FEDERAL SYSTEMS

VERSASYNC FLEX

Flexible Time and Frequency Reference

Key Features

- M-Code Secure GPS
- Alternative Navigation
- GNSS Receiver
- Rugged Mini Rubidium Clock
- BroadShield Threat Detections
    - Customizable design

Its compact size and high level of ruggedization make the VersaSync suitable for mobile applications in harsh environments. VersaSync is available in a wide body form factor that is ideal for land, sea and airborne applications. The design can be efficiently outfitted to match your needs, no matter the mission. Built to endure the most demanding conditions, the VersaSync Flex delivers reliable, uninterrupted signals.

Safran Federal Systems is the trusted Resilient PNT mission partner to U.S. government and defense organizations, from the lab to the field.

High-Performance Time Server

VersaSync Flex 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 in a customizable package. Its compact size and high level of ruggedization makes the VersaSync Flex 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 Safran Federal Systems (Formerly Orolia), the VersaSync Flex 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

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A Perfect Fit for GPS Challenged and GPS-Denied Environments

VersaSync Flex 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 mini-rubidium option, which brings unprecebented time stability and reliability in such a compact form factor. In addition, it can be re-synchronized by an alternative external reference.

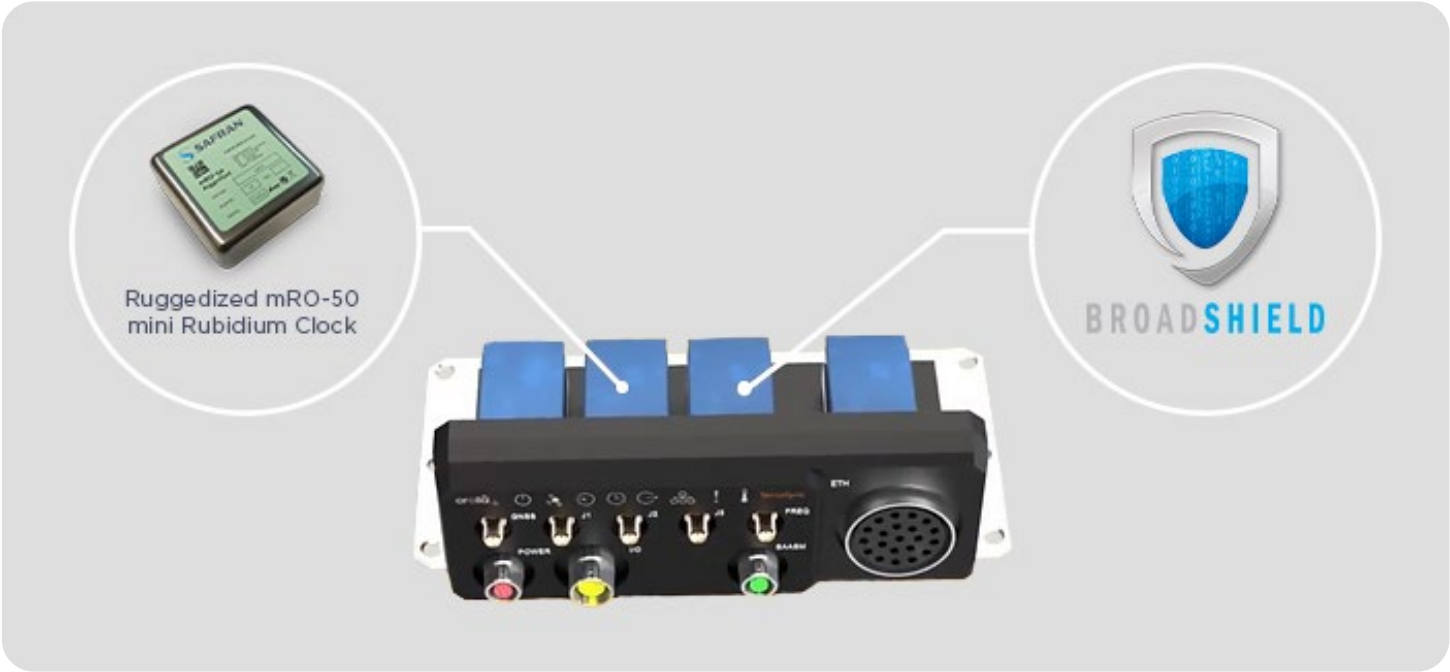
VersaSync Flex with optional M-code includes the latest generation of modernized security architecture, modernized anti-spoofing and anti-jamming for GPS-degraded environments, operations in mixed P(Y)-code and M-code constellations, accelerated Direct-Y and Direct-M code acquisitions, and Over-The-Air-Rekeying (OTAR).

VersaSync Flex with M-code provides better than 41 dB J/S while tracking (state 5) and better than 54 dB J/S (state 3) while providing cryptographic key retention without battery backup.

Highly Reliable, Versatile, and Configurable Solution

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

Built from our proven Versa platform, the VersaSync Flex brings a solid Low SWaP high performance GNSS masterclock in a customizable package.



Timing and Frequency Performance

Performances	OCXO**	OCXO High Perf	mRO-50
Timebase Performances			
Relative Frequency Variation with Aging: - 24 hours - One month - One year	 5×10^{-10} 1×10^{-8} 5×10^{-8}	 2×10^{-10} 4×10^{-9} 2×10^{-8}	 – 1×10^{-10} 1×10^{-9}
Relative Frequency Variation with Temperature	±1 x 10^{-8} (-40°C to 65°C)		4 x 10^{-8} (-10°C to 65°C)
Short Term Stability (Allan Deviation): @ 1 s @ 10 s @ 100 s	 2×10^{-10} 5×10^{-11} 3×10^{-11}		 3×10^{-10} 5×10^{-11} 3×10^{-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		 -90 dBc/Hz -110 dBc/Hz -135 dBc/Hz -140 dBc/Hz
Harmonic Distortion	-40 dBc		
Spurious	-60 dBc		
System Performance*			
Frequency Accuracy Averaged Over 24 hour when Locked on GNSS	3×10^{-12}	2×10^{-12}	1×10^{-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	 0.2 µs 1.5 µs 20 µs
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 Safran for details.

Timing Signals

Timing Signal		Input/Output	Connector
GNSS RF	GPS, SAASM, M-code L1/ L2 GPS	1 input	SMA, 3.3 VDC power supply to antenna
10 MHz	Sine, 10 dBm	4 outputs	SMA
Pulse/DCLS TTL level	1 PPS, xPPS, IRIG, HaveQuick, alarm	Max: 2 inputs Max: 5 outputs	I/O connector
Pulse/DCLS 10 VDC	1 PPS, 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

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 / SAASM Key Fill	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 & Moitoring

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

M-Code Features

- Connector: SMA, +3.3V to power active antenna
- Receiver input: L1/L2
- Crypto Key input: DS101/DS102 key loading. Front panel connector
- Security: M-Code (MPE-M) MGUE
- Antenna/preamplifier: L1 1574.42 MHz & L2 1227.60 MHz, 40 dB gain (antenna sold separately)
- Acquisition time: TTFF (95%): <15 sec hot start, <90 sec warm start
- Purchases and Export of VersaSync M-Code requires coordination through the SMC Production Corps and an FMS case.

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 IEEE 1588. 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 (-10°C to +45°C with mRO)
- Mounting plate temperature, in storage: -45°C to +85°C
- Humidity: 95% RH, non-condensing at 40°C
- Altitude: up to 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 (pulse sawtooth) in accordance with MIL-STD 810G, Method 516.7 Procedure 1

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 63.0mm) 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
- Standby mode (only oscillator is powered): 0.5 W, DC power supply must be within 10 - 32 VDC

Certification/Marking

- RoHS, WEEE compliant

Warranty

- 2 years

Accessories

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

Service

- Yearly Warranty extension

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