



Fully Integrated and **Secure** **Multi-GNSS Module** embedding 6-axis Gyroscope and Accelerometer



20 x 20 x 3 mm ⁽¹⁾

Highlights

- ▷ Mono-frequency L1 GNSS engine:
GPS, GLONASS, QZSS, Galileo, Beidou
- ▷ SBAS (EGNOS, WAAS, MSAS, GAGAN)
- ▷ Advanced GNSS signal attacks detection and mitigation algorithms
- ▷ Secure Hardware & Firmware
- ▷ Secure interface to applications
- ▷ Compliant with Smart DT regulation

ITS Applications

- ▷ Critical Fleet Management Systems
- ▷ Dangerous Goods Transportation
- ▷ Smart Tachograph
- ▷ Pay As You Drive
- ▷ Road User Charging
- ▷ Smart Mobility

Product Description

The module is a fully integrated and secure multi-GNSS module designed to provide confidence and resilience in the position, velocity and time computed from satellite navigation systems.

The product is able to detect GNSS signal spoofing and jamming attempts, GNSS interference, is protected against cyber-attack and delivers authenticated information to the application.

The module integrates in a single casing a multi-constellation GNSS chipset (TESEO III from STMicroelectronics), a secure MCU and several motion sensors. It offers a set of interfaces such as CAN bus to take advantages of external information depending on application contexts. Moreover, it is designed to support the Galileo OS NMA ⁽²⁾ service when available.

The module implements algorithms monitoring GNSS signal and navigation parameters allowing to detect anomalies. When an inconsistency or anomaly is detected, the application is warned and the module enters into dead reckoning navigation providing an estimate of the true position.

Besides, it provides ciphered or digitally signed information ensuring authenticity and integrity of the delivered information.

The product is fully compatible with Smart DT regulation and is RED, EMC and UNECE AECS (eCall) type-approval pre-tested.

⁽¹⁾ 2019 target form factor

⁽²⁾ Galileo Open Service Navigation Message Authentication

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GNSS Features

- ▷ GNSS Chip Teseo III - STA8090F4G
- ▷ Frequency Bands:
GPS L1, GLONASS L1, QZSS L1, Galileo E1, Beidou B1
SBAS L1 (EGNOS, WAAS, MSAS, GAGAN)
- ▷ 48 tracking channels
- ▷ 2 fast acquisition channels
- ▷ Horizontal Accuracy: <1.2 m with SBAS
- ▷ PPS Accuracy: 1 μ s Time 1PPS (RMS)
7 ns in static mode (1 sigma)
- ▷ Dead Reckoning support
- ▷ Hot Start: 1s
- ▷ Cold Start: 35s

Sensitivity

- ▷ Tracking: -161 dBm
- ▷ Acquisition: -146 dBm
- ▷ Re-acquisition: -156 dBm

Interfaces

- ▷ Peripheral Ports I2C, USB, Odometer
- ▷ CAN Standard and extended (FMS)
- ▷ UART NMEA-0183
(9600-960000 bauds)
- ▷ Secure Port ISO7816-3
- ▷ Digital Output GNSS attack attempt
detection
- ▷ Data Storage SD card
- ▷ Antenna Active / Passive
- ▷ Supply Voltage 3.3V Typical

Security Features

- ▷ GNSS spoofing detection
- ▷ GNSS jamming/interference detection
- ▷ GNSS anti-replay protection
- ▷ Galileo OS NMA⁽²⁾ support
- ▷ Level of Confidence indicator (PVT)
- ▷ Firmware and hardware integrity control
- ▷ Secure memory for sensitive data
- ▷ Secure firmware upgrade and module configuration
- ▷ Secure NMEA stream data (digitally signed)
- ▷ Fully compliant with Smart DT ISO7816-4 protocol

Operating Conditions

- ▷ Acceleration Range <4.5 g
- ▷ Velocity Range 555 m/s
- ▷ Altitude Range 18000 m
- ▷ Storage Temperature -40°C to 85°C
- ▷ Operating Temperature -40°C to 85°C

Firmware Customization

- ▷ Firmware fully configurable
- ▷ TCG TMP 2.0 automotive support upon request
- ▷ Customization according to your application needs and requirements

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