SecureSync® 2400

Resilient 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 timekeeping via TCXO, OCXO or Rb oscillator
- Supports a wide variety of available input/output signals
- Modular (configure-to-order) ruggedized shock and vibration tested chassis
- Exceptional operating temperature range of -20°C to +65°C
- High bandwidth NTP
- PTP v2 Master/Slave
- Dual Gb Ethernet
- Secure network management: Enable or disable protocols for encryption, authentication, authorization and accounting
- REST API management
- Alert notifications via SNMP traps and email alert
- Industry-leading five year limited warranty

Resilient Timing for Evolving Requirements

Resilient Timing depends on securing the time reference acquisition and timescale keeping, in the face of GNSS interference. Government recommendations, like the Executive Order in the US or the Cybersecurity Act in European Union, pave the way for future regulations in this domain.

The SecureSync product ecosystem offers a number of solutions to address GNSS threats. With a layered-defense approach, each protective layer increases the sophistication required to compromise, minimizing chances for successful attack.

SecureSync relies on the proven Interference Detection Suite, allowing jamming and spoofing detection. Threats are mitigated by high-performance internal oscillators, or through strong modularity and choice of input interfaces, building redundancy into the timing system architecture.

Whatever your industry, there is a cost-effective SecureSync configuration that keeps your time distribution accurate and available.

Security

SecureSync 2400 is designed with security in mind, combining cybersecurity best practices, including VLAN support account/access management, authentication, encryption, security event logs, network features disabling, as well as regular, secured firmware updates to keep pace with the latest vulnerabilities and protocol improvements.

Networking that Scales

SecureSync 2400 provides strong and scalable networking capability, thanks to higher embedded processing power. Two Gigabit Ethernet ports (one RJ45, one SFP) are available on the base unit enabling flexible network synchronization as a NTP server or PTP master, as a NTP stratum 2 server, or as a PTP slave/boundary clock.

New generation network option cards (1204-4A and 49) provide additional dual and quad Gigabit Ethernet SFP ports, embedding their own processing capability and offering further capabilities as NTP server and PTP slave/master. Scaling up network timing distribution or adding timing redundancy in the network becomes easy.

Modularity

For applications that use "physical" timing signals and require multiple interface types, SecureSync 2400 offers unmatched modularity and a choice of more than 40 option cards. The base unit provides configurable Input/Output timing interfaces (DCLS, RS232/RS485, IRIG AM), on top of 10 MHz and 1 pps outputs. If more interfaces are needed, the base unit supports either 2 (2402) or 6 (2406) option card slots, enabling whatever combination of frequency, phase, NMEA or Have Quick time codes, and network synchronization is needed.

Reliability

At the appliance level, SecureSync includes an optional, dual (redundant), hot swappable power supply. Modularity enables multiple time reference management as well as redundant time distribution architectures, which is instrumental to system-level reliability. Any failure is identified and reported in real time, reducing periods of unavailability.

Monitoring

SecureSync 2400 embeds local and remote monitoring tools, including detailed event logs, real-time access to health and operation status, timing performance graphs, and alerts. Integration into monitoring systems is supported with legacy protocols like SNMP as well as the more recent REST API. Quick, local diagnostics are accelerated thanks to the front panel indicators and OLED display.

Specifications

See option card descriptions for additional performance specifications.

10 MHz Frequency Output:

	TCXO	OCXO	Rubidium
Accuracy (average over 24 hours when GPS locked)	$1x10^{-12}$	$1x10^{-12}$	$1x10^{-12}$
Medium Term Stability (without GPS after 2 weeks of GPS lock)	$1x10^{-8}$/day	$5x10^{-10}$/day	$5x10^{-11}$/month ($3x10^{-11}$/month typical)
After 24 hours	450 µs	25 µs	1 µs
Short Term Stability (Allan Deviation)			
1 sec	$7x10^{-10}$	$1x10^{-11}$	$1x10^{-11}$
10 sec	$4x10^{-10}$	$9x10^{-12}$	$9x10^{-12}$
100 sec	$3x10^{-10}$	$9x10^{-12}$	$4x10^{-12}$
Temperature Stability (peak-to-peak)	$1x10^{-6}$	$5x10^{-9}$	$1x10^{-10}$
Phase Noise (dBc/Hz)			
@1 Hz	—	-95	-80
@10 Hz	—	-123	-98
@100 Hz	-110	-140	-120
@1 kHz	-135	-145	-140
@10 kHz	-140	-150	-140
Signal Waveform & Levels: +13 dBm into 50 ohm, BNC			

1 PPS Output:

	TCXO	OCXO	Rubidium
Accuracy to UTC (1-sigma locked to GPS)	±50 ns	±25 ns	±25 ns
Holdover (constant temp after 2 weeks of GPS lock)			
After 4 hours	12 µs	1 µs	0.2 µs
After 24 hours	450 µs	25 µs	1 µs
Signal Waveform & Levels: TTL (5 V_{P-P}), into 50 ohm, BNC			

Timing Signals

10 MHz Output, BNC

SW Configurable Timing Output, BNC
- TTL Output (1 PPS, xPPS, IRIG DCLS, HAVE QUICK)

SW Configurable Timing Input/Output, HD-15
- TTL Input/Output (1 PPS, xPPS [output only], IRIG DCLS, HAVE QUICK)
- RS-232 Input/Output (NMEA, ASCII ToD)
- RS-485 Input/Output (1 PPS, xPPS, IRIG DCLS, HAVE QUICK, NMEA, ASCII ToD)
- IRIG AM Output

Network Services

Timing
- NTP v2, v3, v4: Conforms with RFC 1305 and 5905. Supports Unicast, Broadcast, Multicast, MD5 encryption, Peering, Stratum 2
- SNTP v3, v4: Conforms with RFC 1769, 2030, 4330, and 5905
- PTP v2: Conforms with IEEE 1588:2019. Supports Master, Slave, E2E, IPv4/v6, Multicast, Unicast, Hybrid modes

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 email

GNSS Receiver

- Connector: Type SMA with Type N cable adapter, +5V to power active antenna (+3.3V for optional SAASM)
- 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 downloaded)
- Antenna system: sold separately, included with SAASM GPS

Oscillator

- Standard Oscillator: OCXO
- Optional Oscillators: TCXO, Rubidium (Rb)

Communications

Network Port
- Dual Gb Ethernet (RJ-45, SFP)

Serial Set-up Interface
- RS-232 communications on front panel micro USB, rear panel RJ-45

Front Panel
- LED segments for time display
- OLED menu display and keypad for status and basic configuration
- LED status buttons with one-click menu access

Power

- Fixed 100-240 VAC, 50/60 Hz, ±10% from IEC60320 connector; power cord included
- Optional dual hot-swap power with load-sharing and failover

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

Environmental

	Operating	Storage	MIL-STD-810
Temp	-20 to +65°C (+55°C for Rb)	-40 to +85°C	501.6, 502.6, 503.6
Humidity	0%-95% RH non-condensing @ 40°C		507.6
Altitude	100-240 VAC up to 13,123 ft (4,000 m)	45,000 ft (13,700 m)	500.6
Shock	ETSI EN 300 019-2-3 Class 3.2 IEC 60721-3-3 Class 12	ETSI EN 300 019-2-3 Class 3.2 IEC 60721-3-3 Class 12	516.7
Vibration	ETSI EN 300 019-2-3 Class 3.2 IEC 60721-3-3 Class 12	ETSI EN 300 019-2-3 Class 3.2 IEC 60721-3-3 Class 12	514.7

Agency Approvals

- CE, TUV, cTUV, FCC part 15 class A, ROHS, WEEE

Physical & Environmental

Size/Weight
- Designed for EIA 19" rack. 18.75" W x 1.74" H (1U) x 15.13" D actual (476 mm W x 44 mm H x 384 mm D actual)
- Weight: 9.0 lbs. (4.08 kg) with Rubidium option; 8.5 lbs. (3.86 kg) without
- Front 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

240w-xyz
Select expansion, power, internal oscillator and GNSS reference options:

w = Expansion	x = Power	y = Internal Oscillator	z = GNSS Reference
2 = 2 Option Slots 6 = 6 Option Slots	0 = AC 6 = Dual Hot-Swap[2]	0 = TCXO 1 = OCXO 3 = Rubidium	3 = Multi-GNSS 7=SAASM GPS (GB-GRAM)[3]

Example
A SecureSync 6 slot base unit with fixed AC power, OCXO internal oscillator, and GPS as the primary reference is Model Number 2406-013. Order option modules for additional input/output functions.

[2] Dual Hot-Swap requires ordering at least one power module.

[3] SAASM GPS option occupies one option module slot.

Optional Upgrade
SS-OPT-BSH: GPS Jamming and Spoofing Detection

Option Modules
Up to 2 or 6 option modules can be accommodated per unit.
See Option Module Card datasheet for details.
STL is an option also available via option card.

Power Modules
Up to 2 power modules may be ordered with the Dual Hot-Swap power option.
2400-HS-A1: 120-240 VAC, 50/60 Hz Hot Swap Power module