spectracom

SecureSync®
Time and Frequency Synchronization System

- **Multi-GNSS available (GPS/GLONASS)**

- **SAASM available in GB-GRAM and MRU receivers**

- **Internal precision time-keeping via TCXO, OCXO or Rb oscillator**

- **Multiple, prioritized input references**

- **A wide variety of input/output signals supported**

- **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 10 MHz 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. 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 (5 MHz, 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 1 RU chassis supports GPS input (SAASM, supporting L1/L2, available for authorized users and required for the US DoD). Multi-GNSS (GPS/GLONASS) input is available as an option. 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
Accuracy (average over 24 hours when GPS locked)	1×10^{-11}	2×10^{-12}	1×10^{-12}	1×10^{-12}	1×10^{-12}
Medium Term Stability (without GPS after 2 weeks of GPS lock)	1×10^{-8}/ day	5×10^{-10}/ day	2×10^{-10}/ day	5×10^{-11}/ month $(3\times10^{-11}$/ month typical)	5×10^{-11}/ month $(3\times10^{-11}$/ month typical)
Short Term Stability (Allan variance)					
1 SEC	2×10^{-9}	5×10^{-10}	5×10^{-11}	2×10^{-11}	5×10^{-10}
10 SEC	1×10^{-9}	5×10^{-11}	2×10^{-11}	2×10^{-12}	2×10^{-11}
100 SEC	3×10^{-10}	1×10^{-11}	1×10^{-11}	2×10^{-12}	5×10^{-12}
Temperature Stability (peak-to-peak)	1×10^{-6}	5×10^{-9}	1×10^{-9}	1×10^{-10}	1×10^{-10}
Phase Noise (dBc/Hz)					
@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
Signal Waveform & Levels: +13 dBm into 50 ohm, BNC					

1 PPS Output:

	TCXO	OCXO	Low Phase Noise OCXO	Rubidium	Low Phase Noise Rubidium
Accuracy to UTC (1-sigma locked to GPS)	±50 ns	±50 ns	±25 ns	±25 ns	±25 ns
Holdover (constant temp after 2 weeks of GPS lock)					
After 4 hours	12 μs	1 μs	0.5 μs	0.2 μs	0.2 μs
After 24 hours	450 μs	25 μs	10 μs	1 μs	1 μs
Signal Waveforms and Levels: TTL (5v p-p), into 50 ohm, BNC					

Network Management

Network Protocols

- IEEE-1588v2 (PTP) via option card(s)
- 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
- IPSec: IPv4/IPv6 Transport Mode
- IPv4/IPv6: Dual stack
- DHCP/DHCP6 (AUTOCONF): Automatic IP address assignment
- HTTP: Browser-based configuration and monitoring
- LDAP: Authentication
- RADIUS: Authentication
- Telnet: Remote configuration
- FTP Server: Access to logs
- Syslog: Logging
- SNMP: Supports v1, v2, v2c, and v3 (no auth/auth/priv) with Enterprise MIB
- Time (RFC868)
- Daytime (RFC867)

Security Features

- Enable/Block Protocols
- Set SNMP Community Names and Network Access
- Password Protected
- Encryption DES, 3DES, AES
- Authentication SHA1, MD5
- 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: v1,v2, v3
- SNMP: remotely configure and manage over an encrypted connection.
- Alert notifications via SNMP Traps and e-mail

GNSS Receivers

- Frequency: GPS L1 (1575.42 MHz), optional: GPS L1 & L2 (1227.6 MHz) (SAASM GPS), GLONASS L1 (1602.0 MHz)
- Satellite tracking: 1 to 32, 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

Oscillator

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

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

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

Power Draw
- TCXO: 40W normal (40W start-up)
- OCXO: 40W normal (50W start-up)
- Rb: 50W normal (80W start-up)

Environmental

	Operating	Storage	MIL-STD-810F
Temperature	-20 to +65°C (+55°C for Rb)	-40 to +85°C	501.4, 502.4
Humidity	0%-95% RH non-condensing @ 40°C		507.4
Altitude	100-240 VAC to 6,560 ft (2,000 M), 100-120 VAC to 13,123 ft (4,000 M) 12-17 VDC and 21-60 VDC to 13,123 ft (4,000 M)	45,000 ft (13,700 M)	500.4
Shock	15g/0.53oz,11ms half sine wave	50g/1.76oz, 11ms half sine wave[1]	516.5
Vibration	10-55Hz/0.07g, 55-500Hz/1.0g	10-55Hz/0.15g, 55-500Hz/2.0g	514.5

[1]SAASM GPS Storage Shock Specs: MRU 35g/1.23oz, GB-GRAM 40g/1.41oz

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 14.0" D actual (425 mm W x 44 mm H x 356 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[1]
- Oscillator for rubidium option is warranted for two years
- Extended warranty is available

[1]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 (12 vdc)	1=OCXO	3=GPS/GLONASS[2]
2=AC/DC (24/48 vdc)	2=Low phase noise OCXO	5=SAASM GPS (MRU)[1]
3=DC (12 vdc)	3=Rubidium	7=SAASM GPS (GB-GRAM)[1]
4=DC (24/48 vdc)	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 10 MHz output signals. Order option modules for additional input/output functions.

[1]SAASM GPS option occupies 2 option modules. Only 4 additional option modules may be purchased.
[2]Operation with GLONASS requires SS OPT-GNS upgrade.

Optional Upgrade
SS OPT-GNS: Adds GLONASS L1 1602 MHz support (Not available with SAASM GPS)
SS OPT-SKY: Adds Skylight™ Indoor GPS Timing System

Option Modules
Up to 6 option modules can be accomodated per unit. See Option Module Card datasheet for details.