VersaSync Rugged Time and Frequency Reference

Applications

Ground
- Mobile radio and C3I sync
- Anti IED jamming systems
- Robotics
- Satcom On The Move (SOTM)

Airborne
- Communication network sync
- Intelligence, Surveillance, and Reconnaissance Platforms (radar, optical, electronic warfare) Flying test bench
- Flight analysis

Marine/Naval
- Communication network sync
- Sensor support (radar, sonar, optical, electronic warfare)
- Offshore/DSO platforms
- Buoys

Accurate in All Conditions

- GNSS (GPS SAASM option) + precision oscillator
- Airborne, ground and marine applications
- MIL-STD environmental qualified
- Up to 45,000 ft, -40 to +71°C, IP65

Flexible

- Wide variety of analog and digital time and frequency signals
- Software configurable inputs/outputs
- Network sync, set-up and management
- Customized COTS available
- VICTORY compatible (optional)

Compact/Rugged

- Optimized SWaP
- < 1 Liter, < 10 Watts, < 1 kg
- VITA 75 form factor
- Conduction-cooled
- Mil-performance connectors
- Standby power mode

High-Performance Time Server

VersaSync is a low SWaP high performance GNSS master clock and network time server that delivers accurate, software configurable time and frequency signals under all circumstances, including GNSS-denied environments. Its compact size and high level of ruggedization make VersaSync suitable for mobile applications in harsh environments. Its small footprint allows for easy integration of the time and frequency functionality into any systems' architecture.

Backed by more than four decades of timing solution expertise from Orolia, VersaSync includes all the timing functionality required in modern, network-centric applications:

- NTP/PTP precise time transfer over Ethernet, including security protocols that prevent network vulnerabilities
- Low phase noise 10 MHz frequency distribution
- Configurable pulse signals, including IRIG or HaveQuick timecodes
- Serial link Time Of Day (ToD) messages

A Perfect Fit for GNSS-Denied Environments

VersaSync accommodates a wide range of precision oscillators, allowing the unit to maintain frequency and time accuracy for long periods of GPS/GNSS outage. These options include OCXO quartz oscillators and a micro-rubidium option, which brings unprecedented time stability and reliability in such a compact form factor. In addition, it can be re-synchronized by an alternative external reference.

Highly Reliable, Versatile, and Configurable Solution

VersaSync physical inputs and outputs are software configurable and can adapt to various application requirements for mission-to-mission configurability.

I/O pins can be configured as TTL, 10 V pulse, RS232, or RS485. This allows VersaSync to provide a high number of outputs of the same, or different types, while still fitting into a small form factor. However, if the combination of software configurable outputs is not enough, VersaSync can accommodate an option board, designed to customer requirements to provide additional outputs of the standard types or future interfaces (IRIG-AM).

VersaSync is designed for exceptional intrinsic reliability. Comprehensive status monitoring capability, either locally or remotely, allows quick fault diagnoses. Physical alarm (dry contact) and network alarms (SNMP traps) are raised in real time. An internal, exportable log can be accessed either locally or remotely.

Timing Interface Summary (Standard Configuration)

Some of the VersaSync I/O interfaces are configurable in terms of type and coding/modulation. When the number of available interfaces is identified as "Max" the actual number of available inputs or outputs is dependent on configuration of other signals. If "Max" is not identified for an interface, it does not depend on the product configuration.

Timing Signals

Timing Signal	Coding/Modulation	Input/Output	Connector
GNSS RF	L1 GPS, GLONASS 72 channels, T-RAIM integrity monitoring Option: L1/L2 SAASM	1 input	SMA, 5 VDC power supply to antenna
10 MHz	Sine, 10 dBm	4 outputs	SMA
Pulse/ DCLS TTL level	1PPS, xPPS, IRIG, HaveQuick, alarm	Max: 2 inputs Max: 5 outputs	I/O connector
Pulse/ DCLS 10 VDC	1PPS, xPPS, IRIG, HaveQuick, alarm	Max: 1 input Max: 1 output	I/O connector
RS232	NMEA 0183, other ASCII ToD formats	Max: 3 inputs Max: 3 outputs	I/O connector
RS485	HaveQuick, xPPS	Max: 3 inputs Max: 4 outputs	I/O connector
NTP over LAN (GbE)	NTP v3, v4; client, server	2	LAN connector
PTP over LAN (GbE)	PTP v1, v2; Master	2	LAN connector

Timing and Frequency Performance

Performances	OCXO**	OCXO High Perf
Timebase Performances		
Relative Frequency Variation with Aging: - 24 hours - One month - One year	5 x10⁻¹⁰ 1 x 10⁻⁸ 5 x 10⁻⁸	2 x 10⁻¹⁰ 4 x 10⁻⁹ 2 x 10⁻⁸
Relative Frequency Variation with Temperature	±1 x 10⁻⁸ (-40°C to 65°C)	
Short Term Stability (Allan Deviation): @ 1 s @ 10 s @ 100 s	2 x 10⁻¹⁰ 5 x 10⁻¹¹ 3 x 10⁻¹¹	
Phase Noise on 10 MHz Output: @ 10 Hz @ 100 Hz @ 1 kHz @ 100 kHz	-120 dBc/Hz -140 dBc/Hz -150 dBc/Hz -155 dBc/Hz	
Harmonic Distortion	-40 dBc	
Spurious	-60 dBc	

Performances	OCXO**	OCXO High Perf
System Performance*		
Frequency Accuracy Averaged Over 24 hour when Locked on GNSS	3 x 10⁻¹²	2 x 10⁻¹²
Phase (1 PPS) Drift in Holdover (no reference available) - 4 hours - 24 hours - 7 days	3 µs 40 µs 1.2 ms	2.8 µs 30 µs 0.6 ms
Phase (1 PPS) Accuracy to UTC	±50 ns	

*While locked to GNSS, and at constant temperature.
** A Rugged, Low Phase Noise OCXO option is available for high-vibration environments such as aircraft and maritime. Contact Orolia for details.

Front Panel Connections

Interface	Type of Data	Connector*
GNSS RF in	GNSS signal	SMA
Power in	DC power	Circular mil-type
Frequency out	10 MHz sine	SMA
Timing in/out	Pulse/DCLS, RS232, RS485; also USB communications	Circular mil-type
GbE	NTP, PTP Navigation messages Monitoring	Circular mil-type
SAASM keyloader	DS101, DS102	Circular mil-type

*connector pin-outs available in the user manual.

Operational Readiness
1PPS time of day available (hot start)
- 60 s: 1ms accuracy to UTC
- 200 s: 1µs accuracy to UTC

Management & Monitoring
User, local:
- Power and Status LEDs on front panel
- USB: ASCII Command Line Interface

User, remote (LAN):
- Status, configuration, event log, software update through web pages

Machine, remote (LAN):
- SNMP
- JSON RPC

Network Security

- Password protected administration accounts
- SSL/SSH-based https, ftps protocols supported for secured access to user interface
- NTP implementation supports MD5, Autokey

Network Synchronization

- NTP v2, v3, v4: Conforms with or exceeds RFC 1305 and RFC 5905. Supports unicast, broadcast, multicast, peering, stratum 2, MD5 encryption, autokey
- PTP v1 and v2: Master – conforms with default profile IEEE1588. Supports layer 2/layer 3, unicast/multicast.
- GPSD (GNSS receiver data)
- VICTORY Interface compatible (optional)

Environmental

- Tested to MIL-STD-810G CH1
- Temperature, in operation: -40°C to +71°C with OCXO
- Mounting plate temperature, in storage: -45°C to +85°C
- Humidity: 95% RH, non-condensing
- Altitude: 45,000 ft
- Environmental Protection: IP 65
- VibrationMIL-STD-810G CH1 Method 514.7, Categories 12,13,14,20,21,24
- Shock: 20 g, 11 ms, sawtooth

EMI/EMC

- Tested according to MIL-STD-461F

Physical

- Size (WxHxD): 5.8"x 2.5"x 5.0" (147.3 x 127.5 x 63.0 mm) VITA 75 compliant
- Weight: 0.91 kg (2.0 lbs)
- Mounting: On a plate, optimized for conduction cooling, 6 through holes

Power

- Input Voltage: 10-32 VDC
- Standby mode (only oscillator is powered): 0.4 W, DC power supply must be within 10 - 32 VDC

Ordering Information

Typical configurations

VersaSync Model	Oscillator	GNSS Receiver
1228-1110	OCXO	GNSS L1
1228-1410	High Perf OCXO	GNSS L1
1228-1121	OCXO	SAASM GPS L1/L2

Inquire with your Orolia Sales Representative configuration availability.

VersaSync Evaluation Kit

- VersaSync EVK: Includes a carrying case, L1 GNSS antenna (8230), 5 meter GPS RF cable, AC to DC power supply and cable, Ethernet cable, and signal breakout cable. VersaSync unit sold separately.

Accessories

- GPS/GNSS antenna, GNSS RF cables, lightning protection, splitters,line amplifiers

Additional Options

- GNSS spoofing/jamming detection
- GPS l1/L2 SAASM
- IRIG-AM support (1228-2XX4)

Service

- Premium Support Package (PSP)
- Yearly Warranty extension
- Long-life support package

Certification/Marking

- RoHS, WEEE compliant

Warranty

- 2 years

For More Information:

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