

Software Release Notice

SSU-2000 and SSU-2000e Basic + NTP + SNMPv2 Firmware Package Release 6.0 24113012-003-0 Release N.00

Introduction

Thank you for choosing Symmetricom as your solution provider for telecommunications synchronization systems.

Current Configuration Matrix

[Table 1](#) identifies the current hardware revisions at the time of this release along with the minimum hardware requirements for each firmware, boot code, and PLD object listed in the matrix. New or revised information is **bold**.

In this release, the following modules contain new firmware files:

- Comms Module
- GPS Module
- ST2E Clock Module
- ST3E Clock Module
- Type-I Clock Module
- PackeTime NTP Module
- PackeTime PTP Module
- JCC Input Module

Table 1. Current Configuration Matrix

Description	Item Type	File Item Number	Rev	File Name	Minimum Hardware Rev ¹
SSU/SDU-2000 MIB		12613127-002-2	M.00	Ssu2000.mib	N/A
Datum MIB		12613250-000-2	A.00	Datum.mib	N/A
Comms Module Basic+NTP+SNMPv2 (with New Flash)	Hardware	23413012-000-0	F.02		
	Firmware	14313012-003-5	R.00	01203R03.DN1	A.00
	Boot Code	14313012-B01-5	E.00	012BTE00.DN1	F.00 or higher
	Boot Code	14313012-B01-5	D.01	012BTD01.DN1	E.10 or lower
	PLD Object	13313012-000-5	C.00	01200C00.DN9	E.00
Comms Module M3 Basic+NTP+SNMPv2 (with New Flash)	Hardware	23413012-001-0	F.02		
	Firmware	14313012-003-5	R.00	01203R03.DN1	A.00
	Boot Code	14313012-B01-5	E.00	012BTE00.DN1	F.00 or higher
	Boot Code	14313012-B01-5	D.01	012BTD01.DN1	E.09 or lower
	PLD Object	13313012-000-5	C.00	01200C00.DN9	D.00
DS1 Input Module	Hardware	23413013-001-0	B.15		
	Firmware	14313013-000-5	E.00	01300E00.DN1	B.07
	Boot Code	14313013-B01-5	B.04	013BTB04.DN1	B.09
	PLD Object	13313013-000-5	B.02	01300B02.DN9	B.05
DS1 Multi-Port Input Module	Hardware	23413013-002-0	B.15		
	Firmware	14313013-000-5	E.00	01300E00.DN1	B.07
	Boot Code	14313013-B01-5	B.04	013BTB04.DN1	B.09
	PLD Object	13313013-000-5	B.02	01300B02.DN9	B.05
E1 Input Module	Hardware	23413014-001-0	B.16		
	Firmware	14313013-000-5	E.00	01300E00.DN1	B.07
	Boot Code	14313013-B01-5	B.04	013BTB04.DN1	B.09
	PLD Object	13313013-000-5	B.02	01300B02.DN9	B.05
E1 Multi-Port Input Module	Hardware	23413014-002-0	B.15		
	Firmware	14313013-000-5	E.00	01300E00.DN1	B.07
	Boot Code	14313013-B01-5	B.04	013BTB04.DN1	B.09
	PLD Object	13313013-000-5	B.02	01300B02.DN9	B.05

Table 1. Current Configuration Matrix (Continued)

Description	Item Type	File Item Number	Rev	File Name	Minimum Hardware Rev ¹
3E Clock Module (with JCC Sync)	Hardware	23413015-000-0	B.08		
	Firmware	14313015-000-5	T.00	01500T00.DN1	A.00
	PLD Object	13313015-000-5	D.00	01500D00.DN9	A.08
	PLD Object	13313015-000-5	D.00	01500D00.DN9	A.07 or lower
Type-I Clock Module (with JCC Sync)	Hardware	23413015-001-0	B.09		
	Firmware	14313015-000-5	T.00	01500T00.DN1	A.00
	PLD Object	13313015-000-5	D.00	01500D00.DN9	A.02
	PLD Object	13313015-000-5	D.00	01500D00.DN9	A.01 or lower
2E Clock Module (with JCC Sync)	Hardware	23413016-000-0	B.05		
	Firmware	14313015-000-5	T.00	01500T00.DN1	A.00
	PLD Object	13313015-000-5	D.00	01500D00.DN9	A.09
	PLD Object	13313015-000-5	D.00	01500D00.DN9	A.08 or lower
DS1 Output Module	Hardware	23413017-000-0	D.03		
	Firmware	14313017-000-5	E.00	01700E00.DN1	A.00
	PLD Object	13313018-000-5	A.00	01800A00.DN9	D.00
	PLD Object	13313017-000-5	A.02	01700A02.DN9	C.09 or lower
E1 Output Module	Hardware	23413018-000-0	D.03		
	Firmware	14313017-000-5	E.00	01700E00.DN1	A.00
	PLD Object	13313018-000-5	A.00	01800A00.DN9	D.00
	PLD Object	13313017-000-5	A.02	01700A02.DN9	C.09 or lower
GPS Input Module	Hardware	23413019-000-0	A.15		
	Firmware	14313019-000-5	D.00	01900D00.DN1	A.00
	PLD Object	13313019-000-5	A.00	01900A00.DN9	A.00
Composite Clock Output Module	Hardware	23413158-000-0	B.03		
	Firmware	14313158-000-5	D.00	15800D00.DN1	A.00
	PLD Object	13313158-000-5	B.00	15800B00.DN9	B.00
2048 kHz Output Module	Hardware	23413159-000-0	A.11		
	Firmware	14313159-000-5	E.00	15900E00.DN1	A.00
	PLD Object	13313159-000-5	A.01	15900A01.DN9	A.07

Table 1. Current Configuration Matrix (Continued)

Description	Item Type	File Item Number	Rev	File Name	Minimum Hardware Rev ¹
Composite Clock Input Module	Hardware	23413279-000-0	A.04		
	Firmware	14313279-000-5	C.00	27900C00.DN1	A.00
	PLD Object	13313279-000-5	A.00	27900A00.DN9	A.00
RS-422 Output Module	Hardware	23413287-000-0	A.04		
	Firmware	14313287-000-5	C.00	28700C00.DN1	A.00
	PLD Object	13313287-000-5	A.00	28700A00.DN9	A.00
E1/2048 kHz Output Module	Hardware	23413292-000-0	B.04		
	Firmware	14313292-000-5	D.00	29200D00.DN1	B.00
	PLD Object	13313292-000-5	B.00	29200B00.DN9	B.00
Dual-DS1 Line Retimer Module	Hardware	23413301-000-0	A.02		
	Firmware	14313301-000-5	B.00	30100B00.DN1	A.00
	PLD Object	13313301-000-5	A.00	30100A00.DN9	A.00
Quad-DS1 Line Retimer Module	Hardware	23413301-001-0	A.02		
	Firmware	14313301-000-5	B.00	30100B00.DN1	A.00
	PLD Object	13313301-000-5	A.00	30100A00.DN9	A.00
J/Sine Wave Output Module	Hardware	23413304-000-0	A.02		
	Firmware	14313304-000-5	B.00	30400B00.DN1	A.00
	PLD Object	13313304-000-5	A.00	30400A00.DN9	A.00
J/Sine Wave Input Module	Hardware	23413305-000-0	A.03		
	Firmware	14313305-000-5	B.00	30500B00.DN1	A.01
	PLD Object	13313305-000-5	A.00	30500A00.DN9	A.00
J/Composite Clock Output Module	Hardware	23413306-000-0	A.02		
	Firmware	14313306-000-5	B.00	30600B00.DN1	A.00
	PLD Object	13313306-000-5	A.00	30600A00.DN9	A.00
J/Composite Clock Input Module	Hardware	23413307-000-0	A.04		
	Firmware	14313307-000-5	D.01	30700D01.DN1	A.01
	PLD Object	13313307-000-5	B.01	30700B01.DN9	A.01
Quad-E1 Line Retimer Module	Hardware	23413309-001-0	A.04		
	Firmware	14313309-000-5	B.00	30900B00.DN1	A.00
	PLD Object	13313309-000-5	A.01	30900A01.DN9	A.00

Table 1. Current Configuration Matrix (Continued)

Description	Item Type	File Item Number	Rev	File Name	Minimum Hardware Rev ¹
PackeTime NTP Module	Hardware	23413325-000-0	A		
	Firmware	17313325-000-5	B.01	17313325-000_REV_B01.rpm	A.00
PackeTime PTP Module	Hardware	23413325-001-0	A		
	Firmware	17313325-001-5	A.00	17313325-001_REV_A00.rpm	A.00
SDU Buffer Module	Hardware	23413122-000-0	B.12		

Note:

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

What's New In This Release

New Features

This release features the PackeTime IEEE 1588 Precision Time Protocol (PTP) module and the capability to configure the TCP management port for TL1 Telnet connections.

PackeTime IEEE 1588 PTP Module

IEEE 1588-2008 defines Precision Time Protocol (PTP) for synchronizing heterogeneous clocks via a packet-based network such as Ethernet. IEEE 1588-2008 is gaining support as the method-of-choice to provide cost-effective synchronization over packetized networks and has the required precision for next generation wireless and access platforms.

Key Features

- *Network Protocol* – IEEE 1588-2008; unicast with reservations (sec 16.1); IPv4 (annex D)
- *PTP Capability* – Enables IEEE 1588-2008 grandmaster clock capability that supports up to 125 clients at full rate per IEEE 1588-2008 telecom profile.
- *Server Precision* – 10 ns rms typical (one-step, hardware time stamps)
- *Time Scale Support* – TAI (International Atomic Time), GPS module required, Arbitrary Time Scale
- *PTP Traffic Port* – One Ethernet Small Form-factor Pluggable (SFP); Optical: 1000 Base-X; Electrical: 100 Base-T, 1000 Base-T
- *VLAN Support* – 4 VLANs (IEEE 802.1Q)
- *Protection* – 1:1 protection (full hardware redundancy)
- *Management* – TL1 and CLI - Integrated into SSU-2000 system management (physical isolation from PTP traffic ports)

- *Improved Noise –Immunity for JCC Input module*

Configurable TCP Management Port

The TCP port for TL1 connections via Telnet protocol to the Communications module is configurable instead of having a fixed value. The TCP TL1 port value can be configured to either port number 3083 or port number 2000.

Refer to the *SSU-2000 Synchronization Supply Unit and the SDU-2000 Synchronization Distribution Unit User Guide* (12713020-002-2) and *SSU-2000 Synchronization Supply Unit and the SDU-2000 Synchronization Distribution Unit Technical Reference* (12713020-003-2) for more information.

Resolved Issues

23871: Changes have been made to the JCC Input module FPGA (PLD Object code) to improve Phase 3Sigma alarm triggers for systems with power/ground connection that is noisy. Changes have also been made to the JCC Input module firmware event reporting to better correlate with Clock module events. Therefore, input signal alarm events, such as LOS and Phase 3Sigma, will be properly announced with Clock module events.

24531: The TL1 command, SET-PRMTR-NTPMOD TL1 can be used to change the bypass parameters.

24456: If SSU2000 is not using the GPS module for ToD source, it is possible to see timestamps in the event log that are not in chronological order by date and time. This is fixed in Release 6.0 which allows the Comms module to be the only time-based event for the event logs.

24557: In Release 5.1 for PackeTime NTP module, if VLAN is enabled, all NTP requests can be processed by the NTP daemon with or without a correct VLAN tag. In Release 6.0, this is fixed. When VLAN is enabled, NTP requests with correct VLAN tags are processed by the NTP daemon.

24645: The SET-PRMTR-SETUP command now requires a valid aid code in the format SxAy, where:

x = SSU-2000 shelf number
y = Module slot number

Example: S1A10 = SSU-2000 Shelf #1, Slot 10

Previous releases allowed the aid code to be an optional parameter for SET-PRMTR-SETUP.

24186: Previously released NTP firmware running on the Comms module inserted the Leap Second as the last second of the prior day. In Version 6.0, the Comms module will now match the same behavior as the PackeTime NTP module and insert the Leap Second as the first second of the new day. [Table 2](#) shows the difference between the 5.1 Version and 6.0 Version Leap-Second sequence in the Comms module.

Table 2. Leap-Second Sequences for Comms Module

5.1 Version	SSU2000 Revision 5.1 COMM - 2 seconds before	11:59:58 PM, December 31st, 2008
	SSU2000 Revision 5.1 COMM - 1 second before	11: 59:59 PM, December 31st, 2008
	SSU2000 Revision 5.1 COMM - leap second	11: 59:59 PM, December 31st, 2008
	SSU2000 Revision 5.1 COMM -1 second after	12:00:00 AM, January 1st, 2009
6.0 Version	SSU2000 Revision 6.0 COMM - 2 seconds before	11:59:59 PM, December 31st, 2008
	SSU2000 Revision 6.0 COMM - 1 second before	12: 00:00 PM, January 1st, 2009
	SSU2000 Revision 6.0 COMM - Leap	12: 00:00 PM, January 1st, 2009
	SSU2000 Revision 6.0 COMM -1 second after	12:00:01 AM, January 1st, 2009

24008: If the SSU2000 was previously configured with GPS or the PackeTime NTP module, the user may see the local time setting on the SSU2000 revert to UTC time after restarting the Communication module (RESTART 1A02). *This is fixed in the 6.0 firmware release.*

Workaround for previous 5.0 or 5.1 firmware releases:

1. Make sure a GPS or PackeTime NTP module is not installed in the system.
2. Use the DATE and TIME commands to set a local time.
3. Restart the unselected clock (1A12) module first.
4. Wait until the unselected clock (1A12) becomes locked.
5. Turn off Clock Auto Return, then Switch the selected clock to 1A12 using the following command:

```
CLK AR OFF
CLK 1A12 SELECT
```

6. Restart the other clock (1A1).
7. Wait until 1A1 becomes locked.
8. Turn on Clock Auto Return, then Switch the selected clock to 1A1 using the command:

```
CLK AR ON
CLK 1A1 SELECT
```

9. Restart the COMM module and the time will not be changed.

Known Issues

24123: The Framers Chips on the SSU-2000 input modules have a clock recovery circuit that is contributing noise into the input's phase measurement when the signal is a framed E1 signal (CAS or CCS) or DS1 (T1). Clock signals 10MHz thru 1MHz do not pass thru this clock recovery circuit on the Input Framer Chip, thus they are "quieter" by approximately 16nS.

Workaround: Symmetricom has determined that the filtering provided by the clock modules will insure that the system output meets system specifications such as G.811. It is recommended that the input measurement function be configured to allow up to 80 ns from observation intervals 1 - 200 seconds or it be set to not alarm or disqualify the input signal.

24692: In some cases of Loss of ToD, the clients will never set it's LI bits. But, the Stratum level that the clients should send out (after the ToD timeout) should go to a Stratum 64 and it does not.

Workaround: Neither the Stratum nor the LI bits are changed. The PackeTime NTP servers should continue to provide timing to its clients even when the TODSRC times-out as it is likely the best source of timing even in holdover. Concurrently, the user will receive a ToD Untraceable Alarm alerting that the SSU2000 needs its TODSRC restored.



Note: See Appendix B in the *SSU-2000 Synchronization Supply Unit and the SDU-2000 Synchronization Distribution Unit User Guide* (12713020-002-2) for more information.

24727: If the maximum number of TL1 sessions are still active in the firmware and the users try to log in using TimeCraft or another TL1 session, the user may see the following error:

```
1: Message 043
Logon Failed for user: admin.
All TL1 sessions may be in use. Please try again.
```

If TL1 sessions are not closed properly or the user does not log out properly, the session may remain open. *Note: There are a maximum of 4 TL1 sessions that can be open at one time.*

Workaround: Do one of the following: (1) Log out of TL1 sessions properly with the CANC_USER command; (2) close any unused TL1 sessions and use the WHO command to see all login sessions, then use the USERS LOGOFF command to log out of any unused TL1 session; or (3) wait approximately 30-60 minutes and the TL1 session will recover automatically.

24943: When there is GPS on the PTP GrandMaster and the timescale is set to PTP, if the timescale is changed to ARB, the PTP packet does not completely change.

Workaround: When GPS is set as the ToD source, the PackeTime PTP module should be set to PTP, not ARB.

Software Application Notice

When you use SynCraft/TimeCraft to download firmware to SSU-2000 modules, Symmetricom recommends that you download one module at a time.

- The SSU-2000 Release 6.0 enhancements are supported in the TimeCraft 2.2 release.
- The SSU-2000 Release 6.0 enhancements are supported in the TimePictra 4.0 release.

Available Documentation

The following documents are available to help you set up and configure your product:

- System Release Notice (this document)
- *SSU-2000 User's Guide* (12713020-002-2) and *SSU-2000 Technical Reference* (12713020-003-2)
- *SSU-2000e User's Guide* (12713140-002-2) and *SSU-2000e Technical Reference* (12713140-003-2)

These documents are also available on the Symmetricom Web site at www.symmetricom.com. 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 download it at no cost from Adobe's Web site (www.adobe.com).

Where to Find Installation Procedures

Please refer to the latest revisions of the *SSU-2000 User Guide* (12713020-002-2) or the *SSU-2000e User Guide* (12713140-002-2) for instructions for installing and updating the firmware.

Contacting Technical Support

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

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