# 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

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' 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 recommended for all installations. 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.)
- ullet ESD circuit protection (15 kV)
- Invariant performance from 2.5 to 16 VDC
- IP69K, REACH, RoHS, and S-9401.V1.0 compliant
- EN45545-2, EN50121, EN50155, and EN61373 compliant

#### **Benefits**

- Excellent multipath rejection
- Increased system accuracy
- Excellent signal-to-noise ratio

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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**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	Axial Ratio		
		dBic typ. at Zenith	dB at Zenith		
GN	ISS				
	L1	4.0	< 1.0		
GPS / QZSS	L2	4.0	< 1.0		
	L5	-1.5	< 1.5		
	G1	2.5	< 1.5		
GLONASS	G2	2.5	< 1.5		
	G3	2.5	< 1.5		
	E1	4.0	< 1.0		
Galileo	E5a	-1.5	< 1.5		
Ganteo	E5b	2.5	< 1.5		
	E6	-	-		
	B1	4.0	< 1.0		
BeiDou	B2	2.5	< 1.5		
BeiDou	B2a	-1.5	< 1.5		
	В3	-	-		
IRNSS / NavIC	L5	-1.5	< 1.5		
QZSS	L6	-	-		
L-band correction services		3.5	< 1.0		
Satellite Communications					
Iridium		-	-		
Globalstar		-	-		
Other					
Axial Ratio at 10°		Efficiency	-		
Phase Centre Variation ± 10 mm					

#### Mechanicals

Mechanical Size 66 mm (dia.) x 21 mm (h.)

[100 mm ground plane recommended]

Weight 185 g

Available Connectors see Ordering Guide

Radome / Enclosure Radome: EXL9330, Base: Zamak White Metal

Mount Through-hole

#### Environmental

Operating Temperature -70 °C to 85 °C Storage Temperature -70 °C to 95 °C

Mechanical Vibration MIL-STD-810D Method 514.4 and 514.5

Shock and Drop MIL-STD-810G Method 516.6
Salt Fog MIL-STD-810F Method 509.4

Low Pressure - Altitude -

IP Rating (housing) 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 3.0 VDC and 25°C

Frequency Ban	Out-of-Band Rejection	
Lower Band	1160 - 1255 MHz	≥ 45 dB @ ≤ 1050 MHz ≥ 30 dB @ ≤ 1125 MHz ≥ 45 dB @ ≥ 1350 MHz
L-band corrections services	1539 - 1559 MHz	
Upper Band	1559 - 1606 MHz	≥ 30 dB @ ≤ 1450 MHz ≥ 30 dB @ ≥ 1690 MHz ≥ 40 dB @ ≥ 1730 MHz

**Architecture** Pre-filter  $\rightarrow$  LNA stage 1  $\rightarrow$  filter  $\rightarrow$  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.</td>

**Supply Voltage Range** 2.5 to 16 VDC nominal, up to 50mV p-p ripple

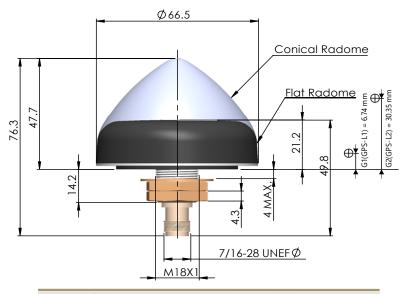
Supply Current 24 mA typ. @ 25 °C ESD Circuit Protection 15 kV air discharge

P 1dB Output -

**Group Delay Variation** 12 ns @ (L1+G1) | 4.8 ns @ (G3+L2+G2)

**Group Delay** 

#### **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/

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