SSU-2000e Synchronization Supply Unit
and the
SDU-2000e Synchronization Distribution Unit

Preliminary

Technical Reference
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How to Use This Guide

This section describes the format, layout, and purpose of this guide.

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Purpose of This Guide

The *SSU-2000 Technical Reference* describes the programming languages that you can use with the Symmetricom SSU-2000 Synchronization Supply Unit, and contains the alarms and events you can use to troubleshoot the SSU-2000.

Who Should Read This Guide

This Technical Reference guide contains detailed information and instructions which are intended to be performed by *qualified personnel only*.

Structure of This Guide

This guide contains the following chapters and appendixes:

Chapter, Title	Description
Chapter 1, Overview	Provides an overview of the *SSU-2000 Technical Reference*.
Chapter 2, TL1 Reference	Describes the TL1 command set available for use in the SSU-2000.
Chapter 3, ICS Command Reference	Describes the ICS command set available for use in the SSU-2000.
Chapter 4, NTP and SNMP	Provides an overview of the NTP and SNMP functions available in the SSU-2000.
Chapter 6, Alarms and Events	Lists the alarms and events that appear on the console and provides basic indications of the source of the alarm.
Chapter 7, Connector Pinouts	Lists the pinout of the connectors in the rear panel of the SSU-2000.
Chapter 8, Default Settings	Includes a list of the factory default values for hardware and software parameters.
Chapter 9, Specifications	Lists the specifications for the SSU-2000.
Chapter 10, Reference Materials	Contains a listing of standards related to synchronizing telecommunications networks.
Index	Provides references to individual topics within this guide.

Conventions Used in This Guide

This guide uses the following conventions:

- **Acronyms and Abbreviations** – Terms are spelled out the first time they appear in text. Thereafter, only the acronym or abbreviation is used.

- **Revision Control** – The title page lists the printing date and versions of the product this guide describes.

- **Typographical Conventions** – This guide uses the typographical conventions described in the table below.

When text appears this way...	... it means:
SSU-2000 User's Guide	The title of a document.
SSU CRITICAL	An operating mode, alarm state, status, or chassis label.
Select **File**, **Open**...	Click the Open option on the File menu.
Press **Enter** Press **;**	A named keyboard key. The key name is shown as it appears on the keyboard. An explanation of the key's acronym or function immediately follows the first reference to the key, if required.
SSU Username:	Text in a source file or a system prompt or other text that appears on a screen.
PING STATUS	A command you enter at a system prompt or text you enter in response to a program prompt. You must enter commands for case-sensitive operating systems exactly as shown.
A *re-timing* application	A word or term being emphasized.
Symmetricom ***does not*** recommend...	A word or term given special emphasis.

Warnings, Cautions, Recommendations, and Notes

Warnings, Cautions, Recommendations, and Notes attract attention to essential or critical information in this guide. The types of information included in each are explained in the following examples.

Warning: To avoid serious personal injury or death, *do not* disregard warnings. All warnings use this symbol. Warnings are installation, operation, or maintenance procedures, practices, or statements, that if not strictly observed, may result in serious personal injury or even death.

Caution: To avoid personal injury, *do not* disregard cautions. All cautions use this symbol. Cautions are installation, operation, or maintenance procedures, practices, conditions, or statements, that if not strictly observed, may result in damage to, or destruction of, the equipment. Cautions are also used to indicate a long-term health hazard.

ESD Caution: To avoid personal injury and electrostatic discharge (ESD) damage to equipment, *do not* disregard ESD cautions. All ESD cautions use this symbol. ESD cautions are installation, operation, or maintenance procedures, practices, conditions, or statements that if not strictly observed, may result in possible personal injury, electrostatic discharge damage to, or destruction of, static sensitive components of the equipment.

Electrical Shock Caution: To avoid electrical shock and possible personal injury, do not disregard electrical shock cautions. All electrical shock cautions use this symbol. Electrical shock cautions are practices, procedures, or statements, that if not strictly observed, may result in possible personal injury, electrical shock damage to, or destruction of components of the equipment.

Recommendation: All recommendations use this symbol. Recommendations indicate manufacturer-tested methods or known functionality. Recommendations contain installation, operation, or maintenance procedures, practices, conditions, or statements, that provide important information for optimum performance results.

Note: All notes use this symbol. Notes contain installation, operation, or maintenance procedures, practices, conditions, or statements, that alert you to important information, which may make your task easier or increase your understanding.

Related Documents and Information

Other helpful documents and software tools are listed below. See your Symmetricom representative or sales office for a complete list of available documentation.

- *SSU-2000e User's Guide*

- SynCraft management software

- TimePictra management software

> **Note:** Symmetricom offers a number of applicable training courses designed to enhance product usability. Contact your local representative or sales office for a complete list of courses and outlines.

Where to Find Answers to Product and Document Questions

For additional information about the products described in this guide, please contact your Symmetricom representative or your local sales office. You can also contact us on the web at www.symmetricom.com.

What's New in This Document

Revision F contains the following changes and new information:

- Added Retrieve Authorization Parameters, on page 45.

- Added Retrieve Bond Parameters, on page 46.

- Added Retrieve Bond Status, on page 47.

- Added the utc parameter to Retrieve Clock Status, on page 52.

- Added the compensation parameter to Retrieve GPS Input Parameters, on page 68.

- Added Retrieve Image, on page 71.

- Added PackeTime aid codes to Retrieve IP Parameters, on page 77.

- Added the gblk and ablk parameters to Retrieve LED, on page 79.

- Added the 256 value to the interval parameter in Retrieve NTP Parameters, on page 88.

- Added Retrieve NTP Module Parameters, on page 89.

- Added Retrieve NTP Module Status, on page 90.

- Added Retrieve NTP Peer Parameters, on page 91.

- Added PackeTime aid codes to Retrieve Ping, on page 101.

- Added the clkTodsrc parameter to Retrieve Reference Parameters, on page 102.

- Added Retrieve Route Parameters, on page 105.

- Added Retrieve Route Status, on page 106.

- Added Retrieve Service Parameters, on page 111.

- Added the `running` value to the `which` parameter, and added PackeTime parameters to Retrieve Setup Parameters, on page 112.

- Added Retrieve TOD Source, on page 125.

- Added Retrieve VLAN Status, on page 128.

- Added Set Authorization Parameters, on page 135.

- Added Set Bond Active, on page 136.

- Added Set Bond Parameters, on page 137.

- Added the tod_timeout parameter to Set Clock Parameters, on page 140 and Retrieve Clock Parameters, on page 51.

- Added Set Commit Parameters, on page 143.

- Added the compensation parameter to Set GPS Input Parameters, on page 150.

- Added Set Image, on page 152.

- Added PackeTime parameters to Set IP Parameters, on page 154.

- Added Set Module, on page 157.

- Added Set NTP Module Parameters, on page 162.

- Added Set NTP Peer Parameters, on page 163.

- Added Set Route Parameters, on page 167.

- Added Set Service Parameter, on page 172.

- Added Set TOD Source, on page 182.

- Added definitions for the user name and password in Set User Parameters, on page 183.

- Added Set VLAN Parameters, on page 184.

- Added text stating that you cannot enable or disable the Communications module in slot A2 in Other TL1 Commands, on page 184.

- Added Load Program, on page 187.

- Added the `TOD_TIMEOUT` parameter to CLK, on page 198.

- Added COMMIT, on page 203.

- Added the `CONFIG_CONFLICT` parameter to CONFIG, on page 204.

- Revised the Example response in HELP, on page 216.

- Added the `COMPENSATION` parameter to INPUT, on page 219.

- Added PackeTime-related information to IP, on page 224.

- Added a note to the addpeer option in NTP, on page 232.

- Added NTPQ, on page 234.

- Added PackeTime-related information to PING, on page 242.

- Added PTIME, on page 245.

- Added ROUTE, on page 251.

- Corrected the syntax for the level 3 command to include the aid as mandatory in SETUP, on page 253.

- Added TODSRC, on page 264.

- Added UPGRADE, on page 265.

- Modified the description of the add parameter in USERS, on page 266.

- Added VLAN, on page 269.

- Corrected the time interval in Broadcast Mode, on page 273.

- Corrected the signal loss of LMR-400 cable in Selecting the Proper Gain Antenna, on page 280.

- Added PackeTime Module Alarms and Events, on page 332.

- Updated the default alarm information in Table 6-3.

- Added Alarm 10, System Conflict to Table 6-4, Table 6-5, Table 6-6, and Table 6-7.

- Added PackeTime Module, on page 358.

- Added the PackeTime module section to Table 9-6.

Chapter 1 Overview

This chapter provides an overview of this guide.

In This Chapter

- SSU-2000e Control Languages

SSU-2000e Control Languages

Software embedded in the SSU-2000e hardware allows operators to query and manage an SSU-2000e from a local or remote management terminal using one of three control interfaces. These management agents allow operators to change factory default settings, set or restore stored configuration settings, configure and provision the SSU-2000e to meet the requirements of a unique environment, and perform maintenance and troubleshooting.

The SSU-2000e supports three control interfaces. Each grants access to command functions according to the security levels assigned to users. The control interfaces are:

- **TL1** – The Transaction Language One (TL1) control language, perhaps the dominant telecommunications industry ASCII command line interface, provides a standard man-machine language. The TL1 language is defined in Bellcore document TR-NWT-000831, Issue 3, Revision 1, December 1993.

- **ICS** – The Interactive Command Set (ICS) control language also called the ASCII command set, can be used to control the SSU-2000e from a terminal connected to one of the SSU-2000e EIA-232 serial ports.

- **SNMP** – The Simple Network Management Protocol (SNMP) protocol is based on a client server query-response mode and is supported by Ethernet only.

There are six main executables (software versions) available for the SSU-2000e as shown in Table 1-2. This section provides information about the TL1 and ICS control languages for all versions of software.

- Chapter 2, TL1 Reference, contains the TL1 commands and responses

- Chapter 3, ICS Command Reference, contains the ICS commands and responses

- Chapter 4, NTP and SNMP, describes NTP support functionality and identifies SNMP command functions, as well as features supported in this software version.

> **Recommendation:** To ensure optimal system performance using the Communications module main executable software shown in Table 1-2, Symmetricom recommends that the module hardware and software used be at the minimum revision levels as shown in Table 1-1.

Table 1-1. Module and Software Revision Levels

Module Part Number	Module Name	Software Revision Level	Hardware Revision level
23413013-001-0	DS1 1-Port Input Module	B	B
23413013-002-0	DS1 3-Port Input Module	B	B
23413014-001-0	E1 1-Port Input Module	B	B
23413014-002-0	E1 3-Port Input Module	B	B
23413019-000-0	GPS Input Module	A	A
23413279-000-0	CC Input Module	A	A
23413016-000-0	Clock Module (STR 2E)	B	A
23413015-000-0	Clock Module (STR 3E)	B	A
23413015-001-0	Clock Module (Type 1)	A	A
23413017-000-0	DS1 Output Module	A	C
23413018-000-0	E1 Output Module	A	C
23413159-000-0	2048 kHz Output Module	A	A
23413158-000-0	CC Output Module	A	A
23413287-000-0	RS-422 Output Module	A	A
23413292-000-0	E1/2048 kHz Output Module	A	A
23413012-000-0	Communications Module	A	E
23413012-001-0	Communications Module	A	E

Table 1-2. Communications Module Software Versions

Version	TL1	ICS	NTP	SNMP v2	SNMP v3
Basic System Load	X	X			
Basic w/NTP Support	X	X	X		
Basic w/SNMP v2 Support	X	X		X	
Basic w/SNMP v2 and NTP Support	X	X	X	X	
Basic w/SNMP v3 Support	X	X		X	X
Basic w/SNMP v3 and NTP Support	X	X	X	X	X

Chapter 2 TL1 Reference

This chapter provides detailed information about the Transaction Language One (TL1) that is used to communicate with the SSU-2000e.

In This Chapter

- TL1 Command Interface
- TL1 Retrieve Commands and Responses
- TL1 Set Commands
- Other TL1 Commands

TL1 Command Interface

Telcordia Technologies (formerly Bellcore) specifies the TL1 command interface for use as a standard man-machine language for controlling telecommunications network elements. TL1 provides command sets to support all operation, administration, maintenance, and provisioning tasks required to maintain and control an SSU-2000e. These tasks include configuring and provisioning security, monitoring system performance, configuring hardware, locating and handling faults, and performing equipment diagnosis and testing.

> **Note:** To communicate with the SSU-2000e, you must first connect a terminal to one of the three EIA-232-C serial communication ports and then provision the Ethernet port. Then you can communicate with the SSU-2000e using an Ethernet telnet session.

To set up an SSU-2000e port for TL1 communications:

1. Log on to one of the SSU-2000e EIA-232 serial ports using a Supervisor-level (or higher) user name and password.

2. Set port A, B, or L to TL1 mode. For example, to set the local port (COML) to TL1 mode, at the system prompt, type:

   `COMM L MODE TL1` then press **Enter**

   The communications mode settings for the COMM A and COMM B ports (located on the connection panel) are stored in non-volatile RAM, and remain in effect even after restarting the SSU-2000e.

   The communications mode settings for the COMM L (local) port (located on the Communications module) always default to ASCII (ICS) mode on startup.

3. To close the serial port for TL1 communications, type `EXIT::::0;` or send three **ESC**ape characters from the management terminal. This logs you out and returns the port to the default communications mode.

When you connect to the SSU-2000e via Ethernet port 2000 (decimal) using a Telnet-type application, the session opens in TL1 mode. Up to four sessions (users) can be connected to port 2000 at one time. Once you are connected, you must log in using the ACT-USER command with a user name and password (if security is active on the unit).

To log off the user and exit from an Ethernet session, type `CANC-USER:::0;`. Another user can then open a new session by using the ACT-USER command.

To log off the user, exit from an Ethernet session, and close the Ethernet connection to port 2000, type `EXIT:::0;`. The next user must first connect to port 2000 and then log in using the ACT-USER command.

Note: The automatic time-out is disabled for the port when you are communicating in TL1 mode using one of the serial communications ports or the Ethernet port.

TL1 Command and Response Conventions

This section describes general and specific conventions for expressing TL1 command and response parameters for the four types of operations application messages:

- **Input Command Message** – This message determines the action that the SSU-2000e will take. For a detailed description of input command messages and conventions, see Input Command Message Conventions, on page 28.

- **In-Process Acknowledgment** – The in-process acknowledgment (IP) response message is sent in response to a command that the SSU-2000e is unable to respond to within two seconds. For a detailed description of in-process acknowledgment response messages and conventions, see In-Process Acknowledgment Response Message Conventions, on page 29.

- **Output response message** – The output response message indicates whether the command was complied with (**COMPLD**) or denied (**DENY**). For a detailed description of output response messages and conventions, see Output Response Message Conventions, on page 30.

- **Autonomous response or report message** – The autonomous response or report message is an output generated by the SSU-200 due to an event, such as an alarm, or a change in status in the system. For a detailed description of autonomous response or report messages and conventions, see Autonomous Report Conventions, on page 32.

TL1 General Conventions

TL1 uses English-like acronyms and shorthand or abbreviations in a format that can be read and composed by humans.

Follow these general conventions for entering all TL1 parameters:

- Enter all command characters in upper-case. In the command syntax, lower-case characters indicate parameters that you must supply.

- All commands must contain the `cmd`, `tid`, and `ctag` fields.

- You may omit trailing commas in the parameters field.

- Terminate command lines with a terminating semicolon (`;`) and an end-of-line designator (`<cr><lf>` or `<cr lf>`). The SSU-2000e executes the command when it receives the terminating semicolon in the command entry.

- `^` is a blank that must appear in a command or response

- `:` is a block separator character

- `::` indicates a null field for a block

■ `;` indicates the end of the message

■ `<cr>` and `<lf>` or `<cr lf>` indicate the ASCII carriage return (CR) and line feed (LF) codes used as a line terminator and may be used separately or combined

■ The ASCII cancel code character (hex 18) can be used to cancel a partially sent command and clear the input buffer.

Input Command Message Conventions

Command messages entered and sent by the user determine the action that the SSU-2000e will take. Command messages are input messages, and are always followed by an acknowledgment or output response message.

The format for the input command message is:

`cmd:tid:[aid]:ctag[:[gb]:<other>;<cr lf>`

where:

■ `cmd` (Command) is a descriptive string of letters that represents the input command. The command string consists of a standard TL1 command verb, followed by one or two command modifiers. The modifiers identify the subject of the command verb and each may be as many as five characters. If two modifiers are used, they must be separated by dashes: `verb- mod1- mod2`.

■ `tid` (Target Identifier) represents the name assigned to the SSU-2000e. The assigned name must be either null or match the name assigned to the SSU-2000e. If the tid is not null, it may must begin with a letter and may contain up to 20 alphanumeric characters see Set Name, on page 160.

> **Note:** The SSU-2000e does not generate a response for entries without a valid tid.

■ `aid` (Access Identifier) is an optional field that represents the shelf, module, and port within the SSU-2000e to which the command is addressed or to which the response applies. The aid must be null (`::`, indicating ALL or not used), ALL (indicating all modules and ports related to the command type), or the aid assigned to an entity in the SSU-2000e.

Follow these conventions for entering the aid field:

    `SxAy-z`
    or   `ALL`

where:

    `S`   placeholder to indicate Shelf number
    `x`   SSU-2000e main (1) or expansion shelf (2-5) number
    `A`   placeholder to separate the shelf number form the slot position
    `y`   slot position (1-16)
    `z`   port number (1-20)
    `ALL` all modules or ports to which the command applies

Specify multiple aids using the ampersand (&)
Use a single ampersand (&) to indicate aid1 and aid2
Use a double ampersand (&&) to indicate a range from aid1 to aid2
The y or z part of the aid also uses the ampersand (&)

- `ctag` (Correlation Tag) field is a six-digit alpha-numeric message identifier code that is received with the command and returned in the response, for correlation of message and response within the operating system. The ctag can be any combination of six alpha-numeric characters randomly generated by the user.

- `gb` (General Block) is an field that is not used by the SSU-2000e but that you must indicate by a double colon, that is, by preceding any parameters following the ctag field with double colons (`::`).

- `other` is a field that is used for commands that require other information. The format for this field is specified in the individual command descriptions.

In-Process Acknowledgment Response Message Conventions

Each command received by the SSU-2000e with a valid tid generates a response when the terminating semicolon is received, followed by an output response message or the output response.

The SSU-2000e sends the in-process acknowledgment (IP) only if it is unable to respond to the command within two seconds. The requested response is then sent in full when the SSU-2000e data is available.

The in-process acknowledgment response always begins with a carriage return and two line feed characters, and ends with the header line containing the source identifier (**sid)**, defined below, and the **date^time** stamp.

The format for the IP acknowledgment message is:

```
<cr lf lf>
^^^sid^date^time <cr lf>
IP^ctag <cr lf>
<
```

where:

- `sid` (Source Identifier) is the returned ID, and is the same as the tid in the input command message to which the IP acknowledgment is responding.

- `date` is the current year, month, and day in the SSU-2000e in the format: YY-MM-DD.

- `time` is the current hours, minutes, and seconds timestamp information in the SSU-2000e in the 24-hour format: HH:MM:SS.

- `IP` is the in-process response message that the SSU-2000e sends in response to a command only if the SSU is unable to respond to the command within two seconds. The SSU sends the requested response in full when the data is available.

- `ctag` (Correlation Tag) field is a six-digit alpha-numeric message identifier code that is received with the command and returned in the response, for correlation of message and response within the operating system.

- The IP acknowledgment response always terminates with the less-than character (<). The semicolon appears after the requested output response message is sent.

Output Response Message Conventions
The output response indicates whether the SSU-2000e complied with (COMPLD) or denied (DENY) the input command.

COMPLD Output Response Message Conventions – If the message is received correctly and can be processed by the SSU-2000e within two seconds, the complied message is sent with data that was requested in the input command message. The requested data is included in the response message lines and is always enclosed in quotation marks.

The format for a complied (COMPLD) output response message is:

```
<cr lf lf>
^^^sid^date^time <cr lf>
M^^ctag^COMPLD <cr lf>
[^^^"response message" <cr lf>]
[...]
;
```

where:

- `sid` (Source Identifier) is the returned ID, and is the same as the tid in the input command message to which the IP acknowledgment is responding

- `date` is the current year, month, and day in the SSU-2000e in the format: YY-MM-DD

- `time` is the current hours, minutes, and seconds timestamp information in the SSU-2000e in the 24-hour format: HH:MM:SS

- `ctag` (Correlation Tag) field is a six-digit alpha-numeric message identifier code that is received with the command and returned in the response, for correlation of message and response within the operating system

- `COMPLD` is the complied message

- `"response message"` is the response message. The response message line for complied messages always begins with 3 spaces (^^^) followed by the response message enclosed in quotation marks, and terminated by <cr lf>. Multiple lines of response messages are allowed. Each command response is terminated by a semicolon following the last <cr lf>.

DENY Output Response Message Conventions – The DENY response contains a four-character error code (ercd) that describes the reason for the denied response. For example, the error code ICNV indicates *Input Command Not Valid*. The error codes are listed in Table 2-1.

The SSU-2000e sends the **DENY** response when:

■ the cmd is not valid

■ the aid is not valid

■ the ctag is not valid, indicated by a response containing the ctag set to a single zero character (0)

■ the unit is unable to comply with the request for the reason indicated by the ercd

The format for a denied (DENY) output response message is:

```
<cr lf lf>
^^^sid^date^time <cr lf>
M^^ctag^DENY <cr lf>
^^^ercd <cr lf>
```

where:

■ `sid` (Source Identifier) is the returned ID, and is the same as the tid in the input command message

■ `date` is the current year, month, and day in the SSU-2000e in the format: YY-MM-DD.

■ `time` is the current hours, minutes, and seconds timestamp information in the SSU-2000e in the 24-hour format: HH:MM:SS

■ `ctag` (Correlation Tag) field is a six-digit alpha-numeric message identifier code that is received with the command and returned in the response, for correlation of message and response within the operating system

■ `DENY` is the deny message

■ `ercd` (Error Code) is a four-character error code that explains the reason for the deny, and is one of the following defined codes (other error codes may be defined and used, if required).

Table 2-1. Denied Response Error Codes

Error Code	Definition
ICNV	Command Not Valid
IIAC	Invalid aid Code
IICT	Invalid ctag
IITA	Invalid Target Identifier
IPEX	Extra Parameter
IPMS	Parameter Missing
IPNV	Parameter Not Valid
SDNR	Data Not Ready

Autonomous Report Conventions

The SSU-2000e sends autonomous reports in response to a detected alarm condition or status change. You can select one of two formats for autonomous messages: GR-831 or GR-833. Use the RTRV-PRMTR-TL1FORMAT command to select which format is generated. These reports are similar to the RTRV-ALARM command responses, but contain an alarm code rather than the complied line.

The GR-831 format for an autonomous alarm report is:

```
<cr lf lf>
^^^sid^date^time <cr lf>
alrmcde^atag^REPT^ALM^[AIDTYPE]<cr lf>
^^^"aid:ntfcncde,condtype,srveff,ocrdat,ocrtm:condscr"<cr lf>
```

The GR-831 format for an autonomous event report is:

```
<cr lf lf>
^^^sid^date^time <cr lf>
alrmcde^atag^REPT^EVT<cr lf>
^^^"aid:ntfcncde,condtype,srveff,ocrdat,ocrtm:condscr"<cr lf>
```

where:

- `sid` is the source ID, and is the assigned name of the unit sending the message

- `date` is the current date in the format: YY-MM-DD

- `time` is the current timestamp information in the 24-hour format HH:MM:SS

- `alrmcde` (Alarm Code) indicates the severity level of the reported alarm or event. The alarm code is one of these four two-character codes:

  *C = critical alarm
  ** = major alarm
  *^ = minor alarm
  A^ = non-alarm event

- `atag` (Alarm Correlation Tag) is a six-digit correlation tag that is incremented each time a message is sent

- `REPT` (Report) indicates an autonomous report

- `AIDTYPE` indicates the cause for the report, such as input signal fault (INP or T1) or module hardware faults (EQPT)

- `"response message"` is the response message. The format for the response message line is:

  `^^^"[aid]:ntfcncde,condtype,srveff,ocrdat,ocrtm[:condscr]" <cr lf>`

  where:

  – `ntfcncde` (Notification Code) is an optional field that further describes the alarm or event in an output response or autonomous report, if required. The notification code is one of these two-character codes:

    CR Critical alarm;

    MJ Major alarm;

    MN Minor alarm:

    CL Cleared alarm;

    NA Event (not an alarm)

– `condtype` (Condition Type) indicates the type of alarm or event that the message is reporting

– `srveff` (Service Affecting or Not Service Affecting) indicates whether the response message affects service: SA (Service Affecting response) or NSA (Not Service Affecting response)

– `ocrdat` (Occurrence Date) indicates the date of occurrence in the format YY-MM-DD (year, month, day)

– `ocrtm` (Occurrence Time) indicates the time of the occurrence in the format HH:MM:SS (hours, minutes, seconds)

– `condscr` (Condition Description) is an optional text string which is sent with the alarm or event and which indicates the alarm or event condition

The GR-833 format for an autonomous alarm report is:

```
<cr lf lf>
^^^sid^date^time <cr lf>
alrmcde^atag^REPT^ALM^[AIDTYPE]<cr lf>
^^^"aid:ntfcncde,condtype,srveff,ocrdat,ocrtm:condscr"<cr lf>
```

where the terms are identified in this section.

The GR-833 format for an autonomous event report is:

```
<cr lf lf>
^^^sid^date^time <cr lf>
alrmcde^atag^REPT^EVT<cr lf>
^^^"aid:condtype,condeff,ocrdat,ocrtm,,,,:condscr"<cr lf>
```

where:

■ `condeff` defines the effect of the event on the system, as follows:

– CL indicates that a standing condition has been cleared

– SC indicates that a standing condition is raised

– TC indicates a transition of a condition.

If any alarm listed in Chapter 6, Alarms and Events, is set to Not Alarmed (NA), then `condeff` is set to SC when the alarm becomes active and CL when the alarm is cleared.

■ Other terms are identified in this section

System Security

The operating software of the SSU-2000e includes a subset of GR-815 security requirements, including user lockout, password aging, and login failure attempts. New commands allow an Administrator-level user to query the security log, set the login failed attempts threshold, set user lockout timer, and set the password-aging timer. New commands also allow you to back up and restore the configuration in the shelf.

In order to use the security features, the hardware and firmware in the SSU-2000e must be as shown in the following table.

Module	Module Part Number	Hardware Revision Required[1]	Firmware Code Part Number
Communications module	23413012-00x-0	A.00 or higher	14313012-000-5 Rev. M.00
Clock modules	23413015-00x-0 23413016-000-0	A.00 or higher A.00 or higher	14313015-000-5 Rev. M.00

Note:
[1] The hardware revision is on a label located on the front panel. You can display the hardware revision by issuing the TL1 command RTRV-INV, or the ICS command CONFIG.

The SSU-2000e system software allows you to set up a list of users with one of five access levels; each level has an increasing level of access to system functions and commands. Each incremental access level incorporates all of the options from the lower numbered access levels and additional options at that level. For instance, a User-level user does not have as many options available as a Technician-level user.

An Administrator-level user assigns the access level to each user when the user id and password is created. Table 2-2 summarizes each access level, ID number, and the operator privileges for each level.

Table 2-2. User Access Levels

Level	ID	Description
Idle	0	Access level 0 is available when no user is logged in. This level allows Idle-level users to view a list of available commands (HELP), syntax, software version number, unit id, or to login.
User	1	Users at the User level can execute level 0 commands and view information about the current configuration and operation, and change communication settings such as line termination and echo. Changes made by a User-level user remain in effect only until the user logs out.
Technician	2	Users at the Technician level (CRAFT persons) can perform levels 0 through 1 functions, and can read or set all installation functions.

Table 2-2. User Access Levels (Continued)

Level	ID	Description
Supervisor	3	Supervisor-level users can execute all commands at levels 0 through 2, and can read or set all functions.
Administrator	4	Administrator-level users can execute all levels of commands; they can view and set software configurations; they can also add, delete, or modify the user table, or log off any user from any port.

TL1 Retrieve Commands and Responses

This section contains an alphabetical listing of TL1 retrieve commands, a description of the command which provides the valid aid codes to use in the command, and an example and description of the components of message lines.

Retrieve 2048 kHz Clock Output Parameters

This command returns the settings for the 2048 kHz Output module or port designated by the aid.

Syntax

```
RTRV-PRMTR-CLKOUT:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves the parameters from all 2048 kHz Output modules in the shelf.
	SxAy[-z]	Retrieves parameters from the specified 2048 kHz Output module [or port].

Response Format

When the aid specifies a port, the response is:

```
^^^"aid:mode,level,bypass,fltmode,pstate,squelch" <cr lf>
```

where:

- `aid` = port access identifier

- `mode` = CLK

- `level` = minimum clock level to enable outputs on the module [ACQ | LOCK]

- `bypass` = allow Clock C selection: [ON | OFF]

- `fltmode` = determines if outputs are set to Fault [OFF | ON | AUTO] when signal levels drop below the threshold output level

- `pstate` = port state [1 | 0] (where 1 = ON and 0 = OFF)

- `squelch` = threshold value [0 | 1 – 16] (where 0 = disabled). If the reference clock PQL exceeds this value, then the output is turned off

When the aid specifies a module, the response is:

```
^^^"aid:mode,level,bypass,fltmode" <cr lf>
^^^"aid:pstate1,pstate2,…,pstate20" <cr lf>
^^^"aid:squelch1,squelch2,…,squelch20" <cr lf>
```

Line 1 contains:
- `aid` = module access identifier

- `mode` = CLK

- `level` = minimum clock level to enable outputs on the module [ACQ | LOCK]

- `bypass` = [ON | OFF] for allowing Clock C selection

- `fltmode` = determines if outputs are set to Fault [OFF | ON | AUTO] when signal levels drop below the threshold output level

Line 2 contains:
- `aid` = module access identifier

- `pstate#` = port state [1 | 0] (where 1 = ON and 0 = OFF), and # = port number [1 – 20]

Line 3 contains:
- `aid` = module access identifier

- `squelch#` = squelch value [0 | 1 – 16] and # = port number [1 – 20]

Related Commands
Set 2048 kHz Output Parameters, on page 130

Retrieve Alarm Cutoff

This command indicates whether the Alarm Cutoff (ACO) function is active in the SSU-2000e. The command creates a momentary change of state (pulse) on the alarm relay, which allows a specially-built alarm panel to squelch the audio alarm. Alarm panels that do not have this capability ignore the pulse. Contact your Symmetricom representative for further details on this alarm panel.

Syntax

```
RTRV-ACO:[tid]::ctag;
```

Response Format

```
"aco"<cr><lf>
```

where `aco` is [ACTIVE | INACTIVE]

Related Commands

Set Alarm Cutoff, on page 132

Retrieve Alarm Elevation Time

This command returns the time for alarm elevation, from 60 seconds to 500 000 seconds, for the specified module. A setting of 0 (zero) means the alarm does not automatically elevate to the next level. When an alarm has been at MINOR or MAJOR level continuously for `elevtime` seconds, then it is elevated to the next level.

Syntax

`RTRV-PRMTR-ELTIME:[tid]:[aid]:ctag;`

Parameter	Value	Description
`[aid]`	`SxAy`	Retrieves the elevtime parameter from the specified module.

Response Format

`^^^"aid:elevtime" <cr lf>`

where:

- `aid` = module access identifier

- `elevtime` = alarm elevation time for the specified module

Related Commands

Set Alarm Level Parameters, on page 134

Retrieve Module Alarms

This command returns only alarm information from the specified modules from the stored event data. An aid or aid range may be used to limit the report to specified modules. The aid code is optional. With an aid of ALL or null, all alarm data between start and stop time is returned.

Syntax

```
RTRV-EVENT-ALARM:[tid]:[aid]:ctag::[count],[start],[stop];
```

Parameter	Value	Description
[aid]	ALL or null	Retrieves alarm data between the specified start and stop time from all modules.
	SxAy	Retrieves alarm data between the specified start and stop time from the specified module.
[count]	1 – 500	Specifies the number of alarms to retrieve. The default count is 1.
[start]	MM-DD, HH:MM	Specifies the start date and time for data. If the date is null but followed by a time, the command defaults to the current date. If the start time is null, but preceded by a date, the command defaults to the current time. If the start date and time are null, the command defaults to the start of the data. The comma must be present to indicate a null start time.
[stop]	MM-DD, HH:MM	Specifies the stop date and time for data. If the date is null but followed by a time, the command defaults to the current date. If the stop time is null but preceded by a date, the command defaults to the current time. If the stop date and time is null, the command defaults to the end of the data.

Response Format

One line containing the time stamp and event message is returned for each alarm in the log.

```
^^^"aid:ntfcncde,condtype,srveff,ocrdat,ocrtm:condscr" <cr lf>
```

where:

- `aid` = module access identifier

- `ntfcncde` = Notification Code [CR | MJ | MN | CL]

- `condtype` = Condition Type (event number)

- `srveff` = service affecting flag [SA | NSA]: SA = service affecting, NSA = non-service affecting

- `ocrdat` occurrence date

- `ocrtm` = occurrence time

- `condstr` = condition description string

Example

```
  SSU_2000 06-05-30 14:54:54
M  100 COMPLD
    "S1A01:CL,1,NSA,06-05-30,13:47:14:\"Input Ref, Ok\""
    "S2A07:CL,4,NSA,06-05-30,13:47:13:\"Clk-C, Ok\""
    "S3A09:CL,4,NSA,06-05-30,13:47:13:\"Clk-C, Ok\""
    "S3A05:CL,4,NSA,06-05-30,13:47:13:\"Clk-C, Ok\""
    "S3A03:CL,4,NSA,06-05-30,13:47;13:\"Clk-C, Ok\""
;
```

Related Commands

Retrieve Events, on page 61
Retrieve Reports, on page 103

Retrieve Alarm Parameters

This command returns the alarm settings for the specified module, or ALL alarms if no aid is specified.

Syntax

RTRV-PRMTR-ALARM:[tid]:[aid]:ctag;

Parameter	Value	Description
[aid]	ALL	Retrieves all the alarm parameters from the shelf.
	SxAy[-z]	Retrieves alarm parameters from the specified module [or port].

Response Format

^^^"aid:almnum,level,startdelay,cleardelay"<cr lf>

where:

- aid = module or port access identifier

- almnum = alarm number

- level = Ignore, Report, Minor, Major, or Critical: [IGN|RPT|MIN|MAJ|CRT]

- startdelay = delay time or errored seconds count for start of the alarm

- cleardelay = cleared seconds count for clearing of the alarm. Delay numbers are reported only if they are settable for the alarm; otherwise they are reported as IMMED (immediate).

Related Commands

Retrieve All Alarms, on page 44

Retrieve Alarm Status

This command returns the current status of alarms from a specified module.

Syntax

`RTRV-STATUS-ALARM:[tid]:[aid]:ctag;`

Parameter	Value	Description
[aid]	SxAy	Retrieves the Alarm parameters from the specified module.

Response Format

`^^^"aid:almnum,stat" <cr lf>`

where:

- `aid` = module or port access identifier

- `almnum` = alarm number for that aid

- `status` = current state of each alarm condition [OK | BAD]

Related Commands

Retrieve Alarm Status, on page 43

Retrieve All Alarms

This command reports all active alarms from the SSU-2000e or designated modules or ports with an aid indicating which module or port is generating the alarm. The response is the complied message followed by the alarm report message(s).

There may be no lines or there may be multiple lines in the report, one for each active alarm. There is no report message for modules or ports that have no alarm condition.

Syntax

```
RTRV-ALARM:[tid]:[aid]:ctag;
```
or
```
RTRV-ALM:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves information for all alarms that are currently active in the entire shelf.
	SxAy[-z]	Retrieves information for all alarms that are currently active in the specified module [or port].

Response Format

```
<cr><lf><lf>

   sid date time<cr><lf>
M  ctag COMPLD<cr><lf>
   "<aid>,aidtype:ntfcncde,condtype,srveff,\"condscr\"<cr><lf>
   "<aid>,aidtype:ntfcncde,condtype,srveff,\"condscr\"<cr><lf>
     .
     .
   "<aid>,aidtype:ntfcncde,condtype,srveff,\"condscr\"<cr><lf>
;
```

where:

- `aid` = module or port access identifier

- `ntfcncde` = notification code (CR, MJ, MN, CL)

- `condtype` = condition type (event number)

- `srveff` = service affecting flag (SA, NSA)

- `condstr` = condition description string

Related Commands

Retrieve Authorization Parameters

This command returns the Authentication keys of the specified PackeTime module. If the key is set to zero, then nothing is returned in the keyid field.

Syntax
```
RTRV-PRMTR-AUTH:[tid]:aid:ctag;
```

Response Format
```
   "aid,index,keyid"<cr><lf>
;
```

where:

- `index` = defines a value of 1 through 8 to provide an index of the NTP server(s); the default is 1

- `keyid` = the module's authentication/encryption key

Related Commands
Set Authorization Parameters, on page 135

Retrieve Bond Parameters

This command returns the state of bonded-pair PackeTime modules.

Syntax

```
RTRV-PRMTR-BOND:[tid]:aid:ctag;
```

Response Format

```
    "aid,state"<cr><lf>
;
```

where:

- `state` = the specified aid's bond state ENA | DIS

Related Commands
Retrieve Bond Status, on page 47
Set Bond Active, on page 136
Set Bond Parameters, on page 137

Retrieve Bond Status

This command returns the status of bonded-pair PackeTime modules.

Syntax

```
RTRV-STATUS-BOND:[tid]:aid:ctag;
```

Response Format

```
    "aid,state,ip,pAstatus,pBstatus"<cr><lf>
;
```

where:

- `state` = the specified aid's bond state ENA | DIS

- `ip` = the shared IP address of bonded ports (or null if disabled)

- `pAstatus` = the bond status for Service port-A: ACT | STDBY | FAIL | null (if disabled)

- `pBstatus` = the bond status for Service port-B: ACT | STDBY | FAIL | null (if disabled)

Related Commands
Retrieve Bond Parameters, on page 46
Set Bond Parameters, on page 137

Retrieve CC Input Parameters

This command returns the settings for the Composite Clock Input module or port designated by the aid.

Syntax

`RTRV-PRMTR-CCINP:[tid]:[aid]:ctag;`

Parameter	Value	Description
[aid]	ALL	Retrieves the parameters from all CC Input modules in the shelf.
	S1Ay[-z]	Retrieves parameters from the specified CC Input module [or port].

Response Format

`^^^"aid:pstate,pri,pql,mode,zs" <cr lf>`

where:

- `aid` = module or port access identifier

- `pstate` = port enabled state [ON | OFF]

- `pri` = priority 1 (highest) through 10 (lowest) or MON for monitor

- `pql` = provisioned priority quality level [1 – 16]

- `mode` = CC, indicating Composite Clock

- `zs` = zero suppression [NA]

Related Commands

Retrieve CC Output Parameters

This command returns the settings for the Composite Clock Output module and port designated by the aid.

Syntax

```
RTRV-PRMTR-CCOUT:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves the parameters from all CC Output modules in the shelf.
	SxAy[-z]	Retrieves parameters from the specified CC Output module [or port].

Response Format

When the aid specifies a port, the format for each response message line is:

```
^^^"aid:mode,level,bypass,pstate,duty,pcomp"<cr lf>
```

where:

- `aid` = port access identifier

- `mode` = CC (composite clock)

- `level` = minimum clock level to enable outputs on the module [WARM | ACQ | LOCK]

- `bypass` = allow Clock C selection: [ON | OFF]

- `pstate` = port state [ON | OFF]

- `duty` = duty cycle of the modules outputs [1 | 0] where 1 = 5/8 and 0 = 50/50

- `pcomp` = phase compensation [1 – 7] where 7 = no compensation and 0 = 2200 ft. The resolution is 275 ft.

When the aid specifies a module, then the response is four lines as follows:

```
^^^"aid: mode,level,bypass"<cr lf>
^^^"aid:pstate1,pstate2,pstate3,…pstate20"<cr lf>
^^^"aid:duty1,duty2,duty3,…duty20"<cr lf>
^^^"aid:pcomp1,pcomp2,pcomp3,…,pcomp20"<cr lf>
```

Line 1 contains:
- `aid` = module access identifier

- `mode` = CC

- `level` = minimum clock level to enable outputs on the module [WARM | ACQ | LOCK]

- `bypass` = allow Clock C selection: [ON | OFF]

Line 2 contains:
- aid = module access identifier

- `pstate#` port state [1| 0] where (1 = ON, 0 = OFF), and # = port number 1 through 20

Line 3 contains:
- `aid` = module access identifier

- `duty#` = duty cycle of the module outputs [1|0], where 1 = 5/8, 0 = 50/50

Line 4 contains:
- `aid` = module access identifier

- `pcomp#` = phase compensation [1 – 7] and # = port number 1 through 20

Related Commands

Set CC Output Parameters, on page 139

Retrieve Clock Parameters

This command returns the settings for the Clock module designated by the aid.

Syntax

```
RTRV-PRMTR-CLK:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves parameters from all Clock modules in the shelf.
	S1A1 | S1A12	Retrieves parameters from the specified Clock module.

Response Format

```
^^^"aid:warmup,mintau,maxtau,clkar,inpswt,inpsel,mintaulimit,maxtau
limit,tod_timeout" <cr lf>
```

where:

- `aid` = Clock module access identifier

- `warmup` = warmup delay time in s

- `mintau` = starting time constant in s

- `maxtau` = final time constant value in s

- `clkar` = current setting for the Clock Auto-Return mode [ON | OFF]

- `inpswt` = input switch {AR|AS|OFF} for Auto-Return (revertive), Auto-Switch (but not revertive), or no auto switch

- `inpsel` = {PRI|PQL} for priority or sync message (PQL) selection of inputs

- `mintaulimit` = minimum tau limit

- `maxtaulimit` = maximum tau limit

- `tod_timeout` = time that the clock can operate without a valid TOD source before indicating that the source is invalid

Related Commands

Retrieve Clock Status

This command returns the clock status, loop mode, current time constant value and current priority quality level (pql).

Syntax

```
RTRV-STATUS-CLK:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves the parameters from both Clock modules.
	S1A1 S1A12	Retrieves the parameters from the designated Clock module.

Response Format

Two message lines are returned if aid = ALL, one for each clock module (if both modules are installed). One message line is returned for the specified Clock module. The format for each response line is:

```
^^^"aid:mstat,mode,tau,pql,(offset),(sigma),utc" <cr lf>
```

where:

- aid = the access identifier of the Clock module whose status is being displayed

- mstat = module status [OK | SEL | DIS | FLT]

- clock mode = [WARM | ACQ | LOCK | HOLD]

- tau = current time constant in seconds for the clock control loop

- pql = Stratum Level of the clock

- offset = clock frequency offset

- sigma = clock frequency sigma value

- utc = indicates if the clock ToD has been synchronized with GPS or PackeTime = YES | NO

Example

```
;rtrv-status-clk:::0;

    SSU_2000 08-04-09 15:33:12
M  0 COMPLD
    "S1A01:SEL,LOCK,9000,2,(-9.23E-10),(1.46E-09),YES"
    "S1A12:OK,LOCK,450,2,(-4.05E-09),(2.37E-09),YES"
;
```

Retrieve Communication Parameters

This command returns the current serial communications protocol settings for the SSU-2000e.

Syntax

RTRV-PRMTR-COMM:[tid]:[aid]: ctag;

Parameter	Value	Description
[aid]	ALL	Retrieves the parameters from all communication ports in the shelf.
	COML | COMA | COMB	Retrieves parameters from the specified serial port.
	TELNET | TL1	Retrieves parameters from the specified telnet port.

Response Format

When the aid specifies a port, the format for the response message line is:

^^^"aid:baud,echo,eol,mode,tout"<cr lf>

where:

- aid = communication port access identifier

- baud = communications baud rate [19200 | 9600 | 4800 | 2400 | 1200]

- echo = indicates if the port operates in full-duplex or half-duplex [ON | OFF]

- eol = indicates the end-of-line character used when the unit transmits ASCII data [CR | LF | CRLF]

- mode = mode of communication [ASCII | TL1]

- tout = inactivity timeout period before the session is logged out [value | NEVER]

When the aid specifies a Telnet port, the format of the response message is:

^^^"aid:,,,,tout"<cr lf>

where:

- aid = communication port [TELNET | TL1]

- tout = inactivity timeout period before the session is logged out [value | NEVER]

Related Commands

Set Communication Parameters, on page 144

Retrieve Configuration

This command is replaced with the Retrieve Inventory command.

Retrieve Configuration Date

This command returns the date and time of the last configuration change.

Syntax

```
RTRV-COND:[tid]::ctag;
```

Response Format

```
"LSTCFGC:ocrdat,ocrtm"<cr><lf>
```

where:

- `ocrdat` is the date of the last configuration change

- `ocrtm` is the time of the last configuration change

Example

```
    SSU_2000 06-05-30 14:19:22
M  100 COMPLD
    "LSTCFGC:06-05-30,14:14:47"
;
```

Related Commands

Retrieve DS1/E1 Input Parameters

This command returns the settings for the DS1 or E1 Input module or port designated by the aid.

Syntax

`RTRV-PRMTR-INPUT:[tid]:[aid]:ctag;`

Parameter	Value	Description
`[aid]`	`ALL`	Retrieves the parameters from all DS1 or E1 Input modules in the shelf.
	`SxAy[-z]`	Retrieves parameters from the specified DS1 or E1 Input module [or port].

Response Format

`^^^"aid:pstate,pri,pql,mode,ssm,zs,crc,gain,csflt,bit" <cr lf>`

where:

- `aid` = module or port access identifier

- `pstate` = port enabled state [ON | OFF]

- `pri` = priority 1 (highest) through 10 (lowest) or MON for monitor

- `pql` = provisioned priority quality level [1 – 16]

- `mode` = framing type or clock frequency in MHz: [ESF | D4 | CCS | CAS | 1 | 1.544 |2.048 | 5 | 10]

- `ssm`, `zs`, `crc`, and `gain` = [ON | OFF]

- `csflt` = Cesium fault [HI | LO | OFF | NA]

- `bit` = bit number 4 through 8 of the Time Slot 0 word used for the E1 sync status message

Related Commands

Set DS1/E1 Input Parameters, on page 146

Retrieve DS1/E1 Output Parameters

This command returns the DS1 or E1 Output module or port settings specified by the aid.

Syntax

```
RTRV-PRMTR-OUTPUT:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves the parameters from all DS1 or E1 Output modules in the shelf.
	SxAy[-z]	Retrieves parameters from the specified DS1 or E1 Output module [or port].

Response Format

When the aid specifies a port, the response is:

```
^^^"aid:mode,level,bypass,zs,crc,bit,pstate,len" <cr lf>
```

where:

- `aid` = port access identifier

- `mode` = output signal mode [ESF | D4 | CCS | CAS]

- `level` = minimum clock level to enable outputs on the module [ACQ | LOCK]

- `bypass` = allow Clock C selection [ON | OFF]

- `zs` = zero suppression [ON | OFF]

- `crc` = error checking [ON | OFF]

- `bit` = SSM bit [4 – 8] for E1 sync status messages

- `pstate` = port enabled state [ON | OFF]

- `len` = line length setting in feet [133 | 266 | 399 | 533 | 655] for DS1 outputs

When the aid specifies a module, the response is:

```
^^^"aid:mode,level,bypass,zs,crc,bit" <cr lf>
^^^"aid:pstate1,pstate2,…pstate20" <cr lf>
^^^"aid:len1,len2,len3,…,len20" <cr lf>
```

where:

Line 1 contains:
- `aid` = module access identifier

- `mode` = outputs signal mode: [ESF | D4 | CCS | CAS]

- `level` = minimum clock level to enable outputs on the module [ACQ | LOCK]

- `bypass` = allow Clock C selection: [ON | OFF]

- `zs` = zero suppression [ON | OFF]

- `crc` = error checking [ON | OFF]

- `bit` = SSM bit [4 – 8] for E1 sync status messages

Line 2 contains:
- `aid` = module access identifier

- `pstate#` = port enabled state [1 | 0] (1 = ON and 0 = OFF), and `#` is the port number [1 – 20]

Line 3 contains:
- `aid` = module access identifier

- `len#` = line length setting in feet [133 | 266 | 399 | 533 | 655] for all 20 DS1 output ports, and `#` is the port number [1 – 20]

Related Commands

Set DS1/E1 Output Parameters,

Retrieve E1/2048 kHz Output Parameters

This command returns the settings for the E1/2048 kHz Output module or port designated by the aid.

Syntax

```
RTRV-PRMTR-OUTE12048:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves the parameters from all E1/2048 kHz Output modules in the shelf.
	SxAy[-z]	Retrieves parameters from the specified E1/2048 kHz Output module [or port].

Response Format

When the aid specifies a port, the format for each line is:

```
^^^"aid:mode,bypass,zs,signal,pstate,squelch,crc,ssm,bit"<cr lf>
```

where:

- `aid` = port access identifier

- `mode` = multiframe selection [CAS | CCS]

- `bypass` = allow Clock C selection: [ON | OFF]

- `zs` = zero suppression [ON | OFF]

- `signal` = port signal type [E1 | 2048]

- `pstate` = port state [ON | OFF]

- `squelch` = threshold value [0 | 1 – 16] (where 0 = disabled). If the reference clock PQL exceeds this value, then the output is turned off.

- `crc` = error checking [ON | OFF]

- `ssm` = Sync Status Messaging enabled [ON | OFF]

- `bit` = bit number [4 – 8] of the Time Slot 0 word used for the E1 sync status message

When the aid specfies a module, then the response is four lines as follows:

```
^^^"aid: mode,bypass,zs,crc,ssm,bit"<cr lf>
^^^"aid:signal1,signal2,signal3,…signal20"<cr lf>
^^^"aid:pstate1,pstate2,pstate3,…pstate20"<cr lf>
^^^"aid:squelch1,squelch2,squelch3,…squelch20"<cr lf>
```

where:

Line 1 contains:

- `aid` = module access identifier

- `mode` = multiframe selection [CAS | CCS]

- `bypass` = allow Clock C selection [ON | OFF]

- `zs` = zero suppression [ON | OFF]

- `crc` = error checking [ON | OFF]

- `ssm` = Sync Status Messaging enabled [ON | OFF]

- `bit` = bit number 4 through 8 of the Time Slot 0 word used for the E1 sync status message

Line 2 contains:

- aid = module access identifier

- `signal#` = port signal type [E1 | 2048], and # = port number [1 – 20]

Line 3 contains:

- aid = module access identifier

- `pstate#` = port state [ON | OFF], and # = port number [1 – 20]

Line 4 contains:

- aid = module access identifier

- `squelch#` = threshold value [0 | 1 – 16] (where 0 = disabled). If the reference clock PQL exceeds this value, then the output is turned off. # = port number [1 – 20]

Related Commands

Set E1/2048 kHz Output Parameters, on page 148

Retrieve Events

This command returns stored event data from any or all modules. An aid or aid range may be used to limit the report to specified modules. The aid code is optional. With an aid of ALL or null, all event data between start and stop time is returned.

Syntax

```
RTRV-EVENT:[tid]:[aid]:ctag::[count],[start],[stop];
```

Parameter	Value	Description
[aid]	ALL	Retrieves event data between the specified start and stop time from all modules.
	SxAy	Retrieves event data between the specified start and stop time from the specified module.
[count]	1 – 500	Specifies the number of events to retrieve. The default count is 1.
[start]	MM-DD, HH:MM	Specifies the start date and time for data. If the date is null but followed by a time, the command defaults to the current date. If the start time is null, but preceded by a date, the command defaults to the current time. If the start date and time are null, the command defaults to the start of the data. The comma must be present to indicate a null start time.
[stop]	MM-DD, HH:MM	Specifies the stop date and time for data. If the date is null but followed by a time, the command defaults to the current date. If the stop time is null but preceded by a date, the command defaults to the current time. If the stop date and time is null, the command defaults to the end of the data.

Response Format

One line containing the time stamp and event message is returned for each event in the log.

```
^^^"aid:ntfcncde,condtype,srveff,ocrdat,ocrtm:condscr" <cr lf>
```

where:

- `aid` = module access identifier
- `ntfcncde` = notification code [CR | MJ | MN | CL]
- `condtype` = condition type (event number)
- `srveff` = service affecting flag [SA | NSA]: SA = service affecting, NSA = non-service affecting
- `ocrdat` = occurrence date
- `ocrtm` = occurrence time
- `condstr` = condition description string

Example

```
    SSU_2000 06-05-30 14:53:56
M   100 COMPLD
    "S1A01:NA,147,NSA,06-05-30,14:14:57:\"Output Pql, 2\""
    "S1A01:NA,146,NSA,06-05-30,14:14:49:\"Inp Select, 1A05-01\""
    "S1A05:NA,193,NSA,06-05-30,14:14:46:\"Priority, 1, TELA\""
    "S1A02:NA,158,NSA,06-05-30,14:11:15:\"NTP Mode, CLIENT\""
;
```

Related Commands

Retrieve Module Alarms, on page 40
Retrieve Reports, on page 103

Retrieve Frequency Data

This command returns the current frequency measurements for the specified input(s) on the DS1, E1, Sine, and GPS Input modules.

Syntax

```
RTRV-DATA-FREQ:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves the current frequency measurements from all modules that are currently active in the entire shelf.
	S1Ay[-z]	Retrieves the current frequency measurements from the specified module [or port].

Response Format

```
^^^"aid:(freqa),(freqb)"<cr lf>
```

where:

- `aid` = module or port access identifier

- `freqa` = frequency of the port versus clock A

- `freqb` = frequency of the port versus clock B

Example

```
    SSU_2000 06-06-26 13:38:57
M  100 COMPLD
    "S1A03-01:(0),(0)"
    "S1A03-02:(0),(0)"
    "S1A03-03:(0),(0)"
    "S1A04-01:(-3),(-31)"
    "S1A05-01:(5),(-23)"
    "S1A06-01:(0),(0)"
    "S1A06-02:(0),(0)"
    "S1A06-03:(0),(0)"
;
```

Related Commands

Retrieve Frequency Parameters

This command returns the MTIE threshold settings for the specified port on a DS1, E1, Sine, or GPS Input module.

Syntax

`RTRV-PRMTR-FREQ:[tid]:[aid]:ctag;`

Parameter	Value	Description
`[aid]`	`ALL`	Retrieves the MTIE threshold parameters from all Input modules in the shelf.
	`S1Ay-z`	Retrieves the MTIE threshold parameters from the specified input port.

Response Format

`^^^"aid:freq,fae,fac,fbe,fbc,fatau,fbtau" <cr lf>`

where:

- `aid` = access identifier of the port

- `fae` = frequency error threshold for A

- `fac` = clear threshold for A

- `fbe` = error threshold for B

- `fbc` = clear threshold for C

- `fatau` = frequency error for A

- `fbtau` = frequency error for B

Related Commands

Retrieve GPS Available Data

This command returns the current tracking data for the specified GPS Input module. If the input specified is not a GPS Input module, a DENY response is returned.

Syntax

```
RTRV-DATA-GPS-AVAIL:[tid]:[aid]:ctag;
```

Parameter	Value	Description
`[aid]`	`S1A3|S1A5`	Retrieves satellite data from the specified GPS Input module.

Response Format

A valid response message contains up to 12 lines. Each line displays information for one of the satellites currently being tracked. The format is:

```
^^^"aid:chan,pn,health,azimuth,elevation"<cr lf>
```

where:

- `aid` = module access identifier

- `chan` = channel number for tracking the satellite

- `pn` = satellite PN code

- `health` = current health of the satellite: H (healthy) or U (unhealthy)

- `azimuth` and `elevation` = calculated orientation of the satellite

Example

```
    SSU_2000 06-05-30 14:40:40
M  100 COMPLD
    "S1A05:1,1,H,272,41"
    "S1A05:2,5,H,76,13"
    "S1A05:3,14,H,344,62"
    "S1A05:4,15,H,164,33"
    "S1A05:5,18,H,98,29"
    "S1A05:6,19,H,268,11"
    "S1A05:7,22,H,56,62"
    "S1A05:8,30,H,110,16"
;
```

Related Commands

Retrieve GPS Data, on page 66

Retrieve GPS Data

This command returns the current tracking data for the specified GPS input. If the input specified is not a GPS Input module, the DENY response is returned.

Syntax

```
RTRV-DATA-GPS:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	S1A3 | S1A5	Retrieves GPS data from the specified GPS Input module.

Response Format

A valid response message contains up to eight lines. Each line displays information for one of the satellites currently being tracked. The format is:

```
^^^"aid:chan,sv#,snr,status"<cr lf>

...

^^^"aid:PPSSIGMA:pps_sigma"<cr lf>
^^^"aid:T3SIGMA:t3sigma_threshold"<cr lf>
```

where:

- `aid` = module access identifier

- `chan` indicates the channel number used to track the corresponding `sv`

- `sv#` = satellite vehicle number

- `snr` = signal-to-noise ratio or signal strength

- `status` = the current tracking status [SRC | COD | FRQ | TIM | EPH | OK] where: SRC = searching, COD = code locking, FRQ = frequency locking, TIM = setting time, EPH = retrieving Ephemeris data, OK = satellite being used in the timing solution

- `pps_sigma` = current 1PPS sigma value

- `t3sigma_threshold` = the current 3-sigma threshold

Example

```
    SSU_2000 06-05-30 14:38:03
M  100 COMPLD
"S1A03: 1,20,093,OK"
"S1A03: 2,07,083,OK"
"S1A03: 3,13,104,OK"
"S1A03: 4,27,066,OK"
"S1A03: 5,16,104,OK"
"S1A03: 6,23,066,OK"
"S1A03: 7,01,104,OK"
"S1A03: 8,31,052,OK"
"S1A03: 9,19,066,OK"
"S1A03:10,25,083,OK"
"S1A03:11,,,EMPTY"
"S1A03:12,,,EMPTY"
"S1A03:PPSSIGMA: 3.60E-17"
"S1A03:T3SIGMA: 2.03E-15"
;
```

Related Commands

Retrieve GPS Input Parameters

This command returns the settings for the GPS Input module designated by the aid.

Syntax

```
RTRV-PRMTR-GPS:[tid]:[aid]:ctag;
```

Parameter	Value	Description
`[aid]`	`S1A3` `S1A5`	Retrieves the parameters from the specified GPS Input module.

Response Format

`^^^"aid:pri,pql,sigma,posel,timel,pdop,compensation" <cr lf>`

where:

- `aid` = module access identifier

- `pri` = priority setting of [0 – 10] with 0 = MON

- `pql` = provisioned priority quality level [1 – 16]

- `sigma` = this field is obsolete

- `posel` = minimum satellite elevation for positioning purposes

- `timel` = minimum satellite elevation for timing purposes

- `pdop` = current pdop mask

- `compensation` = line compensation delay on Expansion shelf cabling, [0 – 250] corresponding to a delay from 0 to 25000 ns. This parameter is used when the PackeTime module is in an Expansion shelf and the ToD source is in the Main shelf.

Related Commands

Set GPS Input Parameters, on page 150

Retrieve GPS Position

This command returns the settings for the GPS Input module designated by the aid.

Syntax

```
RTRV-GPS-POS:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	S1A3|S1A5	Retrieves the GPS data from the specified GPS Input module.

Response Format

If the GPS engine has not yet established a position, the response includes the "No Valid Position Information" message. Otherwise, the format is:

```
^^^"aid:lat,lon,hgt,pdop,mode,avg,posel,timel" <cr lf>
```

where:

- `aid` = module access identifier

- `lat` = current latitude of the receiver in the format (DD)-MM-SS:SS

- `lon` = current longitude of the receiver in the format (DD)-MM-SS.SS

- `hgt` = current height of the receiver in meters

- `pdop` = current Position Dilution of Precision or pdop mask [1 through 10]. Pdop is a measurement that indicates the geometry of the GPS satellites that the SSU-2000e is tracking. Lower values indicate better geometry.

- `mode` = GPS positioning mode is user-specified or calculated: [User|Calc]. If the positioning mode is set to User, the configuration setting is sent to the GPS engine and the mode is set to a fixed position. When the positioning mode is set to Calc, the elevation mask setting for positioning is sent to the engine, the engine is set to positioning mode, and 10 positions are averaged and compared to the configuration setting. If there is a greater than 300 meter error, the unit recalculates the position based on the averaging count. If there is no such error, the unit uses the stored position. The SSU-2000e generates an event when the GPS module calculates a new position, and stores the new position in NVRAM as the current position and changes the engine mode to fixed position.

- `avg` = current GPS position averaging count. Setting the averaging count generates an event and starts a new position fix automatically.

- `posel` = minimum satellite elevation to use for positioning

- `timel` = the minimum satellite elevation to use for timing

Example

```
   SSU_2000 05-03-08 15:37:53
M  1 COMPLD
   "S1A03:(+30:28:08.03),(-097:40:34.05),(254.23),(3.9),CALC,300,5,10"
;
```

Retrieve Header

This command allows you to verify that the SSU-2000e is connected to the computer or network. It may also be used to retrieve the unit name (sid) and date and time. The only action taken by the SSU-2000e is to respond with the complied message.

Syntax

```
RTRV-HDR:[tid]::ctag;
```

Example

```
   SSU_2000 06-05-30 14:56:57
M  100 COMPLD
;
```

Related Commands

Retrieve Name, on page 86
Retrieve Network Element Type, on page 87

Retrieve Image

This command returns the location of the current firmware image in use by the specified PackeTime module.

Syntax

```
RTRV-IMAGE:[tid]:aid:ctag;
```

Response Format

```
^^^"aid:current_partition,reboot_partition"<cr><lf>
^^^"PARTITION-0,revision,date"<cr><lf>
^^^"PARTITION-1,revision,date"<cr><lf>
```

where:

- `current_partition` = 0 | 1

- `reboot_partition` = 0 | 1

Example Response

```
    SSU-2000 07-07-10 12:58:32
M  100 COMPLD
    "PARTITION-0,A.00,09JUL2007"
^^^"PARTITION-1,A.00,09JUL2007"
```

Related Commands

Set Image, on page 152

Retrieve Input Data

This command returns the current LOS, AIS, OOF, BPV, CRC Error and Clear counts for the specified inputs on DS1, E1, or CC Input modules.

Syntax

```
RTRV-DATA-INPUT:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves the current input data from all modules that are currently active in the entire shelf.
	S1Ay[-z]	Retrieves the current input data from the specified module [or port].

Response Format

When the aid specifies a module [or port], the format for each response message line is:

```
^^^"aid:loserr,losclr,aiserr,aisclr,ooferr,oofclr,bpverr,bpvclr,
crcerr,crcclr"<cr lf>
```

where:

- `aid` = module or port access identifier

- `???err` is the erred second count for each of the signal faults as listed above

- `???clr` is cleared second count for each of the signal faults as listed above

When the aid specifies ALL, the format of the response message is:

```
^^^"aid:LOS,loserr,losclr"<cr lf>
^^^"aid:AIS,aiserr,aisclr"<cr lf>
^^^"aid:OOD,ooferr,oofclr"<cr lf>
^^^"aid:BPV,bpverr,bpvclr"<cr lf>>
^^^"aid:CRC,crcerr,crcclr"<cr lf>
```

where:

- `???err` is the erred second count for each of the signal faults as listed above

- `???clr` is cleared second count for each of the signal faults as listed above

Related Commands

Retrieve Signal Fault Alarm Parameters, on page 114
Set Signal Fault Alarm Parameters, on page 174

Retrieve Input Reference

This command returns the current input reference, reference switch mode, and reference selection mode.

Syntax

```
RTRV-INPUT-REF:[tid]::ctag;
```

Response Format

```
^^^"port,swtmode,selmode"<cr lf>
```

where:

- `swtmode` = auto return (revertive) selection, auto switch (but not revertive), or no auto switching [AR | AS | OFF]

- `selmode` = reference selection: [PRI | PQL] for priority quality level or status message selection of inputs

If the input port is not a valid reference, the DENY response is returned.

Example

```
    SSU_2000 06-05-30 14:42:54
M  100 COMPLD
    "S1A05-01,AR,PRI"
;
```

Related Commands

Set Input Reference, on page 153

Retrieve Input Status

This command returns the condition (current operating mode and readings) of the input ports.

Syntax

```
RTRV-STATUS-INPUT:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves the parameters from all Input modules in the shelf.
	S1Ay[-z]	Retrieves parameters from the specified Input module [or port].

Response Format

One line is returned for each module [or port] designated by the aid.

```
^^^"aid:mstat,pstate,(pha),(phb),pql" <cr lf>
```

where:

- aid = module or port access identifier

- mstat = module status {OK | DIS | FLT}

- pstate = the port state {OK | DIS | FLT}

- pha and phb = current 1-second phase values in nanoseconds, or NA if not available

- pql = current pql level (read or provisioned) being reported by the port, if available. If pql = 0 , then the pql is not applicable for that port.

Example

```
    SSU_2000 06-03-08 20:28:19
M  100 COMPLD
    "S1A03-01:OK,OK,(-29),(-8),2"
    "S1A04-01:OK,OK,(-20),(-72),4"
    "S1A05-01:OK,DIS,NA,NA,4"
;
```

Retrieve Inventory

This command returns the inventory management information for the SSU-2000e

Syntax

```
RTRV-INV:[tid]::ctag;
```
or
```
RTRV-INVENTORY:[tid]::ctag;
```

Response Format

The response is the complied message followed by the response message(s). A summary for each module and shelf are returned in the following format:

```
^^^"aid:desc,hwpart,hwrev,hwserial,swpart,swrev,adapterpart" <cr lf>
```

where:

- `aid` is the module or shelf access identifier. See the table below for details.

- `desc` is the text name of the module. See the table below for details.

- `hwpart` is the hardware part number. See the table below for details.

- `hwrev` is the hardware revision level

- `hwserial` is the hardware serial number

- `sw_art` field is the software part number (i.e. 141xxxxx-xxx-x)

- `swrev` field is the software revision level

- `adapterpart` is the Input adapter part number. If empty, then the input adapter identification is not available for the module. For detailed information about adapter identification, refer to Specification, SSU-2000e Input Adapter/ Identification, part number 12613021-001-2.

The aid reported is the shelf address.

The `aid`, `desc` and `hwpart` are per the following table:

aid	desc	hwpart
S1	SSU-2000	25413120-000-0
S2 – S5	SDU-2000	25413023-000-0
S1	SSU-2000e	25413140-000-0 254131140-001-0 (DT)
S2 – S5	SDU-2000e	25413141-000-0 25413141-001-0 (DT)

Example

```
SSU_2000 05-12-13 18:53:57
M  100 COMPLD
   "1:SSU_2000,25413020-000-0"
   "S1A01:Clock Stratum 2E,23413016-000-0,A,1234567890,14313015-000-5,M.00"
   "S1A02:Communications,23413012-000-0,E.,1234567890,14313012-000-5,L.00"
   "S1A03:Input GPS,23413019-000-0,2,1234567890005,14313019-000-5,A.09"
   "S1A05:Input DS1 3Port,23413013-002-0,B.O8,L84407,14313013-000-5,D.04"
   "S1A06:Input Sine,23413305-000-0,REV 1.00,L84408,14313305-000-5,A.00"
   "S1A09:Output 2048 kHz,23413159-000-0,A., L84409,14313159-000-5,C.00"
   "S1A12:Clock Stratum 3E,23413015-000-0,A.06, J10919,14313015-000-5,M.00"
   "2:SDU-2000,25413023-000-0"
   "S2A01:Output E1,23413018-000-0,1,1234567890,14313017-000-5,C.b00.41"
   "S2A02:Output DS1,23413017-000-0,B,990705398000613453,14313017-000-5,B.01"
   "S2A04:Output 2048 kHz,23413159-000-0,A.01,1234567890,14313159-000-5,C.00"
   "S2A05:Output RS422,23413287-000-0,3.0,1234567890,14313287-000-5,A.00"
   "S2A09:Output E1,23413018-000-0,A,1234567890,14313017-000-5,C.b00.41"
   "S2A10:Output Sine,23413304-000-0,REV 2.00,J10840,14313304-000-5,A.00"
   "S2A13:Output 2048 kHz,23413159-000-0,C.0,1234567890,14313159-000-5,C.00"
   "S2A15:Buffer Card,23413122-000-0,B.,990705398000737838,,A.0 "
   "S2A16:Buffer Card,23413122-000-0,B.,990705398000737708,,A.0 "
   "3:SDU-2000,25413023-000-0"
   "S3A05:Output 2048 kHz,23413159-000-0,C.00,1234567890,14313159-000-5,C.00"
   "S3A06:Output 2048 kHz,23413159-000-0,1,1234567890,14313159-000-5,C.00"
   "S3A08:Output 2048 kHz,23413159-000-0,1,1234567890,14313159-000-5,C.00"
   "S3A10:Composite Clock,23413158-000-0,2,123456789000,14313158-000-5,B.01"
   "S3A11:Output E1,23413018-000-0,D,990705398000650816,14313017-000-5,B.01"
   "S3A12:Output E1,23413018-000-0,A,1234567890,14313017-000-5,B.b02.5"
   "S3A15:Buffer Card,23413122-000-0,B.,990705398000737821,,A.0 "
   "S3A16:Buffer Card,23413122-000-0,B.,990705398000737845,,A.0 "
;
```

Retrieve IP Parameters

This command returns the current Internet Protocol settings for the specified module. The default aid (if not included in the command) specifies the Communications module.

Syntax

```
RTRV-PRMTR-IP:[tid]:[aid]:ctag;
```

Response Format

```
^^^"S1A2:addr,mask,gate,mac<cr><lf>

or
^^^"aid-A:addr,mask,gate,mac"<cr><lf>
^^^"aid-B:addr,mask,gate,mac"<cr><lf>
^^^"aid-M:addr,mask,gate,mac"<cr><lf>
```

where:

- `aid-A` = NTP Service port-A

- `aid-B` = NTP Service port-B

- `aid-M` = Maintenance port

- `addr` = the port's IP address

- `mask` = the port's IP mask

- `gate` = the port's IP gateway

- `mac` = the Media Access Control address

All IP numbers are in the IPv4 format (###.###.###.###).

Related Commands
Set IP Parameters, on page 154

Retrieve Keep-alive Parameters

The Keep-alive function causes autonomous messages to be transmitted at a user selectable interval. This command returns the current TL1 and SNMP keep-alive settings for the unit.

Syntax

```
RTRV-PRMTR-KEEPALIVE:[tid]::ctag;
```

Response Format

```
^^^"tl1time,snmptime"<cr lf>
```

where:

- `tl1time` = TL1 session timer in minutes
- `snmptime` = SNMP session timer in minutes.
- Times set to zero indicate keep-alive is disabled

Related Commands

Retrieve LED

This command returns the status of the LEDs in the specified module. The LEDs are reported in order from top to bottom.

Syntax

```
RTRV-LED:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves all LED data from the shelf.
	SxAy	Retrieves LED data from the specified module.

Refer to the *SSU-2000e User's Guide* for a detailed description of each module's LED indicators.

Response Format

If the module does not support this command, the DENY response is returned.

```
^^^"aid:hwpart,num,led1,...,ledn" <cr lf>
```

where:

- `aid` = module access identifier

- hwpart = the hardware part number for the module

- num = total number of LEDs in the specified module

- led*n* = LED status [OFF | GRN | AMB | RED | BLK | GBLK | ABLK], where OFF = LED is off, GRN = LED is green, AMB = LED is amber, RED = LED is red, BLK = LED is blinking, GBLK is green blinking, ABLK is amber blinking

Example

```
    SSU_2000 05-01-13 19:26:34
M   100 COMPLD
    "S1A01:23413016-000-0,7,GRN,GRN,GRN,OFF,OFF,GRN,OFF"
    "S1A02:23413012-000-0,8,GRN,GRN,GRN,GRN,AMB,AMB,OFF,GRN"
    "S1A03:23413019-000-0,4,GRN,GRN,GRN,GRN"
    "S1A04:23413014-002-0,8,GRN,GRN,OFF,OFF,OFF,OFF,OFF,OFF"
    "S1A06:23413305-000-0,8,GRN,GRN,OFF,AMB,OFF,AMB,OFF,AMB"
    "S1A07:23413305-000-0,8,GRN,GRN,OFF,GRN,OFF,GRN,OFF,AMB"
    "S1A10:23413306-000-0,7,GRN,GRN,GRN,OFF,OFF,OFF,OFF"
    "S1A12:23413015-000-0,7,GRN,GRN,OFF,OFF,OFF,GRN,OFF"
;
```

Retrieve Local Time Offset

This command returns the local offset time (the current local time is included in TL1 responses).

The local time offset is the difference between local and UTC times. If the local time zone is ahead of UTC, the value of Offset is positive. If the local time zone is behind UTC, the value of Offset is negative.

Syntax

```
RTRV-DAT:[tid]::ctag;
```

Response Format

```
"OFFSET:(+/-hh.mm)"<cr><lf>
```

where:

- `ocrdat` is the date of the last configuration change
- `ocrtm` is the time of the last configuration change

Example

```
   SSU_2000 06-0-28 13:31:37
M 100 COMPLD
   "OFFSET:(-6:00)"
;
```

Related Commands

Retrieve Login Events

This command displays whether login and logout events are recorded in the event log. Login and logout events always appear in the system console.

Syntax

```
RTRV-PRMTR-EVTLOGIN:[tid]::ctag;
```

Response Format

```
^^^"aid:evtlogin"<cr lf>
```

where:

- `aid` = shelf access identifier
- evtlogin = [ENABLE | DISABLE].

Related Commands

Set Login Events

Retrieve MTIE Data

This command returns the MTIE data for a specified port on a DS1, E1, Sine, or GPS Input module. The command *requires* an aid to identify the input port to report data from. You can specify a Clock module identifier and the start and stop times for the measurement. If you do not specify a clock [CLK-A | CLK-B], the current output clock is used.

Only the values available in the interval between the start and stop times are output. For the first three hours of operation after an input is enabled, the values are displayed on a 1-minute boundary. After the first three hours of operation, the data is displayed on a 1-hour boundary. The returned MTIE values have a timestamp that corresponds to the nearest minute or hour boundaries.

Syntax

```
RTRV-DATA-MTIE:[tid]:aid:ctag[::[clksrc][,start][,stop];
```

Parameter	Value	Description
[aid]	S1Ay-z	Retrieves current MTIE data from the specified Input port.
[clksrc]	[CLK-A | CLK-B]	Specifies which clock supplies the MTIE data.
[start]	{MM-DD}, {HH:MM}	Specified the start date and time. If the date is null but followed by a time, the command defaults to the current date. If the start time is null, but preceded by a date, the command defaults to the current time. If the start date and time are null, the command defaults to the start of the data. The comma must be present to indicate a null start time.
[stop]	{MM-DD}, {HH:MM}	Specifies the stop date and time for data. If the date is null but followed by a time, the command defaults to the current date. If the stop time is null but preceded by a date, the command defaults to the current time. If the stop date and time is null, the command defaults to the end of the data.

Response Format

The response is the complied message followed by the requested data in the format:

```
^^^"aid:ocrdat,ocrtm,MTIE,clksrc,temper,monval"<cr lf>
```

where:

- `aid` = port access identifier

- `ocrdat` and `ocrtm` = the beginning date and time the data was collected

- `clksrc` = clock A or B used for the measurements

- `tmper` = time period for the measurement data, given in seconds. The maximum tmper values for MTIE are 0.05, 0.1, 1, 10, 100, 1000, 10000, and 100000

- `monval` = data value for the time period, in nanoseconds

Example

```
    SSU_2000 06-05-30 14:49:34
M   100 COMPLD
    "S1A04-01:06-05-29,14:59:58,MTIE,CLK-A,0.05,30"
    "S1A04-01:06-05-29,14:59:58,MTIE,CLK-A,0.10,30"
    "S1A04-01:06-05-29,14:59:58,MTIE,CLK-A,1.00,30"
    "S1A04-01:06-05-29,14:59:58,MTIE,CLK-A,10.00,30"
    "S1A04-01:06-05-29,14:59:58,MTIE,CLK-A,100.00,31"
    "S1A04-01:06-05-29,14:59:58,MTIE,CLK-A,1000.00,39"
    "S1A04-01:06-05-29,14:59:58,MTIE,CLK-A,10000.00,51"
    "S1A04-01:06-05-29,14:59:58,MTIE,CLK-A,100000.00,51"
;
```

Related Commands

Retrieve MTIE History, on page 84
Set MTIE Parameters, on page 159

Retrieve MTIE History

This command returns the historical MTIE data for a port on a DS1, E1, Sine, or GPS Input module. The Historical MTIE data is the 24-hour MTIE data stored every day at midnight. There are 99 historical MTIE records stored. The command *requires* an aid to identify the input port to report data from. The optional parameters are the clock identifier and the number of day(s) of MTIE history to be retrieved from the current day (day 0). If you do not specify a clock source [CLK-A | CLK-B], the current output clock is used.

Syntax

```
RTRV-DATA-MTIE-HIST:[tid]:aid:ctag[::[clksrc][,count];
```

Parameter	Value	Description
[aid]	S1Ay-z	Retrieves the current MTIE history data from the specified Input port.
[clksrc]	CLK-A | CLK-B	Specifies which clock supplies the MTIE history data.
[count]	1 - 99	Specifies the number of days of MTIE history to retrieve.

Response Format

The response is the complied message followed by the requested data.

```
^^^"aid:ocrdat,ocrtm,MTIE,clksrc,monval1,monval2,.., monval8"<cr lf>
```

where:

- `aid` = port access identifier

- `ocrdat` and `ocrtm` = beginning date and time the data was collected

- `clksrc` = CLK-A or CLK-B used for the measurements

- `monval?` = the data value for the time period, given in nanoseconds. There are eight monvals in sequence, and the time periods in sequence are 0.05, 0.1, 1, 10, 100, 1000, 10000, and 100000

Example

```
   SSU_2000 06-06-26 12:51:44
M  100 COMPLD
   "S1A05-01:06-06-21,00:01:00,MTIE,CLK-A,21,21,21,49,57,61,73,79"
   "S1A05-01:06-06-22,00:01:00,MTIE,CLK-A,11,11,11,20,24,33,40,79"
   "S1A05-01:06-06-23,00:01:00,MTIE,CLK-A,11,11,11,19,27,30,39,54"
   "S1A05-01:06-06-24,00:01:00,MTIE,CLK-A,12,12,12,20,26,29,41,54"
   "S1A05-01:06-06-25,00:01:00,MTIE,CLK-A,9,9,9,19,24,30,40,53"
;
```

Related Commands
Retrieve MTIE Data, on page 82

Retrieve MTIE Parameters

This command returns the MTIE threshold settings for the DS1, E1, Sine, or GPS Input module or port designated by the aid.

Syntax

```
RTRV-PRMTR-MTIE:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	ALL	Retrieves the MTIE parameters from all Input modules in the shelf.
	S1Ay-z	Retrieves MTIE parameters from the specified Input port.

Response Format

There are always four lines returned for each input port, one for each limit.

```
^^^"aid:MTIE,EL1,t10,t100,t1000,t10000,t100000" <cr lf>
^^^"aid:MTIE,EL2,t10,t100,t1000,t10000,t100000" <cr lf>
^^^"aid:MTIE,CL1,t10,t100,t1000,t10000,t100000" <cr lf>
^^^"aid:MTIE,CL2,t10,t100,t1000,t10000,t100000" <cr lf>
```

where:

The first line contains the module or port aid and the error threshold settings for EL1.
The second line contains the module or port aid and the error threshold settings for EL2.
The third line contains the module or port aidand the clear threshold settings for CL1.
The fourth line contains the module or port aid and the clear threshold settings for CL2.

Example

```
    SSU_2000 06-06-26 15:06:38
M  100 COMPLD
   "S1A05-01:MTIE,EL1,260,440,810,880,1600"
   "S1A05-01:MTIE,EL2,325,550,1010,1100,2000"
   "S1A05-01:MTIE,CL1,230,400,730,790,1440"
   "S1A05-01:MTIE,CL2,290,490,910,990,1800"
;
```

Retrieve Name

This command returns the name assigned to the shelf or to Input or Output ports, excluding the Line Retiming Module. One name of up to 20 characters is returned for each port designated by the aid.

Syntax

```
RTRV-NAME:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	S1A2	Retrieves the name from the unit.
	SxAy[-z]	Retrieves the name from the specified module [or port]..

Response Format

When the aid is S1A2, the name of the unit is returned. When the aid is an I/O module or port, the assigned port name is returned. If no name is assigned to a port, then a null field is returned.

```
^^^"aid:name" <cr lf>
```

Related Commands

Retrieve Network Element Type

This command serves the same purpose as RTRV-HDR with an element type message added.

Syntax

```
RTRV-NETYPE:[tid]::ctag;
```

Response Format

```
^^^"SSU2000" <cr lf>
```

Related Commands

Retrieve Header, on page 70
Retrieve Name, on page 86

Retrieve NTP Parameters

This command returns the current Network Timing Protocol settings for the shelf.

Syntax

```
RTRV-PRMTR-NTP:[tid]::ctag;
```

Response Format

```
^^^"ip1,mode,interval"<cr lf>
^^^"ip2,mode,interval"<cr lf>
^^^"ip3,mode,interval"<cr lf>
^^^"PREFER:todSource"<cr lf>
```

where:

- `ip` = the server ip used by the client or broadcast client or broadcast server.

- `mode` = the operating mode for the given ip [CLIENT | BCLIENT | BROADCAST]. In CLIENT mode, the SSU automatically requests the time from the server. In BCLIENT mode, the server designated by the ip is a broadcast server. In BROADCAST mode, the SSU is set up as a broadcast server.

- `interval` = broadcast interval [32 | 64 | 128 | 256 | 512 | 1024] seconds; used when the SSU is set up as a broadcast server. The SSU is automatically configured as an NTP server with the address specified in the SET-PRMTR-IP command. Up to three NTP ips may be listed.

- todSource = the preferred TOD source [GPS | CLIENT]

Example

```
    SSU_2000 06-06-26 15:08:18
M  100 COMPLD
    "172.16.21.19,CLIENT"
    "172.16.21.42,CLIENT"
    "PREFER:CLIENT"
;
```

Related Commands

Set NTP Parameters, on page 161

Retrieve NTP Module Parameters

This command returns the current ToD source used by the PackeTime module designated by the aid.

Syntax

`RTRV-PRMTR-NTPMOD:[tid]:aid:ctag;`

Parameter	Value	Description
aid	SxAy	Retrieves the ToD source from the specified PackeTime module

Response Format

`^^^"aid:<preferred>,(weight),<compensation>,<tod_timeout>" <cr><lf>`

where:

- `aid` = module access identifier

- `preferred` = TODSCR | PEER

- `weight` = −1 | 0 | ... | 100 and is the load (bandwidth) distribution between port-A and port-B. See Set NTP Module Parameters, on page 162, for further details.

- `compensation` = compensation (0 – 250) for the delay induced by the cable(s) used to connect expansion shelves where the PackeTime ToD Source(s) is located in relationship to the Main shelf. The time offset has a 100nS resolution, thus the "Delay" value shall be multiplied by 100nS to provide 1PPS compensation.

- `tod_timeout` = Peer Availability Timeout. The timer shall have a user settable range from 60 minutes to 10000 minutes, with a default value of 1440 minutes

Related Commands

Set NTP Module Parameters

Retrieve NTP Module Status

This command displays the status of the specified PackeTime module.

Syntax

```
RTRV-STATUS-NTPMOD:[tid]:aid:ctag;
```

If no aid is specified, then ALL is assumed.

Response Format

```
^^^"aid:mstat,redundant,red"<cr><lf>
```

where:

- `mstat` = ENA | DIS as set by the ACT-MODULE and DISC-MODULE commands

- `redundant` = redundant status ACT | STDBY | NA

- `red` = NA | SaXy for non-redundant or the redundant module aid

Retrieve NTP Peer Parameters

This command returns the currently-assigned NTP servers; they are identified by index and IP address.

Syntax

```
RTRV-PRMTR-NTPPEER:[tid]:aid:ctag;
```

Parameter	Value	Description
aid	SxAy	Aid for PackeTime modules

Response Format

```
^^^"aid:index,ip,min,max"<cr><lf>
^^^...<cr><lf>
^^^"aid:preferindex"<cr><lf>
```

where:

- `index` = defines a value of 1 through 8 to provide an index of the NTP server(s); the default is 1

- `ip` = the ip address used by the server

- `min` = 16 | 32 | 64 | 128 | 256 | 512 | 1024 and is the minimum request rate in seconds for Client mode; the default is 16

- `max` = 16 | 32 | 64 | 128 | 256 | 512 | 1024 and is the maximum request rate in seconds for Client mode; the default is 1024

- `preferindex` = the Preferred Peer index, where 0 = no preferred server and 1 – 8 indicates the preference value (lower number = higher preference)

Related Commands

Set NTP Peer Parameters, on page 163

Retrieve NTP Status

This command returns the current Network Timing Protocol (NTP) status of the SSU-2000e.

Syntax

```
RTRV-STATUS-NTP:[tid]::ctag;
```

Response Format

Up to three NTP IP addresses may be listed.

```
^^^ip1,offset,delay,dispersion,stratum,smode"<cr lf>
^^^ip2,offset,delay,dispersion,stratum,smode"<cr lf>
^^^ip3,offset,delay,dispersion,stratum,smode"<cr lf>
^^^SYS:mode,sysIp,sysOffset"<cr lf>
```

where:

- `ip` = the server IP address used by the client or broadcast client or broadcast server

- `offset` = the number of seconds (partial seconds) that the local time was adjusted by

- `delay` = the calculated delay in the communication path

- `dispersion` = a value that indicates the accuracy of the offset/delay settings

- `stratum` = stratum number of the peer

- `smode` = source mode [SERVER | BROADCAST]. Up to three NTP entries may be listed

- `mode` = operational mode [GPS | CLIENT | LOCAL]

- `sysIp` = the system peer's IP address

- `sysOffset` = system peer offset

Example

```
   SSU_2000 06-05-30 14:16:58
M  100 COMPLD
   "172.16.21.19,(0.002249),(0.004485),(0.125549),1,SERVER"
   "172.16.21.42,(0.001745),(0.006743),(0.125640),1,SERVER"
   "SYS:CLIENT,172.16.21.19,(0.001997)"
;
```

Related Commands

Retrieve NTP Parameters, on page 88
Set NTP Parameters, on page 161

Retrieve Operating Mode

This command returns the Operating Mode setting for the system.

Syntax

RTRV-PRMTR-OPERMODE:[tid]::ctag;

Response Format

^^^"mode" <cr lf>

where:

mode = the signal operating mode for the shelf [NORMAL | SUBTENDING]

■ The NORMAL mode means that the SSU is in normal master mode. In this mode, the unit selects an input reference from any available input sources.

■ The SUBTENDING mode means that SSU is in ANSI subtending mode. In this mode, the unit chooses an available Composite Clock Input as an input reference. All other inputs shall not be selected as input reference.

Related Commands

Retrieve Output PQL

This command returns the current value for the PQL Override function for the specified DS1, E1, or E1/2048 kHz Output module.

Syntax

`RTRV-OUT-PQL:[tid]:[aid]:ctag;`

Parameter	Value	Description
aid	ALL	Retrieves the current PQL override level from all modules.
	SxAy	Retrieves the current PQL override level from the specified module.

Response Format

`^^^"aid:pql" <cr lf>`

where:

- `aid` = module access identifier

- pql = the Priority Quality Level [0, 1-16]. If the value is 0, the PQL override function is disabled and the output SSM is provided by the SSU-2000e's PQL.

Note: the PQL Override function is not persistent.

Related Commands
Set Output PQL, on page 165

Retrieve Output Status

This command returns the condition (current operating mode and status) of any Output module or port. This command is not valid for a Line Re-Timing Module.

Syntax

RTRV-STATUS-OUTPUT:[tid]:[aid]:ctag;

Parameter	Value	Description
[aid]	ALL	Retrieves the status parameters from all Output modules in the shelf.
	SxAy[-z]	Retrieves the status parameters from the specified Output module [or port].

Response Format

When the aid specifies a port, the response is:

^^^"aid:mstat,red,clksrc,pql,pstate" <cr lf>

where:

- `aid` = port access identifier

- `mstat` = module status [OK | DIS | FLT]: where OK indicates normal operation, and DIS or FLT indicate all outputs are turned off

- `red` = redundant [NA | SxAy]: where NA = non-redundant, and the aid = the redundant module access identifier

- `clksrc` = clock which is generating the output: [CLK-A | CLK-B | CLK-C | CLK-D]

- `pql` = possible Priority Quality Level (SSM) being generated [0 | 1 – 16], where 0 = not applicable and 1 – 16 are valid values

- `pstate` = port status [1 | 0 | F], where 1 = enabled, 0 = disabled, and F= faulted

When the aid specifies a module, the response is:

^^^"aid:mstat,red,clksrc,pql" <cr lf>
^^^"aid:p1,p2,p3,…p20" <cr lf>

where:

The first line contains:
- `aid` = module access identifier

- `mstat` = module status is [OK | DIS | FLT], where OK = normal operation, and DIS or FLT = all outputs are turned off

- `red` = [NA | SxAy], where: NA = non-redundant, and SxAy = redundant module access identifier

- `clksrc` = clock generating the output [CLK-A | CLK-B | CLK-C | CLK-D]

- `pql` = Priority Quality Level (SSM) being generated [0 | 1 – 16], where 0 = not applicable and 1 – 16 are valid values

The second line contains:
- `aid` = module identifier

- `pstate` = port status [1 | 0 | F | S], where 1 = enabled, 0 = disabled, F = faulted or S = squelched for all 20 outputs

Retrieve Password Status

This command is designed for application software (i.e. SynCraft) to see whether a new password is required after login. This command shall return the current status of a specified user. It is mainly used for required password changes.

Syntax

```
RTRV-PWD-STATE:[tid]::ctag;
```

Response Format

```
^^^"state" <cr lf>
```

where:

- `state` = [OK | EXPIRED] returns the current status of a specified user and tell the requestor what to do next (for example, this user must change his password since password is aged out)

Note: A "PASSWORD EXPIRED AND NEED A NEW PASSWORD" message appears on the screen in the TL1 comment field after a successful login. The user shall issue the SET-USER with PWD password command followed by the SET-PWD-CONFIRM command to confirm the changed password. If the user fails to perform this sequence, his account status will be unchanged.

Example

When a user login (ACT-USER) is successful, the application software (such as SunCraft) shall issue the RTRV-PWD-STATE command to find out if the password is aged out.

If it returns EXPIRED, the application software shall issue the following two TL1 commands back-to-back to change the password. If the application software fails to do so, the TL1 shall stay in this loop until the completion of password change.

```
SET-USER:[tid]::ctag::PWD,username,password;
```

```
SET-PWD-CONFIRM:[tid]::ctag::password;
```

Retrieve Phase Build-Out Parameters

This command returns the Phase Build-Out (PBO) settings for the SSU-2000e. All Input modules use this setting.

Syntax

```
RTRV-PRMTR-PBO:[tid]::ctag;
```

Response Format

```
^^^"aid:mode" <cr lf>
```

where:

- aid = ALL

- `mode` = [DIS | EVT | REP | NONE]
  where:
  `DIS` indicates the PBO function has been disabled.
  `EVT` indicates the PBO function is enabled. PBO events are displayed and stored in the COMM module event buffer.
  `REP` indicates the PBO function is enabled.
  `PBO` events are displayed, but the event is not stored in the COMM module event buffer.
  `NONE` indicates the PBO function is enabled. The PBO event is neither displayed nor stored in the COMM module event buffer.

Related Commands

Set Phase Build-Out Parameter, on page 170

Retrieve Phase Data

This command returns phase data from the phase history buffers from any input port. The command *requires* an aid to identify the input to report data from.

Syntax

```
RTRV-DATA-PHASE:[tid]:aid:ctag[::tmper[,clksrc[,start][,stop]]];
```

Parameter	Value	Description
[aid]	S1Ay-z	Retrieves the current phase data from the specified Input port.
[tmper]	100 | 1000 | 10000	Specifies the averaging time period for data to be returned: with the default of 100 if not specified
[clksrc]	CLK-A | CLK-B	Specifies which clock supplies the phase data.
[start]	{MM-DD}, {HH:MM}	Specifies the start date and time for data. If the date is null but followed by a time, the command defaults to the current date. If the start time is null, but preceded by a date, the command defaults to the current time. If the start date and time are null, the command defaults to the start of the data. The comma must be present to indicate a null start time.
[stop]	{MM-DD}, {HH:MM}	Specifies the stop date and time for data. If the date is null but followed by a time, the command defaults to the current date. If the stop time is null but preceded by a date, the command defaults to the current time. If the stop date and time is null, the command defaults to the end of the data. There is one line for each data point in the specified time between start and stop times. Only the number of values currently available is returned. The maximum stored points for 100-second time period is 7000; the maximum stored points for 1000-second time period is 700; the maximum stored points for 10000-second time period is 70. If a start and stop time is not specified, the default is current value.

Response Format

```
^^^"aid:ocrdat,ocrtm,PHA,clksrc,tmper,(monval)" <cr lf>
```

where:

- `aid` = port access identifier

- `ocrdat` and `ocrtm` are the actual date and time the data was collected

- `clksrc` = CLK-A or CLK-B used for the measurements

- `tmper` = time period of the measurement data, given as xSEC where x = time in s

- `monval` = +/- phase values versus clock for the specified input given in nanoseconds enclosed in parentheses

There is one line for each data point in the specified time between start and stop times. Only the number of values currently available are returned.

Example:

```
    SSU_2000 06-05-30 14:50:52
M  100 COMPLD
    "S1A04-01:06-05-30,14-48-20,PHA,CLK-A,100,(-23)"
;
```

Related Commands

Set Phase Zero, on page 166
Set Phase Build-Out Parameter, on page 170

Retrieve Ping

This command allows you to ping a remote host via TCP/IP. Use this command to verify that the SSU-2000e is communicating over a network.

Syntax

`RTRV-PING::[aid{-A|B|M}]:ctag::ip;`

Parameter	Value	Description
`aid`	S1A2	Default value, specifies the Communications module.
	SxAy[-A|B|M]	Specifies the port-A, port-B, or Maintenance port on the specified PackeTime module.
`ip`		Specifies the host address given in the IPv4 format.

Response Format

The response message is COMPLD if the ping was successful or DENY (SDNR) if unsuccessful.

Related Commands

Retrieve Header, on page 70
Retrieve Name, on page 86

Retrieve Reference Parameters

This command returns the current input reference port and output clock source.

Syntax

```
RTRV-REF:[tid]::ctag;
```

Response Format

```
^^^"port,clksrc,clockCsrc,clkTodsrc" <cr lf>
```

where:

- `port` = input reference port designated by the aid

- `clksrc` = selected clock source [CLK-A | CLK-B | NA] for outputs

- `clockCsrc` = an input port designated as the bypass Clock C source

- clkTodsrc = any TOD source candidate (GPS or PackeTime), and indicates the TODSRC of the selected clock

Retrieve Reports

This command returns only reports (non-alarm) information from the stored event data. An aid or aid range may be used to limit the report to specified modules. The aid code is optional. With an aid of ALL or null, all report data between start and stop time is returned.

Syntax

`RTRV-EVENT-REPORT:[tid]:[aid]:ctag::[count],[start],[stop];`

Parameter	Value	Description
[aid]	ALL	Retrieves all report data between the specified start and stop time from all modules.
	SxAy	Retrieves report data between the specified start and stop time from the specified module.
[count]	1 – 500	Specifies the number of reports to retrieve. The default count is 1.
[start]	MM-DD, HH:MM	Specifies the start date and time for data. If the date is null but followed by a time, the command defaults to the current date. If the start time is null, but preceded by a date, the command defaults to the current time. If the start date and time are null, the command defaults to the start of the data. The comma must be present to indicate a null start time.
[stop]	MM-DD, HH:MM	Specifies the stop date and time for data. If the date is null but followed by a time, the command defaults to the current date. If the stop time is null but preceded by a date, the command defaults to the current time. If the stop date and time is null, the command defaults to the end of the data.

Response Format

One line containing the time stamp and event message is returned for each report in the log.

`^^^"aid:ntfcncde,condtype,srveff,ocrdat,ocrtm:condscr" <cr lf>`

where:

- `aid` = module access identifier
- `ntfcncde` = Notification Code (NA)
- `condtype` = Condition Type (event number)
- `srveff` = service affecting flag [SA | NSA]: SA = service affecting, NSA = non-service affecting
- `ocrdat` occurrence date
- `ocrtm` = occurrence time
- `condstr` = condition description string

Example

```
    SSU_2000 06-05-30 14:55:48
M  100 COMPLD
    "S1A01:NA,147,NSA,06-05-30,14:14:57:\"Output Pql, 2\""
    "S1A01:NA,146,NSA,06-05-30,14:14:49:\"Inp Select, 1A05-01\""
    "S1A05:NA,193,NSA,06-05-30,14:14:46:\"Priority, 1, TELA\""
    "S1A02:NA,158,NSA,06-05-30,14:11:15:\"NTP Mode, CLIENT\""
;
```

Related Commands

Retrieve Route Parameters

This command returns the current list of assigned route table parameters.

> **Note:** The aid in this command specifies the PackeTime module in a specific slot. The aid in the response contains a suffix -A or -B to indicate the Service port for that PackeTime module.

Syntax

```
RTRV-PRMTR-ROUTE:[tid]:aid:ctag;
```

Response Format

```
^^^"aid-{A | B}:index,destination,mask,gateway,iface" <cr lf>
^^^ ... <cr lf>
```

where:

- `index` = 1 | ... | 6 of the route table(s). Default is 1

- `destination` = the destination network, destination host

- `mask` = the mask for the destination net; '255.255.255.255' for a host destination and '0.0.0.0' for the default route

- `gateway` = the gateway address

- `iface` = Interface (Service port) to which packets for this route are sent. 1 = SxAy-A, 2 = SxAy-B

Retrieve Route Status

This command returns up to 20 entries in the current Route Table.

Syntax

```
RTRV-STATUS-ROUTE:[tid]:aid:ctag;
```

Response Format

```
^^^"ROUTE:destination1,gateway,mask,flags,metric,ref,use,iface"
<cr lf>
^^^ ... <cr lf>
^^^"ROUTE:destination20,gateway,mask,flags,metric,ref,use,iface"
<cr lf>
```

```
where:
```

- destination*n* = the destination network, destination host, or 0.0.0.0 is "default"

- gateway = the gateway address, or 0.0.0.0 is '*' if none set

- mask = the mask for the destination net; '255.255.255.255' for a host destination and '0.0.0.0' for the default route

- flags Possible flags include

   U = route is up
   H = target is a host
   G = use gateway
   R = reinstate route for dynamic routing
   D = dynamically installed by daemon or redirect
   M = modified from routing daemon or redirect
   A = installed by addrconf
   C = cache entry
   ! = reject route

- metric = the 'distance' to the target (usually counted in hops)

- ref = number of references to this route

- use = Count of lookups for the route

- iface = Interface to which packets for this route will be sent. 0 = SxAy-M, 1 = SxAy-A, 2 = SxAy-B

- length = actual length (in bytes) of the engineid that follows

- engineid = the engine ID in hex string format (for example: 80 00 02 59 03 00 A0 6E 0E BD EE)

Related Commands

Set Route Parameters, on page 167

Retrieve RS-422 Output Parameters

This command returns the settings for the RS-422 Output module or port specified by the aid.

Syntax

`RTRV-PRMTR-OUT422:[tid]:[aid]:ctag;`

Parameter	Value	Description
`[aid]`	`ALL`	Retrieves the parameters from all RS-422 Output modules in the shelf.
	`SxAy[-z]`	Retrieves parameters from the specified RS-422 Output module [or port].

Response Format

When the aid specifies a port, the response is:

`^^^"aid:mode,bypass,fltmode,pstate,frequency"<cr lf>`

where:

- `aid` = port access identifier

- `mode` = 422

- `bypass` = allow Clock C selection: [ON | OFF]

- `fltmode` = [ON | OFF | AUTO] if output is set to Fault if signal levels fall below the threshold output level

- `pstate` = port enabled state [ON | OFF]

- `frequency` = [0 | 1 |...| 512] where 0 (Reserved) = 4 kHz, 1 = 8 kHz, 2 = 16 kHz ... 512 = 4096 kHz. The resolution of frequency values is 8 kHz.

When the aid specifies a module, the response is:

`^^^"aid:mode,bypass,fltmode"<cr lf>`
`^^^"aid:pstate1,pstate2,...pstate20"<cr lf>`
`^^^"aid:freq1,freq2,...freq20" <cr lf>`

where:

Line 1 contains:
- `aid` = module access identifier

- `mode` = 422

- `bypass` = [ON|OFF] for allowing Clock C selection

- `fltmode` = [ON | OFF | AUTO] if output is set to Fault if signal levels fall below the threshold output level

Line 2 contains:

- `aid` = module access identifier

- `pstate#` = port enabled state [0 | 1] (0 is Off, 1 is On), and `#` is the port number 1 through 20

Line 3 contains:

- `aid` = module access identifier

- `freq#` = is the output frequency [0 | 1 |...| 512] where 0 (Reserved) = 4 kHz, 1 = 8 kHz, 2 = 16 kHz...512 = 4096 kHz, and `#` is the port number 1 through 20

Related Commands

Set RS-422 Output Parameters, on page 168

Retrieve Security Log

This command retrieves the max number of the last latest security log. If there is no count specified, it shall display the last latest one. The count is up to the max resource of the COMM Module in the NVRAM. If it is too big, this command automatically adjusts the number to its own maximum. The current max limit is set to 300. Note: the actual max number is limited on the NVRAM resource.

Syntax

RTRV-SECU-LOG:[tid]::ctag::[count];

Parameter	Value	Description
[count]	[1 - 300]	Retrieves the specified number of log events
	[null]	Retrieves the most recent log event

Response Format

^^^"condType,ocrdat,ocrtm:condstr" <cr lf>

where:

- condType = the Security Log identification number

- ocrdat = occurrence date

- ocrtm = occurrence time

- condstr = condition description string

Example

```
    SSU_2000 05-10-05 15:49:08
M   1 COMPLD   "1,05-10-04,18-00-47:\"LOGIN,COML,ICS,ADMIN\""
    "2,05-10-04,18:01:40:\"LOGIN_FAIL,COML,ICS,ADMIIN\""
    "1,05-10-04,18:01:56:\"LOGIN,COML,ICS,ADMIN\""
    "4,05-10-04,18:12:11:\"AUTO_LOGOUT,COML,ICS,ADMIN\""
    "1,05-10-05,15:41:29:\"LOGIN,ENET,TL1,ADMIN\""
    "1,05-10-05,15:48:55:\"LOGIN,COML,ICS,ADMIN\""
;
```

Retrieve Security Parameters

This command returns the settings for the security parameters.

Syntax

`RTRV-PRMTR-SECU:[tid]::ctag;`

Response Format

`^^^"faillogin,lockout,aging" <cr lf>`

where:

- `faillogin` = the failed login attempt threshold. If zero, user lockout function is disabled

- `lockout` = the user lockout recovery timer in seconds

- `aging` = the password aging setting in days. If zero, the aging function is disabled

Retrieve Service Parameters

This command returns the state of the services on the specified PackeTime module.

Syntax

`RTRV-PRMTR-SERVICE:[tid]:aid:ctag;`

Response Format

`^^^"aid:NTP,state" <cr lf>`

where:

- `state` = the current state of the NTP service ENA | DIS

Related Commands

Set Service Parameter, on page 172

Retrieve Setup Parameters

This command returns the current, user, or factory setting of the module specified in the command.

Syntax

`RTRV-PRMTR-SETUP:[tid]:aid:ctag::which;`

Parameter	Value	Description
`which`	`current`	Returns the current settings in the specified module.
	`user`	Returns the User settings stored in the specified module.
	`factory`	Returns the Factory settings for the specified module.
	`running`	Returns the provisioned parameters for the specified module [or port].
`aid`	`SxAy[-z]`	Specifies the module [or port].

Response Format

The response format varies for each module.

For the Comms module:

```
^^^"PROMPT: name"<cr lf>
^^^"COML: mode,echo,eol,tout"<cr lf>
^^^"COMA: mode,echo,eol,tout"<cr lf>
^^^"COMB: mode,echo,eol,tout"<cr lf>
^^^"TELNET_TIMEOUT: tout"<cr lf>
^^^"TL1_TIMEOUT: tout"<cr lf>
^^^"TL1_KEEPALIVE: keepalive"<cr lf>
^^^"TL1_FORMAT:tl1 format"<cr lf>
^^^"PBO"<cr lf>
^^^"LOGIN_EVT_DIS:login_evt_dis"<cr lf>
^^^"ELEVATION:elevation"<cr lf>
^^^"TODSOURCE:todsource"<cr lf>
^^^"SNMP:snmp_ena"<cr lf>
^^^" SNMP_KEEPALIVE: keepalive "<cr lf>
^^^" SNMP_TRAP: trap "<cr lf>
```

where:

name	is the Unit's name
mode	indicates the mode of communication {ASCII	TL1}
echo	indicates if the port operates in full-duplex or half-duplex {ON	OFF} mode
eol	indicates the end-of-line character to be used when the unit transmits ASCII data {CR	LF	CRLF}

tout	indicates the inactivity timeout period before the session is logged out {value | NEVER}. Some data fields shall be left blank for Telnet parameters
keepalive	is the TL1 or SNMP session timer in minutes. If timer is set to zero indicate keep alive function is disabled for that session
tl1format	is {GR831 | GR833}
pbo	is {DIS | EVT | REP | NONE}
login_evt_dis	is {YES | NO}
elevation	returns the time for alarm elevation, from 60 seconds to 500,000 seconds. A setting of 0 (zero) means no elevation for the alarm
todSource	is the SSU's preferred Time-Of-Day Source {GPS | CLIENT}
snm_ena	{ENA | DIS}
trap	displays V2 format or V3 format, or all V2 and V3 trap formats

The response for a Clock module is in the same format described in Retrieve Clock Parameters, on page 51.

The response for an input module is in the same format described in the references in the table below:

Input Module	Response Format
DS1/E1	Retrieve Input Status, Retrieve MTIE Parameters, Retrieve Frequency Parameters, Retrieve Alarm Parameters
GPS	Retrieve GPS Input Parameters, Retrieve MTIE Parameters, Retrieve Frequency Parameters
Composite Clock	Retrieve CC Input Parameters, Retrieve Alarm Parameters
Sine	Retrieve MTIE Parameters, Retrieve Frequency Parameters

The response for an output module is in the same format described in the references in the table below:

Output Module	Response Format
DS1/E1	Retrieve Output Status
2048 kHz	Retrieve 2048 kHz Clock Output Parameters
Composite Clock	Retrieve CC Output Parameters
RS-422	Retrieve RS-422 Output Parameters
E1/2048 kHz	Retrieve E1/2048 kHz Output Parameters
PackeTime	Retrieve NTP Module Parameters, Retrieve NTP Peer Parameters, Retrieve Authorization Parameters, Retrieve TOD Source, Retrieve Bond Parameters, Retrieve Service Parameters, Retrieve Route Parameters, Retrieve VLAN Status

Retrieve Signal Fault Alarm Parameters

These commands return the erred and cleared second thresholds for the appropriate signal faults on the specified DS1, E1, or Composite Clock Input module.

Syntax

```
RTRV-PRMTR-AIS:tid:[aid]:ctag;
RTRV-PRMTR-BPV:tid:[aid]:ctag;
RTRV-PRMTR-CRC:tid:[aid]:ctag;
RTRV-PRMTR-LOS:tid:[aid]:ctag;
RTRV-PRMTR-OOF:tid:[aid]:ctag;
```

Parameter	Value	Description
[aid]	SxAy[-z]	Retrieves the error and clear threshold data from the specified module [or port].

Response Format

```
^^^"aid:prmtr,errcnt,clcnt"<cr lf>
```

where:

- `aid` = module or port access identifier

- `prmtr` = signal fault [LOS | AIS | OOF | BPV | CRC]

- `errcnt` = setting (in s) for the error threshold. This value is the number of seconds that the error condition must be present before an alarm is declared.

- `clcnt` = setting (in s) for the clear threshold. This value is the number of seconds that the port must be free of the error condition before the alarm is cleared.

Related Commands

Set Signal Fault Alarm Parameters, on page 174

Retrieve SNMP Engine ID Parameter

This command returns the current SNMP engine ID. The engineId uses the MAC address to form the Engine ID and should be formed via an algorithm in line with "RFC 3411 Textual Convention for SnmpEngineID Description" from the MAC address of the SNMP (Ethernet) interface. (very first bit = 1, first four octets = SNMP Management Private Enterprise Number, fifth octet = 3 (MAC address), octets 6...11 = MAC Address).

Syntax

```
RTRV-PRMTR-SNMP-ENGINEID:[tid]::ctag;
```

Response Format

```
^^^"length,engineId" <cr lf>
```

```
where:
```

- `length` = actual length (in bytes) of the engineid that follows

- `engineid` = the engine ID in hex string format (an example of the hex string: 80 00 02 59 03 00 A0 6E 0E BD EE)

Retrieve SNMP Mode Parameter

This command returns the current SNMP mode.

Syntax

`RTRV-PRMTR-SNMP-MODE:[tid]::ctag;`

Response Format

`^^^"mode,trap" <cr lf>`

where:

- `mode` = [ENA | ALM | ENAV2 | ENAV3];
  `ENA` = all SNMP agents are enabled
  `DIS` = all SNMP agents are disabled
  ENAV2 = SNMPv2 agents are enabled
  ENAV3 = SNMPv3 agents are enables

- `trap` = [ALM | ALL];
  `ALM` = Only alarms cause Traps to be transmitted
  `ALL` = All events and alarms cause Traps to be transmitted

Related Commands

Retrieve SNMPv2 Manager List

This command returns the SNMPv2 Manager list.

Syntax

`RTRV-PRMTR-SNMP-MANAGER:[tid]::ctag;`

Response Format

`^^^"ip" <cr lf>`

where:

- `ip` = the IP address of the assigned SNMP Manager

Related Commands

Set SNMPv2 Manager Parameters, on page 176

Retrieve SNMPv2 User List

This command returns the current SNMPv2 user list, which is also known as the Read Community String. The Write Community String is not displayed. This command is only accessible by Level 4 users.

Syntax

```
RTRV-PRMTR-SNMP-USER:[tid]::ctag;
```

Response Format

```
^^^"readcommunity,level" <cr lf>
```

where:

- `readcommunity` = the assigned Read Community String used by SNMP

- `level` = the access level assigned to that user

Related Commands

Set SNMPv2 User Parameter, on page 177

Retrieve SNMPv3 Manager List

This command returns the SNMPv3 Manager list.

Syntax

```
RTRV-PRMTR-SNMPV3-MANAGER:[tid]::ctag;
```

Response Format

```
^^^"ip,username" <cr lf>
```

where:

- `ip` = the assigned SNMPv3 Manager IP address

- `username` = the assigned SNMPv3 Manager username

Related Commands

Set SNMPv3 Manager Parameter, on page 178

Retrieve SNMPv3 Notification Type

This command returns the current SNMPv3 notification type.

Syntax

```
RTRV-PRMTR-SNMPV3-NOTIFICATION:[tid]::ctag;
```

Response Format

```
^^^"notification" <cr lf>
```

where:

- `notification` = {V2 |V3 | ALL} SNMPv2, SNMPv3, or both types when an event occurs

Related Commands

Set SNMPv3 Notification Parameter, on page 179

Retrieve SNMPv3 User List

This command returns the current SNMPv3 user list.

Syntax

`RTRV-PRMTR-SNMPV3-USER:[tid]::ctag;`

Response Format

`^^^"username" <cr lf>`

where:

- `username` = user identification string used by SNMPv3. No authentication or privacy key is displayed.

Related Commands

Set SNMPv3 User Parameters, on page 180

Retrieve TDEV Data

This command returns TDEV data for a port on a DS1, E1, or Sine Input module. This command *requires* an aid to identify the input port to report data from. The ctag and a null field are followed by optional parameters which contain a clock identifier clksrc [CLK-A | CLK-B] and the start and stop times for the measurement. If no clock source is specified, the current output clock is used.

Syntax

`RTRV-DATA-TDEV:[tid]:aid:ctag[::[clksrc][,start][,stop]];`

Parameter	Value	Description
[aid]	S1Ay-z	Retrieves the current TDEV data from the specified Input port.
[clksrc]	CLK-A | CLK-B	Specifies which clock supplies the TDEV data. If clksrc is not specified, the current output clock is used.
[start]	{MM-DD}, {HH:MM}	Specifies the start date and time for data. If the date is null but followed by a time, the command defaults to the current date. If the start time is null, but preceded by a date, the command defaults to the current time. If the start date and time are null, the command defaults to the start of the data. The comma must be present to indicate a null start time.
[stop]	{MM-DD}, {HH:MM}	Specifies the stop date and time for data. If the date is null but followed by a time, the command defaults to the current date. If the stop time is null but preceded by a date, the command defaults to the current time. If the stop date and time is null, the command defaults to the end of the data.

Response Format

The response is the complied message followed by the requested data. Only the values available in the interval between the start and stop times is output. The format for each response message line is:

`^^^"aid:ocrdat,ocrtm,TDEV,clksrc,tmper,monval"<cr lf>`

where:

- `aid` = port access identifier

- `ocrdat` and `ocrtm` = the beginning date and time the data was collected

- `clksrc` = clock used for the measurements

- `tmper` = time period for the measurement data, in seconds

- `monval` = data value for the time period, in nanoseconds. The maximum tmper values for TDEV are 0.1, 0.3, 0.6, 1.0, 3.0, 6.0, 10.0, 30.0, 60.0, 100.0, 300.0, 600.0, 1000.0, 3000.0, 6000.0, and 10000.0

Only the values available in the interval between the start and stop times are output.

Example

```
    SSU_2000 06-05-30 14:51:49
M   100 COMPLD
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,0.10,1.72"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,0.30,0.77"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,0.60,0.52"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,1.00,0.37"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,3.00,0.21"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,6.00,0.16"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,10.00,0.13"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,30.00,0.09"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,60.00,0.10"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,100.00,0.13"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,300.00,0.24"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,600.00,0.90"
    "S1A04-01:06-05-30,14:00:01,TDEV,CLK-A,1000.00,2.09"
;
```

Related Commands

Retrieve TDEV History Data, on page 124

Retrieve TDEV History Data

This command returns the Historical TDEV data for a port on a DS1, E1, or Sine Input module. The Historical TDEV data is the 24-hour TDEV data stored every day at midnight. There are 99 historical TDEV records stored. The command *requires* an aid to identify the input port to report data from. The optional parameters are the clock identifier and the number of days of MTIE history to be retrieved from the current day (day 0). If no clock source [CLK-A | CLK-B] is specified, the current output clock is used.

Syntax

```
RTRV-DATA-TDEV-HIST:[tid]:aid:ctag[::[clksrc][,count];
```

Parameter	Value	Description
[aid]	S1Ay-z	Retrieves the current MTIE history data from the specified Input port.
[clksrc]	CLK-A | CLK-B	Specifies which clock supplies the MTIE history data.
[count]	1 - 99	Specifies the number of days of MTIE history to retrieve.

Response Format

The response is the complied message followed by the requested data.

```
^^^"aid:ocrdat,ocrtm,TDEV,clksrc,monval1,.., monval16"<cr lf>
```

where:

- `aid` = port access identifier

- `ocrdat` and `ocrtm` = the beginning date and time the data was collected

- `clksrc` = clock used for the measurements

- `tmper` = time period for the measurement data, in seconds

- `monval` = data value for the time period, in nanoseconds. There are 16 monvals in sequence, and the time periods in sequence are 0.1, 0.3, 0.6, 1.0, 3.0, 6.0, 10.0, 30.0, 60.0, 100.0, 300.0, 600.0, 1000.0, 3000.0, 6000.0, and 10000.0

Related Commands

Retrieve TDEV Data, on page 122

Retrieve TOD Source

This command displays the aid of each SSU-2000 module that is provisioned as a ToD source, and its assigned priority.

Syntax

```
RTRV-TODSRC:[tid]:[aid]:ctag;
```

Response Format

```
^^^"aid:priority1"<cr><lf>
^^^...<cr><lf>
^^^"aid:priority8"<cr><lf>
```

Related Commands

Set TOD Source, on page 182

Retrieve TL1 Format

This command returns the setting for the format of autonomous reports.

Syntax

```
RTRV-PRMTR-TL1FORMAT:[tid]::ctag;
```

Response Format

```
^^^"format" <cr lf>
```

where:

- `format` = format of the autonomous report [GR831 | GR833]

Example

```
    SSU_2000 06-03-08 20:34:25
M  100 COMPLD
    "GR831"
;
```

Related Commands

Retrieve User List

This command returns the current user list. A user who is not at an administrator level can only get their own information with username and level. A user at an administrator level can display all the information from everybody in the user list.

Syntax
```
RTRV-USER:[tid]::ctag;
```

Response Format

For a user not at the administrator level, the response is:

```
^^^"username,level" <cr lf>
```

where:

- `username` = assigned user

- `level` = access level assigned to that user

For a user at the administrator level, the response is:

```
^^^"username,level,state,passwordState,passwordDaysleft,lockout"
<cr lf>
```

where:

- `username` = assigned user

- `level` = access level assigned to that user

- `state` = whether the username is valid [ENA | DIS]

- `passwordState` = [ALIVE | EXPIRED]

- `passwordDaysleft` = the number of days before the passwordState changes to EXPIRED

- `lockout` = whether the username is locked from access to the system [YES | NO]

Retrieve VLAN Status

This command returns the state of services on the specified PackeTime module, including the state of each Service port, the VLAN Identification, and Priority.

Syntax

```
RTRV-PRMTR-VLAN:[tid]:aid:ctag;
```

Response Format

```
^^^"aid:state" <cr lf>
^^^"aid-A:id,priority" <cr lf>
^^^"aid-B:id,priority" <cr lf>
```

where:

- `state` = is the state ENA | DIS of the service

- `id` = is the VLAN identification 0 | ... | 4094

- `priority` = is the VLAN priority 0 | ... | 8

Related Commands

Set VLAN Parameters, on page 184

TL1 Set Commands

This section provides an alphabetical listing of TL1 set commands, a description of the command which provides the valid aid codes to use in the command, and an example and description of the components of message lines.

The TL1 set commands allow you to set data and time or parameters for the SSU-2000e. The unit responds to set commands with a complied message or a deny message that indicates the cause for the failure. There is no response message line for the set commands.

Set 2048 kHz Output Parameters

This command sets the parameters for the specified 2048 kHz Output modules.

Syntax

```
SET-PRMTR-CLKOUT:[tid]:[aid]:ctag::[pstate],[mode],[level],[bypass],
    [fltmode],[squelch];
```

Parameter	Format	Description
aid	SxAy[-z]	Sets the parameters for the specfied 2048 kHz Output module [or port].
pstate	ON | OFF	Turns the specified module [or port] on or off.
mode		This parameter is ignored.
level	ACQ | LOCK	Outputs are turned on when the active Clock module is at or above the specified state.
bypass	ON | OFF	Allows operation when Clock C is the active clock.
fltmode	OFF | ON | AUTO	Turns outputs on or off when the output level exceeds the 2.1 V fault threshold.
squelch	0 | 1-16	Turns off the specified port if the reference clock PQL exceeds the squelch threshold specified in this field. 0 disables the function.

Empty fields leave parameters unchanged.

Related Commands

Retrieve 2048 kHz Clock Output Parameters, on page 36

Set Active Clock

This command changes the current output clock to the one designated in the aid. If the aid is invalid or the clock is not available for use or clock A/R is on, the DENY response is returned.

Syntax

```
SET-CLK:[tid]:[aid]:ctag;
```

Parameter	Value	Description
[aid]	S1A1 S1A12	Sets the specified Clock module as the active clock.

Related Commands

Retrieve Clock Status, on page 52

Set Alarm Cutoff

This command activates the Alarm Cutoff (ACO) function. The ACO remains active until a new alarm is reported, or an existing alarm is elevated.

Syntax

```
SET-ACO:[tid]::ctag;
```

Related Commands

Retrieve Alarm Cutoff, on page 38

Set Alarm Elevation Time Parameters

This command sets the time for alarm elevation, from 60 seconds to 500,000 seconds. A setting of 0 (zero) means no elevation for the alarm. When an alarm has been at MINOR or MAJOR level continuously for ELTIME seconds, then it is elevated to the next level.

ELTIME may be set for each module or ALL modules, and applies to all alarms created by the module.

Syntax

`SET-PRMTR-ELTIME:[tid]:[aid]:ctag::elevtime;`

Parameter	Format	Description
aid	ALL	Sets the parameters for all modules.
	SxAy	Sets the parameters for the specfied module.
elevtime	0 | 60 – 500000	Sets the time after which an alarm is elevated to the next severity level.

Related Commands

Retrieve Alarm Elevation Time, on page 39

Set Alarm Level Parameters

This command assigns an alarm level to the alarm number specified.

Syntax

`SET-PRMTR-ALARM:[tid]:aid:ctag::almnum,level[,errcnt],[clrcnt];`

Parameter	Format	Description
aid	SxAy	Sets the alarm level parameters for the specfied module.
almnum		Specifies the alarm number to be modified. See Chapter 6, Alarms and Events for a list of alarm numbers.
level	IGN RPT MIN MAJ CRT	Sets the alarm level of the specified alarm number.
errcnt		Specifies the start delay time, which is the number of seconds that the alarm must be present before the alarm message is issued.
clrcnt		Specifies the clear delay time, which is the number of error-free seconds after the alarm condition is cleared before the alarm indication is cleared.

Related Commands

Retrieve All Alarms, on page 44

Set Authorization Parameters

This command allows you to define the authentication key identification and the key for MD5 hash used in the PackeTime module.

Syntax

`SET-PRMTR-AUTH:[tid]:aid:ctag::index,keyid,<key>;`

Parameter	Format	Description
aid	SxAy	Sets the parameters for the specfied PackeTime module.
index	1–16	Defines a unique set of keyid and keys.
keyid	0 – 65534	The port's identification key ID. Default is 0 (no authentication) and key has no meaning.
key	8 to 32 ASCII characters	The port's authentication key, used to create the MD5 hash associated with the keyid.

Related Commands

Retrieve Authorization Parameters, on page 45

Set Bond Active

This command sets the specified PackeTime module port to Active when the ports are bonded. This command only applies when Port Bonding is enabled (use the SET-PRMTR-BOND command).

Syntax

`SET-BOND:[tid]:aid-{A | B}:ctag;`

Parameter	Format	Description
`aid`	`SxAy-A`	Specifies Port-A on a PackeTime module as the Active port.
`aid`	`SxAy-B`	Specifies Port-B on a PackeTime module as the Active port.

Related Commands

Set Bond Parameters, on page 137
Retrieve Bond Parameters, on page 46
Retrieve Bond Status, on page 47

Set Bond Parameters

This command enables and disables Port Bonding on the specified PackeTime module. When port bonding is enabled, Port-B shares the IP address of Port-A.

Syntax

`SET-PRMTR-BOND:[tid]:aid:ctag::<state>;`

Parameter	Format	Description
aid	SxAy	Specifies a PackeTime module.
state	ENA | DIS	Enables and disables port bonding for the specified PackeTime module.

Related Commands

Retrieve Bond Parameters, on page 46

Set CC Input Parameters

This command sets the parameters on the specified Composite Clock Input module or port.

Syntax

`SET-PRMTR-CCINP:[tid]:[aid]:ctag::[pstate],[pri],[pql],[zs];`

Parameter	Format	Description
`aid`	`SxAy[-z]`	Sets the parameters for the specfied CC Input module [or port].
`pstate`	`ON │ OFF`	Turns the selected module [or port] on or off.
`pri`	`1 - 10 │ MON`	Sets the priority of the specified module [or port]; MON = Monitor.
`pql`	`1 - 16`	Sets the priority quality level of the specified module [or port].
`zs`	`ON │ OFF`	Turns zero suppression on or off for the specified module [or port].

Related Commands

Retrieve CC Input Parameters, on page 48

Set CC Output Parameters

This command sets the parameters on the specified Composite Clock Output module or port.

Syntax

```
SET-PRMTR-CCOUT:[tid]:[aid]:ctag::[pstate],[mode],[level],[bypass],
    [duty],[pcomp];
```

Parameter	Format	Description
aid	SxAy[-z]	Sets the parameters for the specfied CC Output module [or port].
pstate	ON | OFF	Turns the specified module [or port] on or off.
mode		This parameter is ignored.
level	ACQ | LOCK	Outputs are turned on when the active Clock module is at or above the specified state.
bypass	ON | OFF	Allows operation when Clock C is the active clock.
duty	1 | 0	Sets the duty cycle on the specified module [or port] to 5/8 (1) or 50/50 (0).
pcomp	0 – 7	Sets the phase compensation delay on the specified module [or port], where 0 = No compensation and 8 = 2200 ft. The resolution of pcomp values is 275 ft.

Empty fields leave parameters unchanged.

Related Commands

Retrieve CC Output Parameters, on page 49

Set Clock Parameters

This command sets the warmup time and tau values for the specified Clock module.

Syntax

```
SET-PRMTR-CLK:[tid]:[aid]:ctag::[warmup],[mintau],[maxtau],tod_out;
```

Parameter	Format	Description
aid	S1A1	Sets the parameters for the Clock module in slot 1.
	S1A12	Sets the parameters for the Clock module in slot 12.
	null	Sets the parameters for both Clock modules.
warmup		Sets the warmup time constant; set to 1200 seconds
mintau		Sets the starting time constant for the specified Clock module.
maxtau		Sets the final time constant value for the specified Clock module ST2E tau range = [300–10 000] ST3E tau range = [150–1200] TYPEI tau range = [150–1200]
tod_out	60 - 10000	Sets the ToD Source timeout, which is the time (in minutes) a clock runs without a valid ToD source before indicating the ToD source is not valid. Default is 1440 min (24 h).

Empty fields leave parameters unchanged.

Related Commands

Retrieve Clock Parameters, on page 51

Set Clock AutoReturn

The command sets the clock mode of returning or not returning after faults are cleared. The `ar` parameter changes the active Clock module selection mode to [ON | OFF] for revertive or non-revertive operation. See *the SSU-2000e User's Guide* for more information on revertive and non-revertive operation.

Syntax

```
SET-CLK-AR:[tid]::ctag::ar;
```

Parameter	Value	Description
[ar]	ON	Sets the active Clock module to the Revertive mode.
	OFF	Sets the active Clock module to the Non-Revertive mode.

Empty fields leave parameters unchanged.

Related Commands

Set Clock Mode

This command sets the clock loop mode to Acquire, Lock, or Hold.

Syntax

`SET-CLK-MODE:[tid]:[aid]:ctag::mode;`

Parameter	Value	Description
`aid`	`S1A1` `S1A12`	Selects the Clock module as the target for the command.
`[mode]`	`ACQ`	Sets the specified Clock module to the Acquire mode.
	`LOCK`	Sets the specified Clock module to the Lock mode.
	`HOLD`	Sets the specified Clock module to the Holdover mode.

If you do not specify an aid, then the mode of both Clock modules changes.

Related Commands

Retrieve Clock Status, on page 52

Set Commit Parameters

This command commits all uncommitted provisioned parameters to become the active parameters for the specified PackeTime module. This command also commits the parameters to non-volatile memory.

> **Note:** You *must* execute this command after setting NTP/PackeTime parameters using the Set NTP Module Parameters and/or Set NTP Peer Parameters commands. Failure to execute this command leaves the original parameters unchanged.
>
> This command takes up to several minutes to execute, depending on the load on the specified module. After you issue the command, a progress indicator appears on the monitor; the command prompt appears when it is complete. Do not include this command in an automated script that runs more than once every five minutes.

Syntax

```
SET-PRMTR-COMMIT:[tid]:aid:ctag;
```

Parameter	Value	Description
`aid`	`SxAy`	Aid for PackeTime modules

Related Commands

All PackeTime Set commands

Set Communication Parameters

This command allows you to set the parameters for the serial communications ports. Use this command to choose between the ICS and TL1 command mode.

Syntax

```
SET-PRMTR-COMM:[tid]:[aid]:ctag::[baud],[echo],[eol], [mode],[tout];
```

Parameter	Format	Description
aid	ALL, COML, COMA, COMB, TELNET, or TL1	Sets the parameters for the specified communications port.
baud	19200|9600 |4800|2400 |1200	Sets the communications baud rate for the specified port.
echo	ON | OFF	Sets the unit to use full (On) or half duplex (Off).
eol	CR | LF | CRLF	Sets the end-of-line character(s) sent by the unit .
mode	ASCII | TL1	Sets the mode of communication.
tout	5 – 43200 | NEVER	Sets the inactivity timeout period in seconds.

Empty fields leave parameters unchanged.

Related Commands

Retrieve Communication Parameters, on page 53

Set Date and Time

This command changes the date and time in the Communications module. All timestamps are affected by this change. The SSU-2000e system clock shall be set to the received date and time and a complied message shall be returned, with the new date/time in the header. If the unit has time set by GPS or NTP client, the DENY response is returned.

Syntax

```
SET-DAT:[tid]::ctag::date,time,offset;
```

Parameter	Format	Description
date	yy-mm-dd	Specifies the date.
time	hh:mm:ss	Specifies the time.
offset	+/-hh:mm	Sets the local time difference between local and UTC time. If the local time is ahead of UTC, then use a positive number; if the local time is behind UTC, then use a negative number. The valid range is +/– 13 hours.

Response

The SSU-2000e clock is set to the received date and time and a complied message is returned, with the new date/time in the header.

Related Commands

Retrieve Header, on page 70

Set DS1/E1 Input Parameters

This command sets the parameters for the specified DS1 or E1 Input module or port.

Syntax

```
SET-PRMTR-INPUT:[tid]:[aid]:ctag::[pstate],[pri],[pql],[mode],[ssm],
    [zs],[crc],[gain],[csflt],[bit];
```

Parameter	Format	Description
aid	S1Ay[-z]	Sets the parameters for the specfied DS1 or E1 Input module [or port].
pstate	ON | OFF	Turns the specified module [or port] on or off.
pri	1 - 10 | MON	Sets the Priority for the specified module [or port]; MON = Monitor.
pql	1 - 16	Sets the Priority Quality Level for the specified module [or port].
mode	ESF | D4 | CCS |CAS | 1 | 1.544 | 2.048 | 5 | 10	Sets the framing mode or clock frequency in MHz. A DENY with ICNV message is returned if the mode setting does not match the module type (DS1 or E1). If mode is set to a framed type then frequency is set to correct frequency for type DS1 (1.544) or E1 (2.048).
ssm	ON | OFF	Sets the specified module [or port] to read or ignore incoming Sync Status Messages.
zs	ON | OFF	Enables or disables zero suppression ■ For DS1: On = B8ZS, Off = AMI ■ For E1: On = HDB3, Off = AMI
crc	ON | OFF	Enables or disables error checking.
gain	ON | OFF	When set to ON, 20 dB gain is applied to the input signal. SSM, zs, crc, and gain are ignored for clock modes.
csflt	HI | LO | OFF	Sets the external Cesium fault alarm input.
bit	4 - 8	Sets the bit number of the Time Slot 0 word used for the E1 SSM. For DS1 input, the bit value is ignored.

Empty fields leave parameters unchanged.

Related Commands

Set DS1/E1 Output Parameters

This command sets the output port parameters for the specified DS1 or E1 Output module or port.

Syntax

```
SET-PRMTR-OUTPUT:[tid]:[aid]:ctag::[pstate],[mode],[level],[bypass],
    [zs],[crc],[len],[bit];
```

Parameter	Format	Description
aid	SxAy[-z]	Sets the parameters for the specfied DS1 or E1 Output module [or port].
pstate	ON | OFF	Enables or disable the specified module [or port].
mode	ESF | D4 | CCS | CAS	Sets the output mode of the specified module [or port].
level	ACQ | LOCK	Outputs are turned on when the active Clock module is at or above the specified state.
bypass	ON | OFF	Allows operation when Clock C is the active clock.
zs	ON | OFF	Turns zero suppression On or Off for the specified module [or port].
crc	ON | OFF	Enables or disables error checking.
len	133 | 266 399 | 533 655	Sets the line build-out in feet for DS1 outputs.
bit	4 - 8	Sets the bit number of the Time Slot 0 word used for the E1 SSM.

Empty fields leave parameters unchanged.

Related Commands

Set E1/2048 kHz Output Parameters

This command sets the output parameters for the specified E1/2048 kHz Output module or port.

Syntax

```
SET-PRMTR-OUTE12048:[tid]:[aid]:ctag::[pstate],[bypass],[zs],
    [signal],[squelch],[mframe],[crc],[ssm],[bit];
```

Parameter	Format	Description
aid	SxAy[-z]	Sets the parameters for the specfied E1/2048 kHz Output module [or port].
pstate	ON | OFF	Enables or disables the specified module [or port].
bypass	ON | OFF	Allows operation when Clock C is the active clock.
zs	ON | OFF	Turns zero suppression on or off for the specified module [or port] when framed outputs are selected.
signal	E1 | 2048	Sets the signal type on the specified module [or port].
squelch	0 | 1 – 16	Turns off the specified module [or port] if the reference clock PQL exceeds the squelch threshold specified in this field. 0 disables the function.
mframe	CAS | CCS	Sets the multiframe mode for the specified module [or port].
crc	ON | OFF	Eanbles or disables error checking.
ssm	ON | OFF	Sets the specified module [or port] to read or ignore incoming Sync Status Messages.
bit	4 – 8	Sets the bit number of the Time Slot 0 word used for the E1 SSM.

Empty fields leave parameters unchanged.

Related Commands

Retrieve E1/2048 kHz Output Parameters, on page 59

Set Frequency Alarm Threshold Parameters

This command sets the input Frequency alarm thresholds for the specified Input module or port.

Syntax

```
SET-PRMTR-FREQ:[tid]:[aid]:ctag::[fae],[fac],[fbe],[fbc],[fatau],
    [fbtau];
```

Parameter	Format	Description
aid	S1Ay[-z]	Sets the parameters for the specfied Input module [or port].
fae	up to 10 000 000 ps/s	Sets the error threshold for input versus A clock.
fac	up to 10 000 000 ps/s	Sets the clear threshold for input versus Clock A.
fbe	up to 10 000 000 ps/s	Sets the error threshold for input versus B clock.
fbc	up to 10 000 000 ps/s	Sets the clear threshold for input versus Clock B, for the designated input.
fatau	10 – 1000	Sets the frequency error tau, the period (in seconds) for the frequency to be calculated for input versus A clock.
fbtau	10 – 1000	Sets the frequency error tau, the period (in seconds) for the frequency to be calculated for input versus B clock.

Empty fields leave parameters unchanged.

Related Commands

Retrieve Frequency Parameters, on page 64

Set GPS Input Parameters

This command sets the parameters for the GPS Input module.

Syntax

```
SET-PRMTR-GPS:[tid]:[aid]:ctag::[pri],[pql],[sigma],compensation;
```

Parameter	Format	Description
aid	S1A3 | S1A5	Sets the parameters for the specified GPS Input module.
pri	0 | 1 - 10	Sets the Priority for the specified module; 0 = Monitor.
pql	1 - 16	Sets the Priority Quality Level for the specified module.
sigma	10 - 1000	This field is obsolete.
compensa-tion	0 - 250	Compensation for antenna cable delay. The time offset has a 100 nS resolution, thus the "compensation" value shall be multiplied by 100 nS to provide 1PPS compensation. Valid range is 0 to 250 for a total compensation range of 0 to 25000 nS (25 μS).

Related Commands

Set GPS Position

This command sets the position mask for the GPS module designated by the aid.

Syntax

```
SET-GPS-POS:[tid]:[aid]: ctag::[(lat)],[(lon)],[(hgt)],[pdop],[avg],
   [posel],[timel];
```

Parameter	Value	Description
[aid]	S1A3 | S1A5	Sets the parameters for the specified GPS Input module.
[lat]	±HH-MM-SS.ss	Sets the latitude of the position. + is North, – is South.
[lon]	±HH-MM-SS.ss	Sets the longitude of the position. + is East, – is West.
[hgt]	±10000.0	Sets the altitude of the location of the shelf in m.
[pdop]	1 to 10	Sets the Position Dilution of Precision (PDOP) number.
[avg]	10 to 3600	Sets the averaging value.
[posel]	0 to 50	Sets the minimum satellite elevation level in degrees for positioning.
[timel]	0 to 50	Sets the minimum satellite elevation level in degrees for timing.

Related Commands

Retrieve GPS Data, on page 66
Retrieve GPS Available Data, on page 65
Retrieve GPS Input Parameters, on page 68

Set Image

This command selects which of two firmware images is loaded when the PackeTime module reboots.

Syntax

```
SET-IMAGE:[tid]:aid:ctag::image;
```

where:

- `image` = 0 | 1

Related Commands

Load Program, on page 187
Retrieve Image, on page 71

Set Input Reference

This command sets the current input reference to the designated input port. If the input port is not a valid reference, then the DENY response is returned. This command also sets the reference selection mode. For more information on reference switching, see "Setting the Reference Switching Mode" in the *SSU-2000e User's Guide*.

Syntax

SET-INPUT-REF:[tid]::ctag::port[,swtmode][,selmode];

Parameter	Value	Description
port	S1Ay-z	Selects the port as the target of the command
[swtmode]	AR	Sets the Autoreturn (revertive) mode
	AS	Sets the Autoswitch (non-revertive) mode
	OFF	Selects no automatic switching on an input fault
[selmode]	PRI	The Priority level of the input signal is the primary factor in determining which input is selected
	PQL	The PQL of the input signal is the primary factor in determining which input is selected

Related Commands

Retrieve Input Data, on page 72

Set IP Parameters

This command sets the Internet Protocol parameters. To provide optimum NTP service levels, you must place the PackeTime Maintenance port and Service port(s) on separate physical networks.

> **Note:** To avoid network routing issues, you must place Port-A and Port-B on separate subnets when the PackeTime module is in the non-bonded mode.

Syntax

`SET-PRMTR-IP:[tid]:aid[-A|B|M]:ctag::[addr],[mask],[gate];`

Parameter	Format	Description
`<aid>`	S1A2	Specifies the Communications module
	SxAy[-A|B|M]	Specifies the PackeTime module [port-A, port-B, or Maintenance port]
`addr`		Sets the IP address for the specified module
`mask`		Sets the IP mask for the specified module
`gate`		Sets the IP gate for the specified module

where:

- `aid-A` = NTP Service port-A

- `aid-B` = NTP Service port-B

- `aid-M` = Maintenance port

- `addr` = the port's IP address

- `mask` = the port's IP mask

- `gate` = the port's IP gateway

All IP numbers are in the IPv4 format (###.###.###.###).

Related Commands

Retrieve IP Parameters, on page 77
Set Commit Parameters, on page 143

Set Keep-alive Parameter

This command supports a "keep-alive" mode in which, based upon a user settable time, the SSU-2000e generates an event to alert an upstream support system that the SSU-2000e and associated communication path is functional.

Syntax

`SET-PRMTR-KEEPALIVE:[tid]::ctag::[tl1_time],[snmp_time];`

Parameter	Format	Description
tl1time	0 | 1 - 60	Sets the TL1 session keep-alive time in minutes. 0 disables the function.
snmptime	0 | 1 - 60	Sets the SNMP session keep-alive time in minutes. 0 disables the function

Related Commands

Retrieve Keep-alive Parameters, on page 78

Set Login Events

This command allows you to select whether login and logout events are stored in the event log. Login and logout events always appear in the system console.

Syntax

```
SET-PRMTR-EVTLOGIN:[tid]::ctag::evtlogin;
```

Parameter	Value	Description
evtlogin	ENABLE | DISABLE	Enables login and logout events to be stored in the event log.

Related Commands

Retrieve Login Events, on page 81

Set Module

This command sets Active the specified PackeTime module. This command only applies when the specified module is one of a redundant pair.

Syntax

```
SET-MODULE:[tid]:aid:ctag;
```

Parameter	Format	Description
aid	SxAy	Sets the specfied PackeTime module as the active module in a redundant pair.

Related Commands

Set Commit Parameters, on page 143

Set MTIE Mask

This command sets the MTIE mask for the selected input to predefined settings. The predefined MTIE mask settings include both Limit 1 and Limit 2 and set and clear thresholds. To create a user-defined mask, use the command described in Set MTIE Parameters, on page 159.

Syntax

`SET-MTIE-MASK:[tid]:[aid]: ctag::mask;`

Parameter	Format	Description
`aid`	`S1Ay[-z]`	Sets the selected Input module [or port] to the mask specified in [mask]

`mask`	`PRS`
	`DS1`
	`G811`
	`G823`
		Each option selects a specific predefined MTIE mask

Related Commands

Set MTIE Parameters

This command sets the input MTIE alarm thresholds (EL1 or EL2) and the clear thresholds (CL1 or CL2) for the specified input. This command is valid for DS1, E1, Sine, and GPS Input modules.

Syntax

```
SET-PRMTR-MTIE:[tid]:[aid]:ctag::[threshold],[t10],[t100],[t1k],
    [t10k],[t100k];
```

Parameter	Format	Description
aid	S1Ay[-z]	Sets the parameters for the specfied Input module [or port].
threshold	EL1 | EL2	Sets the input MTIE alarm threshold for the specified module [or port].
	CL1 | CL2	Sets the clear threshold for the specified module [or port].
t10, t100, t1k, t10k, t100,		Sets the error limits in ns for the measurement time period. Range = [0 – 60000]

Related Commands

Set Name

This command assigns a new name to the unit when you set the aid to S1A2 (Communications Module) or omit the aid. The tid (if used) must match the original name, which is returned in the response sid. The new unit name must be used as the tid (and sid) for all commands following.

When you set the aid that designates an Input or Output port, the name is assigned to the port. The name for unit or port may be null or as many as 20 characters beginning with a letter.

Syntax

```
SET-NAME:[tid]:[aid]:ctag:: name;
```

Parameter	Format	Description
aid	S1A2	Sets the name of the shelf to the value in [name]
	SxAy[-z]	Sets the specified module [or port] to the name specified in [name]
name	up to 20 characters	Defines the name for the device specified in [aid]

Related Commands

Retrieve Name, on page 86

Set NTP Parameters

This command sets the NTP client and NTP broadcast mode of operation.

Syntax

`SET-PRMTR-NTP:[tid]::ctag::mode,ip,interval,prefer;`

Parameter	Format	Description
mode	CLIENT | BCLIENT | BROADCAST | DEL | CLRALL	Sets the mode of operation, where: ■ Client mode requests the time from the time server (specified by ip); this time sets the time in the SSU. ■ Bclient mode accepts time from a broadcast server specified by ip. ■ Broadcast mode configures the SSU as a broadcast time server at the specified ip, the broadcast interval (in seconds) defines the rate at which the time will be broadcast by the server. ■ The del mode deletes the server specified by ip from the list of peers; up to three ip's can be assigned for all peer modes combined. ■ Clrall deletes all peer addresses. If three ip's have been defined and a fourth ip is defined, the system returns a DENY message; you must delete one of the existing ip's prior to adding the new ip.
ip		Sets the IP address of the NTP server.
interval		Sets the rate (in seconds) at which the time is to be broadcast by the server.
prefer	GPS | CLIENT	Selects the time-of-day source in the SSU from GPS or an NTP client.

Related Commands

Set NTP Module Parameters

This command selects the source of the ToD used by the PackeTime module designated by the aid. To make the changes selected by this command, you must execute the SET-PRMTR-COMMIT command after executing this command.

Syntax

SET-PRMTR-NTPMOD:[tid]:aid:ctag::<preferred>,<weight>,<compensation>, <tod_timeout>,<bypass>;

Parameter	Format	Description
aid	SxAy	Aid for the PackeTime module.
preferred	TODSRC | PEER	TODSRC sets the GPS module as the source PEER selects a Peer if operating in Client or Broadcast Client mode. Setting the PREFERRED keyword to TODSRC selects the GPS module as the TOD source. For Release 5.0, it uses the GPS Priority to determine which GPS Input has priority. If the TOD source fails, the PackeTime module will failover to the Peer List. When you set PREFERRED to PEER, then the servers on the Peer List are used until exhausted of valid NTP servers, and then it would failover to GPS if available. Both modes are Auto-Revertive: they switch back to the primary source once it has been validated as good.
weight	-1 | 0 | ... | 100	Sets the load (bandwidth) distribution between Port-A and Port-B as a percentage. For example, 70 means Port-A gets 70% of total bandwidth and Port-B gets the remaining 30%. If Port-A reaches 70% of total bandwidth but Port-B has no traffic, the 30% of bandwidth is wasted, because Port-A cannot use it. To allow either port to use all the bandwidth, weight can be set to -1, indicating no limit between Port-A and Port-B (either Port-A or Port-B can get all the bandwidth, based on first-come, first-serve). Thus the range of this parameter -1 to 100. For bonding mode, this parameter must be forced to -1, so the active port can use 100% of the bandwidth. For non-bonding mode, you can set any value between -1 and 100.
compensation	0 | ... | 250	Compensation for the delay induced by the cable(s) used to connect expansion shelves where the PackeTime ToD Source(s) is located in relationship to the Main shelf. The time offset has a 100 nS resolution, thus the "compensation" value shall be multiplied by 100 nS to provide 1PPS compensation.
tod_timeout	60 | ... | 10000	Peer Availability Timeout. Default is 1440 minutes
bypass	ON | OFF	Allows Clock C selection

Related Commands

Retrieve NTP Module Parameters
Set Commit Parameters

Set NTP Peer Parameters

This command allows you to define up to eight NTP Servers (defined by their IP address), allowing the PackeTime module to operate in NTP Mode 3, NTP Client. To make the changes selected by this command, you must execute the `SET-PRMTR-COMMIT` command after executing this command.

> **Note:** Place any peers on a subnet separate from the one on which the Maintenance port is configured.

Syntax

`SET-PRMTR-NTPPEER:[tid]:aid:ctag::<function>,<index>[,<ip>,min,max];`

Parameter	Value	Description
`aid`	`SxAy`	Aid for PackeTime modules
`<function>`	`ADD | DEL | PREFER`	Adds or deletes the NTP server at the specified IP address, or sets it to the Preferred server
`<index>`	`0 | 1 - 8`	When <function> = PREFER, sets an arbitrary index value to the NTP server at the specified IP address; 0 = no preference, default is 1
`<ip>`	`IPv4 address`	Defines the IP address of the NTP server
`<min>`	`16|32|64|128 |256|512|1024`	Sets the minimum request rate in seconds in Client mode; default is 16
`<max>`	`16|32|64|128 |256|512|1024`	Sets the maximum request rate in seconds in Client mode; default is 1024

Related Commands

Retrieve NTP Peer Parameters
Set Commit Parameters, on page 143

Set Operating Mode

This command sets the Operating Mode for the system.

Syntax

`SET-PRMTR-OPERMODE:[tid]::ctag::mode;`

Parameter	Format	Description
`mode`	`normal | subtending`	Sets the operating mode.

where:

- NORMAL = SSU is in normal master mode. In this mode, the unit selects an input reference from any available input sources.

- SUBTENDING = SSU is in ANSI subtending mode. In this mode, the unit chooses an available Composite Clock Input as an input reference. All other inputs shall not be selected as input reference.

Related Commands

Retrieve Operating Mode, on page 93

Set Output PQL

This command assigns a value to the output SSM and overrides the SSM generated by DS1, E1, and E1/2048 kHz Output modules, which are capable of generating SSMs. Normally, the Clock module provides the SSM to the output module; using this command you can specify the output PQL on a module-by-module basis. The allowed values are 1 through 16; if the value is zero, the PQL override function is disabled and the output SSM is provided by the system's PQL. The PQL override function shall not be persistent.

Syntax

```
SET-OUT-PQL:[tid]:[aid]:ctag::pql;
```

Parameter	Format	Description
aid	SxAy	Sets the output PQL for the specified module.
pql	0 | 1 – 16	Defines the output pql for the specified module.

Related Commands

Retrieve Output PQL, on page 94

Set Phase Zero

This command sets the input phase to zero for the designated port(s) or all input ports with an aid of null or ALL. If `clksrc` is specified [CLK-A | CLK-B], only the one phase value is set to zero; otherwise both values are set to zero.

Syntax

`SET-PHASE-ZERO:[tid]:[aid]:ctag[::clksrc];`

Parameter	Format	Description
aid	S1Ay[-z]	Sets the input phase on the selected Input module or port to zero
clksrc	CLK-A | CLK-B	Sets the phase value for the specified Clock module to zero. If not specified, phase values for both Clock modules are set to zero.

Related Commands

Retrieve Phase Data, on page 99

Set Route Parameters

Static routing describes a system that does not implement adaptive routing. In these systems, routes through a data network are described by fixed paths (statically). These routes are usually entered into the host by the system administrator. An entire network can be configured using static routes, but this type of configuration is not fault tolerant. When there is a change in the network or a failure occurs between two statically defined nodes, traffic will not be rerouted.

This command allows you to add up to six Route Tables to the PackeTime module. The aid code specifies the Ethernet Interface to which packets for this route will be sent: SxAy-A (eth1), SxAy-B (eth2).

Syntax

```
SET-PRMTR-ROUTE:[tid]:aid-{A|B}:ctag::<function>,<index>,
<destination>[mask,gateway];
```

Parameter	Format	Description
aid	SxAy-A	Specifies Service port-A of the PackeTime module
	SxAy-B	Specifies Service port-B of the PackeTime module
function	ADD | DEL	Adds or deletes the specified IP address from the list
index	1 - 6	Specifies which of the six Route Tables to modifiy
destination	IPv4 addrress	The destination network or destination host
mask	255.255. 255.255	Host destination
	0.0.0.0	Default route
gateway	IPv4 addrress	Gateway address

Related Commands

Set RS-422 Output Parameters

This command sets the output parameters for the specified RS-422 Output module or port. You set the frequency for ports 1 through 10; port 11 automatically takes the frequency of port 1, port 12 automatically takes the frequency of port 2, and so on through port 20.

Syntax

```
SET-PRMTR-OUT422:[tid]:[aid]:ctag::[pstate],[bypass],[fltmode],
    [frequency];
```

Parameter	Format	Description
aid	SxAy[-z]	Sets the parameters for the specfied RS-422 Output .
pstate	ON | OFF	Enables or disables the specified module [or port].
bypass	ON | OFF	Allows operation when Clock C is the active clock.
fltmode	ON | OFF | AUTO	Turns the output of the specified module [or port] on or off when the output level exceeds the 2.1 V fault threshold.
frequency	1 - 512	Sets the frequency for the specified module [or port], where 1 = 8 kHz, 2 = 16 kHz ... 512 = 4096 kHz. The resolution is 8 kHz per step.

Empty fields leave parameters unchanged.

Related Commands

Retrieve RS-422 Output Parameters, on page 107

Set Password Confirm

This command confirms the previously-entered SET-USER command when used with the ADD, PWD or TMP mode value. If this command is successful, the changed password shall be effective; otherwise, the account status is unchanged.

Syntax

`SET-PWD-CONFIRM:[tid]::ctag::password;`

Parameter	Format	Description
`password`		Specifes a password, up to 20 characters long. This must exactly match the `password` parameter used in the `SET-USER` command.

Related Command

Set User Parameters, on page 183

Set Phase Build-Out Parameter

This command determines whether an event is displayed and/or stored when a Phase Build-Out occurs on DS1 and E1 Input modules.

Syntax

`SET-PRMTR-PBO:[tid]::ctag::mode;`

Parameter	Format	Description
`mode`	`DIS` | `EVT` `REP` | `NONE`	■ `DIS` – Disables the function ■ `EVT` – enables the PBO function. The PBO event is displayed and stored in the COMM module event buffer. ■ `REP` – enables the PBO function. The PBO event is displayed, but the event is not stored in the COMM module event buffer. ■ `NONE` – enables the PBO function. The PBO event is neither displayed nor stored in the COMM module event buffer.

Related Command

Retrieve Phase Build-Out Parameters, on page 98

Set Security Parameters

This command sets the security thresholds for user accounts.

Syntax

`SET-PRMTR-SECU:[tid]::ctag::[faillogin],[lockout],[aging];`

Parameter	Format	Description
`faillogin`	`0 | 2 - 5`	Sets the number of failed login attempts before the account is locked. 0 disables the feature.
`lockout`		Sets the number of seconds that a user account is locked after `faillogin` has occurred.
`aging`	`0 | 10 - 360`	Sets the number of days that the password is valid. After this time has elapsed, the user must create a new password. 0 disables the feature.

Related Commands

Set Service Parameter

This command allows you to change the type of service available on the PackeTime module. Currenlty, only NTP service is provided by the PackeTime module.

Syntax

`SET-PRMTR-SERVICE:[tid]:aid:ctag::<service>,<state>;`

Parameter	Format	Description
aid	SxAy	Specifies a PackeTime module.
service	NTP	Sets the specified PackeTime module to deliver NTP service.
state	ENA | DIS	Enables or disables the service specified by the service parameter.

Related Commands

Set Commit Parameters, on page 143

Set Setup Parameters

This command sets or saves the configuration of the specified module.

Syntax

`SET-PRMTR-SETUP:[tid]:[aid]:ctag::setup;`

Parameter	Format	Description
`aid`	`SxAy`	Sets or saves the configuration of the specfied module.
`setup`	`Factory`	Restores the module configuration to factory defaults. Any time the configuration has changed from the factory configuration, these configurations become the current configurations.
	`User`	Reloads the previously saved configuration.
	`Save`	Stores the current configuration.

Related Command

Retrieve Configuration Date, on page 55
Backing Up and Restoring the Configuration, on page 185

Set Signal Fault Alarm Parameters

These commands set the input error and clear parameters for signal faults on the specified DS1, E1, or CC Input module or port.

Syntax

```
SET-PRMTR-AIS:tid:[aid]:ctag::[errcnt],[clrcnt];
SET-PRMTR-BPV:tid:[aid]:ctag::[errcnt],[clrcnt];
SET-PRMTR-CRC:tid:[aid]:ctag::[errcnt],[clrcnt];
SET-PRMTR-LOS:tid:[aid]:ctag::[errcnt],[clrcnt];
SET-PRMTR-OOF:tid:[aid]:ctag::[errcnt],[clrcnt];
```

Parameter	Format	Description
aid	SxAy[-z]	Sets the alarm level for the specfied Input module [or port].[1]
errcnt	0-100: LOS and AIS 0-10000: OOF, BPV, and CRC	Specifies the start delay time, which is the number of seconds that the alarm must be present before the alarm message is issued.
clrcnt	0-100: LOS and AIS 0-10000: OOF, BPV, and CRC	Specifies the clear delay time, which is the number of error-free seconds after the alarm condition is cleared before the alarm indication is cleared.

Note:
   [1] For CC input modules and ports, only the LOS and BPV commands apply; AIS, CRC, and OOF commands are denied.

Related Commands

Set SNMP Mode Parameter

This command sets the SNMPv2 and SNMPv3 mode and trap filter parameters.

Syntax

`SET-PRMTR-SNMP-MODE:[tid]::ctag::mode,[trap];`

Parameter	Format	Description

`mode`	`ENA │ DIS`
	`ENAV2 │`
	`ENAV3 │`
	`DISV2 │`
	`DISV3`
		■ `ENA` – Enables all SNMP agents.
		■ `DIS` – Disables all SNMP agents.
		■ `ENAV2` – Enables SNMPv2 operation in the system.
		■ `ENAV3` – Enables SNMPv3 operation in the system.
		■ `DISV2` – Disables SNMPv2 operation in the system.
		■ `DISV3` – Disables SNMPv3 operation in the system.

`trap`	`ALM │ ALL`	■ `ALM` **–** Only alarms cause Traps to be transmitted. ■ `ALL` – All events and alarms cause Traps to be transmitted.

Related Commands
Retrieve SNMP Mode Parameter, on page 116

Set SNMPv2 Manager Parameters

This command allows changes to the SNMPv2 manager table entries.

Syntax

`SET-PRMTR-SNMP-MANAGER:[tid]::ctag::mode,[ip];`

Parameter	Format	Description
`mode`	`ADD` | `DEL` `INIT`	■ `ADD` – Adds an entry to the manager table. Requires an IP address. ■ `DEL` – Deletes a single entry from the manager table. Requires an IP address. ■ `INIT` – Clears all entries in the manager table. Does not require an IP address
`ip`		Specifes an IP address for the `ADD` and `DEL` mode values.

Related Commands

Retrieve SNMPv2 Manager List, on page 117

Set SNMPv2 User Parameter

This command allows changes to the SNMPv2 security system.

Syntax

```
SET-PRMTR-SNMP-USER:[tid]::ctag::mode,[rdcommunity],[wrcommunity],
    [level];
```

Parameter	Format	Description
mode	ADD | DEL MOD | INIT	■ ADD – Adds an entry to the user table. Requires rdcommunity and wrcommunity. ■ DEL – Deletes a single entry from the user table. Requires rdcommunity. ■ MOD – Modifies an entry in the user table. Requires rdcommunity, wrcommunity, and level. ■ INIT – Clears all entries in the user table. Does not require any other fields.
rd community		Specifes a user name.
wr community		Specifies a password for the rdcommunity.
level		Specifies the user level. Defaults to 1 if not specified.

Related Commands

Retrieve SNMPv2 User List,

Set SNMPv3 Manager Parameter

This command allows you to change the SNMPv3 manager table entries.

Syntax

`SET-PRMTR-SNMPV3-MANAGER:[tid]::ctag::mode,[ip],[username];`

Parameter	Format	Description
`mode`	`ADD	DEL	INIT`	■ `ADD` – Adds an entry to the SNMPv3 manager table. Requires `ip` and `username`. ■ `DEL` – Deletes a single entry from the SNMPv3 manager table. Requires `ip`. ■ `INIT` – Clears all entries in the SNMPv3 manager table. Does not require any other fields.
`ip`		Specifes an IP address for the `ADD` and `DEL` mode values.
`username`		Specifies a user in the SNMPv3 manager table.

Related Commands

Set SNMPv3 Notification Parameter

This command sets the SNMPv3 notification type.

Syntax

`SET-PRMTR-SNMPV3-NOTIFICATION:[tid]::ctag::[notification];`

Parameter	Format	Description
notifica- tion	V2 | V3 ALL	■ V2 – Sets v2 notification type. ■ V3 – Sets v3 notification type. ■ All – Sets both v2 and v3 notification type.

Related Commands

Retrieve SNMPv3 Notification Type, on page 120

Set SNMPv3 User Parameters

This command allows changes to the SNMPv3 security system.

Syntax

```
SET-PRMTR-SNMPV3-USER:[tid]::ctag::mode,[username],[authAlgorithm],
    [auth],[priv];
```

Parameter	Format	Description
mode	ADD | DEL MOD | INIT	■ ADD – Adds an entry to the user table. Requires all fields. ■ DEL – Deletes a single entry from the user table. Requires username. ■ MOD – Modifies an entry in the user table. Requires username, and the fields you want to modify. ■ INIT – Clears all entries in the user table. Does not require any other fields.
username		Specifes a user name, up to 20 characters long
auth Algorithm	MD5 | SHA	Specifies the authentication algorithm to use. ■ MD5 – HMAC-MD5 ■ SHA – HMAC-SHA
auth		Specifies the localized authentication key, from 8 to 20 characters long.
priv		Specifies the localized privacy key, from 8 to 20 characters long.

The ADD and MOD modes take time to complete. The TL1 will send a Progress Code to notify users. The Progress Code is defined as:

```
IP cTag <cr lf>
<
```

The following is an example which adds a user to the v3 table with a Progress Code (assume the cTag is 100).

```
SSU_2000 06-08-28 20:28:21
M  100 COMPLD
IP 100
<;
```

Related Commands

Retrieve SNMPv3 User List, on page 121

Set TL1 Format Parameter

This command sets the format of autonomous TL1 messages.

Syntax

`SET-PRMTR-TL1FORMAT:[tid]::ctag::mode;`

Parameter	Format	Description
`mode`	`GR831` | `GR833`	Sets the response format as described by the specified standard.

See Autonomous Report Conventions, on page 32, for more information.

Related Commands

Retrieve TL1 Format, on page 126

Set TOD Source

This command allows you to provision appropriate SSU-2000 modules (either GPS or PackeTime) as ToD sources, and to set their assigned priority. To make the changes selected by this command, you must execute the `SET-PRMTR-COMMIT` command after executing this command.

Syntax

`SET-TODSRC:[tid]:aid::ctag::priority;`

Parameter	Value	Description
`aid`	`SxAy`	Aid of a module that can deliver ToD
`priority`	`0	1 - 8`	Priority level of the ToD source module

Related Commands

Retrieve TOD Source
Set Commit Parameters, on page 143

Set User Parameters

This command allows changes to the user list.

Syntax

`SET-USER:[tid]::ctag::mode,[username],[password],[userlevel];`

Parameter	Format	Description
mode	ADD | PWD ACC | DEL INIT | DIS ENA | ULK TMP	■ ADD – Adds an entry to the user table. Requires username, password., and level. Password confirmation is required. ■ PWD – Changes a user's password. Requires username and password. Password confirmation is required. ■ ACC – Changes a user's access level. Requires username and password. ■ DEL – Deletes a single entry from the user table. Requires username. ■ INIT – Clears all entries in the user table, except Guest and Admin. Does not require any other fields. ■ DIS – Disables a user in the user table. Requires username. ■ ENA – Enables a user in the user table. Requires username. ■ ULK – Unlocks a user that is locked out. Requires username. ■ TMP – Temporarily changes a user's password. The user must change the password on first log-in. Requires username and password. Password confirmation is required.
username		Specifes a user name. The user name must be from 4 to 20 alphanumeric characters long, must use upper-case for all alpha characters, must not start with a numeric character, and must not contain a colon (:), quote (") or blank character.
password		Specifes a password. The password must be from 6 to 10 alphanumeric characters, and include at least one alpha character, one numeric character, and one punctuation character. It must not contain a colon (:), quote (") or blank character, and it must not be the same as the user name. The password must be different than the last three previously-used passwords.
userlevel	1 - 4	Defaults to 1 if not entered.

You *must* issue the SET-PWD-CONFIRM command immediately after issuing this command with the ADD, PWD, or TMP mode parameter.

Related Commands
Set Password Confirm, on page 169

Set VLAN Parameters

The VLAN is the Virtual Local Area Network and the IEEE 802.1Q. This command allows you to enable or disable VLAN in Service Port. It also allows you to set VLAN Identification and Priority for each service port interface. The Service Port IP Address shall be the address defined by the command AID. You must enable the VLAN *and* provide an ID in order for the VLAN to operate. You can leave the Priority at the default level (0). To make the changes selected by this command, you must issue the `SET-PRMTR-COMMIT` command after executing this command.

Syntax

`SET-PRMTR-VLAN:[tid]:aid-{A|B}:ctag::<state>,<id>,<priority>;`

Parameter	Format	Description
`aid`	`SxAy-A`	Specifies the Service port-A on the PackeTime module
	`SxAy-B`	Specifies the Service port-B on the PackeTime module
`state`	`ENA	DIS`	Enables or disables all Service ports on the specified PackeTime module
`id`	`0 - 4094`	Defines the VLAN identification
`priority`	`0 - 7`	Defines the VLAN priority

Related Commands

Retrieve VLAN Status, on page 128
Set Commit Parameters, on page 143

Other TL1 Commands

The section contains the TL1 commands for activating (enabling), disconnecting (disabling), removing or restarting modules, and for logging in or out of the SSU-2000e.

`ACT-MODULE:[tid]:aid:ctag;`
Valid aid codes: `ScAy`
This command activates (enables) a module (not a specific port). You cannot enable the Communications module in slot A2.

`ACT-USER:[tid]:uid:ctag::pwd;`
Valid aid codes: none, requires user name instead.
This command logs in the username `uid` with password `pwd`.

`CANC-USER:[tid]::ctag;`
Valid aid code: None
This command logs off the TL1 user and returns to security level 0.

```
DISC-MODULE:[tid]:aid:ctag;
```
Valid aid code; `SxAy`

This command disconnects (disables) a module (not a specific port). You cannot disable the Communications module in slot A2.

```
EXIT:[tid]::ctag;
```
Valid aid code: None

This command logs off the user and returns an EIA-232 port to ASCII mode or disconnects an Ethernet session to end TL1 communication.

```
RMV-MODULE:[tid]:aid:ctag;
```
Valid aid code: `SxAy`

This command removes configuration information for the specified module from the database of the SSU-2000e.

```
RST-MODULE:[tid]:aid:ctag;
```
Valid aid code: `SxAy`

This command restarts (reboots) the specified module.

```
RST-CLOCK:[tid]:aid:ctag;
```
Valid aid codes: `S1A1`, `S1A12`

This command resets the specified clock module via hardware. This reset is more drastic than the restart in that it does not give the clock time to switch to the secondary clock if it was the primary clock.

Backing Up and Restoring the Configuration

This command allows the Administrator to backup or restore the configuration data to or from an external device via TFTP. The backup configuration operation uses the `tomem` and `todev` parameters. The restore configuration operation uses the `frommem` and `fromdev` parameters.

Syntax

```
CPY-MEM:[<tid>]::<ctag>::[frommem],[fromdev],[tomem],[todev];
```

Parameter	Value	Description
<frommem>	text, 6 to 40 characters	The file name from which the configuration data is to be retrieved. If the text string is in quotes, then the filename is case-sensitive. If this field is null, the default filename is SSUCONFIG.
<fromdev>	TFTP Server IP address	The address from which to retrieve the file specified in <frommem>.
<tomem>	text, 6 to 40 characters	The file name to which the configuration data is to be sent. If the text string is in quotes, then the filename is case-sensitive. If this field is null, the default filename is SSUCONFIG.
<todev>	TFTP Server IP address	The address to which to send the file specified in <tomem>.

Following are examples of backup or restore configuration operation.

Example 1: Backup Successful

Input:

```
CPY-MEM:::TP1000::,,,172.16.20.246;
```

Response:

```
    "\"172.16.20.246, SSUCONFIG\""
    "\"CONFIGURATION BACKUP, PLEASE WAIT\""
    "\"1A01 SIZE= 624\""
    "\"1A02 SIZE=5272\""
    "\"1A06 SIZE=3072\""
    "\"1A08 SIZE=1200\""
    "\"1A10 SIZE=1224\""
    "\"1A12 SIZE= 624\""
    "\"CONFIG IMAGE CREATED, SIZE=13788\""

    SSU_2000 05-10-31 20:11:43
M  100 COMPLD
;
```

Example 2: Backup Failed

Input:

```
CPY-MEM:::TP1000::,,,172.16.20.200;
```

Response:

```
    "\"172.16.20.200, SSUCONFIG\""
    "\"CONFIGURATION BACKUP, PLEASE WAIT\""
    "\"1A01 SIZE= 624\""
    "\"1A02 SIZE=5272\""
    "\"1A06 SIZE=3072\""
    "\"1A08 SIZE=1200\""
    "\"1A10 SIZE=1224\""
    "\"1A12 SIZE= 624\""
    "\"CONFIG IMAGE CREATED, SIZE=13788\""
    "\"BACKUP CONFIGURATION FAILED, TFTP CONNECTION ERROR\""

    SSU_2000 05-10-31 20:13:11
M  100 DENY
    SDNR
;
```

Example 3: Restore Successful

Input:

```
CPY-MEM:::TP1000::,172.16.20.246;
```

Response:

```
"\"172.16.20.246, SSUCONFIG\""
   "\"CONFIGURATION RESTORE, PLEASE WAIT\""
   "\"1A01 DATA IS SAME AS STORED\""
   "\"1A02 SIZE=5272, PASS\""
   "\"1A06 SIZE=3072, PASS\""
   "\"1A08 SIZE=1224, PASS\""
   "\"1A10 SIZE=1224, FAIL\""
   "\"1A12 DATA IS SAME AS STORED\""

   SSU_2000 05-10-31 20:12:26
M  100 COMPLD
;
```

Example 4: Restore Failed

Input:

```
CPY-MEM:::TP1000::,172.16.20.200;
```

Response:

```
"\"172.16.20.200, SSUCONFIG\""
   "\"CONFIGURATION RESTORE, PLEASE WAIT\""
   "\"RESTORE CONFIGURATION FAILED, TFTP CONNECTION ERROR\""

   SSU_2000 05-11-01 15:42:19
M  100 DENY
   SDNR
;
```

Load Program

This command downloads the firmware to a PackeTime module. The command is invoked through the Ethernet port on the Communications module, and the file is transferred through the Maintenance port on the PackeTime module. During the transfer, a Progress code is issued. An event notification is generated to report the success or failure of the command.

The PackeTime module has memory locations for two firmware versions. This command loads the firmware into the location (0 or 1) that is not currently active. When you reboot the module, it loads the most recent firmware version.

To determine the location (0 or 1) of the currently-active firmware, issue the RTRV-IMAGE command (described below).

To determine the version number of the currently-active firmware, issue the RTRV-INV or the RTRV-IMAGE command. Refer to the *SSU-2000 Technical Reference* for details.

Syntax

```
LOAD-PROGRAM:[tid]:aid:ctag::<filename>,<ftp-server>,<user>,<passwd>,
<reboot>;
```

where:

- `filename` = the image file to be downloaded. The file path may be required as part of the filename.

- `ftp-server` = the server IP address in IPv4 format (`ftp:###.###.###.###`)

- `user` = the username requiring access to the server

- `passwd` = the password associated with the user

- `reboot` = `REBOOT` | `MANUAL` for the firmware to reboot after the download. If not specified, the default value is `REBOOT`.

Example

The following is an example firmware upgrade command, where the PackeTime module is installed in slot S1A6, the cTag is 100, the filename is /17313325-000-5_Rev_A00.rpm, the ftp server address is 172.16.21.107, the username is `austinuser`, and the password is `austinpsw`.

The format of the Progress code is:

```
IP ctag <cr><lf>
```

When the download process is complete, the PackeTime module reboots.

```
LOAD-PROGRAM::S1A6:100::"/17313325-000-5_Rev_A00.rpm","ftp:172.
16.21.208","austinusr","austinpsw",REBOOT;

    SSU_2000 07-10-17 14:12:12
M  100 COMPLD
IP 100
<IP 100
<IP 100
. . .
. . .
<IP 100
<    "\"COMPLETED, MODULE RESTART\""
;

    SSU_2000 07-10-17 14:16:41
A   000003 REPT EVT
"S1A06:NA,145,NSA,07-10-17,14-16-40:\"Download, Successful\""
;

SSU_2000 07-10-17 14:16:41
A   000004 REPT EVT
"S1A06:NA,133,NSA,07-10-17,14-16-40:\"Restart, in process,
SYS\""
;
```

Chapter 3 ICS Command Reference

This chapter provides detailed information about the Interactive Command Set (ICS) control language you can use to communicate with the SSU-2000e.

In This Chapter

- Overview
- General Conventions
- ICS Commands

Overview

The Interactive Command Set (ICS), also called the ASCII command set, can be used to control the SSU-2000e from a terminal connected to one of the SSU-2000e EIA-232 serial ports.

This chapter describes ICS command conventions, the prompts, line editing functions, and command syntax for ICS commands. The ICS command functions and features are organized by user security access levels and are listed alphabetically.

Note: If you are unable to access command features using your current security access level, contact your SSU-2000e administrator user for assistance.

General Conventions

The following are ICS command general conventions:

- Braces { } indicate multiple options. When entering options in the ICS command, enter one option from the options listed in the braces. Options within braces { } are separated by a pipe (|).
- Brackets [ ] indicate that the enclosed information is optional.
- *Italics* indicate variable options.
- The variable `xAy-z[&&z]` indicates the aid, or access identifier. This variable specifies the shelf and slot location for hardware components, in this format: `xAy-z[&&z]`.

where:

- x   Shelf number of the unit:
  1 = the SSU-2000e main shelf
  2-5 = the SDU-2000 expansion shelves, numbered from left to right

- A   Place holder or slot separator

- y   Slot number of the shelf, beginning with 1, and incrementing from left to right for each shelf

- z   Port number of the module
  1 or 1–3 for Input modules
  1–20 for Output modules

- [&&z] Optional extension for multiple ports. For example, to configure ports 1 through 10 of a module in slot 5 of shelf 2, use `2A5-1&&10` as the aid.

ICS Prompts

ICS uses the SSU-2000e name followed by command prompt. The prompt is either `+>` or `->`:

- The `+>` prompt indicates that the last output string is an event.

- The `->` prompt indicates that the last output string is a response to a command or end-of-line.

Line Editing

The ICS interface supports these line-editing functions:

- Press **ESC** (Escape) to clear the ICS command buffer.

- Press the **Backspace** key to delete the last character entered.

- Press **Ctrl + C** to stop all output and flush the transmit buffers.

- Input and output end-of-line (EOL) characters function independently. The ICS interface automatically adjusts to changes in incoming EOLs.

Logon Requirements

The ICS interface features an optional logon requirement:

- If the user list is empty and no passwords have been set for default users, logon is not required and the software defaults to the Administrator user.

- After a user name has been added or a password has been entered for the Administrator user, a user name and logon password is required.

- While communicating with the SSU-2000e using an EIA-232-C connection, if the communications port requires a user name and logon password, only these commands are available until an operator logs on: ID, INFO, LOGIN, HELP, and DOY. In this state, the port displays autonomous events but does not allow a query of event history until the operator logs on.

- While communicating with the SSU-2000e using Telnet, if the communications port requires a user name and password to log on, the interface does not allow commands to be performed or events to be displayed until the operator logs on. For example, events are stored in the event history but are not displayed on ports to which no user is logged on.

Command Syntax

The ICS interface follows these conventions for expressing command syntax:

- All lowercase letters are converted to uppercase.

- Command is any valid command consisting of only uppercase letters, excluding the `<Data Separator>` and `<Command Separator>` codes, in this format:

```
Command [<Data Separator> <data>...][<Command Separator>] or EOL
```

  where:

  - `<Data Separator>` is any of the following:

    > (hex 20) space character. Multiple spaces are converted to a single space character.

  - `<data>` The data input for the command. This can be any combination of printable ASCII codes and is specified in the command description section. Use double quotes (" ") to imply literal input. *All* data within the quotes is accepted as a single data entry, allowing you to enter complex input strings. The ICS interface does not convert uppercase characters in quotes to uppercase.

  - `<Command Separator>` is a semicolon (;)

- The interface responds to any input line terminator. Possible terminators are CR, LF, or CRLF. When the interface receives any of these terminators, the input is terminated and the entered command line is processed.

The ICS interface uses the following single-character commands:

  / executes the previous command if it is used as the first character on a line.

  ? alias of the HELP command.

Command descriptions follow this format:

- **Command** The command name as it appears in the system.

- **Description** Brief description of the command functionality.

- **Operation**
  Level 1: Gives the options and operations for Level 1 (Operator)
  Level 2: Gives the options and operations for Level 2 (Technician)
  Level 3: Gives the options and operations for Level 3 (Supervisor)
  Level 4: Gives the options and operations for Level 4 (Administrator)

- **Remarks** Includes comments on the command operation.

- **Related** Shows any commands related to this command. This command may affect other commands or be affected by other commands.

- **Restrictions** Special restrictions on the use or operation of this command.

Command syntax follows these conventions:

{ }	Signifies more than one parameters choice; one must be entered Options are separated by vertical bars
	Pipe or vertical bar, used to separate multiple parameters or options
[ ]	Signifies optional parameters
italics	Signifies variable data
c	Signifies character data (any printable ASCII character)

Terminology:

shelf	The actual shelf number of the unit in the system: 1 indicates the main shelf; 2 through 5 indicate expansion shelves.
slot	The actual slot number in the shelf. Slot numbers begin at 1 and number from left to right in the shelf.
port	The actual port number in the slot. The port number begins at 1.
Comm port	An EIA-232-C, Telnet, or Ethernet TL1 communications port.

Module selection follows these conventions. Each module selection in a unit is defined as: xAy, where:

x	Shelf number (starting from 1)
A	Place holder indicating the slot separator
y	Slot number (starting from 1, left to right, defined by each shelf)

Port selection follows these conventions. Each port of a module is addressed as: xAy-z, where:

| xAy | same as defined for module selection |
| z | Indicates the port number, starting from 1, left to right |

Legal module and port names follow the conventions illustrated by these examples:

1A5-3 indicates shelf 1, slot 5, port 3

1A5 indicates a module in shelf 1, slot 5

The ICS interface allows aliases for modules. Aliases follow the conventions shown in these examples. For example, assuming a 19 inch chassis, these aliases apply:

CLK-A = Clock A, 1A1
CLK-B = Clock B, 1A12
2BUF-A = Shelf 2, Buffer A, 2A15
2BUF-B = Shelf 2, Buffer B, 2A16
3BUF-A = Shelf 3, Buffer A, 3A15

    3BUF-B = Shelf 3, Buffer B, 3A16
    4BUF-A = Shelf 4, Buffer A, 4A15
    4BUF-B = Shelf 4, Buffer B, 4A16
    5BUF-A = Shelf 5, Buffer A, 5A15
    5BUF-B = Shelf 5, Buffer B, 5A16

Communications port names follow these conventions:

    For the EIA-232C serial port
    L = Local RS232 port (i.e., COML = local EIA-232 port)
    A = Serial Port A (i.e., COMA is Serial Port A)
    B = Serial Port B (i.e, COMB is Serial Port B)

    For the Telnet port:
    TELA = Telnet session one
    TELB = Telnet session two
    TELC = Telnet session three
    TELD = Telnet session four

    For the Ethernet TL1 port:
    TL1A = Ethernet TL1 session one
    TL1B = Ethernet TL1 session two

The interface uses ISO 8601 Date and Time Format:

    Date and Time format: yyyy-mm-ddThh:mm:ss
    (example: 1998-02-19T11:03:03)
    Date format: yyyy-mm-dd
    Time format Thh:mm:ss+

ICS Commands

This section provides an alphabetical listing of all ICS commands. For each command, the section provides the following information:

- Command name as it appears in the system

- Description of command function

- Operation of this command at security levels 0 through 4, with descriptions of syntax and command functions for each level

- Remarks and comments about the command operation

- Related Commands lists other commands that may affect or be affected by the command.

- Restrictions describes any special restrictions on the use or operation of the command.

ALARM

Use this command to provide the current alarm status and access to the alarm settings.

Level 0   Not applicable

Level 1   `ALARM [{ALL|xAy[-z]}]`

Use this command to view the current alarm status for the module that you specify. Only active alarms display, unless an option is passed.

If you do not specify a parameter, each active alarm status stored in the Communications Module is displayed. If you specify ALL, the current status of all alarms for all modules through the SPI command displays.

Output from the command includes the alarm number (internal number used for alarm identification), a text description of the alarm, the current status, the current alarm level (elevated alarms are indicated with an asterisk *), and the delay time for the alarm.

Example:

```
SSU_2000->alarm 1A2

2003-05-24T18:23:38Z ID: SSU2000 Name: SSU_2000
Input    #    Alarm         Status          Level(*=Elev) Delay
-------  ---- ------------- --------------- ------------- ---------
1A02    (00) Communication Ok              Minor         5 sec
1A02    (01) Mastership    Ok              Minor         30 sec
1A02    (02) Power-A       Ok               Minor         Immed
```

Level 2   Same as Level 1 operation, with the following additions:

`ALARM TEST {MINOR|MAJOR|CRITICAL}`

Options are:

TEST   Use this option to test and activate alarm relay/LED for one second. This has no effect on alarm status.

MINOR   Sets the MINOR alarm relay/LED

MAJOR   Sets the MAJOR alarm relay/LED

CRITICAL   Sets the CRITICAL alarm relay/LED

Level 3   Same as Level 2 operation, with the following additions:

```
ALARM xAy[-z] # DELAY time
ALARM xAy[-z] # {IGNORE|REPORT|MINOR|MAJOR|CRITICAL}
ALARM ACO
```

Use this command to set up the expected operation for the specified alarm number. Only one alarm number can be passed if you enter additional information.

The additional parameters that you can use are:

#	Alarm number. See Chapter 6, Alarms and Events for a list of alarm numbers.
DELAY	A supervisor-level user can use this parameter to enter the amount of time that an alarm condition must be active before an actual alarm condition is generated. If an alarm is specified to be Immediate, no delay time can be entered. Delay times are in seconds.
	Valid delays are 0 to 86,400 seconds (1 day). If the original value is set to -1 (Immediate) for this command, delay time cannot be set by the user.
IGNORE	Sets the alarm status level to IGNORE. No action is taken for an alarm condition.
REPORT	Sets the alarm status level to REPORT. A report-only message occurs for an alarm condition.
MINOR	Sets the alarm status level to MINOR.
MAJOR	Sets the alarm status level to MAJOR.
CRITICAL	Sets the alarm status level to CRITICAL.
ACO	Activates the Alarm Cutoff function. ACO remains active until a new alarm is reported, or an existing alarm is elevated. The command creates a momentary change of state (pulse) on the alarm relay, which allows a specially-built alarm panel to squelch the audio alarm. Alarm panels that do not have this capability ignore the pulse. Contact your Symmetricom representative for further details on this alarm panel.

Level 4   Same as Level 3 operation.

Remarks   Use of this command implies that you are querying the state of the unit. All information is presented as concisely and completely as possible. Each alarm is listed on a separate line.

Related   ELEVTIME, STATUS

RestrictionsNone

BYE

Use this command to log off.

Level 0   Not applicable

Level 1   BYE
Use this command to log off the system. If passwords are enabled, the logon header displays and you are prompted for a user name.

Level 2   Same as Level 1 operation

Level 3   Same as Level 1 operation

Level 4   Same as Level 1 operation

Remarks   This command implies that you have completed the session and want to return the SSU-2000e to an Idle state.

Related   LOGIN

RestrictionsNone

CLK

Use this command to view the clock status and access the clock operating parameters.

Level 0   Not applicable

Level 1   `CLK [xAy]`
If you do not specify a parameter, the status for both CLOCK A and CLOCK B in the unit displays. If you specify a particular clock address, the clock status and setup information for that clock displays.

Concise status information: Status (Fail | Disable | Selected | OK), Software Phase Locked Loop Mode, Current Tau, PQL Value, Freq Offset, Sigma.

Detailed status information: Same as concise status information, with the addition of Current Max Tau.

Concise setup information: Minimum tau, maximum tau, Clk Freq, clock switching method (such as, AutoReturn or Not), input switching method (AutoReturn On, AutoSwitch On, or AutoSwitch Off), input selection mode (Priority or PQL), and Local Oscillator output is On or Off.

Detailed setup information: Same as concise setup information, with the following additions: Freq.Offset limit, warm-up time, minimum tau limit, and maximum tau limit. The alarm level and delay time are handled by the ALARM command. The alarm elevation time is handled by the ELEVTIME command.

Example:

```
SSU_2000->clk

2003-05-24T18:24:21Z ID: SSU2000 Name: SSU_2000
CLOCK STATUS
Loc# Status Mode Tau   Pql Freq off  Sigma
---- ------ ---- ----- --- --------- ---------
1A01 Sel    LOCK 3330  5    9.22E-11 2.49E-10
1A12 Ok     LOCK 333   5   -7.55E-09 2.75E-10
```

Level 2   Same as Level 1 operation, with the following additions:

```
CLK xAy MODE {ACQUIRE|LOCKED|HOLD}
CLK xAy SELECT
```

Options are:

`MODE {ACQUIRE|LOCKED|HOLD}`
        Sets the current PLL operation parameters.

`ACQUIRE`   Forces re-acquisition of the software PLL loop.

LOCKED   Puts the software PLL mode into the lock state.

HOLD   Puts the software PLL mode into the manual holdover
                    state.

SELECT   Allows the operator to specify the clock reference.

Level 3   Same as Level 2 operation, with the following additions:

```
CLK {AR|ON|OFF}
CLK [xAy] WARMUP value
CLK [xAy] {MINTAU|MAXTAU} value
CLK TOD_TIMEOUT {60 - 10000}
```

Options are:

AR {ON|OFF} Enables or disables the clock autoreturn mode (see the
SSU-2000e User's Guide for information on autoreturn).

WARMUP   Sets the clock warm up time in seconds.

MINTAU   Sets the minimum tau value.

MAXTAU   Sets the maximum tau value.

TOD_TIMEOUT The TOD Traceability Timeout allows the SSU-2000e to
operate without a valid TOD source for the specified length
of time (in minutes) before indicating the TOD source is
invalid. The default value if 1440 minutes (24 hours).

Level 4   Same as Level 3 operation

Remarks   None

Related   SETUP, STATUS

RestrictionsNone

CLS

Use this command to clear the terminal screen.

Level 0   Not applicable

Level 1   CLS

Level 2   Same as Level 1 operation.

Level 3   Same as Level 1 operation.

Level 4   Same as Level 1 operation.

Remarks   This command is for aesthetic purposes only.

RestrictionsNone

COMM

Use this command to view and change the current communication port settings.

Level 0   Not applicable

Level 1   `COMM [{L|A|B}]`

Use this command to display the current settings for the specified communications port. If you do not specify a communications port, settins for all communications ports are displayed. The communications port settings include baud rate, character echo, current output line termination, current session mode, and time-out value.

```
COMM BAUD {1200|2400|4800|9600|19200}
COMM ECHO {ON|OFF}
COMM EOL {CR|LF|CRLF}
```

Use this option to change the setting for the port over which you are communicating. If your security access level is Level 1, the setup changes are not stored in non-volatile RAM.

Options are:

BAUD   Sets the current baud rate setting. Only the baud rates shown above are valid.

ECHO   Enables or disables character echo on the terminal.

EOL {CR|LF|CRLF}
            Sets the current End-Of-Line termination for an output line.

CR   Sets the line termination to carriage return (0xD).

LF   Sets the line termination to line feed (0xA).

CRLF   Sets the line termination to carriage return, followed by a line feed.

Level 2   Same as Level 1 operation, with the following additions:

```
COMM {L|A|B} BAUD {1200|2400|4800|9600|19200}
COMM {L|A|B} ECHO {ON|OFF}
COMM {L|A|B} EOL {CR|LF|CRLF}
```

Level 3   Same as Level 2 operation, with the following additions:

```
COMM {L|A|B} MODE {ASCII|TL1}
COMM {L|A|B|TELNET|TL1} TIMEOUT {[5-43200]|NEVER}
```

Use this option to change the settings for the specified communications port. The setup changes are stored in non-volatile RAM.

Options are:

`MODE {ASCII|TL1}`
Sets the current mode to either ASCII (interactive) or TL1.

`TIMEOUT`   Sets the communications port automatic logout-time-out value. Values are in seconds. NEVER disables automatic logout.

Level 4   Same as Level 3 operation

Remarks   None

Related   None

RestrictionsBAUD, ECHO, AND EOL are only applicable to EIA-232. To set any parameter, the communications port *must* be specified .

COMMIT

Use this command to commit all uncommitted parameters to become the active parameters for the specified PackeTime module. This command also commits uncommitted parameters to non-volatile memory.

Level 0   Not applicable

Level 1   Not applicable

Level 2   Not applicable

Level 3   `COMMIT xAy`

Level 4   Same as Level 3 operation.

Remarks   None

Related   All PackeTime module commands

RestrictionsNone

CONFIG

Use this command to view the current hardware configuration of the SSU-2000e.

Level 0   Not applicable

Level 1   CONFIG [xAy]
If you do not provide parameters, the current hardware inventory displays with each slot on one line (concise information). If you provide parameters, more detailed hardware and software inventory management information displays in multiple lines (detailed information).

Concise information: Concise Information includes slot location, module name, item number, hardware revision number, date of manufacture, and serial number. If the shelf address is 1- 5, it displays shelf description and shelf part number (254xxxxx-xxx-x).

Detailed information: Includes all the concise information described above. It also includes configured revisions (if supported by module), in-service time (if supported by module), and the feature list (if supported by module, for example: the COMM Module returns NTP and SNMP features).

If x is 1-5, the shelf information is displayed. The description and shelf part number are listed in Table 3-1.

Table 3-1. Shelf Configuration Information

Shelf	Description	Shelf Part Number
1	SSU-2000	25413020-000-0
1	SSU-2000e	25413140-000-0, 25413140-001-0
2-5	SDU-2000	25413023-000-0
2-5	SDU-2000e	25413141-000-0, 25413141-001-0

CONFIG SW
This command displays the *software* part number (141xxxxx-xxx-x) and revision number.

CONFIG ADAPTER
This command displays the input adapter part number and its description for each Input module. Refer to I/N 12613021-001-2 for Specification, SSU-2000 Input Adapter/ Identification. Note: This option is only applicable if the software and hardware support this functionality.

```
CONFIG CONFLICT
```
This command displays any existing configuration conflicts. It is used mainly to detect an NTP server in the PackeTime module that has the same IP address as defined in Service Port-A or Port-B.

Level 2   Same as Level 1 operation, with the following additions:

```
CONFIG xAy {REMOVE|DISABLE|ENABLE}
```

Options are:

REMOVE	Use this option to remove module entries from the registry. A module is removable only if it is physically absent.
DISABLE	Use this option to mark a module inactive to be removed from the system.
ENABLE	Use this option to restore a previously disabled module to be active in the system.

Level 3   Same as Level 2 operation

Level 4   Same as Level 3 operation, with the following additions:

```
CONFIG {BACKUP|RESTORE} ipAddress filename
```

Options are:

BACKUP	Stores the entire SSU-2000e configuration to the specified server and filename via TFTP protocol.
RESTORE	Restores the entire SSU-2000e configuration from the specified server and filename via TFTP protocol.
ipAddress	A TFTP server IP address.
filename	A target filename with a variable length of 6 to 40 characters, which may include it's associated path. If this field is null, the default filename is SSUCONFIG. If this field is a quoted string, the filename is case-sensitive.

Remarks   None

Related   VER

RestrictionsNone

The following are examples of the CONFIG command message format:

Example 1

```
SSU_2000->CONFIG

2001-06-21T15:10:34Z ID: SSU2000 Name: JWANG
Loc# Name                 HW Part #       HW Rev  Date     Serial #
---- -------------------- --------------- ------- ------- ------------------
1    SSU-2000             25413020-000-0
1A01 Clock Stratum 2E     23413016-000-0  A       30NOV99 990705398000615020
1A02 Communication        23413012-000-0  A       03NOV99 990705398000614573
1A03 Input GPS            23413019-000-0  A       18DEC99 1234567890005
1A05 Input GPS            23413019-000-0  A       29FEB00 990705398000728324
1A06 Input E1 3Port       23413014-002-0  B       03DEC99 990705398000661713
1A07 Input DS1 3Port      23413013-002-0  B       26JAN00 1234567890
1A08 Input DS1 1Port      23413013-001-0  B.02    21APR00 990705398000736077
1A09 Input DS1 3Port      23413013-002-0  B.02    27MAR00 990705398000736527
1A10 Output DS1           23413017-000-0  D       30NOV99 990705398000613606
1A11 Output DS1           23413017-000-0  B       02MAR00 990705398000613453
1A12 Clock Stratum 3E     23413015-000-0  A       09MAR00 990705398000734493
2    SDU-2000             25413023-000-0
2A01 Output E1            23413018-000-0  D       05JAN00 990705398000650816
2A02 Output E1            23413018-000-0  D       13JAN00 990705398000650793
2A03 Output DS1           23413017-000-0  D       15JAN99 1234567890
2A04 Output DS1           23413017-000-0  D       15JAN99 1234567890
```

Example 2

```
SSU_2000->CONFIG SW

2001-06-21T15:10:45Z ID: SSU2000 Name: JWANG
Loc# Name                 SW Part #       SW Rev   Date
---- -------------------- --------------- -------- -------
1A01 Clock Stratum 2E     14113015-000-0  B.06     20JUN01
1A02 Communication        14113012-003-0  A.00     21JUN01
1A03 Input GPS            14113019-000-0  A.04     21JUN01
1A05 Input GPS            14113019-000-0  A.04     21JUN01
1A06 Input E1 3Port       14113013-000-0  B.04     20OCT00
1A07 Input DS1 3Port      14113013-000-0  B.04     20OCT00
1A08 Input DS1 1Port      14113013-000-0  B.04     20OCT00
1A09 Input DS1 3Port      14113013-000-0  B.04     20OCT00
1A10 Output DS1           14113017-000-0  A.06     19APR01
1A11 Output DS1           14113017-000-0  A.06     19APR01
1A12 Clock Stratum 3E     14113015-000-0  B.06     20JUN01
2A01 Output E1            14113017-000-0  A.06     19APR01
2A02 Output E1            14113017-000-0  A.06     19APR01
2A03 Output DS1           14113017-000-0  A.06     19APR01
2A04 Output DS1           14113017-000-0  A.06     19APR01
2A05 Output E1            14113017-000-0  A.06     19APR01
2A08 Output Comp Clock    14113158-000-0  A.02     09OCT00
2A09 Output Comp Clock    14113158-000-0  A.02     09OCT00
```

DATE

Use this command to view and set the current date.

Level 0   Not applicable

Level 1   DATE
Use this command to view the current date set within the unit. The date format is yyyy-mm-dd.

Level 2   Same as Level 1 operation

Level 3   Same as Level 2 operation, with the following additions:
DATE yyyy-mm-dd

Use this option to set the current date.

Level 4   Same as Level 3 operation

Remarks   None

Related   TIME, DOY

RestrictionsNone

DOY

Use this command to view the Julian date and the year as set in the shelf.

Level 0   This command returns the day of the year and the current year.

Level 1   Same as level 0 operation

Level 2   Same as level 0 operation

Level 3   Same as level 0 operation

Level 4   Same as level 0 operation

Remarks   This command displays the current day of the year and the year in the unit.

Related   DATE, LOGIN, USERS

RestrictionsThis command is always hidden and does not display in the online Help.

ELEVTIME

Use this command to read and set the current time-outs for alarm elevation.

Level 0   Not applicable

Level 1   `ELEVTIME [xAy]`
If you do not specify a parameter, then all elevation times for each module within the unit are displayed.

Level 2   Same as Level 1 operation.

Level 3   Same as Level 2 operation, with the following additions:

`ELEVTIME [xAy] time`

Supervisor-level users can use this command to read and set the current time-out length for alarm elevation. The unit is required to elevate MINOR and MAJOR alarms to the next level after a user-settable time period. Time is in seconds and can be from 60 seconds (1 minute) to 500,000 seconds.

Level 4   Same as Level 3 operation

Remarks   The default value for the elevation time is 86,400 seconds (24 hours).

Related   ALARM, SETUP

RestrictionsNone

Example

The following is an example of the ELEVTIME command message format:

```
SSU_2000->ELEVTIME

SSU_2000->elevtime
2003-06-18T20:44:50Z ID: SSU2000 Name: SSU_2000
1A01 elevation time is 86400 seconds
1A02 elevation time is 86400 seconds
1A03 elevation time is 86400 seconds
1A04 elevation time is 86400 seconds
1A05 elevation time is 86400 seconds
1A08 elevation time is 86400 seconds
1A09 elevation time is 86400 seconds
```

ENGINE

Use this command to read or set the current settings for the GPS engine.

Level 0   Not applicable

Level 1   `ENGINE xAy [ELMASK|POS|AVAIL]`

Options are:

ELMASK   Use this option to read current elevation masks for the GPS engine.

POS   Use this option to read the current antenna position (latitude and longitude).

AVAIL   Use this option to show current satellite availability.

Level 2   Same as Level 1 operation

Level 3   `ENGINE xAy [PMASK mask][TMASK mask]`
`ENGINE xAy POS [lat lon ht][AVG n]`
`ENGINE xAy TDATA [ON|OFF|CLR]`
`ENGINE xAy PDOP {1-10}`

Options are:

PMASK mask   Use this option to read and set the current elevation masks for the GPS engine. The masks change to avoid attempting to track satellites that are below a portion of the sky that might be blocked by the terrain.

PMASK   Use this option to set the positioning mask level. Lower mask levels provide the unit position with a better PDOP.

TMASK mask   Use this option to set the mask level to be used when not in survey mode. This is usually set to a higher level than positioning because of timing degradation of the GPS signals at low elevations. Valid mask levels are from 0 to 60 degrees

POS   Use this option to read and set the current antenna position. In addition, you can set the maximum number of averages to perform on the position calculations.

              `POS [lat lon ht] [AVGn]`

              Same as Level 1 operation, with the addition of being able to set the current position and or the number of averages to use when calculating a position.

lat   Antenna latitude. The decimal point determines the input format. For example, the format is dd:mm:ss.ss for entering 30:27:49.8 seconds.

lon	Antenna longitude. The format is dd:mm:ss.ss.
height	Antenna height; ±10 000.0 meters.
AVG n	Number (n) of averages for the calculated position fixes. Range is 10 to 1,000. Setting this places the unit into survey mode. The frequency control is placed into holdover during survey mode.
AVAIL	Shows the current satellite availability. A table is generated with the following information:
SV	Satellite PN code ID.
Elev	Current elevation above the horizon of the satellite, in degrees.
Azmth	Azimuth of the satellite, in degrees.
Hlth	Health of the satellite, either H or U. Unhealthy can also mean that the user has set the receiver to ignore the satellite.

Note: Only satellites that are above the current elevation mask are shown.

PDOP	Sets the current Position Dilution of Precision or pdop mask (1 through 10). Pdop is a measurement that indicates the geometry of the GPS satellites that the SSU-2000e is tracking. Lower values indicate better geometry.
TDATA	Provides tracking information for the engine. Available options are:
ON	Tracking data displays on that communications port.
OFF	Tracking data does not display on that communications port.
CLR	No tracking data displays on any communications port.

Level 4   Same as Level 3 operation

Remarks

ELMASK	Default values for the masks are 5 degrees for the positioning mask and 10 degrees for time.
POS	Only set the position if you know the accurate position. The software automatically verifies the position on restart. The unit averages 10 position fixes and compares them to the fixed position.

If the position is within 100m RMS, no position updates are performed. If the position error is > 100m RMS, an event is generated stating that the position is being recalculated, and the position is recalculated and updated in the NVRAM. Similarly, setting the AVG time puts the unit back into survey mode, which generates an event that the position is being recalculated.

TDATA   Engine reports are asynchronous outputs, which means they can occur at any time, not necessarily at the time the command is issued.

Related   None

RestrictionsNone

Example

The following is an example of the ENGINE command message format:

```
SSU_2000->ENGINE

2001-06-18T20:46:20Z ID: SSU2000 Name: SSU_2000
GPS Module: 1A03
GPS MOT Engine: 2.2, APR 24 1998
Lat: +30:27:15.89, Lon: -097:39:45.88, Ht: 230.81 m (3D) PDOP: 2.7,
300 ave
GPS Module: 1A05
GPS MOT Engine: 2.2, APR 24 1998
Lat: +30:27:15.75, Lon: -097:39:45.85, Ht: 233.43 m (3D) PDOP: 2.8,
10 ave
```

EVENTS

Use this command to read and control current event log information.

Level 0   Not applicable

Level 1
```
EVENTS [ALARM|REPORT] [#events_display|ALL]
EVENTS [ALARM|REPORT] [startdate [starttime]] [stopdate [stoptime]]
EVENTS [ALARM|REPORT] starttime [stopdate] [stoptime]
EVENTS ?
```

EVENTS If you do not specify any options, only the last event prints.

Options are:

ALARM   Use this option to show alarm events only. The alarm event is defined as any event ID less than 32.

REPORT   Use this option to show report events only. Any events excluding alarm events (for example: any event ID is greater 32).

#event_display
Use this option to show the maximum number of events to display. Zero returns all events.

ALL   Use this option to show all the events stored in the buffer.

[startdate] [starttime]
Use this option to specify the start time and date for displaying events within a time period.

[stopdate] [stoptime]
Use this option to specify the stop time and date for displaying events within a time period

?   Use this option to display the event count.

Note: If you specify times and dates, events that occurred after the starting date and time and before the ending date and time display. Specified dates have the format yyyy-mm-dd, and specified times have the format hh:mm:ss.

Specified dates and times are not provided in ISO timestamp format, and are separated by a space. Start time and stop time default to the current time of day. Stop date defaults to the current date. Start date defaults to the current date, minus 24 hours.

Example

```
SSU_2000+>events alarm

     Time Stamp        Which  Type Event           Description
--------------------- ------- ---- ---------------- --------------------
2001-05-24T18:27:00Z  1A04-03 Maj  LOS              Active
2001-05-24T18:27:29Z  1A01 Rep Soft PLL,            HOLD
2001-05-24T18:27:29Z  1A01 Min Freq Mode,           Holdover
```

Level 2   Same as Level 1 operation

Level 3   Same as Level 2 operation, with the following additions:

```
EVENTS CLR
EVENTS LOGIN [DISABLE|ENBLE]
```

Options are:

CLR   This option clears the event list.

LOGIN   Allows Login and Logout events to be stored in the event
            log.

Level 4   Same as Level 3 operation

Remarks   Events are stored in non-volatile memory. They are retained on startup.

Related   ALARM

RestrictionsNone

FREQUENCY

Use this command to display the input frequency data from a selected input port.

Level 0   Not applicable

Level 1   `FREQUENCY [xAy][{A|B}]`
            Use this command to view the frequency measurement from a selected input module. If you do not provide a parameter, frequency measurement on the selected clock to all inputs displays.

            Options are:

            `A|B Clock A or Clock B`

Level 2   Same as Level 1 operation

Level 3   Same as Level 1 operation

Level 4   Same as Level 1 operation

Remarks   None

Related   INPUT, PHASE

RestrictionsNone

Example
```
SSU_2000->FREQUENCY

1A04-01  FreqA:2001-06-18T20:54:19, 0
1A04-02  FreqA:2001-06-18T20:54:19, 1
1A04-03  FreqA:2001-06-18T20:54:19, 1
1A09-01  FreqA:2001-06-18T20:54:19, 3
1A09-02  FreqA:2001-06-18T20:54:19, 2
1A09-03  FreqA:2001-06-18T20:54:19, 1
```

HELP

Use this command to access online Help.

Level 0   `HELP [command]`
Use this command to access the online Help menus. If you specify Help for a specific command, the Help menu for that command displays. At Level 0, the only valid commands are ID, INFO, LOGIN, and HELP.

Level 1   Same as Level 0 operation, with additional commands available at this level.

`HELP [command] xAy`

The `xAy` is a slot address. If the slot address is given, it displays that module's status and setup information. The slot address is configured as `xAy` where x is the chassis. Valid chassis numbers are:

1: main chassis
others : expansion chassis

y is the slot number within the chassis. The slots are numbered the same as the motherboard ID

Level 2   Same as Level 1 operation

Level 3   Same as Level 1 operation

Level 4   Same as Level 1 operation

Remarks   The Help menu displays only commands that are valid for the current user level. If the first entered character is ?, then the main Help screen appears.

Related   None

RestrictionsNone

Example

`SSU_2000->HELP`

Level 4 commands:

```
ALARM       BYE         CLK         COMM        COMMIT      CONFIG
DATE        ELEVTIME    ENGINE      EVENTS      FREQ        HELP
ID          INFO        INPUT       IONAME      IP          KEEPALIVE
MSG         MTIE        NAME        NTP         NTPQ        OUTPUT
PBO         PHASE       PING        PQLTABLE                PTIME
REF         RESET       RESTART     ROUTE       SECURITY    SETUP
SNMP        STATUS      SYSTIME     TDEV        TIME        TL1FORMAT
TODSRC      UPGRADE     USERS       VER         VLAN        WHO
```

ID

Use this command to display the fixed unit ID for the system.

Level 0   Displays `SSU2000`

Level 1   Same as Level 0 operation

Level 2   Same as Level 0 operation

Level 3   Same as Level 0 operation

Level 4   Same as Level 0 operation

Remarks   This command is used by test systems to determine the type of instrument connected. This is different from the NAME command in that the NAME information is settable by the user. The unit ID is also returned on any status type command.

Related   NAME

RestrictionsNone

Example
```
SSU_2000->ID
Unit ID: SSU2000
```

INFO

Use this command to view information necessary to return a product for service. This includes the unit ID, software version(s), shipping address, and phone number for Symmetricom.

Level 0   `INFO`
            Displays information as follows (assume COMMS Version A, Bootloader A):

```
SSU_2000->info
Unit ID: SSU2000
Main Code:  G.00, 08NOV04
Symmetricom Technical Support
1-888-367-7966 toll free USA
1-408-428-7907 worldwide
Support@Symmetricom.com
SSU_2000->
```

Level 1   Same as Level 0 operation

Level 2   Same as Level 0 operation

Level 3   Same as Level 0 operation

Level 4   Same as Level 0 operation

Remarks   This command displays all service information available for the unit.

Related   ID, VER

RestrictionsNone

INPUT

Use this command to access to the input status, hardware configuration, and alarm settings.

Level 0   Not applicable

Level 1   `INPUT [xAy[-z]][STATUS|SETUP]`
If you do not provide a parameter, the command displays all the input module status information in the unit. If a specified input address is provided, that input status and setup information appears.

Options are:

STATUS   Use this command to display input status information.

SETUP   Use this command to display input setup information.

Status information includes: status, phase A/B values, PQL, hardware alarm (LOS, AIS, OOF, BPV, CRC) statuses, MTIE status.

Setup information includes: port (Enable or Disable), framed signal (D4 or ESF if DS1, CAS or CCS if E1), unframed signal (if specified as CLK), zero suppression (ON or OFF), CRC (ON or OFF), SSM (ON or OFF), PQL provision value (1-16), priority (0-10), high gain (ON or OFF), Cesium fault indication level (High, Low, OFF), MTIE mask limits, hardware alarm (LOS, AIS, OOF, BPV, CRC) error count and clear error count setting.

If E1: SSM bit position (4 through 8)

The alarm level and delay time are handled by the ALARM command. The alarm elevation time is handled by the ELEVTIME command.

Example

```
SSU_2000+>input

2001-07-16T12:57:14Z ID: SSU2000 Name: SSU_2000
INPUT STATUS                  L A O B C
O I O P R  -MTIE1-   -MTIE2-   FREQ
Loc#     Sta PhaseA   PhaseB   Pql S S F V C  A    B    A    B    A   B
------- --- -------- -------- --- --------- ---- ---- ---- ---- --- ---
1A04-01 Dis NA       NA        4   / / / /  Ok   Ok   Ok   Ok   Ok  Ok
1A04-02 Dis NA       NA        4   / / / /  Ok   Ok   Ok   Ok   Ok  Ok
1A04-03 Dis NA       NA        4   / / / /  Ok   Ok   Ok   Ok   Ok  Ok
1A06-01 Sel -1       -2        4   / / / /  Ok   Ok   Ok   Ok   Ok  Ok
1A06-02 Dis NA       NA        4   / / / /  Ok   Ok   Ok   Ok   Ok  Ok
1A06-03 Dis NA       NA        4   / / / /  Ok   Ok   Ok   Ok   Ok  Ok
1A08-01 Dis NA       NA        4   / / / /  Ok   Ok   Ok   Ok   Ok  Ok
GPS STATUS
Loc#    Sta PhaseA   PhaseB   Pql UTC
------- --- -------- -------- --- ---
1A03-01 Ok  -143     -145      2  Yes
1A05-01 Ok  -149     -149      2  Yes
```

Level 2   Same as Level 1 operation

Level 3   Same as Level 2 operation, with the following additions:

```
INPUT xAy[-z] {ESF|D4|CCS|CAS|1MHZ|1.544MHZ|2.048MHZ|5MHZ|6.312MHZ|
10MHZ}
INPUT xAy[-z] {ZS|SSM|CRC}{ON|OFF}
INPUT xAy[-z] PRIORITY {0-10}
INPUT xAy[-z] {ENABLE|DISABLE}
INPUT xAy[-z] SSM {4|5|6|7|8}
INPUT xAy[-z] PQL {1-16}
INPUT xAy[-1] GAIN {ON|OFF}
INPUT xAy[-z] CSFLT {HIGH|LOW|OFF}
INPUT xAy[-z] {LOS|AIS|OOF|BPV|CRC}{SET|CLR} value
INPUT xAy[-z] MTIE [{EL1|EL2|CL1|CL2}]{T10|T100|T1K| T10K|T100K}
value
INPUT xAy[-z] MTIE {PRS|DS1|G.811|G.823}
INPUT xAy[-z] FREQ {A|B}{SET|CLR|TAU} value
INPUT xAy[-a] 400HZ {ON|OFF}
INPUT xAy COMPENSATION {0-250}
```

Allows you to change the setting of a specified Input module.

Options are:

ESF|D4   Sets the T1 framing mode: ESF or D4. For use with the
             DS1 Input module.

CCS|CAS   (For E1) Sets the E1 framing mode: CCS or CAS. For use
             with the E1 Input module.

1MHZ|1.544MHZ|2.048MHZ|5MHZ|10MHZ
             Sets the Input module clock frequency when input is not
             running in framing mode. Only the clock frequencies shown
             are valid. If the input is a framed T1 signal, the CLK rate is
             1.544MHz; if it is a framed E1 signal, the CLK rate is
             2.048 MHz automatically. For use with the DS1 or E1 Input
             module.

SSM {ON|OFF} Enables or disables Sync Status Message reading. For
             use with the DS1/E1 Input module.

ZS {ON|OFF} Enables or disables Zero Suppression. For use with the
             DS1 or E1 Input module.
             For DS1: On = B8ZS, Off = AMI
             For E1: On = HDB3, Off = AMI

CRC {ON|OFF} Enables or disables CRC checking. For use with the DS1
             or E1 Input module.

PRIORITY {0-10}
             Sets Input priority level, where: 0 = monitor,
             1 = highest priority, and 10 = lowest priority. For use with all
             Input modules.

ENABLE   Enables the specified input port on a DS1, E1, CC, or Sine Input module.

DISABLE   Disables the specified input port on a DS1, E1, CC, or Sine Input module. This clears all alarms associated with an input and disables setting of further alarms or use of the input measurements.

SSM {4|5|6|7|8}
     Sets the E1 SSM bit position. For use with the E1 Input module.

PQL {1-16}   Sets the Priority Quality Level (PQL) for the specified input port on any Input module.

GAIN{ON|OFF}   Enables or disables input gain setting. For use with the DS1 or E1 Input module.

CSFLT {HIGH|LOW|OFF}   Sets Cesium fault logic level. For use with the DS1, E1, or Sine Input module.
     HIGH   Alarm active when the fault is a high logic level.
     LOW   Alarm active when the fault is a low logic level.
     OFF   Default. Cesium fault is ignored (not the AIS).

MTIE [{EL1|EL2|CL1|CL2}]{T10|T100|T1K|T10K|T100K} value
     Sets MTIE Limit 1 or Limit 2 for 10/100/1000/ 10 000/ 100 000 seconds threshold. If L1 or L2 are not provided, both limits are implied. The Limit Range is [0 – 60 000]. For use with the DS1, E1, GPS, or Sine Input module.
     EL1   MTIE Error Limit 1
     EL2   MTIE Error Limit 2
     CL1   MTIE Clear Limit 1
     CL2   MTIE Clear Limit 2
     T10   MTIE 10-second period
     T100   MTIE 100-second period
     T1K   MTIE 1000-second period
     T10K   MTIE 10000-second period
     T100K   MTIE 100000-second period

MTIE {PRS|DS1|G.811|G.823}
     Sets MTIE Limit 1 or Limit 2 for predefined values
     ANSI Specification – PRS, DS1
     ITU Specification – G.811, G.823

{AIS|BPV|CRC|LOS|OOF}{SET|CLR} value
     Sets Error Count (SET) or sets Clear Count (CLR) of the specified input hardware alarm signal. Range is 1 to 100. For use with the DS1 or E1 Input module.

FREQ {A|B}{SET|CLR|TAU} value
     Sets Frequency limits on Clock A or Clock B. For use with the DS1, E1, GPS, or Sine Input module.
     SET   Sets Frequency Error Count
     CLR   Sets Frequency Clear Count

TAU   Set frequency tau (default is 400), range is 10 to 1000

COMPENSATION (GPS) Compensation [0 – 250] for antenna cable delay. The time offset shall have a 100 nS resolution, thus the "compensation" value shall be multiplied by 100 nS to provide 1PPS compensation. Valid range is from 0 to 250, for a total compensation range of 0 to 25000 nS (25μS).

Level 4   Same as Level 3 operation

Remarks   None

Related   SETUP, STATUS

RestrictionsNone

IONAME

Use this command to set an alias name for each input or output port.

Level 0   Not applicable

Level 1   `IONAME [xAy]`
Use this command to display a previously specified name associated with each I/O port.

Example:

```
SSU_2000->ioname

2001-05-24T18:28:23Z ID: SSU2000 Name: SSU_2000
1A05-01 GPS Input
```

Level 2   Same as Level 1 operation

Level 3   Same as Level 2 operation, with the following additions:

`IONAME xAy-z[&&z] {CLR|"io_port_name"}`

Use this option to set a name associated with each I/O port. No control characters are allowed. Multiple spaces between words reduce to one blank character. The port alias can contain up to 20 characters. CLR clears the port name associated with the specified module or port.

Level 4   Same as Level 3 operation

Remarks   None

Related   None

RestrictionsCLR is an operand, and cannot be used as an I/O port name.

IP

Use this command to view current Internet Protocol (IP) address information and access related values.

Level 0   Not applicable

Level 1   `IP`
Use this command to display the current IP address, subnet mask, gateway address, and the Ethernet hardware address.

Example

```
SSU_2000->ip

The IP Address is 255.25.52.5
The Subnet Mask is 255.255.255.0
The Default Gateway is 0.0.0.0
The Ethernet Address is 00A06E000CCC
```

Level 2   Same as Level 1 operation

Level 3   Same as Level 2 operation, with the following additions:

`IP [1A2] {ADDR|MASK|GATE} addr` (Comm module), or
`IP xAy-[A|B|M] addr mask gate` (PackeTime module)

Options are:

`ADDR`	Sets the Comms module Internet Protocol (IP) address
`MASK`	Sets the Comms module subnet mask
`GATE`	Sets the Comms module gateway address
`A`	Sets the PackeTime port A address
`B`	Sets the PackeTime port B address
`M`	Sets the PackeTime Maintenance port address
`addr`	The IP address in dotted decimal format; named servers are not allowed
`mask`	The PackeTime mask address in dotted decimal format
`gate`	The PackeTime gateway in dotted decimal format

Level 4   Same as Level 3 operation

Remarks   When you change a network address, you must restart the Communications Module in order for the changes to take effect.

For PackeTime commands, execute the COMMIT ICS command after the IP command to make the changes effective.

If the slot address is not specified, the Communications module information is returned.

For PackeTime commands, `addr`, `mask`, and `gate` are required; the `ADDR`, `MASK`, and `GATE` operands are not valid.

For PackeTime commands, the Port-A and Port-B shall be on a separate subnet from the Maintenance port.

When the PackeTime module is in the non-binding mode, Port-A and Port-B shall be on separate subnets.

Related   None

RestrictionsThe IP address is in the decimal dotted address format (for example, 192.168.70.224). No name server is allowed.

KEEPALIVE

Use this command to enable a "keep-alive" mode that generates a recurring event, based on a user settable time, to alert the upstream support system that the SSU-2000e and associated communication path is functional.

Level 0:   NA

Level 1:   KEEPALIVE

Displays the "keep-alive" time, the length of time between automatic events that are generated for upstream support systems.

Level 2:   Same as level 1 operation

Level 3:   Same as Level 2 operation with the following additions:

KEEPALIVE [TL1|SNMP] [time]

Options are:

TL1   Sets the TL1 session keep-alive time

SNMP   Sets the SNMP session keep-alive time

time   Value in minutes, minimum is 1 minute, maximum is 60 minutes. If 0 minutes are specified, it means 'keep-alive' is disabled

Level 4:   Same as level 3 operation

Remarks   None

Related   None

RestrictionsThe ICS session in RS232 or telnet is not affected.

LOGIN

Use this command to change the active logon name and access level. The user is logged on as the new user name and access level when the password is verified.

Level 0   `LOGIN [user name]`

If you do not provide a user name, the system prompts you for one. When you enter a user name, the system prompts you for a password. The password entry is echoed as '*' characters. If the user name and password match an entry in the user table, the user is logged on at the assigned access level. After five minutes (default) of inactivity on the port, the user is automatically logged off.

Level 1   Same as Level 0 operation

Level 2   Same as Level 0 operation

Level 3   Same as Level 0 operation

Level 4   Same as Level 0 operation

Remarks   Use this command to access various levels of the system. This is the only way to change access levels for a port.

If you lose the password, contact Symmetricom Global Services to generate a new one. There is a GUEST entry, with a null password, that is always present to gain access to Level 1.

Related   BYE, USERS, DOY, COMM

RestrictionsIf no user passwords have been entered, this command is not listed in help.

MSG

Use this command to access the messaging facilities.

Level 0   Not applicable

Level 1   Not applicable

Level 2   `MSG "message to send"`

Use this command to broadcast a message on all active communication sessions. The maximum length of each message is 60 characters.

Note: The MSG is implemented as an event. It displays a full message in an autonomous event. Only 20 characters are stored in the event log when a user queries it later.

Level 3   Same as Level 2 operation

Level 4   Same as Level 3 operation

Remarks   The string must be entered

Related   None

RestrictionsNone

MTIE

Use this command to display the MTIE (Maximum Time Interval Error) data from a selected input port. MTIE is a measure of wander that characterizes frequency offsets and phase transients. MTIE (tau) is the largest Peak-to-Peak TIE (Time Interval Error) in any observation interval of length tau.

Level 0   Not applicable

Level 1   `MTIE xAy-z [{A|B}] startdate [starttime][stopdate [stoptime]]`
           `MTIE xAy-z [{A|B}] starttime [stopdate][stoptime]`
           `MTIE xAy-z [{A|B}] HISTORY [count]`

Options are:

`A| B`   CLK A or CLK B; the default is the selected clock output.

`starttime`   Specifies the start time of a specific period of time to be displayed.

`stopdate`   Specifies the date ending a specific period of time to be displayed.

`stoptime`   Specifies the stop time of a specific period of time to be displayed.

           If the starttime, stopdate, and stoptime are not specified, the system defaults to a 24 hour period.

`HISTORY [count]`
           Displays the one-day MTIE history for the last number of days specified in the count parameter.

This command displays the MTIE information calculated on the input module with a specified clock. A start time and stop time are required to perform an MTIE calculation. If these are not specified in the command line, the `starttime` defaults to the last 24 hours, the `stoptime` defaults to the current time.

Note: If you specify times and dates, the MTIE that occurred after the starting date and time and before the ending date and time displays.

Specified dates have the format yyyy-mm-dd, and specified times have the format hh:mm:ss. Specified dates and times are not provided in ISO timestamp format, and must be separated by a space. Starttime and stoptime both default to the current time of day. Stopdate defaults to the current date. Startdate defaults to the current date, minus 24 hours.

Only the values available in the interval between the start and stop times are output. For the first three hours of operation after an input is enabled, the values are displayed on a 1-minute boundary. After the first three hours of operation, the data is displayed on a 1-hour boundary. The returned MTIE values have a timestamp that corresponds to the nearest minute or hour boundaries.

```
MTIE xAy-z [{A| B}] HISTORY [count]
```

A| B specifies Clock A or Clock B. The default is the selected clock output. This command displays the one-day MTIE history for the last one to 100 days.

Level 2   Same as Level 1 operation

Level 3   Same as Level 2 operation

Level 4   Same as Level 3 operation

Remarks   Since MTIE involves intensive calculations, you can only specify one port.

Related   None

RestrictionsNone

Example
```
SSU_2000+>mtie 1A10-02

MTIE for 1A09-01, on Clock A:
Start Time: 2001-06-24T19:00:00
Stop Time:  2001-06-25T18:20:00
The MTIE (    0.05 sec) is 5
The MTIE (    0.10 sec) is 5
The MTIE (    1.00 sec) is 6
The MTIE (   10.00 sec) is 7
The MTIE (  100.00 sec) is 12
The MTIE ( 1000.00 sec) is 13
The MTIE ( 10000.00 sec) is 22
The MTIE (100000.00 sec) is 22
2001-06-25T18:20:49   1A05 Rep Pos Set by Rec, Information Locked,
TL1A
```

NAME

Use this command to view and set the unit name.

Level 0   Not applicable

Level 1   `NAME`
           Use this command to display the unit name.

Level 2   Same as Level 1 operation

Level 3   `NAME unit_name`
           Sets the current unit name. You can use up to 20 characters for the unit name. This name is for identification purposes only.

Level 4   Same as Level 3 operation

Remarks   The name displays as part of the prompt

Related   Valid names must start with a letter. If TL1 is to be used, care must be taken in the assignment of the unit name as it is the Target Identification (TID) for that mode.

RestrictionsNone

NTP

Use this command to provide access to the NTP (Netswork Timing Protocol) parameters in the SSU-2000e. NTP can run as a server application, a client application, and in broadcast mode. The server always runs and the client and broadcast modes are enabled independently by assigning an address and setting a timer.

Level 0:   NA

Level 1:   NTP
Displays the NTP data: root delay, root dispersion, peer delay, peer dispersion, and peer offset.

Level 2:   Same as level 1 operation.

Level 3:   NTP ADDPEER {CLIENT|BROADCAST|BCLIENT} ip_dotted_address
NTP DELPEER ip_dotted_address
NTP CLRALL
NTP BTIMER {32|64|128|256|512|1024}
NTP {SETUP|STATUS}
NTP PREFER {GPS|CLIENT}

Options are:

ADDPEER	Add NTP peers (servers) to enable broadcast or client mode. **Note:** Place any peers on a subnet separate from the one on which the Maintenance port is configured.
CLIENT	The IP for NTP server in client mode
BROADCAST	The subnet mask for broadcasting mode
BCLIENT	The IP for NTP server in broadcast client mode
DELPEER	Removes NTP servers from the peer table
CLRALL	Clear all the NTP peer addresses in the unit
BTIMER	Set the broadcast timer for 32/64/128/256/512/1024 seconds interval
SETUP	Display NTP setup information
STATUS	Display NTP status information (default setting)
PREFER	Selects the Time-of-Day source from GPS for as an NTP client

Level 4:   Same as level 3 operation

Remarks   None

Related   None

RestrictionsThe maximum number of peers is three. Users can assign a newly created peer to client or broadcast. Normally two peers are used for clients and one peer is for broadcasting (depending upon user requirements).

Example

NTP or NTP STATUS

```
2005-05-19T18:25:33Z ID: SSU2000, Name: SSU_2000
NTP: CLIENT, SOURCE: 172.16.21.18, NTP offset: 0. 00099995
SERVER: 172.16.21.18, CLIENT Mode
Leap: 0, Stratum: 1, Precision: -9
Client delay: 0.001998
Client dispersion: 0.515058
Server offset: 0.00099995
Server delay: 0.001998
Server dispersion: 7.877456
Valid Timeserver: Checking
SERVER: 172.16.21.19, BCLIENT Mode
Leap: 0, Stratum: 1, Precision: -9
Client delay: 0.000000
Client dispersion: 0.001953
Server offset: 0.00390625
Server delay: 0.000000
Server dispersion: 0.127929
Valid Timeserver: Passed
BROADCAST: 172.16.21.255
```

NTP Setup

```
2005-05-19T18:25:33Z ID: SSU2000, Name: SSU_2000
CLIENT: 172.16.21.18
BCLIENT: 172.16.21.19
BROADCAST: 172.16.23.255, Timer 64
```

NTPQ

This command monitors an NTP server and determines its performance. It returns the current NTP status for the unit.

Level 0   NA

Level 1   NA

Level 2   `PTIME xAy NTPQ`
A typical response is:

```
syspeer:172.16.21.91, leap: 0, stratum:2, precision:-18
rootdelay:2.346,rootdispersion:0.134,offset:0.065
reftime:Nov 15 2007 21:12:26.777
remote            refid    st   poll  reach      delay    offset   jitter
===========================================================================
SYMM_TE(0)        .GPS.    0    16    0          0.000    0.000    0.004
-172.16.21.42     .GPS.    1    32    377        5.074    -0.507   0.053
-172.16.21.166    .GPS.    1    32    377        1.510    -0.486   0.051
+172.16.21.99     .GPS.    1    32    377        2.331    0.155    0.058
*172.16.21.91     .GPS.    1    32    377        2.346    0.049    0.057
+172.16.21.19     .GPS.    1    32    377        1.890    0.006    0.061
172.16.22.104     .INIT.   16   32    0          0.006    -0.144   0.000
172.16.21.105     .STEP.   16   32    0          0.000    0.000    0.000
```

where:

`syspeer`: IP address of peer selected by server as most likely to provide best timing information

`leap indicator`: The NTP server leap indicator (0, +1, -1, or NOSYNC).

`precision`: Measure of the number of significant bits in NTP timestamp

`rootdelay`: The calculated root delay value to primary source

`rootdispersion`: The NTP system Root Dispersion (max error relative to the primary reference source at the root of the synchronization subnet, in seconds)

`reference time`: The local time

`peer IP`: address of NTP peer

`reference ID`: The NTP system Reference

`stratum`: The NTP server stratum level

`poll`: The NTP server poll interval

`reach`: The NTP server reachability

`offset`: The client's calculated time offset value for the specified server

Level 3   Same as Level 2 operation.

Level 4   Same as Level 2 operation.

Remarks   This command is valid when a PackeTime module is installed in the specified slot.

Related   None

RestrictionsNone

OPERMODE

This command allows the operator to display or set the unit operating mode which is Normal or Subtending mode. The subtending SSU supports Clock bypass using one of the connected Composite Clock input references.

Level 0: NA

Level 1: `OPERMODE`
Displays the current operating mode.

Level 2: Same as level 1 operation.

Level 3: `OPERMODE [NORMAL|SUBTENDING|JAPANESE]`
`OPERMODE SYNC {1-10}`

If no parameter is given, it displays the current unit operating mode. It would be one of two modes: Normal or ANSI Subtending Mode.

To place the unit into specific mode, confirmation (YES| NO) is required to accept the action. If confirmation failed, it takes no action.

The above options are:

`NORMAL`   puts the unit into normal TSG operation

`SUBTENDING` puts the unit into ANSI subtending mode

`JAPANESE`   This option is not applicable to the SSU-2000e

`SYNC`   Perform a special operation to sync a reference clock to Clock C.

`1-10`   Number of steps in NCO offset, each step is 100 ns. The default value is 1 (i.e. 100 ns)

The unit must be in the subtending mode when you enter this command.

Once this command takes effect, the unit enters the SYNC process. During process, don't change selected clock and selected input reference. Typing ^C will interrupt the SYNC process. You will have a choice to stay or leave the SYNC process.

Level 4: Same as level 3 operation.

Remarks: None.

Related: None.

Restrictions: None

OUTPUT

Use this command to view or set the status of Output modules.

Level 0   Not applicable

Level 1   `OUTPUT [xAy]`
If you do not provide a parameter, the status information for all output modules in the unit displays. If you provide an output address, the status and setup information for the specified output module displays.

Status Information: Output module status, selected clock, status for all four clocks, redundant partner, output PQL value, and output port status

Setup Information: Framer type, zero suppression (On or Off), minimum clock level, PLL mask (On or Off)

The alarm level is handled by the ALARM command. The alarm elevation time is handled by ELEVTIME command.

Example

```
SSU_2000->output

2001-05-24T18:29:00Z ID: SSU2000 Name: SSU_2000
OUT STA  Clk Clk Stat              Port Status        1 1 1 1 1 1 1 1 1 1 2
Loc# Sta Sel  A B C D Rednt M/S Pql 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0
---- --- --- -------- ----- --- --- -----------------------------------
2A01 Ok  A   /Y/Y/Y/Y None      2  / / / / / / / / / / / / / / / / / / / /
2A02 Ok  A   /Y/Y/Y/Y None      2  / / / / / / / / / / / / / / / / / / / /
2A03 Ok  A   /Y/Y/Y/Y None      2  / / / / / / / / / / / / / / / / / / / /
2A04 Ok  A   /Y/Y/Y/Y None      2  / / / / / / / / / / / / / / / / / / / /
2A05 Ok  A   /Y/Y/Y/Y None      2  / / / / / / / / / / / / / / / / / / / /
2A08 Ok  A   /Y/Y/Y/Y None      2  / / / / / / / / / / / / / / / / / / / /
3A08 Ok  A   /Y/Y/Y/Y None      2  / / / / / / / / / / / / / / / / / / / /
3A11 Ok  A   /Y/Y/Y/Y 3A12  (S) 2  / / / / / / / / / / / / / / / / / / / /
3A12 Ok  A   /Y/Y/Y/Y 3A11  (M) 2  / / / / / / / / / / / / / / / / / / / /
1A06 Ok  A   /Y/Y/Y/N 1A07  (M) NA / / / / / / / / / / / / / / / / / / / /
1A07 Ok  A   /Y/Y/Y/N 1A06  (S) NA / / / / / / / / / / / / / / / / / / / /
Level 2               Same as Level 1 operation
```

Level 3   Same as Level 2 operation, with the following additions:

```
OUTPUT xAy {ESF|D4|CCS|CAS}
OUTPUT xAy-z[&&z] {E1|2048}
OUTPUT xAy-z[&&z] {ENABLE|DISABLE}
OUTPUT xAy LEVEL {ACQ|LOCK}
OUTPUT xAy BYPASS {ON|OFF}
OUTPUT xAy-z[&&z] {133FT|266FT|399FT|533FT|655FT}
OUTPUT xAy {CRC|ZS} {ON|OFF}
OUTPUT xAy SSM {ON|OFF}
OUTPUT xAy SSM {4|5|6|7|8}
OUTPUT xAy-z[&&z] DUTYCYCLE {63/37|50/50}
OUTPUT xAy-z[&&z] COMPENSATE {275ft|550ft|825ft|1100ft|1375ft|
        1650ft|1925ft|2200ft}
```

```
OUTPUT xAy FLTMODE {ON|OFF|AUTO}
OUTPUT xAy-z[&&z] {SQUELCH {{0-16}|DISABLE}
OUTPUT xAy-z[&&z] FREQUENCY {8...4096} in 8 kHz steps
OUTPUT xAy SINE {1.544MHZ|6.312MHZ}
OUTPUT xAy 400HZ {ON|OFF}
OUTPUT xAy PLQ {0|{1-16}}
```

Options are:

ESF|D4   Sets the T1 framing mode: ESF or D4. For DS1 Output
                 module

CCS|CAS   Sets the E1 framing mode: CCS or CAS. For E1 Output
                 module

E1|2048   Sets the signal type for the E1/2048 kHz Output module

ENABLE|DISABLE
                 Enable or disable the specified output ports. If the module
                 is one of a redundant pair, this command only affects the
                 specified module's ports.

LEVEL {ACQ|LOCK}
                 Sets the minimum clock level to ACQUIRE or LOCK mode.
                 The Output module turns off the output port if the level is
                 below the minimum clock level.

BYPASS {ON|OFF}
                 Enables or disables the bypass mode to support Clock C.

133FT|266FT|399FT|533FT|655FT
                 Sets the line-length parameters for the output line driver.
                 For DS1 Output module.

CRC {ON|OFF}   Enables or disables the CRC setting. For E1 and E1/2048
                 kHz Output modules.

ZS {ON|OFF}   Enables or disables the zero suppression setting. For the
                 DS1, E1, and E1/2048 kHz Output modules.

SSM {ON|OFF}   Enables or disables the SSM setting. For E1 and E1/2048
                 kHz Output modules.

SSM {4|5|6|7|8}
                 Sets the E1 SSM bit position. For E1 and E1/2048 kHz
                 Output modules.

DUTYCYCLE   Sets the Composite Clock output to 63/37 or 50/50 duty
                 cycles. For CC Output module.

COMPENSATE   Sets current line compensation for the Composite Clock
                 output. For CC Output module.

FLTMODE   Allows the user to turn the output on or off when the output
                 level exceeds 2.1v threshold. For 2048 kHz and RS-422
                 Output modules.

SQUELCH	Turns the output on or off depending on the current PQL and the threshold. 0 disables the squelch. For 2048 kHz and E1/2048 kHz Output modules.
FREQUENCY	Sets the output frequency, starting at 8 kHz and incrementing 8 kHz per step, to 4096 kHz. For RS-422 Output module.
PQL	PQL override (1-16). If zero, PQL override is disabled. For E1/2048, E1, and DS1 Output modules.

Level 4   Same as Level 3 operation

Remarks   None

Related   ALARM, ELEVTIME, SETUP, STATUS

RestrictionsNone

PBO

Use this command to gain access to the phase build-out (PBO) in the input module.

Level 0:   NA

Level 1:   PBO
          Display the PBO current mode from each input

Level 2:   Same as Level 2 operation.

Level 3:   PBO [DISABLE|REPORT|EVENT|NONE]

          Options are:

          DISABLE   PBO disabled

          REPORT   PBO Enabled, the PBO events sent out and displayed, but
                     not stored in the COMM event buffer

          EVENT   PBO Enabled, the PBO events sent out and displayed, but
                     not stored in the COMM event buffer

          NONE   PBO Enabled, but no PBO events displayed

Level 4:   Same as level 3 operation

Remarks   None

Related   INPUT, PHASE

RestrictionsNone

PHASE

Use this command to access phase history data.

Level 0   Not applicable

Level 1   `PHASE [xAy[-z]][{A|B}]{T1|T100|T1K|T10K}[count]`
           Use this command to view the 100 / 1000 / 10 000 second phase history
           information. One-second phase is not stored in phase history. If you do
           not provide a parameter, phase information displays for the selected
           clock to all inputs that last stored the point.

Example

```
SSU_2000->phase

The current phase values with T1:
1A03-01  PhA:2001-05-24T18:29:00, 3
1A04-01  PhA:2001-05-24T18:29:09, 1
1A04-02  PhA:2001-05-24T18:29:09, 1
1A04-03  PhA:2001-05-24T18:29:09, 3
1A05-01  PhA:2001-05-24T18:29:12, 5
1A09-01  PhA:2001-05-24T18:29:12, 1
1A09-02  PhA:2001-05-24T18:29:12, 2
1A09-03  PhA:2001-05-24T18:29:12, NA
1A10-01  PhA:2001-05-24T18:29:13, 1
1A10-02  PhA:2001-05-24T18:29:13, 3
1A10-03  PhA:2001-05-24T18:29:13, 2
1A11-01  PhA:2001-05-24T18:29:14, NA
1A11-02  PhA:2001-05-24T18:29:14, 2
1A11-03  PhA:2001-05-24T18:29:14, NA
```

Level 2   Same as Level 2 operation, with the following additions:

           `PHASE [xAy[-z]] ZERO [{A|B}]`

           Use this command to zero the phase error for the desired input port. If
           you do not provide a parameter, all inputs on both clocks are zeroed.

Level 3   Same as Level 2 operation

Level 4   Same as Level 3 operation

Remarks   None

Related   STATUS, INPUT

RestrictionsNone

PING

Use this command to view network ping (diagnostic) capabilities.

Level 0   Not applicable

Level 1   Not applicable

Level 2   `PING [xAy-[A|B|M]] dotIp`
Use this command to determine if the unit is connected to the network.
This command transmits a packet to the specified address and waits for
a response. If a response is received, the unit displays a successful
command completion message. If no response is received, the unit
times-out and prints an unsuccessful command completion message.

If the aid is not specified, the Communications module is the default.

Level 3   Same as Level 2 operation

Level 4   Same as Level 2 operation

Remarks   No name server is available. The Internet Protocol (IP) address is
formatted as a decimal dotted address.

Related   None

RestrictionsNone

PQLTABLE

Use this command to display or change user-defined Priority Quality Level (PQL) code and text string.

Level 0   Not applicable

Level 1   `PQLTABLE`
           Use this command to display the PQL table setting.

Level 2   Same as Level 1 operation

Level 3   Same as Level 2 operation, with the following additions:

```
PQLTABLE FACTORY
PQLTABLE pql# [{DS1|E1}] UNUSED
PQLTABLE pql# [{DS1|E1}][SSM n][DESC str] [STD{ON|OFF}]
```

Use this command to read or set current PQL translation table information. This table provides the translation from the internal Priority Quality Level (PQL) to the Synchronization Status Message (SSM) for the various framing types.

Options are:

FACTORY   Use this option to set factory defaults for the table. Both DS1 and E1 are affected.

Pql#   PQL number for the entry. The range is 1 to 16.

DS1|E1   Use this option to specify which entry to affect. If you do not specify this information, both entries are assumed.

UNUSED   Marks this entry as unused in the table

SSM n   Use this option to set the SSM value to use for the framing type by specifying a hex number, preceded by *0x*.

DESC str   Use this option to set the descriptive text string for this entry. Use a maximum of 14 characters. You can enclose the string in double quotes to allow entry of spaces and lower-case letters.

STD {ON|OFF} Use this option to set or clear this entry as the standard input type. Only *standard* entries are matched for input.

Level 4   Same as Level 3 operation

Remarks   None

Related   None

RestrictionsNone

Example

```
SSU_2000->pqltable

2001-06-21T15:23:06Z ID: SSU2000 Name: JWANG
DS1                             E1
PQL SSM  S Text Desc          SSM  S Text Desc
--- ---- - ---------------- ---- - ----------------
1   --                        --
2   0x04 s PRS                0x02
3   0x04                      0x02 s PRC/G.811
4   0x08 s STU                0x00 s STU
5   0x0C s St2                0x04   Type II
6   0x78 s Type V             0x04 s G.812 Transit
7   --     Type I             --     Type I
8   0x7C s St3E               0x08   Type III
9   0x10   Type VI            0x08 s G.812 Local
10  0x10 s St3                0x0B   Type IV
11  0x22                      0x0B s G.813 Opt1
12  0x22 s SMC                0x0F   G.813 Opt2
13  0x28 s St4                0x0F
14  0x40 s Reserved           0x0F
15  0x30 s DUS                0x0F s DUS
16  0x7E   Unassigned         0x0F   Unassigned
```

PTIME

This command displays the status of the PackeTime module, and allows you to set and change the PackeTime module parameters.

Level 0   Not applicable

Level 1   PTIME
Displays the status of the PackeTime module.

Level 2   Same as Level 1 operation.

Level 3   Same as Level 1 operation, with the following additions:

```
PTIME xAy PEER # {{ip min max keyid} | PREFER}
PTIME xAy AUTH # keyid "keyvalue"
PTIME xAy WEIGHT {-1 to 100}
PTIME xAy COMPENSATION {0 to 250}
PTIME xAy TOD_TIMEOUT {60 to 10000}
PTIME xAy NTPD {ENABLE | DISABLE}
PTIME xAy BOND {ENABLE | DISABLE}
PTIME xAy-{A | B} ACTIVE
```

Options are:

PEER   Sets the NTP Peer information:
            # is the index of the NTP server 1 | ... | 8, default is 1
            ip is the IP address of the NTP server; 0.0.0.0 deletes it
            min is the minimum request rate in seconds 16 | 32 | 64 |
                128 | 256 | 512 | 1024 Default is 16.
            max is the maximum request rate in seconds 16 | 32 | 64 |
                128 | 256 | 512 | 1024 Default is 64.
            keyid is the current authorization key 0 | 1 | ... | 65534
                where 0 is no authorization key. Default is 0.

AUTH   Sets the authorization key
            # is the index that supports up to 16 possible sets of keyid
                and keys 1 | ... | 16
            keyid is the authorization key 0 | 1 | ... | 65534   where 0 is
                no authorization key. Default is 0.
            keyvalue is from 8 to 32 ASCII characters

WEIGHT   Sets the load (bandwidth) distribution between Port-A and
            Port-B. The value is a percentage of distribution to Port-A;
            for example, when WEIGHT is set to 70, then Port-A is
            assigned 70% of available bandwidth and Port-B is
            assigned the remaining 30%. If Port-A then reaches 70% of
            total bandwidth and Port-B has no traffic, Port-A cannot use
            that 30% and that bandwidth is wasted. To allow either port
            to use all available bandwidth, set WEIGHT to –1. Bandwidth
            is then allocated to each port on a first-come, first-served
            basis.

For bonding mode, `WEIGHT` must be set to –1 to allow the active port to use 100% of the available bandwidth.

`COMPENSATION` Compensation (0 – 250) for the delay induced by the cable(s) used to connect expansion shelves where the PackeTime ToD source(s) is located in relationship to the Main shelf. The time offset has a 100 nS resolution, thus the "compensation" value shall be multiplied by 100 nS to provide 1PPS compensation.

`TOD_TIMEOUT` Sets the time in minutes that the PackeTime module can operate with no peer availability before issuing an alarm. 60 | ... | 10000; default is 1440 (24 hours).

`NTPD` Enables or disables NTP service.

`BOND` Eanbles or disables Service Port Bonding.

`ACTIVE` Sets the specified port (A or B) as Active in the Bonding mode. If the port is not specified, then the specified module is set active in a redundant pair of PackeTime modules.

Level 4   Same as Level 3 operation.

Remarks   None

Related   CLK, COMMIT, INPUT, STATUS

RestrictionsNone

REF

Use this command to access the input reference selection modes and settings.

Level 0   Not applicable

Level 1   REF
Use this command to display the current input reference port and
selected clock.

Level 2   Same as Level 1 operation

Level 3   Same as Level 2 operation, with the following additions:

```
REF xAy-z
REF {AR|AS|OFF}
REF {PRIORITY|PQL}
```

Use the first command REF xAy-z to select a given input port as the
current input reference.

> **Note:** If the Clock module is already selected as an input reference
> and is not in AS OFF mode, this command has no effect. If both
> clocks are removed or in warm-up mode, this command can set an
> initial input reference port for use as the Clock C passthrough. Other
> commands allow you to set input switch methods and input selection
> modes.

Options are:

{AR}   Use this option to enable the input autoreturn (Revertive)
            switching mode.

{AS}   Use this command to enable the input autoswitch
            (Non-revertive) switching mode.

{OFF}   Use this command when no switching is used.

PRIORITY   Use this option to set the PRIORITY as the input selection
            mode.

PQL   Sets the PQL value as the input selection mode

> **Note:** Input reference selection order proceeds from highest (1) to
> lowest (10) priority valid input port. If the inputs have equal Priority
> level, the PQL value is used to distinguish between them.

> **Note:** Input reference selection order proceeds from highest (1) to lowest (16) PQL valid input port. If the inputs have equal PQL values, then the priority is used to distinguish between them.

Level 4   Same as Level 3 operation

Remarks   None

Related   INPUT, CLK, STATUS

RestrictionsNone

Example

```
SSU_2000->ref

2001-06-18T21:29:56Z ID: SSU2000 Name: SSU_2000
Input Reference:
  1A03-01
Bypass Clock C Selected:
  1A04-01
Clock Selected:
  1A01
```

RESET

Use this command to reset the Clock module through the Comm Module.

Level 0:   NA

Level 1:   NA

Level 2:   NA

Level 3:   `RESET {xAy}`
Resets the specified clock module. It must have an operand to indicate Clock A or Clock B. Any other operand is invalid. This command requires the whole entry 'RESET' be entered to verify that the user really wants to restart that module. This command requires a confirmation (YES| NO). If confirmation failed, no action occurs.

Level 4:   Same as Level 3 operation

Remarks   None

Related   RESTART

RestrictionsThis command uses the COMM module PLD's CLK A/B reset bit to reset the clock module. The software is required to hold the RESET bit for at least for 4 seconds and then writes a zero for that RESET bit.

RESTART

Use this command to restart the software for a specified module.

Level 0   Not applicable

Level 1   Not applicable

Level 2   Not applicable

Level 3   `RESTART [xAy]`
Use this command to restart the specified module. The command requires a valid module address.

This command requires the whole entry RESTART to be entered to verify that you want to restart the module. This command requires a confirmation (YES | NO). If confirmation fails, no action is required.

Level 4   Same as Level 3 operation

Remarks   None

Related   None

RestrictionsThis command is based on the target modules that have the SPI software RESTART command support. This command assumes that the target module is working properly. If the target module does not work, this command has no effect.

Note: This command does not work on the Buffer module.

ROUTE

Static routing describes a system that does not implement adaptive routing. In these systems, routes through a data network are described by fixed paths (statically). These routes are usually entered into the host by the system administrator. An entire network can be configured using static routes, but this type of configuration is not fault tolerant. When there is a change in the network or a failure occurs between two statically defined nodes, traffic will not be rerouted.

Level 0   NA

Level 1   NA

Level 2   ROUTE xAy {SETUP | STATUS}

This command sets up or displays the route table status.

Level 3   ROUTE xAy-{A | B} # (destination mask gateway)

Options are:

Index of the Route [1 | ... | 6]

destination   Sets the destination network and network host. 0.0.0.0 deletes the entry

mask   Sets the mask for the destination

gateway   Sets the gateway address

Level 4   Same as Level 3 operation

Remarks   None

Related   None

RestrictionsNone

SECURITY

This command provides the security interface to the SSU-2000e. This command works with the USERS command to allow an Administrator-level user to change passwords, to query the security log, set the login failed attempts threshold, set the user lockout timer, and set the password aging timer.

Level 0:   NA

Level 1:   NA

Level 2:   NA

Level 3:   NA

Level 4:
```
SECURITY
SECURITY LOG {count}
SECURITY FAIL {DISABLE|2-5}
SECURITY LOCKOUT {10-86400}
SECURITY AGING {0|{10-360}}
```

If you do not specify parameters in the command, the current security settings display.

The options are:

LOG   Sets the specified number (count) of the latest security entries to display. If no count is specified, it displays the latest one. The count is up to the max resource of the COMM Module in the NVRAM. If it is too big, the command automatically adjusts the number to its own maximum.

FAIL   Sets the login failed attempt threshold. The range is 2 to 5. The default is 0 (i.e. User Lockout disabled).

LOCKOUT   Sets the user lockout recovery timer (in seconds). This timer determines how long a user is locked out when the login failure threshold is reached. The range is from 10 to 86400 seconds. The default is 60 seconds.

AGING   Determines how long (in days) a password is valid. The range is from 10 to 360 days; the default is 0 (aging disabled).

Remarks   None

Related   USERS

RestrictionsNone

SETUP

Use this command to view the current settings from non-volatile RAM in the entire unit. This includes any user settable information that is currently stored in NVRAM.

The main purpose of this command is to provide a dump of the unit's current configuration so that you can compare site configurations. In addition, this command allows for storage and restoration of user settings, and the restoration of factory settings.

Level 0   Not applicable

Level 1   `SETUP [xAy]`
           If you do not specify a parameter, all setup information for every module in the unit displays. If a specified address operand is provided, setup detail information for the target module displays. Module alarm Level is handled by the ALARM command. The alarm elevation time is handled by the ELEVTIME command. For each target module, refer to INPUT, CLK, or OUTPUT for a description.

           If xAy specifies a Buffer module, the command displays nothing.

           If xAy specifies the Communications module, the command displays: IP address, IP mask, gateway address, communications port settings, total number of users stored, and maximum number of events stored. You can view events from the event log by using the EVENTS command. You can view alarms from each module by using the ALARM command.

           `SETUP xAy REPORT {CURRENT|FACTORY|USER}`

           Options are:

           CURRENT   Use this option to restore the current settings.

           FACTORY   Use this option to display the current factory settings.

           USER   Use this option to display the current user settings.

Level 2   Same as Level 1 operation

Level 3   Same as Level 2 operation, with the following additions:

           `SETUP xAy {FACTORY|USER|SAVE}`
           `SETUP 1A2 CONNECTION FACTORY`

           Options are:

           FACTORY   Use this option to restore the current setting from the factory settings. If addressed as COMM, connection and user list are not included.

USER   Use this option to restore the current setting to the previously-saved user setting. If addressed as COMM, connection and user list are not included.

SAVE   Use this option to save the current setting as the user setting. If addressed as COMM, connection and user list are not included.

CONNECTION FACTORY
                     Use this command to restore the current connection configuration in the Communications module.

Note: Restore the user list to factory settings by using the USER INITUSERTABLE command.

Level 4   Same as Level 3 operation

Remarks   This command provides a way for the unit to save default settings that the user prefers for operation. The target module restores user defaults in the event that current nonvolatile RAM information in the target module is lost.

           If user information is not present, or unusable, the target module restores the current factory settings. If the factory settings are also not usable, the software initializes non-volatile RAM with the current program defaults and transfers those setting into non-volatile RAM as the new factory settings.

Related   INPUT, CLK, OUTPUT, EVENTS, ALARM

RestrictionsNone

SNMP

Use this command to provide access to the SNMP user list and provide the SNMP manager IP addresses.

Level 0: NA

Level 1: `SNMP [V2USER|V2MANAGER|V3USER|V3MANAGER]`
If this command is used with any operand, it displays the valid SNMP user names and their associated access levels. It also displays the SNMP enabled/disabled mode, and SNMP manager IP addresses.

Options are:

`V2USER`   Displays the valid SNMPv2 user names and their associated access levels

`V2MANAGER`   Displays the SNMPv2 manager table contents

`V3USER`   Displays the valid SNMPv3 user names and their associated access levels

`V3MANAGER`   Displays the SNMPv3 manager table contents

Level 2: Same as level 1 operation

Level 3: Same as level 2 operation, with the following additions:

```
SNMP [DISABLE|ENABLE{V2|V3|ALL}]
SNMP TRAP {ALARM|ALL}
SNMP NOTIFICATION {V2|V3|ALL}
```

Options are:

`DISABLE`   Disables the SNMP agent

`ENABLE`   Enables the SNMP agent and allow MIB manager to see the view

`TRAP`   Allows user set filter for SNMP trap (event port)

`ALARM`   Only Alarm Traps sent out

`ALL`   All Traps sent out

`NOTIFICATION`SNMP notification sent out in V2, V3, or both

Level 4: Same as level 3 operation, with the following additions:

```
SNMP V2USER [{INIT|ADD|MODIFY|DELETE}]
SNMP V2MANAGER [INIT|{ADD|DELETE}] [ipAddress]
SNMP V3USER [{INIT|ADD|MODIFY|DELETE}]
SNMP V3MANAGER [INIT|{ADD|DELETE}] [ipAddress][username]
```

Options are:

V2USER	SNMPv2 User Table
INIT	Clears the whole SNMP user table and only leaves the built-in users in the systems. This option clears the table.
ADD	Adds the SNMP user "read community" to the system. If the user exists in the system this option exits with an error. After the read community string is entered, this command prompts for a write community. Write Community entries are echoed as '*'. Valid write community characters are all upper alphanumerical characters. After the write community string is entered, this command prompts for the user level.
MODIFY	Modifies the write community and/or the access level for the given user. If the user id is not in the system, this command exits with an error. Once the user is entered, this option performs identically to the 'ADD' option.
DELETE	Deletes the user from system. If the user id is not in the system, this command exits with an error.

Note: Except for the first built-in entry, Read community: 'public' and Write community: 'private', all user-added community strings are in upper case. You can have up to five SNMPv2 user entries, including the built-in user.

V2MANAGER	SNMPv2 Manager Table
INIT	Initializes the SNMP Manager Table to all null IP addresses.
ADD	Adds an SNMP Manager IP address into the SNMPv2 Manager Table..
DELETE	Deletes an SNMP Manager IP address from the SNMPv2 Manager Table
V3USER	SNMPv3 User Table
INIT	Clears the whole SNMPv3 user table and leaves only the built-in users in the systems.
ADD	Adds the SNMP user "read community" to the system. If the user exists in the system this option exits with an error. Then this command shall prompt you to enter authentication algorithm (HMAC-MD5 or HMAC-SHA). After the authentication algorithm is chosen, this command prompts for authentication key and privacy key. The Authentication and Privacy entries are echoed as '*'. Valid authentication and privacy characters are all upper-case alphanumerical characters.
MODIFY	Modifies the given user of the authentication algorithm and their localized keys. If the user id is not in the system, this

command exits with an error. Once the user is entered, this option performs identically to the 'ADD' option.

DELETE   Deletes the user from system. If the user id is not in the system, this command exits with an error.

Note: Except for the first built-in entry (initial), all user-added community strings are in upper case and are at least three characters and up to 20 characters long. The Authentication and Privacy localized Key must be at least eight characters and up to 20 characters long. You can have up to five SNMPv3 user entries, including the built-in user.

V3MANAGER   SNMPv3 Manager Table

INIT   Initializes the SNMPv3 Manager Table to all null IP addresses.

ADD   Adds an SNMP Managerv3 IP address into the SNMPv3 Manager Table..

DELETE   Deletes an SNMPv3 Manager IP address from the SNMPv3 Manager Table

Remarks

Related   USERS

RestrictionsNone

STATUS

Use this command to view the current status of the unit. The status includes a count of the current active alarms and related information, which provides a quick view of unit performance.

Level 0   Not applicable

Level 1   `STATUS [xAy]`
             If you do not provide a parameter, status information from every module in the unit displays. If a specified address operand is provided, status detail information for that target module displays. For each target module, refer to INPUT, CLK, or OUTPUT for a description.

             If xAy specifies the Communications module, the bus connection profile displays within 900 seconds.

             If xAy specifies a Buffer module, nothing displays.

Level 2   Same as Level 1 operation

Level 3   Same as Level 1 operation

Level 4   Same as Level 1 operation

Remarks   None

Related   CLK, OUTPUT, INPUT, EVENTS

RestrictionsNone

SYSTIME

Use this command to view the length of time in ISO format that the devices have had power applied.

Level 0   Not applicable

Level 1   `SYSTIME [xAy]`
            If you do not provide a parameter, length of time for all modules displays.

Level 2   Same as Level 1 operation

Level 3   Same as Level 1 operation

Level 4   Same as Level 1 operation

Remarks   None

Related   None

RestrictionsNone

Example

```
SSU_2000->systime

2001-06-18T21:31:57Z ID: SSU2000 Name: SSU_2000
1A01 0T09:13:35
1A02 5T03:25:59
1A03 4T04:06:37
1A04 3T06:26:05
1A05 4T04:05:48
1A08 4T03:30:10
1A09 9T01:43:29
1A10 9T01:43:31
1A11 9T01:43:32
1A12 0T09:12:35
2A01 9T01:30:59
2A02 0T05:32:39
2A03 9T01:30:53
```

TDEV

Use this command to view Time Deviation (TDEV) information from the specified input port.

Level 0   Not applicable

Level 1   `TDEV xAy-z [{A|B}] startdate [starttime] [stopdate [stoptime]]`
`TDEV xAy-z [{A|B}] starttime [stopdate] [stoptime]`

Use this command to display the TDEV information calculated on the input modules. A|B specifies Clock A or Clock B. The default is the selected clock output.

To perform a TDEV calculation, a start and a stop time are required. If none are specified in the command line, the time defaults to the last 24 hours. If the stop time is not specified, the current time is assumed.

This command displays the returned TDEV values and the window sizes for which they are valid. The command also displays the start and stop time for TDEV calculation.

Note: If you specify times and dates, TDEV displays that occurred after the starting date and time and before the ending date and time. Specified dates have the format yyyy-mm-dd, and specified times have the format hh:mm:ss.

Specified dates and times are not provided in ISO timestamp format, and are separated by a space. Start time and stop time both default to the current time of day. Stop date defaults to the current date. Start date defaults to the current date, minus 24 hours.

`TDEV xAy-z [{A|B}] HISTORY [count]`

A | B specifies Clock A or Clock B. The default is the selected clock output. This command displays the one-day TDEV history for the last one to 100 days.

Level 2   Same as Level 1 operation

Level 3   Same as Level 2 operation

Level 4   Same as Level 3 operation

Remarks   Since TDEV is an intensive calculation, you can only specify one port.

Related   None

RestrictionsNone

Example

```
SSU_2000->tdev 1a9-1

TDEV for 1A09-01, on Clock A:
Start Time: 2001-06-19T01:00:00
Stop Time:  2001-06-19T13:57:00
The TDEV (    0.10 sec) is 0.56
The TDEV (    0.30 sec) is 0.33
The TDEV (    0.60 sec) is 0.24
The TDEV (    1.00 sec) is 0.18
The TDEV (    3.00 sec) is 0.11
The TDEV (    6.00 sec) is 0.09
The TDEV (   10.00 sec) is 0.07
The TDEV (   30.00 sec) is 0.06
The TDEV (   60.00 sec) is 0.07
The TDEV (  100.00 sec) is 0.09
The TDEV (  300.00 sec) is 0.14
The TDEV (  600.00 sec) is 0.19
The TDEV ( 1000.00 sec) is 0.24
The TDEV ( 3000.00 sec) is 0.62
The TDEV ( 6000.00 sec) is 1.22
The TDEV (10000.00 sec) is 1.60
```

TIME

Use this command to access the timekeeping facilities.

Level 0   Not applicable

Level 1   `TIME`
Use this command to view the current time within the unit. The time is displayed in the following format:

```
SSU_2000->time
T18:29:41Z
```

Level 2   Same as Level 1 operation

Level 3   `TIME [T]hh:mm:ss`
`TIME OFFSET [+/-]hh:mm`

If no parameter is given, then the current local time with the local time offset is displayed.

Options are:

`hh:mm:ss`   Set the current local time for the unit. If the time is set by a receiver such as GPS, then the time is locked and cannot be changed.

`OFFSET`   Sets the local time offset, which is the difference between local and UTC time. If local time is ahead of UTC, then offset is positive; If local time is behind UTC, then offset is negative.

Use this command to set the current time within the unit.

Level 4   Same as Level 3 operation

Remarks   None

Related   DATE

RestrictionsNone

TL1FORMAT

Use this command to view and set the format of autonomous messages. The format can be either GR831-compliant, or GR833-compliant.

Level 0   Not applicable

Level 1   `TL1FORMAT`
           Use this command to view the current format of autonomous messages. The response is displayed in the following format:

           `SSU_2000->GR831`

Level 2   Same as Level 1 operation

Level 3   `TL1FORMAT [GR831|GR833]`

           Use this command to set the format of autonomous messages.

           Options are:

           `GR831`   Generates GR-831 compliant events on all TL1 sessions

           `GR833`   Generates GR-833 compliant events on all TL1 sessions

Level 4   Same as Level 3 operation

Remarks   None

Related   None

RestrictionsNone

TODSRC

This command allows you to configure the GPS Input module as the TOD Source to provide Time-of-Day to the PackeTime module.

Level 0   Not applicable

Level 1   TODSRC
Use this command to view the current TODSRC preference and priority.

Level 2   Same as Level 1 operation.

Level 3   Same as Level 1 operation with the following additions:

```
TODSRC xAy PREFER {TOD | PEER}
TODSRC xAy PRIORITY {0 ... 8}
```

Options are:

PREFER   Sets the module's (or redundant module pair; not a per-port parameter) preferred TOD source to be either the GPS module or the selected peer if operating in the Client mode.

PRIORITY   Sets the priority of the specified module as the TOD source. 0 | ... | 8, where 0 disallows the specified module from being a TOD source, 1 is the highest priority, and 8 is the lowest.

Level 4   Same as Level 3 operation.

Remarks   None

Related   None

RestrictionsNone

UPGRADE

This command downloads the firmware to a PackeTime module. The command is invoked through the Ethernet port on the Communications module, and the file is transferred through the Maintenance port on the PackeTime module. During the transfer, a Progress code is issued. An event notification is generated to report the success or failure of the command.

The PackeTime module has memory locations for two firmware versions. This command loads the firmware into the location (0 or 1) that is not currently active. When you reboot the module, it loads the most recent firmware version.

To determine the location (0 or 1) of the currently-active firmware, issue the RTRV-IMAGE command (described below).

To determine the version number of the currently-active firmware, issue the RTRV-INV or the RTRV-IMAGE command.

Level 0   Not applicable

Level 1   Not applicable

Level 2   Not applicable

Level 3   Not applicable

Level 4   `UPGRADE xAy`
           The following prompts appear in sequence:

`SERVER`	The IP address of the server where the upgrade image is located. Use the IPv4 format with a prefix of `ftp:` or `sftp:` to indicate an FTP site or secured FTP site, respectively.
`FILENAME`	The filename of the image to download from the specified server. You may need to include the path as part of the filename.
`USERNAME`	A valid user account in the specified server.
`PASSWORD`	The password for the specified user account.

After the Password prompt, you are asked to verify that you want to restart the PackeTime module after the upgrade.

Remarks   None

Related   None

RestrictionsNone

USERS

Use this command to access the user list.

Level 0   Not applicable

Level 1   USERS
           USERS [PWD]

           Options are:

           null   If this option is not provided in the command, valid user
                       names and their associated access levels display.

           PWD   This option changes the user's password. This does not
                       allow for change of user name or access level.

Level 2   Same as Level 1 operation

Level 3   Same as Level 2 operation

Level 4   Same as Level 3 operation, with the following additions:

           USERS
           USERS LOGOFF comport
           USERS INITUSERTABLE
           USERS {ADD|PWD|ACCESS|DELETE|TEMPPWD}
           USERS {DISABLE|ENABLE|UNLOCK} username

           Options are:

           null   Displays all user names, levels, disabled/enabled state,
                       password aging, and lockout state.

           LOGOFF comport
                       Allows the ADMIN user to free the other comm port so that
                       it may be reconfigured. The user on the other port is
                       immediately logged off, terminating any data they may have
                       been entering. The valid comport names are L, A, B, TELA,
                       TELB, TELC, TELD, TL1A, and TL1B.

           INITUSERTABLE
                       Use this option to clear the user table and leave only the
                       built-in (default) system users. This option requires users to
                       confirm their intention to clear the user table by entering the
                       complete INITUSRTABLE command.

ADD   Use this option to add a user to the system. The user name must be from 4 to 20 alphanumeric characters long, must use upper-case for all alpha characters, must not start with a numeric character, and must not contain a colon (:), quote (") or blank character. If the user exists in the system, this option exits with an error. After the user ID is entered, you are prompted for a password. Password entries are echoed as '*'. The password must be from 6 to 10 alphanumeric characters, and include at least one alpha character, one numeric character, and one punctuation character. It must not contain a colon (:), quote (") or blank character, and it must not be the same as the user name. The password must be different than the last three previously-used passwords. After you enter the password, you are prompted for the user level (1 through 4).

PWD   Changes the password of the specified user. If the user id is not in the system, this command exits with an error. Password confirmation is required. This command requires `username` and `password` as its operands.

DELETE   Deletes the specified user from system. If the user id is not in the system, this command exits with an error. This command requires `username` as its operand.

ACCESS   Changes the access level of a specified user. If the user id is not in the system, this command exits with an error. Once the user is entered, the user shall be prompted to change the access level. This command requires `username` and `password` as its operands.

TEMPPWD   Provides a temporary password to a specified user. The user at first login must change this temporary password. This command requires `username` and `password` as its operands.

DISABLE   Disables, enables, or unlocks the specified user in the
ENABLE   system.
UNLOCK

Remarks

Related   LOGIN, BYE, SECURITY

RestrictionsNone

VER

Use this command to view the current software version for the Communications module.

Level 0   Not applicable

Level 1   `VER`
            This command displays information as follows (assumes Communications Module Main Code Version B).

```
Current Version:
Main Code: B.00, 14AUG02
```

Level 2   Same as Level 1 operation

Level 3   Same as Level 1 operation

Level 4   Same as Level 1 operation

Remarks   None

Related   INFO

RestrictionsNone

VLAN

This command allows you to view and provision the Virtual Local Area Network and the IEEE 802.1Q.

Level 0   NA

Level 1   `VLAN`

Level 2   Same as Level 1 operation

Level 3   Same as Level 1 operation, with the following additions:

```
VLAN xAy {ENABLE | DISABLE}
VLAN xAy -[A | B] ID {0 - 4094}
VLAN xAy-[A | B] PRIORITY {0 - 7}
```

Options are:

ENABLE   Enables the VLAN for the specified PackeTime module.

DISABLE   Disables the VLAN for the specified PackeTime module.

ID   Sets the VLAN identification for the specified PackeTime module.

PRIORITY   Sets the VLAN priority for the specified PackeTime module.

Level 4   Same as Level 3 operation

Remarks   None

Related   None

RestrictionsNone

WHO

Use this command to view current ports that have users and the port connections.

Level 0   Not applicable

Level 1   WHO
Use this command to view who is logged on all active communication ports. User name and the communication port name display.

Level 2   Same as Level 1 operation

Level 3   Same as Level 1 operation

Level 4   Same as Level 1 operation

Remarks   None

Related   USERS, LOGIN

RestrictionsNone

Example

```
SSU_2000->who

2001-06-18T21:37:59Z ID: SSU2000 Name: SSU_2000
You are ADMIN, with access level 4, connected to TELB
ADMIN is connected to COML
ADMIN is connected to COMA
ADMIN is connected to COMB
ADMIN is connected to TELA
```

Chapter 4 NTP and SNMP

This chapter provides detailed information about the Network Time Protocol (NTP) and Simple Network Management Protocol (SNMP) available with the SSU-2000e.

In This Chapter

- NTP Support
- SNMP Protocol

NTP Support

The Network Time Protocol (NTP) is used to synchronize the time of a computer client or server to another server or reference time source, such as a GPS receiver or local timing source.

The SSU-2000e implements the NTP v.3 (RFC 1305) version. It can run as a server application and a client application. In addition, broadcast mode may be implemented as either a server or client. The NTP server always runs and the client and broadcast modes are enabled independently by assignment of addresses and setting of timers.

Server Mode

The NTP server application always runs at port 123 (default NTP port) of the unit IP address and responds to requests for time in the NTP format. If the unit has time set from GPS then it indicates it is a primary time source by a 0 in the LI field and a 1 in the STR field. It the unit has time set by the client application then it indicates it is a secondary source by putting a 0 in the LI field and the source server STR + 1 in the STR field.

If the unit time has not been set by one of the above then it indicates that time is not valid by setting the LI field to 3. Once the unit time has been set by either radio or client then LI = 0. Setting time by the keyboard sets (or leaves) LI = 3, since this is not an accurate time setting. If the time has been set, and the unit switches to a non-radio reference, then the STR becomes the PQL value for the selected reference input. If the unit enters holdover mode then the STR becomes the PQL of the selected Clock. (PQL is an internal representation of the received or assigned SSM value of the reference. See the SSU-2000e documentation for details.)

Client Mode

If a valid time server IP other than 0.0.0.0 (default) is assigned AND a client timer other than 0 (default) is set AND no radio time is available, then the unit will request time from port 123 of the assigned server IP at the designated time interval (32 to 1024 seconds). Once time is set by the client mode then the server will have LI = 0 and STR = the time source STR + 1. A second server IP may be entered and the NTP protocol will check both servers and select the best source per the NTP specifications. An NTP response received in the client mode overrides the time set by keyboard and changes the LI field to 0 as indicated above.

Broadcast Mode

If a broadcast address mask other than 255.255.255.255 (default) is assigned AND a broadcast timer other that 0 (default) is set, then the unit will send NTP time broadcasts to all devices within the subnet defined by the mask, at the designated time interval (32 to 1024 seconds). The LI and STR fields will be set as described in the server mode above.

If a broadcast client address other than 0.0.0.0 (default) is assigned, then the unit will listen for NTP broadcast from that address, and set time accordingly on receipt of the broadcast.

The ICS commands for setting up NTP are described in NTP, on page 232.

The TL1 commands for viewing and setting NTP parameters are described in Retrieve NTP Parameters, on page 88, Retrieve NTP Status, on page 92, and Set NTP Parameters, on page 161, respectively.

SNMP Protocol

This section describes the two versions of SNMP that the SSU-2000e supports. The Communications module software determines the version of SNMP used by the SSU-2000e. See Table 4-1 for the part number for the various software loads that are available.

SNPMP v2 Details

SNMP is based on a client-server query-response mode that requires an Ethernet connection. A manager application (software installed on a computer) is the client generating the queries, and an agent (software on the SSU-2000e) is the server generating responses.

If SNMP is present, port 161 becomes the port of standard SNMP interactive communications and port 162 becomes the trap port. Since the SSU-2000e SNMP supports all existing functions, full system control of the SSU-2000e can be maintained through SNMP.

All reports, queries, and autonomous messages are available through SNMP. All control and provisioning and some administration is available through SNMP. You cannot use SNMP to:

- change communication port parameters
- set a user ID and Password
- set IP assignments
- reset a connection

■ change SNMP authentication and privacy settings

Refer to the MIB Specification (part number 12613250-000-2) for further information.

SNMP v3 Details

Symmetricom's implementation of SNMP v3 does not allow remote user configuration. Users and user levels must be set by an administrator (level 4 access) using TL1 or ICS commands only. The administrator can add up to five users to the SNMP user table and set the users to access level 1 (user), access level 2 (technician), or access level 3 (supervisor).

User levels are based on authentication and privacy settings. There are two authentication protocols: HMAC-MD5-96 and HMAC-SHA-96. The HMAC-MD5-96 authentication key is 16 characters long and the HMAC-SHA-96 authentication key is 20 characters long. The privacy protocol is CBC-DES with a 16-character key. All keys are uppercase.

A user with no authentication and no privacy only has access to the "system" object in the Management Information Base (MIB).

A user with authentication, but no privacy can only view the SSU-2000e MIB.

A user with authentication and privacy and has full access to the MIB in accordance with the specification.

Management Information Base

The Management Information Base (MIB) is a virtual database of managed objects, their object identifiers, and variables. Typical SSU-2000e MIB object identifiers include the SSU-2000e system, its modules, module features, input ports, output ports, etc. and variables include settings and measurements.

The MIB is controlled by the SSU-2000e's SNMP agent. The SNMP agent is a server program that sends SSU-2000e status (stored in the MIB database) to the network manager when the manager transmits GET or GET NEXT commands. The manager can also transmit SET commands that instruct the agent to set MIB variables to new values. The TRAP command sets up a communication link that allows the server to send the manager indications of MIB occurrences, such as a fault condition.

Enabling SNMP

To use the TL1 command to enable SNMP and have the unit transmit all alarms and events, type:

```
SET-PRMTR-SNMP-MODE::::::ENA,ALL;
```

To use the ICS command to enable SNMP and have the unit transmit all alarms and events, type:

`SNMP ENABLE` and press **Enter**.

Adding a User

TL1 Command

To use the TL1 command to add user XYZ with MD5 authentication using algorithm HMAC-MD5 with the 16 character authentication key, a 16 character privacy key, and user level 3, type:

```
SET-PRMTR-SNMPV3-USER::::::ADD,XYZ,MD5,123456789ABCDEFG,
123456789ABCDEFG,3;
```

> **Note:** Valid authentication key and privacy key characters include numbers, upper and lowercase letters, and the character set ":;<=>?@". The semicolon functions properly only in ICS mode, and the colon must be enclosed in quotes in TL1 mode, as "`USER:NAME`" or "`PASS:WORD`". To enter lowercase letters, enclose the input in quotes, as "`UserName`" or "`PassWord`". *Do not* use spaces in usernames.

ICS Command

To use the ICS command to add user XYZ with MD5 authentication using algorithm HMAC-MD5 with the 16 character authentication key, a 16 character privacy key, and user level 3, type:

`SNMP V3USER ADD XYZ` and press **Enter**.

At the prompt, type `123456789ABCDEFG` (or any other 16-character authentication key) and press **Enter**.

At the prompt, type `123456789ABCDEFG` (or any other 16-character privacy key) and press **Enter**.

At the prompt, type `3` and press **Enter**.

> **Note:** Valid authentication key and privacy key characters include numbers, upper and lowercase letters, and the character set ":;<=>?@". The semicolon functions properly only in ICS mode, and the colon must be enclosed in quotes in TL1 mode, as "`USER:NAME`" or "`PASS:WORD`". To enter lowercase letters, enclose the input in quotes, as "`UserName`" or "`PassWord`". *Do not* use spaces in usernames.

Adding a Manager IP Address

You can add up to four managers in the SNMP manager table.

TL1 Command

To use the TL1 command to add an SNMP manager IP address for traps with username XYZ, type:

```
SET-PRMTR-SNMPV3-MANAGER::::::ADD,192.100.100.100,XYZ;
```

ICS Command

To use the ICS command to add an SNMP manager IP address and username, type:

```
SNMP V3MANAGER ADD 192.100.100.100 XYZ
```
then press **ENTER**.

User and Manager Tables

ICS and TL1 commands allow users to:

- Add up to five SNMP user names in the SNMP user table

- Delete/display SNMP user names (read community string) and their associated access levels

  TL1: `SET-PRMTR-SNMP-USER: [tid]::ctag::mode,[rd_community],` `[wr_community], [level];` and `RTRV-PRMTR-SNMP-USER:[tid]::ctag;`

  ICS: `SNMP [V2USER|V2MANAGER|V3USER|V3MANAGER]`

- The factory default setting for *read community string* is "public"

- The factory default setting for *write community string* is "private"

- Disable/enable SNMP

  TL1: `SET-PRMTR-SNMP-MODE:[tid]::ctag::[mode], [trap_filter];` and `RTRV-PRMTR-SNMP-MODE:[tid]::ctag;`

  ICS: `SNMP [DISABLE|ENABLE]`

- Add/delete the SNMP manager IP address for traps (up to four managers in the SNMP manager table)

  TL1: `SET-PRMTR-SNMP-MANAGER:[tid]::ctag::mode,[ip];` and `RTRV-PRMTR-SNMP-MANAGER:[tid]::ctag;`

  ICS: `SNMP TRAP {ALARM|ALL}`

Keep-Alive Support

SNMP supports a "keep-alive" mode based on a user-settable time. An event is generated to alert the upstream support system that the SSU-2000e and associated paths are functional. This mode is only supported in TL1 and SNMP sessions, not in ICS, Telnet, or Hyperterminal sessions. The factory default mode is set to *Disabled*.

TL1: `SET-PRMTR-KEEPALIVE:[tid]::ctag::[tl1_time], [snmp_time];` and `KEEPALIVE:[tid]::ctag;`

ICS: `KEEPALIVE [TL1|SNMP] [time]`

Shelf Information

Each shelf and distribution unit's description, part number, and revision level can be displayed. Using the following commands with specific options the hardware information can be displayed. Refer to Retrieve Inventory, on page 75, and CONFIG, on page 204, for more information.

TL1: `RTRV-INV:[tid]:[aid]:ctag;`

ICS: `CONFIG xAy {REMOVE|DISABLE|ENABLE}`

Software Information

Individual module software, part number, and associated revision level can be displayed. Using the following commands with specific options the software information can be displayed. Refer to Retrieve Inventory, on page 75, and CONFIG, on page 204, for more information.

TL1: `RTRV-INV:[tid]:[aid]:ctag;`

ICS: `CONFIG SW`

Communications Module Software Version

There are four main executables (software versions) available depending on the features-added functions required for the specific application, see Table 4-1.

Table 4-1. Communications Module Software Versions

Part Number	Software Version
24113012-000-0	Basic System Load
24113012-001-0	Basic + NTP Support
24113012-002-0	Basic + SNMP v2 Support
24113012-003-0	Basic + NTP and SNMP v2 Support
24113012-004-0	Basic + SNMP v3 Support
24113012-005-0	Basic + NTP and SNMP v3 Support

Chapter 5 Antennas

This chapter provides information about optional antennas, antenna kits, part numbers and installation procedures for connecting GPS antennas to the SSU-2000e.

In This Chapter

- Antenna Kits and Accessories
- Installing Antennas
- Optional Accessories
- Ordering Information

Antenna Kits and Accessories

This section provides a list of antenna kits and accessories as well as descriptions and associated part numbers.

Selecting the Proper Gain Antenna

When installing the GPS radio receiver, it is important to select the proper gain antenna and coaxial cable that accounts for the insertion loss between the antenna and the radio receiver to avoid under-driving or over-driving the radio receiver antenna input. The gain required at 1575 MHz for a GPS radio receiver input is the manufacturer's specification for the radio receiver to acquire satellites, with some level of signal degradation allowed.

L1 Antenna gains are usually specified as the minimum effective gain. Such antenna gains can have 4.5 to 10 dB more signal strength at different satellite azimuths and elevations, depending on their reception pattern. The GPS engine requires a signal level at the antenna connector input of the chassis to be between 13.8 dB and 36.8 dB. This tolerance allows for the signal loss of the internal coaxial cable and connectors. The optimal signal level at the radio receiver input is 25.3 dB.

All antenna kits include the GPS L1 antenna, mounting pipe, floor flange, transient eliminator, pre-assembled coaxial cable (for antenna to transient eliminator), roll of 3M 2150 weatherproof tape, and a right angle adapter. All chassis, antennas, transient eliminators, and in-line amplifiers have N-type connectors.

All antenna kits supplied use LMR-400, or equivalent, low-loss coaxial cable. Other types of coaxial cable are available for GPS antenna applications; however, it is imperative that you calculate the specific cable loss to ensure a signal level between 13.8 dB and 36.8 dB at the antenna connector input. The L1 signal loss of LMR-400 is 0.167 dB/meter. The L1 signal loss of a 90 V transient eliminator is typically 0.25 dB.

GPS Antenna With a Low Noise Amplifier, 26, 40, 48, or 68 dB
Symmetricom offers three versions of GPS antennas with 26, 40, 48, or 68 dB internal Low Noise Amplifier (LNA). These antennas, which are compatible with most commercial GPS receivers, receive, amplify, and filter the L1 (1575.42 MHz) signal from GPS satellites. The antenna is housed in a weatherproof package suitable for permanent installation in an exposed location. For additional transient eliminator protection requirements, you can install a 250B-90 Gas Tube transient eliminator in series with the antenna coaxial cable.

The cable between the antenna and the SSU-2000e cable should be kept to the shortest reasonable length. With the appropriate antenna (lised in Table 5-1), inline amplifier, and coaxial cable, the antenna functions properly up to 1000 ft (305 m) from the radio receiver. The tables listed below provide information about the antenna:

- Table 5-1 lists the item number and provides a brief description of each antenna

- Table 5-2 provides specification information for GPS antenna with internal LNA

- Table 5-3 through Table 5-6 lists the item numbers and provides a brief description of the antenna accessories available for the GPS series antennas.

Table 5-1. GPS Antennas with Internal LNA

Part Number	Description	Minimum Cable Length
99013091-006	26 dB Antenna with 3 m + 3 m cable	3 m (10 ft)
99013091-013	26 dB Antenna with 3 m + 10 m cable	3 m (10 ft)
99013091-033	26 dB Antenna with 3 m + 30 m cable	3 m (10 ft)
99013150-048	26 dB Antenna with 3 m + 45 m cable	3 m (10 ft)
99013073-070	40 dB Antenna with 10 m + 67 m cable	30 m (100 ft)
99013073-120	40 dB Antenna with 10 m + 110 m cable	30 m (100 ft)
99013074-150	48 dB Antenna with 10 m + 140 m cable	76 m (250 ft)
99013074-180	48 dB Antenna with 10 m + 170 m cable	76 m (250 ft)
99013074-230	48 dB Antenna with 10 m + 220 m cable and 20 dB Amplifier	198 m (650 ft)
99013074-300	48 dB Antenna with 10 m + 290 m cable and 20 dB Amplifier	198 m (650 ft)

Table 5-2 provides specifications for GPS antennas with internal LNA.

Table 5-2. Specifications for GPS Antennas with Internal LNA

Characteristic	Specification
Mechanical	
Mounting	4 holes, 1.75 in x 1.75 in (4.445 cm x 4.445 cm) centers, 0.25 in (0.635 cm) mounting holes
Diameter	3.5 in (88.9 cm)
Height	12.94 in (328.7 cm), including pipe mount
Weight	< 3 lbs (1.4 kg)
Environmental	
Temperature	−40°C to +75°C
Relative Humidity	100% Non-Immersed
Altitude	200 ft. (60 m) below sea level to 13,000 ft. (3962 m) above sea level

Table 5-2. Specifications for GPS Antennas with Internal LNA (Continued)

Characteristic	Specification
Electrical	
Power	4.7 to 28 VDC (5 VDC Nominal)
Element	Right Hand Circular
Carrier	L1 (1545.42 MHz)
Bandwidth	10 MHz
Noise Figure	< 2.5 dB
Output Impedance	50 Ω
Gain Marine 26 Marine 40 Marine 50	26.5 dB ± 3 dB 40 dB minimum 48 dB minimum

Table 5-3 through Table 5-5 list the available accessories for GPS antennas with internal LNA.

Table 5-3. 26 dB L1 GPS Antenna Accessory Kit

Part Number	Description
12013076-xxx-0 (xxx = length)	Cable, LMR-400, 10 ft. up to maximum of 190 ft. (Customer specified length)
112-43400-00-3	Transient Eliminator, 90 Volts, 1.5 GHz, N-Type
12013076-010-0	Cable, LMR-400, 10 ft., Right Angle
400302-0500	Roll, 3M 2150 Weatherproof Tape

Table 5-4. 40 dB L1 GPS Antenna Accessory Kit

Part Number	Description
12013076-xxx-0 (xxx = length)	Cable, LMR-400, 70 ft. to maximum of 370 ft. (Customer-specified length)
112-43400-00-3	Transient Eliminator, 90 Volts, 1.5 GHz, N-Type
12013076-030-0	Cable, LMR-400, 30 ft., Right Angle
551100-6013	Adapter, Right Angle Female to Right Angle Male
12010210-000-0	Bracket Assembly, Antenna Mount Right Angle

Table 5-4. 40 dB L1 GPS Antenna Accessory Kit (Continued)

Part Number	Description
400302-0500	Roll, 3M 2150 Weatherproof Tape
12813080-000-0	Crimper Kit, LMR-400 (crimp tool, 2150 tape, LMR preptool, 10 each crimp N-type connectors)

Table 5-5. 48 dB and 68 dB L1 GPS Antenna Accessory Kit

Part Number	Description
12013076-xxx-0 (xxx = length)	Cable, LMR-400, 220 ft. to maximum of 970 ft. (Customer-specified length)
112-43400-00-3	Transient Eliminator, 90 Volts, 1.5 GHz, N-Type
12013076-010-0	Cable, LMR-400, 30 ft., Right Angle
551100-6013	Adapter, Right Angle Female to Right Angle Male
12010210-000-0	Bracket Assembly, Antenna Mount Right Angle
570704-0002 (68 dB Output Only)	GPS L1 inline amplifier (required for lengths > 650 ft.)
400302-0500	Roll, 3M 2150 Weatherproof Tape
12813080-000-0	Crimper Kit, LMR-400 (crimp tool, 2150 tape, LMR preptool, 10 each crimp N-type connectors)

Transient Eliminators

Symmetricom offers the FCC-250B-90-1.5NFNF Transient Eliminator for installations that require antenna coaxial lead-in protection. The FCC-250B- 90-1.5NFNF Transient Eliminator passes DC power and frequencies in the 1.5 GHz range with non-downconverter L1 GPS antennas. In most installations, the transient eliminator mounts near the point at which the antenna lead enters the facility. Table 5-6 provides the transient eliminator specifications.

Table 5-6. FCC-250B-90-1.5NFNF Specifications

Characteristic	Specification
Type	Gas
Response Time	< 2 nanoseconds
Impedance	50 Ω
Insertion Loss	< 0.25dB @ 1,575 MHz

Table 5-6. FCC-250B-90-1.5NFNF Specifications (Continued)

Characteristic	Specification
VSWR	< 1.6:1 @ 1,575 MHz
DC Breakdown Voltage	90 Volts
Dissipation Capacity	10 000 Amperes, impulse 8/20 µsec
Connector Type	N-Type
Temperature	–55°C to + 70°C
Relative Humidity	100% Non-immersed
Altitude	200 ft. (60 m) below sea level to 13 000 ft. (3962 m) above sea level

GPS L1 Inline Amplifier

The GPS L1 Inline Amplifier (570704-0002) option boosts the signal from the antenna. Use this amplifier on LMR-400 cables that are longer than 650 feet; it receives power from the GPS radio receiver through the antenna coaxial cable connections. Table 5-7 provides mechanical and electrical specifications for the amplifier.

Table 5-7. GPS L1 Inline Amplifier Specifications

Characteristic	Specification
Mechanical	
Connectors, (In/Out)	N-Type
Gain	20 dB $\pm$ 2 dB
Dimensions, includes connectors	Length: 3.77 in (9.6 cm)
Electrical	
Power	+4 VDC to +28 VDC
Current	< 10 mA
Noise Factor	< 3 dB

GPS L1 Inline Amplifier Assembly

This assembly (item number 11013077-000-0) mounted on an aluminum plate is designed with mounting holes to allow for several mounting configurations. The assembly consists of a GPS inline amplifier, a 90 V L1 Transient Eliminator, and an adapter for connectivity.

Antenna Coaxial Cables

Symmetricom provides several low-loss cable types, as well as LMR-400 with N-type connectors on both ends.

- Table 5-8 lists the optional antenna coaxial cables

- Table 5-9 lists the optional antenna coaxial cable crimper kits

- Table 5-10 provides antenna cable specifications

Table 5-8. Optional Antenna Coaxial Cables

Part Number	Description
12012992-xxx-0	Cable, RG-213/U, with N-Type Connectors
12012994-xxx-0	Cable, UHF/VHF (B-89913), with N-Type Connectors
12012995-xxx-0	Cable, UHF/VHF (B-9913), with N-Type Connectors
12013076-xxx-0	Cable, LMR-400 or equivalent, with N-Type Connectors

Contact your sales office for available cable lengths and specific cable item number.

Table 5-9. Optional Antenna Coaxial Cable Crimper Kits

Part Number	Description
12813059-000-0	Crimp Kit for RG213 (10 each N-Type Connectors, crimp tool, weatherproof tape)
12813060-000-0	Crimp Kit for 9913 (10 each N-Type Connectors, crimp tool, weatherproof tape)
12813080-000-0	Crimp Kit for LMR-400 or equivalent (10 ea. N-Type connector, crimp tool, weatherproof tape)

Table 5-10. Antenna Cable Specifications

Cable Type	Measured Loss (@1.575 GHz dB per foot)	DC Resistance (Ω per foot)	Type Center Conductor	Flammability
RG213/U (Belden 8267)	0.093 dB	0.0030	Stranded 13 AWG	U/L CSA
RG213/U (Belden 8267)	0.093 dB	0.0030	Stranded 2.62 mm^2	U/L CSA
UHF/VHF (Belden 9913)	0.058 dB	0.0027	Solid 10 AWG	
UHF/VHF (Belden 9913)	0.058 dB	0.0027	5.26 mm^2	
UHF/VHF (Belden 89913)	0.089 dB	0.0027	Solid 10 AWG	Plenum U/L CSA
UHF/VHF (Belden 89913)	0.089 dB	0.0027	5.26 mm^2	Plenum U/L CSA
LMR-400	0.051 dB	Shield – 0.00165 Center – 0.00139	0.109 inch Solid	
LMR-400	0.051 dB	Shield – 0.00165 Center – 0.00139	0.27686 cm^2 Solid	

Installing Antennas

This section provides a procedure for installing a GPS antenna. Before beginning the installation, review Planning the Installation, on page 287, and gather the necessary tools and materials described in Antenna Installation Tools and Materials, on page 290

Antenna Connection Overview

The SSU-2000e chassis has two antenna connections located on the rear panel. The antenna connections are made via isolated TNC connectors J6 and J7, labeled ANTENNA-A and ANTENNA-B, respectively. The connectors are DC isolated and AC bypassed to frame ground. These connections are used for radio receiver antenna connections only. The antenna connections (J6 and J7) are connected via the backplane to module slots 3 and 5. When installing GPS antennas, the installed modules must correspond to these connections (for instance, slot 3 to ANTENNA-A and Slot 5 to ANTENNA-B). Installation procedures for GPS antennas are outlined below. Table 5-11 outlines the antenna signal connections.

Table 5-11. Antenna Signal Connections

Signal Name	From	To
Ant-A	A3 P5-A	J6-A
Ant-A-RTN	A3 P5-B	J6-B
Ant-B	A5 P5-A	J7-A
Ant-B-RTN	A5 P5-B	J7-B

Planning the Installation

Prior to installing the antenna, you should plan the site, antenna location, grounding scheme, cable route, and all other details.

Locating the Antenna

Use Figure 5-1 as a guide to locating the antenna.
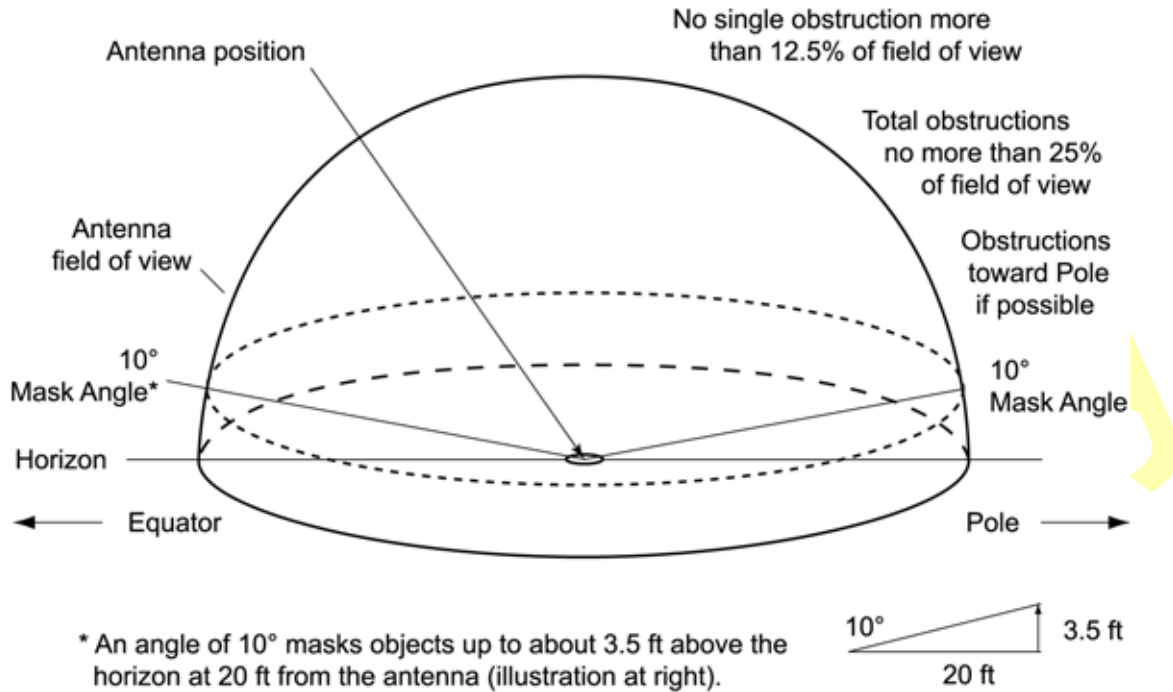
Figure 5-1.   Locating the GPS Antenna

> ⚠ **Caution:** To avoid damage to the GPS antenna, *do not* place the antenna where high-power radio signals are beamed directly at the unit. Such signals can damage the preamplifier of the GPS antenna.

> ⚡ **Warning:** To avoid serious injury to personnel or damage to equipment, exercise caution when working near high voltage lines. In particular:
>
> ■ Use extreme caution when installing the GPS antenna near, under, or around high voltage lines.
>
> ■ Follow local building electrical codes for grounding using the frame ground lugs on the SSU-2000e chassis.
>
> ■ The in-line amplifier receives 5 VDC power from the GPS radio receiver, and is supplied on the center conductor of the LMR-400 or equivalent coaxial cable. If the application requires an in-line amplifier, mount the amplifier/plate assembly where the transient eliminator would normally be mounted.
>
> ■ Symmetricom does not recommend cutting the antenna cables provided in the GPS Antenna Kit.

Recommendation: Symmetricom recommends that you consider the following location and environment influences before installing the GPS antenna:

- If possible, provide the antenna with an unobstructed 360-degree view of the sky from the horizon.
- In general, do not allow obstructions that obscure the horizon (as viewed from the antenna) by more than 10 degrees, as shown in Figure 5-1.
- Locate the antenna well away from, and preferably in a plane above electrical equipment such as elevators, air conditioners, or other machinery.
- To reduce the risk of lightning damage, *do not* place the antenna at the highest point of the building.
- Locate the GPS antenna at least 12 feet from metallic objects, if possible.
- Locate the antenna high enough to avoid drifted snow.
- Locate the transient eliminator in a protected area to avoid contact with standing water.
- Locate the antenna within 30 feet of the point at which the antenna cable enters the building.
- Allow at least 10 feet of separation distance between GPS antennas.
- Surfaces above the plane of the unit that are between the antenna and the horizon can produce reflected (multi-path) signals, which can degrade the performance of the radio receiver.

Developing a Grounding Scheme

In addition to determining where to locate and mount the antenna and cabling, you should develop a grounding scheme. The purpose of the grounding scheme is to provide some protection against voltage surges and static discharge. If transient eliminators are used, they also need to be connected to the perimeter ground system or bulkhead entrance panel that is connected to the perimeter ground system.

Caution: To ensure proper grounding, observe these precautions when installing the antenna:

- Allow no sharp bends in the ground conductors.
- Ensure that no painted surface insulates the transient eliminator or grounding clamps.
- Ensure that ground conductors are bonded to the metal enclosure box (if used) and do not enter through an access hole.
- Do not use soldered connections for grounding purposes.
- Secure all grounding connections with mechanical clamp type connectors.

■ In general, follow local building codes when selecting a grounding scheme, wire size, and installation.

Use #6 AWG (13.3 mm) copper ground wire or larger, depending on the distance to the earth ground electrode. Refer to your local electrical codes for specific details. In most cases, 1/0 AWG (55.0 mm) ground wire will maintain 1/10 the resistance of the coaxial shied..

> **Note:** Larger ground conductors provide better transient elimination; that is, the larger the ground conductor, the less likely the chance of transients.

■ Connect transient eliminators, if part of the grounding scheme, to earth ground through a conductor.

Symmetricom makes no recommendation as to whether to install transient eliminators. Symmetricom can provide suitable transient eliminators as an option.

> **Note:** *Do not* connect the outside transient eliminator ground to the inside equipment rack ground. Doing so can defeat the protection afforded by the transient eliminator.

■ Never connect antenna systems to the same earth ground connector as heating and cooling systems, elevator or pump motors, or other motors or machinery which can induce noise in the antenna system.

Antenna Installation Tools and Materials

These standard tools and materials are not supplied in the antenna kit, but may be required for installing the GPS antenna. For a list of antenna kit contents, see Table 5-1.

■ Four each 0.25 in (6 mm) fasteners for installing the antenna floor flange

■ Extra cable ties or acceptable cable clamps

■ #6 AWG (minimum) copper ground wire

■ Eight-foot (2.9 m) ground electrode

■ Custom mounting plates, U-bolts, masonry bolt, and so forth, as needed for mounting to a tower, roof, or wall of a building

■ A cable puller may be required for installing the antenna coaxial cable

■ Digital voltmeter (DVM)

> **Caution:** To prevent damage to connectors, use caution while pulling cable.

⚠️ **Caution:** To avoid damage to the connectors, do not use the connectors to pull the cable. If at all possible, avoid bundling the coaxial cable with other cables (and possible noise sources). Use appropriate cable-pulling devices when pulling the coaxial cable through conduit or a weather head.

Cutting Antenna Cables

Symmetricom recommends that you coil excess cable to avoid gain mismatch between the GPS antenna and the radio receiver. Coiling the excess cable also allows you to use the factory-installed crimped connector.

Symmetricom *does not* recommend cutting the antenna cables provided in the GPS Antenna Kits. If you must cut the cables, please ensure that the following requirements are met.

Be aware of these cable and connector requirements before cutting antenna cables:

Cable Requirements – The total cable length from the radio receiver to the antenna must not be shorter than the minimum cable lengths indicated in the GPS Antenna Kits (see Table 5-1).

Connector Requirements – The cables provided with the GPS Antenna Kit have factory installed crimped connectors. If you cut these cables, you must supply and add a connector. Symmetricom recommends that you use only crimp-style N-type connectors in the Crimper Kit for this application (see Table 5-9).

Installing the Antenna

This section provides installation procedures for installing the GPS antenna.

Note: Follow local building electrical codes when installing the GPS antenna.
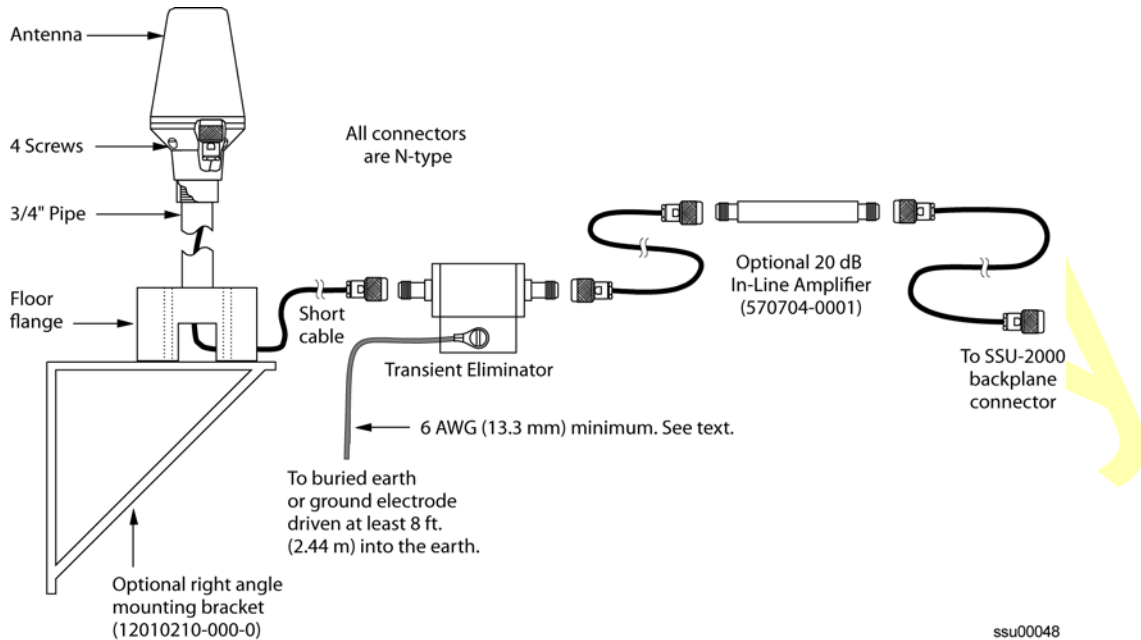
Figure 5-2.   GPS Antenna Installation

To mount the GPS antenna:

- To mount the antenna to any stable flat surface, use the floor flange supplied in the GPS Antenna Kit. The mounting surface and the local building codes determine the type and number of fasteners, screws, bolts, and so forth, that may be required.

- To mount the antenna on the side of a building or tower, use the optional right angle mounting bracket (part number 12010210-000-0).

- To secure the coaxial cable to the mast, use one or more 8-inch cable ties or appropriate cable clamps.

Connecting the Cable to the Antenna

To connect the coaxial cable to the mounted antenna (see Figure 5-2):

1. Loosen the four screws securing the top of the antenna in place to gain access to the connector.

2. Route the shorter antenna coaxial cable from the antenna through the floor flange (in the lower half of the antenna base) to the unit.

⚠ **Caution:** To avoid damage to the connectors, do not use the connectors to pull the cable. If at all possible, avoid bundling the coaxial cable with other cables (and possible noise sources). Use appropriate cable-pulling devices when pulling the coaxial cable through conduit or a weather head.

3. Connect the cable to the antenna and run the cable from the antenna through the slot of the floor flange.

> ⚠️ **Caution:** To avoid damage to internal solder connections, do not over-tighten the connector.

4. Replace the four screws to secure the top of the antenna in place with the cable connected.

Installing the Transient Eliminator

If you are installing a transient eliminator, follow these guidelines:

- Transient eliminators should be installed in accordance with your antenna system grounding scheme

- Mount the transient eliminator within 30 fett (9 m) of the GPS antenna

- If required, mount a second transient eliminator near the GPS antenna

To install the transient eliminator:

> 📑 **Note:** Step 6 in the following procedure cannot be done if you cut the cable (as described in Step 1).

1. If necessary, cut the coaxial cable and install mating connectors (see Cutting Antenna Cables, on page 291).

2. Using the DVM, measure the resistance between the center conductor and shield to verify that the center conductor and shield are not shorted together.

3. Connect the longer GPS antenna coaxial cable to the transient eliminator.

4. Connect the ground wire between the transient eliminator and the proper grounding zone (building ground, master ground bar, or other) for the mounting location.

> 🗂️ **Recommendation:** Symmetricom does not recommend soldered connections for grounding purposes. All grounding connections should be secured with mechanical clamp connectors.

5. Wrap the connectors with weatherproof tape for added protection.

6. Verify that the antenna coaxial cable center conductor is not shorted to the shield of the cable.

Installing the Antenna Cable

You should install the antenna cable from the transient eliminator to the SSU-2000e using the shortest route possible. Follow all applicable building and electrical codes to ensure a water-tight and fire-resistant installation. .

> ⚠️ **Caution:** To avoid damage to the connectors, do not use the connectors to pull the cable. If at all possible, avoid bundling the cable with other cables (and possible noise sources). Use appropriate cable-pulling devices when pulling the cable through conduit or a weather head.

Connecting the GPS Antenna

Before connecting the GPS antenna to the SSU-2000e, see Antenna Connection Overview, on page 287. Then, follow the instructions below.

1. Before connecting the antenna coaxial cable to the SSU-2000e, test the DC resistance between the center conductor and the shield using an ohmmeter. The reading should be approximately 260 Ω for an active GPS antenna.

   If the actual reading is incorrect, you may have a shorted or open cable or transient eliminator (if installed). Therefore, apply the same measurements directly to the GPS antenna. This requires disconnecting the antenna cable at the antenna.

> **Note:** The open-circuit range of an individual ohmmeter can cause readings to vary among meters.

2. Secure the free end of the antenna cable to the appropriate antenna connector on the rear panel of the SSU-2000e using the right angle adapter provided with the antenna cable.

> **Recommendation:** Symmetricom recommends coiling excess cable to avoid gain mismatch between the GPS antenna and the SSU-2000e. Coiling the excess cable also allows you to use the factory-installed crimped connector.

Antenna Installation Completeness Checklist

To verify that antenna installation is complete:

- Verify that all power and ground wires are installed correctly and securely fastened.

- Verify that all input and output cables are properly installed.

- Verify that all antenna connectors are secure, tight, and weatherproofed.

Optional Accessories

Table 5-12 provides a list of optional accessories which may be used to mount or install the SSU-2000e.

Table 5-12. Optional Accessories

Part Number	Description
22013085-000-0	9 pin-D wire-wrap adapter (not included with unit)
551026-0038	Cable EIA-232 shielded DB9P to DB9S, 5 ft. (1.5 m)

Ordering Information

To order any accessory, contact the Symmetricom Sales Department at the following address and phone number, and supply the accessory name and part number:

USA and Canada
Symmetricom, Inc.
2300 Orchard Parkway
San Jose, CA 95131-1017

Toll-free in North America: 1-888-367-7966
Telephone: 408-428-7907
Fax: 408-428-7998
email: us_canada_sales@symmetricom.com
Internet: http://www.symmetricom.com

Europe, Middle East, and Africa (EMEA)
Symmetricom GmbH
Fichtenstrasse 25
85649 Munich Germany
Telephone: +49 8104 66240
Fax :+49 8104 662428
email: emea_sales@symmetricom.com

Latin America
Symmetricom Latin America
Ft Lauderdale, Florida, USA
Telephone: +1 305-895-4301
Telephone: +1 954 385 2416
Fax: +1 954 252 4031
email: latin_america_sales@symmetricom.com

Asia and Pacific Rim

Symmetricom Hong Kong Ltd
P.O. Box No. 71
Texaco Road Post Office
Hong Kong
Telephone: + 852 2405 5203
Fax: + 852 2405 5713
email: asia_sales@symmetricom.com

Chapter 6 Alarms and Events

This chapter describes the alarms and events that the SSU-2000e generates, and provides some troubleshooting information for dealing with these alarms and events.

In This Chapter

- Message Format
- Clock Module Alarms and Events
- Communication Module Alarms and Events
- CC Input Module Alarms and Events
- DS1/E1 Input Module Alarms and Events
- GPS Input Module Alarms and Events
- 2048 kHz Output Module Alarms and Events
- CC Output Module Alarms and Events
- DS1 Output Module Alarms and Events
- E1/2048 kHz Output Module Alarms and Events
- RS-422 Output Module Alarms and Events
- PackeTime Module Alarms and Events
- Buffer Module Alarms and Events

Message Format

After the Communications module is installed and functioning properly, it monitors the SSU-2000e and logs events into non-volatile memory, where you can inspect it at a later date. Events are conditions within the unit or at the interfaces of the unit which may indicate abnormal operation or a change in the unit's operational status. Recurring events may be escalated to alarm status and may require action by the user. Conversely, alarms may be de-escalated and corrected automatically.

Although every alarm is considered to be an event, not every event is an alarm. For example, a *login* is recorded as an event but is not considered to be an alarm. In this case, no action is required by the user.

The following sections list all alarm and event messages by their designated numbers, a description of each, and any corrective action to clear the alarm or condition, if necessary.

TL1 Autonomous Message Format

Figure A-1 shows the structure of a typical TL1 Alarm message.
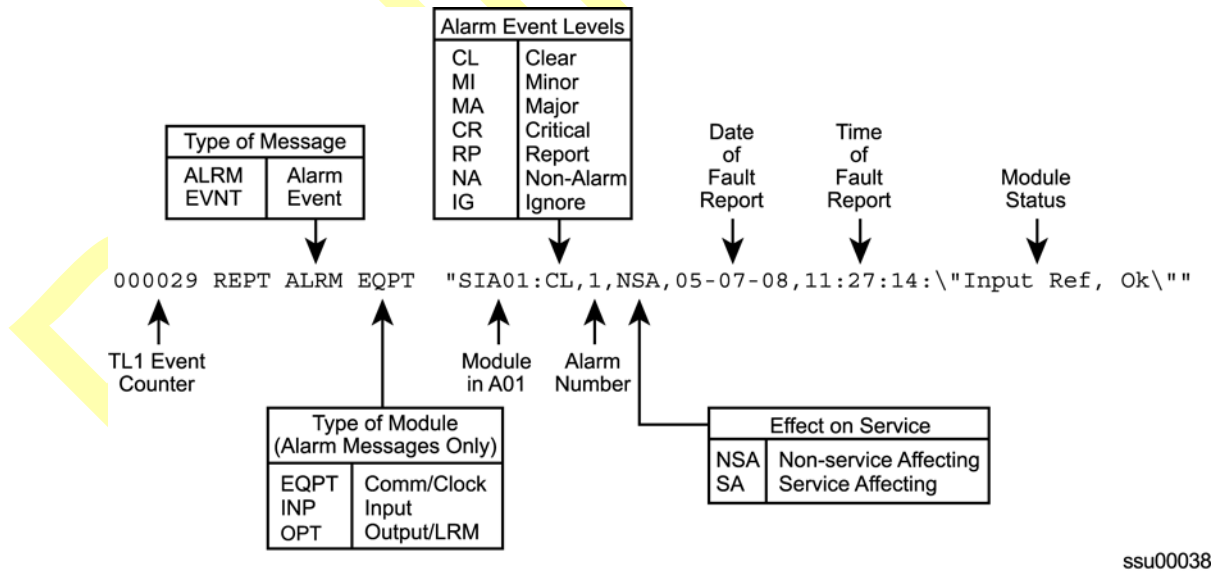
Figure 6-1.   TL1 Alarm and Event Message Structure

With the exception of loss of power alarms (on main chassis and expansion unit) all alarms are module alarms.

SNMP Trap Message Format

The following event message is an example of the response received from an autonomous event trap. Table 6-1 provides a description of the response content. For more information on MIB items, refer to the file SSU.MIB.

Tue Jun 20 08:35:26 2006 SNMPv2c trap from [192.168.21.18]

```
sysUpTime      :   (6496500)
snmpTrapOID    :   ssuEvent(1.3.6.1.4.1.601.3.1.1.52.0.1)
tpTag          :   (12)
tpEvt          :   (1)
tpId           :   (199)
tpMCode        :   (1013)
tpTimestamp    :   (0x07:d6:06:14:08:23:1a:00:2b:00:00)
tpChassis      :   (1)
tpSlot         :   (6)
tpPort         :   (1)
tpAlmCode      :   (5)
tpNtfCode      :   (5)
tpElevated     :   (2)
tpDescr        :   (Port, Enable, TELA)
```

Table 6-1. SNMP Event Message Format

MIB Definition	Content Example	Content Description
SysUpTime	(6496500)	System operating time (in seconds)
snmpTrapOID	ssuEvent (1.3.6.1.4.1.601.3.1.1.52.0.1)	SSU object identifier (includes the system, modules, ports, variables, etc.)
tpTag	(12)	Trap counter (number of traps sent)
tpEvt	(1)	Event Type 1 = autonomous 2 = user requested event to be resent
tpId	**(199)**[1]	**Trap Identification**
tpMCode	(1013)	Symmetricom's module code number
tpTimestamp	(0x07:d6:06:14:08:23:1a:00:2b:00:00)	Event timestamp
tpChassis	(1)	Shelf ID (1 through 5)
tpSlot	(6)	Module slot number
tpPort	(1)	Module port number

Table 6-1. SNMP Event Message Format (Continued)

MIB Definition	Content Example	Content Description
tpAlmCode	(5)	Alarm code 1 = minor 2 = major 3 = critical 4 = ignore 5 = report
tpNtfCode	(5)	Notification code 1 = minor 2 = major 3 = critical 5 = report 6 = clear
tpElevated	(2)	Elevated alarm indicator 1 = yes 2 = no
tpDescr	**(Port, Enable, TELA)[2]**	**Trap Message**

Note:

[1] Refer to Module specific Alarm/Event/Trap ID for values.

[2] Refer to Module specific Alarm/Event/Trap Response for message content.

Clock Module Alarms and Events

Table 6-2 lists the alarms and events for the Clock modules, and includes corresponding alarm descriptions, alarm levels, status messages, and corrective action. The MIB trap for SNMP is listed in the Alarm/Event/Trap Description column. Table 6-3 lists the default parameters for the Clock module alarms.

Table 6-2. Clock Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	Status of module-to- module communication	Unable to communicate with other modules. Re-seat modules.
001	Input reference available status	Input reference is not available. Perform the following: ■ Check the Input reference settings ■ Check the Input port's status ■ Check that the phase value is valid ■ Ensure that the Input port priority is set ■ Verify that the PQL value is equal to or greater than the clock PQL value When the Input reference recovers, the alarm clears.
002	Frequency mode degradation	Invalid reference input causes Holdover. Verify input setup.
003	Frequency control parameters within specification	The reference input frequency is over the clock pull-in range.
004	Output frequency status within specification	Output exceeded pull-in range of oscillator. Select new input reference.
005	Clock module usable as the output reference	Clock mode has warmed up.
006	Status of the numerically controlled oscillator phase locked loop	Alarm clears within one minute after module is installed. If alarm persists, re-seat modules.
007	Status of the local oscillator phase lock loop	Alarm clears within 1 minute after module is installed. If alarm persists, re-seat module.
008	Status of the rubidium's internal phase lock loop (ST2E clock only)	Only available with Stratum 2E Rubidium module. If alarm persists, re-seat module.
009	Status of the hardware configuration	Call Symmetricom Global Services. Return to factory.
129	Module Installed	A user has installed a Clock module.
130	Module Removed	A user has removed a Clock module.
131	Module Enabled	A user has enabled a Clock module.

Table 6-2. Clock Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
132	Module Disabled	A user has disabled a Clock module.
133	Module Restarting	A user has requested a reboot.
144	Clock Select	A user has selected a Clock module to be Active.
145	Set Software PLL	Status of the software phase-locked loop.
146	Input Select	The identified input port is selected.
147	Output PQL	A user has changed the output PQL value.
148	Bypass Clock C selection	A user has set the selected input as an output source.
149	Acq-Sync Operation	The status of the sync operation.
150	Subtending	A user has changed the operating mode.
194	User Change Warmup Time	A user has changed the oscillator warmup time setting.
195	User Change Start TC	A user has changed the starting Time Constant (tau).
196	User Change Default TC	A user has changed the default Time Constant (tau).
199	User Change Clock Switch	A user has changed the Clock Auto-Return mode.
200	User Change Input Switch	A user has changed the Clock Auto-Switch mode.
201	User Change LO External Output	A user has changed the Local Oscillator Output on the LO Output connector.
202	User Change Input Selection Mode	A user has changed the reference selection mode.
203	User Change Sync Speed	A user has changed sync speed.
251	Alarm Error Delay Time Changed	A user has changed the Alarm Delay time.
252	Alarm Level Changed	A user has changed the Alarm level.
253	Elevation Time Changed	A user has changed alarm elevation time.
254	Setup Changed	A user has set the module's configuration.

Table 6-3. Clock Module Alarm Defaults

ID	Description	Alarm Level	Alarm Settable?	Error Delay (s)	Error Delay Settable?	Clear Delay	Clear Delay Settable?
000	Backplane communication	Minor	Yes	5	Yes	Immed	No
001	Input Reference not available	Minor	Yes	0	Yes	Immed	No
002	Freq Mode Control Loop has not received usable phase data from a reference input	Minor	Yes	120	Yes	Immed	No
003	Freq Control	Major	Yes	0	Yes	Immed	No
004	Output Freq, indicates that the output of the Control Loop has achieved a stability equated to PRS quality output	Minor	Yes	600	Yes	Immed	No
005	Output Reference	Minor	Yes	0	Yes	Immed	No
006	NCO PLL, indicates that the PLL on the output of the NCO is unlocked	Major	Yes	Immed	No	Immed	No
007	LO PLL, indicates that the PLL on the output of the Local Oscillator is unlocked	Major	Yes	Immed	No	Immed	No
008	Rb PLL, indicates that the PLL on the output of the Rubidium LO is unlocked	Major	Yes	Immed	No	Immed	No
009	Hardware Config Error, indicates a mismatch between the hardware of the module and the hardware number.	Major	Yes	Immed	No	Immed	No

Communication Module Alarms and Events

There are six versions of operating software available for the Communication module. This section describes the alarms and events associated with this software.

Basic and Basic + NTP

Table 6-4 lists the alarms and events for the following Communication module firmware versions:

- Basic (24113012-000-0)
- Basic + NTP (24113012-001-0)

This table includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column. Table 6-5 lists the default parameters for the Communication module alarms.

Table 6-4. Basic and Basic + NTP Communications Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	Communication, Fault	Unable to communicate with other modules. Re-seat modules.
001	InterCommunication, Fault	Identifies master output controller. No action necessary.
002	Power-A, Lost	■ Verify that the fuse for Power A is properly installed and not OPEN. ■ Verify that Power Bus A is providing –48 VDC to the unit. If no power is connected to the Power A input and there is no plan to connect power, issue the command AL 10-1 IG at the prompt.
003	Power-B, Lost	■ Verify that the fuse for Power B is properly installed and not OPEN. ■ Verify that Power Bus B is providing –48 VDC to the unit. If no power is connected to the Power B input and there is no plan to connect power, enter the command AL 10-1 IG at the prompt.
004	SPI Watchdog, Timeout	Unable to communicate with other modules. Re-seat module.
005	Shelf #2 Comm, Lost	Unable to communicate with Expansion Shelf 2. Check cables.
006	Shelf #3 Comm, Lost	Unable to communicate with Expansion Shelf 3. Check cables.
007	Shelf #4 Comm, Lost	Unable to communicate with Expansion Shelf 4. Check cables.
008	Shelf #5 Comm, Lost	Unable to communicate with Expansion Shelf 5. Check cables.

Table 6-4. Basic and Basic + NTP Communications Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
009	Detect Mdl Removed, Fault	A module has been removed from the system or is not responding to Comms module queries. Replace the removed module with the same type, or issue the command CONFIG xAy REMOVE to remove the module information from the system database.
010	System Conflict	The IP addresses in the PackeTime module are conflicting. For example, the same IP address is assigned to Port-A and Port-B in a PackeTime module, or the same IP address is assigned to ports on several PackeTime modules.
105	KeepAlive, SSU2000	The Keep Alive function has been enabled/ disabled.
129	Install, Comm Module	The Comms module has been installed.
130	Remove, Comm Module	The Comms module has been removed.
131	Enable, Comm Module, COML	The Comms module has been enabled.
132	Disable, Comm Module, COML	The Comms module has been disabled.
133	Restart, in 5 seconds, COML	The Comms module has been rebooted (Warm boot).
144	Log In, JAY, COML, level: 2	User at indicated level has logged in.
145	Log Out,TIM, COML, level: 2	User at indicated level has logged out.
146	Auto Out, TIM, COML, level: 3	System automatically logging out a user.
147	Msg, <HELLO BILL>, COML	Message sent from a user.
148	Not Acknowledged, 1A01	Module configuration could not be obtained.
150	Module Status, Fault, 1A04	Module did not boot properly.
151	UTC Time, Valid	Time of startup; NTP is enabled but GPS time not being used.
152	TODSYNC, Timeout	Time of day (TOD) was requested by the Comms module, no response from the GPS module.
153	Upload Image, Start	System firmware upgrade status.
154	Upgrade, 1A02	Module's firmware upgrade has started.
155	Upgrade ACK, 1A02	Module's firmware upgrade was completed.
156	Upgrade NAK, 1A02	Module's firmware upgrade was not completed.
157	Config, 1A06, Not Support	Call Symmetricom Global Services. Return to factory.
158	NTP Mode, GPS	The SSU is configured with NTP running in an NTP Client, Broadcast, or Broadcast Client server mode; Local is displayed when NTP server is initialized. If GPS is not installed or setup, or NTP has not been configured NTP remains in Local mode and uses Comms module time.

Table 6-4. Basic and Basic + NTP Communications Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
159	Reset, Clk-B, COML	A user has reset the specified clock.
160	Clk-C Source, 1A04-01	Bypass clock source has changed.
161	Sync Clk-C, Start	Status of Sync acquire operation.
192	InitUserTable, JAY, COML	Administrator initialized user database.
193	Add User, DONNA, COML	Administrator added a user to user database.
194	Mod User, CALEB, COML	User/Administrator modified user database.
195	Del User, TEST1, COML	Administrator deleted user from user database.
196	Pql Table, DS1, pql(5)=ST2, COML	PQL database has been modified.
197	Pql Factory Dflt, COML	PQL database has been set to factory defaults.
198	Unit Name, , COML	The SSU name has been changed.
199	NTP Peer Add, 192.5.41.40, CLIENT, COML	An NTP client was added at the IP address shown.
200	NTP Peer Del, 192.5.41.40, COML	An NTP client was deleted at the IP address shown.
201	NTP Brd Timer, 64 seconds, COML	The NTP broadcast server timer has been set to the interval shown.
202	SNMPv2 User, ADD, id=1, COML	An SNMP user has been added to the user table in the position shown.
203	SNMP Agent, V2, COML	The SNMP mode has been enabled.
204	SNMPv2 Manager, INIT, 192,5.41.39, COML	An SNMP Manager has been initialized at the IP address shown.
206	SNMP Trap, ALM, COML	The SNMP Trap Port has been set to send traps on alarms only.
207	Chg KeepAlive, ALL, 15 minutes, COML	The Keep Alive timer has been set to the interval shown.
208	Operating Mode, Subtending, COML	A user has changed the operating mode.
209	Notification, V3, COML	A user has changed the notification format.
210	Login Event, Enable, COML	A user has changed whether login events are stored.
211	TL1 Format, GR831, COML	A user has changed the TL1 format to the specified value.
212	SNMPv3 User, ADD, id=1, COML	An SNMP user has been added to the user table in the position shown.
213	SNMPv3 Manager, INIT<192.5.41.39, COML	An SNMP Manager has been initialized at the IP address shown.

Table 6-4. Basic and Basic + NTP Communications Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
251	Err Delay, (1), 300 sec, COML	A user has changed the alarm delay time.
252	Alm Level, (2), Rep, COML	A user has changed the alarm level.
253	Elevate Time, 3600 sec, COML	A user has changed the alarm elevation time.
254	Setup, Save, COML	A user has saved the setup to the user default.

Table 6-5. Communications Module Alarm Defaults

ID	Description	Alarm Level	Alarm Settable?	Error Delay (s)	Error Delay Settable?	Clear Delay	Clear Delay Settable?
000	Backplane communication	Minor	Yes	5	Yes	Immed	No
001	Mastership Problems	Minor	Yes	30	Yes	Immed	No
002	Loss of Power A	Minor	Yes	Immed	No	Immed	No
003	Loss of Power B	Minor	Yes	Immed	No	Immed	No
004	SPI Watchdog Timeout	Major	Yes	Immed	No	Immed	No
005	Shelf #2 Comm	Critical	Yes	0	Yes	Immed	No
006	Shelf #3 Comm	Critical	Yes	0	Yes	Immed	No
007	Shelf #4 Comm	Critical	Yes	0	Yes	Immed	No
008	Shelf #5 Comm	Critical	Yes	0	Yes	Immed	No
009	Module Removed	Minor	Yes	5	Yes	Immed	No
010	System Conflict						

Basic + SNMPv2 and Basic + NTP + SNMPv2

Table 6-6 lists the alarms and events for the following Communication module firmware versions:

- Basic + SNMPv2 (24113012-002-0)
- Basic + NTP + SNMPv2 (24113012-003-0)

This table includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column.

Table 6-6. Basic +SNMPv2 and Basic +NTP + SNMPv2 Communications Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	Communication, Fault	Unable to communicate with other modules. Re-seat modules.
001	InterCommunication, Fault	Identifies master output controller. No action necessary.
002	Power-A, Lost	Verify that the fuse for Power A is properly installed and not OPEN. Verify that Power Bus A is providing –48 VDC to the unit. If no power is connected to the Power A input and there is no plan to connect power, issue the command `AL 10-1 IG` at the prompt.
003	Power-B, Lost	■ Verify that the fuse for Power B is properly installed and not OPEN. ■ Verify that Power Bus B is providing –48 VDC to the unit. If no power is connected to the Power B input and there is no plan to connect power, enter the command `AL 10-1 IG` at the prompt.
004	SPI Watchdog, Timeout	Unable to communicate with other modules. Re-seat module.
005	Shelf #2 Comm, Lost	Unable to communicate with Expansion Shelf 2. Check cables.
006	Shelf #3 Comm, Lost	Unable to communicate with Expansion Shelf 3. Check cables.
007	Shelf #4 Comm, Lost	Unable to communicate with Expansion Shelf 4. Check cables.
008	Shelf #5 Comm, Lost	Unable to communicate with Expansion Shelf 5. Check cables.
009	Detect Mdl Removed, Fault	A module has been removed from the system or is not responding to Comms module queries. Replace the removed module with the same type, or issue the command `CONFIG xAy REMOVE` to remove the module information from the system database.
010	System Conflict	The IP addresses in the PackeTime module are conflicting. For example, the same IP address is assigned to Port-A and Port-B in a PackeTime module, or the same IP address is assigned to ports on several PackeTime modules.
105	KeepAlive, SSU2000	The Keep Alive function has been enabled/ disabled.
129	Install, Comm Module	The Comms module has been installed.
130	Remove, Comm Module	The Comms module has been removed.
131	Enable, Comm Module, COML	The Comms module has been enabled.
132	Disable, Comm Module, COML	The Comms module has been disabled.
133	Restart, in 5 seconds, COML	The Comms module has been rebooted (Warm boot).
144	Log In, JAY, COML, level: 2	User at indicated level has logged in.

Table 6-6. Basic +SNMPv2 and Basic +NTP + SNMPv2 Communications Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
145	Log Out, TIM, COML, level: 2	User at indicated level has logged out.
146	Auto Out, TIM, COML, level: 3	System automatically logging out a user.
147	Msg, <HELLO BILL>, COML	Message sent from a user.
148	Not Acknowledged, 1A01	Module configuration could not be obtained.
150	Module Status, Fault, 1A04	Module did not boot properly.
151	UTC Time, Valid	Time of startup; NTP is enabled but GPS time not being used.
152	TODSYNC, Timeout	Time of day (TOD) was requested by the Comms module, no response from the GPS module.
153	Upload Image, Start	System firmware upgrade status.
154	Upgrade, 1A02	Module's firmware upgrade has started.
155	Upgrade ACK, 1A02	Module's firmware upgrade was completed.
156	Upgrade NAK, 1A02	Module's firmware upgrade was not completed.
157	Config, 1A06, Not Support	Call Symmetricom Global Services. Return to factory.
158	NTP Mode, GPS	The SSU is configured with NTP running in an NTP Client, Broadcast, or Broadcast Client server mode; Local is displayed when NTP server is initialized. If GPS is not installed or setup, or NTP has not been configured NTP remains in Local mode and uses Comms module time.
159	Reset, Clk-B, COML	A user has reset the specified clock.
160	Clk-C Source, 1A04-01	Bypass clock source has changed.
161	Sync Clk-C, Start	Status of Sync acquire operation.
192	InitUserTable, JAY, COML	Administrator initialized user database.
193	Add User, DONNA, COML	Administrator added a user to user database
194	Mod User, CALEB, COML	User/Administrator modified user database
195	Del User, TEST1, COML	Administrator deleted user from user database
196	Pql Table, DS1, pql(5)=ST2, COML	PQL database has been modified
197	Pql Factory Dflt, COML	PQL database has been set to factory defaults
198	Unit Name, , COML	The SSU name has been changed
199	NTP Peer Add, 192.5.41.40, CLIENT, COML	An NTP client was added at the IP address shown
200	NTP Peer Del, 192.5.41.40, COML	An NTP client was deleted at the IP address shown

Table 6-6. Basic +SNMPv2 and Basic +NTP + SNMPv2 Communications Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
201	NTP Brd Timer, 64 seconds, COML	The NTP broadcast server timer has been set to the interval shown
202	SNMPv2 User, ADD, id=1, COML	An SNMP user has been added to the user table in the position shown.
203	SNMP Agent, V2, COML	The SNMP mode has been enabled.
204	SNMPv2 Manager, INIT, 192,5.41.39, COML	An SNMP Manager has been initialized at the IP address shown.
206	SNMP Trap, ALM, COML	The SNMP Trap Port has been set to send traps on alarms only.
207	Chg KeepAlive, ALL, 15 minutes, COML	The Keep Alive timer has been set to the interval shown.
208	Operating Mode, Subtending, COML	A user has changed the operating mode.
209	Notification, V3, COML	A user has changed the notification format.
210	Login Event, Enable, COML	A user has changed whether login events are stored.
211	TL1 Format, GR831, COML	A user has changed the TL1 format to the specified value.
212	SNMPv3 User, ADD, id=1, COML	An SNMP user has been added to the user table in the position shown.
213	SNMPv3 Manager, INIT<192.5.41.39, COML	An SNMP Manager has been initialized at the IP address shown.
251	Err Delay, (1), 300 sec, COML	A user has changed the alarm delay time.
252	Alm Level, (2), Rep, COML	A user has changed the alarm level.
253	Elevate Time, 3600 sec, COML	A user has changed the alarm elevation time.
254	Setup, Save, COML	A user has saved the setup to the user default.

Basic + SNMPv3 and Basic + NTP + SNMPv3

Table 6-7 lists the alarms and events for the following Communication module firmware versions:

- Basic + SNMPv3 (24113012-004-0)

- Basic + NTP + SNMPv3 (24113012-005-0)

This table includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column.

Table 6-7. Basic +SNMPv3 and Basic +NTP + SNMPv3 Communications Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	Communication, Fault	Unable to communicate with other modules. Re-seat modules.
001	InterCommunication, Fault	Identifies master output controller. No action necessary.
002	Power-A, Lost	Verify that the fuse for Power A is properly installed and not OPEN. Verify that Power Bus A is providing –48 VDC to the unit. If no power is connected to the Power A input and there is no plan to connect power, issue the command AL 10-1 IG at the prompt.
003	Power-B, Lost	■ Verify that the fuse for Power B is properly installed and not OPEN. ■ Verify that Power Bus B is providing –48 VDC to the unit. If no power is connected to the Power B input and there is no plan to connect power, enter the command AL 10-1 IG at the prompt.
004	SPI Watchdog, Timeout	Unable to communicate with other modules. Re-seat module.
005	Shelf #2 Comm, Lost	Unable to communicate with Expansion Shelf 2. Check cables.
006	Shelf #3 Comm, Lost	Unable to communicate with Expansion Shelf 3. Check cables.
007	Shelf #4 Comm, Lost	Unable to communicate with Expansion Shelf 4. Check cables.
008	Shelf #5 Comm, Lost	Unable to communicate with Expansion Shelf 5. Check cables.
009	Detect Mdl Removed, Fault	A module has been removed from the system or is not responding to Comms module queries. Replace the removed module with the same type, or issue the command CONFIG xAy REMOVE to remove the module information from the system database.
010	System Conflict	The IP addresses in the PackeTime module are conflicting. For example, the same IP address is assigned to Port-A and Port-B in a PackeTime module, or the same IP address is assigned to ports on several PackeTime modules.
105	KeepAlive, SSU2000	The Keep Alive function has been enabled/ disabled.
129	Install, Comm Module	The Comms module has been installed.
130	Remove, Comm Module	The Comms module has been removed.
131	Enable, Comm Module, COML	The Comms module has been enabled.
132	Disable, Comm Module, COML	The Comms module has been disabled.
133	Restart, in 5 seconds, COML	The Comms module has been rebooted (Warm boot).
144	Log In, DAVE, COML, level: 2	User at indicated level has logged in.
145	Log Out, TIM, COML, level: 2	User at indicated level has logged out.
146	Auto Out, TIM, COML, level: 3	System automatically logging out a user.

Table 6-7. Basic +SNMPv3 and Basic +NTP + SNMPv3 Communications Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
147	Msg, <HELLO BILL>, COML	Message sent from a user.
148	Not Acknowledged, 1A01	Module configuration could not be obtained.
150	Module Status, Fault, 1A04	Module did not boot properly.
151	UTC Time, Valid	Time of startup; NTP is enabled but GPS time not being used.
152	TODSYNC, Timeout	Time of day (TOD) was requested by the Comms module, no response from the GPS module.
153	Upload Image, Start	System firmware upgrade status.
154	Upgrade, 1A02	Module's firmware upgrade has started.
155	Upgrade ACK, 1A02	Module's firmware upgrade was completed.
156	Upgrade NAK, 1A02	Module's firmware upgrade was not completed.
157	Config, 1A06, Not Support	Call Symmetricom Global Services. Return to factory.
158	NTP Mode, GPS	The SSU is configured with NTP running in an NTP Client, Broadcast, or Broadcast Client server mode; Local is displayed when NTP server is initialized. If GPS is not installed or setup, or NTP has not been configured NTP remains in Local mode and uses Comms module time.
159	Reset, Clk-B, COML	The clock listed was reset by a user.
160	Clk-C Source, 1A04-01	Bypass clock source has changed.
161	Sync Clk-C, Start	Status of Sync acquire operation.
192	InitUserTable, JAY, COML	Administrator initialized user database.
193	Add User, DONNA, COML	Administrator added a user to user database.
194	Mod User, CALEB, COML	User/Administrator modified user database.
195	Del User, TEST1, COML	Administrator deleted user from user database.
196	Pql Table, DS1, pql(5)=ST2, COML	PQL database has been modified.
197	Pql Factory Dflt, COML	PQL database has been set to factory defaults.
198	Unit Name, , COML	The SSU name has been changed.
199	NTP Peer Add, 192.5.41. 40, CLIENT, COML	An NTP client was added at the IP address shown.
200	NTP Peer Del, 192.5.41. 40, COML	An NTP client was deleted at the IP address shown.
201	NTP Brd Timer, 64 seconds, COML	The NTP broadcast server timer has been set to the interval shown.

Table 6-7. Basic +SNMPv3 and Basic +NTP + SNMPv3 Communications Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
202	SNMPv2 User, ADD, id=1, COML	An SNMP user has been added to the user table in the position shown.
203	SNMP Agent, V2, COML	The SNMP mode has been enabled.
204	SNMPv2 Manager, INIT,192,5.41.39, COML	An SNMP Manager has been initialized at the IP address shown.
206	SNMP Trap, ALM, COML	The SNMP Trap Port has been set to send traps on alarms only by A user.
207	Chg KeepAlive, ALL, 15 minutes, COML	The Keep Alive timer has been set to the interval shown.
208	Operating Mode, Subtending, COML	A user has changed the operating mode.
209	Notification, V3, COML	A user has changed the notification format.
210	Login Event, Enable, COML	A user has changed whether login events are stored.
211	TL1 Format, GR831, COML	A user has changed the TL1 format to the specified value.
212	SNMPv3 User, ADD, id=1, COML	An SNMP user has been added to the user table in the position shown.
213	SNMPv3 Manager, INIT,192,5.41.39, COML	An SNMP Manager has been initialized at the IP address shown.
251	Err Delay, (1), 300 sec, COML	A user has changed the alarm delay time.
252	Alm Level, (2), Rep, COML	An alarm level change.
253	Elevate Time, 3600 sec, COML	A user has changed the alarm elevation time.
254	Setup, Save, COML	A user has saved the setup to the user default.

CC Input Module Alarms and Events

Table 6-8 lists the alarms and events for the Composite Clock Input module, and includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column. Table 6-9 lists the default parameters for the Composite Clock Input module alarms.

Table 6-8. Composite Clock Input Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	LOS, Active	No CC signal.
003	BPV, Active	Invalid BPV density.
006	Hdw Config, Fault	Input module can be installed only in the Main shelf. If module is installed in slot previously used by a different module type, use the CONF xAy REMOVE command. Call Symmetricom Global Services.
007	Phase Hdw, Fault	One of the clock PLLs is not locked.
008	Phase 3Sigma, Fault	Check incoming signal quality. The phase measurements are invalid or missing.
009	Phase Polarity, Event	The input signal is unstable.
129	Install, CC Input Module	The Input module has been installed.
130	Remove, CC Input Module	The Input module has been removed.
131	Enable, CC Input Module, COML	The Input module has been enabled.
132	Disable, CC Input Module, COML	The Input module has been disabled.
133	Restart, in 5 seconds, COML	Module re-boot.
134	Cannot Enable, CC Input Module, COML	Internal firmware conflict. Restart module; if the problem persists, call Symmetricom Global Services.
144	Zero Phase, B, COML	A user has forced the phase to be cleared.
146	OutofWindow, Positive BPV	Positive BPV reversed.
147	Sync Clk-C, Start	Start syncing clock C to selected clock.
148	Operating Mode, Subtending	Subtending mode is enabled.
199	Port, Disable, COML	A user has Enabled	Disabled input port.
201	Priority, 5, COML	A user has changed input priority level.
203	Prov PQL, 5, COML	A user has changed input provisioned PQL.
207	Err Cnt, BPV, 16, COML	Signal Alarm Error Count (LOS, AIS, OOF, BPV, or CRC).

Table 6-8. Composite Clock Input Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
208	Clr Cnt, OOF, 5, COML	Current Signal Alarm Clear Count (LOS, AIS, OOF, BPV, or CRC).
224	IoName, Set	A user has set the IO Name.
251	Err Delay, (0), 10 sec, COML	An alarm delay time change.
252	Alm Level, (2), Maj, COML	An alarm level change.
253	Elevate Time 86400 sec, COML	An alarm elevation time change.
254	Setup, Save, COML	User defaults have been set and saved.

Table 6-9. Composite Clock Input Module Alarm Defaults

ID	Description	Alarm Level
000	LOS	Major
003	BPV	Major
005	Hdw Config	Major
006	Clock PLL	Major
007	Phase Hdw	Major
008	Phase 3Sigma	Minor
009	Phase Polarity	Major

DS1/E1 Input Module Alarms and Events

Table 6-10 lists the alarms and events for DS1/E1 Input modules (1 port and 3 port), and includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column. Table 6-11 lists the default parameters for the DS1/E1 Input module alarms.

Table 6-10. DS1/E1 Input Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	LOS, Active	Verify signal is connected. To extinguish, disable port.
001	AIS, Active	Verify input signal is good. Port can be disabled.
002	OOF, Active	Change frame type: ■ DS1–ESF or D4 ■ E1–CAS or CCS
003	BPV, Active	Verify port ZS is on. Verify signal is good.
004	CRC, Active	Verify port CRC is off. Verify signal is good.
005	MTIE/L1, Exceeded	MTIE limit 1 has been exceeded.
006	MTIE/L2, Exceeded	MTIE limit 2 has been exceeded.
007	PQL, Below Prov	Received SSM (PQL) is below provisioned PQL.
008	SSM, Lost	Set port SSM to Off to clear.
009	Ref Qualifier, Fault	Re-seat module, or correct the input signal to clear the fault.
010	Clock PLL, Unlocked	Re-seat module.
011	Input PLL, Unlocked	Verify input frequency setting. Re-seat module.
012	Phase Hdw, Fault	Re-seat module.
013	FREQ, Exceeded	Input frequency greater than threshold. Monitor frequency; if persistent, check source.
014	Hdw Config, Fault	Input module can be installed only in the Main shelf. If module is installed in slot previously used by a different module type, use the CONF xAy REMOVE command. Call Symmetricom Global Services.
129	Install, DS1/3P Input Module	The Input module has been installed.
130	Remove, DS1/3P Input Module	The Input module has been removed.
131	Enable, Input Module, COML	The Input module has been enabled.
132	Disable, Input Module, COML	The Input module has been disabled.
133	Restart, in 5 seconds, COML	Module re-boot.

Table 6-10. DS1/E1 Input Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
134	Cannot Enable, Input Module, COML	Internal firmware conflict. Restart module; if the problem persists, call Symmetricom Global Services.
144	Zero Phase, B, COML	User has forced the phase to be cleared.
145	Rcv Pql Chg, 3, old=4	Input has received a different PQL.
146	Phase Buildout, 334000, 335000, Clk-B	Input performed phase buildout and difference in Phase that cause PBO.
193	DS1 Framer, ESF, COML	An Input framer setup change.
194	E1 Framer, CCS, COML	An Input setup change.
195	Freq, 10 MHz, COML	User changed input framer setup.
196	ZS, On, COML	User changed input framer setup.
197	SSM, Off, COML	User changed input SSM capability.
198	CRC, On, COML	User changed CRC setup.
199	Port, Disable, COML	User Enabled	Disabled input port.
200	SSM, Auto, COML	User changed SSM setup.
201	Priority, 5, COML	User changed input priority level.
202	SSM Bit, 4, COML	User changed SSM Bit location (E1 only).
203	Prov PQL, 5, COML	User changed input provisioned PQL.
204	MTIE Err Limit, T100, L1, 550, COML	User changed input MTIE limits (L1 | L2).
205	Gain, On, COML	User changed the input gain control.
206	CSFlt, Off, COML	User changed input Cesium Fault control.
207	Err Cnt, BPV, 16, COML	Signal Alarm Error Count (LOS, AIS, OOF, BPV, or CRC).
208	Clr Cnt, OOF, 5, COML	Current Signal Alarm Clear Count (LOS, AIS, OOF, BPV, or CRC).
209	Freq Err Limit, Clk-A, 100, COML	The frequency error limit settings have been changed.
210	Freq Clr Limit, Clk-A, 800, COML	The frequency clear limit settings have been changed.
211	MTIE Clr Limit, T100, L1, 500, COML	The MTIE error limit settings have been changed.
212	MTIE Limit, DS1, COML, Setting	The MTIE clear limit settings have been changed.
213	PBO, Report, COML	Phase Build-out system response has been changed to the indicated setting.
214	Freq Tau, Clk-A, 400, COML	The frequency TAU limits have been set.

Table 6-10. DS1/E1 Input Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
224	IoName, Set	A user has set the IO Name.
251	Err Delay, (0), 10 sec, COML	An alarm delay time change.
252	Alm Level, (2), Maj, COML	An alarm level change.
253	Elevate Time 86400 sec, COML	An alarm elevation time change.
254	Setup, Save, COML	User defaults have been set and saved.

Table 6-11. DS1/E1 Input Module Alarm Defaults

ID	Description	Alarm Level
000	LOS	Major
001	AIS	Major
002	OOF	Minor
003	BPV	Minor
004	CRC	Minor
005	MTIE/L1	Minor
006	MTIE/L2	Major
007	PQL	Minor
008	SSM	Major
009	Ref Qualifier	Minor
010	Clk PLL	Major
011	Inp PLL	Major
012	Phase Hdw	Major
013	FREQ	Minor
014	Hdw Config	Major

GPS Input Module Alarms and Events

Table 6-12 lists the alarms and events for the GPS Input module, and includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column. Table 6-13 lists the default parameters for the GPS Input module alarms.

Table 6-12. GPS Input Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	Hdw Config, Fault	Input module can be installed only in the Main shelf. If module is installed in slot previously used by a different module type, use the CONF xAy REMOVE command. Call Symmetricom Global Services (SGS).
001	Tracking, Not Tracking	No visible satellites seen at startup.
002	Antna Conntd, Not Connected	Verify that: ■ The antenna is connected ■ The cable and connectors are not damaged ■ The antenna is correctly placed
003	Antna Shorted, Shorted	Ring out the cable to ensure that the center conductor is not shorted to the sleeve, then verify that: ■ The antenna cable is connected properly ■ The cable and connectors are not damaged
004	Engine Hdw, Fault	Reseat module. If problem persists, call SGS.
005	Engine System, Fault	If alarm doesn't clear after 30 minutes, call SGS.
006	Position, Unknown	If alarm doesn't clear after 1 hour, call SGS.
007	Clock PLL, Unlocked	Ensure that the GPS priority level is set to 1. Reseat module. If problem persists, call SGS.
008	Item Number, Unknown	Call SGS. Return to factory.
009	GPS Qualifier, Fault	Reseat module. If problem persists, call SGS.
010	Phase Hdw, Fault	Reseat module. If problem persists, call Symmetricom Global Services.
011	MTIE/L1, Fault	Check inputs. If inputs are OK, call SGS.
012	MTIE/L2, Fault	Check inputs. If inputs are OK, call SGS.
013	FREQ, Fault	Check inputs. If inputs are OK, call SGS.
129	Install, GPS Module	The Input module has been installed.
130	Remove, GPS Module	The Input module has been removed.
131	Enable, GPS Module, COML	The Input module has been enabled.

Table 6-12. GPS Input Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
132	Disable, GPS Module, COML	The Input module has been disabled.
133	Restart, in 5 seconds, COML	Module re-boot.
134	Cannot Enable, GPS Module, COML	Internal firmware conflict. Restart module; if the problem persists, call SGS.
144	Zero Phase, B, COML	User has forced the phase to be cleared.
193	Priority, 3, COML	User has changed the Priority level on the GPS input module to the level shown.
194	Prov PQL, 2, COML	User has changed the Priority quality level to the level shown.
195	ElMask, POS 10, COML	User has changed the elevation mask on the input module to the level shown.
197	Satellite Ignore, 3, COML	User has set the GPS engine to ignore the satellite number indicated.
198	Position, 300 AvgCnt, COML	The position has been calculated.
199	Tracking Mode, On, COML	User specified GPS positioning mode has been set.
200	Pos Set by Rec, Information Locked, COML	User specified GPS positioning mode has been set to Calc and the position has been recalculated and locked in.
201	Engine Set Time, GPS	System time has been set to UTC by the GPS module.
203	PDOP, 2, COML	User has changed the PDOP on the GPS input module to the setting shown.
224	IoName, Set	A user has set the IO Name.
251	Err Delay, (0), 10 sec, COML	An alarm delay time change.
252	Alm Level, (2), Maj, COML	An alarm level change.
253	Elevate Time 86400 sec, COML	An alarm elevation time change.
254	Setup, Save, COML	User defaults have been set and saved.

Table 6-13. GPS Input Module Alarm Defaults

ID	Description	Alarm Level
000	Hdw Config	Major
001	Tracking	Major
002	Antna Conntd	Major
003	Antna Shorted	Major

Table 6-13. GPS Input Module Alarm Defaults (Continued)

ID	Description	Alarm Level
004	Engine Hdw	Major
005	Engine System	Minor
006	Position	Minor
007	Clk PLL	Major
008	Item Number	Major
009	GPS Qualifier	Report
010	Phase Hdw	Major
011	MTIE/L1	Minor
012	MTIE/L2	Major
013	Freq	Minor

2048 kHz Output Module Alarms and Events

Table 6-14 lists the alarms and events for the 2048 kHz Output module, and includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column. Table 6-15 lists the default parameters for the 2048 kHz Output module alarms.

Table 6-14. 2048 kHz Output Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	Alarm Deprecated, Fault	Alarm not enabled
001	Module Match, Invalid	A redundant pair has one DS1 module and one E1 module. Replace module.
002	Clk-A, Lost	Clock module in slot A1 is in warm-up mode or has other problems.
003	Clk-B, Lost	Clock module in slot A12 is in warm-up mode or has other problems.
004	Clk-C, Lost	Reference signal is in LOS and both clocks have been removed or are in warm-up.
005	Clk-D, Lost	Only in SDU. Loss of backup clock. Check cable.
006	Clk Level, Below	Clock A or B is below output module setting.
007	Clk Selected, None	No clocks, no output.
008	VCXO, Lost	VCXO problems, re-seat or replace module.
009	PLL, Unlocked	No clocks or VCXO. Re-seat and check clocks.
010	Configuration, Fault	Redundant configuration mismatch. Re-seat or replace module.
011	IntPortFlt, Active, 40000	Driver chip indicated a port fault on port 2 (4000 Hex).
013	Hdw Config, Fault	If module is installed in slot previously used by a different module type, use the CONF xAy REMOVE command. If problem persists, call Symmetricom Global Services.
014	Squelch, Below Prov	Input signal PQL is below user-defined threshold.
129	Install, 2048 Output Module	Module Installed
130	Remove, 2048 Output Module	Module Removed
131	Enable, 2048 Output Module, COML	Module Enabled
132	Disable, 2048 Output Module, COML	Module Disabled
133	Restart, in 5 seconds, COML	User request for a module to reboot

Table 6-14. 2048 kHz Output Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
202	Min Clk Level, ACQ, COML	User has changed Minimum Clock Level to turn on outputs
203	Bypass, ON, COML	User has changed Bypass mode of operation
204	Squelch, Port[0-5], 0, COML	User has changed squelch PQL level.
206	FltMode, ON, COML	User has changed fault recovery strategy.
224	IoName, Set	User has changed the port name.
252	Alm Level, (1), Min, COML	User has changed time to elevate alarm level.
253	Elevate Time, 86400 sec, COML	An alarm elevation time change.
254	Setup, User Default, COML	User has reset setup to user-defined default values.

Table 6-15. 2048 kHz Output Module Alarm Defaults

ID	Description	Alarm Level
000	Alarm Deprecated	Major
001	Module Match	Major
002	Clk-A	Major
003	Clk-B	Major
004	Clk-C	Major
005	Clk-D	Major
006	Clk Level	Major
007	Clk Selected	Major
008	VCXO	Major
009	PLL	Major
010	Configuration	Major
011	IntPortFlt	Major
013	Hdw Config	Major
014	Squelch	Major

CC Output Module Alarms and Events

Table 6-16 lists the alarms and events for the Composite Clock Output module, and includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column. Table 6-17 lists the default parameters for the Composite Clock Output module alarms.

Table 6-16. CC Output Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	Alarm Deprecated, Fault	Alarm not enabled
001	Module Match, Invalid	Redundant configuration mismatch. Re-seat or replace module.
002	Clk-A, Lost	Clock module in slot A1 is in warm-up mode or has other problems.
003	Clk-B, Lost	Clock module in slot A12 is in warm-up mode or has other problems.
004	Clk-C, Lost	Reference signal is in LOS and both clocks have been removed or are in warm-up.
005	Clk-D, Lost	Only in SDU. Loss of backup clock. Check cable.
006	Clk Level, Below	Clock A or B is below output module setting.
007	Clk Selected, None	No clocks, no output.
008	VCXO, Lost	VCXO problems, re-seat or replace module.
009	PLL, Unlocked	No clocks or VCXO. Re-seat and check clocks.
010	Configuration, Fault	Redundant configuration mismatch. Re-seat or replace module.
011	IntPortFlt, Active, 40000	Driver chip indicated a port fault on port 2 (4000 Hex).
012	ExtPortFlt, Active, 40000	Indication of external port fault on ports 2 and 4 (A000 Hex).
013	Hdw Config, Fault	If module is installed in slot previously used by a different module type, use the CONF xAy REMOVE command. If problem persists, call Symmetricom Global Services.
129	Install, CC Output Module	Module Installed.
130	Remove, CC Output Module	Module Removed.
131	Enable, CC Output Module, COML	Module Enabled.
132	Disable, CC Output Module, COML	Module Disabled.
133	Restart, in 5 seconds, COML	User request for a module to reboot.

Table 6-16. CC Output Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
134	Cannot Enable, CC Output Module, COML	Cannot enable module due to configuration error.
202	Min Clk Level, ACQ, COML	User has changed Minimum Clock Level to turn on outputs.
203	Bypass, ON, COML	User has changed Bypass mode of operation
204	Squelch, Port[0-5], 0, COML	User has changed squelch PQL level.
205	Delay, Port{1-4}, 1375ft, COML	CC signal phase offset settings have been changed for the port shown.
224	IoName, Set	User has changed the port name.
252	Alm Level, (1), Min, COML	User has changed time to elevate alarm level.
253	Elevate Time, 86400 sec, COML	An alarm elevation time change.
254	Setup, User Default, COML	User has reset setup to user-defined default values.

Table 6-17. CC Output Module Alarm Defaults

ID	Description	Alarm Level
000	Alarm Deprecated	Major
001	Module Match	Major
002	Clk-A	Major
003	Clk-B	Major
004	Clk-C	Major
005	Clk-D	Major
006	Clk Level	Major
007	Clk Selected	Major
008	VCXO	Major
009	PLL	Major
010	Configuration	Major
011	IntPortFlt	Major
013	Hdw Config	Major
014	Squelch	Major

DS1 Output Module Alarms and Events

Table 6-18 lists the alarms and events for the DS1 Output module, and includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column. Table 6-19 lists the default parameters for the DS1 Output module alarms.

Table 6-18. DS1 Output Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	Redundant, Fault	Output alignment problem. Disable module, then re-enable.
001	Module Match, Invalid	A redundant pair has one DS1 module and one E1 module. Replace module.
002	Clk-A, Lost	Module in slot A1 is in warm-up mode or has other problems.
003	Clk-B, Lost	Module in slot A12 is in warm-up mode or has other problems.
004	Clk-C, Lost	Reference signal is in LOS and both clocks have been removed or are in warm-up.
005	Clk Level, Below	Clock A or B is below output module setting.
006	Clk Selected, None	No clocks, no output.
007	PortFlt, Active, 40000	Indicates which output port is in fault (typically shorted). Repair short and re-enable port.
008	VCXO, Lost	VCXO problems, re-seat or replace module.
009	PLL, Unlocked	No clocks or VCXO. Re-seat and check clocks.
010	Configuration, Fault	Redundant configuration mismatch. Re-seat or replace module.
011	Hdw Config, Fault	If module is installed in slot previously used by a different module type, use the CONF xAy REMOVE command. If problem persists, call Symmetricom Global Services.
012	Clk-D, Lost	Only in SDU. Loss of backup clock. Check cable.
129	Install, DS1 Output Module	Module Installed.
130	Remove, DS1 Output Module	Module Removed.
131	Enable, DS1 Output Module, COML	Module Enabled.
132	Disable, DS1 Output Module, COML	Module Disabled.
133	Restart, in 5 seconds, COML	User request for a module to reboot.
144	Cannot Enable, Output Module, COML	Cannot enable module due to configuration error.
193	Frame Mode, ESF, COML	Output framing type change.

Table 6-18. DS1 Output Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
194	ZS, On, COML	User changed output framing type.
195	DS1 LEN, Port[0-5], len=133ft, COML	User changed output line length.
199	CRC, On, COML	User has changed output framing type.
201	SSM Bit, 8, COML	User has changed output SSM bit position (E1 only).
202	Min Clk Level, ACQ, COML	User has changed Minimum Clock Level to turn on outputs.
203	Bypass, ON, COML	User has changed Bypass mode of operation
204	Squelch, Port[0-5], 0, COML	User has changed squelch PQL level.
205	Delay, Port{1-4}, 1375ft, COML	CC signal phase offset settings have been changed for the port shown.
224	IoName, Set	User has changed the port name.
252	Alm Level, (1), Min, COML	User has changed time to elevate alarm level.
253	Elevate Time, 86400 sec, COML	An alarm elevation time change.
254	Setup, User Default, COML	User has reset setup to user-defined default values.

Table 6-19. DS1 Output Module Alarm Defaults

ID	Description	Alarm Level
000	Redundant	Major
001	Module Match	Major
002	Clk-A	Major
003	Clk-B	Major
004	Clk-C	Major
005	Clk Level	Major
006	Clk Selected	Major
007	PortFlt	Major
008	VCXO	Major
009	PLL	Major
010	Configuration	Major
011	Hdw Config	Major
012	Clk-D	Major

E1/2048 kHz Output Module Alarms and Events

Table 6-20 lists the alarms and events for the E1/2048 kHz Output module, and includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column. Table 6-21 lists the default parameters for the E1/2048 kHz Output module alarms.

Table 6-20. E1/2048 kHz Output Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	Hdw Config, Fault	If module is installed in slot previously used by a different module type, use the CONF xAy REMOVE command. If problem persists, call Symmetricom Global Services.
001	Configuration, Fault	Redundant configuration mismatch. Re-seat or replace module.
002	Clk-A, Lost	Clock module in slot A1 is in warm-up mode or has other problems.
003	Clk-B, Lost	Clock module in slot A12 is in warm-up mode or has other problems.
004	Clk-C, Lost	Reference signal is in LOS and both clocks have been removed or are in warm-up.
005	Clk-D, Lost	Only in SDU. Loss of backup clock. Check cable.
006	Clk Selected, None	No clocks, no output.
007	VCXO, Lost	VCXO problems, re-seat or replace module.
008	PLL, Unlocked	No clocks or VCXO. Re-seat and check clocks.
009	Sync, Fault	Failed to sync with master module in redundant pair.
010	Squelch, Below Prov, 40000	PQL below provisioned level.
011	PortFlt, Active, 40000	Indicates which output port is in fault (typically shorted). Repair short and re-enable port.
129	Install, E1/2048 Output Module	Module Installed.
130	Remove, E1/2048 Output Module	Module Removed.
131	Enable, E1/2048 Output Module, COML	Module Enabled.
132	Disable, E1/2048 Output Module, COML	Module Disabled.
133	Restart in 5 seconds, COML	User request for a module to reboot.
134	Cannot Enable, E1/2048 Output Module, COML	Cannot enable module due to configuration error.

Table 6-20. E1/2048 kHz Output Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
193	Signal, Port[1-20], E1, COML	Output framing type change.
194	Port Cntl, Port[1-20], Enable, COML	User has enabled | disabled specified port.
195	ZS, On, COML	User has changed Zero Suppression mode.
196	Bypass, On, COML	User has changed Bypass mode.
197	Squelch, Port[5-10], 6, COML	User has changed squelch PQL level.
198	Multiframe, CCS, COML	User has changed multiframe setting.
199	CRC, On, COML	User has changed CRC setup.
200	SSM, Auto, COML	User has changed SSM setting.
201	SSM Bit, 4, COML	User has changed SSM bit position.
224	IoName, Set	User has changed the port name.
252	Alm Level, (1), Min, COML	User has changed time to elevate alarm level.
253	Elevate Time, 86400 sec, COML	An alarm elevation time change.
254	Setup, User Default, COML	User has reset setup to user-defined default values.

Table 6-21. E1/2048 kHz Output Module Alarm Defaults

ID	Description	Alarm Level
000	Hdw Config	Major
001	Configuration	Major
002	Clk-A	Major
003	Clk-B	Major
004	Clk-C	Major
005	Clk-D	Major
006	Clk Selected,	Major
007	VCXO	Major
008	PLL	Major
009	Sync	Major
010	Squelch	Major
011	PortFlt	Major

RS-422 Output Module Alarms and Events

Table 6-22 lists the alarms and events for the RS-422 Output module, and includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column. Table 6-23 lists the default parameters for the RS-422 Output module alarms.

Table 6-22. RS-422 Output Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	Hdw Config, Fault	If module is installed in slot previously used by a different module type, use the CONF xAy REMOVE command. If problem persists, call Symmetricom Global Services.
001	Configuration, Fault	Redundant configuration mismatch. Re-seat or replace module.
002	Clk-A, Lost	Clock module in slot A1 is in warm-up mode or has other problems.
003	Clk-B, Lost	Clock module in slot A12 is in warm-up mode or has other problems.
004	Clk-C, Lost	Reference signal is in LOS and both clocks have been removed or are in warm-up.
005	Clk-D, Lost	Only in SDU. Loss of backup clock. Check cable.
006	Clk Selected, None	No clocks, no output.
007	VCXO, Lost	VCXO problems, re-seat or replace module.
008	PLL, Unlocked	No clocks or VCXO. Re-seat and check clocks.
009	PortFlt, Fault, 40000	Indicates which output port is in fault (typically shorted). Repair short and re-enable port.
129	Install, RS422 Output Module	Module Installed.
130	Remove, RS422 Output Module	Module Removed.
131	Enable, RS422 Output Module, COML	Module Enabled.
132	Disable, RS422 Output Module, COML	Module Disabled.
133	Restart, in 5 seconds, COML	User request for a module to reboot.
134	Cannot Enable, RS422 Output Module, COML	Cannot enable module due to configuration error.
203	Bypass, On, COML	User has changed the Bypass mode.

Table 6-22. RS-422 Output Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
205	Frequency, Port[1-4], 16kHz, COML	User has changed the port output frequency.
206	FltMode, On, COML	User has changed the Fault mode.
224	IoName, Set	User has changed the port name.
252	Alm Level, (0), Maj, COML	User has changed the level of specified alarm.
253	Elevate Time, 86400 sec, COML	User has changed the alarm elevation time.
254	Setup, User Default, COML	User has changed setup to user-defined values.

Table 6-23. RS-422 Output Module Alarm Defaults

ID	Description	Alarm Level
000	Hdw Config	Major
001	Configuration	Major
002	Clk-A	Major
003	Clk-B	Major
004	Clk-C	Major
005	Clk-D	Major
006	Clk Selected	Major
007	VCXO	Major
008	PLL	Major
009	PortFlt	Major

PackeTime Module Alarms and Events

Table 6-12 lists the alarms and events for the PackeTime module, and includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. .

Table 6-24. PackeTime Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	CLK-A, Fault	Loss of Clock (source) A
001	CLK-B, Fault	Loss of Clock (source) B
002	CLK-C, Fault	Loss of Clock (source) C
003	CLK-D, Fault	Loss of Clock (source) D
004	Clk Selected, Fault	Clock source has been selected as reference
005	TOD Traceable, Fault	Time of Day is traceable to UTC
006	Link PA, Fault	Loss of link (connectivity) on Port A
007	Link PB, Fault	Loss of connectivity on Port B
008	Link PM, Fault	Loss of connectivity on Port M(aintenance)
009	FPGA, Fault	Loss of communication to FPGA
010	PLL, Fault	25 MHz PLL has unlocked
011	Redundant, Fault	Loss of communication with redundant module
012	Peer Time, Fault	Peer Mode only; Time error >1 second between module and Peer
013	Excess Traffic	Traffic load in excess of 2500 requests per second
129	Install, PackeTime	The module has been installed.
130	Remove, PackeTime	The module has been removed.
131	Enable, PackeTime	The module has been enabled.
132	Disable, PackeTime	The module has been disabled.
133	Restart, PackeTime	Module re-boot.
134	Cannot Enable, PackeTime	Internal firmware conflict. Restart module; if the problem persists, call SGS.
144	UTC Time, Set	Module's TOD has been set to UTC
145	Download, Successful	
146	TOD Set, by GPS	
147	TOD Set, by NTP	

Table 6-24. PackeTime Module Alarm and Event Messages (Continued)

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
148[1]	Leap Sec, Pending	NTP will apply a leap second at midnight June 31 or December 31
149[1]	Leap Sec, Inserted	NTP has applied a leap second at midnight June 31 or December 31
150[1]	Bonding, PA Active, COML	Service ports have been configured in Bonded mode of operation
151	Slot, Active, COML	PackeTime module in specified slot is the Active module in a redundant NTP pair
152	Req Reboot, This Module	
153[1]	Ports Network Setup, Requires Bonding	Provisioning two PackeTime modules to operate in redundant mode requires Bonding to be enabled
193	Image, 0, COML	Indicates that the firmware image 1 | 0 that is active
194	EthPort, ETH1, changed, COML	Ethernet port configuration change
195	TODSRC Prefer, TODSRC, COML	The Preferred Time of Day can be TODSRC or PEER
196	TODSRC Priority, 2, COML	TODSRC Priority set for this Module
197[1]	Broadcast, DEL, 1, COML	NTP Mode of operation
198	Peer, ADD, 1, COML	NTP peer added
199	Prefer, Peer, 1, COML	NTP Peer added as preferred peer
200	Auth, 1, 2000	NTP Authentication key defined
201	PortAWeight, -1, COML	Load balancing configuration defined between NTP Port A and B
202	Committed, Set	Configuration stored in non-volatile memory
203	NTPd Service, Disable, COML	NTP Daemon has been disabled
204[1]	Bond State, Enable, COML	Port bonding enabled
205[1]	Bond Mode, ACTSTBY, COML	Module is in Active Standby
251	Err Delay, (1), 300 sec, COML	Modified error delay
252	Alm Level, (2), Maj, COML	Modified alarm level
253	Elevate Time, 7200 sec, COML	Modified alarm elevation time
254	Setup, User Default, COML	Changed the user-saved module configuration

Note:

[1]Available in a future release.

Table 6-25 lists the alarm and event autonomous messages generated by the PackeTime module to report conditions. The Alarm category of autonomous messages reported by the Retrieve-Event-Alarm command are associated with conditions that have been identified as alarms ("CR", "MJ", "MN" and "CL"). All alarms are written into the event log. The severity of each alarm is fixed and cannot be provisioned to a different severity level.

Table 6-25. PackeTime Alarms

Alarm ID	Description of Alarm Condition	Alarm Delay	Default Alarm Severity
000 – 001	Loss of Clock source A, B	Immediate	Minor
002 – 003	Loss of Clock source C, D	20 s	Minor
004	Clock module selected	Immediate	Major
005	TOD no longer traceable to UTC	Immediate	Minor
006 – 007	NTP Service port A, B failure	10 s	Report
008	NTP Maintenance port failure	5 s	Minor
009	PackeTime module FPGA program error	Immediate	Major
010	PackeTime module PLL unlock	Immediate	Major
011	Loss of communication with redundant NTP port	Immediate	Report
012	Peer time	Immediate	Minor
013	Excess traffic on service port	Immediate	Minor

Buffer Module Alarms and Events

Table 6-26 lists the alarms and events for the RS422 Output module, and includes the typical response for each alarm or event, it's event number, and a description or a suggested corrective action. The SNMP MIB trap is listed in the Alarm/Event/Trap Description column.

Table 6-26. Buffer Module Alarm and Event Messages

Alarm/ Event/ Trap ID	Typical Alarm/Event/Trap Response	Description/ Corrective Action
000	Pwr-A, Lost	■ Verify that the fuse for Power A is properly installed and not OPEN. ■ Verify that Power Bus A is providing –48 VDC to the unit. If no power is connected to the Power A input and there is no plan to connect power, issue the command AL 10-1 IG at the prompt.
001	Pwr-B, Lost	■ Verify that the fuse for Power B is properly installed and not OPEN. ■ Verify that Power Bus B is providing –48 VDC to the unit. If no power is connected to the Power B input and there is no plan to connect power, enter the command AL 10-1 IG at the prompt.
129	Install, Buffer Module	Module Installed.
130	Remove, Buffer Module	Module Removed.
251	Err Delay, (0), 300 sec, COML	User has changed the error delay time.
252	Alm Level, (0), Maj, COML	User has changed the level of specified alarm.
253	Elevate Time, 86400 sec, COML	User has changed the alarm elevation time.

Chapter 7 Connector Pinouts

This chapter describes the pinouts for each of the connectors on the SSU-2000e chassis.

In This Chapter

- Signal Names and Definitions
- Shelf Module Slot Addressing and Size Assignments
- I/O Connector Grounding

Signal Names and Definitions

All the connectors in the following sections are located on the top of the front panel of the SSU-2000e, as shown in Figure 7-1.
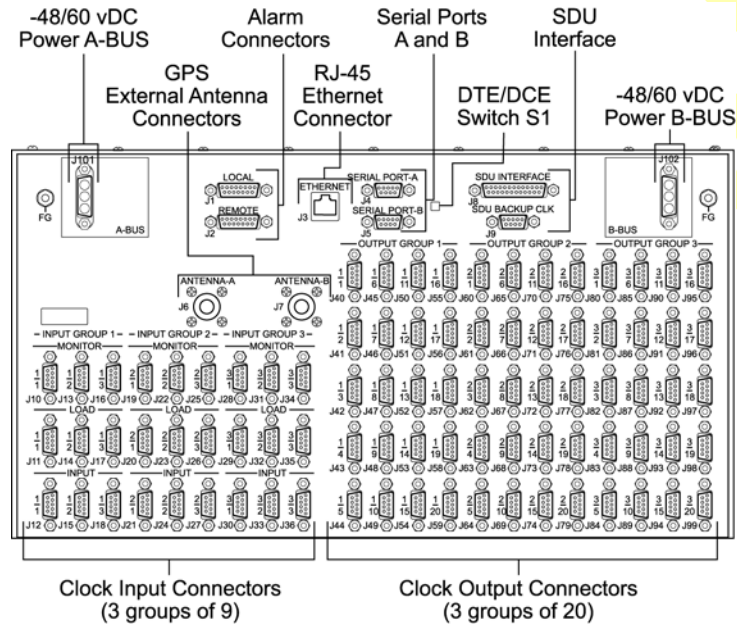
Figure 7-1.   SSU-2000e Connection Panel

Power and Ground

Figure 7-2 shows the power and ground connections for the SSU-2000e chassis.
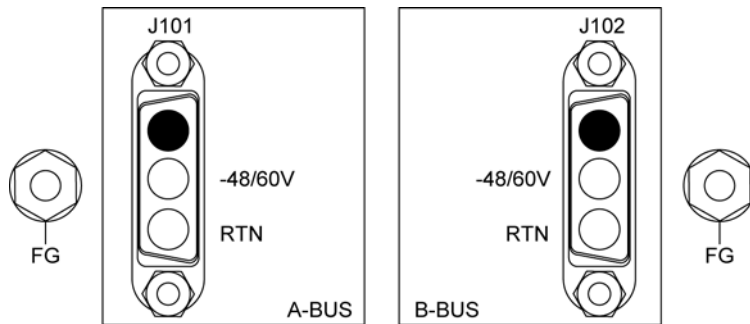
Figure 7-2.   Power and Ground Connection Pinouts

Communication Interfaces

Figure 7-3 shows the communications interfaces on the rear panel of the SSU-2000e. Table 7-1 describes the signal names, definitions, and pinouts of Communications connectors.
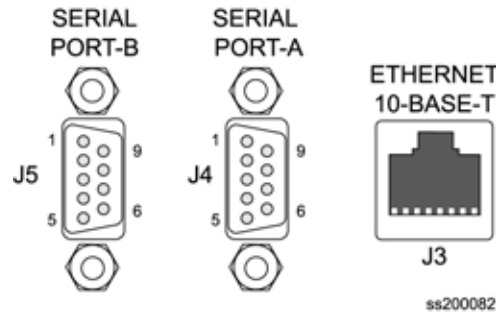
Figure 7-3.   Communications Interface Pinout

Table 7-1. Pinouts of Communications Interfaces

Name	Description	Connector–Pin
DCD-A	Serial Port A, Data Carrier Detect Control Line	J4-1
DSR-A	Serial Port A, Data Set Ready Control Line	J4-6
RXD-A	Serial Port A, Received Data	J4-2
RTS-A	Serial Port A, Request to Send Control Line	J4-7
TXD-A	Serial Port A, Transmitted Data	J4-3
CTS-A	Serial Port A, Clear to Send Control Line	J4-8
DTR-A	Serial Port A, Data Terminal Ready Control Line	J4-4
RI-A	Serial Port A, Ring Indicator Control Line	J4-9
RTN-A	Serial Port A, Signal Return	J4-5
DCD-B	Serial Port B, Data Carrier Detect Control Line	J5-1
DSR-B	Serial Port B, Data Set Ready Control Line	J5-6
RXD-B	Serial Port B, Received Data	J5-2
RTS-B	Serial Port B, Request to Send Control Line	J5-7
TXD-B	Serial Port B, Transmitted Data	J5-3
CTS-B	Serial Port B, Clear to Send Control Line	J5-8
DTR-B	Serial Port B, Data Terminal Ready Control Line	J5-4
RI-B	Serial Port B, Ring Indicator Control Line	J5-9

Table 7-1. Pinouts of Communications Interfaces (Continued)

Name	Description	Connector–Pin
RTN-B	Serial Port B, Signal Return	J5-5
TX+	Ethernet 10-Base-T, Positive Side of Transmitted Data	J3-1
TX-	Ethernet 10-Base-T, Negative Side of Transmitted Data	J3-2
RX+	Ethernet 10-Base-T, Positive Side of Received Data	J3-3
RX-	Ethernet 10-Base-T, Negative Side of Received Data	J3-6

Local OSC and Antennas

Figure 7-4 illustrates the location of the oscillator and antenna connectors. Table 7-2 describes the pinouts of local Oscillators and antenna connectors.
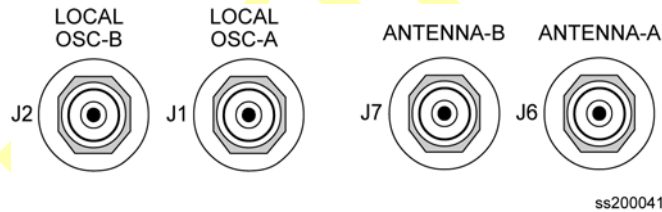
Figure 7-4.   Local Oscillator and Antenna Connectors

Table 7-2. Signal Names and Locations of Local OSC and Antennas

Name	Description	Connector–Pin
LO-A+	Local Oscillator A, Positive Side of Signal	J1-A (Ctr)
LO-A-	Local Oscillator A, Negative Side of Signal	J1-B (Shld)
LO-B+	Local Oscillator B, Positive Side of Signal	J2-A (Ctr)
LO-B-	Local Oscillator B, Negative Side of Signal	J2-B (Shld)
ANT-A	Antenna A, Center Conductor (Received Signal & Ant. Power)	J6-A (Ctr)
ANT-A-RTN	Antenna A, Return	J6-B (Shld)
ANT-B	Antenna B, Center Conductor (Received Signal & Ant. Power)	J7-A (Ctr)
ANT-B-RTN	Antenna A, Return	J7-B (Shld)

Alarm Contact Closures

Figure 7-5 illustrates the alarm closure connectors on the rear panel of the SSU-2000e chassis. Table 7-3 outlines signal names, definitions, and locations of alarm contact closures.
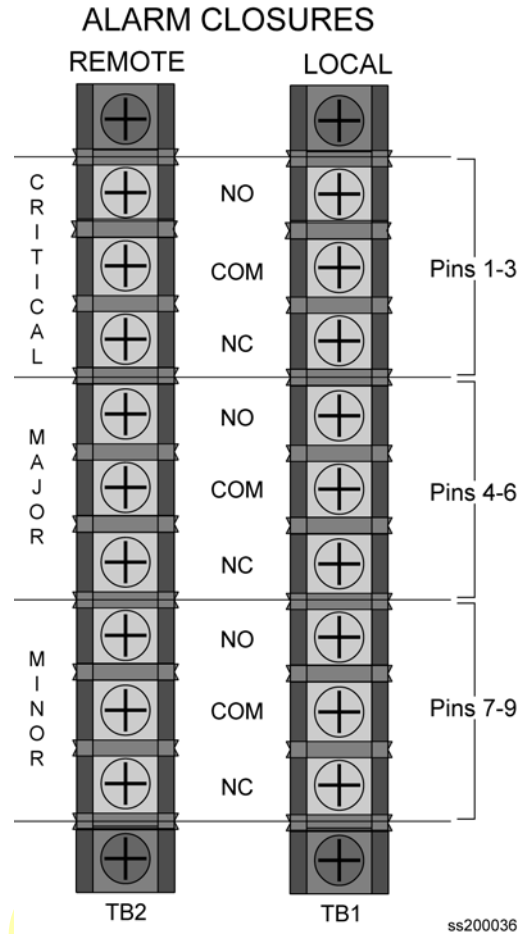
Figure 7-5.   Alarm Connector Pinout

Table 7-3. Signal Names and Locations of Alarms

Name	Description	Connector–Pin
LCRT-NO	Local Critical Alarm, Normally Open Contact	TB1-1
LCRT-COM	Local Critical Alarm, Common Contact	TB1-2
LCRT-NC	Local Critical Alarm, Normally Closed Contact	TB1-3
LMAJ-NO	Local Major Alarm, Normally Open Contact	TB1-4
LMAJ-COM	Local Major Alarm, Common Contact	TB1-5
LMAJ-NC	Local Major Alarm, Normally Closed Contact	TB1-6
LMIN-NO	Local Minor Alarm, Normally Open Contact	TB1-7
LMIN-COM	Local Minor Alarm, Common Contact	TB1-8
LMIN-NC	Local Minor Alarm, Normally Closed Contact	TB1-9
RCRT-NO	Remote Critical Alarm, Normally Open Contact	TB2-1

Table 7-3. Signal Names and Locations of Alarms (Continued)

Name	Description	Connector–Pin
RCRT-COM	Remote Critical Alarm, Common Contact	TB2-2
RCRT-NC	Remote Critical Alarm, Normally Closed Contact	TB2-3
RMAJ-NO	Remote Major Alarm, Normally Open Contact	TB2-4
RMAJ-COM	Remote Major Alarm, Common Contact	TB2-5
RMAJ-NC	Remote Major Alarm, Normally Closed Contact	TB2-6
RMIN-NO	Remote Minor Alarm, Normally Open Contact	TB2-7
RMIN-COM	Remote Minor Alarm, Common Contact	TB2-8
RMIN-NC	Remote Minor Alarm, Normally Open Contact	TB2-9

SDU-2000 Expansion Interface

Figure 7-6 illustrates the SDU Interface and the Backup Clock Connector, located on the rear panel of the SSU-2000e. Table 7-4 outlines signal names, definitions, and locations of the SDU Expansion interface and backup clock connectors.
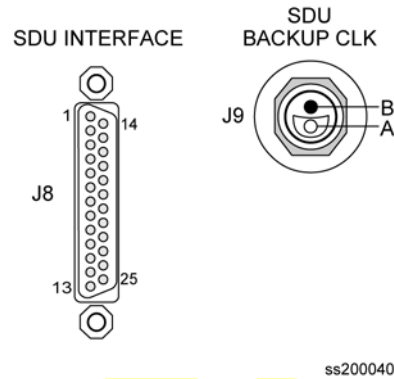
Figure 7-6.   SDU Interface and Backup Clock Connector Pinouts

Table 7-4. Signal Names and Locations for SDU-2000 Interface

Name	Description	Connector–Pin
SCLK2+/–	SPI Clock Signal, generated by SPI Master	J8-1&14
MOSI2+/–	SPI Master Out / Slave In Data line	J8-2&15
MISO2+/–	SPI Master In / Slave Out Data line	J8-3&16
SS2+/–	SPI Slave Select line, generated by SPI Master	J8-5&18
SBUSY2+/–	SPI Slave Busy line, generated by SPI Slave	J8-4&17
SRQ2+/–	SPI Service Request line, generated by SPI Slave	J8-6&19
CLKAOUT2+/–	Clock A to Output Modules (synced 4 kHz)	J8-7&20
CLKBOUT2+/–	Clock B to Output Modules (synced 4 kHz)	J8-8&21
CLKC2+/–	Pass-through Clock from Input to Output Modules (4 kHz)	J8-9&22
CLKD2+	Selected Clock via TBNC/BNO to SDU-2000 (Backup 4 kHz)	J9-A
CLKD2–	Selected Clock via TBNC/BNO to SDU-2000 (Backup 4 kHz)	J9-B
EXPSP1+/–	Spare Connection to SDU-2000	J8-11&24
EXPSP2+/–	Spare Connection to SDU-2000	J8-12&25
SOUT2+/–	SPI Expansion Shelf Select Request, generated by SDU SPI Slave	J8-10&23
LG	Logic Ground Connection	J8-13

Shelf Module Slot Addressing and Size Assignments

Table 7-5 outlines the shelf module slot addressing and size assignments.

Table 7-5. Shelf Module Slot Addressing and Size Assignments

Slot-A	Address	Module Types	Comments
1	1	Clock	Clock A
2	2	Com	Communications
3	3	I/O or Receiver	Input, non-redundant Output, or a GPS Receiver module
4	4	I/O, Output Pair A	Input or Output, paired with 5
5	5	I/O, Output Pair A or Receiver	Input, Output, paired with 4, or a GPS Receiver module
6, 7	6, 7	I/O, Output Pair B	Inputs or paired Output modules
8, 9	8, 9	I/O, Output Pair C	Inputs or paired Output modules
10, 11	10, 11	I/O, Output Pair D	Inputs or paired Outputs modules
	12 - 15	I/O, Extras	Reserved for future I/O
12	17	Clock	Clock B
	0	All	Addresses all modules in the Shelf

I/O Connector Grounding

Table 7-6 outlines I/O connector grounding for all connectors.

Table 7-6. I/O Connector Grounding

Name	Connector Type	Reference Description	Termination Type
Local OSC A	BNC	J1	Body/Shield: Connected to Frame Ground Plane
Local OSC B	BNC	J2	Body/Shield: Connected to Frame Ground Plane
Ethernet 10-Base-T	RJ45	J3	Body/Shield: Connected to Frame Ground Plane
Serial Port A	DE9S	J4	Body/Shield: Connected to Frame Ground Plane
Serial Port B	DE9S	J5	Body/Shield: Connected to Frame Ground Plane

Table 7-6. I/O Connector Grounding (Continued)

Name	Connector Type	Reference Description	Termination Type
ANTENNA A	TNC	J6	Shield: 0.01μF Bypass to Frame Ground Plane
ANTENNA B	TNC	J7	Shield: 0.01μF Bypass to Frame Ground Plane
SDU Interface	DB25S	J8	Body/Shield: Connected to Frame Ground Plane
SDU Backup Clk	TBNC/BNO	J9	Shield: Connected to Frame Ground Plane
I/0-1	Micro D50S	J10	Body/Shield: Connected to Frame Ground Plane
I/0-2	Micro D50S	J11	Body/Shield: Connected to Frame Ground Plane
I/0-3	Micro D50S	J12	Body/Shield: Connected to Frame Ground Plane
I/0-4	Micro D50S	J13	Body/Shield: Connected to Frame Ground Plane
I/0-5	Micro D50S	J14	Body/Shield: Connected to Frame Ground Plane
I/0-6	Micro D50S	J15	Body/Shield: Connected to Frame Ground Plane
I/0-7	Micro D50S	J16	Body/Shield: Connected to Frame Ground Plane
I/0-8	Micro D50S	J17	Body/Shield: Connected to Frame Ground Plane
I/0-9	Micro D50S	J18	Body/Shield: Connected to Frame Ground Plane
RESET	TBNC/BNO	J19	Shield: 0.01μF Bypass to Frame Ground Plane
LG (Logic Ground)	Stake-On	TB3 & TB4	Terminal: 1.0μF Bypass to Frame Ground Plane

Chapter 8 Default Settings

This chapter contains tables that list the factory default settings for the SSU-2000e. If you make any changes to the factory default settings, record them in Table 8-15 for future reference. Use the "SETUP" command to verify settings.

In This Chapter

- Communications Module Default Settings
- Clock Module Default Settings
- DS1 and E1 Input Module Default Settings
- GPS Input Module Default Settings
- DS1 and E1 Line Re-timing Module Default Settings
- DS1 and E1 Output Module Default Settings
- 2048 kHz Output Module Default Settings
- E1/2048 kHz Output Module Default Settings
- Composite Clock Output Module Default Settings
- RS-422 Output Module Default Settings
- PackeTime Module
- Priority Quality Level (PQL) Table Default Settings
- User Changes to Factory Defaults

Communications Module Default Settings

Table 8-1 lists settings and factory defaults for the SSU-2000e Communications Module.

Table 8-1. Communications Module Factory Default Settings

Setting	Factory Default
Unit Name	SSU_2000
Module Information configurations	Current Configuration = the configuration that is currently in use. User Default Configuration = configuration the user specifies as the default if the current configuration is invalid or not present. Factory Configuration = the factory default configuration
User List configurations	Maximum of 25 users including four built-in users.
EIA-232-C Port Comm Port Timeout	All three comm ports are set to 9600 baud, Interactive Mode, CRLF, and Echo on Five minutes for all (Interactive Mode). (Note: the unit should have one user added; that is, not in the INITUSERTABLE state). If it is in the INITUSERTABLE state, no timeout is applied. No Timeout is assigned for the TL1 Mode.
Ethernet IP Address	IP Address 0.0.0.0 Gateway Address 0.0.0.0 Network Mask 255.255.255.0

Clock Module Default Settings

The Stratum 2E, TYPE I, and Stratum 3E Clock modules are software configurable via one of the serial or Ethernet ports. Table 8-2 lists settings and factory defaults for the Clock modules.

Table 8-2. Stratum 2E and 3E Clock Module Default Settings

Setting	Factory Default			Range		
	ST2E	TYPE I	ST3E	ST2E	TYPE I	ST3E
Warmup Time (s)	1200			900 – 3600		
Min Lock Tau (s)	1000	150	1000	300–10 000	150–1200	150–1200
Max Lock Tau (s)	9000	155	1200	300–10 000	150–1200	150–1200
Clk Switch AR	On			On (1)	Off (0)		
Input Switch	Auto Return (AR)			AR (2)	AS On (1)	AS Off (0)		

Table 8-2. Stratum 2E and 3E Clock Module Default Settings (Continued)

Setting	Factory Default ST2E	Factory Default TYPE I	Factory Default ST3E	Range ST2E	Range TYPE I	Range ST3E
Input Selection Mode	Priority			Priority (0) | PQL (1)		
Local Oscillator (LO)	Off			On (1) |Off (0)		
Frequency Offset	Set: 4.0 E–8 Clear: 3.5 E–8	Set: 2.5 E–7 Clear: 2.0 E–7	Set: 9.8 E–6 Clear: 9.3 E–6	Constant		
Elevation Time (s)	86 400			60 to 500 000 s, 0 = disabled		
PQL Setting	5	6	8	Constant		

DS1 and E1 Input Module Default Settings

The DS1 Input Module and E1 Input modules maintain factory default and current user configuration information in nonvolatile memory. This information is retrieved at power up and is modified by commands from the Communications module.

When the current user configuration cannot be used, the Input module settings automatically revert to factory defaults. Table 8-3 lists factory default settings and ranges for all DS1 Input module or E1 Input module software parameters.

Table 8-3. DS1 and E1 Input Module Default Configuration

Configuration Setting	Factory Default	Range
Input Frequency (for unframed signals)	1.544 for DS1 Input module 2.048 MHz for E1 Input module	1 MHz, 1.544 MHz, 2.048 MHz, 5 MHz, 10 MHz
Framing Type	ESF for DS1 Input module CCS for E1 Input module	D4 or ESF for DS1 Input Module CAS or CCS for E1 Input Module
Zero Suppression	On	On/Off
CRC	Off	On/Off
SSM	Off	On/Off
Provisioned PQL	4 for DS1 Input module **Note:** PQL 4=STU 4 for E1 Input Module	2,3,4,5,6, or 8
Priority	0	0 to 10 (0 = Monitor)
E1 SSM Bit Position	8 (Not applicable for DS1 Input Module)	4 to 8

Table 8-3. DS1 and E1 Input Module Default Configuration (Continued)

Configuration Setting	Factory Default	Range
Cesium Fault Nominal	Off	Low/High/Off
Gain	Off	On or Off (20 dB)
Input Signal Error Limit (LOS, AIS, OOF, BPV, CRC)	Defaults are: **LOS:** 10 seconds (Err Cnt) 5 seconds (Clr Cnt) **AIS:** 12 seconds (Err Cnt) 5 seconds (Clr Cnt) **OOF:** 14 seconds (Err Cnt) 5 seconds (Clr Cnt) **BPV, CRC:** 16 seconds (Err Cnt) 5 seconds (Clr Cnt)	1 to 100 for LOS and AIS 1 to 10 000 for BPV, CRC and OOF
MTIE Limits	See Table 8-4 and Table 8-5	1 to 10 000
MTIE Limit 1 Alarm Mode	MINOR	Ignore, Report, Minor, Major, or Critical
MTIE Limit 2 Alarm Mode	MAJOR	Ignore, Report, Minor, Major, or Critical
Alarm Initial Severity	MINOR (except LOS and Level 2 MTIE, which are MAJOR)	Ignore, Report, Minor, Major, or Critical
Alarm Initial Delay	0 s	0 to 86 400 s
Alarm Elevation Time	86 400 s	60 to 500 000 s, 0 is disabled
Port Status	Disabled	Enabled/Disabled
Port Name	Not applicable	Any string from 0 to 20 characters

MTIE Limits for the DS1 Input Module

Table 8-4 provides MTIE limits for the DS1 Input Module configuration and factory defaults and settings.

Table 8-4. DS1 Input Module – MTIE Limits

Time (s)	Set Limit L1 (ns)	Set Limit L2 (ns)	Clear Limit L1 (ns)	Clear Limit L2 (ns)
10	260	325	230	290
100	440	550	400	490

Table 8-4. DS1 Input Module – MTIE Limits

Time (s)	Set Limit L1 (ns)	Set Limit L2 (ns)	Clear Limit L1 (ns)	Clear Limit L2 (ns)
1000	810	1010	730	910
10000	880	1100	790	990
100000	1600	2000	1440	1800

MTIE Limits for the E1 Input Module

Table 8-5 provides MTIE limits for the E1 Input Module configuration settings and factory defaults and ranges.

Table 8-5. E1 Input Module – MTIE Limits

Time (s)	Set Limit L1 (ns)	Set Limit L2 (ns)	Clear Limit L1 (ns)	Clear Limit L2 (ns)
10	80	100	70	90
100	800	1000	700	900
1000	1600	2000	1400	1800
10000	1170	2835	2000	2500
100000	4260	5330	3800	4800

GPS Input Module Default Settings

The GPS Input Module maintains factory default and current user configuration settings. The configuration settings for the GPS Input Module are provided in Table 8-6.

Table 8-6. GPS Input Module Default Configuration Settings

Configuration Setting	Factory Default	Range
Position (GPS only)		
Latitude (+ = North, – = South)	0	± 90 degrees
Longitude (+ = East, – = West)	0	±180 degrees
Height	0	–60 to 4,000 meters
Averages	300	10 to 3600
PDOP	0	1 to 10
Pos Mode	Calc	User | Calc
Min Elevation for position	5	0 to 50 degrees

Table 8-6. GPS Input Module Default Configuration Settings (Continued)

Configuration Setting	Factory Default	Range
Min PDOP for position	3	1 to 10
Min Elevation for timing	10	0 to 50 degrees
Module Status	Enabled	Enabled | Disabled
Priority	0	0 to 10
Sigma limit	25	10 to 1000 US
PQL	2	1 to 16
Disabled SV list	Not applicable	Up to 31 SV numbers
Min PDOP for position	3	1 to 10
FREQ Set ClkA	16 000	0 to 10 000 000
FREQ Set ClkB	16 000	0 to 10 000 000
FREQ Clear ClkA	12 000	0 to 10 000 000
FREQ Clear ClkB	12 000	0 to 10 000 000
Frequency Alarm Mode	Major	Ignore | Report | Minor | Major | Critical
MTIE T10 Set Limit1	260	0 to 60 000
MTIE T10 Set Limit2	325	0 to 60 000
MTIE T100 Set Limit1	440	0 to 60 000
MTIE T100 Set Limit 2	550	0 to 60 000
MTIE T1K Set Limit 1	810	0 to 60 000
MTIE T1K Set Limit 2	1010	0 to 60 000
MTIE T10K Set Limit 1	880	0 to 60 000
MTIE T10K Set Limit 2	1100	0 to 60 000
MTIE T100K Set Limit 1	1600	0 to 60 000
MTIE T100K Set Limit 2	2000	0 to 60 000
MTIE T10 Clear Limit 1	230	0 to 60 000
MTIE T10 Clear Limit 2	290	0 to 60 000
MTIE T100 Clear Limit 1	400	0 to 60 000
MTIE T100 Clear Limit 2	490	0 to 60 000
MTIE T1K Clear Limit 1	730	0 to 60 000
MTIE T1K Clear Limit 2	910	0 to 60 000
MTIE T10K Clear Limit 1	790	0 to 60 000

Table 8-6. GPS Input Module Default Configuration Settings (Continued)

Configuration Setting	Factory Default	Range
MTIE T10K Clear Limit 2	990	0 to 60 000
MTIE T100K Clear Limit 1	1440	0 to 60 000
MTIE T100K Clear Limit 2	1800	0 to 60 000

DS1 and E1 Line Re-timing Module Default Settings

Table 8-7 lists settings and factory defaults for the Line Re-timing Modules.

Table 8-7. DS1 Line Re-timing Module Configuration

Configuration Setting	Factory Default	Range
DS1 Line Re-Timing Module		
Slips Threshold	Error = 4, Clear <4	1 to 255 (in any 24 hour period)
Fault Strategy	AIS	AIS SQUELCH
Port Enable	Enabled	Enabled | Disabled
Port LBO	1 (0–133 ft)	1 = 0–133 ft 2 = 133–266 ft 3 = 266–399 ft 4 = 399–533 ft 5 = 533–655 ft
Circuit ID	None (blank)	String from 0-43 characters (only valid TL1 characters are supported)
E1 Line Re-Timing Module		
Slips Threshold	Error = 4, Clear <4	1 to 255 (in any 24 hour period)
Fault Strategy	AIS	AIS SQUELCH
Port Enable	Enabled	Enabled Disabled
Circuit ID	None (blank)	String from 0-43 characters (only valid TL1 characters are supported)

DS1 and E1 Output Module Default Settings

Table 8-8 lists settings and factory defaults for the SSU-2000e DS1 and E1 Output modules.

Table 8-8. DS1 and E1 Output Module Default Settings

Setting	Factory Default	Range
DS1 Output Module		
Enable/Disable Outputs	Enabled	Settable for each output port
Minimum Clock Level	Acquire	Acquire	Lock
Bypass Mode	ON	ON – Clock C is selected if it is the only one available OFF – Clock C is not selected even if no other clock is available
Framing	ESF	D4	ESF
Line Length	0-133 ft	133-266 ft	266-399 ft	399-533 ft	533-655 ft
PQL Override	Disabled	0	1 – 16, 0 is disabled
Zero Suppression	ON	ON – B8ZS OFF – AMI
Alarm Elevation Time	86 400 s	60 to 500 000 s, 0 is disabled
E1 Output Module		
Enable/Disable Outputs	Enabled	Settable for each output port
Minimum Clock Level	Acquire	Acquire/Lock
Bypass Mode	ON	ON – Clock C is selected if it is the only one available OFF – Clock C will not be selected even if no other clock is available
Framing	CAS	CCS/CAS
PQL Override	Disabled	0	1 – 16, 0 is disabled
Zero Suppression	ON	ON – HDB3 OFF – AMI
CRC	ON	ON/OFF
SSM Bit Selection	8	4	5	6	7	8
Alarm Elevation Time	86 400 s	60 to 500 000 s, 0 is disabled

2048 kHz Output Module Default Settings

The 2048 kHz Output module maintains factory default and current user configuration settings. The configuration settings for the 2048 kHz Output Module are provided in Table 8-9.

Table 8-9. 2048 kHz Output Module Configuration

Setting	Factory Default	Range
Port State	Enabled	Disabled/Enabled
Min Clock	Acquire	Acquire/Lock
Framing	Not applicable	Not applicable
Bypass	On	On/Off
Fault Action	On	Off/On/Auto
Alarm Elevation Time	86 400 s	60 to 500000, 0 is disabled
Squelching	0	1 to 16, 0 is disabled

E1/2048 kHz Output Module Default Settings

The factory default setting and range for all E1/2048 kHz Output module software parameters are listed in Table 8-10.

Table 8-10. E1/2048 kHz Output Module Configuration

Configuration Setting	Factory Default	Range
Signal Type	E1	E1 | 2048
Framing Mode	CAS	CAS | CCS
Priority Quality Level	2	0 | 1 – 16
Zero suppression	On	On | Off
SSM	On	On | Off
CRC	On	On
SSM Bit Position	8	4 | 5 | 6 | 7 | 8
Port Output (per port)	Enabled	Enable | Disable
Bypass	Enable	Enable | Disable

Table 8-10. E1/2048 kHz Output Module Configuration (Continued)

Configuration Setting	Factory Default	Range
Port Label (per port)	Null	Up to 20 printable characters; 0 is string terminator
Alarm Elevation	86 400 s	60 – 500 000 s, 0 is disabled
Squelching	0	1–16, 0 is disabled

Composite Clock Output Module Default Settings

The Composite Clock Output module maintains factory default and current user configuration settings. The configuration settings for the Composite Clock Output Module are provided in Table 8-11.

Table 8-11. Composite Clock Output Module Configuration

Configuration Setting	Factory Default	Range
Port State	Enabled	Disabled | Enabled
Min Clock	Acquire	Acquire | Lock
Bypass	On	On | Off
Fault Action	On	Off | On | Auto
Duty Cycle	5/8	5/8 or 50/50
Alarm Elevation Time	86 400 s	60 to 500 000, 0 is disabled
Port Delay	3 (1375 feet) in Normal mode, 7 (275 feet) in Subtending mode	0 to 7 (2200, 1925, 1650, 1375, 1100, 825, 550, and 275 feet)

RS-422 Output Module Default Settings

The factory default setting and range for all RS-422 Output module software parameters are listed in Table 8-12.

Table 8-12. RS-422 Output Module Configuration

Configuration Setting	Factory Default	Range
Port State	Enabled	Disabled	Enabled
Min Clock	Acquire	Acquire	Lock
Framing	Not applicable	Not applicable
Bypass	On	On	Off
Fault Action	On	Off	On	Auto
Duty Cycle	50/50	5/8 or 50/50
Alarm Elevation Time	86 400 s	60 to 500 000 s, 0 is disabled

PackeTime Module

The factory default settings and ranges for the PackeTime module software parameters are listed in Table 8-13.

Table 8-13. PackeTime Configuration Settings

Configuration Setting	Factory Default	Range
Alarm elevation time	86 400 s	60 – 500 000

Maintenance port
  IP address
  Mask
  Gate
Port A
  IP address
  Mask
  Gate
Port B
  IP address
  Mask
  Gate
	
	10.0.0.100
	255.255.255.0
	0.0.0.0
	
	10.0.0.101
	255.255.255.0
	0.0.0.0
	
	10.0.0.101
	255.255.255.0
	0.0.0.0
		
		Valid IPv4 address
		Valid IPv4 address
		Valid IPv4 address
		
		Valid IPv4 address
		Valid IPv4 address
		Valid IPv4 address
		
		Valid IPv4 address
		Valid IPv4 address
		Valid IPv4 address

TODSRC
  Preferred mode
  Priority
	
	GPS
	0 (No priority)
		
		GPS
			PEER
			0
				...	8

Table 8-13. PackeTime Configuration Settings (Continued)

Configuration Setting	Factory Default	Range
Bonding	Disable	Disable | Enable
Port Weight	−1	−1 | 0 | ... | 100
External Peer list	None	Valid IPv4 address
Broadcast	None	Valid IPv4 address
Trusted Key	None	

Priority Quality Level (PQL) Table Default Settings

The configuration settings for the PQL table are provided in Table 8-14.

Table 8-14. Default PQL Values

	DS1			E1		
PQL	SSM	S	DS1 Description	SSM	S	E1 Description
1	0x08			0x00		
2	0x04	S	PRS	0x02		
3	0x04		PRC	0x02	S	G.811
4	0x08	S	STU	0x00	S	STU
5	0x0C	S	ST2	0x04		Type II
6	0x0C		Type I	0x04		Type I
7	0x78	S	Type V	0x04	S	G.812 Transit
8	0x7C	S	ST3E	0x08		Type III
9	0x10		Type VI	0x08	S	G.812 Local
10	0x10	S	ST3	0x0B		Type IV
11	0x22			0x0B	S	G.813 Opt 1
12	0x22	S	SMC	0x0F		G.813 Opt 2
13	0x28	S	ST4	0x0F		
14	0x40	S	Reserved	0x0F		
15	0x30	S	DUS	0x0F	S	DUS
16	0x40			0x0F		

User Changes to Factory Defaults

Use Table 8-15 to record any changes you make to the factory default settings.

Table 8-15. User Changes to Factory Default Settings

Setting	Factory Default	User Changes
Communications Module Defaults		
Unit Name	SSU_2000	
Module Information configurations	Current Configuration = the configuration that is currently in use User Default Configuration = configuration the user specifies as the default if the current configuration is invalid or not present Factory Configuration = the factory default configuration	
User List configurations	Maximum of 25 users including four built-in users	
EIA-232-C Port Comm Port Timeout	All three comm ports are set to 9600 baud, Interactive Mode, CRLF, and Echo on Five minutes for all (Interactive Mode). (Note: the unit should have one user added, i.e. not in the INITUSERTABLE state). If it is in the INITUSERTABLE state, no timeout is applied. No Timeout is assigned for the TL1 Mode	
Ethernet IP Address	IP Address 0.0.0.0 Gateway Address 0.0.0.0 Network Mask 255.255.255.0	
Clock Module 1		
Warmup Time	1200 s	
Min Tau Limit	2E: 300 s TYPE I: 150 s 3E: 150 s	
Max Tau Limit	2E: 10 000 s TYPE I:1200 s 3E: 1200 s	

Table 8-15. User Changes to Factory Default Settings (Continued)

Setting	Factory Default	User Changes
Min Lock Tau	2E: 1000 s TYPE I: 150 s 3E: 1000 s	
Max Lock Tau	2E: 9000 s TYPE 1: 155 s 3E: 1200 s	
Clk Switch AR	On	
Input Switch	AutoReturn (AR)	
Input Selection Mode	Priority	
Local Oscillator (LO)	Off	
Elevation Time	86400 seconds	
PQL Setting	2E: 5 TYPE I: 6 3E: 8	
Clock Module 2		
Warmup Time	1200 s	
Min Tau Limit	2E: 300 s TYPE I: 150 s 3E: 150 s	
Max Tau Limit	2E: 10 000 s TYPE I:1200 s 3E: 1200 s	
Min Lock Tau	2E: 1000 s TYPE I: 150 s 3E: 1000 s	
Max Lock Tau	2E: 9000 s TYPE 1: 155 s 3E: 1200 s	
Clk Switch AR	On	
Input Switch	AutoReturn (AR)	
Input Selection Mode	Priority	
Local Oscillator (LO)	Off	
Elevation Time	86400 seconds	
PQL Setting	2E: 5 TYPE I: 6 3E: 8	

Chapter 9 Specifications

This chapter provides specifications for the SSU-2000e and for its functional components, such as operating conditions, power inputs, clock inputs and outputs, indicators, EMC and safety standards, and chassis dimensions.

In This Chapter

- SSU-2000e Shelf Specifications
- SDU-2000 Shelf Specifications

SSU-2000e Shelf Specifications

General Specifications

The operating limits for the unit are set to factory default settings as listed in Chapter 8, Default Settings.

Table 9-1 details the general specifications for a fully populated unit configured with SSU function. Inputs apply only to the SSU function.

Table 9-1. General Specifications

Characteristics	Specification
General	
Architecture	■ Main Shelf: 2 clocks, 1 Communications module and 9 mixed I/O modules ■ Expansion Shelf: 14 output modules and 2 buffer modules ■ Up to 4 Expansion Shelves per system
Long Term Frequency (Accuracy)	Stratum 1 PRS per (ANSI) T1.101 and ITU-T G.811
Clock Performance	Meets requirements of the Telcordia Technologies (formerly Bellcore) document GR-1244-CORE
Reference Signals	Determined by the type of Input module: ■ GPS navigation signal ■ DS1 – D4 or ESF ■ E1 – CAS or CCS ■ Clock – 1 MHz, 1.544 MHz, 2048 kHz, 5 MHz, 10 MHz ■ Composite Clock
Sync Status Messaging (SSM)	Compliant with SSM specifications per T1X1.3 TR33, (ANSI) T1.101-1999, and Telcordia Technologies GR-253 and 378-CORE and with applicable parts of ITU-T G.781
Event Log	Stores at least 500 event history including timestamp, event type, event/alarm level, and condition causing the event; stores the last 10 events in non-volatile memory.
Configuration Data	Firmware stores factory configuration, customer configuration, current configuration, and board identification information, and provides a command which can be used to restore saved settings.
Alarm Levels	Commands can set alarm level to IGNORE, REPORT, MINOR, MAJOR, and CRITICAL. MINOR and MAJOR alarms can be elevated to the next higher level after a user-defined time period.

Table 9-1. General Specifications (Continued)

Characteristics	Specification
Communications Ports	Three EIA-232 Serial Ports: ■ Serial PORT-A (J4) ■ Serial PORT-B (J5) ■ Comms Module Serial Port One Ethernet Port: ■ Ethernet port (10 Base T)
Communication Management	
Management Interface	■ Simple fault, visual and contact closures ■ ICS ■ TL1 ■ SNMP
Input Section	
Ports	■ Maximum of 27 ■ 1 or 3 ports per Input module ■ Reference or monitoring capability
Signal Type	DS1, E1, 2048 kHz (G.703 Sec.13), 1.544 MHz, 2.048 MHz, 1, 5, and 10 MHz Clocks (user-settable), Composite Clock (GR.378), 1.544/6.312 MHz (G.703)
GPS	Integrated (single or dual)
Sync Status Messaging (SSM)	Fully supported
Selection Mode	Priority and PQL (user settable)
Performance Measurement	
Resolution	1 ns
Sampling Rate	40 Hz
MTIE and TDEV	Exceeds latest ANSI, ITU-T and Telcordia Technologies standards
Clock	
Type (Holdover)	■ Stratum 2E Rubidium (2 weeks) ■ Stratum 3E Quartz ■ TYPE I Quartz
Control	■ DDS (Direct Digital Synthesis) technology Integrated CPU

Table 9-1. General Specifications (Continued)

Characteristics	Specification
Output Section	
Port	20 Ports per module for DS/E1, 2048 kHz, and Composite clock
Signal Type	■ DS1 ■ E1 ■ 2.048 MHz (G703 Sec.13) ■ Composite Clock (CC), GR.378 ■ RS-422 ■ DS1 Line Re-Timing ■ E1 Line Re-Timing
Distribution Capacity	
Main Shelf	■ Up to nine DS1/E1 output modules in Main Shelf ■ 20 outputs per output module
SDU-2000 Expansion	■ Up to four Expansion Shelves ■ Up to 14 output modules per expansion shelf with 20 outputs per module ■ Maximum of 1120 outputs in four Expansion Shelves
Alarm Closures	
MINOR	Contact closure (NC or NO) 1 Amp Form C
MAJOR	Contact closure (NC or NO) 1 Amp Form C
CRITICAL	Contact closure (NC or NO) 1 Amp Form C
Chassis Power and Grounds	
Power Connections	A & B Input connections at opposite upper sides of the rear panel
DC	–38 to –72.5 VDC (–48 VDC nominal)
DC Power (maximum)	< 240 watts, per chassis
Fuse Type/Rating	2 fuses; GMT-5A
Grounds	–48 VDC return, isolated from frame and logic grounds
Chassis Mechanical	
Width	17 inches (43.2 cm)
Depth	11.5 inches (29.2 cm)
Height	10.5 inches (26.7 cm)
Weight (provisioned)	~ 27 lbs (12.3 kg)
Chassis Environmental	

Table 9-1. General Specifications (Continued)

Characteristics	Specification
Temperature Operational Stratum Levels	+1.7°C to +49°C @ 8.3°C max rate of change per hour GR-1244-CORE Sec. 2.2
Relative Humidity Operational	5% to 85% Non-condensing GR-63-CORE Sec. 4.1.2 ETS 300 019-1 Class 3.1
Temperature Operational Short Term Non-Stratum performance	–5°C to +50°C @ 30°C max per hour rate of change. Duration <96 hours GR-63-CORE Sec. 4.1.2 ETS 300 019-1 Class 3.1
Relative Humidity Operational Short Term	5% to 90% Non-condensing. Duration <96 hours GR-63-CORE Sec. 4.1.2 ETS 300 019-1 Class 3.1
Temperature Storage	–25°C to +55°C Duration <12 months GR-63-CORE Sec. 4.1.1 ETS 300 019-1 Class 1.2
Relative Humidity Storage	5% to 100% Non-condensing. Duration <12 months GR-63-CORE Sec. 4.1.1 ETS 300 019-1 Class 1.2
Temperature Transporting	-40°C to +70°C Duration <3 months GR-63-CORE Sec. 4.1.1 ETS 300 019-1 Class 2.3
Chassis Environmental	
Relative Humidity Transporting	5% to 100% Non-condensing. Duration <3 months GR-63-CORE Sec. 4.1.1 ETS 300 019-1 Class 2.3
Heat Dissipation	GR-63-CORE Sec. 4.1.4
Altitude	200 ft below to 13,000 ft (–61 to 3961 m) above sea level GR-63-CORE Sec. 4.1.3
Airborne Contaminants	GR-63-CORE Sec. 4.5.2.1
Shock Operational	ETS 300 019-2-3 Class T3.1
Sinusoidal Vibration Operational	GR-63-CORE Sec. 4.4.3
Seismic Vibration	GR-63-CORE Sec. 4.4.1 Earthquake Zone 4 ETS 300 019-2-3-A1
Shock Transporting	ETS 300 019-2-2 Class T2.2
Sinusoidal Vibration Transporting	GR-63-CORE Sec. 4.4.4 fig. 4-3
Random Vibration Transporting	ETS 300 019-2-2 Class 2.1, 2.2, 2.3, and 2.3 special
Packaged Equipment Shock	GR-63-CORE Sec. 4.3.1.2
Unpackaged Equipment Shock	GR-63-CORE Sec. 4.3.2
Electrical Safety	GR-1089-CORE Sec. 7
Material/Component Fire Resistance	GR-1089-CORE Sec. 4.2.3.1

Table 9-1. General Specifications (Continued)

Characteristics	Specification
EMC	
Immunity/Resistibility ESD	EN 300 386-2 V1.1.3 Sec. 5.1.1.1 & 5.1.1.4 GR-1089-CORE Sec. 2
Immunity Radiated	EN 300 386-2 V1.1.3 Sec. 5.1.1.2 GR-1089-CORE Sec. 3.3.1 & 3.3.2
Immunity Fast Transient	EN 300 386-2 V1.1.3 Sec. 5.1.3.1 & 5.1.5.1
Immunity Surges	EN 300 386-2 V1.1.3 Sec. 5.1.3.2
Immunity Radio Freq. Conducted	EN 300 386-2 V1.1.3 Sec. 5.1.3.3 & 5.1.5.2 GR-1089-CORE Sec. 3.3.3
Emissions Radiated	EN 300 386-2 V1.1.3 Sec. 5.1.1.3 GR-1089-CORE Sec. 3.2.1 & 3.2.2
Emissions Radio Freq. Disturbance voltage	EN 300 386-2 V1.1.3 Sec. 5.1.5.3 GR-1089-CORE Sec. 3.2.4
Interface A (Power Input)	ETS 300 132-2 Part 2: Operated by direct current (DC)
Low-Impedance Plane (Grounding)	ETS 300 253 GR-1089-CORE Sec. 9
Intra-building Lighting	GR-1089-CORE Sec. 4.5.9
Antenna Output & Receiver Input	EN 61000-4-5 1 kV tested combination wave generator (1.2/50—8/20 μs) 12 Ω impedance
I/O Adapter Panels	
Width	■ 19" EIA Standard rack mount ■ Optional rack ears for mounting in 23" EIA, AT&T racks, and ETSI 530mm racks/cabinet
Height	1.75 in. (4.4 cm)
Depth	2.0 in. (5.0 cm) (including connector extension)
Outdoor Operational Conditions	
(GPS Antenna Only)	ETS 300 019-1 Class 4.1E
GPS PRS Performance and Antenna Environmental	
GPS Performance	Compliant with Stratum 1 PRS (Primary Reference Source) per (ANSI) T1.101-1999, ITU-T G.811, and Telcordia Technologies (Bellcore) GR-2830-CORE.
Temperature	–40°C to +72.5°C

Table 9-1. General Specifications (Continued)

Characteristics	Specification
Relative Humidity	100% Non-Immersed
Altitude	200 ft. below sea level to 13,000 ft. above sea level

Operating Conditions Specifications

The unit operates at specified parameters in the operating conditions summarized in Table 9-2.

Table 9-2. Normal Operating Conditions

Parameter	Minimum	Maximum	Units	Notes
Supply Voltage	–38	–65	Volts DC	
Temperature	0	50	°C	1
Temperature Rate of Change	–	8.3	°C/Hr	
Relative Humidity	5	85	%	2
Altitude	–200 ft.	13,000	feet	3

1. Inlet air temperature, limited convection 15 ft./min.
2. Non-condensing over specified temperature range.
3. The maximum operation ambient temperature shall be reduced by 2°C for every 984 ft. altitude above 4,921 ft.

The unit is not damaged when exposed to the levels specified in Table 9-3, but performance is degraded. The unit returns to specified performance upon returning to specified operating conditions.

Table 9-3. Exceptional Operating Conditions

Parameter	Minimum	Maximum	Units	Notes
Supply Voltage	–38	–74	Volts, DC	1
Temperature	–5	50	°C	2
Relative Humidity	5	90	%	3

1. The unit is not damaged if the polarity on the power leads is reversed.
2. At 30°C max/hour rate of change.
3. Non-condensing.

Power Input and Grounding Specifications

Table 9-4 provides power input specifications.

Table 9-4. Power Input Specifications

Parameter	Specification
Supply power	–38 to –72.5 VDC (–48 VDC nominal)[1, 2, 3]
Power, maximum	< 240 watts at power on
Power, typical	< 100 watts at normal operation
Connector	#6 Ring Terminal Block

1. Reversing the input polarity does not damage the unit.
2. Isolated power inputs are user-settable for positive or negative grounding schemes.
3. The 48 VDC return is connected to the common ground plane at power source.

Input Signal Specifications

Table 9-5 details the input signal specifications.

Table 9-5. Input Signal Specifications

Parameter	Specification
DS1 Signals	
Framing	D4/SF or ESF (User Selectable)
Bit Rate	1544 kbit/s
Format	AMI or B8ZS (per (ANSI) T1.102 & ITU-T G.703 Sec. 5)
Amplitude Range	+3 to –24 dBDSX
Jitter and Wander Tolerance	Meets the requirements of Bellcore GR-1244-CORE, Section 4.
Input Error Threshold	0 to 255 Intervals per hour (AIS, LOS, OOF, BPV, CRC)
Input Impedance	3.3 kΩ (External termination)
E1 Signals	
Type	G.703 Sec. 9 Framed E1
Bit Rate	2048 kbit/s
Format	CAS or CCS (per ITU-TG.703 Sec. 2 & (ANSI) T1.102 DS1A CRC4 enabled/disabled AMI or HDB3)
Amplitude Range	+3 to –27 dBTLO

Table 9-5. Input Signal Specifications (Continued)

Parameter	Specification
Jitter and Wander Tolerance	Meets the requirements of ITU-T G.823
Input Error Threshold	0 to 255 Intervals per hour (AIS, LOS, LOF, BPV, CRC)
Type	G.703 Sec. 9 Framed E1
Input Termination	External
Clock Inputs	
Frequency	1	1.544	2.048	5	10 MHz (user-selectable)
Wave Shape	Sine or Square wave
Amplitude Range	1.5 to 10 V peak-to-peak
Input Error Threshold	0 to 255 intervals per hour (LOS)
Input Impedance	50	75	100	120	3300 Ω (user-selectable)

Output Signal Specifications

Table G-6 details the input signal specifications.

Table 9-6. Output Signal Specifications

Parameter	Specification
DS1 Signals	
Framing (user selectable)	Outputs: D4/Super Frame (SF) or Extended Super Frame (ESF)
Pulse Amplitude	2.4 to 3.6 V peak into 100 Ω
Output Jitter	< 0.03 UI
Signal Waveshape Rise Time Pulse Width Pulse Interval Duty Cycle	Framed, all ones, Alternate Mark Inversion (AMI) per (ANSI) T1.102 and ITU Rec. G.703 < 100 ns < 324 ns, nominal 648 ns, nominal 50%
Number of Outputs	20 per module
Termination Impedance	100 Ω ± 5%

Table 9-6. Output Signal Specifications (Continued)

Parameter	Specification
E1 Signals	
Framing (user selectable)	CAS, CCS
Signal Waveshape Rise Time Pulse Width Pulse Interval Duty Cycle	Framed, all ones, Alternate Mark Inversion (AMI) Per ITU Rec. G.703 Sec. 9 < 100 nsec < 244 nsec, nominal 488 nsec, nominal 50%
Pulse Amplitude	2.4 to 3.6 V peak into 120 Ω 1.9 to 2.8 V peak into 75 Ω
Output Jitter	< 0.03 UI
Number of Outputs	20 per module
Termination Impedance	120 Ω ± 5%

Parameter	Specification	
Composite Clock Signals (64 kbit/s)		
Number of Outputs	20 per module	
Signal Waveshape	Rectangular (62.5% or 50/50 duty cycle), software selectable, per G.703 Sec. 4 and GR-378	
Duty Cycle	**5/8 (62.5%)**	**50/50**
Rise Time	< 500 ns	< 500 ns
Pulse Width	9.8 µS ±5%	7.8125 µS ±5%
Pulse Interval	15.625 µS ±5%	15.625 µS ±5%
Amplitude	2.7 to 5.5 V peak	1.0 ±0.1 V
Termination Impedance	133 Ω ±5%	110 Ω

Parameter	Specification
2048 kHz Clock Signals	
Signal Waveshape Rise Time Fall Time Duty Cycle	Per ITU Rec. G.703 Sec. 13 Square wave < 50 ns < 50 ns 50% ±5%
Amplitude	1.0 to 1.9 V peak into 120 Ω 0.75 to 1.5 V peak into 75 Ω
Jitter	< 0.03 UI
Number of Outputs	20 per module
Termination Impedance	120 Ω ± 5% or 75Ω ± 5%

Table 9-6. Output Signal Specifications (Continued)

Parameter	Specification
PackeTime Module	
Network Protocol	NTP v3 – RFC1305 compliant IPv4
Time Stamping	Hardware Time Stamping
Inputs	Stratum 1: Time-of-Day feed from GPS Input module Stratum 2: Full NTP Client with peering
NTP Service Ports	2 Ethernet Small Form-factor Pluggable (SFP) Optical: 1000BaseX Electrical 100/1000BaseT
NTP Transaction Rate	1000/s fully authenticated, up to 1500/s unauthenticated
Authentication	MD5 (RFC1321) (available in a future release)
Protection	1+1 Protection (available in a future release)
Maintenance port	Used for firmware upgrades
Accuracy	10 μs

SDU-2000 Shelf Specifications

Table 9-7 lists the system-level specifications for the SDU-2000.

Table 9-7. SDU-2000 System Specifications

Specification	Description
System Specifications	
Architecture	■ 2 Buffer modules and 10 mixed Output modules ■ Expansion drive for up to three additional Expansion shelves ■ Maximum of four Expansion Shelves per system ■ Maximum of 61 m (200 ft) between the SSU-2000e main shelf and the farthest expansion shelf
Output Section	
Port	■ 20 ports per Output module pair
Distribution Capacity	■ 100 summed outputs per shelf

Table 9-7. SDU-2000 System Specifications (Continued)

Specification	Description
Signal Type	■ DS1 ■ E1 ■ 2048 Kbit/s ■ 1 MHz, 1.544 MHz, 2.048 MHz (G703/Sec. 13) ■ 5 MHz ■ RS-422 ■ Composite Clock (CC) ■ DS1 Line Re-Timing ■ E1 Line Re-Timing
Expansion Shelf Mechanical	
Height	10.5 in (26.7 cm)
Depth	11.5 in (29.2 cm)
Width	17 in (43.2 cm) without mounting ears
Environmental	
Operating Temperature Range	0°C to 50°C
Storage Temperature	–20°C to 75°C
Relative Humidity	80% Non-condensing over specified temperature range
Altitude	196 ft (60 m) below sea level to 13123 ft (4000 m) above sea level
Power	
Input Power	Redundant Inputs: –38 to –72.5 VDC, 240 W max, 110 W typical
Grounds	Return DC isolated from frame and logic grounds. Integrated frame and logic ground.
Power Connections	A-BUS and B-BUS input power connectors (#6 terminal block) on opposite sides of the rear panel.

Chapter 10 Reference Materials

This chapter lists the standards and other reference materials that apply to the SSU-2000e.

In This Chapter

- (ANSI) T1.101–1999, Synchronization Interface Standards for Digital Networks.
- Generic Requirements
- Technical Advisories and Framework Technical Advisories
- Technical References
- EIA/TIA Documents
- Other Reference Documents

American National Standards Institute (ANSI) Documents

> **Note:** Bellcore, or Bell Communications Research, is now Telcordia Technologies, Inc. Many reference documents listed in this section were originally published by Bellcore, but are now available from Telcordia Technologies, Inc.

1. (ANSI) T1.101–1999, Synchronization Interface Standards for Digital Networks.

2. (ANSI) T1.101-199x, revision of T1X1.3/98-002R2, *Synchronization Interface Standard.*

3. (ANSI) T1.102–1993, *Digital Hierarchy-Electrical Interfaces.*

4. (ANSI) T1.105–1995, *Synchronous Optical Network (SONET) - Basic Description including Multiplex Structure, Rates and Formats.*

5. (ANSI) T1.105.01–1995, *Synchronous Optical Network (SONET) - Automatic Protection Switching.*

6. (ANSI) T1.105.03–1994, *Synchronous Optical Network (SONET) - Jitter at Network Interfaces.*

7. (ANSI) T1.105.03a-1995, *Synchronous Optical Network (SONET) - Jitter at Network Interfaces - DS1 Supplement.*

8. (ANSI) T1.105.03b-1997, *Synchronous Optical Network (SONET) - Jitter at Network Interfaces - DS3 Supplement.*

9. (ANSI) T1.105.04–1995, *Synchronous Optical Network (SONET): Data Communication Channel Protocols and Architectures.*Family of Requirements

10. FR–476, *OTGR Section 6: Network Maintenance: Access and Testing* (Bellcore, 1997 Edition) *(A subset of OTGR, FR–439).*

11. FR–480, *OTGR Section 10: User System Interface* (Bellcore, 1997 Edition). *(A subset of OTGR, FR–439*).

Generic Requirements

1. GR–63–CORE, *Network Equipment-Building System (NEBS) Requirements: Physical Protection*, Issue 1 (Bellcore, October 1995). (A module of LSSGR, FR–64, TSGR, FR–440, and NEBSFR, FR-2063.)

2. GR–78–CORE, *Generic Requirements for the Physical Design and Manufacture of Telecommunications Products and Equipment,* Issue 1 (Bellcore, September 1997). (A module of RQGR, FR–796 and NEBSFR, FR–2063.)

3. GR-378-CORE, *Generic Requirements for Timing Signal Generators,* Issue 2 (Bellcore, February 1999).

4. GR–474–CORE, *OTGR Section 4: Network Maintenance: Alarm and Control for Network Elements,* Issue 1 (Bellcore, December 1997). (A module of OTGR, FR–439.)

5. GR–499–CORE, *Transport Systems Generic Requirements (TSGR): Common Requirements,* Issue 1 (Bellcore, December 1995). (A module of TSGR, FR–440.)

6. GR–831–CORE, *OTGR Section 12.1: Operations Application Messages - Language for Operations Application Messages,* Issue 1 (Bellcore, November 1996). (A module of OTGR, FR–439.)

7. GR–1089–CORE, Issue 2, Revision 1, 2-1999, Electromagnetic Compatibility and Electrical Safety– Generic Criteria for Network Telecommunications Equipment

Technical Advisories and Framework Technical Advisories

1. TA–NPL–000286 (not available).

2. TA–NPL–000464, *Generic Requirements and Design Considerations for Optical Digital Signal Cross-Connect Systems,* Issue 1 (Bellcore, September 1987).

3. TA–NWT–000487 (see GR–487–CORE).

4. TA–NWT–000782, *SONET Digital Switch Trunk Interface Criteria,* Issue 2 (Bellcore, October 1992).

5. TA–NWT–000983, *Reliability Assurance Practices for Optoelectronic Devices in Loop Applications*, Issue 2 (Bellcore, December 1993).

6. TA–TSV–001294, *Generic Requirements for Element Management Layer (EML) Functionality and Architecture,* Issue 1 (Bellcore, December 1992).

7. FA–NWT–001345, *Framework Generic Requirements for Element Manager (EM) Applications for SONET Subnetworks,* Issue 1 (Bellcore, September 1992).

8. TA–NWT–001385, *Generic Requirements for Optoelectronic Devices in Fiber Optic Systems,* Issue 1 (Bellcore, April 1993) plus Bulletin 1, January 1994.

9. TR–TSY–000825, *OTGR Section 10.A: User System Interface - User System Language,* Issue 2 (Bellcore, February 1988). (A module of OTGR, FR–NWT–000439.)

10. TR–TSY–000827, *OTGR Section 11.1: Generic Operations Interfaces: Non-OSI Communications Architecture,* Issue 1 (Bellcore, November 1988). (A module of OTGR, FR–439.)

11. TR–NWT–000835, *OTGR Section 12.5: Network Element and Network System Security Administration Messages,* Issue 3 (Bellcore, January 1993). (A module of OTGR, FR–439.)

12. TR–OPT–000839 (see GR–839–CORE).

13. TR–NWT–000917, *SONET Regenerator (SONET RGTR) Equipment Generic Criteria,* Issue 1 (Bellcore, December 1990). (A module of TSGR, FR–440.) TR–NWT–000930, *Generic Requirements for Hybrid Microcircuits Used in Telecommunications Equipment,* Issue 2 (Bellcore, September 1993). (A module of RQGR, FR–796.)

14. TR–NWT–001112, *Broadband-ISDN User to Network Interface and Network Node Interface Physical Layer Generic Criteria,* Issue 1 (Bellcore, June 1993).

15. TA–NPL–000286 (not available).

16. TA–NPL–000464, *Generic Requirements and Design Considerations for Optical Digital Signal Cross-Connect Systems,* Issue 1 (Bellcore, September 1987).

17. TA–NWT–000487 (see GR–487–CORE).

18. TA–NWT–000782, *SONET Digital Switch Trunk Interface Criteria,* Issue 2 (Bellcore, October 1992).

19. TA–NWT–000983, *Reliability Assurance Practices for Optoelectronic Devices in Loop Applications*, Issue 2 (Bellcore, December 1993).

20. TA–TSV–001294, *Generic Requirements for Element Management Layer (EML) Functionality and Architecture,* Issue 1 (Bellcore, December 1992).

21. FA–NWT–001345, *Framework Generic Requirements for Element Manager (EM) Applications for SONET Subnetworks,* Issue 1 (Bellcore, September 1992).

22. TA–NWT–001385, *Generic Requirements for Optoelectronic Devices in Fiber Optic Systems,* Issue 1 (Bellcore, April 1993) plus Bulletin 1, January 1994.

Technical References

1. TR–NWT–000057, *Functional Criteria for Digital Loop Carrier Systems*, Issue 2 (Bellcore, January 1993). (A module of TSGR, FR–440.)

2. TR–NWT–000078 (see GR–78–CORE).

3. TR–NWT–000170, *Digital Cross-Connect System (DSC 1/0) Generic Criteria*, Issue 2 (Bellcore, January 1993).

4. TR–NWT–000357, *Generic Requirements for Assuring the Reliability of Components Used in Telecommunication Systems,* Issue 2 (Bellcore, October 1993). (A module of RQGR, FR–796.)

5. TR–NWT–000418, *Generic Reliability Assurance Requirements for Fiber Optic Transport Systems,* Issue 2 (Bellcore, December 1992). (A module of RQGR, FR–796.)

6. TR–NWT–000468, *Reliability Assurance Practices for Optoelectronic Devices in Central Office Applications,* Issue 1 (Bellcore, December 1991). (A module of RQGR, FR–796.)

7. TR–NWT–000496, *SONET Add-Drop Multiplex Equipment (SONET ADM) Generic Criteria,* Issue 3 (Bellcore, May 1992). (A module of TSGR, FR–440.)

8. TR–NWT–000835, *OTGR Section 12.5: Network Element and Network System Security Administration Messages,* Issue 3 (Bellcore, January 1993). (A module of OTGR, FR–439.)TR–OPT–000839 (see GR–839–CORE).TR–NWT–000917, *SONET Regenerator (SONET RGTR) Equipment Generic Criteria,* Issue 1 (Bellcore, December 1990). (A module of TSGR, FR–440.)

9. TR–NWT–000930, *Generic Requirements for Hybrid Microcircuits Used in Telecommunications Equipment,* Issue 2 (Bellcore, September 1993). (A module of RQGR, FR–796.)

10. TR–NWT–001112, *Broadband-ISDN User to Network Interface and Network Node Interface Physical Layer Generic Criteria,* Issue 1 (Bellcore, June 1993).

11. TR–TSY–000191, *Alarm Indication Signal Requirements and Objectives,* Issue 1 (Bellcore, May 1986). (A module of TSGR, FR–440.)

12. TR–TSY–000454 (see GR–454–CORE).

13. TR–TSY–000458, *Digital Signal Zero, "A" (DS-0A 64 kb/s) Systems Interconnection,* Issue 1 (Bellcore, December 1989).

14. TR–TSY–000782, *SONET Digital Switch Trunk Interface Criteria,* Issue 2 (Bellcore, September 1989). (A module of LSSGR, FR–64, and TSGR, FR–440.)

15. TR–TSY–000824, *OTGR Section 10.1: User System Interface - User System Access,* Issue 2 (Bellcore, February 1988). (A module of OTGR, FR–439.)

16. TR–TSY–000825, *OTGR Section 10.A: User System Interface - User System Language,* Issue 2 (Bellcore, February 1988). (A module of OTGR, FR–NWT–000439.)

17. TR–TSY–000827, *OTGR Section 11.1: Generic Operations Interfaces: Non-OSI Communications Architecture,* Issue 1 (Bellcore, November 1988). (A module of OTGR, FR–439.)

18. TR-TSY-001003, *Generic Requirements for Embedded DC-to-DC Converters,* Bellcore Technical Reference.

EIA/TIA Documents

1. EIA/TIA–455–170, *Cutoff Wavelength of Single-Mode Fiber by Transmitted Power.*

2. EIA/TIA–492, *Generic Specification for Optical Waveguide Fiber.*

3. EIA/TIA–559, *Single-Mode Fiber Optic System Transmission Design.*

4. FOTP–127, *Spectral Characterization of Multimode Laser Diodes.*

5. OFSTP–2, *Effective Transmitter Output Power Coupled into Single-Mode Fiber Optic Cable.*

6. OFSTP–3, *Fiber Optic Terminal Receiver Sensitivity and Maximum Receiver Input Power.*

7. OFSTP–10, *Measurement of Dispersion Power Penalty in Single-Mode Systems.*

8. OFSTP–11, *Measurement of Single Reflection Power Penalty for Fiber Optic Terminal Equipment.*These publications are available from:
EIA/TIA Standards Sales Office
2001 Pennsylvania, NW
Washington, DC 20006
(202) 457-4963

Other Reference Documents

1. ETS 300 132-2, *European Telecommunication Standard, ETS 300 132-2, Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 2: Operated by direct current (dc).*

2. ETS 300 132-2, *DC system voltage requirements.*

3. ETS 300 253, *Earthing system requirements.*

4. FCC Part 15 Class A/GR 1089-CORE, *EMC requirements.*

5. IEC 654-4, *Airborne contaminants.*

6. IEC 68-2-10, *Mould growth.*

7. IEC 68-2-27, *Testing method, shock.*

8. IEC 68-2-29, *Testing method, shock.*

9. IEC 68-2-36, *Testing method, random vibration.*

10. IEC 917-2-2, *Dimensions for subracks and plug-in units.*

11. ISO 1043-1:1987, *Symbols for marking of polymers.*

12. ISO 1043-2:1988, *Symbols for marking of polymers.*

13. ISO 11469:1993, *Marking of polymers.*

14. ITU-T K21, *EMC immunity requirements.*

15. UL 1950/CSA C22.2 No 950-95, *Safety requirements.*

16. EN 300 386-2 class B, *EMC requirements.*

17. EN 60950, *Safety requirements.*

18. ETS 300 019 series, *ETSI environmental conditions and tests.*

19. ETS 300 119-2, *ETSI requirements for racks and cabinets.*

20. IEC 950/EN60950, *European Safety Requirements,* August 1993.

21. ITU-T Rec G.703.

22. ITU-T Rec G.704.

23. ITU-T Rec G.811.

24. ITU-T Rec G.812.

25. ITU-T Rec G.823.

26. RFC 1305, Network Time Protocol (Version 3), *Specification, Implementation and Analysis.*

27. RFC 3030, SMTP Service Extensions

28. T1 Technical Report No. 33, *A technical report on synchronization network management using synchronization status messages,* 1994.

29. EN 300 386-2 V1.1.3 (1997-12), Electro-magnetic Compatibility and Radio Spectrum Matters (ERM); Telecommunications Equipment Electro-Magnetic Compatibility (EMC) requirements; Part 2: Product Family Standard.

30. ETS 300 386-1 (1994) sub clause 6.4.2 & 7.2.3, Equipment Engineering (EE); Telecommunications Network Equipment Electro-Magnetic Compatibility (EMC) Requirements; Part 1: Product Family Overview, Compliance criteria and test levels.

31. EN 55022 (1994), Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment.

32. EN 61000-4-2 (1995), Electromagnetic Compatibility (EMC); Part 4: Testing and Measurement Techniques; Section 2: Electrostatic Discharge Immunity Test; Basic EMC publication.

33. EN 61000-4-3 (1996), Electromagnetic Compatibility (EMC); Part 4: Testing and Measurement Techniques; Section 3: Radiated, Radio Frequency, Electromagnetic Field Immunity Test.

34. EN 61000-4-4 (1995), Electromagnetic Compatibility (EMC); Part 4: Testing and Measurement Techniques; Section 4: Electrical Fast Transient/Burst Immunity Test; Basic EMC publication.

35. EN 61000-4-5 (1995), Electromagnetic Compatibility (EMC); Part 4: Testing and Measurement Techniques; Section 5: Surge Immunity Test.

36. EN 61000-4-6 (1996), Electromagnetic Compatibility (EMC); Part 4: Testing and Measurement Techniques; Section 6: Conducted Disturbances Induced by Radio Frequency Fields.

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