



# SecureSync™

## Time and Frequency Synchronization System



*Shown with secure GPS (SAASM) option.*

- **Internal precision time-keeping via OCXO or Rb oscillator**
- **Multiple, Prioritized Input References**
- **Supported Input/Output Signals (type and quantity dependent on signal and configuration)**
  - **GPS, Secure GPS (L1/L2, SAASM)**
  - **1PPS**
  - **Frequency (10 MHz, 5 MHz)**
  - **IRIG**
  - **HaveQuick/STANAG 4430**
  - **NTP servers/PTP masters**
  - **Serial Time Codes**
  - **E1/T1**
- **Modular (configure-to-order) ruggedized shock and vibration-tested chassis**
- **Exceptional Operating Temperature Range of -20 C to +70 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**
- **5-Year Limited Warranty**

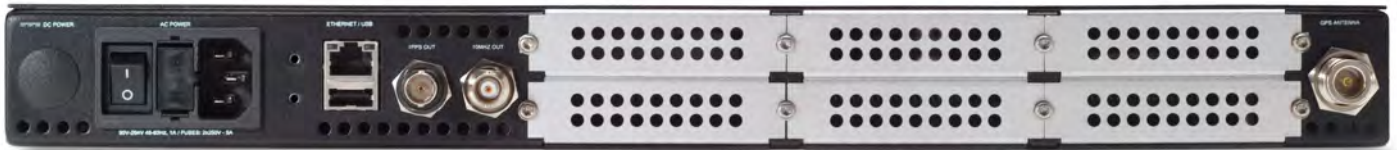
SecureSync™ combines Spectracom's precision master clock technology and secure network-centric approach with a compact modular hardware design to bring you a powerful time & frequency reference system at the lowest cost of ownership. Military and commercial applications alike will benefit from its extreme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

An important advantage of SecureSync is its unique rugged and flexible modular chassis that can be configured for your specific needs. 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 phase discontinuity. A variety of internal oscillators (typically locked to GPS) are available depending on your requirement for holdover and phase noise. Choose from a variety of configurable option cards each with a variety of input/output timing signal types and quantity, 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-1588). 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.

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:

	OCXO	Low Phase Noise OCXO	Rubidium
<b>Accuracy</b> (average over 24 hours when GPS locked)	$2 \times 10^{-12}$	$1 \times 10^{-12}$	$1 \times 10^{-12}$
<b>Medium Term Stability</b> (without GPS after 2 weeks of GPS lock)	$1 \times 10^9$ /day	$2 \times 10^{10}$ /day	$1 \times 10^{11}$ /day $5 \times 10^{11}$ /month
<b>Short Term Stability</b> (Allan variance)			
1 SEC	$1 \times 10^{-10}$	$1 \times 10^{-10}$	$3 \times 10^{-11}$
10 SEC	$3 \times 10^{-10}$	$3 \times 10^{-11}$	$1 \times 10^{-11}$
100 SEC	$3 \times 10^{-10}$	$3 \times 10^{-10}$	$3 \times 10^{-12}$
<b>Temperature Stability</b> (peak-to-peak)	$1 \times 10^8$	$1 \times 10^9$	$1 \times 10^{10}$
<b>Phase Noise</b>			
@1 Hz	-90 dBc/Hz	-95 dBc/Hz	-75 dBc/Hz
@10 Hz	-120 dBc/Hz	-125 dBc/Hz	-95 dBc/Hz
@100 Hz	-140 dBc/Hz	-148 dBc/Hz	-120 dBc/Hz
@1 KHz	-145 dBc/Hz	-153 dBc/Hz	-140 dBc/Hz
@10 KHz	-150 dBc/Hz	-155 dBc/Hz	-140 dBc/Hz

**Signal Waveform and Levels** +13 dBm into 50 ohm, BNC

#### 1PPS Output:

	OCXO	Low Phase Noise OCXO	Rubidium
<b>Accuracy to UTC</b> (1-sigma locked to GPS)	+/- 50 ns	+/- 25 ns	+/- 25 ns
<b>Holdover</b> (constant temp after 2 weeks of GPS lock)			
After 4 hours	3 $\mu$ s	0.8 $\mu$ s	0.3 $\mu$ s
After 24 hours	60 $\mu$ s	12 $\mu$ s	2 $\mu$ s

**Signal Waveforms and Levels** TTL (5v p-p), into 50 ohm, BNC

## NETWORK MANAGEMENT

### Network Protocols:

- NTP v2, v3, v4: Conforms with or exceeds RFC 1305. Supports Unicast, Broadcast, Multicast, MD5 encryption, Peering, Stratum 2, Autokey
- SNTP v3, v4: Conforms with or exceeds RFC 1769, 2030, and 4330
- IPsec: IPv4/IPv6 Transport Mode
- IPv4/IPv6: Dual stack
- DHCP/DHCP6 (AUTOCONF): Automatic IP address assignment
- HTTP: Browser-based configuration and monitoring
- LDAP: Authentication
- Telnet: Remote configuration
- RADIUS: Authentication
- 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)
- IEEE-1588 (PTPv2)

### 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: remotely configure and manage over an encrypted connection.

## 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 with 100 ft (30 M) antenna cable

**COMMUNICATIONS**

**Network Port**

- RJ-45, 10/100-baseT

**Serial Set-up Interface**

- RS-232 communications on DB-9

**Front Panel**

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

**POWER**

**Choice of:**

- AC (90-264 VAC, 48-63 Hz) from energy star, CEC compliant power supply and IEC60320 connector; power cord included
- 12 VDC (10-14 VDC) or 24/48 VDC (20-72 VDC), secure locking device
- Auto-failover in the case of AC and DC

**Power Draw:**

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

**ENVIRONMENTAL**

	Operating	Storage	MIL-STD-810F
<b>Temperature</b>	-20 to +70 C (+50 C for Rb)	-40 to +85 C	501.4, 502.4
<b>Humidity</b>	10%-95% RH non-condensing @ 40 C		507.4
<b>Altitude</b>	16,400 ft (5,000 M)	45,000 ft (13,700 M)	500.4
<b>Shock</b>	15g/0.53oz, 11ms, half sine wave	50g/1.76oz, 11ms, trapezoidal pulse	516.5
<b>Vibration</b>	10-55Hz/0.07g, 55-500Hz/1.0g	10-55Hz/0.15g, 55-500Hz/2.0g	514.5

**AGENCY APPROVALS**

CE, UL, 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



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

USA [www.spectracomcorp.com](http://www.spectracomcorp.com) | [sales@spectracomcorp.com](mailto:sales@spectracomcorp.com) | 95 Methodist Hill Drive | Rochester, NY 14623 | +1.585.321.5800

FRANCE [www.spectracom.fr](http://www.spectracom.fr) | [sales@spectracom.fr](mailto:sales@spectracom.fr) | 3 Avenue du Canada | 91974 Les Ulis, Cedex | +33 (0)1 64 53 39 80

UK [www.spectracom.co.uk](http://www.spectracom.co.uk) | [sales@spectracom.co.uk](mailto:sales@spectracom.co.uk) | 6A Beechwood | Chineham Park | Basingstoke, Hampshire, RG24 8WA | +44 (0)1256 303630



**ORDERING INFORMATION**

**BASE UNITS**

**1200-X-Y-Z**

Select power, internal oscillator and GPS reference options:

X=Power	Y=Internal Oscillator	Z=Primary Reference
0=AC	1=OCXO	0=IRIG
1=AC/DC (12 vdc)	2=Low phase noise OCXO	2=GPS
2=AC/DC (24/48 vdc)	3=Rubidium	4=Secure GPS (SAASM) <sup>1</sup>
3=DC (12 vdc)		
4=DC (24/48 vdc)		

**Example: 1200-012**

A SecureSync base unit with AC power, OCXO internal oscillator, and GPS as the primary reference. Comes with a 10/100-BaseT 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.

**OPTION MODULES**

Up to 6 option modules can be accommodated per unit.

Model Number	Desc	Sig Type	Inputs	Outputs
<b>1204-01</b>	1PPS in/out /10MHz in	T TL (1PPS), Sine(10 MHz)	1PPS & 10MHz	1PPS
<b>1204-03</b>	1PPS in/out /10MHz in	RS-485 (1PPS), Sine (10 MHz)	1PPS & 10MHz	1PPS
<b>1204-05</b>	IRIG	AM or DCLS	1	2
<b>1204-02</b>	ASCII Time Code	RS-232	1	1
<b>1204-04</b>	ASCII Time Code	RS-485	1	1
<b>1204-08</b>	5MHz	Sine	0	3
<b>1204-0C</b>	10MHz	Sine	0	3
<b>1204-06</b>	Multi-port Ethernet (GigE)	10/100/1000 baseT	3	
<b>1204-09</b>	E1 (75 ohm)	per ITU-T G703	2.048 MHz	2.048 MHz & Mb/sec
<b>1204-0B</b>	E1 (120 ohm)	per ITU-T G703	2.048 MHz	2.048 MHz & Mb/sec
<b>1204-0A</b>	T1	per GR-499-CORE (10.3)	1.544 MHz	1.544 MHz & Mb/sec
<b>1204-0D</b>	HaveQuick	STANAG 4430	0	3

## OPTION MODULE CARDS

Add only the features you need by selecting SecureSync option cards.

Up to 6 cards can be accommodated per unit. In a few cases, the number of cards of any one type may be restricted. See maximum number of cards for each type.

### 1PPS/10 MHZ INPUT AND 1PPS OUTPUT

Use external timing or frequency signals as a system reference. Also adds additional 1PPS output. Choose from TTL/Sine (BNC into 50 ohms) or RS-485 (3.8 mm terminal block).

	1PPS Input	10MHz Input	1PPS Output
<b>Quantity</b>	1	1	1
<b>Signal Type and Connector</b>	TTL (BNC) or RS-485 (terminal block)	Sine (1v peak-to-peak into 50 ohms, BNC)	TTL (BNC) or RS-485 (terminal block)
<b>Input Signal Jitter:</b>	< +/- 500 ns to achieve oscillator lock, < +/- 50 ns to achieve system performance		
<b>Performance</b>	See System Performance Specifications		
<b>Maximum Number of Cards:</b>	6		

#### Ordering Information

1204-1: 1PPS/10MHz input (TTL levels) module

1204-3: 1PPS/10MHz input (RS-485 levels) module

### FREQUENCY OUTPUT (5,10 MHZ)

	Frequency output
<b>Quantity</b>	3
<b>Signal Type and Connector</b>	+13 dBm into 50 ohm, BNC
<b>Performance</b>	Contact factory for performance specifications
<b>Maximum Number of Cards</b>	4 (5 MHz) and 1 (10 MHz)

#### Ordering Information

1204-8: 5 MHz output (3X) module

1204-C: 10 MHz output (3X) module

### E1 OR T1 INPUT/OUTPUT

	Frequency input	Frequency output	Data Rate output
<b>Frequency</b>	2.048 or 1.544 MHz	2.048 or 1.544 MHz	2.048 or 1.544 MB/sec <sup>1</sup>
<b>Quantity</b>	1	1	1
<b>Signal Type and Connector</b>	2.048: Unbalanced, BNC into 75 ohms or balanced into 120 ohms on terminal block 1.544: RS-485 on terminal block		

**Input Signal Jitter:** < +/- 500 ns to achieve oscillator lock, < +/- 50 ns to achieve system performance

**Performance** Contact factory for Performance Specifications

**Maximum Number of Cards:** 6

<sup>1</sup>1.544 MB/sec output is DS1 framed all ones, supports superframe (SF or D4) and enhanced superframe (ESF), supporting synchronous status message (SSM) see GR-378-CORE.

#### Ordering Information

1204-9: E1 – 2.048 (75 ohm) module

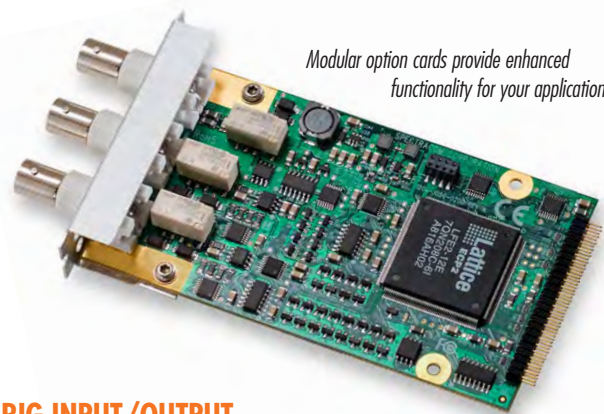
1204-B: E1 – 2.048 (120 ohm) module

1204-A: T1 – 1.544 module

USA [www.spectracomcorp.com](http://www.spectracomcorp.com) | [sales@spectracomcorp.com](mailto:sales@spectracomcorp.com) | 95 Methodist Hill Drive | Rochester, NY 14623 | +1.585.321.5800

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UK [www.spectracom.co.uk](http://www.spectracom.co.uk) | [sales@spectracom.co.uk](mailto:sales@spectracom.co.uk) | 6A Beechwood | Chineham Park | Basingstoke, Hampshire, RG24 8WA | +44 (0)1256 303630



Modular option cards provide enhanced functionality for your application.

### IRIG INPUT/OUTPUT

	Input	Output
<b>Quantity</b>	1	2
<b>Signal Type and Connector</b>	IRIG A, B, G, NASA 36, Amplitude Modulated (0.5 v to 6 v peak-to-peak into 50 ohm on BNC) or DC Level Shift (unmodulated), user selectable	IRIG A, B, E, G, NASA 36, Amplitude Modulated (0 to 5 v peak-to-peak into 50 ohm on BNC) or DC Level Shift (unmodulated), user selectable
<b>Accuracy</b>		+/- 20-200 microsec (format dependent)
<b>Maximum Number of Cards</b>		6

#### Ordering Information

1204-5: IRIG module

### ASCII TIME CODE

	Input	Output
<b>Quantity</b>	1	1
<b>Connector</b>	RS-232 on DB-9 or RS-485 on terminal block	
<b>Accuracy</b>		+/- 100-1000 microsec (format dependent)
<b>Maximum Number of Cards</b>		6

#### Ordering Information

1204-2: ASCII Time Code Module (RS-232)

1204-4: ASCII Time Code Module (RS-485)

### GIGABIT ETHERNET

<b>Quantity</b>	3
<b>Connector</b>	RJ45
<b>Management</b>	Enabled or disabled (NTP server only)
<b>Maximum Number of Cards</b>	1

#### Ordering Information

1204-6: Gigabit Ethernet (3x) Module

0110-1200 (C)

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