

# TW3972



## TW3972 Triple-Band GNSS Antenna + L-Band

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

### Overview

The TW3972 is a precision-tuned triple-band Accutenna® technology antenna providing triple-band GPS/QZSS-L1/L2/L5, GLONASS-G1/G2/G3, Galileo-E1/E5a/E5b, BeiDou-B1/B2/B2a, NavIC-L5, including the satellite-based augmentation system (SBAS) available in the region of operation [WAAS (North America), EGNOS (Europe), MSAS (Japan), or GAGAN (India)], plus L-Band correction services coverage, and is especially designed for precision triple-frequency positioning.

Ideal for train control sensors, autonomous vehicle tracking and guidance, precision agriculture, and other applications where precision matters, The TW3972 provides superior multipath signal rejection, a linear phase response, and tight phase centre variation (PCV).

The TW3972 features a precision-tuned, twin circular dual-feed, stacked patch element. The signals from the two orthogonal feeds are combined in a hybrid combiner, amplified in a wideband LNA, then band-split for narrow filtering in each band and further amplified prior to recombination at the output. The antenna also has a strong pre-filter to mitigate inter-modulated signal interference from LTE and other cellular bands. The TW3972 offers excellent axial ratio and a tightly grouped phase centre variation.

The TW3972 meets all requirements of the Association of American Railroads (AAR)'s Electronics Environmental Requirements and System Management Standard (S-9401.V1.0). In addition, it is also compliant with the EN45545-2, EN50121, EN50155, and EN61373 standards.

The TW3972 is housed in a through-hole mount, weatherproof enclosure for permanent installations. L-bracket (PN 23-0040-0) or pipe mount (23-0065-0) are available. A 100 mm ground plane is provided with the antenna, which ensures optimal performance. This antenna is also available in an OEM format: TW3967XF (28 dB) and TW3972EXF (35 dB).



### Applications

- Autonomous vehicle tracking and guidance
- Positive Train Control (PTC)
- Positive Train Location (PTL)
- Precision GNSS position
- Precision agriculture
- Triple-frequency RTK and PPP receivers
- Law enforcement and public safety

### Features

- Very low noise preamp (< 2.5 dB typ.)
- Low axial ratio (< 2.0 dB typ.)
- Tight phase centre variation
- High-gain LNA (37 dB typ.)
- Low current (24 mA typ.)
- ESD circuit protection (15 kV)
- Invariant from 2.5 to 16 VDC

### Benefits

- Excellent multipath rejection
- Increased system accuracy
- Excellent signal-to-noise ratio
- IP69K, REACH, RoHS, and S-9401.V1.0 compliant
- EN45545-2, EN50121, EN50155, and EN61373 compliant
- AAR Certified

**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](http://www.tallysman.com)

**Contact us:**  
[info@tallysman.com](mailto:info@tallysman.com)  
T: +1 613 591-3131

# TW3972 Triple-Band GNSS Antenna + L-Band

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

Antenna			
Technology	Dual-feed Stacked RHCP ceramic patch		
		Gain dBic typ. at Zenith	Axial Ratio dB at Zenith
<b>GNSS</b>			
GPS / QZSS	L1	4	< 1.0
	L2	4	< 1.0
	L5	-1.5	< 1.5
GLONASS	G1	2.5	< 1.5
	G2	2.5	< 1.5
	G3	2.5	< 1.5
Galileo	E1	4	< 1.0
	E5A	-1.5	< 1.5
	E5B	2.5	< 1.5
	E6	-	-
BeiDou	B1	4	< 1.0
	B2	2.5	< 1.5
	B2a	-1.5	< 1.5
	B3	-	-
IRNSS / NavIC	L5	-1.5	< 1.5
QZSS	L6	-	-
L-Band Services (1525 MHz - 1559 MHz)		3.5	< 1.0
<b>Satellite Communications</b>			
Iridium		-	-
Globalstar		-	-
<b>Other</b>			
Axial Ratio at 10°	-	Efficiency	-
PC Variation	± 10 mm	PCO	-

Mechanicals	
Size	66 mm (dia.) x 21 mm (h.) 100 mm ground plane provided
Weight	185 g
Radome	Radome: EXL9330, Base: Zamak White Metal
Mount	19 mm through hole
Available Connectors	Please refer to ordering guide

Environmental	
Operating Temperature	-70 °C to 85 °C
Storage Temperature	-70 °C to 95 °C
Vibration	MIL-STD-810D Method 514.4 and 514.5
Shock	MIL-STD-810G Method 516.6
Salt Fog	MIL-STD-810F Method 509.4
IP Rating	IP69K
Compliance	IPC-A-610, FCC, RED / CE Mark, RoHS, REACH, S-9401.V1.0, EN45545-2, EN50121, EN50155, EN61373

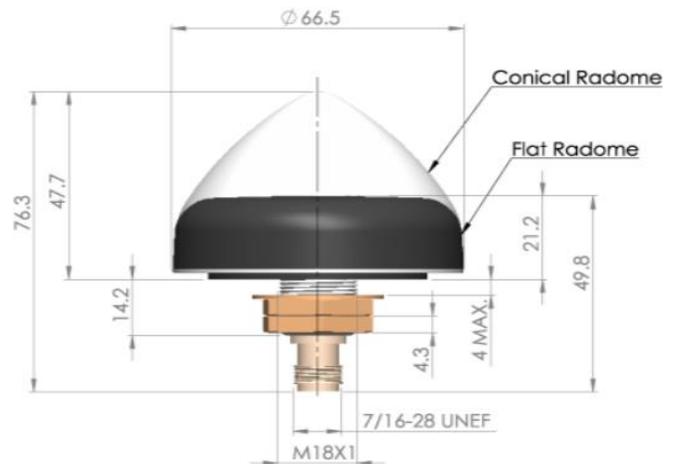
Warranty:	
Parts and Labour	3-year standard warranty

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

	Frequency Bandwidth	Out of Band Rejection
Lower Band	1160 - 1255 MHz	≥ 45 dB @ ≤ 1050 MHz ≥ 30 dB @ ≤ 1125 MHz ≥ 45 dB @ ≥ 1350 MHz
L-Band - Correction Services	1540 - 1559 MHz	-
Upper Band	1559 - 1606 MHz	≥ 30 dB @ ≤ 1450 MHz ≥ 30 dB @ ≥ 1690 MHz ≥ 40 dB @ ≥ 1730 MHz

Architecture	Pre-filter → LNA stage 1 → filter → LNA stage 2
Gain	37 dB typ.   35 dB min.
Noise Figure	2.5 dB typ. @ 25 °C
VSWR	< 1.5:1 typ.   1.8:1 max.
Supply Voltage Range	2.5 to 16 VDC nominal, up to 50mV p-p ripple
Max. Input Power	24 mA typ. @ 25 °C
ESD Circuit Protection	15 kV air discharge
P 1dB Output	-
Group Delay	12 ns @ (L1+G1)   4.8 ns @ (G3+L2+G2)

## Mechanical Diagram



## Ordering Information

Part Number **33-3972-xx-yy-zzzz**

where xx = connector type, yy = shape and colour of radome, and zzzz = cable length in mm

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