HC990XF

TALLYSMAN®
A CALIAN® COMPANY

HC990XF Extended-Filter Full-Band GNSS Low-Profile Helical Antenna + L-Band

Frequency Coverage: GPS/QZSS-L1/L2/L5, QZSS-L6, GLONASS-G1/G2/G3, Galileo-E1/E5a/E5b/E6, BeiDou-B1/B2/B2a/B3, NavIC-L5 + L-Band correction services

Overview

The patented HC990XF eXtended-filter low-profile helical antenna is designed for precision positioning, covering the GPS/QZSS-L1/L2/L5, QZSS-L6, GLONASS-G1/G2/G3, Galileo-E1/E5a/E5b/E6, BeiDou-B1/B2/B2a/B3, and NavIC-L5 frequency bands, including the satellite-based augmentation system (SBAS) available in the region of operation [WAAS (North America), EGNOS (Europe), MSAS (Japan), or GAGAN (India)], as well as L-band correction services.

The patent-pending HC990XF utilizes Tallysman's latest wideband helical element design. The antenna element provides 67 MHz of signal bandwidth supporting the entire upper GNSS band and L-Band corrections (1539 - 1606 MHz) and 136 MHz of the lower band signal bandwidth (1164 - 1300 MHz). The other key component of the antenna is the axial ratio, which is a measure of how well the antenna captures the broadcast Right Hand Circular Polarized (RHCP) signal and mitigates the reflected LHCP signals. The Tallysman HC990XF has a high peak gain of 2.5 dBi and 0.5 dB axial ratio at zenith, enabling excellent multipath mitigation and a very precise phase centre.

Weighing only 45 gms, the light and compact HC990XF features a precision-tuned helix element that provides excellent axial ratios and operates without the requirement of a ground plane, making it ideal for a wide variety of applications, including unmanned aerial vehicles (UAVs).

The HC990XF antenna supports Tallysman's eXtended Filtering (XF) technology. Worldwide the radio frequency spectrum has become congested as many new LTE bands have been activated, and their signals or harmonic frequencies can affect GNSS antennas and receivers. In North America, the planned Ligado service, which will broadcast in the frequency range of 1526 to 1536 MHz, can affect GNSS signals. Similarly, new LTE signals in Europe [Band 32 (1452 – 1496 MHz)] and Japan [Bands 11 and 21 (1476 – 1511 MHz)] have also affected GNSS signals. Tallysman's XF technology mitigates all these signals.

Applications

- Autonomous unmanned aerial vehicles (UAVs)
- Precision GNSS positioning
- Precision land survey positioning
- Mission-critical GNSS timing
- Marine and avionics systems

Features

- Very low noise preamp (2.5 dB typ.)
- Axial ratio (≤ 0.5 dB at zenith)
- High LNA gain (28 dB typ. | 35 dB typ.)
- Low current (25 mA typ. | 31 mA typ.)
- ESD circuit protection (15 kV)
- Invariant performance from 2.2 to 16 VDC
- REACH and RoHS compliant

Benefits

- Extremely light (45 g)
- Excellent RH circular polarized signal reception
- Great multipath rejection
- Increased system accuracy
- Excellent signal-to-noise ratio
- Industrial temperature range

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**

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Antenna

Technology Full-spectrum, RHCP quadrifilar helix

		Gain	Axial Ratio
		dBic typ. at Zenith	dB at Zenith
GNSS			
GPS / QZSS	L1	2.5	≤ 0.5
	L2	2.2	≤ 0.5
	L5	1.8	≤ 0.5
GLONASS	G1	2.5	≤ 0.5
	G2	2.5	≤ 0.5
	G3	2.0	≤ 0.5
Galileo	E1	2.5	≤ 0.5
	E5A	1.8	≤ 0.5
	E5B	2.0	≤ 0.5
	E6	2.8	≤ 0.5
BeiDou	B1	2.5	≤ 0.5
	B2	2.0	≤ 0.5
	B2a	1.8	≤ 0.5
	B3	2.9	≤ 0.5
IRNSS / NavIC	L5	1.8	≤ 0.5
QZSS	L6	2.8	≤ 0.5
L-Band Services (1525 MHz - 1559 MHZ)		2.0	≤ 0.5
Satellite Communications			
Iridium		-	-
Globalstar		-	-
Other			
Axial Ratio at 10°	-	Efficiency	-
PC Variation	TBD	PCO	

Mechanicals

Mechanical Size	65.50 mm (dia.) x 37.50 mm (h.)
Weight	45 g
Radome	EXL9330
Mount	3x M2.5 screws
Available Connectors	SMA Male

Environmental

Operating Temperature	-45 °C to +85 °C
Storage Temperature	-55 °C to +95 °C
Vibration	TBD
Shock	TBD
Salt Fog	TBD
IP Rating	IP67
Compliance	IPC-A-610, FCC, RED / CE Mark, RoHS, REACH

Warranty:

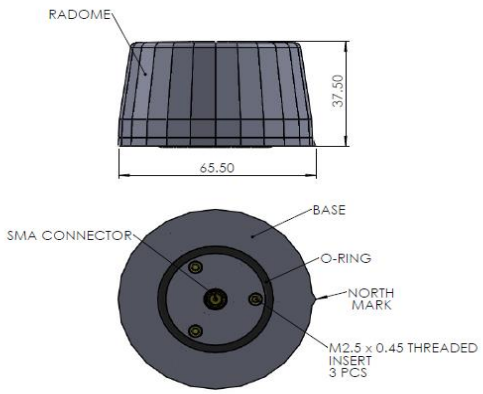
Parts and Labour 3-year standard warranty

Low Noise Amplifier (LNA) - Measured at 3V and 25°C

Frequency Bandwith		Out of Band Rejection
Lower Band	1164 - 1300 MHz	≥ 85 dB @ ≤ 0950 MHz ≥ 70 dB @ ≤ 1125 MHz ≥ 75 dB @ ≥ 1350 MHz
L-Band - Correction Services	1164 - 1300 MHz	-
Upper Band	1559 - 1606 MHz	≥ 65 dB @ ≤ 1500 MHz ≥ 45 dB @ ≤ 1525 MHz ≥ 05 dB @ ≤ 1536 MHz ≥ 30 dB @ ≥ 1626 MHz ≥ 65 dB @ ≥ 1650 MHz

Architecture	Pre-filter → LNA
Gain	28 dB typ. | 35 dB typ.
Noise Figure	2.5 dB typ.
VSWR	< 1.5:1 typ. | 1.8:1 max.
Supply Voltage Range	2.2 to 16 VDC
Supply Current	25 mA typ. (28 dB) | 31 mA typ. (35 dB)
ESD Circuit Protection	15 kV air discharge
P 1dB Output	13.3 dBm @ L1 | 13.1 dBm @ L2/L6
Group Delay	21 ns @ L1 | 3 ns @ L2 | 31 ns @ L5 | 48 ns @ L5

Mechanical Diagram



Ordering Information

Part Number **33-HC990XF-xx**

where xx=28 dB or 35 dB Gain

Please refer to our **Ordering Guide** to review available radomes and connectors at:
https://www.tallysman.com/resource/tallysman-ordering-guide/