

SecureSync®

Time and Frequency Synchronization Platform



- Multi-GNSS synchronization (GPS, Galileo, GLONASS, BeiDou, QZSS)
- SAASM option
- Alternate signal options
- BroadShield GPS jamming and spoofing detection option
- Internal precision time-keeping via TCXO, OCXO or Rb oscillator
- Multiple, prioritized input references
- 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 Orolia's precision master clock technology and secure network-centric approach with a compact modular hardware design to bring you a powerful time and 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 upgradable options. Add alternate signals of opportunity to GPS or GNSS input references to improve resilience, or use them 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 multi-GNSS (GPS/Galileo/GLONASS/BeiDou/QZSS) input. Options include SAASM, supporting L1/L2, available for authorized users and required for the US DoD, and BroadShield GPS jamming and spoofing detection. 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)	1x10 ⁻¹¹	2x10 ⁻¹²	1x10 ⁻¹²	1x10 ⁻¹²	1x10 ⁻¹²
Medium Term Stability (without GPS after 2 weeks of GPS lock)	1x10 ⁻⁸ /day	5x10 ⁻¹⁰ /day	2x10 ⁻¹⁰ /day	5x10 ⁻¹¹ /month (3x10 ⁻¹¹ /month typical)	5x10 ⁻¹¹ /month (3x10 ⁻¹¹ /month typical)
Short Term Stability (Allan Deviation)					
1 sec	2x10 ⁻⁹	5x10 ⁻¹⁰	5x10 ⁻¹¹	2x10 ⁻¹¹	5x10 ⁻¹¹
10 sec	1x10 ⁻⁹	5x10 ⁻¹¹	2x10 ⁻¹¹	2x10 ⁻¹²	2x10 ⁻¹¹
100 sec	3x10 ⁻¹⁰	1x10 ⁻¹¹	1x10 ⁻¹¹	2x10 ⁻¹²	5x10 ⁻¹²
Temperature Stability (peak-to-peak)	1x10 ⁻⁶	5x10 ⁻⁹	1x10 ⁻⁹	1x10 ⁻¹⁰	1x10 ⁻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 and 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 Services

Timing

- NTP v2, v3, v4: Conforms with or exceeds RFC1305 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 Receiver

- Connector: Type N, +5V to power active antenna
- Frequency: GPS L1 (1575.42 MHz), Galileo E1 (1575.42 MHz), GLONASS L1 (1602.0 MHz), BeiDou B1 (1561.1 MHz), QZSS L1 (1575.42 MHz); optional SAASM: GPS L1 & L2 (1227.6 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 download)
- 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)

Communications

Network Port

- RJ-45, 10/100 Base-T

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, $\pm 10\%$ or 100-120 V_{AC}, 400 Hz, $\pm 10\%$ from IEC60320 connector; power cord included
- 12-17 V_{DC}, -15% to +20% or 21-60 V_{DC}, -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
Temperature	-20 to +65°C (+55°C for Rb)	-40 to +85°C	
Humidity	0%-95% RH non-condensing @ 40°C		
Altitude	100-240 V _{AC} up to 6,560 ft (2,000 m), 100-120 V _{AC} up to 13,123 ft (4,000 M) 12-17 V _{DC} and 21-60 V _{DC} up to 13,123 ft (4,000 m)	45,000 ft (13,700 m)	
Shock	15g, 11ms half sine wave	50g, 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

¹SAASM 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 Warranty¹

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

¹The warranty period may be dependent on country.

Ordering Information

Base Units

1200-XYZ

Select power, internal oscillator and GNSS reference options:

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

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.

¹SAASM GPS option occupies 2 option modules. Only 4 additional option modules may be purchased.

Optional Upgrades

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

SS-OPT-BSH: GPS Jamming and Spoofing Detection

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.



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