

# SecureSync®

## Time and Frequency Synchronization System



Shown with secure GPS (SAASM) option.

- **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 (GigE option)**
- **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. For security, system management can be restricted to a dedicated management LAN. 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). 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
<b>Accuracy</b> (average over 24 hours when GPS locked)	1x10 <sup>-4</sup>	2x10 <sup>-12</sup>	1x10 <sup>-12</sup>	1x10 <sup>-12</sup>
<b>Medium Term Stability</b> (without GPS after 2 weeks of GPS lock)	1x10 <sup>-8</sup> /day	5x10 <sup>-10</sup> /day	2x10 <sup>-10</sup> /day	5x10 <sup>-11</sup> /month (3x10 <sup>-11</sup> /month typical)
<b>Short Term Stability (Allan variance)</b>				
1 SEC	—	5x10 <sup>-12</sup>	5x10 <sup>-12</sup>	1x10 <sup>-11</sup>
10 SEC	—	1x10 <sup>-11</sup>	1x10 <sup>-11</sup>	3x10 <sup>-12</sup>
100 SEC	—	6x10 <sup>-11</sup>	6x10 <sup>-11</sup>	1x10 <sup>-12</sup>
<b>Temperature Stability</b> (peak-to-peak)	1x10 <sup>-6</sup>	5x10 <sup>-9</sup>	1x10 <sup>-9</sup>	1x10 <sup>-10</sup>
<b>Phase Noise</b> (dBc/Hz)				
@1 Hz	—	-90	-95	-75
@10 Hz	—	-120	-125	-95
@100 Hz	-110	-140	-148	-120
@1 KHz	-135	-145	-153	-140
@10 KHz	-140	-150	-155	-140
<b>Signal Waveform &amp; Levels:</b> +13 dBm into 50 ohm, BNC				

#### 1 PPS Output:

	TCXO	OCXO	Low Phase Noise OCXO	Rubidium
<b>Accuracy to UTC</b> (1-sigma locked to GPS)	±50 ns	±50 ns	±25 ns	±25 ns
<b>Holdover</b> (constant temp after 2 weeks of GPS lock)				
After 4 hours	12 µs	1 µs	0.5 µs	0.2 µs
After 24 hours	450 µs	25 µs	10 µs	1 µs
<b>Signal Waveforms and Levels:</b> 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

### GPS Receivers

- Frequency: L1 (1575.42 MHz), optional: L1 & L2 (1227.6 MHz) (SAASM GPS)
- Satellite tracking: 1 to 12, GPS 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

**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 24-48 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
<b>Temperature</b>	-20 to +65°C (+55°C for Rb)	-40 to +85°C	501.4, 502.4
<b>Humidity</b>	0%-95% RH non-condensing @ 40°C		507.4
<b>Altitude</b>	100-240 VAC to 6,560 ft (2,000 M), 100-120 VAC to 13,123 ft (4,000 M)	45,000 ft (13,700 M)	500.4
<b>Shock</b>	15g/0.53oz, 11ms half sine wave	50g/1.76oz, 11ms half sine wave <sup>1</sup>	516.5
<b>Vibration</b>	10-55Hz/0.07g, 55-500Hz/1.0g	10-55Hz/0.15g, 55-500Hz/2.0g	514.5

<sup>1</sup>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**

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

## Ordering Information

### Base Units

#### 1200-XYZ

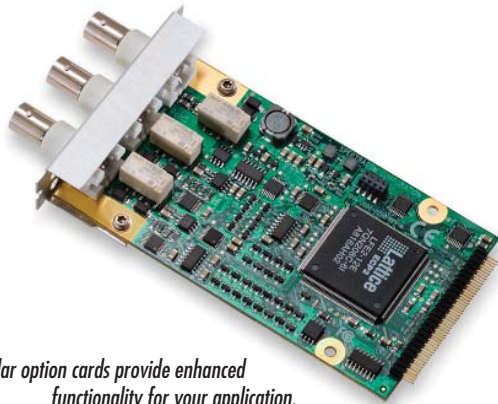
Select power, internal oscillator and GPS reference options:

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

#### 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.

<sup>1</sup>SAASM GPS option occupies 2 option modules. Only 4 additional option modules may be purchased.



Modular option cards provide enhanced functionality for your application.

## Option Modules

Up to 6 option modules can be accommodated per unit.

Model No.	Desc	Sig Type	Inputs	Outputs
1204-01	1PPS in/out/ freq in	TTL (1PPS), Sine (freq)	1PPS & freq	1PPS
1204-03	1PPS in/out/ freq in	RS-485	1PPS & freq	1PPS
1204-18	1PPS out	TTL	0	4
1204-19	1PPS out	10v	0	4
1204-21	1PPS out	RS-485	0	4
1204-28	1PPS in/out	TTL	1	3
1204-26	1MHz	Sine	0	3
1204-08	5MHz	Sine	0	3
1204-1C	10MHz	Sine	0	3
1204-09	E1 (75 ohm)	per ITU-T G703	0	3
1204-0A	T1 (100 ohm) or E1 (120 ohm)	per GR-499- CORE (10.3)/ ITU-T G703	0	3
1204-05	IRIG in/out	AM or DCLS	1	2
1204-15	IRIG out	AM or DCLS	0	4
1204-02	ASCII Time Code	RS-232	1	1
1204-04	ASCII Time Code	RS-485	1	1
1204-12	Precision Time Protocol (PTP)	10/100 baseT		1
1204-10	HaveQuick	TTL	0	4
1204-1B	HaveQuick	RS-485	0	4
1204-29	HaveQuick in/out	TTL	1	3
1204-06	Multi-port Ethernet (GigE)	10/100/1000 baseT		3
1204-17	Prog. TTL out	TTL	0	4
1204-0F	Alarms	Relay	0	3
1204-23	Event Input w/ Broadcast	TTL (event) RS-232 (time stamp)	1	1
1204-1D	STANAG Input	per STANAG 4246, 4372, 4430, and ICD-GPS-060	1 PPS 1 ToD	0
1204-24	STANAG Isolated Input	per STANAG 4246, 4372, 4430, and ICD-GPS-060	1 PPS 1 ToD	0
1204-11	STANAG Output	per STANAG 4246, 4372, 4430, and ICD-GPS-060	0	1 PPS 2 ToD 1.5 MHz
1204-25	STANAG Isolated Output	per STANAG 4246, 4372, 4430, and ICD-GPS-060	0	1 PPS 2ToD