

**New !**

Improved holdover with new high performance OCXO option

# VERSASYNC

## Rugged Time and Frequency Reference



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.

The Miniature Rubidium oscillator option brings outstanding holdover capability, for applications facing persistent GNSS outages.

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.

The «standby mode» capability allows the unit to maintain precise timescale, while being minimally powered, with time distribution being resumed once main power is reapplied.

VersaSync optionally includes proven GNSS interference detection algorithms (jamming, spoofing), and implements smart time reference management in case of GNSS interference detection.

VersaSync also embeds strong operational cybersecurity, enabling secured time distribution on governmental / defense networks.

Backed by more than four decades of timing solution expertise from Safran, 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

### Applications

#### Ground

- Mobile radio and C3I sync
- Anti IED jamming systems
- Robotics
- Satcom On The Move (SOTM)
- Flying Clock - Time distribution in persistent GNSS denied environment

#### Airborne

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

#### Marine/Naval

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

**Safran Electronics & Defense is with you every step of the way, building in the intelligence that gives you a critical advantage in observation, decision-making and guidance.**

## Secure in all conditions

- GNSS interference detection and mitigation
- MCODE variants available
- Standby mode : low-power (< 1.5 W) time-keeping mode
- High level of operational and network security

## Flexible

- Wide variety of analog and digital time and frequency signals as time input and output
- Software configurable inputs/outputs
- Network synchronization, configuration and monitoring
- Customized COTS available
- VICTORY compatible (optional)

## Compact/Rugged

- Optimized SWaP
- < 1 Liter, < 10 Watts, < 1 kg
- VITA 75 form factor
- Conduction-cooled



## A Perfect Fit for GNSS-Denied Environments

VersaSync accommodates two internal oscillator options, allowing the unit to maintain frequency and time accuracy for long periods of GPS/GNSS outage. This includes a high performance OCXO option, as a perfect fit for hours-long missions in harsh temperature/shocks environment, and miniature rubidium oscillator, as a perfect fit for days-long missions. VersaSync 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.

VersaSync is designed for exceptional intrinsic reliability. Comprehensive status monitoring capability, either locally or remotely, allows quick fault diagnoses. Remote monitoring is based on SNMP protocol and RestAPI, providing flexibility for automated / scripted monitoring. An internal, exportable log can be accessed either locally or remotely.

## Future-proof, network-enabled time distribution

VersaSync is a key enabler for network-based migration strategies, and enables precise time distribution to network elements or network-connected sensors, using NTP or PTP protocols - towards sub-millisecond time transfer accuracy. Without any compromise on cyber security

# Technical Specifications

## Timing Signals

Timing Signal	Coding/Modulation	Input/Output	Connector
GNSS RF	L1 GPS, GLONASS 72 channels, T-RAIM integrity monitoring Option: L1/L2, MCODE	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 v2; Master, slave	2	LAN connector

## Timing and Frequency Performance

Performances	OCXO High Perf	mRO-50
Timebase Performances		
Relative Frequency Variation with Aging:		
- 24 hours	$1 \times 10^{-10}$	—
- One month	$3 \times 10^{-9}$	$1 \times 10^{-10}$
- One year	$3 \times 10^{-8}$	$1 \times 10^{-9}$
Relative Frequency Variation with Temperature	$\pm 1 \times 10^{-9}$ (-40°C to +71 °C)	$\pm 1 \times 10^{-9}$ (-10°C to 65°C)
Short Term Stability (Allan Deviation):		
@ 1 s	$1 \times 10^{-10}$	$1 \times 10^{-10}$
@ 10 s	$3 \times 10^{-11}$	$3 \times 10^{-11}$
@ 100 s	$3 \times 10^{-11}$	$1 \times 10^{-11}$
Phase Noise on 10 MHz Output:		
@ 10 Hz	- 115 dBc/Hz	- 90 dBc/Hz
@ 100 Hz	- 133 dBc/Hz	- 110 dBc/Hz
@ 1 kHz	- 147 dBc/Hz	- 135 dBc/Hz
@ 100 kHz	- 155 dBc/Hz	- 140 dBc/Hz
Harmonic Distortion	- 40 dBc	
Spurious	- 60 dBc	
System Performance in main power mode		
Frequency Accuracy Averaged Over 24 hour when Locked on GNSS	$2 \times 10^{-12}$	$1 \times 10^{-12}$
Maximum time error (1 PPS) in Holdover (no reference available), at constant temperature, following 48 hours disciplining		
- 4 hours	1.5 µs	0.2 µs
- 24 hours	10 µs	1.5 µs
- 7 days	0.4 ms	20 µs
Phase (1 PPS) Accuracy to UTC when locked on GNSS @ 1 sigma	±15 ns	

## 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
M-Code keyloader	DS101, DS102	Circular mil-type

\*connector pin-outs available in the user manual.

## Operational Readiness

### Time to 1 pps accuracy (GNSS receiver hot start)

- 90 s: 1ms accuracy to UTC
- 150 s: 1µs accuracy to UTC

## Network Services

### Timing

- NTP v2, v3, v4: Complies with RFC 1305 and 5905. Supports Unicast, Broadcast, Multicast, Symmetric Key Encryption, Peering, Stratum 2
- SNTP v3, v4: Complies with RFC 1769, 2030, 4330, and 5905
- PTP v2: Complies with IEEE 1588:2019. Supports Master, Slave, E2E, IPv4/v6, Multicast, Unicast, Hybrid modes
- PTP supported profiles: default, power (IEEE 61850-9-3, IEEE C37.238-2011/2017), telecom (ITU-T G.8265.1, G.8275.2), Enterprise

### Management & Communications

- IPv4/IPv6: Dual stack
- VLAN support
- DHCPv4/DHCPv6 (AUTOCONF)/SLAAC: Automatic IP address assignment
- Syslog: Logging
- HTTP(S): Browser-based configuration and monitoring
- REST API configuration and monitoring
- (S)FTP Server: Access to files (logs, etc.)
- SNMP: Supports v1, v2c, and v3 (no auth/auth/priv) with Enterprise MIB
- SMTP: Email

### Security Features

- Configurable Password Policy
- Authentication: LDAP, RADIUS, TACACS+
- Enable/Block protocols
- Access Control Lists
- HTTP Strict Transport Security (HSTS) support
- SSL/SSH
- FIPS 140-2 certified cryptomodule
- SFTP/SCP: Securely transfers files to and from the time server over an SSH session
- SNMP v3: Remotely configure and manage over an encrypted connection
- Alert notifications via SNMP traps and email
- Signed firmware updates

## Environmental

- Tested to MIL-STD-810G
- Operating mounting plate temperature:
  - OCXO : -40°C to +71°C
  - mini Rub: -40°C to +60 °C
- Temperature in storage: -45°C to +85°C
- Humidity: 95% RH, non-condensing
- Altitude: 45,000 ft
- Environmental Protection: IP 65
- Vibrations: MIL-STD-810G Method 514.6E-1 (7.7 g rms, 20 to 1000 Hz) and 514.6E-2
- Shock: 20 g, 11 ms, sawtooth

## EMI/EMC

- Tested 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
- Main power : 10 W
- Stby mode power : 1.5 W

## Regulatory approvals

- FCC Part 15, CE Mark, UK CA, RoHS

## Warranty

- 2 years

## Ordering Information

### Typical configurations

VersaSync Model	Oscillator	GNSS Receiver
1228-1610	High Perf OCXO	GNSS L1
1228-1311	Mini Rubidium	GNSS L1

Inquire with your Safran 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
- Evaluation cables equipped with mating connectors

### Additional Options

- VP-OPT-BSH : GPS spoofing/jamming detection, triggers switch to other reference or holdover when interference is detected

### Service

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

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