



# GNSS-501 & GNSS-502 Antennas

## USER GUIDE

GM-14915144

Rev 3

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The GNSS-501 and GNSS-502 are active antennas designed to receive signals from GPS, GLONASS, BeiDou and Galileo satellites as well as L-Band signals.

The GNSS-501 antenna is designed to operate in GPS L1, GLONASS L1 and L-Band frequencies. The GNSS-501 also supports Galileo E1 frequency and the BeiDou B1 frequency.

The GNSS-502 antenna is designed to operate in GPS L1/L2, GLONASS L1/L2 and L-Band frequencies. The GNSS-502 also supports the Galileo E1 and E5b frequencies as well as BeiDou B1 and B2 frequencies.

This guide provides the basic information you need to install and begin using your new antenna.

### ADDITIONAL EQUIPMENT REQUIRED

The following equipment is required to set up the GNSS-501 or GNSS-502 antenna:

- Coaxial cable with a male TNC connector
- A device with an antenna input port that both receives the RF signal and provides 3.3 - 18.0 VDC to the antenna (all NovAtel GNSS receivers provide the necessary power through their antenna RF connectors)

### SITE SELECTION GUIDELINES

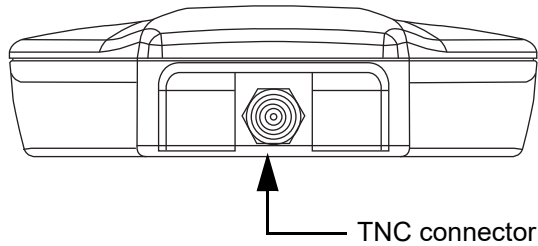
Before installing the antenna, select a site that as closely as possible meets the following conditions for optimal performance:

- An unobstructed line-of-sight from horizon to horizon and at all bearings and elevation angles
- As far as possible from reflective objects, especially those that are above the antenna and any water bodies, which can be a strong source of multipath reflections
- If obstructions and reflective surfaces are within 30 m, ensure the site is as high as possible. Otherwise, mount the antenna as close as possible to a reference ground plane, i.e., rooftop, earth, etc., if one exists.



To avoid potential adverse effects, do not locate antennas near any high sources of heat.

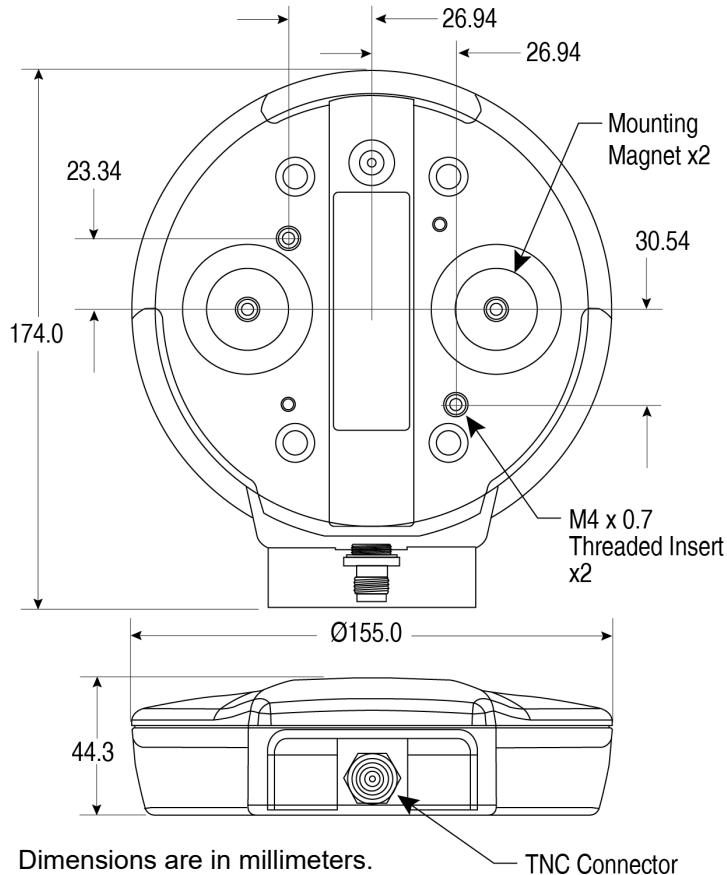
## INSTALLING THE ANTENNA



After a site has been selected, install the antenna as follows:

1. Mount the antenna on a secure, stable structure using the provided magnetic mounts. A surface mounting plate (NovAtel P/N 01018317) is also available for mounting on non-magnetic surfaces.
2. Attach the TNC connector of the coaxial cable to the antenna's TNC connector. Attach the other end of the coaxial cable to the antenna input port of the receiving device, which must provide power as detailed in the *SPECIFICATIONS* section of this guide. All NovAtel GNSS receivers provide the necessary power through their antenna RF connectors.

## MECHANICAL DRAWING






# SPECIFICATIONS

	GNSS-501	GNSS-502
<b>Radio Frequency</b>		
Pass band (typical)	Upper band: 1588.5 ± 23.0 MHz L-Band 1545.0 ± 20.0 MHz	Upper band: 1588.0 ± 23.0 MHz Lower band: 1220.0 ± 31.0 MHz L-Band: 1555.0 ± 10.0 MHz
Out-of-band rejection (typical) band edges ± 50 MHz band edges ± 100 MHz	15 dB (typical) 25 dB (typical)	15 dB (typical) 25 dB (typical)
Gain at zenith ( $\theta = 90^\circ$ ) (min)	L1/B1/E1/G1: +4.0 dBic L-Band: +4.0 dBic	L1/B1/E1/G1: +4.0 dBic L2/B2/G2/E5b: +4.0 dBic L-Band: +4.0 dBic
Gain roll-off (zenith to horizon)	L1/B1/E1/G1/L-Band 12 dB	L1/L2/B1/B2/E1/E5b/ G1/G2/L-Band 12 dB
LNA gain (typical)	29 dB	L1: 34 dB L2: 38 dB
Polarization	Right-hand circular	
Noise figure (typical)	2.5 dB typical	
L1-L2 differential propagation delay (maximum)	-	7 ns
Nominal impedance	50 $\Omega$	
VSWR	$\leq 2.0 : 1$	
<b>Power</b>		
Input voltage	3.3 - 18.0 VDC	
Current (typical)	20 mA	
<b>Environmental</b>		
Operating temperature	-40°C to +85°C (-40°F to +185°F)	
Storage temperature	-55°C to +85°C (-67°F to +185°F)	
Random Vibration (operating)	MIL-STD-810G(CH1), 514.7 Annex E Procedure 1, Category 24	
Salt Fog	MIL-STD-810G(CH1), 509.6	
Shock	MIL-STD-810G(CH1), 516.7 (40 g) Procedure 1	
Bump	IEC 68-2-27 Ea (25 g)	
Water/Dust Resistance	IP67, IP69K	
<b>Physical</b>		
Diameter	155 mm (6.10")	
Weight	450 g (15.88 oz)	

## WEEE NOTICE

If you purchased your GNSS-501 or GNSS-502 antenna in Europe, return it to your dealer or supplier at the end of its life. The objectives of the European Community's environment policy are, in particular, to preserve, protect and improve the quality of the environment, protect human health and utilize natural resources prudently and rationally. Sustainable development advocates the reduction of wasteful consumption of natural resources and the prevention of pollution. Waste electrical and electronic equipment (WEEE) is a regulated area. Where the generation of waste cannot be avoided, it should be reused or recovered for its material or energy. WEEE products may be recognized by their wheeled bin label ()<sup>1</sup>.

## ROHS

The GNSS-501 and GNSS-502 are compliant with the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU.

## REACH

The GNSS-501 and GNSS-502 are compliant with Regulation (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). The Candidate List of Substances of Very High Concern (SVHC) published by the European Chemical Agency (ECHA) is updated occasionally and available at <https://echa.europa.eu/candidate-listtable>. Please contact NovAtel Customer Support if you require further information.

## FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## INNOVATION, SCIENCE AND ECONOMIC DEVELOPMENT (ISED)

This device complies with CAN ICES-003(B) / NMB-3 (B).

## PATENT NOTICE

The GNSS-501 and GNSS-502 antenna is manufactured and protected under U.S. Patents #14/331,948 (patent pending).

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1. See [www.novatel.com](http://www.novatel.com) | [Products](#) | [WEEE and RoHS](#) for more information.

## QUESTIONS OR COMMENTS

If you have any questions or comments regarding your GNSS-501 or GNSS-502 product, contact NovAtel Customer Service using one of these methods

### Log a Case and Search Knowledge:

Website: [www.novatel.com/support](http://www.novatel.com/support)

### Log a Case, Search Knowledge and View Your Case History: (login required)

Web Portal: <https://novatelsupport.force.com/community/login>

### Email:

[support@novatel.com](mailto:support@novatel.com)

### Telephone:

U.S. and Canada: 1-800-NOVATEL (1-800-668-2835)

International: +1-403-295-4900



## GNSS-501 and GNSS-502 Antennas Quick Start Guide

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