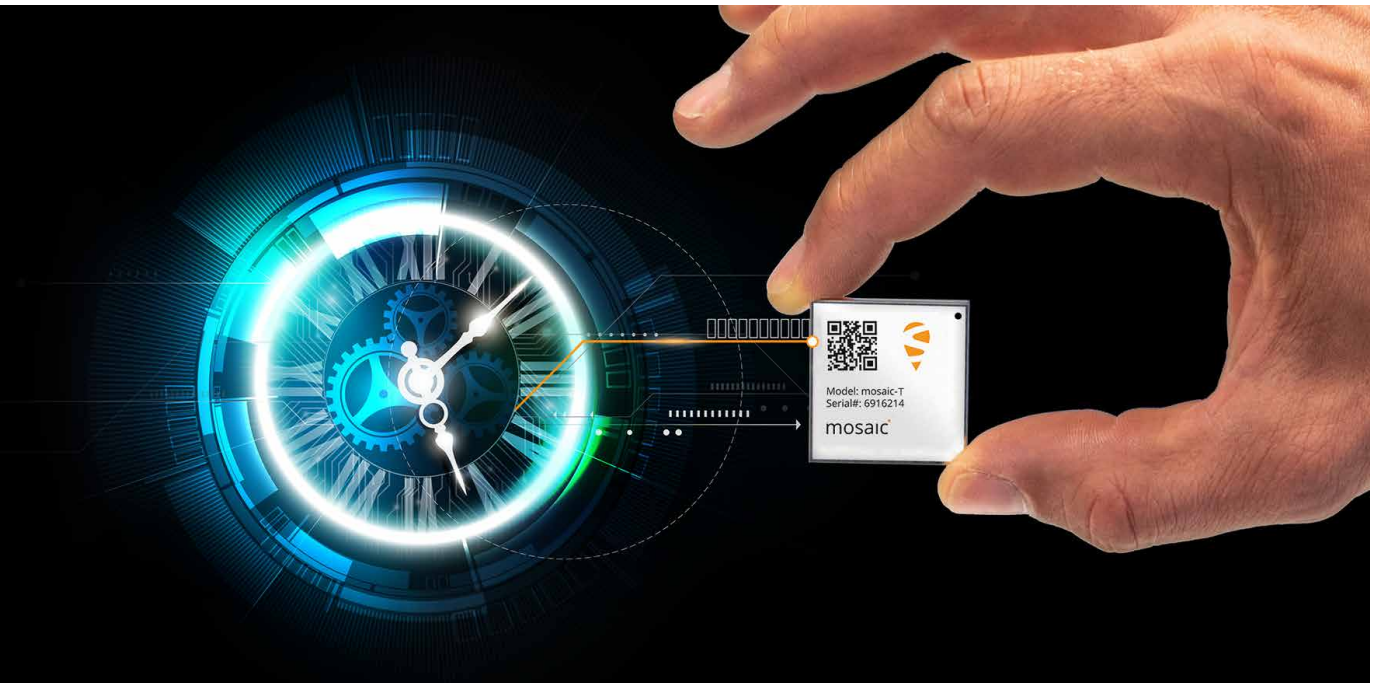
mosaic-T

Compact multi-frequency GNSS timing receiver module

septentrio



Timing

Scientific

IoT

Infrastructure

Telecommunication Network

Septentrio mosaic-T™ is a **multi-band, multi-constellation GNSS timing receiver** designed specifically for providing the highest security and availability for critical infrastructure and other applications where resilient timing is essential.

Mosaic-T™ is a low power surface-mount **module** with a wide array of interfaces including a dedicated timing input for time and frequency synchronization. It offers superior availability by tracking all Global Navigation Satellite System constellations (GNSS) and their current and future signals. With unique **built-in AIM+ technology** for anti-jamming, anti-spoofing and **interference mitigation**, Septentrio offers a highly resilient and precise timing receiver in a very small form factor.

With optional AtomiChron services, mosaic-T is providing 4 constellation NMA for superior Anti-spoofing and precise timing reaching sub nanosecond precision.

KEY FEATURES

- **Accurate and resilient with dedicated timing features**
- **All-in-view satellite tracking: multi-constellation, multi-frequency**
- **Dedicated inputs for clock and frequency synchronisation**
- **OSNMA and 4 constellation NMA support[8]**
- **Highly secure against jamming and spoofing with AIM+ unique interference mitigation technology combined with Fugro AtomiChron services[8]**
- **Industry-leading ultra-low power consumption**
- **Easy-to-integrate**

BENEFITS

Top performance without compromises

The best of both worlds: small size with solid performance. Mosaic-T™ offers a high-precision solution for time and frequency synchronization under challenging conditions such as during GNSS jamming or spoofing. It offers unmatched resilience thanks to its all-constellation multi-frequency capabilities and AIM+ technology.

More compact than ever

Sized at only 31 x 31 x 4 mm and weighing no more than 7g, mosaic-T™ offers unparalleled size to performance ratio.

Meant for automated assembly

The mosaic-T™ module is designed for high volume automated assembly lines with minimal amount of additional components required. All interfaces, commands and data messages are fully documented. The complete RxTools software suite is also included with mosaic-T™. It enables quick and easy receiver configuration, data logging and analysis.

Advanced technologies inside

Septentrio's GNSS+ toolset enables accuracy and reliability in the toughest conditions with:

- **AIM+** the most advanced anti-jamming, anti-spoofing on-board interference mitigation technology on the market (narrow and wide band, chirp jammers).
- **LOCK+** for robust tracking despite mechanical shocks and vibrations.
- **APME+** multipath mitigation to distinguish direct signals from those reflected off nearby structures.
- **IONO+** provides advanced protection against ionospheric disturbances.

FEATURES

GNSS technology

448 hardware channels for simultaneous tracking of all visible supported satellite signals:

- GPS: L1C/A, L1PY, L2C, L2PY, L5
- GLONASS: L1CA, L2CA, L3 CDMA
- Beidou: B1I, B1C, B2a, B2b, B2I, B3
- Galileo: E1, E5a, E5b, E5 AltBoc, E6
- QZSS: L1C/A, L1 C/B, L2C, L5
- NavIC: L5
- SBAS: Egnos, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- On module L-band

Septentrio's patented GNSS+ technologies

- **AIM+** industry leading anti-jamming, anti-spoofing interference monitoring & mitigation technology
- **IONO+** advanced scintillation mitigation
- **APME+** a posteriori multipath estimator for code and phase multipath mitigation
- **LOCK+** superior tracking robustness under heavy mechanical shocks or vibrations
- **RAIM+** receiver autonomous integrity monitoring

OSNMA Support
4 constellations NMA Support[8]
5 constellations position engine
T-RAIM Support

Protocols

Septentrio Binary Format (SBF)
NMEA 0183, v2.3, v3.03, V4.0
NTP & PTP

Interfaces

4 UART (LVTTL, up to 4 Mbps)
Ethernet (RMII/MDIO), 10/100 Mbps
USB device (2.0, HS)
SDIO (mass storage)
2 GPIO user programmable
2 Event markers
1 Configurable PPS out[4]
Clock sync input
Frequency sync input (10 MHz)

PERFORMANCE

Time precision

xPPS out[4]	5 ns
xPPS out with AtomiChron[7,8]	<1ns
Event accuracy	< 20 ns

Positioning modes accuracy [1,2]

	Horizontal	Vertical
Standalone	1.2 m	1.9 m
SBAS	0.6 m	0.8 m

Velocity accuracy [1,2]

3 cm/s

Maximum update rate

Position 10 Hz

Latency [3]

<10 ms

Time to first fix

Cold start[5]	< 45 s
Warm start[6]	< 20 s
Re-acquisition	1 s

Tracking performance (C/N0 threshold)

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

Firmware

Free product lifetime upgrades

PHYSICAL AND ENVIRONMENTAL

Package

Type	SMT solderable land grid array
Size	31 x 31 x 4 mm / 1.29 x 1.29 x 0.15 in
Weight	6.8 g / 0.24 oz

Electrical

Antenna pre-amplification range	15-50 dB
Antenna bias voltage	3.0-5.5 V Build-in current limit (150 mA)
Input voltage	3.3 VDC
Power consumption	0.6 W typ 1.1 W max

Environmental

Operating temp	-40 to 85° C -40 to 185° F
Storage temp	-55 to 85° C -67 to 185° F
Humidity	5% - 95% (non-condensing)
Vibration	MIL-STD-810G
Certification	RoHS, WEEE, CE, FCC

[1] Open sky conditions
[2] RMS levels
[3] 99.9%
[4] Incl. software compensation of sawtooth effect
[5] No information available (no almanac, no approx position)
[6] Ephemeris and approx. position known
[7] After Convergence
[8] Wth Optional AtomiChron services

BBR 66/02/2025

EMEA
Greenhill Campus (HQ)
Interleuvenlaan 15i
3001 Leuven, **Belgium**

Espoo, **Finland**

Americas
2601 Airport Drive,
Suite 360
Torrance, CA 90505, **USA**

septentrio.com/contact

Asia-Pacific
Shanghai, **China**
Yokohama, **Japan**
Seoul, **Korea**

septentrio.com

ISO 9001 2015 CERTIFIED