TW5390

CALIAN®
Confidence. Engineered.

TW5390 Smart GNSS Antenna for High Precision with IMU, L-Band

Overview

The TW5390 is a multi-band (L1/L2), multi-constellation integrated GNSS receiver/antenna with Inertial Measurement Unit (IMU) (for Untethered Dead Reckoning) and integrated L-Band receiver for PointPerfect PPP-RTK corrections. The TW5390 is capable of providing sub 1 meter accuracy stand alone, sub 6 cm accuracy with PPP-RTK corrections and sub 1 cm with RTK corrections. Combined with the IMU to achieve Sensor Fusion, TW5390 supports the most demanding positioning applications in the most challenging environments such as a dense urban canyon and off-grid positioning.

Interference Resilience

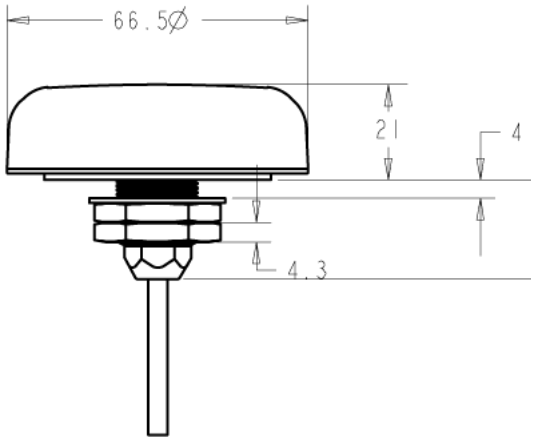
The TW5390 incorporates a latest generation multi-band (L1/L2) GNSS receiver and IMU with a Tallysman Accutenna® multi-band (L1/L2/L-Band) triple band dual feed patch. The state of the art GNSS receiver supports concurrent tracking of all four major constellations (GPS, BeiDou, Galileo and GLONASS) in multiple frequency bands. The multi-band (L1/L2) architecture is highly effective method for the removal of ionospheric error. The TW5390 employs multi-stage filtering with low noise figure LNAs, combined with the dual feed Accutenna®, which greatly improves the rejection of multi-path signal interference. The IMU Sensor Fusion further mitigates effects of severe multi-path reflections and provides continuous position availability during periods of GNSS signal obstruction offering exceptional performance to meet the most challenging precise positioning applications.

Precise Point Positioning

The TW5390 offers support for a broad range of corrections services (RTCM RTK, networked PPP-RTK or PointPerfect PPP-RTK over L-Band) allowing performance optimization according to each application's unique requirements. The concurrent multi-band (L1/L2) access to all four satellite constellations improves the receiver's convergence capability to deliver a quick, precise and reliable position solution which is resilient to ionospheric errors and improves resilience against interference and jamming.

As an RTK rover, The TW5390 accepts RTCM RTK messaged from a base station, Virtual Reference Station or SPARTN SSR message type via the PointPerfect subscription service.

The TW5390 provides sub 6 cm positioning accuracy in conjunction with PointPerfect PPP-RTK corrections and sub 1 cm accuracy with RTK. TW5390 can receive PointPerfect PPP-RTK corrections over L-Band when outside of terrrestrial networking coverage.



Mechanical Dimensions (mm)

Features

- Improved noise immunity with multi-band u-blox ZED F9R GNSS receiver
- PointPerfect PPP-RTK (networked and L-Band)
- Improved multi-path rejection with Dual feed Accutenna®
- Multi-band GNSS receiver is resilient to ionospheric errors
- High reliability timing with expansive constellation array
- IMU provides continuous availability during periods of signal loss
- Exceptional position performance standalone without correction services
- 5V operation
- RS-422 differential (or RS-232) signalling
- Industrial grade IP69K enclosure
- Rugged fixed mount
- Multiple cable lengths (5m, 15m and 25m)
- Available with conical radome

TW5390 Smart GNSS Antenna

Specifications

Antenna

Architecture	Multi-band (L1/L2), Dual Feed
Axial Ratio	L1: < 1 dB typical.
Frequencies	GPS L1C/A L2C, GLO L1OF L2OF, GAL E1B/C E5b, BDS B1I B2I, QZSS L1C/A L2C
SBAS L1 C/A	WAAS, EGNOS, MSAS, GAGAN
Channels	184-channel u-blox F9 engine
Anti-jamming	Active CW detection
Corrections Receiver	L-Band PPP-RTK (SSR)

Interface

Pwr, Gnd

33-5390-09-yy-zz	Data, Timepulse: RS-422 levels
33-5390-29-yy-zz	Data: RS-232; Timepulse: RS-422

Serial Protocol

Output	NMEA 0183, UBX Binary, RTCM v3.3, SPARTN v2.0
Baud Rate	Configurable
Update Rate	9 Hz (4); 10 Hz (GPS+GAL+BDS); 20 Hz (GPS+GAL); 20 Hz (GPS+GLO); 16 Hz (GP+BDS); 25 Hz (GPS)

Mechanical

Dimensions	66.5 mm dia. x 21 mm H
Weight	135 g
Mounting Method	Industrial grade fixed Mount
Cable Length	5, 15, 25m with RJ45 termination

Electrical

Voltages	5 VDC
Current	0.6 Watts (nominal operating) Measured @ 5VDC supply

Environmental

Operating Temperature	-40℃ to +85℃
Storage Temperature	-40℃ to +85℃
Weatherproof	IP69K
Shock	Vertical axis 50G,other axis 30G 3 axis sweep – 15 min
Vibration	10-200 Hz log sweep 3G

Sensitivity

Tracking & Nav	-160 dBm
Reacquisition	-160 dBm
Hot starts	-158 dBm
Cold starts	-147 dBm

Acquisition

Cold start	25 sec
Aided start	3 sec
Reacquisition	2 sec

Horizontal Posistion Accuracy (4 Constellations)

Standard PVT	1.5m CEP
Standard SBAS	1.0m CEP
Corrected RTK	0.01m + 1ppm CEP
Augmented SPARTN (PPP-RTK)	<0.06m CEP
SPARTN Convergence	<45 sec*

Heading

Dynamic Heading Accuracy	0.3^{o} (30 m/sec)

Timing

Timing Accuracy	30 ns RMS

Ordering Information:

33-5390-09-yy-zz-PC0	(RJ45; Data and Timepulse: RS-422, PC0 = NMEA out, no adaptor cable.)
33-5390-29-yy-zz-PC0	(RJ45; Data: RS-232, Timepulse RS-422, PC0 = NMEA out, no adaptor cable.)

yy = Radome (00=grey conical, 10-grey low profile, 01-white conical, 11=white low profile)
zz = Cable length in meters. Standard is 5m. (15m and 25m are special order only)

33-5390-09-yy-zz-PC0 SDK Test Adaptor required for programming	**33-0095-11**
33-5390-29-yy-zz-PC0 SDK Test Adaptor required for programming	**33-0095-6**

About Calian GNSS: With global headquarters and manufacturing in Ottawa, Canada, Calian GNSS is a leading manufacturer of high-precision antennas and components for Global Navigation Satellite System (GNSS) applications. Calian GNSS' mission is to support the needs of a new generation of positioning systems by delivering unprecedented antenna precision at competitive prices. Learn more at **www.calian.com/GNSS**

Contact us:
info.gnss@calian.com
T: +1 613 591-3131

Calian GNSS Ltd.
36 Steacie Drive,
Ottawa ON
K2K 2A9 Canada