HCS885EXF

PRELIMINARY

HCS885EXF Smart Helical GNSS Antenna for High Accuracy UAV

Overview

The HCS885EXF is an embedded multi-band (L1/L5), multi-constellation integrated GNSS receiver/antenna with RTK corrections and PointPerfect® PPP-RTK augmentation compatibility. The HCS885EXF is capable of providing sub 1 meter accuracy stand-alone, sub 1 cm accuracy with RTK corrections and sub 10 cm accuracy with PPP-RTK corrections. It is based on the Tallysman HC885SEXF antenna, making it light-weight and very suited for unmanned aerial vehicle (UAV) applications that require precise location and precise heading.

Interference Resilience

The HCS885EXF incorporates a latest generation multi-band (L1/L5) GNSS receiver with a precision-tuned multi-band Tallysman antenna (L1/L5) that provides excellent axial ratios and operates without the requirement for a ground plane. 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 concurrent multi-band (L1/L5) access to all four satellite constellations improves the receiver's convergence capability to deliver a quick, precise and reliable position solution.

The multi-band architecture is the most effective method for the removal of ionospheric error, and the L5 band provides superior interference and multipath performance vs. L2. The HCS885EXF employs Tallysman eXtended Filter (XF) technology which mitigates near-band and out-of-band interference such as LTE signals and their harmonics, enabling operation in the most challenging deployments.

PPP-RTK, RTK and Heading

The HCS885EXF offers support for corrections services (PPP-RTK - PointPerfect) or RTK base/rover corrections, allowing performance optimization according to an application's unique requirements. The HCS885EXF can be configured as a multi-receiver pair for moving base precise heading applications. HCS88EXF mounts flush. Control, corrections and position output are delivered over a 6 pin JST receptacle connector inset into the base.

Features

- Improved noise immunity with multi-band GNSS receiver
- Excellent RH circular polarized signal reception
- Multi-band receiver has high immunity to ionospheric errors
- Light-weight precision-tuned helical element; with excellent axial ratios and Tallysman eXtended Filtering
- Extreme light weight (8 g) embedded packaging

- Exceptional position performance (Stand-alone or corrected)
- PPP-RTK: PointPerfect® Augmentation
- RTK Base/Rover configurations and Moving Base Heading
- CMOS signalling with RS232 option
- Industrial grade IP67 enclosure
- Surface Mount with O-ring seal
- 6-pin JST port for Pixhawk standard compatibility

HCS885EXF Smart Helical GNSS Antenna

Specifications

Antenna

Architecture	Multi-band (L1/L5), helical
Axial Ratio	≤ 0.5 dB at Zenith.
PCV	±3 mm
Frequencies	GPS/QZSS: L1 C/A, L5; GLO: L1OF; GAL: E1-B/C, E5a; BDS: B1l & B2a
SBAS L1 C/A	WAAS, EGNOS, MSAS L1Sb, GAGAN
Channels	184-channel u-blox F9 engine
Anti-jamming	Active Continuous Wave detection

Interface

Pwr, Gnd	
Tx1, Rx1	CMOS levels, RS232 Optional.
Connector	6 Position Receptacle Connector JST, 1.25 mm
Optional Tx2, Rx2 or Timepulse	CMOS Levels

Serial Protocol

Output	NMEA 0183, UBX Binary, RTCM v3.3, SPARTN v2.0
Baud Rate	Configurable
Update Rate (PVT)	7 Hz (4); 8 Hz (GPS+GAL+BDS); 18 Hz (GPS+GAL); 20 Hz (GPS+GLO); 11 Hz (GPS+BDS); 25 Hz (GPS)

Mechanical

Dimensions	38.75 mm dia. x 41.11 mm H
Weight	8 g
Mounting Method	Customer Defined
Cable Length	none

Electrical

Voltages	5 VDC
Current	TBD

Environmental

Operating Temperature	-40℃ to +85℃
Storage Temperature	-40℃ to +85℃
Weatherproof	IP67
Shock	Vertical axis 50G,other axis 30G 3 axis sweep – 15 min
Vibration	10-200 Hz log sweep 3G

Sensitivity (4 Constellations)

Tracking & Nav	-167 dBm
Reacquisition	-160 dBm
Hot starts	-157 dBm
Cold starts	-148 dBm

Acquisition (4 Constellations)

Cold start	27 sec
Aided start	4 sec
Reacquisition	3 sec

Position and Velocity Accuracy (4 Constellations)

Horizontal PVT/SBAS/RTK (CEP)	1.5m/ 1.0m/ 0.01+1ppm
Horizontal PPP-RTK (CEP)	<0.1m SPARTN;
Vertical PVT/SBAS/RTK (R50)	2.0m/ 1.5m/ 0.01m+1ppm
Vertical PPP-RTK (R50)	<0.20m SPARTN;
Typical Convergence	<12s RTK; <65s SPARTN;
Velocity accuracy	0.05m/s

Heading

Dynamic Heading Accuracy	0.3°
Precise Heading Accuracy	TBD

Timing (optional)

Timing Accuracy	30 ns RMS

Ordering Information:

33-HCS885EXF-x9-PC0 (PCO = NMEA out, no cable.)
x = Interface. 4 = CMOS, 2 = RS-232

HCS885XF Test Adaptor required for programming 33-0095-6 (5V RS-232)

Please refer to the Ordering Guide for the current and complete list of available product options.

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About Tallysman: With global headquarters and manufacturing in Ottawa, Canada, Tallysman is a leading manufacturer of high-precision antennas and components for Global Navigation Satellite System (GNSS) applications. Tallysman's 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.tallysman.com**

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

www.tallysman.com