

HC977



HC977 Triple-Band Helical Antenna + L-Band

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

Overview

The patented HC977 helical antenna is designed for precision positioning, covering the GPS/QZSS-L1/L2/L5, GLONASS-G1/G2/G3, Galileo-E1/E5a/E5b, BeiDou-B1/B2/B2a, 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.

Weighing only 42 g, the light and compact HC977 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 HC977 features an industry-leading low current, low-noise amplifier (LNA) that includes an integrated low-loss pre-filter to prevent harmonic interference from high-amplitude signals, such as 700 MHz band LTE and other nearby in-Band cellular signals.

All Tallysman housed helical antenna elements are protected by a robust military-grade IP69K-compliant plastic enclosure. The enclosure's base provides two threaded inserts for secure attachment, as well as a rubber O-ring around the outer edge to seal the antenna base and its integrated male SMA connector.

Tallysman's helical family has passed a rigorous 30-hour vibration test procedure, consisting of five cycles of 2-hour tests per axis (x, y, z):

- Cycle 1: 1.05 Grms;
- Cycle 2: 1.20 Grms;
- Cycle 3: 1.35 Grms;
- Cycle 4: 3.67 Grms;
- Cycle 5: 3.67 Grms.

For mounting instructions, visit:

https://www.tallysman.com/downloads/Helical_Mounting_Instruction.pdf



Applications

- Autonomous unmanned aerial vehicles (UAVs)
- Precision GNSS positioning
- Precision land survey positioning
- Mission-critical GNSS timing
- Network timing and synchronization
- Sea and land container tracking
- Fleet management and asset tracking
- Marine and avionics systems
- Law enforcement and public safety

Features

- Very low noise preamp (1.6 dB typ.)
- Axial ratio (≤ 0.5 dB at zenith)
- LNA gain (28 dB typ. | 35 dB typ.)
- Low current (15 mA typ. | 21 mA typ.)
- ESD circuit protection (15 kV)
- Invariant performance from 2.2 to 16 VDC
- IP69K, REACH, and RoHS compliant

Benefits

- Extremely light (42 g)
- Ideal for RTK and PPP surveying systems
- Excellent RH circular polarized signal reception
- Great multipath rejection
- Increased system accuracy
- Excellent signal-to-noise ratio
- Industrial temperature range
- Rugged design, ideal for harsh environments

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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+ L-Band correction services

Antenna

Technology Triple-frequency, RHCP quadrifilar helix

		Gain	Axial Ratio
		dBic typ. at Zenith	dB at Zenith
GNSS			
GPS / QZSS	L1	2.5	≤ 0.5
	L2	2	≤ 0.5
	L5	1	≤ 0.5
GLONASS	G1	1.5	≤ 0.5
	G2	1.1	≤ 0.5
	G3	2.6	≤ 0.5
Galileo	E1	2.5	≤ 0.5
	E5A	1.1	≤ 0.5
	E5B	2.2	≤ 0.5
	E6	-	-
BeiDou	B1	2.5	≤ 0.5
	B2	2.7	≤ 0.5
	B2a	1	≤ 0.5
	B3	-	-
IRNSS / NavIC	L5	1	≤ 0.5
QZSS	L6	-	-
L-Band Services (1525 MHz - 1559 MHz)		1.5	≤ 0.5
Satellite Communications			
Iridium		-	-
Globalstar		-	-
Other			
Axial Ratio at 10°	-	Efficiency	-
PC Variation	± 3.0 mm (all freq.)	PCO	-

Mechanicals

Mechanical Size	44.2 mm (dia.) x 62.4 mm (h.)
Weight	42 g
Radome	3x M2.5 screws
Mount	SMA (male)
Available Connectors	Radome and Base: EXL9330

Environmental

Operating Temperature	-40 °C to + 85 °C
Storage Temperature	-50 °C to + 95 °C
Vibration	MIL-STD-810E - Test method 514.5
Shock	MIL-STD-810E - Test method 514.5
Salt Fog	-
IP Rating	IP69K
Compliance	IPC-A-610, FCC, RED / CE Mark, RoHS, REACH

Warranty:

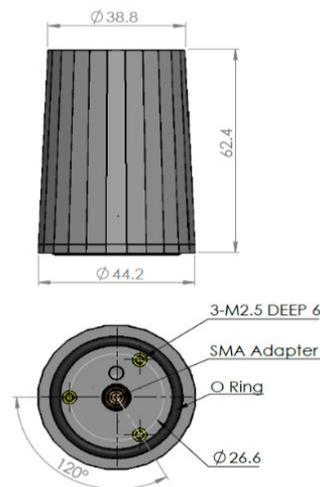
Parts and Labour	3-year standard warranty
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Low Noise Amplifier (LNA) - Measured at 3V and 25°C

Frequency Bandwidth		Out of Band Rejection
Lower Band	1160 - 1255 MHz	Pre-filter → LNA
L-Band - Correction Services	1160 - 1255 MHz	
Upper Band	1559 - 1606 MHz	> 36 dB @ < 1400 MHz > 44 dB @ < 1450 MHz > 28 dB @ > 1700 MHz

Architecture	28 dB typ. 35 dB typ.
Gain	1.6 dB typ.
Noise Figure	< 1.5:1 typ. 1.8:1 max.
VSWR	2.2 to 16 VDC
Supply Voltage Range	15 mA typ. (28 dB) 21 mA typ. (35 dB)
Supply Current	15 kV air discharge
ESD Circuit Protection	22.7 dBm @ L1 25.1 dBm @ L2/L5
P 1dB Output	2 ns @ L1 5 ns @ L2
Group Delay	2 ns @ L1 5 ns @ L2

Mechanical Diagram



Ordering Information

Part Number	33-HC977-xx
	where xx = gain (28 or 35 dB)

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