# HC975

TALLYSMAN®

When **precision** matters.®

## HC975 Triple-band Helical Antenna + L-band

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

The HC975 helical antenna is designed and crafted for precision positioning, covering the GPS/QZSS-L1/L2/L5, GLONASS-G1/G3, Galileo-E1/E5, 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 lightweight and compact HC975 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 HC975 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 near in-band cellular signals.

All Tallysman® helical antenna elements are protected by a robust military-grade IP67-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 SMA connector.

Tallysman®'s HC975 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.

### 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
- Axial ratio: ≤ 0.5 dB at zenith
- LNA gain: 28 dB typ. or 35 dB typ.
- Low current: 15 mA typ. or 21 mA typ.
- ESD circuit protection: 15 kV
- Invariant performance from 2.2 to 16 VDC
- IP67, REACH, and RoHS compliant

### Benefits

- Extremely lightweight (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**

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

Revision: 1.0

# HC975 Triple-band Helical Antenna + L-band

**Frequency Coverage:** GNSS/QZSS-L1/L2/L5, GLONASS-G1/G3, Galileo-E1/E5a/E5b, BeiDou-B1/B2/B2a, NavIC-L5 + 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** | 2.6 | ≤ 0.5 |
| | **L2** | 1.6 | ≤ 0.5 |
| | **L5** | 0.0 | ≤ 0.5 |
| **GLONASS** | **G1** | 1.8 | ≤ 0.5 |
| | **G2** | - | - |
| | **G3** | 2.6 | ≤ 0.5 |
| **Galileo** | **E1** | 2.6 | ≤ 0.5 |
| | **E5a** | 0.0 | ≤ 0.5 |
| | **E5b** | 2.6 | ≤ 0.5 |
| | **E6** | - | - |
| **BeiDou** | **B1** | 2.5 | ≤ 0.5 |
| | **B2** | 2.6 | ≤ 0.5 |
| | **B2a** | 0.0 | ≤ 0.5 |
| | **B3** | - | - |
| **IRNSS / NavIC** | **L5** | - | ≤ 0.5 |
| **QZSS** | **L6** | - | - |
| **L-band correction services** | | 1.5 | ≤ 0.5 |
| **Satellite Communications** | | | |
| **Iridium** | | - | - |
| **Globalstar** | | - | - |
| **Phase Centre** | | | |
| **Phase Centre Variation (PCV)** | | ± 3.0 mm (all freq.) | |
| **Phase Centre Offset (PCO)** | | 32 mm @ L1 \|37 mm @ L2/L5 | |

## Mechanicals

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

## Environmental

| | |
|---|---|
| **Operating Temperature** | -40 °C to + 85 °C |
| **Storage Temperature** | -50 °C to + 95 °C |
| **Random Vibration** | MIL-STD-810E - Test method 514.5<br>4 hours per axis (x, y, z) at 3.674 Grms |
| **Shock and Drop** | - |
| **Salt Fog** | - |
| **IP Rating (housing)** | IP67 |
| **Compliance** | IPC-A-610, FCC, RED / CE Mark, RoHS, REACH |

## Warranty:

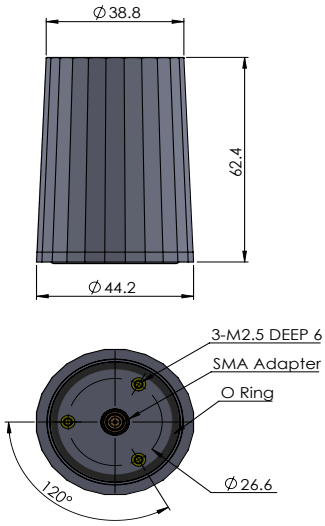
| | |
|---|---|
| **Parts and Labour** | 3-year standard warranty |

## Low Noise Amplifier (LNA) - Measured at 3.0 VDC and 25°C

| Frequency Bandwith | | Out-of-Band Rejection |
|---|---|---|
| **Lower Band** | **1160 - 1255 MHz** | **> 63 dB @ < 1000 MHz**<br>**> 38 dB @ < 1100 MHz**<br>**> 57 dB @ < 1325 MHz** |
| **L-band corrections services** | **1539 - 1559 MHz** | |
| **Upper Band** | **1559 - 1606 MHz** | **> 36 dB @ < 1400 MHz**<br>**> 44 dB @ < 1450 MHz**<br>**> 28 dB @ > 1700 MHz** |

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

## Mechanical Diagram




## Ordering Information

**Part Number** **33-HC975-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/**