

# SecureSync®

## Time and Frequency Synchronization Platform



- **GPS synchronization**
- **Multi-GNSS option (Galileo, GLONASS, BeiDou, QZSS)**
- **SAASM option**
- **STL option**
- **Internal precision time-keeping via TCXO, OCXO or Rb oscillator**
- **Multiple, prioritized input references**
- **A wide variety of input/output signals supported**
- **Industry-leading low phase noise capability**
- **Modular (configure-to-order) ruggedized shock and vibration tested chassis**
- **Exceptional operating temperature range of -20°C to +65°C**
- **High bandwidth NTP performance**
- **Ethernet 10/100 Base-T**
- **Secure network management: enable or disable protocols for encryption, authentication, authorization and accounting**
- **IPv4/IPv6 dual stack**
- **Alert notifications via SNMP Traps and e-mail alert**
- **5-year limited warranty**

SecureSync® combines Spectracom’s precision master clock technology and secure network-centric approach with a compact modular hardware design to bring you a powerful time & frequency reference system at the lowest cost of ownership. Military and commercial applications alike will benefit from its extreme reliability, security, and flexibility for synchronizing critical operations.

An important advantage of SecureSync is its unique rugged chassis designed to meet Mil 810F for environmental performance. The modular design provides for the most cost effective solution. Built-in time and frequency functions are extended with up to 6 input/output modules. Included with the base unit is an extremely accurate 1PPS timing signal aligned to a 10MHz frequency signal without any 10 MHz phase discontinuity. A variety of internal oscillators are available depending on your requirement for holdover and phase noise. On-board clocks synchronize to a variety of external references as standard, factory-installed, or upgradeable options. Add STL to GPS or GNSS input references to improve resilience, or use STL alone for indoor applications. Choose from a variety of option cards to add to your configuration of timing signals, including additional 1PPS, 10MHz, time code (IRIG, ASCII, HaveQuick), other frequencies (5MHz, 2.048 MHz, 1.544 MHz), telecom T1/E1 data rates, multi-network NTP, and PTP. Modules can be customized for your exact requirements.

To support network time synchronization, SecureSync supports the latest features of network time protocol (NTP) and precision time protocol (PTP, IEEE-1588v2). An optional multi-port NTP configuration allows for operation across 4 isolated LAN segments. Up to 6 PTP ports can be added to operate in various PTP deployments.

SecureSync is a security-hardened network appliance designed to meet rigorous network security standards and best practices. It ensures accurate timing through multiple references, tamper-proof management, and extensive logging. Robust network protocols are used to allow for easy but secure configuration. Features can be enabled or disabled based on your network policies. Installation is aided by DHCP (IPv4), AUTOCONF (IPv6), and a front-panel keypad and display. The 1RU chassis supports GPS input. Options include SAASM, supporting L1/L2, available for authorized users and required for the US DoD, and multi-GNSS (GPS/Galileo/GLONASS/BeiDou/QZSS). The unit is powered by AC on an IEC60320 connector. DC as back-up, or primary, is available.



Base units include 10 MHz and 1PPS output signals, network port, and choice of power, GPS reference, and internal oscillator options.

## Specifications

### System Performance

See option card descriptions for additional performance specifications.

#### 10 MHz Frequency Output:

	TCXO	OCXO	Low Phase Noise OCXO	Rubidium	Low Phase Noise Rubidium
<b>Accuracy</b> (average over 24 hours when GPS locked)	$1 \times 10^{-11}$	$2 \times 10^{-12}$	$1 \times 10^{-12}$	$1 \times 10^{-12}$	$1 \times 10^{-12}$
<b>Medium Term Stability</b> (without GPS after 2 weeks of GPS lock)	$1 \times 10^{-8}$ /day	$5 \times 10^{-10}$ /day	$2 \times 10^{-10}$ /day	$5 \times 10^{-11}$ /month ( $3 \times 10^{-11}$ /month typical)	$5 \times 10^{-11}$ /month ( $3 \times 10^{-11}$ /month typical)
<b>Short Term Stability (Allan Deviation)</b>					
1 sec	$2 \times 10^{-9}$	$5 \times 10^{-10}$	$5 \times 10^{-11}$	$2 \times 10^{-11}$	$5 \times 10^{-11}$
10 sec	$1 \times 10^{-9}$	$5 \times 10^{-11}$	$2 \times 10^{-11}$	$2 \times 10^{-12}$	$2 \times 10^{-11}$
100 sec	$3 \times 10^{-10}$	$1 \times 10^{-11}$	$1 \times 10^{-11}$	$2 \times 10^{-12}$	$5 \times 10^{-12}$
<b>Temperature Stability</b> (peak-to-peak)	$1 \times 10^{-6}$	$5 \times 10^{-9}$	$1 \times 10^{-9}$	$1 \times 10^{-10}$	$1 \times 10^{-10}$
<b>Phase Noise (dBc/Hz)</b>					
@1 Hz	—	-95	-100	-80	-100
@10 Hz	—	-123	-128	-98	-128
@100 Hz	-110	-140	-148	-120	-148
@1 kHz	-135	-145	-153	-140	-153
@10 kHz	-140	-150	-155	-140	-155
<b>Signal Waveform &amp; Levels:</b> +13 dBm into 50 ohm, BNC					

#### 1 PPS Output:

	TCXO	OCXO	Low Phase Noise OCXO	Rubidium	Low Phase Noise Rubidium
<b>Accuracy to UTC</b> (1-sigma locked to GPS)	$\pm 50$ ns	$\pm 50$ ns	$\pm 25$ ns	$\pm 25$ ns	$\pm 25$ ns
<b>Holdover</b> (constant temp after 2 weeks of GPS lock)					
After 4 hours	12 $\mu$ s	1 $\mu$ s	0.5 $\mu$ s	0.2 $\mu$ s	0.2 $\mu$ s
After 24 hours	450 $\mu$ s	25 $\mu$ s	10 $\mu$ s	1 $\mu$ s	1 $\mu$ s
<b>Signal Waveforms and Levels:</b> TTL (5 V <sub>pp</sub> ), into 50 ohm, BNC					

### Network Services

#### Timing

- NTP v2, v3, v4: Conforms with or exceeds RFC 1305 and 5905. Supports Unicast, Broadcast, Multicast, MD5 encryption, Peering, Stratum 2, Autokey
- SNTP v3, v4: Conforms with or exceeds RFC 1769, 2030, 4330, and 5905
- Time (RFC 868)
- Daytime (RFC 867)
- IEEE-1588v2 (PTP) via option card(s)
- NTP over Anycast

#### Management

- IPv4/IPv6: Dual stack
- DHCPv4/DHCPv6 (AUTOCONF)/SLAAC: Automatic IP address assignment
- Authentication: LDAP, RADIUS, TACACS+
- Syslog: Logging
- SNMP: Supports v1, v2c, and v3 (no auth/auth/priv) with Enterprise MIB

#### Communications

- HTTP: Browser-based configuration and monitoring
- Telnet: Remote configuration
- FTP Server: Access to files (logs, etc.)
- SMTP: Email

#### Security Features

- Enable/Block Protocols
- Set SNMP community names and network access
- Password Protected
- Standard encryption/authentication protocols
- SSL Web-based Interface: SSL is used to secure HTTPS protocol to access configuration and status web pages
- SSH: SSL and data compression technologies provide a secure and efficient means to control, communicate with, and transfer data to or from the time server remotely
- SCP: securely transfers files to and from the time server over an SSH session
- SFTP: FTP replacement operates over an encrypted SSH transport
- SNMP v3: remotely configure and manage over an encrypted connection
- Alert notifications via SNMP Traps and e-mail

### GNSS Receivers

- Connector: Type N, +5V to power active antenna
- Frequency: GPS L1 (1575.42 MHz); optional SAASM: GPS L1 & L2 (1227.6MHz); optional Multi-GNSS: Galileo E1 (1575.42MHz), GLONASS L1 (1602.0 MHz), BeiDou B1 (1561.1 MHz), QZSS L1 (1575.42 MHz)
- Satellite tracking: 1 to 72, T-RAIM satellite error management
- Synchronization time: cold start < 15 minutes (includes almanac download), warm start < 5 minutes (assumes almanac downloaded)
- Antenna system: sold separately, included with SAASM GPS



Add the features you need through options modules, up to 6 option modules per unit.

**Oscillator**

- Standard Oscillator: OCXO
- Optional Oscillators: TCXO, Low Phase Noise OCXO (LPN OCXO), Rubidium (Rb), Low Phase Noise Rubidium (LPN Rb)

**Communications**

**Network Port**

- RJ-45, 10/100-baseT

**Serial Set-up Interface**

- RS-232 communications on DB-9 connector

**Front Panel**

- LED segments displays time
- Lockable keypad and configurable LCD display for network set-up
- Power/Status LEDs

**Power**

**Choice of**

- 100-240 V<sub>AC</sub>, 50/60 Hz, ±10% or 100-120 V<sub>AC</sub>, 400 Hz, ±10% from IEC60320 connector; power cord included
- 12-17 V<sub>DC</sub>, -15% to +20% or 21-60 V<sub>DC</sub>, -15% to +20%, secure locking device
- Auto-failover in the case of AC and DC

**Power Draw**

- TCXO: 40 W normal (50 W start-up)
- OCXO: 40 W normal (50 W start-up)
- Rb: 50 W normal (80 W start-up)
- LPN Rb: 52 W normal (85 W start-up)

**Environmental**

	Operating	Storage	MIL-STD-810F
<b>Temperature</b>	-20 to +65°C (+55°C for Rb)	-40 to +85°C	
<b>Humidity</b>	0%-95% RH non-condensing @ 40°C		
<b>Altitude</b>	100-240 V <sub>AC</sub> up to 6,560 ft (2,000 m), 100-120 V <sub>AC</sub> up to 13,123 ft (4,000 m) 12-17 V <sub>DC</sub> and 21-60 V <sub>DC</sub> up to 13,123 ft (4,000 m)	45,000 ft (13,700 m)	
<b>Shock</b>	15g, 11ms half sine wave	50g, 11ms half sine wave <sup>1</sup>	516.5
<b>Vibration</b>	10-55Hz/0.07g <sup>2</sup> /Hz 55-500Hz/1.0g <sup>2</sup> /Hz	10-55Hz/0.15g <sup>2</sup> /Hz 55-500Hz/2.0g <sup>2</sup> /Hz	514.5

<sup>1</sup>SAASM GPS Storage Shock Specs: MRU 35g, GB-GRAM 40g

**Agency Approvals**

CE, UL, cUL, CSA, FCC part 15 class A, ROHS, WEEE

**Physical & Environmental**

**Size/Weight**

- Designed for EIA 19" rack. 16.75" W x 1.72" H (1U) x 14.33" D actual (425 mm W x 44 mm H x 364 mm D actual)
- Weight: 6.5 lbs. (2.95 kg) with Rubidium option; 6.0 lbs. (2.72 kg) without
- Rack mount hardware included (assembly required)

**Warranty**

**Five Year Limited Warranty<sup>1</sup>**

- Oscillator for rubidium option is warranted for two years
- Extended warranty is available

<sup>1</sup>The warranty period may be dependent on country.

**Ordering Information**

**Base Units**

**1200-XYZ**

Select power, internal oscillator and GPS reference options:

X=Power	Y=Internal Oscillator	Z=Primary Reference
0=AC	0=TCXO	1=No GNSS
1=AC/DC (12V <sub>DC</sub> )	1=OCXO	3=GPS/Multi-GNSS <sup>2</sup>
2=AC/DC (24/48V <sub>DC</sub> )	2=Low phase noise OCXO	5=SAASM GPS (MRU) <sup>1</sup>
3=DC (12V <sub>DC</sub> )	3=Rubidium	7=SAASM GPS (GB-GRAM) <sup>1</sup>
4=DC (24/48V <sub>DC</sub> )	5=Low phase noise Rb	

**Example**

A SecureSync base unit with AC power, OCXO internal oscillator, and GPS as the primary reference is Model Number 1200-013. It comes with a 10/100 Base-T network port and 1 each 1PPS and 10MHz output signals. Order option modules for additional input/output functions.

<sup>1</sup>SAASM GPS option occupies 2 option modules. Only 4 additional option modules may be purchased.  
<sup>2</sup>Operation with multi-GNSS requires SS-OPT-GNS upgrade.

**Optional Upgrade**

SS-OPT-GNS: Adds Galileo E1, GLONASS L1, BeiDou B1, QZSS L1 (Not available with SAASM GPS)

SS-OPT-SKY: Adds Skylight™ Indoor GPS Timing System

**Option Modules**

Up to 6 option modules can be accommodated per unit.

STL is an option also available via option card.

See Option Module Card datasheet for details.