



# **TimeProvider 500 IEEE 1588v2 Translator**

***User's Guide***  
*Revision B – March 2009*  
*Part Number 098-00078-000*

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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](#)
- [Structure of This Guide](#)
- [Conventions Used in This Guide](#)

## Purpose of This Guide

---

The *TimeProvider 500 User Guide* provides detailed information about Symmetricom's TimeProvider 500 IEEE 1588v2 Translator features, functionality, operations, specifications, and default settings. Also included are guidelines for installing and configuring the unit, a description of the Command Line Interface (CLI) command set, guidelines for maintenance and troubleshooting, and how to contact technical support.

## Structure of This Guide

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This user guide contains the following chapters and appendixes:

Chapter, Title	Description
Chapter 1, Overview	Describes the features and functionality of TimeProvider 500.
Chapter 2, Part Numbers and Return Information	Lists the part numbers and provides return procedures.
Chapter 3, Operations	Provides packet flow and operation state descriptions, an explanation of a show status example, information about alarms and events, frequency locked loop, logs, user sessions, and an acceptable master description.
Chapter 4, CLI Commands	Describes the CLI command set.
Chapter 5, Maintenance and Troubleshooting	Contains preventative maintenance and safety consideration information, where to return a unit if necessary, and how to get technical assistance.
Appendix A, System Messages	Provides suggested corrective action for system messages that display in response to an event or alarm.
Appendix B, Specifications and Factory Defaults	Lists the specifications and default settings for TimeProvider 500.

## Conventions Used in This Guide

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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:
<i>Symmetricom Product Document</i>	The title of a document.
CRITICAL	An operating mode, alarm state, status, or chassis label.
Select <b>File</b> , <b>Open</b> ...	Click the Open option on the File menu.
Press <b>Enter</b> 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.
<i>qualified personnel</i>	A word or term being emphasized.
Symmetricom <b>does not</b> recommend...	A word or term given special emphasis.

## Warnings, Cautions, Recommendations, and Notes

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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

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

## Where to Find Answers to Product and Document Questions

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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](http://www.symmetricom.com).

## What's New In This Guide

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This is the first release of the TimeProvider 500 User's Guide.

## User's Guide Updates

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When this manual is updated the updated version will be available for downloading from Symmetricom's 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 Support at: <http://www.symmetricom.com/support/online-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.

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# Chapter 1 Overview

This chapter provides introductory information for the TimeProvider 500.

## In This Chapter

- [Overview](#)
- [Key Features](#)
- [Telecommunications Using PTP](#)
- [Functional Description](#)
- [Installation and Configuration](#)
- [Configuration Setup](#)
- [Installation and Provisioning Checklist](#)

## Overview

---

The TimeProvider 500 shown in [Figure 1-1](#) is a stand-alone, one Rack Unit (RU) device that provides a client-clock function with the ability to synchronize to a grandmaster clock. To perform the client-clock function, the TimeProvider 500 uses IEEE-1588 v2 [often referred to as Precision Time Protocol (PTP)] as a frequency reference to steer either T1 or E1 frequency outputs. TimeProvider 500 can be configured and monitored using the Command-Line Interface (CLI) accessible locally with the RS232 connection or remotely via a Telnet connection. The TimeProvider 500 enables rapid migration from TDM-based to packet-based timing and synchronization solutions.

The TimeProvider 500 “translates” IEEE 1588v2 packet flow into two T1/E1 signaling outputs (G.823/G.824), eliminating the need to deploy embedded PTP software clients in network endpoint devices such as wireless base stations (BTSs and Node Bs), Digital Subscriber Line Access Multiplexer (DSLAM)s, and Line Terminating Equipment (LTE).

The TimeProvider 500 PTP translation function enables legacy Time-Division Multiplexing (TDM)-based devices to transparently send and receive critical timing and synchronization signals over a packet-based, Ethernet backhaul network without requiring any modifications to their existing hardware or software.

TimeProvider 500 is fully interoperable with Symmetricom’s TimeProvider 5000, TimeHub, and SSU 2000 IEEE 1588v2 grandmaster products, as well as third-party grandmaster products that comply with the IEEE 1588v2 protocol standard.

# Key Features

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The key features supported in this release of the TimeProvider 500 IEEE 1588v2 Translator include:

**Hardware Features:**

- 1 RU Package
- Single -48 VDC Power Supply
- OXCO Oscillator
- Single 100 Mbps PTP Network Port
- Dual T1/E1 Output Ports
- DE-9 Craft Port
- Ethernet Management Port
- Bookend Solution with Symmetricom PTP Blade and TimeProvider 5000 Grandmaster Products

**Software Features:**

- E1/T1 Signaling
- PTP to E1/T1 Conversion
- Unicast Communications
- Virtual Local Area Network (VLAN)
- PTP Performance Metrics
- Command Line Interface (CLI)



Figure 1-1. TimeProvider 500

## Telecommunications Using PTP

PTPv2 is a next generation precision timing protocol specifically designed to provide precise timing and synchronization over packet-based Ethernet networks. With the advent of v2, PTP has now been adapted to meet the more sophisticated synchronization requirements of telecommunications applications. PTPv2 captures those requirements by providing a set of added capabilities and protocol extensions that allow service providers to fine tune their packet-based networks for the stringent timing and synchronization requirements of telecom-oriented applications. New PTPv2 capabilities, such as support of unicast and telecom profile extension, provide the higher level of accuracy and performance optimization that Telecom requires.

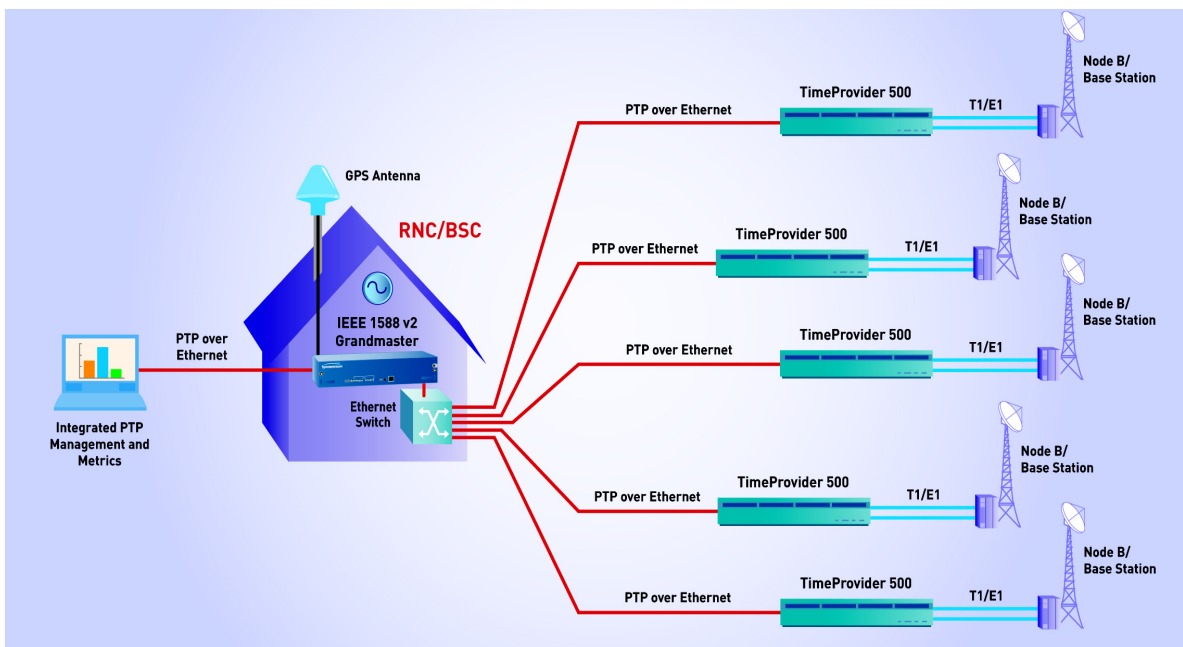


Figure 1-2. TimeProvider 500 Wireless Backhaul Application

# Functional Description

Figure 1-3 is a front view of the TimeProvider 500. All user connections are on the panel.

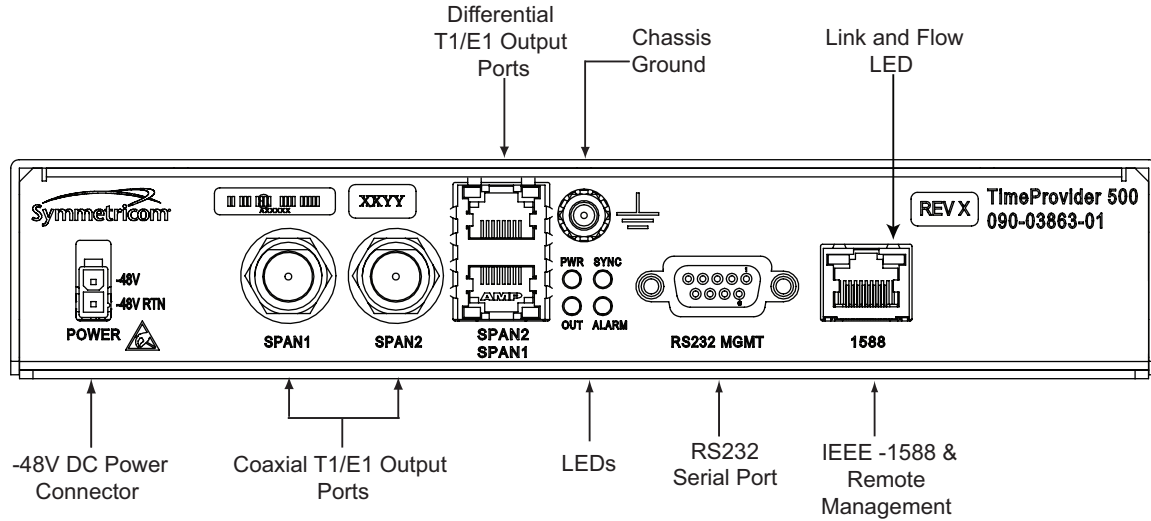


Figure 1-3. TimeProvider 500 Front Panel

## Power Connector

A Molex-style connector is used to provide -48 volts DC (labeled **Power**). When the unit is successfully powered, the PWR LED near the center of this panel will illuminate green. If the power connection is reversed, the unit will not be damaged, it simply will not power-up. Startup power will be < 17 watts. Steady-state power (nominal 25° C) <9.5 watts.

The TimeProvider 500 uses -48 VDC power and is not equipped with a power switch. Power to the unit must be controlled by a Branch Circuit Over-Current Protection Device to the DC power main.



**Warning:** To avoid serious personal injury or death, exercise caution when working near high voltage lines and follow local building electrical codes for grounding the shelf.

## RJ48C Connectors

The stack of 2 RJ48C connections labeled **SPAN1** and **SPAN2** (can use standard Ethernet cable) provides two separately driven output signals, configurable as either E1 or T1. These are differential outputs (tip and ring) conforming to signal levels defined in G.703.



**Note:** The RJ48C physical connector is the same as RJ45 (an 8-pin modular connector). RJ45 is used for Ethernet whereas the term RJ48C is used for T1 lines. The pinouts for RJ45 and RJ48C are different. RJ45 (Ethernet) uses pins 1, 2, 3 and 6 whereas RJ48C uses pins 4 and 5.

## T1/E1 Frequency Output Connectors

TimeProvider 500 provides configurable outputs at either E1 (2.048MHz) or T1 (1.544MHz) frequencies. Specific signal types at each frequency are detailed in the CLI command, [set output signaltype](#), on page 71. Both outputs must be the same signal type.

There are two independent, separately driven outputs, labeled **SPAN1** and **SPAN2**. For differential connection to either output, use the appropriate RJ-48C connection shown in [Figure 1-4](#). **SPAN1** is the upper connection and **SPAN2** is the lower connection. For single-ended connection to either output, use the BNC connectors shown in [Figure 1-5](#).

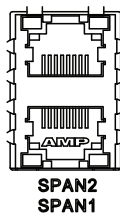


Figure 1-4. Differential T1/E1 Output Ports

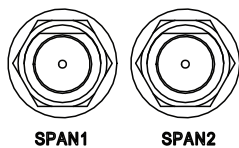


Figure 1-5. Single-Ended T1/E1 Output Ports



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**Note:** The outputs from the left BNC and lower RJ48C connection (both labeled **SPAN1**) are generated from the same driver circuit, so for proper signal level only one of those connections should be used at any one time. The same situation applies to the right BNC and upper RJ48C, both labeled **SPAN2**.

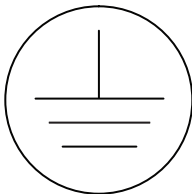
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## LEDs

- At the center are four LEDs:
  - **PWR** illuminates green when the unit is powered.
  - **SYNC** provides high-level status indication. The indications and associated meanings are described later in this document.
  - **OUT** illuminates green when output is being generated on the SPAN connections.
  - **ALARM** illuminates Red to indicate a CRITICAL or MAJOR active alarm, AMBER to indicate MINOR alarm. Current alarm status can be checked using the `show alarm` command. For more information, see the CLI command, [show alarm](#), on page 76.

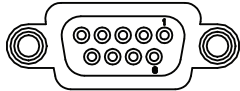
## Chassis Ground

Above the LEDs is a connection to chassis ground. A 4mm Grounding Terminal Stud is located on the TimeProvider 500's front panel. The grounding terminal is marked with the universal ground symbol.



## RS232 MGMT Serial Port

The DE9 connector labeled **RS232 MGMT** provides a local serial connection to TimeProvider 500. Through this connection, a Command Line Interface (CLI) provides configuration and status monitoring capability. The RS-232 serial port connection is made through a DE9S female connector. This port allows you to connect to a computer using terminal emulation software for remote monitoring and control. When connecting to this port, use a shielded direct connect cable. See [Establish Serial Communication](#), on page 31 for default settings.



**RS232 MGMT**

Figure 1-6. RS-232 MGMT Serial Port

[Table 1-1](#) describes the EIA-232 connector pin assignments for the serial port.

Table 1-1. Serial Port Connector Pin Assignments

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

## IEEE 1588 Remote Management Port

The **RJ-45 connector** labeled “1588” is the connection into the network that is providing the grandmaster clock(s). This same connection is also used for remote management.

## Installation and Configuration

---

Before you begin to install the TimeProvider 500, review all the information in this section. If difficulties are encountered during the installation process, contact Symmetricom Global Services (SGS). Refer to the [Obtaining Technical Assistance](#), on page 85 for contact information. SGS provides you with technical product expertise and support, and Customer Service provides support about orders, Return Material Authorization (RMA)s, and other customer service-related information.

## Site Survey

Before you begin installation, determine the shelf location, ensure the appropriate power source is available (–48 V DC), and ensure that the equipment rack is properly grounded. Refer to [Part Numbers and Return Information](#), on page 41 for more information about ordering kits for rack mounting of the TimeProvider 500. The TimeProvider 500 is designed to mount in a 19-inch (48 cm) rack, occupies 1.66 in (40.64 mm, 1 RU) of vertical rack space, and has a depth of 8.0 in (203.2 mm).



**Note:** 21-inch and 23-inch rack mounting adapters are available as separately ordered items.

---

## Environmental Requirements

Please refer to the [Maintenance and Troubleshooting](#), on page 83 and [Specifications and Factory Defaults](#), on page 91 for more information.

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

- Operating Temperature: 23° F to 131° F (–5° C to +55° C)
- Operating Humidity: 5% to 90% RH
- Use only shielded cable for **SPAN1**, **SPAN2**, and the DE9 connector (**RS232 MGMT**). Ground appropriately at both ends, or as required by local standards.



**Warning:** The shielded cables on **SPAN1**, **SPAN2**, and the **RS232 MGMT** port must be used to assure EMC compliance.

---

- 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 TimeProvider 500. Electromagnetic interference can adversely affect the operation of nearby equipment.

Refer to [Electromagnetic Environment](#), on page 97 for more information.

---



## User-Supplied Tools and Equipment

You will need the following tools and equipment to install the TimeProvider 500:

- Standard tools used for installation
- Cable ties, waxed string or acceptable cable clamps
- 1 mm<sup>2</sup> / 18 AWG (minimum) wire at 300 volt insulation for –48 V DC
- 4 mm<sup>2</sup> / 16 AWG wire to connect grounding lug to permanent earth ground. Use the UL listed ring lug for earthing ground.
- Shielded cabling of the appropriate impedance required by the specific signal type for signal wiring (including SPAN1, SPAN2, and Ethernet)
- Mating connectors for terminating signal wiring
- Fasteners for mounting the equipment in rack
- Digital multimeter or standard voltmeter for verifying power connections to the shelf.
- Laptop computer with serial communications software (e.g., Microsoft Hyperterminal and ProComm Plus) for setting system parameters.

## Unpack the Unit

The TimeProvider 500 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 TimeProvider 500, observe the following procedures.

---

Unpack and inspect the unit as follows:

1. 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.
2. Open the container, being careful to cut only the packaging tape.
3. Locate and set aside the printed information and paperwork that is included in the container.
4. Remove the unit from the container and place it on an anti-static surface.
5. Locate and set aside small parts which may be packed in the container.
6. Remove the accessories from the container.
7. Remove the anti-static packaging from the unit and accessories.

8. Follow the instructions for assembling the rack mounts to the TimeProvider 500. See [Part Numbers and Return Information](#), on page 41 for more information.
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 top of the unit. See [Figure 1-7](#) for the location of the label. Contact your Symmetricom distributor if the model or item number does not match the information on the shipping list.

For a complete listing of item numbers, see [Part Numbers and Return Information](#), on page 41.

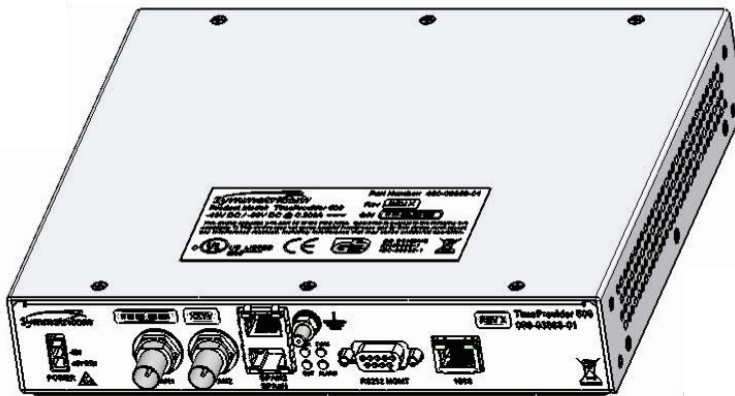


Figure 1-7. Location of TimeProvider 500 Product Label

## Rack Mounting the TimeProvider 500

The installation procedure described in this section provides general guidelines for installing the TimeProvider 500. Refer to [TimeProvider 500 System and Accessory Part Numbers](#), on page 41 for information about available rack mount kits and mounting adapter bracket kits.

When installing the TimeProvider 500, always follow applicable local electrical standards. Use the following steps to mount the TimeProvider 500 in a rack.

1. Attach the rack mounting brackets to the TimeProvider 500 using 6-32 x 1/4-inch screws.



**Note:** Using screws other than 6-32 x 1/4 inch could cause damage to the unit. Always use the proper screws for the equipment rack.

---

2. Ensure that the mounting brackets on both sides are attached at equal distances from the front of the unit.
3. Mount the TimeProvider 500 to the front of the equipment rack rails with four screws and associated hardware as shown in [Figure 1-8](#).

## Rack Mounting Safety Instructions

- *Elevated Operating Ambient* - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature of the TimeProvider 500, which is +55° C.
- *Reduced Air Flow* - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- *Mechanical Loading* - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- *Circuit Overloading* - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- *Reliable Earthing* - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (for example, use of power strips).

Figure 1-8 shows a TimeProvider 5000 grandmaster clock at the top, dual-mounted TimeProvider 500s in the middle, and a single-mounted TimeProvider 500 at the bottom.

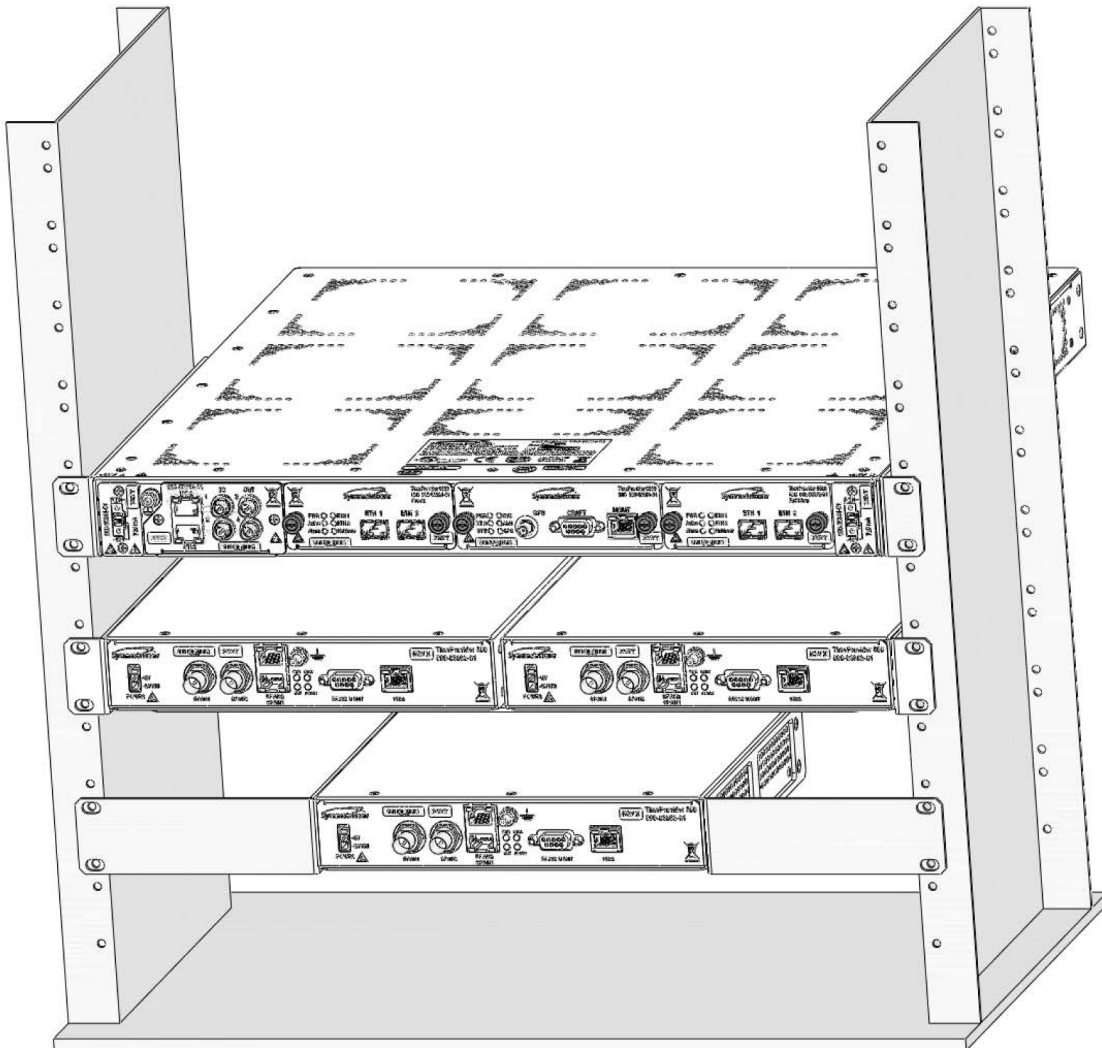


Figure 1-8. TimeProvider 5000 and TimeProvider 500 Rack Mounting Example

## Ground the Shelf

Ground the TimeProvider 500 using the 4mm Grounding Terminal Stud on the front of the TimeProvider 500. This Grounding Terminal is marked with the universal ground symbol, as shown in [Figure 1-9](#).

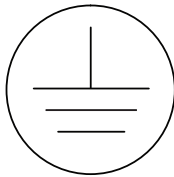


Figure 1-9. Universal Ground Symbol

To make ground connections, follow these steps:

1. Connect a 16 AWG green/yellow striped insulated wire from the Grounding terminal on the TimeProvider 500 shelf to the Earth Ground on the rack or cabinet. Connect it to the Earth Ground In accordance with Local Electrical Codes. The surface of the Earth grounding terminal must be clean of contaminants and oxidation.
2. Remove 1/4 in. (6mm) of the insulation from the 16 AWG green/yellow stripped wire and coat the conductor with an electrically conductive antioxidant compound such as Kopr-shield spray. Spray antioxidant compound on the exposed wire only.
3. Crimp a #10 (4mm) UL listed Ring Lug to one end of the 16 AWG green/yellow stripped wire and connect it to the TimeProvider 500 using the 4mm kept nut supplied. Clamp the Ring Lug between the two flat washers.
4. Clean the connection point on the rack to a bright finish and coat it with an electrically conductive antioxidant compound such as Kopr-shield spray. Connect the Ring Lug to the rack or grounding rod by means in accordance with Local Electrical Codes. Do not connect multiple connectors to the same screw assembly.
5. Crimp the other end of the green/ yellow stripped wire to a 1/4" (6mm) UL listed Ring Lug and connect to the Earth Grounding terminals using an external star lock washer between the Ring Lug and rack or earthing point to be grounded.

## Configuration Setup

---

Setting up the TimeProvider 500 requires very few steps, primarily because it uses auto-negotiation with grandmaster clocks to establish and maintain the PTP flow (the messages needed for synchronization through the network). Once connectivity with the intended master clock(s) is established, the synchronization process will automatically occur. The high-level steps needed are:

- Apply power to the TimeProvider 500.
- Configure the network address of the TimeProvider 500, and confirm successful connectivity.
- Configure the target address of the master clock(s) from which the TimeProvider 500 should synchronize. Verify connectivity.
- Verify PTP flow between TimeProvider 500 and master clock(s)
- Configure TimeProvider 500 signal output, if needed.

The configuration actions performed in this section are stored in non-volatile memory and are retained when the unit is power-cycled.

## Apply Power

The TimeProvider 500 should be connected to -48VDC Mains through the Branch Circuit Over-Current Protection Device with a maximum 1 amp fuse. TimeProvider 500 is intended for installation in a Restricted Access Location in Accordance with Articles 110-26, 110-27 or the National Electric Code ANSI/NFPA70, or per the applicable code in the country of installation. To connect power leads to the shelf, follow these steps:

1. Remove the fuse from the front panel of the Branch Circuit Over-Current Protection Device. Replace the fuse at the end of the installation procedure.
2. Wire the provided Molex connector to 18 AWG UL1007 wire with the crimp pins supplied. Insert Molex pins into the Molex connector provided. Wire the other end of the power wires to the Branch Circuit Over-Current Protection Device.
3. Plug the Molex connector into the TimeProvider 500 and replace the fuse in the Branch Circuit Over-Current Protection Device. The TimeProvider 500 -48 VDC power connector is keyed to only connect one way.
4. The connector has a latching mechanism. Push the connector in until it clicks into place. When power is successfully provided, the LED labeled “PWR” will illuminate green. Descriptions of LED indicators are shown in [Reading LED Conditions](#), on page 84.



**Note:** When disconnecting, the latch arm needs to be tilted away from the “catch” by pressing on the connector and then pulling.



**Warning:** To avoid serious personal injury or death, exercise caution when working near high voltage lines and follow local building electrical codes for grounding the shelf.

---

## Establish Serial Communication

Serial communication with TimeProvider 500 is established so that configuration can be accomplished. To establish serial communication, follow these steps:

1. Connect a serial cable from the computer's serial port with the TimeProvider 500's 9-pin serial port connector labeled RS232 MGMT.
2. Run your terminal emulation program, and configure the designated COM port on the computer using [Table 1-2](#) and as shown in [Figure 1-10](#).

Table 1-2. COM Port Properties

Settings	Value
Bits per second	57600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

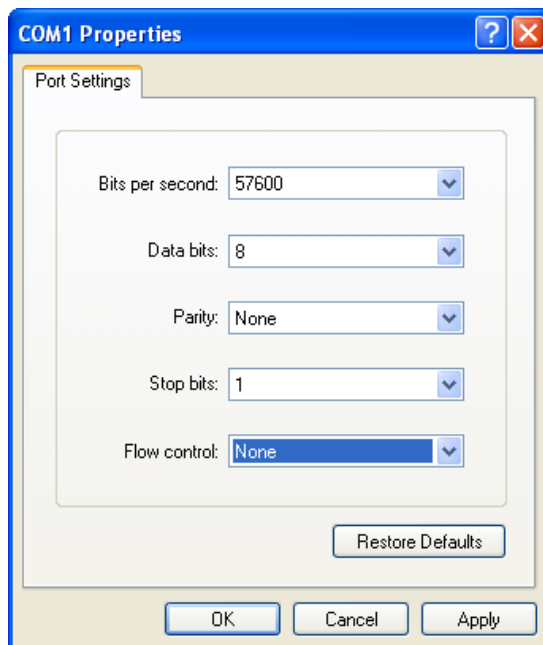


Figure 1-10. TimeProvider 500 Serial Port Settings

## Logon to TimeProvider 500

Logon is required to configure or view TimeProvider 500 settings. To logon to the TimeProvider 500, follow these steps:

1. Wait for the system to boot.
2. At the login prompt, type **admin**, then press **Enter**.
3. At the password prompt, type **symmadmin\*\***, then press **Enter**.

Below is an example of what you will see.

```
TP-500 12:56:38 01/01/1970 (1)
Login: admin
Password: *****
```

A successful logon will respond with the `TP-500>` prompt.

### Log On Tips

- `admin` is the factory shipped user name and `symmadmin**` is the factory shipped password. The `set user` command can be used to change the user name and password. See [CLI Commands](#), on page 55 for more information.
- Logon sessions can be initiated using the serial port or remotely using Telnet. If using Telnet, an appropriate TimeProvider 500 network address needs to be established before remote sessions can be successful.
- A serial session will automatically logout whenever 60 minutes elapse without any user entry.
- A remote (Telnet) session will automatically logout whenever 10 minutes elapse without any entry.
- The TimeProvider 500 simultaneously supports up to five remote logon sessions and one serial logon session.

## Configure the TimeProvider 500 IP Address

This step establishes the IP address of the TimeProvider 500. The LAN connection from the RJ-45 connector labeled “1588” is used within the PTP domain for all interactions with grandmaster clocks. This connection is also used for TimeProvider 500 configuration and status monitoring via Telnet.

Type `show ptp` to view a list of current PTP-related settings, which includes the IP address, subnet mask, and gateway of the TimeProvider 500 as shown in [Figure 1-11](#) and [Table 1-3](#).



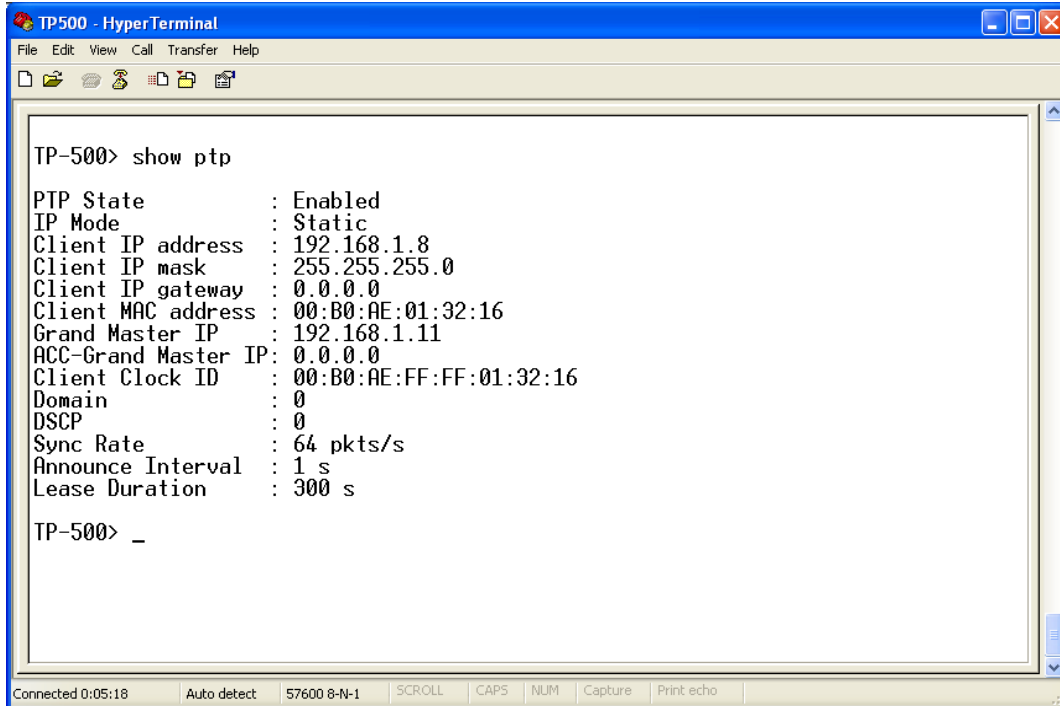


Figure 1-11. Show PTP Response Example

Table 1-3. TimeProvider 500 PTP Settings Example

Show PTP Settings	Value
Client IP address	192.168.1.254
Client IP netmask	255.255.255.0
Client IP gateway	0.0.0.0

To change the TimeProvider 500 IP address to 192.168.1.5, use the `set ip` CLI command as shown in the following example. In the example, the subnet mask and gateway are not changed, but still must be included.

```
SET IP ADDRESS 192.168.1.5 NETMASK 255.255.255.0 GATEWAY 0.0.0.0
```

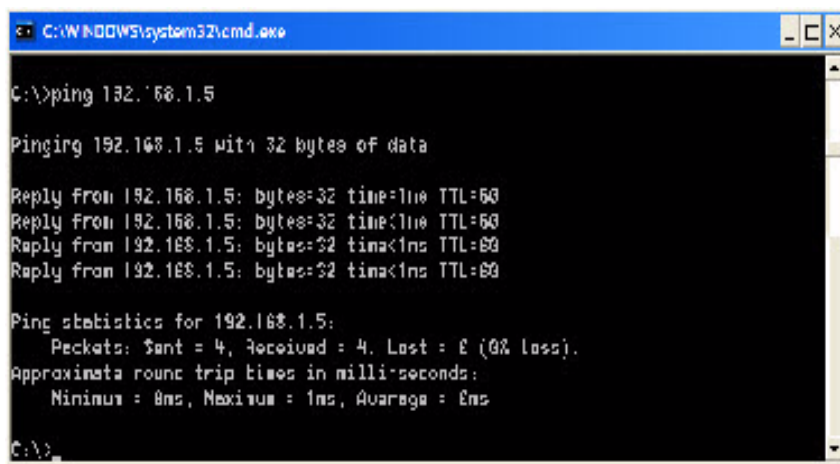
Use the `set ip` CLI command to configure IP settings appropriate to your network. To confirm the IP address values, use the `show ptp` CLI command. Refer to [TimeProvider 500 CLI Command Set](#), on page 57 for more information.

## Confirm TimeProvider 500 Network Communication

If not already done, a standard RJ45 Ethernet cable should be connected from the TimeProvider 500 port labeled “1588” into the network that will provide connection to the grandmaster clock(s). TimeProvider 500 connection is 100BaseT.

There are a number of ways to confirm that TimeProvider 500 is now available on the network. The following is a method available on any Windows® PC:

1. From a PC that is on the same network as the TimeProvider 500, select **Start > Run**.
2. In the Run dialog box, select **cmd**, then click **OK**. This will initiate a command session as shown in [Figure 1-12](#).
3. At the prompt, type `ping` followed by the TimeProvider 500 IP address, then press **Enter**. See [Figure 1-12](#). The example shows successful connection.



```
C:\WINDOWS\system32\cmd.exe
C:\>ping 192.168.1.5

Pinging 192.168.1.5 with 32 bytes of data:

Reply from 192.168.1.5: bytes=32 time=1ms TTL=64
Reply from 192.168.1.5: bytes=32 time<1ms TTL=64
Reply from 192.168.1.5: bytes=32 time<1ms TTL=64
Reply from 192.168.1.5: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milliseconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>
```

Figure 1-12. Pinging the TimeProvider 500

If ping was not successful, here are some considerations:

- First, ensure that a physical link has been established from the TimeProvider 500 to whatever it is connected to (likely a switch). The small green LED in the upper-right-hand corner of the “1588” connector on the TimeProvider 500 (see [Figure 1-3](#)) should be lit solid green. If it is not, there is likely a basic link problem. A similar check can be done on the computer being used for the ping. For the remainder of this discussion, it is assumed that the user is able to establish connection from the computer into the network that includes the PTP flow of the TimeProvider 500 being used.
- Once the physical link is established, ensure that the device linked to the TimeProvider 500 is capable of running 100BaseT. The TimeProvider 500 will auto-negotiate the rate, but does not support speeds other than 100BaseT.

- The TimeProvider 500 supports VLAN. If you are intending to include the TimeProvider 500 in a VLAN subnet, to configure, follow these steps:
  1. Enable VLAN on TimeProvider 500 with `set vlan-mode enable`. The factory default is `disable`.
  2. Establish appropriate VLAN settings using `set vlan-config <vlan_id> priority <vlan_priority>`. The bracketed settings are dependent on how your VLAN is setup.
  3. The settings can be confirmed using `show vlan-config`.
  4. With VLAN enabled, a successful ping to the TimeProvider 500 requires that the computer from which the ping is issued to be part of the same VLAN as the TimeProvider 500.

## Configure Target IP Address for Grandmaster Clock(s)

To configure the IP address so that the TimeProvider 500 will communicate with a grandmaster clock, follow these steps:

1. Use the `show ptp` command to view the current PTP settings. See the Grand Master IP address shown in the [Figure 1-11](#) example.
2. Set the IP address for the grandmaster clock that the TimeProvider 500 will use as its reference with the `set ptp master` command. In the following example, the target grandmaster clock's IP address is set to 192.168.1.11.

```
SET PTP MASTER 192.168.1.11
```

Use the `set ptp master` command to set the IP value appropriate for your targeted master clock. Confirm the setting is as intended using the `show ptp` command.

3. Use the `ping` CLI command to confirm connectivity between the TimeProvider 500 and the targeted grandmaster clock.

If there is connectivity, TimeProvider 500 will produce a response similar to the following:

```
TP-500> ping 192.168.1.11
Pinging 192.168.1.11 [192.168.1.11]:
Reply from 192.168.1.11: time=5ms
Reply from 192.168.1.11: time=0ms
Reply from 192.168.1.11: time=0ms
Reply from 192.168.1.11: time=0ms
```

If there is lack of connectivity, TimeProvider 500 will produce a response similar to the following response:

```
TP-500>ping 192.168.1.11
Pinging 192.168.1.11 [192.168.1.11]:
Request timed out
```

If the ping request times out, here are some considerations to help troubleshoot:

- All of the items listed for troubleshooting connectivity with the TimeProvider 500 in [Confirm TimeProvider 500 Network Communication](#), on page 34 should be considered.
- The targeted grandmaster clock settings should be reviewed, if available. For example, check the address settings it is actually using and anything related to network configuration. For example, there could be firewalls in place preventing connection.
- If VLAN is being used in the TimeProvider 500, it is essential that the grandmaster also be a member of the same VLAN (established by the `vlan_id` setting). If VLAN is enabled, and two grandmasters are targeted by the TimeProvider 500, then both must be in the same VLAN. See [Configure Acceptable Grandmaster Clock \(Optional\)](#) for more information.

## Configure Acceptable Grandmaster Clock (Optional)

The TimeProvider 500 supports a capability to select two grandmaster clocks for its source of synchronization. This capability is described in detail in [Configure Target IP Address for Grandmaster Clock\(s\)](#), on page 35.



**Note:** If VLAN is being used, when configuring a second grandmaster, both grandmasters must be in the same VLAN.

---

To configure access to a second grandmaster, the procedure is identical to the procedure in [Configure Target IP Address for Grandmaster Clock\(s\)](#), except that the `set ptp acc-master` command is used instead of the `set ptp master` command. Confirmation of the configured acceptable master address can be seen via `show ptp` as shown in [Figure 1-11](#). In the example, note that the ACC-Grand Master IP is shown as 0.0.0.0, which is the factory default (unconfigured). If the second grandmaster is not being used, it is recommended that the 0.0.0.0 setting be left because this clues the TimeProvider 500 to not attempt communication with a second grandmaster.

## Confirming PTP Flow

Now that connectivity between the TimeProvider 500 and the grandmaster clock(s) is established, the actual PTP flow should commence. The TimeProvider 500 uses “auto-negotiated unicast” to initiate and maintain the flow. Simply stated, the TimeProvider 500 starts the action by asking the grandmaster clock(s) to send it the appropriate set of PTP packets at the desired rate and for a desired duration. Once flow is established, the TimeProvider 500 periodically re-requests because the flow would otherwise time out. The idea behind the time out is that this allows client clocks (such as TimeProvider 500) to be removed from the network without continuously consuming resources from the grandmaster clock.

A quick visual check for PTP flow is to look at the LED in upper right-hand corner of the RJ-45 connector labeled “1588” (see Link and Flow LED in [TimeProvider 500 Front Panel](#), on page 20). If there is flow, the Link and Flow LED will blink at a high-rate (multiple blinks per second). A more detailed confirmation is to use the `show status` query to observe actual flow rate (see [Details from Show Status Example](#), on page 44).

The rows in this response relevant to PTP flow are re-copied here:

In the Forward Flow section:

```
GM Packets/sec      : 66 pkts/s
Acc GM Packets/sec  : 0 pkts/s
```

These rows indicate approximate rate of “Sync” packets being received from GM (grandmaster) and Acc GM (acceptable grandmaster). Since the default packet rate setting for TP500 is 64 Sync Packets / second, this shows that the grandmaster flow is good. The Acc GM is 0 because it has not been configured for use.

In the Reverse Flow section:

```
Packets/sec        : 66 pkts/s
```

This row indicated the approximate rate of “Delay Request Response” messages from the currently selected grandmaster clock. In this example, the grandmaster clock’s rate is as expected.

Toward the End section:

```
GM Flow State       : Normal
Acc-GM Flow State   : Waiting for GM to respond to signaling
```

These rows provide a summary of flow from the grandmaster clock to acceptable grandmaster clock.

[Possible Flow State](#), on page 47 shows several events related to PTP flow that can be used to check on successful flow.

If the PTP flow is not as expected, here are some considerations:

- Although it would likely require special user configuration, make sure the grandmaster clock does not have its PTP port disabled. A disabled port will not support PTP flow. TimeProvider 500 provides a similar setting (see the `set ptp state` command), but the port is enabled by default.
- The grandmaster clock must support unicast PTP. Some master clocks only support multi-cast PTP. The TimeProvider 500 will not be able to establish PTP flow from a multi-cast only grandmaster. Also, the TimeProvider 500 supports the auto-negotiated type of unicast, which just means that the TimeProvider 500 initiates the flow by requesting it. If a grandmaster only supports static unicast mode, or if it has had auto-negotiated unicast mode disabled, the TimeProvider 500 will not be able to establish a PTP flow.
- Although perhaps unlikely, it is possible that the grandmaster does not have sufficient resources to support the requested PTP flow. For example, a grandmaster has a limit on how many clients can be supported.

## Configure Frequency Outputs

By factory default, the TimeProvider 500 will produce 2.048 MHz output. If this is the desired output, no configuration will be needed. The outputs from the SPAN1 BNC and RJ48C connections are generated from the same driver circuit, so for proper signal level, only one of those connections should be used. The same situation applies to the right-most BNC and upper RJ48C, both labeled “SPAN2”.

“SPAN1” and “SPAN2” are provisioned to be the same type of output. This is why the output commands described below do not distinguish which physical output is being configured – the single choice applies to all of them.

The `show output` command identifies the current output signal type. The following example shows that TimeProvider 500 is currently generating a framed E1 signal with CSS.

```
TP-500> show output

Output frametype      : E1 CCS
HDB3                  : Enabled
Freerun output mode  : on
Holdover output mode : on
```

The output can be observed on an oscilloscope by connecting directly from the SPAN1 or SPAN 2 BNC connectors or the RJ48C connectors.

The signal connections on the RJ48C connectors provide differential outputs on pins 4 (ring) and 5 (tip), per ANSI T1.403. To properly observe the outputs via the RJ48C connection on a scope requires the use of a balun to convert to a single-ended signal. There are many types of measurement devices that are designed for use with differential signals, which would be appropriate to directly use with the RJ48C outputs (for example, a device that can evaluate the framing).

Set the signal type as desired using the `set output signaltype <selection>` command. The `<selection>` choices are shown in [Table 1-4](#).

Table 1-4. Output Signal Selections

Selection	Output Generated
Disable	No output
e1_2048m	2.048MHz square wave (default)
e1_ccs	E1 CCS, no CRC4
e1_ccs4	E1 CCS, with CRC4
e1_cas	E1 CAS, no CRC4
e1_cas4	E1 CAS, with CRC4
e1_ais	E1 AIS
t1_1544m	1.544 MHz square wave
t1_sf	Super-Frame T1
t1_esf	Extended Super-Frame T1
t1_iso_pulse	T1 Isolated Pulse

For example, set all outputs to `e1_ccs` with the following command:

```
TP-500> set output signaltype e1_ccs
```

The output LED provides high-level indication about output status as shown in [Table 5-2](#) on page 84.

## Installation and Provisioning Checklist

---

To make sure that you have properly installed and provisioned your TimeProvider 500, use [Table 1-5](#) to verify that you have completed the required operations. For further details about each of the operations, refer to the section shown in [Table 1-5](#).

Table 1-5. Installation and Provisioning Checklist

Operation	More Information	Complete
TimeProvider 500 Site Survey	<a href="#">Site Survey</a> , on page 24	
Unpack Unit	<a href="#">Unpack the Unit</a> , on page 25	

Table 1-5. Installation and Provisioning Checklist

Operation	More Information	Complete
Shelf Mounting ( <i>optional</i> )	<a href="#">Rack Mounting the TimeProvider 500</a> , on page 26	
Shelf Grounding ( <i>optional</i> )	<a href="#">Ground the Shelf</a> , on page 29	
Apply Power	<a href="#">Apply Power</a> , on page 30	
Establish Serial Communication	<a href="#">Establish Serial Communication</a> , on page 31	
TimeProvider 500 Logon	<a href="#">Logon to TimeProvider 500</a> , on page 32	
Configure TimeProvider 500 IP Address	<a href="#">Configure the TimeProvider 500 IP Address</a> , on page 32	
Confirm TimeProvider 500 Network Communication	<a href="#">Confirm TimeProvider 500 Network Communication</a> , on page 34	
Configure Target Address for Grandmaster Clock(s)	<a href="#">Configure Target IP Address for Grandmaster Clock(s)</a> , on page 35	
Configure Acceptable GrandMaster ( <i>optional</i> )	<a href="#">Configure Acceptable Grandmaster Clock (Optional)</a> , on page 36	
Confirming PTP Flow	<a href="#">Confirming PTP Flow</a> , on page 37	
Configure Frequency Outputs	<a href="#">Configure Frequency Outputs</a> , on page 38	

Now that you have completed the required steps to install and configure the TimeProvider 500 for operation, the Command Line Interface (CLI) can be used for additional configuration or status monitoring. Refer to [TimeProvider 500 CLI Command Set](#), on page 57 for further details.



# Chapter 2 Part Numbers and Return Information

## In This Chapter

- [TimeProvider 500 System and Accessory Part Numbers](#)
- [Returning the TimeProvider 500](#)

## TimeProvider 500 System and Accessory Part Numbers

---

This section provides part numbers and accessories available for the TimeProvider 500.

*Table 2-1. Component Part Numbers*

Item	Part Number
TimeProvider 500 IEEE 1588v2 Translator Kit	990-03863-01
Power Connector and Pins (included with part number 990-03863-01)	093-00063-000
TimeProvider 500 19" Rack Mount Kit	093-00090-000
TimeProvider 500 19" Dual Rack Mount Kit	093-00069-000
21" Mounting Adapter Bracket Kit	093-00011-000
23" Mounting Adapter Bracket Kit	093-00012-000

## Returning the TimeProvider 500

---

You should return the equipment to Symmetricom only after you have exhausted the troubleshooting procedures described in this user guide, 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.

## 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](http://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.

# Chapter 3 Operations

## In This Chapter

- [Introduction](#)
- [Status of Packet Flow and Operational States](#)
- [Details from Show Status Example](#)
- [Frequency Locked Loop](#)
- [Alarms & Events](#)
- [Date & Time](#)
- [User Sessions](#)
- [Firmware Upgrade](#)
- [Acceptable Master](#)

## Introduction

---

Having completed the initial setup and checklist, the unit is now ready for operation as a 1588 client-clock. This section provides information about how to interpret TimeProvider 500 operational status and performance. See the [CLI Commands](#), on page 55 for a complete list of configuration and query commands with examples and responses from TimeProvider 500.

## Status of Packet Flow and Operational States

---

The `show status` command provides performance-related information. [Figure 3-1](#) provides example output.

```
TP-500> show status

Current time is      : 05:52:04 01/04/1970
Current FLL state   : Normal FLL
FLL state duration  : 843 min
Reference           : Grandmaster

Forward Flow (Master to Slave)
Weight              : 22.18
Transient free (out of 900 s) : 900 s
Transient free (out of 3600 s) : 3599 s
Transactions used   : 13.9 %
Operational Min TDEV : 612.5 ns
Min Cluster Width   : 2700.0 ns
Mode Width          : 14528.0 ns
GM Packets/sec      : 66 pkts/s
Acc GM Packets/sec  : 0 pkts/s

Reverse Flow (Slave to Master)
Weight              : 77.82
Transient free (out of 900 s) : 900 s
Transient free (out of 3600 s) : 3599 s
Transactions used   : 18.0 %
Operational Min TDEV : 824.5 ns
Min Cluster Width   : 3400.0 ns
Mode Width          : 23872.0 ns
Packets/sec         : 65 pkts/s

Output Tdev Estimate : 0.00 ns
Frequency Correction  : -96.84 ppb
Phase Correction      : -0.16 ppb
Residual Phase Error : -1710.46 ns
GM Flow State        : Normal
Acc-GM Flow State    : Initializing
GM clock id          : 00:B0:AE:FF:FF:00:32:76
Acc-GM clock id      : 00:00:00:00:00:00:00:00
```

Figure 3-1. Details from Show Status Example

## Details from Show Status Example

---

```
Current time is      : 05:52:04 01/04/1970
```

TimeProvider 500 time when the `show status` command was issued. See the command [set clock](#), on page 63.

```
Current FLL state   : Normal FLL
FLL state duration  : 843 min
Reference          : GrandMaster
```

The first line provides the current state of the Frequency Locked Loop (FLL). The second line indicates how long the TP500 has been in this FLL state. The third line indicates which grandmaster clock (if any) is currently providing the reference. The TimeProvider 500 supports a capability to select a reference grandmaster clock from two candidate grandmasters. See [Acceptable Master](#), on page 54.



**Note:** Warm-up FLL state duration does not increment until a flow is established.

```

Forward Flow (Master to Slave)
Weight                : 22.18
Transient free (out of 900 s) : 900 s
Transient free (out of 3600 s) : 3599 s
Transactions used      : 13.9 %
Operational Min TDEV  : 612.5 ns
Min Cluster Width     : 2700.0 ns
Mode Width            : 14528.0 ns
GM Packets/sec        : 66 pkts/s
Acc GM Packets/sec    : 0 pkts/s
  
```

The items above are related to the packet flow from the master clock to the TP500 (“Sync” messages being received), designated as the Forward Flow.

- Weight indicates the percentage contribution of the forward flow sync packets being used to drive the TP500 outputs. The remaining percentage is being taken from reverse flow (Delay\_resp packets).
- The Transient Free values are rolling 15 minute (900 s) and 1 hour (3600 s) metrics. Transients include loss of sync flow, phase steps, and pops against both dynamic and static thresholds. If a given second includes a transient, it will not be considered “transient free”. Generally, if 80% or more of the indicated times (900 or 3600 seconds) are transient free, transient packet behavior should not be causing output performance issues.
- Transactions used indicates the percentage of sync packets that meet all clustering criteria and are therefore included in extracting the clock offset estimates. Generally, if this value is below 10%, output performance may be compromised.
- Operational Min TDEV is an operational stability estimate using the minimum TDEV metric defined in G.8261. Smaller values correlate to better output performance.
- Min Cluster Width is the current operational minimum cluster width used in the forward clock estimate.
- Mode Width is the current estimate of the main mode of the forward packet delay variation. The mode width is used in both weighting and compensation. Mode Width is a good indicator of loading.

- The packets/sec responses are average measures of the number of SYNC packets being received from the indicated master clock. The value should be very close to the requested SYNC packet flow rate, which in this case is 64 packets / second. For the example, the Acceptable GM response is 0 because there is no established flow.

```
Reverse Flow (Slave to Master)
Weight                : 77.82
Transient free (out of 900 s) : 900 s
Transient free (out of 3600 s) : 3599 s
Transactions used     : 18.0 %
Operational Min TDEV : 824.5 ns
Min Cluster Width    : 3400.0 ns
Mode Width           : 23872.0 ns
Packets/sec          : 65 pkts/s
```

The TP500 utilizes a Reverse Flow as an additional method to attain output frequency stability. This flow is initiated by the TP500 (delay request packets) which triggers delay request response packets from the master clock. The Packets/second line indicates an average rate of delay request responses being received. The other items are similar to the Forward flow explanations, except they are measures based on the reverse flow only.

```
Output Tdev Estimate : 0.00 ns
```

Available in a future release, this metric uses the reference clock model being developed in ITU SG13 to provide an operational estimate of the output performance of the TP500 in terms of peak TDEV stability.

```
Frequency Correction : -96.84 ppb
```

This is the current correction (in parts per billion: 1E-9) applied to the synthesizer to provide traceable frequency output.

```
Phase Correction      : -0.16 ppb
```

This is the current correction (in parts per billion: E-9) applied to the synthesizer to provide traceable phase output.

```
Residual Phase Error : -1710.46 ns
```

This is the current estimate of the residual phase error of the TP500 outputs.

```
GM Flow State        : Normal
Acc-GM Flow State    : Initializing
GM clock id          : 00:B0:AE:FF:FF:00:32:76
Acc-GM clock id      : 00:00:00:00:00:00:00:00
```

Flow state provides status on the condition of the 1588 message flow between the TP500 and the identified potential master clock. GM is the grandmaster, Acc-GM is the acceptable grandmaster, both of which can be configured using the `set ptp` command described in [Set PTP Commands](#), on page 71. If there is an established flow, the clock ID of that master clock is shown (it can be directly recovered from any PTP packet sent by that master). In the example shown, there is no Acc-GM flow, so its clock ID is zeroed. [Table 3-1](#) and [Figure 3-2](#) shows the possible values for the flow state. In the previous example, the acceptable grandmaster will remain in the initializing state because there is no actual grandmaster clock at its assigned address..

Table 3-1. Possible Flow State

Flow State	Description
Initializing	Communication with grandmaster clock is being established.
Waiting for GM to respond to signaling	TimeProvider 500 is waiting for a lease request response from the grandmaster clock.
Checking for SYNC messages	TimeProvider 500 is waiting on SYNC messages per the flow request agreement.
Checking announce messages	TimeProvider 500 is waiting for an announce message to be qualified.
Normal	The 1588 packet flow with the grandmaster clock is as expected.
Suspended	The user has disabled 1588 packet flow.

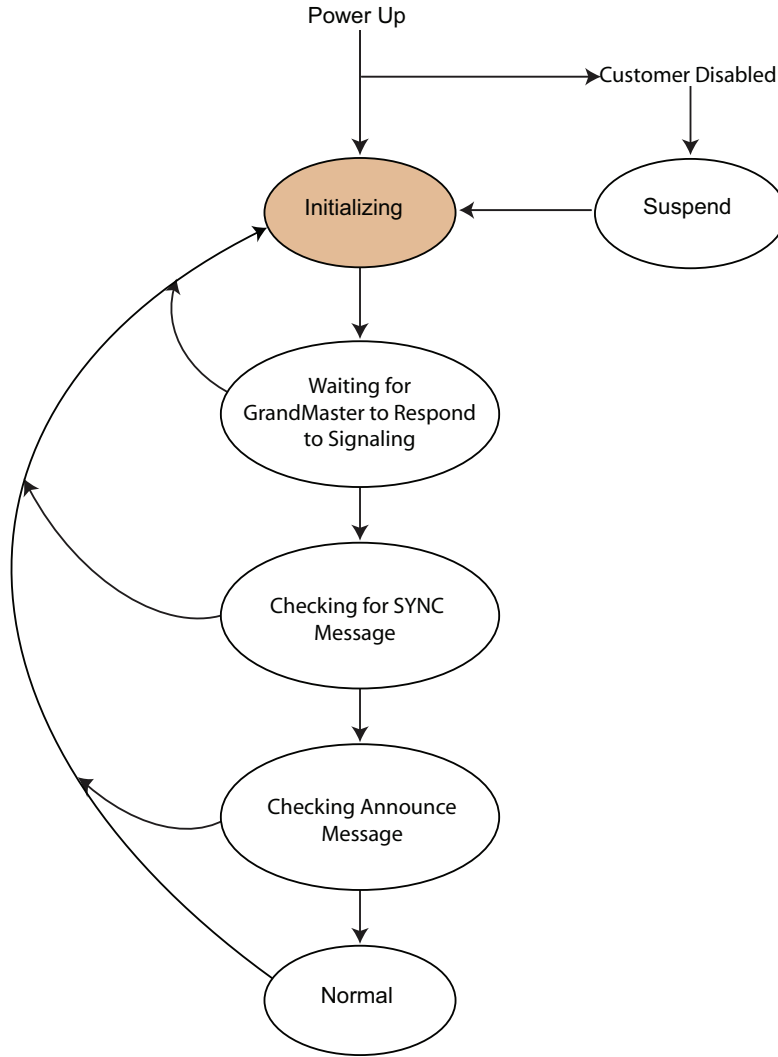


Figure 3-2. Possible State Flow

## Frequency Locked Loop

---

The TimeProvider 500 drives a state sequence that allows the operational status of the Frequency Locked Loop (FLL) to be observed. These can be viewed via the `show status` CLI command query. [Table 3-2](#) lists the FLL states, transition conditions, and SYNC LED impact. The possible sequential flow of frequency locked-loop states is shown in [Figure 3-3](#).



Table 3-2. Frequency Locked-Loop State

TimeProvider 500 State	Current FLL State	Typical Duration	SYNC LED	Comment
FREERUN	Warm-up	~2-3 minutes	OFF initially and then may blink. Amber if flow is established during warm-up.	Unit is getting ready for operation.
	No SYNC Flow	None	OFF and may blink Amber prior to exit state.	No Sync packets have been received from master. Will remain in this state if there is no flow from master clock.
	Acquiring	~20 minutes	Blinking Green	TimeProvider 500 is receiving sync packets from grandmaster and performing coarse frequency adjustment.
NORMAL	Fast FLL	~90 minutes	Blinking Green	Performance margins are being improved, but steady-state not yet attained.
	Normal FLL	Continual	Green	Performance margins are stable
	Bridging	300 seconds, but depends on bridge-time setting.	Green	Abnormality such as significant load change or loss of sync flow has been observed. Note: Default bridge-time setting is 180 seconds. Actual bridging time is always 120 seconds longer than the bridge-time setting.
HOLDOVER	Holdover	Varies depending on how long it takes to correct the reason for holdover.	Red	TimeProvider 500 is no longer using sync flow from grandmaster to control the outputs.

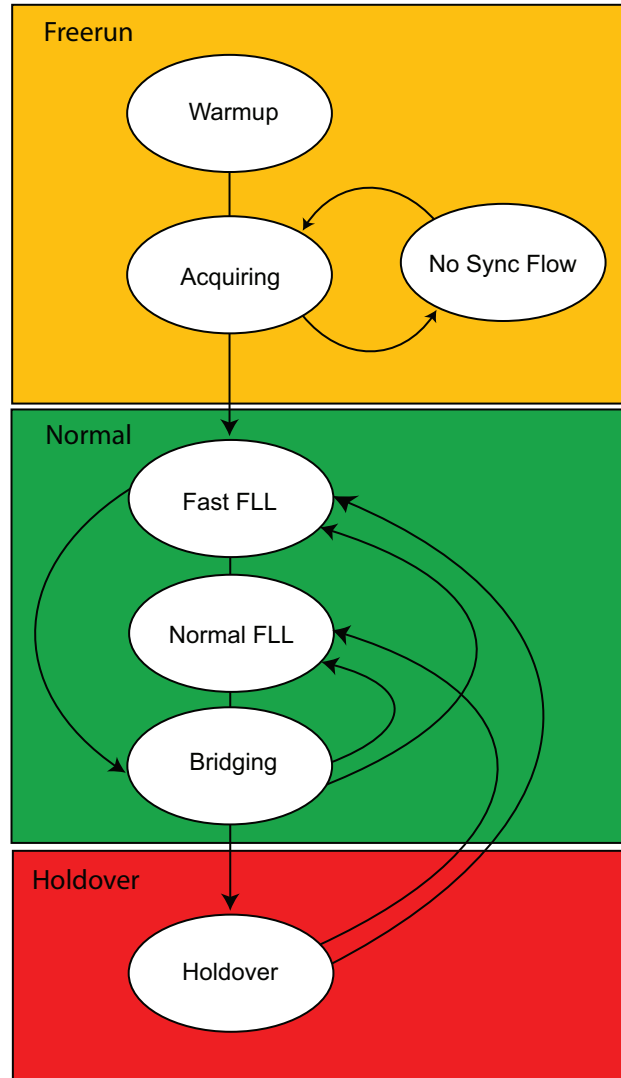


Figure 3-3. Possible Frequency Locked-Loop State Transitions

## Alarms & Events

---

Each detected condition can have one of four severity levels: EVENT, MINOR, MAJOR, CRITICAL. Each condition has a default severity as shown in Table A-1 on page 87. The CLI provides several types of configurable options for each condition. See the [Set Alarm Commands](#), on page 61. The basic capabilities are:

- Change the severity level of the condition.
- Disable or enable any reporting of the condition.
- Define an amount of time after detection of the condition before it will actually be reported.

`show alarm-config` queries the above settings for all of the conditions. See the CLI command, [show alarm-config](#), on page 76 for more information. These conditions become manifest in the TimeProvider 500 in three areas:

1. An event log provides history of “entry into” and “exit from” any condition that has not been configured as disabled. Each entry in the log is timestamped. See [show log](#), on page 80 for more information.
2. The `show alarm` query provides a listing of all conditions that are currently present, excluding those that have either been disabled (by user) or are of severity level = EVENT.
3. The ALARM LED indicates the highest severity level of all conditions that are currently present. As with `show alarm`, the ALARM LED will not respond to conditions that have been disabled (by user). [Table 3-3](#) shows the relationship between highest active severity level and ALARM LED indication.

Table 3-3. Alarm Levels

Highest Severity of Active Alarms	Alarm LED Status
Event	OFF
Minor	Amber
Major	Red
Critical	Red

When an alarm clears, the alarm condition is no longer present and the following occurs:

- An entry is placed into the alarm log showing that the alarm condition has cleared.
- If the alarm information is included in the `show alarm` response, it will be removed from that response.
- The Alarm LED logic will execute and may drive a change in the Alarm LED indication.

For more information, refer to [System Messages](#), on page 87 for alarm message details.

## Date & Time

---

Use the `set time` command to set the time and date. The time and date is used for log entries and some responses.

There is no real-time clock in the TimeProvider 500, so if the TimeProvider 500 is power-cycled, the time line will be adjusted. The following rules apply and are intended to keep the time line in the logs from having negative time jumps:

- When the TimeProvider 500 powers up, the latest entry in the **event** and **configuration** logs are checked for date and time. The latest entry is the last one written into the respective log.
- The date and time of the latest entries are compared to see which one contains the most recent time and date. The most recent (date and time-wise) one will become the starting point for internal date and time. In other words, while the unit is powered, the time line will proceed from that reference.
- As entries that will be logged occur, the entries will reflect the current time and date (based on reference described in prior bullet). These entries become candidates for the “latest entry” discovery on the next power-up.
- When `set clock` is used, the date and time are immediately updated. Since this places an entry in the logs, this provides a new timeline basis for the next power-up.

## TimeProvider 500 Logs

---

The TP500 provides two types of non-volatile logs: Event and Configuration.

### Event Log

The event log provides timestamped entries whenever any of the conditions associated with the events identified in [Table 3-3](#) are set or cleared. Additionally, other significant actions also generate log entries, such as power-on, resetting of time (see `set clock` command), clearing of the log, and changes of FLL state. The log can be viewed using `show log event`.

### Configuration Log

The configuration log provides timestamped entries whenever a user setting is changed, thus providing a history of configuration actions. Additionally, other significant actions also generate log entries, such as session logon and logout, power-on, clearing of the log, and resetting of time. The configuration log can be viewed using `show log configuration`.

Both logs are cleared with `clear log`.

## User Sessions

---

TimeProvider 500 user sessions can occur in two ways:

1. Locally with a serial connection
2. Remotely with a Telnet connection.

Either way, a userID and password are required. All TimeProvider 500 sessions are enabled with the same use ID and a single password. There can be up to five simultaneous Telnet sessions. Remote sessions time out after 10 minutes with no entry. A serial session times out after 60 minutes with no entry.

### Logon UserID

The factory default userID is `admin` and can be changed with the `set user` command. See [set user](#), on page 66 for more information.

### Password

The factory default password is `symmadmin**` and can be changed with the `set user` command. See [set user](#), on page 66 for more information.

To avoid a possible service call to gain access to the TimeProvider 500, Symmetricom recommends that you record any changes made to the password.

## Firmware Upgrade

---

TimeProvider 500 firmware can be remotely upgraded via FTP. See [upgrade](#), on page 60 for details. Two firmware images are maintained in flash memory to provide a backup in the event of file corruption. These images can be viewed using the CLI command, `show image`. For more information, see the CLI command, [show image](#), page 78.

TimeProvider 500 continues normal operation during the upgrade process. After upgrading the firmware, to make the newly downloaded firmware active, reset TimeProvider 500 using the `reboot system` CLI command. See [reboot](#), on page 59.

The `show inventory` command shows the version of software that is currently running. The following example shows that TimeProvider 500 is running firmware version 1.0.0.

```
TP-500> show inventory

Product Number   : 090-03863-01
Firmware Version : 1.0.0
Serial Number    : r45180
```

## Acceptable Master

---

TimeProvider 500 supports a capability to select from one of two master clocks. Use of this feature is easily enabled by providing target addresses for two master clocks. See [set ptp master](#), on page 73 and [set ptp acc-master](#), on page 72. When both are configured to non-zero IP addresses, the TimeProvider 500 will attempt to establish PTP flow with both. If a flow problem persists, or no flow can be established at all with one of the candidate masters, then the other one will be used as long as it has acceptable PTP flow. Along with such obvious reasons for selecting one of the master clocks, a rule-hierarchy is defined in IEEE-1588 which uses Announce messages received from both candidate masters and compares information to determine which of the two clocks is preferred. Details of the comparison algorithm are beyond the scope of this document, but can be seen in Figure 27 of *IEEE Std 1588™-2008*.

The show status query provides indication as to which of the candidate masters (if any) is currently being used as the synchronization reference. See the “Reference” row in the example found in [Details from Show Status Example](#), on page 44.

# Chapter 4 CLI Commands

The Command Line Interface (CLI) is used to display information or configure and manage the TimeProvider 500 from either a terminal connected to the EIA-232 serial port or the Ethernet port.

## Overview

The section describes the CLI command conventions, CLI command keyboard usage and command-line format. [Figure 4-1](#) shows the general structure of the CLI.

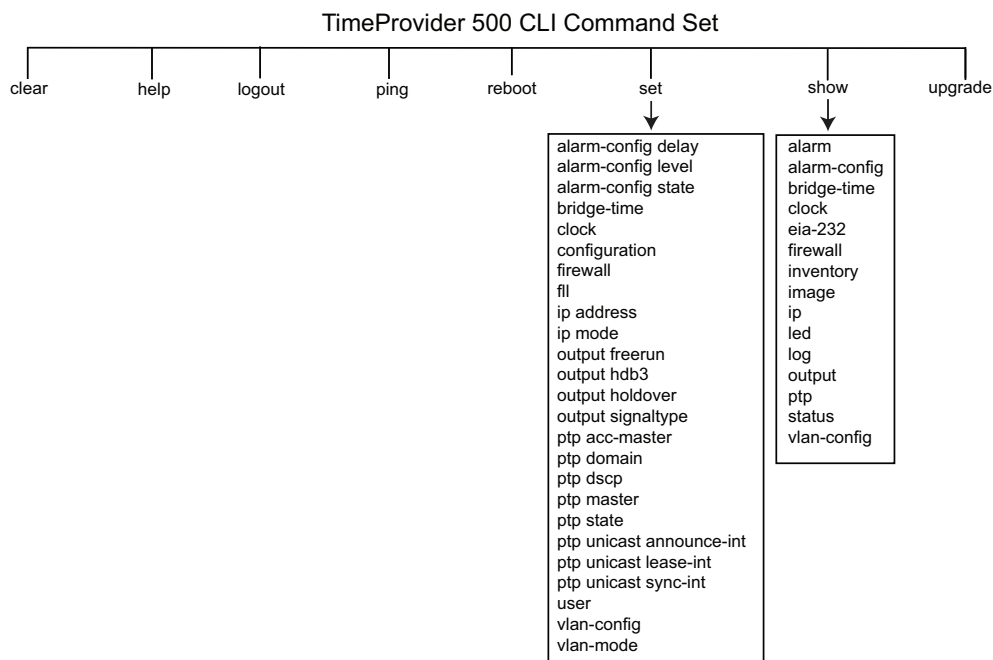


Figure 4-1. TimeProvider 500 CLI Command Set

## TimeProvider 500 CLI Command Conventions

The following are conventions used for the TimeProvider 500 CLI command set.

- [ ] — Brackets provide information about the allowed range. The first value is the minimum, and the last value is the maximum.
- { } — Braces signify more than one parameter data option.
- | — Vertical bars separate options.
- *Italics* indicates variable data.
- All commands are completed by pressing the Enter key.

## CLI Command Keyboard Usage

- The interface has built-in features for navigating within the CLI command hierarchy and are as follows:
- Press the TAB key or type `help` at the prompt for a list of the available top-level commands. See [help](#), on page 58 for more information.
- Press the TAB key at any time while typing a command. TimeProvider 500 will respond with the completion of the keyword or available completion choices based on the letters you type.
  - If typing of a keyword is partially complete, the completion will display if it is unique, otherwise, completion choices will be available.
  - If the keyword is complete after pressing the TAB key, the choices for the next syntax element will display.

For example, typing `s` at the prompt displays:

```
TP-500> s
```

Then pressing the TAB key displays:

```
set          - Changes settings
show         - Displays settings
```

Continuing with the example, typing `se` and then pressing the TAB key, displays `set` because it is the only possible command. Next, typing `o` and then pressing the TAB key, displays `set output` as the only possible command completion. When typing `s` and then pressing the TAB key, `set output signaltype` displays. Finally, pressing the TAB key results in the `signaltype` options for `set output signaltype` displaying as shown in the following:

```
e1_2048m     - Enables 2.048 MHz
e1_ais       - Enables E1 with AIS
e1_cas       - Enables E1 CAS without CRC4
e1_cas4      - Enables E1 CAS with CRC4
e1_ccs       - Enables E1 CCS without CRC4
e1_ccs4      - Enables E1 CCS with CRC4
disable      - Disables output
t1_sf        - Enables T1 with SF
t1_esf       - Enables T1 with ESF
t1_1544m     - Enables T1 1.544 MHz
t1_iso_pulse - Enables T1 with isolated pulse
```

- Previously typed commands can be recalled by using the UP ARROW key. You can recall up to five previously typed commands. Continually pressing the UP ARROW key will cycle you through the five previously typed commands. After pressing the UP ARROW key five times, you will go back to the last command you previously typed. Use the DOWN ARROW key to cycle the five prior typed commands in the opposite direction.



- You can use BACKSPACE to correct keystroke errors, or to reuse parts of a previously typed command. When using BACKSPACE, the removed characters will still appear on the screen, but they have been removed to the position shown by the cursor. When you start typing, the removed characters are overwritten.



**Note:** Both the TAB key and “?” have the same function. Both can be used at any time while typing a command (including at the prompt) to provide continuation options.

---

## Command Line Format

The command line format is as follows:

```
[Verb] Command [Parameter] [Data] EOL
```

### Example:

```
set output freerun squelch
```

- set = Verb
- output =Command
- freerun = Parameter
- squelch = Data

### Command line format description:

**Verb** – the type of action to be taken with the command.

**Parameter** –command input that defines the particular command element to be shown or modified.

**Data** – The data input for the parameter, if any

**EOL** – this parser responds to any input line terminator. Possible terminators are CR, LF, or CRLF. When the parser receives any of these terminators, the input is terminated, and the command line entry is processed. Pressing the Enter key also produces EOL.

---

## TimeProvider 500 CLI Command Set

---

This section provides details for each of the TimeProvider 500 commands which includes a description of the command's function, details of associated ranges when applicable, the command's default settings, and both an example of using the command and an example of the response you will receive from TimeProvider 500.

## clear log

This command clears the contents of event and configuration logs. An entry showing the time that the log was cleared will display at the start of the log.

### Command Syntax and Example:

```
clear log
```

### Response:

```
All logs have been cleared
```

**Example:** Event log example after using `show log` command.

```
Event Log  
Log 000 15:17:54 01/07/1970
```

## help

This command provides a list of first-level CLI commands.

### Command Syntax and Example:

```
help
```

**Response:** You will see the following:

```
TP-500> help  
  
clear          - Clears log  
help           - Print this list  
logout         - Logs off of telnet session  
ping          - Sends ping to IP address  
reboot        - Reboots client  
set           - Changes settings  
show          - Displays settings  
upgrade       - Downloads new firmware into memory  
logout
```

## logout

This command terminates a user's session. The `logout` command is used to terminate a serial connection session or a remote session via telnet.

**Example 1:** Logout from a serial connection example. The user is prompted to login.

```
TP-500> logout  
  
Logging out  
  
TP-500 04:36:09 01/01/1970 (1)
```

Login:

**Example 2:** A logout from a telnet session.

```
TP-500> logout

Logging out

Goodbye

Connection to host lost.
```

## ping

This command pings (ICMP echo request) a device at a selected IP address.

**Command Syntax:**

```
ping <ip address>
```

**Range:**

```
ip address = x1.x2.x3.x4
```

```
Range for all settings = [0, 1, ... , 255]
```

**Example:** Checks to see if the device at 192.168.1.11 is accessible. In this case, the device is a TimeProvider 5000 IEEE 1588 grandmaster clock.

**When the device is accessible:**

```
TP-500> ping 192.168.105.1

Pinging 192.168.1.1 [192.168.1.1]:
Reply from 192.168.1.1: time=0ms
Reply from 192.168.1.1: time=0ms
Reply from 192.168.1.1: time=0ms
Reply from 192.168.1.1: time=0ms
```

**When the device is not accessible:**

```
ping 192.168.1.11
Pinging 192.168.1.11 [192.168.1.11]:
Request timed out
```

**Note:**

Domain Name Service (DNS) is not supported.

## reboot

This command performs a soft reboot (restart) of TimeProvider 500.

**Example:**

```
reboot system
```

### Response:

```
Rebooting system

Bootcode version 1.0.5
Loading Maincode image: 1

-----PTP client -----

TP-500 00:00:00 01/01/1970 (1)
Login:
```

## upgrade

This command is used to upgrade the TimeProvider 500 firmware. The file for the TimeProvider 500 firmware upgrade is accessed through an FTP server. For this command, **upgrade** is the complete path and includes the file name; **FTP** is the IP address of the FTP site; and **user\_name** is the login name of the for the FTP server.

### Command Syntax:

```
upgrade file_path FTP:ftp_server_ip user_name <enter>
Password: pwd
```

### Range:

**file\_path:**  
The full-path name to the file being downloaded from the FTP server.

**ftp\_server\_ip:**  
The IP address of the FTP server.

**user\_name:**  
The login user name for the FTP server.

**pwd:**  
The login password for the FTP server  
<enter>:

Press **Enter**.

**Example:** The TimeProvider 500 firmware upgrade file name is **Maincode.bin** and is located at the FTP server at IP 192.168.2.3. The login user name for the FTP server is “anonymous” and there is no password, so you will press ENTER instead of entering a password.

Type the following:

```
upgrade /Maincode.bin FTP:192.168.2.3 anonymous <enter>
Password: <now enter password>
```



**Note:** TimeProvider 500 provides the password prompt after you press ENTER.

---

**Response:** A response is generated from TimeProvider 500 ending with “Transfer complete.”

## Set Commands

---

The set commands enable you to change settings or values such as configuring a master clock’s IP address, creating a user name and password for a logon, or specifying output behaviors for TimeProvider 500.

## Set Alarm Commands

---

The set alarm command set allows you to enable or disable reporting of selected alarms, configure the severity level of alarms, and the delay before an alarm is reported. Alarm number mapping is shown in Table A-1 on page 87.

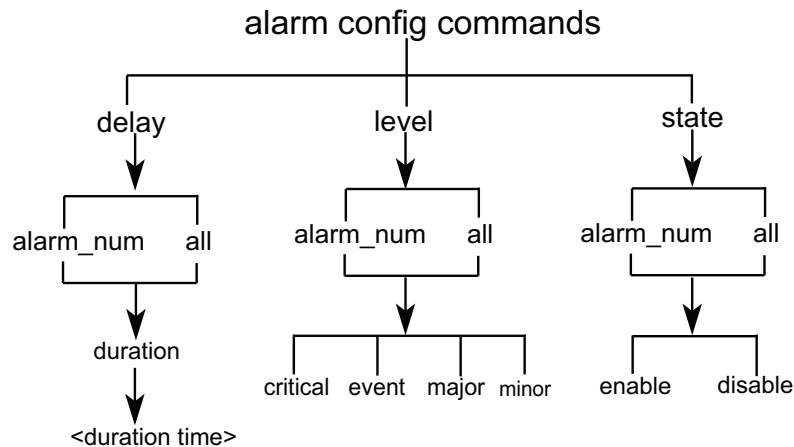


Figure 4-2. Alarm Configuration Commands

### set alarm-config delay

This command allows the user to delay the reporting of selected alarms (in seconds). The *alarm\_num* option allows you to select an individual alarm. The *all* option allows you to apply the setting to all alarms.

#### Command Syntax:

```
set alarm-config delay { alarm alarm_num | all } duration delay_time
```

**Example:** Sets alarm number 5 delay time to 10 seconds

```
set alarm-config delay alarm 5 duration 10
```

**Response:**

```
Alarm 5 delay set to 10 seconds
```

## set alarm-config level

This command configures the severity level of the selected alarm. The `alarm_num` option allows you to select an individual alarm. The `all` option allows you to apply settings to all alarms. See [show alarm](#), on page 76 for more information. The selected severity may change the alarm LED indication (see [System Messages](#), on page 87 for details).

### Command Syntax:

```
set alarm-config level { alarm alarm_num | all } { event | minor | major | critical }
```

**Range:** `alarm_num` = [0, 1, ... , N], N currently= 14

**Default:** See [System Messages](#), on page 87 for default severities.

**Example:** Sets all alarms to minor severity.

```
set alarm-config level all minor
```

### Response:

```
All alarm levels set to minor
```

## set alarm-config state

This command enables or disables the reporting of selected alarms. `alarm_num` allows you to apply settings to individual alarms, and `all` allows you to apply setting to all the alarms.

```
set alarm-config state { alarm alarm_num | all } { enable | disable }
```

**Range:** `alarm_num` = [0, 1, ... , N], N currently= 14

**Default:** all alarms set to `enable`.

**Example:** Disables alarm number 3

```
set alarm-config state alarm 3 disable
```

### Response:

```
Alarm 3 is disabled
```



**Note:** To see changes made, use the CLI command, `show alarm-config`. See [show alarm-config](#), on page 76.

---

## Other Set Commands

---

### set bridge-time

This command sets the amount of time (in seconds) that TimeProvider 500 will remain in bridge mode. Regardless of the bridge-time setting, there will be an additional 120 seconds of bridging time.

**Command Syntax:**

```
set bridge-time time_val
```

**Range:**

```
Time_val = [ 0, 1, ... , 86400]
```

**Default:**

```
Time_val = 180 seconds
```

**Example:** Sets the bridging time to 300 seconds.

```
set bridge-time 300
```

**Response:**

```
Bridging time set to 300
```

### set clock

This command sets the date and time for use in logging and alarm reporting.

**Command Syntax:**

```
set clock time HH:MM:SS date MM/DD/YYYY
```

**Range:**

```
HH = [00, 01, ... , 23] = hour  
MM = [00, 01, ... , 59] = minutes  
SS = [00, 01, ... , 59] = seconds  
MM = [01, 02, ... , 12] = month  
DD = [01, 02, ... , 31] = day  
YYYY = [2008, ... , 2089] = year
```

Leading zeros are never required

**Default:** 00:00:00 01/01/1970



**Note:** The `set configuration` command does not alter the time and date.

---

**Example:**

```
set clock time 09:30:00 date 09/17/2008
```

**Response:**

```
Time is: 09:30:00 09/17/2008
```



**Note:** The time and date is not updated while TimeProvider 500 is powered-down. Also, the date and time values are not stored in non-volatile memory and will not be recovered on power-cycle. For more information, see [Date & Time](#), on page 52.

---

## set configuration

This command resets user-defined settings to known values with a single command. The **factory** configuration will change all settings. The **default** configuration is a subset of the **factory** configuration and *will not* change communication-related settings such as TimeProvider 500's IP address. The **default** configuration is less extensive and potentially more useful in some situations. See Table B-10 on page 96 for more information.

**Command Syntax:**

```
set configuration [ default | factory ]
```

**Default:** TimeProvider 500 ships with its configuration set to **factory**.

**Example:** Sets TimeProvider 500's configuration to the **factory** settings.

```
set configuration factory
```

**Response:**

```
Setting configuration to factory
```

## set firewall

This command creates a firewall to block remote use of the selected capability.

**Command Syntax:**

```
set firewall { telnet | icmp } { allow | block }
```



**Default:**

```
telnet = allow  
  
icmp = allow
```

**Example:** Blocks remote use of Telnet.

```
set firewall telnet block
```



**Note:** icmp is “ping.”

---

**Response:**

```
telnet blocked
```

## set ip

This command sets the IP address, gateway, and network mask for the TimeProvider 500.

**Command Syntax:**

```
set ip address a1.a2.a3.a4 netmask m1.m2.m3.m4 gateway g1.g2.g3.g4
```

**Range:**

```
Range for all settings = [0, 1, ... , 255]
```

**Default:** set configuration factory configures the TimeProvider 500 to the following settings:

```
Address = 192.168.1.9  
Netmask = 255.255.255.0  
Gateway = 192.168.1.1
```

**Example:** Sets the IP address to; 192.168.2.52; netmask 255.255.255.0 gateway; 192.168.1.1.

```
set ip address 192.168.2.52 netmask 255.255.255.0 gateway 192.168.1.1
```

**Response:**

```
IP address: 192.168.2.52, netmask: 255.255.255.0, gateway: 192.168.1.1
```



**Note:** set configuration factory configures the TimeProvider 500 to the default settings. set configuration default *does not* alter the current IP address, gateway, and netmask settings.

When the IP address is changed, the settings take immediate effect.

---

## set ip-mode

This command configures the addressing mode for TimeProvider 500.



**Note:** DHCP is not supported in this release.

---

### Command Syntax:

```
set ip-mode [ static | dhcp ]
```

### Default:

```
ip-mode = static
```

### Example:

```
set ip-mode static
```

### Response:

```
IP-mode set to static
```

## set user

This command sets the user name and password for the TimeProvider 500 logon. In response to the CLI command, `set user`, TimeProvider 500 will prompt for old (current) password, new user name, and new password.

### User Name Range:

`user_name` command requirements:

- Must be between 4–20 characters in length.
- The `user_name` is case-sensitive.
- All characters must be alphanumeric (letters `a` through `z` and numbers `0` through `9`).

### Password Range:

- Must be between 8–32 characters in length.
- All characters must be printable ASCII (ASCII decimal values 33–126), and a comma, semicolon, and colon are never allowed.
- $\geq 2$  characters must be non-alphabetic. For example, a number would qualify.
- $\geq 1$  character must be non-alphanumeric (“!” would qualify)

### Default User Name:

admin

### Default Password:

symmadmin\*\*



**Note:** The default `user_name` and `curr_pwd` are the user name and password shipped from the factory. Using the `set configuration` command does not return the password to the factory default value.

---

### Example:

```
TP-500> set user

Enter old password: *****

Enter new user name: doug

Enter new password: *****

Verify new password: *****
```

### Response:

```
updated accepted
```



**Note:** This command can be used to change the password, user name or both. To change only the user name, the new password entries must be the same as the old password. To change only the password, the user name entry must be the same as the current user name.

Symmetricom recommends that you record password changes to avoid a possible service call to gain access to the TimeProvider 500.

---

## set vlan-config

This command sets the VLAN parameters.

### Command Syntax:

```
set vlan-config vlan_id priority vlan_priority
```

### Range:

```
vlan_id = [1, ... , 4094]
```

```
vlan_priority = [0, 1, ... ,7]
```

### Default:

```
vlan_id = 2
```

```
vlan_priority = 0
```



**Note:** The `set configuration factory` command will reset this setting. The `set configuration default` command will not change the current setting.

---

**Example:** Sets VLAN ID to 22 and priority to 6.

```
set vlan-config 22 priority 6
```

**Response:**

```
VLAN ID set to 22 and priority to 6
```



**Note:** These settings will only be used if `vlan-mode` is set to `enable`.

---

## set vlan mode

This command controls whether Virtual Local Area Network (VLAN) is used.

**Command Syntax:**

```
set vlan-mode { enable | disable }
```

**Default:**

```
vlan mode = disable
```



**Note:** The `set configuration factory` command will reset this setting. The `set configuration default` command will not change the current setting.

---

**Example:** Enables vlan mode of operation

```
set vlan-mode enable
```

**Response:**

```
VLAN is enabled
```

---

## Set Output Commands

The `set output` commands enable you to create settings and conditions for output signal behavior of the TimeProvider 500.

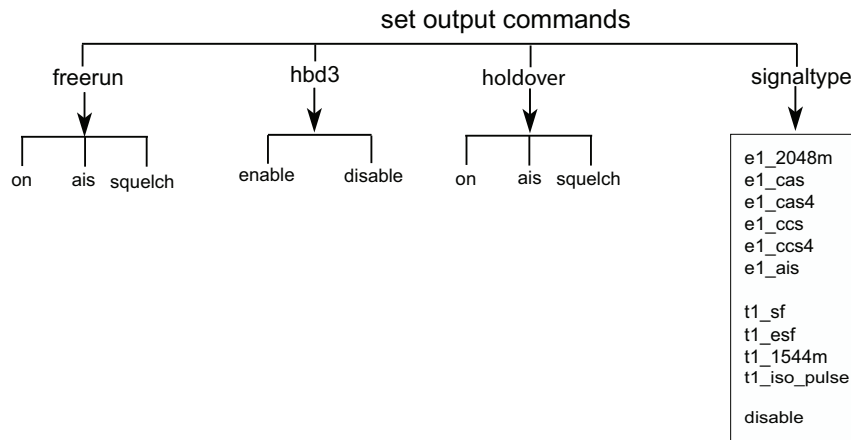


Figure 4-3. Set Output Commands

## set output freerun

This command sets the specific output behavior of TimeProvider 500 when it is in freerun mode. The following parameters are used when specifying output behavior:

- **on**—using this setting will use the `set output signaltype` when TimeProvider 500 is in freerun mode. See [Table 3-2](#).
- **ais**—using this setting will cause the appropriate Alarm Indication Signal (AIS) to be generated when in freerun mode. If `set output signaltype` is set to `disable`, no AIS output will be generated.
- **squelch**—using this setting causes the outputs to be turned off when in freerun mode regardless of the `set output signaltype` **settings**.

### Command Syntax:

```
set output freerun { ais | on | squelch }
```

### Default:

```
freerun = on
```

**Example:** Assures disabled output while in freerun mode.

```
set output freerun squelch
```

### Response:

```
Output will be squelch in freerun state.
```

## set output hdb3

This command sets whether or not High-Density Bipolar 3 (HDB3) encoding will be used for framed E1 outputs.

### Command Syntax:

```
set output hdb3 { enable | disable }
```

### Default:

```
hdb3 = enable
```

**Example:** Turns off HDB3 encoding.

```
set output hdb3 disable
```

### Response:

```
HDB3 set to disable
```

## set output holdover

This command sets specific output behavior when TimeProvider 500 is in holdover mode. The following parameters are used when specifying output behavior:

- **on**—using this setting will use the `set output signaltype` when TimeProvider 500 is in holdover mode.
- **ais**—using this setting will cause the appropriate AIS to be generated when in holdover mode. If `set output signaltype` is set to `disable`, no AIS output will be generated.
- **squelch**—using this setting causes the outputs to be turned off when in holdover mode regardless of the `set output signaltype` settings.

### Command Syntax:

```
set output holdover { ais | on | squelch }
```

**Example:** Turns off the outputs while in holdover mode.

```
set output holdover squelch
```

### Response:

```
Output will be squelch in holdover state
```

## set output signaltype

This command sets the type of output generated by TimeProvider 500. The same type of output will be provided on all output ports. The TimeProvider 500 output ports are the two BNC connections and the two RJ-48C connections.

### Command Syntax:

```
set output signaltype { disable | e1_signals | t1_signals | special_signals
}
```

### Where:

```
e1_signals = [ e1_2048m | e1_cas | e1_cas4 | e1_ccs | e1_ccs4 | e1_ais ]
```

```
t1_signals = [ t1_sf | t1_esf | t1_1544m ]
```

```
special_signals = [ e1_ais | t1_iso_pulse ]
```

### Default:

```
signaltype = e1_2048m
```

**Example:** Sets the output to produce a T1 isolated pulse pattern.

```
set output signaltype t1_iso_pulse
```

### Response:

```
Setting output to T1 isolated pulse
```



**Note:** When output is being generated, the OUT LED will illuminate green for either an *e1\_signal* or a *t1\_signal* signaltype. For signal types of *e1\_ais* or *t1\_iso\_pulse*, the OUT LED will illuminate as blink green indicating a special signal type.

## Set PTP Commands

The `set ptp` commands configure settings related to PTP connectivity and flow rates.

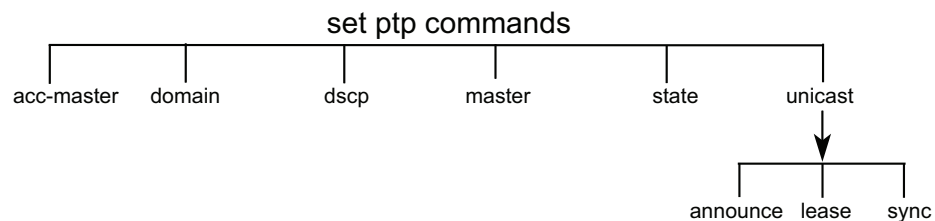


Figure 4-4. Set PTP Commands

## set ptp acc-master

This command configures the IP address of the targeted acceptable master clock.

### Command Syntax:

```
set ptp acc-master <ip_address>
```

### Range:

```
ip_address = x1.x2.x3.x4  
Range for all settings = [0, 1, ..., 255]
```

### Default:

```
ip_address = 0.0.0.0
```



**Note:** The TimeProvider 500 will not attempt communications with the acceptable master if this setting is left to 0.0.0.0.

---

### Example:

```
TP-500> set ptp acc-master <ip address: 192.168.2.43>
```



**Note:** The set configuration factory command will reset the IP address of the acceptable grandmaster clock to its default value. The set configuration default command will not change the current IP address setting.

---

## set ptp domain

This command sets the ptp domain value for TimeProvider 500.

### Command Syntax:

```
set ptp domain domain_number
```

### Range:

```
domain_number = [0, 1, ..., 127]
```

### Default:

```
domain_number = 0
```

**Example:** Sets the domain number to 3.

```
set ptp domain to 3
```

### Response:

```
Domain set to 3
```



## set ptp dscp

This command configures the Differentiated Services Code Point (DSCP) value for TimeProvider 500 outbound packets. DSCP is the lower 6 bits of the DS field of the IP packet header.

### Command Syntax:

```
set ptp dscp dscp_value
```

### Range:

```
dscp_value = [0, 1, ..., 63 ]
```

### Default:

```
dscp_value = 0
```

**Example:** Sets the DSCP outbound packet value to 16.

```
set dscp to 16
```

### Response:

```
DSCP set to 16
```

## set ptp master

This command configures the IP address of the targeted grandmaster clock.

### Command Syntax:

```
set ptp master ip_address
```

### Range:

```
ip_address = x1.x2.x3.x4  
Range for all settings = [0, 1, ..., 255]
```

### Default:

```
ip_address = 192.168.1.11
```



**Note:** Setting target address to 0.0.0.0 will cause TimeProvider 500 to not attempt communication with a master clock.



**Note:** The `set configuration factory` command will reset the IP address of the master clock to the default value. The `set configuration default` command will not change the current IP address setting.

---

**Example:**

```
set ptp master to 192.168.2.43
```

**Response:**

```
Grand Master address set to 192.168.2.43
```

## set ptp state

This command controls whether or not the TimeProvider 500 will use PTP messages for synchronization. When set to `disable`, TimeProvider 500 will not synchronize to any master clock.

**Command Syntax:**

```
set ptp state { disable | enable }
```

**Default:**

```
state = enable
```

**Example:** Disables synchronization for TimeProvider 500.

```
set ptp state disable
```

**Response:**

```
PTP state disabled
```

## set ptp unicast announce-int

This command sets the desired interval (in seconds) between announce messages sent by the grandmaster clocks.

**Command Syntax:**

```
set ptp unicast announce-int a_interval
```

**Range:**

```
a_interval = [1 | 2 | 4 | 8] seconds
```

**Default:**

```
a_interval = 1 second
```

**Example:** Sets the desired announce interval to 4 seconds.

```
set ptp unicast announce-int 4
```

**Response:**

Announce period set to 4 seconds

## set ptp unicast lease-int

This command sets the lease duration that the TimeProvider 500 will attempt to establish between a grandmaster clock server and itself.

### Command Syntax:

```
set ptp unicast lease-int lease_duration
```

### Range:

```
lease_duration = [ 10, 11, ... , 3000 ] seconds
```

### Default:

```
300 seconds
```

**Example:** Sets the lease duration to 200 seconds.

```
set ptp unicast lease-int 200
```

### Response:

```
PTP lease set to 200 seconds
```

## set ptp unicast sync-int

This command sets the TimeProvider 500 requested unicast packet rate for Sync and Delay\_Resp messages from master clock(s).

### Command Syntax:

```
set ptp unicast sync-int sync_rate
```

### Range:

```
sync_rate = [ 32 | 64 | 128 ] packets/second
```

### Default:

```
sync_rate = 64 packets/second
```

**Example:** Sets the packet rate to 32 packets per second.

```
set ptp unicast sync-int 32
```

### Response:

```
Sync rate set to 32 pkts/sec
```

# Show Commands

---

The show commands provide current TimeProvider 500 values and status. Alarms that are of “event” severity are not shown.

## show alarm

This command provides a list of active alarms.

### Example:

ID	Severity	Time-Date	Description
0	MAJOR	00:00:01 01/01/1970	Lost communication with GM
2	MAJOR	00:00:01 01/01/1970	Free-run
3	MAJOR	00:00:01 01/01/1970	Sync packet rate low
4	MAJOR	00:00:01 01/01/1970	Delay packet rate low
9	MAJOR	00:00:01 01/01/1970	LINK loss of signal

## show alarm-config

This command provides a table that shows available alarms, associated *alarm\_num*, delay, state, severity level, and alarm description. However, other commands allow configuration of delay, state, and severity level.

### Example:

ID	Delay	State	Severity	Description
0	3	ENABLED	MAJOR	Holdover
1	3	ENABLED	MAJOR	Free-run
2	3	ENABLED	MAJOR	Bridging
3	3	ENABLED	MAJOR	FPGA
4	3	ENABLED	MAJOR	10MHz LOS
5	3	ENABLED	MAJOR	LINK loss of signal
6	3	ENABLED	MAJOR	Outputs disabled
7	3	ENABLED	MAJOR	PTP Disabled
8	3	ENABLED	MAJOR	Sync packet rate low(GM)
9	3	ENABLED	MAJOR	Sync packet rate low(Acc-GM)
10	3	ENABLED	MAJOR	Delay packet rate low
11	3	ENABLED	MAJOR	Announce Timeout(GM)
12	3	ENABLED	MAJOR	Announce Timeout(Acc-GM)
13	3	ENABLED	MAJOR	Signaling Ack Timeout(GM)
14	3	ENABLED	MAJOR	Signaling Ack Timeout(Acc-GM)

## show bridge-time

This command shows the current bridge time setting. This setting determines how long the TimeProvider 500 will remain in BRIDGING FLL state before a transition into HOLDOVER state. Regardless of the bridge-time setting, there will be an additional 120 seconds of bridging time. See [Table 3-2](#) and [Figure 3-3](#).

### Command Syntax and Example:

```
show bridge-time
```

### Response:

```
Bridging time set to 180
```

## show clock

This command shows TimeProvider 500's time and date.

### Command Syntax and Example:

```
show clock
```

### Response:

```
Time is: 19:40:21 01/01/1970
```

## show eia-232

Shows the serial port setting on TimeProvider 500.

### Command Syntax:

```
show eia-232
```

### Example:

```
show eia-232
```

### Response:

```
Baud      : 57600  
Parity    : none  
Data bits : 8
```



**Note:** Settings are not changeable.

---

## show firewall

This command shows the current firewall settings.

### Command Syntax:

```
show firewall
```

### Example:

```
show firewall
```

### Response:

```
ICMP    is Allowed  
Telnet  is Allowed
```

## show inventory

This command shows the product number, firmware version, and product serial number. You cannot set or change these values.

### Command Syntax and Example:

```
show inventory
```

### Response:

```
Product Number   : 090-03863-01  
Firmware Version : 1.0.4  
Serial Number    : q86543
```



**Note:** The firmware version shows which version is currently running. The firmware version displayed is not necessarily the same firmware version stored in flash memory.

---

## show image

This commands shows information about firmware images that are currently stored in flash memory.

### Command Syntax:

```
show image
```

### Default:

Images 0 and 1 contain the most recent TimeProvider 500 firmware released at the time of shipment.

### Example:

```
show image
```

**Response:**

```
Image 0
rev:      [1.0.4]
size:     [513204 bytes]
checksum: [0xFE550C54]
seq:      [47]
Image is  [Good]

Image 1
rev:      [1.0.4]
size:     [513428 bytes]
checksum: [0xFE554F8D]
seq:      [48]
Image is  [Good]
```

## show ip

This command shows the current IP setting for TimeProvider 500.

**Command Syntax:**

```
show ip
```

**Example:** Shows the current TimeProvider 500 IP setting.

```
show ip
```

**Response:**

```
Static IP address: 192.168.2.52
Static IP mask:    255.255.255.0
Static IP gateway: 0.0.0.0
IP-mode:           static
VLAN mode:         Disabled
```

## show led

This command shows the illumination status of each LED.

**Command Syntax:**

```
show led
```

**Range:**

```
LED states = [Amber | Green | Red | Blink Amber | Blink Green | Blink Red | Off]
```

**Example:** Shows the status of the LEDs.

```
show led
```

**Response:**

```
Power: Green  
Sync: Off  
Output: Blink Green  
Alarm: Red
```

## show log

This command shows the content of the selected log. The configuration log provides history of configuration changes and the event log provides a history of alarms and events (event, minor, major, and critical levels). The show event log lists up to 200 entries numbered from 000 to 199. The sequence of the records in the log is “first in” and “first out.” The latest entry is assigned the highest number in the log.

### Command Syntax:

```
show log { configuration | event }
```

**Default:** Logs are empty when shipped from the factory.

### Example:

```
TP-500> show log event
```

```
Event Log
```

```
Current time is: 01:52:49 11/02/2008  
Log 000: 20:48:42 01/11/1970: Logs cleared  
Log 001: 20:49:25 01/11/1970: FLL state change from Bridging to Fast FLL  
Log 002: 20:49:26 01/11/1970: Exit alarm 2 - Bridging  
Log 003: 01:36:00 11/02/2008: Time was 20:53:12 01/11/1970  
Log 004: 01:45:49 11/02/2008: Enter alarm 4 - 10MHz LOS  
Log 005: 01:45:51 11/02/2008: Exit alarm 4 - 10MHz LOS
```



**Note:** For a given *alarm\_num*, the event log will only generate log entries when the *alarm\_num* is set to enable.

---

## show output

This command provides a summary of signal output settings.

### Command Syntax:

```
show output
```

### Example:

```
TP-500> show output  
  
Output frametype : E1 2.048 MHz  
HDB3 : Enabled  
Freerun output mode : on  
Holdover output mode: on
```



## show ptp

This command provides a summary of all PTP-related settings.

### Command Syntax:

```
show ptp
```

### Example:

```

PTP State:           Enabled
IP Mode:             Static
Client IP address:   192.168.1.9
Client IP mask:      255.255.255.0
Client IP gateway:   0.0.0.0
Client MAC address:  00:B0:AE:01:32:16
Grand Master IP:    192.168.1.11
ACC-Grand Master IP: 192.168.1.12
Client Clock ID:    00:B0:AE:FF:FF:01:32:16
Domain:              0
DSCP:                0
Sync Rate:           64 pkts/s
Announce Interval:  1 s
Lease Duration:      300 s

```

## show status

This command provides a summary of current TimeProvider 500 performance status. For more details, refer to [Details from Show Status Example](#), on page 44.

### Command Syntax:

```
show status
```

### Example:

```

Current time is      : 01:54:23 11/02/2008
Current FLL state    : Fast FLL
FLL state duration   : 21 min
Reference            : Grandmaster

Forward Flow (Master to Slave)
Weight               : 20.00
Transient free (out of 900 s) : 863 s
Transient free (out of 3600 s) : 3308 s
Transactions used    : 97.9 %
Operational Min TDEV : 52.4 ns
Min Cluster Width    : 500.0 ns
Mode Width           : 500.0 ns
GM Packets/sec       : 66 pkts/s
Acc GM Packets/sec   : 0 pkts/s

Reverse Flow (Slave to Master)
Weight               : 80.00

```

```
Transient free (out of 900 s) : 863 s
Transient free (out of 3600 s) : 3308 s
Transactions used : 97.9 %
Operational Min TDEV : 52.4 ns
Min Cluster Width : 500.0 ns
Mode Width : 500.0 ns
Packets/sec : 66 pkts/s

Output Tdev Estimate : 0.00 ns
Frequency Correction : -1.82 ppb
Phase Correction : 0.00 ppb
Residual Phase Error : 0.00 ns
GM Flow State : Normal
Acc-GM Flow State : Suspended
GM clock id : 00:B0:AE:FF:FE:01:A4:D0
Acc-GM clock id : 00:00:00:00:00:00:00:00
```

## show vlan-config

This command shows the current VLAN settings.

### Command Syntax:

```
show vlan-config
```

### Example:

```
show vlan-config
```

### Response:

```
VLAN is: Enabled
VLAN ID: 22
VLAN priority: 5
```



**Note:** See `set vlan-mode` and `set vlan-config` for VLAN configuration.

---

# Chapter 5 Maintenance and Troubleshooting

This chapter describes maintenance and troubleshooting procedures for the TimeProvider 500.

## In This Chapter

- [Preventive Maintenance](#)
- [Safety Considerations](#)
- [Reading LED Conditions](#)
- [Obtaining Technical Assistance](#)
- [Upgrading the Firmware](#)

## Preventive Maintenance

---

The TimeProvider 500 requires minimal preventive maintenance. Ensure the unit is not exposed to hazards such as direct sunlight, open windows, water, or extreme heat.



**Caution:** To avoid electromagnetic discharge damage to the circuitry, never attempt to vacuum the TimeProvider 500.



**Caution:** To avoid damage, under no circumstances should the interior chassis of the TimeProvider 500 be allowed to come in contact with water.

[Table 5-1](#) lists preventive maintenance measures to be performed periodically. Do not disassemble components just for the purpose of inspection.

*Table 5-1. 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. Refer to the National Electric Code ANSI/NFPA70, or per the application code in the country of installation for more information.

## Reading LED Conditions

---

In [Table 5-2](#), the function of each LED and its color illumination indicators are described.

Table 5-2. LED Conditions

Indicator	Label	Description
Power Indicator	PWR	<b>Green</b> - Power available <b>Off</b> - Power not available
PTP Synchronization Indicator	SYNC	<b>Off</b> -No synchronization packets are being received from the Grandmaster clock. <b>Blinking Amber</b> - Synchronization packets are being received from the Grandmaster clock. <b>Blinking Green</b> - Performance margins are improved, but steady state is not yet attained or TimeProvider 500 is receiving sychronization packets from the Grandmaster clock and performing frequency adjustments. <b>Green</b> - Performance margins are stable or abnormal packet flow is observed such as loss of synchronization flow or significant load change. <b>Amber</b> - TimeProvider 500 is no longer using synchronization flow from the Grandmaster clock to control the outputs.
T1/E1 signal activity	OUT	<b>Off</b> - No output <b>Green</b> - A normal sync signal-type is being generated. <b>Blinking Green</b> -An output is being generated but it is not a signal type normally used for synchronization such as <code>e1_ais</code> and <code>t1_iso_pulse</code> . See <a href="#">set output signaltype</a> , on page 71 for more information.
Alarm Indicator	ALARM	<b>Off</b> - An active condition with event severity is not present. <b>Amber</b> - A minor alarm. <b>Red</b> - A major or critical alarm.

## Obtaining Technical Assistance

---

If you have technical questions about the TimeProvider 500, 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](mailto:support@symmetricom.com) or [emeasupport@symmetricom.com](mailto:emeasupport@symmetricom.com).

## Upgrading the Firmware

---

You can upgrade the TimeProvider 500 firmware using CLI commands. Refer to [CLI Commands](#), on page 55 and the command [upgrade](#), on page 60 for details on the upgrade process.



# Appendix A System Messages

## In this chapter:

- [Introduction](#)
- [Grandmaster Clock Link Corrective Action](#)

## Introduction

---

[Table A-1](#) provides information about the alarm messages that display in response to an occurrence of an event or an alarm. The alarm number (`alarm_num`) is used in the CLI commands to alter delay, enable status, or define alarm severity if desired.

Table A-1. Alarm System Messages

Description	Alarm Number	Default Severity Level	MsgText	Corrective Action
The TimeProvider 500 is in holdover mode.	0	Major	Holdover	See <a href="#">Grandmaster Clock Link Corrective Action</a> , on page 90.
The TimeProvider 500 is in free-run mode. This is a normal temporary condition as the unit powers-up, but if the alarm persists when the unit is expected to have PTP flow, there may be a problem.	1	Major	Free-run	See <a href="#">Grandmaster Clock Link Corrective Action</a> , on page 90.
The TimeProvider 500 is in bridging mode. This shows that a condition exists which causes TimeProvider 500 to be unable to maintain normal frequency lock.	2	Event	Bridging	TimeProvider 500 may have lost PTP flow. Allow TimeProvider 500 to re-lock.
An FPGA problem is detected.	3	Critical	FPGA	Send TimeProvider 500 back to the factory. See <a href="#">Returning the TimeProvider 500</a> , on page 41.

Table A-1. Alarm System Messages

Description	Alarm Number	Default Severity Level	MsgText	Corrective Action
An internal 10 MHz is not detected.	4	Critical	10MHZ LOS	Send TimeProvider 500 back to the factory. See <a href="#">Returning the TimeProvider 500</a> , on page 41.
A LINK loss of signal. This alarm is a normal condition when a network cable is not connected to TimeProvider 500.	5	Major	LINK loss of signal	Check the LAN connection.
The outputs are disabled because the <code>set output signaltype</code> command is set to <code>disable</code> . This alarm provides a reminder that the <code>disable</code> setting is present.	6	Major	Outputs disabled	To enable output signals, change the output <code>signaltype</code> to a setting other than <code>disable</code> .
PTP is disabled via the <code>set ptp state</code> command. This alarm provides a reminder that the TimeProvider 500 will not operate normally with this setting.	7	Major	PTP disabled	See <a href="#">Grandmaster Clock Link Corrective Action</a> , on page 90.
The sync packet rate from the grandmaster has fallen below the expected rate.  Note: This alarm does not occur if the grandmaster IP address is set to 0.0.0.0. With an 0.0.0.0 IP address setting, TimeProvider 500 is not expecting packet flow signals from the grandmaster clock.	8	Major	Sync packet rate low(GM)	See <a href="#">Grandmaster Clock Link Corrective Action</a> , on page 90.



Table A-1. Alarm System Messages

Description	Alarm Number	Default Severity Level	MsgText	Corrective Action
<p>The synchronization packet rate from the acceptable grandmaster clock has fallen below the expected rate.</p> <p>Note: This alarm does not occur if the acceptable grandmaster IP address is set to 0.0.0.0. With an 0.0.0.0 IP address setting, TimeProvider 500 is not expecting packet flow signals from the acceptable grandmaster clock.</p>	9	Major	Sync packet rate low(Acc-GM)	See <a href="#">Grandmaster Clock Link Corrective Action</a> , on page 90.
<p>The delay_resp messages from the selected grandmaster clock is below the expected rate.</p> <p>Note: This alarm does not occur if the IP address of both possible grandmaster clocks is set to 0.0.0.0. With an 0.0.0.0 IP address setting, TimeProvider 500 is not expecting packet flow signals from the possible grandmaster clocks.</p>	10	Major	Delay packet rate low	See <a href="#">Grandmaster Clock Link Corrective Action</a> , on page 90 and verify that the grandmaster clock is ready for connection.
<p>The announce messages from the grandmaster clock are disqualified.</p> <p>Note: This alarm does not occur if the grandmaster clock's IP address is set to 0.0.0.0. With an 0.0.0.0 IP address setting, TimeProvider 500 is not expecting packet flow signals from the grandmaster clock.</p>	11	Major	Announce timeout (GM)	See <a href="#">Grandmaster Clock Link Corrective Action</a> , on page 90 and verify that the grandmaster clock is ready for connection.

Table A-1. Alarm System Messages

Description	Alarm Number	Default Severity Level	MsgText	Corrective Action
<p>The announce messages from acceptable grandmaster are disqualified.</p> <p>Note: This alarm does not occur if the grandmaster clock's IP address is set to 0.0.0.0. With an 0.0.0.0 IP address setting, TimeProvider 500 is not expecting packet flow signals from the grandmaster clock.</p>	12	Major	Announce timeout (Acc-GM)	Verify that the grandmaster clock is ready for connection.
<p>The grandmaster clock signaling acknowledgements have timed out. This means that signaling requests from TimeProvider 500 are not being acknowledged by the grandmaster clock.</p>	13	Major	Signaling Ack Timeout (GM)	See <a href="#">Grandmaster Clock Link Corrective Action</a> , on page 90.
<p>The acceptable grandmaster clock signaling acknowledgements have timed out. This means that signaling requests from TimeProvider 500 are not being acknowledged by the grandmaster clock.</p>	14	Major	Signaling Ack Timeout (Acc-GM)	See <a href="#">Grandmaster Clock Link Corrective Action</a> , on page 90.

## Grandmaster Clock Link Corrective Action

---

When there is an issue with the link to the grandmaster clock, do the following:

- Check the IP address of TimeProvider 500 by using the `show ip` CLI command. See [show ip](#), on page 79.
- Check the IP addresses of the grandmaster clocks with the `show ptp` CLI command. See [show ptp](#), on page 81.
- Check VLAN with the `show vlan-config` CLI command. See [show vlan-config](#), on page 82.
- Try to ping TimeProvider 500 from another element on the Ethernet subnet. See [ping](#), on page 59.

# Appendix B Specifications and Factory Defaults

This appendix provides mechanical and electrical specifications and factory defaults for the TimeProvider 500.

## In This Appendix

- [Component Specifications](#)
- [Factory Defaults](#)

## Component Specifications

---

This section provides the specifications for the TimeProvider 500 components and input and output signals.

### Mechanical

*Table B-1. TimeProvider 500 Mechanical Specifications*

Parameter	Description
Mounting	19 in. Rack
Rack Mounting Position	Front mounting location, unit protrudes 0.75 in. / 4.445cm
Width	8.53 in. / 216.7 mm
Height	1.63 in. / 41.4 mm
Depth	8.0 in. / 203.2 mm
Weight	870 g. fully loaded

## Environmental

Table B-2. TimeProvider 500 Environmental Specifications

Parameter	Description
Operating Temperature	-5° to +55° C, 23° to 131° F
Storage Temperature	-25° to +55° C, -13° to 131° F
Operating Humidity	5% to 90% RH
Storage Humidity	10% to 100% RH

## Power

Table B-3. TimeProvider 500 Power Specifications

Parameter	Description
DC Input	-48VDC / -60VDC Nominal 0.20A current, Operating range: -40VDC to -72VDC 0.280A (warm-up) @ 48V 0.180A (operating) @ 48V
Branch Circuit Over-Current Protection Device	1.0 A
DC Power	9.6 W, typical

## Serial Port

Table B-4. Serial Port Specifications

Item	Description
Connector Type	9-pin, female D connector
Connector Label	RS232 MGMT
Interface	RS-232, data terminal equipment (DTE)
Baud Rate	57.6 Kbps
Data Bits	8
Parity Bit	None
Stop Bits	1
Flow Control	None
Timeout	Approximately 60 minutes

## Ethernet Port

Table B-5. LAN Port Specifications

Connector	Description
Connector Type	IEEE 802.3
Speed	100 Mbps
Connector Label	1588
Interface	IEEE 1588v2
Timeout	Approximately 10 minutes

## T1 Outputs

Table B-6. T1 Output Specifications

Parameter	Specification
Framing (user selectable)	D4/Super Frame (SF) Extended Super Frame (ESF)
Signal Waveshape	Framed, all ones, Alternate Mark Inversion (AMI) per (ANSI) T1.102 and ITU Rec. G.703
Pulse Amplitude	2.4 to 3.6 volts peak into 100 $\Omega$
Termination Impedance	100 $\Omega$ $\pm$ 5% balanced

## 1.544 MHz Signals

Table B-7. 1.544 MHz Specifications

Parameter	Specification
Amplitude	1.0 to 1.9 volts peak, 1.5 volts peak nominal into 120 $\Omega$ 0.8 to 1.5 volts peak, 1.2 volts peak nominal into 75 $\Omega$
Wave Shape	Square Wave
Termination Impedance	75 $\Omega$

## E1 Outputs

Table B-8. E1 Output Specifications

Parameter	Specification
Framing (user selectable)	CAS, CCS, CAS4, CCS4
Signal Waveshape	Framed, all ones, Alternate Mark Inversion (AMI) Per ITU Rec. G.703 Sec. 9
Pulse Amplitude	2.4 to 3.6 volts peak into 120 $\Omega$ 1.9 to 2.8 volts peak into 75 $\Omega$
Termination Impedance	120 $\Omega \pm 5\%$ balanced; 75 $\Omega \pm 5\%$ unbalanced

## 2.048 MHz Signals

Table B-9. 2.048 MHz Specifications

Parameter	Specification
Amplitude	1.0 to 1.9 volts peak, 1.5 volts peak nominal into 120 $\Omega$ 0.8 to 1.5 volts peak, 1.2 volts peak nominal into 75 $\Omega$
Wave Shape	Square Wave
Termination Impedance	75 $\Omega$

## Holdover

< 20 microseconds after 24 hours following loss of PTP reference

### Test Conditions:

- TimeProvider 500 subjected to 5° C temperature variation throughout test.
- TimeProvider 500 referenced to PTP for at least 24 hours prior to the start of holdover.
- TimeProvider 500 powered > 5 days prior to the test.

# Factory Defaults

Table B-10 provides general and communication default values.

Table B-10. General and Communication Parameters

Description	Default Value	Value Range
User Name	admin	20 ASCII characters
User Password	symmadmin**	32 ASCII characters, a minimum of 8
EIA-232 Port	57.6k-8-N-1	Fixed
IP Mode	Static	DHCP   Static <i>Note: DHCP is not supported in this release.</i>
IP Address	192.168.1.9	Valid IPv4 address
PTP State	Enabled	Enable   Disable
Gateway Address	0.0.0.0	Valid IPv4 Address
Network Mask	255.255.255.0	Valid IPv4 Mask
Grandmaster IP Address	192.168.1.11	Valid IPv4 Address
Acc-Grandmaster IP Address	0.0.0.0	Valid IPv4 Address
Domain	0	0-127
DSCP	0	0-63
Sync Rate	64 pkt/second	32, 64, 128 pkt/sec
Announce Interval	1 second	1, 2, 4, 8 second(s)
Lease Duration	300s	1-3000 second(s)
VLAN	Disabled	Enable   Disable
VLAN ID	2	[1, ... , 4094]
VLAN Priority	0	[0, 1, ... , 7]
Signal Type (E1/T1)	2.048 MHz (e1_2048m)	<b>E1 signal type:</b> [e1_2048m   e1_cas   e1_cas4   e1_ccs   e1_ccs4   e1_ais] <b>T1 signal type:</b> [t1_sf   t1_esf   t1_1544m   t1_iso_pulse]
HDB3	Enabled	Enable   Disable
Freerun Output	ON	{ ais  on   squelch }
Holdover Output	ON	{ ais   on   squelch}
Alarm Delay	3 seconds	{ Alarm Alarm_Num   All } {Enable   Disable }



Table B-10. General and Communication Parameters (Continued)

Description	Default Value	Value Range
Alarm State	Enabled	Enable   Disable
Bridge Time	180 seconds	[0, 1, ..., 86400]
Firewall	Allowed	Allowed   Blocked



**Note:** When using the `set configuration factory CLI` command, User Name and User Password does not return to the default value in [Table B-10](#). When using the `set configuration default CLI` command, User Name, User Password, IP Mode, IP Address, Gateway Address, Network Mask, Grandmaster IP Dress, Acc-Grandmaster IP Address, VLAN, VLAN ID, and VLAN Priority does not return to the default value in [Table B-10](#).

## Electromagnetic Environment

Categories that may be covered here include: Indirect and direct ESD immunity, Electrical fast transients, radiated immunity, conducted immunity, and surge protection.

### Emissions/Immunity

- FCC Pt. 15 Class B
- ICES-003 Class B
- VCCI Class A
- AS/NZS CISPR 22 Class B
- ETSI 300 386 Class B
- EN 55022/24 Class B
- KN 55022/24 KCC Class B
- EMC IMMUNITY MEETS CRITERIA A
  - EN61000-4-2 ESD
  - EN61000-4-3 RADIATED IMMUNITY
  - EN61000-4-4 ELECTRICAL FAST TRANCIENT BURST
  - EN61000-4-5 SURGE
  - EN61000-4-6 CONDUCTED IMMUNITY

## Regulatory Requirements

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Symmetricom is certified with the following safety compliant certificates:

- UL
- cUL
- CB Scheme
- GS Mark
- CE Mark

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