds:SDH:TRIB:FEBe:ANALysis" or "UASeconds:SDH:TRIB:REI:ANALysis" | Unavailable seconds |
| "PUASeconds:SDH:TRIB:FEBe:ANALysis" or "PUASeconds:SDH:TRIB:REI:ANALysis" | Path Unavailable seconds |

SDH Block Based Bit Analysis Results

:SENSe:DATA? <"result">

| | |
|---|-------------------------------|
| Result = "ESEconds:SDH:BLKBit:ANALysis" | Error Seconds |
| "SESeconds:SDH:BLKBit:ANALysis" | Severely Errored Seconds |
| "EBCount:SDH:BLKBit:ANALysis" | Errored block count |
| "BBECount:SDH:BLKBit:ANALysis" | Background block error count |
| "ESRatio:SDH:BLKBit:ANALysis" | Error Second Ratio |
| "SESRatio:SDH:BLKBit:ANALysis" | Severely Errored Second Ratio |
| "BBERatio:SDH:BLKBit:ANALysis" | Background Block Error ratio |
| "UASeconds:SDH:BLKBit:ANALysis" | Unavailable seconds |

SDH M.2101 Analysis Results

:SENSe:DATA? <"result">

| | |
|--|--|
| Result = "ESEconds:SDH:LOW:RECeive:ANALysis: M2101" | Low Order Path Receive Direction Errored Seconds |
| "SESeconds:SDH:LOW:RECeive:ANALysis: M2101" | Low Order Path Receive Direction Severely Errored Seconds |
| "UASeconds:SDH:LOW:RECeive:ANALysis: M2101" | Low Order Path Receive Direction Unavailable Seconds |
| "ESEconds:SDH:LOW:TRANsmit:ANALysis: M2101" | Low Order Path Transmit Direction Errored Seconds |

SENSe subsystem - Result Returning Commands

| | |
|---|---|
| "SESeconds:SDH:LOW:TRANsmit:ANALysi s:M2101" | Low Order Path Transmit Direction Severely Errored Seconds |
| "UASeconds:SDH:LOW:TRANsmit:ANALysi s:M2101" | Low Order Path Transmit Direction Unavailable Seconds |
| "ESECONDS:SDH:HIGH:RECeive:ANALYSIS: M2101" | High Order Path Receive Direction Errored Seconds |
| "SESeconds:SDH:HIGH:RECeive:ANALYSIS :M2101" | High Order Path Receive Direction Severely Errored Seconds |
| "UASeconds:SDH:HIGH:RECeive:ANALYSIS :M2101" | High Order Path Receive Direction Unavailable Seconds |
| "ESECONDS:SDH:HIGH:TRANsmit:ANALysi s:M2101" | High Order Path Transmit Direction Errored Seconds |
| "SESeconds:SDH:HIGH:TRANsmit:ANALysi s:M2101" | High Order Path Transmit Direction Severely Errored Seconds |
| "UASeconds:SDH:HIGH:TRANsmit:ANALysi s:M2101" | High Order Path Transmit Direction Unavailable Seconds |
| "ESECONDS:SDH:SECTion:RECeive:ANALy sis:M2101" | Section Layer Path Receive Direction Errored Seconds |
| "SESeconds:SDH:SECTion:RECeive:ANAL ysis:M2101" | Section Layer Path Receive Direction Severely Errored Seconds |
| "UASeconds:SDH:SECTion:RECeive:ANAL ysis:M2101" | Section Layer Path Receive Direction Unavailable Seconds |
| "ESECONDS:SDH:SECTion:TRANsmit:ANAL ysis:M2101" | Section Layer Path Transmit Direction Errored Seconds |
| "SESeconds:SDH:SECTion:TRANsmit:ANA Lysis:M2101" | Section Layer Path Transmit Direction Severely Errored Seconds |
| "UASeconds:SDH:SECTion:TRANsmit:ANA Lysis:M2101" | Section Layer Path Transmit Direction Unavailable Seconds |

SENSe subsystem - Result Returning Commands**SDH Service Disruption Results****:SENSe:DATA? <"result">**

| | | |
|----------|---------------------|----------------------|
| Result = | "SDTest:COUNt:LONG" | Longest error burst |
| | SDTest:COUNt:SHORt" | Shortest error burst |
| | "SDTest:COUNt:LAST" | Last error burst |

Returns: <range>,<value>

| | | |
|-----------|---|--|
| <range> = | 0 | Result invalid due to receiver configuration |
| | 1 | Result valid |
| | 2 | Result out of range |

Value is returned in milliseconds. If the value is > 2000 or no result is available or the result is not applicable then 9.91E+37 is returned.

SDH Optical Power Result**:SENSe:DATA? <"result">**

| | | |
|----------|--------------|---------------------|
| Result = | "OPOWer:SDH" | Optical power (dBm) |
|----------|--------------|---------------------|

SDH Pointer Activity Results**:SENSe:DATA? <"result">**

| | | |
|--------|-----------------------------|----------------------------|
| Result | "PACTivity:SDH:PVALue" | AU Pointer value |
| | "PACTivity:SDH:NDFSeconds" | AU Pointer NDF seconds |
| | "PACTivity:SDH:MNDFseconds" | AU Pointer MNDF seconds |
| | "PACTivity:SDH:PCOunt" | AU Pointer +ve Adj Count |
| | "PACTivity:SDH:PSEConds" | AU Pointer +ve Adj Seconds |
| | "PACTivity:SDH:NCOunt" | AU Pointer -ve Adj Count |

SENSe subsystem - Result Returning Commands

| | |
|---------------------------------------|----------------------------|
| "PACTivity:SDH:NSEConds" | AU Pointer -ve Adj Seconds |
| "PACTivity:SDH:IOFFset" | Implied VC4 Offset |
| "PACTivity:SDH:TRIButary:PVALue" | TU Pointer Value |
| "PACTivity:SDH:TRIButary:NDFSeconds" | TU Pointer NDF seconds |
| "PACTivity:SDH:TRIButary:MNDFseconds" | TU Pointer MNDF seconds |
| "PACTivity:SDH:TRIButary:PCOunt" | TU Pointer +ve Adj Count |
| "PACTivity:SDH:TRIButary:PSEConds" | TU Pointer +ve Adj Seconds |
| "PACTivity:SDH:TRIButary:NCOunt" | TU Pointer -ve Adj Count |
| "PACTivity:SDH:TRIButary:NSEConds" | TU Pointer -ve Adj Seconds |
| "PACTivity:SDH:TRIButary:IOFFset" | Implied TU VC Offset |

SDH Alarm Seconds Results

:SENSe:DATA? <"result">

| | | |
|----------|---|------------------------------|
| Result = | "ASEConds:PLOSSs" | Power loss |
| | "ASEConds:SDH:LOS" | Loss Of Signal |
| | "ASEConds:SDH:LOF" | Loss Of Frame |
| | "ASEConds:SDH:OOF" | Out Of Frame |
| | "ASEConds:SDH:H4MF" | H4 Multiframe Loss |
| | "ASEConds:SDH:LOP" | Loss Of Pointer |
| | "ASEConds:SDH:MSAis" | Multiplexer Section AIS |
| | "ASEConds:SDH:PAIS" | Path AIS |
| | "ASEConds:SDH:PSLoss" | Pattern Synchronization Loss |
| | "ASEConds:SDH:MSFerf" | Multiplexer Section FERF |
| | "ASEConds:SDH:PFERf" or "ASEConds:SDH:RDI" | STM Path FERF/HP-RDI |
| | "ASEConds:SDH:K1K2" | K1K2 byte change |
| | "ASEConds:SDH:TRIB:LOP" | TU Loss Of Pointer |

SDH Command Reference

SENSe subsystem - Result Returning Commands

| | |
|---------------------------|----------------------------|
| "ASEConds:SDH:TRIB:PAIS" | TU Path AIS |
| "ASEConds:SDH:TRIB:PFERf" | TU Path FERF/LP-RDI |
| or | |
| "ASEConds:SDH:TRIB:RDI" | |
| "ASEConds:SDH:OPSL" | Overhead Pattern Sync Loss |

SENSe subsystem - Result Returning Commands

FETCh subsystem

FETCh subsystem

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

:FETCh:STRing:DATA:TELEcom:SDH:J0?

Returns: <string>

The value of the STM-N regenerator overhead J0 byte is returned as a 16 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. This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SDH:J0:HEXadecimal?

Returns: <block>

Returns the value of the STM-N regenerator overhead J0 byte as 16 hexadecimal numbers if CRC7 is not detected, 15 hexadecimal numbers if CRC7 is detected. Each number is in the range "00" to "FF". The block header is " #216" if CRC7 not detected, " #215" if CRC7 is detected. This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SDH:J1?

Returns : <string>

If interfacing at STM-1/4, the value of the VC-4, VC-4-NC J1 path trace byte is returned as a, 64 ASCII character, string (15 ASCII characters if CRC7 is detected). If interfacing at STM-0, the value of the VC-3 J1 path trace byte is returned as a string. If the string contains any non printing characters then ~ is substituted. This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SDH:J1:HEXadecimal?

Returns : <block>

If interfacing at STM-1/4, returns the value of the VC-4, VC-4-NC J1 path trace byte as 64 hexadecimal numbers (15 if CRC7 is detected). If interfacing at STM-0,

SDH Command Reference

FETCh subsystem

the value of the VC-3 J1 path trace byte is returned as 64 hexadecimal numbers (15 if CRC7 is detected).

Each number is in the range "00" to "FF". The block header is "#264" (" #215" if CRC7 is detected). This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SDH:TRIButary:J1?

Returns : <string>

When the VC-3 is mapped into a higher level container such as VC-4 the value of the VC-3 J1 path trace byte is returned as a, 64 ASCII character, string (15 ASCII characters if CRC7 is detected). If the string contains any non printing characters then ~ is substituted. This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SDH:TRIButary:J1:HEXadecimal?

Returns : <block>

When the VC-3 is mapped into a higher level container such as VC-4 returns the value of the VC-3 J1 path trace byte as 64 hexadecimal numbers (15 if CRC7 is detected). Each number is in the range "00" to "FF". The block header is "#264" (" #215" if CRC7 is detected). This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SDH:TRIButary:J2?

Returns: <string>

Returns the 15 or 16 byte J2 path trace as a string. The HP 37718A attempts to align the received pattern by detecting the CRC7 byte. If the CRC7 byte is detected, a 15 byte pattern is returned. If the CRC7 byte is not detected, a 16 byte pattern is returned. If the string contains any non-printing characters then ~ is substituted. This is a snapshot of the received path trace and is only updated once per second.

:FETCh:STRing:DATA:TELEcom:SDH:TRIButary:J2:HEXadecimal?

Returns: <block>

Returns the value of the J2 path trace byte as 15 or 16 hexadecimal numbers. The HP 37718A attempts to align the received pattern by detecting the CRC7 byte. If the CRC7 byte is detected, 15 hexadecimal numbers are returned. If the CRC7 byte is

SDH Command Reference

FETCh subsystem

not detected, 16 hexadecimal numbers are returned. Each number is in the range "00" to "FF". The block header is "#215" if 15 Hex numbers and "#216" if 16 Hex numbers. This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SDH:K1?

Returns : <string>

The value of the MPS K1 byte is returned as an 8 bit string in the range "00000000" to "11111111".

:FETCh:STRing:DATA:TELEcom:SDH:K2?

Returns : <string>

The value of the MPS K2 byte is returned as an 8 bit string in the range "00000000" to "11111111".

:FETCh:STRing:DATA:TELEcom:SDH:S1?

Returns : <string>

The value of the SYNC S1 byte (bits 5-8) is returned as a 4 bit string in the range "0000" to "1111".

:FETCh:SCALar:DATA:TELEcom:SDH:OVERhead? <numeric>,<numeric>,<discrete>

<numeric> = <numeric> range 1 to 16
(first parameter - VC4 number)

<numeric> = <numeric> range 1 to 3
(second parameter - Column number)

<discrete> = A1|A2|J0/Z0|B1|E1|F1|D1|D2|D3|H1|H2
(third parameter - H3|B2|K1|K2|D4|D5|D6|D7|D8|D9|D10|D11
Byte name) D12|Z1/S1|Z2/M1|E2|X13|X21|X22|X23|X31
X32|X33|X52|X53|X61|X62|X63
X71|X72|X73|X81|X82|X83|X93

SDH Command Reference

FETCh subsystem

Returns the selected overhead byte as an 8 bit binary string in the range "00000000" to "11111111". The byte number is given by its defined name if it has one.

Undefined bytes are represented by <Xrc>, 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.

If an STM-1 signal is being transmitted, the only applicable value of VC4 is 1.

Notice that column number 1 is actually columns 1,4 & 7, 2 is columns 2,5 & 8 and 3 is columns 3,6 & 9.

C1/J0 byte: The J0 capability is available at STM-0 and STM-1 only.

Z2/M1 byte: If any other SDH option is fitted, the Z2 capability is available and M1 is not available.

ZO byte is available when STM-4 is selected.

Returns: <string>

:FETCh:SCALAr:DATA:TELEcom:SDH:POVerhead:H4Sequence?

Obtains the length of the H4 byte sequence.

| | | | |
|-----------|------------|------|------------------|
| Returns : | <discrete> | LONG | Long sequence |
| | <discrete> | SHOR | Short sequence |
| | <discrete> | UNKN | Unknown sequence |

:FETCh:SCALAr:DATA:TELEcom:SDH:POVerhead? <discrete>

<discrete> = J|B3|C2|G1|F2|H4|Z3|F3|Z4/
byte name K3|Z5/N1

Obtains the value of the named path overhead byte. The value of the named byte is returned as a string in the range "00000000" to "11111111". This is a snapshot of the overhead byte and is captured once per second.

:FETCh:SCALAr:DATA:TELEcom:SDH:TRIButaryPOVerhead? <discrete>

<discrete> = C2|G1|F2|H4|Z3|F3|Z4/K3|Z5/N1| TU-3
V5|N2|K4 TU-2/TU-12/TU11

Obtains the value of the specified path overhead byte. The value of the named byte is returned as a string in the range "00000000" to "11111111". This is a snapshot of the overhead byte and is captured once per second.

SDH Command Reference

FETCh subsystem

:FETCh:SCALar:DATA:TELEcom:SDH:TRIButary:POVerhead:SLABel?

Returns the signalling label of the selected tributary in numeric form.

:FETCh:ARRAy:DATA:TELEcom:SDH:ASCan?

Returns (each of one or more rows): `<numeric>{,<numeric>}`

The results returned are those for the last FULL scan. Results from partial scans are not available. If no full scan has been completed since the instrument was powered up, this command will return -1.

If data is available it is returned as a set of string arrays one for each scanned group. The arrays are separated by a CR/LF pair. A group is defined as a set of scanned paths at either the AU or TU level. The arrays consist of comma separated numerics, one for each path scanned. The value of the numeric indicates the status of the scanned path. The following values are valid.

| Value | State |
|-------|---------------------------|
| 0 | No Problems Detected |
| 1 | Alarms or Errors Detected |
| 2 | Path Unequipped |
| 3 | Loss of Pointer |
| 4 | AIS |
| 5 | RDI |
| 6 | H4 Multiframe Loss |
| ? | Invalid |

For a specific signal structure, the format of the returned strings are shown below:

a) STM-1 AU-4 TU-2

This signal consists of 1 AU-4 containing 3 TUG-3's each of which contains 7 TUG-2s. The TUG-2's in turn each contain a TU-2. From the perspective of the Alarm Scan function the paths are 1 at the AU-4 level and 21 at the TU level. The single AU path is defined as a group on its own while the 21 TU's are arranged as 3

SDH Command Reference

FETCh subsystem

groups of 7 paths with the groups corresponding to the TUG-2 allocation. For this configuration, four arrays are returned with formats shown below:

```
AU-4 GROUP -> AU4
TUG-3 #1   -> TU#1 , TU#2 , TU#3 , TU#4 , TU#5 , TU#6 , TU#7
TUG-3 #2   -> TU#1 , TU#2 , TU#3 , TU#4 , TU#5 , TU#6 , TU#7
TUG-3 #3   -> TU#1 , TU#2 , TU#3 , TU#4 , TU#5 , TU#6 , TU#7
```

For Example, the output could look like:

```
0
1,1,1,0,0,1,0
2,2,2,2,2,2,2
0,0,0,0,1,0,0
```

b) STM-1 AU-4 TU-3

This signal consists of 1 AU-4 containing 3 TUG-3's each of which contains 1 TU-3. In this configuration there are 4 paths, 1 at the AU-4 level and 3 at the TU-3 level. Again, the single AU path is defined as a group on its own. The TU paths in this instance are also defined as groups corresponding to their allocation within the TUG-3's. For this configuration, four arrays are returned with the following format:

```
AU-4 Group -> AU-4
TUG-3 #1   -> TU-3 #1
TUG-3 #2   -> TU-3 #2
TUG-3 #3   -> TU-3 #3
```

The output will look something like:

```
0
1
2
2
```

c) STM-1 AU-4 TU-12

This signal again consists of 1 AU-4 containing 3 TUG-3's. In this case however, the TUG-3's each contain 7 TUG-2's. These TUG-2's each contain 3 TU-12's. In terms of paths the signal comprises 1 path at the AU-4 level and 63 paths at the TU-12 level. Again the single AU-4 is defined as a group on its own. The 63 TU-12 paths are split into 3 groups corresponding to their allocation with the 3 TUG-3's. For this configuration, four arrays are returned with the following format:

NOTE: TU-12's designated thus [TUG-3# - TUG-2# - TU#]

SDH Command Reference

FETCh subsystem

k) STM-0 AU-3 TU-11

This signal again comprises 1 AU-3 containing 7 TUG-2's. However, this time the TUG-2's each contain 4 TU-11's. As before, the AU-3 path is defined as a group on its own, while the 7 TU-2 paths are also defined as one group. For this configuration, 2 groups are returned with the following format:

NOTE: TU-11's designated thus [TUG-2# - TU-11#]

AU-3 Group -> AU-3

TUG-2 -> [1-1],[1-2],[1-3],[1-4],[2-1],[2-2],[2-3],[2-4],[3-1],[3-2],[3-3],[3-4],[4-1],[4-2],[4-3],[4-4],[5-1],[5-2],[5-3],[5-4],[6-1],[6-2],[6-3],[6-4],[7-1],[7-2],[7-3],[7-4]

The output will look like:

0

1,1,1,1,0,0,0,0,0,0,1,1,1,1,1,1,1,1,1,0,0,0,2,0,0,0,0,0,1

l) Unrecognized Structure

When Alarm Scan is operating in AUTO mode, it is possible that due to various signal alarm conditions, it may not be able to determine the structure for a particular group of paths. When this occurs that group is marked as an "Unrecognized Structure". The string returned for such a group is the SCPI NAN - "9.91E+37"

:FETCh:ARRAy:DATA:TELEcom:SDH:TSCan?

Returns (each of one or more rows): <numeric>{,<numeric>}

The results returned are those for the last FULL scan. Results from partial scans are not available. If no full scan has been completed since the instrument was powered up, this command will return -1.

If data is available it is returned as a set of string arrays one for each scanned group. The arrays are separated by a CR/LF pair. A group is defined as a set of scanned paths at either the AU or TU level. The arrays consist of comma separated numerics, one for each tributary scanned. The value of the numeric indicates the status of the scanned tributary. The following values are valid.

FETCh subsystem

| Value | State |
|-------|---------------------------|
| 0 | No Problems Detected |
| 1 | Alarms or Errors Detected |

For a specific signal structure, the format of the returned strings are shown below:

a) STM-1 AU-4 TU-2

This signal consists of 1 AU-4 containing 3 TUG-3's each of which contains 7 TUG-2s. The TUG-2's in turn each contain a TU-2. There are therefore 21 (7*3) tributaries in this signal which must be scanned. The 21 tributaries are arranged as 3 groups of 7 paths with the groups corresponding to the TUG-2 allocation. For this configuration, three arrays are returned with formats shown below:

```
TUG-3 #1    -> TU#1 , TU#2 , TU#3 , TU#4 , TU#5 , TU#6 , TU#7
TUG-3 #2    -> TU#1 , TU#2 , TU#3 , TU#4 , TU#5 , TU#6 , TU#7
TUG-3 #3    -> TU#1 , TU#2 , TU#3 , TU#4 , TU#5 , TU#6 , TU#7
```

For Example, the output could look like:

```
1 , 1 , 1 , 0 , 0 , 1 , 0
1 , 1 , 1 , 0 , 0 , 1 , 1
0 , 0 , 0 , 0 , 1 , 0 , 0
```

b) STM-1 AU-4 TU-3

This signal consists of 1 AU-4 containing 3 TUG-3's each of which contains 1 TU-3. There are therefore 3 tributaries which must be scanned. The three tributaries are defined as groups corresponding to their allocation within the TUG-3's. For this configuration, three arrays are returned with the following format:

```
TUG-3 #1    -> TU-3 #1
TUG-3 #2    -> TU-3 #2
TUG-3 #3    -> TU-3 #3
```

The output will look something like:

```
0
1
1
```


SDH Command Reference

FETCh subsystem

1,1,1,0,0,0,0,1,1,1,1,1,1,1,0,0,1,0,0,0,0

2) STM-4

For the STM-4 situation, the formats are similar to those defined above for STM-1 except that there will be data returned for all four STM-1's in the signal.

A case which is not described in the formats for STM-1 signals is that of an STM-4 signal with a VC-4 structure. In the STM-1 case this structure is not considered since there is only one tributary in the signal. However in the STM-4 case there are 4 tributaries and the scan is carried out.

In this case each VC-4 is treated as a separate group, hence 4 arrays are returned from the SCPI command:

```
STM-1 #1 VC-4
STM-1 #2 VC-4
STM-1 #3 VC-4
STM-1 #4 VC-4
```

The output will look like:

```
0
0
1
1
```

:FETCh:ARRay:DATA:TELEcom:SDH:PGRaph?

Returns: <array>

Returns an array of 576 bytes, 2 bytes for each of the possible 288 points on the displayed pointer graph. The 2 bytes at each point indicate the maximum and minimum offset at that point. Each byte has 3 numeric entries separated by commas.

The value of the 3 numeric entries, <range bit>,<validity bit>,<offset value>, provide the following information:

| Range bit | Validity Bit | Offset Value | Description |
|-----------|--------------|--------------|---------------------------|
| 1 | 1 | -18 to +18 | Valid in range result |
| 1 | 0 | 0 | No measurement |
| 1 | 1 | 9.91E+37 | Alarms during measurement |
| 2 | 1 | 0 | Offset out of range > +18 |

SDH Command Reference

FETCh subsystem

F2

H4

F3

K3

N1

Returns: <string>

Returns the value of the selected path overhead byte as an 8 bit string in the range "00000000" to "11111111".

:FETCh:ARRAy:DATA:TELEcom:SDH:POVerhead? <numeric>

<numeric> = 1 to 9

Returns the value of the selected path overhead bytes as an array of strings. Each string is in the range "00000000" to "11111111". This is a snapshot of the overhead byte and is captured once per second.

The array always begins with byte 1 of the path overhead and ends with the byte number specified by <bytes>.

Byte Order: (1) J1 (2) B3 (3) C2 (4) G1 (5) F2 (6) H4 (7) F3 (8) K3 (9) N1.

:FETCh:SCALAr:DATA:TELEcom:SDH:TRIButaryPOVerhead? <name>

<name> = C2|G1|F2|H4|Z3|Z4|Z5 TU-3
V5|N2|K4 TU-2/TU-12

Obtains the value of the named TU-2/3/12/11 path overhead byte. The value of the named byte is returned as a string in the range "00000000" to "11111111". This is a snapshot of the overhead byte and is captured once per second.

:FETCh:SCALAr:DATA:TELEcom:SDH:TRIButary:POVerhead:SLABel?

Returns the signalling label of the selected tributary in numeric form.

:FETCh:ARRAy:DATA:TELEcom:SDH:OVERhead?

<numeric>,<numeric>,<numeric>

<numeric> = 1 to 27 (Byte)
(first parameter)

SDH Command Reference

FETCh subsystem

| | | |
|-----------------------------------|---------|-----------------|
| <numeric> = (second parameter) | 1 to 16 | (STM-1 Number) |
| <numeric> = (third parameter) | 1 | (Columns 1,4,7) |
| | 2 | (Columns 2,5,8) |
| | 3 | (Columns 3,6,9) |

Returns the value of the selected transport overhead bytes as an array of strings. Each string is in the range "00000000" to "11111111". This is a snapshot of the overhead byte and is captured once per second.

The array always begins with byte 1 of the transport overhead and ends with the byte number specified by the first parameter.

| Number | Name | Number | Name | Number | Name |
|--------|------|--------|------|--------|------|
| 1 | A1 | 10 | H1 | 19 | D7 |
| 2 | A2 | 11 | H2 | 20 | D8 |
| 3 | C1 | 12 | H3 | 21 | D9 |
| 4 | B1 | 13 | B2 | 22 | D10 |
| 5 | E1 | 14 | K1 | 23 | D11 |
| 6 | F1 | 15 | K2 | 24 | D12 |
| 7 | D1 | 16 | D4 | 25 | S1 |
| 8 | D2 | 17 | D5 | 26 | Z2 |
| 9 | D3 | 18 | D6 | 27 | E2 |

SONET SCPI Command Reference

OUTPut subsystem, see page 5-3.

SOURce subsystem - Transmitter SONET Settings Commands, see page 5-5.

SONET Mapping Settings, see page 5-9.

SOURce subsystem - Transmitter SONET OVERHEAD SETUP, see page 5-22.

SOURce subsystem - Transmitter SONET Test Function Commands, see page 5-34.

INPut subsystem, see page 5-61.

SENSe subsystem - Receiver SONET Settings, see page 5-63.

SENSe subsystem - Receiver SONET Test Function Commands, see page 5-72.

SENSe subsystem - Alarm Scan Control, see page 5-79.

SENSe subsystem - SONET Tributary Scan Control, see page 5-81.

SENSe subsystem - Result Returning Commands, see page 5-84.

FETCh subsystem, see page 5-97.

SONET Command Reference

SONET Command Reference

This chapter contains detailed information on the SCPI (Standard Commands for Programming Instruments) and IEEE 488.2 common commands you will use when writing programs to control your HP 37718A for SONET operation.

Please also refer to chapter 2 Common Commands for general information on SCPI command formats and for a list of commands that are common to PDH, SDH or SONET operation; they are as follows:

SCPI Command Format

Remote Control Commands

Instrument Options

INSTRument subsystem

SOURce subsystem

SOURce subsystem - Transmitter Common Commands

INPut subsystem

SENSe subsystem

SENSe subsystem - Receiver Common Commands

SENSe subsystem - Test Timing

SENSe subsystem - Analysis Control

SENSe subsystem - Trouble Scan Results

SENSe subsystem - Configuring Graphics

SENSe subsystem - Managing Graphics Stores

SENSe subsystem - Retrieving Graphics Store Data

SENSe subsystem - Retrieving Data for a Single Graph

SENSe subsystem - Obtaining Graphics End of Measurement Results

STATus Subsystem

SYSTem Subsystem

IEEE common capabilities

OUTPut subsystem

OUTPut subsystem

This subsystem controls the characteristics of the instrument's output ports.

:OUTPut:TELEcom:SONet:RATE <discrete>

| | | |
|--------------|------|------------------|
| <discrete> = | STS1 | STS-1 Electrical |
| | STS3 | STS-3 Electrical |

Is only valid when :SOURce:DATA:TELEcom:SOURce <discrete> is set to SONet.

:OUTPut:TELEcom:SONet:RATE?

Returns: <discrete>

:OUTPut:TELEcom:SONet:LEVel <discrete>

| | | |
|--------------|------|--------------------------|
| <discrete> = | XCON | 450 feet simulated cable |
| | HIGH | 0 feet simulated cable |
| | LOW | 900 feet simulated cable |

Selects the signal level for the STS-1 output.

The corresponding query returns the STS-1 signal level in discrete short form.

:OUTPut:TELEcom:SONet:LEVel?

Returns: <discrete>

:OUTPut:TELEcom:OC48:RATE <discrete>

| | | |
|--------------|------|---------------|
| <discrete> = | OC1 | OC-1 optical |
| | OC3 | OC-3 Optical |
| | OC12 | OC-12 Optical |
| | OC48 | OC-48 Optical |

SOURce subsystem - Transmitter SONET Settings Commands**SONET Clock settings****:SOURce:CLOCK:SONet:SOURce <discrete>**

| | | |
|--------------|----------|---------------------|
| <discrete> = | INTernal | Internal |
| | EXTernal | External Clock/Data |
| | RSTS1 | STS-1 Electrical |
| | ROC1 | OC-1 Optical |
| | RMN1 | STS-1 Monitor |
| | RSTS3 | STS-3 Electrical |
| | ROC3 | OC-3 Optical |
| | RMN3 | STS-3 Monitor |
| | ROC12 | OC-12 Optical |
| | RMN12 | STS-12 Monitor |
| | ROC48 | OC-48 Optical |

Selects the SONET transmitter clock sync source. If the RX is set to an STS rate, then the only received clock rate that may be selected is the one in use. This restriction does not apply if the RX is set to a non STS rate. If EXT is selected, the Format is set using :SOURce:CLOCK:SONet:FORMat <discrete>.

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

:SOURce:CLOCK:SONet:SOURce?

Returns : <discrete>

:SOURce:CLOCK:SONet:LEVel <discrete>

| | | |
|--------------|-----------|------------|
| <discrete> = | TERMinate | Terminated |
| | MONitor | Monitor |

Selects the transmitter SONET clock sync source level.

SOURce subsystem - Transmitter SONET Settings Commands

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

:SOURce:CLOCK:SONet:LEVel?

Returns : <discrete>

:SOURce:CLOCK:SONet:FORMat <discrete>

| | | |
|--------------|---------|------------------|
| <discrete> = | CLOCK | Clock Format |
| | DATA | Data Format |
| | K64 | 64kb/s data |
| | DS1Bits | DS1 bit rate |
| | M10Ref | 10 MHz Reference |

Selects the transmitter SONET EXT clock sync source format.

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

:SOURce:CLOCK:SONet:FORMat?

Returns : <discrete>

:SOURce:CLOCK:SONet:FOFFset <boolean>

| | |
|-------------|----------|
| <boolean> = | 0 or OFF |
| | 1 or ON |

Enables/disables the SONET Frequency Offset. The amount of Offset is set using :SOURce:CLOCK:SONet:FOFFset:OFFSet <numeric>,<suffix>.

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

:SOURce:CLOCK:SONet:FOFFset?

Returns : <boolean>

:SOURce:CLOCK:SONet:FOFFset:OFFSet <numeric>,<suffix>

SOURce subsystem - Transmitter SONET Settings Commands

| | | |
|-------------|-------------------|-------------------|
| <numeric> = | -999 to +999 | Parts per Million |
| | -0.0999 to 0.0999 | % or Ratio |
| <suffix> = | PPM | Parts per Million |
| | PCT | Percentage |

Sets the amount of SONET Frequency Offset when Frequency Offset is enabled by setting :SOURce:CLOCK:SONet:FOFFset <boolean> to ON. If Ratio is chosen as the method of specifying Offset, no suffix is required.

The corresponding query returns the amount of SONET Frequency Offset in ppm.

:SOURce:CLOCK:SONet:FOFFset:OFFSet?

Returns : <numeric>

Thru mode settings

:SOURce:DATA:TELEcom:SONet:THRumode <discrete>

| | | |
|--------------|----------|--------------------------|
| <discrete> = | INTernal | Select Normal SONET Mode |
| | THRU | Select SONET Thru Mode |

Selects/Deselects SONET THRU mode.

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

:SOURce:DATA:TELEcom:SONet:THRumode?

Returns : <discrete>

:SOURce:DATA:TELEcom:SONet:THRumode:POVerwrite <payload>

| | | |
|--------------|-------|--------------------------|
| <discrete> = | OFF | Payload Overwrite Off |
| | STS3c | Overwrite STS-3C payload |
| | STS1 | Overwrite STS-1 payload |
| | VT6 | Overwrite VT-6 payload |

SOURce subsystem - Transmitter SONET Settings Commands

| | |
|------|--------------------------|
| VT2 | Overwrite VT-2 payload |
| VT15 | Overwrite VT-1.5 payload |

Selects the type of thru-mode payload to overwrite.

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

:SOURce:DATA:TELEcom:SONet:THRumode:POVerwrite?

Returns : <discrete>

:SOURce:DATA:TELEcom:SONet:THRumode:COVerwrite <boolean>

| | | |
|-------------|----------|------------------------|
| <boolean> = | 0 or OFF | Overhead Overwrite Off |
| | 1 or ON | Overhead Overwrite On |

Enables/disables section overhead overwrite.

The corresponding query returns the section overhead overwrite state in discrete form as listed above.

:SOURce:DATA:TELEcom:SONet:THRumode:COVerwrite?

Returns : <boolean>

SONET Mapping Settings

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

<numeric> = 1 to 16 STS3 number under test.

Only valid if :OUTPut:TELEcom:OC48:RATE <discrete> is set to a rate higher than STS-3. Selects the transmitted STS-3 that is selected for test.

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

:SOURce:DATA:TELEcom:SONet:STS3?

Returns : <numeric>

:SOURce:DATA:TELEcom:SONet:STS12c <numeric>

<numeric> = 1 to 4 STS12 number under test.

SOURce subsystem - Transmitter SONET Settings Commands

:SOURce:DATA:TELEcom:SONet:STS12c?

Returns : <numeric>

SPE Layer Selection

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

<discrete> = STS3c
STS1
STS12c
STS48c

Set 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: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>

VT Layer Selection

:SOURce:DATA:TELEcom:SONet:PAYLoad <discrete>

<discrete> = STS3c or M140 140 Mb/s
STS1 STS-1
VT2 or M2 2 Mb/s
VT6 VT-6

SOURce subsystem - Transmitter SONET Settings Commands

| | |
|-------------|---------|
| STS12c | STS-12c |
| STS48c | STS-48c |
| VT15 or DS1 | VT-1.5 |

This command selects the SONET transmitter mapping.

The corresponding query returns the SONET mapping in discrete form, as listed above.

:SOURce:DATA:TELEcom:SONet:PAYLoad?

Returns : <discrete>

Payload Layer Selection**:SOURce:DATA:TELEcom:SONet:MAPPING <discrete>**

| | | |
|--------------|------|------------------------------|
| <discrete> = | M140 | 140 Mb/s (STS3c only) |
| | M34 | 34 Mb/s (STS1 Full SPE only) |
| | DS3 | DS3 (STS1 Full SPE only) |
| | BULK | Bulk Filled (STS1 or STS3c) |

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

Only valid if :SOURce:DATA:TELEcom:SONet:PAYLoad <discrete> is set to STS1 or STS3C.

The corresponding query returns the low order mapping in discrete form as listed above.

:SOURce:DATA:TELEcom:SONet:MAPPING?

Returns: <discrete>

:SOURce:DATA:TELEcom:SONet:TRIButary:MAPPING <discrete>

| | | |
|--------------|---------------|----------------------------|
| <discrete> = | ASYNc or ASM2 | Asynchronous 2 Mb/s |
| | FBYTe or FLM2 | 2 Mb/s Floating Byte |
| | DS1 or ASDS1 | Asynchronous 1.544Mb/s DS1 |
| | BULK | Bulk Filled |

SOURce subsystem - Transmitter SONET Settings Commands

Selects the transmitter low order mapping. Only valid if
:SOURce:DATA:TELEcom:SONet:PAYLoad <discrete> is set to VT2 or VT15.

The corresponding query returns the low order mapping in discrete short form.

:SOURce:DATA:TELEcom:SONet:TRIButary:MAPPING?

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 selected STS1.

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

:SOURce:DATA:TELEcom:SONet:VTGRoup?

Returns : <numeric>

:SOURce:DATA:TELEcom:SONet:TRIButary <numeric>

<numeric> = 1 to 3 Tributary Number for VT2
1 to 4 Tributary number for VT-1.5

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:TRIButary?

Returns : <numeric>

VT Payload and Test Pattern

:SOURce:DATA:TELEcom:SONet:PAYLoad:TYPE <discrete>

<discrete> = UNFRamed No framing
FRAMed 8, 34 & 140 Mb/s

SOURce subsystem - Transmitter SONET Settings Commands

Returns: <discrete>

:SOURce:DATA:TELEcom:SONet:PAYLoad:PATtern <discrete>

| | | |
|--------------|--------|--|
| <discrete> = | PRBS9 | 2^9-1 |
| | PRBS11 | $2^{11}-1$ |
| | PRBS15 | $2^{15}-1$ |
| | PRBS20 | $2^{20}-1$ |
| | PRBS23 | $2^{23}-1$ |
| | QRSS | $2^{20}-1$ with 14 consecutive zero limit (DS1 only) |
| | AZERo | All Zeros |
| | AONE | All Ones |
| | STress | 3-in-24 stress pattern (DS1 only) (requires option 110) |
| | P1010 | Word 1010 |
| | P1000 | Word 1000 |
| | UWORD | 16 Bit User Word |

Selects the transmitter SONET payload data pattern.

If UWORD is selected, the word pattern is set using
:SOURce:DATA:TELEcom:SONet:PAYLoad:UWORD <string>.

The corresponding query returns the transmitter SONET payload data pattern in discrete form, as listed above.

:SOURce:DATA:TELEcom:SONet:PAYLoad:PATtern?

Returns : <discrete>

:SOURce:DATA:TELEcom:SONet:PAYLoad:UWORD <string>

Sets the SONET transmitter user word pattern in the range "0000000000000000" to "1111111111111111".

The corresponding query returns the user word pattern as a string.

SOURce subsystem - Transmitter SONET Settings Commands**:SOURce:DATA:TELEcom:SONet:PAYLoad:UWORD?**

Returns : <string>

:SOURce:DATA:TELEcom:SONet:PRBS:POLarity <discrete>

<discrete> = INVerted
 NORMAl

Selects the PRBS pattern polarity.

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

:SOURce:DATA:TELEcom:SONet:PRBS:POLarity?

Returns: <discrete>

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

| | | |
|-------------|-------------------|-------------------|
| <numeric> = | -100 to +100 | Parts per Million |
| | -0.0100 to 0.0100 | % or Ratio |
| <suffix> = | PPM | Parts per Million |
| | PCT | Percentage |

Sets the 140, 34, 2 Mb/s, DS3 or DS1 payload frequency offset in parts per million (ppm).

The corresponding query returns the offset in numeric form.

:SOURce:DATA:TELEcom:SONet:PAYLoad:OFFSet?

Returns: <numeric> ppm

:SOURce:DATA:TELEcom:SONet:TRIButary:CONCatenate <numeric>, <numeric>

| | | |
|-------------------------------|---|-------------------|
| <numeric> = (first parameter) | 0 | Concatenation Off |
| | 2 | VT6-2c |
| | 3 | VT6-3c |

SOURce subsystem - Transmitter SONET Settings Commands

| | | |
|-----------------------------------|--------|-----------------|
| | 4 | VT6-4c |
| | 5 | VT6-5c |
| | 6 | VT6-6c |
| <numeric> = (second parameter) | 1 to 6 | VT6-2c selected |
| | 1 to 5 | VT6-3c selected |
| | 1 to 4 | VT6-4c selected |
| | 1 to 3 | VT6-5c selected |
| | 1 to 2 | VT6-6c selected |

Selects the VT6 concatenation (first parameter) and starting at VT (second parameter).

The corresponding query returns the VT6 concatenation and starting at VT in numeric form as listed above.

:SOURce:DATA:TELEcom:SONet:TRIButary:CONCatenate?

Returns : <numeric>, <numeric>

Background Settings**:SOURce:DATA:TELEcom:SONet:PRIMary:BACKground:PAYLoad
:PATtern <discrete>**

| | | |
|--------------|----------|------------------------------|
| <discrete> = | PRBS9 | 2^9-1 |
| | PRBS15 | $2^{15}-1$ |
| | NUMBered | (VT-6 or framed VT-2/VT-1.5) |
| | P1100 | word 1100 |

Selects the background payload pattern for VTs within the foreground VT Group. The corresponding query returns the background pattern in discrete form as listed above.

SOURce subsystem - Transmitter SONET Settings Commands**:SOURce:DATA:TELEcom:SONet:PRIMary:BACKground:PAYLoad
:PATtern?**

Returns: <discrete>

: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:STS3:BACKground <discrete>

| | | |
|--------------|------------|-------------------|
| <discrete> = | UNEQuipped | Fixed at 00000000 |
| | AS_FG | As Foreground |

Selects the payload in the background (non test) STS-3s. This command only applies if the interface rate is higher than STS-3.
The corresponding query returns the type of payload in the background STS-3s in discrete short form.

:SOURce:DATA:TELEcom:SONet:STS3:BACKground?

Returns: <discrete>

:SOURce:DATA:TELEcom:SONet:STS12c BACKground <discrete>

| | | |
|--------------|------------|-------------------|
| <discrete> = | UNEQuipped | Fixed at 00000000 |
| | AS_FG | As Foreground |

Selects the payload in the background (non test) STS-12c's. This command only applies if the interface rate is higher than STS-12c.
The corresponding query returns the type of payload in the background STS-12c in discrete short form.

SONET Command Reference

SOURce subsystem - Transmitter SONET Settings Commands

:SOURce:DATA:TELEcom:SONet:STS12c:BACKground?

Returns:

<discrete>

SOURce subsystem - Transmitter SONET OVERHEAD SETUP**SOURce subsystem - Transmitter SONET OVERHEAD SETUP**

Lists the settings for the commands associated with the TRANSMIT OVERHEAD SETUP display.

:SOURce:DATA:TELEcom:SONet:OVERhead:DEFAULT

Sets all overhead bytes to their default value :

| Byte | Value | Byte | Value | Byte | Value | Byte | Value |
|------|----------|-------|----------|-------|----------|------|----------|
| A1 | 11110110 | A2 | 00101000 | C1/J0 | 00000001 | B1 | xxxxxxxx |
| E1 | 00000000 | F1 | 00000000 | D1 | 00000000 | D2 | 00000000 |
| D3 | 00000000 | E2 | 00000000 | H1 | xxxx10xx | H2 | xxxxxxxx |
| H3 | xxxxxxxx | B2 | xxxxxxxx | K1 | 00000000 | K2 | 00000000 |
| D4 | 00000000 | D5 | 00000000 | D6 | 00000000 | D7 | 00000000 |
| D8 | 00000000 | D9 | 00000000 | D10 | 00000000 | D11 | 00000000 |
| D12 | 00000000 | S1/Z1 | 00000000 | Z2/M1 | 00000000 | J1 | Default |
| B3 | xxxxxxxx | C2 | 00000001 | G1 | 00000000 | F2 | 00000000 |
| H4 | 00000000 | Z3 | 00000000 | Z4 | 00000000 | N1 | 00000000 |

:SOURce:DATA:TELEcom:SONet:OVERhead:DATA <numeric>, <numeric>, <discrete>, <string>

<numeric> = STS-3 Number: range 1 to 16
(first parameter)

<numeric> = STS-1 Number: range 1 to 3
(second parameter)

<discrete> = A1|A2|C1/J0/Z0|E1|F1|D1|D2|D3|H1|K1|
K2|D4|D5|D6|D7|D8|D9|D10|D11
D12|S1/Z1|Z2/M1/M0|E2|X21|X22|X23
X31|X32|X33|X52|X53|X61|X62|X63
X71|X72|X73|X81|X82|X83|X93

<string> = "00000000" to "11111111"

Sets the binary value for the selected transmitter section overhead byte. The byte number is given by its defined name if it has one. Undefined bytes are represented

SOURce subsystem - Transmitter SONET OVERHEAD SETUP

by "Xrc", 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.

If an STS-3 signal is being transmitted, the only applicable value of STS-3 number is 1.

The byte is set to the binary representation of the given 8 character string.

In the case of STS-1 #1 only bits 2 and 3 of H1 may be set. The value sent must however still be 8 bits long. The unused bits should be marked 'x', i.e. to set bits 2 and 3 to '11' send the value 'xxxx11xx'.

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

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

Returns : <string>

:SOURce:DATA:TELEcom:SONet:OVERhead:DATA:HEXadecimal <numeric>, <numeric>, <discrete>, <string>

<numeric> = STS-3 Number: range 1 to 16
(first parameter)

<numeric> = STS-1 Number: range 1 to 3
(second parameter)

<discrete> = A1|A2|J0|Z0|E1|F1|D1|D2|D3|H1|K1
K2|D4|D5|D6|D7|D8|D9|D10|D11
D12|S1|Z1|M0/M1/Z2|E2|X21|X22|X23|X31
X32|X33|X52|X53|X61|X62|X63
X71|X72|X73|X81|X82|X83|X93

<string> = "00" to "FF"

Sets the hexadecimal value for the selected transmitter transport overhead byte. The byte number is given by its defined name if it has one. Undefined bytes are represented by "Xrc", 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.

If an STS-3 signal is being transmitted, the only applicable value of STS-3 is 1.

The byte is set to the hexadecimal representation of the given 2 character string.

SONET Command Reference

SOURce subsystem - Transmitter SONET OVERHEAD SETUP

In the case of STS-1 #1 only bits 2 and 3 of H1 may be set. Any hexadecimal value can be sent but only bits 2 and 3 will be set and all other bits will remain unchanged.

The corresponding query returns the hexadecimal value of the specified byte.

:SOURce:DATA:TELEcom:SONet:OVERhead:DATA:HEXadecimal?
<numeric>, <numeric>, <discrete>

Returns: <string>

:SOURce:DATA:TELEcom:SONet:POVerhead:DATA <discrete>, <string>

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

<string> = "xx00xxx0" to "xx11xxx1" for V5

"00000000 to 11111111 not V5

Sets the binary value of the specified STS-3, STS-12C and STS-48C path overhead byte.

The corresponding query returns the value of the specified high order path overhead byte as a string, as described above.

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

Returns: <string>

: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) |

SOURce subsystem - Transmitter SONET OVERHEAD SETUP

| | |
|------|-----------------|
| FDDI | FDDI (00010101) |
| USER | User Defined |

Sets the value of the STS POH path label (C2 Byte). To update the USER byte value use the :SOURce:DATA:TELEcom:SONet:POVerhead:DATA <discrete>, <string> command.

The corresponding query returns the value of the C2 byte in discrete short form.

:SOURce:DATA:TELEcom:SONet:POVerhead:SLABel?

Returns: <discrete>

:SOURce:DATA:TELEcom:SONet:POVerhead:J1:PATtern <discrete>

| | | |
|--------------|----------|-------------------------|
| <discrete> = | DEFault | 64 NULL characters |
| | TEST | HP37718A.... |
| | USER | User Defined |
| | CRC7Test | HP: - GB(Serial Number) |
| | CRC7User | User Defined |

Sets the type of pattern that is to be transmitted in the J1 byte of the STS path overhead. The pattern repeats every 64 characters (16 chars in CRC7 case) and is transmitted byte by byte in subsequent frames.

The corresponding query returns the type of pattern being transmitted in STS path overhead byte J1 in discrete form as listed above.

:SOURce:DATA:TELEcom:SONet:POVerhead:J1:PATtern?

Returns : <discrete>

:SOURce:DATA:TELEcom:SONet:POVerhead:J1 <string>

Sets the user defined pattern that is to be transmitted in the J1 byte of the STS path overhead. The pattern should be 64 characters long, terminated with CR/LF. If less than 64 characters are input, the instrument will pad with the required number of NULL characters and terminate with CR/LF. The pattern repeats every 64 characters and is transmitted byte by byte in subsequent frames.

The corresponding query returns the value of the user defined pattern as a string, as defined above. If the string contains any non printing characters, ~ is substituted. If CRC7 was returned in response to

SOURce subsystem - Transmitter SONET OVERHEAD SETUP

:SOURce:DATA:TELEcom:SONet:POVerhead:J1:PATtern? , this query command is not valid.

:SOURce:DATA:TELEcom:SONet:POVerhead:J1?

Returns : <string>

:SOURce:DATA:TELEcom:SONet:POVerhead:J1:CRC7 <string>

This command sets the CRC7 based user defined string that is to be transmitted using the J1 byte and configures the instrument to use this string. The string can be up to 15 characters in length; remaining characters are set to NULLs. A frame marker byte with CRC7 is added to this string.

The string is transmitted byte by byte in subsequent frames. The string repeats every 16 characters. The corresponding query returns the current value of the string. If the string contains any non printing characters, ~ is substituted.

:SOURce:DATA:TELEcom:SONet:POVerhead:J1:CRC7?

Returns : <string>

:SOURce:DATA:TELEcom:SONet:POVerhead:J1:HEXadecimal?

Returns : <block>

Returns a 64 byte block of data. Each byte represents the hexadecimal value of an ASCII character of STS path overhead byte J1 in the range "00" to "FF". The 64 hexadecimal numbers are preceded by the header "#264".

If CRC7 was returned in response to

:SOURce:DATA:TELEcom:SONet:POVerhead:J1:PATtern?, this query command is not valid.

:SOURce:DATA:TELEcom:SONet:TRIButary:POVerhead:DATA <discrete>, <string>

<discrete>= V5|Z6|Z7

Sets the value of the specific VT-2, VT-1.5 or VT-6 path overhead byte to the value specified by string (in the range "00000000" to "11111111"). The byte is specified by the first parameter.

SOURce subsystem - Transmitter SONET OVERHEAD SETUP

Only bits 3, 4 and 8 of V5 can be set but an 8 bit string must be sent with the unsettable bits set to x. To set bits 3, 4 and 8 to "1" send "xx11xxx1".

The corresponding query returns the byte specified by type in string form, as described above.

:SOURce:DATA:TELEcom:SONet:TRIButary:POVerhead:DATA? <discrete>

Returns: <string>

:SOURce:DATA:TELEcom:SONet:OVERhead:J0:PATtern <discrete>

| | | |
|--------------|-------|-------------------------|
| <discrete> = | FIXed | Fixed Byte |
| | TEST | HP: - GB(Serial Number) |
| | USER | User Defined |

Sets the type of pattern that is to be transmitted in the J0 byte of the STS section overhead. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

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

:SOURce:DATA:TELEcom:SONet:OVERhead:J0:PATtern?

Returns: <discrete>

:SOURce:DATA:TELEcom:SONet:OVERhead:J0 <string>

Sets the user defined pattern that is to be transmitted in the J0 byte of the regenerator overhead. The pattern should be 15 characters long. The instrument automatically appends a E.164 CRC character to make up a 16 character sequence. If less than 15 characters are input, the instrument will pad with the required number of NULL characters. The pattern repeats every 16 characters and is transmitted character by character in subsequent frames.

The corresponding query returns the value of the user defined pattern as a string, as defined above. If the string contains any non printing characters, ~ is substituted.

If FIXed was returned in response

to: SOURce:DATA:TELEcom:SONet:OVERhead:J0:PATtern?, this query command is not valid.

:SOURce:DATA:TELEcom:SONet:OVERhead:J0?

Returns: <string>

SOURce subsystem - Transmitter SONET OVERHEAD SETUP

:SOURce:DATA:TELEcom:SONet:OVERhead:J0:HEXadecimaL?

Returns: <block>

Returns a 15 byte block of data. Each byte represents the hexadecimal value of an ASCII character "00" to "FF". The 15 hexadecimal numbers are preceded by the header "#215".

If FIXed was returned in response to :SOURce:DATA:TELEcom:SONet:OVERhead:J0:PATtern?, this query command is not valid.

:SOURce:DATA:TELEcom:SONet:TRIButary:POVerhead:J2:PATtern <discrete>

| | | |
|--------------|---------|-------------------------|
| <discrete> = | DEFault | 15 NULL characters |
| | TEST | HP: - GB(Serial Number) |
| | USER | User Defined |
| | FIXed | Fixed Byte |

Sets the type of pattern that is to be transmitted in the J2 byte of the VT-6, VT-2 or VT-1.5 path overhead. The pattern repeats every 16 characters and is transmitted byte by byte in subsequent frames.

The corresponding query returns the type of pattern being transmitted in VT-6 or VT-2 path overhead byte J2 in discrete form as listed above.

:SOURce:DATA:TELEcom:SONet:TRIButary:POVerhead:J2:PATtern?

Returns : <discrete>

:SOURce:DATA:TELEcom:SONet:TRIButary:POVerhead:J2 <string>

Sets the user defined pattern that is to be transmitted in the J2 byte of the VT-6, VT-2 or VT-1.5 path overhead. The pattern should be 15 characters long. If less than 15 characters are input, the instrument will pad with the required number of NULL characters and a frame marker byte with CRC7 is added to the string. The pattern repeats every 16 characters and is transmitted byte by byte in subsequent frames.

The corresponding query returns the value of the user defined pattern as a string, as defined above. If the string contains any non printing characters, ~ is substituted.

SOURce subsystem - Transmitter SONET OVERHEAD SETUP

:SOURce:DATA:TELEcom:SONet:TRIButary:POVerhead:J2?

Returns : <string>

:SOURce:DATA:TELEcom:SONet:TRIButary:POVerhead:J2:HEXadecimal?

Returns : <block>

Returns a 16 byte block of data. Each byte represents the hexadecimal value of an ASCII character of VT-6, VT-2 or VT-1.5 byte J2 in the range "00" to "FF". The 15 hexadecimal numbers are preceded by the header "#215".

:SOURce:DATA:TELEcom:SONet:TRIButary:POVerhead:J2:FIXed <string>

<string> = "00000000" to "11111111"

Sets the user defined fixed byte that is to be transmitted in the J2 byte of the VT-6, VT-2 or VT-1.5 path overhead. The value is a binary string.

The corresponding query returns the value of the user defined fixed byte as a binary string, as defined above.

:SOURce:DATA:TELEcom:SONet:TRIButary:POVerhead:J2:FIXed?

Returns : <string>

:SOURce:DATA:TELEcom:SONet:TRIButary:POVerhead:V5:SLABel <numeric>

<numeric> = 0 to 7

Sets the VT-6, VT-2 or VT-1.5 signal label (Byte V5) value.

The corresponding query returns the signal label value in numeric form.

:SOURce:DATA:TELEcom:SONet:TRIButary:POVerhead:V5:SLABel?

Returns : <numeric>

:SOURce:DATA:TELEcom:SONet:POVerhead:H4Sequence <discrete>

<discrete> = LONG Long Sequence

SOURce subsystem - Transmitter SONET OVERHEAD SETUP

| | |
|-------|----------------|
| SHORT | Short Sequence |
| COC1 | COC1 Sequence |

Sets the H4 path overhead byte sequence length when :SOURce:DATA:TELEcom:SONet:PAYLoad <discrete> is set to VT6 or VT2 or VT1.5.

The corresponding query returns the H4 byte sequence length in discrete form as listed above.

:SOURce:DATA:TELEcom:SONet:POVerhead:H4Sequence?

Returns : <discrete>

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

| | | |
|--------------|--------------|--|
| <discrete> = | SYNChronized | Synchronized - traceability unknown (0000) |
| | STRatum1 | Stratum 1 traceable (0001) |
| | STRatum2 | Stratum 2 traceable (0111) |
| | STRatum3 | Stratum 3 traceable (1010) |
| | SONet | SONET minimum clock traceable (1100) |
| | NETWork | Network synchronization (1110) |
| | DONTusesync | Do not use for synchronization (1111) |
| | USER | |

Selects the SONET SYNC message type (S1 Byte Bits 5 to 8). To update the USER byte value use either the :SOURce:DATA:TELEcom:SONet:OVERhead:DATA <numeric>, <numeric>, <discrete>, <string> or the :SOURce:DATA:TELEcom:SONet:OVERhead:DATA:HEXadecimal <numeric>, <numeric>, <discrete>, <string> command.

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

SONET Command Reference

SOURce subsystem - Transmitter SONET OVERHEAD SETUP

:SOURce:DATA:TELEcom:SONet:OVERhead:SBYTe?

Returns : <discrete>

SONET Command Reference

:SOURce subsystem - Transmitter SONET Test Function Commands

| | |
|-------|-------------------|
| TWO | Frame Errors only |
| THRee | Frame Errors only |
| FOUR | Frame Errors only |

Selects the transmitter SONET Error rate of the error type selected by :SOURce:DATA:TELEcom:SONet:ERRor:TYPE <discrete>. This command is applicable when :SOURce:DATA:TELEcom:TFUNction <discrete> is set to SONet.

If bit errors are to be added to the PDH payload then :SOURce:DATA:TELEcom:TFUNction <discrete> must be set to PDHP.

The corresponding query returns the selected transmitter SONET error rate in discrete form, as listed above.

:SOURce:DATA:TELEcom:SONet:ERRor:RATE?

Returns : <discrete>

:SOURce:DATA:TELEcom:SONet:ERRor:RATE:USER <numeric>

<numeric>= 9.9E-3 to 90.1E-9 mantissa resolution 0.1,
exponent resolution 1

Sets the user defined SONET Error Add rate. Note that if :SOURce:DATA:TELEcom:SONet:ERRor:RATE <discrete> is not already set to USER, then this command will automatically set it to USER.

Associated commands:

:SOURce:DATA:TELEcom:SONet:ERRor:RATE <discrete>

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

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

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

Returns: <numeric>

:SOURCE subsystem - Transmitter SONET Test Function Commands

| | |
|------|-------------------------|
| E_6 | 1.0E-6 error rate |
| E_7 | 1.0E-7 error rate |
| USER | User defined error rate |

Sets the PDH Payload error rate for the error type selected by :SOURCE:DATA:TELEcom:SONet:PDHPayload:ERROR:TYPE <discrete>. This command is applicable when :SOURCE:DATA:TELEcom:SOURCE <discrete> is set to PDHPayload.

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

:SOURCE:DATA:TELEcom:SONet:PDHPayload:ERROR:RATE?

Returns: <discrete>

:SOURCE:DATA:TELEcom:SONet:PDHPayload:ERROR:RATE:USER <numeric>

<numeric> 1.1E-3 to 0.1E-9 mantissa resolution 0.1, exponent resolution 1

Sets the user defined SONET PDH payload Error Add rate of the error type selected by :SOURCE:DATA:TELEcom:SONet:PDHPayload:ERROR:TYPE <discrete>. This command is applicable when :SOURCE:DATA:TELEcom:SOURCE <discrete> is set to PDHPayload.

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

:SOURCE:DATA:TELEcom:SONet:PDHPayload:ERROR:RATE:USER?

Returns: <numeric>

:SOURCE:DATA:TELEcom:SONet:ERROR:APSThreshold:NERRORs <numeric>

<numeric> = 0 to 640 for STS 0
0 to 1920 for STS1

:SOURCE subsystem - Transmitter SONET Test Function Commands

0 to 7680 for STS12

0 to 30720 for STS48

Sets the number of errors for the APS Threshold when

:SOURCE:DATA:TELEcom:SONet:ERRor:RATE <discrete> is set to APST.

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>

**:SOURCE:DATA:TELEcom:SONet:ERRor:APSThreshold:EINterval
<discrete>**

| | | |
|--------------|--------|------------------|
| <discrete> = | MS10 | 10 milliseconds |
| | MS100 | 100 milliseconds |
| | S1 | 1 second |
| | S10 | 10 seconds |
| | S100 | 100 seconds |
| | S1000 | 1,000 seconds |
| | S10000 | 10,000 seconds |

Sets the interval between APS Threshold errors when

:SOURCE:DATA:TELEcom:SONet:ERRor:RATE <discrete> is set to APST .

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

:SOURCE:DATA:TELEcom:SONet:ERRor:APSThreshold:EINterval?

Returns : <discrete>

:SOURCE subsystem - Transmitter SONET Test Function Commands**:SOURCE:DATA:TELEcom:SONet:ALARm <discrete>**

| | | |
|--------------|--------------|-------------------------------|
| <discrete> = | NONE | Alarms Off |
| | LOS | Loss of Signal |
| | LOF | Loss of Frame |
| | SEF | Severely Errored Frame Defect |
| | AISL | Line AIS (AIS-L) |
| | RDIL | Line FERF (RDI-L) |
| | LOPP | Loss of Pointer (LOP-P) |
| | AISP | Path AIS (AIS-P) |
| | RDIP | Path FERF (RDI-P) |
| | PUNequipped | Path Unequipped (UNEQ-P) |
| | LOPV | VT Loss of Pointer (LOP-V) |
| | AISV | VT Path AIS (AIS-V) |
| | RDIV | VT Path FERF (RDI-V) |
| | LOMultiframe | Multiframe (H4) Loss |
| | VTUNequipped | VT Unequipped |

Selects the TX Test Function alarm type when

:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to ERR.

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

:SOURCE:DATA:TELEcom:SONet:ALARm?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:ALARm:SSEFrame

Generates a single Severely Errored Frame alarm.

:SOURCE subsystem - Transmitter SONET Test Function Commands

:SOURCE:DATA:TELEcom:SONet:POINter <discrete>

| | | |
|--------------|----------|-----------------------------|
| <discrete> = | BURSt | Adds bursts |
| | NPOinter | New Pointer |
| | OFFSet | Adds offset in ppm |
| | T1105 | Adds T1.105/GR-253 sequence |

Selects the Pointer adjustment type when

:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to POIN.

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

:SOURCE:DATA:TELEcom:SONet:POINter?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:POINter:TYPE <discrete>

| | |
|--------------|-----|
| <discrete> = | SPE |
| | VT |

Selects the TX pointer type when

:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to POIN.

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

:SOURCE:DATA:TELEcom:SONet:POINter:TYPE?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:POINter:DIRection <discrete>

| | |
|--------------|-----------|
| <discrete> = | INCRement |
| | DECRement |
| | ALTernate |

Selects the direction of the pointer burst adjustment when

:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to POIN.

:SOURCE subsystem - Transmitter SONET Test Function Commands

The corresponding query returns the pointer burst direction in discrete form as listed above.

:SOURCE:DATA:TELEcom:SONet:POINter:DIRection?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:POINter:IDECrement <numeric>

| | | |
|-------------|---------|--------------------|
| <numeric> = | 1 to 10 | SPE |
| | 1 to 5 | VT-6, VT-2, VT-1.5 |

Selects the number of places by which the pointer is to be incremented or decremented when :SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to POIN and :SOURCE:DATA:TELEcom:SONet:POINter <discrete> is set to BURS .

The corresponding query returns the number of places in numeric form.

:SOURCE:DATA:TELEcom:SONet:POINter:IDECrement?

Returns : <numeric>

:SOURCE:DATA:TELEcom:SONet:POINter:TRANsmitted?

Returns: <numeric>

Returns the currently transmitted value of the SPE pointer in numeric form.

:SOURCE:DATA:TELEcom:SONet:POINter:ACTion

Forces the new pointer value defined by :SOURCE:DATA:TELEcom:SONet:POINter:VALue <numeric> to be adopted.

:SOURCE:DATA:TELEcom:SONet:POINter:VALue <numeric>

<numeric> = 0 to 782

Selects the SPE New Pointer value when :SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to POIN and :SOURCE:DATA:TELEcom:SONet:POINter <discrete> is set to NPO.

:SOURCE subsystem - Transmitter SONET Test Function Commands

The corresponding query returns the new pointer value in numeric form as listed above.

:SOURCE:DATA:TELEcom:SONet:POINter:VALue?

Returns : <numeric>

:SOURCE:DATA:TELEcom:SONet:TRIButary:POINter:TRANsmitted?

Returns: <numeric>

Returns the currently transmitted value of the VT pointer in numeric form.

:SOURCE:DATA:TELEcom:SONet:TRIButary:POINter:VALue <numeric>

| | |
|----------|------------|
| 0 to 427 | for VT-6 |
| 0 to 139 | for VT-2 |
| 0 to 103 | for VT-1.5 |

Selects the VT New Pointer value when

:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to POIN and
:SOURCE:DATA:TELEcom:SONet:POINter <discrete> is set to NPO.

The corresponding query returns the new pointer value in numeric form as listed above.

:SOURCE:DATA:TELEcom:SONet:TRIButary:POINter:VALue?

Returns : <numeric>

:SOURCE:DATA:TELEcom:SONet:POINter:NPOINter <discrete>

| | | |
|--------------|------|-----------------------|
| <discrete> = | NDF | With New Data Flag |
| | NNDF | Without New Data Flag |

Selects the type of new pointer when

:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to POIN and
:SOURCE:DATA:TELEcom:SONet:POINter <discrete> is set to NPO.

:SOURCE subsystem - Transmitter SONET Test Function Commands

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

:SOURCE:DATA:TELEcom:SONet:POINter:NPOINter?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:POINter:ADJust

Adjust pointer to new settings if :SOURCE:DATA:TELEcom:SONet:POINter <discrete> is set to BURS or NPO .

:SOURCE:DATA:TELEcom:SONet:POINter:OFFSet <discrete>

| | | |
|--------------|--------|-----------------|
| <discrete> = | SIGNAL | Line offset |
| | SPE | SPE rate offset |
| | VT | VT rate offset |

Determines whether the Output signal rate, SPE Rate or VT rate is offset.

The corresponding query returns the signal Rate, which is offset, in discrete form as listed above.

:SOURCE:DATA:TELEcom:SONet:POINter:OFFSet?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:POINter:OFFSet:RATE <numeric>, <suffix>

| | | |
|-------------|------------------|-------------------|
| <numeric> = | -100 to +100 | parts per million |
| | -0.010 to +0.010 | percent |
| <suffix> = | PPM | parts per million |
| | PCT | percent |

Selects the amount of offset applied to the Output Signal Rate or the SPE Rate or the VT Rate when :SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to POIN and :SOURCE:DATA:TELEcom:SONet:POINter <discrete> is set to OFFS.

SONET Command Reference

:SOURCE subsystem - Transmitter SONET Test Function Commands

The default suffix unit is percent.

The corresponding query returns the offset in PPM.

:SOURCE:DATA:TELEcom:SONet:POINter:OFFSet:RATE?

Returns : <numeric>

:SOURCE:DATA:TELEcom:SONet:POINter:T1105 <discrete>

| | | |
|-------------|-------------|---------------------------|
| <discrete>= | RSINgle | Repeating single (e) |
| | RBURst | Repeating burst (f) |
| | RPTRansient | Repeating phase transient |
| | PNORmal | Periodic normal (g/h) |
| | PADDEd | Periodic added (g/h) |
| | PCANcelled | Periodic cancelled (g/h) |

Selects the T1.105/GR-253 Pointer sequence adjustment type when

:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to POIN and

:SOURCE:DATA:TELEcom:SONet:POINter <discrete> is set to T1105 .

The corresponding query returns the T1.105/GR-253 adjustment type in discrete form as listed above.

:SOURCE:DATA:TELEcom:SONet:POINter:T1105?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:POINter:T1105:PATTern <discrete>

| | | |
|--------------|------------|--------------|
| <discrete> = | CONTInuous | No pattern |
| | P873 | 87:3 pattern |
| | P261 | 26:1 pattern |

Selects the pattern of the T1.105/GR-253 pointer sequence when

:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to POIN and

:SOURCE:DATA:TELEcom:SONet:POINter <discrete> is set to T1105 and

SONET Command Reference

:SOURCE subsystem - Transmitter SONET Test Function Commands

:SOURCE:DATA:TELEcom:SONet:POINter:T1105 <discrete> is set to PNOR, PADD or PCAN.

The corresponding query returns the T1.105/GR-253 pattern in discrete form as listed above.

:SOURCE:DATA:TELEcom:SONet:POINter:T1105:PATtern?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:POINter:T1105:POLarity <discrete>

<discrete> = NEGative
 POSitive

Selects the polarity of the T1.105/GR-253 pointer sequence when :SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to POIN and :SOURCE:DATA:TELEcom:SONet:POINter <discrete> is set to T1105.

The corresponding query returns the T1.105/GR-253 polarity in discrete form as listed above.

:SOURCE:DATA:TELEcom:SONet:POINter:T1105:POLarity?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:POINter:T1105:INTerval <numeric>, <suffix>

| | | |
|-------------|---------|--------------|
| <numeric> = | numeric | See text |
| <suffix> = | MS | milliseconds |
| | S | seconds |

Selects the interval between T1.105/GR-253 adjustments.

(STS-3C, STS-1, STS-12C, STS-48C) Range is 7.5ms, 10ms, 20ms, 30ms, 34ms, 40ms to 100ms in 10ms steps. 100 ms to 1s in 100ms steps. 1s, 2s, 5s and 10s. .

(VT-6, VT-2, VT-1.5) Range is 200ms, 500ms, 1s, 2s, 5s and 10s.

The corresponding query returns the T1.105/GR-253 interval as listed above.

The default suffix unit is seconds.

:SOURCE subsystem - Transmitter SONET Test Function Commands

:SOURCE:DATA:TELEcom:SONet:POINter:T1105:INTerval?

Returns : <numeric>, <suffix>

:SOURCE:DATA:TELEcom:SONet:POINter:T1105:SEQuence <discrete>

| | | |
|--------------|------------|--|
| <discrete> = | STOP | Stop the current T1.105/GR-253 pointer sequence |
| | START | Start a T1.105/GR-253 pointer sequence |
| | INITialize | Start a T1.105/GR-253 pointer sequence preceded by initialization and cooldown |

Stops/Starts the T1.105/GR-253 pointer sequence.

The corresponding query returns the sequence start state in discrete form as listed above. See also STAT:SONet2.

:SOURCE:DATA:TELEcom:SONet:POINter:T1105:SEQuence?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:SEQuence <discrete>

| | | |
|--------------|-------|-----------------------|
| <discrete> = | STOP | Stop current sequence |
| | START | Start new sequence |

Starts/Stops a Single or Repeat run Sequence.

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

:SOURCE:DATA:TELEcom:SONet:SEQuence?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:SEQuence:MODE <discrete>

| | | |
|--------------|--------|------------|
| <discrete> = | SINGLE | Single Run |
| | REPeat | Repeat Run |

SONET Command Reference

:SOURCE subsystem - Transmitter SONET Test Function Commands

Selects the type of SEQUENCE when

:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to SEQ.

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

:SOURCE:DATA:TELEcom:SONet:SEQUence:MODE?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:SEQUence:OHBYte <discrete>

<discrete> = A1A2 | J0 | Z0 | E1 | F1 | Section Overhead
 D1D3|
 BNDA1A2|X22|X23|X32|
 X33

 K1K2 | D4D12 | S1 | Z1 | Line Overhead
 Z2 | M1 | M0 | E2

 J1 | C2 | G1 | F2 | H4 | Z3 | Path Overhead
 Z4 | N1

Selects the overhead byte into which the overhead sequence is to be inserted when

:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to SEQ.

Some of the parameters are only available in certain STS-1's or STS-3's.

BNDA1A2 selects the 6 middle A1A2 boundary bytes.

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

:SOURCE:DATA:TELEcom:SONet:SEQUence:OHBYte?

Returns: <discrete>

:SOURCE:DATA:TELEcom:SONet:SEQUence:STS1 <numeric>

<numeric> 1 to 3 STS-1 Number of byte to sequence.

Sets the STS-1 Number of the byte to be sequenced.

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

:SOURCE subsystem - Transmitter SONET Test Function Commands

:SOURCE:DATA:TELEcom:SONet:SEQuence:STS1?

Returns: <numeric>

:SOURCE:DATA:TELEcom:SONet:SEQuence:STS3:SElect <numeric>

<numeric> = 1 to 16

Selects STS-3 number for channels that occur in more than one STS-3.

The corresponding query returns the STS-3 number in numeric form.

:SOURCE:DATA:TELEcom:SONet:SEQuence:STS3:SElect?

Returns: <numeric>

:SOURCE:DATA:TELEcom:SONet:SEQuence:DATA <discrete>, <string>

<discrete> = A | B | C | D | E

<string> = "00" to "FFFFFFFFFFFFFFFFFFFF"

Sets the Sequence data pattern for the designated block to the hexadecimal value contained in the string. The number of hexadecimal characters is dependent on the overhead byte or bytes selected. Two hexadecimal characters are required per byte, for Example:

E1 - 1 byte "00" to "FF"

D4D12 - 9 bytes "000000000000000000" to "FFFFFFFFFFFFFFFFFFFF"

The corresponding query returns the hexadecimal value of the designated block as a string.

:SOURCE:DATA:TELEcom:SONet:SEQuence:DATA? <discrete>

Returns : <string>

:SOURCE:DATA:TELEcom:SONet:SEQuence:ORder <discrete>, <discrete>, <discrete>, <discrete>, <discrete>

<discrete> = A | B | C | D | E

Selects the order of transmission for the blocks of data used in the sequence.

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

:SOURCE subsystem - Transmitter SONET Test Function Commands

:SOURCE:DATA:TELEcom:SONet:SEQuence:ORDer?

Returns : <discrete>, <discrete>, <discrete>, <discrete>, <discrete>

:SOURCE:DATA:TELEcom:SONet:SEQuence:FCOunt <numeric>, <numeric>

<numeric> = 1 to 5 Block number
(first parameter)

<numeric> = 0 to 64000 Frame count
(second parameter)

Selects the number of frames in which the block of data, designated by the block_no, is to be transmitted.

The corresponding query returns the frame count of the block specified in numeric form.

:SOURCE:DATA:TELEcom:SONet:SEQuence:FCOunt? <numeric>

<numeric>= 1 to 5 Block number

Returns : <numeric> Frame count

:SOURCE:DATA:TELEcom:SONet:STESt:SPATtern <discrete>

<discrete> = AZERos All Zero's pattern

AONes All Ones pattern

G958 G.958 sequence

Selects the pattern used in the OC-3 Optical stress test when is set to STES.

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

:SOURCE:DATA:TELEcom:SONet:STESt:SPATtern?

Returns : <discrete>

SONET Command Reference

:SOURCE subsystem - Transmitter SONET Test Function Commands

| | |
|--------------|-------------------------------------|
| FIVE | Not Used (0101) |
| WTRestore | Wait To Restore (0110) |
| SEVen | Not Used (0111) |
| MSWitch | Manual Switch (1000) |
| NINE | Not Used (1001) |
| SDLPriority | Signal Degrade Low Priority (1010) |
| SDHPriority | Signal Degrade High Priority (1011) |
| SFLPriority | Signal Fail Low Priority (1100) |
| SFHPriority | Signal Fail High Priority (1101) |
| FSWitch | Forced Switch (1110) |
| LOPRotectioN | Lockout Of Protection (1111) |

Selects the transmitter SONET APS message to be transmitted (K1 Byte, Bits 1 to 4). Only valid if :SOURCE:DATA:TELEcom:TFUNctioN <discrete> is set to SONet and :SOURCE:DATA:TELEcom:SONet:TFUNctioN:TYPE <discrete> is set to APSM. SDHPriority and SFHPriority are only valid when :SOURCE:DATA:TELEcom:SONet:APSMessages:ARCHitecture <discrete> 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 | Working Channel 1 |
| | 2 | Working Channel 2 |
| | 3 | Working Channel 3 |

:SOURCE subsystem - Transmitter SONET Test Function Commands

| | |
|----|-----------------------|
| 4 | Working Channel 4 |
| 5 | Working Channel 5 |
| 6 | Working Channel 6 |
| 7 | Working Channel 7 |
| 8 | Working Channel 8 |
| 9 | Working Channel 9 |
| 10 | Working Channel 10 |
| 11 | Working Channel 11 |
| 12 | Working Channel 12 |
| 13 | Working Channel 13 |
| 14 | Working Channel 14 |
| 15 | Extra Traffic Channel |

Selects the transmitter SONET APS message channel (K1 Byte, Bits 5 to 8). Only valid if `:SOURCE:DATA:TELEcom:TFUNction <discrete>` is set to SONet and `:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete>` is set to APSM. Working Channels 1 to 14 are only valid if `:SOURCE:DATA:TELEcom:SONet:APSMessages:ARCHitecture <discrete>` is set to OTN.

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

:SOURCE:DATA:TELEcom:SONet:APSMessages:CHANnel?

Returns : <numeric>

:SOURCE:DATA:TELEcom:SONet:APSMessages:BRIDGE <string>

<string> = "0000" to "1111"

Selects the SONET transmitter Linear APS message bridged channel (K2 Byte, Bits 1 to 4). Only valid if `:SOURCE:DATA:TELEcom:TFUNction <discrete>` is set to SONet and `:SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete>` is set

SONET Command Reference

:SOURCE subsystem - Transmitter SONET Test Function Commands

Only valid if :SOURCE:DATA:TELEcom:TFUNCTION <discrete> is set to SONet and :SOURCE:DATA:TELEcom:SONet:TFUNCTION:TYPE <discrete> is set to APSM and :SOURCE:DATA:TELEcom:SONet:APSMessages:TOPology <discrete> is set to LIN.

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 - Span (0010) |
| | ERING | Exerciser - Ring (0011) |
| | ESPan | Exerciser - Span (0100) |
| | WTRestore | Wait to Restore (0101) |
| | MSRing | Manual Switch - Ring (0110) |
| | MSSPan | Manual Switch - Span (0111) |
| | SDRing | Signal Degrade - Ring (1000) |
| | SDSPan | Signal Degrade - Span (1001) |
| | SDPRotectio | Signal Degrade - Protection (1010) |
| | SFRing | Signal Fail - Ring (1011) |
| | SFSPan | Signal Fail - Span (1100) |
| | FSRing | Forced Switch Ring (1101) |
| | FSSPan | Forced Switch - Span(1110) |
| | LOPRotectio | Lockout Of Protection (1111) |

Selects the transmitter Ring APS message to be transmitted (K1 Byte, Bits 1 to 4). Only valid if :SOURCE:DATA:TELEcom:TFUNCTION <discrete> is set to SONet and :SOURCE:DATA:TELEcom:SONet:TFUNCTION:TYPE <discrete> is set to APSM and :SOURCE:DATA:TELEcom:SONet:APSMessages:TOPology <discrete> is set to RING.

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

:SOURCE subsystem - Transmitter SONET Test Function Commands

:SOURCE:DATA:TELEcom:SONet:APSMessages:RCODE?

Returns: <discrete>

:SOURCE:DATA:TELEcom:SONet:APSMessages:DNODE <string>

<string> = "0000" to "1111"

Selects the SONET transmitter Ring APS message destination node (K1 Byte, Bits 5 to 8). Only valid if :SOURCE:DATA:TELEcom:TFUNCTION <discrete> is set to SONet and :SOURCE:DATA:TELEcom:SONet:TFUNCTION:TYPE <discrete> is set to APSM and :SOURCE:DATA:TELEcom:SONet:APSMessages:TOPology <discrete> is set to RING.

The corresponding query returns the APS messages destination node as a string as listed above.

:SOURCE:DATA:TELEcom:SONet:APSMessages:DNODE?

Returns: <string>

:SOURCE:DATA:TELEcom:SONet:APSMessages:SNODE <string>

<string> = "0000" to "1111"

Selects the SONET transmitter Ring APS message source node (K2 Byte, Bits 1 to 4). Only valid if :SOURCE:DATA:TELEcom:TFUNCTION <discrete> is set to SONet and :SOURCE:DATA:TELEcom:SONet:TFUNCTION:TYPE <discrete> is set to APSM and :SOURCE:DATA:TELEcom:SONet:APSMessages:TOPology <discrete> is set to RING.

The corresponding query returns the APS messages source node as a string as listed above.

:SOURCE:DATA:TELEcom:SONet:APSMessages:SNODE?

Returns: <string>

:SOURCE:DATA:TELEcom:SONet:APSMessages:PCODE <discrete>

| | | |
|--------------|-------|------------|
| <discrete> = | SHORT | Short path |
| | LONG | Long path |

:SOURCE subsystem - Transmitter SONET Test Function Commands

Selects the SONET transmitter Ring APS message path type (K2 bit 5). Only valid if :SOURCE:DATA:TELEcom:TFUNCTION <discrete> is set to SONet and :SOURCE:DATA:TELEcom:SONet:TFUNCTION:TYPE <discrete> is set to APSM and :SOURCE:DATA:TELEcom:SONet:APSMessages:TOPology <discrete> is set to RING.

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 <discrete>

| | | |
|--------------|------------|--------------------------|
| <discrete> = | IDLE | Idle (000) |
| | BRIDged | Bridged (001) |
| | BASWitched | Bridged & Switched (010) |
| | P011 | 011 |
| | P100 | 100 |
| | P101 | 101 |

Selects the SONET transmitter Ring APS messages status code (K2 Byte, Bits 6 to 8). Only valid if :SOURCE:DATA:TELEcom:TFUNCTION <discrete> is set to SONet and :SOURCE:DATA:TELEcom:SONet:TFUNCTION:TYPE <discrete> is set to APSM and :SOURCE:DATA:TELEcom:SONet:APSMessages:TOPology <discrete> is set to RING.

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

:SOURCE:DATA:TELEcom:SONet:APSMessages:SCODE?

Returns: <discrete>

:SOURCE:DATA:TELEcom:SONet:APSMessages:DOWNload

Start transmission of the SONET transmitter APS message. Only valid if :SOURCE:DATA:TELEcom:TFUNCTION <discrete> is set to SONet and :SOURCE:DATA:TELEcom:SONet:TFUNCTION:TYPE <discrete> is set to APSM.

SONET Command Reference

:SOURCE subsystem - Transmitter SONET Test Function Commands

:SOURCE:DATA:TELEcom:SONet:IDCC <discrete>

| | | |
|--------------|------|-------------|
| <discrete> = | SDCC | Section DCC |
| | LDCC | Line DCC |

Selects the Data Communication Channel Insert port when

:SOURCE:DATA:TELEcom:SONet:TFUNCTION:TYPE <discrete> is set to IDCC .

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

:SOURCE:DATA:TELEcom:SONet:IDCC?

Returns : <discrete>

:SOURCE:DATA:TELEcom:SONet:OBERtest:CHANnel <discrete>

| | | |
|--------------|-------------------------|------------------|
| <discrete> = | C1 J0 Z0 E1 F1 D1 D2 D3 | Section Overhead |
| | K1 K2 D4 D5 D6 D7 | Line Overhead |
| | D8 D9 D10 D11 D12 X22 | |
| | X23 X32 X33 | |
| | S1 Z1 M0/M1/Z2 E2 | |
| | J1 C2 G1 F2 H4 Z3 | Path Overhead |
| | Z4 N1 | |

Selects the TX overhead byte used for the overhead BER test when

:SOURCE:DATA:TELEcom:SONet:TFUNCTION:TYPE <discrete> is set to OBER.

M0 is valid at STS-1 only.

The corresponding query returns the overhead byte identity in discrete form as listed above.

:SOURCE:DATA:TELEcom:SONet:OBERtest:CHANnel?

Returns <discrete>

:SOURCE:DATA:TELEcom:SONet:OBERtest:STS1 <numeric>

<numeric> 1 to 3

SONET Command Reference

:SOURCE subsystem - Transmitter SONET Test Function Commands

Sets the STS-1 Number (within the currently selected STS-3) of the Section Overhead byte currently selected for the overhead bit transmitter error rate test function.

The command is only valid if :SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to OBER. It is only applicable when Z0 is selected by :SOURCE:DATA:TELEcom:SONet:OBERtest:CHANnel <discrete>

The corresponding query returns the STS-1 Number in numeric form as described above.

:SOURCE:DATA:TELEcom:SONet:OBERtest:STS1?

Returns: <numeric>

:SOURCE:DATA:TELEcom:SONet:OBERtest:STS3:SElect <numeric>

<numeric> = 1 to 16

Selects STS-3 number for channels that occur in more than one STS-3:

It is only applicable when Z0 is selected by

:SOURCE:DATA:TELEcom:SONet:OBERtest:CHANnel <discrete>

The corresponding query returns the STS-3 number in numeric form.

:SOURCE:DATA:TELEcom:SONet:OBERtest:STS3:SElect?

Returns: <numeric>

:SOURCE:DATA:TELEcom:SONet:OBERtest <discrete>

<discrete> = ONCE Single error

Injects a single overhead BER error when

SOURCE:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to OBER.

INPut subsystem

INPut subsystem

This subsystem controls the characteristics of the instrument's input ports.

:INPut:TELEcom:SONet:RATE <discrete>

| | | |
|--------------|------|------------------|
| <discrete> = | STS1 | STS-1 Electrical |
| | STS3 | STS-3 Electrical |

Is only valid when the SONET Module is fitted and
:SENSe:DATA:TELEcom:SENSe <discrete> is set to SONet.

The corresponding query returns the SONET rate in discrete short form.

:INPut:TELEcom:SONet:RATE?

Returns : <discrete>

:INPut:TELEcom:SONet:GAIN <discrete>

| | | |
|--------------|------|------------|
| <discrete> = | DB20 | 20 dB Gain |
| | DB26 | 26 dB Gain |

Selects the Monitor gain for the SONET receiver. Only valid when
:INPut:TELEcom:LEVel <discrete> is set to MON.

The corresponding query returns the Monitor gain in discrete short form.

:INPut:TELEcom:SONet:GAIN?

Returns: <discrete>

:INPut:TELEcom:OC48:RATE <discrete>

| | | |
|--------------|------|---------------|
| <discrete> = | OC1 | OC-1 optical |
| | OC3 | OC-3 Optical |
| | OC12 | OC-12 Optical |
| | OC48 | OC-48 Optical |

SENSe subsystem - Receiver SONET Settings

SONET Mapping settings

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

<numeric> = 1 to 16 STS-3 Number under test

Selects the STS-3 number under test. Only valid if :INPut:TELEcom:OC48:RATE <discrete> is set a rate higher than STS3.

The corresponding query returns the test STS3 number.

:SENSe:DATA:TELEcom:SONet:STS3?

Returns : <numeric>

:SENSe:DATA:TELEcom:SONet:STS12c <numeric>

<numeric> = 1 to 4 STS-12c Number under test

SONET Command Reference
SENSe subsystem - Receiver SONET Settings

SPE Layer Selection

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

<discrete> = STS3c
STS1
STS12c
STS48c

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:STS1 <numeric>

<numeric> = 1 to 3 STS1 Number

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>

VT Layer Selection

:SENSe:DATA:TELEcom:SONet:PAYLoad <discrete>

<discrete> = STS3C or M140 140 Mb/s
STS1 STM-0
VT2 or M2 2 Mb/s
VT6 VT-6
STS12c
STS48c

SENSe subsystem - Receiver SONET Settings

VT15 or DS1 VT-1.5

This command selects the SONET receiver mapping

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

:SENSe:DATA:TELEcom:SONet:PAYLoad?

Returns : <discrete>

Payload Layer Selection**:SENSe:DATA:TELEcom:SONet:MAPPING <discrete>**

| | | |
|--------------|------|------------------------------|
| <discrete> = | M140 | 140 Mb/s (STS3c only) |
| | M34 | 34 Mb/s (STS1 Full SPE only) |
| | DS3 | DS3 - (STS1 Full SPE only) |
| | BULK | Bulk Filled (STS1 or STS3c) |

Selects the Receiver SONET payload for single payload cases. Only valid if :SENSe:DATA:TELEcom:SONet:PAYLoad <discrete> is set to STS1 or STS3c.

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

:SENSe:DATA:TELEcom:SONet:MAPPING?

Returns: <discrete>

:SENSe:DATA:TELEcom:SONet:TRIButary:MAPPING <discrete>

| | | |
|--------------|------------------|-----------------------------|
| <discrete> = | ASYNc or ASM2 | Asynchronous 2 Mb/s |
| | FBYTe or FLM2 | 2 Mb/s Floating Byte |
| | DS1 or ASDS1 | Asynchronous 1.544 Mb/s DS1 |
| | BULK | Bulk Filled |

Selects the low order mapping. Only valid if

:SENSe:DATA:TELEcom:SONet:PAYLoad <discrete> is set to VT2 or VT15.

The corresponding query returns the low order mapping in discrete short form.

SENSe subsystem - Receiver SONET Settings

:SENSe:DATA:TELEcom:SONet:TRIButary:MAPPING?

Returns: <discrete>

:SENSe:DATA:TELEcom:SONet:PRIMary:TS0 <boolean>

<boolean> = 0 or OFF Data in TS0
1 or ON Signaling in TS0

Determines the content of TS0 as Data/Signaling.

The corresponding query returns the TS0 state in numeric form.

: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:TRIButary <numeric>

<numeric> = 1 to 3 Tributary number for VT-2
1 to 4 Tributary number for VT-15

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

The corresponding query returns the receiver test tributary in numeric form.

SONET Command Reference
SENSe subsystem - Receiver SONET Settings

:SENSe:DATA:TELEcom:SONet:TRIButary?

Returns : <numeric>

VT Payload and Test Pattern

:SENSe:DATA:TELEcom:SONet:PAYLoad:TYPE <discrete>

| | | |
|--------------|----------|------------------|
| <discrete> = | UNFRamed | No framing |
| | FRAMed | 8, 34 & 140 Mb/s |
| | PCM30 | 2 Mb/s |
| | PCM31 | 2 Mb/s |
| | PCM30CRC | 2 Mb/s |
| | PCM31CRC | 2 Mb/s |
| | DM2 | Drop 2 Mb/s |
| | DM34 | Drop 34 Mb/s |
| | DM140 | Drop 140 Mb/s |
| | D4 | DS1 Framing |
| | ESF | DS1 Framing |
| | SLC96 | DS1 Framing |
| | M13 | DS3 Framing |
| | CBIT | DS3 Framing |
| | DDS1 | Drop DS1 |
| | DDS3 | Drop DS3 |

To set the framing type to be structured use the command
:SENSe:DATA:TELEcom:SONet:PAYLoad:STRUcture <discrete>.

Only valid if a Structured PDH receiver is fitted.

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

SONET Command Reference
SENSe subsystem - Receiver SONET Settings

:SENSe:DATA:TELEcom:SONet:PAYLoad:TYPE?

Returns : <discrete>

:SENSe:DATA:TELEcom:SONet:PAYLoad:STRUcture <discrete>

| | | |
|--------------|--------------|--------------------|
| <discrete> = | UNSTRuctured | All rates |
| | STRUctured | All framed formats |

Determines whether the receiver is to expect any structure in the PDH payload.

The corresponding query returns the receiver structure setting in discrete form as listed above.

:SENSe:DATA:TELEcom:SONet:PAYLoad:STRUcture?

Returns: <discrete>

:SENSe:DATA:TELEcom:SONet:PAYLoad:PATtern <discrete>

| | | |
|--------------|--------|---|
| <discrete> = | PRBS9 | 2^9-1 |
| | PRBS11 | $2^{11}-1$ |
| | PRBS15 | $2^{15}-1$ |
| | PRBS20 | $2^{20}-1$ |
| | QRSS | $2^{20}-1$ with 14 consecutive zero limit (DS1 only) |
| | PRBS23 | $2^{23}-1$ |
| | AZERo | All Zero's |
| | AONE | All One's |
| | STRess | 3-in-24 stress pattern (DS1 only) (requires option 110) |
| | P1010 | Word 1010 |

SONET Command Reference
SENSe subsystem - Receiver SONET Settings

:SENSe:DATA:TELEcom:SONet:TRIButary:CONCatenate
<numeric>,<numeric>

| | | |
|--------------------------------|--------|-------------------|
| <numeric> = (first parameter) | 0 | Concatenation Off |
| | 2 | VT6-2c |
| | 3 | VT6-3c |
| | 4 | VT6-4c |
| | 5 | VT6-5c |
| | 6 | VT6-6c |
| <numeric> = (second parameter) | 1 to 6 | VT6-2c selected |
| | 1 to 5 | VT6-3c selected |
| | 1 to 4 | VT6-4c selected |
| | 1 to 3 | VT6-5c selected |
| | 1 to 2 | VT6-6c selected |

Selects the VT6 concatenation level (first parameter) and starting at the VT (second parameter).

The corresponding query returns the VT6 concatenation and starting VT in numeric form as listed above.

:SENSe:DATA:TELEcom:SONet:TRIButary:CONCatenate?

Returns : <numeric>,<numeric>

SENSe subsystem - Receiver SONET Test Function Commands

| | | |
|--------------|----------------------------------|------------------|
| <discrete> = | A1A2 J0 Z0 E1 F1 D1D3 | Section Overhead |
| | BND A1A2 X22 X23 X32 X33 | |
| | H1H2 K1K2 D4D12 S1 Z1 | Line Overhead |
| | Z2 M1 M0 E2 | |
| | J1 C2 G1 F2 H4 Z3 Z4 | Path Overhead |
| | N1 | |

Selects the overhead byte or bytes to be captured. Is only valid when :
SENSe:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to OCAP.

BND A1A2 selects the 6 middle A1A2 boundary bytes.

The corresponding query returns the byte(s) to be captured in discrete form as listed above.

:SENSe:DATA:TELEcom:SONet:OCAPture:OHBYte?

Returns: <discrete>

:SENSe:DATA:TELEcom:SONet:OCAPture:STS1 <numeric>

<numeric> = 1 to 3

Selects the Section overhead column from which to capture. This only applies to Z1 and Z2.

The corresponding query returns the column to be captured in numeric form.

:SENSe:DATA:TELEcom:SONet:OCAPture:STS1?

<numeric>= 1 to 3

:SENSe:DATA:TELEcom:SONet:OCAPture:STS3:SElect <numeric>

<numeric> = 1 to 16

Only valid if a rate higher than STS-3 is selected. Selects STS-3 number for channels that occur in more than one STS-3.

SENSe subsystem - Receiver SONET Test Function Commands

The corresponding query returns the STS-3 number in numeric form.

:SENSe:DATA:TELEcom:SONet:OCAPture:STS3:SElect?

Returns: <numeric>

:SENSe:DATA:TELEcom:SONet:OCAPture:TRIGger <discrete>

<discrete> = OFF
ON
ONNot On Not

Selects the Overhead Capture Trigger mode. If OFF is selected, capture begins immediately. If ON is selected, capture begins when the received data matches the pattern defined by :SENSe:DATA:TELEcom:SONet:OCAPture:TRIGger:PATtern <string>. If ONN is selected, capture begins when the received data does not match the pattern defined by

:SENSe:DATA:TELEcom:SONet:OCAPture:TRIGger:PATtern <string>.

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

:SENSe:DATA:TELEcom:SONet:OCAPture:TRIGger?

Returns : <discrete>

:SENSe:DATA:TELEcom:SONet:OCAPture:TRIGger:PATtern <string>

Sets the Overhead Capture Trigger Pattern to the hexadecimal value contained in the string. The number of hexadecimal characters in the string is dependent on the overhead byte or bytes selected.

Two hexadecimal characters are required per byte, for example:

E1 - 1 Byte - "00" to "FF"

D4D12 - 9 Bytes - "000000000000000000" to "FFFFFFFFFFFFFFFFFFFF"

Is only valid when : SENSe:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to OCAP and :SENSe:DATA:TELEcom:SONet:OCAPture:TRIGger <discrete> is set to ON or ONN

The corresponding query returns the Trigger Pattern selected, as a string as described above.

SENSe subsystem - Receiver SONET Test Function Commands

:SENSe:DATA:TELEcom:SONet:OCAPture:TRIGger:PATtern?

Returns : <string>

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

<discrete> = SDCC Section DCC
LDCC Line DCC

Selects the DataCommunications channel to be dropped via the rear panel DROP port. Is only valid when :SENSe:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to DDCC.

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

:SENSe:DATA:TELEcom:SONet:DDCC?

Returns : <discrete>

:SENSe:DATA:TELEcom:SONet:PGRaph:PTYPE <discrete>

<discrete> = STS3c
STS1
STS12c
STS48c
VT6
VT2
VT15

Selects the type of pointer to be captured for pointer graph.

The corresponding query returns the type of pointer, in discrete short form.

:SENSe:DATA:TELEcom:SONet:PGRaph:PTYPE?

Returns: <discrete>

:SENSe:DATA:TELEcom:SONet:PGRaph:CINterval <discrete>

<discrete> = SEC1 1 second interval

SENSe subsystem - Receiver SONET Test Function Commands

| | |
|-------|--------------------|
| SEC5 | 5 second interval |
| SEC20 | 20 second interval |
| MIN1 | 1 minute interval |
| MIN5 | 5 minute interval |
| MIN20 | 20 minute interval |

Selects the pointer graph capture interval.

The corresponding query returns the pointer graph capture interval, in discrete form as listed above.

:SENSe:DATA:TELEcom:SONet:PGRaph:CINterval?

Returns: <discrete>

:SENSe:DATA:TELEcom:SONet:OBERTest:STS3 <discrete>

<discrete> = C1/J0 | Z0 | E1 | F1 | D1 | D2 | Section Overhead
D3
K1 | K2 | D4 | D5 | D6 | D7 | D8 | Line Overhead
D9 | D10 | D11 | D12 | S1/Z1 |
M1/Z2 | M0 |
E2|X22|X23|X32|X33
J1 | C2 | G1 | F2 | H4 | Z3 | Z4 | Path Overhead
N1

Selects the overhead byte used for the overhead BER test. Is only valid when :
SENSe:DATA:TELEcom:SONet:TFUNction:TYPE <discrete>is set to OBER .

The corresponding query returns the Overhead byte name in discrete form as listed above.

:SENSe:DATA:TELEcom:SONet:OBERTest:STS3?

Returns: <discrete>

:SENSe:DATA:TELEcom:SONet:OBERTest:STS1 <numeric>

<numeric>= 1 to 3

SONET Command Reference

SENSe subsystem - Receiver SONET Test Function Commands

Sets the STS-1 Number (within the currently selected STS-3) of the Section overhead of the channel for the receiver overhead BER test function. This command is only valid if :SENSe:DATA:TELEcom:SONet:TFUNction:TYPE <discrete> is set to OBER and it is only applicable when Z0 is selected by :SENSe:DATA:TELEcom:SONet:OBERtest:CHANnel <discrete>.

The corresponding query returns the STS-1 Number in numeric form as listed above

:SENSe:DATA:TELEcom:SONet:OBERtest:STS1?

Returns: <numeric>

:SENSe:DATA:TELEcom:SONet:OBERtest:STS3:SElect <numeric>

<numeric> = 1 to 16

Only valid if a rate higher than STS-3 is selected. Selects STS-3 number for channels that occur in more than one STS-3. This command is only applicable when Z0 is selected by

:SENSe:DATA:TELEcom:SONet:OBERtest:CHANnel <discrete>.

The corresponding query returns the STS-3 number in numeric form.

:SENSe:DATA:TELEcom:SONet:OBERtest:STS3:SElect?

Returns: <numeric>

SONET Command Reference
SENSe subsystem - Alarm Scan Control

SENSe subsystem - Alarm Scan Control

:SENSe:DATA:TELEcom:SONet:ASCan:MODE <discrete>

| | | |
|--------------|-----------|----------------------------------|
| <discrete> = | AUTomatic | Automatic receiver configuration |
| | RSETtings | Fixed receiver configuration |

Selects the SONET alarm scan mode.

The corresponding query returns the alarm scan mode in discrete short form.

:SENSe:DATA:TELEcom:SONet:ASCan:MODE?

Returns: <discrete>

:SENSe:DATA:TELEcom:SONet:ASCan:BIP <discrete>

| | | |
|--------------|--------|---------------------------------|
| <discrete> = | OFF | Fail if Alarm |
| | GTE0 | Fail if alarm or any BIP error |
| | GTEE_6 | Fail if alarm or BIP ER > 10E-6 |
| | GTEE_3 | Fail if alarm or BIP ER > 10E-3 |

Selects the SONET alarm scan BIP error threshold.

The corresponding query returns the alarm scan BIP error threshold in discrete short form.

:SENSe:DATA:TELEcom:SONet:ASCan:BIP?

Returns: <discrete>

:SENSe:DATA:TELEcom:SONet:ASCan <boolean>

| | | |
|-------------|----------|-----------------------------|
| <boolean> = | 0 or OFF | Stop the current alarm scan |
| | 1 or ON | Start a new alarm scan |

Start/Stop the SONET alarm scan.

The corresponding query returns the alarm scan state as 0 or 1.

SONET Command Reference
SENSe subsystem - Alarm Scan Control

:SENSe:DATA:TELEcom:SONet:ASCan?

Returns: <boolean>

SENSe subsystem - SONET Tributary Scan Control

SENSe subsystem - SONET Tributary Scan Control**:SENSe:DATA:TELEcom:SONet:TSCan:PERiod <numeric>, <suffix>**

| | | |
|-------------|---------|---------|
| <numeric> = | 1 to 99 | |
| <suffix> = | d | Days |
| | h | Hours |
| | m | Minutes |
| | s | Seconds |

Sets the test duration for each tributary.

The corresponding query returns the test duration for each tributary.

:SENSe:DATA:TELEcom:SONet:SONet:TSCan:PERiod?

Returns: <numeric>,<suffix>

:SENSe:DATA:TELEcom:SONet:TSCan:BIP <discrete>

| | | |
|--------------|--------|------------------------|
| <discrete> = | GTE0 | Fail if any BIP error |
| | GTEE_6 | Fail if BIP ER > 10E-6 |
| | GTEE_3 | Fail if BIP ER > 10E-3 |

Selects the SONET tributary scan BIP error threshold.

The corresponding query returns the alarm scan BIP error threshold in discrete short form.

:SENSe:DATA:TELEcom:SONet:TSCan:BIP?

Returns: <discrete>

:SENSe:DATA:TELEcom:SONet:TSCan <boolean>

| | | |
|-------------|----------|---------------------------------|
| <boolean> = | 0 or OFF | Stop the current tributary scan |
| | 1 or ON | Start a new tributary scan |

Start/Stop the SONET tributary scan.

SONET Command Reference

SENSe subsystem - SONET Tributary Scan Control

The corresponding query returns the alarm scan state as 0 or 1.

:SENSe:DATA:TELeom:SONet:TSCan?

Returns: <boolean>

SENSe subsystem - Result Returning Commands

Frequency Results (SONET)

:SENSe:DATA? <"result">

| | | |
|----------|-------------------|------------------------------|
| Result = | "FREQUency:SONet" | RX SONET clock frequency |
| | "FOFPpm:SONet" | RX SONET clock offset in ppm |
| | "FOFHZ:SONet" | RX SONET clock offset in Hz |

SONET Short Term Results

:SENSe:DATA? <"result">

| | | |
|----------|----------------------------|-------------------------------|
| Result = | "ECOunt:SONet:STERm:FRAME" | Frame error count |
| | "ERATio:SONet:STERm:FRAME" | Frame error ratio |
| | "ECOunt:SONet:STERm:CVS" | Section B1 BIP error count |
| | "ERATio:SONet:STERm:CVS" | Section B1 BIP error ratio |
| | "ECOunt:SONet:STERm:CVL" | Line B2 BIP error count |
| | "ERATio:SONet:STERm:CVL" | Line B2 BIP error ratio |
| | "ECOunt:SONet:STERm:REIL" | REI-L (Line FEBE) error count |
| | "ERATio:SONet:STERm:REIL" | REI-L (Line FEBE) error ratio |
| | "ECOunt:SONet:STERm:CVP" | Path B3 BIP error count |
| | "ERATio:SONet:STERm:CVP" | Path B3 BIP error ratio |
| | "ECOunt:SONet:STERm:REIP" | REI-P (Path FEBE) error count |
| | "ERATio:SONet:STERm:REIP" | REI-P (Path FEBE) error ratio |
| | "ECOunt:SONet:STERm:CVIec" | CV-IEC error count |

SONET Command Reference
SENSe subsystem - Result Returning Commands

| | |
|--------------------------------|-------------------------|
| "ERATio:SONet:STERm:CVIec" | CV-IEC error ratio |
| "ECOut:SONet:STERm:TRIB:CVV" | VT Path BIP error count |
| "ERATio:SONet:STERm:TRIB:CVV" | VT Path BIP error ratio |
| "ECOut:SONet:STERm:TRIB:REIV" | VT FEBE error count |
| "ERATio:SONet:STERm:TRIB:REIV" | VT FEBE error ratio |

SONET Cumulative Results

:SENSe:DATA? <"result">

| | | |
|----------|--------------------------|-------------------------------|
| Result = | "ECOut:SONet:FRAMe" | Frame error count |
| | "ERATio:SONet:FRAMe" | Frame error ratio |
| | "ECOut:SONet:CVS" | Section B1 BIP error count |
| | "ERATio:SONet:CVS" | Section B1 BIP error ratio |
| | "ECOut:SONet:CVL" | Line B2 BIP error count |
| | "ERATio:SONet:CVL" | Line B2 BIP error ratio |
| | "ECOut:SONet:REIL" | REI-L (Line FEBE) error count |
| | "ERATio:SONet:REIL" | REI-L (Line FEBE) error ratio |
| | "ECOut:SONet:CVP" | Path B3 BIP error count |
| | "ERATio:SONet:CVP" | Path B3 BIP error ratio |
| | "ECOut:SONet:REIP" | REI-P (Path FEBE) error count |
| | "ERATio:SONet:REIP" | REI-P (Path FEBE) error ratio |
| | "ECOut:SONet:CVIec" | CV-IEC error count |
| | "ERATio:SONet:CVIec" | CV-IEC error ratio |
| | "ECOut:SONet:TRIB:CVV" | VT Path BIP error count |
| | "ERATio:SONet:TRIB:CVV" | VT Path BIP error ratio |
| | "ECOut:SONet:TRIB:REIV" | VT FEBE error count |
| | "ERATio:SONet:TRIB:REIV" | VT FEBE error ratio |
| | "ECOut:SONet:OVERhead" | Overhead error count |

SONET Command Reference
SENSe subsystem - Result Returning Commands

SONET Section B1 BIP (CV-S) Analysis Results

:SENSe:DATA? <"result">

| | | |
|---------|--------------------------------|-------------------------------|
| Result= | "ESECONDS:SONet:CVS:ANALYSIS" | Error Seconds |
| | "SESECONDS:SONet:CVS:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SONet:CVS:ANALYSIS" | Errored block count |
| | "BBECOUNT:SONet:CVS:ANALYSIS" | Background block error count |
| | "ESRATIO:SONet:CVS:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SONet:CVS:ANALYSIS" | Severely Errored Second Ratio |
| | "BBERATIO:SONet:CVS:ANALYSIS" | Background Block Error ratio |
| | "UASECONDS:SONet:CVS:ANALYSIS" | Unavailable seconds |

SONET Line B2 BIP (CV-L) Analysis Results

:SENSe:DATA? <"result">

| | | |
|---------|---------------------------------|-------------------------------|
| Result= | "ESECONDS:SONet:CVL:ANALYSIS" | Error Seconds |
| | "SESECONDS:SONet:CVL:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SONet:CVL:ANALYSIS" | Errored block count |
| | "BBECOUNT:SONet:CVL:ANALYSIS" | Background block error count |
| | "ESRATIO:SONet:CVL:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SONet:CVL:ANALYSIS" | Severely Errored Second Ratio |
| | "BBERATIO:SONet:CVL:ANALYSIS" | Background Block Error ratio |
| | "UASECONDS:SONet:CVL:ANALYSIS" | Unavailable seconds |
| | "PUASECONDS:SONet:CVL:ANALYSIS" | Path Unavailable seconds |

SONET Command Reference
SENSe subsystem - Result Returning Commands

SONET Line FEBE (REI-L) Analysis Results

:SENSe:DATA? <"result">

| | | |
|---------|----------------------------------|-------------------------------|
| Result= | "ESECONDS:SONet:REIL:ANALYSIS" | Error Seconds |
| | "SESECONDS:SONet:REIL:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SONet:REIL:ANALYSIS" | Errored block count |
| | "BBECOUNT:SONet:REIL:ANALYSIS" | Background block error count |
| | "ESRATIO:SONet:REIL:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SONet:REIL:ANALYSIS" | Severely Errored Second Ratio |
| | "BBERATIO:SONet:REIL:ANALYSIS" | Background Block Error ratio |
| | "UASECONDS:SONet:REIL:ANALYSIS" | Unavailable seconds |
| | "PUASECONDS:SONet:REIL:ANALYSIS" | Path Unavailable seconds |

SONET Path B3 BIP (CV-P) Analysis Results

:SENSe:DATA? <"result">

| | | |
|---------|---------------------------------|-------------------------------|
| Result= | "ESECONDS:SONet:CVP:ANALYSIS" | Error Seconds |
| | "SESECONDS:SONet:CVP:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SONet:CVP:ANALYSIS" | Errored block count |
| | "BBECOUNT:SONet:CVP:ANALYSIS" | Background block error count |
| | "ESRATIO:SONet:CVP:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SONet:CVP:ANALYSIS" | Severely Errored Second Ratio |
| | "BBERATIO:SONet:CVP:ANALYSIS" | Background Block Error ratio |
| | "UASECONDS:SONet:CVP:ANALYSIS" | Unavailable seconds |
| | "PUASECONDS:SONet:CVP:ANALYSIS" | Path Unavailable seconds |

SONET Command Reference
SENSe subsystem - Result Returning Commands

SONET Path FEBE (REI-P) Analysis Results

:SENSe:DATA? <"result">

| | | |
|---------|----------------------------------|-------------------------------|
| Result= | "ESECONDS:SONet:REIP:ANALYSIS" | Error Seconds |
| | "SESECONDS:SONet:REIP:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SONet:REIP:ANALYSIS" | Errored block count |
| | "BBECOUNT:SONet:REIP:ANALYSIS" | Background block error count |
| | "ESRATIO:SONet:REIP:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SONet:REIP:ANALYSIS" | Severely Errored Second Ratio |
| | "BBERATIO:SONet:REIP:ANALYSIS" | Background Block Error ratio |
| | "UASECONDS:SONet:REIP:ANALYSIS" | Unavailable seconds |
| | "PUASECONDS:SONet:REIP:ANALYSIS" | Path Unavailable seconds |

SONET CV-IEC Analysis Results

:SENSe:DATA? <"result">

| | | |
|---------|----------------------------------|-------------------------------|
| Result= | "ESECONDS:SONet:CVIec:ANALYSIS" | Error Seconds |
| | "SESECONDS:SONet:CVIec:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SONet:CVIec:ANALYSIS" | Errored block count |
| | "BBECOUNT:SONet:CVIec:ANALYSIS" | Background block error count |
| | "ESRATIO:SONet:CVIec:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SONet:CVIec:ANALYSIS" | Severely Errored Second Ratio |
| | "BBERATIO:SONet:CVIec:ANALYSIS" | Background Block Error ratio |
| | "UASECONDS:SONet:CVIec:ANALYSIS" | Unavailable seconds |

SONET Command Reference
SENSe subsystem - Result Returning Commands

SONET Virtual Tributary Path BIP (CV-V) Analysis Results

:SENSe:DATA? <"result">

| | | |
|---------|--------------------------------------|-------------------------------|
| Result= | "ESECONDS:SONet:TRIB:CVV:ANALYSIS" | Error Seconds |
| | "SESECONDS:SONet:TRIB:CVV:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SONet:TRIB:CVV:ANALYSIS" | Errored block count |
| | "BBECOUNT:SONet:TRIB:CVV:ANALYSIS" | Background block error count |
| | "ESRATIO:SONet:TRIB:CVV:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SONet:TRIB:CVV:ANALYSIS" | Severely Errored Second Ratio |
| | "BBERATIO:SONet:TRIB:CVV:ANALYSIS" | Background Block Error ratio |
| | "UASECONDS:SONet:TRIB:CVV:ANALYSIS" | Unavailable seconds |
| | "PUASECONDS:SONet:TRIB:CVV:ANALYSIS" | Path Unavailable seconds |

SONET Virtual Tributary Path FEBE (REI-V) Analysis Results

:SENSe:DATA? <"result">

| | | |
|----------|---------------------------------------|-------------------------------|
| Result = | "ESECONDS:SONet:TRIB:REIV:ANALYSIS" | Error Seconds |
| | "SESECONDS:SONet:TRIB:REIV:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SONet:TRIB:REIV:ANALYSIS" | Errored block count |
| | "BBECOUNT:SONet:TRIB:REIV:ANALYSIS" | Background block error count |
| | "ESRATIO:SONet:TRIB:REIV:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SONet:TRIB:REIV:ANALYSIS" | Severely Errored Second Ratio |
| | "BBERATIO:SONet:TRIB:REIV:ANALYSIS" | Background Block Error ratio |
| | "UASECONDS:SONet:TRIB:REIV:ANALYSIS" | Unavailable seconds |
| | "PUASECONDS:SONet:TRIB:REIV:ANALYSIS" | Path Unavailable seconds |

SONET Command Reference
SENSe subsystem - Result Returning Commands

SONET Block Based Bit Analysis Results

:SENSe:DATA? <"result">

| | | |
|----------|-----------------------------------|-------------------------------|
| Result = | "ESECONDS:SONet:BLKBit:ANALYSIS" | Error Seconds |
| | "SESECONDS:SONet:BLKBit:ANALYSIS" | Severely Errored Seconds |
| | "EBCOUNT:SONet:BLKBit:ANALYSIS" | Errored block count |
| | "BBECOUNT:SONet:BLKBit:ANALYSIS" | Background block error count |
| | "ESRATIO:SONet:BLKBit:ANALYSIS" | Error Second Ratio |
| | "SESRATIO:SONet:BLKBit:ANALYSIS" | Severely Errored Second Ratio |
| | "BBERATIO:SONet:BLKBit:ANALYSIS" | Background Block Error ratio |
| | "UASECONDS:SONet:BLKBit:ANALYSIS" | Unavailable seconds |

SONET M.2101 Analysis Results

:SENSe:DATA? <"result">

| | | |
|----------|---|--|
| Result = | "ESECONDS:SONet:LOW:RECEIVE:ANALYSIS:M2101" | Low Order Path Receive Direction Errored Seconds |
| | "SESECONDS:SONet:LOW:RECEIVE:ANALYSIS:M2101" | Low Order Path Receive Direction Severely Errored Seconds |
| | "UASECONDS:SONet:LOW:RECEIVE:ANALYSIS:M2101" | Low Order Path Receive Direction Unavailable Seconds |
| | "ESECONDS:SONet:LOW:TRANSMIT:ANALYSIS:M2101" | Low Order Path Transmit Direction Errored Seconds |
| | "SESECONDS:SONet:LOW:TRANSMIT:ANALYSIS:M2101" | Low Order Path Transmit Direction Severely Errored Seconds |
| | "UASECONDS:SONet:LOW:TRANSMIT:ANALYSIS:M2101" | Low Order Path Transmit Direction Unavailable Seconds |
| | "ESECONDS:SONet:HIGH:RECEIVE:ANALYSIS:M2101" | High Order Path Receive Direction Errored Seconds |

SONET Command Reference

SENSe subsystem - Result Returning Commands

| | |
|---|--|
| "SESeconds:SONet:HIGh:RECEive:ANALy sis:M2101" | High Order Path Receive Direction Severely Errored Seconds |
| "UASeconds:SONet:HIGh:RECEive:ANALy sis:M2101" | High Order Path Receive Direction Unavailable Seconds |
| "ESECONDS:SONet:HIGh:TRANsmIt:ANALy sis:M2101" | High Order Path Transmit Direction Errored Seconds |
| "SESeconds:SONet:HIGh:TRANsmIt:ANAL ysis:M2101" | High Order Path Transmit Direction Severely Errored Seconds |
| "UASeconds:SONet:HIGh:TRANsmIt:ANAL ysis:M2101" | High Order Path Transmit Direction Unavailable Seconds |
| "ESECONDS:SONet:SECTIon:RECEive:ANA Lysis:M2101" | Section Layer Path Receive Direction Errored Seconds |
| "SESeconds:SONet:SECTIon:RECEive:ANA Lysis:M2101" | Section Layer Path Receive Direction Severely Errored Seconds |
| "UASeconds:SONet:SECTIon:RECEive:ANA Lysis:M2101" | Section Layer Path Receive Direction Unavailable Seconds |
| "ESECONDS:SONet:SECTIon:TRANsmIt:AN ALysis:M2101" | Section Layer Path Transmit Direction Errored Seconds |
| "SESeconds:SONet:SECTIon:TRANsmIt:AN ALysis:M2101" | Section Layer Path Transmit Direction Severely Errored Seconds |
| "UASeconds:SONet:SECTIon:TRANsmIt:AN ALysis:M2101" | Section Layer Path Transmit Direction Unavailable Seconds |

SENSe subsystem - Result Returning Commands

SONET Service Disruption Results

:SENSe:DATA? <"result">

| | | |
|----------|---------------------|----------------------|
| Result = | "SDTest:COUNt:LONG" | Longest error burst |
| | SDTest:COUNt:SHORT" | Shortest error burst |
| | "SDTest:COUNt:LAST" | Last error burst |

Returns: <range>,<value>

| | | |
|-----------|---|--|
| <range> = | 0 | Result invalid due to receiver configuration |
| | 1 | Result valid |
| | 2 | Result out of range |

Value is returned in milliseconds. If the value is > 2000 or no result is available or the result is not applicable then 9.91E+37 is returned.

SONET Optical Power Result

:SENSe:DATA? <"result">

Result = "OPOWer:SONet" Optical power (dBm)

SONET Pointer Activity Results

:SENSe:DATA? <"result">

| | | |
|--------|-------------------------------|-----------------------------|
| Result | "PACTivity:SONet:PVALue" | SPE Pointer value |
| | "PACTivity:SONet:NDFSeconds" | SPE Pointer NDF seconds |
| | "PACTivity:SONet:MNDFseconds" | SPE Pointer MNDF seconds |
| | "PACTivity:SONet:PCOut" | SPE Pointer +ve Adj Count |
| | "PACTivity:SONet:PSEConds" | SPE Pointer +ve Adj Seconds |
| | "PACTivity:SONet:NCOunt" | SPE Pointer -ve Adj Count |

SONET Command Reference

SENSe subsystem - Result Returning Commands

| | |
|---|-----------------------------|
| "PACTivity:SONet:NSEConds" | SPE Pointer -ve Adj Seconds |
| "PACTivity:SONet:IOFFset" | Implied SPE Offset |
| "PACTivity:SONet:TRIButary:PVALue" | VT Pointer Value |
| "PACTivity:SONet:TRIButary:NDFSeconds" | VT Pointer NDF seconds |
| "PACTivity:SONet:TRIButary:MNDFseconds" | VT Pointer MNDF seconds |
| "PACTivity:SONet:TRIButary:PCOunt" | VT Pointer +ve Adj Count |
| "PACTivity:SONet:TRIButary:PSEConds" | VT Pointer +ve Adj Seconds |
| "PACTivity:SONet:TRIButary:NCOunt" | VT Pointer -ve Adj Count |
| "PACTivity:SONet:TRIButary:NSEConds" | VT Pointer -ve Adj Seconds |

SONET Alarm Seconds Results

:SENSe:DATA? <"result">

| | | |
|----------|----------------------------|-------------------------------|
| Result = | "ASEConds:SONet:LOS" | Loss Of Signal |
| | "ASEConds:SONet:LOF" | Loss Of Frame |
| | "ASEConds:SONet:SEF" | Severely Errored Frame Defect |
| | "ASEConds:SONet:H4MF" | H4 Multiframe Loss |
| | "ASEConds:SONet:LOPP" | Loss Of Pointer (LOP-P) |
| | "ASEConds:SONet:AISL" | Line AIS (AIS-L) |
| | "ASEConds:SONet:AISP" | Path AIS (AIS-P) |
| | "ASEConds:SONet:PSLoss" | Pattern Synchronization Loss |
| | "ASEConds:SONet:RDIL" | Line FERF (RDI-L) |
| | "ASEConds:SONet:RDIP" | Path FERF (RDI-P) |
| | "ASEConds:SONet:K1K2" | K1K2 byte change |
| | "ASEConds:SONet:TRIB:LOPV" | VT Loss Of Pointer (LOP-V) |
| | "ASEConds:SONet:TRIB:AISV" | VT Path AIS (AIS-V) |

SONET Command Reference

SENSe subsystem - Result Returning Commands

| | |
|----------------------------|----------------------------|
| "ASEConds:SONet:TRIB:RDIV" | VT Path FERF (RDI-V) |
| "ASEConds:SONet:OPSL" | Overhead Pattern Sync Loss |

FETCh subsystem

FETCh subsystem

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

:FETCh:STRing:DATA:TELEcom:SONet:J0?

Returns: <string>

The value of the STS-N Section overhead J0 byte is returned as a 16 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. This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SONet:J0:HEXadecimal?

Returns: <block>

Returns the value of the STS-N Section overhead J0 byte as 16 hexadecimal numbers if CRC7 is not detected, 15 hexadecimal numbers if CRC7 is detected. Each number is in the range "00" to "FF". The block header is " #216" if CRC7 not detected, " #215" if CRC7 is detected. This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SONet:J1?

Returns : <string>

The value of the SPE J1 path trace byte is returned as a, 64 ASCII character, string (15 ASCII characters if CRC7 is detected). If the string contains any non printing characters then ~ is substituted. This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SONet:J1:HEXadecimal?

Returns : <block>

Returns the value of the SPE J1 path trace byte as 64 hexadecimal numbers (15 if CRC7 is detected).

SONET Command Reference

FETCh subsystem

Each number is in the range "00" to "FF". The block header is "#264" (" #215" if CRC7 is detected). This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SONet:TRIButary:J2?

Returns: <string>

Returns the 15 or 16 byte J2 path trace as a string. The HP 37718A attempts to align the received pattern by detecting the CRC7 byte. If the CRC7 byte is detected, a 15 byte pattern is returned. If the CRC7 byte is not detected, a 16 byte pattern is returned. If the string contains any non-printing characters then ~ is substituted. This is a snapshot of the received path trace and is only updated once per second.

:FETCh:STRing:DATA:TELEcom:SONet:TRIButary:J2:HEXadecimal?

Returns: <block>

Returns the value of the J2 path trace byte as 15 or 16 hexadecimal numbers. The HP 37718A attempts to align the received pattern by detecting the CRC7 byte. If the CRC7 byte is detected, 15 hexadecimal numbers are returned. If the CRC7 byte is not detected, 16 hexadecimal numbers are returned. Each number is in the range "00" to "FF". The block header is "#215" if 15 Hex numbers and "#216" if 16 Hex numbers. This is a snapshot of the overhead byte and is captured once per second.

:FETCh:STRing:DATA:TELEcom:SONet:K1?

Returns : <string>

The value of the MPS K1 byte is returned as an 8 bit string in the range "00000000" to "11111111".

:FETCh:STRing:DATA:TELEcom:SONet:K2?

Returns : <string>

The value of the MPS K2 byte is returned as an 8 bit string in the range "00000000" to "11111111".

:FETCh:STRing:DATA:TELEcom:SONet:S1?

Returns : <string>

SONET Command Reference

FETCh subsystem

The value of the SYNC S1 byte (bits 5-8) is returned as a 4 bit string in the range "0000" to "1111".

:FETCh:SCALAr:DATA:TELEcom:SONet:OVERhead?

<numeric>,<numeric>,<discrete>

<numeric> range 1 to 16

=(STS3#)

<numeric> range 1 to 3

=(STS1#)

<discrete> = A1|A2|C1|J0/Z0|B1|E1|F1|D1|D2|D3|H1|H2
H3|B2|K1|K2|D4|D5|D6|D7|D8|D9|D10|D11
D12|S1/Z1|Z2/M1/M0|E2|X13|X21|X22|X23|X31
|X32|X33|X52|X53|X61|X62|X63|X71
|X72|X73|X81|X82|X83|X93

Returns the selected overhead byte as an 8 bit binary string in the range "00000000" to "11111111". The byte number is given by its defined name if it has one. Undefined bytes are represented by <Xrc>, 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. If an STS-3 signal is being transmitted, the only applicable value of STS3# is 1.

:ETCh:SCALAr:DATA:TELEcom:SONet:POVerhead:H4Sequence?

Returns: <string>

Obtains the length of the H4 byte sequence.

| | | | |
|-----------|------------|------|------------------|
| Returns : | <discrete> | LONG | Long sequence |
| | | SHOR | Short sequence |
| | | UNKN | Unknown sequence |

SONET Command Reference

FETCh subsystem

:FETCh:SCALar:DATA:TELEcom:SONet:POVerhead? <discrete>

<discrete> = J1|B3|C2|G1|F2|H4|Z3|Z4|N1

Obtains the value of the named path overhead byte. The value of the named byte is returned as a string in the range "00000000" to "11111111". This is a snapshot of the overhead byte and is captured once per second.

Returns: <string>

:FETCh:SCALar:DATA:TELEcom:SONet:TRIButary:POVerhead? <discrete>

<discrete> = V5|Z6|Z7 VT-6|VT-2|VT-1.5

Obtains the value of the specified path overhead byte. The value of the named byte is returned as a string in the range "00000000" to "11111111". This is a snapshot of the overhead byte and is captured once per second.

Returns: <string>

:FETCh:SCALar:DATA:TELEcom:SONet:TRIButary:POVerhead:SLABel?

Returns the signalling label of the selected tributary in numeric form.

Returns: <numeric>

:FETCh:ARRAy:DATA:TELEcom:SONet:ASCan?

Returns (each of one or more rows): <numeric>{,<numeric>}

The results returned are those for the last FULL scan. Results from partial scans are not available. If no full scan has been completed since the instrument was powered up, this command will return -1.

If data is available it is returned as a set of string arrays one for each scanned group. The arrays are separated by a CR/LF pair. A group is defined as a set of scanned paths at either the SPE or VT level. The arrays consist of comma separated numerics, one for each path scanned. The value of the numeric indicates the status of the scanned path. The following values are valid.

SONET Command Reference

FETCh subsystem

| Value | State |
|-------|---------------------------|
| 0 | No Problems Detected |
| 1 | Alarms or Errors Detected |
| 2 | Path Unequipped |
| 3 | Loss of Pointer |
| 4 | AIS |
| 5 | RDI |
| 6 | H4 Multiframe Loss |
| ? | Invalid |

For a specific signal structure, the format of the returned strings are shown below:

a) STS-3 STS-1 VT-6

This signal consists of 3 STS-1s each of which contains 7 VT-Groups. The VT-Groups's in turn each contain 1 VT-6. From the perspective of the Alarm Scan function the paths are 3 at the STS-1 level and 21 at the VT level. The STS-1 paths are defined as a group on their own while the 21 VTs are arranged as 3 groups of 7 paths with the groups corresponding to the STS-1 allocation. For this configuration, four arrays are returned with fomats shown below:

```
STS-3      -> STS1#1, STS1#2, STS1#3
STS-1 #1   -> VT#1,VT#2,VT#3,VT#4,VT#5,VT#6,VT#7
STS-1 #2   -> VT#1,VT#2,VT#3,VT#4,VT#5,VT#6,VT#7
STS-1 #3   -> VT#1,VT#2,VT#3,VT#4,VT#5,VT#6,VT#7
```

For Example, the output could look like:

```
0,1,1
1,1,1,0,0,1,0
2,2,2,2,2,2,2
0,0,0,0,1,0,0
```

b) STS-3 STS-1 Full SPE

This signal consists of 3 STS-1s each containing 1 Full SPE. In this configuration there are 3 paths, 3 at the STS-1 level and no lower paths. For this configuration, 3 arrays are returned with the following format:

SONET Command Reference

FETCh subsystem

```
STS-1      -> STS-1
VT-Group   -> [1-1],[1-2],[1-3],[2-1],[2-2],[2-3],[3-1],
               [3-2],[3-3],[4-1],[4-2],[4-3],[5-1],[5-2],
               [5-3],[6-1],[6-2],[6-3],[7-1],[7-2],[7-3]
```

The output will look like:

```
0
1,1,1,0,0,0,0,1,1,1,1,1,1,1,0,0,2,0,0,0,0
```

g) STS-1 VT-1.5

This signal again comprises 1 STS-1 containing 7 VT Groups. However, this time the VT Group's each contain 4 VT-1.5's. As before, the STS-1 path is defined as a group on its own, while the 7 VT-1.5 paths are also defined as one group. For this configuration, 2 groups are returned with the following format:

NOTE: VT-1.5's designated thus [VT-Group# - VT-1.5#]

```
STS-1      -> STS-1
VT-Group   -> [1-1],[1-2],[1-3],[1-4],[2-1],[2-2],[2-
               3],[2-4],[3-1],[3-2],[3-3],[3-4],[4-1],[4-2],[4-3],[4-
               4],[5-1],[5-2],[5-3],[5-4],[6-1],[6-2],[6-3],[6-4],[7-
               1],[7-2],[7-3],[7-4]
```

The output will look like:

```
0
1,1,1,1,0,0,0,0,0,1,1,1,1,1,1,1,1,1,0,0,0,2,0,0,0,0,0,1
```

h) Unrecognized Structure

When Alarm Scan is operating in AUTO mode, it is possible that due to various signal alarm conditions, it may not be able to determine the structure for a particular group of paths. When this occurs that group is marked as an "Unrecognized Structure". The string returned for such a group is the SCPI NAN - "9.91E+37"

:FETCh:ARRAy:DATA:TELEcom:SONet:TSCan?

Returns (each of one or more rows): <numeric>{,<numeric>}

The results returned are those for the last FULL scan. Results from partial scans are not available. If no full scan has been completed since the instrument was powered up, this command will return -1.

SONET Command Reference

FETCh subsystem

If data is available it is returned as a set of string arrays one for each scanned group. The arrays are separated by a CR/LF pair. A group is defined as a set of scanned paths at either the STS or VT level. The arrays consist of comma separated numerics, one for each tributary scanned. The value of the numeric indicates the status of the scanned tributary. The following values are valid.

| Value | State |
|-------|---------------------------|
| 0 | No Problems Detected |
| 1 | Alarms or Errors Detected |

For a specific signal structure, the format of the returned strings are shown below:

a) STS-1 VT-6

This signal consists of 1 STS-1 containing 7 VT-Groups. Each VT-Group contains 1 VT-6. There are therefore 7 tributaries to be scanned. These are defined as one group and hence for this configuration, 1 array is returned with the following format:

STS-1 -> VT6#1, VT6#2, VT6#3, VT6#4, VT6#5, VT6#6, VT6#7

The output will look like:

1,1,1,0,0,0,0

b) STS-1 VT-2

This signal again comprises 1 STS-1 containing 7 VT-Groups. However, this time the VT-Groups each contain 3 VT-2's. There are therefore 21 (7*3) tributaries to be scanned. These are defined as one group and are returned in the following format:

NOTE: VT-2's designated thus [VT-Group# - VT-2#]

STS-1 -> [1-1],[1-2],[1-3],[2-1],[2-2],[2-3],[3-1],
[3-2],[3-3],[4-1],[4-2],[4-3],[5-1],[5-2],
[5-3],[6-1],[6-2],[6-3],[7-1],[7-2],[7-3]

The output will look like:

1,1,1,0,0,0,0,1,1,1,1,1,1,1,0,0,1,0,0,0,0

SONET Command Reference

FETCh subsystem

c) STS-1 VT-1.5

This signal again comprises 1 STS-1 containing 7 VT-Groups. However, this time the VT-Group's each contain 4 VT-1.5's. There are therefore 28 (7*4) tributaries to be scanned. These are defined as one group and are returned in the following format:

NOTE: VT-1.5's designated thus [VT-Group# - VT-1.5#]

```
STS-1      -> [1-1],[1-2],[1-3],[1-4],[2-1],[2-2],[2-3],[2-4],[3-1],[3-2],[3-3],[3-4],[4-1],[4-2],[4-3],[4-4],[5-1],[5-2],[5-3],[5-4],[6-1],[6-2],[6-3],[6-4],[7-1],[7-2],[7-3],[7-4]
```

The output will look like:

```
1,1,1,0,0,0,0,1,1,1,1,1,1,1,0,0,1,0,0,0,0
```

2) STS-12/OC-12

For the STS-12/OC-12 situation, the formats are similar to those defined above for STS-1/STS-3 except that there will be data returned for all four STS-3's in the signal.

Consider a STS-12 signal with a STS-3C structure. In the STS-3 case this structure would not be considered since there is only one tributary in the signal. However in the STS-12/OC-12 case there are 4 tributaries and the scan is carried out.

In this case each STS-3C is treated as a separate group, hence 4 arrays are returned from the SCPI command:

```
STS-3 #1 STS-3C
STS-3 #2 STS-3C
STS-3 #3 STS-3C
STS-3 #4 STS-3C
```

The output will look like:

```
0
0
1
1
```

:FETCh:ARRay:DATA:TELEcom:SONet:PGRaph?

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

SONET Command Reference

FETCh subsystem

Returns an array of 576 bytes, 2 bytes for each of the possible 288 points on the displayed pointer graph. The 2 bytes at each point indicate the maximum and minimum offset at that point. Each byte has 3 numeric entries separated by commas.

The value of the 3 numeric entries, <range bit>,<validity bit>,<offset value>, provide the following information:

| Range bit | Validity Bit | Offset Value | Description |
|-----------|--------------|--------------|---------------------------|
| 1 | 1 | -18 to +18 | Valid in range result |
| 1 | 0 | 0 | No measurement |
| 1 | 1 | 9.91E+37 | Alarms during measurement |
| 2 | 1 | 0 | Offset out of range > +18 |
| 0 | 1 | 0 | Offset out of range < -18 |

The graph entries are arranged as shown below. Each entry has the format previously described above:

```
<max offset 1>,<min offset 1>,<max offset 2>,<min offset 2>,  
<max offset 3>,<min offset 3>,<max offset 4>,<min offset 4>,  
<max offset 5>,<min offset 5>,<max offset 6>,<min offset 6>,  
.....  
.....  
<max offset 287>,<min offset 287>,<max offset 288>,<min offset 288>
```

Range of valid offset values is -18 thru +18

A typical return array might look like:

```
1,1,9.91E+37,1,1,9.91E+37,1,1, 0,1,1, 0,1,1, +1,1,1, -2, etc....
```

:FETCh:ARRAy:DATA:TELEcom:SONet:OCAPture? <numeric>

| | | |
|------------|---------|-----------------------------|
| <numeric = | 1 to 8 | D4D12 and A1A2 |
| | 1 to 16 | All other Overhead Channels |

Returns (each of one or more rows): <string>,<numeric> ,

(last row): <string>,<numeric>

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

SONET Command Reference

FETCh subsystem

Each entry consists of an alphanumeric string and a numeric separated by commas. The alphanumeric string provide the hexadecimal value of the captured data. The length of the string depends upon the overhead channel selected for capture, two hexadecimal characters/overhead byte. The numeric indicates the number of frames for which the captured data existed. If this command is issued when a capture is being performed, some entries will contain no data. In this case 9.91E+37 is returned.

The overhead byte or bytes to be captured is specified by :SENS:DATA:TEL:OCAP:CHAN <channel>.

:FETCh:ARRay:DATA:TELEcom:SONet:POVerhead? <numeric>

<numeric> = 1 to 9

Returns the value of the selected path overhead bytes as an array of strings. Each string is in the range "00000000" to "11111111". This is a snapshot of the overhead byte and is captured once per second.

The array always begins with byte 1 of the path overhead and ends with the byte number specified by <numeric>.

Byte Order: (1) J1 (2) B3 (3) C2 (4) G1 (5) F2 (6) H4 (7) Z3 (8) Z4 (9) N1.

Returns: <string>{,<string>}

**:FETCh:ARRay:DATA:TELEcom:SONet:OVERhead? <numeric><numeric>
<numeric>**

<numeric> = 1 to 27 (Byte Number)
(first parameter)

<numeric> = 1 to 16 (STS-3 number)
(second parameter)

<numeric> = 1 to 3 (STS-1 number)
(third parameter)

Returns the value of the selected transport overhead bytes as an array of strings. Each string is in the range "00000000" to "11111111". This is a snapshot of the overhead byte and is captured once per second.

The array always begins with byte 1 of the transport overhead and ends with the byte number specified by the first parameter.

SONET Command Reference

FETCh subsystem

| Number | Name | Number | Name | Number | Name |
|--------|-------|--------|------|--------|----------|
| 1 | A1 | 10 | H1 | 19 | D7 |
| 2 | A2 | 11 | H2 | 20 | D8 |
| 3 | J0/Z0 | 12 | H3 | 21 | D9 |
| 4 | B1 | 13 | B2 | 22 | D10 |
| 5 | E1 | 14 | K1 | 23 | D11 |
| 6 | F1 | 15 | K2 | 24 | D12 |
| 7 | D1 | 16 | D4 | 25 | S1/Z1 |
| 8 | D2 | 17 | D5 | 26 | M0/M1/Z2 |
| 9 | D3 | 18 | D6 | 27 | E2 |

Returns (each of one or more rows): <string>,{<string>}

Status Reporting

Status Reporting

Status Reporting

The status reporting capability of the HP 37718A is provided by the Status Registers and the Status Byte. The STATus subsystem and some IEEE common capability commands control the status registers and the status byte.

Table 6-1 **Status Registers**

The following status registers are provided in the HP 37718A and conform to IEEE 488.2:

| Status Register | Description |
|------------------------|--|
| Standard Event | This register is accessed by issuing the *ESR? common capability command. |
| QUESTionable | Defined by SCPI. |
| OPERation | Defined by SCPI. |
| INSTrument | Monitors general instrument conditions and summarizes the DISK status register. |
| DATA | Summarizes the PDH, FAS, SPDH, SDH, SDH2, SONet, SONet2 and BIN status registers. |
| FAS | Monitors the condition of the Unstructured PDH FAS signal. (UPDH option). |
| SPDH | Summarizes the M140 , M34, M8, M2, DS3, DS2 and DS1 status registers. (SPDH option). |
| M140 | Monitors the condition of the Structured PDH 140 Mb/s signal. (SPDH option). |
| M34 | Monitors the condition of the Structured PDH 34 Mb/s signal. (SPDH option). |
| M8 | Monitors the condition of the Structured PDH 8 Mb/s signal. (SPDH option). |

Status Reporting

| Status Register | Description |
|------------------------|--|
| M2 | Monitors the condition of the Structured PDH 2 Mb/s signal. (SPDH option). |
| DS1 | Monitors the condition of the Structured PDH DS1 signal. (SPDH option). |
| DS2 | Monitors the condition of the Structured PDH DS2 signal. (SPDH option). |
| DS3 | Monitors the condition of the Structured PDH DS3 signal. (SPDH option). |
| SDH/SONET | Monitors the primary conditions of the SDH/SONET signal. (SDH/SONET option). |
| SDH2/SONET2 | Monitors miscellaneous SDH/SONET conditions. (SDH/SONET option). |
| DISK | Monitors the disk activity. |

Status Reporting

General Status Register

The status registers conform to IEEE 488.2 and each comprises 4 registers as shown in Figure 6-1.

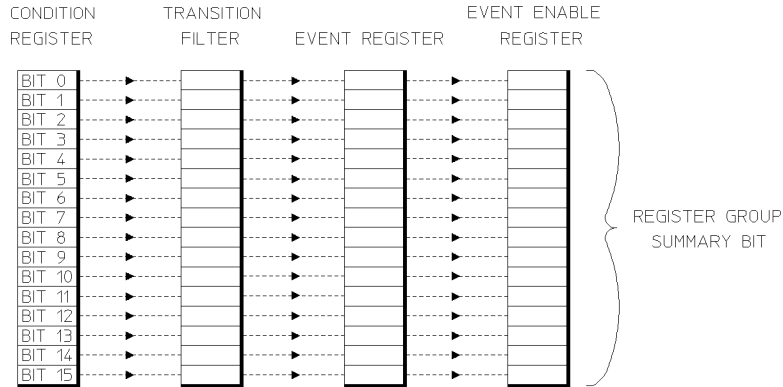


Figure 6-1

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 sets the Event register.

Event Register

Latches the transient states that occur in the Condition register as specified by the Transition Filter.

Event Enable Register

Acts like a mask on the Event register. It determines which bits in the Event register set the summary bit in the Status Byte.

Status Reporting

Status Byte

*STB? or a serial poll - 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 all output messages are read from the HP 37718A.

DB5 ESR - Event status register summary. Indicates that a bit has been set in the Event status register.

DB6 RQS - Request Service. Set when an SRQ is generated for whatever reason. Cleared by SPOLL or *STB?.

DB7 OPER - OPERation status register summary. Indicates that a bit has been set in the OPERation status register.

Status Reporting

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.

Status Reporting

QUEStionable Status Register

Provides a summary of the DATA status register.

:STATus:QUEStionable:EVENT? - Returns the QUEStionable Status Register value in numeric form.

:STATus:QUEStionable:ENABle <numeric> - Sets the event enable register mask.

:STATus:QUEStionable:ENABle? - Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|------|-----|
| - | CMW | - | - | - | - | DATA | - |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| - | - | - | - | - | - | - | - |

DB0 - DB8 Not used, always read as 0.

DB9 DATA - DATA status register summary.

DB10 - DB13 Not used, always read as 0.

DB14 CMW - Command Warning

DB15 Not used, always reads as 0.

Status Reporting

OPERation Status Register

Provides a summary of the INSTRument status register, and reports when a measurement is being made.

:STATus:OPERation:EVENT? - Returns the OPERation Status Register value in numeric form.

:STATus:OPERation:ENABLE <numeric> - Sets the event enable register mask.

:STATus:OPERation:ENABLE? - Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|-----|-----|
| - | - | INST | - | - | - | - | - |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|-----|------|-----|-----|-----|-----|
| - | - | - | MEAS | - | - | - | - |

DB0 - DB3 Not used, always reads as 0.

DB4 MEAS - Measuring. Currently making a measurement.

DB5 - DB12 Not used, always read as 0.

DB13 INST - INSTRument status register summary.

DB14 - DB15 Not used, always read as 0.

Status Reporting

INSTRUMENT Status Register

Reports the instrument status.

:STATUS:INSTRUMENT:EVENT? - Returns the INSTRUMENT Status Register value in numeric form.

:STATUS:INSTRUMENT:ENABLE <numeric> - Sets the event enable register mask.

:STATUS:INSTRUMENT:ENABLE? - Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|-----|-----|
| - | - | - | - | - | - | - | - |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|------|-----|-----|-----|-----|-----|-----|-----|
| DISK | STP | STC | - | - | EOT | LQE | SMG |

- DB0** SMG - Graphics Results enabled.
- DB1** LQE - Logging Queue Empty.
- 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 - Short Term Period complete.
- DB7** DISK - Disk status register summary.
- DB8 - DB15** Not used, always read as 0.

Status Reporting

DATA Status Register

Summarizes the alarm status registers shown. In addition provides a Power Failed alarm indication.

:STATUS:DATA:EVENT? - Returns the DATA Status Register value in numeric form.

:STATUS:DATA:ENABLE <numeric> - Sets the event enable register mask.

:STATUS:DATA:ENABLE? - Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|-----|-----|
| - | PWF | - | - | - | - | - | - |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|------|------|------|-----|-----|-----|
| - | - | SPDH | JITT | SDH2 | SDH | FAS | - |

| | |
|------------------|--|
| DB0 | Not used |
| DB1 | FAS - FAS status register summary. |
| DB2 | SDH - SDH status register summary. |
| DB3 | SDH2 - SDH2 status register summary. |
| DB4 | JITT - JITTter status register summary. |
| DB5 | SPDH - SPDH status register summary. |
| DB6 | Not used |
| DB7 | Reserved for future use, always read as 0. |
| DB8 | Not used |
| DB9 | Reserved for future use, always read as 0. |
| DB10-DB13 | Not used, always read as 0. |
| DB14 | PWF - Power Failed during measurement. |
| DB15 | Not used, always read as 0. |

Status Reporting

ISUMmary Status Register

Provides alarm indications summarised from SDH/SONET and SPDH status registers and should be used in preference to the SDH/SONET and SPDH status registers.

This register provides a summary of the SDH/SONET and SPDH status registers for each of the conditions shown below. Use this register to determine the status of the instrument independent of its configuration. It is recommended that for pattern loss in particular this register is used in preference to the SDH/SONET and SPDH registers as this removes the dependence on receiver payload selection.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|-----|-----|
| - | ERR | PSL | - | - | - | | |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| - | - | LOP | FAR | AIS | LOF | LOS | PLO |

| | |
|-------------|--------------------------------|
| DB0 | PLO - Power Loss. |
| DB1 | LOS - LOss of Signal. |
| DB2 | LOF - Loss of frame. |
| DB3 | AIS - Alarm indication signal. |
| DB4 | FAR - Far end alarms. |
| DB5 | LOP - Loss of pPointer. |
| DB6 | Not used |
| DB7 | Not used |
| DB8 | Not used |
| DB9 | Not used |
| DB10 | Not used |
| DB11 | Not used |
| DB12 | Not used |
| DB13 | PSL - Pattern sync loss. |
| DB14 | ERR - Errors detected. |
| DB15 | Not used |

Status Reporting

SDH Status Register

Provides primary alarm indications related to the SDH signal.

:STATUS:SDH:EVENT? - Returns the SDH Status Register value in numeric form.

:STATUS:SDH:ENABLE <numeric> - Sets the event enable register mask.

:STATUS:SDH:ENABLE? - Returns the current mask setting in numeric form.

| | | | | | | | |
|------|------|-------|-------|-------|-------|-------|-----|
| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
| - | ERR | LPRDI | TUAIS | TULOP | HPRDI | MSRDI | H4 |

| | | | | | | | |
|-----|-----|-------|-------|-----|-----|-----|-----|
| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
| CSL | PSL | AUAIS | MSAIS | LOP | OOF | LOF | LOS |

| | |
|-------------|--|
| DB0 | LOS - Loss Of Signal. |
| DB1 | LOF - Loss Of Frame. |
| DB2 | OOF - Out Of Frame. |
| DB3 | LOP - Loss Of Pointer. |
| DB4 | MSAIS - Multiplexer Section AIS. |
| DB5 | AUAIS - AU AIS. (Formerly Path AIS). |
| DB6 | PSL - Pattern Synchronization Loss. |
| DB7 | CSL - Clock Synchronization Loss. |
| DB8 | H4 - H4 LOM. |
| DB9 | MSRDI - Multiplexer Section RDI. (Formerly MS FERF). |
| DB10 | HPRDI - High Order Path RDI. (Formerly Path FERF). |
| DB11 | TULOP - Tributary Loss Of Pointer. |
| DB12 | TUAIS - Tributary Path AIS. |
| DB13 | LPRDI - Low Order Path FERF. (Formerly TU FERF). |
| DB14 | ERR - Errors Alarm. |
| DB15 | Not used, always read as 0. |

Status Reporting

SDH2 Status Register

Provides miscellaneous SDH monitoring.

:STATUS:SDH2:EVENT? - Returns the SDH2 Status Register value in numeric form.

:STATUS:SDH2:ENABLE <numeric> - Sets the event enable register mask.

:STATUS:SDH2:ENABLE? - Returns the current mask setting in numeric form.

| | | | | | | | |
|------|------|------|------|------|------|-----|-----|
| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
| - | BDL | BCL | PSA | RAS | TAS | PSI | FMU |

| | | | | | | | |
|------|------|-------|------|-------|------|-----|------|
| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
| ALSC | K1K2 | TMNDF | TNDF | TPADJ | MNDF | NDF | PADJ |

| | |
|-------------|---|
| 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 | ALSC - SDH Alarm/Trib scan in progress. |
| DB8 | FMU - Frequency Measurement Update. |
| DB9 | PSI - TX pointer sequence initialization. |
| DB10 | TAS - TX Async 2 Mb/s Settling. |
| DB11 | RAS - RX Async 2 Mb/s Settling. |
| DB12 | PSA - TX pointer sequence active. |
| DB13 | BCL - SDH Binary Clock Loss. |
| DB14 | BDL - SDH Binary Data Loss. |
| DB15 | Not used, always read as 0. |

Status Reporting

SONet Status Register

Provides primary alarm indications related to the SONET signal.

:STATUS:SONet:EVENT? - Returns the SONET Status Register value in numeric form.

:STATUS:SONet:ENABLE <numeric> - Sets the event enable register mask.

:STATUS:SONet:ENABLE? - Returns the current mask setting in numeric form.

| | | | | | | | |
|------|------|------|------|------|------|------|-----|
| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
| - | ERR | RDIV | AISV | LOPV | RDIP | RDIL | H4 |

| | | | | | | | |
|-----|-----|------|------|------|-----|-----|-----|
| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
| CSL | PSL | AISP | AISL | LOPP | SEF | LOF | LOS |

| | |
|-------------|--------------------------------------|
| DB0 | LOS - Loss Of Signal. |
| 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 | PSL - Pattern Synchronization Loss. |
| DB7 | CSL - Clock Synchronization Loss. |
| DB8 | H4 - H4 LOM. |
| 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 | ERR - Errors Alarm. |
| DB15 | Not used, always read as 0. |

Status Reporting

SONet2 Status Register

Provides miscellaneous SONet monitoring.

:STATus:SONet2:EVENT? - Returns the SONet2 Status Register value in numeric form.

:STATus:SONet2:ENABLE <numeric> - Sets the event enable register mask.

:STATus:SONet2:ENABLE? - Returns the current mask setting in numeric form.

| | | | | | | | |
|------|------|------|------|------|------|-----|-----|
| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
| - | BDL | BCL | PSA | RAS | TAS | PSI | FMU |

| | | | | | | | |
|------|------|-------|------|-------|------|-----|------|
| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
| ALSC | K1K2 | TMNDF | TNDF | TPADJ | MNDF | NDF | PADJ |

| | |
|-------------|---|
| 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 | ALSC - SONET Alarm/Trib scan in progress. |
| DB8 | FMU - Frequency Measurement Update. |
| DB9 | PSI - TX pointer sequence initialization. |
| DB10 | TAS - TX Async 2 Mb/s Settling. |
| DB11 | RAS - RX Async 2 Mb/s Settling. |
| DB12 | PSA - TX pointer sequence active. |
| DB13 | BCL - SONET Binary Clock Loss. |
| DB14 | BDL - SONET Binary Data Loss. |
| DB15 | Not used, always read as 0. |

Status Reporting

SPDH Status Register

Provides alarm indications related to the Structured PDH signal.

:STATUS:SPDH:EVENT? - Returns the SPDH Status Register value in numeric form.

:STATUS:SPDH:ENABLE <numeric> - Sets the event enable register mask.

:STATUS:SPDH:ENABLE? - Returns the current mask setting in numeric form.

| | | | | | | | |
|------|------|------|------|------|------|-----|-----|
| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
| - | ERR | PSL | ILOS | IPES | DPES | FMU | LOC |

| | | | | | | | |
|-----|------|-----|-----|-----|-----|-----|------|
| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
| DS2 | ALSC | 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 | ALSC - PDH Alarm Scan in progress. |
| DB7 | DS2 - DS2 status register summary. |
| DB8 | LOC - VCXO Lock Loss. Cleared when the VCXO has locked |
| DB9 | FMU - Frequency Measurement in progress. Cleared when the frequency measurement result has updated. |
| DB10 | DPES - 2 Mb/s Drop Port Elastic Store settled. |
| DB11 | IPES - 2 Mb/s Insert Port Elastic Store settled. |
| DB12 | ILOS - 2 Mb/s Insert Port Loss of Signal. |
| DB13 | PSL - Pattern Synchronization loss. |
| DB14 | ERR - Errors present. |
| DB15 | Not used, always read as 0. |

Status Reporting

M140 Status Register

Provides alarm indications related to the Structured PDH 140 Mb/s signal.

:STATus:M140:EVENT? - Returns the M140 Status Register value in numeric form.

:STATus:M140:ENABle <numeric> - Sets the event enable register mask.

:STATus:M140:ENABle? - Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|-----|-----|
| - | - | DEFO | IEFO | MIN | RAI | - | - |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| - | - | AIS | - | - | - | LOF | LOS |

DB0 LOS - Loss Of Signal.

DB1 LOF - Loss Of Frame.

DB2 -DB4 Not used, always read as 0.

DB5 AIS - Alarm Indication Sequence.

DB6 - DB9 Not used, always read as 0.

DB10 RAI - Remote Alarm.

DB11 MIN - Minor Alarm.

DB12 IEFO - Insert port Excess Frequency Offset.

DB13 DEFO - Drop port Excess Frequency Offset.

DB14 - DB15 Not used, always read as 0.

Status Reporting

M34 Status Register

Provides alarm indications related to the Structured PDH 34 Mb/s signal.

:STATUS:M34:EVENT? - Returns the M34 Status Register value in numeric form.

:STATUS:M34:ENABLE <numeric> - Sets the event enable register mask.

:STATUS:M34:ENABLE? - Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|-----|-----|
| - | - | DEFO | IEFO | MIN | RAI | - | - |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| - | - | AIS | - | - | - | LOF | LOS |

DB0 LOS - Loss Of Signal.

DB1 LOF - Loss Of Frame.

DB2 -DB4 Not used, always read as 0.

DB5 AIS - Alarm Indication Sequence.

DB6 - DB9 Not used, always read as 0.

DB10 RAI - Remote Alarm.

DB11 MIN - Minor Alarm.

DB12 IEFO - Insert port Excess Frequency Offset.

DB13 DEFO - Drop port Excess Frequency Offset.

DB14 - DB15 Not used, always read as 0.

Status Reporting

M8 Status Register

Provides alarm indications related to the Structured PDH 8 Mb/s signal.

:STATUS:M8:EVENT? - Returns the M8 Status Register value in numeric form.

:STATUS:M8:ENABLE <numeric>- Sets the event enable register mask.

:STATUS:M8:ENABLE?- Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|-----|-----|
| - | - | - | - | MIN | RAI | - | - |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| - | - | AIS | - | - | - | LOF | LOS |

DB0 LOS - Loss Of Signal.

DB1 LOF - Loss Of Frame.

DB2 -DB4 Not used, always read as 0.

DB5 AIS - Alarm Indication Sequence.

DB6 - DB9 Not used, always read as 0.

DB10 RAI - Remote Alarm.

DB11 MIN - Minor Alarm.

DB12 - DB15 Not used, always read as 0.

Status Reporting

M2 Status Register

Provides alarm indications related to the Structured PDH 2 Mb/s signal.

:STATUS:M2:EVENT? - Returns the M2 Status Register value in numeric form.

:STATUS:M2:ENABLE <numeric> - Sets the event enable register mask.

:STATUS:M2:ENABLE? - Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|-----|-----|
| - | - | - | - | MIN | RAI | - | - |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|-----|-----|-----|------|-----|-----|
| - | - | AIS | CRC | CAS | RMFR | LOF | LOS |

| | |
|--------------------|----------------------------------|
| DB0 | LOS - Loss Of Signal. |
| DB1 | LOF - Loss Of Frame. |
| DB2 | RMFR - Remote Multiframe Alarm. |
| DB3 | CAS - CAS Multiframe Loss. |
| DB4 | CRC - CRC4 Multiframe Loss. |
| DB5 | AIS - Alarm Indication Sequence. |
| DB6 - DB9 | Not used, always read as 0. |
| DB10 | RAI - Remote Alarm. |
| DB11 | MIN - Minor Alarm. |
| DB12 - DB15 | Not used, always read as 0. |

Status Reporting

DS3 Status Register

Provides alarm indications related to the Structured PDH DS3 signal.

:STATus:DS3:EVENT? - Returns the DS3 Status Register value in numeric form.

:STATus:DS3:ENABle <numeric> - Sets the event enable register mask.

:STATus:DS3:ENABle? - Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|------|------|
| - | FMM | IDLE | EXZ | - | RAI | DEFO | IEFO |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| - | - | AIS | MFM | - | OOF | - | LOS |

DB0 LOS - Loss Of Signal.

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 - DB7 Not used, always read as 0.

DB8 IEFO - Insert port Excess Frequency Offset.

DB9 DEFO - Drop port Excess Frequency Offset.

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.

Status Reporting

DS2 Status Register

Provides alarm indications related to the Structured PDH DS2 signal.

:STATUS:DS2:EVENT? - Returns the DS2 Status Register value in numeric form.

:STATUS:DS2:ENABLE <numeric> - Sets the event enable register mask.

:STATUS:DS2:ENABLE? - Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|-----|-----|
| - | - | - | - | - | - | - | - |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| - | - | - | - | - | OOF | - | - |

DB2

OOF - Out Of Frame.

Status Reporting

DS1 Status Register

Provides alarm indications related to the Structured PDH DS1 signal.

:STATus:DS1:EVENT? - Returns the DS1 Status Register value in numeric form.

:STATus:DS1:ENABle <numeric> - Sets the event enable register mask.

:STATus:DS1:ENABle? - Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|-----|-----|
| - | - | IDLE | EXZ | - | RAI | - | - |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| - | - | AIS | - | - | OOF | - | LOS |

| | |
|------------------|----------------------------------|
| DB0 | LOS - Loss Of Signal. |
| DB1 | Not used, always read as 0. |
| DB2 | OOF - Out Of Frame |
| DB3 - DB4 | Not used, always read as 0. |
| DB5 | AIS - Alarm Indication Sequence. |
| DB6 - DB9 | Not used, always read as 0. |
| DB10 | RAI - Remote Alarm. (FERF). |
| DB11 | Not used, always read as 0. |
| DB12 | EXZ - Excess Zeros. |
| DB13 | IDLE - Idle. |
| DB15 | Not used, always read as 0. |

Status Reporting

DISK Status Register

Provides alarm indications related to the Disk.

:STATUS:DISK:EVENT? - Returns the DISK Status Register value in numeric form.

:STATUS:DISK:ENABLE <numeric> - Sets the event enable register mask.

:STATUS:DISK:ENABLE? - Returns the current mask setting in numeric form.

| DB15 | DB14 | DB13 | DB12 | DB11 | DB10 | DB9 | DB8 |
|------|------|------|------|------|------|-----|-----|
| - | - | - | - | - | - | - | - |

| DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| - | - | - | - | - | - | - | FMT |

DB0 Formatting Disk.

DB1 - DB15 Not used, always read as 0.

Status Reporting

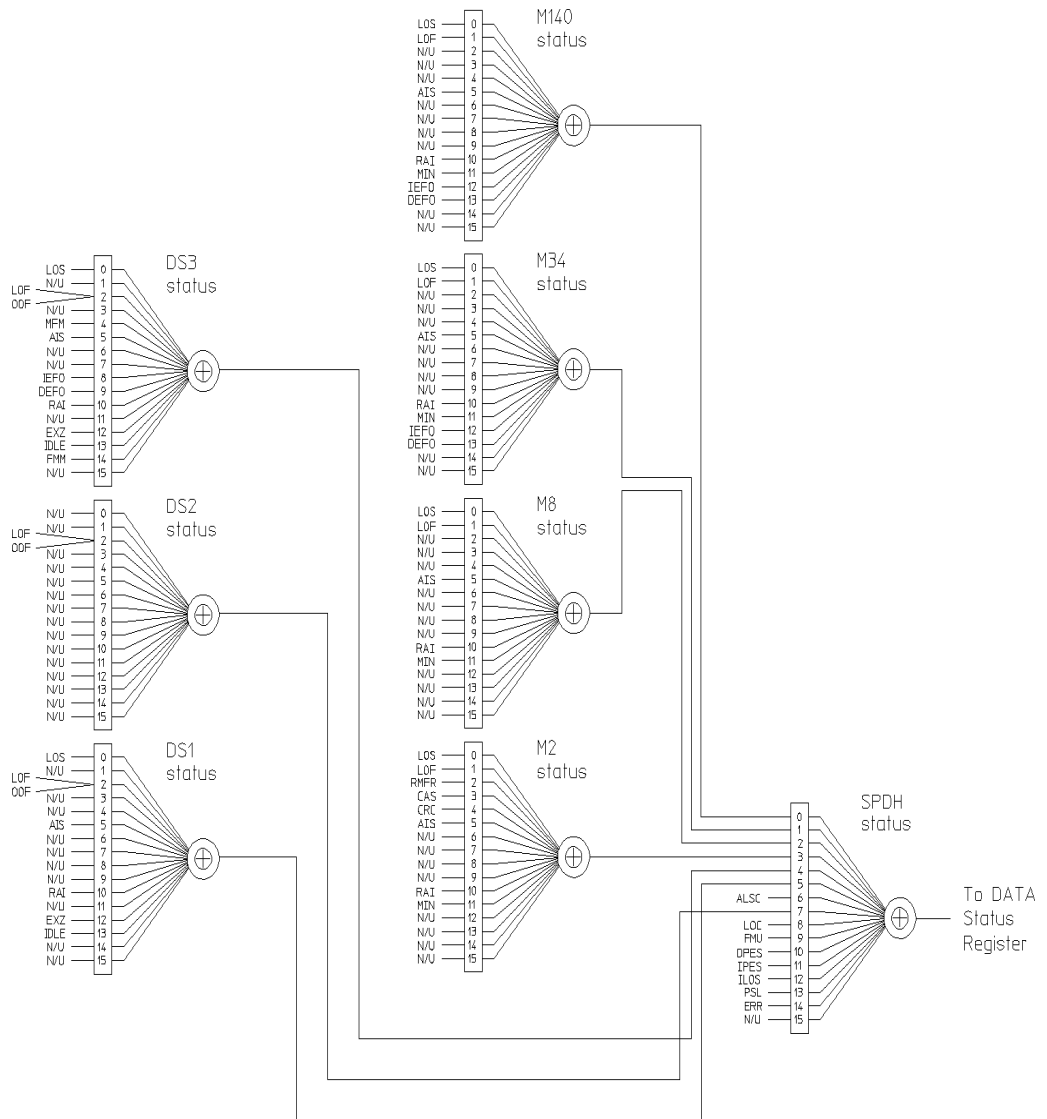


Figure 6-2 Status Registers Relationship 1

Status Reporting

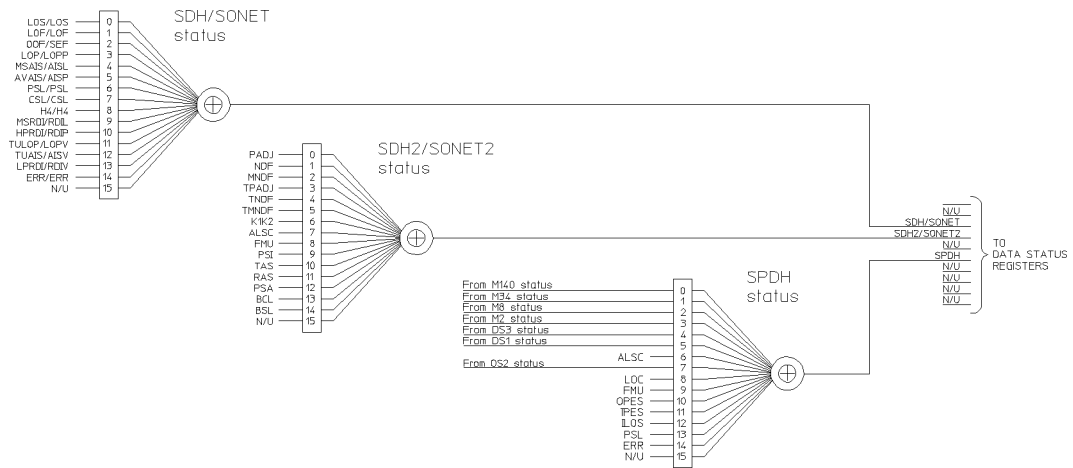
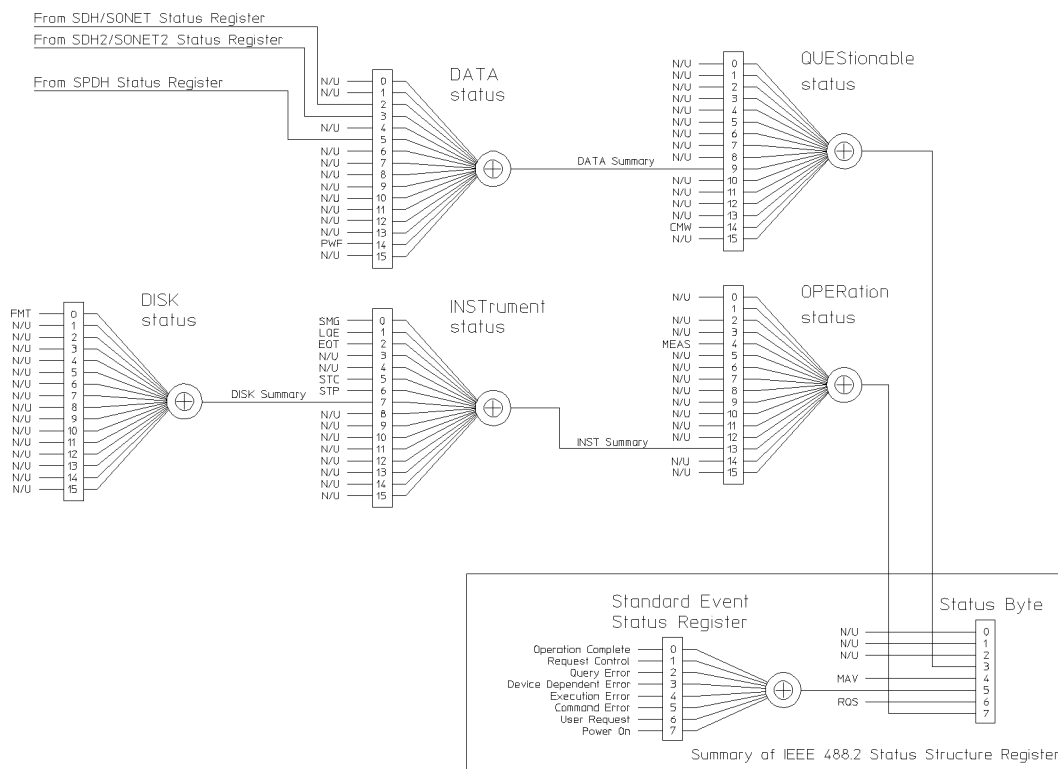


Figure 6-3 Status Registers Relationship 2

Status Reporting



The use of Bit 15 is not allowed since some controllers may have difficulty reading a 16 bit unsigned integer. The value of this bit shall always be 0.

Figure 6-4

Status Registers Relationship 3

Programmed Status Reporting

When a condition is detected, a summary bit is generated by the Status Register which detects the condition. The summary bit in most cases passes through other Status Registers before affecting the Status Byte. These other Status Registers also generate a summary bit, therefore to report a condition requires the setting of the Event Enable Register mask in all registers in the chain.

When implementing status reporting into your programming, consider the following with reference to the Status Registers Relationship diagram, Figures 6-2 to 6-4:

Status Reporting

Programming Interrupts

1) Define which conditions you want 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 all subsequent Status Registers between the reporting Status Register and the Status Byte. Using an example from the SDH Status Register :

LOS + LOF

| | |
|---------------------------------|---|
| :STAT:SDH :ENAB 3 | Set the SDH event enable register to summarize for LOF(2) + LOS (1) |
| :STAT:SDH :PTR 3;NTR 0 | Transition filter passes positive transitions bits 0 and 1. |
| :STAT:DATA:ENAB 4 | Set the DATA event enable register to summarize for SDH(4) |
| :STAT:DATA:PTR 4;NTR 0 | Transition filter passes positive transitions bit 2. |
| :STAT:QUES:ENAB 512 | Set the QUES event enable register to summarize for DATA(512) |
| :STAT:QUES:PTR 512;NTR 0 | Transition filter passes positive transitions bit 9. |

2) If you are implementing a service request/serial poll 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 poll operation (SPOLL) or by issuing the *STB? common capabilities command, for example :

***STB?** Returns 8 - QUES summary

Status Reporting

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:PDH :EVEN? | Returns 3 - LOF (2) + LOS (1) |

The interrogation of the status byte and status registers reveals that the cause of the interrupt was Unavailability and Pattern Synchronization Loss.

Example Program

```
10 ! Program Name : 21SRQ_DEMO
20 !
30 ! Program to illustrate the use of the Service Request Routine
31 ! in the HP 37718A .
40 ! Written by George Hossack (QTD Product Support)
50 !
60 ! The program starts a 10 second BER measurement on the HP 37718A
70 ! then continually reads and displays the HP 37718A Short-Term
80 ! BER until a Service Request is received from the HP 37718A .
90 ! When this happens, the Controller will suspend current activity
100 ! and read registers to determine the cause of the SRQ.
110 ! The maskable registers are set in the program to generate SRQ at
120 ! end of a measurement or when an HP 37718A Alarm condition occurs.
130 ! If the SRQ is found to be caused by End of Measurement then the
140 ! the program will read and print the measurement result before
150 ! continuing to read and display the received Short-Term BER.
160 ! If the SRQ is found to be caused by a masked alarm condition then
170 ! the program will read and print the alarm status then stop as it
```

Status Reporting

```
180 ! is invalid to return results when a recognized Alarm condition
190 ! exists.
191 !
200 PRINT CHR$(12) !Clear screen
210 PRINT TABXY(27,1);"Service Request - Demo Program"
220 !
230 COM Hp37718 !Common variable(s)
240 Hp37718=705 ! assign variable to default address
250 CALL Init_instr ! Sub to initialize the 37718A
260 !
270 CALL Config_regs_14 ! Sub to configure 37718 regs for SRQ
280 !
290 ON INTR 7 CALL Read_stat_byte ! Specify interrupt routine
300 !
310 CALL Tx_setup ! Sub to set up 37718A Transmitter
320 !
330 CALL Rx_setup ! Sub to set up 37718A Receiver
340 !
350 CALL Results_setup ! Sub to setup results display
360 !
370 OUTPUT Hp37718;"*CLS" ! Clear any existing SRQ/ Remote errors
380 WAIT 3
390 ENABLE INTR 7;2 ! Enable computer to recognize interrupt
400 !
410 CALL Run_meas
420 !
430 CALL Read_short_rslt
440 END
```


Status Reporting

```
450 !
460 !
470 !
480 !
490 SUB Config_regs_14
500 ! This sub sets up the conditions for generating an SRQ.
510 ! In this case, an SRQ will occur when Signal Loss or FRame Loss
520 ! alarms are detected.
530 ! An SRQ is also set to occur at the end of the Measurement period.
540 !
550 !
560 COM Hp37718
570 !OUTPUT Hp37718;"*CLS"      ! Clear any existing SRQ/Remote errors
580 !
590 OUTPUT Hp37718;" :STAT:M140:PTR 3;NTR 0"
600 ! Set the Transition Filter to pass positive transitions in
610 ! Bits 0,1 of the M140 Register
620 !
630 OUTPUT Hp37718;" :STAT:M140:ENAB 3"
640 !Enable LOF and LOS bits in the M140 status register
650 !to set the telecom summary bit in the Data status register
660 !on occurrence of any of these events.
661 !
662 OUTPUT Hp37718;" :STAT:SPDH:PTR 1;NTR 0"
663 ! Set the Transition Filter to pass positive transitions in Bit 0
664 !of the SPDH Data Status register.
665 OUTPUT Hp37718;" :STAT:SPDH:ENAB 1"
666 !Enable the M140 data bit in the SPDH Status register to set
```

Status Reporting

667 !the SPDH summary bit in the Data status register
670 !
680 OUTPUT Hp37718;".STAT:DATA:PTR 16;NTR 0"
690 !Set the Transition Filter to pass positive transitions in Bit 5
700 !of the Data Status register.
710 OUTPUT Hp37718;".STAT:DATA:ENAB 16"
720 !Enable the SPDH data bit in the Data Status register to set
730 !the data summary bit in the Questionable status register
740 !
750 !
760 OUTPUT Hp37718;".STAT:QUES:PTR 512;NTR 0"
770 !Set the transition filter to pass positive transitions in bit 9 of
780 !the Questionable status register
790 OUTPUT Hp37718;".STAT:QUES:ENAB 512"
800 !Enable the data summary bit in the Questionable status register
810 !to set the questionable data summary bit in the status byte
820 !
830 !
840 !
850 OUTPUT Hp37718;".STAT:INST:PTR 4;NTR 0"
860 !Set the Transition Filter to pass positive transitions in Bit 4
870 !(End of Test) in the Instrument Status Register
880 OUTPUT Hp37718;".STAT:INST:ENAB 4"
890 !Enable the EOT data bit in the Instrument Status register to set
900 !the data summary bit in the Operation status register
910 !
920 !
930 OUTPUT Hp37718;".STAT:OPER:PTR 8192;NTR 0"

Status Reporting

```
940 !Set the transition filter to pass positive transitions in bit 13
950 !of the Operation status register
960 OUTPUT Hp37718;":STAT:OPER:ENAB 8192"
970 !Enable the instrument summary bit in Operation status register
980 !to set the Operation register summary bit in the status byte
990 !
1000 !
1010 OUTPUT Hp37718;"*SRE 200"
1020 !Set the SRQ mask to cause an SRQ on occurrence of Bit 3 (Ques Reg)
1030 !Bit 6 (RQS) or 7 (Oper reg) being set in the Status byte.
1040 !
1050 !
1060 SUBEND
1070 !
1080 SUB Read_stat_byte
1090 !This subroutine reads the Telecom status register to determine the
1100 !reason(s) for the SRQ.
1110 COM Hp37718
1120 BEEP 700,.5
1130 DISP "SRQ detected"
1140 WAIT 1    ! allow time for registers to be updated
1150 DISP
1160 Intr_check=SPOLL(Hp37718) ! Interrogate Primary Status Byte register
1170 ! using Serial Poll method - returns value Intr_check
1180 ! DISP "interrupt check number is ";Intr_check
1190 SELECT Intr_check ! read the value of Primary Status Byte to see
1200 ! cause of interrupt
1201 !
```

Status Reporting

```
1210 CASE 0 ! interrupt from unspecified device
1220 PRINT CHR$(12)          !Clear screen
1229 PRINT TABXY(20,10);"The Controller has received an interrupt from"
1230 PRINT TABXY(20,11);"Remove all unspecified equipment from HP-IB"
1231 STOP
1232 !
1240 CASE 192 ! End of Test Period (rqs[64]+oper[128])
1250 CALL Read_meas_rslt ! measurement has ended, so read back result.
1260 !
1270 CASE 72,200 ! masked Alarm condition has occurred (with EOT?)
1280 CALL Read_m140_reg
1290 !
1300 CASE ELSE
1305 PRINT TABXY(20,10);"The Controller has received an unspecified"
1310 PRINT TABXY(20,11);"interrupt from the HP 37718A - check cause"
1311 STOP
1312 !
1320 END SELECT
1330 SUBEND
1340 !
1350 !
1360 SUB Init_instr
1370 ! sub to initialize the 37718A
1380 !
1390 !
1400 COM Hp37718
1410 DISP "Initializing HP37718A " !
1420 OUTPUT Hp37718;"*CLS"      ! Clear any existing SRQ/Remote errors
```

Status Reporting

1430 WAIT 2 ! allow time for initialization
1440 OUTPUT Hp37718;"*RST" ! set instrument to default settings
1450 WAIT 2 ! allow time for initialization
1460 DISP
1470 SUBEND
1480 !
1490 !
1500 SUB Tx_setup
1510 !
1520 !sub to setup the 37718A transmitter
1530 COM Hp37718 !Common variable(s)
1540 OUTPUT Hp37718;"OUTP:TEL:SPDH:RATE M140"
1550 OUTPUT Hp37718;"OUTP:TEL:SPDH:CODE CMI"
1560 !OUTPUT Hp37718;"OUTP:TEL:SPDH:LEV UNB"
1570 ! Set up PDH Output conditions
1580 !
1590 !
1600 OUTPUT Hp37718;"INST:COUP RTTX"
1610 ! Setup Instrument Subsystem
1620 !
1630 !
1640 OUTPUT Hp37718;"SOUR:DATA:TEL:SOUR PDH"
1650 !SOUR:DATA:TEL:SPDH:PAYL:TYPE FRAM
1660 SOUR:DATA:TEL:SPDH:PATT PRBS23
1670 ! Setup transmit (Source) conditions
1680 !
1690 !
1700 SUBEND

Status Reporting

1710 !
1720 !
1730 SUB Rx_setup
1740 !
1750 !sub to setup the 37718A Receiver
1760 COM Hp37718 !Common variable(s)
1770 ! Use default
1780 SUBEND
1790 !
1800 !
1810 SUB Results_setup
1820 !
1830 ! Sub to setup the Results page
1840 COM Hp37718 !Common variable(s)
1850 OUTPUT Hp37718;"SENS:DATA:TEL:TEST:TYPE SING"
1860 OUTPUT Hp37718;"SENS:DATA:TEL:TEST:PER 10s" !Set Test Period
1870 !
1880 SUBEND
1890 !
1900 !
1910 SUB Run_meas
1920 !
1930 ! Sub to start and run the measurement
1940 COM Hp37718 !Common variable(s)
1950 !
1960 OUTPUT Hp37718;"SENS:DATA:TEL:TEST ON"
1970 SUBEND
1980 !

Status Reporting

2110 SUB Read_meas_rslt
2120 !
2130 ! Sub to read back the 37718A result
2140 COM Hp37718 !Common variable(s)
2150 !
2160 WAIT 2
2170 OUTPUT Hp37718;"SENS:DATA? ""ERAT:SPDH:BIT""
2180 ! Return the measurement result BER Ratio
2190 ENTER Hp37718;Ber_ratio ! Read back bit error results
2200 PRINT TABXY(27,12); "MEASURED BER RATIO IS ";Ber_ratio
2210 CALL Run_meas
2220 OUTPUT Hp37718;"*CLS" ! Clear any existing SRQ/Remote errors
2230 WAIT 3
2240 ENABLE INTR 7;2 ! Re-enable computer to recognize interrupt
2250 PRINT TABXY(25,12);"
2260 SUBEND
2270 !
2280 !
2290 SUB Read_short_rslt
2300 !
2310 ! Sub to read back the 37718A Short Term Results
2320 WAIT 2 ! Allow time for Short Term results update
2330 !
2340 COM Hp37718 !Common variable(s)
2350 REPEAT
2360 OUTPUT Hp37718;"SENS:DATA? ""ECO:SPDH:STER:BIT""
2370 ! Returns the short-term BER Result
2380 ENTER Hp37718;Short_rate ! Readback Short Term BER result

Status Reporting

```
2390 !
2400 PRINT TABXY(27,10);"SHORT-TERM BER COUNT IS ";Short_rate
2410 WAIT 1
2420 PRINT TABXY(25,10);"                               "
2430 !PRINT CHR$(12) !Clear screen
2440 UNTIL Forever
2450 SUBEND
2460 !
2470 !
2480 SUB Read_m140_reg
2490 !
2500 ! Sub to read the M140 register
2510 COM Hp37718 !Common variable(s)
2520 !
2530 !
2540 OUTPUT Hp37718;".STATUS:M140:EVENT?" !Read PDH Status register
2550 ENTER Hp37718;Alrm_reg_value
2570 SELECT Alrm_reg_value
2580 CASE 1 ! LOS detected
2590 PRINT CHR$(12) !Clear screen
2600 PRINT TABXY(20,10); "Signal loss has been detected on HP37718A "
2601 PRINT TABXY(30,11); "Results invalid"
2602 !
2610 CASE 2 ! LOF detected
2620 PRINT CHR$(12) !Clear screen
2630 PRINT TABXY(20,10); "140MFrame Loss has been detected on HP37718A
"
2660 !
2820 CASE ELSE ! unknown SRQ
```


Status Reporting

```
2830 PRINT CHR$(12)           !Clear screen
2840 PRINT TABXY(20,10);"A Status Alarm has occurred on the HP 37718A "
2843 PRINT TABXY(20,11);"Check instrument Front Panel to see cause "
2860 END SELECT
2870 !
2871 STOP
2880 !
2920 !
2930 SUBEND
```

Figure 6-5 **Status Reporting Program Example**

Status Reporting

General Information

General Information

General Information

This chapter contains general remote control information.

- **SCPI Overview** - Gives a brief overview of the SCPI Standard.
 - **HP-IB Universal Commands** - Describes the HP-IB Universal commands.
-

SCPI Overview

Standard Commands for Programmable Instruments (SCPI) is a standard of the SCPI Consortium that provides guidelines for remote programming commands for instruments. The goal of SCPI is to reduce Automatic Test Equipment (ATE) program development time. It accomplishes this by providing a consistent programming environment for instrument control and data usage. This programming environment uses defined programming messages, instrument responses, and data formats across all SCPI instruments, regardless of manufacturer.

SCPI is based on two IEEE standards:

- ANSI/IEEE Standard 488.1-1987, *IEEE Standard Digital Interface for Programmable Instrumentation*
- ANSI/IEEE Standard 488.2-1987, *IEEE Standard Codes, Formats, Protocols, and Common Commands. For use with ANSI/IEEE Standard 488.1-1987, IEEE Standard Digital Interface for Programmable Instrumentation*

General Information

HP-IB Universal Commands

The Required Commands perform the most basic remote functions over HP-IB and are common to all HP-IB controllable instruments. The commands are as follows:-

- DEVICE CLEAR
- SERIAL POLL
- REMOTE ENABLE
- LOCAL LOCKOUT
- GO TO LOCAL

Device Clear (CLEAR)

This command will initialize the instrument HP-IB hardware.

The command format using HP 200/300 Series Basic, for example is:

CLEAR 705 (where 7 is the Bus I/O select code and 05 is the device address).

Serial Poll (SPOLL)

A serial poll will retrieve the value of the primary status byte. This byte contains useful information about the current state of the instrument.

for example :

SPOLL(705) (where 7 is the Bus I/O select code and 05 is the device address).

Remote Enable (REMOTE)

The Remote command instructs the instrument to enter the REMOTE state and be ready to accept instructions via HP-IB.

When the HP 37718A receives this command it illuminates the front panel REMOTE indicator.

for example:

REMOTE 705 (where 7 is the Bus I/O select code and 05 is the device address).

General Information

Local Lockout (LOCAL LOCKOUT)

It is recommended that the Local Lockout command is sent after the Remote command. This disables the front panel local key preventing the return to local mode and thus any interference to the instrument settings.

It should always be preceded by the REMOTE command.

for example:

LOCAL LOCKOUT 7 (will configure all the instruments on the bus to the Local Lockout condition.)

NOTE

If the instrument has been set to the LOCAL LOCKOUT condition, then the front panel LOCAL key is disabled. The instrument can only be returned to LOCAL operation by the controller sending the LOCAL command or by cycling power to the instrument.

Local (LOCAL)

The Local command returns the instrument from Remote operation to local front panel control.

for example:

LOCAL 7 or LOCAL 705 (where 7 is the Bus I/O select code and 05 is the device address).

SCPI Error Messages

SCPI Error Messages

SCPI Error Messages

The system-defined error/event numbers are chosen on an enumerated (“1 of N”) basis. The SCPI defined error/event numbers and the error description portions of the ERRor query response are listed here. The first error/event described in each class (for example, –100, –200, –300, –400) is a “generic” error. In selecting the proper error/event number to report, more specific error/event codes are preferred, and the generic error/event is used only if the others are inappropriate.

No Error

This message indicates that the device has no errors.

No Error

The queue is completely empty. Every error/event in the queue has been read or the queue was purposely cleared by power-on, *CLS, etc.

Command Errors [–199, –100]

An < error/event number > in the range [–199, –100] indicates that an *IEEE 488.2* syntax error has been detected by the instrument’s parser. The occurrence of any error in this class should cause the command error bit (bit 5) in the event status register (*IEEE 488.2*, section 11.5.1) to be set. One of the following events has occurred:

- An *IEEE 488.2* system error has been detected by the parser. That is, a controller-to-device message was received which is in violation of the *IEEE 488.2* standard. Possible violations include a data element which violates the device listening formats or whose type is unacceptable to the device.
 - An unrecognized header was received. Unrecognized headers include incorrect device-specific headers and incorrect or not implemented *IEEE 488.2* common commands.
 - A Group Execute Trigger (GET) was entered into the input buffer inside of an
-

SCPI Error Messages

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, SETUP&. This error might be used in place of errors -114, -121, -141, and perhaps some others.

-102

Syntax error

An unrecognized command or data type was encountered; for example, a string was received when the device does not accept strings.

-103

Invalid separator

The parser was expecting a separator and encountered an illegal character; for example, the semicolon was omitted after a program message unit, *ESE 1 :OUTP1:TEL:RATE 140 Mb/s

-104

Data type error

The parser recognized a data element different than one allowed; for example, numeric or string data was expected but block data was encountered.

-105

GET not allowed

A Group Execute Trigger was received within a program message (see *IEEE 488.2*, 7.7).

-108

Parameter not allowed

More parameters were received than expected for the header; for example, the *RCL common command only accepts one parameter, so receiving *RCL 0,1 is not allowed.

SCPI Error Messages

- 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 than twelve characters (see *IEEE 488.2*, 7.6.1.4.1).
- 113 **Undefined header**
- The header is syntactically correct, but it is undefined by this specific device; for example, *XYZ is not defined for any device.
- 114 **Header suffix out of range**
- Indicates that a non-header character has been encountered in what the parser expects is a header element.
- 120 **Numeric data error**
- This error, as well as errors –121 through –129, are generated when parsing a data element which appears to be numeric, including the non-decimal numeric types. This particular error message should be used if the device cannot detect a more specific error.
- 121 **Invalid character in number**
- An invalid character for the data type being parsed was encountered; for example, an alpha in a decimal numeric or a “9” in octal data.

SCPI Error Messages

- 123 **Exponent too large**
The magnitude of the exponent was larger than 32000 (see *IEEE 488.2, 7.7.2.4.1*).
- 124 **Too many digits**
The mantissa of a decimal numeric data element contained more than 255 digits excluding leading zeros (see *IEEE 488.2, 7.7.2.4.1*).
- 128 **Numeric data not allowed**
A legal numeric data element was received, but the device does not accept one in this position for the header.
- 130 **Suffix error**
This error, as well as errors –131 through –139, are generated when parsing a suffix. This particular error message should be used if the device cannot detect a more specific error.
- 131 **Invalid suffix**
The suffix does not follow the syntax described in *IEEE 488.2, 7.7.3.2*, or the suffix is inappropriate for this device.
- 134 **Suffix too long**
The suffix contained more than 12 characters (see *IEEE 488.2, 7.7.3.4*).
- 138 **Suffix not allowed**
A suffix was encountered after a numeric element which does not allow suffixes.
- 140 **Character data error**
This error, as well as errors –141 through –149, are generated when parsing a character data element. This particular error message should be used if the device cannot detect a more specific error.
- 141 **Invalid character data**
Either the character data element contains an invalid character or the particular element received is not valid for the header.

SCPI Error Messages

- 144 **Character data too long**
The character data element contains more than twelve characters (see *IEEE 488.2, 7.7.1.4*).
- 148 **Character data not allowed**
A legal character data element was encountered where prohibited by the device.
- 150 **String data error**
This error, as well as errors –151 through –159, are generated when parsing a string data element. This particular error message should be used if the device cannot detect a more specific error.
- 151 **Invalid string data**
A string data element was expected, but was invalid for some reason (see *IEEE 488.2, 7.7.5.2*); for example, an END message was received before the terminal quote character.
- 158 **String data not allowed**
A string data element was encountered but was not allowed by the device at this point in parsing.
- 160 **Block data error**
This error, as well as errors –161 through –169, are generated when parsing a block data element. This particular error message should be used if the device cannot detect a more specific error.
- 161 **Invalid block data**
A block data element was expected, but was invalid for some reason (see *IEEE 488.2, 7.7.6.2*); for example, an END message was received before the length was satisfied.
- 168 **Block data not allowed**
A legal block data element was encountered but was not allowed by the device at this point in parsing.

SCPI Error Messages

-170

Expression error

This error, as well as errors -171 through -179, are generated when parsing an expression data element. This particular error message should be used if the device cannot detect a more specific error.

-171

Invalid expression

The expression data element was invalid (see *IEEE 488.2, 7.7.7.2*); for example, unmatched parentheses or an illegal character.

-178

Expression data not allowed

A legal expression data was encountered but was not allowed by the device at this point in parsing.

-180

Macro error

This error, as well as errors -181 through -189, are generated when defining a macro or executing a macro. This particular error message should be used if the device cannot detect a more specific error.

-181

Invalid outside macro definition

Indicates that a macro parameter placeholder ($\$<number>$) was encountered outside of a macro definition.

-183

Invalid inside macro definition

Indicates that the program message unit sequence, sent with a *DDT or *DMC command, is syntactically invalid (see 10.7.6.3).

-184

Macro parameter error

Indicates that a command inside the macro definition had the wrong number or type of parameters.

SCPI Error Messages

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

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

SCPI Error Messages

- 211 **Trigger ignored**
- Indicates that a GET, *TRG, or triggering signal was received and recognized by the device but was ignored because of device timing considerations; for example, the device was not ready to respond. Note: a DT0 device always ignores GET and treats *TRG as a Command Error.
- 212 **Arm ignored**
- Indicates that an arming signal was received and recognized by the device but was ignored.
- 213 **Init ignored**
- Indicates that a request for a measurement initiation was ignored as another measurement was already in progress.
- 214 **Trigger deadlock**
- Indicates that the trigger source for the initiation of a measurement is set to GET and subsequent measurement query is received. The measurement cannot be started until a GET is received, but the GET would cause an INTERRUPTED error.
- 215 **Arm deadlock**
- Indicates that the arm source for the initiation of a measurement is set to GET and subsequent measurement query is received. The measurement cannot be started until a GET is received, but the GET would cause an INTERRUPTED error.
- 220 **Parameter error**
- Indicates that a program data element related error occurred. This error message should be used when the device cannot detect the more specific errors described for errors –221 through –229.
- 221 **Setting conflict**
- Indicates that a legal program data element was parsed but could not be executed due to the current device state (see *IEEE 488.2*, 6.4.5.3 and 11.5.1.1.5.)

SCPI Error Messages

- 222 **Data out of range**
- Indicates that a legal program data element was parsed but could not be executed because the interpreted value was outside the legal range as defined by the device (see *IEEE 488.2*, 11.5.1.1.5.)
- 223 **Too much data**
- Indicates that a legal program data element of block, expression, or string type was received that contained more data than the device could handle due to memory or related device-specific requirements.
- 224 **Illegal parameter value**
- Used where exact value, from a list of possibles, was expected.
- 230 **Data corrupt or stale**
- Possibly invalid data; new reading started but not completed since last access.
- 231 **Data questionable**
- Indicates that measurement accuracy is suspect.
- 240 **Hardware error**
- Indicates that a legal program command or query could not be executed because of a hardware problem in the device. Definition of what constitutes a hardware problem is completely device-specific. This error message should be used when the device cannot detect the more specific errors described for errors –241 through –249.
- 241 **Hardware missing**
- Indicates that a legal program command or query could not be executed because of missing device hardware; for example, an option was not installed. Definition of what constitutes missing hardware is completely device-specific.
- 250 **Mass storage error**
- Indicates that a mass storage error occurred. This error message should be used when the device cannot detect the more specific errors described for errors –251 through –259.

SCPI Error Messages

-251

Missing mass storage

Indicates that a legal program command or query could not be executed because of missing mass storage; for example, an option that was not installed. Definition of what constitutes missing mass storage is device-specific.

-252

Missing media

Indicates that a legal program command or query could not be executed because of a missing media; for example, no disk. The definition of what constitutes missing media is device-specific.

-253

Corrupt media

Indicates that a legal program command or query could not be executed because of corrupt media; for example, bad disk or wrong format. The definition of what constitutes corrupt media is device-specific.

-254

Media full

Indicates that a legal program command or query could not be executed because the media was full; for example, there is no room on the disk. The definition of what constitutes a full media is device-specific.

-255

Directory full

Indicates that a legal program command or query could not be executed because the media directory was full. The definition of what constitutes a full media directory is device-specific.

-256

File name not found

Indicates that a legal program command or query could not be executed because the file name on the device media was not found; for example, an attempt was made to read or copy a nonexistent file. The definition of what constitutes a file not being found is 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.

SCPI Error Messages

- 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**
- 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 message 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.

SCPI Error Messages

- 274 **Macro parameter error**
Indicates that the macro definition improperly used a macro parameter placeholder (see *IEEE 488.2*, 10.7.3).
- 275 **Macro definition too long**
Indicates that a syntactically legal macro program data sequence could not be executed because the string or block contents were too long for the device to handle (see *IEEE 488.2*, 10.7.6.1).
- 276 **Macro recursion error**
Indicates that a syntactically legal macro program data sequence could not be executed because the device found it to be recursive (see *IEEE 488.2*, 10.7.6.6).
- 277 **Macro redefinition not allowed**
Indicates that a syntactically legal macro label in the *DMC command could not be executed because the macro label was already defined (see *IEEE 488.2*, 10.7.6.4).
- 278 **Macro header not found**
Indicates that a syntactically legal macro label in the *GMC? query could not be executed because the header was not previously defined.
- 280 **Program error**
Indicates that a downloaded program-related execution error occurred. This error message should be used when the device cannot detect the more specific errors described for errors –281 through –289.
-
- NOTE** A downloaded program is used to add algorithmic capability to a device. The syntax used in the program and the mechanism for downloading a program is device-specific.
-
- 281 **Cannot create program**
Indicates that an attempt to create a program was unsuccessful. A reason for the failure might include not enough memory.

SCPI Error Messages

-282

Illegal program name

The name used to reference a program was invalid; for example, redefining an existing program, deleting a nonexistent program, or in general, referencing a nonexistent program.

-283

Illegal variable name

An attempt was made to reference a nonexistent variable in a program.

-284

Program currently running

Certain operations dealing with programs may be illegal while the program is running; for example, deleting a running program might not be possible.

-285

Program syntax error

Indicates that a syntax error appears in a downloaded program. The syntax used when parsing the downloaded program is device-specific.

-286

Program runtime error

SCPI Error Messages

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.

-312

PUD memory lost

Indicates that the protected user data saved by the *PUD command has been lost.

SCPI Error Messages

- 313 **Calibration memory lost**
Indicates that nonvolatile calibration data used by the *CAL? command has been lost.
- 314 **Save/Recall memory lost**
Indicates that the nonvolatile data saved by the *SAV? command has been lost.
- 315 **Configuration memory lost**
Indicates that the nonvolatile data saved by the device has been lost. The meaning of this error is device-specific.
- 330 **Self-test failed**
- 350 **Queue overflow**
A specific code entered into the queue in lieu of the code that caused the error. This code indicates that there is no room in the queue and an error occurred but was not recorded.
- 360 **Communication error**
This is the generic communication error for devices that cannot detect the more specific errors described for errors -361 through -363.
- 361 **Parity error in program message**
Parity bit not correct when data received for example, on a serial port (for example, a baud rate mismatch).
- 362 **Framing error in program message**
A stop bit was not detected when data was received for example, on a serial port.
- 363 **Input buffer overrun**
Software or hardware input buffer on serial port overflows with data caused by improper or nonexistent pacing.

SCPI Error Messages

Query Errors [–499, –400]

An < error/event number > in the range [–499, –400] indicates that the output queue control of the instrument has detected a problem with the message exchange protocol described in *IEEE 488.2*, chapter 6. The occurrence of any error in this class should cause the query error bit (bit 2) in the event status register (*IEEE 488.2*, section 11.5.1) to be set. These errors correspond to message exchange protocol errors described in *IEEE 488.2*, section 6.5. One of the following is true:

- An attempt is being made to read data from the output queue when no output is either present or pending;
- Data in the output queue has been lost.

Events that generate query errors shall not generate command errors, execution errors, or device-specific errors; see the other error definitions in this section.

–400

Query error

This is the general query error for devices that cannot detect more specific errors. This code indicates only that a Query Error as defined in *IEEE 488.2*, 11.5.1.1.7 and 6.3 has occurred.

–410

Query INTERRUPTED

Indicates that a condition causing an INTERRUPTED Query error occurred (see *IEEE 488.2*, 6.3.2.3); for example, a query followed by DAB or GET before a response was completely sent.

–420

Query UNTERMINATED

Indicates that a condition causing an UNTERMINATED Query error occurred (see *IEEE 488.2*, 6.3.2.2); for example, the device was addressed to talk and an incomplete program message was received.

–430

Query DEADLOCKED

Indicates that a condition causing a DEADLOCKED Query error occurred (see *IEEE 488.2*, 6.3.1.7); for example, both input buffer and output buffer are full and the device cannot continue.

SCPI Error Messages

-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.)

**HP 37718A/19A and HP
37717C SCPI Differences**

HP 37718A/19A and HP 37717C SCPI Differences

The following section gives information on the SCPI commands that have changed between the HP 37718A/19A and HP 37717C. In most cases this only involves the addition of STM-16/STS-48 capabilities.

Common Commands

SOURce:DATA:TELEcom:SOURce replaces OPT1|OPT4 and OC3|OC12 parameters with OPT16 and OC48. The old parameters will still be accepted but it is recommended that the new ones are used. Note: This command selects the physical output port - not the actual line rate.

SENSe:DATA:TELEcom:SENSe replaces OPT1|OPT4 and OC3|OC12 parameters with OPT16 and OC48. The old parameters will still be accepted but it is recommended that the new ones are used. Note: As with the equivalent SOURce command this selects the physical input port - not the actual line rate.

SYSTem:TRIGger is a new command.

PDH Commands

SOURce subsystem:

The SOURce:DATA:TELEcom:SPDH:PAYLoad:TYPE command has changed. The parameter option 'STRuctured' has been removed from both command and query. A new command has been created for this alone, :SOURce:DATA:TELEcom:SPDH:PAYLoad:STRucture.

The corresponding query will no longer return 'Structured'. To determine if the signal is structured, :SOURce:DATA:TELEcom:SPDH:PAYLoad:STRucture? must be used.

SENSe subsystem

The :SENSe:DATA:TELEcom:SPDH:PAYLoad:TYPE command has changed. It has been changed in the same manner as the corresponding :SOURce subsystem command/query pair described above..

HP 37718A/19A and HP 37717C SCPI Differences

SDH Commands

OUTPut Subsystem:

Commands containing the OPT1 and OPT4 nodes are no longer supported (although they still exist) and have been replaced by commands containing the OPT16 node. The new command selects the optical port that is used for all rates - i.e. STM-0, STM-1, STM-4 and STM-16.

OUTPut:TELEcom:OPT16:RATE;INTErface;WAVElength are new commands, but notionally replace the equivalent OPT1|4 commands.

SOURce subsystem:

The SOURce:CLOCK:SDH:SOURce command has had the ROPT16 parameter added to cover the STM-16 cases.

SOURce:CLOCK:SDH:FORMat adds M10Ref as an allowed parameter for selecting the 10MHz Reference as the clock sync source.

SOURce:DATA:TELEcom:SDH:AU4 now allows parameters up to 16 to cover the case when STM-16 is selected.

SOURce:DATA:TELEcom:SDH:AU4C is a new command to select the AU4-4-4C number when the line rate is STM-16.

SOURce:DATA:TELEcom:SDH:AU:TYPE adds AU4_16C as an allowed parameter.

SOURce:DATA:TELEcom:SDH:PAYLoad adds VC4_16C as an allowed parameter.

The :SOURce:DATA:TELEcom:SDH:PAYLoad:TYPE command has changed. The parameter option 'STRuctured' has been removed from both command and query. A new command has been created for this alone,

:SOURce:DATA:TELEcom:SDH:PAYLoad:STRucture. Note that structured payloads are only supported when a structured PDH module is fitted.

The corresponding query will no longer return 'Structured'. To determine if the signal is structured, :SOURce:DATA:TELEcom:SDH:PAYLoad:STRucture? must be used.

:SOURce:DATA:TELEcom:SDH:TUG3:BACKground:PAYLoad[:PATTern] has changed. Before this release all three backgrounds could be programmed and only the two in context at any time would be in effect. The other would be masked by the foreground selection. Now, there are only two background channels, called LO and HI. LO can be channel 1 (if the foreground is not in channel 1) or 2. HI can be channel 2 or 3, depending on which channel is the foreground. Changing which channel is the foreground will change the channel selections of LO and/or HI. The

HP 37718A/19A and HP 37717C SCPI Differences

mapping selections and user words associated with HI and LO will be unaffected by such a change, but they may apply to a different channel.

For correct operation, it is recommended that the backgrounds are setup after each change of foreground channel number.

Furthermore, the TU3 background is now always of the user selectable word form instead of merely fixed word for the cases where TU3 was a mixed background. The effect of this is that the parameter UWORD will be converted to TU3. The effect is the same for the command, but the query will return TU3 instead of the previous behavior of returning UWORD.

:SOURCE:DATA:TELEcom:SDH:OVERhead:DATA now allows STM-1 Number parameter up to 16 when STM-16.

SOURCE:DATA:TELEcom:SDH:OVERhead:DATA:HEXadecimal now allows STM-1 Number parameter up to 16 when STM-16.

SOURCE:DATA:TELEcom:SDH:ERRor:TYPE adds EFRame (Entire Frame Error Add) as a possible error type.

SOURCE:DATA:TELEcom:SDH:ERRor:RATE adds USER as an allowed rate.

SOURCE:DATA:TELEcom:SDH:ERR:RATE:USER is a new command allowing the actual user rate to be set.

SOURCE:DATA:TELEcom:SDH:ERRor:MSPThreshold:NERR now goes up to 30720 in order to cover the STM-16 case.

SOURCE:DATA:TELEcom:SDH:SEQuence:OHBYte adds BNDA1A2 (the 6 middle A1A2 boundary bytes) and X22,X23,X32,X33 (the Media Bytes) as allowed parameters.

SOURCE:DATA:TELEcom:SDH:SEQuence:CHANnel:SElect now allows parameters up to 16 in order to support STM-16.

SOURCE:DATA:TELEcom:SDH:STESt:BLENght now allows up to 4174 to be selected as the optical stress length. This covers the STM-16 case.

SOURCE:DATA:TELEcom:SDH:IDCC:POLarity now only accepts NORMAl as a parameter - REVERsed is no longer supported

:SOURCE:DATA:TELEcom:SDH:SEQuence:CHANnel has been replaced by SOURCE:DATA:TELEcom:SDH:SEQuence:OHBYte <discrete>. It is retained for backward compatibility only.

SOURCE:DATA:TELEcom:SDH:OBERtest:CHANnel:SElect now allows parameters up to 16 for STM-16.

HP 37718A/19A and HP 37717C SCPI Differences

INPut subsystem:

Commands containing the OPT1 and OPT4 nodes are no longer supported (although they still exist). They are replaced by commands containing the OPT16 node. The new command selects the optical port that is used for all rates - not just STM-16.

INPut:TELEcom:OPT16:RATE;INTErface are new commands, but notionally replace the equivalent OPT1|4 commands.

SENSe Subsystem:

SENSe:DATA:TELEcom:SDH:AU4 now allows parameters up to 16 when STM-16 selected.

SENSe:DATA:TELEcom:SDH:AU4C is a new command to select the AU4-4-4C number when the line rate is STM-16.

SENSe:DATA:TELEcom:SDH:AU:TYPE adds AU4_16C as an allowed parameter.

SENSe:DATA:TELEcom:SDH:PAYLoad adds VC4_16C as an allowed parameter.

SENSe:DATA:TELEcom:SDH:PAYLoad:TYPE has changed. This command/query pair has been changed in the same manner as the corresponding :SOURCE subsystem command/query pair.

SENSe:DATA:TELEcom:SDH:OCAPture:OHBYte adds Media Bytes and the 6 middle A1A2 boundary bytes to its possible parameters

SENSe:DATA:TELEcom:SDH:OCAPture:CHANnel:SELEct now allows parameters up to 16 for STM-16.

SENSe:DATA:TELEcom:SDH:PGRaph:PTYPE adds AU4_16C as an allowed parameter.

SENSe:DATA:TELEcom:SDH:IDCC:POLarity now only accepts NORMal as a parameter - REVERsed is no longer supported

SENSe:DATA:TELEcom:SDH:OBERTest:CHANnel:SELEct now allows parameters up to 16 for STM-16.

FETCh subsystem:

FETCh:SCALar:DATA:TELEcom:SDH:OVER? now allows STM-1 selection parameter up to 16.

HP 37718A/19A and HP 37717C SCPI Differences

SONET Commands

OUTPut Subsystem:

Commands containing the OC3 and OC12 nodes are no longer supported (although they still exist) and have been replaced by commands containing the OC48 node. The new command selects the optical port that is used for all rates - i.e. OC-1, OC-3, OC-12 and OC-48.

OUTPut:TELEcom:OC48:RATE;INTErface;WAVElength are new commands, but notionally replace the equivalent OC3 and OC12 commands.

SOURce subsystem:

The SOURce:CLOCK:SONet:SOURce command has had the ROC48 parameter added to cover the OC-48 cases.

SOURce:CLOCK:SONet:FORMat adds M10Ref as an allowed parameter for selecting the 10MHz Reference as the clock sync source.

SOURce:DATA:TELEcom:SONet:STS3 now allows parameters up to 16 to cover the case when OC-48 is selected.

SOURce:DATA:TELEcom:SONet:STS12c is a new command to select the STS-12C number when the line rate is OC-48.

SOURce:DATA:TELEcom:SONet:SPE:TYPE adds STS48c as an allowed parameter.

SOURce:DATA:TELEcom:SONet:PAYLoad adds STS48c as an allowed parameter.

SOURce:DATA:TELEcom:SONet:OVERhead:DATA now allows STS-3 Number parameters up to 16 when OC-48.

SOURce:DATA:TELEcom:SONet:OVERhead:DATA:HEXadecimal now allows the STS-3 Number parameter up to 16 when OC-48.

SOURce:DATA:TELEcom:SONet:ERRor:TYPE adds EFrame (Entire Frame Error Add) as a possible error type.

SOURce:DATA:TELEcom:SONet:ERRor:RATE adds USER as an allowed rate.

SOURce:DATA:TELEcom:SONet:ERR:RATE:USER is a new command allowing the actual user rate to be set.

SOURce:DATA:TELEcom:SONet:ERRor:APSThreshold:NERR now goes up to 30720 in order to cover the OC-48 case.

SOURce:DATA:TELEcom:SONet:SEQUence:OHBYte adds BNDA1A2 (the 6 middle A1A2 boundary bytes) and X22,X23,X32,X33 (the Media Bytes) as allowed parameters.

HP 37718A/19A and HP 37717C SCPI Differences

SOURce:DATA:TELEcom:SONet:SEQuence:STS3:SElect now allows parameters up to 16 in order to support OC-48.

SOURce:DATA:TELEcom:SONet:STESt:BLENgtH now allows up to 4174 to be selected as the optical stress length. This covers the OC-48 case.

SOURce:DATA:TELEcom:SONet:IDCC:POLarity now only accepts NORMAl as a parameter - REVersed is no longer supported

SOURce:DATA:TELEcom:SONet:OBERtest:STS3:SElect now allows parameters up to 16 for OC-48.

INPut subsystem:

Commands containing the OC3 and OC12 nodes are no longer supported (although they still exist). They are replaced by commands containing the OC48 node. The new command selects the optical port that is used for all rates - not just OC-48.

INPut:TELEcom:OC48:RATE;INTerface are new commands, but notionally replace the equivalent OC3 and OC12 commands.

SENSe Subsystem:

SENSe:DATA:TELEcom:SONet:STS3 now allows parameters up to 16 when OC-48 is selected.

SENSe:DATA:TELEcom:SONet:STS12c is a new command to select the STS-12C number when the line rate is OC-48.

SENSe:DATA:TELEcom:SONet:SPE:TYPE adds STS48C as an allowed parameter.

SENSe:DATA:TELEcom:SONet:PAYLoad adds STS48C as an allowed parameter.

SENSe:DATA:TELEcom:SONet:OCAPture:OHBYte adds Media Bytes and the 6 middle A1A2 boundary bytes to its allowed parameters.

SENSe:DATA:TELEcom:SONet:OCAPture:CHANnel:SElect now allows parameters up to 16 for OC-48.

SENSe:DATA:TELEcom:SONet:PGRaph:PTYPe adds STS48c as an allowed parameter.

SENSee:DATA:TELEcom:SONet:IDCC:POLarity now only accepts NORMAl as a parameter - REVersed is no longer supported

SENSe:DATA:TELEcom:SONet:OBERtest:STS3:SElect now allows parameters up to 16 for OC-48.

FETCh subsystem:

HP 37718A/19A and HP 37717C SCPI Differences

FETCh:SCALar:DATA:TELEcom:SONet:OVER? now allows STS-3 selection parameter up to 16.

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This book contains the information required for remote control of the HP 37718A Communications Performance Analyzer.

