

System Release Notice

TimeProvider 5000

Introduction

This document provides information about TimeProvider 5000 release 2.0.4. The latest information regarding features, enhancements, license keys, premium features, and known issues is included in this document.

Summary of Features

New Features

- NTP Server
 - Dedicated NTP server (no PTP) - 20,000 transaction per second capacity per IOC
Optional 120,000 transaction per second capacity per IOC (license key is required)
 - NTP server option on PTP Grandmaster - 20,000 transaction per second capacity, with the following possible configurations (license key is required):
 - 1 port PTP w/1000 clients capacity, 1 port NTP w/ 20,000 transaction per second
 - 2 ports of PTP - 500 clients per port
 - 2 ports of NTP, 10,000 transaction per second per port
- Support for TimeProvider E10 expansion shelf
 - SyncE, including SSM on ESMC messages, supported with optical SFP
 - Multicast PTP supported on layer 2 (Annex F of IEEE 1588-2008)
 - 8 Ethernet ports standard
Optional second group of 8 Ethernet ports for total of 16 ports (license key is required)
- Support for TimeProvider E30 expansion shelf
 - 12 E1/2048kHz output ports
 - 12 1PPS+TOD output ports

- Three IMC modules supporting expansion shelves, available with
 - 1 GPS input port
 - 2 GPS input ports
 - GPS and GPS/Beidou input ports
- ITU-T G.8265.1 Telecom Profile
- New command to deactivate PTP client
- SNMP support for new features and expansion shelves, ifTable and other selected public MIBs (license key is required)
- Reference selection via SSM on E1 and T1 input
- Time and frequency reference modes
- Auto-switching between references based on quality level or priority
- Optional support for 500 VLAN per IOC port (license key is required)
- Optional support for PTP probe (license key is required)
 - Layer 3 unicast
 - Layer 3 multicast
 - Layer 2 multicast
- Event and SNMP trap when PTP client is added or dropped

Resolved Issues

- FSB 098-40621-56: If system has been on for over 248 days, unicast clients will not be dropped from the client list, potentially preventing new clients from being added. In multicast mode, best master clock algorithm will not function after 248 days.
- 9589: Send trap when PTP client added or dropped (enhancement)
- 65059: Internal communication errors if a new IOC is added to the system if the IOC was previously set with a different intra-system class than is presently configured in the TP5000 system
- 65079: The error message received during local configuration backup if IOC card is not installed is misleading
- 65165: Sometimes the standby IOC could not exit standby warmup state
- 65304: Upgrade via FTP could fail if file path was too long
- 65788: May lose expansion shelf management connection if you connect IMC expansion port to IN-2 port of expansion shelf
- 65795: May get "Communication to IMC failed" alarms for expansion shelves.

Known Issues

- 09983: Ping succeeds for non-existent VLAN

Workaround: Only specify configured and enabled VLAN IDs in the ping command.

- 10089: tp5000eNotifySeverity was not included in the tp5000eTrapEvent for the 2.0 SNMP MIB included on the CD

Workaround: This will be resolved in the next update release.

- 10092: SNMP agent response time can be excessive or appear to “hang”. This occurs after a large number of SNMP transactions.

Workaround: Add and delete an unused SNMP community.

- 10114: Will not accept a RADIUS server IP address with a zero in the 2nd or 3rd octet of the address
- 66390: The Tx PQL values for "show syncE status" may not match the system PQL values, when the system PQL is 3 or 4. The values in the syncE ESMC messages are correct.
- 66393: The syncE bidirectional mode is not supported in release 2.0.4.
- 23909: SNMPv3 improper HMAC-validation allows authentication bypass. See <http://www.kb.cert.org/vuls/id/878044>

Workaround: Attach IMC Ethernet port to protected network.

Software Options

The TimeProvider 5000 also provides several software options. An activation key is required to access these options. [Table 1-1](#) lists all options for the TP 5000.

Table 1-1. TimeProvider 5000 Premium Features and Options

FW Version	Available Options	Notes
1.0	■ SNMP	Keys for options in v1.0 are 6 characters
1.2	■ SNMP ■ PTP Multicast & 2-step clock	40-character activation key for PTP option 6 character activation key for SNMP option
2.0	■ SNMP ■ NTP w/20,000 TPS Capacity for PTP IMC ■ R1.2 PTP Multicast & 2-step clock ■ R2.0 500 VLAN (16 base + extended 484) ■ PTP Probe ■ NTP w/120,000 TPS capacity for NTP IMC ■ TPE10 PTP/SyncE 16 ports license (Adds availability of Ports 9-16 to standard 8 ports)	40-character activation key for all options in the v2.0 release 6-character activation key supported for SNMP option from v1.0 or v1.2

Compatibility Matrix

[Table 1-2](#) below describes the minimum firmware revision required for TP 5000 hardware. The IMC, IOC and expansion shelves should all contain the same firmware revision. Firmware upgrade procedures are available in Chapter 6 of the TimeProvider 5000 User's Guide.

Table 1-2. Compatibility Matrix - TP5000 Hardware and Firmware

Description	P/N	HW Rev.	Minimum FW Rev.	Notes
IMC Module	090-50331-01	Rev L or higher	1.2.3	This module can't distinguish between 090-50301-01 and 090-50301-02 chassis.
		Rev K or lower	1.0.6	This module can't distinguish between 090-50301-01 and 090-50301-02 chassis.
	090-50331-02		2.0.4*	
	090-50331-04		2.0.4*	
	090-50331-05		2.0.4*	

Table 1-2. Compatibility Matrix - TP5000 Hardware and Firmware (Continued)

Description	P/N	HW Rev.	Minimum FW Rev.	Notes
IMC Module - NTP	090-50332-01		2.0.4*	This module can't distinguish between 090-50301-01 and 090-50301-02 chassis.
I/O Module	090-50311-01		1.0.6**	
	090-50312-01		1.0.6**	
	090-50314-01		1.2.3**	
	090-50315-01		2.0.4*, **	Should be used w/ 090-50301-02 chassis
IOC Module, Quartz	090-50321-01	Rev L or higher	1.2.3	
		Rev K or lower	1.0.6	
IOC Module, Rubidium	090-50322-01	Rev M or higher	1.2.3	
		Rev L or lower	1.0.6	
Main Chassis	990-50301-01		1.0.6	
Main Chassis	990-50301-02		2.0.4*	Chassis can be used by older firmware, but p/n can't be identified by "show inventory"
TimeProvider E10 Expansion Shelf Ethernet	990-50401-01		2.0.4*	Must be used w/ 090-50331-02, 090-50331-04, 090-50331-05
TimeProvider E30 Expansion Shelf E1 & PPS-TOD	990-50401-02		2.0.4*	Must be used with 090-50331-02, 090-50331-04, 090-50331-05

* These items are also supported by firmware release 1.3.8 for China region.

** The FW revision for the I/O module refers to the IMC/IOC firmware revision.

Notes

Parameter	Default Value
CLI Administrator	User Name: admin Password: symmadmin**
IMC MGMT IP Address	192.168.0.100
IOC IP Addresses	192.168.1.11 192.168.2.11

- Serial port settings are 57600 baud, 8N1, Flow Control – None.
- After configuring IP and VLAN parameters, be sure to use the CLI command to restart the IP interface in order to apply the changes. It is recommended that the settings be verified with the “show ip status” command.
- In the port redundancy mode (bonded), the configuration from IOC Ethernet port 1 will be used for both ports.
- In the port redundancy mode (bonded), the same type of SFP (multi-mode, single-mode, or electrical) must be installed in both IOC ports. Symmetricom highly recommends that both SFPs have the same performance specifications, especially timing characteristics.
- For card redundancy, the configuration for IOC1 is used for both cards. The IOC1 configuration is also used if the system includes only one IOC which is installed in the IOC2 slot.
- TimeProvider 5000, by default, uses IP addresses 172.16.250.8 through 172.16.250.63 internally. These addresses should not be used for external devices attached to the unit.
- If using a gateway, then all IP interfaces and the VLAN interface should be configured with the proper gateway IP address. If not using a gateway, then configure the TP5000 to not use a gateway by setting the gateway address to 0.0.0.0.
- During power-up and rebooting, messages will be displayed on the EIA-232 console port. The messages are normal and should be ignored.
- Both -48VDC power supply inputs should be connected to avoid generating -48V alarms.
- PTP slaves (clients) should not send unicast negotiation requests faster than once every 10 seconds.
- If the IP interface is disabled, with the port in non-redundant mode, some PTP configurations for that interface can't be set.
- Upgrades use SCP for secure FTP transfer and therefore SSH firewall applies. Both SSH and SFTP firewalls need to be “allowed” for upgrades.
- TimeProvider 5000 IOC only supports full-duplex 100/1000 connections. Ethernet hubs are half-duplex and therefore not supported.

- SNMP supports adding/deleting one row at a time for SNMP users, trap users, communities, SNMP managers, and CLI users. This also includes multiple accesses to the TimeProvider 5000 from the same or different SNMP managers. Refreshing after making changes is necessary.
- For SNMPv3, the following protocols are supported:
 - Authentication: HMAC-MD5 and HMAC-SHA
 - Privacy: CBC-DES and CFB-AES128
- For SNMPv3 traps, both a user and a trapuser need to be configured identically. In addition, the manager should use the desired user to connect to the TimeProvider 5000. This will ensure that a SNMPv3 trap will be successfully received by the manager using the corresponding trapuser username.
- The active IOC may switch during insertion of an IMC.
- Modules should not be removed and inserted more frequently than once every 2 hours.
- The TimeProvider 5000 only supports the active mode of FTP; it does not support the passive (PASV) mode.
- Settings for input priorities, input ssm value (PQL value), and input port state are changed to the default values when upgrading from 1.2.3 to a higher revision.
- IMC expansion port should be connected to IN-1 of expansion shelf.
- If PTP static client unreachable alarms are active when PTP is restarted or the IP interface is restarted, then the alarms will be cleared and then set. This results in extra alarm events in the log.
- DTI connection from IMC to expansion shelf must be enabled at both IMC and expansion shelf. See "set exp-if dti" CLI command. May lose expansion shelf management connection if you connect IMC expansion port to IN-2 port of expansion shelf and DTI is disabled or a faulty cable is used.

Upgrading the Firmware

You can upgrade the firmware in the IMC, IOC or redundant IOCs, or expansion shelves using CLI commands and software available from Symmetricom. Only users with Admin level access can execute the upgrade command. The command places the IMC in the firmware download mode and prevents all other sessions from making changes to the configuration. During the upgrade process, no new sessions are allowed.

The upgrade procedure to be used to upgrade the TP 5000 is based on the configuration of the TP 5000, firmware version from which the unit is being upgraded, and whether loss of outputs is acceptable.

- TP5000 with a single IOC module upgrading from 1.1.8 or 1.2.3 release to 2.0.4, please follow the procedure [TP5000 Upgrade - Loss of Outputs](#) below.
- TP5000 with Redundant IOC modules upgrading from 1.2.3 release to 2.0.4, please follow the step-by-step procedure [TP5000 with Redundant IOC Modules v1.2.3 - No Loss of Outputs](#) below.

- TP5000 with Redundant IOC modules upgrading from 1.1.8 release to 2.0.4, please follow the step-by-step procedure [TP5000 with Redundant IOC Modules v1.1.8 - No Loss of Outputs](#) below.
- All systems: When upgrading from released versions prior to 1.1.8, the upgrade process must be performed in two steps. The TP5000 must be upgraded to 1.1.8 first and then upgraded to 2.0.4 using the relevant procedure below. See page 258 in Rev. D of the TimeProvider User's Guide (098-00028-000 Rev. D) for the procedure "Upgrading from TP5000 v1.0 to v1.1 or Higher".

Upon receipt of any new/repaired equipment, perform the relevant software upgrade procedure below prior to putting the shelf into service.



Note: If a PTP probe license is installed, follow the procedure [TP5000 Upgrade - Loss of Outputs](#). The system will enable PTP probe mode (default) when different firmware versions are operating within the system. This will occur during the system upgrade of a TP5000 with redundant IOC modules, and the system must be returned to the grandmaster mode to restore outputs. Use the commands "set packet-service ioc1-1 ptp-gm" and "set packet-service ioc1-2 ptp-gm" to return to grandmaster mode.



Caution: To avoid a possible service call, do not issue a command to the TimeProvider 5000, do not remove power from the TimeProvider 5000, and do not remove an IOC or IMC from the chassis during the upgrade process. Doing so could corrupt the flash memory in a module, disabling the TimeProvider 5000.



Note: Linux, Windows, and other third-party FTP servers can be used in the upgrade process of the TP5000.



Note: If you need assistance selecting an SFTP server application, contact Symmetricon Global Services. See [Contacting Technical Support](#), on page 406.

TP5000 Upgrade - Loss of Outputs

This method is the easiest and quickest upgrade method, but there will be Loss of Service (LOS) at reboot. The IMC and IOC must be rebooted together after all components are upgraded.

1. Verify that SSH or telnet connection to IMC is available
2. Upgrade IMC to 2.0.4 using the command "upgrade imc <filepath> [ftp: | sftp:] <ftp-ip-address> <username>", but **DO NOT** reboot



Note: The FTP firewall is set to "Block" by default. Use the following command to set the IMC firewall to "Allow" for telnet communications:

```
set firewall imc ftp allow
```



Note: The TimeProvider 5000 only supports active FTP; it does not support passive (PASV) mode.



Note: For SFTP, both the SFTP and SSH firewalls must be set to "Allow". They are both set to "Allow" by default.



Note: If an SFTP server is used, the protocol does not need to be included with the address.

```
ftp:192.168.5.64
```

```
[sftp:]192.168.5.64
```

3. Upgrade IOC1 to 2.0.4, and if present, IOC2. Use the command "upgrade iocx <filepath> [ftp: | sftp:] <ftp-ip-address> <username>" (where x is either 1 or 2), but **DO NOT** reboot
4. Reboot system with "reboot system" CLI command
5. Verify that the TimeProvider 5000 is running correctly by issuing commands "show status", "show alarm", and "show inventory". If the system is showing an alarm for a setting that is disabled, re-enable and disable that setting and the alarm will be cleared.

TP5000 with Redundant IOC Modules v1.2.3 - No Loss of Outputs

This approach should be used to avoid LOS for a TP5000 with redundant IOC modules. It is critical that the IMC is rebooted immediately after the IOC. Since there are two IOCs present within the shelf, the IMC will be rebooted twice.

1. Verify that SSH or telnet connection to IMC is available. Verify that a PTP probe option is not installed. This requires using both the "show license" and "show option" CLI commands. If there is a probe license, you must follow the procedure TP5000 Upgrade - Loss of Outputs.

2. Verify that both IOC outputs on the active card are functioning properly by checking the active alarms with the "show alarm" CLI command. If any alarms are present, resolve these issues first before proceeding.
3. Upgrade IMC to 2.0.4 using the command "upgrade imc <filepath> [ftp: | sftp:] <ftp-ip-address> <username>", but **DO NOT** reboot
4. Upgrade both IOCs to 2.0.4 using the command "upgrade iocx <filepath> [ftp: | sftp:] <ftp-ip-address> <username>" (where x is either 1 or 2), but **DO NOT** reboot
5. Once all modules have been loaded with the 2.0.4 revision, issue the "show status" command, taking note as to which IOC module is standby and which is active.
6. Reboot the standby IOC module by issuing the command "reboot iocx" (where the x is the standby IOC position, either 1 or 2). Immediately after the Tp5000> prompt returns from this command, issue the command "reboot imc".
7. Allow both the standby IOC and the IMC to fully reboot and then log into the TimeProvider 5000.
8. Issue the command "show status". The current reference input and the phase offset fields may be incorrect - this is temporary. Please ignore this.

Issue the command "show alarm". At this point in the upgrade procedure there may be alarms present that are invalid- this is temporary. Please ignore this. Wait until the standby IOC changes from standby warm-up mode to standby.

9. Make standby IOC active with the command "set ioc-state iocx active" (where x is the standby IOC, either 1 or 2).
10. Verify IOC switch state with "show ioc-state" CLI command. Also verify that the current standby IOC is running the previous firmware version with "show inventory".
11. Reboot standby IOC with "reboot iocx" (where the x is the standby IOC position, either 1 or 2). Immediately after the prompt returns, reboot IMC with "reboot imc".
12. After the standby IOC module and IMC module return to service, log into the TimeProvider 5000 and issue the command "show inventory". Make sure all of the modules are now at 2.0.4 revision.
13. Issue the command "show ref". All of the input references that are not being used must be disabled. Choose the appropriate commands from the list below for the input references that need to be disabled:

```
set gnss state disable
set gps state disable
set input state port1 disable
set input state port2 disable
set pps-tod state port1 disable
set pps-tod state port2 disable
```

14. Verify that the TimeProvider 5000 is running correctly by issuing commands "show status", "show alarm", and "show inventory".

TP5000 with Redundant IOC Modules v1.1.8 - No Loss of Outputs

This approach should be used to avoid LOS with a TP5000 with redundant IOC modules. It is critical that the IMC is rebooted immediately after the IOC. Since there are two IOCs present within the shelf, the IMC will be rebooted twice.

1. Verify that SSH or telnet connection to IMC is available.
2. Verify that both IOC outputs on the active card are functioning properly by checking the active alarms with the "show alarm" CLI command. If any alarms are present, resolve these issues first before proceeding.
3. Upgrade IMC to 2.0.4 using the command "upgrade imc <filepath> [ftp: | sftp:] <ftp-ip-address> <username>", but **DO NOT** reboot
4. Upgrade both IOCs to 2.0.4 using the command "upgrade iocx <filepath> [ftp: | sftp:] <ftp-ip-address> <username>" (where x is either 1 or 2), but **DO NOT** reboot
5. Once all modules have been loaded with the 2.0.4 revision, issue the "show status" command, taking note as to which IOC module is standby and which is active.
6. Reboot the standby IOC module by issuing the command "reboot iocx" (where the x is the standby IOC position, either 1 or 2). Immediately after the Tp5000> prompt returns from this command issue the command "reboot imc".

Allow both the standby IOC and the IMC to fully reboot and return to service. Once you are able to log back into the TimeProvider 5000, issue the command "show status". The current reference input and the phase offset fields may be incorrect - this is temporary. Please ignore this.

Issue the command "show alarm". At this point in the upgrade procedure, there may be alarms present that are invalid- this is temporary. Please ignore this. Wait until the standby IOC changes from standby warm-up to standby.

7. Make standby IOC active with the command "set ioc-state iocx active" (where x is the current standby IOC, either 1 or 2).
8. There will be a temporary gap in the PTP flow. To minimize the gap, immediately restart IP interfaces on IOC:
 - a. Use the command "set ip ioc1-1 restart"
 - b. Use the command "set ip ioc1-2 restart"
9. Verify IOC switch state with the command "show ioc-state". Also verify that the current standby IOC is running the previous firmware version with "show inventory".
10. Reboot standby IOC with "reboot iocx" (where the x is the standby IOC position, either 1 or 2). Immediately after the prompt returns, reboot IMC with "reboot imc".
11. After the standby IOC module and IMC module return to service, log into the TimeProvider 5000 and issue the command "show inventory". Make sure all of the modules are now at 2.0.4 revision.

12. Issue the command "show ref". All of the input references that are not being used must be disabled. Choose the appropriate commands from the list below for the input references that need to be disabled:
 - set gnss state disable
 - set gps state disable
 - set input state port1 disable
 - set input state port2 disable
 - set pps-tod state port1 disable
 - set pps-tod state port2 disable
13. Verify that the TimeProvider 5000 is running correctly by issuing commands "show status", "show alarm", and "show inventory".

Upgrading an Expansion Shelf

To upgrade the software in an expansion shelf with ID=4, for example, use the following procedure:

1. Login at the Admin level (see [Logging In And Out](#), on page 360).
2. Type set configuration backup exp4-to-imc and press **Enter** to save the contents of the expansion shelf configuration to the IMC card.
3. Type upgrade exp{0-9} <filepath> <ftp-server> <user name> (use the IP address of the FTP server) and press **Enter**

Example - FTP: For a TP E10 PTP/SyncE expansion shelf with ID=4, FTP server with IP address 192.168.5.64, a user name of "user1", and an upgrade path of "/ver2.bin" the command is:

```
upgrade exp4 /ver2.bin ftp:192.168.5.64 user1
```

Example - SFTP: For a TP E30 E1/1PPS+TOD expansion shelf with ID=4, an SFTP server with IP address 192.168.5.65, a user name of "user1", and a upgrade file path of "/ver2.bin" the command is:

```
upgrade exp4 /ver2.bin 192.168.5.65 user1
```

4. When prompted, enter the password for the server. The new software is loaded into the expansion shelf with the specified ID.



Note: The system will transfer the file from the specified server and then upgrade the expansion shelf.

5. The TimeProvider 5000 validates the received file, and if the file is valid it updates the flash memory in the expansion shelf.



Note: If the file is not valid, the TimeProvider 5000 will reject it.

Downgrading the Firmware

You can also downgrade the firmware in the IMC, IOC or redundant IOCs to an earlier version using “upgrade” and other CLI commands and software available from Symmetricom. Only users with Admin level access can execute the “upgrade” command.



Note: To avoid incompatibility issues, you must use configuration files created with the firmware release version to which the unit has been downgraded. Symmetricom does not recommend downgrading a system which is in service.

This section describes the downgrade procedure. There will be loss of outputs at reboot and the configuration **must** be set to factory defaults.

1. Verify that SSH or telnet connection to IMC is available
2. Downgrade IMC to 1.2.3 or 1.1.8 using the command "upgrade imc <filepath> [ftp: | sftp:] <ftp-ip-address> <username>", but **DO NOT** reboot
3. Downgrade IOC1 and if present, IOC2 to 1.2.3 or 1.1.8. Use the command "upgrade iocx <filepath> [ftp: | sftp:] <ftp-ip-address> <username>" (where x is either 1 or 2), but **DO NOT** reboot
4. Reboot system with "reboot system" CLI command
5. Set factory defaults with “set configuration factory” CLI command
6. Verify that the TimeProvider 5000 is running correctly by issuing commands "show status", "show alarm", and "show inventory". If the system is showing an alarm for a setting that is disabled, re-enable and disable that setting and the alarm will be cleared.

Using the Release CD

To launch the CD for Microsoft Windows, insert the CD into your computer’s CD-ROM drive, then do the following:

- In Windows Explorer, double-click on the PDF documentation file for your product.

Available Documentation for Setup and Configuration

- System Release Notice (this document)

- *TimeProvider 5000 User's Guide* (098-00028-000)
- *TimeProvider 5000 SNMP Agent User's Guide* (098-00385-000)
- SNMP MIBs

This Software Release Notice and the User's Guides are included in PDF format on the CD. Use Adobe Acrobat Reader to open the appropriate file on the CD.

You will need the version of Adobe Acrobat Reader that is appropriate for your Operating System to view and print these documents. If you don't have Acrobat Reader already installed on your system, you can install it from the CD or download it from Adobe's Web site (<http://www.adobe.com>).

Where to Find Installation Procedures

Please refer to the *TimeProvider 5000 User's Guide* for instructions for installing and updating the software.

Contacting Technical Support

If you encounter any difficulty installing the update or operating the product, contact Symmetricom Global Services at:

U.S.A. Call Center:

including Americas, Asia, and Pacific Rim
Symmetricom, Inc.
2300 Orchard Parkway
San Jose, CA 95131-1017

Toll-free in USA: 888-367-7966 (1-888-FOR-SYMM)

Telephone: 408-428-7907

Fax: 408-428-7998

E-mail: support@symmetricom.com

Internet: <http://www.symmetricom.com>

Europe, Middle East, and Africa (EMEA) Call Center:

Symmetricom Global Services EMEA
Altlaufstrasse 42
85635 Hoehenkirchen-Siegersbrunn
Germany

Telephone: +49 700 3288 6435

Fax: +49 8104 662 433

E-mail: emeasupport@symmetricom.com

Internet: <http://www.symmetricom.com>