VersaSync – Rugged Time and Frequency Reference

Applications

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

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

Marine/Naval
- Sensor support (radar, sonar, optical, electronic warfare)
- Communication network sync
- 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. 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 another future interface (IRIG AM, 1553 bus, etc.).

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.

Custom Solutions Available
Orolia can customize the VersaSync to adapt to your specific requirements. Contact us to learn how we can efficiently design and validate a special configuration to match your needs.

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 requirements for other signals. If “Max” is not identified for an interface, it does not depend on the product configuration.
## Technical Specifications: SecureSync SAASM

### Timing Signals

<table>
<thead>
<tr>
<th>Timing Signal</th>
<th>Coding/Modulation</th>
<th>Input/Output</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>GNSS RF</td>
<td>L1 GPS, GLONASS</td>
<td>1 input</td>
<td>SMA, 5 VDC power supply to antenna</td>
</tr>
<tr>
<td>10 MHz</td>
<td>Sine, 10 dBm</td>
<td>1 output(s)</td>
<td>SMA</td>
</tr>
<tr>
<td>Pulse/DCLS</td>
<td>1PPS, xPPS, IRIG, HaveQuick, alarm</td>
<td>Max: 2 inputs Max: 5 outputs</td>
<td>I/O connector</td>
</tr>
<tr>
<td>TTL level</td>
<td>1PPS, xPPS, IRIG, HaveQuick, alarm</td>
<td>Max: 1 input Max: 1 output</td>
<td>I/O connector</td>
</tr>
<tr>
<td>RS232</td>
<td>NMEA 0183, other ASCII ToD formats</td>
<td>Max: 3 inputs Max: 3 outputs</td>
<td>I/O connector</td>
</tr>
<tr>
<td>RS485</td>
<td>HaveQuick, xPPS</td>
<td>Max: 3 inputs Max: 4 outputs</td>
<td>I/O connector</td>
</tr>
<tr>
<td>NTP over LAN (GbE)</td>
<td>NTP v3, v4; client, server</td>
<td>2</td>
<td>LAN connector</td>
</tr>
<tr>
<td>PTP over LAN (GbE)</td>
<td>PTP v1, v2; Master</td>
<td>2</td>
<td>LAN connector</td>
</tr>
</tbody>
</table>

### Timing and Frequency Performance

<table>
<thead>
<tr>
<th>Performances</th>
<th>OCXO**</th>
<th>OCXO High Perf</th>
<th>CSAC</th>
<th>MAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Frequency Variation with Aging:</td>
<td>24 hours</td>
<td>1 x 10^{-6}</td>
<td>2 x 10^{-10}</td>
<td>3 x 10^{-12}</td>
</tr>
<tr>
<td>- 2 hours</td>
<td>10^{-8}</td>
<td>10^{-13}</td>
<td>10^{-15}</td>
<td>10^{-17}</td>
</tr>
<tr>
<td>- One month</td>
<td>10^{-16}</td>
<td>10^{-19}</td>
<td>10^{-17}</td>
<td>10^{-19}</td>
</tr>
<tr>
<td>- One year</td>
<td>10^{-19}</td>
<td>10^{-19}</td>
<td>10^{-19}</td>
<td>10^{-19}</td>
</tr>
</tbody>
</table>

### 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 v2, v3 (get, set, traps)
- JSON RPC

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**Note:**
- A rugged, low Phase Noise OCXO option is available for high vibration environments such as aircraft and maritime. Contact Orolia for details.
- Connector pin-outs available in the user manual.
- While locked to GNSS, and at constant temperature.

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**Front Panel Connections**

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

*connector pin-outs available in the user manual.
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
- 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
- Typical Power Draw: 10 W (18 with MAC oscillator)
- Standby mode (only oscillator is powered): 0.4 W, DC power supply must be within 10 - 32 VDC

Certification/Marking
- RoHS, WEEE compliant

Warranty
- 2 years

Ordering Information

Standard Units

<table>
<thead>
<tr>
<th>VersaSync Model</th>
<th>10 MHz Out, Qty</th>
<th>Oscillator</th>
<th>GNSS Receiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>1228-0110</td>
<td>1</td>
<td>OCXO</td>
<td>GNSS L1</td>
</tr>
<tr>
<td>1228-0410</td>
<td>1</td>
<td>High Perf OCXO</td>
<td>GNSS L1</td>
</tr>
<tr>
<td>1228-1110</td>
<td>4</td>
<td>OCXO</td>
<td>GNSS L1</td>
</tr>
<tr>
<td>1228-1410</td>
<td>4</td>
<td>High Perf OCXO</td>
<td>GNSS L1</td>
</tr>
<tr>
<td>1228-0211</td>
<td>1</td>
<td>CSAC</td>
<td>GNSS L1</td>
</tr>
<tr>
<td>1228-0121</td>
<td>1</td>
<td>OCXO</td>
<td>SAASM GPS L1/L2</td>
</tr>
<tr>
<td>1228-0221</td>
<td>1</td>
<td>CSAC</td>
<td>SAASM GPS L1/L2</td>
</tr>
</tbody>
</table>

VersaSync Evaluation Kit
- VersaSync EVK: Includes a carrying case, L1 GNSS antenna (B230), 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
- BroadShield™ GNSS spoofing/jamming detection
- GPS L1/L2 SAASM
- IRIG-AM support

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

Additional configurations are available upon customer request.