SecureSync®

Time and Frequency Synchronization Platform

SecureSync® combines Orolia’s precision master clock technology and secure network-centric approach with a compact modular hardware design to bring you a write out 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 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 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 (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 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.

- 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
Specifications

System Performance
See option card descriptions for additional performance specifications.

10 MHz Frequency Output:

<table>
<thead>
<tr>
<th></th>
<th>TCXO</th>
<th>OCXO</th>
<th>Low Phase Noise OCXO</th>
<th>Rubidium</th>
<th>Low Phase Noise Rubidium</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>1x10^-12</td>
<td>2x10^-12</td>
<td>1x10^-12</td>
<td>1x10^-12</td>
<td>1x10^-12</td>
</tr>
<tr>
<td><strong>Medium Term Stability</strong></td>
<td>1x10^-7/ day</td>
<td>5x10^-10/ day</td>
<td>2x10^-10/ day</td>
<td>5x10^-10/ month (3x10^-12/ month typical)</td>
<td>5x10^-10/ month (3x10^-12/ month typical)</td>
</tr>
<tr>
<td><strong>Short Term Stability</strong></td>
<td>1x10^-10</td>
<td>5x10^-12</td>
<td>1x10^-10</td>
<td>1x10^-10</td>
<td>1x10^-10</td>
</tr>
<tr>
<td><strong>Temperature Stability</strong> (peak-to-peak)</td>
<td>5x10^-10</td>
<td>1x10^-10</td>
<td>1x10^-10</td>
<td>2x10^-10</td>
<td>2x10^-10</td>
</tr>
</tbody>
</table>

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

Sign waveforms and levels: +13 dBm into 50 ohm, BNC

1 PPS Output:

<table>
<thead>
<tr>
<th></th>
<th>TCXO</th>
<th>OCXO</th>
<th>Low Phase Noise OCXO</th>
<th>Rubidium</th>
<th>Low Phase Noise Rubidium</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy to UTC</strong> (1-sigma locked to GPS)</td>
<td>±50 ns</td>
<td>±50 ns</td>
<td>±25 ns</td>
<td>±25 ns</td>
<td>±25 ns</td>
</tr>
<tr>
<td><strong>Holdover</strong> (constant temp after 2 weeks of GPS lock)</td>
<td>12 µs</td>
<td>1 µs</td>
<td>0.5 µs</td>
<td>0.2 µs</td>
<td>0.2 µs</td>
</tr>
<tr>
<td>After 4 hours</td>
<td>12 µs</td>
<td>1 µs</td>
<td>0.5 µs</td>
<td>0.2 µs</td>
<td>0.2 µs</td>
</tr>
<tr>
<td>After 24 hours</td>
<td>450 µs</td>
<td>25 µs</td>
<td>10 µs</td>
<td>1 µs</td>
<td>1 µs</td>
</tr>
</tbody>
</table>

Sign waveforms and levels: TTL (5Vp-p), 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 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
Technical Specifications: SecureSync

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, ±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: 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
<table>
<thead>
<tr>
<th></th>
<th>Operating</th>
<th>Storage</th>
<th>MIL-STD-810F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>-20 to +65°C (+55°C for Rb)</td>
<td>-40 to +85°C</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>0%-95% RH non-condensing @ 40°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altitude</td>
<td>100-240 VAC up to 6,660 ft (2,000 m), 100-120 VAC up to 13,123 ft (4,000 M) 12-17 VAC and 21-60 VAC up to 13,123 ft (4,000 m)</td>
<td>45,000 ft (13,700 m)</td>
<td></td>
</tr>
<tr>
<td>Shock</td>
<td>15g, 11ms half sine wave</td>
<td>50g, 11ms half sine wave</td>
<td>$16.5</td>
</tr>
<tr>
<td>Vibration</td>
<td>10-55Hz/0.07g, 55-500Hz/1.0g</td>
<td>10-55Hz/0.15g, 55-500Hz/2.0g</td>
<td>$14.5</td>
</tr>
</tbody>
</table>

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

*The warranty period may be dependent on country.

Ordering Information
Base Units
1200-XYZ
Select power, internal oscillator and GNSS reference options:

<table>
<thead>
<tr>
<th>X=Power</th>
<th>Y=Internal Oscillator</th>
<th>Z=Primary Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>0=AC</td>
<td>1=TCXO</td>
<td>0=No GNSS</td>
</tr>
<tr>
<td>1=AC/DC</td>
<td>2=OCXO</td>
<td>1=Multi-GNSS</td>
</tr>
<tr>
<td>2=AC/DC</td>
<td>3=Low phase noise OCXO</td>
<td>2=SAAASM GPS (MRU)</td>
</tr>
<tr>
<td>1=Rubidium</td>
<td>3=Low phase noise Rb</td>
<td>7=SAAASM GPS (GB-GRAM)</td>
</tr>
</tbody>
</table>

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.

SAASM 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.