

HCS885XF Datasheet

HCS885XF L1/L5 Smart GNSS Helical Antenna for Precise Heading

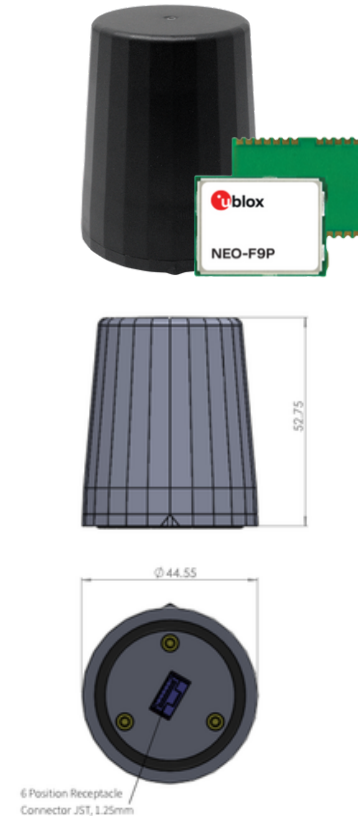
Overview

The HCS885XF is a multi-band (L1/L5), multi-constellation integrated GNSS receiver/antenna with RTK corrections and PointPerfect Flex® PPP-RTK augmentation compatibility. The HCS885XF 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. It is capable of moving base RTK Precise Heading, and can act as either base or rover. It is based on the Calian HC885SXF antenna, making it light-weight and very suited for unmanned aerial vehicle (UAV) applications that require precise location and precise heading.

Interference Resilience

The HCS885XF incorporates a latest generation multi-band (L1/L5) GNSS receiver IMU with a Tallysman precision tuned multi-band (L1/L5) helical antenna 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 HCS885XF 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.



Mechanical Dimensions (mm)

PPP-RTK, RTK and Precise Heading

The HCS885XF supports PointPerfect Flex PPP-RTK augmentation, over network connections, and RTK base/rover capability, with moving base RTK Precised Heading, particularly useful for UAV and robotic applications. The HCS885XF can be configured as a multi-receiver base/rover pair. Combining fast survey-in of the base unit with moving base RTK enhances the location accuracy as well as the heading accuracy. HCS885XF mounts flush with three threaded inserts for secure attachment and provides a rubber O-ring around the outer edge for seal. Control, corrections and position output are delivered via a 6 pin JST receptacle connector inset into the base.

Features:

- Improved noise immunity with multi-band u-blox NEO F9P GNSS receiver
- PointPerfect Flex PPP-RTK (networked)
- RTK Base/Rover configurations and Moving Base RTK Precise Heading
- Excellent Right-Hand circular polarized signal reception
- Multi-band GNSS receiver has high resilience to ionospheric errors
- Light-weight precision-tuned helical element; with excellent axial ratios and Calian's Tallysman extended Filtering
- 5V operation
- CMOS signalling with RS232 option
- Industrial grade IP69K enclosure
- Surface mount with O-ring seal
- 6-pin JST port for Pixhawk framework compatibility

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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: B1I & 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
HCS885XF-29.....Data, opt. timepulse or TX2/RX2: RS-232
HCS885XF-49.....Data, opt. timepulse or TX2/RX2:
3.3V CMOS
Connector.....6 Position JST Receptacle Connector,
1.25mm pitch

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.....44.55 mm dia. x 52.75 mm H
Weight.....38 g
Mounting Method.....3x M2.5 screws
Cable Length.....no cable

Electrical

Voltages.....5 VDC
Current.....TBD

Environmental

Operating Temperature..... -40°C to $+85^{\circ}\text{C}$
Storage Temperature..... -40°C to $+85^{\circ}\text{C}$
Weatherproof.....IP69K
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

Cold start.....27 sec
Aided start.....3 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)..... $<0.1\text{m}$ SPARTN;
Vertical PVT/SBAS/RTK (R50).....2.0m/1.5m/0.01m+1ppm
Vertical PPP-RTK (R50)..... $<0.20\text{m}$ SPARTN;
Typical Convergence..... $<12\text{s}$ RTK; $<65\text{s}$ SPARTN;
Velocity accuracy.....0.05m/s

Heading

Dynamic Heading Accuracy..... 0.3°
Precise Heading Accuracy.....TBD

Timing

Timing Accuracy.....30 ns RMS

Ordering Information:

33-HCS885XF-29-PC0 (JST 6 pos. receptacle, 1.25mm; Data, Timepulse, RS-232; PC0 = NMEA out, no adaptor cable)
33-HCS885XF-49-PC0 (JST 6 pos. receptacle, 1.25mm; Data, Timepulse, CMOS; PC0 = NMEA out, no adaptor cable)
33-HCS885XF-79-PC0 (JST 6 pos. receptacle, 1.25mm; Data, Tx2, Rx2: CMOS; PC0 = NMEA out, no adaptor cable)

33-HCS885XF-29-PC0 SDK Test Adaptor required for programming
33-HCS885XF-49-PC0 SDK Test Adaptor cable required for programming

33-0095-16 (5V RS-232)
27-0205-03

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