TimeCreator 1000

DOCSIS Timing Interface Server

User's Guide

Revision B – October 2008

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How to Use This Guide

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

In This Preface

- Purpose of This Guide
- Who Should Read This Guide
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Purpose of This Guide

The *TimeCreator 1000 User's Guide* describes the procedures for unpacking, installing, using, maintaining, and troubleshooting the Symmetricom TimeCreator 1000 DOCSIS Timing Interface Server (TimeCreator 1000). It also includes appendixes that describe alarms and events, the languages that you use to communicate with the TimeCreator 1000, default values, and other information.

Who Should Read This Guide

Chapter 1, Overview of the TimeCreator 1000, is written for non-technical audiences who need general information about the product. Chapter 2, Engineering and Ordering Procedures, and subsequent chapters contain technical information about the product. Other chapters and appendixes describe installation, maintenance, and configuration instructions or details primarily intended for qualified maintenance personnel.

This User's Guide is designed for the following categories of users:

- **Systems Engineers** – Chapter 1 provides an introduction to the TimeCreator 1000, Cross-references in this chapter direct you to detailed system information in other chapters as appropriate.

- **Installation Engineers** – Chapter 2 through Chapter 6 and the appendixes provide detailed information and procedures to ensure proper installation, operation, configuration, and testing of the TimeCreator 1000.

- **Maintenance Engineers** – Chapter 6 and the appendixes provide preventive and corrective maintenance guidelines, as well as procedures for diagnosing and troubleshooting fault indications and alarms.

While Chapter 1 is written for non-technical audiences who need information about the TimeCreator 1000 system, others, such as Chapter 2 through Chapter 6 contain detailed information and instructions which are intended to be performed by *qualified personnel* only.

Structure of This Guide

This guide contains the following sections and appendixes:

Chapter, Title	Description
Chapter 1, Overview of the TimeCreator 1000	Provides an overview of the product, describes the major hardware and software features, and lists the system specifications.
Chapter 2, Engineering and Ordering Procedures	Lists the part number and ordering procedure for all TimeCreator 1000 parts and accessories.
Chapter 3, Installing the TimeCreator 1000	Contains procedures for unpacking and installing the system, and for powering up the unit.
Chapter 4, General Guidelines for using the Symmetricom TimeCreator 1000	Provides basic information to which users can refer to ensure proper system operation.
Chapter 5, Provisioning	Describes the commands and procedures required to provision the TimeCreator 1000 after installing the unit.
Chapter 6, Maintenance and Troubleshooting	Contains preventive and corrective maintenance, and troubleshooting procedures for the product.
Appendix A, Alarms Events and System Messages	Lists the alarms and events and provides basic indications of the source of the alarm.
Appendix B, Command Descriptions and Communications Interface	Describes the CLI command conventions, functions, and features and the SNMP, NTP, SSH, and SFTP protocols.
Appendix C, Installing the Two-Way GPS Antenna	Provides procedures for installing a GPS antenna and connecting it to the TimeCreator 1000.
Appendix D, Specifications and Factory Defaults	Lists the specifications for the TimeCreator 1000.
Appendix E, Software Licenses	Contains licensing information for third party software.
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:
TimeCreator 1000 User's Guide	The title of a document.
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.
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.
qualified personnel	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

See your Symmetricom representative or sales office for a complete list of available documentation.

> **Note:** Symmetricom offers training courses designed to enhance your knowledge of the TimeCreator 1000. 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 Guide

Added "Managing the IP Address Whitelist" section to Chapter 5.

Added "Provisioning Root Server Recovery Modes" section to Chapter 5.

Added new commands in Appendix B:

- Set Authentication Radius Radiusserveraddress:port
- Set Configuration Restore user IMC
- Set Configuration Restore user IOC
- Show Logged-in-user
- Set Recvconfig IMC user@host:file
- Set Recvconfig IOC user@host:file
- Show Root-recovery Status
- Show Root-recovery Config
- Set Root-recovery Autorecoverymode
- Set Root-recovery Rapidrecovery
- Set Sendconfig IMC user@host:file
- Set Sendconfig IOC user@host:file

- Show SNMP v2
- Set SNMPv2
- Set SNMPv2 Rocommunity
- Set SNMPv2 Rwcommunity
- Show Whitelist
- Set Whitelist

Chapter 1 Overview of the TimeCreator 1000

This chapter provides introductory information for the TimeCreator 1000.

In This Chapter

- Overview
- Performance Monitoring
- Physical Description
- Functional Description
- Communication Ports
- Outputs
- Reference Inputs and TOD Sources
- Alarms

Overview

The TimeCreator 1000, shown in Figure 1-2, is a DOCSIS Timing Interface (DTI) Server that delivers accurate timestamp and frequency synchronization, and with GPS it can also provide Time of Day (TOD) to DTI client elements in a Modular Cable Modem Termination System (M-CMTS) architecture. M-CMTS elements shown in Figure 1-1 (Edge QAMs, Upstream Receivers, M-CMTS Core, etc.) use DTI to synchronize the DOCSIS Timestamp and Symbol Clock used in the DOCSIS communications between modems and the headend/hub. The TimeCreator 1000 functions as either a root server or subtending server. The root server is at the top of a server hierarchy and is the source of traceable time and frequency for all subtending DTI servers and clients in a building. The subtending server receives its time and frequency reference through a direct connection to a root server's DTI link connector; a subtending server cannot be referenced to another subtending server.
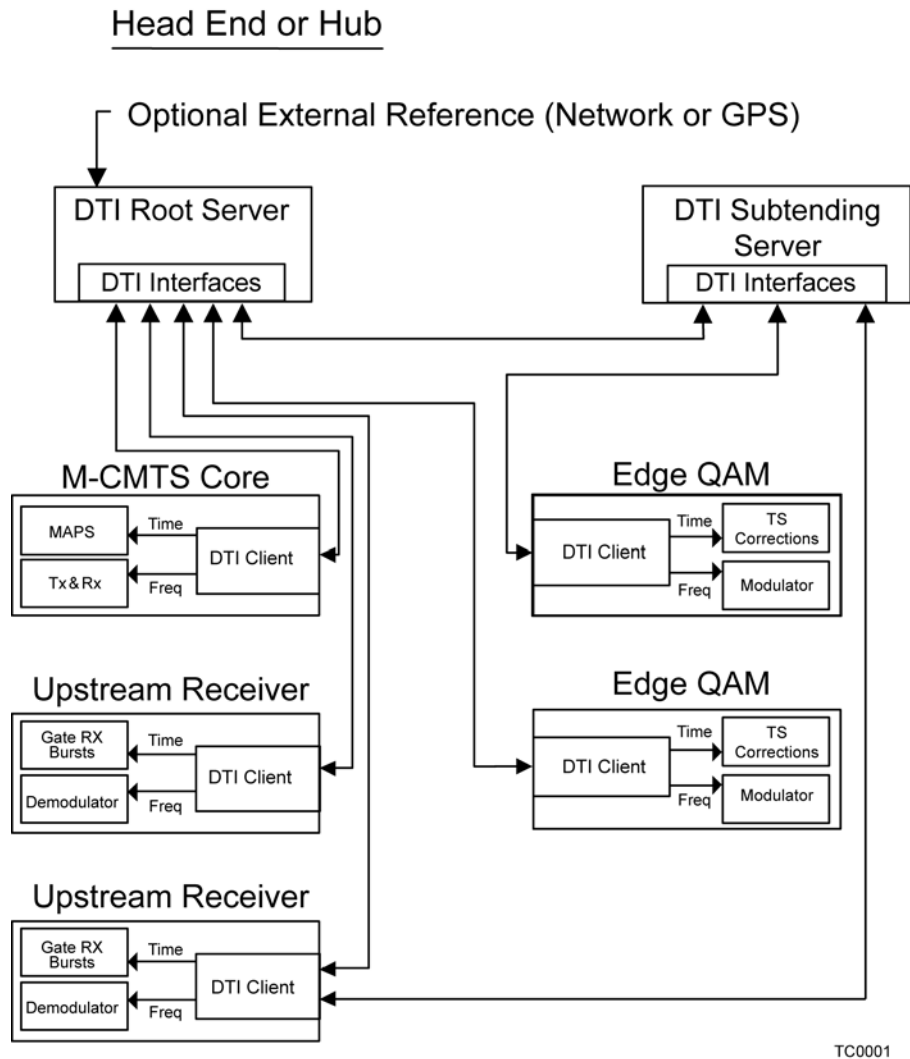
Figure 1-1.   DTI Server Hierarchy and M-CMTS Elements

A TimeCreator 1000 in a root server configuration can use either its internal clock as the master frequency for the headend/hub meeting DOCSIS specifications, or it can be configured to use GPS. GPS is required for Business Services over DOCSIS (BSoD), which allows you to deliver T1, E1, and NxDSO emulation services. GPS is also required for Network Time Protocol (NTP), common time between headends/hub, and other applications. NTP, the user-specified time, and the IMC's real-time clock (RTC) can also be used as a basis for the DOCSIS timestamp to provide system TOD for operation in free-run mode only.

The TimeCreator 1000 features include:

- 10+2 DTI Ports

  – 10 standard DTI Client Connections

  – 2 dual mode DTI Connections for use as a standard DTI Client Connection or input from a Root DTI ServerCarrier-Class Performance

- Optional High Reliability Redundant Operation

- SNMP, SSH, and CLI Management

- DTI Client Health Monitoring

- NTP Server Option

- TOD and BSoD Support (requires GPS input)

- Compact 1RU Design

- AC and DC Power Options

- Subtending of up to Twelve DTI Servers

- DTI Server Configurable with Dual Path Protection and 24 Hour Holdover

- Software Upgradeable
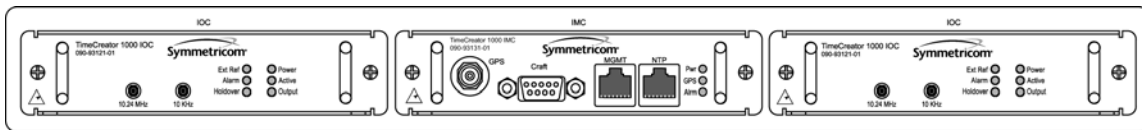
TC0002

Figure 1-2.   TimeCreator 1000 Front View
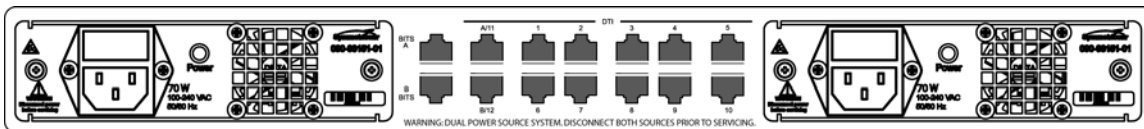
TC0003

Figure 1-3.   TimeCreator 1000 Rear View

Shelf

The TimeCreator 1000 shelf requires a minimum of three plug-in modules to operate:

- Power Supply module

- Input/Output/Clock (IOC) module

- Information Management Card (IMC) module.

It is recommended that a second Power Supply module and IOC are added to the configuration for redundant operation. Since the TimeCreator 1000 provides the Master DOCSIS Clock and Timestamp for the entire Headend or Hub site, it is designed to provide high reliability through redundancy, although redundancy is not required. The flexibility of configuration and therefore cost enables various deployment scenarios for root, slave, and protected architectures.

Input Signals

The TimeCreator 1000 can use either GPS or DTI signals as external input references to acquire the system's frequency, DTI timestamp, and TOD alignment. NTP and the user-specified time from the IMC's real-time clock (RTC) can also provide system TOD with much less accuracy. Only GPS can provide a common timestamp across the network for a distributed M-CMTS deployment. It is suggested that all root TimeCreator 1000 servers be configured with GPS. Upgrading any DTI Server from a user time or NTP time to GPS for BSoD or distributed M-CMTS architectures will require resetting the DOCSIS Timestamp and thus re-range all cable modems. The GPS input connects to the TNC connector on the IMC and the DTI input from a root DTI Server connects to the rear panel port A and port B RJ-45 connectors (labeled A/11 and B/12). NTP runs on the IMC's management Ethernet port.

> **Note:** When ports A/11 and B/12 are provisioned as outputs, they are referenced as Ports 11 and 12.

DTI Input Priority Level

You can assign a priority level to each DTI input and the value determines which input is used as the system reference. The range is 1 to 5 and the lower the priority level, the higher the priority. Use the Set Interface Priority command to provision these parameters.

Setting the Input Reference Switching Mode

The DTI reference selection at ports A and B can be either revertive or non-revertive. In the revertive mode, if an input used as the system reference is disqualified (for any reason), the reference switches to the next-highest input and reverts to the initial input when that input is re-qualified. In this mode, the reference switches two times: once when the disqualifying event occurs, and again when the

initial input is re-qualified. In the non-revertive mode, the system reference switches to the next-highest input but does not revert to the initial input when the initial input is re-qualified. The system reference switches only once when the disqualifying event occurs. Revertive mode is used when the port priorities are different and non-revertive mode is used when the priorities are the same.

Output Signals

The TimeCreator 1000 passes frequency and TOD output through rear panel DTI links. Ports 1 through 10 are permanent output ports and ports A/11 and B/12 can be provisioned as either outputs or inputs.

> **Note:** When ports A/11 and B/12 are provisioned as inputs, they are referenced as ports A and B.

Communications Ports

The EIA-232 serial and Ethernet connections are located on the IMC. The EIA-232 serial and Ethernet connections allow you to provision the system from a terminal or computer running a terminal emulation application.

Local Craft Serial Port

The EIA-232 port supports local control; you can configure the TimeCreator 1000 with commands using a terminal or personal computer (PC) with terminal emulation software. The connector is located on the IMC. The Local port is configured as a DCE interface and the default specifications are as follows:

- 8 data bits

- 1 stop bit

- no parity

- 9600 baud rate (57600 is supported only in the IMC rev H version 1.00.13 or below)

- Flow Control: None

Ethernet

An Ethernet connector provides connectivity to an Ethernet local area network and each port can be assigned a unique internet protocol (IP) address. Once the IP address is set and a connection is made to a local area network (LAN), you can access the TimeCreator 1000 on an intranet. The Ethernet port supports two simultaneous connections to port 23.

Clock Design

The TimeCreator 1000 clock design includes a highly stable ovenized Quartz crystal to produce accurate synchronization outputs. In a dual-IOC configuration, the clock function is redundant to provide protection. Each IOC qualifies the input signal and filters jitter and wander noise elements that may exist. In the event that all input references are lost or disqualified, the unit goes into holdover mode with the oscillator providing the system reference.

The IOC meets Type III performance.

Operating Modes

The TimeCreator 1000 has the following operating modes:

- **Warm-up** – The period immediately following power-up that allows local oscillator stabilization required for stable frequency generation from the system.

- **Free-run** – This operating mode allows the system to generate a DTI output that has stable generation of frequency and TOD when the system has no external frequency reference (GPS or DTI). TOD can be from NTP, a user-specified time, or from the IMC's real-time clock.

- **Fast-Lock** (Acquire) – In this mode the system quickly locks the local oscillator frequency to another frequency source (GPS or DTI reference) to establish the system's frequency and TOD.

- **Normal** (Locked) – In this operating mode, the system's output frequency and TOD are tracking the reference frequency (GPS or DTI) and TOD within the DTI specified requirements.

- **Bridging** – If all input references are lost, the TimeCreator 1000 goes into bridging mode. In this mode, the outputs continue to provide accurate timing for a limited period. If the system qualifies the reference prior to the end of the bridging time, the system re-enters Normal operation mode. If the inputs are not re qualified before the bridging time has elapsed, the TimeCreator 1000 enters holdover mode.

- **Holdover** – If the reference signal is lost, the clock enters holdover mode. The accuracy of the TimeCreator 1000 output is then dependent on the quality level of the oscillator.

- **Frequency Mode** – In this operating mode, the system's frequency is tracking the reference frequency (GPS). In this mode, a user can add a GPS reference to the TimeCreator 1000 and use the frequency from GPS to meet BSoD specifications without re-setting the DOCSIS Timestamp and causing a re-ranging of the cable modems.

Note: In Frequency Mode, DTI output and IMC GPS are not in sync.

Performance Monitoring

Server Status Monitoring

DTI client status log files provide information on client status, oscillator type, and the server's cable advance flag and cable advance value.

Phase Measurements

TheTimeCreator 1000 measures phase data. Peak to peak jitter and MTIE results are calculated for the user. Frame error rate (FER) is also calculated and made available to the user. It is calculated over a 10-second window.

MTIE Calculations

MTIE is a measure of the relative noisiness of a signal that relates to frequency offsets and phase transients. The TimeCreator 1000 automatically calculates MTIE for each enabled input from the most recent 1000 seconds. From this calculation, you can retrieve MTIE values for 35-second and user-configurable windows. You can set an alarm threshold for each of these windows; if the MTIE value exceeds this threshold and the alarm is enabled, the TimeCreator 1000 generates an alarm.

Physical Description

The TimeCreator 1000 consists of a 19-inch (48 cm) rack mount shelf, plug-in modules, AC power supply cables and *optional* GPS cables, and hardware.

Note: 23-inch (58.42 cm) rack mounting brackets are also available as a separately ordered item.

The front of the TimeCreator 1000 has two IOC module slots and one IMC module slot. The rear has two power supply slots, twelve DTI link connectors and two BITS connectors (see Figure 1-4). The minimum configuration is one Power module, one IOC module, and an IMC module. The second IOC and Power module slots are available for redundancy.

Note: The BITS connectors are not functional in this release.
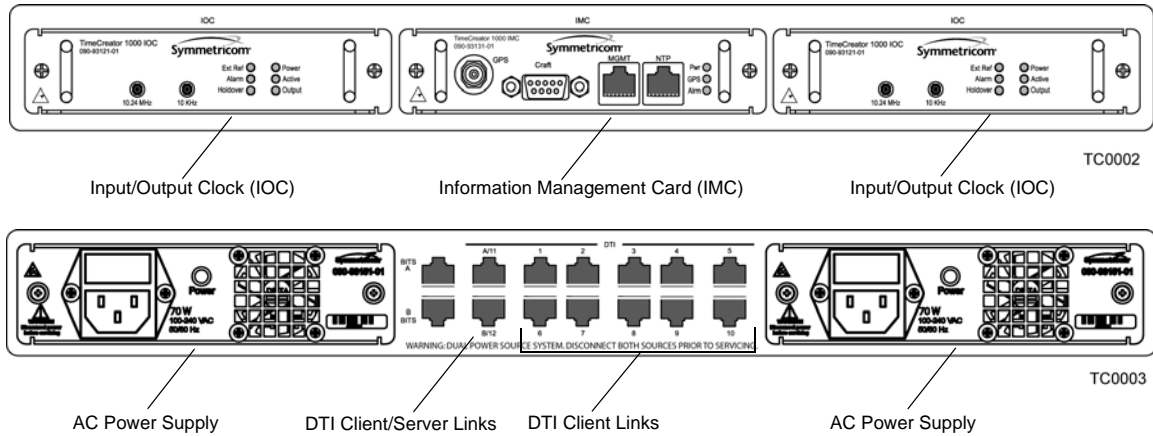
Figure 1-4.   TimeCreator 1000 Modules and DTI Links

Functional Description

The TimeCreator 1000 accepts one GPS input and two DTI inputs for system reference and it allows you to provision the DTI input reference priority. When a GPS or DTI reference is qualified as the system reference, the server uses the qualified reference to acquire the system's frequency, DTI timestamp, and TOD alignment.

The TimeCreator 1000 rear panel has ten DTI client links and two client/server links. Client links connect to an M-CMTS Core, Upstream receiver, Edge QAM, or DTI server. Server links allow a subtending server to receive time and frequency signals from a DTI root server. There are also two T1/E1 BITS frequency inputs.

Note: The BITS connectors are not functional in this release.

Figure 1-5 is a block diagram of the TimeCreator 1000, Figure 1-6 is a block diagram of the IMC card, and Figure 1-7 is a block diagram of the IOC card.
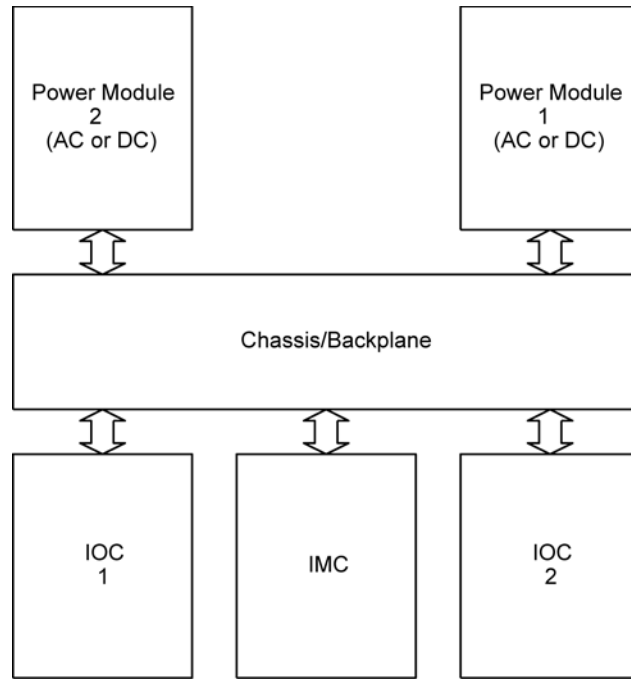
TC0012

Figure 1-5.   TimeCreator 1000 Block Diagram
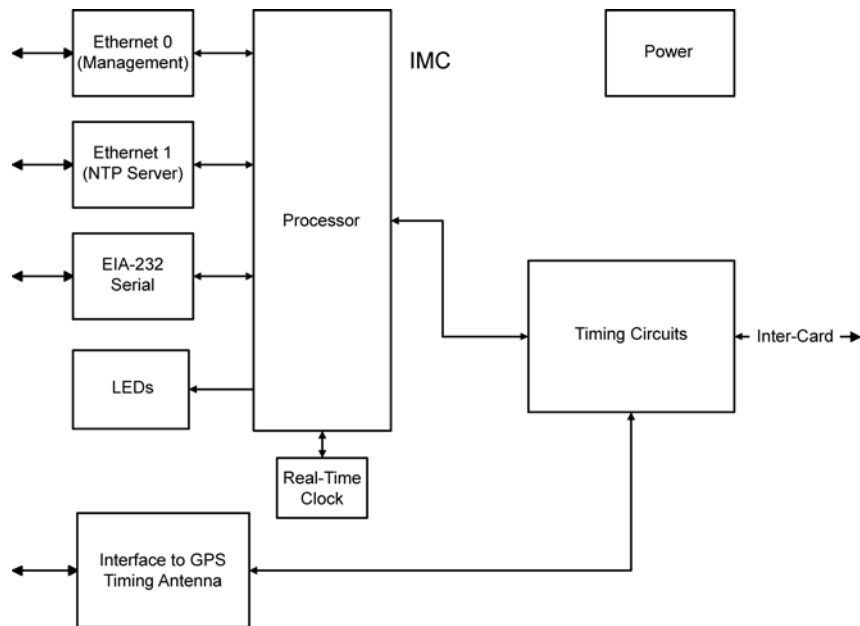
TC0014

Figure 1-6.   IMC Module Block Diagram
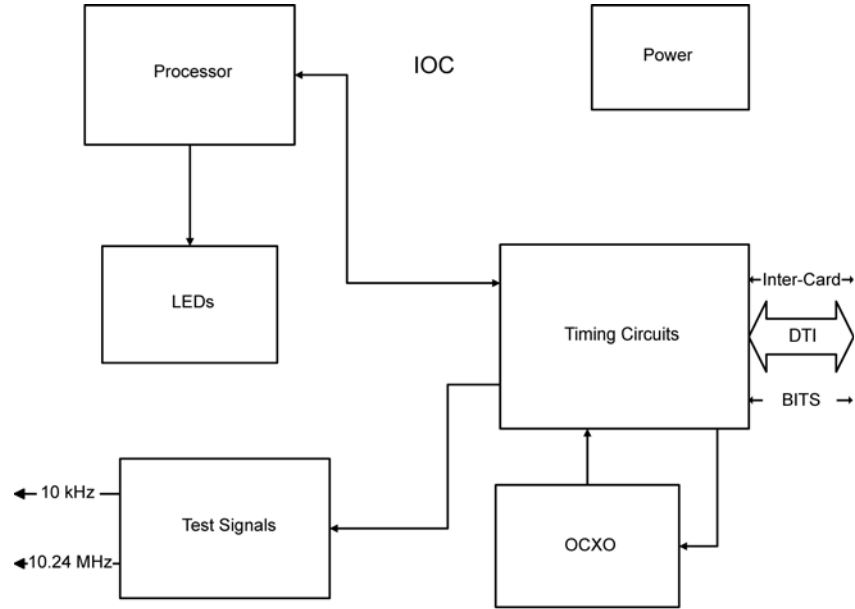
Figure 1-7.   IOC Module Block Diagram

IOC Module

The IOC module has LED status indicators and test outputs for the system. The LEDs indicate:

■ Power Status

■ Active Status

■ Output Status

■ External Reference Status

■ Alarm Status

■ Holdover Status

The test output connectors provide a 10.24 MHz master clock signal and a 10 kHz DTI frame clock signal.

IMC Module

Connectors for Ethernet management, NTP time server, EIA-232 serial, and the Two-Way GPS Timing Antenna connections are located on the IMC module. The IMC's LEDs indicate the following:

■ Power Status

■ Alarm Status

■ GPS Signal Status

Power Module

The TimeCreator 1000 allows either –48 V DC power connection, or 120/220 V AC power connection depending on the type of module used. The LED indicates power status.

Rear Panel Connectors

The TimeCreator 1000 rear panel connections are RJ-45 connectors. There are ten permanent DTI client connectors and two DTI client/server connectors that can be provisioned as either client or server links. This allows the TimeCreator 1000 to support up to 12 DTI client links, or when provisioned as a subtending server to receive two time and frequency references. There are also two BITS connectors.

Each DTI link connection has associated LEDs that indicate connection status.

Note: The BITS connectors are not functional in this release.

Communication Ports

Communications ports on the IMC allow you to provision, monitor, and troubleshoot the shelf. You communicate with the TimeCreator 1000 using either CLI or SNMP protocols.

Local Craft Serial Port

The EIA-232 port supports local control; you can configure the TimeCreator 1000 with CLI commands using a terminal or personal computer (PC) with terminal emulation software. The connector is located on the IMC. The Local port is configured as a DCE interface and the default settings are as follows:

- Baud = 9600 baud rate (57600 is supported only in the IMC rev H version 1.00.13 or below)
- Word Length = 8 bits
- Parity = None
- Stop bits = 1
- Software Handshaking, Xon/Xoff

Management Ethernet Port

The Management Ethernet connector provides connectivity to an Ethernet local area network. Each Ethernet port has a unique internet protocol (IP) address and once the IP address is set and a connection is made to a LAN, you can access the TimeCreator 1000.

NTP Server Ethernet Port

The NTP server port serves the TimeCreator 1000's system time to external NTP clients. The default source for the NTP timestamp is GPS, but if GPS is not configured, the NTP timestamp is the same as the DOCSIS timestamp. This Ethernet port is configured separately from the management port.

Outputs

The DTI link connectors use a single pair for transmission in both directions. The server and client alternate data transmission therefore eliminating the need for a crossover connection. The DTI server output is a Manchester encoded frame with an underlying bit-rate of 5.12 Mbps locked to the DTI Master Clock. You can enable or disable each output individually through user commands (see the command Set Interface, on page 135). The TimeCreator 1000 automatically calibrates each DTI Output when a DTI Client is connected eliminating the need to manually compensate for cable lengths. The maximum cable length is 656 Ft. (200 m).

The TimeCreator 1000 provides a 10.24 MHz master clock signal and a 10 kHz frame clock on the front panel.

Reference Inputs and TOD Sources

The TimeCreator 1000 can use either GPS or DTI signals as external input references to acquire the system's frequency, DTI timestamp, and TOD alignment. The GPS reference signal input connects to a TNC connector on the IMC module and the DTI reference signal input is connected to RJ-45 connectors labeled A/11 and B/12 on the rear panel. The Set Interface Priority user command allows you to set priority levels for the two DTI reference signals (see the command Set Interface, on page 135).

> **Note:** When ports A/11 and B/12 are provisioned as outputs, they are referenced as ports 11 and 12.

NTP, the user-specified time, and the IMC's real-time clock (RTC) provide system TOD for operation in free-run mode only. The default settings provision the TimeCreator 1000 to operate in free-run mode only.

> **Note:** The BITS input connectors are not functional in this release.

It is recommended that the root server in a DTI network with root and subtending servers be referenced to GPS. Using GPS allows the user to recover from root server outages with minimal cable modem re-ranging. The root server can be set to user mode and still provide protection from excessive re-ranging, but requires some additional network resources to enable an orderly network recovery from any major root outages. If, for example, a power outage affects the root server, it must have a way to recover the previous network time and phase when it returns to normal operation. To do this the TimeCreator has a 'Root-Server Recovery' function that re-synchronizes the root server to the rest of the network. To accomplish this there has to be a connection between the root server, port 12 and a subtending server port 1. When the root server recovers power (or has been serviced) it will automatically query time from a subtending server so that it will not cause unnecessary cable modem re-ranging.

Alarms

The TimeCreator 1000 uses alarms to notify you when certain conditions are deteriorating below user-specified levels. These alarms are indicated by module status LEDs and by SNMP traps. You can provision the alarm to either be enabled or disabled and the current alarm state can be obtained via the communication ports. For more information, see Provisioning Alarms, on page 84 and Appendix A, Alarms Events and System Messages.

Chapter 2 Engineering and Ordering Procedures

This chapter describes the items available for the TimeCreator 1000, and lists the part number for each item.

In This Chapter

- Overview
- TimeCreator 1000 Part Numbers
- User-Supplied Tools and Materials

Overview

The TimeCreator 1000 can operate in either a basic configuration, or in a redundant configuration in one shelf. Basic configuration consists of the following components:

- 1 Shelf
- 1 IMC module
- 1 AC or DC power module
- 1 IOC module

Note: When operating in basic configuration, blank panels are available to cover the vacant module slots in the shelf.

Redundant configuration consists of the following components:

- 1 Shelf
- 1 IMC module
- 2 AC or DC power modules
- 2 IOC modules

TimeCreator 1000 Part Numbers

System Configurations

This section provides part numbers and descriptions for the various system configurations and parts available for the TimeCreator 1000. Table 2-1 provides a list of common configurations and Table 2-2 lists the shelf component and accessory part numbers.

Table 2-1. Common Configurations

System Configuration	Part Number
TimeCreator 1000 No Redundancy With NA AC Power - see Table 2-4	990-93101-01
Basic Slave - NA AC Power (1 SH, 1 IMC, 2 IOC, 2 AC) - see Table 2-5	990-93105-01
Basic Slave - DC Power (1 SH, 1 IMC, 2 IOC, 2 DC) - see Table 2-6	990-93106-01
Basic Root - NA AC Power (1 SH, 1 IMC, 2 IOC, 2 AC, GPS) - see Table 2-7	990-93107-01
Basic Root - DC power (1 SH, 1 IMC, 2 IOC, 2 DC, GPS) - see Table 2-8	990-93108-01

Table 2-1. Common Configurations (Continued)

System Configuration	Part Number
Enhanced Root - NA AC Power (1 SH, 1 IMC, 2 IOC, 2 AC, GPS, NTP) - see Table 2-9	990-93109-01
Enhanced Root - DC power (1 SH, 1 IMC, 2 IOC, 2 DC, GPS, NTP) - see Table 2-10	990-93110-01

Table 2-2. Component Part Numbers

Item	Part Number
Shelf	090-93100-01
IOC Module	090-93121-01
IMC Module	090-93131-01
DC Power Module	090-93141-01
AC Power Module	090-93151-01
IOC Module Slot Blank Panel	090-93122-01
Power Module Slot Blank Panel	090-93142-01

Two-Way GPS Antenna

Table 2-3 lists the parts available for the GPS antenna.

Table 2-3. GPS Parts and Accessories

Part Number	Description
990-93500-01[1]	Two Way Antenna Kit
090-58545-01	Two Way GPS Antenna (spare)
043-00018-01	Lightning suppressor (spare)
060-58545-01	RG-58 cable, 3 m (10 ft.)
060-58545-02	RG-58 cable, 6 m (20 ft.)
060-58545-05	RG-58 cable, 15 m (50 ft.)
060-58545-10	RG-58 cable, 30 m (100 ft.)
060-58545-20	RG-58 cable, 60 m (200 ft.)
060-58545-30	RG-58 cable, 90 m (300 ft.)

Table 2-3. GPS Parts and Accessories (Continued)

Part Number	Description
060-58545-50	RG-58 cable, 150 m (500 ft.)
154-00023-01	Crimp tool for RG-58 cable
371-001	TNC connectors for RG-58 cable

Note:

[1]   Kit includes GPS antenna, mounting hardware, and lightning suppressor. Order antenna cables separately

Common Configuration Parts Lists

The following tables list the items shipped with each common system configuration. In addition, Table 2-11 provides a list of items shipped with the GPS Antenna Kit, and Table 2-12 provides the NTP option license part number.

Table 2-4. TimeCreator 1000 No Redundancy - NA AC Power - P/N 990-93101-01

Item	Part Number	Quantity
TimeCreator 1000 Shelf (SH)	090-93100-01	1
TimeCreator 1000 IOC card (IOC)	090-93121-01	1
TimeCreator 1000 IMC card (IMC)	090-93131-01	1
TimeCreator 1000 AC power card (AC)	090-93151-01	1
TimeCreator 1000 Blank Panel for power slot (BPP)	090-93142-01	1
TimeCreator 1000 Blank panel for IOC slot (BPI)	090-93122-01	1
NA AC power connector cable	160-00004-02	1
CD Manuals	998-93101-01	1

Table 2-5. Basic Slave - NA AC Power - P/N 990-93105-01

Item	Part Number	Quantity
TimeCreator 1000 Shelf (SH)	090-93100-01	1
TimeCreator 1000 IOC card (IOC)	090-93121-01	2
TimeCreator 1000 IMC card (IMC)	090-93131-01	1

Table 2-5. Basic Slave - NA AC Power - P/N 990-93105-01 (Continued)

Item	Part Number	Quantity
TimeCreator 1000 AC power card (AC)	090-93151-01	2
NA AC power connector cable	160-00004-02	2
CD Manuals	998-93101-01	1

Table 2-6. Basic Slave - DC Power - P/N 990-93106-01

Item	Part Number	Quantity
TimeCreator 1000 Shelf (SH)	090-93100-01	1
TimeCreator 1000 IOC card (IOC)	090-93121-01	2
TimeCreator 1000 IMC card (IMC)	090-93131-01	1
TimeCreator 1000 DC power card (DC)	090-93141-01	2
CD Manuals	998-93101-01	1

Table 2-7. Basic Root - NA AC Power - P/N 990-93107-01

Item	Part Number	Quantity
TimeCreator 1000 Shelf (SH)	090-93100-01	1
TimeCreator 1000 IOC card (IOC)	090-93121-01	2
TimeCreator 1000 IMC card (IMC)	090-93131-01	1
TimeCreator 1000 AC power card (AC)	090-93151-01	2
2-way Timing Antenna	090-58545-01	1
GPS/volute ant bracket kit	093-00001-01	1
TimeProvider/TimeCreator GPS hardware kit	093-58545-01	1
IF antenna mounting kit	093-72010-71	1
AC power connector cable	160-00004-02	2
CD Manuals	998-93101-01	1

Table 2-8. Basic Root - DC power - P/N 990-93108-01

Item	Part Number	Quantity
TimeCreator 1000 Shelf (SH)	090-93100-01	1
TimeCreator 1000 IOC card (IOC)	090-93121-01	2
TimeCreator 1000 IMC card (IMC)	090-93131-01	1
TimeCreator 1000 DC power card (DC)	090-93141-01	2
2-way Timing Antenna	090-58545-01	1
GPS/volute ant bracket kit	093-00001-01	1
TimeProvider/TimeCreator GPS hardware kit	093-58545-01	1
IF antenna mounting kit	093-72010-71	1
CD Manuals	998-93101-01	1

Table 2-9. Enhanced Root - NA AC Power - P/N 990-93109-01

Item	Part Number	Quantity
TimeCreator 1000 Shelf (SH)	090-93100-01	1
TimeCreator 1000 IOC card (IOC)	090-93121-01	2
TimeCreator 1000 IMC card (IMC)	090-93131-01	1
TimeCreator 1000 AC power card (AC)	090-93151-01	2
License Certificate	920-93200-01	1
2-way Timing Antenna	090-58545-01	1
GPS/volute ant bracket kit	093-00001-01	1
TimeProvider/TimeCreator GPS hardware kit	093-58545-01	1
IF antenna mounting kit	093-72010-71	1
NA AC power connector cable	160-00004-02	2
CD Manuals	998-93101-01	1

Table 2-10. Enhanced Root - DC power - P/N 990-93110-01

Item	Part Number	Quantity
TimeCreator 1000 Shelf (SH)	090-93100-01	1
TimeCreator 1000 IOC card (IOC)	090-93121-01	2
TimeCreator 1000 IMC card (IMC)	090-93131-01	1
TimeCreator 1000 DC power card (DC)	090-93141-01	2
License Certificate	920-93200-01	1
2-way Timing Antenna	090-58545-01	1
GPS/volute ant bracket kit	093-00001-01	1
TimeProvider/TimeCreator GPS hardware kit	093-58545-01	1
IF antenna mounting kit	093-72010-71	1
NA AC power connector cable	160-00004-02	2
CD Manuals	998-93101-01	1

Table 2-11. GPS Antenna Kit - P/N 990-93500-01

Item	Part Number	Quantity
2-way Timing Antenna	090-58545-01	1
GPS/volute ant bracket kit	093-00001-01	1
TimeProvider/TimeCreator GPS hardware kit	093-58545-01	1
IF antenna mounting kit	093-72010-71	1

Table 2-12. NTP option - P/N 990-93200-01

Item	Part Number	Quantity
License Certificate	920-93200-01	1

User-Supplied Tools and Materials

You need to supply the following tools and materials for installing and testing the TimeCreator 1000.

- Phillips-head screwdriver to install the TimeCreator 1000 shelf in a rack

- ESD wrist strap for installing modules

- Digital multimeter (Fluke 77 or equivalent) for verifying power connections to the shelf

- Laptop computer with communications software (e.g., Windows Hyperterminal, ProComm Plus) for setting system parameters

These standard tools and materials are not supplied, but may be required for installing the GPS antenna and the Two-Way Antenna Interface:

- Standard tool kit

- Fasteners for mounting the equipment in rack

- PVC glue

Chapter 3 Installing the TimeCreator 1000

This chapter describes the procedures for installing the TimeCreator 1000.

In This Chapter

- Getting Started
- Unpacking the Unit
- 097-93100-01 Revision B – October, 2008
- Working With Modules
- Making Signal Connections
- Making Ground and Power Connections
- Installation Check List
- Applying Power to the TimeCreator 1000

Getting Started

Before you begin to install the TimeCreator 1000, review the information in this section.

If you encounter any difficulties during the installation process, contact Symmetricom Global Services (SGS). See Obtaining Technical Assistance, on page 97 for telephone numbers. SGS includes Product Technical Support for technical information, and Customer Service for information about your order, RMAs, and other information.

Site Survey

Before you begin installation, determine the shelf location, ensure the appropriate power source is available (–48 V DC or 120/220 V AC depending on power module type), and ensure that the equipment rack is properly grounded.

The TimeCreator 1000 is designed to mount in a 19-inch (48 cm) rack, occupies 1.75 in (4.5 cm, 1 RU) of vertical rack space, and has a depth of 20 in (50.8 cm).

Note: 23-inch (58.42 cm) rack mounting brackets are also available as a separately ordered item.

Environmental Requirements

To prevent the unit from malfunctioning or interfering with other equipment, install and operate the unit according to the following guidelines:

- Operating temperature: 32° F to 104° F (0° C to 40°C)

- Operating Humidity: 10% to 90% RH non-condensing

- Use only shielded cable for all signal wiring, including I/O, clocks and Ethernet. Ground appropriately at both ends, or as required by local standards.

Note: Continuing improvements to the design of the Time Creator 1000 have lowered the level of emissions. UTP cable can be used for DTI links with Time Creator chassis revisions E or greater (revision is on label on bottom of shelf). UTP cable can be used for Ethernet connections to IMC's revisions H or later.

■ Secure all cable screws to their corresponding connectors.

⚠ **Caution:** To avoid interference, you must consider the electromagnetic compatibility (EMC) of nearby equipment when you install the TimeCreator 1000.

Electromagnetic interference can adversely affect the operation of nearby equipment.

Installation Tools and Equipment

You will need the following tools and equipment to install the TimeCreator 1000:

■ Standard tool kit

■ Cable ties, waxed string or acceptable cable clamps

■ No. 18 AWG (minimum) wire at 300volt insulation for –48 V DC

■ No. 12 AWG wire to connect grounding lug to permanent earth ground

■ Signal wiring (including DTI Links, GPS, and Ethernet) uses shielded cabling of the appropriate impedance required by the specific signal type

■ Mating connectors for terminating signal wiring

■ Fasteners for mounting the equipment in rack

■ Digital Voltmeter (DVM)

Unpacking the Unit

The TimeCreator 1000 is packaged to protect it from normal shock, vibration and handling damage.

⚠ **Caution:** To avoid electrostatic discharge (ESD) damage to parts that are packaged with the TimeCreator 1000, observe the following procedures.

Unpack and inspect the unit as follows:

1. Wear a properly grounded protective wrist strap or other ESD device.

2. Inspect the container for signs of damage. If the container appears to be damaged, notify both the carrier and your Symmetricom distributor. Retain the shipping container and packing material for the carrier to inspect.

3. Open the container, being careful to cut only the packaging tape.

4. Locate and set aside the printed information and paperwork that is included in the container.

5. Remove the unit from the container and place it on an anti-static surface.

6. Locate and set aside small parts which may be packed in the container.

7. Remove the accessories from the container.

8. Remove the anti-static packaging from the unit and accessories.

9. Verify that the model and item number shown on the shipping list agrees with the model and item number on the equipment. The item number can be found on a label affixed to the unit. Contact your Symmetricom distributor if the model or item number do not match.

For a complete listing of item numbers, contact your Symmetricom distributor.

Rack Mounting the Shelf

The installation procedure described in this section provides general guidelines for installing the TimeCreator 1000. Always follow applicable local electrical codes.

Use the following steps to mount the TimeCreator 1000 in a 19- or 23-inch (48 or 58.42 cm) rack.

Note: The TimeCreator 1000 comes equipped with 19-inch rack mounting brackets. 23-inch rack mounting brackets are available as a separately ordered item.

1. If necessary, attach the rack mounting brackets to the shelf using 6-32 x 1/4-inch screws. Ensure that the mounting brackets on both sides are attached at equal distances from the front of the unit (see Figure 3-1).

2. Mount the shelf to the front of the equipment rack rails with four screws and associated hardware. Use the proper screws for the equipment rack.
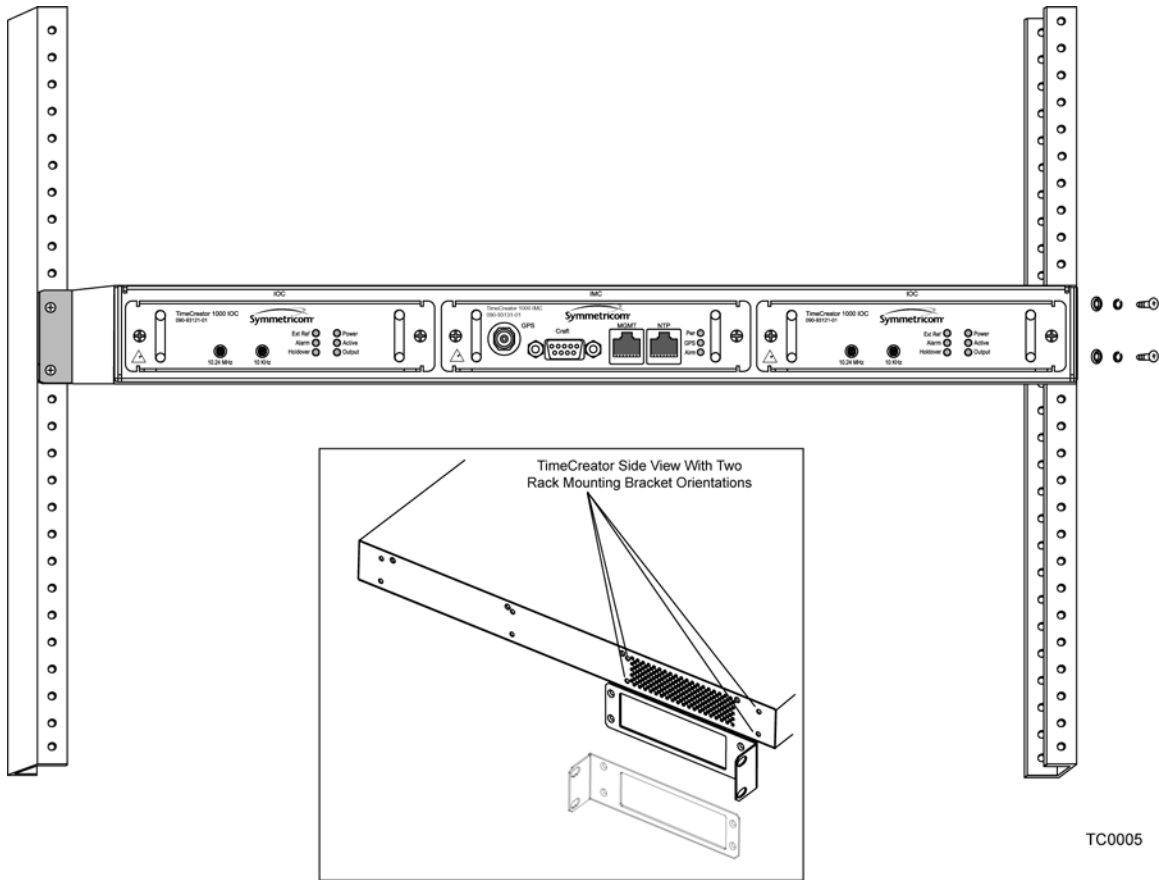
Figure 3-1. Installing the TimeCreator 1000

Working With Modules

This section describes how to install, remove, and handle the modules associated with the TimeCreator 1000.

Handling Modules

When handling any of the modules, observe the following precautions:

1. Use proper static control precautions when handling modules! Protect the equipment against ESD (electrostatic discharge) by using a grounded protective wrist strap and normal equipment grounding.

2. Avoid touching component leads and edge connectors.

3. Avoid placing the module on an ungrounded surface.

4. Avoid allowing the module to come in contact with insulated surfaces.

Inserting Modules

This procedure is common for all modules.

> ⚠ **Caution:** You must disconnect power prior to removing the power module, but all other modules can be removed and inserted while system power is supplied without damaging modules; however, system performance may be affected.

Use the following procedure to insert a module into the shelf:

1. Align the module edges within the guides of the selected slot.

2. Slide the module into the chassis and press firmly until it seats fully into its backplane edge connector. Handles on each side of the faceplate are provided for removing and inserting the module.

3. Tighten the captive screws located on each side of the panel.

> ⚠ **Caution:** To avoid possible damage or intermittent failures, ensure that you have completely inserted the module into the chassis and that you have securely tightened the captive screws.

> 📝 **Note:** A Phillips screw driver is required to tighten or loosen the power supply module fasteners.

Removing Modules

To remove a module, loosen the captive screws and then pull out on the handles located on each side of the module. Be sure to place the module on a static-free surface.

> ⚠ **Caution:** You must disconnect power prior to removing the power supply module.

> ⚠ **Caution:** You must disconnect the GPS antenna before removing the IMC module or removing ground connection.

Making Signal Connections

The connectors for the GPS input signal, Management and NTP Server Ethernet connections, and EIA-232 serial connection are located on the IMC module. The rear panel has RJ-45 connectors for ten client DTI links, two DTI client/server links, and two T1/E1 BITS frequency links.

Note: The T1/E1 BITS links do not function in this release.

Making Communications Connections

The IMC allows user control of the TimeCreator 1000. The EIA-232 serial port, Ethernet Management port, and NTP server port are located on the IMC as shown in Figure 3-2. See Working With Modules, on page 47 for module installation instructions.
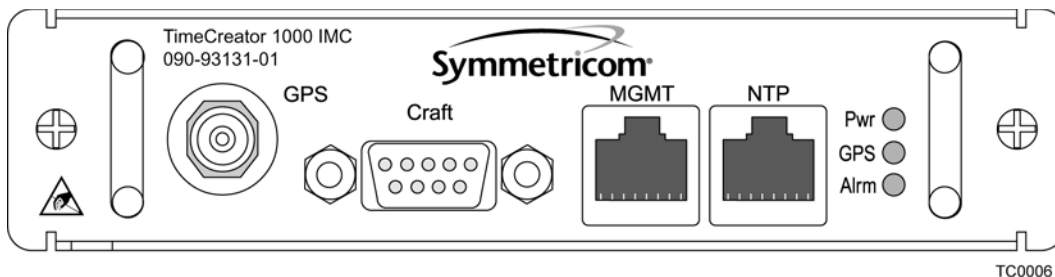
Figure 3-2.   IMC Module

Ethernet Management and NTP Server Ports

The Ethernet Management and NTP server ports are standard 10Base-T/100Base-T shielded RJ-45 receptacles. To connect the TimeCreator 1000 to an Ethernet network, and to connect the NTP server to an NTP client, use shielded twisted pair Ethernet RJ-45 cable.

Note: Continuing improvements to the design of the Time Creator 1000 have lowered the level of emissions. UTP cable can be used for DTI links with Time Creator chassis revisions E or greater (revision is on label on bottom of shelf). UTP cable can be used for Ethernet connections to IMC's revisions H or later.

The connector pinouts are listed in Table 3-1.

Table 3-1. Management and NTP Server Ethernet Connector Pin Assignments

Signal Name	Pin
TX+ (Transmit positive)	1
TX- (Transmit negative)	2
RX- (Receive negative)	3
RX+ (Receive positive)	6
Not Used	4, 5, 7, 8

EIA-232 Serial (Craft) Port

The EIA-232 serial port connection is made through a DE9S female connector on the IMC. This ports allow you to connect to a terminal or PC using a terminal emulation software package for remote monitoring and control. When connecting to this port, use a shielded EIA-232 direct connect cable with the cable shield connected to pin 1.

Figure 3-3 shows the EIA-232 connector pin assignments for the serial port.
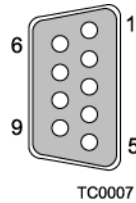
Figure 3-3.   Serial Port Connector Pins

Table 3-2 describes the EIA-232 connector pin assignments for the serial port.

Table 3-2. Serial Port Connector Pin Assignments

Signal	Pin
TXD (Received Data)	2
RXD (Transmitted Data)	3
Ground	5

GPS Connections

The TimeCreator 1000 GPS input TNC connector is located on the IMC. To connect a GPS signal, you must install a GPS antenna. For detailed installation instructions, see Appendix C, Installing the Two-Way GPS Antenna. In addition to the installation instructions, this appendix also provides a list of the standard tools you will need and a list of available parts. See Working With Modules, on page 47 for module installation instructions.

⚠ **Caution:** The GPS cable should only be connected while the unit is properly grounded.

Input and Output Connections

The DTI link and BITS connections are RJ-45 connectors located on the rear panel (see Figure 3-4).

Note: The BITS connectors are not functional in this release.

Note: Guidelines for deploying the TimeCreator 1000 are available in the application note titled "Deploying Reliable DOCSIS Synchronization.Visit Symmetricom's website at the following URL to access this application note.

http://www.symmetricom.com/resources/downloads/application-notes

DTI Connectors

The DTI server and client connections are shielded RJ-45 receptacles on the rear panel and they are standard 10Base-T/100Base-T connectors. The client connectors are ports 1 through 10 and additionally ports 11 and 12 if these two ports are provisioned as outputs. The server connectors are ports A and B if these two ports are provisioned as inputs.

To connect a TimeCreator 1000 server output to M-CMTS components, install a shielded twisted pair RJ-45 cable, CAT5E or better, between the M-CMTS components and the rear panel DTI server output connector (port 1-10 or port 11 or 12 if optioned as a server port).

Note: Continuing improvements to the design of the Time Creator 1000 have lowered the level of emissions. UTP cable can be used for DTI links with Time Creator chassis revisions E or greater (revision is on label on bottom of shelf).

To connect a TimeCreator 1000 root server to a subtending server, install a shielded twisted pair RJ-45 cable, CAT5E or better, from the root server's rear panel DTI connector to the subtending server's client input port (port A or port B, when optioned as 'client').

> **Note:** Continuing improvements to the design of the Time Creator 1000 have lowered the level of emissions. UTP cable can be used for DTI links with Time Creator chassis revisions E or greater (revision is on label on bottom of shelf).

If the root server in a DTI network with subtending servers is set to user mode to utilize root server recovery, a connection should be made from the root server port 12 to a subtending server port 1. This enables root server recovery, in an orderly manner, from any outages affecting the root server

The connector pinouts are listed in Table 3-3.

Table 3-3. DTI and Root DTI Connector Pin Assignments

Signal Name	Pin
SIG+ (Positive Side of Transmitted/Received Data)	1
SIG– (Negative Side of Transmitted/Received Data)	2
Not Used	3, 4, 5, 6, 7, 8
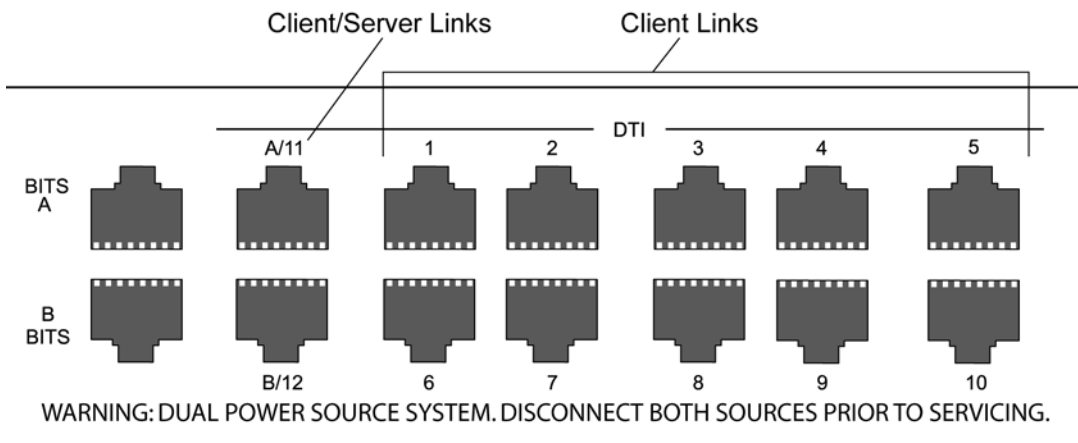
Figure 3-4.   Rear Panel DTI Links

Making Ground and Power Connections

The TimeCreator 1000 has the option of using either 120/220 V AC, or –48 V DC power. For non-redundant operation, install either one AC module or one DC module. For redundant operation, install either two AC modules, two DC modules, or one AC and one DC module (see Figure 3-6).

Ground Connections

After installing the TimeCreator 1000 into the rack, connect the shelf to the proper grounding zone or master ground bar. The grounding lug is a screw on the side of the unit, near the back. Using a ring terminal on the 12 AWG wire, connect the ground lug to permanent earth ground

Recommendation: Although there are a number of methods for connecting the equipment to earth ground, Symmetricom recommends running a cable of the shortest possible length from the ground lug to earth ground.

Power Connections

Install the appropriate power module and make the power connections as follows:

DC Power

1. Ensure the power source is turned off.

2. Connect the frame ground terminal to earth ground.

3. Locate power terminals on the –48 V DC Power Module.

4. Using 16 AWG (minimum) stranded wire, connect primary power to the terminal screws. Symmetricom recommends that you use a #6 spade lug termination for each power lead.

Warning: To avoid possible damage to equipment, you must provide power source protective fusing as part of the installation.
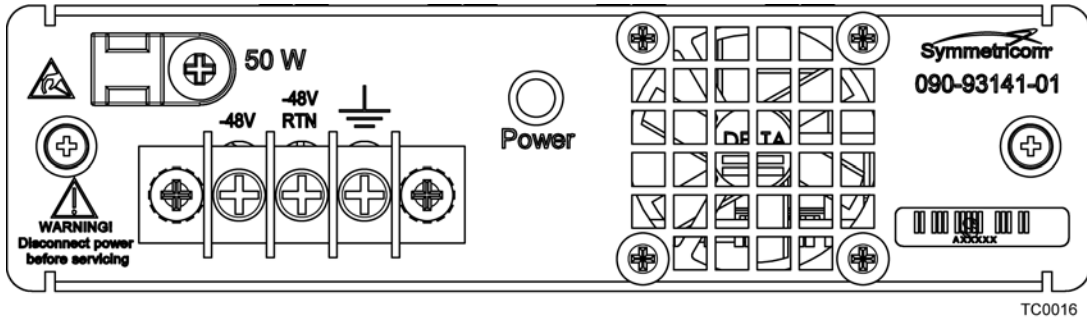
Figure 3-5.   TimeCreator 1000 DC Power Module

AC Power

1. Ensure the power source is turned off.

2. Connect the power cord to the power connector on the 120V-220V AC Power Module.

> **Note:** The AC power socket contains two 2 amp fuses: one in line and one spare.

3. Connect the power cord to the power source.

> **Warning:** To avoid possible damage to equipment, you must provide power source protective fusing as part of the installation.
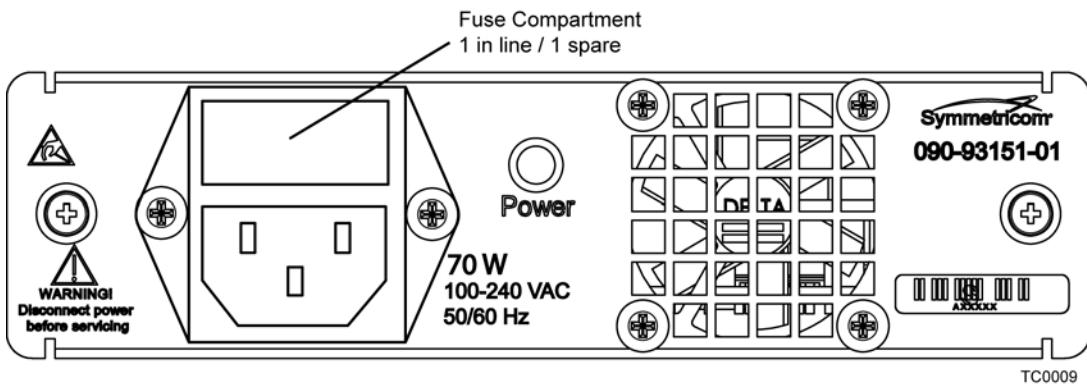
Figure 3-6.   TimeCreator 1000 AC Power Module

Installation Check List

To verify that the installation of the TimeCreator 1000 is complete, perform the checks and procedures in Table 3-4.

Table 3-4. Installation Completeness Checklist

Operation	Complete
Ensure the TimeCreator 1000 chassis is securely attached to mounting rack	
Ensure that the appropriate modules (and filler panels if needed) are installed	
Verify that all power and ground wires are installed correctly and securely	
Verify that all communications cables are properly installed	
Verify that all input and output cables are properly installed	

Applying Power to the TimeCreator 1000

The TimeCreator 1000 is not equipped with a Power switch. DC power is controlled by a power distribution panel. AC power is applied when a standard 120 or 220 V AC power cord connected to the 100-240 AC Power module is plugged into the appropriate power outlet.

Normal Power Up Indications

As the TimeCreator 1000 powers up and begins normal operation, the IOC module and IMC module LEDs all turn on. After the module self-test is complete and the module firmware is operational, the LED states may change to indicate the appropriate state or status.

Table 3-5 provides a description of the module LEDs.

Table 3-5. Module LED Descriptions

LED	Color	Description
Power Module		
Status	Off	Power input not connected or Power Module Failure
	Green	Power Module is functioning properly

Table 3-5. Module LED Descriptions (Continued)

LED	Color	Description
IMC Module		
Power	Off	Module power fault
	Green	Module power is functioning properly
GPS	Off	System is not provisioned to use GPS reference
	Amber	GPS input is enabled but GPS input has not been qualified as reference
	Green	System is provisioned to use GPS reference and GPS reference is qualified as reference
Alarm	Off	There are no alarms being generated by the system
	Red	There are alarms being generated by the system
Ethernet Connection	Off	No Ethernet link established
	Green	Ethernet link established
Ethernet Activity	Off	No Ethernet activity
	Amber	Blinks with Ethernet activity
IOC Module		
Ext Ref	Off	System is not provisioned to use external references
	Amber	System is provisioned to use external references, but at least one of the reference inputs has been disqualified from being selected as system reference
	Green	System is provisioned to use external reference(s) and all reference inputs are qualified as possible system references
Power	Off	Module power fault
	Green	Module power is functioning properly
Alarm	Off	There are no alarms being generated by IOC Module's components, Input, Outputs, Clocks, etc.
	Red	There are alarms being generated by IOC Module's components, Input, Outputs, Clocks, etc.
Active	Off	Module is in Standby Mode
	Green	Module is in Active Mode, output source
Holdover	Off	Module is not in Holdover
	Amber	Module is in Holdover
Output	Off	DTI output error or port is in standby mode
	Green	All DTI server ports are operating normally

Table 3-5. Module LED Descriptions (Continued)

LED	Color	Description
DTI Links		
A/11 - B/12 DTI Client State	Off	Disabled, or Enabled and qualified as reference input
	Amber	Enabled and not qualified as reference input
A/11 - B/12 DTI Client Connection Status	Off	Disabled or not connected to DTI Server
	Green	Connected to DTI Server
A/11 - B/12 DTI Server State	Off	Disabled, or client operating normally
	Amber	1. Enabled, client indicates Warm-up, Free-run, Holdover, or Acquire states 2. In Test Mode, the DTI Output State LED and DTI Server Port Connectivity Status LED alternate being ON and OFF
A/11 - B/12 DTI Server Connection Status	Off	Disabled or not connected to DTI client
	Green	1. Connected to DTI client 2. In Test Mode, the DTI Server Port State LED and DTI Server Port Connectivity Status LED alternate being ON and OFF
1 - 10 DTI Server State	Off	Disabled, or client operating normally
	Amber	1. Enabled, client indicates Warm-up, Free-run, Holdover, or Acquire states 2. In Test Mode, the DTI Output State LED and DTI Server Port Connectivity Status LED alternate being ON and OFF
1 - 10 DTI Server Connection Status	Off	Disabled or not connected to DTI client
	Green	1. Connected to DTI client 2. In Test Mode, the DTI Server Port State LED and DTI Server Port Connectivity Status LED alternate being ON and OFF

Chapter 4 General Guidelines for using the Symmetricom TimeCreator 1000

This chapter describes

In This Chapter

- Clock Operations
- GPS
- NTP Client Mode
- DHCP
- CLI commands

Clock Operations

For TOD sources of RTC, user, and NTP, the unit initially sets the time from the selected source. The unit then operates in freerun. The unit will not update the time, phase, or frequency.

The user can force an update in the user and NTP modes. In GPS mode, the initial time is set from GPS, and the unit maintains frequency and phase lock to GPS.

When recovering from extended holdover, the frequency is locked to the GPS reference. If the phase error is small, the phase is corrected by slewing. If the phase error is large, an alarm is generated and the user will need to command the phase to be corrected. This prevents unmanaged discontinuities of the DOCSIS time stamp.

Table 4-1. TOD Source Modes

TOD Source	Initial Time	Frequency Lock	Phase Lock
RTC (Default)	Real-time clock	Freerun	Freerun
User	User	Freerun	Freerun
NTP	NTP	Freerun	Freerun
GPS	GPS	GPS	GPS
DTI (subtending)	Root server	Root server	Root server

GPS

Refer to the user manual for proper installation of the GPS antenna. Proper cable, grounding techniques, and lightning arrestors should be used. Mount the antenna outside, preferably on the roof with a clear view of the sky. *Do not* mount the antenna near a wall or other obstruction blocking part of the sky. Mount the antenna well above roads or parking lots.

Allowed at least one hour for the unit to track and lock to GPS.

NTP Client Mode

If the system time is off by more than four hours, then the system mode should be set to user mode and the time set to within four hours. The unit can then be configured to use NTP.

Since the unit only sets the time once, the time could be off by more than 100 ms if this procedure is not followed.

DHCP

This unit's DHCP client will not continually attempt to acquire an IP address if the Ethernet cable is not connected at power up, or when DHCP mode is enabled.

After the cable is connected, enter the following commands to restart DHCP:

```
set ip-state eth0 disable

set ip-state eth0 enable
```

CLI commands

> **Note:** The "sync tod-source now" command used in some of the following examples forces the TimeCreator 1000 to immediately start using the new reference for time and frequency. This command is useful in lab tests, but its use should be carefully planned since it may cause cable modems to resync.

Logging In And Out

The default administrator user name is "admin" with password "SymmTC1000"

To logout:
```
Logout
```

Adding And Deleting Users

Only an administrator-level user can add or delete users.

Additional users can be added with the `set user` command

Saving The Present Configuration To Non-volatile Memory

```
Set configuration backup
```

Restoring Default Configuration

To restore factory defaults, while preserving users and IP configuration:
```
Set configuration default
```

To restore factory defaults:

```
Set configuration factory
```

Determining Status

```
Show alarms (presently active alarms)

Show status (general status of unit)

Show gps (GPS information)

Show inventory
```

Enabling Outputs

Example for port 5:

```
Set interface state port 5 enable
```

Setting The Output To Test Mode

Example for port 9:

```
Set interface test-mode port 9 enable
```

Configuring For Default Mode (Real Time Clock)

```
Set tod-source rtc

Sync tod-source now
```

Configuring For User Mode

```
Set tod-source user
```

Example to set the clock in user mode:

```
Set clock date 2006-05-20 time 10:23:00

Sync tod-source now
```

Configuring For GPS Mode

```
Set tod-source gps

Set interface state gps enable
```

(Wait until GPS is available)

```
Sync tod-source now
```

Configuring For NTP Mode

```
Show clock
```

Example if time is more than 4 hours off:

```
Set tod-source user
Set clock date yyyy-mm-dd time hh:mm:ss

Set tod-source ntp

Set NTP-server add <ip address>

Set service ntpd disable

Set service ntpd enable

Sync tod-source now
```

Configuring For Subtending Mode

Example for portA (port 11):

```
Set tod-source dti

Set interface type porta client

Set interface state port 11 enable (Previous 2 commands must be
issued first)
```

Example on root server using port 5:

```
Set interface state port 5 enable

Set interface tod-mode verbose
```

Forcing Unit To Send New Time

If you change the TOD source after the unit has left warm-up, you must enter the
following command to change the time and DOCSIS time stamp:

```
Sync tod-source now
```

If you change to GPS, enter the command after the unit is ready; use the `show
alarms` command and check for the presence of the "jam sync required" alarm to
indicate readiness.

This command should also be entered after you change the time in user mode.

Setting Manual Cable Advance

Example to set cable advance for port 5 to 0x001023:

```
Set cable-adv port 5 manual 00:10:23
```

Setting Auto Cable Advance

Example to set cable advance for port 5:

```
Set cable-adv port 5 auto
```

Configuring Static IP

Example for host ip address of 192.168.5.2, with router gateway at 192.168.5.1:

```
Set ip-state eth0 disable

Set ip-mode eth0 mode static

Set ip eth0 addr 192.168.5.2

Set ip eth0 mask 24

Set ip eth0 gateway 192.168.5.1

Set ip eth0 broadcast 192.168.5.255

Set ip-state eth0 enable
```

Configuring Dynamic IP

Ethernet cable should already by connected and DHCP server configured:

```
Set ip-state eth0 disable

Set ip-mode eth0 mode dhcp

Set ip-state eth0 enable
```

Switching Active And Standby Cards

Example for IOC 1 presently active, and switching to IOC 2):

```
Set ioc-state IOC2 active
```

Chapter 5 Provisioning

This chapter describes the procedures for provisioning the TimeCreator 1000. Use the procedures in this chapter after you have installed and powered up the TimeCreator 1000 (see Chapter 3, Installing the TimeCreator 1000).

In This Chapter

Establishing a Connection to the TimeCreator 1000

To set up and manage the TimeCreator 1000 with a terminal or a computer with terminal emulation, you must establish either a serial connection or an Ethernet connection. To connect through the serial port, see Communicating Through the Serial Port, on page 66. If the TimeCreator 1000 is connected to an Ethernet LAN, use the procedure described in Communicating Through the Ethernet Port, on page 66.

> **Note:** Before you can communicate with the TimeCreator 1000 through an Ethernet connection, you must first configure the Ethernet port using the serial connection.

Communicating Through the Serial Port

An EIA-232 serial port is available on the IMC module for a direct serial connection to a terminal or a computer with terminal emulation. Use the following procedure to connect the TimeCreator 1000 to a terminal or a computer with terminal emulation through a straight serial cable:

> **Note:** For information on restricting user access, see Managing the User Access List, on page 68.

1. Connect one end of a straight cable to the serial port on the computer or terminal and the other end to the EIA-232 connector on the IMC.

2. Configure the emulation software for 8 data bits, 1 stop bit, no parity, and 9600 baud rate.

> **Note:** 57600 baud rate is supported only in the IMC rev H version 1.00.13 or below.

3. Start the terminal emulation software and press **Enter**. The system prompt should appear. If it does not, recheck each step in this procedure.

Communicating Through the Ethernet Port

To communicate with the TimeCreator 1000 using an Ethernet LAN connection, you must first configure the Ethernet port through the EIA-232 serial port.

Configuring the Ethernet Port

Use the following procedures to configure the TimeCreator 1000 Ethernet parameters (IP Address, Subnet Mask, and Gateway Address).

> **Note:** The TimeCreator 1000 default IP address is 10.0.0.100, the subnet mask is 255.255.255.0, and the gateway address is 0.0.0.0. If these defaults are acceptable, the following procedure using the serial port is not required.

1. Establish a direct serial connection to the TimeCreator 1000 as described in Communicating Through the Serial Port, on page 66.

2. Provision the IP, Gateway, and Subnet Mask addresses for the TimeCreator 1000. The IT department or site administrator for your location can recommend specific addresses for these parameters. The mask is specified as a prefix number which is the number of 1's from the MSB with the remaining bits set to 0. For example 255.255.255.0 is set with the value 24.Use the dotted decimal format xxx.xxx.xxx.xxx to enter the address parameter with the following commands:

Example

Type `set ip eth0 addr 192.168.0.10`, then press **Enter**.
Type `set ip eth0 gateway 192.168.0.254`, then press **Enter**.
Type `set ip eth0 mask 24`, then press **Enter**.
Type `set ip-state eth0 restart`

Connecting Through an Ethernet LAN

1. Ensure that the TimeCreator 1000 is connected to a LAN (see Making Communications Connections, on page 49 for details).

2. Telnet from your PC to the IP address assigned to the TimeCreator 1000 (see Configuring the Ethernet Port, on page 67).

3. Type your user name and press **Enter**. If you are not assigned as a user in the system, contact the system administrator or see Adding a User, on page 69.

4. Type your assigned password and press **Enter**. The system prompt appears.

Managing the User Access List

When you are logged in at the Admin level you can add, edit, or delete user names in the user access list. The user list can contain up to 20 names and users can be set to one of three different security levels described in Table 5-1. Users are required to enter a user name and password to log in to the system. Users can access or modify only the parameter settings allowed by their assigned security level.

> ⚠ **Caution:** To avoid a possible service call, do not lose or misplace the user name and password of the Admin-level user.

> ⚠ **Caution:** After three failed login attempts the user account is locked out; this includes the admin user. To avoid a service call, it is recommended that at least two admin-level users be configured.

Table 5-1. User Level and Access

Security Level	Description
User	Users can edit their password and retrieve information, or access any command at the User security level.
Power-User	Users are allowed to change configuration and issue User-level commands.
Admin	Users are allowed to modify the security database or download new firmware and issue commands at any level.

Use the procedures in this section to manage user access to the TimeCreator 1000.

Login

Use the following procedure to log in to the system at the admin level.

1. Ensure that the TimeCreator 1000 is connected to a LAN, or directly connected to a PC through the EIA-232 serial port. See Making Communications Connections, on page 49.

2. If the TimeCreator 1000 is connected to a LAN Telnet from your PC to the assigned IP address.

   If the TimeCreator 1000 is connected to a PC directly through the serial port, start a Telnet session and press **Enter**.

3. Type your user name and press **Enter**. The system prompts for a password.

4. Type your password and press **Enter**. The system prompt appears.

> **Note:** The unit's default user name is admin and the default password is SymmTC1000. To avoid unauthorized access, you should change the default user name and password.

Adding a User

Use the following procedure to add a user to the system access list.

> **Note:**
>
> User passwords can contain numbers, upper and lowercase letters, and the character set ":;<=>?@".
>
> For a description of user access levels, see Managing the User Access List, on page 68.

1. Login at the Admin level (see Login, on page 68).

2. Type `show user` and press **Enter** to view the current list of users.

3. Type `set user add` and press **Enter**. The system prompts you for a user name.

4. Type a user name and press **Enter**. The name you enter will be the log-in name for the user. The system prompts you for a password.

5. Type a password and press **Enter**. The password you enter will be the log-in password for the user. The system responds with the confirm password prompt.

6. Retype the password and press **Enter**. The system prompts you for an access level.

7. Type the user access level and press **Enter**.

8. Type `show user` and press **Enter** to verify that the account exists (repeat steps 4, 5, and 6 to add other users).

Deleting A User

Use the following procedure to delete user ABC from the system access list.

1. Login at the Admin level (see Login, on page 68).

2. Type `show user` and press **Enter** to view the current list of users.

3. Type `set user del abc` and press **Enter**.

Displaying Current Users and User Access Levels

Use the following procedure to retrieve a list of all assigned users and their access levels.

1. Login at the Admin level (see).

2. Type `show user` and press **Enter**. The system displays the current list of users.

Displaying Logged in Users

Use the following procedure to retrieve a list of users that are currently logged in.

1. Login at the Admin level (see).

2. Type `show logged-in-user` and press **Enter**. The system displays the current list of users who are logged in.

Changing a User's Password and Access Level

Use the following procedure to change the password and access level.

Note:

All users can change their own password with Set User Password command.

User passwords can contain numbers, upper and lowercase letters, and the character set ":;<.

For a description of user access levels, see .

---

1. Login at the Admin level (see).

2. Type `show user` and press **Enter** to view the current list of users.

3. Type `set user modify <user> password` and press **Enter**. The system prompts you for a password.

4. Type the user's password and press **Enter**. The system responds with the confirm password prompt.

5. Type the user's password again and press **Enter**.

6. Type `set user modify <user> access-level` and press **Enter**. The system prompts you for the new access level.

Locking Out a User

Use the following procedure to prevent user ABC from logging on to the system.

1. Login at the Admin level (see Login, on page 68).

2. Type `show user` and press **Enter** to view the current list of users.

3. Type `set user lock abc` and press **Enter**.

Managing the IP Address Whitelist

The whitelist feature in TimeCreator allows the user to filter IP access addresses to prevent malicious attacks. In the default condition, all IP addresses are allowed access. Once the first IP address has been added to the whitelist, any future IP sessions will only be accepted if they originate from IP addresses from the whitelist. Symmetricom recommends that users enable this feature, especially if the management port is connected to a public network rather than a private network.

Note: Symmetricom recommends that the IP address of the administrator station always be added to the whitelist first. This will prevent an accidental lockout of the administrator via Telnet/SSH.

The whitelist must be committed before any changes to the whitelist will be implemented.

Add an IP Address to the Whitelist

Use the dot-decimal notation format xxx.xxx.xxx.xxx to enter the IP address parameter.

1. Login at the Admin level (see Login, on page 66).

2. To view the current list of IP addresses on the whitelist, type `show whitelist` and press **Enter**.

3. To add a specific IP address to the whitelist, type `set whitelist add <ip address>` and press **Enter**. (For example, `set whitelist add 192.168.5.10`).

4. To add IP addresses using a subnet mask, type `set whitelist add <ip address>/<ip mask>` and press **Enter**. The mask indicates which parts of the IP address are significant – it is specified as a prefix number which is the number of

1's from the MSB with the remaining bits set to 0. A mask of 255.255.255.0 is set with the value 24. (For example, `set whitelist add 192.168.5.0/24`) The default value is 32, or 255.255.255.255, to match the full 32-bit IP address. .

5. Type `set whitelist commit` and press **Enter.**

Delete an IP Address From the Whitelist

1. Login at the Admin level (see Login, on page 66).

2. To view the current list of IP addresses on the whitelist, type `show whitelist` and press **Enter**.

3. Type `set whitelist delete <ip address>` and press **Enter**. (For example, `set whitelist delete 192.168.5.10`).

4. Type `set whitelist commit` and press **Enter.**

Set the Whitelist to Default

1. Login at the Admin level (see Login, on page 66).

2. Type `set whitelist default` and press **Enter.**

Provisioning Login Authentication

The authentication scheme used in the TimeCreator 1000 allows you to provision either a RADIUS or TACACS+ server IP address and authentication key(s) for server access. If RADIUS or TACACS+ is enabled, the system allows local login if the server doesn't authenticate the user and the user is configured locally.

To provision the authentication scheme for the local device:

Type `set authentication local` and press **Enter**.

To provision the RADIUS server IP address and the authentication key for server access:

1. Type `set authentication radius server <address>` and press **Enter** (address is the server IP address, for example 192.168.0.10).

2. Type `set authentication radius key <key>` and press **Enter** (key is up to 32 ASCII characters).

3. Type `set authentication radius enable` and press **Enter**.

To provision the TACACS+ server IP address and the authentication key for server access:

1. Type `set authentication tacacs+ server <address>` and press **Enter** (address is the server IP address, for example 192.168.0.10).

2. Type `set authentication tacacs+ key <key>` and press **Enter** (key is up to 32 ASCII characters).

3. Type `set authentication tacacs+ enable` and press **Enter**.

Provisioning Services

Using the Set Service command, you can control the TimeCreator 1000 services (see Set Service, on page 160). This command allows you to enable or disable the following services:

- EIA-232
- Telnet
- SSH
- NTP
- SNMP

Example

To enable NTP, enter the following command:

Type `set service ntp enable` and press **Enter**.

Provisioning the Ethernet Ports

The TimeCreator 1000 supports static IP addresses as well as dynamically allocated addresses on the MGMT (Management) port and NTP port. The dynamically allocated address requires a connection to a DHCP server. When provisioning the unit for static IP address, you can set the Host address, Mask address, and Gateway address, or you can set the addresses to the factory default. See Appendix D, Specifications and Factory Defaults for default IP addresses.

Static IP Mode

Use the following procedure to configure the TimeCreator 1000 IP parameters (Host Address, Subnet Mask, and Gateway Address) on the MGMT port. Use the dot-decimal notation format xxx.xxx.xxx.xxx to enter the address parameter.

Example

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set ip-mode eth0 mode static` and press **Enter**.

3. Type `set ip eth0 addr 192.168.0.10` and press **Enter**.

4. Type `set ip eth0 mask 24` and press **Enter**.

5. Type `set ip eth0 gateway 192.168.0.1` and press **Enter**.

6. Type `set ip-state eth0 restart` and press **Enter**.

DHCP Mode

You can either enable or disable DHCP mode on the MGMT port or NTP port. Use the following procedure to configure the TimeCreator 1000 to enable DHCP on the MGMT port.

Example

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `ip-mode eth0 mode dhcp` and press **Enter**.

3. Type `set ip-state eth0 restart` and press **Enter**.

Setting the System Date Time and Time Offset

The TimeCreator 1000 Time of Day can be set either by an external source, or manually with the Set Clock command. You can set the time and date only in the user tod-source mode. Use the following procedure to manually set the system date, time, and time offset:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set clock date <date value> time <time value>` and press **Enter**. Enter the date value in format yyyy-mm-dd.

3. Type `set clock offset <offset value>` and press **Enter**. Enter the time offset value in format hh-mm. Only offsets corresponding to valid time zones are supported. The time offset will only affect the time associated with the logs.

Setting the DTI Server Type

The TimeCreator 1000 can be provisioned as a root server operating with a GPS external reference, or if no external reference is qualified, it can operate in free-run mode. The TimeCreator 1000 can also be provisioned to operate as a subtending server receiving its reference from a root DTI server.

The TimeCreator 1000 stays in warm-up until the time is obtained. If RTC mode is selected, then the time is already available. Other modes need to obtain the time from an external source. Once the unit has passed beyond warm-up, a jam sync is required to adjust the time when changing the TOD source.

> ⚠️ **Warning:** Changing the TOD source and performing the jam sync may require cable modems to re-sync. For information on jam sync, see Force System Time to Reference (Jam Sync), on page 79 and refer to the command Sync TOD-Source, on page 168.

Use the following procedure to provision the TimeCreator 1000 mode of operation as either a root DTI server or subtending server.

> **Note:** A TimeCreator 1000 that is provisioned as a subtending server must use the reference source of a root DTI server.

Root DTI Server in Free-run Mode

The TimeCreator 1000 operates in free-run mode when there is no qualified external reference and the TOD is either set by the user, set with NTP, or set to the default Real Time Clock (RTC) mode.

User Time Set Mode
The Set Clock Date Time command is used to set the system time.

Example

To provision the TimeCreator 1000 as a root server in free-run mode with the TOD set by the user to the current time, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set tod-source user` and press **Enter**.

3. Type `set clock date <date> time <time>` and press **Enter**.

NTP (Client) Set Mode
The Set TOD-Source NTP command is used to provision the Time of Day source to be an NTP server.

Example

To provision the TimeCreator 1000 as a root server with an NTP server supplying
the TOD, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set tod-source ntp` and press **Enter**.

Default Time Set Mode
In the default mode, the time is obtained from the real-time clock on the IMC card.

Example

To provision the TimeCreator 1000 TOD source to be the IMC's real-time clock
(RTC), perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set tod-source rtc` and press **Enter**.

Root DTI Server in GPS Mode

In GPS mode, the time is obtained from GPS. The system waits until it has valid
time from GPS before it transitions out of warm-up.

Example

To provision the TimeCreator 1000 as a root server with GPS as the external
reference, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set tod-source gps` and press **Enter**.

3. Type `set interface tod-mode verbose` and press **Enter**.

Subtending DTI Server Mode

A TimeCreator 1000 provisioned as a subtending server must connect directly to a
root DTI server through the DTI client interface. A subtending server cannot be
referenced to another subtending system. The root server must be in the verbose
TOD mode so that the subtending server can obtain the necessary information via
the DTI link.

Example

To provision the TimeCreator 1000 as a subtending server, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set tod-source dti` and press **Enter**.

3. Follow the steps in Provisioning the Input Reference, on page 77 to provision the input reference ports.

> **Note:** The root server *must* be in verbose TOD mode. On the root server, enter the following command: Type `set interface tod-mode verbose` and press **Enter**.

Provisioning the Input Reference

When operating in normal (locked) mode, the TimeCreator 1000 uses the external reference (GPS or DTI) to acquire the system's frequency, DTI timestamp, and TOD alignment. DTI references are connected to ports A and B and you can provision a priority level for each port. You can also provision NTP to provide TOD. The TOD source must be set prior to enabling the desired interface.

Setting the GPS Parameters

When the GPS reference is enabled, you can set the satellite position parameters either automatically or manually. In manual mode, you must specify the latitude, longitude, and height. You can also specify the elevation mask which filters the satellites used by the system.

Example

To provision the TimeCreator 1000 to set a GPS reference for manual mode and specify the position, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Verify that the TOD source has been set to GPS.

3. Type `set interface state gps enable` and press **Enter**.

4. Type `set gps mode manual position <latitude> <longitude> height` (in meters) and press **Enter**.

Setting the DTI Parameters

DTI references connect to ports A and B. When you provision DTI as a reference, you must enable the ports and set them for client mode. You can also set a priority value for each port.

Example

To provision ports A and B for DTI reference, set port A for a priority of 1 and port B for a priority of 2 then perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Verify that the TOD source has been set to DTI. This must be set before the state or type can be set.

3. Type `set interface type portA client` and press **Enter**.

4. Type `set interface type portB client` and press **Enter**.

5. Type `set interface state port 11 enable` and press **Enter**.

6. Type `set interface state port 12 enable` and press **Enter**.

7. Type `set interface priority portA 1` and press **Enter**.

8. Type `set interface priority portB 2` and press **Enter**.

Setting the NTP Parameters

When the TimeCreator 1000 is provisioned for free-run mode, the unit can set its time from an external NTP server connected to the MGMT port.

Example

To enable the MGMT port to receive TOD from an NTP server, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Verify that the TOD source has been set to NTP.

3. Type `set service ntp enable` and press **Enter**.

4. Type `set firewall ntp enable` and press **Enter**.

5. Type `set ntp-server add <ip address>` and press **Enter**. If required by the NTP server, specify a keyID with the NTP-Server command, use the NTP-Key

command to add key configuration, and NTP-Authorization to enable or disable authorization operation.

Force System Time to Reference (Jam Sync)

The "jam sync" function allows you to either set the current time as TOD immediately, or to specify when the "jam sync" will occur.

> ⚠️ **Warning:** Changing the TOD source and performing the jam sync may require cable modems to re-sync. For information on jam sync, see Force System Time to Reference (Jam Sync), on page 79 and refer to the command Sync TOD-Source, on page 168.

Example

To immediately perform a "jam sync", perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `sync tod-source now` and press **Enter**.

Provisioning the DTI Links

The TimeCreator 1000 rear panel has ten permanent DTI client links that provide DTI timing signals to client elements in an M-CMTS architecture. There are also two DTI client/server ports that can be provisioned as either DTI reference links (for subtending servers), or as additional DTI links to client elements. DTI ports 11 and 12 must be provisioned to the appropriate type, either client or server, before being enabled or disabled.

The LED status indicators on the DTI links are described in Table 5-2.

Enabling and Disabling the DTI Server Links

To enable all DTI link ports, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set tod-source dti` and press **Enter**.

3. Type `set interface state all enable` and press **Enter**.

Enabling and Disabling the DTI Client/Server Links

To set up ports 11 and 12 as client DTI links, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set interface type portA client` and press **Enter**.

3. Type `set interface type portB client` and press **Enter**.

4. Type `set interface state port 11 enable` and press **Enter**.

5. Type `set interface state port 12 enable` and press **Enter**.

Table 5-2. DTI Link LED Indicators

Indicator	Color	Description
DTI Output Status	Off	1. A DTI output issue exists on at least one DTI output port 2. When operating as the Standby IOC
	Green	All DTI outputs are operating normally
DTI Output State	Off	1. Disabled 2. Client Operating Normally
	Amber	1. Enabled, client indicates Warm-up, Free-run, Holdover, or Fast-Lock states 2. In Test Mode the DTI Output State LED and DTI Output Connectivity Status LED shall alternate being "on" and "off"
DTI Output Connectivity Status	Off	1. Disabled 2. Not connected to DTI client
	Green	1. Connected to DTI client 2. In Test Mode the DTI Output State LED and DTI Output Connectivity Status LED shall alternate being "on" and "off"
DTI Input State	Off	1. Disabled 2. Enabled and qualified as reference input
	Amber	Enabled and not qualified as reference input
DTI Input Connectivity Status	Off	1. Disabled 2. Not connected to DTI server
	Green	Connected to DTI server

Enabling DTI Test Mode

Test Mode produces a continuous stream test signal from the DTI links that is all ones prior to Manchester encoding.

Example

To enable test mode on port 10, perform the following steps:

1. Login at the Admin or Power-User level (see).

2. Type `set interface test-mode port 10 enable` and press **Enter**.

Provisioning Revertive and Non-Revertive Mode

The revertive and non-revertive function allows you to select the action taken when the system reference at ports A and B is disqualified and then re-qualified.

In the revertive mode, if an input used as the system reference is disqualified (for any reason), the reference switches to the next-highest input and reverts to the initial input when that input is re-qualified. In this mode, the reference switches two times: once when the disqualifying event occurs, and again when the initial input is re-qualified.

In the non-revertive mode, when the system reference is disqualified (for any reason), the system reference switches to the other input but does not revert to the initial input when the initial input is re-qualified. The system reference switches only once when the disqualifying event occurs. When the priorities of the ports are the same, the ports act in the non-revertive mode. If the priorities are different, the ports act in the revertive mode.

Example

To provision the TimeCreator 1000 ports A and B for revertive mode, perform the following steps:

1. Login at the Admin or Power-User level (see).

2. Type `set interface priority portA 2` and press **Enter**.

3. Type `set interface priority portB 3` and press **Enter**.

Provisioning Root Server Recovery Modes

If the root server in a DTI network with subtending servers is set for user mode, the *root-recovery autorecoverymode* needs to be enabled. This activates the mechanism for re-synchronizing the root server time and phase to the other parts of the DTI network. In order for recovery to function correctly there must be a connection from the root server port 12 to a subtending server port 1. In addition, port 1 of the subtending server needs to be enabled.

Example:

To set the root server so that it can automatically recover from an outage enter the following command:

```
Set root-recovery autorecoverymode enable
```

Root recovery settings in the root server can be retrieved by using the following query:

```
Show root-recovery config
```

The reply to this command shows the *autorecoverymode* setting and the per port rapid recovery mode. If there is an outage of a TimeCreator root server, when it gets back on line, it will slowly pull the phase of the subtending servers back into alignment in a manner which minimizes cable modem re-ranging. If the mis-alignment of the subtending server is large, it may take a long time to do so. When conditions warrant, the user can set another root-recovery per port control, rapidrecovery, to achieve a shorter re-alignment time. The user can determine whether they need to activate rapid recovery by using the following query:

```
Show root-recovery status
```

In response to this query the TimeCreator returns a response showing whether the auto recovery process is taking place (running or not running), whether a port is able to recover in a controlled manner, and how long re-alignment will take (in minutes). If you decide that a shorter recovery is necessary, enter the following command at the root server:

```
Set root-recovery rapidrecovery {port #|all} {enable | disable}
```

If the 'enable' parameter is used, the duration of the recovery process is shortened by at least a factor of 10, depending on the phase error of the subtending server as a result of the outage duration.

Provisioning SNMP

Enabling SNMP allows you to use an SNMP interface to remotely manage the TimeCreator 1000 over an Ethernet connection. You can provision SNMP to be enabled or disabled on the specified Ethernet port, provision the SNMP manager address to the specified IP address or to the default settings, and set user authentication.

Example

To enable SNMP on the MGMT port, set the manager IP address to 192.168.100.100 with engine ID ABC123, add user ABC, with no authorization or privacy, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set service snmp enable` and press **Enter**.

3. Type `set firewall snmp enable` and press **Enter**.

4. Type `set snmp manager 192.168.100.100 engineID ABC123` and press **Enter**.

5. Type `set snmp user add ABC securLvl noauth` and press **Enter**.

Provisioning an NTP Server

To provision the NTP server, you must enable it on the NTP server port. When NTP is enabled, the TimeCreator 1000 can serve its system time to external NTP clients.

Example

To enable NTP on the NTP server port, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set service ntp enable` and press **Enter**.

3. Type `set firewall ntp enable eth1` and press **Enter**.

Note: If desired, use the NTP-Key command to configure keys.

Provisioning Cable Advance

The Cable Advance command allows you to compensate for the response time between client and server DTI links due to cable length. You can specify any or all ports and provision for auto correction or manual correction.

> **Note:** Symmetricom recommends that you use the automatic cable advance feature. Refer to the command Set Cable Advance, on page 122.

Example

To provision cable advance auto mode on DTI link port 1, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `show cable-adv` and press **Enter** to view the current setting.

3. Type `set cable-adv port 1 auto` and press **Enter**.

Provisioning Alarms

This section describes the commands used to provision and manage alarms in the TimeCreator 1000. The user can provision the alarms to be enabled or disabled and set thresholds to turn the alarms on and off. For a list of all alarms, see Appendix A, Alarms Events and System Messages.

Software commands allow you to perform the following:

- Provision the set and clear alarm thresholds
- Provision the alarm (enable or disable)
- Retrieve current alarm settings
- Retrieve current alarms
- Display alarm status

Alarms are also indicated by LEDs on the IOC and IMC modules.

Provisioning the Set and Clear Alarm Thresholds

Alarm set and clear values can be entered for the following:

- MTIE-t

- MTIE-35

- Jitter

- FER

The set and clear values are the threshold settings that determine when an alarm is activated and deactivated. The set value is the threshold above which an alarm is activated. The clear value is the threshold below which an alarm is deactivated.

Use the following commands to provision the set and clear alarm threshold values.

Example

To set the MTIE-t, MTIE-35, Jitter, FER threshold of all ports to a set value of 8000 and a clear value of 5000, perform the following steps:

1. Login at the Admin or Power-User level (see Login, on page 68).

2. Type `set alarm-threshold mtie-t all set 8000` and press **Enter**.

3. Type `set alarm-threshold mtie-t all clear 5000` and press **Enter**.

4. Type `set alarm-threshold mtie-35 all set 8000` and press **Enter**.

5. Type `set alarm-threshold mtie-35 all clear 5000` and press **Enter**.

6. Type `set alarm-threshold jitter all set 8000` and press **Enter**.

7. Type `set alarm-threshold jitter all clear 5000` and press **Enter**.

8. Type `set alarm-threshold fer all set 8000` and press **Enter**.

9. Type `set alarm-threshold fer all clear 5000` and press **Enter**.

Retrieving Current Alarm Settings

The Show Alarm Threshold command displays the set and clear alarm thresholds for every alarm type, or you can individually display the MTIE-t, MTIE-35, Jitter, or FER on the specified port. If a port number is not specified, all ports are displayed.

Example

To display set and clear thresholds for all alarm types on all ports, enter the following:

Type `show alarm-threshold all` and press **Enter**.

To display individual set and clear alarm thresholds, such as FER, for port 5, enter the following:

Type `show alarm-threshold fer port5` and press **Enter**.

Retrieving Current Alarms

The Show Alarms command displays all current alarms. To display a list of all current alarms enter the following:

Type `show alarms` and press **Enter**.

Displaying Alarm and Unit Status

The Show Status command displays the system status information as follows:

- Assigned System Name and asset tag value
- Uptime for the IMC module
- System date and time
- Number of standing system alarms
- Active IOC module
- Standby IOC module
- Currently selected TOD Source
- Summary for the GPS Input
- Summary for each DTI client port
- Summary for each DTI server port
- Clock status for each IOC module

To display the system status, enter the following:

Type `show status` and press **Enter**.

Routine Operation Commands

This section describes the commands you use to perform the following routine operations with the TimeCreator 1000:

- Displaying alarms
- Displaying events
- Displaying the TimeCreator 1000 configuration

Displaying Alarms

The Show Log Alarm command displays all local alarms in the alarm log in chronological order (first in - first out).

Example

Type `show log alarm` and press **Enter**.

Displaying Events

The Show Log Event command displays all local events in the event log in chronological order (first in - first out). The event log contains the 1000 most recent alarmed and non-alarmed events.

Example

Type `show log event` and press **Enter**.

Restarting the TimeCreator 1000

The system can be restarted via a command. Since reference output signals will be lost, it is not recommended to restart the entire system unless required. Only the admin user can issue the reboot command. The following command restarts the IMC card:

Example

Type `reboot imc` and press **Enter**.

Saving and Restoring Provisioning Data

Symmetricom recommends that you keep an electronic version and/or a written version of the provisioning changes you make to the TimeCreator 1000.

Backing up Provisioning Data

To backup up the current configuration, enter the following:

Type `set configuration backup` and press **Enter**.

To change the current configuration to the backup copy, enter the following:

Type `set configuration restore` and press **Enter**.

To change the current configuration to factory default while preserving user and IP information, enter the following:

Type `set configuration default` and press **Enter**.

To change the current configuration to the factory default, enter the following:

Type `set configuration factory` and press **Enter**.

Notes:

Setting the configuration to `default` will not overwrite the user login information or the system's IP address. Setting the configuration to `factory` will overwrite the user login information and return the system's IP address to the factory set address.

IOC configuration is automatically saved in the IOC card one minute after the configuration is changed.

Chapter 6 Maintenance and Troubleshooting

This chapter describes maintenance and troubleshooting procedures for the TimeCreator 1000.

In This Chapter

- Preventive Maintenance
- Safety Considerations
- ESD Considerations
- Diagnosing the IOC
- Diagnosing the IMC
- Repairing the TimeCreator 1000
- Obtaining Technical Assistance
- Upgrading the Firmware
- Returning the TimeCreator 1000
- User's Guide Updates

Preventive Maintenance

The TimeCreator 1000 requires minimal preventive maintenance. Ensure the unit is not exposed to hazards such as direct sunlight, open windows, water, or extreme heat. See Environmental Requirements, on page 44, for electromagnetic compatibility conditions that may cause damage.

Caution: To avoid electromagnetic discharge damage to the circuitry, never attempt to vacuum the TimeCreator 1000.

Caution: To avoid damage, under no circumstances should the interior chassis of the TimeCreator 1000 be allowed to come in contact with water.

Table 6-1 lists preventive maintenance measures to be performed periodically. Do not disassemble components just for the purpose of inspection.

Table 6-1. Preventive Maintenance

Item	Inspection	Corrective Action	Interval
Chassis	Inspect for dirt or foreign material	Clean the exterior of chassis with a soft dry cloth	Periodically
Cables	Inspect for pinched, worn or damaged cable	Replace pinched, worn or damaged cable at the first opportunity	Periodically
Connectors	Inspect for loose or damaged connector	Tighten loose connectors. If damaged, replace the connector and/or cable at the first opportunity	Periodically

Safety Considerations

Follow your company's safety guidelines and policies when working on or around live equipment.

ESD Considerations

Maintenance personnel should wear ESD wrist straps when installing or working on all TimeCreator 1000 equipment and modules. Plug the user-supplied wrist strap into the TimeCreator 1000. Place IMC and IOC modules into static-free bags when not in use.

Diagnosing the IOC

Reading LED Conditions

Table 6-2 shows the function of the LED indicators on the IOC.

Table 6-2. LED Conditions for the IOC

Indicator	Color	Description
Power	Off	power is off or power fault
	Green	power is on
Alarm	Off	no alarms generated by module inputs, outputs, or clock
	Red	module failure
External Ref	Off	System is not provisioned to use external references
	Amber	one of the provisioned reference inputs has been disqualified from being selected as system reference
	Green	all provisioned reference inputs are qualified as possible system references
Active	Off	module is in standby mode
	Green	module is in active mode
Holdover	Off	Module is not in holdover and is tracking at least one input
	Amber	Module is in holdover and not tracking inputs
Output	Off	A DTI output issue exists on at least one DTI output port, or the module is the standby IOC
	Green	All DTI outputs are operating normally

Removing the IOC

You can remove either of two IOCs in a shelf without affecting outputs. If you need to remove the only IOC in a shelf, or remove both IOCs from a shelf, outputs are interrupted and will resume once one IOC has achieved normal operating state.

Removing the Only IOC
To remove the only IOC in a shelf, use the following procedure. Output signals will be interrupted; they will resume once the IOC has achieved normal operating state.

1. Save the contents of the IOC memory in the IMC by issuing the following command:

   Type `set configuration backup ioc` and press **Enter**.

2. Issue the following command to take the IOC out of service:

   Type `set ioc-state IOC1 disable` and press **Enter**.

3. Attach a wrist grounding strap and connect it to the TimeCreator 1000 chassis.

4. Loosen the captive retaining screws and pull out on them to unseat the IOC from the shelf.

> **Warning:** To avoid possible electrostatic damage to the IOC, place it in a static-free bag or on a static-free surface.

5. Place the IOC in a static-free bag or on a static-free surface.

Install a new IOC using the appropriate procedure in

Removing a Redundant IOC

To remove one IOC when two IOCs are in a shelf, use the following procedure:

> **Note:** To avoid generating unnecessary alarms, be sure to take the IOC out of service before removing it.

> **Caution:** To avoid a loss of output signals, do not take the only IOC in a shelf out of service.

1. Issue the following command to take the IOC out of service:

   Type `set ioc-state disable IOC2` and press **Enter**.

> **Note:** An IOC that is out of service cannot be selected to generate or monitor outputs. An out-of-service IOC does not generate alarms.

2. Attach a wrist grounding strap and connect it to the TimeCreator 1000 chassis.

3. Loosen the captive retaining screws and pull out on them to unseat the IOC from the shelf.

Warning: To avoid possible electrostatic damage to the IOC, place it in a static-free bag or on a static-free surface.

4. Place the IOC in a static-free bag or on a static-free surface.

5. Install a new IOC using the appropriate procedure in Replacing the IOC, on page 94.

Removing Two IOCs

To remove both IOCs in a shelf, use the following procedure:

1. Save the contents of the active IOC memory in the IMC by issuing the following commands:

   Type `set configuration backup ioc` and press **Enter**.

2. Issue the following commands to take the standby and active IOCs out of service:

   Type `set ioc-state disable IOC2` and press **Enter**.

   Type `set ioc-state disable IOC1` and press **Enter**.

Caution: Output signals are turned off when you place the second IOC out of service.

3. Attach a wrist grounding strap and connect it to the TimeCreator 1000 chassis.

4. Loosen the captive retaining screws and pull out on them to unseat the standby IOC from the shelf.

Warning: To avoid possible electrostatic damage to the IOC, place it in a static-free bag or on a static-free surface.

5. Place the IOC in a static-free bag or on a static-free surface.

6. Repeat Steps 3 and 4 for the Active IOC.

7. Install new IOCs using the appropriate procedure in Replacing the IOC, on page 94.

Replacing the IOC

This section contains procedures for replacing IOC in three circumstances:

- Replacing the only IOC in a shelf
- Replacing one of two IOCs in a shelf
- Replacing both IOCs in a shelf

Replacing the Only IOC

To replace the only IOC in a shelf, use the following procedure. Output signals will resume once the IOC has achieved normal operating state. This procedure assumes that you have stored the contents of the IOC memory in the IMC using the Set Configuration Backup IOC command.

1. Attach a wrist grounding strap and connect it to the TimeCreator 1000 chassis.

2. Install the IOC into the shelf and tighten the captive retaining screws.

3. Copy the contents of the IOC memory stored in the IMC by issuing the following command.

   Type `set configuration restore ioc` and press **Enter**.

If you have not stored the contents of the IOC memory in the IMC, then provision the IOC using the procedures and commands described in Chapter 5, Provisioning.

4. Wait for the IOC to reboot and achieve normal operating state.

Replacing a Redundant IOC

To replace either of two IOCs in a shelf, use the following procedure. Output signals will not be affected by this procedure. You can also use this procedure to add an IOC to a shelf that has only one IOC.

1. Install the IOC into the shelf and tighten the captive retaining screws.

2. Wait for the IOC to reboot and achieve the normal operating state. During this time the Active IOC updates the new IOC's memory with current values.

Replacing Both IOCs

Use this procedure to replace both IOCs in a shelf. Output signals will resume when the Active IOC has warmed up and qualified the reference signals. This procedure assumes that you have stored the contents of the IOC memory in the IMC using the Set Configuration Backup IOC command.

1. Attach a wrist grounding strap and connect it to the TimeCreator 1000 chassis.

2. Install the IOC into the left slot of the shelf and tighten the captive retaining screws. This IOC will become the Active IOC.

3. Wait for the IOC to reboot.

4. Retrieve the contents of the IOC memory stored in the IMC by issuing the following command:

   Type `set configuration restore ioc` and press **Enter**.

   If you have not stored the contents of the IOC memory in the IMC, then provision the IOC using the procedures and commands described in Chapter 5, Provisioning.

5. Install the second IOC into the right slot of the shelf and tighten the captive retaining screws. This IOC will become the Standby IOC.

6. Wait for the IOC to reboot and qualify the reference inputs. During this time the active IOC updates the new IOC's memory with current values.

Diagnosing the IMC

Reading LED Conditions

Table 6-3 shows the function of the LED indicators on the front panel of the IMC.

Table 6-3. LED Conditions for the IMC

Indicator	Color	Description
Power	Off	Module power fault
	Green	Module power is functioning properly
Alarm	Off	There are no alarms being generated
	Red	There are alarms being generated by some component in the system
GPS	Off	System is not provisioned to use GPS reference
	Amber	GPS input enabled, GPS input not qualified as reference
	Green	System is provisioned to use GPS reference, GPS reference is qualified as reference
Ethernet state	Off	No Ethernet link established
	Green	Ethernet link established
Ethernet activity	Off	No Ethernet activity
	Amber	Blinks with Ethernet activity

Replacing the IMC

You can remove the IMC from the shelf and replace it without affecting outputs.

1. Save the contents of the IMC memory in an IOC (example is for IOC1) by issuing the following command:

   Type `set configuration backup imc ioc1` and press **Enter**.

2. Attach a wrist grounding strap and connect it to the TimeCreator 1000 chassis.

3. Remove the IMC by loosening the captive screws and pulling the IMC from the shelf.

⚠	**Warning:** To avoid possible electrostatic damage to the IMC, place it in a static-free bag or on a static-free surface.

4. Place the IMC in a static-free bag or on a static-free surface.

5. Insert another IMC into the shelf and tighten the captive screws.

6. Reload the IMC memory from the IOC by issuing the following command:

   Type `set configuration restore imc ioc1` and press **Enter**.

Repairing the TimeCreator 1000

Repairing the TimeCreator 1000 is limited to replacing modules. Refer to Working With Modules, on page 47, for information on how to properly handle modules to prevent electrostatic or physical damage.

To remove an IOC, loosen the captive screws and pull the module out of the shelf. Place the module on an anti-static surface or in an anti-static bag.

To remove the IMC, loosen the captive screws and pull the module out of the shelf. Place the module on an anti-static surface or in an anti-static bag.

⚠	**Warning:** To avoid possible electrostatic damage to the module or panel, place it in a static-free bag or on a static-free surface.

Obtaining Technical Assistance

If you have technical questions about the TimeCreator 1000, call Symmetricom Global Services (SGS) at 888-367-7966 (toll-free in USA only), 408-428-7907, or +49 700 3288 6435 in Europe, Middle East, or Africa. You can also E-mail your technical questions to support@symmetricom.com or emeasupport@symmetricom.com.

Upgrading the Firmware

You can upgrade the firmware in the IMC, IOC, or redundant IOCs using CLI commands and software available from Symmetricom. Only users with Admin level access can execute the command. The command places the IMC in the firmware download mode and prevents all other sessions from making changes to the configuration. During the upgrade process, no new sessions are allowed. Refer to Appendix B, Command Descriptions and Communications Interface and the command Upgrade, on page 169 for details on the upgrade process.

> ⚠ **Caution:** To avoid a possible service call, do not issue a command to the TimeCreator 1000, do not remove power from the TimeCreator 1000, and do not remove an IOC or IMC from the shelf during the upgrade process. Doing so could corrupt the flash memory in a module, disabling the TimeCreator 1000.

Upgrading the IOC

The Upgrade command allows you to install firmware in a single IOC in basic configuration, or in either IOC of a redundant configuration. This section contains procedures for upgrading a shelf with a single IOC and for upgrading a shelf with redundant IOCs.

Upgrading Single IOCs

To upgrade the software in a single IOC, use the procedure in this section. Outputs from the TimeCreator 1000 are interrupted for up to 30 minutes until the upgraded IOC enters the Locked mode.

1. Login at the Admin level (see Login, on page 68).

2. Type `set configuration backup` and press **Enter** to save the contents of the IOC configuration.

3. Type `upgrade ioc1 <filename> <ftp-server> ftp auto-reboot` and press **Enter**. (For example, `upgrade ioc1 ver2.bin 192.168.5.64 ftp`

`auto-reboot)` The user is then prompted for the user name and password for the server and the new software is loaded into the IOC.

> **Note:** The system will FTP the file from the specified FTP server (IP or name) and then upgrade the module.

> **Note:** Firmware upgrades will not be implemented unless the IOC is rebooted, whether manually or with the `auto-reboot` command.

4. The new software is loaded into the IOC, the IOC is rebooted, and it then enters Warm-up mode for up to 30 minutes..

> **Caution:** For non-redundant IOC modules, the IOC will restart and the outputs will be interrupted for approximately 30 minutes.

5. Type `set configuration restore` and press **Enter** to restore the contents of the IOC configuration.

Upgrading Redundant IOCs

When upgrading redundant IOCs, you should upgrade them one at a time if the unit is in service and a service interruption needs to be avoided. When you enter the command without specifying an IOC (such as IOC1 or IOC2), both IOCs are loaded with the firmware and a reboot is necessary to activate it. Adding the auto-reboot option to the end of the upgrade command sequences rebooting of the IOCs so that the standby IOC is rebooted first. The IMC waits until that IOC is out of warmup, and then it is set active. At that point, the previously active IOC is rebooted.

> **Note:** Symmetricom recommends that redundant IOCs use the same firmware revision.

> **Note:** Symmetricom recommends that redundant IOCs be upgraded individually to avoid interruption of outputs.

To upgrade the software in both IOCs, use the following procedure:

1. Login at the Admin level (see Login, on page 68).

2. Type `set configuration backup` and press **Enter** to save the contents of the active IOC configuration.

3. Type `upgrade ioc <filename> <ftp-server> ftp auto-reboot` (use the IP address or server name) and press **Enter**.

4. When prompted, enter a user name and password for the server.

> **Note:** The system will FTP the file from the specified FTP server (IP or name) and then upgrade the module.

5. The new software is loaded into the IOC, the IOC is rebooted, and it then enters Warm-up mode for up to 30 minutes.

If you are upgrading the active IOC, the TimeCreator 1000 performs the following:

- the active IOC enters standby mode
- the second IOC changes to active mode
- firmware is transferred to the standby IOC

After the download, the standby IOC must achieve Lock mode before changing back again to active mode. The standby IOC is then upgraded.

> **Note:** If the initial IOC upgrade is not successful, the entire process is aborted, an error message is generated, and the IOC restarts with the original firmware.

6. Type `set configuration restore` and press **Enter** to restore the contents of the IOC configuration.

Upgrading the IMC

To upgrade the software in the IMC, use the following procedure:

> **Note:** Outputs are not affected during the IMC upgrade procedure.

1. Login at the Admin level (see Login, on page 68).

2. Type `set configuration backup` and press **Enter** to save the contents of the IMC configuration.

3. Type `upgrade imc <filename> <ftp-server> ftp auto-reboot` (use the IP address or server name) and press **Enter**. The `auto-reboot` option automatically reboots the unit after the firmware is installed to activate it. Otherwise, the user must enter the command `reboot IMC` when installation is complete.

4. When prompted, enter a user name and password for the server.

> **Note:** The system will FTP the file from the specified FTP server (IP or name) and then upgrade the module.

5. The TimeCreator 1000 validates the received file, and if the file is valid it updates the flash memory and reboots the IMC.

> **Note:** If the file is not valid, the TimeCreator 1000 will reject it.

Returning the TimeCreator 1000

You should return the equipment to Symmetricom only after you have exhausted the troubleshooting procedures described earlier in this chapter, or if Symmetricom Global Services has advised you to return the unit.

> **Note:** Please retain the original packaging for re-shipping the product. If the original packaging is not available, contact Symmetricom Global Services (SGS) for assistance.

Repacking the Unit

Return all units in the original packaging. If the original packaging is not available, contact Symmetricom Global Services. Use standard packing procedures for products being returned for repair to protect the equipment during shipment. Connectors should be protected with connector covers or the equipment should be wrapped in plastic before packaging. Ensure that the connectivity panels are protected when packaged.

Equipment Return Procedure

To return equipment to Symmetricom for repair:

1. Call Symmetricom Global Services (SGS) at 888-367-7966 (toll-free in USA only), 408-428-7907, or +49 700 3288 6435 in Europe, Middle East, or Africa to obtain a return material authorization number (RMA) before returning the product for service.

   You can request an RMA on the internet at www.symmetricom.com/Support/req_repair.htm.

   Retain the assigned RMA number for future reference.

2. Provide a description of the problem, product item number, serial number, and warranty expiration date.

3. Provide the return shipping information (customer field contact, address, telephone number, and so forth.)

4. Ship the product to Symmetricom, transportation prepaid and insured, with the Return Material Authorization (RMA) number and item numbers or part numbers clearly marked on the outside of the container to the address given with the RMA.

   Repaired equipment is returned to you with shipping costs prepaid by Symmetricom.

User's Guide Updates

When this manual is updated the updated version will be available for downloading from Symmetricom's internet web site. After downloading, you can view the manual on a computer or print it using Adobe Acrobat Reader.

Manual updates are available by logging in to Telecom Solutions at:

www.symmetricom.com/support/

Note: If you are downloading a manual for the first time, you will need to register with Symmetricom. If you are currently registered, login and download the manual update.

Appendix A Alarms Events and System Messages

The TimeCreator 1000 provides a log of events and alarms that are stored in non-volatile memory on the IMC module. This appendix provides details on the events, alarms, and system messages and provides descriptions of the information that is displayed.

In This Appendix

- Events
- Alarm Messages
- System Messages

Events

The following table provides a list of event messages and a description of each message.

> **Note:** You can display the events and alarms on a terminal or computer running terminal emulation by entering the Show Alarm command. Refer to Show Alarms, on page 115 and Establishing a Connection to the TimeCreator 1000, on page 66 for further details.

Table A-1. Events

Message	Description
Aborted auto root recovery	Indicates that auto root recovery has been aborted
Entered auto root recovery	Indicates that auto root recovery has been entered
Exited auto root recovery	Indicates that auto root recovery has been exited
IMC Module reboot	IMC module has restarted
IOC <#> Module reboot	IOC 1 module (or IOC 2 if installed) has restarted
IOC <#> has transitioned into fast-lock mode	IOC 1 module (or IOC 2 if installed) has entered or exited fast-lock mode
IOC <#> has transitioned into warm-up mode	IOC 1 module (or IOC 2 if installed) has entered or exited warm-up mode
IOC <#> has transitioned into free-run mode	IOC 1 module (or IOC 2 if installed) has entered or exited free-run mode
IOC <#> has transitioned into normal mode	IOC 1 module (or IOC 2 if installed) has entered or exited normal mode
IOC <#> has transitioned into bridging mode	IOC 1 module (or IOC 2 if installed) has entered or exited bridging mode
IOC <#> has transitioned into holdover mode	IOC 1 module (or IOC 2 if installed) has entered or exited holdover mode
IOC <#> is the active IOC module	IOC 1 module (or IOC 2 if installed) is the active IOC module
IOC <#> is the standby IOC module	IOC 1 module (or IOC 2 if installed) is the standby IOC module
IOC <#> is disabled	IOC 1 module (or IOC 2 if installed) is disabled

Table A-1. Events (Continued)

Message	Description
IOC <#> has transitioned into frequency mode	IOC 1 module (or IOC 2 if installed) has transitioned into frequency mode
IOC <#> has selected GPS as reference	IOC 1 module (or IOC 2 if installed) has selected GPS as reference
IOC <#> has selected DTI port <#> as reference	IOC 1 module (or IOC 2 if installed) has selected the specified DTI port as reference
IOC <#> has selected BITS port <#> as reference	IOC 1 module (or IOC 2 if installed) has selected the specified BITS port as reference
IOC <#> has been removed	Indicates that the specified IOC was removed from the shelf
IOC <#> has been inserted	Indicates that the specified IOC was installed in the shelf
Firmware copy between IOC modules failed	Firmware copy between IOC modules failed
Output Port <#> cable advance value is invalid	Client cable advance at (port 1 through port 12) is invalid
Output Port <#> cable advance value is valid	Client cable advance at (port 1 through port 12) is valid
Output Port <#> performance is unstable	Client performance at port (port 1 through port 12) is unstable
Output Port <#> performance is stable	Client performance at port (port 1 through port 12) is stable
Output Port %port entered ["bridging", "normal holdover", "extended holdover", "rapid", "legacy"] recovery	Output port (port 1 through port 12) has entered the indicated mode of recovery
Output Port %port exited ["bridging", "normal holdover", "extended holdover", "rapid", "legacy"] recovery	Output port (port 1 through port 12) has exited the indicated mode of recovery
Output Port %port recovery timeout	Output port (port 1 through port 12) recovery has timed out
Port <#> has transitioned into fast-lock mode	Port (port 1 through port 12) has entered or exited fast-lock mode
Port <#> has transitioned into warm-up mode	Port (port 1 through port 12) has entered or exited warm-up mode
Port <#> has transitioned into free-run mode	Port (port 1 through port 12) has entered or exited free-run mode
Port <#> has transitioned into normal mode	Port (port 1 through port 12) has entered or exited normal mode

Table A-1. Events (Continued)

Message	Description
Port <#> has transitioned into bridging mode	Port (port 1 through port 12) has entered or exited bridging mode
Port <#> has transitioned into holdover mode	Port (port 1 through port 12) has entered or exited holdover mode
Port <#> has transitioned into test mode	Port (port 1 through port 12) has entered or exited test mode
Port <#> MTIE-t interval has been set to <value>	Indicates the MTIE-t calculation interval for the port has been set to the specified value.
Port <#> Jitter interval has been set to <value>	Indicates the Peak-Peak Jitter calculation interval for the port has been set to the specified value.
Port <#> FER interval has been set to <value>	Indicates the frame error rate calculation interval for the port has been set to the specified value.
Power Module <#> has been removed	Indicates that the specified Power module (1 or 2) was removed from the shelf
Power Module <#> has been inserted	Indicates that the specified Power module (1 or 2) was installed in the shelf
System TOD has been set by GPS	System Time Of Day has been set by GPS
System TOD has been set by NTP	System Time Of Day has been set by NTP
DTI TOD has been set	DTI TOD has been set
UTC time from GPS is available	UTC time from GPS is available

Alarm Messages

The TimeCreator 1000 provides set and clear alarm messages to notify you when certain conditions are exceeding the user-specified levels (when alarms are set) and when certain conditions return to within the user-specified levels (when alarms are cleared). Alarms also indicate hardware and signal status.

The following table provides a list of alarm messages and a description of each message.

Note: You can display the events and alarms on a terminal or computer running terminal emulation by entering the Show Alarm command. Refer to Show Alarms, on page 115 and Establishing a Connection to the TimeCreator 1000, on page 66 for further details.

Table A-2. Alarms

Message	Description
Port <#> is within the MTIE-t threshold, <value>	Indicates that the MTIE-t error rate is within the user-set threshold
Port <#> has exceeded the MTIE-t threshold, <value>	Indicates that the MTIE-t error rate has exceeded the user-set threshold
Port <#> is within the MTIE-35 threshold, <value>	Indicates that the MTIE-35 error is within the user-set threshold
Port <#> has exceeded the MTIE-35 threshold, <value>	Indicates that the MTIE-35 error has exceeded the user-set threshold
Port <#> is within FER threshold, <value>	Indicates that the Frame Error Rate is within the user-set threshold
Port <#> has exceeded the FER threshold, <value>	Indicates that the Frame Error Rate has exceeded the user-set threshold
Port <#> is within the P-P Jitter threshold, <value>	Indicates that the Peak-to-Peak Jitter is within the user-set threshold
Port <#> has exceeded the P-P Jitter threshold, <value>	Indicates that the Peak-to-Peak Jitter has exceeded the user-set threshold
Input Port <#> cable advance value is invalid	Indicates that the cable advance value for the specified port is not valid
Input Port <#> cable advance value is valid	Indicates that the cable advance value for the specified port is valid
Input Port <#> performance is unstable	Indicates that performance for the specified port is unstable
Input Port <#> performance is stable	Indicates that performance for the specified port is stable
Input Port <#> cable is disconnected	DTI input port A or B cable is disconnected
Input Port <#> cable is connected	DTI input port A or B cable is connected
Output Port <#> cable is disconnected	Output Port (port 1 through port 12) DTI client cable is disconnected
Output Port <#> cable is connected	Output Port (port 1 through port 12) DTI client cable is connected
DTI Port <#> reference is disqualified as system reference	Indicates that the reference signal at the specified DTI input port cannot be used as system reference
DTI Port <#> reference is qualified as system reference	Indicates that the reference signal at the specified DTI input port can be used as system reference
IOC <#> has been in holdover mode for extended period	Indicates that the specified IOC has been in Holdover mode for an extended period

Table A-2. Alarms (Continued)

Message	Description
IOC <#> has transitioned out of extended holdover mode	Indicates that the specified IOC (IOC1 or IOC2 is now out of extended holdover mode
IOC <#> operational failure	Indicates that the specified IOC module is not functioning properly
No IOC module in system	Both IOC modules are removed
One or more IOC modules in system	At least one IOC module in the system
IOC modules incompatible	Indicates that redundant IOC modules are not compatible
IMC operational failure	Indicates that the specified IMC module is not functioning properly
Inter-IOC communications failed	Indicates that communication between redundant IOC modules has failed
Inter-IOC communications restored	Indicates that communication between redundant IOC modules has been restored
IMC-IOC <#> communications failed	Indicates that communication between the IMC and IOC modules has failed
IMC-IOC <#> communications restored	Indicates that communication between the IMC and IOC modules has been restored
IMC and IOC modules incompatible	Indicates that the IMC and IOC modules are not compatible
GPS antenna communications failed	Indicates that the GPS signal is not connected
GPS antenna communications restored	Indicates that the GPS signal is OK
GPS reference is disqualified as system reference	Indicates that the GPS reference signal at the specified port cannot be used as system reference
GPS reference is qualified as system reference	Indicates that the GPS reference signal at the specified port can be used as system reference
Power Module <#> output failure	Power module A or B output voltage failure
Power Module <#> output failure cleared	Power module A or B output voltage ok
Power Module <#> fan failure	The fan of power module A or B failed
Power Module <#> fan failure cleared	The fan of power module A or B is ok

System Messages

The following table provides a list of system messages that are displayed in response to a provisioning event or to an alarm that occurs when an associated threshold or timer is outside of the provisioned setting.

Table A-3. System Provisioning Messages

Message	Description
Port <#> MTIE-t Alarm Set Threshold has been set to <value>	Indicates the MTIE-t alarm set threshold for the port has been set to the specified value
Port <#> MTIE-t Alarm Clear Threshold has been set to <value>	Indicates the MTIE-t alarm clear threshold for the port has been set to the specified value
Port <#> MTIE-35 Alarm Set Threshold has been set to <value>	Indicates the MTIE-35 alarm set threshold for the port has been set to the specified value
Port <#> MTIE-35 Alarm Clear Threshold has been set to <value>	Indicates the MTIE-35 alarm clear threshold for the port has been set to the specified value
Port <#> P-P Jitter Alarm Set Threshold has been set to <value>	Indicates the peak-to-peak jitter alarm set threshold for the port has been set to the specified value
Port <#> P-P Jitter Alarm Clear Threshold has been set to <value>	Indicates the peak-to-peak jitter alarm clear threshold for the port has been set to the specified value
Port <#> FER Alarm Set Threshold has been set to <value>	Indicates the FER alarm set threshold for the port has been set to the specified value
Port <#> FER Alarm Clear Threshold has been set to <value>	Indicates the FER alarm clear threshold for the port has been set to the specified value
Port <#> Cable Advance has been set to <value>	Indicates the cable advance for the port has been set to the specified value
Port <#> state has been set to <value>	Indicates the port state has been set to the specified value
Port <#> type has been set to <value>	Indicates the port type has been set to the specified value
Port <#> priority has been set to <value>	Indicates the port priority has been set to the specified value
Port <#> test mode has been set to <value>	Indicates the port test mode has been set to the specified value
The Bridging Time has been set to <value>	Indicates the bridging time has been set to the specified value
Port statistics have been cleared	Indicates the port statistics have been cleared

Table A-3. System Provisioning Messages (Continued)

Message	Description
IOC <#> has been set to Active	Indicates the IOC has been set to active
IOC <#> has been set to Disabled	Indicates the IOC has been set to disabled
IOC <#> has been set to Standby	Indicates the IOC has been set to standby.
Date has been set to <value>	Indicates the date has been set to the specified value
Time has been set to <value>	Indicates the time has been set to the specified value
Local Time Offset has been set to <value>	Indicates the local time offset has been set to the specified value. This offset will only affect the time associated with the logs.
System Configuration has been backed-up	Indicates the system configuration has been backed-up
System configuration has been restored	Indicates the system configuration has been restored
System configuration has been set to default	Indicates the system configuration has been set to default
System configuration has been set to factory default	Indicates the system configuration has been set to factory default
FTP from <ip_address> file <filename> successful	Indicates the file transfer was successful
FTP from <ip_address> file <filename> unsuccessful	Indicates the file transfer was unsuccessful
GPS Position mode has been set to <value>	Indicates the GPS position mode has been set to the specified value
GPS Position has been set to <latitude>, <longitude>, <height>	Indicates the GPS position has been set to the specified values
GPS Position mask has been set to <value>	Indicates the GPS position mask has been set to the specified value
GPS port state has been set to <value>	Indicates the GPS port state has been set to the specified value
GPS port priority has been set to <value>	Indicates the GPS port priority has been set to the specified value
<eth_intfc> Host IP address has been set to <ip_address>	Indicates the host IP address has been set to the specified value
<eth_intfc> Host Mask has been set to <ip_address>	Indicates the host mask address has been set to the specified value
<eth_intfc> Host Gateway has been set to <ip_address>	Indicates the host gateway address has been set to the specified value

Table A-3. System Provisioning Messages (Continued)

Message	Description
<eth_intfc> IP-mode has been set to <value>	Indicates the IP-mode has been set to the specified value
<eth_intfc> IP-state has been set to <value>	Indicates the IP-state has been set to the specified value
<logfiletype> log size has been set to <size>	Indicates the log size has been set to the specified value
<logfiletype> log interval has been set to <value>	Indicates the log interval has been set to the specified value.
<logfiletype> log interval has been set to <value>	Indicates the log interval has been set to the specified value.
Test messages beginning	When the "Message" command is used, the text "Test messages beginning" appears before the message event is logged.
System mode has been set to <mode>	Indicates the system mode has been set to the specified mode
Authorization mode has been set to <mode>[, <ip_address>]	Indicates the authorization mode has been set to the specified mode and address
<Service> state has been set to state on <ethernet port>	Indicates the specified service state has been set on the specified port
SNMP manager host has been set to <ip_address>	Indicates the SNMP manager host has been set to the specified address
SNMP <user> has been added	Indicates the specified SNMP user host has been added
SNMP <user> has been deleted	Indicates the specified SNMP user host has been deleted
TOD Source has been set to <value>	Indicates the TOD source has been set to the specified value
TOD Source will sync at <date> <time>	Indicates the TOD source will sync at the specified date and time
<Module> firmware was upgraded successfully to <version>	Indicates the firmware upgrade to the specified version was successful
<Module> firmware was upgraded unsuccessfully	Indicates the firmware upgrade to the specified version was unsuccessful
<user> has been added	Indicates the specified user was added
<user> has been deleted	Indicates the specified user was deleted
<user> has been locked	Indicates the specified user has been locked

Table A-3. System Provisioning Messages (Continued)

Message	Description
<user> has been unlocked	Indicates the specified user has been unlocked
IMC module reboot requested by user	Indicates that the user requested the IMC module to reboot.
IOC <#> module reboot requested by user	Indicates that the user requested the specified IOC module to reboot.

The following table provides a list of system notification messages and descriptions.

Table A-4. System Notification Messages

Message	Description
<username> authorization granted	Authorization has been granted to the specified username
<username> authorization terminated	Authorization has been terminated for the specified username
<username> authorization denied	Authorization has been terminated for the specified username

Appendix B Command Descriptions and Communications Interface

This appendix describes the CLI command conventions, the prompts, line editing functions, and command syntax. The CLI command functions and features are organized by user security access levels and are listed alphabetically.

In This Appendix

- CLI Overview
- CLI Commands
- Simple Network Management Protocol
- Network Time Protocol
- Secure Shell Protocol
- Secure File Transfer Protocol

CLI Overview

The Command Line Interface (CLI), also called the ASCII command set, can be used to control the TimeCreator 1000 from a terminal connected to the EIA-232 serial port, or the Ethernet port.

General Conventions

The following are CLI command general conventions:

- Commands *are not* case sensitive

- Braces { } indicate multiple options. When entering options in the CLI 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.

Each command listed provides the following information:

- Command name

- Description of command function

- Operation of this command at security levels 1 through 3, with descriptions of syntax and command functions

- 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.

Command User Levels

The TimeCreator 1000 provides a hierarchy of CLI command user levels that permit an increasing level of access to system parameters. This allows the system administrator to add users who can only view but not change system parameters and users who can view *and* change system parameters.

The users assigned to each security level have access options available as follows:

- Level 1 - user class, with read-only rights

- Level 2 - power user class, with read-write rights

- Level 3 - administrator user class, with read-write rights and can also configure users and upgrade firmware

CLI Commands

This section provides an alphabetical listing of all CLI commands.

Show Alarms

This command displays a list of all standing (active) system alarms.

Level 1:   `show alarms`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: The information displayed is expected to be identical to an entry in the Event/Alarm Log File.

Related: `show status, generate message, show alarm-threshold, set alarm-threshold`

Show Alarm-State

This command displays the state of each alarm: if it is enabled or disabled.

Level 1:   `show alarm-state`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: See the list of alarm codes in the Set Alarm-State command.

Related: `set alarm-state`

Set Alarm-State

This command is used to enable or disable specific alarms. Table B-1 provides a list of alarm codes and their description.

Level 1:   Not Applicable

Level 2:   `set alarm-state <alarm code> {enable|disable}`

Level 3:   Same as Level 2

Related: `show alarm-state`

Table B-1. Set Alarm-State Alarm Codes

Alarm Code	Description
IMCCOM	IMC to IOC communication failure
IOCCOM	IOC to IOC communication failure
IOCFAIL	IOC failure
IMCFAIL	IMC failure
OUTDISC	DTI output disconnected
INPDISC	DTI input disconnected
INPCBLADV	DTI input cable advance invalid
INPUNSTBL	DTI input unstable
INPDISQ	Input disqualified (DTI, GPS or BITS)
GPSCOMM	GPS communications failure
IOCINCOMP	Two IOC modules are incompatible
IMCINCOMP	IOC and IMC are incompatible
IOCRMV	Both IOC removed
MTIET	MTIE-t threshold exceeded
MTIE35	MTIE-35 threshold exceeded
PPJITTER	PP-jitter threshold exceeded
FER	Frame Error Rate threshold exceeded
EXTHOLD	IOC in holdover for extended period
PWROUTPUT	Power module output failure
PWRFAN	Power module fan failure
JAMSYNC	Jam sync required
XSYNC	IOC synchronization failure

Show Alarm-Threshold

This command displays the set and clear alarm thresholds for MTIE-35, Jitter, MTIE-35, MTIE-t, and FER.

Level 1:   `show alarm-threshold`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: When ports A/11 and B/12 are configured as clients, alarm thresholds are not used.

Related: `set alarm-threshold`

Set Alarm-Threshold

Use this command to provision the set and clear alarm thresholds for MTIE-35, Jitter, MTIE-35, MTIE-t, and FER on the specified port. The threshold can be set for all ports or an individual port.

Level 1:   Not Applicable

Level 2:   `set alarm-threshold jitter [port#|all]`
                 `[set|clear] value`

                 `set alarm-threshold mtie-35 [port#|all]`
                 `[set|clear] value`

                 `set alarm-threshold mtie-t [port#|all]`
                 `[set|clear] value`

                 `set alarm-threshold fer [port#||all]`
                 `[set|clear] value`

Level 3:   Same as Level 2

Remarks: When ports A/11 and B/12 are configured as clients, alarm thresholds are not used. The alarm is disabled if either threshold, set, or clear is set to zero.

Related: `show alarm-threshold`

Alias

Use this command to create a short form of a frequently used command.

Level 1:   `alias <name= string 1 - 2147483647>`

                     Enter name followed by "="

Level 2:   same as Level 1

Level 3:   same as Level 1

Example

To display all defined aliases:

At the system prompt, type `alias` and press **Enter**.

Example

To define the alias w for the command `where`:

At the system prompt, type `alias w='where'` and press **Enter**.

Related: None

Show Authentication

Displays how the TimeCreator 1000 authenticates users. If applicable, it displays the RADIUS server and key and TACACS+ server and key.

Level 1:   Not Applicable

Level 2:   `show authentication`

Level 3:   Same as Level 2

Example

To display the authentication status:

At the system prompt, type `show authentication` and press **Enter**.

Response

TACACS+ Login Status: disabled

Radius Login Status: disabled

Remarks: Authentication can be local, RADIUS, or TACACS+. Show authentication can also be disabled, but not local.

Related: None

Set Authentication

Use this command to provision the authentication scheme, the RADIUS server IP address or hostname and the authentication key(s) for server access, or the TACACS+ server IP address or hostname and the authentication key(s) for server access. Only one RADIUS or TACACS+ server is supported. Only one key is supported.

Level 1:   Not Applicable

Level 2:   `set authentication radius {enable | disable}`
                     `set authentication tacacs+ {enable | disable}`

                     Provisions the specified state.

Level 3:   `set authentication radius address <address> set`
                     `authentication radius key <key string>`

                     `set authentication tacacs+ address <address> set`
                     `authentication tacacs+ key <key string>`

Remarks: Authentication can be by local, RADIUS, and TACACS+

Related: `show authentication`

Set Authentication Radius Radiusserveraddress:port

This command is used to set the radius server and to optionally set the port. If the port is omitted, 1812 is assumed.

Level 1:   Not Applicable

Level 2:   `set authentication radius radiusserveraddress:port`

Example: `set authentication radius 192.168.82.96`

Example: `set authentication radius 192.168.82.96:1645`

Example: `set authentication radius 192.168.82.96:1812`

Level 3:   Same as Level 2

Remarks:

Related:

Show Bridge-Time

This command displays the bridging time that is used when the system does not have a qualified reference.

Level 1:   `show bridge-time`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: If the system does not qualify a TOD source (frequency reference) within the specified bridging time, the system transitions to holdover mode.

Related: `set bridge-time`

Set Bridge-Time

Use this command to provision the amount of time the system will remain in bridging mode before transitioning into the holdover mode.

Level 1:   Not Applicable

Level 2:   Not Applicable

Level 3:   `set bridge-time`

Remarks: The default value is 900 seconds. Based on DOCSIS requirements and the characteristics of the TimeCreator 1000 oscillator, impairments in performance are not expected within this default time period.

The range for this parameter is 100 –100000 seconds

Related: `show bridge-time`

Show Cable Advance

This command displays the cable advance setting for all enabled DTI outputs.

Level 1:   `show cable-adv`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: The cable advance value may not be updated if the cable is disconnected or the port is disabled, including manual cable advance values.

Related: `set cable-adv`

Set Cable Advance

Use this command to provision DTI client and server link(s) to use the specified cable advance value.

Level 1:   Not Applicable

Level 2:   `set cable-adv {port# | all} {auto | manual value}`

Level 3:   Same as Level 2

Remarks: A value of ff:ff:ff provisions the port to use the current automatic value for the cable delay value, thereby freezing the current value.

> **Note:** If the cable advance is presently valid, then the cable advance setting is constrained to update at a rate of 26 ps/s, as required by the DTI specification, in both automatic and manual modes. To make a large change in the cable advance manually, first disable the port with the Set Interface command.

Related: `show cable-adv`

CLI-Settings

Shows whether the "more" function is enabled or disabled.

Level 1:   `cli-settings`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related: `cli-settings more`

CLI-Settings More

This command is used to enable or disable the "more" function. The "more" function is used to page through a large number of command description lines when they go beyond one display screen.

Level 1:   `cli-settings more {enable | disable}`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: The "more" function stops and waits for a user to hit the 'space' bar before displaying additional pages of information. Entering `q` discontinues displaying more information.

Show Clock

This command displays the system's date, time, leap seconds, and local time offset. The `show dti-clock` command displays the date, time, leap seconds, and local time offset transmitted on the DTI ports.

Level 1:   `show clock`

                    `show dti-clock`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: If the Show Clock command and the Show DTI-Clock command time/date values are different and the unit is not in warm-up, then a "jam-sync" is probably required.

Related: `set clock`

Set Clock

Use this command to provision the IMC's user-assigned date, time, leap seconds, and local time offset.

Level 1:   Not Applicable

Level 2:   `set clock date <yyyy-mm-dd> time <hh:mm:ss>`

                    `set clock offset <value>`

                    `set clock leapseconds <value>`

Level 3:   Same as Level 2

Remarks: The date and time can only be set in the user tod-source mode. The leap seconds value can only be set in the user and NTP tod-source modes. The leap seconds value is the accumulated number of seconds between GPS and UTC time. The local time offset only affects the time associated with the logs.

Table B-2 provides a list of supported time zone offsets:

> **Note:** If the offset is changed, then the unit saves the configuration and restarts.

Related: `show clock, show dti-clock`

Restrictions: The Date format is yyyy-mm-dd.
The Time format is hh:mm:ss.
The Local Time Offset is hh:mm.

Table B-2. Time Zone Offsets

Supported Time Zone Offsets									
-12:00	-11:00	-10:00	-9:00	-8:00	-7:00	-6:00	-5:00	-4:00	-3:30
-3:00	-2:00	-1:00	+0:00	+1:00	+2:00	+3:00	+4:00	+4:30	+5:00
+5:30	+6:00	+6:30	+7:00	+8:00	+9:00	+9:30	+10:00	+11:00	+12:00

Set Configuration

Use this command to backup the current configuration, restore the current
configuration from a backup copy, or set the current configuration to factory default
values.

Level 1:   Not Applicable

Level 2:   `set configuration [backup|restore|default|factory]`

                    `set configuration backup -- save configuration in
same card`

                    `set configuration backup IOC -- save IOC
configuration in IMC`

                    `set configuration backup IMC {IOC1 | IOC2} -- save
IMC configuration in either IOC1 or IOC2`

                    `set configuration restore -- restore configuration
from the same card`

                    `set configuration restore IOC -- restore IOC
configuration from IMC`

                    `set configuration restore IMC {IOC1 | IOC2} --
restore IMC configuration from either IOC1 or IOC2.`

                    `set configuration default -- set the configuration
to default, preserving user and ip configuration`

                    `set configuration factory -- set the configuration
to factory default`

Level 3:   Same as Level 2

Remarks: Setting the configuration to default will not overwrite user login
information or system's IP address. Setting the configuration to factory resets all
settings to the factory default. The IOC configuration is automatically saved in the
IOC one minute after a configuration setting is changed.

Related: See Set commands

Set Configuration Restoreuser IMC

This command is used to restore the IMC configuration from the remote server. This is a two-step process that also requires using the `set recvconfig IMC user@host:file` command.

Level 1:   Not Applicable

Level 2:   `set configuration restoreuser IMC`

Example: `set sendconfig IMC user@192.168.3.86:/home/user/imc.bak`

Example: `set configuration restoreuser IMC`

Level 3:   Same as Level 2

Remarks:

Related:

set configuration restoreuser IOC

This command is used to restore the IOC configuration from the remote server. This is a two-step process that also requires using the `set recvconfig IOC user@host:file` command.

Level 1:   Not Applicable

Level 2:   `set configuration restoreuser IOC`

Example: `set sendconfig IOC user@192.168.3.86:/home/user/ioc.bak`

Example: `set configuration restoreuser IOC`

Level 3:   Same as Level 2

Remarks:

Related:

Show EIA-232

This command displays the serial port's operating parameters: baud rate, parity, word length, stop bits, and handshaking.

Level 1:   `show eia-232`

                    Serial port configuration:
                    Baud - 9600
                    Data - 8
                    Parity - none
                    Stop - 1

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: The serial interface is fixed at 9600, None, 8, 1, Xon/Xoff. There is no associated set command. The EIA-232 interface can be enabled and disabled using the Set Service command.

Note: 57600 baud rate is supported only in the IMC rev H version 1.00.13 or below.

Related: `set resource, show resource`

Exit

If the engine is currently at a command-node or major command node, exit will take the control to its parent. An exit at the root module will have no effect.

Level 1:

Level 2:

Level 3:

Remarks:

Related:

Show Firewall

This command displays the firewall configuration.

Level 1:   Not Applicable

Level 2:   `show firewall`

Level 3:   Same as Level 2

Related: `set firewall`

Set Firewall

Use this command to configure the firewall. The firewall is used to selectively block traffic of specified protocols from the Ethernet ports. If the firewall is enabled for a protocol, then traffic using that protocol is allowed. If the protocol type is disabled, then traffic of that type is blocked.

Level 1:   Not Applicable

Level 2:   `set firewall icmp {enable|disable}`
                      `set firewall telnet {enable|disable}`
                      `set firewall ssh {enable|disable}`
                      `set firewall ftp {enable|disable}`
                      `set firewall ntp {enable|disable}`
                      `set firewall snmp {enable|disable}`
                      `set firewall radius {enable|disable}`
                      `set firewall tacplus {enable|disable}`
                      `set firewall syslog {enable|disable}`

Level 3:   Same as Level 2

Related: `show firewall`

Generate Message

Use this command to generate all TimeCreator 1000 specific messages.

Level 1:   Not Applicable

Level 2:   Not Applicable

Level 3:   `generate message`

Related: `show log`

Show GPS

This command displays the position (latitude, longitude, height), elevation mask value (positioning filter), mode of operation (manual or automatic), and GPS satellite tracking status. It also displays information for all satellite vehicles being tracked: vehicle number, health, noise ratio, satellite elevation, satellite azimuth.

Level 1:   `show gps`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related: `set gps`

Set GPS

Use this command to provision the GPS for mode of operation, position, and positioning elevation mask. With this command, you can provision the GPS to use either automatic or manual mode to determine the system's position. You can provision the GPS position if the system is provisioned for Manual mode of operation. You can also provision the elevation mask to provide a method of filtering satellites to be used by the system.

Note: Latitude and Longitude are entered as pddd:mm:ss.sss, where p is N or S for latitude and E or W for longitude, ddd is degrees, mm is minutes, and ss.sss is seconds. For example: N59:20:3.458 or W121:31:42.69. Height is in meters.

Level 1:   Not Applicable

Level 2:   `set gps {mode [auto|manual]|position <lat> <long>`
                      `<height>|mask value}`

Latitude is in the format N|Sdd:mm:ss.sss, for example:
`N37:22:45.123`
`S48:33:67.456`

Longitude is in the format E|Wddd:mm:ss.sss, for example:
`W121:55:36.123`
`E157:33:47.456`

Height is in meters with one digit after the decimal point, for example:
`17.5`

Level 3:   Same as Level 2

Related: `show gps`

Restrictions: The system must have the GPS mode of operation provisioned as manual before you can successfully provision the position manually.

History

Use this command to display a list of commands that have been executed.

Level 1:   `history`

save_to_file   - The history will get saved in this file.

load_from_file - The history from this file will be loaded. The file-name should be of an existing file.

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Show Hostname

This command displays the host name for the TimeCreator 1000.

Level 1:   `show hostname`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related: `set hostname`

Set Hostname

This command sets the host name for the TimeCreator 1000.

Level 1:   Not Applicable

Level 2:   `set hostname {hostname}`

Level 3:   Same as Level 2

Remarks: Hostname can contain up to 20 characters.

Related: `show hostname`

Show Interface

This command displays the port state (enabled or disabled) for the GPS, client, or server ports. It also displays the reference priorities and the port number, type, test mode, and state.

Level 1:   `show interface`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: There are a total of 12 ports. Ports A/11 and B/12 have dual functionality; they can be provisioned as either DTI client or DTI server ports.

Related: `set interface`

Set Interface

Use this command to provision the port state to be enabled or disabled for the GPS, client, or server ports. You can provision ports A/11 and B/12 as either DTI client ports or DTI server ports and you can also provisions the priority levels. You can provision the DTI server ports to be in test mode.

Level 1:   Not Applicable

Level 2:   `set interface state {gps|port} {#|all}`
                      `{enable|disable}`

                      `set interface test-mode port {#|all}`
                      `{enable|disable}`

                      `set interface tod-mode {short|verbose}`

                      `set interface type {porta|portb} {client|server}`

                      `set interface priority {porta|portb} value`

Level 3:   Same as Level 2

Remarks: Rear panel ports A/11 and B/12 are referred to as ports A and B for the interface state and type commands.

If the priority of the ports are the same, the port selection is non-revertive. For instance:

1. If one port is disqualified and the second port is qualified, the second port will be used as the reference.

2. If the first port is once again qualified, then the unit will not switch back to using the first port; it will continue to use the second port as reference.

Set the ToD source to the desired value before setting the interface state or type. The type should be set before the state is set for ports 11 and 12. Ports A/11 and B/12 must be configured as server ports for the test signal is generated in test mode. If test mode is enabled, the test signal is generated regardless of the port enable/disable state setting.

Related: `show interface`

Show Interval

This command displays the interval over which performance data is calculated for all types of data and for all output ports.

Level 1:   `show interval`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related: `set interval`

Set Interval

This command allows you to provision the interval over which performance data is calculated for the specified type of data (P-P Jitter, MTIE-t, FER) and for the specified output ports.

Level 1:   Not Applicable

Level 2:   `set interval jitter [port#|all]`
                     `value`

                     `set interval mtie-t [port#|all] value`

                     `set interval fer [port#|all] value`

Level 3:   Same as Level 2

Remarks: Setting the interval to 0 disables calculation of performance data.

Show Inventory

This command displays the installed module inventory information: model number, user-assigned asset number, IMC's MAC addresses, IMC and IOC modules' serial numbers, IMC and IOC modules' PCB versions, IMC and IOC modules' FPGA versions, IMC and IOC modules' firmware versions.

Level 1:   `show inventory`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: The user can only modify the Asset number.

Related: `set inventory`

Set Inventory

Use this command to provision the IMC module's user-assigned asset value information.

Level 1:   Not Applicable

Level 2:   `set inventory asset <string>`

                    Enter user-assigned asset value string from 1 to 20 characters.

Level 3:   Same as Level 2

Related: `show inventory`

Show IOC-State

This command displays the state of both the active and standby IOC module. If either IOC module cannot assume the active, standby, or disabled state, the state indicates NOT AVAILABLE.

Level 1:   show ioc-state

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: The active IOC module generates DTI outputs. The redundant module is the standby Module.

Related: set ioc-state

Set IOC-State

Use this command to provision the standby module to become the active module, or for either module to be disabled. IOC1 references the IOC module to the left of the IMC and IOC2 references the IOC module to the right of the IMC.

Level 1:   Not Applicable

Level 2:   set ioc-state [active|standby|disable][IOC1|IOC2]

Level 3:   Same as Level 2

Remarks: If the active IOC module is disabled, the system sets the redundant IOC module to be the active module prior to disabling the currently active module. If the redundant IOC module cannot become the active module, the command is ignored.

Related: show ioc-state

Show IP

This command displays the Host address, Mask, and Gateway IP settings for both Ethernet interfaces. It also indicates if DHCP is enabled for the interface and if the interface is disabled.

Level 1:   `show ip {config | status}`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: Use `show ip config` to display the current user-selected configuration settings. Use `show ip status` to display the current interface configuration. The status version of the command gives the Ethernet link status and the IP interface status.

Related: `set ip`

Set IP

Use this command to provision the Host address, Mask, Gateway, and Broadcast IP settings for both Ethernet interfaces.

Level 1:   Not Applicable

Level 2:   `set ip {eth0|eth1} {[addr|mask|gateway|broadcast] address}`

Level 3:   Same as Level 2

Remarks: The address format allows IPv4 and IPv6 multiple octet formats. Use IP-State to disable the interface while configuring the system. The mask is defined as an integer defining the number of 1-bits from the MSB. The rest of the bits are 0. For example a value of 24 corresponds to 255.255.255.0.

> **Notes:**
>
> IPv6 is not supported in this release.
>
> If a gateway address is configured, but the gateway device is not functioning or is not connected, then the Ethernet interface will not function.
>
> Use `set ip-state {port} restart` after configuring the IP interface.

Related: `show ip, set ip-mode, set ip-state`

Set IP-Mode

Use this command to set the DHCP mode for both Ethernet interfaces. You can set up the interface to use either DHCP or a static IP.

Level 1:   Not Applicable

Level 2:   `set ip-mode {eth0|eth1} mode {dhcp|static}`

Level 3:   Same as Level 2

Remarks: Use Set IP-State to restart the interface after configuring the system.

Related: `show ip, set ip, set ip-state`

Set IP State

Use this command to enable or disable the specified Ethernet interface. You must restart the interface after you configure it.

Level 1:   Not Applicable

Level 2:   `set ip-state {eth0|eth1} {enable|disable|restart}`

Level 3:   Same as Level 2

Remarks: Restart disables the interface and then enables it.

Related: `show ip`

Show Log

This command displays the specified log file from the local storage. The Index parameter selects one of the rotated log files. The Head parameter, along with the count value, displays the specified number of events from the beginning of the file. The Tail parameter, along with the count value (#), displays the specified number of events from the end of the file. If the Index is not specified or set to zero, the current log file is displayed. If neither Head nor Tail parameter is issued, the 20 most recent entries are displayed. the command display the specified log's user provisioned line buffer size and total number of lines buffered. The log files are:

- Performance Log - log of performance monitoring data

- NTP Log

- Alarm Log

- Event Log

- Command Log

- Security Log

Level 1:   `show log {performance|ntp|alarm|event|command|`
`security} [index {head|tail} count]`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related: `set log`

Clear Log

This command clears the specified log.

Level 1:   Not Applicable

Level 2:   `clear log {performance|ntp|alarm|event|command|`
`security|all}`

Level 3:   Same as Level 2

Show Log-size

Use this command to display the specified log buffer, the maximum number of kilobytes stored in the file before it is rotated.

Level 1:   `show log-size`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Set Log-size

Use this command to provision the specified log file buffer size, the maximum number of kilobytes to be stored in the file before it is rotated.

Level 1:   Not Applicable

Level 2:'   `set log-size {performance|ntp|alarm|event|command|`
                      `security} size`

Level 3:   Same as Level 2

Remarks: Provisioning a log file size to zero disables the logging of that type of data.

Related: `show log`

Show Log-Interval

This command displays the user provisioned log intervals.

Level 1:   `show log-interval`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related: `show log`

Set Log-Interval

Use this command to provision the interval for the specified log. The interval is the time, in seconds, between successive log entries. Only the performance log can be provisioned.

Level 1:   Not Applicable

Level 2:   `set log-interval performance {interval}`

Level 3:   Same as Level 2

Remarks: Setting the log interval to zero disables logging.

Related: `show log`

Show Logged-in-user

This command displays a list of currently logged in users.

Level 1:   `show logged-in-users`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks:

Related:

Logout

This command terminates the current user connection.

Level 1:   `logout`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Show Mode

This command displays the TimeCreator 1000 mode configuration, either root or subtending.

Level 1:   `show mode`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Remarks: For subtending mode, this command returns "proxy". This is the term used by the SNMP MIB.

Related: `set tod-source`

Show NTP

This command displays the NTP configuration, including server addresses, polling intervals, preferred server, and key information.

Level 1:   show ntp

Level 2:   Same as level 1

Level 3:   Same as level 1

Set ntp-server

This command provisions which NTP servers to use, the minimum and maximum poll intervals, if the server is preferred, and key ID. This information is used when the TimeCreator 1000 is acting as an NTP client.

Level 1:   Not applicable

Level 2:   `set ntp-server add <server ip address or hostname>`
`[key <keyid>] [min <value>] [max <value>]`
`[preferred {yes|no}]`

`set ntp-server modify <server ip address or`
`hostname> [key <keyid>] [min <value>] [max <value>]`
`[preferred {yes|no}]`

`set ntp-server del <server ip address or hostname>`

Level 3:   Same as level 2

Remarks: Valid key ID range is 1 to 65534. Valid poll intervals are 4 to 10, which correspond to 16 to 1024 seconds. The NTP service must be disabled and then enabled with the Set Service command for changes to take effect. If a key ID is specified, then authentication is used when connecting to the NTP server. The key must be defined with the Set NTP-Key command.

Set ntp-authentication

This command provisions NTP authentication.

Level 1:   Not applicable

Level 2:   `set ntp-authentication {enable|disable}`

Level 3:   Same as level 2

Remarks: The NTP service must be disabled and then enabled with the Set Service command for changes to take effect. This configuration is not used in the client-server mode of NTP.

Set ntp-key

This command provisions NTP key ID and key string pairs. This will be used when the TimeCreator 1000 is an NTP client and also when it is an NTP server. Key ID and string pairs can be added, modified, or deleted.

Level 1:   Not applicable

Level 2:   `set ntp-key add <keyid> <key_string>`

`set ntp-key modify <keyid> <key_string>`

`set ntp-key del <keyid>`

Level 3:   Same as level 2

Remarks: Valid key ID range is 1 to 65534 and the key string can be up to 32 ASCII characters. Up to nine NTP keys can be configured. The key must not contain the "#" or "?" characters. The NTP service must be disabled and then enabled with the Set Service command for changes to take effect.

Ping

Use this command to ping the host specified by the address (xxx.xxx.xxx.xxx) and display ping statistics.

Level 1:   `ping address`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Reboot

This command restarts one or more of the modules. Using this command can cause a loss of outputs.

Level 1:   Not Applicable

Level 2:   Not Applicable

Level 3:   `reboot {imc|ioc1|ioc2|system}`

Remarks: Selecting the "system" option restarts all system modules.

Show remote-syslog

This command displays the remote syslog server that log messages are sent to from the TimeCreator 1000.

Level 1:   `show remote-syslog`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related: `set remote-syslog`

Set remote-syslog

This command is used to configure a remote syslog server to receive log messages from the TimeCreator 1000.

Level 1:   Not Applicable

Level 2:   `set remote-syslog enable <hostaddr>`

                        `set remote-syslog disable`

Level 3:   Same as Level 2

Related: `show remote-syslog`

Set Recvconfig IMC user@host:file
This command is used to restore the IMC configuration from the remote server. This is a two-step process that also requires using the `set configuration restoreuser IMC` command.

Level 1:   Not Applicable

Level 2:   `set recvconfig IMC user@host:file`

Example: `set recvconfig IMC user@192.168.3.86:/home/user/imc.bak`

Example: `set configuration restoreuser IMC`

Level 3:   Same as Level 2

Remarks:

Related:

Set Recvconfig IOC user@host:file
This command is used to restore the IOC configuration from the remote server. This is a two-step process that also requires using the `set configuration restoreuser IOC` command.

Level 1:   Not Applicable

Level 2:   `set recvconfig IOC user@host:file`

Example: `set recvconfig IOC user@192.168.3.86:/home/user/ioc.bak`

Example: `set configuration restoreuser IOC`

Level 3:   Same as Level 2

Remarks:

Related:

Show Root-recovery Config

This command displays the root server recovery configuration. It shows whether the auto recovery mode is enabled or not, a global setting; or if rapid recovery is enable or not for each port (1 through 12).

Level 1:   show root-recovery config

Example:

```
tc1000> show root-recovery config
Root server recovery configuration:
Auto recovery mode: disabled
Port 01 rapid recovery mode: disabled
Port 02 rapid recovery mode: disabled
Port 03 rapid recovery mode: disabled
Port 04 rapid recovery mode: disabled
Port 05 rapid recovery mode: disabled
Port 06 rapid recovery mode: disabled
Port 07 rapid recovery mode: disabled
Port 08 rapid recovery mode: disabled
Port 09 rapid recovery mode: disabled
Port 10 rapid recovery mode: disabled
Port 11 rapid recovery mode: disabled
Port 12 rapid recovery mode: disabled
tc1000>
```

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related:

Remarks:

Show Root-recovery Status

This command displays the root server recovery status. It shows read-only properties, such as whether the auto recovery script is running or not, projected recovery time in minutes, and rapid recovery capable.

Level 1:   `show root-recovery status`

`Example:`

```
tc1000> show root-recovery status
Auto recovery process: not running
Port 01 projected recovery time: 0 minutes
Port 02 projected recovery time: 0 minutes
Port 03 projected recovery time: 0 minutes
Port 04 projected recovery time: 0 minutes
Port 05 projected recovery time: 0 minutes
Port 06 projected recovery time: 0 minutes
Port 07 projected recovery time: 0 minutes
Port 08 projected recovery time: 0 minutes
Port 09 projected recovery time: 0 minutes
Port 10 projected recovery time: 0 minutes
Port 11 projected recovery time: 0 minutes
Port 12 projected recovery time: 0 minutes
Port 01 recovery capability status: No
Port 02 recovery capability status: No
Port 03 recovery capability status: No
Port 04 recovery capability status: No
Port 05 recovery capability status: No
Port 06 recovery capability status: No
Port 07 recovery capability status: No
Port 08 recovery capability status: No
Port 09 recovery capability status: No
Port 10 recovery capability status: No
Port 11 recovery capability status: No
Port 12 recovery capability status: No
```

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related:

Remarks:

Set Root-recovery Autorecoverymode

This command is used to enable or disable the auto recovery mode (a global setting), enable or disable the rapid recovery mode for all ports, and enable or disable the rapid recovery mode on a per port basis (1 through 12).

Level 1:   Not Applicable

Level 2:   `set root-recovery autorecoverymode [enable|disable|abort]`

Level 3:   Same as Level 2

Related: `show root-recovery config`

Set Root-recovery Rapidrecovery

This command is used to enable or disable the rapid recovery mode, enable or disable the rapid recovery mode for all ports, and enable or disable the rapid recovery mode on a per port basis (1 through 12).

Level 1:   Not Applicable

Level 2:   `set root-recovery rapidrecovery`
                     `[port#|all|enable|disable]`

```
Examples:

set root-recovery rapidrecovery port 1   enable
set root-recovery rapidrecovery port 12 enable
set root-recovery rapidrecovery port 1   disable
set root-recovery rapidrecovery port 12 disable
```

Level 3:   Same as Level 2

Related: `show root-recovery config`'

Set Sendconfig IMC user@host:file

This command is used to save the IMC configuration to a remote server using the Secure Copy (SCP) protocol

Level 1:   Not Applicable

Level 2:   `set sendconfig imc user@host:file`

Example: `set sendconfig IMC user@192.168.3.86:/home/user/imc.bak`

Level 3:   Same as Level 2

Remarks:

Related:

Set Sendconfig IOC user@host:file

This command is used to save the IOC configuration to a remote server using the Secure Copy (SCP) protocol:

Level 1:   Not Applicable

Level 2:   `set sendconfig IOC user@host:file`

Example: `set sendconfig IOC user@192.168.3.86:/home/user/ioc.bak`

Level 3:   Same as Level 2

Remarks:

Related:

Show Services

This command displays all TimeCreator 1000 service states.

Level 1:   Not Applicable

Level 2:   `show services`

Level 3:   Same as Level 2

Remarks: Services include EIA-232, Telnet, SSH, NTP, and SNMP.

Set Service

Use this command to specify the state of each service.

Level 1:   Not Applicable

Level 2:
```
set service eia-232 {enable|disable}
set service telnet {enable|disable}
set service ssh {enable|disable}
set service ntp {enable|disable}
set service snmp {enable|disable}
```

Level 3:   Same as Level 2

Remarks: Services include EIA-232, Telnet, FTP, SSH, NTP, and SNMP.

> **Note:** The command also includes the capability of controlling the syslog service. Disabling this service is not recommended.

Show SNMP

Use these commands to display the SNMP Manage assigned to the agent, and all assigned users (username only).

Level 1:   Not Applicable

Level 2:   Not Applicable

Level 3:   `show snmp manager`

This command displays the SNMP manager and the engineID.

`show snmp user`

This command displays all assigned users (user names only).

`show snmp trap`

This command displays whether traps are sent as SNMPv2 or SNMPv3 and also the SNMPv3 trap user.

Related: `set snmp`

Set SNMP

Use this command to provision the SNMP state, user authentication, and manager.

Level 1:   Not Applicable

Level 2:   Not Applicable

Level 3:
```
set snmp user {add|delete} username securlvl
{noauth|auth|priv}
```

Use this command to add or delete an SNMP user, including authentication and privacy. If appropriate, the user is prompted for AuthKey, PrivKey, AuthType, and PrivType. You can set AuthType to MD5 or SHA. You can set PrivType to DES or AES.

```
set snmp manager address (xxx.xxx.xxx.xxx
engineid {value}
```

Use this command to set the SNMP manager address to the specified IP address or hostname and configure engine ID for the manager.

```
set snmp default
```

Use this command to clear the SNMP manager information.

```
set snmp trapuser username securlvl
{noauth|auth|priv}
```

Use this command to set an SNMPv3 user. If the security level is set for "auth", then the user is prompted for AuthType and AuthKey. You can set AuthType to MD5 or SHA. If the security level is set for "priv", then the user is prompted for AuthType, AuthKey, PrivType, and PrivKey. You can set PrivType to DES or AES.

```
set snmp trapversion {2|3}
```

Use this command to select whether traps are sent as SNMPv2c or SNMPv3.

Related: `show snmp`

Show SNMP v2

Use this command to display whether SNMPv2 is enabled and whether read-write access is enabled.

Level 1: Not Applicable

Level 2: Not Applicable

Level 3: `show snmp v2`

Related: `set snmpv2`

Set SNMPv2

Use this command to enable or disable SNMPv2 and control read-write access.

Level 1: Not Applicable

Level 2: Not Applicable

Level 3: `set snmpv2 {Disable | Enable}`

Remarks:

Related: `show snmp v2`

Set SNMPv2 Rocommunity

Use this command to set snmpv2 read only community. The default setting is public.

Level 1: Not Applicable

Level 2: Not Applicable

Level 3: `set snmpv2 rocommunity`

Example: `set snmpv2 rocommunity rouser`

Related: `set snmpv2`

Set SNMPv2 Rwcommunity

Use this command to set the snmpv2 read-write community. The default setting is private.

Level 1: Not Applicable

Level 2: Not Applicable

Level 3: `set snmpv2 rwcommunity`

Example: `set snmpv2 rwcommunity rwuser`

Remarks:

Related: `set snmpv2`

Show Statistics

This command displays the statistics information for the following:

- DTI Client Peak-to-Peak Jitter (connected to a server port)

- DTI Client MTIE-35 (connected to a server port)

- DTI Client MTIE-t (connected to a server port)

- DTI Client FER (connected to a server port)

Level 1:   show statistics

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related: clear statistics

Clear Statistics

This command clears all statistics.

Level 1:   Not Applicable

Level 2:   clear statistics

Level 3:   Same as Level 2

Related: show statistics

Status

This command displays the system status information as follows:

- Assigned System Name and asset tag

- Uptime for the IMC

- System date and time

- Number of standing system alarms

- Active IOC module

- Standby IOC module

- Currently selected TOD Source

- Summary for the GPS Input

- Summary for each DTI client port

- Summary for each DTI server port

- Clock operating mode for the IOC

Level 1:   `show status`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related: `show alarms`

Set-timeout

Use this command to change the timeout time. If the timeout is reached, the CLI logs out with a message "Session timeout" … The user can set the timeout as desired.

Level 1:   Not Applicable

Level 2:   Not Applicable

Level 3:   `set-timeout`

Remarks: The range for the session timeout parameter is 30 − 3600 seconds. TimeCreator will accept the `set-timeout` command from Level 1 and Level 2 users, but TimeCreator will return the message "Unable to open configuration file to record timeout value". The value entered by Level 1 or Level 2 users will only apply to the session in which the command was entered.

Show TOD-Source

This command displays the Time Of Day Source.

Level 1:   `show tod-source`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related: `sync tod-source, set tod-source`

Set TOD-Source

Use this command to provision the TOD Source.

Level 1:   Not Applicable

Level 2:   `set tod-source {gps|dti|ntp|rtc|user}`

Use this command to provision the TOD Source to be provided
by GPS, DTI client port, NTP server, or the local Real-Time
Clock.

Level 3:   Same as Level 2 (default)

Note: If the system has passed the warm up state, the Sync
TOD-Source command is also required.

Related: `sync tod-source, show tod-source`

Sync TOD-Source

Use this command to change the time and phase of the DTI outputs.

Level 1:   Not Applicable

Level 2:   `sync tod-source {now | yyyy-mm-dd hh:mm:ss}`

Use this command to provision the TOD-Source to "jam sync"
when the command is issued or at the specified date/time.

Level 3:   Same as Level 2

Related: `set tod-source, show tod-source`

Upgrade

Use this command to upgrade the specified modules firmware with the specified filename. If the IP address, username, and password is provided, the system will FTP the filename from the specified server (IP or name) and then upgrade the specified module. The system can download the file from an http, ftp, or sftp server. If the optional keyword "auto-reboot" is added, then the upgraded card will reboot after being upgraded. IOC cards will verify that there is a standby IOC card available before rebooting. The new firmware is not used until the card is rebooted.

Level 1:   Not Applicable

Level 2:   Not Applicable

Level 3:   `upgrade {imc|ioc|ioc1|ioc2} filename server {ftp|sftp|http} [auto-reboot]`

The user will be prompted for the username and password for the server.

Show User

This command displays all assigned users and access levels (local access does not require RADIUS or TACACS+ authentication).

Level 1: Not Applicable

Level 2: Not Applicable

Level 3: `show user`

Related: `set user`

Set User

Use this command to provision the local user password and access level.

Level 1: `set user password <username>`

Level 1 users can only change their own password.

Level 2: Same as Level 1

Level 3: `set user add`

`set user del <username>`

`set user modify <username> access-level <level>`

`set user password <username>`

`set user lock <username>`

`set user unlock <username>`

`set user default`

When adding a user, the system prompts the Administrator for username, password, password verification and level of access.

Use Del to remove (delete) a user from the access list.

Use Modify to change the access-level of the user.

Use password to change the password for the user. The system prompts for the password.

Use Lock to lock out the specified user.

Use Unlock to unlock the specified user. The user could have been locked by the lock command or by too many failed login attempts. Users are locked out after 3 consecutive failed login attempts.

Use Default to remove all users from the access list and set the default user and password.

Remarks: The password is not echoed back to the user's terminal.

Related: `show user`

Where

Use this command to display the path of the current command node or module starting from the root.

Level 1:   `where`

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Show Whitelist

This command displays the list of IP addresses on the whitelist.

Level 1:   show whitelist

Level 2:   Same as Level 1

Level 3:   Same as Level 1

Related: set whitelist

Set Whitelist

Use this command to add or delete IP addresses to/from the whitelist. Once the first IP address has been added to the whitelist, any future IP sessions will only be accepted if they originate from IP addresses from the whitelist. In the default condition, all IP addresses are allowed access.

Level 1:   Not Applicable

Level 2:   Not Applicable

Level 3:   set whitelist add <ip address>

                      set whitelist add <ip address>/<ip mask>

                      set whitelist delete <ip address>

                      set whitelist commit

                      set whitelist default

Example: set whitelist add 192.168.5.10
                      set whitelist commit

Example: set whitelist add 192.168.5.0/24
                      set whitelist commit

Example: set whitelist delete 192.168.5.10
                      set whitelist commit

> **Note:** Symmetricom recommends that the IP address of the administrator station always be added to the whitelist first. This will prevent an accidental lockout of the administrator via Telnet/SSH.

Remarks: The whitelist must be committed before any changes to the whitelist will be implemented.

Related: show whitelist

Simple Network Management Protocol

This section describes the two versions of SNMP supported by the TimeCreator 1000: SNMPv2c and SNMPv3.

SNMP Features

The Simple Network Management Protocol (SNMP) is an application layer protocol that allows you to manage network devices. 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 TimeCreator 1000) is the server generating responses. The TimeCreator 1000 SNMP supports most existing functions.

If SNMP is present, port 161 becomes the port of standard SNMP interactive communications and port 162 becomes the trap port.

SNMP allows you to perform the following functions:

- Alarm management
- GPS input configuration
- DTI client and server port configuration
- TOD source configuration

SNMPv3 Security Features

SNMPv3 provides additional security features not available in SNMPv2c. In addition to the functions of SNMPv2c, SNMPv3 allows user levels that are based on authentication and privacy settings. The authentication protocol HMAC-SHA-1-96 is 20 characters long and the privacy protocol CBC-DES is a 16-character key. All keys are uppercase.

The administrator can add up to 20 users to the SNMP user table.

Management Information Base

The Management Information Base (MIB) is a virtual database of managed objects, their object identifiers, and variables. Typical MIB object identifiers include the TimeCreator 1000, its modules, module features, input ports, output ports, etc. and variables that include settings and measurements.

The MIB is controlled by the TimeCreator 1000's SNMP agent. The SNMP agent is a server program that sends TimeCreator 1000 status (stored in the MIB database) to the network manager when the manager transmits GET or GETNEXT messages. The manager can also transmit SET messages that instruct the agent to set MIB variables to new values. The TRAP message is used by the server to send the manager indications of MIB occurrences, such as a fault condition.

SNMP Users and Manager Addresses

SNMP CLI commands allows you to:

- Enable and disable SNMP

- Set SNMP manager IP address for traps

- Add up to 20 SNMP user names in the SNMP user table

- Display SNMP user names (read community string) and their associated access levels

- Delete SNMP user names

Enabling SNMP
The Set Service Snmp command allows you to enable or disable the SNMP (see Set Service, on page 160).

Example:

Use the following command to enable SNMP:

Type `set service snmp enable` and press **ENTER**.

Adding a Manager IP Address
The Set Snmp Manager command allows you to specify an SNMP manager IP address (see Set SNMP, on page 162).

Example:

Use the following command to add the SNMP manager IP address `192.100.100.100` and engineID XYZ:

Type `set snmp manager address 192.100.100.100 engineid xyz` then press **Enter**.

Adding and Removing SNMP Users
The Set Snmp User command allows you to add or remove users and specify access privileges using algorithm HMAC-SH-1-96 or MD5 with the 20 character authentication key and a CBC-DES 16 or AES character privacy key (see Set SNMP, on page 162).

Example

Use the following command to add user ABC with the 20 character MD5 authentication key 123456789ABCDEFGHIJK and 16 DES character privacy key 123456789ABCDEFG.

Type `set snmp user add abc securlvl priv` and press **Enter**.

Enter MD5 at the authentication protocol prompt.

Enter 123456789ABCDEFGHIJK at the authentication key prompt

Enter DES at the privacy protocol prompt

Enter 123456789ABCDEFG at the privacy key prompt

Displaying SNMP Users

The Show Snmp commands allow you to display the SNMP configuration. This includes the SNMP manager, users, trap version, trap user, and whether SNMPv2 is enabled (see Show SNMP, on page 161).

Example

Use the following command to display the list of SNMP users (admin user level 3 required).

Type `show snmp user` and press **Enter**.

> **Note:** Valid authentication key and privacy key characters include numbers, upper and lowercase letters, and the character set `:=?@_`. Do not use spaces in user names.

Network Time Protocol

Network Time Protocol (NTP) is used to synchronize system clocks to a common time source by transmitting and receiving time of day over a TCP/IP network.

The TimeCreator 1000 implements NTPv4, and supports the NTP v.3 (RFC 1305) version. It can run as a server application and a client application. The NTP server always runs and the client is enabled independently.

Server Mode

The NTP server application always runs at port 123 (default NTP port) on the NTP Ethernet port and responds to requests for time in the NTP format. The NTP datagram provides fields (bits) of information that indicate the integrity of the time delivered by the server, two of these are the LI and STR fields. The Leap Indicator (LI) field indicates that Time has been successfully set (LI=0) or that Time has not been successfully set (LI=3). The Stratum (STR) field indicates the number of "hops" a client is from the root NTP server: for every hop, STR is incremented by one (1). If the unit has time set from GPS, then it indicates it is a primary time source with 0 in the LI field and 1 in the STR field. If the unit has time set by the client application, it indicates it is a secondary source with 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.

Client Mode

If GPS is not available or disabled, and a valid NTP server is configured, then the unit will request time from port 123 of the assigned server IP at the designated time interval (16 to 1024 seconds). Once time is set by the client mode, the server will have LI = 0 and Stratum = 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.

Secure Shell Protocol

Secure Shell Protocol (SSH) provides secure, encrypted communications and services between hosts on unsecured networks.

Secure File Transfer Protocol

Secure File Transfer Protocol (SFTP) uses SSH to transfer files encrypting both commands and data, including passwords, to provide secure transmission for copying files.

Appendix C Installing the Two-Way GPS Antenna

This document describes the procedures for installing the Symmetricom Two-Way GPS antenna and the Two-Way Antenna Interface.

In This Appendix

- Tools
- Parts
- Making GPS Connections

Tools

These standard tools and materials are not supplied, but may be required for installing the Two-Way GPS antenna:

- Standard tool kit
- Fasteners for mounting the equipment in rack
- PVC glue

Parts

The following table identifies the parts available for the GPS antenna.

Table C-1. GPS Parts and Accessories

Part Number	Description
990-93500-01[1]	Two-Way GPS Antenna Kit
090-58545-01	Two-Way GPS Antenna (spare)
043-00018-01	Lightning suppressor (spare)
060-58545-01	RG-58 cable, 10 ft. (3 m)
060-58545-02	RG-58 cable, 20 ft. (6 m)
060-58545-05	RG-58 cable, 50 ft. (15 m)
060-58545-10	RG-58 cable, 100 ft. (30 m)
060-58545-20	RG-58 cable, 200 ft. (60 m)
060-58545-30	RG-58 cable, 300 ft. (90 m)
060-58545-50	RG-58 cable, 500 ft. (150 m)
154-00023-01	Crimp tool for RG-58 cable
371-001	TNC connectors for RG-58 cable

Note:

[1]   Kit includes GPS antenna and mounting hardware. Order antenna cables separately

Making GPS Connections

To connect the GPS antenna signal, you must install a GPS antenna using the procedure in this document.

Installing the GPS Antenna

These installation procedures are to be used in support of local company procedures and the Installation Job Specification.

Prior to installing the antenna, the site, antenna location, lightning suppressor location, cable route, and all other details should be planned. Use Figure C-1 as a guide to locating the antenna.
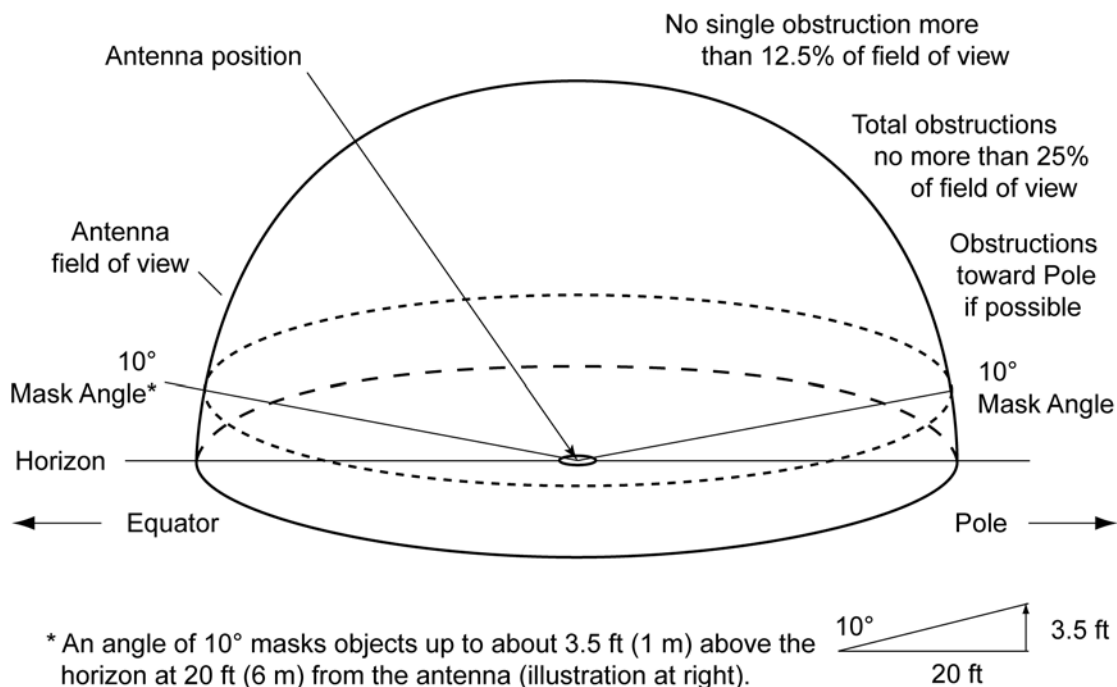
Figure C-1.   Locating the GPS Antenna

To install the antenna, refer to Figure C-2, and perform the procedure in this section. Ensure all user-supplied materials are available. The maximum distance between the antenna and the device is approximately 985 feet (300 m). The minimum cable length is 6.6 feet (2 m). The GPS Antenna should always be as close to the TimeCreator 1000 as practical.

Warning: To prevent arcing, ensure that the lightning suppressor is installed away from electrical devices and cabling.

Note: Use the following antenna installation instructions as a guideline only. Install the antenna using company-approved techniques, and follow all appropriate local building and electrical codes.

Recommendation: Symmetricom recommends that you use one of the following grounding points:

- Valid roof ring ground system
- Cad weld to building structural steel
- Ground plate within 50 feet (15 m) of antenna cable entrance into building

You can order two lengths of cable: one connecting the antenna to the lightning suppressor and one from the suppressor to the TimeCreator 1000. Or you can order one length of cable; you need to cut the cable and terminate it properly, using your own tools.
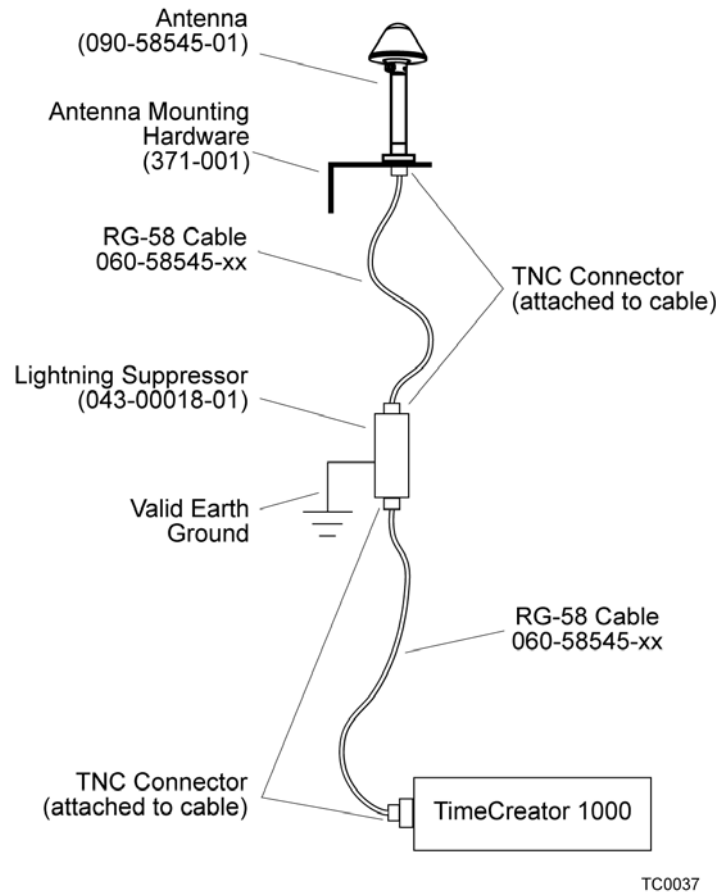
Figure C-2.   Antenna-to-Device Cabling

To install the antenna:

1. Attach the antenna mounting bracket to a 1-inch (2.5 cm) diameter pipe or wood post.

   – If you are mounting the bracket to a pipe, assemble as shown in Figure C-3. Slide the two V-bolts over the pipe, and through the mounting bracket slots; then place the provided four washers and four nuts over the V-bolts, against the mounting bracket. Leave the V-bolts loose enough to allow for final adjustments.
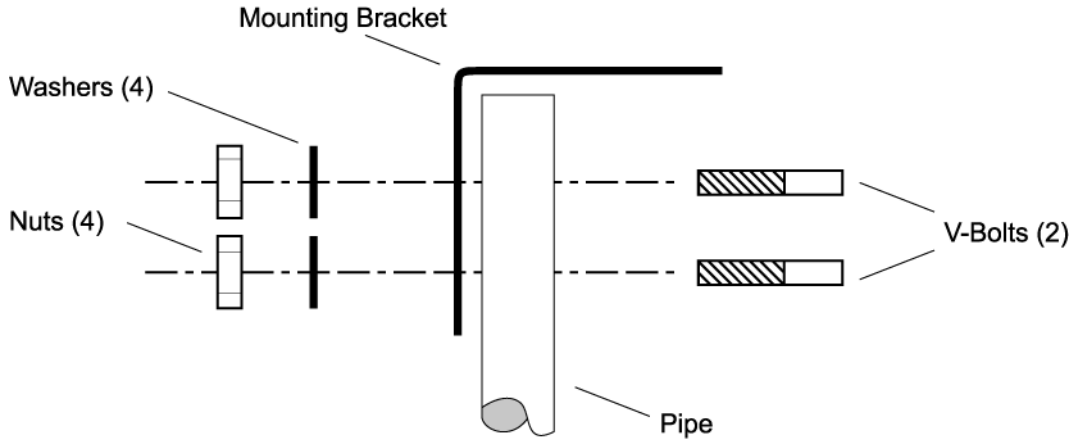
Figure C-3.   Installing the Antenna Bracket on a Pipe

– If you are mounting the bracket to a wood post, assemble as shown in Figure C-4. Install the provided two self-tapping screws in two diagonally positioned mounting bracket slots, and attach to the post.
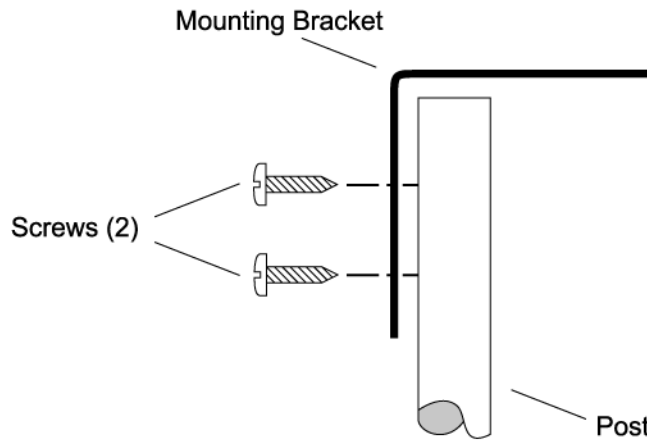
Figure C-4.   Installing the Antenna Bracket on a Post

2. Mount the antenna and mast assembly to the "L" bracket.

3. Connect the mast to the flange using PVC glue.

4. Feed an RG58 (060-58545-xx) cable through the bottom of the mast as illustrated. See Table C-1 for specific cable lengths.

5. Connect the cable to the antenna "pigtail" and pull the cable back through the mast.

6. Mount the antenna and mast assembly to the "L" bracket using the supplied nuts, bolts, and washers, as shown in Figure C-5.
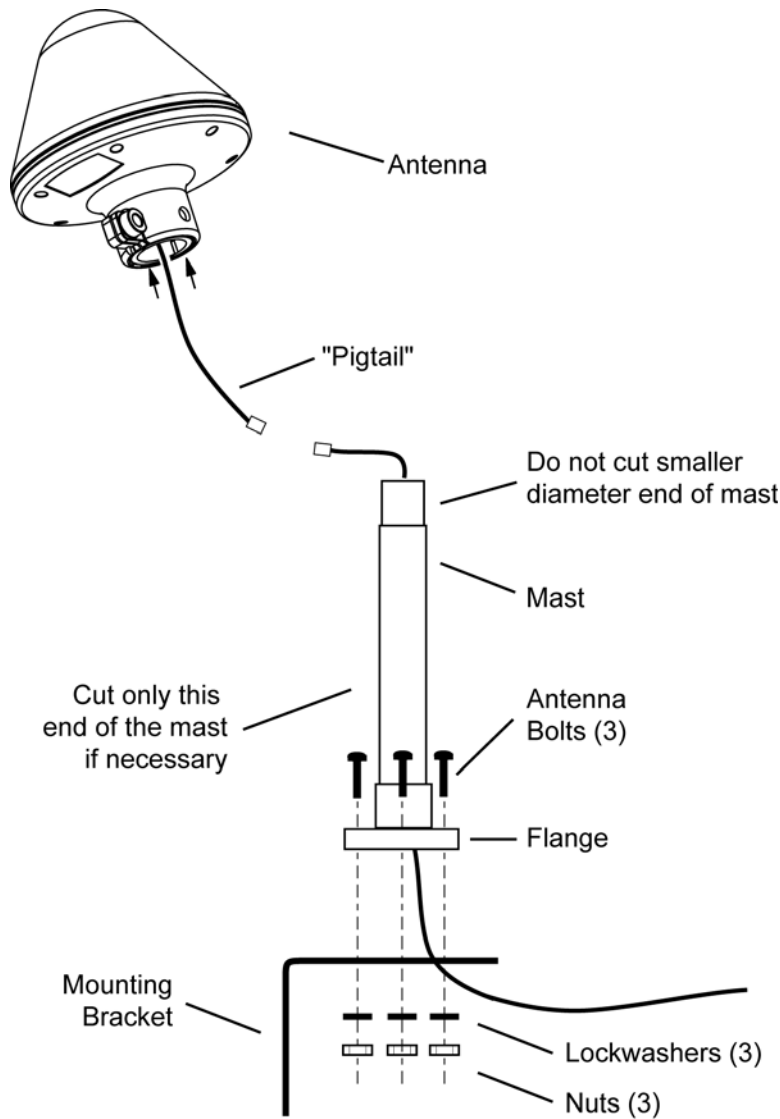
TC0022

Figure C-5.   Attaching the Antenna to the Bracket

7. Using a plumb line or bubble level, ensure the antenna is within 5° of vertical (perpendicular to the horizon), and tighten the mounting bracket bolts.

8. Bolt the lightning suppressor mounting plate to a flange that is attached to a valid earth ground. The roof ring ground system, a grounding plate, and building structural steel are examples of valid earth ground points. If the mounting plate cannot be bolted to a valid earth ground, bolt the mounting plate to a point within 15 feet (4.6 m) of the chosen valid earth ground. A minimum 30-foot (9 m) bend radius is required when installing the ground wire. If the mounting plate is to be

installed in a nonmetallic junction box, perform the installation and bolt the assembly near the chosen valid earth ground.

Note: A junction box must have inside dimensions of 2.75 inches by 2.75 inches by 1.6 inches (7 cm by 7 cm by 4 cm) to hold the mounting plate and attached components.

---

9. Assemble the lightning suppressor as shown in Figure C-6.
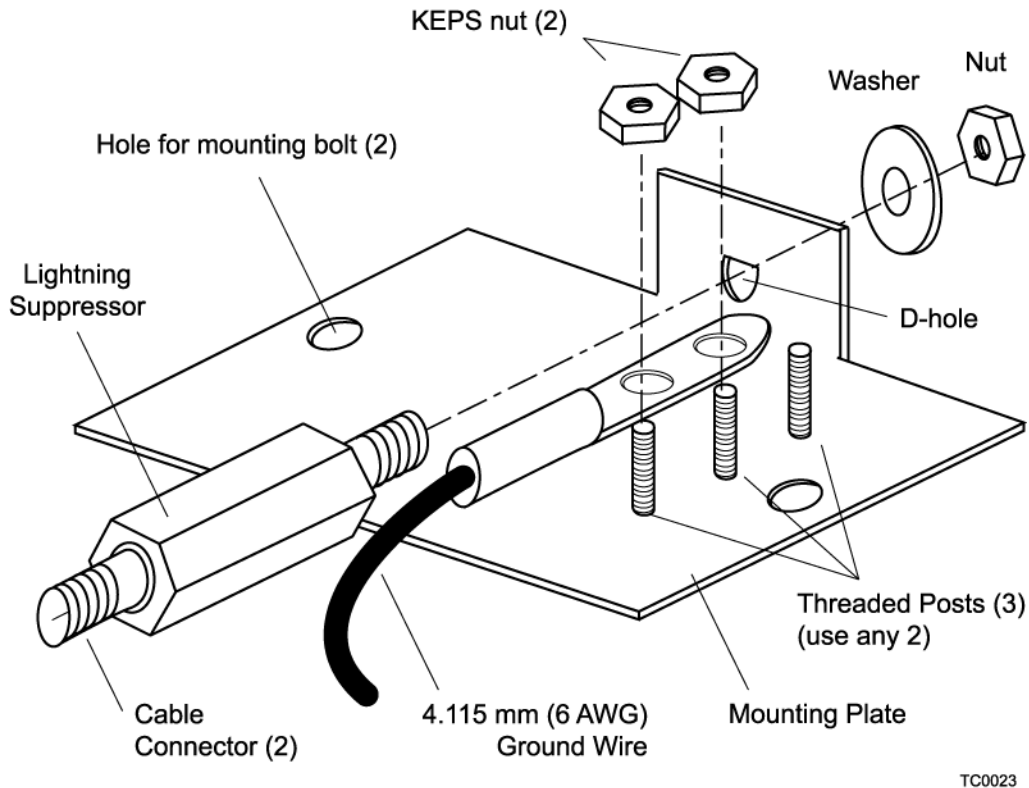
Figure C-6.   Assembling the Lightning Suppressor

10. Install 1.5 inch (3.8 cm) nonmetallic conduit from the antenna to the lightning suppressor, and from the lightning suppressor to the cable entrance into the building.

11. Install a user-supplied bracket, preferably non-metallic, to support the vertical section of conduit to the antenna.

12. Route the antenna cable through the conduit, and connect the cable to the lightning suppressor. See Table C-1 for specific cable lengths.

13. If the lightning suppressor is not mounted directly to a valid earth ground, crimp a length of 4.115 mm (6 AWG) ground cable to the two-hole terminal, slide the

terminal over two of the three threaded posts on the lightning suppressor mounting plate, and attach the terminal to the mounting plate with two KEPS nuts. Use the two posts that allow the least bending of the cable.

14. Connect an RG58 (060-58545-xx) cable between the lightning suppressor and the TimeCreator 1000. See Table C-1 for specific cable lengths.

15. Install fire-stopping material in all holes opened in the roof and/or walls during this procedure.

16. Check all connections for tightness to prevent arcing and intermittent operation.

17. Coat all exposed connectors with an electrically conductive antioxidant compound (e.g. Kopr-Shield spray).

Appendix D Specifications and Factory Defaults

This appendix provides mechanical and electrical specifications and factory defaults for the TimeCreator 1000.

In This Appendix

- Specifications
- Factory Defaults

Specifications

This section provides the specifications for the TimeCreator 1000 components and input and output signals.

Mechanical

Table D-1. TimeCreator 1000 Mechanical Specifications

Parameter	Description
Mounting	19 in. Rack
Rack Mounting Positions	Front mounting location, unit protrudes 0.75 in. (4.445 cm) Mid-point mounting location, unit protrudes 6.33 in. (16.08 cm)
Width	17.25 in. (43.82 cm)
Height	1.75 in. (4.45 cm)
Depth	19.9 in. (50.5 cm)
Weight	11 lb. (5 kg) fully loaded 7 lb. (3.2 kg) empty

Environmental

Table D-2. TimeCreator 1000 Environmental Specifications

Parameter	Description
Operating Temperature	0° to 40° C, 32° to 104° F
Storage Temperature	–25° to 70° C, –13° to 158° F
Operating Humidity	10% to 90% RH non-condensing
Storage Humidity	5% to 90% RH non-condensing

Power

Table D-3. TimeCreator 1000 Power Specifications

Parameter	Description
AC Input Power	100-240 V AC at 50/60 Hz.
AC Power Fuse	2 A (2 each)
AC Power	40 W
DC Input Power	–36 V DC to –72 V DC –48 V DC, 2.7 A (maximum) Either positive or negative ground
DC Recommended Battery Feed Fuse	3 A
DC Power	40 W

Serial Port

Table D-4. Serial Port Specifications

Item	Description
Connector Type	9-pin, female D connector
Connector Label	Craft
Interface	RS-232
Baud Rate	9600 Kbps (57600 is supported only in the IMC rev H version 1.00.13 or below)
Data Bits	8
Parity Bit	None
Stop Bits	1
Flow Control	None

LAN Port

Table D-5. LAN Port Specifications

Connector	Description
MGMT	RJ-45 (10Base-T/100 Base-T) - Supports two telnet sessions and two SSH sessions over TCP/IP.
NTP	RJ-45 (10Base-T/100 Base-T) - Supports NTP clients that comply with RFC 1305.

Input Signals

Table D-6. Input Signal Specifications

Parameter	Specification
GPS	
Requirement	Proprietary Rooftop Antenna (see Roof Antenna specification in Table D-8)
Interface	TNC connector
DTI	
Termination Impedance	100 ohms
Amplitude	2.2Vpp to 2.8Vpp
Data Rate	5.12 Mbps

Output Signals

Table D-7. Output Signal Specifications

Parameter	Specification
Termination Impedance	100Ω
Amplitude	2.2Vpp to 2.8Vpp
Data Rate	5.12 Mbps

Roof Antenna

Table D-8. Antenna Specifications

Parameter	Specification
Type	Active, with proprietary 2-way time transfer technology
Cable length	Maximum 1000 ft. (305 m) from antenna to shelf
Dimensions	Height: 6.5 in (16.5 cm) Diameter: 5.9 in (15 cm)
Weight	1.7 lb. (0.77 kg)
Operating Temperature	–35 to 75°C
Storage Temperature	–40 to 80°C
Operating Humidity	0 to 100% relative humidity
Power	36 V nominal
Connector type	TNC
Impedance	50 Ω / 75 Ω

Factory Defaults

This section provides the factory defaults for the TimeCreator 1000 GPS and DTI port parameters, IMC and communications parameters, and alarm parameters.

Table D-9. GPS and DTI Port Parameters

Description	Default Value	Value Range
System Mode of Operation	Root	Root	Subtending
Port 1 thru 10 State	Enable	Enable	Disable
Port 1 thru 12 Cable Advance Mode	Auto	Auto	Manual
Port 1 thru 12 Cable Advance Value	0	0 to 200 meters
Port A & B Type	Server	Server	Client
Port A & B State	Disabled	Enable	Disable
Port A Priority (input)	2	1 thru 5
Port B Priority (input)	3	1 thru 5
GPS State	Disable	Enable	Disable

Table D-9. GPS and DTI Port Parameters (Continued)

Description	Default Value	Value Range
GPS Priority	1	1 thru 5
GPS Position Mode	Auto	Auto | Manual
GPS Position	Lat – 0:0:0.0 Long – 0:0:0.0 Elevation– 0.0 m	LAT = dd:mm:ss.ssN or dd:mm:ss.ssS LONG = dd:mm:ss.ssE or dd:mm:ss.ssW ELEV = +/-hhhh.h height in meters
GPS Elevation Mask	10	0 to 45 degrees
Leapseconds	14	0 to 40

Table D-10 provides the IMC module and communication parameter factory default values and range.

Table D-10. IMC and Communication Parameters

Description	Default Value	Value Range
TOD Source	RTC	RTC | USER | NTP | DTI | GPS
Local Time Offset	00:00	+/-hh:mm
EIA-232 Service	Enable	Enable | Disable
Telnet Service	Enable	Enable | Disable
SSH Service	Enable	Enable | Disable
SNMP Service	Enable	Enable | Disable
FTP Service	Disable	Enable | Disable
NTP Service	Enable	Enable | Disable
SYSLOG Service	Enable	Enable | Disable
User #1 Access level	3	1 | 2 | 3
User #1 UserName	admin	
User #1 Password	SymmTC1000	
Eth0 IP mode	Static	Static|DHCP
Eth0 IP state	Enable	Enable|Disable
Eth0 Host IP Address	10.0.0.100	Valid IPv4 Host Address

Table D-10. IMC and Communication Parameters (Continued)

Description	Default Value	Value Range
Eth0 Host Gateway Address	0.0.0.0	Valid IPv4 Gateway Address
Eth0 Host Mask	255.255.255.0 (24)	0 to 32
Eth1 IP mode	Static	Static|DHCP
Eth1 IP state	Enable	Enable|Disable
Eth1 Host IP Address	10.0.0.101	Valid IPv4 Host Address
Eth1 Host Gateway Address	0.0.0.0	Valid IPv4 Gateway Address
Eth1 Host Mask	255.255.255.0 (24)	0 to 32
Hostname	TC1000	20 ASCII characters
SNMP Manager IP Address or hostname		Valid IPv4 Host Address or hostname
SNMP Username (list)		20 ASCII Characters
SNMP Authentication Key (list)		20 ASCII Characters
SNMP Private Key (list)		20 ASCII Characters a Minimum of 8 characters
NTP Server Key ID		1 to 65535
NTP Server Encryption Key		Max of 32 ASCII Characters
NTP Peer IP or hostname		Valid IPv4 Address or hostname
NTP Peer Key ID		1 to 65535
NTP Peer Encryption Key		Max of 32 ASCII Characters
RADIUS Authentication	Disable	Enable | Disable
RADIUS Server IP Address or hostname		Valid IPv4 Host Address or hostname
RADIUS Server Key		Max of 32 ASCII characters
TACACS+ Authentication	Disable	Enable | Disable
TACACS+ Server #1 IP Address or hostname		Valid IPv4 Host Address or hostname
TACACS+ Server key		Maximum of 32 ASCII characters
Local Alarm Log Buffer Size	100	0 to 100 kbytes
Local Event Log Buffer Size	100	0 to 100 kbytes
Local Command Log Buffer Size	100	0 to 100 kbytes

Table D-10. IMC and Communication Parameters (Continued)

Description	Default Value	Value Range
Local Security Log Buffer Size	100	0 to 100 kbytes
Local NTP Log Buffer Size	100	0 to 100 kbytes
Local Performance Log Buffer Size	100	0 to 100 kbytes
Performance Log Interval (sec)	60	0 = disable or 10 to 86400

Alarm Default Values

Table D-11. GPS and DTI Port Alarm Parameters

Description	Default Value	Value Range (seconds)
Port 1 thru 12 – FER Interval	10	0 = Disable, 1 to 1000
Port 1 thru 12 – Jitter Interval	10	0 = Disable, 1 to 1000
Port 1 thru 12 – MTIE-t Interval	35	0 = Disable, 1 to 1000
Port 1 thru 12 – FER Set Threshold (E-04)	100	0 = Disable, 5 to 10000
Port 1 thru 12 – FER Clear Threshold (E-04)	10	0 = Disable, 5 to 10000
Port 1 thru 12 – P-P_Jitter Set Threshold (pS)	8000	0 = Disable, 5000 to 10000000
Port 1 thru 12 – P-P_Jitter Clear Threshold (pS)	5000	0 = Disable, 5000 to 10000000
Port 1 thru 12 – MTIE-35 Set Threshold (pS)	10000	0 = Disable, 5000 to 10000000
Port 1 thru 12 – MTIE-35 Clear Threshold (pS)	7000	0 = Disable, 5000 to 10000000
Port 1 thru 12 – MTIE-t Set Threshold (pS)	10000	0 = Disable, 5000 to 10000000
Port 1 thru 12 – MTIE-t Clear Threshold (pS)	7000	0 = Disable, 5000 to 10000000

Appendix E Software Licenses

This product contains licensed third party software, including software available under the GPL licensing scheme. The text of each license is available in the "License" folder located on the Product Information CD-ROM that is supplied with the TimeCreator 1000. Additionally, you can obtain these licenses and the open-source software by contacting Symmetricom Technical support at the following numbers:

- Worldwide (Main Number): 1-408-428-7907

- USA, Canada, Latin America including Caribbean, Pacific Rim including Asia, Australia and

- New Zealand: 1-408-428-7907

- USA toll-free: 1-888-367-7966 (1-888-FOR-SYMM)

- Europe, Middle East & Africa: 49 700 32886435

An administrative fee may be charged to obtain the source code.

By using the TimeCreator 1000, the user agrees to the terms of these licenses.

In This Appendix

- Third-Party Software

Third-Party Software

The following is a list of third-party software applications provided with the TimeCreator 1000.

- bash-2.05a
- busybox-1.01
- cron-3.0pl1
- daemontools-0.76
- dhcpcd-1.3.22pl1
- e2fsprogs-1.27
- eepro100-1.09
- findutils-4.1.7
- glibc-2.3.2
- glibc-2.3.2
- grub-0.97
- hardhatutils-1.14
- hostname-2.09
- ifupdown-0.6.4
- initscripts-2.78
- iproute-20030805
- iptables-1.2.9
- iputils-tracepath-20020124
- kernel-2.4.20_dev
- less-358
- libpam-0.72
- libpam-cracklib-0.72
- libpam-dev-0.72
- libpam-modules-0.72
- libpam-runtime-0.72
- linux-ftpd-0.17
- linuxinfo-1.1.7
- logrotate-3.5.7
- ltrace-0.3.10

- macphy-1.6
- mii
- modutils-2.4.21
- mount-2.11h
- net-snmp-5.1
- net-tools-1.60
- netbase-4.06
- netkit-telnet-server-0.17
- ntp-dev-4.2.0b-rc1-20060306
- openssh-3.7.1p2
- openssh-clients-3.7.1p2
- openssh-server-3.7.1p2
- openssl-0.9.7b
- pam_radius_license-1.3.16
- pam_tacplus-1.2.9
- pam_tally-0.1
- pciutils-2.1.8
- rpm-4.1
- setserial-2.17
- shellutils-2.0.11
- sudo-1.6.7p3
- sysklogd-1.4.1
- sysvinit-2.78
- util-linux-2.11h
- xinetd-2.3.3

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