2016年1月吉日

お客様　御中

丸　文　株　式　会　社
シ　ス　テ　ム　営　業　本　部
営業第3部　情報通信課

Microsemi FTD社製SyncServerシリーズ製造中止のお知らせ

拝啓　貴社ますますご清祥のこととお慶び申し上げます。
平素は格別のお引き立てを賜り、ありがたく厚く御礼申し上げます。さて、この度弊社取扱メーカーであるMicrosemi FTD社より下記製品について、製造中止の発表が御座いましたので、下記にお知らせ致します。ご査収の程、宜しく御願い致します。

敬具

記

1）対象製品

1520R-S100	SyncServer S100
1520R-S200	SyncServer S200
1520R-S200-OCXO	SyncServer S200 with OCXO
1520R-S200-RB	SyncServer S200 with Rubidium
1520R-S200-DC	SyncServer S200 with DC power
1520R-S250	SyncServer S250
1520R-S250-OCXO	SyncServer S250 with OCXO
1520R-S250-RB	SyncServer S250 with Rubidium
1520R-S250-DC	SyncServer S250 with DC power
1520R-S250i	SyncServer S250i
1520R-S300	SyncServer S300
1520R-S300-OCXO	SyncServer S300 with OCXO
1520R-S300-RB	SyncServer S300 with Rubidium
1520R-S300-DC	SyncServer S300 with DC power
1520R-S300-RB-DC	SyncServer S300 with Rubidium / DC power
1520R-S350	SyncServer S350
1520R-S350-OCXO	SyncServer S350 with OCXO
1520R-S350-RB	SyncServer S350 with Rubidium
1520R-S350-DC	SyncServer S350 with DC power
1520R-S350-RB-DC	SyncServer S350 with Rubidium DC power
1520R-S350i	SyncServer S350i
090-01074-000	IEEE 1588-2008/PTP Option
090-01075-000	IEEE 1588-2008/PTP Upgrade Option
1520R-LFR40-KIT	SyncServer 40 KHz LFR Kit (JJY 40 KHz)
1520R-LFR60-KIT	SyncServer 60 KHz LFR Kit (WWVB or JJY 60 KHz)

2）製造中止理由

市場動向を考慮した製品の取扱い停止。

3）ご注文受付期限

S100、S200 シリーズ

2016 年 6 月 30 日までご注文を受け付けます。

S300 シリーズ

2016 年 9 月 30 日までご注文を受け付けます。

注)ただし、数に限りがある為、ご注文の状況により早期に受付を終了する可能性がございますのでご了承ください。

4）保守サポート

S100、S200 シリーズ

2018 年 6 月 30 日まで、カスタマーサポート部門にて修理・保守を受け付けさせて頂きます。

S300 シリーズ

2018 年 9 月 30 日まで、カスタマーサポート部門にて修理・保守を受け付けさせて頂きます。

詳しくは各担当営業まで御問い合わせください。

5）後継機種

SyncServer S600/S650 ハイグレードネットワークタイムサーバ

上記製品は製造中止となりますが、今後もこれまで同様に時刻周波数関連機器の製造販売、及び保守サービスは続けてまいりますので、今後とも変わらぬご愛顧を賜りますようお願い申し上げます。

以上

添付： Microsemi 社製造中止レター（３枚）

Microsemi 社製 S600/650 カタログ（１１枚）

Obsolescence Notice

Microsemi Corporation

January 18, 2016

Product Discontinuance Notification (PDN)

Subject: Notice of Last Time Order and Manufacture Discontinuance of SyncServer S100/S200/S250/S300/S350 Series Time Servers

Microsemi® offers a last time order opportunity prior to the discontinuance of the items listed below. Last time buy orders must be received by the Last Time Order date. Note that there are two last time order dates depending on models and part numbers; June 30, 2016 or September 30, 2016.

Please note there are limited quantities available of all these products and orders can be accepted only while supplies last. Contact Microsemi for availability.

Part Number	Model Description	Alternative Model*	Alternative Part Number(s)*	Last Time Order	MD	Last Ship Date	EOL
1520R-S100	SyncServer S100	None	None	Jun 30, 2016	Jul 1, 2016	Aug 31, 2016	June 30, 2018
1520R-S200	SyncServer S200	SyncServer S600	090-15200-601	Jun 30, 2016	Jul 1, 2016	Aug 31, 2016	June 30, 2018
1520R-S200-OCXO	SyncServer S200 with OCXO	SyncServer S600+OCXO	090-15200-602	Jun 30, 2016	Jul 1, 2016	Aug 31, 2016	June 30, 2018
1520R-S200-RB	SyncServer S200 with Rubidium	SyncServer S600+Rubidium	090-15200-603	Jun 30, 2016	Jul 1, 2016	Aug 31, 2016	June 30, 2018
1520R-S200-DC	SyncServer S200 & 40-60 Vdc Power Supply	none	none	Jun 30, 2016	Jul 1, 2016	Aug 31, 2016	June 30, 2018
1520R-S250	SyncServer S250	SyncServer S650+Timing I/O Module	090-15200-651	Jun 30, 2016	Jul 1, 2016	Aug 31, 2016	June 30, 2018
1520R-S250-OCXO	SyncServer S250 with OCXO	Configure-to-Order S650 with components to right →	090-15200-650 090-15201-001 090-15201-003 090-15201-006	Jun 30, 2016	Jul 1, 2016	Aug 31, 2016	June 30, 2018
1520R-S250-RB	SyncServer S250 with Rubidium	SyncServer S650+ Timing I/O Module+ Rubidium	090-15200-652	Jun 30, 2016	Jul 1, 2016	Aug 31, 2016	June 30, 2018
1520R-S250-DC	SyncServer S250 & 40-60 Vdc Power Supply	none	none	Jun 30, 2016	Jul 1, 2016	Aug 31, 2016	June 30, 2018
1520R-S250i	SyncServer S250i	none	none	Jun 30, 2016	Jul 1, 2016	Aug 31, 2016	June 30, 2018

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One Enterprise, Aliso Viejo CA 92656 USA
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Obsolescence Notice

Part Number	Model Description	Alternative Model*	Alternative Part Number(s)*	Last Time Order	MD	Last Ship Date	EOL
1520R-S300	SyncServer S300	SyncServer S600 + Security Protocol Option	090-15200-601 920-15201-002	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-S300-OCXO	SyncServer S300 with OCXO	Configure-to-Order S600 with components to right →	090-15200-600 090-15201-001 090-15201-003 920-15201-102	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-S300-RB	SyncServer S300 with Rubidium	Configure-to-Order S600 with components to right →	090-15200-603 920-15201-002	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-S300-DC	SyncServer S300 & 40-60 Vdc Power Supply	none	none	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-S300-RB-DC	SyncServer S300 & Rubidium Oscillator & 40-60 Vdc Power Supply	none	none	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-S350	SyncServer S350	SyncServer S650 + Security Protocol Option	090-15200-651 920-15201-002	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-S350-OCXO	SyncServer S350 with OCXO	Configure-to-Order S650 with components to right →	090-15200-650 090-15201-001 090-15201-003 090-15201-006 920-15201-102	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-S350-RB	SyncServer S350 with Rubidium	SyncServer S650 + Rubidium + Security Protocol Option	090-15200-652 920-15201-002	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-S350-DC	SyncServer S350 & 40-60 Vdc Power Supply	none	none	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-S350-RB-DC	SyncServer S350 & Rubidium Oscillator & 40-60 Vdc Power Supply	none	none	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-S350i	SyncServer S350i	none	none	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
090-01074-000	IEEE 1588-2008/PTP Option for NEW S300/S350 SyncServers	none	none	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
090-01075-000	IEEE 1588-2008/PTP Upgrade Option for Customer Owned S300/S350 SyncServers	none	none	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-LFR40-KIT	SyncServer 40 KHz LFR Kit (JJY 40 KHz)	none	none	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018
1520R-LFR60-KIT	SyncServer 60 KHz LFR Kit (WWVB or JJY 60 KHz)	none	none	Sep 30, 2016	Oct 1, 2016	Nov 30, 2016	Sep 30, 2018

***Note:** SyncServer S600/S650 models do not include antenna cable and/or components. SyncServer S600/S650 is compatible with existing SyncServer

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Obsolescence Notice

S100/S200/S300 antenna installations. New SyncServer S600/S650 installations where no preexisting S100/S200/S300 antenna infrastructure exists will require ordering antenna, cable and accessories as needed.

Definitions

Manufacture Discontinuance (MD): MD means product will no longer be manufactured or available for sale beginning with the date specified above.

Last Time Order Date: Orders for this product must be received by this date.

End of Life: EOL means product will no longer be repaired or serviced except if under an extended coverage service contract.

Support Policy

Repair services will be available on a repair or replacement basis during the warranty/contract period. In the event of parts or component obsolescence, repairs will be made on a best efforts basis until the end of life. All other service options (telephone technical support, training, etc.) are available from Microsemi Frequency and Time Division's service and support organization on a contract or case-by-case basis. Interested customers should contact the Microsemi Frequency and Time Division to check a product's eligibility for services and any applicable terms.

If you have any questions regarding this letter or would like to inquire about other product support services (e.g. Installation, Telephone Technical Support, Maintenance, Training, etc.) please contact our Customer Assistance Center at 1-888-367-7966 (Toll Free) or 1-408-428-7907, your Sales Representative, or our website **www.microsemi.com**

Microsemi Frequency and Time Division is highly committed to the Frequency & Time technology market and the customers we serve. We thank you for your understanding and look forward to serving you in future.

Microsemi Corporation

Any projected dates in this notification are based on the most current product information at the time this PDN is being issued, but they may change due to unforeseen circumstances. For the latest schedule and any other information, please contact your local Microsemi Sales Office, the factory contact shown above, or your local distributor.

SyncServer S600

High Performance, Enhanced Security Network Time Server

Key Features

- Ultra high-bandwidth NTP time server
- Stratum 1 Operation via GNSS satellites
- Four GbE ports standard, all with patented NTP hardware timestamping
- Built-in DoS detection and protection
- Security-Hardened NTP Reflector™ with firewall protection
- Web-based management with high security cipher suite
- Exceptional time accuracy to UTC
- Extended environmental specifications
- TACACS+, RADIUS, LDAP, and more
- IPv6/IPv4 on all ports
- Rubidium Atomic Clock or OCXO oscillator upgrades
- Dual power supply option
- PTP and GLONASS ready, no additional hardware required

Key Benefits

- Synchronizes thousands of NTP clients
- Security-Hardened for peace-of-mind time service operations
- Multiple GbE NTP ports for easy network configuration and adaptation
- Best-in-class time accuracy for improved log file timestamp precision and usability
- Very reliable and easy-to-use network time appliance for modern networks and business operations

Best in Class

Modern networks require accurate, secure, and reliable time services as provided by the Microsemi SyncServer S600. The Security-Hardened S600 network time server is purpose-built to deliver exact hardware-based Network Time Protocol (NTP) timestamps. The unparalleled accuracy and security is rounded out with outstanding ease-of-use features for reliable network time services ready to meet the needs of the user network and business operations today, and in the future.

High Security and Capacity

The four standard GbE ports combined easily handle more than 10,000 NTP requests per second using hardware time stamping and compensation. All traffic to the S600 CPU is bandwidth-limited for protection against denial-of-service (DoS) attacks.

For significantly more robust and secure NTP operations, enable the Security-Hardened NTP Reflector™ with 100% hardware-based NTP packet processing capable of 120,000 NTP requests per second*. The Reflector also works with the CPU-protecting firewall, bandwidth limiting all non-NTP traffic. Coupled with the Reflector is DoS detection, notification, and protection against abnormally high network traffic. The NTP Reflector™ processes all packets at GbE line speed, thereby making it impervious to the level of network traffic that could be delivered in a DoS attack.

Security is an inherent part of the SyncServer S600 architecture. In addition to standard security features related to the hardening of the web interface, NTP operations and to server access, unsecure access protocols are deliberately omitted from the S600 while remaining services can be disabled. Advanced authentication services such as TACACS+, RADIUS, and LDAP are optionally available.

Timing and Design Reliability

The 72-channel GNSS receiver, coupled with Microsemi's patented Active Thermal Compensation Technology, provides best-in-class time accuracy of <15 ns RMS to UTC. Backstop this with a durable hardware design subjected to severe shock and vibration testing, and high reliability components that extend the operating temperature range to a very wide -20°C to +65°C. Further, choose the dual power supply option with SNMP trap enabled monitoring to avoid time service interruptions. As with all Microsemi time servers, upgrading to a high performance oscillator, such as a Rubidium atomic clock, keeps the S600 accurate for a long time in the event of a GNSS service disruption.

Leverage Built-In Hardware

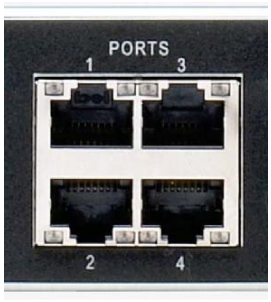
The SyncServer S600 includes additional built-in hardware features that are enabled through software license keys, such as the Security-Hardened NTP Reflector™. Anticipated future software enabled hardware options are GbE PTP operations and GLONASS support.

The SyncServer S600, the future of time server operations, today.

** NTP Reflector is part of the Security Protocol License and will appear in version 1.1 due April 2016.*

Four GbE Ports for Performance, Flexibility, and Security

The S600 has four dedicated and isolated GbE Ethernet ports, each equipped with NTP hardware time stamping. These are connected to a very high-speed microprocessor with microsecond accurate time stamps to assure high-bandwidth NTP performance. This more than meets the need of servicing 10,000 NTP requests per second.



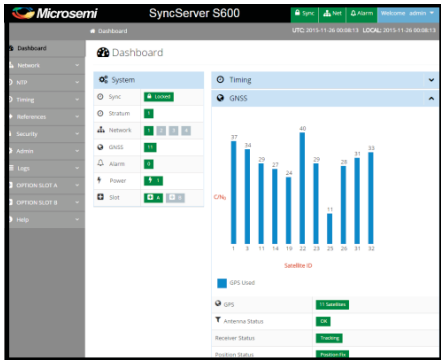
Four GbE ports provide network configuration flexibility and enhanced security. "Multiple" isolated and synchronized time servers can also be configured.

Multiple ports provide the flexibility to adapt to different network topologies as networks grow and change. A S600 can be the single time-source to synchronize clients on different subnets and physical networks. Since each port is independent, it can appear as though there are four clocks available, even though there is only a single time reference.

NTP can be served on all four ports. The highly secure web-based management interface is only available on port 1 so that administrators may choose to keep that IP address private and secure. Unique access control lists for each port can govern server response to client requests for time.

Intuitive, Secure, and Easy to Use Web Interface

The modern web interface is the primary control interface of the S600. Once the keypad and display are used to bring the unit online, complete status and control functions are easily found via the well-organized left side-expanding/collapsing navigation menu.



At-a-glance dashboard presentation combined with logical organization and intuitive controls make configuring the S600 quite easy.

Standard Management Access Security

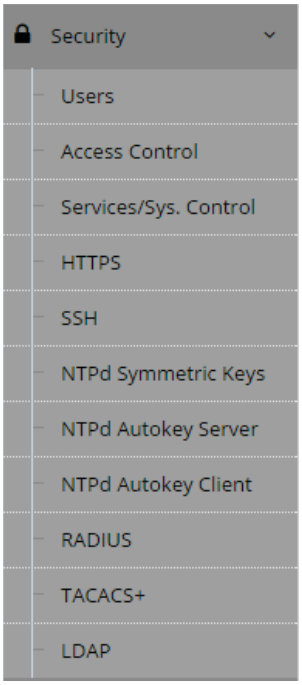
All of the expected network management protocols are standard in the S600. These include mandatory password access, HTTPS/SSL only (using the high encryption cipher suite), SSH, access control lists, service termination, SNMPv2/v3, and NTP MD5 authentication. All traffic to the S600 CPU is bandwidth-limited for protection against DoS attacks. The local keypad on the server can be password-protected to prevent tampering.

Security-Hardening Option

The SyncServer S600 can be seriously hardened from both an NTP perspective and an authentication perspective through the Security Protocol License Option, which includes the Security-Hardened NTP Reflector.

Operational Hardening— via the 120,000 NTP packet per second NTP Reflector™ with 100% hardware based NTP packet processing also works with a CPU-protecting firewall by bandwidth limiting all non-NTP traffic. The Reflector also monitors packet flow for DoS detection and reporting, yet remains impervious to the level of network traffic as it operates at line speed.

Authentication Hardening— is available for NTP client or server authentication through the NTP Autokey function or user access authentication via TACACS+, RADIUS, and LDAP. (See the *SyncServer Options datasheet* for more detail on the Security Protocol License Option.)



An entire drop down menu in the S600 is dedicated to security related protocols.

Unprecedented NTP Accuracy

The Stratum 1 level S600 derives nanosecond accurate time directly from the atomic clocks aboard the GNSS satellites. By using an integrated, 72-channel Global Navigation Satellite System (GNSS) receiver, every visible satellite can be tracked and used to maintain accurate and reliable time. Even in urban canyon environments where direct satellite visibility can be limited, manually inputting the position can be sufficient to acquire accurate time even from a single intermittent satellite.

Ultra High Performance NTP

The S600 can effortlessly support hundreds of thousands of network clients while maintaining microsecond caliber NTP timestamp accuracy. NTP request throughput rates exceed 10,000 requests/ second while also maintaining NTP timestamp accuracy. If the Security License option is enabled, the NTP Reflector™ can process over 120,000 NTP requests per second with 15 nanosecond caliber time stamp accuracy with the added benefit of security hardening the network port. This can easily translate into sub-millisecond typical NTP client synchronization accuracy on a LAN.

Peering and Holdover

If the GNSS reference signal is lost entirely, the S600 can automatically revert to retrieving time from other user-designated internal or external network time servers. This technology, known as "peering", prevents disruption of time service to the network and the network administrator is notified immediately of the change in time reference status and stratum change via SNMP.

A popular adjunct to peering is letting the time server operate in holdover (also called “free run” or “flywheel”), where the clock in the time server is allowed to drift if the GNSS signal is lost. The user can specify how far to let the clock drift in terms of estimated time accuracy before reverting to peering. If the optional Rubidium Atomic Clock is installed, the S600 can flywheel for weeks and still be accurate to less than a millisecond.

Time Cross-Checking for Peace-of-Mind Reliability

The S600 can time cross-check GNSS against at least two other time servers. This protects against an improperly operating GNSS receiver that can subtly corrupt the time. It also serves as a form of spoofing protection.

Flexible Control over System Timing Inputs and Outputs

By protocol definition, the S600 serves NTP in the UTC timescale (or optionally the GPS timescale). However, the S600 can display local time rather than UTC time on the front panel.

Serial Time Outputs

The dedicated Data/Timing port is provided to output NMEA-0183 or NENA PSAP strings. If NENA is selected, the serial Console port also supports the two-way timing aspects of the standard. In addition, the F8 and F9 Microsemi legacy time strings are also available.

Oscillator Upgrades Improve Holdover Accuracy and Save Valuable Time

The standard S600 is equipped with a crystal oscillator that keeps the S600 accurate to nanoseconds when tracking GNSS. However, if GNSS connectivity is lost, thereby placing the server in holdover, the oscillator will begin to drift impacting timing accuracy. Upgrading the oscillator improves the holdover accuracy significantly. For example, consider the drift rates below for the standard oscillator compared to the OCXO and Rubidium upgrades:

Oscillator Holdover Drift
(1st 24 hours)

- Standard 400 microseconds
- OCXO 25 microseconds
- Rubidium <1 microsecond

The value of the upgraded oscillator is that if the GNSS signal is lost the S600 can continue to serve very accurate NTP time. This provides the IT staff plenty of time to correct the problem with no degradation or disruption in network time synchronization accuracy.

Specifications

GNSS Receiver/Antenna

- 72 parallel channel GNSS receiver
- GPS time traceable to UTC (USNO)
- Acquisition time: 30 seconds (cold start)
- Cable length: up to 900 ft. (275 m). See Options below.

Time Accuracy

<15 ns RMS to UTC (USNO) at 1PPS output

After 1 day locked to GNSS; evaluated over normal environment (test range <+/-5°F) defined in GR-2830

Oscillator Aging (Monthly)

Standard	+/- $1e^{-7}$
OCXO	+/- $5e^{-9}$
Rb	+/- $1e^{-10}$

After 1 month of continuous operation

Holdover Accuracy

1 day holdover, microseconds

Standard Oscillator	400 µs
OCXO Oscillator	25 µs
Rubidium Oscillator	< 1 µs

Evaluated over normal environment (test range <+/-5°F) defined in GR-2830 after 3 days locked to GNSS

Frequency Ouput Accuracy and Stability

After 1 day locked to GNSS
Frequency output accuracy: $<1x10^{-12}$ @ 1day

Network Protocols

NTP
NTP Unicast, Autokey, MD5
SNTP
SNMP v2c, v3
Custom MIB
DHCP/DHCPv6
TACACS+
LDAPv3
RADIUS
HTTPS/SSL
SMTP Forwarding
SSHv2
IPv4/IPv6
Syslog 1 to 8 servers
Key management protocols can be individually disabled.
PORT 1: Management & Time protocols
PORT 2, 3 and 4: Time protocols only

NTP Server Performance

- 10,000 NTP requests per second while maintaining accuracy associated with reference time source.
- Stratum 1 via GNSS: overall server timestamp accuracy of 5 microseconds to UTC with 1-sigma variation of 15 microseconds (typical). All NTP time stamps are hardware based or have real-time hardware compensation for internal asymmetric delays. The accuracy is inclusive of all NTP packet delays in and out of the server as measured at the network interface. The SyncServer easily supports many hundreds of thousands of NTP clients
- NTP Reflector option: 120,000 NTP client mode 3 requests per second. NTP packets time stamped 100% in hardware with prevailing clock accuracy. All non-NTP packets provided to the CPU on a bandwidth limited basis. The NTP Reflector included as part of the Security Protocol License Option*.

Mechanical/Environmental

- Size: 1.73" x 17.24" x 15.88" (4.4 cm x 43.8 cm x 40.3 cm) 1U rack mount, including BNCs
- Power: 110/220 VAC, 50-60 Hz, 65 watts
  Optional 2nd power supply
- Operating temperature: Non Rb: -20°C to +65°C
  Rb: -5°C to +55°C
- Storage temperature: -40°C to +85°C (IEC 60068-2-1Ab (low temp soak), IEC 60068-2-2Bb (hi-temp soak), IEC 60068-2-14Nb (change of temp) IEC 60068-2-78Cb (humidity storage), IEC 60068-2-30Db (humidity condensation)
- Operational Humidity: <=95%, non-condensing, IEC 60068-2-78Cb, IEC 60068-2-30Db
- Certifications: FCC Part 15, Class A, CISPR 22, Class A, UL/CSA 60950-1, IEC 60950-1, EN 60950-1, PSE, VCCI, RoHS 6/6
- Server weight: 12.5 lbs (5.7 kgs),
- Shipping package: 16.3 lbs (7.4 kgs)

Shock and Vibration:

• Operational:	ETSI EN-300 019-2-3, Mil-Std-810G
• Storage:	IEC 60068-2-6 Fc (sinusoidal vib) Mil-Std-810G, figure 514.6C-3
• Transportation:	
Bounce	IEC 60068-2-27Ea (shock 18 g)
Vibration	IEC 60068-2-64Fh (random vib)
Package drop	IEC 60068-2-31 Ec
• Seismic:	EN300 019-2-3 NEBS GR-63-CORE.

Front Panel

Display: Sharp, high-resolution 160x32 vacuum-fluorescent.
Keypad: 0-9 numeric, up, down, left, right, ENTER, CLR, TIME, STATUS, MENU. Keypad lockout.
LEDs (tri-color green/red/orange)

- Sync: Time reference status
- Network: Network connection status
- Alarm: Fault condition

Rear Panel

Network:	Four RJ-45 100/1000Base-T Ethernet, Speed/Duplex: Auto, 100/1000 full
Serial Data/Timing:	NMEA-0183; ZDA/GGA/GSV/RMC messages; NENA 04-002 messages; DB9-F RS-232, user selectable rate to 115.2 kbps
1PPS-Out:	BNC, Rising edge on-time, TTL into 50 Ω
GNSS:	BNC L1, 1575 MHz
Console:	DB9-F RS-232
Alarm Relay:	SPST ,maximum 300 mA and 32 V
Power:	IEC 60320 C14 connector, optional second power supply/connector, hitless switching.

Options

- Security License Upgrade option for Security-Hardened NTP Reflector*, RADIUS, LDAP, TACACS+, NTP Autokey
- Dual power supplies (with dual connectors)
- Rubidium or OCXO oscillator upgrade for extended holdover
- Antenna kits, cables, lightning arrestors, inline amplifiers, etc. are documented in the SyncServer S600/S650 Options Datasheet
- Domain Time II Comprehensive time client, server and management software for easy distribution, management and monitoring of time across Windows networks.

Product Includes

SyncServer S600, locking power cord, and rack mount ears. Two-year hardware warranty. Current manual and MIB are available online at *www.microsemi.com*.

SyncServer S600: 090-15200-601
SyncServer S600+OCXO: 090-15200-602
SyncServer S600+Rubidium: 090-15200-603

To add more options or Configure-to-Order, contact factory.

** NTP Reflector is part of the Security Protocol License and will appear in version 1.1 due April 2016.*

SyncServer S600 rear panel

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Microsemi Corporation (Nasdaq: MSCC) offers a comprehensive portfolio of semiconductor and system solutions for communications, defense & security, aerospace and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; security technologies and scalable anti-tamper products; Ethernet Solutions; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, Calif., and has approximately 3,600 employees globally. Learn more at www.microsemi.com.

SyncServer S650

Accurate, Secure, and Flexible Time and Frequency Standard

S650 with two optional Timing I/O modules

Key Features

- <15 ns RMS to UTC (USNO)
- <1x10^{-12} Frequency accuracy
- Modular timing architecture with unique and innovative FlexPort™ technology
- Most popular timing signal inputs/outputs are standard in the base Timing I/O module (IRIG B, 10 MHz, 1 PPS, etc.)
- Four GbE ports standard, all with patented NTP hardware timestamping
- Web-based management with high-security cipher suite
- -20°C to +65°C operating temperature, shock & vibration qualified
- IPv6/IPv4 on all ports
- Rubidium Atomic Clock or OCXO oscillator upgrades
- Dual power supply option
- PTP and GLONASS ready, no additional hardware required

Key Benefits

- FlexPort™ timing technology efficiently and cost-effectively adds innovative "any signal, any connector" technology, eliminating the wasted space inherent with legacy style fixed-signal modules/BNCs
- Multiple GbE network ports for easy network configuration and adaptation
- Reliable and rugged design for long product life and wide application scope
- Many security-hardened, network-based features for stringent IA requirements.

Unparalleled Flexibility

The modular Microsemi SyncServer S650 combines the best of time and frequency instrumentation with unique flexibility and powerful network/security-based features.

The base Timing I/O module with 8 BNC connectors comes standard with the most popular Timing I/O signals (IRIG B, 10 MHz, 1 PPS, and so on). When more flexibility is required, the unique Microsemi FlexPort™ Technology option enables 6 of the BNCs to output any supported signal (time codes, sine waves, programmable rates, and so on), all configurable in real time via the secure web interface. This incredibly flexible BNC-by-BNC configuration makes very efficient and cost-effective use of the 1U space available. Similar functionality is applied to the 2 input BNCs as well. Unlike legacy modules with fixed count BNCs outputting fixed signal types per module, with FlexPort™ technology you can have up to 12 BNCs output in any combination of supported signal types.

This level of timing signal flexibility is unprecedented, and can even eliminate the need for additional signal distribution chassis as there is no degradation in the precise quality of the coherent output signals.

Robust Timing and Design

The 72-channel GNSS receiver coupled with Microsemi's patented Active Thermal Compensation Technology provides excellent accuracy of <15 ns RMS to UTC (USNO). Backstop this with a durable hardware design subjected to MIL-STD-810G testing, high-reliability components extending the operating temperature range to a very wide -20°C to +65°C, and a dual power supply option. Further, upgrading to a high performance oscillator, such as a Rubidium atomic clock, keeps the S650 accurate for long periods in the event of a GNSS service disruption.

Secure Networking

Security is an inherent part of the SyncServer S650. In addition to many security features and protocols, unsecure access protocols are deliberately omitted while remaining services can be disabled.

The four standard GbE ports accommodate more than 10,000 NTP requests per second using hardware time stamping and compensation. All network traffic to the S650 CPU is bandwidth-limited for protection against denial-of-service (DoS) attacks. For more secure NTP operations, enable the optional Security-Hardened NTP Reflector™ with line speed, 100% hardware-based NTP packet processing*. The Reflector is also a CPU-protecting firewall, bandwidth limiting non-NTP traffic to the CPU. It is also equipped with DoS detection, notification, and protection against abnormally high network traffic.

Leverage Built-In Hardware

The SyncServer S650 includes additional built-in hardware features that are enabled through software license keys, such as the Security-Hardened NTP Reflector™. Anticipated future software enabled hardware options are GbE PTP operations and GLONASS support.

The SyncServer S650, the future of time and frequency, today.

** NTP Reflector is part of the Security Protocol License and will appear in version 1.1 due April 2016.*

Four GbE Ports for Performance, Flexibility, and Security

The S650 has four dedicated and isolated GbE Ethernet ports, each equipped with NTP hardware time stamping. These are connected to a very high-speed microprocessor with microsecond accurate time stamps to assure high-bandwidth NTP performance. This more than meets the need of servicing 10,000 NTP requests per second.

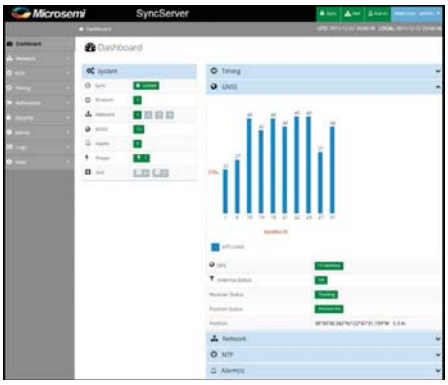
Four GbE ports provide network configuration flexibility and enhanced security. "Multiple" isolated and synchronized time servers can also be configured.

Multiple ports provide the flexibility to adapt to different network topologies as networks grow and change. An S650 can be the single time-source to synchronize clients on different subnets and physical networks. Since each port is independent, it can appear as though there are four clocks available, even though there is only a single time reference.

NTP can be served on all 4 ports. The highly secure web-based management interface is only available on port 1 so that administrators may choose to keep that IP address private and secure. Unique access control lists per port can govern server response to client requests for time.

Intuitive, Secure and Easy to Use Web Interface

The modern web interface is the primary control interface of the S650. Once the keypad and display are used to bring the unit online, complete status and control functions are easily found via the well organized left side-expanding/collapsing navigation menu.



At a glance dashboard presentation combined with logical organization and intuitive controls make configuring the S650 quite easy.

Standard Management Access Security

All of the expected network management protocols are standard in the S650. These include mandatory password access, HTTPS/SSL only (using the high encryption cipher suite), SSH, access control lists, service termination, SNMPv2/v3, and NTP MD5 authentication. All traffic to the S650 CPU is bandwidth-limited for protection against DoS attacks. The local keypad on the server can be password-protected to prevent tampering.

Security-Hardening Option

The SyncServer S650 can be seriously hardened from both an NTP perspective and an authentication perspective through the Security Protocol License Option, which includes the Security-Hardened NTP Reflector.

Operational Hardening—via the 120,000 NTP packet per second NTP Reflector™ with 100% hardware based NTP packet processing also works with a CPU-protecting firewall by bandwidth limiting all non-NTP traffic. The Reflector also monitors packet flow for DoS detection and reporting, yet remains impervious to the level of network traffic as it operates at line speed.

Authentication Hardening—is available for NTP client/server authentication through the NTP Autokey function or user access authentication via TACACS+, RADIUS and LDAP. (See the *SyncServer Options datasheet* for more detail on the Security Protocol License Option).

An entire drop down menu in the S650 is dedicated to security related protocols.

Unprecedented NTP Accuracy

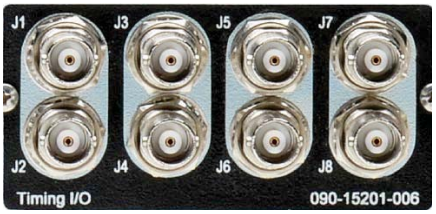
The Stratum 1 level S650 derives nanosecond accurate time directly from the atomic clocks aboard the GNSS satellites. By using an integrated, 72-channel GNSS receiver, every visible satellite can be tracked and used to maintain accurate and reliable time. Even in urban canyon environments where direct satellite visibility can be limited, manually inputting the position can be sufficient to acquire accurate time from as few as one intermittent satellite.

Ultra High Performance NTP

The S650 can effortlessly support hundreds of thousands of network clients while maintaining microsecond caliber NTP timestamp accuracy. NTP request throughput rates exceed 10,000 requests/second while maintaining NTP timestamp accuracy. If the Security License option is enabled, the NTP Reflector™ can process over 120,000 NTP requests per second with 15 nanosecond caliber time stamp accuracy with the added benefit of security hardening the network port. This can easily translate into sub-millisecond typical NTP client synchronization accuracy on a LAN.

More Timing I/O Standard

The Base S650 can host two modules. The Timing I/O module is equipped with 8 BNC connectors for timing signal input and output. The standard configuration offers a broad yet fixed selection of signal I/O including IRIG B, 10 MHz, 1 PPS, and so on.



FlexPort™, the Ultimate in Timing Flexibility

Microsemi's unique FlexPort™ Technology efficiently and cost-effectively adds innovative "any signal, any connector" technology, eliminating the wasted space inherent with legacy style fixed signal modules/BNCs.

The FlexPort™ Technology option enables the 6 output BNCs (J3-J8) to output any supported signal (time codes, sine waves, programmable rates, and so on.) all configurable in real time through the secure web interface. The 2 input BNCs (J1-J2) can support a wide variety of input signal types. (See the *S650 Option datasheet* for full details).

This level of timing signal flexibility is unprecedented and can even eliminate the need for additional signal distribution chassis as there is no degradation in the precise quality of the coherent signals.

Serial Time Outputs

The dedicated Data/Timing port is provided to output NMEA-0183 or NENA PSAP strings. If NENA is selected, the serial Console port also supports the two-way timing aspects of the standard. In addition, the F8 and F9 Microsemi legacy time strings are also available.

Oscillator Upgrades Improve Holdover Accuracy and Save Valuable Time

The standard S650 is equipped with a crystal oscillator that keeps the S650 accurate to nanoseconds when tracking GNSS. However, if GNSS connectivity is lost, thereby placing the server in holdover, the oscillator will begin to drift impacting timing accuracy. Upgrading the oscillator improves the holdover accuracy significantly. For example, consider the drift rates below for the standard oscillator compared to the OCXO and Rubidium upgrades:

Oscillator Holdover Drift
(1st 24 hours)

- Standard 400 microseconds
- OCXO 25 microseconds
- Rubidium <1 microsecond

The value of the upgraded oscillator is that if the GNSS signal is lost the S650 can continue to provide very accurate time and frequency. This provides personnel time to correct the problem with only gradual degradation or disruption in time synchronization accuracy.

Specifications

GNSS Receiver/Antenna

- 72 parallel channel GNSS receiver
- GPS time traceable to UTC (USNO)
- Acquisition time: 30 seconds (cold start)
- Cable length: up to 900 ft. (275 m). See Options below.

Time Accuracy

< 15 ns RMS to UTC (USNO) at 1PPS output

After 1 day locked to GNSS; evaluated over normal environment (test range <+/- 5°F) defined in GR-2830

Oscillator Aging (Monthly)

Standard	+/- $1e^{-7}$
OCXO	+/- $5e^{-9}$
Rb	+/- $1e^{-10}$

After 1 month of continuous operation

Holdover Accuracy

1 day holdover, microseconds

Standard Oscillator	400 µs
OCXO Oscillator	25 µs
Rubidium Oscillator	< 1 µs

Evaluated over normal environment (test range <+/- 5°F) defined in GR-2830 after 3 days locked to GNSS

Frequency Ouput Accuracy and Stability

After 1 day locked to GNSS
Frequency output accuracy: < $1x10^{-12}$ @ 1day

Network Protocols

NTP
NTP Unicast, Autokey, MD5
SNTP
SNMP v2c, v3
Custom MIB
DHCP/DHCPv6
TACACS+
LDAPv3
RADIUS
HTTPS/SSL
SMTP Forwarding
SSHv2
IPv4/IPv6
Syslog 1 to 8 servers
Key management protocols can be individually disabled.
PORT 1: Management & Time protocols
PORT 2, 3, and 4: Time protocols only

NTP Server Performance

- 10,000 NTP requests per second while maintaining accuracy associated with reference time source.
- Stratum 1 via GNSS: overall server timestamp accuracy of 5 microseconds to UTC with 1-sigma variation of 15 microseconds (typical). All NTP time stamps are hardware based or have real-time hardware compensation for internal asymmetric delays. The accuracy is inclusive of all NTP packet delays in and out of the server as measured at the network interface. The SyncServer easily supports many hundreds of thousands of NTP clients
- NTP Reflector option: 120,000 NTP client mode 3 requests per second. NTP packets time stamped 100% in hardware with prevailing clock accuracy. All non-NTP packets provided to the CPU on a bandwidth limited basis. The NTP Reflector included as part of the Security Protocol License Option*.

Mechanical/Environmental

- Size: 1.73" x 17.24" x 15.88" (4.4 cm x 43.8 cm x 40.3 cm) 1U rack mount , including BNCs
- Power: 110/220 VAC, 50-60 Hz, 65 watts
  Optional 2nd power supply
- Operating temperature: Non Rb: -20°C to +65°C
  Rb: -5°C to +55°C
- Storage temperature: -40°C to +85°C (IEC 60068-2-1Ab (low temp soak), IEC 60068-2-2Bb (hi-temp soak), IEC 60068-2-14Nb (change of temp) IEC 60068-2-78Cb (humidity storage), IEC 60068-2-30Db (humidity condensation)
- Operational Humidity: <= 95%, non-condensing, IEC 60068-2-78Cb, IEC 60068-2-30Db
- Certifications: FCC Part 15, Class A, CISPR 22, Class A, UL/CSA 60950-1, IEC 60950-1, EN 60950-1, PSE, VCCI, RoHS 6/6
- Server weight: 12.5 lbs (5.7 kgs),
- Shipping package: 16.3 lbs (7.4 kgs)

Shock and Vibration:

- Operational: ETSI EN-300 019-2-3, Mil-STD-810G
- Storage: IEC 60068-2-6 Fc (sinusoidal vib)
  Mil-Std-810G, figure 514.6C-3
- Transportation:
  - Bounce: IEC 60068-2-27Ea (shock 18g)
  - Vibration: IEC 60068-2-64Fh (random vib)
  - Package drop: IEC 60068-2-31 Ec
- Seismic: EN300 019-2-3
  NEBS GR-63-CORE.

Front Panel

Display: Sharp, high-resolution 160x32 vacuum-fluorescent.
Keypad: 0-9 numeric, up, down, left, right, ENTER, CLR, TIME, STATUS, MENU. Keypad lockout.
LEDs (tri-color green/red/orange)

- Sync: Time reference status
- Network: Network connection status
- Alarm: Fault condition

Rear Panel

Network:	Four RJ-45 100/1000Base-T Ethernet, Speed/Duplex: Auto, 100/1000 full
Serial Data/Timing:	NMEA-0183; ZDA/GGA/GSV/RMC messages; NENA 04-002 messages; DB9-F RS-232, user selectable rate to 115.2 kbps
1PPS-Out:	BNC, Rising edge on-time, TTL into 50 Ω
GNSS:	BNC L1, 1575 MHz
Console:	DB9-F RS-232
Alarm Relay:	SPST ,maximum 300 mA and 32 V
Power:	IEC 60320 C14 connector, optional second power supply/connector, hitless switching.

Timing Input/Output Module (090-15201-0006)

	Input BNCs		Output BNCs					
Configuration	J1	J2	J3	J4	J5	J6	J7	J8
Standard	IRIG B AM 124 or 1PPS	10 MHz	IRIG B AM 124	10 MHz	IRIG B B004 DCLS	1PPS	off	off
FlexPort Option	IRIG B124 IRIG B004 IRIG B120 IRIG B000 IEEE-1344 1PPS 10MPPS	1 MHz 5 MHz 10 MHz	FlexPort J3-J8 Software Selectable Outputs per BNC (Configured via the web interface): a) Pulse: i) Fixed Rate: 10/5/1MPPS, 100/10/1/kPPS, 100/10/1/0.5PPS ii) Programmable Period: 100 ns to 2 sec, step size of 10 ns b) Timecode: IRIG B 000/004/1344 DCLS, 120/124/1344 AM c) Sine: 1/5/10 MHz					

Signal Levels	
IRIG-In	AM: Ratio 2:1 to 3.5:1 Amp: 1 V to 8 V p-p, into 50 DCLS: <1.5 V for logic 0, >2 V for logic 1
IRIG-Out	AM: Ratio 10:3, Amp: 3.5 ± 0.5 Vpp, Zout 50 Ω DCLS: <0.8 V for logic 0, >2.4 V for logic 1, Zout 50 Ω for logic 0, >2.4 V for logic 1, Zout 50 Ω
1PPS-In	Rising edge active, TTL into 50 Ω
Rate/Pulse/1PPS-Out	Rising edge on-time, TTL into 50 Ω
1,5,10 MHz-In	Sine wave, 1 Vpp to 8 Vpp, into 50 Ω
1/5/10 MHz-Out	Sine wave 2.6 Vpp into 50 Ω
10 MPPS In	< 1 V for logic 0, > 2 V for logic 1, into 50 Ω

Output Stability (10 MHz)

(Measured on any 10MHz output) module

Oscillator	1S	10S	100S	1kS	10kS
Standard	$<1e^{-9}$	$<2e^{-10}$	$<1e^{-10}$	$<1e^{-11}$	$<1e^{-12}$
OCXO	$<1e^{-9}$	$<5e^{-11}$	$<5e^{-11}$	$<7e^{-12}$	$<7e^{-13}$
Rubidium	$<2e^{-10}$	$<3e^{-11}$	$<3e^{-11}$	$<5e^{-12}$	$<5e^{-13}$

Options

- Timing Input/Output Module
- FlexPort Option to enable software selectable signals on Timing I/O module BNCs
- Security License Upgrade option for Security-Hardened NTP Reflector*, RADIUS, LDAP, TACACS+, NTP Autokey
- Dual power supplies (with dual connectors)
- Rubidium or OCXO oscillator upgrade for extended holdover
- Antenna kits, cables, lightning arrestors, inline amplifiers, etc. are documented in the SyncServer S600/S650 Options Datasheet
- Domain Time II Comprehensive time client, server & management software for easy distribution, management and monitoring of time across Windows networks.

SyncServer S650 shown with two optional Timing I/O Modules

** NTP Reflector is part of the Security Protocol License and will appear in version 1.1 due April 2016.*

Product Includes

SyncServer S650 (no option modules installed in base unit), locking power cord, and rack mount ears. Two-year hardware warranty. Current manual and MIB are available online at *www.microsemi.com.*

SyncServer S650 (base)+Timing I/O Module: 090-15200-651
SyncServer S650 (base) +Timing I/O Module+Rubidium: 090-15200-652

To add more options or Configure-to-Order, contact factory.

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