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SCPI COMMAND REFERENCE GUIDE (NIC and NAA IV)

MARCH 2003
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Technical Support

Technical Support is available by calling toll free (in the US) **1.877.929.HELP (4357)** 24 hours/day 7 days/week. Outside of the US, call **727.519.2860**.

Return Shipping Instructions

If it is necessary to return the unit, obtain a **Return Material Authorization (RMA) number** and **Return Shipping Address** by contacting Technical Support between 8:00 a.m. and 6:30 p.m. EST, Monday through Friday.

Please enclose a letter that briefly describes the reason for returning the unit and include the following information:

- Unit Serial Number
- Customer Name and Shipping Address
- Customer Contact Name and Telephone Number
- Secondary Customer Contact Name and Telephone Number
- Customer Supplied Purchase Order Number (if applicable)

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If the original shipping container (box) is available, place the unit (and letter that describes the reason for the return) into the canvas carry bag, and pack it into the original Digital Lightwave, Inc. shipping container. **Do not include personal items such as jumper cords or connectors. Digital Lightwave, Inc. will not be responsible for these items.** Use the original foam inserts to protect all six sides of the unit.

Securely seal the shipping container, and mark **FRAGILE** on the container to ensure careful handling.

Include the **RMA number** on the outside of the shipping container.

If the original shipping container is not available, pack the unit (and letter that describes the reason for the return) into the canvas carry bag, and use the following general instructions to repack the unit using commercially available materials:

- Use a strong shipping container, similar to the original unit shipping box. Verify that the substitute container is rated at **350 lbs. per square inch** pressure durable.
- Make sure that the unit is satisfactorily protected by using a layer of ESD Protected short absorbing foam material. The foam padding must be 3- to 4-inches in thickness (70- to 100-mm) and applied to all six sides of the unit to provide adequate protection. Make sure that the canvas bag and unit cannot move or shift within the container.
- Securely seal the shipping container, and mark **FRAGILE** on the container to ensure careful handling.
- Include the **RMA number** on the outside of the shipping container.

Contact Technical Support for the Repair Department's Return Shipping Address.

When service is complete, your unit will be returned to you postage paid if the shipment is within the United States. You are responsible for paying all shipping charges, duties, taxes, and other charges for products returned to Digital Lightwave, Inc. from any location within or outside of the United States.

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Safety Guidelines for Portable Products

The following safety precautions are provided to avoid injury and prevent damage to this product or any products connected to it during normal operation. Only qualified maintenance personnel should perform service procedures.

Use Proper Power Cord: To avoid fire hazard, only use the power cord specified for this instrument. For use in North America, use a power cord (maximum 6-foot length) with a type SJT, 18 AWG, two conductor with ground, IEC 320 connector on one end and a NEMA 5-15 connector on the other end.

For use outside of North America, use an HO5VV-F power cord with a 1-mm^2, two conductor plus ground, IEC 320 connector on one end, and a wall-socket plug on the other end that is certified for use in the country of installation.

NOTE ➤
The entire cordset must be certified for use in the country of installation. ◄

Avoid Electric Overload: This unit is designed to be powered from 100–120 and 200–240 VAC, 50–60 Hz.

Ground the Instrument: The unit is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the instrument, ensure that the product is properly grounded.

Do Not Operate in Hazardous Conditions: To avoid injury or fire hazard, do not operate this instrument in wet, damp, or other hazardous conditions. Do not operate this instrument in an explosive atmosphere. This instrument is not intended for outdoor use.

Eye Protection: Users should never stare into unterminated connectors or broken fibers. In addition, fiber cables and interfaces should always be handled as if they were emitting laser light. Always leave protective covers on optical connectors to prevent damage and prevent laser emissions.

Field Service: This equipment is not intended to be serviced in the field. All service is intended to be completed by Digital Lightwave, Inc.

WARNING
This is a class A product per EN55022. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. ◄

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Sicherheitshinweise

Zur Vermeidung von Verletzungen und Beschädigungen dieses Produktes oder angeschlossener Geräte während des normalen Betriebs sollten die folgenden Sicherheitshinweise beachtet werden. Reparaturarbeiten dürfen nur von qualifizierten Fachkräften durchgeführt werden.

Richtiges Stromkabel verwenden: Zur Vermeidung einer Brandgefahr sollte ausschließlich das für dieses Instrument vorgegebene Stromkabel verwendet werden. Spezifikationen für Nordamerika: Stromkabel (maximale Länge 1,82 m) der Bauart SJT, 3-adrig, Größe 18 AWG (zwei Leiter, ein Schutzleiter) sowie einem IEC 320-Steckverbinder an einem Ende und einem NEMA 5-15-Steckverbinder am anderen Ende.

Spezifikationen für Länder außerhalb der USA: Stromkabel der Bauart HO5VV-F, 3-adrig (zwei Leiter, ein Schutzleiter, 1 mm^2) sowie einem IEC 320-Steckverbinder an einem Ende und einem für die Verwendung in dem jeweiligen Land zugelassenen Netzstecker am anderen Ende.

Hinweis:
Der gesamte Kabelsatz muss für die Verwendung im jeweiligen Land zugelassen bzw. zertifiziert sein. ◄

Elektrische Überlastungen vermeiden. Dieses Gerät ist für eine Stromversorgung von 100–120 und 200–240 VAC, 50–60 Hz ausgeführt. Zur Vermeidung von elektrischen Schlägen, Brandgefahr und Beschädigungen des Instruments darf keine höhere Spannung angelegt werden.

Das Instrument muss geerdet werden. Das Gerät ist durch den Schutzleiter des Stromkabels geerdet. Zur Vermeidung von elektrischen Schlägen muss der Schutzleiter mit der Erdung verbunden sein. Vor dem Anschluss an den Ein- oder Ausgangsklemmen des Instruments muss sichergestellt werden, dass das Produkt richtig geerdet ist.

Das Gerät darf nicht unter gefährlichen Bedingungen eingesetzt werden. Zur Vermeidung von Verletzungen oder Brandgefahr das Gerät nicht in nasser, feuchter oder anderweitig gefährlicher Umgebung betreiben. Das Gerät nicht in explosionsgefährdeten Bereichen verwenden.

Augen schützen. Benutzer sollten niemals in abgetrennte Steckverbinder oder getrennte LWL-Kabel blicken. Bei LWL-Kabeln und Anschlüssen sollte als Vorsichtsmaßnahme stets angenommen werden, dass sie Laserlicht ausstrahlen. Die LWL-Anschlüsse sollten immer mit den Schutzabdeckungen verschlossen gehalten werden, um Beschädigungen und

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Laserausstrahlungen zu vermeiden.

Kundenseitige Reparaturen: Dieses Gerät darf nicht kundenseitig repariert werden. Alle Reparaturarbeiten müssen von Digital Lightwave, Inc. durchgeführt werden.

Warnung:
Dieses ist ein Gerät der Klasse A nach EN55022. In einem Wohngebiet kann dieses Gerät Funkstörungen verursachen. In diesem Fall muss der Benutzer entsprechende Abhilfemaßnahmen unternehmen. Die verwendeten Kabel dürfen nicht länger als 3 m sein, um die Anforderungen der EMV-Richtlinien zu erfüllen. ◄

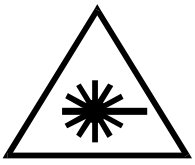
Umweltschutz: Dieses Produkt kann bleihaltiges Lötmaterial und eine Lithiumbatterie für die Computerunterstützung enthalten. Senden Sie bitte alle Digital Lightwave Produkte zur vorschriftsmäßigen Entsorgung an das Werk zurück. Der Betrieb dieses Produktes hat keine schädlichen Auswirkungen auf die Umwelt.

Lasersicherheit: Dieses Produkt enthält Lasergeräte der Klasse 1 (21 CFR 1040.10 und 1040.11 konform; EN60825-1: 1993 +A11+A2). Niemals in das abgetrennte LWL-Kabel blicken. Wenn das LWL-Kabel nicht an den LWL-Anschlüssen angeschlossen ist, sollten immer die Staubschutzkappen auf den LWL-Anschlussöffnungen angebracht sein. CDRH-Zugriffszahl: 0021615.

Laserprodukt der Klasse 1

HINWEIS

Nicht angeschlossene LWL-Verbinder können Laserstrahlen emittieren. Nicht mit optischen Instrumenten betrachten.



Class 1 Laser Product

NOTICE

Unterminated optical connectors may emit laser radiation. Do not view with optical instruments.

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Bei Verwendung von nicht in diesem Dokument spezifizierten Steuerungen, Einstellungen oder Verfahren besteht die Gefahr einer gefährlichen Strahlenaussetzung.

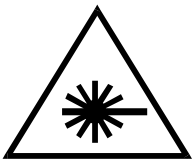
Safety Guidelines for Rackmount Products

Read and follow all warnings, cautions, and instructions marked on the product and included in this document. Only qualified personnel should perform installation or service.

This unit is designed to be NEBS Level 3 Conformant per Telcordia/ Bellcore GR-1089-CORE and GR-63-CORE.

1. Always wear an ESD wriststrap and follow appropriate ESD procedures when installing or servicing the unit and its components.
2. The unit is suitable for connection to intra-building or non-exposed cabling only per Telcordia/Bellcore NEBS GR-1089-CORE.
3. Turn off the unit's subpanel circuit breakers when making power input connections.
4. Verify that the input power requirements (-42 VDC to -56 VDC) are correct before installing the unit. This product is intended to operate from a -48 VDC source derived from batteries, SELV, or an NEC Class II device.
5. Do not attempt to lift and install the unit alone. A fully configured unit can weigh up to 58 pounds (26.31 kgs.).
6. The unit is configured and shipped to mount into a 23- or 19-inch rack. A minimum of four mounting screws are required to attach the unit to a rack's mounting rails. Eight mounting screws are recommended. Mounting screws are the responsibility of the customer.
7. Always make sure that a component is installed into the correct slot. (Use the label, visible when components are removed, to verify the slot position.)
8. An empty slot should never be exposed. Always have an empty slot covered by the appropriate blank faceplate when a component is removed for any period of time. This is required for NEBS GR-1089-CORE and EMC conformance.
9. The circuit packs contain Class 1 laser devices (21 CFR 1040.10 and 1040.11 Compliant; EN60825-1:1993+A11+A2). Never look into an unterminated fiber. Always place shutters on the optical ports when fiber is not attached to the optical ports. CDRH Accession Number: 9922616.

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Class 1 Laser Product

NOTICE

Unterminated optical connectors may emit laser radiation. Do not view with optical instruments.

Sicherheitshinweise Lesen und befolgen Sie bitte alle Warn- und Vorsichtshinweise sowie alle Anweisungen auf dem Produkt und in diesem Dokument. Installation und Reparatur dürfen nur von qualifizierten Fachkräften durchgeführt werden.

Dieses Gerät ist für NEBS Level 3 Konformität nach Telcordia/Bellcore GR-1089-CORE und GR-63-CORE ausgeführt.

1. Zur Installation oder Wartung des Gerätes sollte immer ein Antistatik-Armband getragen und die entsprechenden ESE-Verfahren beachtet werden.
2. Das Gerät eignet sich für den Anschluss an gebäudeinterne oder nicht freiliegende Kabel, sofern die Anforderungen nach Telcordia/ Bellcore NEBS GR-1089-CORE erfüllt werden.
3. Vor dem Anschluss an die Leistungseingänge müssen die Leistungsschutzschalter auf der Unterverteilungsschalttafel des Gerätes ausgeschaltet werden.
4. Vor der Installation des Geräts ist zu prüfen, ob die Eingangsleistungsanforderungen (-42 VDC bis -56 VDC) erfüllt sind. Dieses Gerät ist für den Betrieb mit einer -48 VDC Batteriestromquelle, SELV oder einem NEC-Gerät der Klasse II bestimmt.
5. Das Gerät sollte keinesfalls von einer Person alleine gehoben und installiert werden. Voll konfiguriert kann es bis zu 26,3 kg wiegen.
6. Das Gerät wird für die Montage in einem 58,4 cm oder 48,3 cm Rack konfiguriert und geliefert. Zur Befestigung an den Rackschienen müssen mindestens vier Befestigungsschrauben verwendet werden. Acht Schrauben werden empfohlen. Die Befestigungsschrauben müssen kundenseitig gestellt werden.
7. Es ist wichtig, darauf zu achten, dass jede Komponente in den richti-

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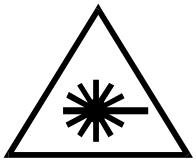
gen Steckplatz installiert wird. (Die Steckplatzposition kann bei ausgebauten Komponenten anhand der Etikettierung bestätigt werden.)

8. Freie Steckplätze dürfen nicht ungeschützt freiliegen. Wenn eine Komponente für längere Zeit entfernt wird, sollte der leere Steckplatz mit einer passenden Abdeckplatte abgedeckt werden. Die Steckplatzabdeckung ist zur Aufrechterhaltung der NEBS GR-1089-CORE- und EMV-Konformität notwendig.
9. Die Baugruppen enthalten Lasergeräte der Klasse 1 (21 CFR 1040.10 und 1040.11 konform; EN60825-1:1993 +A11+A2). Niemals in das abgetrennte LWL-Kabel blicken. Wenn das LWL-Kabel nicht an den LWL-Anschlüssen angeschlossen ist, sollten die LWL-Anschlussöffnungen immer mit Klappen abgedeckt werden. CDRH-Zugriffszahl: 9922616.

Laserprodukt der Klasse 1

HINWEIS

Nicht angeschlossene LWL-Verbinder können Laserstrahlen emittieren. Nicht mit optischen Instrumenten betrachten.



Class 1 Laser Product

NOTICE

Unterminated optical connectors may emit laser radiation. Do not view with optical instruments.

Bei Verwendung von nicht in diesem Dokument spezifizierten Steuerungen, Einstellungen oder Verfahren besteht die Gefahr einer gefährlichen Strahlenaussetzung.

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Contents

1 Introducing SCPI Commands

Overview 1-1
SCPI Command Menu Hierarchy 1-1
Configuring the Unit for SCPI Command Mode 1-1
SCPI Configuration when using a Touch Screen or Remote Control GUI - Method 1 1-2
SCPI Configuration when using a Touch Screen or Remote Control GUI - Method 2 1-3
SCPI Configuration when using a Touch Screen or Remote Control GUI - Method 3 1-4
SCPI Configuration when using the EMS 1-5
Verifying Connectivity 1-5
Opening a SCPI Session 1-6
Multisession SCPI Overview 1-8
Long and Short SCPI Command Formats 1-9
Query and Set SCPI Commands 1-9

2 Standard SCPI Commands

Overview 2-1
"STAR" Commands 2-2
SYSTem Commands 2-2
STATus Commands 2-5
Miscellaneous Commands: INITiate, ABORt, INSTrument, and ROUTe Commands 2-7

3 Extended SCPI Commands

Overview 3-1
Extended SCPI Commands 3-1
RES (Fetch) Branch 3-1
TX (SOURce) Branch 3-20
RX (Sense) Branch 3-40
GET Branch 3-51

4 ATM SCPI Commands

Overview 4-1
Supported ATM SCPI Commands 4-1

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RES (Fetch) Branch 4-1
TX (SOURce) Branch 4-7
ATMVCC Branch 4-13
ATMSCAN Branch 4-19
ATMSYS Branch 4-20
SVCSETUP Branch 4-22
SVCCFG Branch 4-29
TXRX Branch 4-34
RX (Sense) Branch. 4-36

5 Gigabit Ethernet SCPI Commands

Overview 5-1
Supported GigE SCPI Commands 5-1
RES (Fetch) Branch 5-1
TX (SOURce) Branch 5-3
RFC2544 Branch 5-4
Packet Branch. 5-6
GET Branch 5-12

6 OSA SCPI Commands

Overview 6-1
Supported OSA SCPI Commands 6-1
RX (Sense) Branch. 6-1

7 Error Codes

Overview 7-1

8 Register Definitions

Overview 8-1
*STB?
Status Byte (Immediate Response Queue). 8-1
*ESR?
Standard Event Status Register (Immediate Response Queue) . . 8-1
STATus:QUES?
Questionable Register 8-2
STATus:OPER:TCON?
Telecom Configuration Register (TCON) 8-2
DS1 Registers
STAT:QUES:DS1@1? and STAT:QUES:DS1@2 8-3
DS3 Register

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STAT:QUES:DS3? 8-3
E1 Registers
STAT:QUES:E1@1? and STAT:QUES:E1@2. 8-4
E3 Register
STAT:QUES:E3?. 8-5
E4 Register
STAT:QUES:E4?. 8-5
SDH/SONET Register
STAT:QUES:SDH? or STAT:QUES:SONET?. 8-6

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1 Introducing SCPI Commands

Overview

Digital Lightwave products support automated programming and remote control using the **Standard Commands for Programmable Instruments** (SCPI) protocol. This protocol consists of standard and extended SCPI commands, which are listed in this reference guide.

SCPI commands can be issued over a variety of hardware interfaces, such as GPIB and serial, and software interfaces, such as Ethernet.

This reference guide lists Standard and Extended SCPI commands, Error Codes, and Register Definitions supported by the configured unit. You may not have access to all commands based on the product configuration you purchased. SCPI commands are fully compatible across all DLI NIC and NAA IV products.

SCPI Command Menu Hierarchy

The following is a hierarchal view of the SCPI Command menu.

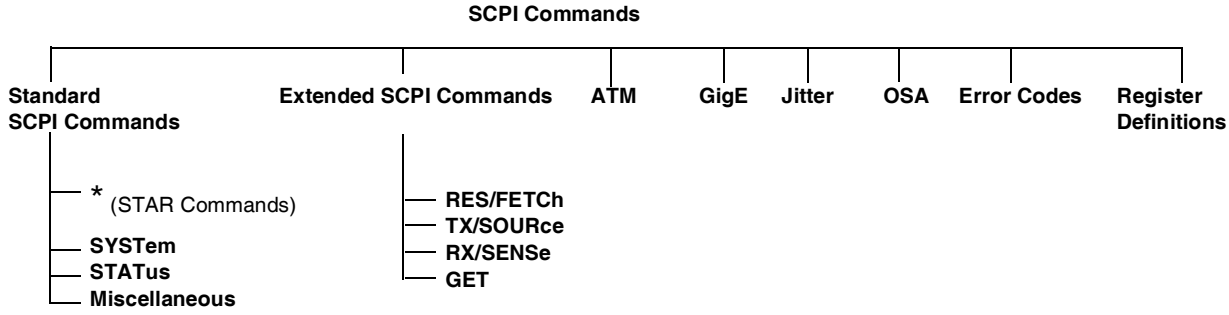


Figure 1-1. SCPI Command Menu Hierarchy

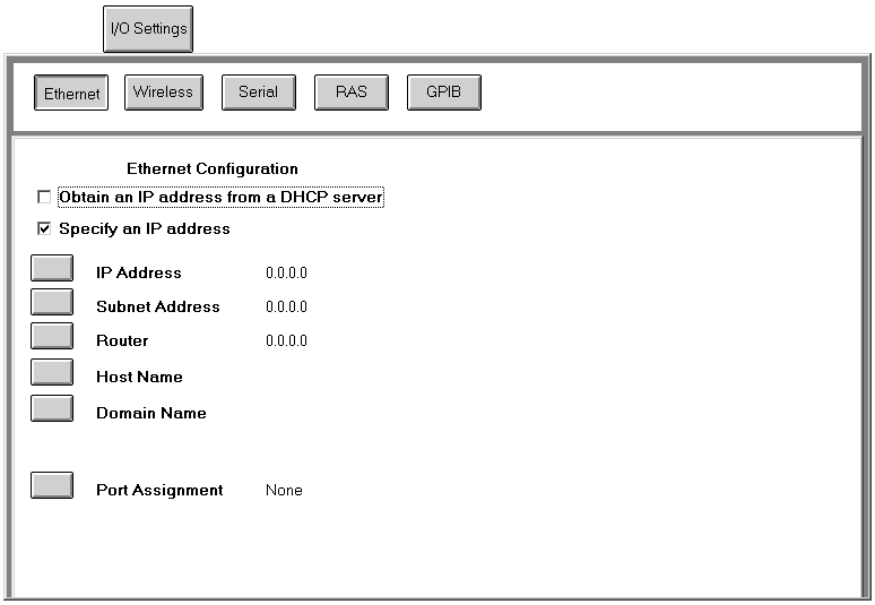
Configuring the Unit for SCPI Command Mode

Before you can issue SCPI commands to the unit, you must first decide on a hardware or software interface to use, and then configure the unit for that interface. The following sections describe how to configure the unit for SCPI command operation when using either a portable unit's touch screen, the Remote Control GUI, or the EMS software. Methods 1, 2, and 3 vary based the unit's software version. Use the method that matches the I/O Settings screens that appear on your unit.

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SCPI Configuration when using a Touch Screen or Remote Control GUI - Method 1

The I/O Settings screen appears by selecting the **System** tab and then the **I/O Settings** button. **Units with feature set 3.2 or greater display the following I/O Settings screen:**



If your unit displays this screen, use the following procedures to configure the unit for SCPI operation.

1. Select SYSTEM. This appears on the unit's touch screen or Remote Control GUI.
2. Select I/O Settings. The **Ethernet Configuration** functions appear.

   NOTE ➤

   Select Serial or GPIB if using the the serial or GPIB ports. ➤
3. Select Port Assignment and select **SCPI** to assign SCPI operations to the port.

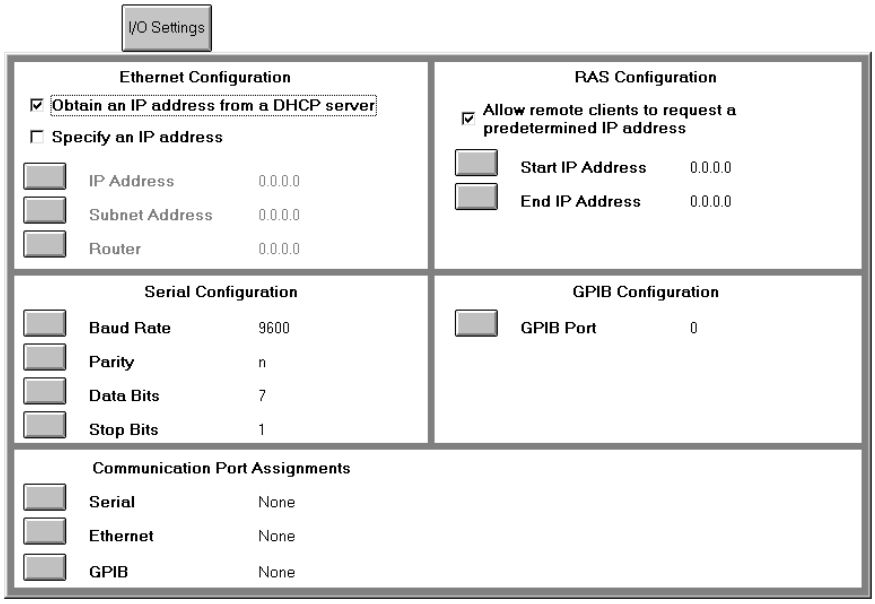
   If it is necessary to change port parameters, refer to the unit's online help file for more information.

   This concludes the unit's SCPI port configuration using either the touch screen or Remote Control GUI.

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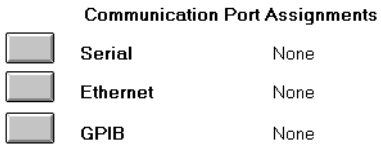
SCPI Configuration when using a Touch Screen or Remote Control GUI - Method 2

The I/O Settings screen appears by selecting the **System** tab and then the **I/O Settings** button. **Some units may display the following I/O Settings screen:**



If your unit displays this screen, use the following procedures to configure the unit for SCPI operation.

1. Select SYSTEM. This appears on the unit's touch screen or Remote Control GUI.
2. Select I/O Settings. The **Communication Port Assignments** functions appear.



3. Select a port (**Serial**, **Ethernet**, or **GPIB**) to assign to SCPI operation.

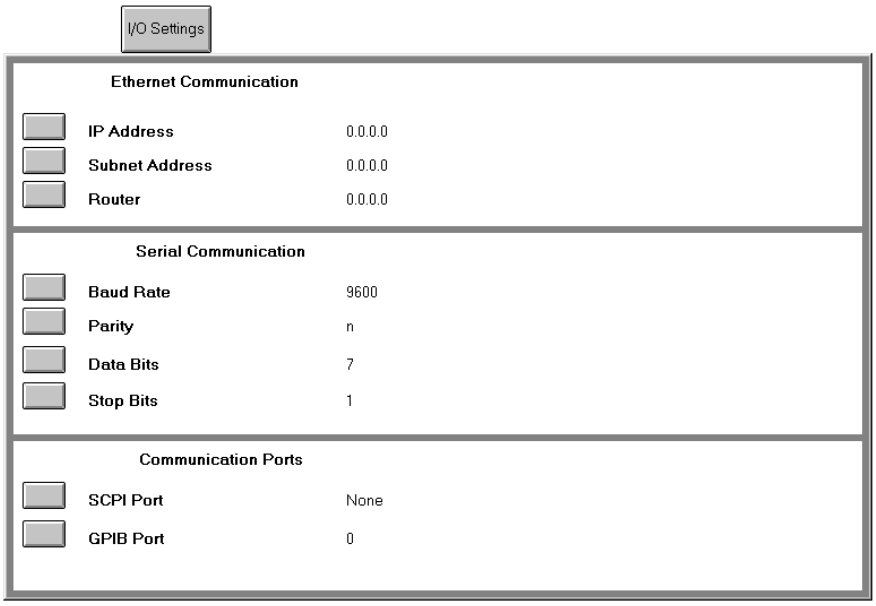
   If it is necessary to change port parameters, refer to the unit's online help file for more information.

   This concludes the unit's SCPI port configuration using either the touch screen or Remote Control GUI.

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SCPI Configuration when using a Touch Screen or Remote Control GUI - Method 3

The I/O Settings screen appears by selecting the **System** tab and then the **I/O Settings** button. **Some units may display the following I/O Settings screen:**

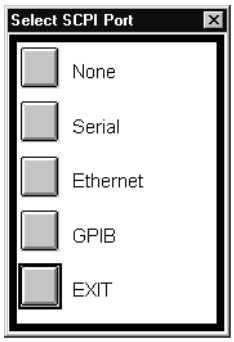


If your unit displays this screen, use the following procedures to configure the unit for SCPI operation.

1. Select SYSTEM. This appears on the unit's touch screen or Remote Control GUI.
2. Select I/O Settings. The **Communication Ports** functions appear.



3. Select **SCPI Port**. The SCPI port options appear.



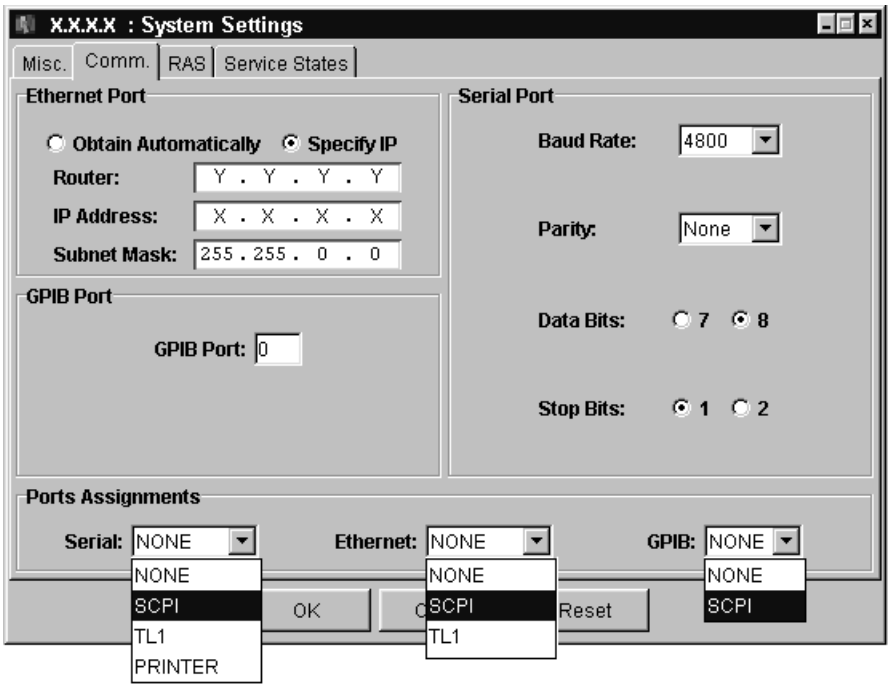
4. Select the connection method you will use to send SCPI commands to and from the unit.

   This concludes the unit's SCPI port configuration using either the touch screen or Remote Control GUI.

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SCPI Configuration when using the EMS

1. Select the **Tools** function menu.
2. Select **Setup**.
3. Select **System Properties**. The System Settings window appears.
4. Select the **Comm** tab. The communications parameters appear.



5. Select and set the communications port that you will use to send SCPI commands to and from the unit.
6. Select **OK**.

   This concludes the unit's SCPI port configuration using the EMS.

Verifying Connectivity

You can connect the unit directly to a PC (using the Serial port) or remotely using the Ethernet port. You must have a terminal emulation package (for example, HyperTerminal) or a terminal protocol, such as Telnet, as an interface for issuing SCPI commands.

After configuring the unit for SCPI operation, perform the following quick test to verify connectivity between the unit and your terminal software.

1. Open your terminal software, make sure it is properly configured for the unit's SCPI port settings, and connect to the unit.

   NOTE ➤
   Use port number **8090** if you are using Ethernet or a Telnet application to issue SCPI commands to the unit. ◄

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2. Verify connectivity by sending the **SCPI?** command (Identification) to the unit. This command queries the unit for its identification sequence. For example,

   Type: `SCPI?`

   Press: Enter

   A **YES** message indicates that you can communicate with the unit.

   To continue using SCPI commands, you must log in and open a SCPI session.

Opening a SCPI Session

The following procedures describe how to log in, retrieve a product inventory, and select a specific test unit (protocol processor).

1. Use the **LOGIN** command to open a SCPI session. For example,

   Type: `LOGIN Admin Admin1`

   (Admin = default user ID; Admin1 = default password)

   Press: Enter

2. Use the **GET:PROTOCOLS?** command to retrieve an inventory of protocol processors installed in the unit.

   Type: `GET:PROTO?`

   Press: Enter

   The information returned appears using the following format:

   W X Y Z; W X Y Z; ... W X Y Z;

   where

   W = chassis ID (only appears for NAA IV and NIC Plus)

   X = slot ID (only appears for NAA IV and NIC Plus)

   Y = card ID (only appears for NAA IV and NIC Plus)

   Z = protocol processor

3. Use the **INST** command to select a protocol processor.

   For example, when using a NIC 10G or NIC 2.5G portable unit:

   Type: `INST X`

   where *X* = OC192, OC48, OC12, OC192Q@N, STM64, STM16, STM4, STM64Q@N, E1@N, E3, E4, DS3, DS@N, or ATM

   Press: Enter

   When using an NAA IV or NIC Plus:

   Type: `INST X Z`

   where

   X = slot ID

   NOTE ➤
   The slot ID is only required when multiple circuit packs of the same type

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(for example, two 2.5G circuit packs) are installed in the unit.

For a 19-inch NAA IV chassis, slots 1-5 and 7-10 can be selected. Slot 6 is reserved for the System Controller circuit pack.

For a 23-inch NAA IV chassis, slots 1-6 and 8-13 can be selected. Slot 7 is reserved for the System Controller circuit pack. ◄

Z = OC192, OC48, OC12, OC192Q@N, STM64, STM16, STM4, STM64Q@N, E1@N, E3, E4, DS3, DS1@N, ATM, or GIGE@N

Press: Enter

When using an NAA IV or NIC Plus with multiple Gigabit Ethernet circuit packs:

Type: **`INST W X Y Z`**

where

W = chassis ID

X = slot ID

NOTE ➤
The slot ID is only required when multiple circuit packs of the same type are installed in the unit. ◄

Y = card ID

NOTE ➤
The card ID is required when multiple Gigabit Ethernet circuit packs are installed in the unit. ◄

Z = GIGE@N

where N is 1 (Port 1) or 2 (Port 2)

NOTE ➤
All SCPI commands issued will be sent to the selected protocol processor. This is true until a new protocol processor is selected using the INST command. ◄

SCPI commands can now be issued to the selected protocol processor. An error message is returned if you enter a SCPI command that is not applicable for the selected protocol processor.

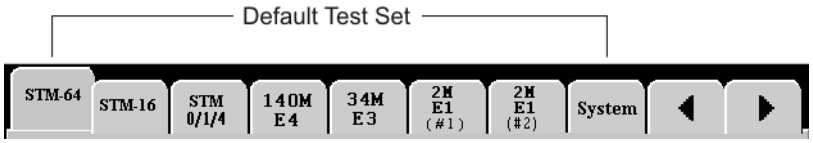
- To close a SCPI session, use the **LOGOUT** command.

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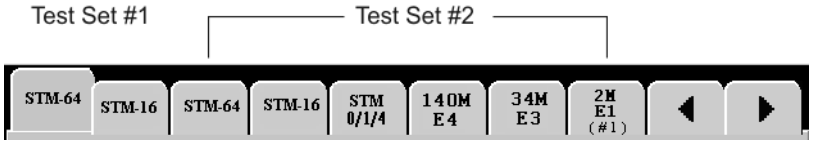
Multisession SCPI Overview

A NIC portable unit can support up to five simultaneous SCPI users, and an NAA IV unit can support up to 10 simultaneous SCPI users. This is known as multisession SCPI. The following guidelines apply to multisession SCPI:

- The first user to select a circuit pack in the unit will automatically lock all associated circuit packs. This grouping of circuit packs is known as a Test Set. When a Test Set is locked, other users cannot access these circuit packs while the first user is logged on.
- A Test Set is a series of adjacent circuit packs (based on a circuit pack's internal addressing and starting from the highest to the lowest speed) that are installed in a unit.



A unit can contain multiple circuit packs of the same type (for example, two 10 Gbps circuit packs).



When this type of configuration occurs, the first instance of the higher speed circuit pack is considered a test set (Test Set #1). Any lower speed circuit packs adjacent to this card are included in the test set. When the second instance of the higher speed circuit pack is encountered, it is considered the beginning of the second test set (Test Set #2). Likewise, any subsequent lower speed circuit packs are included as part of the second test set.

- The user, who has the Test Set locked, can unlock the Test Set and still remain logged on by issuing the **INST NONE** SCPI command.

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Long and Short SCPI Command Formats

SCPI commands for the units are not case sensitive and can be entered using all upper-case characters, all lower-case characters, or a mixture of both.

SCPI commands can be issued using either the long-character format or the short-character format. In this reference guide:

- Upper-case characters indicate the minimum number of characters required for a successful command.
- Lower-case characters are optional.
- Parameters should be separated by a space, unless otherwise documented in the command.
- SCPI commands should be typed on one single line completed with a hard carriage return.
- Replies from SCPI commands have a carriage return appended.

The following examples show how the **SYSTem:VERSion** query command is issued in both long-character and short-character formats:

To enter the **long-character** format of this command, type:

```
SYSTEM:VERSION?
```

The response `SCPI 1995.0` appears.

The same command can be entered using any of the following **short-character** formats:

```
SYST:VERS?          SYSTEM:VERS?
SYST:VERSI?         SYSTEM:VERSI?
SYST:VERSIO?        SYSTEM:VERSIO?
SYST:VERSION?
```

Query and Set SCPI Commands

In general, SCPI commands are query and set functions. A Query command interrogates the unit for the current value of the issued SCPI command. It is terminated with a question mark (?) and does not require a colon after the last parameter.

For example, to query the unit for the current selected protocol processor, type:

```
INST?
```

A Set command changes a command's value. The new command value is appended to the end of the command string. For example, to change the unit to the STM-16 protocol processor, type:

```
INST STM16
```


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2 Standard SCPI Commands

Overview

This chapter lists the Standard SCPI commands supported by the configured unit. You may not have access to all commands based on the product configuration you purchased. SCPI commands are fully compatible across all DLI products.

Standard SCPI Commands

These commands are from the SCPI standard. SCPI commands for the configured unit are not case sensitive; therefore, both upper and lower cases can be used for the short version of a command. SCPI commands should be typed on one single line completed with a hard carriage return.

For example, the System Error Query command can be sent to the register queue by typing any of the following formats:

SYSTEM:ERROR?

syst:err?

SYST:ERROR?

system:erro?

Pattern Setting and Reporting

Patterns can be a user-specified bit pattern, or can be a character string, describing the pattern. Patterns are specified with one of these formats:

NNNNNN	(Decimal Integer)
#Bbbbbbbbbbb	(Binary Integer)
#Hhhhhhhhhh	(Hexadecimal Integer)
xxxxxxxxxxxx	(Predefined pattern description string)

For pattern queries, the Binary format is always returned.

For specifying patterns that can be variable size, the binary format must be used. The number of characters after the #B shall dictate the length of the pattern.

The pattern description string must not begin with a decimal character or "#" to prevent it from being confused with the numeric bit patterns. For example:

127	(8-bit, user-defined bit pattern of 01111111)
#B000	(3-bit, all-zero user-defined bit pattern)
#H00FF010A	(4-byte, user-defined bit pattern)
PRBS23-1	(PRBS 2^{23}-1 predefined pattern)
2_IN_1	(INVALID PATTERN - Begins with a numeral)

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TWO_IN_1 (Predefined pattern)

This command changes the SONET/SDH overhead using Hex:

TX:OH:D1 #HFF

This command changes a pattern using a binary input:

TX:PATT #B1010101010101010

This command is for an E1 CAS channel query using a decimal for channel:

TX:CAS 21?

"STAR" Commands

The "Star" commands are standard SCPI commands that are used to set or query a device's Status Byte Register.

The following commands are supported:

"Star" Command	Description
*CLS	Sets all SCPI registers to zero.
*IDN?	Identification Sequence. Queries the IEEE standard identification sequence of the unit. The following four values, each separated by commas, are returned for this command: Company Name, Product Model Name, Serial Number, Software Version.
*ESR?	Queries the Standard Event Status Register.
*RST	Resets to factory default settings.

SYSTem Commands

The System commands affect the entire instrument, not just one protocol. These commands allow you to query and set basic system items such as ports, printing, and configuration. The following is a list of supported System commands.

SYSTem Command	Description
SYSTem:AUTOLOGIN:DETails <UserName Password>	Sets the unit's user name and password. These values are case sensitive. The user name must be 5 to 18 characters. The password must be 4 to 8 characters. User accounts entered using SCPI commands have Administrator permissions.
SYSTem:AUTOLOGIN:VALue <true or false>	Enables and disables Auto login. True = On. False = Off. These values are not case sensitive.
SYSTem:AUTOLOGIN:VALue?	Queries the Auto login status and returns a value of True, if Auto login is enabled, or False, if Auto login is disabled.
SYSTem:AUTOLOGIN:USER?	Queries the Auto login user name as defined by the **SYStem:AUTOLOGIN:DETails** command.

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SYSTem Command	Description
SYSTem:BACKLight <value> SYSTem:BACKLight?	Sets or queries the intensity of a unit's screen. Values range from 0 (brightest setting) to 255 (dimmest setting).
SYSTem:COMMunicate:SERial: BAUD <value> SYSTem:COMMunicate:SERial:BAUD?	Sets or queries the RS-232 baud rate. Valid baud rates are: 1200, 2400, 4800, 9600, 14400, and 19200.
SYSTem:COMMunicate:SERial:BITS <value> SYSTem:COMMunicate:SERial:BITS?	Sets or queries the RS-232 data bits. Valid data bit values are: 7 or 8.
SYSTem:COMMunicate:SERial:PARity <value> SYSTem:COMMunicate:SERial:PARity?	Sets or queries the RS-232 parity. Valid parity values are: EVEN, ODD, or NONE.
SYSTem:COMMunicate:SERial:SBITs <value> SYSTem:COMMunicate:SERial:SBITs?	Sets or queries the RS-232 stop bits. Valid stop bit values are: 1 or 2.
SYSTem:COMMunicate:ETHERnet: ADDRess <value> SYSTem:COMMunicate:ETHERnet:ADDRess?	Sets or queries the Ethernet IP address. (e.g., 208.143.235.123)
SYSTem:COMMunicate:ETHERnet: SUBnet <value> SYSTem:COMMunicate:ETHERnet:SUBnet?	Sets or queries the Ethernet IP subnet mask. (e.g., 255.255.255.0)
SYSTem:COMMunicate:ETHERnet: ROUTer <value> SYSTem:COMMunicate:ETHERnet:ROUTer?	Sets or queries the Ethernet IP router for this subnet. (e.g., 255.255.255.1)
SYSTem:DATE <MM,DD,YYYY> and SYSTem:DATE?	Sets or queries the date on the system. Four digits are required for the year.
SYSTem:DTESTUList? **Note:** This command reports the unit's inventory in relation to the default test unit grouping. It helps determine which protocol processors in a given test unit are locked when the **INST** command is used. The **SYSTem:LOCK:OWNER?** command reports which user owns the test lock.	Queries and displays a list of default test units and corresponding protocol processors. (For a description about test units, refer to the *Multisession SCPI Overview* section in Chapter 1.) **Returned format string guidelines:** ■ When more than one protocol processor is associated with a default test unit, a comma (,) delimiter is used. ■ When multiple default test units are present, a colon (:) delimiter is used. ■ For NIC Plus portable and NAA IV rackmount products, the default test unit name, chassis number, slot number, card ID, and protocol processor ID appear. ■ For NIC portable products, the default test unit name and protocol processor ID appear. **Example output for NIC Plus and NAA IV products:** Default1 1 1 0 OC192, 1 1 0 STM64, 1 2 0 OC48, 1 2 0 STM16: Default2 1 5 0 E4, 1 5 0 E3, 1 5 0 DS3, 1 5 0 E1@1, 1 5 0 DS1@1 **Example output for NIC products:** Default1 OC192, STM64, OC48, STM16: Default2 E4, E3, DS3, E1@1, DS1@1

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SYSTem Command	Description
SYSTem:ERRor?	Queries the first error waiting in the error queue, and removes that one error from the queue.
SYSTem:ERRor:CODE? SYSTem:ERRor:CODE:NEXT? SYSTem:ERRor:NEXT?	Queries the first error waiting in the error queue, and removes that one error from the queue.
SYSTem:ERRor:CODE:LAST?	Queries the last error waiting in the error queue, and empties the queue in the process.
SYSTem:ERRor:COUNt?	Queries the number of errors waiting in the error queue. Valid error values are: 0 to 79.
SYSTem:ERRor:LAST?	Queries the last error waiting in the error queue, and empties the queue in the process.
SYSTem:LEGACYR?	Queries the system for its current error code reporting format. Refer to Chapter 5, Error Codes for a list of error codes and descriptions. True = Error code number only. False = Error code number and definition.
SYSTem:LEGACYR <format>	Sets the error code format. Valid values for <format> are: Valid values for <format> are: **Format** — **Description** TRUE — Only the error code number is returned. For example, 101. This is the old error code format. FALSE — The error code number and description are returned. For example, 101, “Object not initialized.” This is the new error code format. False is the factory default value.
SYSTem:LOCK:OWNER?	Queries and reports a list of locked protocol processors and the lock owner. **NONE** is reported if no protocol processors are locked. **Returned format string guidelines:** ■ A colon delimiter is used to separate multiple protocol processors installed in a unit. ■ For NIC Plus portable and NAA IV rackmount products, the chassis number, slot number, card ID, protocol processor ID, and lock owner appear. ■ For NIC portable products, the default test unit name and protocol processor ID appear. **Example output for NIC Plus and NAA IV products:** 1 1 0 OC192_STM64 Admin: 1 2 0 E3_DS3 JOE **Example output for NIC products:** OC192_STM64 Admin: E3_DS3 JOE
SYSTem:OSCillator <value> SYSTem:OSCillator?	Sets or queries the Oscillator Value. This command is used to set the unit’s internal clock frequency. The value can be adjusted in 255 steps, where 0 is the lowest frequency, 128 is the center frequency, and 255 is the highest frequency.
SYSTem:PORT:SCPI <value> SYSTem:PORT:SCPI?	Sets or queries which port accepts SCPI commands. Valid ports are: GPIB, SERIAL, 232MODEM, PCMCIA, ETHERNET, or NONE.

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SYSTem Command	Description
SYSTem:RESPonse <setting>	Sets the command response setting to one of ALWAYS or STANDARD. STANDARD is the default and behaves per the SCPI standard where only queries return a response. ALWAYS means that every command returns a response of +0 or an error code.
SYSTem:RESPonse?	Queries the current response setting, ALWAYS or STANDARD.
SYSTem:RUNTIME?	Returns the system runtime ODOMETER as three integers: Days, Hours, and Minutes, separated by commas.
SYSTem:SPEAKer <value> SYSTem:SPEAKer?	Sets or queries the unit's speaker volume. Values range from 0 to 15.
SYSTem:TIME <HH,MM,SS> SYSTem:TIME?	Sets or queries the time on the system, as Hours, Minutes and Seconds.
SYSTem:VERSion?	Queries the version number of the SCPI code. Format is "NN.NN.NN".
SYSTem:WHOAMI?	Queries and displays the user name and number associated with the current logged session using the following format: **UserId/Session** where, Session is TCP*n* (n is an integer greater than 0), RS232, or GPIB. For example: Admin/TCP2 The current session is owned by the user Admin and is connected to the SCPI Proxy using TCP/IP connection #2.

STATus Commands

The Status Branch commands allow you to query and set commands for functions in the OPERation and QUEStionable registers.

The following is a list of supported Status Branch commands. **The contents of these registers are described in Chapter 8, *Register Definitions*.**

STATus Command	Description
STATus:OPERation:TCON? STATus:OPERation:TELECOM? STATus:OPERation:TCON:EVENt? STATus:OPERation:TELECOM:EVENt? STATus:OPERation:TCON:CONDition? STATus:OPERation:TELECOM:CONDition?	Queries the Telecom Configuration register. Register definitions are in this document.
STATus:OPERation:TCON:ENABle? STATus:OPERation:TELECOM:ENABle? STATus:OPERation:TCON:ENABle <MASK> STATus:OPERation:TELECOM:ENABle <MASK>	Queries and sets the TCON register mask.
STATus:QUEStionable? STATus:QUEStionable:CONDition?	Queries the standard QUEStionable register. Register definitions are in this document.

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STATus Command	Description
STATus:QUEStionable:EVENt?	Queries a latched version of the standard QUEStionable register. Register definition is the same as unlatched. Latched bits are cleared when **INIT** command is sent.
STATus:QUEStionable:ENABle? STATus:QUEStionable:ENABle <MASK>	Queries and sets the QUEStionable register mask.
STATus:QUEStionable:DS1@N? STATus:QUEStionable:DS1@N:CONDition?	Queries the DS1 register. Register definitions are in this document (N = 1 or 2).
STATus:QUEStionable:DS1@N:EVENt?	Queries a latched version of the DS1 register. Register definition is the same as unlatched. Latched bits are cleared when **INIT** command is sent (N = 1 or 2).
STATus:QUEStionable:DS1@N:ENABle? STATus:QUEStionable:DS1@N:ENABle <MASK>	Queries and sets the DS1 register mask (N = 1 or 2).
STATus:QUEStionable:E1@N? STATus:QUEStionable:E1@N:CONDition?	Queries the E1 register. Register definitions are in this document (N = 1 or 2).
STATus:QUEStionable:E1@N:EVENt?	Queries a latched version of the E1 register. Register definition is the same as unlatched. Latched bits are cleared when **INIT** command is sent (N = 1 or 2).
STATus:QUEStionable:E1@N:ENABle? STATus:QUEStionable:E1@N:ENABle <MASK>	Queries and sets the E1 register mask (N = 1 or 2).
STATus:QUEStionable:E3? STATus:QUEStionable:E3:CONDition?	Queries the E3 register. Register definitions are in this document.
STATus:QUEStionable:E3:EVENt?	Queries a latched version of the E3 register. Register definition is the same as unlatched. Latched bits are cleared when **INIT** command is sent.
STATus:QUEStionable:E3:ENABle? STATus:QUEStionable:E3:ENABle <MASK>	Queries and sets the E3 register mask.
STATus:QUEStionable:E4? STATus:QUEStionable:E4:CONDition?	Queries the E4 register. Register definitions are in this document.
STATus:QUEStionable:E4:EVENt?	Queries a latched version of the E4 register. Register definition is the same as unlatched. Latched bits are cleared when **INIT** command is sent.
STATus:QUEStionable:E4:ENABle? STATus:QUEStionable:E4:ENABle <MASK>	Queries and sets the E4 register mask.
STATus:QUEStionable:SDH? STATus:QUEStionable:SDH:CONDition?	Queries the SDH/SONET register. Register definitions are in this document.
STATus:QUEStionable:SDH:EVENt?	Queries a latched version of the SDH/SONET register. Register definition is the same as unlatched. Latched bits are cleared when **INIT** command is sent.
STATus:QUEStionable:SDH:ENABle? STATus:QUEStionable:SDH:ENABle <MASK>	Queries and sets the SDH/SONET register mask.
STATus:QUEStionable:SONET? STATus:QUEStionable:SONET:CONDition?	Queries the SDH/SONET register. Register definitions are in this document.
STATus:QUEStionable:SONET:EVENt?	Queries a latched version of the SDH/SONET register. Register definition is the same as unlatched. Latched bits are cleared when **INIT** command is sent.

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STATus Command	Description
STATus:QUEStionable:SONET:ENABle? STATus:QUEStionable:SONET:ENABle <MASK>	Queries and sets the SDH/SONET register mask.

Miscellaneous Commands: INITiate, ABORt, INSTrument, and ROUTe Commands

The following commands can start and stop basic unit functionality. In addition, these commands perform a number of miscellaneous commands that control unit settings.

Command	Description
ABORt <protocol processor or blank> **Note:** A protocol processor has not been selected if error code -224 appears. Use the **INST** command to select a protocol.	*Protocols Supported:* ALL Stops data acquisition for the selected protocol processor(s). **Note:** If one of the protocol processors listed below has other protocol processors associated with it (for example, a drop/insert configuration), then those protocol processors are also stopped. For example, if the **ROUTe S3** command is in effect, the **ABORT STM4** command will also stop the E3/DS3 protocol processor. Valid protocol processor values are: **Protocol Processor** <blank> Stops the protocol processor currently selected by the INST command. Error code -224 appears if no instrument is selected. STM64 Stops the STM-64 protocol processor STM16 Stops the STM-16 protocol processor STM4 Stops the STM-4 protocol processor OC192 Stops the OC-192 protocol processor OC48 Stops the OC-48 protocol processor OC12 Stops the OC-12 protocol processor E4 Stops the E4 protocol processor E3 Stops the E3 protocol processor E1@N Stops the E1@N protocol processor DS3 Stops the DS3 protocol processor DS1@N Stops the DS1@N protocol processor ATM Stops the ATM protocol processor ALL Stops all protocol processors **Note:** Although the ALL parameter is currently supported in SCPI release 2.0.51, it may not be supported for future major releases. If an error code appears when using the ALL parameter, then it is not supported in your SCPI release.

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Command	Description
AUTOCONfig <type or blank> **Note:** If multiple circuit packs of the same type (for example two 2.5G circuit packs) are installed in a NIC Plus portable or NAA IV rackmount unit, then all circuit packs are automatically configured when this command is issued.	*Protocols Supported:* ALL Automatically configures settings to match the signal being received. When configuring tributaries, the first non-idle/unequipped tributary is used. If all are idle or all unequipped, no further tributary examination is done. TYPE is one of the following: **Type** — **Meaning** MASTER or <blank> — Configure all, including tributaries, starting with SDH/SONET highest speed STM4 — Configure STM-4 and tributaries STM16 — Configure STM-16 only, no tributaries STM64 — Configure STM64 only, no tributaries OC192 — Configure OC192 only, no tributaries OC48 — Configure OC48 only, no tributaries OC12 — Configure OC12 and tributaries E4T — Configure E4 and tributaries E4 — Configure E4 only, no tributaries E3T — Configure E3 and tributaries E3 — Configure E3 only E1@N — Configure E1@N only DS3T — Configure DS3 and tributaries DS3 — Configure DS3 only, no tributaries DS1@N — Configure DS1@N only
DELAY <milliseconds>	*Protocols Supported:* SYSTEM Waits an integer number of milliseconds before processing next command.
DURation <minutes>	*Protocols Supported:* ALL Set the duration of the specified test to an integer number of minutes or "CONTINUOUS." No practical maximum.
DURation?	*Protocols Supported:* ALL Returns the duration of the specified test as an integer (minutes), or "CONTINUOUS."
ELAPSEdtime?	*Protocols Supported:* ALL Returns the time the specified test has been running in seconds.
PROTOCOL <protocol mode>	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Selects a protocol processor mode. **Protocol Mode** — **Description** SDH — Enables SDH mode SONET — Enables SONET mode **Note:** The following protocols are only available on products that contain both SONET/SDH and PDH hardware. **Protocol Mode** — **Description** SDH_DS1_DS3 — Enables SDH, DS1 and DS3 modes SDH_E1_DS3 — Enables SDH, E1, and DS3 modes SDH_E1_E3 — Enables SDH, E1, and E3 modes SONET_DS1_DS3 — Enables SONET, DS1, and DS3 modes SONET_E1_DS3 — Enables SONET, E1, and DS3 modes

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Command	Description
PROTOCOL?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Queries the protocol processor for its current mode of operation.
REMAINingtime?	*Protocols Supported:* ALL Returns the time remaining of the specified test in seconds. For a test that is running and has a finite duration (not CONTINUOUS), this time is the duration minus the elapsed time. A value of zero indicates the protocol processor is stopped. A value of "CONTINUOUS" indicates there is no end to the test.
INITiate <protocol processor or blank> **Note:** A protocol processor has not been selected if error code -224 appears. Use the **INST** command to select a protocol. When using the ALL parameter, refer to the description listed to the right.	*Protocols Supported:* ALL Starts data acquisition for the selected protocol processor(s). When the INIT command is issued, it automatically stops the protocol processor and then starts data acquisition. There is no need to issue the **ABORT** command before using the **INIT** command. **Note:** If one of the protocol processors listed below has other protocol processors associated with it (for example, a drop/insert configuration), then those protocol processors are also started. For example, if the **ROUTe S3** command is in effect, the **INIT STM4** command will also initialize the E3/DS3 protocol processor. Valid protocol processor values are: **Protocol Processor** <blank> — Starts the protocol processor currently selected by the INST command. Error code -224 appears if no instrument is selected. STM64 — Starts the STM-64 protocol processor STM16 — Starts the STM-16 protocol processor STM4 — Starts the STM-4 protocol processor OC192 — Starts the OC-192 protocol processor OC48 — Starts the OC-48 protocol processor OC12 — Starts the OC-12 protocol processor E4 — Starts the E4 protocol processor E3 — Starts the E3 protocol processor E1@N — Starts the E1@N protocol processor DS3 — Starts the DS3 protocol processor DS1@N — Starts the DS1@N protocol processor ATM — Starts the ATM protocol processor ALL — Starts all protocol processors. **Note:** Although the ALL parameter is currently supported in SCPI release 2.0.51, it may not be supported for future major releases. If an error code appears when using the ALL parameter, then it is not supported in your SCPI release.

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Command	Description
INSTrument <protocol processor> (for all portable and rackmount products)	*Protocols Supported:* ALL Selects a specific circuit pack card installed in a unit. Additional parameters can be used when multiple circuit packs of the same class or type are installed.
INSTrument <slot ID*> <protocol processor> (for NIC Plus portable and NAA IV rackmount products)	For example, if two 2.5G circuit packs are installed in an NAA IV, one in slot 4 and one in slot 9, then one of the following commands must be used to select and control the second circuit pack installed in slot 9: INST 9 STM16 *or* INST 1 9 0 STM16
INSTrument <chassis ID**> <slot ID> <card ID**> <protocol processor> (for rackmount products only)	**Chassis ID (optional)** 0 = Chassis ID for a NIC Plus 1 = Chassis ID for an NAA IV
	Slot ID (optional) For a 23-inch NAA IV chassis, slots 1-6 and 8-13 can be selected. Slot 7 is reserved for the System Controller circuit pack. For a 19-inch NAA IV chassis, slots 1-5 and 7-10 can be selected. Slot 6 is reserved for the System Controller circuit pack.
* The slot ID parameter is only required when multiple circuit packs of the same type (for example two 2.5G circuit packs) are installed in a NIC Plus portable or NAA IV rackmount unit. If a slot ID is not specified, the command will default to the first circuit pack installed.	**Card ID (optional)** Card ID. Selects the circuit pack, within a slot, by its card number. This parameter is required when multiple Gigabit Ethernet circuit packs are installed. Use the GET:PROTO? command to determine a circuit pack's chassis, slot, and card IDs.
** The chassis ID and card ID parameters are always optional and only applicable for NIC Plus portable and NAA IV rackmount products.	**Protocol Processor (required)** NONE — No protocol processor is selected. GIGE@N — Selects the Gigabit Ethernet protocol processor and port (N= 1 or 2. N defaults to 1.) STM64Q@N — Selects STM-64 Quad RX protocol processor (N=1, 2, 3, or 4. N automatically defaults to 1; therefore, STM64Q = STM64Q@1.) STM64 — Selects STM-64 protocol processor STM16 — Selects STM-16 protocol processor STM4 — Selects STM-4 protocol processor OC192Q@N — Selects OC-192 Quad RX protocol processor (N=1, 2, 3, or 4. N automatically defaults to 1; therefore, OC192Q = OC192Q@1.) OC192 — Selects OC-192 protocol processor OC48 — Selects OC-48 protocol processor OC12 — Selects OC-12 protocol processor OSA — Selects the Optical Spectrum Analyzer protocol processor E4 — Selects E4 protocol processor E3 — Selects E3 protocol processor E1@N — Selects E1@N protocol processor (N=1 or 2) DS3 — Selects DS3 protocol processor DS1@N — Selects DS1@N protocol processor (N=1 or 2) ATM — ATM protocol processor JITT12 — Selects the OC-12 Jitter protocol processor
Note: Use the **GET:PROTOcols?** command to view an inventory of all protocol processors (which includes the chassis ID, slot ID, and card ID) installed in the unit. This command is useful when multiple circuit packs of the same type are installed. Refer to the GET:PROTO? command for more information.	

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Command	Description
INSTrument? **Note:** A protocol processor has not been selected if error code -224 appears. Use the **INST** command to select a protocol.	*Protocols Supported:* ALL Queries which protocol is selected. **Note:** If issued for an NAA IV or NIC Plus product, the chassis ID, slot ID, and card ID are also returned. For example, 1 9 0 STM16.
LOGIN <ID> <password>	*Protocols Supported:* SYSTEM Logs in with a user ID and password, which contain only alphanumeric characters.
LOGOUT	*Protocols Supported:* SYSTEM Ends a remote session initiated by LOGIN.
REPORT:PRINT	*Protocols Supported:* ALL Print Results report for a protocol over the already assigned port.
ROUTe <preset>	*Protocols Supported:* ALL Chooses one of these preset routing configurations: **Preset** — **Description** S10L — STM64/OC192 to Line Interface S10S — STM64/OC192 to STM16/OC48 Drop/Insert S10SL — STM64/OC192 to STM16/OC48 Line Interface Drop/Insert S2.5L — STM16/OC48 to Line Interface (no STM64/OC192 Drop/Insert) S2.5S — STM-16 to STM-4 Drop/Insert SL — STM-4/OC-12 to Line Interface S1@N — STM-4/OC-12 Drop/Insert to E1/DS1 protocol processor instance N S3 — STM-4/OC-12 Drop/Insert to E3/DS3 protocol processor S4 — STM-4/OC-12 Drop/Insert to E4 protocol processor 43 — E4 Line Interface to E3 Line interface 4L — E4 Line Interface to E4 Processor 31@N — E3/DS3 Line Interface to E1/DS1 processor instance N 3L — E3/DS3 Line Interface to E3/DS3 processor 1L@N — E1/DS1 Line Interface to E1/DS1 processor instance N
SCPI?	*Protocols Supported:* SYSTEM Queries the SCPI processor to see if it is attached to the port used. Returns "YES" if the SCPI processor is attached to that port and is processing commands.
TEST:EXECute <test name> **Note:** This command is only valid when tests have been defined using the Element Management System software.	*Protocols Supported:* ALL Executes a test. Use the TEST:NAMEs? command to display a list of defined test configurations stored on the system.
TEST:NAMEs? **Note:** This command is only valid when tests have been defined using the Element Management System software.	*Protocols Supported:* ALL Queries which test names are available in the system. A test configuration contains the duration, criteria, and protocol processors used to perform a test. The test configurations are stored on the system and are assigned a test name.
TEST:PROTOcols <test name>? **Note:** This command is only valid when tests have been defined using the Element Management System software.	*Protocols Supported:* ALL Queries which protocol processors are associated with the entered test name.

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Command	Description
TEST:STOP <test name> **Note:** This command is only valid when tests have been defined using the Element Management System software.	*Protocols Supported:* ALL Stops a test. Use the TEST:NAMEs? command to display a list of defined test configurations stored on the system.

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3 Extended SCPI Commands

Overview

This chapter lists the Standard SCPI commands supported by the configured unit. You may not have access to all commands based on the product configuration you purchased. SCPI commands are fully compatible across all DLI products.

The majority of commands listed in this chapter are intended for the OC-192, OC-48, OC-1/3/12, STM-64, STM-16, STM-0/1/4, E4, E3, E1, DS3, and DS1protocol processors. ALL indicates that the command is supported by all of the previously listed protocol processors.

- For ATM-specific commands, refer to **Chapter 4,** ATM SCPI Commands
- For GigE-specific commands, refer to **Chapter 5,** Gigabit Ethernet SCPI Commands
- For OSA-specific commands, refer to **Chapter 6,** OSA SCPI Commands

Extended SCPI Commands

These commands are extensions to the SCPI command set. These commands are adapted to the configured unit and are unique to each protocol processor. SCPI commands should be typed on one single line completed with a hard carriage return. These commands require zero or one parameters, and return zero or one values.

RES (Fetch) Branch

The RES branch is used to retrieve results. Alternatively, each command can be sent using the "FETC" or "FETCH" keyword instead of the “RES” keyword.

The following is a list of supported RESULT commands.

RESULT Command	Description
RES:AIS:Secs?	*Protocols Supported:* E1, E3, E4, DS3, D1 Seconds for which there was an AIS alarm.
RES:AIS:HP:Secs?	*Protocols Supported:* STM-4, STM-16, STM-64 Seconds for which there was an HP-AIS alarm.
RES:AIS:LINE:Secs?	*Protocols Supported:* OC-12, OC-48, OC-192 Seconds for which there was a Line AIS alarm.
RES:AIS:MS:Secs?	*Protocols Supported:* STM-4, STM-16, STM-64 Seconds for which there was an MS-AIS alarm.
RES:AIS:PATH:Secs?	*Protocols Supported:* OC-12, OC-48, OC-192 Seconds for which there was a Path AIS alarm.
RES:AIS:TU:Secs?	*Protocols Supported:* STM-4 Seconds for which there was a TU-AIS alarm.

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RESULT Command	Description
RES:AIS:VT:Secs?	Protocols Supported: OC-12 Seconds for which there was a VT-AIS alarm.
RES:ALarm:<alarm type>?	*Protocols Supported:* ALL Queries and reports the state (On or Off) of the selected alarm LED.

Alarm Type	Protocol Processors	Meaning
AIS	E1, E3, E4, DS3, DS1	Alarm Indication Signal
AISL	OC-12, OC-48, OC-192	Line Alarm Indication Signal
AISP	OC-12, OC-48, OC-192	Path Alarm Indication Signal
AISV	OC-12	VT Alarm Indication Signal
IDLE	DS1, DS3	Idle alarm
LOS	E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS1, DS3	Loss of Signal
LOF	E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192	Loss of Frame
LOPP	OC-12, OC-48, OC-192	Loss of Pointer Path
OOF	DS1, DS3	Out of Frame
RAI	E1, E3, E4	Remote Alarm Indication
YELLOW	DS1, DS3	Yellow alarm (RAI)
RDIL	OC-12, OC-48, OC-192	Line Remote Defect Indication
RDIP	OC-12, OC-48, OC-192	Path Remote Defect Indication
RDIV	OC-12	VT Remote Defect Indication
RFIV	OC-12	VT RFI
RMFAI	E1	Remote Multi-Frame Alarm Indicator
CASMFL	E1	Channel-Associated Signaling Multi Frame Loss
MSAIS	STM-4, STM-16, STM-64	MS-AIS
MSRDI	STM-4, STM-16, STM-64	MS-RDI
AUAIS	STM-4, STM-16, STM-64	AU-AIS
AULOP	STM-4, STM-16, STM-64	AU-LOP
HPUNEQ	STM-4, STM-16, STM-64	HP-UNEQ
HPRDI	STM-4, STM-16, STM-64	HP-RDI
TUAIS	STM-4	TU-AIS
TULOP	STM-4	TU-Loss of Pointer
LPUNEQ	STM-4	LP-Unequipped
LPRDI	STM-4	LP-RDI
LPRFI	STM-4	LP-RFI
UNEQP	OC-12, OC-48, OC-192	Path Unequipped
UNEQV	OC-12	VT Unequipped

RES:APS:Secs?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Seconds for which there was an APS alarm (event). Also known as a K1K2 alarm.

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RESULT Command	Description
RES:APS:LOG:?	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Queries the log of the last 15 APS commands received. Commands are returned in comma-delimited format, similar to the *TX:APS:SEQ* command. Each has three values: K1, K2, Frames. If frames is zero for a row, then that indicates no entry for that row (this will happen if there are less than 15 commands received in the log). The log is refreshed at restart. 65535 in the number of frames indicates continuous, or a larger number of frames than 65534.
RES:APS:STATE?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the current status of the automatic protection switch (APS) function. The following values can be returned for this command: APS STOP:Indicates that the APS function is stopped. ARMED APS SINGLE:Indicates that the APS test is configured for single round-trip delay operation. RUNNING APS SINGLE: Indicates that an APS test is in progress using the single round-trip delay configuration. ARMED APS CONTINUOUS: Indicates that the APS test is configured for continuous round-trip delay operation. RUNNING APS CONTINUOUS: Indicates that an APS test is in progress using the continuous round-trip delay configuration.
RES:APS:TIME:LAST?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the current/last APS duration (measured in seconds) of an APS test.
RES:APS:TIME:MIN?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the fastest APS (in seconds) measured during the APS test.
RES:APS:TIME:MAX?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the slowest APS (in seconds) measured during the APS test.
RES:APS:FRAME:LAST?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the current/last frame count of an APS test.
RES:APS:FRAME:MIN?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the frame count for the fastest APS measured during the APS test.
RES:APS:FRAME:MAX?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the frame count for the slowest APS measured during the APS test.
RES:B1:AVErage?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the average B1 error rate.
RES:B1:COUNt?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the B1 error count.
RES:B1:RATe?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the current B1 error rate.
RES:B1:BBE?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the B1 background block error count.
RES:B1:ES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of seconds there were B1 Errors using ANSI rules.

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RESULT Command	Description
RES:B1:ES:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of seconds there were B1 errors using G.821 rules.
RES:B1:ES:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of seconds there were B1 errors using G.826 rules.
RES:B1:SES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of B1 Severely Errored Seconds using ANSI rules.
RES:B1:SES:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of B1 severely errored seconds using G.821 rules.
RES:B1:SES:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of B1 severely errored seconds using G.826 rules.
RES:B2:AVErage?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the average B2 error rate.
RES:B2:COUNt?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the B2 error count.
RES:B2:RATe?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the current B2 error rate.
RES:B2:BBE?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the B2 background block error count.
RES:B2:ES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of seconds there were B2 Errors using ANSI rules.
RES:B2:ES:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of seconds there were B2 errors using G.821 rules.
RES:B2:ES:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of seconds there were B2 errors using G.826 rules.
RES:B2:SES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of B2 Severely Errored Seconds using ANSI rules.
RES:B2:SES:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of B2 severely errored seconds using G.821 rules.
RES:B2:SES:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of B2 severely errored seconds using G.826 rules.
RES:B2:UAS:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of B2 Unavailable Seconds using ANSI rules.
RES:B2:UAS:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of B2 unavailable seconds using G.821 rules.
RES:B2:UAS:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of B2 unavailable seconds using G.826 rules.
RES:B3:AVErage?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the average B3 error rate.
RES:B3:COUNt?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the B3 error count.
RES:B3:RATe?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the current B3 error rate.
RES:B3:BBE?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the B3 background block error count.
RES:B3:ES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of seconds there were B3 Errors using ANSI rules.

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RESULT Command	Description
RES:B3:ES:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of seconds there were B3 errors using G.821 rules.
RES:B3:ES:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of seconds there were B3 errors using G.826 rules.
RES:B3:SES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of B3 Severely Errored Seconds using ANSI rules.
RES:B3:SES:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of B3 severely errored seconds using G.821 rules.
RES:B3:SES:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of B3 severely errored seconds using G.826 rules.
RES:B3:UAS:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of B3 Unavailable Seconds using ANSI rules.
RES:B3:UAS:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of B3 unavailable seconds using G.821 rules.
RES:B3:UAS:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of B3 unavailable seconds using G.826 rules.
RES:BIP:LP:AVErage?	*Protocols Supported:* STM-4 Queries and reports the average LP-BIP error rate.
RES:BIP:LP:COUNt?	*Protocols Supported:* STM-4 Queries the LP-BIP error count.
RES:BIP:LP:RATe?	*Protocols Supported:* STM-4 Queries and reports the current LP-BIP error rate.
RES:BIP:LP:BBE?	*Protocols Supported:* STM-4 Queries the current LP-BIP background block error count.
RES:BIP:LP:ES:821?	*Protocols Supported:* STM-4 Queries the number of seconds there were LP-BIP errors using G.821 rules.
RES:BIP:LP:ES:826?	*Protocols Supported:* STM-4 Queries the number of seconds there were LP-BIP errors using G.826 rules.
RES:BIP:LP:SES:821?	*Protocols Supported:* STM-4 Queries the number of LP-BIP severely errored seconds using G.821 rules.
RES:BIP:LP:SES:826?	*Protocols Supported:* STM-4 Queries the number of LP-BIP severely errored seconds using G.826 rules.
RES:BIP:LP:UAS:821?	*Protocols Supported:* STM-4 Queries the number of LP-BIP unavailable seconds using G.821 rules.
RES:BIP:LP:UAS:826?	*Protocols Supported:* STM-4 Queries the number of LP-BIP unavailable seconds using G.826 rules.
RES:BIP:VT:AVErage?	Queries and reports the average VT-BIP error rate.
RES:BIP:VT:COUNt?	*Protocols Supported:* OC-12 Queries the VT-BIP error count.
RES:BIP:VT:RATe?	*Protocols Supported:* OC-12 Queries the current VT-BIP error rate.
RES:BIP:VT:ES:ANSI?	*Protocols Supported:* OC-12 Queries the number of seconds there were VT-BIP errors using ANSI rules.

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RESULT Command	Description
RES:BIP:VT:SES:ANSI?	*Protocols Supported:* OC-12 Queries the number of VT-BIP severely errored seconds using ANSI rules.
RES:BIP:VT:UAS:ANSI?	*Protocols Supported:* OC-12 Queries the number of VT-BIP unavailable seconds using ANSI rules.
RES:BIT:AVErage?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Queries the average bit error rate.
RES:BIT:COUNt?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Queries the bit error count.
RES:BIT:RATe?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Queries the bit error rate.
RES:BIT:BBE?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64 Queries the number of bit background block errors.
RES:BIT:ES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192, DS3, DS1 Queries the number of seconds there were BIT Errors using ANSI rules.
RES:BIT:ES:821?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64 Queries the number of seconds there were bit errors using G.821 rules.
RES:BIT:ES:826?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64 Queries the number of seconds there were bit errors using G.826 rules.
RES:BIT:SES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192, DS3, DS1 Queries the number of BIT Severely Errored Seconds using ANSI rules.
RES:BIT:SES:821?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64 Queries the number of bit severely errored seconds using G.821 rules.
RES:BIT:SES:826?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64 Queries the number of bit severely errored seconds using G.826 rules.
RES:BIT:UAS:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192, DS3, DS1 Queries the number of BIT Unavailable Seconds using ANSI rules.
RES:BIT:UAS:821?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64 Queries the number of bit unavailable seconds using G.821 rules.
RES:BIT:UAS:826?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64 Queries the number of bit unavailable seconds using G.826 rules.
RES:BPV:AVErage?	*Protocols Supported:* E1, E3, STM-4, DS3, DS1, OC-12 Queries and reports the average bipolar violation error rate.
RES:BPV:COUNt?	*Protocols Supported:* E1, E3, STM-4, DS3, DS1, OC-12 Queries the bipolar violation count.
RES:BPV:RATe?	*Protocols Supported:* E1, E3, STM-4, DS3, DS1, OC-12 Queries the bipolar violation error rate.
RES:CLOCK:Secs?	*Protocols Supported:* DS3, DS1 Queries and reports the number of seconds that there was a loss of clock alarm.
RES:CPPAR:AVErage?	*Protocols Supported:* DS3 Queries and reports the average CP-bit parity error rate.
RES:CPPAR:COUNt?	*Protocols Supported:* DS3 Queries the CP-bit parity error count.

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RESULT Command	Description
RES:CPPAR:RATe?	*Protocols Supported:* DS3 Queries the current CP-bit parity error rate.
RES:CRC:AVErage?	*Protocols Supported:* E1, DS1 Queries and reports the average CRC error rate.
RES:CRC:COUNt?	*Protocols Supported:* E1, DS1 Queries the current CRC error count.
RES:CRC:RATe?	*Protocols Supported:* E1, DS1 Queries the current CRC error rate.
RES:CRC:BBE?	*Protocols Supported:* E1 Queries the number of CRC background block errors.
RES:CRC:ES:821?	*Protocols Supported:* E1 Queries the number of seconds there were CRC errors using G.821 rules.
RES:CRC:ES:826?	*Protocols Supported:* E1 Queries the number of seconds there were CRC errors using G.826 rules.
RES:CRC:SES:821?	*Protocols Supported:* E1 Queries the number of CRC severely errored seconds using G.821 rules.
RES:CRC:SES:826?	*Protocols Supported:* E1 Queries the number of CRC severely errored seconds using G.826 rules.
RES:CRC:UAS:821?	*Protocols Supported:* E1 Queries the number of CRC unavailable seconds using G.821 rules.
RES:CRC:UAS:826?	*Protocols Supported:* E1 Queries the number of CRC unavailable seconds using G.826 rules.
RES:EXZ:AVErage?	*Protocols Supported:* DS1 Queries and reports the average error rate for excessive zero errors.
RES:EXZ:COUNt?	*Protocols Supported:* DS1 Queries and reports the excessive zeros error count.
RES:EXZ:RATe?	*Protocols Supported:* DS1 Queries and reports the current excessive zeros error rate.
RES:FEBE:AVErage?	*Protocols Supported:* E1, DS3 Queries and reports the average FEBE error rate.
RES:FEBE:COUNt?	*Protocols Supported:* E1, DS3 Queries the current FEBE count for PDH and DS3.
RES:FEBE:RATe?	*Protocols Supported:* E1, DS3 Queries the current PDH and DS3 FEBE error rate.
RES:FEBE:BBE?	*Protocols Supported:* E1 Queries the number of FEBE background block errors.
RES:FEBE:ES:821?	*Protocols Supported:* E1 Queries the number of seconds there were FEBE errors using G.821 rules.
RES:FEBE:ES:826?	*Protocols Supported:* E1 Queries the number of seconds there were FEBE errors using G.826 rules.
RES:FEBE:SES:821?	*Protocols Supported:* E1 Queries the number of FEBE severely errored seconds using G.821.
RES:FEBE:SES:826?	*Protocols Supported:* E1 Queries the number of FEBE severely errored seconds using G.826.
RES:FEBE:UAS:821?	*Protocols Supported:* E1 Queries the number of FEBE unavailable seconds using G.821.

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RESULT Command	Description
RES:FEBE:UAS:826?	*Protocols Supported:* E1 Queries the number of FEBE unavailable seconds using G.826.
RES:FRAMe:AVErage?	*Protocols Supported:* E1, E3, E4, DS3, DS1 Queries and reports the average frame error rate.
RES:FRAMe:COUNt?	*Protocols Supported:* E1, E3, E4, DS3, DS1 Queries the current frame error count.
RES:FRAMe:RATe?	*Protocols Supported:* E1, E3, E4, DS3, DS1 Queries the current frame error rate.
RES:FRAMe:ES:821?	*Protocols Supported:* E1, E3, E4 Queries the number of seconds there were frame errors using G.821 rules.
RES:FRAMe:ES:826?	*Protocols Supported:* E1, E3, E4 Queries the number of seconds there were frame errors using G.826 rules.
RES:FRAMe:SES:821?	*Protocols Supported:* E1, E3, E4 Queries the number of frame severely errored seconds using G.821 rules.
RES:FRAMe:SES:826?	*Protocols Supported:* E1, E3, E4 Queries the number of frame severely errored seconds using G.826 rules.
RES:FRAMe:UAS:821?	*Protocols Supported:* E1, E3, E4 Queries the number of frame unavailable seconds using G.821 rules.
RES:FRAMe:UAS:826?	*Protocols Supported:* E1, E3, E4 Queries the number of frame unavailable seconds using G.826 rules.
RES:IDLE:Secs?	*Protocols Supported:* DS3, DS1 Queries and reports the number of seconds that there was an Idle alarm.
RES:LCV:AVErage?	*Protocols Supported:* E4 Queries and reports the average Line Code Violation error rate.
RES:LCV:COUNt?	*Protocols Supported:* E4 Queries the Line Code Violation count.
RES:LCV:RATe?	*Protocols Supported:* E4 Queries the Line Code Violation error rate.
RES:LOF:Secs?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the number of seconds a loss of frame was present.
RES:LOP:AU:Secs?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of seconds an AU Loss of pointer alarm was present.
RES:LOP:STS:Secs?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of seconds an STS (Path) Loss of pointer alarm was present.
RES:LOP:TU:Secs?	*Protocols Supported:* STM-4 Queries the number of seconds a TU Loss of pointer alarm was present.
RES:LOP:VT:Secs?	Protocols Supported: OC-12 Queries the number of seconds a VT Loss of pointer alarm was present.
RES:LOS:Secs?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1, Jitter Queries the number of seconds a loss of signal was present.
RES:NDF:AU?	*Protocols Supported:* STM-4, STM-16, STM-64 Returns the AU NDF count.

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RESULT Command	Description
RES:NDF:TU?	*Protocols Supported:* STM-4 Returns the TU NDF count.
RES:NDF:STS?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns the STS NDF count.
RES:NDF:VT?	Protocols Supported: OC-12 Returns the VT NDF count.
RES:NDFERRor:AU:AVErage?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries and reports the average SDH AU-NDF error rate.
RES:NDFERRor:AU:COUNt?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the SDH AU-NDF error count.
RES:NDFERRor:AU:RATe?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the SDH AU-NDF error rate.
RES:NDFERRor:STS:AVErage?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries and reports the average SONET STS-NDF Error Rate.
RES:NDFERRor:STS:COUNt?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the SONET STS-NDF Error Count.
RES:NDFERRor:STS:RATe?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the SONET STS-NDF Error Rate.
RES:NDFERRor:TU:AVErage?	*Protocols Supported:* STM-4 Queries and reports the average SDH TU-NDF error rate.
RES:NDFERRor:TU:COUNt?	*Protocols Supported:* STM-4 Queries the SDH TU-NDF error count.
RES:NDFERRor:TU:RATe?	*Protocols Supported:* STM-4 Queries the SDH TU-NDF error rate.
RES:NDFERRor:VT:AVErage?	*Protocols Supported:* OC-12 Queries and reports the average SONET VT-NDF error rate.
RES:NDFERRor:VT:COUNt?	*Protocols Supported:* OC-12 Queries the SONET VT-NDF error count.
RES:NDFERRor:VT:RATe?	*Protocols Supported:* OC-12 Queries the SONET VT-NDF error rate.
RES:NPJC:AU?	*Protocols Supported:* STM-4, STM-16, STM-64 Returns the number of negative AU Pointer justifications.
RES:NPJC:STS?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns the number of negative STS Pointer justifications.
RES:NPJC:TU?	*Protocols Supported:* STM-4 Returns the number of negative TU Pointer justifications.
RES:NPJC:VT?	*Protocols Supported:* OC-12 Returns the number of negative VT Pointer justifications.
RES:OOF:Secs?	*Protocols Supported:* STM-4, STM-16, STM-64, DS3, DS1 Out of frame seconds.
RES:PATsync:Secs?	*Protocols Supported:* ALL Seconds for which there was loss of pattern.
RES:PJCS:AU?	*Protocols Supported:* STM-4, STM-16, STM-64 Returns the number of seconds there was a negative or positive AU Pointer justification.

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RESULT Command	Description
RES:PJCS:STS?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns the number of seconds there was a negative or positive STS Pointer justification.
RES:PJCS:TU?	*Protocols Supported:* STM-4 Returns the number of seconds there was a negative or positive TU Pointer justification.
RES:PJCS:VT?	*Protocols Supported:* OC-12 Returns the number of seconds there was a negative or positive VT Pointer justification.
RES:PLM:HP:Secs?	*Protocols Supported:* STM-4, STM-16, STM-64 Returns the number of HP Label Mismatch seconds.
RES:PLM:LP:Secs?	*Protocols Supported:* STM-4 Returns the number of LP Label Mismatch seconds.
RES:PLM:PATH:Secs?	*Protocols Supported:* OC-12, OC-48, OC-192 Path Label Mismatch seconds.
RES:PLM:PATH:VT:Secs?	*Protocols Supported:* OC-12 VT Label Mismatch seconds.
RES:PPAR:AVErage?	*Protocols Supported:* DS3 Queries and reports the average P-bit parity error rate.
RES:PPAR:COUNt?	*Protocols Supported:* DS3 Queries the P-bit parity error count.
RES:PPAR:RATe?	*Protocols Supported:* DS3 Queries the P-bit parity error rate.
RES:PPJC:AU?	*Protocols Supported:* STM-4, STM-16, STM-64 Returns the number of positive AU Pointer justifications.
RES:PJCS:STS?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns the number of seconds there was a negative or positive STS Pointer justification.
RES:PPJC:TU?	*Protocols Supported:* STM-4 Returns the number of positive TU Pointer justifications.
RES:PPJC:VT?	*Protocols Supported:* OC-12 Returns the number of positive VT Pointer justifications.
RES:RDI:HP:Secs?	*Protocols Supported:* STM-4, STM-16, STM-64 Seconds for which there was an HP-RDI alarm.
RES:RDI:LINE:Secs?	*Protocols Supported:* OC-12, OC-48, OC-192 Seconds for which there was an RDI-L alarm.
RES:RDI:LP:Secs?	*Protocols Supported:* STM-4 Seconds for which there was an LP-RDI alarm.
RES:RDI:MS:Secs?	*Protocols Supported:* STM-4, STM-16, STM-64 Seconds for which there was an MS-RDI alarm.
RES:RDI:PATH:Secs?	*Protocols Supported:* OC-12, OC-48, OC-192 Seconds for which there was an RDI-P alarm.
RES:RDI:VT:Secs?	Protocols Supported: OC-12 Seconds for which there was an RDI-VT alarm.
RES:REI:HP:AVErage?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the average HP-REI error rate.

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RESULT Command	Description
RES:REI:HP:COUNt?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the HP-REI error count.
RES:REI:HP:RATe?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the HP-REI error rate.
RES:REI:HP:BBE?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the HP-REI background block error count.
RES:REI:HP:ES:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of seconds there were HP-REI errors using G.821 rules.
RES:REI:HP:ES:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of seconds there were HP-REI errors using G.826 rules.
RES:REI:HP:SES:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of HP-REI severely errored seconds using G.821 rules.
RES:REI:HP:SES:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of HP-REI severely errored seconds using G.826 rules.
RES:REI:HP:UAS:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of HP-REI unavailable seconds using G.821 rules.
RES:REI:HP:UAS:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of HP-REI unavailable seconds using G.826 rules.
RES:REI:LINE:AVErage?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the average LINE-REI rate.
RES:REI:LINE:COUNt?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the current LINE-REI count using ANSI rules.
RES:REI:LINE:RATe?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the current LINE-REI error rate.
RES:REI:LINE:ES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of seconds there were LINE-REI Errors.
RES:REI:LINE:SES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of LINE-REI Severely Errored Seconds.
RES:REI:LINE:UAS:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of LINE-REI Unavailable Seconds.
RES:REI:LP:AVErage?	*Protocols Supported:* STM-4 Queries the average LP-REI error rate.
RES:REI:LP:COUNt?	*Protocols Supported:* STM-4 Queries the LP-REI error count.
RES:REI:LP:RATe?	*Protocols Supported:* STM-4 Queries the LP-REI error rate.
RES:REI:LP:BBE?	*Protocols Supported:* STM-4 Queries the LP-REI background block error count.
RES:REI:LP:ES:821?	*Protocols Supported:* STM-4 Queries the number of seconds there were LP-REI errors using G.821 rules.
RES:REI:LP:ES:826?	*Protocols Supported:* STM-4 Queries the number of seconds there were LP-REI errors using G.826 rules.

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RESULT Command	Description
RES:REI:LP:SES:821?	*Protocols Supported:* STM-4 Queries the number of LP-REI severely errored seconds using G.821 rules.
RES:REI:LP:SES:826?	*Protocols Supported:* STM-4 Queries the number of LP-REI severely errored seconds using G.826 rules.
RES:REI:LP:UAS:821?	*Protocols Supported:* STM-4 Queries the number of LP-REI unavailable seconds using G.821 rules.
RES:REI:LP:UAS:826?	*Protocols Supported:* STM-4 Queries the number of LP-REI unavailable seconds using G.826 rules.
RES:REI:MS:AVErage?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the average MS-REI error rate.
RES:REI:MS:COUNt?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the current MS-REI count.
RES:REI:MS:RATe?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the current MS-REI error rate.
RES:REI:MS:BBE?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the MS-REI background block error count.
RES:REI:MS:ES:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of seconds there were MS-REI errors using G.821 rules.
RES:REI:MS:ES:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of seconds there were MS-REI errors using G.826 rules.
RES:REI:MS:SES:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of MS-REI severely errored seconds using G.821 rules.
RES:REI:MS:SES:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of MS-REI severely errored seconds using G.826 rules.
RES:REI:MS:UAS:821?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of MS-REI unavailable seconds using G.821 rules.
RES:REI:MS:UAS:826?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of MS-REI unavailable seconds using G.826 rules.
RES:REI:PATH:AVErage?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the average PATH-REI error rate.
RES:REI:PATH:COUNt?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the current PATH-REI count.
RES:REI:PATH:RATe?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the current PATH-REI error rate.
RES:REI:PATH:ES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of seconds there were PATH-REI Errors using ANSI rules.
RES:REI:PATH:SES:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of PATH-REI Severely Errored Seconds using ANSI rules.
RES:REI:PATH:UAS:ANSI?	*Protocols Supported:* OC-12, OC-48, OC-192 Queries the number of PATH-REI Unavailable Seconds using ANSI rules.

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RESULT Command	Description
RES:REI:VT:AVErage?	*Protocols Supported:* OC-12 Queries and reports the average VT-REI error rate.
RES:REI:VT:COUNt?	*Protocols Supported:* OC-12 Queries the current VT-REI count.
RES:REI:VT:RATe?	*Protocols Supported:* OC-12 Queries the current VT-REI error rate.
RES:REI:VT:ES:ANSI?	*Protocols Supported:* OC-12 Queries the number of seconds there were VT-REI errors using ANSI rules.
RES:REI:VT:SES:ANSI?	*Protocols Supported:* OC-12 Queries the number of VT-REI severely errored seconds using ANSI rules.
RES:REI:VT:UAS:ANSI?	*Protocols Supported:* OC-12 Queries the number of VT-REI unavailable seconds using ANSI rules.
RES:RFI:LP:Secs?	*Protocols Supported:* STM-4 Queries the number of LP-RFI alarm seconds.
RES:RFI:VT:Secs?	*Protocols Supported:* OC-12 Quires the duration of a detected VT-RFI alarm.
RES:RTD:STATE?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the current status of the round-trip delay (RTD) function. The following values can be returned for this command: RTD STOP:Indicates that the round-trip delay function is stopped. ARMED RTD SINGLE:Indicates that the RTD test is configured for single round-trip delay operation. RUNNING RTD SINGLE: Indicates that an RTD test is in progress using the single round-trip delay configuration. ARMED RTD CONTINUOUS: Indicates that the RTD test is configured for continuous round-trip delay operation. RUNNING RTD CONTINUOUS: Indicates that an RTD test is in progress using the continuous round-trip delay configuration.
RES:RTD:TIME:LAST?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the current/last RTD duration (measured in seconds) of an RTD test.
RES:RTD:TIME:MIN?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the fastest RTD (in seconds) measured during the RTD test.
RES:RTD:TIME:MAX?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the slowest RTD (in seconds) measured during the RTD test.
RES:RTD:FRAME:LAST?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the current/last frame count of an RTD test.
RES:RTD:FRAME:MIN?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the frame count for the fastest RTD measured during the RTD test.
RES:RTD:FRAME:MAX?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the frame count for the slowest RTD measured during the RTD test.
RES:SEF:Secs?	*Protocols Supported:* OC-12, OC-48, OC-192 Severely Errored Frame seconds.

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RESULT Command	Description
RES:SPM? **Note:** Select a protocol processor (using the **INST** command) before using this command. Error code 508 appears if a protocol processor is not selected.	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports Performance Monitoring statistics for SONET and SDH protocols. Use this command to retrieve all bulk alarms, errors, average error counts, error rate counts, and current error counts associated with the SONET/SDH protocol processor. Results for this command appear as a full list of values in a single text-line, even if the individual field is zero. In the following example, only one alarm is indicated (tag ah = 1882 LOF alarm seconds). All other values (0) indicate no errors or alarms. 0, 0, 0, 0, 0, 0, 0, 1882, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0.00e+000, 0.00e+000, 0, 0.00e+000, 0.00e+000, 0, 0.00e+000, 0.00e+000, 0, 0.00e+000, 0.00e+000, 0, 0.00e+000, 0.00e+000, 0, 0.00e+000, 0.00e+000, 0, 0.00e+000, 0.00e+000, 0, 0.00e+000, 0.00e+000, 0, 0.00e+000, 0.00e+000, 0 **Result format guidelines:** Results are returned using the following format: ***N, N, N, N, ...*** where *N* is: An integer greater than or equal to zero, or a scientific-notation numeral greater than or equal to zero (0.00e+000). The value's position in the text string is represented by one of the following tags (the first tag position is aa): **For OC-1/3/12 and STM-0/1/4,** **alarm and error durations appear in seconds:** aa SS Bits Mismatch alarm seconds ab BPV errors seconds ac B3 errors seconds ad REI-P/HP-REI errors seconds ae NDF-P/AU-NDF errors seconds af BIT errors seconds ag LOS alarm seconds ah LOF alarm seconds ai SEF/OOF alarm seconds aj TIM-S/RS-TIM alarm seconds ak AIS-L/MS-AIS alarm seconds al RDI-L/MS-RDI alarm seconds am B1 errors seconds an B2 errors seconds ao REI-L/MS-REI errors seconds ap APS-L/MS-APS alarm seconds aq AIS-P/AU-AIS alarm seconds ar LOP-P/AU-LOP alarm seconds as UNEQ-P/HP-UNEQ alarm seconds at PLM-P/HP-PLM alarm seconds au RDI-P/HP-RDI alarm seconds av TIM-P/HP-TIM alarm seconds aw BIP-V/LO-BIP errors seconds

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RESULT Command	Description	
RES:SPM? (continued)	ax	REI-V/LP-REI errors seconds
	ay	LOM-V/TU-LOM alarm seconds
	az	NDF-V/TU-NDF errors seconds
	ba	AIS-V/TU-AIS alarm seconds
	bb	LOP-V/TU-LOP alarm seconds
	bc	UNEQ-V/TU-UNEQ alarm seconds
	bd	PLM-V/LP-PLM alarm seconds
	be	RDI-V/LP-RDI alarm seconds
	bf	TIM-V/LP-TIM alarm seconds
	bg	RFI-V/LP-RFI alarm seconds
	bh	PAT SYNC alarm seconds
	bi	Power Loss alarm seconds
	bj	PP Paused alarm seconds
	For OC-1/3/12 and STM-0/1/4, the average error, error rate, and current error rate counts appear as follows:	
	B1 errors	
	da	average error rate (in scientific notation, 0.00e+00)
	db	error rate (in scientific notation, 0.00e+00)
	dc	error count
	B2 errors	
	dd	average error rate (in scientific notation, 0.00e+00)
	de	error rate (in scientific notation, 0.00e+00)
	df	error count
	REI-L/MS-REI errors	
	dg	average error rate (in scientific notation, 0.00e+00)
	dh	error rate (in scientific notation, 0.00e+00)
	di	error count
	B3 errors	
	dj	average error rate (in scientific notation, 0.00e+00)
	dk	error rate (in scientific notation, 0.00e+00)
	dl	error count
	REI-P/HP - REI errors	
	dm	average error rate (in scientific notation, 0.00e+00)
	dn	error rate (in scientific notation, 0.00e+00)
	do	error count
	BIP-V/LP-BIP errors	
	dp	average error rate (in scientific notation, 0.00e+00)
	dq	error rate (in scientific notation, 0.00e+00)
	dr	error count
	REI-V/LP-REI errors	
	ds	average error rate (in scientific notation, 0.00e+00)
	dt	error count
	du	error count
	BPV errors	
	du	average error rate (in scientific notation, 0.00e+00)
	dv	error count
	dw	error count

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RESULT Command	Description
RES:SPM? (continued)	BIT errors dx average error rate (in scientific notation, 0.00e+00) dy error rate (in scientific notation, 0.00e+00) dz error count NDF-P/AU-NDF errors ea average error rate (in scientific notation, 0.00e+00) eb error rate (in scientific notation, 0.00e+00) ec error count NDF-V/TU-NDF errors ed average error rate (in scientific notation, 0.00e+00) ee error rate (in scientific notation, 0.00e+00) ef error count **For OC-48, OC-192, STM-16, and STM-64, alarm and error durations appear in seconds:** aa B1 errors ab B2 errors BPV errors ac REI-L/MS-REI errors ad B3 errors ae REI-P/HP-REI errors af BIT errors ag No NDF errors ah LOS alarm seconds ai LOF alarm seconds aj SEF/OOF alarm seconds ak LOP-P/AU-LOP alarm seconds al AIS-L/MS-AIS alarm seconds am AIS-P/AU-AIS alarm seconds an UNEQ-P/HP-UNEQ alarm seconds ao Pattern Loss alarm seconds ap RDI-L/MS-RDI alarm seconds aq APS-L/MS-APS alarm seconds ar PLM-P/HP-PLM alarm seconds as TIM-S alarm seconds at TIM-P/HP-TIM alarm seconds au APS Changes alarm seconds av Concatenation alarm seconds aw SS Bits Mismatch alarm seconds ax PP Paused alarm seconds ay Power Loss alarm seconds az TC-IEC errors ba TC-REI errors alarm seconds bb TC-OEI errors bc TC-RDI alarm seconds s bd TC-ODI alarm seconds s be TC-AIS alarm seconds bf TC-UNEQ alarm seconds bg TC-TIM alarm seconds bh TC-LOF alarm seconds

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RESULT Command	Description
RES:SPM? (continued)	**For OC-48, OC-192, STM-16, and STM-64, the average error, error rate, and current error rate counts appear as follows:** B1 errors da average error rate (in scientific notation, 0.00e+00) db error rate (in scientific notation, 0.00e+00) dc error count B2 errors dd average error rate (in scientific notation, 0.00e+00) de error rate (in scientific notation, 0.00e+00) df error count REI-L/MS-REI errors dg average error rate (in scientific notation, 0.00e+00) dh error rate (in scientific notation, 0.00e+00) di error count B3 errors dj average error rate (in scientific notation, 0.00e+00) dk error rate (in scientific notation, 0.00e+00) dl error count REI-P/HP-REI errors dm average error rate (in scientific notation, 0.00e+00) dn error rate (in scientific notation, 0.00e+00) do error count No NDF errors dp average error rate (in scientific notation, 0.00e+00) dq error rate (in scientific notation, 0.00e+00) dr error count BIT errors ds average error rate (in scientific notation, 0.00e+00) dt error rate (in scientific notation, 0.00e+00) du error count TC-IEC errors ea average error rate (in scientific notation, 0.00e+00) eb error rate (in scientific notation, 0.00e+00) ec error count TC-REI errors ed average error rate (in scientific notation, 0.00e+00) ee error rate (in scientific notation, 0.00e+00) ef error count TC-OEI errors eg average error rate (in scientific notation, 0.00e+00) eh error rate (in scientific notation, 0.00e+00) ei error count

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RESULT Command	Description
RES:STSD? **Note:** Select a protocol processor (using the **INST** command) before using this command. Error code 508 appears if a protocol processor is not selected.	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports all Trouble Scan results for SONET and SDH protocols. Use this command to retrieve any and all alarms or errors associated with a the current protocol processor. If no alarms or errors are detected, the following is returned: **"No Errors or Alarms"** If an alarm or error is detected, results are returned using the following format: ***TAG N, TAG N, TAG N,....*** where, *N* is an integer number greater than 0, and *TAG* is one of the following: **For OC-1/3/12 and STM-0/1/4:** aa SS Bits Mismatch alarm seconds ab BPV errors ac B3 errors ad REI-P/HP-REI errors ae NDF-P/AU-NDF errors af BIT errors ag LOS alarm seconds ah LOF alarm seconds ai SEF/OOF alarm seconds aj TIM-S/RS-TIM alarm seconds ak AIS-L/MS-AIS alarm seconds al RDI-L/MS-RDI alarm seconds am B1 errors an B2 errors ao REI-L/MS-REI errors ap APS-L/MS-APS alarm seconds aq AIS-P/AU-AIS alarm seconds ar LOP-P/AU-LOP alarm seconds as UNEQ-P/HP-UNEQ alarm seconds at PLM-P/HP-PLM alarm seconds au RDI-P/HP-RDI alarm seconds av TIM-P/HP-TIM alarm seconds aw BIP-V/LO-BIP errors ax REI-V/LP-REI errors ay LOM-V/TU-LOM alarm seconds az NDF-V/TU-NDF errors ba AIS-V/TU-AIS alarm seconds bb LOP-V/TU-LOP alarm seconds bc UNEQ-V/TU-UNEQ alarm seconds bd PLM-V/LP-PLM alarm seconds be RDI-V/LP-RDI alarm seconds bf TIM-V/LP-TIM alarm seconds bg RFI-V/LP-RFI alarm seconds bh PAT SYNC alarm seconds bi Power Loss alarm seconds bj PP Paused alarm seconds

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RESULT Command	Description
RES:STSD? (continued) **Note:** Select a protocol processor (using the **INST** command) before using this command. Error code 508 appears if a protocol processor is not selected.	**For OC-48, OC-192, STM-16, and STM-64:** aa B1 errors ab B2 errors BPV errors ac REI-L/MS-REI errors ad B3 errors ae REI-P/HP-REI errors af BIT errors ag No NDF errors ah LOS alarm seconds ai LOF alarm seconds aj SEF/OOF alarm seconds ak LOP-P/AU-LOP alarm seconds al AIS-L/MS-AIS alarm seconds am AIS-P/AU-AIS alarm seconds an UNEQ-P/HP-UNEQ alarm seconds ao Pattern Loss alarm seconds ap RDI-L/MS-RDI alarm seconds aq APS-L/MS-APS alarm seconds ar PLM-P/HP-PLM alarm seconds as TIM-S alarm seconds at TIM-P/HP-TIM alarm seconds au APS Changes alarm seconds av Concatenation alarm seconds aw SS Bits Mismatch alarm seconds ax PP Paused alarm seconds ay Power Loss alarm seconds az TC-IEC errors ba TC-REI errors alarm seconds bb TC-OEI errors bc TC-RDI alarm seconds s bd TC-ODI alarm seconds s be TC-AIS alarm seconds bf TC-UNEQ alarm seconds bg TC-TIM alarm seconds bh TC-LOF alarm seconds
RES:TCM:API?	Queries and reports the value of the 16-byte Tandem Connection Monitoring (TCM) trace.
RES:TCM:IEC?	Queries and reports the number of TC-Incoming Error Counts (B3 errors) logged by the unit when configured for TCM mode.
RES:TCM:OEI?	Queries and reports the number of TC-Outgoing Error Indication error counts logged by the unit when configured for TCM mode.
RES:TCM:REI?	Queries and reports the number of TC-Remote Error Indication error counts logged by the unit when configured for TCM mode.
RES:TCM:AIS:Secs?	Queries and reports the number of seconds an AIS alarm was logged by the unit when configured for TCM mode.
RES:TCM:LOF:Secs?	Queries and reports the number of seconds an LOF alarm was logged by the unit when configured for TCM mode.
RES:TCM:ODI:Secs?	Queries and reports the number of seconds a TC-Outgoing Defect Indicator alarm was logged by the unit when configured for TCM mode.

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RESULT Command	Description
RES:TCM:RDI:Secs?	Queries and reports the number of seconds an RDI alarm was logged by the unit when configured for TCM mode.
RES:TCM:TIM:Secs?	Queries and reports the number of seconds a TIM alarm was logged by the unit when configured for TCM mode.
RES:TCM:UNEQ:Secs?	Queries and reports the number of seconds an Unequipped alarm was logged by the unit when configured for TCM mode.
RES:TIM:HP:Secs?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of HP Trace Identifier Mismatch seconds.
RES:TIM:LP:Secs?	*Protocols Supported:* STM-4 Queries the number of TU Trace Identifier Mismatch seconds.
RES:TIM:PATH:Secs?	*Protocols Supported:* OC-12, OC-48, OC-192 Path Trace Identifier Mismatch seconds.
RES:TIM:RS:Secs?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of RS Trace Identifier Mismatch seconds.
RES:TIM:SECtion:Secs?	*Protocols Supported:* OC-12, OC-48, OC-192 Section Trace Identifier Mismatch seconds.
RES:TIM:VT:Secs?	Protocols Supported: OC-12 VT Trace Identifier Mismatch seconds
RES:UNEQ:HP:Secs?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the number of HP Unequipped seconds.
RES:UNEQ:LP:Secs?	*Protocols Supported:* STM-4 Queries the number of LP Unequipped seconds.
RES:UNEQ:PATH:Secs?	*Protocols Supported:* OC-12, OC-48, OC-192 Path Unequipped seconds.
RES:UNEQ:VT:Secs?	*Protocols Supported:* OC-12 VT Unequipped seconds.
RES:YELLOW:Secs?	*Protocols Supported:* DS3, DS1 Queries and reports the number of seconds that there was a Yellow (RAI – Remote Alarm Indication) alarm.

TX (SOURce) Branch

The TX branch is used to set and retrieve Transmit settings. Alternatively, each command can be sent using the "SOUR" or "SOURCE" keyword instead of the “TX” keyword.

The following is a list of supported Transmit commands.

Transmit Command	Description
TX:ALarm:TYPE?	*Protocols Supported:* ALL Queries the current protocol processor for the alarm type it is generating. For a list of returned values, see the *TX:ALarm:TYPE* < *alarm* > command.

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<table>
<tr><th>Transmit Command</th><th>Description</th></tr>
<tr><td>TX:ALarm:TYPE < alarm ></td><td>Protocols Supported: ALL
Sets the alarm being generated. Valid parameters, meanings and protocol processors are:

<table>
<tr><th>Alarm</th><th>Protocol Processors</th><th>Meaning</th></tr>
<tr><td>OFF</td><td>ALL</td><td>No alarm generation</td></tr>
<tr><td>AIS</td><td>E1, E3, E4, DS3, DS1</td><td>Alarm Indication Signal</td></tr>
<tr><td>AISL</td><td>OC-12, OC-48, OC-192</td><td>Line Alarm Indication Signal</td></tr>
<tr><td>AISP</td><td>OC-12, OC-48, OC-192</td><td>Path Alarm Indication Signal</td></tr>
<tr><td>AISV</td><td>OC-12</td><td>VT Alarm Indication Signal</td></tr>
<tr><td>IDLE</td><td>DS1, DS3</td><td>Idle alarm</td></tr>
<tr><td>LOS</td><td>E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS1, DS3</td><td>Loss of Signal</td></tr>
<tr><td>LOF</td><td>E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192</td><td>Loss of Frame</td></tr>
<tr><td>LOPP</td><td>OC-12, OC-48, OC-192</td><td>Loss of Pointer Path</td></tr>
<tr><td>OOF</td><td>DS1, DS3</td><td>Out of Frame</td></tr>
<tr><td>RAI</td><td>E1, E3, E4</td><td>Remote Alarm Indication</td></tr>
<tr><td>YELLOW</td><td>DS1, DS3</td><td>Yellow alarm (RAI)</td></tr>
<tr><td>RDIL</td><td>OC-12, OC-48, OC-192</td><td>Line Remote Defect Indication</td></tr>
<tr><td>RDIP</td><td>OC-12, OC-48, OC-192</td><td>Path Remote Defect Indication</td></tr>
<tr><td>RDIV</td><td>OC-12</td><td>VT Remote Defect Indication</td></tr>
<tr><td>RFIV</td><td>OC-12</td><td>VT RFI</td></tr>
<tr><td>RMFAI</td><td>E1</td><td>Remote Multi-Frame Alarm Indicator</td></tr>
<tr><td>CASMFL</td><td>E1</td><td>Channel-Associated Signaling Multi Frame Loss</td></tr>
<tr><td>MSAIS</td><td>STM-4, STM-16, STM-64</td><td>MS-AIS</td></tr>
<tr><td>MSRDI</td><td>STM-4, STM-16, STM-64</td><td>MS-RDI</td></tr>
<tr><td>AUAIS</td><td>STM-4, STM-16, STM-64</td><td>AU-AIS</td></tr>
<tr><td>AULOP</td><td>STM-4, STM-16, STM-64</td><td>AU-LOP</td></tr>
<tr><td>HPUNEQ</td><td>STM-4, STM-16, STM-64</td><td>HP-UNEQ</td></tr>
<tr><td>HPRDI</td><td>STM-4, STM-16, STM-64</td><td>HP-RDI</td></tr>
<tr><td>TUAIS</td><td>STM-4</td><td>TU-AIS</td></tr>
<tr><td>TULOP</td><td>STM-4</td><td>TU-Loss of Pointer</td></tr>
<tr><td>LPUNEQ</td><td>STM-4</td><td>LP-Unequipped</td></tr>
<tr><td>LPRDI</td><td>STM-4</td><td>LP-RDI</td></tr>
<tr><td>LPRFI</td><td>STM-4</td><td>LP-RFI</td></tr>
<tr><td>UNEQP</td><td>OC-12, OC-48, OC-192</td><td>Path Unequipped</td></tr>
<tr><td>UNEQV</td><td>OC-12</td><td>VT Unequipped</td></tr>
</table>
</td></tr>
<tr><td>TX:APS:ACTION <state></td><td>Protocols Supported: STM-4, STM-16, STM-64, OC-12, OC-48, OC-192
Starts and stops the round-trip delay function. Valid <state> values are:
SINGle — Monitors for a single APS event. If the event occurs, the duration is reported and the state returns to Inactive.
STOP — Stops APS monitoring. The state returns to Inactive.
CONTinuos — Constantly monitors for APS events and updates the Protection Switch Time durations.</td></tr>
</table>

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Transmit Command	Description
TX:APS:GOOD:TIME?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the current setting of the APS's Consecutive Good Time Required function. This value indicates the duration of the number of valid frames that occur before the APS function is confirmed to be activated. Valid values for this command range from 0.125 msec to 2047.875 msec.
TX:APS:GOOD:TIME <value>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Sets the value for the APS's Consecutive Good Time Required function. Valid values range from 0.125 msec to 2047.875 msec.
TX:APS:GOOD:FRAME?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the current setting of the APS's Consecutive Good Frames Required function. This value indicates the number of valid frames that occur before the APS function is confirmed to be activated. Valid values for this command range from 1 to 16383 frames.
TX:APS:GOOD:FRAME <value>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Sets the value for the APS's Consecutive Good Frames Required function. Value values range from 1 to 16383 frames.
TX:APS:SEQuence?	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Queries the values of the K1/K2 bytes and frames used for APS sequencing. The K1 and K2 bytes appear in HEX notation. The frames appear in decimal notation.
TX:APS:SEQuence <commands>	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Specifies 1 to 15 APS commands to be transmitted. Each command contains the K1 value, K2 value, and number of frames to transmit (1 to 65535). Format is comma-delimited, with 3 numeric values for each command. Example, containing 3 commands: TX:APS:SEQ 0, 0, 100, 5, 1, 20, 255, 255, 10
TX:AU:INSert?	*Protocols Supported:* STM-4, STM-16, STM-64 Queries the current Foreground AU inserted.
TX:AU:INSert <value>	*Protocols Supported:* STM-4, STM-16, STM-64 Sets the current Foreground AU inserted. A value can be numeric or "ALL." ALL indicates that all the AUs have the same contents (broadcast).
TX:AU:TYPe?	*Protocols Supported:* STM-4 Queries the current AU type generated.
TX:AU:TYPe <value>	*Protocols Supported:* STM-4 Sets the current AU type generated. Valid values are: AU-3, AU-4, AU-4-4C
TX:CAS:<channel>?	*Protocols Supported:* E1 Queries the E1 test for the value being transmitted in any of the 30 CAS channels. Channel must be a decimal integer from 1 to 30.
TX:CAS:<channel> <value>	*Protocols Supported:* E1 Sets the value generated in any of the 30 CAS channels. Channel must be a decimal integer from 1 to 30 or "ALL." If "ALL," the number specified in value will be applied to all 30 channels, or it is the channel number. Value can be any integer from 0 to 15 specified as integer, hex or binary.
TX:CLOCK:SYStem?	*Protocols Supported:* SYSTEM Queries the source of the external system clock (must be set the same for all protocols).

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<table>
<tr><th>Transmit Command</th><th>Description</th></tr>
<tr><td>TX:CLOCK:SYStem <clock source value></td><td>Protocols Supported: SYSTEM
Sets the source of the external system clock for all processors BITS or SETS. Valid values are: BITS or SETS.</td></tr>
<tr><td>TX:CLOCK?</td><td>Protocols Supported: E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1, Jitter
Queries the current test for its reference clock source.</td></tr>
<tr><td>TX:CLOCK <clock type></td><td>Protocols Supported: E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1, Jitter
Sets the current protocol processor's reference clock (for determining how the transmitted signal will be clocked) to one of the following types based on the protocol processor selected. EXTERNAL sets it to BITS or SETS, depending on the TX:CLOCK:SYStem setting. Valid clock types and descriptions are:

<u>Clock Type</u> — <u>Description</u>
INT — Internal Clock
EXTERNAL — External BITS or SETS reference clock input (not valid for Jitter)
LOOP — Received (Recovered) signal (not valid for Jitter)
BITS — Synchronizes the transmitted signal to the BITS (Building Integrated Timing Supply) clock input, which is 1.544 MHz. If this option is selected, but BITS clocking is not available, then this function defaults to Internal.
SETS — Synchronizes the transmitted signal to the SETS (Synchronous Equipment Timing Source) clock input, which is 2.048 MHz. If this option is selected, but SETS clocking is not available, then this function defaults to Internal.
RECOVERED — Jitter recovered signal (Jitter only)
EXT10MHZ — Derives Jitter timing from an external timing source attached to the unit’s 10 MHz In reference clock connector.
EXT2MHZ — Derives Jitter timing from an external timing source attached to the unit’s 2.048 MHz In reference clock connector.</td></tr>
<tr><td>TX:COUPled?</td><td>Protocols Supported: E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1
Queries the current protocol processor to see if Receive and Transmit are coupled or set independently. Returns string YES or NO</td></tr>
<tr><td>TX:COUPled <mode></td><td>Protocols Supported: E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1
Sets the current protocol processor to either couple Receive and Transmit setting or make Receive and Transmit setting operate independently. Valid modes are: YES or NO.</td></tr>
<tr><td>TX:DCC?</td><td>Protocols Supported: STM-4, OC-12
Returns values as in TX:DCC</td></tr>
</table>

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Transmit Command	Description
TX:DCC < channel >	*Protocols Supported:* STM-4, OC-12 Specifies the bit stream to be sent over one of the datacomm channels. For those bytes not used (or if the value is NONE) the single byte value in the Transmit Overhead specification is used. Valid values are: **Channel** — **Description** NONE — Only use single byte values in the Transmit Overhead setting RSPRBS — Insert PRBS 2^7 -1 into RS DCC channel (D1-D3) RSPRBSINV — Insert PRBS 2^7-1 Inverted into RS DCC channel (D1-D3) MSPRBS — Insert PRBS 2^7-1 into MS DCC channel (D4-D12) MSPRBSINV — Insert PRBS 2^7-1 Inverted into MS DCC channel (D4-D12) RSDCC — Insert bit stream from DCC Port into RS DCC channel (D1-D3) MSDCC — Insert bit stream from DCC Port into MS DCC channel (D4-D12) SECTionPRBS — Insert PRBS 2^7-1 into Section DCC channel (D1-D3) SECTionPRBSINV — Insert PRBS 2^7-1 Inverted into Section DCC channel (D1-D3) LINEPRBS — Insert PRBS 2^7-1 into Line DCC channel (D4-D12) LINEPRBSINV — Insert PRBS 2^7-1 Inverted into Line DCC channel (D4-D12) SECTionDCC — Insert bit stream from DCC Port into Section DCC channel (D1-D3) LINEDCC — Insert bit stream from DCC Port into Line DCC channel (D4-D12)
TX:E13:INSert:@N?	*Protocols Supported:* E3, DS3 Queries the inserted E1 channel on the E13 or DS3 Mux for instance N. Values returned are 1-16 (for E3) and 1-21 (for DS3) or "ALL," where "ALL" means "All Background" (Broadcast).
TX:E13:INSert:@N <value>	*Protocols Supported:* E3, DS3 Sets the E1 insert channel for instance N to one of the 16 E13 or 21 DS3 channels available. Values are 1 to 16 (for E3) and 1-21 (for DS3) or "ALL." "ALL" means "All Background" (Broadcast).
TX:E34:INSert?	*Protocols Supported:* E4 Queries the current inserted E3 channel on the E34 Mux. Values returned are 1-4 or "ALL," where "ALL" means "All Background" (Broadcast).
TX:E34:INSert <value>	*Protocols Supported:* E4 Sets the E3 insert channel to one of the 4 E34 channels. Values are 1 to 4 or "ALL." "ALL" means "All Background" (Broadcast).
TX:EBITs?	*Protocols Supported:* E1 Returns the transmitted E-bits as a 2-bit binary number.
TX:EBITs <value>	*Protocols Supported:* E1 Sets the transmitted E-bits per the value passed, ignoring all but the low-order 2 bits in "value."

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<table>
<tr><th>Transmit Command</th><th>Description</th></tr>
<tr><td>TX:ERR:RATE?</td><td>Protocols Supported: ALL
Queries the error rate and returns the value as given in the command.</td></tr>
<tr><td>TX:ERR:RATE < rate ></td><td>Protocols Supported: ALL
Sets the error rate. Valid values are:

<u>Rate</u> <u>Description</u>
N.NNe-NN where each N is a numeral
0 = OFF
SINGLE Single error generation; does not change the current generation rate
Special strings Future expansion; must begin with an alphabetic character, not a numeral.</td></tr>
<tr><td>TX:ERR:TYPE?</td><td>Protocols Supported: ALL
Queries the error type selected for the current protocol processor.</td></tr>
<tr><td>TX:ERR:TYPE <error></td><td>Protocols Supported: ALL
Sets the error type for the current protocol processor to one of the following types:
<u>Error</u> <u>Protocol(s)</u> <u>Description</u>
NONE ALL Stops Error Generation
BIT ALL Errors in the payload pattern
BPV E1, E3, STM-4, DS3, DS1, OC-12 Bipolar violations
FRAME E1, E3, E4, DS3, DS1 Framing errors
CPAR DS3 C-Parity Bit error
CRC E1, DS1 CRC errors
FEBE E1 Far End Block Errors
B1 STM-4, STM-16, STM-64 OC-12, OC-48, OC-192 RS/Section BIP-8 Errors
B2 STM-4, STM-16, STM-64 OC-12, OC-48, OC-192 MS/LINE BIP-8 Errors
B3 STM-4, STM-16, STM-64 OC-12, OC-48, OC-192 HP/PATH BIP-8 Errors
LCV E4 Line Code Violations
LPBIP STM-4 LP-BIP-2 or LP-BIP-8 (depending on Mapping)
MSREI STM-4, STM-16, STM-64 MS-REI
HPREI STM-4, STM-16, STM-64 HP-REI
LPREI STM-4 LP-REI
PPAR DS3 P-Parity Bit error
REIL OC-12, OC-48, OC-192 Line Remote Error Indicator
REIP OC-12, OC-48, OC-192 Path Remote Error Indicator
REIV OC-12 VT Remote Error Indicator</td></tr>
</table>

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Transmit Command	Description
TX:FEAC:CODE <type>	*Protocols Supported:* DS3 Sets the transmitted FEAC code to one of the following: **FEAC Type** — **Description** SDS1LOS — Single DS1 LOS/HBE MDS1LOS — Multiple DS1 LOS/HBER DS1SA — DS1 equipment failure SA DS1NSA — DS1 equipment failure NSA DS3SA — DS3 equipment failure SA DS3NSA — DS3 equipment failure NSA DS3LOS — DS3 LOS/HBER IDLE — DS3 idle received OOF — DS3 Out of Frame AIS — DS3 AIS received LPUP — DS3 NIU loop up LPDN — DS3 NIU loop down COMSA — Com equipment failure NSA 000001–111111 — Unassigned value ranging from 000001 to 111111
TX:FEAC:CODE?	*Protocols Supported:* DS3 Returns the current value of the *TX:FEAC:CODE* command.
TX:FEAC:CYCle <value>	*Protocols Supported:* DS3 Sets the number of FEAC cycles sent for Burst mode. Valid values range from 1 to 16.
TX:FEAC:CYCle?	*Protocols Supported:* DS3 Returns the current setting for the number of FEAC cycles sent. Values returned range from 1 to 16.
TX:FEAC:RX:CODE?	*Protocols Supported:* DS3 Returns the value of the last FEAC code received.
TX:FEAC:RX:SEConds?	*Protocols Supported:* DS3 Returns the number of seconds since a FEAC code was last received.
TX:FEAC:TX <value>	*Protocols Supported:* DS3 Starts or stops the FEAC. Valid values are BURST, CONTinuous, and OFF.
TX:FEAC:TX:?	Protocols Supported: DS3 Returns the current setting for FEAC transmission.
TX:FRAC_E1:MASK?	*Protocols Supported:* E1 Queries the Transmit fractional E1 mask, returned as a 32-bit integer.
TX:FRAC_E1:MASK < mask >	*Protocols Supported:* E1 Sets the 32-bit Transmit fractional E1 mask by which DS0s are enabled.
TX:FRAC_T1:MASK?	*Protocols Supported:* DS1 Queries the Transmit fractional DS1 mask, returned as a 32-bit integer.
TX:FRAC_T1:MASK < mask >	*Protocols Supported:* DS1 Sets the 32-bit Transmit fractional DS1 mask by which DS0s are enabled.
TX:FRAMing:BG?	*Protocols Supported:* E3, E4, DS3 Queries the current protocol processor for the background framing it is transmitting.

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<table>
<tr><th>Transmit Command</th><th>Description</th></tr>
<tr><td>TX:FRAMing:BG</td><td>Protocols Supported: E3, E4, DS3, DS1
Sets the background framing in the MUX to one of the following types:
<u>Framing</u> — <u>Protocol(s)</u> — <u>Description</u>
UNframed — DS1, E1, E3 — Unframed
ESF — DS1 — Extended Super Frame
D4/SF — DS1 — D4/Super Frame
C-BIT — DS3 — C-Bit Frame
M13 — DS3 — M13 Frame
PCM30 — E1 — Framed E1, with CAS but no CRC
PCM31 — E1 — Framed E1, without CAS or CRC
PCM30CRC — E1 — Framed E1, with CAS and CRC
PCM31CRC — E1 — Framed E1, without CAS but with CRC
FRamed — E3 — Framed</td></tr>
<tr><td>TX:FRAMing?</td><td>Protocols Supported: E1, E3, E4, DS3, DS1
Queries the current protocol processor for the framing it is transmitting.</td></tr>
<tr><td>TX:FRAMing < frame ></td><td>Protocols Supported: E1, E3, E4, DS3
Sets the transmitter of the current protocol processor to one of the following framing types:
<u>Framing</u> — <u>Protocol(s)</u> — <u>Description</u>
ESF — DS1 — ESF framing for DS1
SF/D4 — DS1 — SF/D4 framing for DS1
SLC96 — DS1 — SLC-96 framing for DS1
M13 — DS3 — M13 framing for DS3
C-BIT — DS3 — C-Bit framing for DS3
UNframed — E1, E3, E4, DS3, DS1 — Unframed
FRamed — E3, E4 — Framed
PCM30 — E1 — Framed E1, with CAS but no CRC
PCM31 — E1 — Framed E1, without CAS or CRC
PCM30CRC — E1 — Framed E1, with CAS and CRC
PCM31CRC — E1 — Framed E1, without CAS but with CRC</td></tr>
<tr><td>TX:FREQOFF:LINE?</td><td>Protocols Supported: E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1
Returns the current transmitted line frequency offset as a decimal number with one digit.</td></tr>
<tr><td>TX:FREQOFF:LINE
< offset ></td><td>Protocols Supported: E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1
Sets the transmitted line frequency offset. Valid values are -100.0 to 100.0 in increments of 0.1.</td></tr>
<tr><td>TX:FREQOFF:AU?</td><td>Protocols Supported: STM-4, STM-16, STM-64
Returns the current transmitted AU Frequency offset as a decimal number with one digit.</td></tr>
<tr><td>TX:FREQOFF:AU < offset ></td><td>Protocols Supported: STM-4, STM-16, STM-64
Sets the transmitted AU frequency offset. Valid values are -100.0 to 100.0 in increments of 0.1.</td></tr>
<tr><td>TX:FREQOFF:SPE?
< offset ></td><td>Protocols Supported: OC-12, OC-48, OC-192
Returns the current transmitted SPE Frequency offset as a decimal number with one digit.</td></tr>
</table>

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Transmit Command	Description
TX:FREQOFF:SPE < offset >	*Protocols Supported:* OC-12, OC-48, OC-192 Sets the transmitted SPE frequency offset. Valid offset values are -100.0 to 100.0 in increments of 0.1.
TX:FREQOFF:TU?	*Protocols Supported:* STM-4 Returns the current transmitted TU Frequency offset as a decimal number with one digit.
TX:FREQOFF:TU < offset >	*Protocols Supported:* STM-4 Sets the transmitted TU frequency offset. Valid values are -100.0 to 100.0 in increments of 0.1.
TX:FREQOFF:VT?	*Protocols Supported:* OC-12 Returns the current transmitted VT frequency offset as a decimal number with one digit.
TX:FREQOFF:VT <offset>	*Protocols Supported:* OC-12 Sets the transmitted VT frequency offset. Valid values are -100.0 to 100.0 in increments of 0.1.
TX:INTerface?	*Protocols Supported:* STM-4, OC-12, Jitter Queries the type of transmit interface.
TX:INTerface <interface value>	*Protocols Supported:* STM-4, OC-12, Jitter Sets the transmit interface speed and type (optical or electrical). Valid interface values are: **Interface** / **Protocol(s)** / **Description** STM0E / STM-4 / 52 Mbps electrical interface STM1E / STM-4 / 155 Mbps electrical interface STM0 / STM-4, Jitter / 52 Mbps optical interface STM1 / STM-4, Jitter / 155 Mbps optical interface STM4 / STM-4, Jitter / 622 Mbps optical interface STSX1 / OC-12 / 52 Mbps electrical interface OC1 / OC-12, Jitter / 52 Mbps optical interface OC3 / OC-12, Jitter / 155 Mbps optical interface OC12 / OC-12, Jitter / 622 Mbps optical interface
TX:LABel:HP?	*Protocols Supported:* STM-4, STM-16, STM-64 Returns HP Signal Label, as an 8-bit binary string.
TX:LABel:HP <value>	*Protocols Supported:* STM-4, STM-16, STM-64 Sets the 8-bit HP signal label to any value from 0 to 255.
TX:LABel:LP?	*Protocols Supported:* STM-4 Returns LP signal label, as an 8-bit binary string.
TX:LABel:LP <value>	*Protocols Supported:* STM-4 Sets the 8-bit LP signal label to any value from 0 to 255.
TX:LABel:PATH?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns PATH signal label, as an 8 bit binary string.
TX:LABel:PATH <value>	*Protocols Supported:* OC-12, OC-48, OC-192 Sets the 8-bit PATH signal label to any value from 0 to 255.
TX:LABEL:VT?	*Protocols Supported:* OC-12 Returns VT-Path signal label as an 8-bit binary string.
TX:LABEL:VT <value>	*Protocols Supported:* OC-12 Sets the 8-bit VT-Path signal label to any value from 0 to 255.

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Transmit Command	Description
TX:LASER?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, GIGE, Jitter Returns ON, OFF depending on whether laser is on or off.
TX:LASER <mode>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, GIGE, Jitter Turns the laser on or off. Valid modes are: ON or OFF.
TX:LASERTYPE?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Returns 1310 or 1550 depending on which laser is selected.
TX:LASERTYPE <laser>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Selects the laser to use for dual laser systems. Valid lasers are: 1310 or 1550.
TX:LCODE <mode>	*Protocols Supported:* E1, DS1 Sets the line coding. Valid modes are: AMI, HDB3, B8ZS.
TX:LCODE?	*Protocols Supported:* E1, DS1 Queries the line code transmitted.
TX:LOOPback:ACTivate <value>	*Protocols Supported:* DS3 Transmits loopback activation for DS3. Valid values are BURST, CONTinuous, and OFF.
TX:LOOPback:AUTO	*Protocols Supported:* DS1 Sets the Auto Response setting to ON or OFF.
TX:LOOPback:AUTO?	*Protocols Supported:* DS1 Returns the current auto response setting.
TX:LOOPback:CODE <value>	*Protocols Supported:* DS1 Sets the loopback type. The user-defined value is 16 binary bits. The first 8 bits are the loopup code, the second 8 bits are the loopdown code. For example, 0000000011111111, where 00000000 is the loopup code and 11111111 is the loopdown code. **Parameter** — **Description** PAYLOAD — OUT-OF-BAND SMARTJACK — OUT-OF-BAND OUTLINE — OUT-OF-BAND 4BIT — IN-BAND 5BIT — IN-BAND INLINE — IN-BAND <user-defined> — IN-BAND
TX:LOOPback:CODE?	*Protocols Supported:* DS1 Returns the current setting for the loopback code. For user-defined values, it returns the 16 binary bits.
TX:LOOPback:CYCle <value>	*Protocols Supported:* DS3 Sets the number of loopback cycles that are sent for Burst mode. A value from 1 to 16 can be entered.
TX:LOOPback:CYCle?	*Protocols Supported:* DS3 Returns the current setting of the TX:LOOPBACK:CYCLE command.
TX:LOOPback:DEACTivate <value>	*Protocols Supported:* DS3 Transmits loopback activation for DS3. Valid values are BURST, CONTinuous, and OFF.
TX:LOOPback: DOWNcode?	*Protocols Supported:* DS1 Returns the binary image of the loopdown code set in Type and Code.

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Transmit Command	Description
TX:LOOPback:LINE <value>	*Protocols Supported:* DS1 Sets the Tester Line Looped setting to UP or DOWN.
TX:LOOPback:LINE?	*Protocols Supported:* DS1 Returns the current Tester Line Looped setting.
TX:LOOPback:PAYload <value>	*Protocols Supported:* DS1 Sets the Tester payload Looped setting to UP or DOWN.
TX:LOOPback:PAYload?	*Protocols Supported:* DS1 Returns the current Tester Payload Looped setting.
TX:LOOPback:RX:LINE?	*Protocols Supported:* DS3 Returns the last loopback value received. The value returned is from the TX:LOOPBACK:ACTIVATE or TX:LOOPBACK:DEACTIVATE command.
TX:LOOPback:RX: SEConds?	*Protocols Supported:* DS3 Returns the number of seconds since a loopback **Activate** or **Deactivate** command has been received.
TX:LOOPback:RX:TYPE?	*Protocol Supported:* DS3 Returns the value of the last loopback type received. If **1** is returned, the last loopback type received is Activate. If **2** is returned, the last loopback type received is Deactivate.
TX:LOOPback:SEND <value>	*Protocols Supported:* DS1 Transmits loopback activation. Argument values are UP or DOWN. This takes several seconds to take effect when an IN-BAND type is sent. The TX:LOOP:STATus command can be used to determine when it has taken effect.
TX:LOOPback:TYPE <value>	*Protocols Supported:* E1, DS3, DS1 Sets the loopback type. **Parameter** / **Protocol(s)** / **Description** IN / DS1 / IN-BAND OUT / DS1 / OUT-OF-BAND (ESF Framing) NONE / E1 / No loopback LINE / E1 / Line Loopback PAYLOAD / E1 / Payload Loopback 1 to 28 / DS3 / Part of signal looped ALL / DS3 / Entire signal
TX:LOOPback:TYPE?	*Protocols Supported:* E1, DS3, DS1 Returns the current loopback type.
TX:LOOPback:UPcode?	*Protocols Supported:* DS1 Returns the binary image of the loopup code set in TYPE and CODE.
TX:M13:INSert:@N?	Protocols Supported: DS3 Queries the inserted DS1 channel for instance N on the M13 Mux. Values returned are 1-28 or “ALL,” where “ALL” means “All Background” (Broadcast).
TX:M13:INSert:@N <value>	Protocols Supported: DS3 Sets the DS1 insert channel for instance N to one of the 28 M13 channels available. Values are 1 to 28 or “ALL.” “ALL” means “All Background” (Broadcast).

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Transmit Command	Description
TX:MAPping?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, E1, E3, E4, DS3, DS1 Queries the protocol processor for the mapping it is transmitting.
TX:MAPping <mapping>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, E1, E3, E4, DS3, DS1 Sets the transmitter to one of the following mappings.

Mapping	**Protocol(s)**	**Meaning**
STS192CBULK	OC-192	STS-192c Bulk Fill
STS48	OC-192	STS-48 Drop/Insert
AU464CBULK	STM-64	AU-4-64c Bulk Fill
AU416C	STM-64	AU-4-16c Drop/Insert
AU416CBULK	STM-16	AU-4-16c Bulk Fill
AU44C	STM-16	AU-4-4c Drop/Insert
STS48CBULK	OC-48	STS-48c Bulk Fill
STS12	OC-48	STS-12 Drop/Insert
C44CBULK	STM-4	C4-4c Bulk Fill
C4BULK	STM-4	C-4 Bulk Fill
E4	STM-4	E4 Drop/Insert
E3	STM-4, E4	E3 Drop/Insert
DS3	STM-4, OC-12	DS3 Drop/Insert
C3BULK	STM-4	C-3 Bulk Fill
C2BULK	STM-4	C-2 Bulk Fill
C12BULK	STM-4	C-12 Bulk Fill
C11BULK	STM-4	C-11 Bulk Fill
E1	STM-4, E3, OC-12, DS3	E1 Drop/Insert
FRACtional	E1	Fractional E1
DS1	STM-4, OC-12, DS3	DS1 Drop/Insert
STS12CBULK	OC-12	STS-12c Bulk Fill
STS3CBULK	OC-12	STS-3c Bulk Fill
STS1BULK	OC-12	STS1 Bulk Fill
VT6BULK	OC-12	VT6 Bulk Fill
VT2BULK	OC-12	VT2 Bulk Fill
VT15BULK	OC-12	VT1.5 Bulk Fill
BULK	E1, E3, E4, DS1, DS3	Bulk Fill
56KFRACtional	DS1	Fractional T1, 56K
64KFRACtional	DS1	Fractional T1, 64K

TX:NDF:AU?	*Protocols Supported:* STM-4, STM-16, STM-64 Returns YES or NO, depending on the value of the AU New Data Flag.
TX:NDF:AU <mode>	*Protocols Supported:* STM-4, STM-16, STM-64 Sets the AU New Data Flag. Valid modes are: YES or NO.
TX:NDF:STS?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns YES, NO depending on the value of the STS New Data Flag.
TX:NDF:STS <mode>	*Protocols Supported:* OC-12, OC-48, OC-192 Set the STS New Data Flag. Valid modes are: YES or NO.
TX:NDF:TU?	*Protocols Supported:* STM-4 Returns YES, NO depending on the value of the TU New Data Flag.
TX:NDF:TU <value>	*Protocols Supported:* STM-4 Sets the TU New Data Flag. Valid modes are: YES or NO.

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Transmit Command	Description
TX:NDF:VT?	*Protocols Supported:* OC-12 Returns YES, NO depending on the value of the VT New Data Flag.
TX:NDF:VT <value>	Protocols Supported: OC-12 Sets the VT New Data Flag. Valid modes are: YES or NO.
TX:OH:<OH BYTE>?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the currently transmitted SDH/SONET overhead byte or trace. J0 Trace is returned as quoted 15-byte string (CRC-7 byte is removed). J1 and J2 traces are returned as quoted 62-byte strings, with the last two bytes truncated (Carriage Return, Line Feed). If all ones, a trace will be returned as ALLONES, without any quotes. Other overhead bytes are returned in Hexadecimal format (#Hxx).
TX:OH:<OH BYTE> <value>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Sets the currently transmitted SDH/SONET overhead byte or trace. J0 is specified as a 15-byte string. J1 and J2 traces are specified as quoted 0 to 62 byte strings. If set as all ones, a trace should be specified as ALLONES, without any quotes. Carriage Return and Line Feed are always added to the specified string for a trace. Other overhead bytes may be specified in any numeric integer format. Valid two-character strings for OH BYTE specification are: **SOH (SDH) / TOH (SONET):** A1, A2, J0, Z0 E1, F1 D1, D2, D3 K1, K2 D4, D5, D6 D7, D8, D9 D10, D11, D12 S1, Z2, E2 **9 Byte HP (SDH) / Path (SONET):** C2, G1, F2, F3, K3, N1, J1, H4 **9 Byte TU-3 LP (SDH):** LPC2, LPG1, LPF2, LPF3, LPK3, LPN1 **4 Byte LP (SDH) / VT (SONET):** J2, N2, K4
TX:OH:INTRusive: <group>?	*Protocols Supported:* STM64, OC192 Queries whether a group of overhead bytes is changed or not. Only used when in passthru mode, although the setting and query is valid when not in passthru mode, and no error should be returned if set or queried when not in passthru mode.

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Transmit Command	Description
TX:OH:INTRusive:<group> <mode>	*Protocols Supported:* STM64, OC192 Only used when in passthru mode, although the setting and query is valid when not in passthru mode, and no error should be returned if set or queried when not in passthru mode. Valid modes are: YES or NO. When Passthru mode is ON, it must be specified whether the overhead bytes are obtained from the received signal (passed thru), or if they are modified according to the TX:OH settings. These can be done only in groups, which are: A1 A2 J0Z0 (J0 or Z0 byte) B1 E1 F1 D1D3 (D1, D2, D3) H1H3 (H1, H2, H3) D3D12 (D3 through D12) B2 K1 K2 S1Z1 (S1 or Z1 byte) M1Z2 (M1 or Z2 byte) E2 The Group name is passed as part of the command, followed by a value of YES or NO. YES means the bytes in that group are being passed through without change (intrusion). Example: TX:OH:INTR:D3D12 YES
TX:ORDER?	*Protocols Supported:* STM-4, OC-12 Returns values as in TX:ORDER.
TX:ORDER <value>	*Protocols Supported:* STM-4, OC-12 Sets the orderwire add. Parameter values are as follows: E1 Insert bit stream from orderwire into E1 (E2 single byte, as in *TX OH* settings). E2 Insert bit stream from orderwire into E2 (E1 single byte, as in *TX OH* settings). NONE E1 and E2 single bytes, as in TX OH settings.
TX:PASSthru?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, E3 Returns the pass-thru (thru-mode) setting.
TX:PASSthru <mode>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, E3 Sets the pass-thru (thru-mode) setting. NO is the same as OFF. Valid modes for STM-4 are: INTrusive, INTrusive, AddDrop, NONINTrusive. Valid modes for STM-16 are: YES or NO.
TX:PATTern:AU:BG?	*Protocols Supported:* STM-4, STM-16, STM-64 Returns the 8-bit pattern in background AUs as a 8-bit binary integer.

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Transmit Command	Description
TX:PATTern:AU:BG <pattern>	*Protocols Supported:* STM-4, STM-16, STM-64 Sets the pattern in background AUs. This is an 8-bit pattern.
TX:PATTern:BG?	*Protocols Supported:* E1, E3, E4, DS3, DS1 Returns the pattern in the payload of background frames.
TX:PATTern:BG <pattern>	*Protocols Supported:* E1, E3, E4, DS3, DS1 Sets the pattern in the payload of background frames.
TX:PATTern:STS:BG?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns the 8 bit pattern in background STS's as an 8-bit binary integer.
TX:PATTern:STS:BG <pattern>	*Protocols Supported:* OC-12, OC-48, OC-192 Sets the pattern in background STS's. This is an 8-bit pattern.
TX:PATTern:TU:BG?	*Protocols Supported:* STM-4 Returns the 8-bit pattern in background TU's as an 8-bit binary integer.
TX:PATTern:TU:BG <pattern>	*Protocols Supported:* STM-4 Sets the pattern in background TU's. This is an 8-bit pattern.
TX:PATTern:VT:BG?	*Protocols Supported:* OC-12 Returns the 8-bit pattern in background VT's as an 8-bit pattern.
TX:PATTern:VT:BG <pattern>	*Protocols Supported:* OC-12 Sets the pattern in background VT's. This is an 8-bit pattern.
TX:PATTern?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Queries the current protocol processor for the (foreground) pattern it is sending. Returns a binary pattern for user-defined bit string, or a predefined pattern. See *TX:PATTern* for Predefined Patterns.

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Transmit Command	Description
TX:PATTern <pattern>	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Sets the (foreground) transmit pattern. Pattern parameter can be a numeric value for a user-defined bit pattern, or a predefined pattern. See Chapter 2-1, *Pattern Setting and Reporting*, for more specific examples. Valid predefined patterns, protocols, and descriptions are:

Pattern	Protocol(s)	Description
PRBS6	DS1	2^6-1 PRBS pattern
PRBS9	E1, E3, STM-4, OC-12, DS1	2^9-1 PRBS pattern
PRBS9INV	E1, E3, STM-4, OC-12	2^9-1 Inverted PRBS pattern
PRBS11	E1, E3, STM-4, OC-12 DS1	2^{11}-1 PRBS pattern
PRBS11INV	E1, E3, STM-4, OC-12	2^{11}-1 Inverted PRBS pattern
PRBS15	E1, E3, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1	2^{15}-1 PRBS pattern
PRBS15INV	E1, E3, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3	2^{15}-1 Inverted PRBS pattern
PRBS20	E1, E3, E4, STM-4, OC-12, DS3, DS1	2^{20}-1 PRBS pattern
PRBS20INV	E1, E3, E4, STM-4, OC-12, DS3	2^{20}-1 Inverted PRBS pattern
PRBS23	E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1	2^{23}-1 PRBS pattern
PRBS23INV	E1, E3, E4, STM-4, STM-16, STM-64 OC-12, OC-48, OC-192	2^{23}-1 Inverted PRBS pattern
PRBS31	STM-4, STM-16, STM-64, OC-12, OC-48, OC-192	2^{31}-1 PRBS pattern
PRBS31INV	STM-4, STM-16, STM-64, OC-12, OC-48, OC-192	2^{31}-1 Inverted PRBS pattern
ALL ONES	DS3, DS1	All Ones pattern
ALL ZEROS	DS3, DS1	All Zeros pattern
QRSS	DS1	QRSS pattern
3in24	DS1	3 in 24 pattern
1in8	DS1	1 in 8 pattern
1010	DS1	1010 pattern
55DLY	DS1	55 Octet Daly pattern
T1-2	DS1	T1-2 pattern (96 octet pattern)
T1-3	DS1	T1-3 pattern (54 octet pattern)

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Transmit Command	Description		
TX:PATTern <pattern> (continued)	T1-4	DS1	T1-4 pattern (120 octet pattern)
	T1-5	DS1	T1-5 pattern (53 octet pattern)
	55-OCTET	DS1	55-Octet pattern
	DDS-1	DS1	100 bytes of ALL ONES followed by 100 bytes of ALL ZEROS.
	DDS-2	DS1	100 bytes of 01111110 followed by 100 bytes of ALL ZEROS.
	DDS-3	DS1	01001100 transmitted continuously
	DDS-4	DS1	00000010 transmitted continuously
	DDS-5	DS1	DDS-1 four times, DDS-2 four times, DDS-3 once, DDS-4 once transmitted continuously.
	DDS-6	DS1	11111110 repeated seven times followed by an octet of ALL ONES continuously.
	BRIDGE	DS1	21 pattern bridge tap sequence
	MULTI	DS1	5 pattern multi-pattern sequence
TX:PTR:ADJ:AU <count>	*Protocols Supported:* STM-4, STM-16, STM-64 Adjusts the AU pointer by either incrementing or decrementing it, rather than assigning it a "new" value, as is done in **TX:PTR:AU**. The <count> may be one of the following: **Count Type** — **Description** 1 — single increment -1 — single decrement 2 to 8 — increment burst of 2 to 8 -2 to -8 — decrement burst of 2 to 8		
TX:PTR:ADJ:STS <count>	*Protocols Supported:* OC-12, OC-48, OC-192 Adjusts the STS pointer by either incrementing or decrementing it, rather than assigning it a "new" value, as is done in **TX:PTR:STS**. Valid count types and descriptions are: **Count Type** — **Description** 1 — single increment -1 — single decrement 2 to 8 — increment burst of 2 to 8 -2 to -8 — decrement burst of 2 to 8		
TX:PTR:ADJ:TU <count>	*Protocols Supported:* STM-4, STM-16, STM-64 Adjusts the TU pointer by either incrementing or decrementing it, rather than assigning it a "new" value, as is done in **TX:PTR:TU**. The <count> may be one of the following: **Count Type** — **Description** 1 — single increment -1 — single decrement 2 to 8 — increment burst of 2 to 8 -2 to -8 — decrement burst of 2 to 8		

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Transmit Command	Description
TX:PTR:ADJ:VT <count>	*Protocols Supported:* OC-12 Adjusts the VT pointer by either incrementing or decrementing it, rather than assigning it a "new" value, as is done in **TX:PTR:VT**. The <count> may be one of the following: **Count Type** — **Description** 1 — single increment -1 — single decrement 2 to 8 — increment burst of 2 to 8 -2 to -8 — decrement burst of 2 to 8
TX:PTR:AU?	*Protocols Supported:* STM-4, STM-16, STM-64 Returns the AU Pointer value currently being transmitted. Valid range is 0 to 782.
TX:PTR:AU <value>	*Protocols Supported:* STM-4, STM-16, STM-64 Sets a new AU pointer. Valid values are 0 to 782.
TX:PTR:STS?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns STS Pointer value currently being transmitted. Valid range is 0 to 782.
TX:PTR:STS <value>	*Protocols Supported:* OC-12, OC-48, OC-192 Sets a new STS pointer. Valid values are 0 to 782.
TX:PTR:TU?	*Protocols Supported:* STM-4 Returns the TU Pointer value currently being transmitted.
TX:PTR:TU <value>	*Protocols Supported:* STM-4 Sets a new TU pointer. Valid range depends on the TU type. **TU Type** — **Range** TU-3 — 0-764 TU-2 — 0-427 TU-12 — 0-139 TU-11 — 0-103
TX:PTR:VT?	*Protocols Supported:* OC-12 Returns VT pointer value currently being transmitted.
TX:PTR:VT <value>	*Protocols Supported:* OC-12 Sets a new VT pointer. Valid values are 0 to 139 for VT2 and 0 to 103 for VT1.5.
TX:RTD:ACTION <state>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Starts and stops the round-trip delay function. Valid <state> values are: SINGle — Monitors for a single RTD event. If the event occurs, the duration is reported and the state returns to Inactive. STOP — Stops RTD monitoring. The state returns to Inactive. CONTinuos — Constantly monitors for RTD events and updates the Round Trip Delay Time durations.
TX:RTD:GOOD:TIME?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the current setting of the RTD's Consecutive Good Time Required function. This value indicates the duration of the number of valid frames that occur before the round-trip delay function is confirmed to be activated. Valid values for this command range from 0.125 msec to 2047.875 msec.

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Transmit Command	Description
TX:RTD:GOOD:TIME <value>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Sets the value for the RTD's Consecutive Good Time Required function. Valid values range from 0.125 msec to 2047.875 msec.
TX:RTD:GOOD:FRAME?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries and reports the current setting of the RTD's Consecutive Good Frames Required function. This value indicates the number of valid frames that occur before the round-trip delay function is confirmed to be activated. Valid values for this command range from 1 to 16383 frames.
TX:RTD:GOOD:FRAME <value>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Sets the value for the RTD's Consecutive Good Frames Required function. Value values range from 1 to 16383 frames.
TX:SIGLEVel?	*Protocols Supported:* E1, DS3, DS1 Queries the current protocol processor for the signal level it is transmitting.
TX:SIGLEVel <value>	*Protocols Supported:* E1, DS3, DS1 Sets the transmitter of the current protocol processor to one of the following signal levels: 0DB for 0 dBdsx E1, DS1 -7.5DB for -7.5 dBdsx E1, DS1 -15DB for -15 dBdsx E1, DS1 DSX3 for DSX-3 DS3 only DS3H for DS3 High DS3 only DS3L for DS3 Low DS3 only
TX:SLOT?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Returns the slot number for Transmit Overhead setting.
TX:SLOT <value>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Sets a slot number for the Transmit Overhead setting. For SDH, a slot is derived from the AU and TUG-3 number, and the STS number for SONET. Note: The slot specification for setting overhead can be different from the inserted Foreground STS or AU and TUG-3 combination.
TX:SPARE:BIT?	*Protocols Supported:* E1 Returns the spare bit number generated (first parameter in the **TX:SPARE** command).
TX:SPARE:VALUE?	*Protocols Supported:* E1 Returns the spare bit value generated (second parameter in the **TX:SPARE** command).
TX:SPARE:<SpareBit> <value>	*Protocols Supported:* E1 Sets the spare bits generated in the E1 FAS channel. If the <SpareBit> is 0, then the number in bits 5 to 8 of "value" is be applied to all spare bits. If the <SpareBit> is 4 to 8, then the number in "value" will be applied as an 8-bit stream to the SpareBit bit.
TX:SS?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Returns values as in TX:SS.

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Transmit Command	Description
TX:SS <ss>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 The SS bits are the two bits of the H1 byte between the NDF flag and STS pointer. Valid values for <ss> are 0 to 3.
TX:STS:INSert?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns the number of the current STS inserted, or "ALL" for broadcast mode. A.K.A. "SPE Under Test".
TX:STS:INSert <fg>	*Protocols Supported:* OC-12, OC-48, OC-192 Sets the Inserted STS to "ALL" (Broadcast mode) or numeric. Also known as "SPE Under Test".
TX:TCM:API?	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Queries and reports the current value of the TCM Trace. Valid values that can appear for this command are: ALLONES, ALLZEROS, or any user defines string with a 15-character maximum value.
TX:TCM:API <trace>	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Sets the transmitted TCM trace value. Valid <trace> values are: ALLONES Selects an All Ones pattern for the TCM Trace. ALLZEROS Selects an All Zeros pattern for the TCM Trace. User Defines Allows you to enter a user defined string from 1- to 15-characters in length.
TX:TCM:MODE?	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Queries and reports the current status of the unit's TCM mode function. Enable appears if TCM mode is on. Disable appears if TCM mode is off.
TX:TCM:MODE <state>	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Enables and disables TCM mode. Valid <state> values are: ENABLE Turns TCM mode on. DISABLE Turns TCM mode off.
TX:TU:INSert?	*Protocols Supported:* STM-4 Returns the number of the current TU inserted, or "ALL" for broadcast mode.
TX:TU:INSert <fg>	*Protocols Supported:* STM-4 Sets the Inserted TU and TUG-2 based on one of the following values: **fg value** **Description** ALL All TUs are inserted (broadcast) 1 to NN Numeric value of TU-11, TU-12, or TU-2 inserted NN has the following values, depending on the container type and AU: NN=1 if C4-16c, C4-4c, C-4, or AU-3 and C-3 NN=7 if C-2 NN=84 if C-12 NN=63 if C-11 NN=3 if AU-4 and C-3
TX:TUG3:INSert?	*Protocols Supported:* STM-4 Returns the number of the current TUG-3 inserted.
TX:TUG3:INSert <value>	*Protocols Supported:* STM-4 Sets the inserted TUG-3. Valid values are: 1, 2, or 3
TX:XBITs?	*Protocols Supported:* E1 Returns the first CAS byte in the transmitted 16-frame multiframe, with the non-X-bits in the byte set to 0. The byte is returned as an 8-bit binary number.

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Transmit Command	Description
TX:XBITs <value>	*Protocols Supported:* E1 Sets the X-bits in the first byte of the transmitted CAS multiframe. The non-X-bits are ignored.
TX:VT:INSert?	*Protocols Supported:* OC-12 Returns the number of the current VT channel inserted, or “ALL” for broadcast mode.
TX:VT:INSert <VT channel>	*Protocols Supported:* OC-12 Sets the inserted VT channel based on one of the following values: **VT channel value** — **Description** ALL — All VTs are inserted (broadcast) 1 to N — Numeric value of VT2 or VT1.5 inserted, where N is 21 if VT2 or N is 28 if VT1.5

RX (Sense) Branch

The RX branch is used to set and retrieve Receive settings. Alternatively, each command can be sent using the "SENS" or "SENSE" keyword instead of the “RX” keyword.

SENSe Command	Description
RX:ABCD:<channel>?	*Protocols Supported:* E1 Queries E1 for the value received in any of the 30 4-bit CAS ABCD bits. Channel must be a decimal integer from 1 to 30. ABCD bits are in lower 4 bits of byte value returned.
RX:ABCD:DS0?	*Protocols Supported:* DS1 Returns the ABCD Signaling bits in the dropped DS0.
RX:APS:ABORT	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Aborts the APS protection switch measurement criteria.
RX:APS:CRITeria?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the APS protection switch measurement criteria.
RX:APS:CRITeria <criteria>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Sets the APS protection switch measurement criteria. Valid criteria are: B1, SEF, AISL, AISP, or PRBS. AISL is Line AIS, and AISP is Path AIS.
RX:APS:FRAMES?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the APS protection switch measurement time in frames from the test last done. If none were done since booting, it returns 0. If measuring, returns 0.
RX:APS:START	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Starts the APS protection switch measurement criteria.
RX:APS:STATE?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the APS protection switch measurement state, either DONE or MEASURING.
RX:AU:DROP?	*Protocols Supported:* STM-4, STM-16 Queries the current AU dropped.
RX:AU:DROP <value>	*Protocols Supported:* STM-4, STM-16 Sets the current AU dropped. Value must be numeric.

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SENSe Command	Description
RX:AU:TYPe?	*Protocols Supported:* STM-4 Queries the current AU Type received.
RX:AU:TYPe <value>	*Protocols Supported:* STM-4 Sets the current AU type received. Valid values are: AU-3, AU-4, AU-4-4C
RX:CALibrate:SAVE	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Saves calibration values just set. Requires permission for performing calibration to be set at login.
RX:CALibrate:<channel>: SAVE	*Protocols Supported:* STM-4, OC-12 Saves calibration values just set for Channel 1 or Channel 2. Channel parameter is entered as CH1 or CH2. Requires permission for performing calibration to be set at login.
RX:CALibrate:<type>?	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Queries calibration values and returns an integer value. Type is one of the following power readings. **Type (dBm)** **Description** -20 -20 dBm Power Reading -10 -10 dBm Power Reading 0 0 dBm Power Reading
RX:CALibrate:<channel>: <type>?	*Protocols Supported:* STM-4, OC-12 Queries Channel 1 and Channel 2 calibration values, and returns an integer value. Channel parameter is entered as CH1 or CH2. Type is one of the following power readings. **Channel** **Type (dBm)** **Description** CH1 -10 -10 dBm Power Reading CH1 -5 -5 dBm Power Reading CH1 0 0 dBm Power Reading CH2 -30 -30 dBm Power Reading CH2 -10 -10 dBm Power Reading CH2 0 0 dBm Power Reading
RX:CALibrate:<type> <value>	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Sets calibration values. Type is one of the power readings listed below. Value is an integer value ranging from 0 to 32767. **Type (dBm)** **Description** -20 -20 dBm Power Reading -10 -10 dBm Power Reading 0 0 dBm Power Reading
RX:CALibrate:<channel>: <type> <value>	*Protocols Supported:* STM-4, OC-12 Sets Channel 1 and Channel 2 calibration values. Channel parameter is entered as CH1 or CH2. Type is one of the power readings listed below. Value is an integer value ranging from 0 to 32767. **Channel** **Type (dBm)** **Description** CH1 -10 -10 dBm Power Reading CH1 -5 -5 dBm Power Reading CH1 0 0 dBm Power Reading CH2 -30 -30 dBm Power Reading CH2 -10 -10 dBm Power Reading CH2 0 0 dBm Power Reading

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SENSe Command	Description
RX:CALibrate:POSZ?	*Protocols Supported:* E1, DS1, E3, DS3 Queries the protocol processor for the Positive Signal Calibration's Zero Power Reading.
RX:CALibrate: POSZ <value>	*Protocols Supported:* E1, DS1, E3, DS3 Sets the Zero Power Reading value for the protocol processor's Positive Signal Calibration.
RX:CALibrate:POS5?	*Protocols Supported:* E1, DS1 Queries the protocol processor for the Positive Signal Calibration's 0.5 Volts Reading.
RX:CALibrate: POS5 <value>	*Protocols Supported:* E1, DS1 Sets the 0.5 Volts Reading value for the protocol processor's Positive Signal Calibration.
RX:CALibrate:POS2? (2.0 volts reading for E1 and DS1)	*Protocols Supported:* E1, DS1 Queries the protocol processor for the Positive Signal Calibration's 2.0 Volts Reading.
RX:CALibrate: POS2 <value> (2.0 volts reading for E1 and DS1)	*Protocols Supported:* E1, DS1 Sets the 2.0 Volts Reading value for the protocol processor's Positive Signal Calibration.
RX:CALibrate:POS2? (0.2 volts reading for E3 and DS3)	*Protocols Supported:* E3, DS3 Queries the protocol processor for the Positive Signal Calibration's 0.2 Volts Reading.
RX:CALibrate: POS2 <value> (0.2 volts reading for E3 and DS3)	*Protocols Supported:* E3, DS3 Sets the 0.2 Volts Reading value for the protocol processor's Positive Signal Calibration.
RX:CALibrate:POS8?	*Protocols Supported:* E3, DS3 Queries the protocol processor for the Positive Signal Calibration's 0.8 Volts Reading.
RX:CALibrate: POS8 <value>	*Protocols Supported:* E3, DS3 Sets the 0.8 Volts Reading value for the protocol processor's Positive Signal Calibration.
RX:CALibrate:POSBZ?	*Protocols Supported:* E1@2, DS1@2 Queries the protocol processor for the Positive Monitor (Bridged) Signal Calibration's Zero Power Reading.
RX:CALibrate: POSBZ <value>	*Protocols Supported:* E1@2, DS1@2 Sets the Zero Power Reading value for the protocol processor's Positive Monitor (Bridged) Signal Calibration.
RX:CALibrate:POSB5?	*Protocols Supported:* E1@2, DS1@2 Queries the protocol processor for the Positive Monitor (Bridged) Signal Calibration's 0.5 Volts Reading.
RX:CALibrate: POSB5 <value>	*Protocols Supported:* E1@2, DS1@2 Sets the 0.5 Volts Reading value for the protocol processor's Positive Monitor (Bridged) Signal Calibration.

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SENSe Command	Description
RX:CALibrate:POSB2?	*Protocols Supported:* E1@2, DS1@2 Queries the protocol processor for the Positive Monitor (Bridged) Signal Calibration's 2.0 Volts Reading.
RX:CALibrate: POSB2 <value>	*Protocols Supported:* E1@2, DS1@2 Sets the 2.0 Volts Reading value for the protocol processor's Positive Monitor (Bridged) Signal Calibration.
RX:CALibrate:NEGZ?	*Protocols Supported:* E1, DS1, E3, DS3 Queries the protocol processor for the Negative Signal Calibration's Zero Power Reading.
RX:CALibrate: NEGZ <value>	*Protocols Supported:* E1, DS1, E3, DS3 Sets the Zero Power Reading value for the protocol processor's Negative Signal Calibration.
RX:CALibrate:NEG5?	*Protocols Supported:* E1, DS1 Queries the protocol processor for the Negative Signal Calibration's 0.5 Volt Reading.
RX:CALibrate: NEG5 <value>	*Protocols Supported:* E1, DS1 Sets the 0.5 Volts Reading value for the protocol processor's Negative Signal Calibration.
RX:CALibrate:NEG2?	*Protocols Supported:* E1, DS1 Queries the protocol processor for the Negative Signal Calibration's 2.0 Volt Reading.
RX:CALibrate: NEG2 <value>	*Protocols Supported:* E1, DS1 Sets the 2.0 Volts Reading value for the protocol processor's Negative Signal Calibration.
RX:CALibrate:NEGBZ?	*Protocols Supported:* E1@2, DS1@2 Queries the protocol processor for the Negative Monitor (Bridged) Signal Calibration's Zero Power Reading.
RX:CALibrate: NEGBZ <value>	*Protocols Supported:* E1@2, DS1@2 Sets the Zero Power Reading value for the protocol processor's Negative Monitor (Bridged) Signal Calibration.
RX:CALibrate:NEGB5?	*Protocols Supported:* E1@2, DS1@2 Queries the protocol processor for the Positive Monitor (Bridged) Signal Calibration's 0.5 Volts Reading.
RX:CALibrate: NEGB5 <value>	*Protocols Supported:* E1@2, DS1@2 Sets the 0.5 Volts Power Reading value for the protocol processor's Negative Monitor (Bridged) Signal Calibration.
RX:CALibrate:NEGB2?	*Protocols Supported:* E1@2, DS1@2 Queries the protocol processor for the Negative Monitor (Bridged) Signal Calibration's 2.0 Volts Reading.
RX:CALibrate: NEGB2 <value>	*Protocols Supported:* E1@2, DS1@2 Sets the 2.0 Volts Reading value for the protocol processor's Negative Monitor (Bridged) Signal Calibration.
RX:CALibrate:POSZ?	*Protocols Supported:* E3, DS3 Queries the protocol processor for the Positive Signal Calibration's Zero Power Reading.
RX:CALibrate: POSZ <value>	*Protocols Supported:* E3, DS3 Sets the Zero Power Reading value for the protocol processor's Positive Signal Calibration.

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SENSe Command	Description
RX:CODEC?	*Protocols Supported:* E1, DS1 Returns CODEC encoding type.
RX:CODEC <setting>	*Protocols Supported:* E1, DS1 Sets CODEC encoding. Valid encoding settings are: ALAW or MULAW.
RX:COUPled?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Queries the current protocol processor to see if Receive and Transmit are coupled or set independently. Returns string YES or NO.
RX:COUPled <mode>	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Sets the current protocol processor to either couple Receive and Transmit setting or make Receive and Transmit setting operate independently. Valid modes are: YES or NO.
RX:DCC?	*Protocols Supported:* STM-4, OC-12 Returns values as in RX:DCC.
RX:DCC < channel >	*Protocols Supported:* STM-4, OC-12 Specifies the expected bit stream to be received from one of the datacomm channels. Valid values are: NONE — No bit streams processed from D1-D12 RSPRBS — Drop PRBS 2^7-1 to RS DCC channel (D1-D3) RSPRBSINV — Drop PRBS 2^7-1 Inverted from RS DCC channel (D1-D3) MSPRBS — Drop PRBS 2^7-1 from MS DCC channel (D4-D12) MSPRBSINV — Drop PRBS 2^7-1 Inverted from MS DCC channel (D4-D12) RSDCC — Drop bit stream to DCC Port from RS DCC channel (D1-D3) MSDCC — Drop bit stream to DCC Port from MS DCC channel (D4-D12) SECTionPRBS — Insert PRBS 2^7-1 into Section DCC channel (D1-D3) SECTionPRBSINV — Insert PRBS 2^7-1 Inverted into Section DCC channel (D1-D3) LINEPRBS — Insert PRBS 2^7-1 into Line DCC channel (D4-D12) LINEPRBSINV — Insert PRBS 2^7-1 Inverted into Line DCC channel (D4-D12) SECTionDCC — Insert bit stream from DCC Port into Section DCC channel (D1-D3) LINEDCC — Insert bit stream from DCC Port into Line DCC channel (D4-D12)
RX:DS0:DROP?	*Protocols Supported:* E1, DS1 Returns DS0 channel dropped to speaker and analysis.
RX:DS0:DROP < 1 to NN >	*Protocols Supported:* E1, DS1 Sets DS0 channel dropped to speaker and analysis. Valid values for NN are: 1 to 31 for E1 (0 is FAS), 1 to 24 for DS1.

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SENSe Command	Description
RX:DS0:VALUE?	*Protocols Supported:* DS1 Returns DS0 value dropped (most recent 8-bit value).
RX:E13:DROP:@N?	*Protocols Supported:* E3, DS3 Queries the current dropped channel on the E13 or DS3 Mux for instance N. Values returned are 1-16 (for E3) or 1- 21 (for DS3).
RX:E13:DROP:@N <value>	*Protocols Supported:* E3, DS3 Sets the E1 drop channel for instance N to one of the 16 E13 or 21 DS3 channels available. Values are 1 to 16 (for E3) or 1- 21 (for DS3).
RX:E34:DROP?	*Protocols Supported:* E4 Queries the current inserted E3 channel on the E34 Mux. Values returned are 0-4, where 0 means "All Background" (Broadcast).
RX:E34:DROP <value>	*Protocols Supported:* E4 Sets the E3 insert channel to one of the four E34 channels available. Values are 0 to 4. The value 0 is used to mean "All Background" (Broadcast).
RX:EBITs?	*Protocols Supported:* E1 Returns the received E-bits as a 2-bit binary number.
RX:FRAC_E1:MASK < mask >	*Protocols Supported:* E1 Sets the 32-bit Receive fractional E1 mask.
RX:FRAC_E1:MASK?	*Protocols Supported:* E1 Queries the Receive fractional E1 mask, returned as a 32-bit integer.
RX:FRAC_T1:MASK < mask >	*Protocols Supported:* DS1 Sets the 32-bit Received fractional T1 mask.
RX:FRAC_T1:MASK?	*Protocols Supported:* DS1 Queries the Receive fractional T1 mask, returned as a 32-bit integer.
RX:FRAMing?	*Protocols Supported:* E1, E3, E4, DS1, DS3 Queries the current protocol processor for the framing it is trying to receive.
RX:FRAMing < frame >	*Protocols Supported:* E1, E3, E4, DS1, DS3 Sets the receiver of the current protocol processor to one of the following framing types: **Framing** / **Protocol(s)** / **Description** UNframed / E1, E3, E4, DS3, DS1 / Unframed FRamed / E3, E4 / Framed M13 / DS3 / M13 Framing for DS3 C-BIT / DS3 / C-Bit Framing for DS3 ESF / DS1 / ESF Framing for DS1 SF/D4 / DS1 / SF/D4 Framing for DS1 SLC96 / DS1 / SLC-96 Framing for DS1 PCM30 / E1 / Framed E1, with CAS but no CRC PCM31 / E1 / Framed E1, without CAS or CRC PCM30CRC / E1 / Framed E1, with CAS and CRC PCM31CRC / E1 / Framed E1, without CAS but with CRC
RX:FREQuency?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Queries the line frequency, in Mhz, as a decimal number.

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SENSe Command	Description
RX:FREQOFFset:Hz?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Queries and reports the line frequency offset in Hz.
RX:FREQOFFset:Ppm?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Queries and reports the line frequency offset in ppm.
RX:INPUT?	*Protocols Supported:* E1, DS3, DS1 Returns the Input termination (protected monitor) type.
RX:INPUT <input termination value>	*Protocols Supported:* E1, DS3, DS1 Sets the Input Termination (protected monitor) type to one of these: **Type** — **Valid Protocols** TERMinated — E1#1, DS3, DS1 BRIDGED — E1#2, DS1 MONitor — E1#1, E1#2, DS3, DS1 TERM 100 — E1#2 TERM120 — E1#2
RX:INTerface?	*Protocols Supported:* STM-4, OC-12, Jitter Queries the type of receive interface.
RX:INTerface <interface value>	*Protocols Supported:* STM-4, OC-12, Jitter Sets the receive interface speed and type (optical or electrical). Valid <interface values> are: **Interface** — **Protocol(s)** — **Description** STM0E — STM-4 — 52 Mbps electrical interface STM1E — STM-4 — 155 Mbps electrical interface STM0 — STM-4, Jitter — 52 Mbps optical interface STM1 — STM-4, Jitter — 155 Mbps optical interface STM4 — STM-4, Jitter — 622 Mbps optical interface STSX1 — OC-12 — 52 Mbps electrical interface OC1 — OC-12, Jitter — 52 Mbps optical interface OC3 — OC-12, Jitter — 155 Mbps optical interface OC12 — OC-12, Jitter — 622 Mbps optical interface
RX:LABel:HP?	*Protocols Supported:* STM-4, STM-16, STM-64 Returns the expected HP Signal Label, as an 8-bit binary string.
RX:LABel:HP<value>	*Protocols Supported:* STM-4, STM-16, STM-64 Sets the expected 8-bit HP Signal Label to any value from 0 to 255.
RX:LABel:LP?	*Protocols Supported:* STM-4 Returns the expected LP Signal Label, as a 3- or 8-bit binary string (depending on the VC type).
RX:LABel:LP<value>	*Protocols Supported:* STM-4 Sets the expected 3- or 8-bit LP Signal Label to any value from 0 to 7 or 255 (depending on the VC type).
RX:LABel:PATH?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns the expected Path Signal Label, as an 8 bit binary string.
RX:LABel:PATH<value>	*Protocols Supported:* OC-12, OC-48, OC-192 Sets the expected 8 bit Path Signal Label to any value from 0 to 255.
RX:LABEL:VT?	*Protocols Supported:* OC-12 Returns the expected VT Signal Label, as a 3-bit binary string.

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SENSe Command	Description
RX:LABEL:VT<value>	*Protocols Supported:* OC-12 Sets the expected 3-bit VT Signal Label to any value from 0 to 7.
RX:LCODE?	*Protocols Supported:* E1, DS1 Queries the line code being received. Returns AMI, HDB3, or B8ZS.
RX:M13:DROP:@N?	*Protocols Supported:* DS3 Returns the number of DS1 or E1 dropped for instance N.
RX:M13:DROP:@N [1 to NN]	*Protocols Supported:* DS3 Sets the DS1 or E1 drop channel for instance N to one of the NN mux channels. NN is 28 for DS3/DS1, 21 for DS3/E1, and 16 for E3.
RX:MAPping?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, E1, E3, E4 Queries the protocol processor for the mapping it is receiving.
RX:MAPping < mapping >	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, E1, E3, E4 Sets the tributary mapping. See *TX:MAPping* for a list of mappings.
RX:OH:<OH BYTE>?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the received overhead byte. Byte is returned as a hexadecimal number (#Hxx), except for the J0 which is returned as a 15-byte string without the CRC byte, and, J1 or J2 traces, which are returned as a 62-byte string, without the Carriage Return and Line Feed at the end. Valid two-character strings for OH BYTE specification are: **SOH (SDH) / TOH (SONET):** A1, A2, J0, Z0 B1, E1, F1 D1, D2, D3 H1, H2, H3 B2, K1, K2 D4, D5, D6 D7, D8, D9 D10, D11, D12 S1, Z2, E2 **9 Byte HP (SDH) / Path (SONET):** J1, B3, C2, G1, F2, H4, F3, K3, N1 **9 Byte TU-3 LP (SDH)** LPJ1, LPB3, LPC2, LPG1, LPF2, LPH4, LPF3, LPK3, LPN1 **4 Byte LP (SDH STM-4 only):** V5, J2, N2, K4
RX:OPP?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries the optical power in dBm for optical signals. Refer to *RX:ROPP?* for raw unit values.
RX:ORDER?	*Protocols Supported:* STM-4, OC-12 Returns the orderwire dropped configuration.

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SENSe Command	Description
RX:ORDER <value>	*Protocols Supported:* STM-4, OC-12 Sets the orderwire drop. Parameter values are as follows: E1 Drop bit stream to orderwire from E1 E2 Drop bit stream to orderwire from E2 NONE No bit stream sent to orderwire output.
RX:PATTern?	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Queries the current protocol processor for the expected receive pattern. Returns a binary pattern for user-defined bit string or a predefined pattern. See *RX:PATTern* and *TX:PATTern* for Predefined Patterns.
RX:PATTern <pattern>	*Protocols Supported:* E1, E3, E4, STM-4, STM-16, STM-64, OC-12, OC-48, OC-192, DS3, DS1 Sets the expected receive pattern. Pattern parameter can be a numeric value for a user-defined bit pattern, or a predefined pattern. Predefined Patterns are defined in *TX:PATTern*. "LIVE" is also allowed for *RX:PATTern*.
RX:PLM?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries whether PLM Alarm reporting is enabled.
RX:PLM <mode>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Enables (yes) or disables (no) PLM Alarm Reporting. Valid modes are: YES or NO.
RX:PNPV?	*Protocols Supported:* E1, E3, E4, STM-4, OC-12, DS3, DS1 Queries the Peak negative pulse voltage in volts.
RX:PNPVR?	*Protocols Supported:* E1, E3, DS3, DS1 Queries the Peak negative pulse voltage in raw units.
RX:PPPV?	*Protocols Supported:* E1, E3, E4, STM-4, OC-12, DS3, DS1 Queries the Peak positive pulse voltage in volts.
RX:PPPVR?	*Protocols Supported:* E1, E3, DS3, DS1 Queries the Peak positive pulse voltage in raw units.
RX:PTR:AU?	*Protocols Supported:* STM-4, STM-16, STM-64 Returns the AU pointer value received as a decimal number.
RX:PTR:STS?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns the STS pointer value received as a decimal number.
RX:PTR:TU?	*Protocols Supported:* STM-4 Returns the TU pointer value received as a decimal number.
RX:PTR:VT?	*Protocols Supported:* OC-12 Returns the VT Pointer value received as a decimal number.
RX:SIGnaling?	*Protocols Supported:* DS1 Returns the Circuit Signaling value.

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SENSe Command	Description
RX:SIGnaling <type>	*Protocols Supported:* DS1 Sets the Circuit Signaling to one of the following: **Type** — **Description** UNK — Unknown LS — Loop-Start GS — Ground-Start LRB — Loop-Rev-Battery NET — Network-Prov-Rev-Battery EM — E&M CI — CI-Prov-Loop-Start
RX:SITE?	*Protocols Supported:* DS1 Returns the Test Site value.
RX:SITE <type>	*Protocols Supported:* DS1 Sets the Test Site to one of the following: **Type** — **Description** UNK — Unknown CN — Customer <- Network NC — Network <- Customer
RX:SLOT?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Returns the slot number for Receive Overhead SCPI query (*RX:OH:xx?*).
RX:SLOT <value>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Sets a slot number for Receive Overhead SCPI query (*RX:OH:xx?*). A slot is derived from the AU and TUG-3 number for SDH, and the STS number for SONET. Note: The slot specification for setting overhead can be different from the Foreground AU and TUG-3 dropped (SDH) or STS number (SONET).
RX:SPARE?	*Protocols Supported:* E1 Returns spare bit values received as eight-decimal integers. Bits 1 to 3 of each integer are set to zero, and the spare bits are in 4 to 8. The 8 integers are comma-delimited. Example: 0, 8, 248, 16, 24, 0, 0, 8.
RX:STS:DROP?	*Protocols Supported:* OC-12, OC-48, OC-192 Returns the number of the current STS dropped as a decimal number. For OC-48 this is an STS-12, and for OC-192 this is an STS-48.
RX:STS:DROP <value>	*Protocols Supported:* OC-12, OC-48, OC-192 Sets the current SPE or STS dropped (under test).
RX:TCM:API?	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Queries and reports the expected TCM Trace value.
RX:TCM:API <expected>	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Sets the expected value for the receive TCM Trace. Valid <expected> values are: ALLONES — Selects an All Ones pattern for the TCM Trace. ALLZEROS — Selects an All Zeros pattern for the TCM Trace. User Defines — Allows you to enter a user defined string from 1- to 15-characters in length.

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SENSe Command	Description
RX:TCM:MODE?	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Queries and reports the current status of the unit's receive TCM mode function. Enable appears if TCM mode is on. Disable appears if TCM mode is off.
RX:TCM:MODE <state>	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Enables and disables receive TCM mode. Valid <state> values are: ENABLE Turns TCM mode on. DISABLE Turns TCM mode off.
RX:TCM:TIM:MODE?	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Queries and reports the current status of the unit's TCM-TIM mode setting. Values that appear are Enable or Disable.
RX:TCM:TIM:MODE <state>	*Protocols Supported:* STM-16, STM-64, OC-48, OC-192 Enables TCM TIM alarm reporting. This type of alarm occurs if the incoming TCM trace does not match the expected TCM trace. Valid <state> values are: ENABLE Turns TCM TIM alarm mode on. DISABLE Turns TCM TIM alarm mode off.
RX:TIM?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries whether TIM Alarm reporting is enabled.
RX:TIM <mode>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Enables or disables TIM Alarm Reporting. Valid modes are: YES or NO.
RX:TRACE:<type>?	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Queries what the expected J0, J1, or J2 trace is (set type to one of those 3).
RX:TRACE:<type> <value>	*Protocols Supported:* STM-4, STM-16, STM-64, OC-12, OC-48, OC-192 Sets the expect trace, where type is J0, J1 or J2. (See *TX:OH* for format of traces.)
RX:TU:DROP?	*Protocols Supported:* STM-4 Returns the number of the current TU, dropped as a decimal number.
RX:TU:DROP <value>	*Protocols Supported:* STM-4 Sets the dropped TU and TUG-2 based on one of the following values: 1 to NN Numeric value of TU-11, TU-12, or TU-2 dropped NN has the following values, depending on the container type and AU: NN=1 if C4-16c, C4-4c, C-4, or AU-3 and C-3 NN=7 if C-2 NN=21 if C-12 NN=28 if C-11 NN=3 if AU-4 and C-3
RX:TUG3:DROP?	*Protocols Supported:* STM-4 Returns the number of the current TUG-3s dropped.
RX:TUG3:DROP <value>	*Protocols Supported:* STM-4 Sets the dropped TUG-3. Valid values are 1, 2, or 3.

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SENSe Command	Description
RX:XBITs?	*Protocols Supported:* E1 Returns the first CAS byte in the receive 16-frame multiframe, with the non-X-bits in the byte set to 0. The byte is returned as a decimal number.
RX:VT:DROP?	*Protocols Supported:* OC-12 Returns the number of the current VT channel dropped as a decimal number.
RX:VT:DROP <value>	*Protocols Supported:* OC-12 Sets the dropped VT channel.

GET Branch

The Get Branch SCPI commands act as batch commands by retrieving values for multiple unit parameters using a single SCPI command. This is similar to using the Transmit and Receive Function Group buttons to view various settings of the different protocol processors.

Many of the GET commands substitute a variable to report information about a specific test set. In this section, these commands are grouped together. Use the following table to locate a specific command.

Refer to this command...	For information about the following commands.
GET:PROTOcols?	*Protocols Supported:* SYSTEM Queries the types of protocol processors contained in the system. For example: STM4, E1@1, E1@2, etc. For Gigabit Ethernet, this command queries and reports the protocol processor ID, chassis ID, slot ID, and card ID for the Gigabit Ethernet protocol processor. This command is useful when multiple circuit packs are installed in the unit. For example, if a NIC Plus has two Gigabit Ethernet circuit packs installed, both circuit packs may appear as being installed in a single slot. To avoid this confusion, the GET:PROTO? command returns identity parameters for all circuit packs detected in the unit. Results for this command are returned in the following format: For circuit pack 1: 0 1 1 GIGE@1 0 1 1 GIGE@2 which means: Chassis ID 0, Slot 1, Card 1, GIGE Port 1; Chassis ID 0, Slot 1, Card 1, GIGE Port 2 For circuit pack 2: 0 1 2 GIGE@1 0 1 2 GIGE@2 which means: Chassis ID 0, Slot 1, Card 2, GIGE Port 1; Chassis ID 0, Slot 1, Card 2, GIGE Port 2

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Refer to this command...	For information about the following commands.
GET:VERsion?	*Protocols Supported:* SYSTEM Queries the versions of software running in the system. Each is specified as the protocol name (similar to the GET:PROTOcols command) followed by "=" and the version in NN.NN.NN format. For example: SC=1.0.1, SCPI=2.0.1 System Controller software is indicated by SC, SCPI by SCPI, TL1 by TL1, GUI by GUI.
GET:PARTnumbers?	*Protocols Supported:* SYSTEM Queries the part numbers for hardware and software in the system. Parts are returned in a comma-delimited string.

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4 ATM SCPI Commands

Overview

This chapter lists the ATM SCPI commands supported by the configured unit. You may not have access to all commands based on the product configuration you purchased.

Supported ATM SCPI Commands

These commands are extensions to the SCPI command set. These commands are adapted to the configured unit and are unique to each protocol processor. SCPI commands should be typed on one single line completed with a hard carriage return. These commands require zero or one parameters, and return zero or one values.

RES (Fetch) Branch

The RES branch is used to retrieve ATM results. Alternatively, each command can be sent using the "FETC" or "FETCH" keyword instead of the “RES” keyword.

The following is a list of supported RESULT commands.

RES Command	Description
RES:AAL0:TXCELLs?	Queries the AAL 0 transmitted cells count.
RES:AAL0:RXCELLs?	Queries the AAL 0 received cells count.
RES:AAL0:BANDwidth?	Queries the bandwidth used by AAL 0 connections
RES:AAL0:BIT:COUNT?	Queries the count of AAL 0 bit errors.
RES:AAL0:BIT:AVGRATE?	Queries the average rate of AAL 0 bit errors.
RES:AAL0:BIT:CURRATE?	Queries the current rate of AAL 0 bit errors.
RES:AAL0:PATSynch?	Queries the duration of loss of pattern synchronous alarm (LOPS) on AAL 0 connections.
RES:AAL1:TXCELLs?	Queries the AAL1 transmitted cells count.
RES:AAL1:RXCELLs?	Queries the AAL1 received cells count.
RES:AAL1:BANDwidth?	Queries the bandwidth used by AAL 1 connections.
RES:AAL1:BIT:COUNT?	Queries the count of AAL 1 bit errors.
RES:AAL1:BIT:AVGRATE?	Queries the average rate of AAL 1 bit errors.
RES:AAL1:BIT:CURRATE?	Queries the current rate of AAL 1 bit errors.
RES:AAL1:ERRsecs?	Queries the AAL1 errored seconds count.
RES:AAL1:PATSynch?	Queries the duration of loss of pattern synchronous alarm (LOPS) on AAL 1 connections.
RES:AAL1:SNPERRor:COUNT?	Queries the SNP error count for AAL 1 connections.

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RES Command	Description
RES:AAL1:SNPERRor: AVGRATE?	Queries the average rate of SNP error for AAL 1 connections.
RES:AAL1:SNPERRor: CURRATE?	Queries the current rate of SNP error for AAL 1 connections.
RES:AAL1:LOSTcells:COUNT?	Queries the lost cells count for AAL 1 connections
RES:AAL1:LOSTcells: AVGRATE?	Queries the average rate of lost cells for AAL 1 connections.
RES:AAL1:LOSTcells: CURRATE?	Queries the current rate of missequenced cells for AAL 1 connections.
RES:AAL1:MISSEQcells: COUNT?	Queries the missequenced cells count for AAL 1 connections.
RES:AAL1:MISSEQcells: AVGRATE?	Queries the average rate of missequenced cells for AAL 1 connections.
RES:AAL1:MISSEQcells: CURRATE?	Queries the current rate of missequenced cells for AAL 1 connections.
RES:AAL5:RXPDUs?	Queries the AAL5 PDUs received count.
RES:AAL5:TXPDUs?	Queries the AAL 5 PDUs transmitted count.
RES:AAL5:RXCELLs?	Queries the AAL 5 received cells count.
RES:AAL5:BANDwidth?	Queries the bandwidth used by AAL 5 connections.
RES:AAL5:BIT:COUNT?	Queries the count of AAL 5 bit errors.
RES:AAL5:BIT:AVGRATE?	Queries the average rate of AAL 5 bit errors.
RES:AAL5:BIT:CURRATE?	Queries the current rate of AAL 5 bit errors.
RES:AAL5:ERRsecs?	Queries the AAL5 errored seconds count.
RES:AAL5:PATSynch?	Queries the duration of loss of pattern synchronous alarm (LOPS) on AAL 5 connections.
RES:AAL5:CRCerror:COUNT?	Queries the count of AAL 5 CRC errors.
RES:AAL5:CRCerror: AVGRATE?	Queries the average rate of AAL 5 CRC errors.
RES:AAL5:CRCerror: CURRATE?	Queries the current rate of AAL 5 bit errors.
RES:AAL5:LENerror:COUNT?	Queries the count of AAL 5 length errors.
RES:AAL5:LENerror: AVGRATE?	Queries the average rate of AAL 5 length errors.
RES:AAL5:LENerror: CURRATE?	Queries the current rate of AAL 5 length errors.
RES:AAL5PADerror:COUNT?	Queries the count of AAL 5 padding errors.
RES:AAL5:PADerror: AVGRATE?	Queries the average rate of AAL 5 padding errors.
RES:AAL5:PADerror: CURRATE?	Queries the current rate of AAL 5 padding errors.
RES:HECCorr:COUNT?	Queries the count of HEC correctable errors.
RES:HECCorr:AVGRATE?	Queries the average rate of HEC correctable errors.
RES:HECCorr:CURRATE?	Queries the current rate of HEC correctable errors.

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RES Command	Description
RES:HECUncorr:COUNT?	Queries the count of HEC uncorrectable errors.
RES:HECUncorr:AVGRATE?	Queries the average rate of HEC uncorrectable errors.
RES:HECUncorr:CURRATE?	Queries the current rate of HEC uncorrectable errors.
RES:CELLsync:Secs?	Queries the duration of Loss of Cell synchronization alarm.
RES:IDLE:COUNT?	Queries the count of idle cells received.
RES:IDLE:BANDwidth?	Queries the bandwidth of idle cells received.
RES:DISCARD:COUNT?	Queries the count of discarded cells.
RES:DISCARD:BANDwidth?	Queries the bandwidth of discarded cells.
RES:OAM:VALID:COUNT?	Queries the count of valid OAM cells received.
RES:OAM:VALID:BANDwidth?	Queries the bandwidth of valid OAM cells received.
RES:OAM:ERR:COUNT?	Queries the count of errored OAM cells received.
RES:OAM:ERR:BANDwidth?	Queries the bandwidth of errored OAM cells received.
RES:TOTAL:COUNT?	Queries the total user cells received count.
RES:TOTAL:BANDwidth?	Queries the total bandwidth of user cells received.
RES:AIS:F5:Secs?	Queries the duration of a detected F5-AIS alarm.
RES:RDI:F5:Secs?	Queries the duration of a detected F5-RDI alarm
RES:OAM:F5:CCcells?	Queries the F5 OAM continuity check cells received.
RES:OAM:F5:LPBKcells?	Queries the F5 OAM loopback cells received.
RES:AIS:F4:Secs?	Queries the duration of a detected F4-AIS alarm.
RES:RDI:F4:Secs?	Queries the duration of a detected F4-RDI alarm.
RES:OAM:F4:CCcells?	Queries the F4 OAM continuity check cells received.
RES:OAM:F4:LPBKcells?	Queries the F4 OAM loopback cells received.
RES:SCNRsecs?	Queries the duration of an SCNR (Selected Cells Not Received) condition.
RES:FEBEerr:COUNT?	Queries the count of PLCP FEBE errors.
RES:FEBEerr:AVGRATE?	Queries the average rate of PLCP FEBE errors.
RES FEBEerr:CURRATE?	Queries the current rate of PLCP FEBE errors.
RES:B1BITerr:COUNT?	Queries the count of PLCP B1 BIT errors.
RES:B1BITerr:AVGRATE?	Queries the average rate of PLCP B1 BIT errors.
RES:B1BITerr:CURRATE?	Queries the current rate of PLCP B1 BIT errors.
RES:B1BLOCKerr:COUNT?	Queries the count of PLCP B1 Block errors.
RES:B1BLOCKerr:AVGRATE?	Queries the average rate of PLCP B1 Block errors.
RES:B1BLOCKerr:CURRATE?	Queries the current rate of PLCP B1 Block errors.
RES:FRAMINGerr:COUNT?	Queries the count of PLCP Framing errors.
RES:FRAMINGerr:AVGRATE?	Queries the average rate of PLCP Framing errors.
RES:FRAMINGerr:CURRATE?	Queries the current rate of PLCP Framing errors.
RES:POIerr:COUNT?	Queries the count of PLCP POI errors.
RES:POIerr:AVGRATE?	Queries the average rate of PLCP POI errors.
RES:POIerr:CURRATE?	Queries the current rate of PLCP POI errors.
RES:PLCPYEL:SECS?	Queries the duration of PLCP Yellow alarms detected.
RES:PLCPOOF:SECS?	Queries the duration of PLCP OOF alarms detected.
RES:PLCPLOF:SECS?	Queries the duration of PLCP LOF alarms detected.

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RES Command	Description
RES:SVC:CALLSTAT:TOTAL?	Queries the total number of Switch Virtual Circuits (SVC) set up by the user.
RES:SVC:CALLSTAT:ACTIVE?	Queries the number of active SVCs.
RES:SVC:CALLSTAT:TX:ATTEMPT?	Queries the number of TX calls attempted.
RES:SVC:CALLSTAT:TX:CONNECT?	Queries the number of TX calls connected.
RES:SVC:CALLSTAT:TX:REJECT?	Queries the number of TX calls rejected.
RES:SVC:CALLSTAT:TX:CLRD?	Queries the number TX calls cleared.
RES:SVC:CALLSTAT:TX:CAUSE?	Queries the last transmitted Cause value.
RES:SVC:CALLSTAT:TX:DGN?	Queries the last transmitted diagnostic value.
RES:SVC:CALLSTAT:RX:RCVD?	Queries the number of RX calls received.
RES:SVC:CALLSTAT:RX:ACCPT?	Queries the number of RX calls accepted.
RES:SVC:CALLSTAT:RX:REJECT?	Queries the number of RX calls rejected.
RES:SVC:CALLSTAT:RX:CLRD?	Queries the number of RX calls cleared.
RES:SVC:CALLSTAT:RX:CAUSE?	Queries the last received Cause value.
RES:SVC:CALLSTAT:RX:DGN?	Queries the last received diagnostic value.
RES:SVC:CALLSTAT:AVGSETUP?	Queries the average setup time for the SVCs.
RES:SVC:CALLSTAT:MINSETUP?	Queries the minimum setup time for the SVCs.
RES:SVC:CALLSTAT:MAXSETUP?	Queries the maximum setup time for the SVCs.
RES:SVC:CALLSTAT:AVGREL?	Queries the average release time for the SVCs.
RES:SVC:CALLSTAT:MINREL?	Queries the minimum release time for the SVCs.
RES:SVC:CALLSTAT:MAXREL?	Queries the maximum release time for the SVCs.
RES:SVC:ERRSTAT:PROTDECR?	Queries the count of Q.93B signaling message protocol discriminator errors.
RES:SVC:ERRSTAT:CREFFMT?	Queries the count of Q.93B signaling message call reference format errors.
RES:SVC:ERRSTAT:CREFVAL?	Queries the count of Q.93B signaling message invalid call reference value errors.
RES:SVC:ERRSTAT:MSGTYPE?	Queries the count of Q.93B signaling message invalid message type errors.

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RES Command	Description
RES:SVC:ERRSTAT:MSGLEN?	Queries the count of Q.93B signaling message invalid message length errors.
RES:SVC:ERRSTAT:IEMISS?	Queries the count of Q.93B signaling message mandatory IE missing errors.
RES:SVC:ERRSTAT: IECONTENT?	Queries the count of Q.93B signaling message invalid IE content errors.
RES:SVC:ERRSTAT: IEUNRECOG?	Queries the count of Q.93B signaling message unrecognized IE errors.
RES:SVC:ERRSTAT:PDULEN?	Queries the count of Q.SAAL PDU length errors.
RES:SVC:ERRSTAT:PDUTYPE?	Queries the count of Q.SAAL PDU type errors.
RES:SVC:ERRSTAT: PDUALIGN?	Queries the count of Q.SAAL PDU alignment errors.
RES:VCC:QOS:CER?	Queries the cell error ratio for the current VCC entry.
RES:VCC:QOS:CLR?	Queries the cell loss ratio for the current VCC entry.
RES:VCC:QOS:CMR?	Queries the cell misinsertion rate for the current VCC entry.
RES:VCC:QOS:SECBR?	Queries the severely errored cell block ratio for the current entry.
RES:VCC:QOS:NONCOMP1?	Queries the count of cells non-compliant to GCRA-1 for the current entry.
RES:VCC:QOS:NONCOMP2?	Queries the count of cells non-compliant to GCRA-2 for the current entry.
RES:VCC:QOS:STATus?	Queries the quality of service (QOS) status for the current entry. Status = 1 if cells with CLP = 1 are received on the VCC.
RES:VCC:QOS:STATECS?	Queries the duration of STA conditions for the current entry.
RES:VCC:QOS:CLP1?	Queries the count of CLP1 cells received for the current entry.
RES:VCC:AAL:TXCELLs?	Queries the transmitted cell count for the current entry.
RES:VCC:AAL:RXCELLs?	Queries the received cell count for the current entry.
RES:VCC:AAL:RXPDU: COUNT?	Queries the received PDU count for the current entry. **Note:** This command is only available for AAL 5.
RES:VCC:AAL:RXPDU:RATE?	Queries the received PDU rate (represented as the number of PDUs per second) for the current entry. **Note:** This command is only available for AAL 5.
RES:VCC:AAL:BANDwidth?	Queries the bandwidth used by the current entry.
RES:VCC:AAL:BIT:COUNT?	Queries the count of bit errors for the current entry.
RES:VCC:AAL:BIT:RATE?	Queries the rate of bit errors for the current entry.
RES:VCC:AAL:PATSynch?	Queries the duration of loss of pattern synchronization for the current entry.
RES:VCC:AAL:SNPERRor: COUNT?	Queries the AAL 1 SNP error count for the current entry.
RES:VCC:AAL:SNPERRor: RATE?	Queries the AAL 1 SNP error rate for the current entry.
RES:VCC:AAL:LOSTcells: COUNT?	Queries the AAL 1 lost cells count for the current entry.
RES:VCC:AAL:LOSTcells: RATE?	Queries the AAL 1 lost cells rate for the current entry.
RES:VCC:AAL:MISSEQcells: COUNT?	Queries the AAL 1 missequenced cells count for the current entry.

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RES Command	Description
RES:VCC:AAL:MISSEQcells: RATE?	Queries the AAL 1 missequenced cells rate for the current entry.
RES:VCC:AAL:CRCerror: COUNT?	Queries the count of AAL 5 CRC errors for the current entry.
RES:VCC:AAL:CRCerror: RATE?	Queries the rate of AAL 5 CRC errors for the current entry.
RES:VCC:AAL:LENerror: COUNT?	Queries the count of AAL 5 length errors for the current entry.
RES:VCC:AAL:LENerror: RATE?	Queries the rate of AAL 5 length errors for the current entry.
RES:VCC:AAL:PADerror: COUNT?	Queries the count of AAL 5 padding errors for the current entry.
RES:VCC:AAL:PADerror: RATE?	Queries the rate of AAL 5 padding errors for the current entry.
RES:VCC:AAL:ERRFlag?	Queries the AAL error flag for the current VCC entry.
RES:VCC:AAL:O191:MINCTD?	Queries the minimum CTD value for the current VCC entry. The value is reported in nano-seconds.
RES:VCC:AAL:O191:MAXCTD ?	Queries the maximum CTD value for the current VCC entry. The value is reported in nano-seconds.
RES:VCC:AAL:O191:MEANCT D?	Queries the average CTD value for the current VCC entry. The value is reported in nano-seconds.
RES:VCC:AAL:O191:MISINS?	Queries the misinserted cell count.
RES:VCC:AAL:O191:LOST?	Queries the lost cell count.
RES:VCC:AAL:O191:ERR?	Queries the errored cell count.
RES:VCC:AAL:O191:AVAIL?	Queries the availability ratio.
RES:VCC:AAL:O191:CLR?	Queries the cell loss ratio.
RES:VCC:AAL:O191:CMR?	Queries the cell misinsertion rate.
RES:VCC:AAL:O191:CER	Queries the cell error ratio.
RES:VCC:AAL:O191:SECBR?	Queries the severely errored cell block ratio.
RES:VCC:AAL:O191:MTBO?	Queries the mean time between outages. This is reported in seconds.
RES:VCC:AIS:F5:Secs?	Queries the duration of F5-AIS alarm detected for the current entry.
RES:VCC:RDI:F5:Secs?	Queries the duration of F5-RDI alarm detected for the current entry.
RES:VCC:OAM:F5:CCcells?	Queries the F5 OAM continuity check cells received for the current entry.
RES:VCC:OAM:F5:LPBKcells?	Queries the F5 OAM loopback cells received for the current entry.
RES:VCC:AIS:F4:Secs?	Queries the duration of detected F4-AIS alarm for the current entry.
RES:VCC:RDI:F4:Secs?	Queries the duration of detected F4-RDI alarm for the current entry.
RES:VCC:OAM:F4:CCcells?	Queries the F4 OAM continuity check cells received for the current entry.
RES:VCC:OAM:F4:LPBKcells?	Queries the F4 OAM loopback cells received for the current entry.

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TX (SOURce) Branch

The TX branch is used to set and retrieve ATM Transmit settings. Alternatively, each command can be sent using the "SOUR" or "SOURCE" keyword instead of the “TX” keyword.

The following is a list of supported Transmit commands.

TX Command	Description
TX:ALarm:DEFECTtype: <octet>	Sets the defect type octet to be sent in the OAM AIS/RDI cell payload. This can be specified in either binary, Hexadecimal, or decimal formats.
TX:ALarm:DEFECTtype?	Queries the defect type octet for the OAM AIS/RDI cells.
TX:ALarm:DURation?	Queries the ATM test set for the duration of the alarm it is generating.
TX:ALarm:DURation: <seconds>	Sets the duration (in seconds) for the alarm currently configured for the ATM protocol processor. The alarm starts after the duration is entered. The duration values range from 0 seconds to 32765 seconds or it can be set to CONTINUOUS generation.
TX:ALarm:SCOPE?	Queries the ATM test set for the scope of the alarm it is generating.
TX:ALarm:SCOPE: <vpi,vci>	Sets the scope of the alarm generated by the ATM test set. Default scope or for alarm generation is <0,0>. Values can be specified in either Hexadecimal or decimal formats. For physical layer alarms (Cell Sync and PLCPYEL), the scope must be set to <0,0>, which are invalid VPI/VCI values.
TX:ALarm:TYPE?	Queries the current protocol processor for the alarm type it is generating. For a list of returned values, see the *TX:ALarm:TYPE* < *alarm* > command.
TX:ALarm:TYPE <alarm>	Sets the alarm being generated. Valid parameters, meanings and protocol processors are: **Alarm** / **Protocol Processors** / **Meaning** OFF / ATM / No alarm generation AISF4S / ATM / F4 Segment Alarm Indication Signal (AIS) AISF4E / ATM / F4 End AIS AISF5S / ATM / F5 Segment AIS AISF5E / ATM / F5 End AIS RDIF4S / ATM / F4 Segment RDI RDIF4E / ATM / F4 End RDI RDIF5S / ATM / F5 Segment RDI RDIF5E / ATM / F5 End RDI CELLSYNC / ATM / Cell Sync PLCPYEL / ATM / PLCP Yellow Alarm LOPS / ATM / Loss of Pattern Synchronization Alarm
TX:BGRND:SEQNUM <sequence number>	Sets the sequence number for background traffic generation. The sequence number can vary from 1 to 4. Up to four sequences can be defined for background traffic with each one identified by the sequence number. **Note:** All sequence related commands (SEQNUM, SEQHDR, SEQPAYLD) are referenced to the sequence number used by this command.
TX:BGRND:SEQNUM?	Queries the current sequence number.

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TX Command	Description
TX:BGRND:SEQHDR <ATM cell header>	Sets the header for the current sequence.
TX:BGRND:SEQHDR?	Queries the header for the current sequence.
TX:BGRND:SEQPAYLD <payload octet>	Sets the payload octet for the current sequence.
TX:BGRND:SEQPAYLD?	Queries the payload octet for the current sequence.
TX:BGRND:BURST <burst>	Sets the burst count for the current sequence. Valid values range from 1 to 255.
TX:BGRND:BURST?	Queries the burst count for the current sequence.
TX:BGRND:SKIP <skip>	Sets the skip count for the current sequence. Valid values range from 1 to 1000.
TX:BGRND:SKIP?	Queries the skip count for the current sequence.
TX:BGRND:SEQSTAT <enable / disable>	Enables or disables the current sequence.
TX:BGRND:SEQSTAT?	Queries the status of the current sequence.
TX:BGRND:TRAF <on / off>	Starts or stops generation of background traffic on all enabled sequences.
TX:BGRND:TRAF?	Queries the status of background traffic generation.
TX:BGRND:SEQCNT?	Queries the number of sequences defined currently for background traffic generation.
TX:BURST: SCOPE <vpi,vci>	Sets the scope for burst traffic generation. Default scope for burst traffic generation is <0,0>. Values can be entered in Hexadecimal or decimal formats.
TX:BURST:SCOPE?	Queries the scope for burst cell/PDU generation.
TX:BURST:BURST <count>	Sets the burst count for burst cell/PDU generation. Valid values are 1 to 1000. **Note:** The burst scope must be set using the *TX:BURST:SCOPE <vpi,vci>* command before using the *TX:BURST:BURST <count>* command.
TX:BURST:BURST?	Queries the burst count for burst cell/PDU generation. For AAL0 and AAL1 connections, the count returned is for cells sent and or AAL5 connections, the count returned is for PDUs sent.
TX:ERRor:BURST <count>	Sets the burst count for the current error type. This command is not valid for BIT, SN, or SNP errors. Valid values are 1 to 10.
TX:ERRor:BURST?	Queries the burst count for the current error setting.
TX:ERRor:DURation <seconds>	Sets the duration, in seconds, of the error being generated by the ATM protocol processor. Valid values range from 0 to 32767 seconds or it can be set to CONTINUOUS generation.
TX:ERRor:DURation?	Queries the protocol processor for the duration of the error being generated.
TX:ERRor:RATE?	Queries the error rate.

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<table>
<tr><th>TX Command</th><th>Description</th></tr>
<tr><td>TX:ERRor:RATE <rate></td><td>Sets the error rate. Valid values are:

<u>Rate</u> <u>Description</u>
0 = OFF
N.Ne-N where each N is a numeral from 1 to 9
Note: This error rate format is not valid for BIT, SN, SNP, O.191 SN, or O.191 CRC errors. For these errors, only the following error rates are valid: 1.0e-2, 1.0e-3, 1.0e-4, 1.0e-5, 1.0e-6, 1.0e-7, 1.0e-8, and 1.0e-9.</td></tr>
<tr><td>TX:ERRor:SCOPE <vpi,vci></td><td>Sets the VPI and VCI for the ATM error. Default scope or for error generation is <0,0>. Values can be specified in either Hexadecimal or decimal formats. For physical layer errors (HEC correctable and HEC uncorrectable), the scope must be set to <0,0>, which are invalid VPI/VCI values.</td></tr>
<tr><td>TX:ERRor:SCOPE?</td><td>Queries the protocol processor for the scope of the current error generated.</td></tr>
<tr><td>TX:ERRor:TYPE?</td><td>Queries the error type selected for the current protocol processor.</td></tr>
<tr><td>TX:ERRor:TYPE <error></td><td>Note: The error generation scope must be set using the TX:ERRor:SCOPE command before using the TX:ERR:TYPE <error> command.
Sets the error type for the current protocol processor to one of the following types:

<u>Error</u> <u>Protocol(s)</u> <u>Description</u>
NONE ATM Stops error generation
BIT ATM BIT errors
HECC ATM HEC correctable error
HECU ATM HEC uncorrectable error
CRC ATM AAL5 CRC error
LEN ATM AAL5 length error
PAD ATM AAL5 padding error
O191SN ATM O.191 SN error
O191CRC ATM O.191 CRC error
SN ATM AAL1 SN error
SNP ATM AAL1 SNP error</td></tr>
<tr><td>TX:LPBK:CLEARcount</td><td>Clears the loopback count.</td></tr>
<tr><td>TX:LPBK:DURation <seconds></td><td>Sets the duration, in seconds, of the loopback generated by the ATM protocol processor. The valid range is 0 to 32767.</td></tr>
<tr><td>TX:LPBK:DURation?</td><td>Queries the duration of OAM loopback generation.</td></tr>
<tr><td>TX:LPBK:SCOPE <vpi, vci></td><td>Sets the scope of the loopback being generated by the ATM protocol processor. Default scope for loopback generation is <0,0>. Values can be specified in either Hexadecimal or decimal formats.</td></tr>
<tr><td>TX:LPBK:SCOPE?</td><td>Queries the scope of the OAM loopback generation setting.</td></tr>
<tr><td>TX:LPBK:SINGLoopback</td><td>Starts a single loopback test.
Note: The loopback scope (using the TX:LPBK:SCOPE <vpi, vci> command) and type (using the TX:LPBK:TYPE <type> command) must be set prior to using this command.</td></tr>
</table>

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TX Command	Description
TX:LPBK:TYPE <type>	Sets the loopback type. **Note:** The loopback generation scope must be set using the *TX:LPBK:SCOPE <scope>* command before using the *TX:LPBK:TYPE <type>*. **Parameter** — **Description** NONE — Invalid type F4SEG — F4 Segment loopback F4ETE — F4 End to End loopback F5SEG — F5 Segment loopback F5ETE — F5 End to End loopback
TX:LPBK:TYPE?	Returns the current loopback type.
TX:NWIMPairment:SCOPE <vpi,vci>	Sets the scope of the network impairment being generated by the protocol processor. These values can be entered using Hexadecimal or decimal formats. The scope must be set to <0,0> (invalid VPI/VCI values) for the following types of network impairments: Cell error generation; cell loss; cell misinsertion; cell delay variation; and cell reordering
TX:NWIMPairment: SCOPE?	Queries the scope of the network impairment setting.
TX:NWIMPairment:TYPE <type>	**Note:** The network impairment generation scope must be set using the *TX:NWIMP:SCOPE* command before using the *TX:NWIMP:TYPE <type>* command. Sets the network impairment type for the current protocol processor to one of the following types: **Error** — **Protocol(s)** — **Description** NONE — ATM — Stops network impairment CEG — ATM — Cell error generation CLOS — ATM — Cell loss CMIS — ATM — Cell Misinsertion CDV — ATM — Cell delay variation CREO — ATM — Cell recording REMAP — ATM — VPI.VCI remapping CLPTG — ATM — CLP tagging CISET — ATM — CI setting
TX:NWIMPairment:TYPE?	Queries the current network impairment type setting.
TX:NWIMPairment: ERRMask <mask>	Sets the error mask octet (one byte) for cell error generation. Error mask can be specified in either binary, Hexadecimal, or decimal formats.
TX:NWIMPairment: ERRMask?	Queries the error mask octet for cell error generation.
TX:NWIMPairment:OCTET Select <octet number>	Sets the octet to be errored for cell error generation. Valid values range from 1 to 53.
TX:NWIMPairment:OCTET Select?	Queries the octet to be errored for cell error generation.
TX:NWIMPairment: HDRSelect <hrd>	Sets the header select (32-bit). Header select can be specified in either Hexadecimal or decimal formats. Header select is valid for the following network impairment types: Cell error generation; cell loss; CI setting; and CLP tagging.

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TX Command	Description
TX:NWIMPairment: HDRSelect?	Queries the header select.
TX:NWIMPairment: HDRMask <mask>	Sets the header mask (32-bit). Header select can be specified in either Hexadecimal or decimal formats. Header select is valid for the following network impairment types: Cell error generation; cell loss; CI setting; and CLP tagging.
TX:NWIMPairment: HDRMask?	Queries the header mask. This command is valid for the network impairment types mentioned in the *TX:NWIMPairment:HDRMask <mask>* command.
TX:NWIMPairment:BURST <count>	Sets the burst count for the current network impairment setting (1-10). Header select is valid for the following types: Cell error generation; cell loss; CI setting; CLP tagging; cell misinsertion; and cell delay variation.
TX:NWIMPairment: BURST?	Queries the burst count for the current network impairment setting. It is valid for the following types: Cell error generation; cell loss; CI setting; CLP tagging; cell misinsertion; and cell delay variation.
TX:NWIMPairment: RATE <rate>	Sets the rate for network impairment generation. It is valid for the following types: Cell error generation; cell loss; CI setting; CLP tagging; cell misinsertion; and cell delay variation. Valid rate values are: **Rate** — **Description** N.Ne-N — where each N is a numeral from 1 to 9 0 — = OFF
TX:NWIMPairment:RATE?	Sets the rate for network impairment generation. It is valid for the following types: Cell error generation; cell loss; CI setting; CLP tagging; cell misinsertion; and cell delay variation.
TX:NWIMPairment: DURation <seconds>	Sets the duration (in seconds) for the network impairment currently generated for the ATM protocol processor. The duration values range from 0 seconds to 32765 seconds or it can be set to CONTINUOUS generation.
TX:NWIMPairment: DURation?	Queries the duration of the network impairment being generated by the ATM test set.
TX:NWIMPairment: MISINSHeader <hdr>	Sets the misinserted cell's header (32-bit) for Cell Misinsertion network impairment. This can be specified in either Hexadecimal or decimal formats.
TX:NWIMPairment: MISINSHeader?	Queries the misinserted cell's header for Cell misinsertion network impairment.
TX:NWIMPairment: PAYLoadoctet <octet>	Sets the payload octet (one byte) of the misinserted cell. This can be specified in either binary, Hexadecimal, or decimal formats.
TX:NWIMPairment: PAYLoadoctet?	Queries the payload octet of the misinserted cell.
TX:NWIMPairment: REMAPHeader <ATM header>	Sets the ATM header for remapping. Refer to the **ATMVCC Branch** for ATM header information.
TX:NWIMPairment: REMAPHeader?	Queries the ATM header for remapping.
TX:NWIMPairment: REORDER	Reorders a pair of cells matching the header select and header mask set earlier.

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TX Command	Description
TX:PMOAM: SCOPE <vpi,vci>	Sets the scope for PM-OAM cell generation. The default scope is <0,0>. The scope has to be set to the VPI/VCI of the VCC on which the PM-OAM has been enabled. The VPI/VCI can be entered using either Hexadecimal or decimal formats.
TX:PMOAM:SCOPE?	Queries the scope for the PM-OAM cell generation.
TX:FWMON [ENABLE, DISABLE] {<blksize>}	Enables or disables the generation of Forward Monitoring PM-OAM cells on the VCC indicated by the scope. When enabling the generation of FW PM-OAM cells only, the block size must be specified. The block size specifies the number of user cells after which a FM PM-OAM cell is inserted. The block size can take any one of the following values: 128, 256, 512, 1024, 2048, 4096, 8192, 16384, or 32768. **Note:** PM-OAM can be enabled or disabled only when the VCC is not transmitting or receiving cells.
TX:BWREP [ENABLE, DISABLE]	Enables or disables the generation of Backward Reporting PM-OAM cells on the VCC indicated by the scope. Once enabled, a backward reporting PM-OAM cell is sent in response to each forward monitoring PM-OAM cell received. **Note:** PM-OAM can be enabled or disabled only when the VCC is not transmitting or receiving cells.
TX:FWMON?	Queries the Forward Monitoring PM-OAM setting.
TX:BWREP?	Queries the Backward Monitoring PM-OAM setting.
TX:SVCTEST:TYPE <test type>	Sets the SVC load test type. The following are valid values: **Type** — **Description** NONE — No SVC test is set. CALLSETUP — SVC call setup test. Setup - Connect ACK sequence CYCLIC — SVC cyclic call test. Setup - Release Complete sequence CALLBURST — SVC call burst test. SVCs are established with the specified burst and skip profile
TX:SVCTEST:TYPE?	Queries the SVC load test type.
TX:SVCTEST:CALLRATE <rate>	Sets the call rate for the SVC load test The call rate appears as number of calls per second. Valid values range from 1 to 256.
TX:SVCTEST:CALLRATE?	Queries the call rate for the SVC load test.
TX:SVCTEST:DUR <duration in seconds>	Sets the duration of the SVC load test. The duration should be set such that (call rate * duration) is less than or equal to 5000.
TX:SVCTEST:DUR?	Queries the duration of the SVC load test.
TX:SVCTEST:BURST <burst size>	Sets the burst size for Call Burst SVC load test. The burst is specified as number of seconds or as RANDOM. The burst parameter specifies the duration for which the SETUP messages are sent continuously.
TX:SVCTEST:BURST?	Queries the burst size for the Call Burst SVC load test.
TX:SVCTEST:SKIP <skip size>	Sets the skip size for Call Burst SVC load test. The skip is specified as number of seconds. The skip parameter specifies the duration for which no SETUP message are sent out.
TX:SVCTEST:SKIP?	Queries the skip size for Call Burst SVC load test.

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ATMVCC Branch

The ATMVCC Branch contains SCPI commands that control functionality associated with the ATM VCC Table Function Group button.

- Allow you to create and edit VCC Table entries
- Query and change VCC Table entry

Using the ATMVCC Branch Commands

Before you can use an ATMVCC command, you must first select a VCC Table entry. For first-time ATM operation, create a VCC Table entry

1. Issue the *ATMSYS:INTERFACE?* command to determine if the ATM protocol processor is configured for NNI or UNI mode. (This determines how you enter the VCC Table header.)
2. To add a VCC Table entry, issue the *ATMVCC:TABLE:ADD* command.

   For UNI, enter:

   - One digit for the GFC value
   - Two digits for the VPI value
   - Four digits for the VCI value
   - One digit for the PTI value
   - One digit for the CLP value

   an X represents a wildcard character and a single space is required between each value, for example

   ATMVCC:TABLE:ADD x 12 0040 x x

   For NNI, enter:

   - Two digits for the VPI value
   - Four digits for the VCI value
   - One digit for the PTI value
   - One digit for the CLP value

   an X represents a wildcard character and a single space is required between each value, for example

   ATMVCC:TABLE:ADD 21 0050 x x
3. Issue the *ATMVCC:TABLE:ENTRY?* command to verify that the entry was added to the VCC Table.

ATMVCC Command	Description
ATMVCC:AAL?	Queries the current virtual channel for its AAL value.
ATMVCC:AAL <type>	Sets the AAL type as specified for the current VCC table entry. Valid values are: **Type** — **Description** 0 — AAL0 1 — AAL1 5 — AAL5

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ATMVCC Command	Description
ATMVCC:AALPDU?	Returns the AAL PDU length for the current AAL5 VCC table entry.
ATMVCC:AALPDU <length>	Sets the AAL PDU length for the current VCC table entry to the value specified. The value ranges from 1 to 65512.
ATMVCC:CDVT?	Queries the CDVT parameter for the current VCC table entry.
ATMVCC:CDVT <value>	Sets the CDVT parameter (in number of cell slots) for the current VCC entry. Valid values range from 1 to 1047552.
ATMVCC:COUNT?	Queries the count of VCCs present in the VCC table.
ATMVCC:DELETE:CURrent	Deletes the current virtual channel from the VCC Table.
ATMVCC:DELETE:ALL	Deletes all virtual channels from the VCC table. **Note:** This command deletes the entire VCC table.
ATMVCC:HEADER:n?	Queries the ATM header (32-bit) for the **Nth** entry in the VCC table.
ATMVCC:MBS?	Returns the maximum burst size (MBS) for the current VCC table entry. MBS is only valid for VBR connections.
ATMVCC:MBS <value>	Sets the MBS for the current VCC table entry. MBS is only valid for VBR connections.
ATMVCC:PCR?	Returns the peak cell rate (PCR) for the current VCC table entry.
ATMVCC:PCR <value>	Sets the PCR for the current VCC table entry.
ATMVCC:RX:PATtern?	Returns the pattern name as specified in the *ATMVCC:RX:PAT <pattern>* command.
ATMVCC:RX:PATtern:<pattern>	Sets the value of the expected ATM receive pattern. The following values are valid: **Pattern** — **Description** WORD <word> — User word (32-bit) pattern PRBS — 2^{15}-1 PRBS pattern INVPRBS — 2^{15}-1 inverted PRBS pattern O191_REV0 — O.191 Revision-0 test cell pattern O191_REV1 — O.191 Revision-1 test cell pattern ALLONES — All 1s pattern ALLZEROS — All 0s pattern 1010 — Alternating 1 and 0s pattern PDU<#of Bytes> <byte1>...<byteN> — Full cell/PDU pattern. **Note:** Up to 100 bytes can be entered for a Full PDU pattern.
ATMVCC:RX:STATUS?	Returns the receive enable status of the current VCC table entry. Returned values are: DISABLE, MONITOR, or DETAIL.

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ATMVCC Command	Description
ATMVCC:RX:STATUS <status>	Sets the receive enable status of the current VCC table entry. The following values are valid: **Status** — **Description** MONITOR — Enables monitoring of the entry. DETAIL — Enables detailed monitoring of the entry for a maximum of four entries. DISABLE — Disables monitoring of the entry.
ATMVCC:RX:STATALL <status>	Sets the receive enable status of all VCC table entries. The following values are valid: **Status** — **Description** MONITOR — Enables monitoring of all entries. DISABLE — Disables monitoring of all entries.
ATMVCC:RX:TOGGLE?	Queries the value of the *ATMVCC:RX:TOGGLE <toggle>* command.
ATMVCC:RX:TOGGLE <toggle>	Starts and stops monitoring on all enabled VCC table entries. Valid values are: **Toggle** — **Description** ON — Monitors all enabled VCC table entries as specified (Monitor or Detail). OFF — Stops monitoring all enabled VCC table entries.
ATMVCC:SCR?	Returns the sustained cell rate (SCR) for the current VCC table entry. SCR is only valid for VBR connections.
ATMVCC:SCR <value>	Sets the SCR for the current VCC table entry. SCR is only valid for VBR connections.
ATMVCC:SHAPING?	Returns the traffic shaping for the current VCC table entry.
ATMVCC:SHAPING <type>	Sets the traffic shaping for the current VCC table entry. The following values are valid: **Type** — **Description** RTVBR — ?Variable Bit Rate traffic shaping NRTVBR — ?Variable Bit Rate traffic shaping UBR — Unspecified Bit Rate traffic shaping CBR — Constant Bit Rate traffic shaping ABR — Available Bit Rate traffic shaping

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ATMVCC Command	Description
ATMVCC:TABLE:ADD <header>	Adds a virtual channel to the VCC Table. The ATM header contains the following parameters: Use the following guidelines to enter the VCC Header: **gfc** — a single digit Hex value (0 to F) that represents the Generic Flow Control bit in a VCC Header. The GFC is used only for a UNI interface. It is not required for an NNI interface. **vpi** — a 2 digit hex value (for a UNI interface) or a 3 digit hex value (for an NNI interface) that represents the Virtual Path Identifier. **vci** — a 4 digit Hex value that represents the Virtual Channel Identifier. **pti** — a 2 digit binary value (0 or 1) that represents the Payload Type Indicator bits in a VCC Header. Enter values only for the 2nd and 3rd bit position. **clp** — a single digit binary value that represents the Cell Loss Priority bit in a VCC Header. **Note:** Use a space to separate VCC Header parameters. For example, To enter a UNI VCC Header: **ATMVCC:TABLE:ADD F 01 0040 11 0** To enter an NNI VCC Header: **ATMVCC:TABLE:ADD 01 0040 11 X**
ATMVCC:TABLE:ENTRY?	Returns the current VCC Table entry for its VCC Header. For a UNI VCC Header, the query may appear similar to the following: **0 0F 0040 0x0 x** For an NNI VCC Header, the query may appear similar to the following: **00F 0040 0x0 x**
ATMVCC:TABLE:ENTRY <header>	Sets the current VCC table entry (for GPIB/SCPI) to the entry specified. The ATM header contains the following parameters: **gfc** — a single digit Hex value (0 to F) that represents the Generic Flow Control bit in a VCC Header. The GFC is used only for a UNI interface. It is not required for an NNI interface. **vpi** — a 2 digit hex value (for a UNI interface) or a 3 digit hex value (for an NNI interface) that represents the Virtual Path Identifier. **vci** — a 4 digit Hex value that represents the Virtual Channel Identifier. **pti** — a 2 digit binary value (0 or 1) that represents the Payload Type Indicator bits in a VCC Header. Enter values only for the 2nd and 3rd bit position. **clp** — a single digit binary value that represents the Cell Loss Priority bit in a VCC Header. **Note:** The entry must exist in the VCC table; this entry is used for changes and deletion. If it does not exist, then the most recent entry added to the VCC table becomes the editable table.

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ATMVCC Command	Description
ATMVCC:TABLE:SEARCH <vpi,vci>	Searches the VCC table for a connection with the given VPI/ VCI values. If a connection is found, its index (which starts at 1) in the VCC table is returned. If no connection is found, then -1 is returned.
ATMVCC:TABLE:ADDSVC [number of connections]	Establishes and adds a specified number of SVCs in the VCC table. If no value is specified, then the default value of 1 is used. Valid values range from 1 to 256. **Note:** Before using this command, the SVC setup message parameters must be set. Refer to the SVCSETUP commands for more information. Any added entry uses PRBS pattern as the default Transmit and Receive patterns. The current VCC entry is set to the newly added connection. the VPI.VCI allocated for the SVC can be queried using the ATMVCC:TABLE:ENTRY? command.
ATMVCC:TABLE:TURBOadd <N, header>	Adds N entries to the VCC table. Valid values for N are 1 to 256. The ATM header contains the following parameters: **gfc** — a single digit Hex value (0 to F) that represents the Generic Flow Control bit in a VCC Header. The GFC is used only for a UNI interface. It is not required for an NNI interface. **vpi** — a 2 digit hex value (for a UNI interface) or a 3 digit hex value (for an NNI interface) that represents the Virtual Path Identifier. **vci** — a 4 digit Hex value that represents the Virtual Channel Identifier. **pti** — a 2 digit binary value (0 or 1) that represents the Payload Type Indicator bits in a VCC Header. Enter values only for the 2nd and 3rd bit position. **clp** — a single digit binary value that represents the Cell Loss Priority bit in a VCC Header. **Note:** The entry must exist in the VCC table; this entry is used for changes and deletion. If it does not exist, then the most recent entry added to the VCC table becomes the editable table.
ATMVCC:TX:CSIbyte <octet>	Sets the AAL1 CSI octet for the current entry to the passed value. This can be specified in either binary, Hexadecimal, or decimal formats.
ATMVCC:TX:PATtern?	Returns the transmit pattern for the current VCC table entry.

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ATMVCC Command	Description
ATMVCC:TX:PATtern <pattern>	Sets the value of the ATM transmit pattern. The following values are valid: **Pattern** — **Description** WORD <word> — User word (32-bit) pattern PRBS — 2^{15}-1 PRBS pattern INVPRBS — 2^{15}-1 inverted PRBS pattern O191_REV0 — O.191 Revision-0 test cell pattern O191_REV1 — O.191 Revision-1 test cell pattern ALLONES — All 1s pattern ALLZEROS — All 0s pattern 1010 — Alternating 1 and 0s pattern PDU<#of Bytes> <byte1>...<byteN> — Full cell/PDU pattern. **Note:** Up to 100 bytes can be entered for a Full PDU pattern.
ATMVCC:TX:STATALL <status>	Sets the receive enable status of all VCC table entries. The following values are valid: **Status** — **Description** ENABLE — Allows transmit to be turned on for all entries. DISABLE — Allows transmit to be turned off for all entries.
ATMVCC:TX:STATUS?	Returns the transmit enable status of the current VCC table entry. Returned values are: ENABLE or DISABLE.
ATMVCC:TX:STATUS <status>	Sets the receive enable status of the current VCC table entry. The following values are valid: **Status** — **Description** ENABLE — Allows transmit to be turned on for the entry. DISABLE — Allows transmit to be turned off for the entry. ERR_ENABLE — Allows transmit to be turned on for the entry with the capability to generate (1) Errors (2) Alarms (3) PM-OAM Cells (4) Loopback OAM Cells.
ATMVCC:TX:TOGGLE?	Queries the value of the *ATMVCC:TX:TOGGLE <toggle>* command.
ATMVCC:TX:TOGGLE <toggle>	Starts and stops monitoring on all enabled VCC table entries. Valid values are: **Toggle** — **Description** ON — Monitors all enabled VCC table entries as specified (Monitor or Detail). OFF — Stops monitoring all enabled VCC table entries.
ATMVCC:TX:UUfield?	Queries the AAL5 User-to-User (UU) indication for the current entry.
ATMVCC:TX:UUfield <octet>	Sets the AAL5 UU indication for the current entry. Any coding of an octet is valid for the UU field. Values can be specified in binary, Hexadecimal, or decimal formats.

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ATMVCC Command	Description
ATMVCC:TYPE?	Queries the VCC type of the current entry in the VCC table. The response is either PVC or SVC.
ATMVCC:CREFValue?	Queries the call reference value of the current entry in the VCC table. The entry will be an SVC.
ATMVCC:CREFFlag?	Queries the call reference flag of the current entry in the VCC table. The entry will be an SVC.
ATMVCC:O191:BLKSIZE <block size>	Sets the O.191 block size for a VCC with O.191 as the receive pattern. Valid values for block size are: 128, 256, 512, 1024, 2048, 4096, 8192, 16384, or 32768.
ATMVCC:O191:BLKSIZE?	Queries the O.191 block size for a VCC with O.191 as the receive pattern.
ATMVCC:O191:FLOWtype <flow type>	Sets the CLP flow to be analyzed for a VCC with O.191 as the receive pattern. The flow type can be analyzed and set to any of the following values: CLP0, CLP1, or CLP01.
ATMVCC:0191:FLOWtype?	Queries the CLP flow to be analyzed for a VCC with O.191 as the receive pattern.

ATMSCAN Branch

The ATM Scan Branch SCPI commands support functionality associated with the Scan button. The Scan button is located under the ATM Functns Function Group button.

ATMSCAN Commands	Description
ATMSCAN:ADDVCC:N	Adds a specific VCC (that appears in the Scan table as a result of using the Scan function) to the ATM protocol processor's VCC Table. For example, *ATMSCAN:ADDVCC:3*
ATMSCAN:ADDVCC:ALL	Add all VCCs (that appear in the Scan table as a result of using the Scan function) to the ATM protocol processor's VCC Table.
ATMSCAN:CLEAR	Removes all elements from the Scan table
ATMSCAN:COUNT?	Queries the number of VCCs in the Scan table.
ATMSCAN:HDRS?	Queries the **header select** used for scanning.
ATMSCAN:HDRS <header select>	Sets the VCC header select (32-bit) for scanning. This value can be specified in Hexadecimal or decimal formats.
ATMSCAN:HDRM? (Protocol supported: ATM)	Queries the **header mask** used for scanning.
ATMSCAN:HDRM <header select>	Sets the VCC header mask (32-bit) for scanning. This value can be specified in Hexadecimal or decimal formats.
ATMSCAN:HEADER:n?	Queries a specific VCC (that appears in the Scan table as a result of using the Scan function) for its VPI and VCI values.

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ATMSCAN Commands	Description
ATMSCAN:SEARCH <vpi,vci>	Searches the list of scanned VPI/VCI pairs for the given VPI/VCI values. If a present, the VPI/VCI pair's index (which starts at 1) in the scanned list is returned. If a VPI/VCI pair is not found, then -1 is returned.
ATMSCAN:START	Starts the VCC scan operation.
ATMSCAN:STOP	Stop the VCC scan operation.

ATMSYS Branch

The ATM System Branch SCPI commands support functionality associated with the Settings button. This button is located under the ATM Functns Function Group button.

ATMSYS Commands	Description
ATMSYS:CELLRATE?	Queries the ATM cell rate's unit of measure.
ATMSYS:CELLRATE <unit of measure>	Determines how the ATM interface's bandwidth is represented in units of measure: **Unit of Measure** — **Description** CPS — Cells per second. (Default value) The bandwidth is entered and displayed as cells-per-second. BW — Bandwidth percentage. The bandwidth is entered and displayed as a percentage ranging from 0.0 percent KB — Kilobits per second. The bandwidth is entered and displayed as Kbps. MB — Megabits per second. The bandwidth is entered and displayed as Mbps.
ATMSYS:INTERFACE?	Queries the ATM interface setting.
ATMSYS:INTERFACE <interface>	Sets the ATM interface. The following values are valid: **Interface** — **Description** UNI — User-Network Interface NNI — Network-Network Interface
ATMSYS:MAPping?	Queries the protocol processor for the ATM physical mapping.

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ATMSYS Commands	Description
ATMSYS:MAPping <mapping>	Sets the physical mapping for ATM. The following values are valid: **Mapping:** NONE E3_DIRECT E3_PLCP E1_1_DIRECT E1_1_PLCP E1_2_DIRECT E1_2_PLCP DS3_DIRECT DS3_PLCP DS1_1_DIRECT DS1_1_PLCP DS1_2_DIRECT DS1_2_PLCP STM4_C4_4c STM4_C4 STM4_C3 STM4_C2 STM4_C12 STM4_C11 STM1_C4 STM1_C3 STM1_C2 STM1_C12 STM1_C11 STM0_C3 STM0_C2 STM0_C12 STM0_C11 STM1e_C4 STM1e_C3 STM1e_C2 STM1e_C12 STM1e_C11 STM0e_C3 STM0e_C2 STM0e_C12 STM0e_C11 OC12_STS12c OC12_STS3c OC12_FULLSPE OC12_VT15 OC12_VT2 OC12_VT6 OC3_STS3c OC3_FULLSPE OC3_VT15 OC3_VT2 OC3_VT6 OC1_FULLSPE OC1_VT15 OC1_VT2 OC1_VT6 STS1_FULLSPE STS1_VT15 STS1_VT2 STS1_VT6
ATMSYS:RESTART	Restarts the ATM protocol processor, all accumulated statistics, and any activities stopped by the *ATMSYS:STOP* command. **Note:** This command is usually issued after the *ATMSYS:STOP* command.
ATMSYS:SCRAMBLing?	Queries the ATM cell scrambling setting.
ATMSYS:SCRAMBLing <scrambling>	Sets the ATM protocol processor's cell scrambling mode. Valid values are: **Scrambling** — **Description** ON — Enables ingress scrambling and egress descrambling OFF — Disables ingress scrambling and egress descrambling
ATMSYS:STOP	Stops the ATM protocol processor.

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SVCSETUP Branch

The Switched Virtual Circuit Setup Branch SCPI commands are used to

- Set the information elements of the SETUP message internally in SCPI. These elements are used when trying to establish an SVC using the ATMVCC:TABLE:ADDSVC command.

  The SVC setup parameters are initially set to the values taken from the default SVC setup parameter list. These can be optionally modified using the SVCSETUP commands. After ATMVCC:TABLE:ADDSVC command is issued, the SVC setup parameters will be set to the values from the default parameters list. Refer to the SVCCFG:DEFSETUP branch for setting and getting the default setup parameters.

- Queries the information elements of the SETUP message for the current VCC table entry. For this operation, the current VCC table entry should be set to an existing SVC in the VCC table.

- Queries the information elements of the SETUP message stored internally in SCPI. For this operation, the current VCC table entry should be set as INVALID.

SVCSETUP Commands	Description
SVCSETUP:QOSCLASS:FWD <QOS class>	Sets the forward QoS class for the SVC to be established. The Qos Class can be any one of the following: **QoS Class** — **Meaning** CLASS0 — QoS class 0 CLASS1 — QoS class 1 CLASS2 — QoS class 2 CLASS3 — QoS class 3 CLASS4 — QoS class 4
SVCSETUP:QOSCLASS:FWD?	Queries the forward QoS class setting for the SVC to be established.
SVCSETUP:QOSCLASS:BWD <QOS class>	Sets the backward QoS class for the SVC to be established.
SVCSETUP:QOSCLASS:BWD?	Queries the backward QoS class setting for the SVC to be established.
SVCSETUP:CDPTY <called party address>	Sets the ATM address of the called party (destination). The called party address has to be specified in one of the following formats: The ISO-NSAP ATM address format is: <NSAP, NetworkPrefix, ESI, SEL> The E.164 Native ATM addressing format is: <E164, E.164 Address digits> where, Network prefix is 13 octets ESI is 6 octets SEL is 1 octet E.164 address digits are 1-15 octets The network prefix, ESI and SEL octets or the E.164 addressing digits have to be specified in hexadecimal format.
SVCSETUP:CDPTY?	Queries the ATM address of the called party (destination).
SVCSETUP:AALTYPE <AAL type>	Sets the AAL type of the SVC to be established. Valid values are AAL0, AAL1 or AAL5.

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SVCSETUP Commands	Description
SVCSETUP:AALTYPE?	Queries the AAL type of the SVC to be established.
SVCSETUP:MAXSDUSIZE:FWD <size>	Sets the forward maximum AAL5 CPCS SDU size.
SVCSETUP:MAXSDUSIZE:FWD?	Queries the forward maximum AAL5 CPCS SDU size.
SVCSETUP:MAXSDUSIZE:BWD <size>	Sets the backward maximum AAL5 CPCS SDU size.
SVCSETUP:MAXSDUSIZE:BWD?	Queries the backward maximum AAL5 CPCS SDU size.
SVCSETUP:TRAFDESCR:FWD:COMB <combination>	Sets the forward traffic combination. The following combinations are valid: **Combination** — **Meaning** COMB1 — PCR for CLP0 and CLP0+1 are specified. COMB2 — PCR for CLP0, CLP0+1 and tagging are specified. COMB3 — PCR for CLP0+1, SCR for CLP0 and MBS for CLP0 are specified. COMB4 — PCR for CLP0+1, SCR for CLP0, MBS for CLP0 and tagging are specified. COMB5 — PCR for CLP0+1 is specified. COMB6 — PCR for CLP0+1, SCR for CLP0+1 and MBS for CLP0+1 are specified. **Note:** The combination needs to be set prior to the setting of the individual traffic parameters associated with that combination.
SVCSETUP:TRAFDESCR:FWD:COMB?	Queries the forward traffic combination.
SVCSETUP:TRAFDESCR:BWD:COMB <combination>	Sets the backward traffic combination. The following combinations are valid: **Combination** — **Meaning** COMB1 — PCR for CLP0 and CLP0+1 are specified. COMB2 — PCR for CLP0, CLP0+1 and tagging are specified. COMB3 — PCR for CLP0+1, SCR for CLP0 and MBS for CLP0 are specified. COMB4 — PCR for CLP0+1, SCR for CLP0, MBS for CLP0 and tagging are specified. COMB5 — PCR for CLP0+1 is specified. COMB6 — PCR for CLP0+1, SCR for CLP0+1 and MBS for CLP0+1 are specified. **Note:** The combination needs to be set prior to the setting of the individual traffic parameters associated with that combination.
SVCSETUP:TRAFDESCR:BWD:COMB?	Queries the backward traffic combination.
SVCSETUP:TRAFDESCR:FWD:PCR0 <value>	Sets the forward PCR for CLP0.
SVCSETUP:TRAFDESCR:FWD:PCR0?	Queries the forward PCR for CLP0.
SVCSETUP:TRAFDESCR:BWD:PCR0 <value>	Sets the backward PCR for CLP0.
SVCSETUP:TRAFDESCR:BWD:PCR0?	Queries the backward PCR for CLP0.
SVCSETUP:TRAFDESCR:FWD:PCR01 <value>	Sets the forward PCR for CLP0+1.

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SVCSETUP Commands	Description
SVCSETUP:TRAFDESCR:FWD:PCR01?	Queries the forward PCR for CLP0+1.
SVCSETUP:TRAFDESCR:BWD:PCR01 <value>	Sets the backward PCR for CLP0+1.
SVCSETUP:TRAFDESCR:BWD:PCR01?	Queries the backward PCR for CLP0+1.
SVCSETUP:TRAFDESCR:FWD:SCR0 <value>	Sets the forward SCR for CLP0.
SVCSETUP:TRAFDESCR:FWD:SCR0?	Queries the forward SCR for CLP0.
SVCSETUP:TRAFDESCR:BWD:SCR0 <value>	Sets the backward SCR for CLP0.
SVCSETUP:TRAFDESCR:BWD:SCR0?	Queries the backward SCR for CLP0.
SVCSETUP:TRAFDESCR:FWD:SCR01 <value>	Sets the forward SCR for CLP0+1.
SVCSETUP:TRAFDESCR:FWD:SCR01?	Queries the forward SCR for CLP0+1.
SVCSETUP:TRAFDESCR:BWD:SCR01 <value>	Sets the backward SCR for CLP0+1.
SVCSETUP:TRAFDESCR:BWD:SCR01?	Queries the backward SCR for CLP0+1.
SVCSETUP:TRAFDESCR:FWD:MBS0 <value>	Sets the forward MBS for CLP0.
SVCSETUP:TRAFDESCR:FWD:MBS0?	Queries the forward MBS for CLP0.
SVCSETUP:TRAFDESCR:BWD:MBS0 <value>	Sets the backward MBS for CLP0.
SVCSETUP:TRAFDESCR:BWD:MBS0?	Queries the backward MBS for CLP0.
SVCSETUP:TRAFDESCR:FWD:MBS01 <value>	Sets the forward MBS for CLP0+1.
SVCSETUP:TRAFDESCR:FWD:MBS01?	Queries the forward MBS for CLP0+1.
SVCSETUP:TRAFDESCR:BWD:MBS01 <value>	Sets the backward MBS for CLP0+1.
SVCSETUP:TRAFDESCR:BWD:MBS01?	Queries the backward MBS for CLP0+1.
SVCSETUP:TRAFDESCR:FWD: TAGging <requested/not-requested>	Sets the forward tagging requested parameter.
SVCSETUP:TRAFDESCR:FWD:TAGging?	Queries the forward tagging requested parameter.
SVCSETUP:TRAFDESCR:BWD:TAGging <requested/not-requested>	Sets the backward tagging requested parameter.
SVCSETUP:TRAFDESCR:BWD:TAGging?	Queries the backward tagging requested parameter.

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SVCSETUP Commands	Description
SVCSETUP:EXTQOS:FWD: CDVACCeptable <value>	Sets the forward acceptable peak to peak CDV parameter. It has to be specified in terms of micro-secs. **Note:** The extended QoS parameters can be set only for the UNI 4.0 signalling protocol version.
SVCSETUP:EXTQOS:FWD:CDVACCeptable?	Queries the forward acceptable peak to peak CDV parameter.
SVCSETUP:EXTQOS:BWD:CDVACCeptable <value>	Sets the backward acceptable peak to peak CDV parameter. It has to be specified in terms of micro-secs.
SVCSETUP:EXTQOS:BWD:CDVAcceptable?	Queries the backward acceptable peak to peak CDV parameter.
SVCSETUP:EXTQOS:FWD:CDVCumulative <value>	Sets the forward cumulative peak to peak CDV parameter. It has to be specified in terms of micro-secs.
SVCSETUP:EXTQOS:FWD:CDVCumulative?	Queries the forward cumulative peak to peak CDV parameter.
SVCSETUP:EXTQOS:BWD:CDVCumulative <value>	Sets the backward cumulative peak to peak CDV parameter. It has to be specified in terms of micro-secs.
SVCSETUP:EXTQOS:BWD:CDVCumulative?	Queries the backward cumulative peak to peak CDV parameter.
SVCSETUP:EXTQOS:FWD:CLR <value>	Sets the forward Cell Loss Ratio exponent. It can take values from 1 to 15.The CLR is taken to be 10^{-value}.
SVCSETUP:EXTQOS:FWD:CLR?	Queries the forward Cell Loss Ratio exponent.
SVCSETUP:EXTQOS:BWD:CLR <value>	Sets the backward Cell Loss Ratio exponent. It can take values from 1 to 15.The CLR is taken to be 10^{-value}.
SVCSETUP:EXTQOS:BWD:CLR?	Queries the backward Cell Loss Ratio exponent.
SVCSETUP:ABR:FWD:ICR <value>	Sets the forward Initial Cell Rate for ABR traffic type. **Note:** The ABR setup parameter commands are applicable only for UNI4.0
SVCSETUP:ABR:FWD:ICR?	Queries the forward Initial Cell Rate for ABR traffic type.
SVCSETUP:ABR:BWD:ICR <value>	Sets the backward Initial Cell Rate for ABR traffic type.
SVCSETUP:ABR:BWD:ICR?	Queries the backward Initial Cell Rate for ABR traffic type.
SVCSETUP:ABR:FWD:RIF <value>	Sets the forward Rate Increase Factor for ABR traffic type. RIF can have a value in the range 0-15.
SVCSETUP:ABR:FWD:RIF?	Queries the forward Rate Increase Factor for ABR traffic type.
SVCSETUP:ABR:BWD:RIF <value>	Sets the backward Rate Increase Factor for ABR traffic type. RIF can have a value in the range 0-15.
SVCSETUP:ABR:BWD:RIF?	Queries the backward Rate Increase Factor for ABR traffic type.
SVCSETUP:ABR:FWD:RDF <value>	Sets the forward Rate Decrease Factor for ABR traffic type. RIF can have a value in the range 0-15.

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SVCSETUP Commands	Description
SVCSETUP:ABR:FWD:RDF?	Queries the forward Rate Decrease Factor for ABR traffic type.
SVCSETUP:ABR:BWD:RDF <value>	Sets the backward Rate Decrease Factor for ABR traffic type. RIF can have a value in the range 0-15.
SVCSETUP:ABR:BWD:RDF?	Queries the backward Rate Decrease Factor for ABR traffic type.
SVCSETUP:TRAFTYPE <type>	Sets the traffic type. Valid traffic types are: RTVBR Real time Variable Bit Rate NRTVBR Non real time Variable Bit Rate UBR Unspecified Bit Rate CBR Constant Bit Rate ABR Available Bit Rate
SVCSETUP:TRAFTYPE?	Queries the traffic type.
SVCSETUP:CONNID <vpi, vci>	Command to specify the VPI/VCI of the SVC to be established. This is applicable only for UNI4.0 signalling protocol.
SVCSETUP:CONNID?	Queries the VPI/VCI setting for the SVC to be established.
SVCSETUP:ALTDESCR:FWD:COMB <combination>	Sets the forward traffic combination for Alternate ATM traffic descriptor IE. The following combinations are valid: **Combination** **Meaning** COMB1 PCR for CLP0 and CLP0+1 are specified. COMB2 PCR for CLP0, CLP0+1 and tagging are specified. COMB3 PCR for CLP0+1, SCR for CLP0 and MBS for CLP0 are specified. COMB4 PCR for CLP0+1, SCR for CLP0, MBS for CLP0 and tagging are specified. COMB5 PCR for CLP0+1 is specified. COMB6 PCR for CLP0+1, SCR for CLP0+1 and MBS for CLP0+1 are specified. **Note:** Alternate ATM traffic descriptor IE is valid only for UNI4.0 signalling protocol version.
SVCSETUP:ALTDESCR:FWD:COMB?	Queries the forward traffic combination for Alternate ATM traffic descriptor IE.

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SVCSETUP Commands	Description
SVCSETUP:ALTDESCR:BWD:COMB <combination>	Sets the backward traffic combination for Alternate ATM traffic descriptor IE. The following combinations are valid: **Combination** — **Meaning** COMB1 — PCR for CLP0 and CLP0+1 are specified. COMB2 — PCR for CLP0, CLP0+1 and tagging are specified. COMB3 — PCR for CLP0+1, SCR for CLP0 and MBS for CLP0 are specified. COMB4 — PCR for CLP0+1, SCR for CLP0, MBS for CLP0 and tagging are specified. COMB5 — PCR for CLP0+1 is specified. COMB6 — PCR for CLP0+1, SCR for CLP0+1 and MBS for CLP0+1 are specified.
SVCSETUP:ALTDESCR:BWD:COMB?	Queries the backward traffic combination for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:PCR0 <value>	Sets the forward PCR-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:PCR0?	Queries the forward PCR-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:PCR0 <value>	Sets the backward PCR-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:PCR0?	Queries the backward PCR-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:PCR01 <value> <value>	Sets the forward PCR-CLP0+1 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:PCR01?	Queries the forward PCR-CLP0+1 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:PCR01 <value>	Sets the backward PCR-CLP0+1 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:PCR01?	Queries the backward PCR-CLP0+1 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:SCR0 <value>	Sets the forward SCR-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:SCR0?	Queries the forward SCR-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:SCR0 <value>	Sets the backward SCR-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:SCR0?	Queries the backward SCR-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:SCR01 <value>	Sets the forward SCR-CLP0+1 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:SCR01?	Queries the forward SCR-CLP0+1 for Alternate ATM traffic descriptor IE.

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SVCSETUP Commands	Description
SVCSETUP:ALTDESCR:BWD:SCR01 <value>	Sets the backward SCR-CLP0+1 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:SCR01?	Queries the backward SCR-CLP0+1 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:MBS0 <value>	Sets the forward MBS-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:MBS0?	Queries the forward MBS-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:MBS0 <value>	Sets the backward MBS-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:MBS0?	Queries the backward MBS-CLP0 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:MBS01 <value>	Sets the forward MBS-CLP0+1 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:MBS01?	Queries the forward MBS-CLP0+1 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:MBS01 <value>	Sets the backward MBS-CLP0+1 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:MBS01?	Queries the backward MBS-CLP0+1 for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:TAGging <requested /not requested>	Sets the forward tagging requested parameter for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:FWD:TAGging?	Queries the forward tagging requested parameter for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:TAGging <requested/not requested>	Sets the backward tagging requested parameter for Alternate ATM traffic descriptor IE.
SVCSETUP:ALTDESCR:BWD:TAGging?	Queries the backward tagging requested parameter for Alternate ATM traffic descriptor IE.
SVCSETUP:MINDESCR:FWD:PCR0 <value>	Sets the forward PCR-CLP0 for Minimum Acceptable ATM traffic descriptor IE. **Note:** Minimum acceptable ATM traffic descriptor IE is valid only for UNI4.0 signalling protocol.
SVCSETUP:MINDESCR:FWD:PCR0?	Queries the forward PCR-CLP0 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:BWD:PCR0 <value>	Sets the backward PCR-CLP0 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:BWD:PCR0?	Queries the backward PCR-CLP0 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:FWD:PCR01 <value>	Sets the forward PCR-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:FWD:PCR01?	Queries the forward PCR-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:BWD:PCR01 <value>	Sets the backward PCR-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.

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SVCSETUP Commands	Description
SVCSETUP:MINDESCR:BWD:PCR01?	Queries the backward PCR-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:FWD:SCR01 <value>	Sets the forward SCR-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:FWD:SCR01?	Queries the forward SCR-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP: MINDESCR:BWD:SCR01 <value>	Sets the backward SCR-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:BWD:SCR01?	Queries the backward SCR-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:FWD:MBS01 <value>	Sets the forward MBS-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:FWD:MBS01?	Queries the forward MBS-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:BWD:MBS01 <value>	Sets the backward MBS-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:MINDESCR:BWD:MBS01?	Queries the backward MBS-CLP0+1 for Minimum Acceptable ATM traffic descriptor IE.
SVCSETUP:TRNST:MAX?	Queries the maximum transit delay. **Note:** End-to-End transit delay is applicable only for UNI4.0.
SVCSETUP:TRNST:MAX <delay>	Sets the maximum transit delay.
SVCSETUP:TRNST:CUM?	Queries the cumulative transit delay.
SVCSETUP:TRNST:CUM <delay>	Sets the cumulative transit delay.

SVCCFG Branch

The commands in this branch are related to configuring SVC parameters like UNI version, station address, default SETUP message parameters etc..

SVCCFG Commands	Description
SVCCFG:UNIVERsion <UNI signalling protocol version>	Selects the UNI signalling protocol version. Valid values are: UNI3.0 UNI3.1 and UNI4.0
SVCCFG:UNIVERsion?	Queries the UNI signalling protocol version.

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SVCCFG Commands	Description
SVCCFG:ATMADDRess <addressing format, ATM address>	Sets the calling party ATM address. The ATM address can be specified in the following formats: **Format** — **Meaning** NSAP — ISO-NSAP Addressing format E.164 — E.164 Addressing format. ISO-NSAP ATM address format is: <NetworkPrefix, ESI, SEL> E.164 Native ATM addressing format is: < E.164 Address digits> where, Network prefix — 13 octets ESI — 6 octets SEL — 1 octet E.164 address digits — 1-15 decimal digits The network prefix, ESI and SEL octets have to be specified in hexadecimal format.
SVCCFG: ATMADDRess?	Queries the calling party ATM address.
SVCCFG:SIGCONnection <bandwidth>	Sets the signalling connection's (VPI=0 and VCI=5) peak cell rate.
SVCCFG:SIGCONnection?	Queries the signalling connection's (VPI=0 and VCI=5) peak cell rate.
SVCCFG:SIGFILTER:TYPE <type>	Sets signalling filters.Following are the valid signalling filter types: **Type** — **Meaning** TYPE0 — No filters are set. TYPE1 — Filtering based on Call Reference Value TYPE2 — Filtering based on Call Reference Flag TYPE3 — Filtering based on Call Reference Value and Call Reference Flag. TYPE4 — Filtering based on signalling message types. TYPE5 — Filtering based on signalling message types and Call Reference Value. TYPE6 — Filtering based on signalling message types and Call Reference Flag. TYPE7 — Filtering based on signalling message types, Call Reference Value and Call Reference Flag.
SVCCFG:SIGFILTER:TYPE?	Queries the signalling filter type setting.
SVCCFG:SIGFILTER:CALLREFValue <value>	Sets the Call Reference Value to be used in filtering signalling messages.
SVCCFG:SIGFILTER:CALLREFValue?	Queries the Call Reference Value to be used in filtering signalling messages.

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SVCCFG Commands	Description
SVCCFG:SIGFILTER:CALLREFMask <value>	Sets the Call Reference Mask to be used in filtering signalling messages.
SVCCFG:SIGFILTER:CALLREFMask?	Queries the Call Reference Mask to be used in filtering signalling messages.
SVCCFG:SIGFILTER:CALLREFFlag <value>	Sets the Call reference flag for filtering. This can be either 0 or 1.
SVCCFG:SIGFILTER:CALLREFFlag?	Queries the Call reference flag for filtering.
SVCCFG:SIGFILTER:MSGTYPE <type1 type2...typeN>	Sets the message type(s) for filtering. Following message types are valid for this command. **Type** — **Meaning** SETUP — Filter on SETUP message. CONN — Filter on CONNECT message. CONNACK — Filter on CONNECT ACKNOWLEDGE message. CALLPROC — Filter on CALL PROCEEDING message. REL — Filter on RELEASE message. RELCMP — Filter on RELEASE COMPLETE message. STAT — Filter on STATUS message. STATENQ — Filter on STATUS ENQUIRY message. RST — Filter on RESTART message. RSTACK — Filter on RESTART ACKNOWLEDGE message. ALERT — Filter on ALERT message.
SVCCFG:SIGFILTER:MSGTYPE?	Queries the message type(s) selected for filtering signalling messages.
SVCCFG:DEFSETUP:CDPTY < addressing format, address>	Sets the default called party ATM address. The ATM address can be specified in the following formats: Format — Meaning NSAP — ISO-NSAP Addressing format E.164 — E.164 Addressing format. ISO-NSAP ATM address format is: < NetworkPrefix, ESI, SEL> E.164 Native ATM addressing format is: < E.164 Address digits> where, Network prefix — 13 octets ESI — 6 octets SEL — 1 octet E.164 address digits — 1-15 decimal digits The network prefix, ESI and SEL octets have to be specified in hexadecimal format.
SVCCFG:DEFSETUP:CDPTY?	Queries the default called party address setting.

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SVCCFG Commands	Description
SVCCFG:DEFSETUP:AALTYPE <type>	Sets the default AAL type.
SVCCFG:DEFSETUP:AALTYPE?	Queries the default AAL type.
SVCCFG:DEFSETUP:QOSCLASS <default QOS class>	Sets the default QoS class (used in both forward and backward directions).
SVCCFG:DEFSETUP:QOSCLASS?	Queries the default QoS class
SVCCFG:DEFSETUP:MAXSDUSIZE <default Max CPCS SDU size>	Sets the default maximum AAL5-CPCS SDU size (used in both forward and backward directions).
SVCCFG:DEFSETUP:MAXSDUSIZE?	Queries the default maximum AAL5-CPCS SDU size
SVCCFG:DEFSETUP:PCR0 <value>	Sets the default PCR for CLP0 (used in both forward and backward directions).
SVCCFG:DEFSETUP:PCR0?	Queries the default PCR for CLP0.
SVCCFG:DEFSETUP:PCR01 <value>	Sets the default PCR for CLP0+1 (used in both forward and backward directions).
SVCCFG:DEFSETUP:PCR01?	Queries the default PCR for CLP0+1.
SVCCFG:DEFSETUP:SCR0 <value>	Sets the default SCR for CLP0 (used in both forward and backward directions).
SVCCFG:DEFSETUP:SCR0?	Queries the default SCR for CLP0.
SVCCFG:DEFSETUP:SCR01 <value>	Sets the default SCR for CLP0+1 (used in both forward and backward directions).
SVCCFG:DEFSETUP:SCR01?	Queries the default SCR for CLP0+1.
SVCCFG:DEFSETUP:MBS0 <value>	Sets the default MBS for CLP0 (used in both forward and backward directions).
SVCCFG:DEFSETUP:MBS0?	Queries the default MBS for CLP0.
SVCCFG:DEFSETUP:MBS01 <value>	Sets the default MBS for CLP0+1 (used in both forward and backward directions).
SVCCFG:DEFSETUP:MBS01?	Queries the default MBS for CLP0+1.
SVCCFG:DEFSETUP:TAGging <requested / not requested>	Sets the default tagging requested parameter to "Requested" or "Not Requested" for both forward and backward directions.
SVCCFG:DEFSETUP:TAGging?	Queries the default tagging requested parameter.

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SVCCFG Commands	Description
SVCCFG:DEFSETUP:COMBination <value>	Sets the default traffic combination for both forward and backward directions. The following combinations are valid: **Combination** — **Meaning** COMB1 — PCR for CLP0 and CLP0+1 are specified. COMB2 — PCR for CLP0, CLP0+1 and tagging are specified. COMB3 — PCR for CLP0+1, SCR for CLP0 and MBS for CLP0 are specified. COMB4 — PCR for CLP0+1, SCR for CLP0, MBS for CLP0 and tagging are specified. COMB5 — PCR for CLP0+1 is specified. COMB6 — PCR for CLP0+1, SCR for CLP0+1 and MBS for CLP0+1 are specified.
SVCCFG:DEFSETUP:COMBination?	Queries the default traffic combination.
SVCCFG:DEFSETUP:TRAFtype <value>	Sets the default traffic type for both forward and backward directions. Valid traffic types are: RTVBR — Real time Variable Bit Rate NRTVBR — Non real time Variable Bit Rate UBR — Unspecified Bit Rate CBR — Constant Bit Rate ABR — Available Bit Rate
SVCCFG:DEFSETUP:TRAFtype?	Queries the default traffic type.
SVCCFG:DEFSETUP:ICR <value>	Sets the default ICR value for ABR SVCs.
SVCCFG:DEFSETUP:ICR?	Queries the default ICR value for ABR SVCs.
SVCCFG:DEFSETUP:RIF <value>	Sets the default RIF for ABR SVCs.
SVCCFG:DEFSETUP:RIF?	Queries the default RIF for ABR SVCs.
SVCCFG:DEFSETUP:RDF <value>	Sets the default RDF for ABR SVCs.
SVCCFG:DEFSETUP:RDF?	Queries the default RDF for ABR SVCs.
SVCCFG:DEFSETUP:MCR <value>	Sets the default MCR (minimum cell rate) for ABR SVCs.
SVCCFG:DEFSETUP:MCR?	Queries the default MCR (minimum cell rate) for ABR SVCs.
SVCCFG:DEFSETUP:TBE <value>	Sets the default TBE (Transient buffer exposure) for ABR SVCs. Valid range for TBE is 1 to (2^24 - 1).

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SVCCFG Commands	Description
SVCCFG:DEFSETUP:TBE?	Queries the default TBE (Transient buffer exposure) for ABR SVCs.
SVCCFG:TIMER <timer> <value>	Sets the value for UNI signalling protocol timers. **Timer** — **Meaning** T301 — Timer for ALERT T303 — Timer for SETUP T308 — Timer for RELEASE T309 — Timer for Link Connection T310 — Timer for Call Proceeding Received T313 — Timer for CONNECT T316 — Timer for RESTART T317 — Timer for RESTART received T322 — Timer for STATUS POLL — Timer for POLL pdu KEEPALIVE — Timer for Keep Alive NORESP — Timer between receipt of STAT pdu CC — Timer between BGN and END pdu IDLE — Idle timer period.
SVCCFG:TIMER <timer>?	Queries the value of UNI signalling protocol timer specified.
SVCCFG:SIGNalling <enable / disable>	Enables or disables signalling.
SVCCFG:SIGNalling?	Queries the status of signalling.

TXRX Branch

The commands in this branch are related to configuring SVC parameters like UNI version, station address, default SETUP message parameters etc..

TXRX Commands	Description
TXRX:CAPTURE:SCOPE <vpi,vci>	Sets the scope of data capture. The default scope is <0,0>. The scope has to be set to the VPI/VCI of the VCC on which capture of data is to be done. VPI.VCI can be specified in either hexadecimal or decimal formats.
TXRX:CAPTURE:SCOPE?	Queries the scope of data capture.
TXRX:CAPTURE:ENABLE <number of bytes>	Starts data capture for the specified number of bytes. The VC on which the capture is to be done should have been set using TXRX:CAPTURE:SCOPE command before to this. The number of bytes to capture can vary from 1 to 4096 bytes.
TXRX:CAPTURE:DISABLE	Stops data capture

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TXRX Commands	Description
TXRX:CAPTURE?	Queries the status of data capture operation. Returned values are: ON — Capture is proceeding on the VCC. OFF — Capture is not set on the VCC. COMPLETE <bytes> — Capture is complete with the specified number of bytes.
TXRX:CAPTURE:DATA <offset, number of bytes>	Queries the captured data. The command take the following parameters: Offset — Byte offset from which to display the captured data. Number of bytes — Number of bytes of captured data displayed from the specified offset. Valid values for Offset range from 1 to 4096. Valid number of bytes can range from 1 to 100.
TXRX:CAPTURE:SEND <vpi,vci,number of bytes>	Sends the captured and modified data on the specified VCC. The specified VCC should be a Transmit full PDU VCC in the VCC table. **Note:** The captured data can be optionally modified before sending using the*TXRX:CAPTURE:MODIFIED* command.
TXRX:CAPTURE:SEND?	Queries the status of the “captured and modified data send” operation. The return values could be any one of the following: ON — Sending of captured and modified data on the VCC is going on. OFF — Sending of captured and modified data on the VCC is completed.
TXRX:CAPTURE:MODIFY <offset, number of bytes, byte 1, byte 2, ...byte n>	Modifies the captured data. The bytes specified in the command are used to replace the bytes present in the captured data starting from the offset for the number of bytes. Valid values for offset range from 1 to 4096. Valid values for the number of bytes can range from 1 to 100. **Note:** The modified data is stored only internally in SCPI until the *TXRX:CAPTURE:SEND* command is issued. Once this command is issued, the modified data is sent to the ATM protocol processor for transmission.
TXRX:CAPTURE:MODIFY <offset, number of bytes>?	Queries the modified data.

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RX (Sense) Branch

The RX branch is used to set and retrieve Receive ATM settings. Alternatively, each command can be sent using the "SENS" or "SENSE" keyword instead of the “RX” keyword.

SENSe Command	Description
RX:QOSANLYS: TYPE <type>	Sets the QOS analysis test type. Valid values are: **Type** **Description** NONE Invalid test type CDV 1-point CDV analysis INTARRVL Cell inter-arrival time analysis
RX:QOSANLYS:TYPE?	Queries the QOS analysis test type.
RX:QOSANLYS: HDRS <header select>	Sets the header select for QOS analysis.
RX:QOSANLYS:HDRS?	Selects the mask header for QOS analysis.
RX:QOSANLYS: HDRM <header mask>	Sets the mask header for QOS analysis.
RX:QOSANLYS:HDRM?	Queries the header mask for QOS analysis.
RX:QOSANLYS: EXPCELLrate <cell rate>	Sets the expected cell rate. This is valid only for 1-point CDV analysis. The input format is based on the unit of measure for cell rates. Refer to the *ATMSYS:CELLRATE* command for setting the unit of measure.
RX:QOSANLYS: EXPCELLrate?	Queries the expected cell rate. This is valid only for 1-point CDV analysis. The output format is based on the unit of measure for cell rates. Refer to the *ATMSYS:CELLRATE* command for unit of measure information.
RX:QOSANLYS:START	Starts the QOS analysis test.
RX:QOSANLYS:STOP	Stops the QOS analysis test.
RX:QOSANLYS?	Queries the status of QOS analysis test. Returned values are START or STOP.
RX:QOSANLYS:MINCDV?	Queries the minimum 1-point CDV measurement. The value reported is in nano-seconds.
RX:QOSANLYS: MAXCDV?	Queries the maximum 1-point CDV measurement. The value reported is in nano-seconds.
RX:QOSANLYS: MINARRVL?	Queries the minimum cell inter-arrival time measurement. The value reported is in nano-seconds.
RX:QOSANLYS: MAXARRVL?	Queries the maximum cell inter-arrival time measurement. The value reported is in nano-seconds.

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5 Gigabit Ethernet SCPI Commands

Overview

This chapter describes the Gigabit Ethernet (GigE) SCPI commands supported by the configured unit. You may not have access to all commands based on the product configuration you purchased.

Supported GigE SCPI Commands

These commands are extensions to the SCPI command set. These commands are adapted to the configured unit and are unique to each protocol processor. SCPI commands should be typed on one single line completed with a hard carriage return. These commands require zero or one parameters, and return zero or one values.

RES (Fetch) Branch

The RES branch is used to retrieve Gigabit Ethernet results. Alternatively, each command can be sent using the "FETC" or "FETCH" keyword instead of the “RES” keyword.

The following is a list of supported RESULT commands.

RESULT Command	Description
RES:APS:AVG?	Queries and reports the average duration of an APS switch.
RES:APS:LAST?	Queries and reports the duration of the last APS switch.
RES:APS:MAX?	Queries and reports the duration of the longest APS switch.
RES:APS:MIN?	Queries and reports the duration of the shortest APS switch.
RES:APS:STATE?	Queries and reports the current APS switch state.
RES:BERT:BIT:AVGRATE?	Queries the average bit error rate.
RES:BERT:BIT:COUNT?	Queries the bit error count.
RES:BERT:BIT:CURRATE?	Queries the current bit error rate.
RES:BERT:BIT:ES?	Queries and reports the number of seconds a bit error was present.
RES:BERT:CODE:COUNT?	Queries and reports the code error count.
RES:BERT:CODE:AVGRATE?	Queries and reports the average code error rate.
RES:BERT:CODE:CURRATE?	Queries and reports the current code error rate.
RES:BERT:CODE:ES?	Queries and reports the number of seconds a code error was present.
RES:BERT:FCS:COUNT?	Queries and reports the Frame Check Sequence (FCS) error count.
RES:BERT:FCS:AVGRATE?	Queries and reports the FCS average error rate.
RES:BERT:FCS:CURRATE?	Queries and reports the current FCS error rate.
RES:BERT:FCS:ES?	Queries and reports the number of seconds an FCS error was present.
RES:BERT:FRAMERX:COUNT?	Queries the number of frames received during a bit-error-rate test.
RES:BERT:FRAMETX:COUNT?	Queries the number of frames sent during a bit-error-rate test.

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RESULT Command	Description
RES:BERT:PATSync:Secs?	Queries the number of seconds a loss of pattern was present.
RES:TXFRAMes?	Reports the total number of frames transmitted by the current Ethernet stream.
RES:RXFRAMes?	Reports the total number of frames received by the current Ethernet stream.
RES:TXBYTes?	Reports the total number of bytes transmitted by the current Ethernet stream.
RES:RXBYTes?	Reports the total number of bytes received by the current Ethernet stream.
RES:INVALid:FCS?	Reports the error count for invalid FCS errors.
RES:INVALid:IPCHECKsum?	Reports the error count for invalid IP checksum errors.
RES:UNDERsized?	Reports the error count for undersized frames.
RES:OVERsized?	Reports the error count for oversized frames.
RES:LOS:Secs?	Reports the LOS alarm seconds count.
RES:VLAN:TAGged?	Reports the number of received VLAN tagged frames.
RES:VLAN:QOS? <entry>	Reports the number of frames received for the selected QOS user priority level.
RES:PAUSE:FRAMes?	Reports the number of Pause packets received.
RES:PAUSE:QUANTas?	Reports the number of Pause Quantas received.
RES:PAUSE:ENDFRAMes?	Reports the number of Pause frames received with a Quantas value of 0.
RES:PACKets:IP?	Reports the number of IP packets received.
RES:PACKets:ICMP?	Reports the number of ICMP packets received.
RES:PACKets:UDP?	Reports the number of UDP packets received.
RES:PACKets:TCP?	Reports the number of TCP packets received.
RES:PACKets:BGP?	Reports the number of BGP packets received.
RES:PACKets:OSPF?	Reports the number of OSPF packets received.
RES:PACKets:IGMP?	Reports the number of IGMP packets received.
RES:PACKets:JUMBO?	Reports the number of Jumbo packets received.
RES:STRM:OUTofseq? <tgen> **Note:** <tgen> = traffic generator	Reports the number of out of sequence frames received by the Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
RES:STRM:TXFRAMes? <tgen>	Reports the number of packets transmitted by the selected Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
RES:STRM:RXFRAMes? <tgen>	Reports the number of packets received by the selected Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
RES:STRM:TXBYTes? <tgen>	Reports the number of bytes transmitted by the selected Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
RES:STRM:RXBYTes? <tgen>	Reports the number of bytes received by the selected Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
RES:STRM:VLANtagged? <tgen>	Reports the number of VLAN tagged packets received by the selected Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
RES:STRM:TXBW? <tgen>	Reports the number of bytes transmitted as a percentage of bandwidth. Valid <tgen> values are 1, 2, 3, or 4.

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RESULT Command	Description
RES:STRM:RXBW? <tgen>	Reports the number of bytes received as a percentage of bandwidth. Valid <tgen> values are 1, 2, 3, or 4.

TX (SOURce) Branch

The TX branch is used to set and retrieve Gigabit Ethernet transmit settings. Alternatively, each command can be sent using the "SOUR" or "SOURCE" keyword instead of the “TX” keyword.

The following is a list of supported Transmit commands.

Transmit Command	Description
TX:APS:ACTION?	Queries and reports the current setting of the APS Action State function. Valid responses are Single, Stop, and Continuous.
TX:APS:ACTION <state>	Starts and stops Gigabit Ethernet APS mode. Valid <state> values are: SINGle — Monitors for a single APS event. If the event occurs, the duration is reported and the state returns to Inactive. STOP — Stops APS monitoring. The state returns to Inactive. CONTinuos — Constantly monitors for APS events and updates the Protection Switch Time durations.
TX:APS:BAD?	Queries and reports the Consecutive Bad Time Required value. The value that appears is in milliseconds.
TX:APS:BAD <value>	Sets a value for the Consecutive Bad Time Required for a Gigabit Ethernet APS test. Values range from 0.1 to 409.0.
TX:APS:GOOD?	Queries and reports the Consecutive Good Time Required value. The value that appears in milliseconds.
TX:APS:GOOD <value>	Sets a value for the Consecutive Good Time Required for a Gigabit Ethernet APS test. Values range from 0.1 to 409.0.
TX:BERT:ERR:RATE?	Queries the current bit error rate.
TX:BERT:ERR:RATE <rate>	Sets the error rate. Valid values for <rate> are: **Rate** — **Description** 0 — Off. Stops error generation SINGLE — Single error generation; does not change the current generation rate N.NNe-NN — where each N is a numeral
TX:BERT:ERR:TYPE?	Queries and reports the current type of error configured for the BERT test.
TX:BERT:ERR:TYPE <error>	Sets the error type for the BERT test to one of the following types: **Error** — **Description** NONE — Stops error generation. BIT — Injects BIT errors into the payload pattern. FCS — Injects Frame Check Sequence errors into the payload pattern.
TX:BERT:FRAMESIZE?	Queries the frame size in bytes.
TX:BERT:FRAMESIZE <packet size>	Sets the frame size in bytes. Valid values for <packet size> range from 64 bytes to 9216 bytes.
TX:BERT:FRAMING?	Queries the current framing parameter.
TX:BERT:FRAMING <frame>	Sets the framing parameter. Valid values for <frame> are UNFRAMED and FRAMED.

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Transmit Command	Description
TX:BERT:PATTern?	Returns the current Gigabit Ethernet pattern value.
TX:BERT:PATTern <pattern>	Sets the expected Gigabit Ethernet receive pattern value. Valid values for <pattern> are: **Pattern** — **Description** <word> — Uses a user-defined 32-bit pattern. The pattern is entered using HEX notation. For example, TX:BERT:PATT #HFFFFFFFF. PRBS — Uses a PRBS pattern. INVPRBS — Uses an inverted PRBS pattern. LIVE — User data is received; no pattern is used. This is a receive only function.
TX:BERT:TESTMode?	Queries the current Test mode parameter.
TX:BERT:TESTMode <mode>	Sets the Test mode parameter. Valid values for <mode> are: ON — Starts a BERT test. It continues until the BERT test is turned off. OFF — Stops a BERT test.

RFC2544 Branch

The RFC2544 branch is used to configure and operate the Gigabit Ethernet's RFC 2544 functionality.

The following is a list of supported RFC2544 commands.

RFC 2544 Command	Description
RFC:THRUput:STREAMid?	Queries and reports which Ethernet stream is currently selected. Valid values that appear are 1, 2, 3, or 4.
RFC:THRUput:STREAMid <id>	Selects an existing Ethernet stream to use for the test. Valid <id> values are: 1 Stream ID 1 2 Stream ID 2 3 Stream ID 3 4 Stream ID 4 An error is returned if a stream ID, that does not exist, is entered. **Note:** Ethernet streams are created using the Packet Branch's **STRM:ADD** command.
RFC:THRUput:DURation?	Queries and reports the duration set, or remaining, for the RFC 2544 Throughput test. The value that appears is in seconds.
RFC:THRUput:DURation <secs>	Sets the duration (in seconds) for the RFC 2544 Throughput test. Valid values for <secs> range from 1 to 600.
RFC:THRUput:LOSSrate?	Queries and reports the packet loss rate threshold for the RFC 2544 Throughput test. This value specifies how many packets can be lost without signifying a failure.
RFC:THRUput:LOSSrate <rate>	Sets the acceptable packet loss rate for an RFC 2544 Throughput test. When this value is exceeded, this portion of the test is considered a failure. Valid <rate> values range from 1 to 100.
RFC:THRUput:RESolutionrate?	Queries and reports the granularity specified for determining the exact passing rate of the RFC 2544 Throughput test.

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RFC 2544 Command	Description
RFC:THRUput:RESolutionrate <rate>	Sets the granularity, or resolution rate, used to determine the passing rate of the RFC 2544 Throughput test. Valid values for <rate> range from 1 to 100.
RFC:THRUput:ACTivate?	Queries and reports the On/Off state of the RFC 2544 Throughput test. Values that appear are ON or OFF.
RFC:THRUput:ACTivate <state>	Starts and stops an RFC 2544 Throughput test. Valid <state> values are: ON Activates the test. OFF Deactivates the test.
RFC:THRUput:PASS? <size>	Returns the passing rate for a specific packet size. Valid <size> values are: 64, 128, 256, 512, 1024, 1280, or 1518.
RFC:THRUput:TX? <size>	Returns the number of transmitted packets for a specific packet size. Valid <size> values are: 64, 128, 256, 512, 1024, 1280, or 1518.
RFC:THRUput:RX? <size>	Returns the number of received packets for a specific packet size. Valid <size> values are: 64, 128, 256, 512, 1024, 1280, or 1518.
RFC:THRUput:MIN? <size>	Returns the minimum latency value for a specific packet size. Valid <size> values are: 64, 128, 256, 512, 1024, 1280, or 1518.
RFC:THRUput:MAX? <size>	Returns the maximum latency value for a specific packet size. Valid <size> values are: 64, 128, 256, 512, 1024, 1280, or 1518.
RFC:THRUput:AVG? <size>	Returns the average latency value for a specific packet size. Valid <size> values are: 64, 128, 256, 512, 1024, 1280, or 1518.
RFC:FRAMEloss:TX? <size> <rate>	Reports the total number of frames transmitted for a specific packet size and rate in an RFC 2544 Frame Loss test. Valid <size> values are: 64, 128, 256, 512, 1024, 1280, or 1518. Valid <rate> values are: 10, 20, 30, 40, 50, 60, 70, 80, 90, or 100.
RFC:FRAMEloss:RX? <size> <rate>	Reports the total number of frames received for a specific packet size and rate in an RFC 2544 Frame Loss test. Valid <size> values are: 64, 128, 256, 512, 1024, 1280, or 1518. Valid <rate> values are: 10, 20, 30, 40, 50, 60, 70, 80, 90, or 100.
RFC:FRAMEloss:ACTivate <state>	Starts and stops an RFC 2544 Frame Loss test. Valid <state> values are: ON Activates the test. OFF Deactivates the test.

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Packet Branch

The Packet branch is used to configure and operate the Gigabit Ethernet's Packet functionality.

The following is a list of supported Stream commands.

Stream Command	Description
STRM:NUMber?	Queries and reports the number of configured Ethernet streams. The following values can be returned: 0, 1, 2, 3, or 4. **Note:** If 0 is returned, all STRM commands are disabled except for **STM:ADD**.
STRM:ADD?	Queries and reports if an Ethernet stream can be added. The following values can appear: TRUE — Indicates that a stream can be added using the STRM:ADD command. FALSE — Indicates that no additional streams can be added until a stream is deleted. For example, if four Ethernet stream are currently defined, FALSE is returned. Another stream cannot be added unless one of the four existing stream is deleted (see **STRM:DELete** command).

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Stream Command	Description
STRM:ADD <all fields>	Creates an Ethernet stream. The <all fields> value contains 20 different parameters that define an Ethernet stream's profile. When adding a stream, use the following format guideline: STRM:ADD a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, where, a = MAC source address mask, see STRM:SRC:MASK:MAC command b = MAC source address, see STRM:SRC:MAC command c = MAC destination address mask, see STRM:DEST:MASK:MAC command d = MAC destination address, see STRM:DEST:MAC command e = IP source address mask, see STRM:SRC:MASK:IP command f = IP source address, see STRM:SRC:IP command g = IP destination address mask, see STRM:DEST:MASK:IP command h = IP destination address, see STRM:DEST:IP command *i = Not implemented. Use a null character or blank space for this value.* j = Payload, see STRM:PAYload command k = Payload user data. A value is only required if Payload is set to USER. Otherwise, enter a blank space for this value. See STRM:PAYload command *l = Not implemented. Use a null character or blank for this value.* m = Frame length, see STRM:FRAMELENgth command n = UDP source port, see STRM:SRC:PORT command o = UDP destination port, see STRM:DEST:PORT command p = Percent bandwidth, see STRM:BW command *q = Not implemented. Use a null character or blank space for this value.* r = VLAN tag, see STRM:VLAN:TAG command s = VLAN ID, see STRM:VLAN:ID command t = VLAN QOS, see STRM:VLAN:QOS command **Note:** If a value is not entered (a null character or blank space), the command's default value is used. For readability, use a blank space for items *i*, *l*, and *q* listed above. When entering values for items *a* through *t* listed above, do not use the <tgen> parameter that is listed in that command's description. Always place a comma after the last parameter. The following example illustrates how to create an Ethernet stream using the STRM:ADD command. STRM:ADD 16, 10-2b-3a-22-14-AA, 16, 10-2b-3a-22-14-FF, 8, 010. 011.010.111, , , , ONES, , , 64, , , 3, , ON, 20, 7,

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Stream Command	Description
STRM:UPDate <tgen>, <all fields> **Note:** Use the **STRM:GET?** command to view the current parameter values for a selected Ethernet stream.	Updates the parameters of an existing Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4. The <all fields> value contains 20 different parameters that define an Ethernet stream's profile. When updating an existing stream, use the following format guideline: STRM:UPDate <tgen>, a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, where, <tgen> = Stream's ID number (1, 2, 3, or 4). ***This is required.*** a = MAC source address mask, see STRM:SRC:MASK:MAC command b = MAC source address, see STRM:SRC:MAC command c = MAC destination address mask, see STRM:DEST:MASK:MAC command d = MAC destination address, see STRM:DEST:MAC command e = IP source address mask, see STRM:SRC:MASK:IP command f = IP source address, see STRM:SRC:IP command g = IP destination address mask, see STRM:DEST:MASK:IP command h = IP destination address, see STRM:DEST:IP command *i = Not implemented. Use a null character or blank space for this value.* j = Payload, see STRM:PAYload command k = Payload user data. A value is only required if Payload is set to USER. Otherwise, enter a blank space for this value. See STRM:PAYload command *l = Not implemented. Use a null character or blank for this value.* m = Frame length, see STRM:FRAMELENgth command n = UDP source port, see STRM:SRC:PORT command o = UDP destination port, see STRM:DEST:PORT command p = Percent bandwidth, see STRM:BW command *q = Not implemented. Use a null character or blank space for this value.* r = VLAN tag, see STRM:VLAN:TAG command s = VLAN ID, see STRM:VLAN:ID command t = VLAN QOS, see STRM:VLAN:QOS command **Note:** If a value is not entered (null character or blank space), the command's default value is used. For readability, use a blank space for items *i*, *l*, and *q* listed above. When entering values for items *a* through *t* listed above, do not use the <tgen> parameter that is listed in that command's description. Always place a comma after the last parameter. The following example illustrates how to create an Ethernet stream using the STRM:UPDate command. STRM:UPD 2, 16, 10-2b-3a-22-14-AA, 16, 10-2b-3a-22-14-FF, 8, 010. 011.010.111, , , , ONES, , , 64, , , 3, , ON, 20, 7,
STRM:GET? <tgen> **Note:** <tgen> = traffic generator	Returns the parameter values of a specific Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
STRM:DELete <tgen>	Deletes the selected Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.

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Stream Command	Description
STRM:CONTROL <tgen> <state>	Starts and stops the transmission of a selected Ethernet stream. Valid <tgen> values are 0 – Selects all defined streams 1 – Stream ID #1 2 – Stream ID #2 3 – Stream ID #3 4 – Stream ID #4 Valid <state> values are ON or OFF.
STRM:CONTROL? <tgen>	Queries and reports the transmission state (On or Off) for the selected Ethernet stream. Valid <tgen> values are: 0 – Queries all defined streams 1 – Queries Stream ID #1 2 – Queries Stream ID #2 3 – Queries Stream ID #3 4 – Queries Stream ID #4 **Note:** An error is returned if the selected stream does not exist. The following is an example of what is returned by this command if only a single stream is defined and enabled: Stream ID#1 ON. If four streams are defined, but only Stream 2 is On, then the following is an example of what is returned by this command when the 0 tgen value is used: Stream ID#1 OFF, Stream ID#2 ON, Stream ID#3 OFF, Stream ID#4 ON.
STRM:SRC:MASK:MAC? <tgen>	Reports the mask that is configured for the MAC source address of a specific Ethernet stream.
STRM:SRC:MASK:MAC <tgen> <mask>	Creates an address mask for an Ethernet stream's MAC source address. The MAC address is a 6-byte HEX value. Valid <tgen> values are 1, 2, 3, or 4. Valid <mask> values are: 0 Fixed address value is used (default), i.e., 10-2b-3a-22-14-12 8 Last address element is a variable, i.e., 10-2b-3a-22-14-XX 16 Last two address elements are variables, i.e., 10-2b-3a-22-XX-XX 24 Last three address elements are variables, i.e., 10-2b-3a-XX-XX-XX 32 Last four address elements are variables, i.e., 10-2b-XX-XX-XX-XX
STRM:SRC:MAC? <tgen>	Reports the MAC source address for a selected Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
STRM:SRC:MAC <tgen> <addr>	Creates and edits the MAC source address for a specific Ethernet stream. Valid values for <tgen> are 1, 2, 3, or 4. The <addr> parameter is a 6-byte HEX value (ranging from 0 to FF) and entered using the following format: XX-XX-XX-XX-XX-XX (default value is 00-00-00-00-00-00).
STRM:DEST:MASK:MAC? <tgen>	Reports the mask that is configured for the MAC destination address of a specific Ethernet stream.

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Stream Command	Description
STRM:DEST:MASK:MAC <tgen> <mask>	Creates an address mask for an Ethernet stream's MAC destination address. The MAC address is a 6-byte HEX value. Valid <tgen> values are 1, 2, 3, or 4. Valid <mask> values are: 0 Fixed address value is used (default), i.e., 10-2b-3a-22-14-12 8 Last address element is a variable, i.e., 10-2b-3a-22-14-XX 16 Last two address elements are variables, i.e., 10-2b-3a-22-XX-XX 24 Last three address elements are variables, i.e., 10-2b-3a-XX-XX-XX 32 Last four address elements are variables, i.e., 10-2b-XX-XX-XX-XX
STRM:DEST:MAC? <tgen>	Reports the MAC destination address for a selected Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
STRM:DEST:MAC <tgen> <addr>	Creates and edits the MAC destination address for a specific Ethernet stream. Valid values for <tgen> are 1, 2, 3, or 4. The <addr> parameter is a 6-byte HEX value (ranging from 0 to FF) and entered using the following format: XX-XX-XX-XX-XX-XX (default value is 00-00-00-00-00-00).
STRM:SRC:MASK:IP? <tgen>	Reports the Ethernet stream's IP source address. Valid <tgen> values are 1, 2, 3, or 4.
STRM:SRC:MASK:IP <tgen> <mask>	Creates an address mask for an Ethernet stream's IP source address. The IP address is an ASCII string entered using yyy.yyy.yyy.yyy format, where yyy is a value ranging from 0 to 255. Valid <tgen> values are 1, 2, 3, or 4. Valid <mask> values are: 0 Fixed address value is used (0.0.0.0 = default) , i.e., 127.0.1.8 8 Last address element is a variable, i.e., 127.0.1.XXX 16 Last two address elements are variables, i.e., 127.0.XXX.XXX 24 Last three address elements are variables, i.e., 127.XXX.XXX.XXX
STRM:SRC:IP? <tgen>	Reports the IP source address for a specific Ethernet stream.
STRM:SRC:IP <tgen> <addr>	Creates and edits the IP source address for a specific Ethernet stream. Valid values for <tgen> are: 1, 2, 3, or 4. The <addr> value is an ASCII string entered using the following format: XXX.XXX.XXX.XXX where, XXX is a value ranging from 0 to 255. Default <addr> is 0.0.0.0.
STRM:DEST:MASK:IP? <tgen>	Reports the Ethernet stream's IP destination address. Valid <tgen> values are 1, 2, 3, or 4.
STRM:DEST:MASK:IP <tgen> <mask>	Creates an address mask for an Ethernet stream's IP destination address. The address mask is an ASCII string entered using yyy.yyy.yyy.yyy format, where yyy is a value ranging from 0 to 255. Valid <tgen> values are 1, 2, 3, or 4. Valid <mask> values are: 0 Fixed address value is used (0.0.0.0 = default), i.e., 127.0.1.8 8 Last address element is a variable, i.e., 127.0.1.XXX 16 Last two address elements are variables, i.e., 127.0.XXX.XXX 24 Last three address elements are variables, i.e., 127.XXX.XXX.XXX

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Stream Command	Description
STRM:DEST:IP? <tgen> <addr>	Creates and edits the IP destination address for a specific Ethernet stream. Valid values for <tgen> are: 1, 2, 3, or 4. The <addr> value is an ASCII string entered suing the following format: XXX.XXX.XXX.XXX where, XXX is a value ranging from 0 to 255. Default <addr> is 0.0.0.0.
STRM:DEST:IP <tgen>	Reports the IP destination address for a specific Ethernet stream.
STRM:PAYload? <tgen>	Reports the type of payload used for a specific Ethernet stream.
STRM:PAYload <tgen> <pattern> <hex value>	Creates and edits the pattern used for the Ethernet stream's payload. Valid <tgen> values are 1, 2, 3, or 4. Valid <pattern> values are: USER Allows a user defined hex value to be entered for the pattern. See <hex value> below for more information. ONES Uses and All Ones pattern ZEROS Uses an All Zeros pattern (default) Valid <hex value> values range from 0 to FFFFFFFF. The <hex value> parameter is only used when the <pattern> parameter is set to USER.
STRM:FRAMELENgth? <tgen>	Reports the frame size for a specific Ethernet stream.
STRM:FRAMELENgth <tgen> <length>	Sets the frame size for a specific Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4. Valid <length> values range from 60 to 9220. (Default is 64.)
STRM:SRC:PORT? <tgen>	Reports the UDP source port value for a specific Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
STRM:SRC:PORT <tgen> <port>	Sets the UDP source port for a selected Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4. Valid <port> values range from 0 to 65535. (Default is 0.)
STRM:DEST:PORT? <tgen>	Reports the UDP destination port value for a specific Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
STRM:DEST:PORT <tgen> <port>	Sets the UDP destination port value for a specific Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4. Valid <port> values range from 0 to 65535. (Default is 0.)
STRM:BW? <tgen>	Reports the bandwidth value selected for a single Ethernet stream or the total bandwidth value for all configured Ethernet streams. Valid <tgen> values are: 1 Reports the bandwidth configured for stream 1. 2 Reports the bandwidth configured for stream 2. 3 Reports the bandwidth configured for stream 3. 4 Reports the bandwidth configured for stream 4. **Note:** If no <tgen> parameter is entered, then the command reports the total bandwidth used by all configured streams.
STRM:BW <tgen> <bw>	Sets the bandwidth percentage used for a selected Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4. Valid <bw> values range from 3 to 100. (Default is 100 percent.)
STRM:VLAN:ID? <tgen>	Reports the VLAN ID assigned to a specific Ethernet stream.
STRM:VLAN:ID <tgen> <id>	Assigns a VLAN ID to a specific Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4. Valid <id> values range from 0 to 4095. (Default is 0.)

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Stream Command	Description
STRM:VLAN:QOS? <tgen>	Reports the VLAN QOS value for a specific Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
STRM:VLAN:QOS <tgen> <qos>	Sets the VLAN QOS user priority level for a specific Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4. Valid <qos> values range from 0 to 7. (Default is 0.)
STRM:VLAN:TAG? <tgen>	Reports the VLAN tag value for a specific Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4.
STRM:VLAN:TAG <tgen> <tag>	Enables and disables VLAN tagging for a specific Ethernet stream. Valid <tgen> values are 1, 2, 3, or 4. Valid <tag> values ON (enables VLAN tagging) or OFF (disables VLAN tagging). Default is OFF.

GET Branch

The Get Branch SCPI commands act as batch commands by retrieving values for multiple unit parameters using a single SCPI command. This is similar to using the Transmit and Receive Function Group buttons to view various settings of the different protocol processors.

Many of the GET commands substitute a variable to report information about a specific test set. In this section, these commands are grouped together. Use the following table to locate a specific command.

Refer to this command...	For information about the following commands.
GET:PROTOcols?	Queries the types of protocol processors contained in the system. For example: STM4, E1@1, E1@2, etc. For Gigabit Ethernet, this command queries and reports the protocol processor ID, chassis ID, slot ID, and card ID for the Gigabit Ethernet protocol processor. This command is useful when multiple circuit packs are installed in the unit. For example, if a NIC Plus has two Gigabit Ethernet circuit packs installed, both circuit packs may appear as being installed in a single slot. To avoid this confusion, the GET:PROTO? command returns identity parameters for all circuit packs detected in the unit. Results for this command are returned in the following format: For circuit pack 1: 0 1 1 GIGE@1 0 1 1 GIGE@2 which means: Chassis ID 0, Slot 1, Card 1, GIGE Port 1; Chassis ID 0, Slot 1, Card 1, GIGE Port 2 For circuit pack 2: 0 1 2 GIGE@1 0 1 2 GIGE@2 which means: Chassis ID 0, Slot 1, Card 2, GIGE Port 1; Chassis ID 0, Slot 1, Card 2, GIGE Port 2

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6 OSA SCPI Commands

Overview

This chapter describes the Optical Spectrum Analyzer (OSA) SCPI commands supported by the configured unit. You may not have access to all commands based on the product configuration you purchased.

Supported OSA SCPI Commands

These commands are extensions to the SCPI command set. These commands are adapted to the configured unit and are unique to each protocol processor. SCPI commands should be typed on one single line completed with a hard carriage return. These commands require zero or one parameters, and return zero or one values.

RX (Sense) Branch

The RX branch is used to set and retrieve OSA Receive settings. Alternatively, each command can be sent using the "SENS" or "SENSE" keyword instead of the “RX” keyword.

SENSe Command	Description
RX:CBAND:SPACING?	Queries and reports the C-band channel spacing value.
RX:CBAND:SPACINGS <spacing>	Sets the C-band channel spacing. Valid values for <spacing> are: **Spacing (GHz)** — **Description** 50 — 50 GHz spacing 100 — 100 GHz spacing 200 — 200 GHz spacing
RX:CBAND:CHTABLE? **Note:** Error code -925 appears if no channel data is available.	Queries and returns C-band channel data. Data appears in a comma-delimited list, for example: A,B,C,D,E,F where, A is an C-band channel number which ranges from 1 to 80 (for example, C#3) B is the C-band Grid value C is the wavelength in nanometers (nm) D is the deviation value in picometers (pm) E is the channel power value F is the signal-to-noise ratio The following is an example of C-band channel data for a single channel: C#3,1570.40,1570.45,–100,–32.92,31.75 If multiple channels are listed, data is separated with a colon (:). For example: C#3,1570.40,1570.45,–100,–32.92,31.75:C#7,1470.40,1470.45,–90,–25.90,40.75
RX:LBAND:SPACING?	Queries and reports the L-band channel spacing value.

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SENSe Command	Description
RX:LBAND:SPACINGS <spacing>	Sets the L-band channel spacing. Valid values for <spacing> are: **Spacing (GHz)** **Description** 50 50 GHz spacing 100 100 GHz spacing 200 200 GHz spacing
RX:LBAND:CHTABLE? **Note:** Error code -925 appears if no channel data is available.	Queries and returns L-band channel data. Data appears in a comma-delimited list, for example: A,B,C,D,E,F where, A is an L-band channel number which ranges from 1 to 80 (for example, L#3) B is the L-band Grid value C is the wavelength in nanometers (nm) D is the deviation value in picometers (pm) E is the channel power value F is the signal-to-noise ratio The following is an example of L-band channel data for a single channel: L#3,1570.42,1570.33,–90,–33.25,35.82 If multiple channels are listed, data is separated with a colon (:). For example: L#3,1570.42,1570.33,–90,–33.25,35.82:L#7,1584.53,1584.56,30, –32.74,36.46
RX:REPBAND?	Queries and returns the type of band (C-band or L-band) that is being reported or monitored.
RX:REPBAND<band>	Sets the type of band that is being reported or monitored. Valid values for <band> are: CBAND or LBAND

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7 Error Codes

Overview

The error codes assist in debugging problems. These error codes can be returned from SCPI commands in request to a command or query that is invalid.

Error codes are returned in the following default format:

eror code number, “definition”

If you have existing SCPI command scripts that require error codes to be returned using only the error code number, use the **SYST:LEGACYR TRUE** command for this type of formatting. Refer to the SYST:LEGACYR? command for additional information.

Error Code	Definition
101	“Object not initialized “
102	“File read/write failed”
103	“Insufficient memory “
104	“Unauthorized User”
105	“Invalid protocol processor index”
201	“User not found”
202	“User not logged-in”
203	“Failed to add user “
204	“Failed to delete user”
205	“Failed to lock user”
206	“Invalid login name”
207	“Invalid password”
208	“User cannot modify privilege”
209	“Maximum logged sessions reached”
210	“Upgrade in progress”
211	“User already logged-in”
301	“Failed to initialize system”
302	“Failed to reboot”
303	“Invalid test ID”
304	“Failed to configure TCP configuration””
305	“Failed to configure RS232 configuration”
306	“Invalid RS232 configuration parameters”
307	“Failed to CPLD”
308	“Invalid CPLD data”
309	“Invalid date-time”
310	“Serial port is busy “
311	“Sound card failed”

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Error Code	Definition
312	“Invalid GPIB address”
313	“Invalid license key”
401	“Data manager, index out of range”
501	“Protocol manager, invalid PP type”
502	“Protocol manager, invalid CORBA-any”
503	“Protocol manager, invalid command type”
504	“Protocol manager, invalid preset command”
505	“Protocol manager, test unit active”
506	“Protocol manager, test unit locked”
507	“Protocol manager, user ID not found”
508	“Invalid protocol processor mode”
509	“Protocol processor not present”
601	“Invalid test unit ID”
602	“Invalid test ID”
603	“Invalid protocol processor lock attempt”
701	“Record not found”
702	“Duplicate record”
800	“Invalid registry key”
801	“Invalid registry entry”
802	“Incompatible versions”
803	“Failed to bind to CORBA”
804	“Invalid IP address”
900	“Unhandled internal error”
901	“Invalid Scrambling mode”
902	“Invalid unit of measure”
903	“Invalid for current scope”
904	“Invalid for current setting”
905	“Invalid for alarm type”
906	“Invalid error type”
907	“Invalid network impairment type”
908	“Invalid OAM type”
909	“Invalid AAL type”
910	“Invalid traffic type”
911	“Invalid receive status”
912	“Invalid transmit status”
913	“Invalid transmit/receive toggle (on/off) type”
914	“Transmit is on.”
915	“Transmit is off.”
916	“Receive is on.”
917	“Receive is off.”
918	“Invalid VCC table entry”

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Error Code	Definition
919	“Invalid scope”
920	“Invalid PMOMA block size specified”
921	“Invalid interface”
922	“Invalid mapping”
923	“Invalid framing”
924	“Invalid pattern”
925	“No modified data captured”
926	“Invalid background sequence”
927	“Invalid for current UNI version”
928	“Invalid SVC test type”
929	“Invalid UNI version”
930	“Unhandled exception”
931	“Invalid results”
932	“Invalid settings”
933	“Invalid ATM address format”
934	“Invalid UNI timer”
935	“Invalid QOS class specified”
936	“Invalid signal filter type specified”
937	“Invalid call reference flag specified”
938	“Invalid SVC message type”
939	“VCC entry is not an SVC”
940	“VCC entry not valid for O.191 RX pattern”
941	“Invalid O.191 flow type”
942	“Invalid QOS test type”
997	“Instrument Locked”
998	“Unauthorized user”
999	“User already logged in”
-100	“Command error”
-104	“Data type error”
-108	“Parameter not allowed”
-109	“Missing parameters”
-120	“Numeric data error”
-200	“Execution error”
-203	“Command protected”
-213	“Init ignored”
-222	“Data out of range”
-224	“Illegal parameter value”
-256	“File name not found”
-300	“System controller exception”
-310	“System exception”
-350	“Queue overflow”

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8 Register Definitions

Overview

The configured unit supports the following registers. The tables below define these registers.

*STB?
Status Byte (Immediate Response Queue)

BIT	Value
0	TCON Summary
1	Latched version of bit 3 (Summary of STATus: QUEStionable:EVENt?)
2	Errors are in Queue
3	QUEStionable Status Summary
4	MAV (Output available in its Queue)
5	Standard Event Status Register Summary
6	
7	

*ESR?
Standard Event Status Register (Immediate Response Queue)

BIT	Value
0	Operation Pending (Always zero, indicating done)
1	Request Control (Always zero)
2	Query Error (Indicates an error in the error queue is from a query)
3	Device-Dependent Error (Indicates existence of a fault)
4	Execution error (Always zero)
5	Command error (Indicates an error in the error queue is from a command)
6	User Request (Always zero)
7	Power on (Always zero)

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STATus:QUES?
Questionable Register

Refer to the *Status Branch* section in Chapter 2 for more information about Status Branch commands.

BIT	Value
0	E1@1 Summary
1	E1@2 Summary
2	E3 Summary
3	E4 Summary
4	DS1@1 Summary
5	DS1@2 Summary
6	DS3 Summary
7	SDH Summary
8	
9	
10	
11	
12	
13	
14	
15	Not Used - Forbidden

STATus:OPER:TCON?
Telecom Configuration Register (TCON)

Refer to the *Status Branch* section in Chapter 2 for more information about Status Branch commands.

BIT	Value
0	E1@1 Protocol Processor Selected
1	E1@2 Protocol Processor Selected
2	E3 Protocol Processor Selected
3	E4 Protocol Processor Selected
4	DS1 @ 1 Protocol Processor Selected
5	DS1 @ 2 Protocol Processor Selected
6	DS3 Protocol Processor Selected
7	SDH/SONET Protocol Processor Selected

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BIT	Value
8	
9	
10	
11	
12	
13	
14	
15	Not Used - Forbidden

DS1 Registers
STAT:QUES:DS1@1? and STAT:QUES:DS1@2

BIT	Value
0	DS1 Clock Sync Alarm
1	DS1 Loss of Signal
2	DS1 Loss of Frame
3	DS1 Loss of Pattern
4	DS1 Alarm Indication Signal (AIS)
5	DS1 COFA
6	DS1 RAI
7	DS1 Idle
8	Looped Tester
9	Loop Up Detected
10	Loop Down Detected
11	
12	
13	
14	
15	Not Used - Forbidden

DS3 Register
STAT:QUES:DS3?

BIT	Value
0	DS3 Clock Sync Alarm
1	DS3 Loss of Signal

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BIT	Value
2	DS3 Loss of Frame
3	DS3 Loss of Pattern
4	DS3 Alarm Indication Signal (AIS)
5	DS3 Idle
6	DS3 X-Bit Alarm
7	
8	
9	
10	
11	
12	
13	
14	
15	Not Used - Forbidden

E1 Registers
STAT:QUES:E1@1? and STAT:QUES:E1@2

BIT	Value
0	E1 Clock Sync Alarm
1	E1 Loss of Signal
2	E1 Loss of Frame
3	E1 Loss of Pattern (LSS)
4	E1 Alarm Indication Signal (AIS)
5	E1 CASMFL
6	E1 RAI
7	E1 RMFAI
8	E1 COFA
9	Payload Looped
10	Line Looped
11	
12	
13	
14	
15	Not Used - Forbidden

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E3 Register
STAT:QUES:E3?

BIT	Value
0	E3 Clock Sync Alarm
1	E3 Loss of Signal
2	E3 Loss of Frame
3	E3 Loss of Pattern
4	E3 Alarm Indication Signal (AIS)
5	E3 RDI (RAI)
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	Not Used - Forbidden

E4 Register
STAT:QUES:E4?

BIT	Description / Value
0	E4 Clock Sync Alarm
1	E4 Loss of Signal
2	E4 Loss of Frame
3	E4 Loss of Pattern
4	E4 Alarm Indication Signal (AIS)
5	E4 RDI (RAI)
6	
7	
8	
9	
10	
11	
12	
13	

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BIT	Description / Value
14	
15	Not Used - Forbidden

SDH/SONET Register
STAT:QUES:SDH? or STAT:QUES:SONET?

BIT	Value
0	Clock Sync
1	LOS
2	LOF
3	MS-AIS/AIS-L
4	MS-RDI/RDI-L
5	AU-AIS/AIS-P
6	AU-LOP/LOP-P
7	HP-UNEQ/UNEQ-P
8	HP-RDI/RDI-P
9	TU-AIS/AIS-V
10	TU-LOP/LOP-V
11	LP-UNEQ/UNEQ-V
12	LP-RDI/RDI-V
13	LP-RFI/RFI-V
14	Loss of Pat Sync
15	Not Used - Forbidden

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