



GPS-704-WB

USER GUIDE

GM-14915141

Rev 1

April 2015

The GPS-704-WB is an active antenna that can receive signals from GPS, GLONASS, BeiDou and Galileo satellites as well as L-Band signals. It is designed to operate at the following frequencies:

- GPS L1 (1575.42 MHz), GPS L2 (1227.60 MHz) and GPS L5 (1176.5 MHz)
- GLONASS L1 (1593 - 1609 MHz), GLONASS L2 (1238 - 1254 MHz) and GLONASS L3 (1202 MHz)
- Galileo E1 (1575.42 MHz), Galileo E5a and E5b (1164 - 1215 MHz) and Galileo E6 (1260 - 1300 MHz)
- BeiDou B1 (1561 MHz), BeiDou B2 (1207.14 MHz) and BeiDou B3 (1268.52 MHz)
- L-Band (1525 - 1560 MHz)

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

ADDITIONAL EQUIPMENT REQUIRED

The equipment listed below is required to set up a GPS-704-WB antenna:

- A mount, such as a range pole, tribrach or tripod, with a 5/8" x 11 thread that extends between 3/8" and 7/8" (9 mm and 22 mm)
- A 1" open-end wrench
- Coaxial cable with a male TNC connector
- A device with an antenna input port that both receives the RF signal and provides 4.5 - 18.0 VDC to the antenna. (All NovAtel GNSS receivers provide the necessary power through their antenna RF connectors.)

SITE SELECTION GUIDELINES

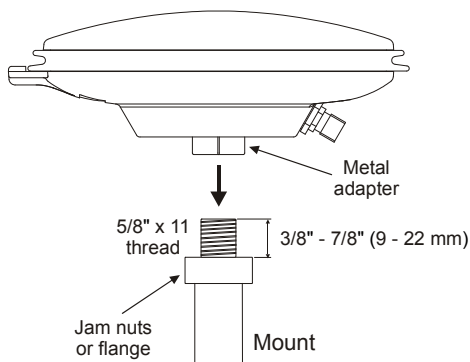
Before installing the antenna, select a site that as closely as possible meets the following conditions for optimal performance:


- 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 low as possible.

INSTALLING THE ANTENNA

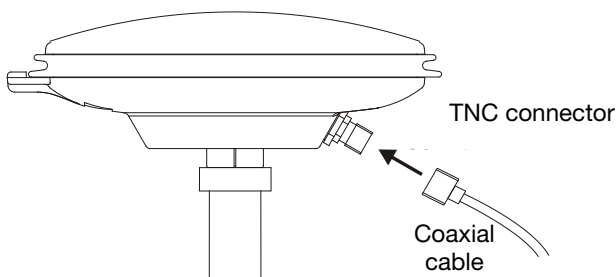
After a site has been selected, install the antenna as follows.

1. Verify that the thread on the mount does not extend more than 7/8" (22 mm) to ensure the plastic inside the antenna receptacle is not damaged when the mount is inserted. If it extends further than 7/8" (22 mm), add two jam nuts to shorten the exposed thread, ensuring the nuts are well-tightened.
2. Align the mount thread with the metal adapter on the bottom of the antenna and rotate the antenna clockwise until it is securely screwed to the mount. Using a wrench, tighten the adapter to the mount.



 The metal adapter on the bottom of the antenna is fixed in place. Do not attempt to remove it.

3. Remove the dust cap from the antenna's connector.
4. Attach the male TNC connector of the coaxial cable to the antenna's TNC connector.

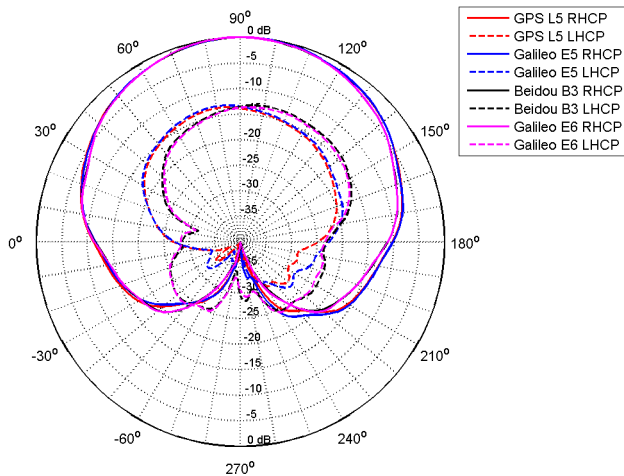
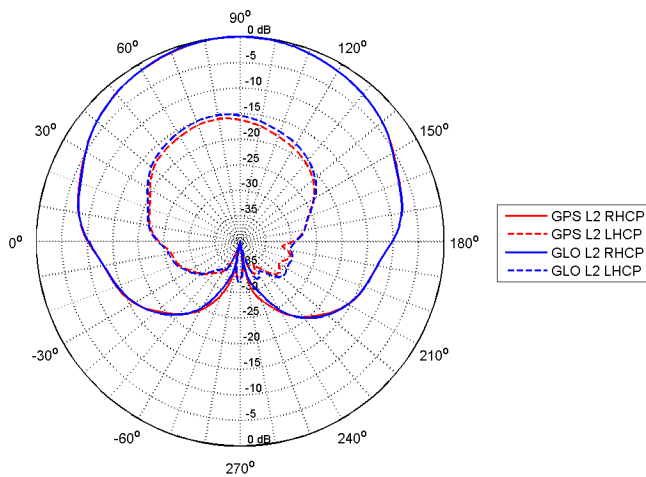
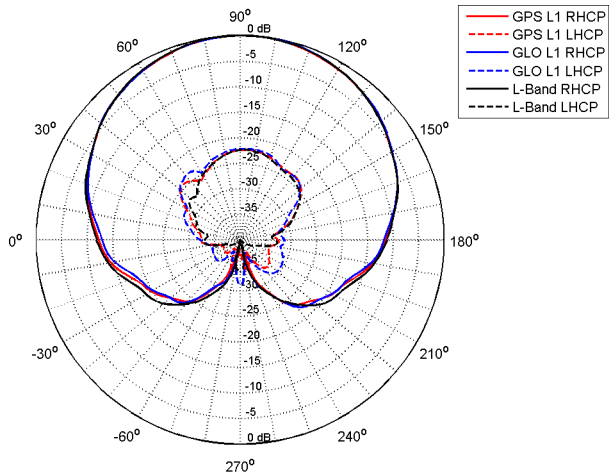


5. Attach the other end of the coaxial cable to the antenna input port of the receiving device. The receiving device must provide power as detailed in the *SPECIFICATIONS* section of this guide. All NovAtel GNSS receivers provide the necessary power through their antenna RF connectors.

ANTENNA CARE

The GPS-704-WB is designed to withstand the elements, including rain, snow and dust. However, to ensure your antenna performs optimally, keep the radome (the top surface of the antenna) clean and brush off any ice and snow. In addition, ensure the connector remains clean and dry and replace the dust cap when a cable is not connected.

ELEVATION GAIN PATTERN

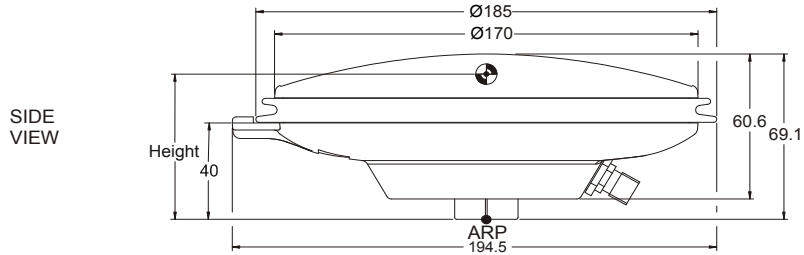
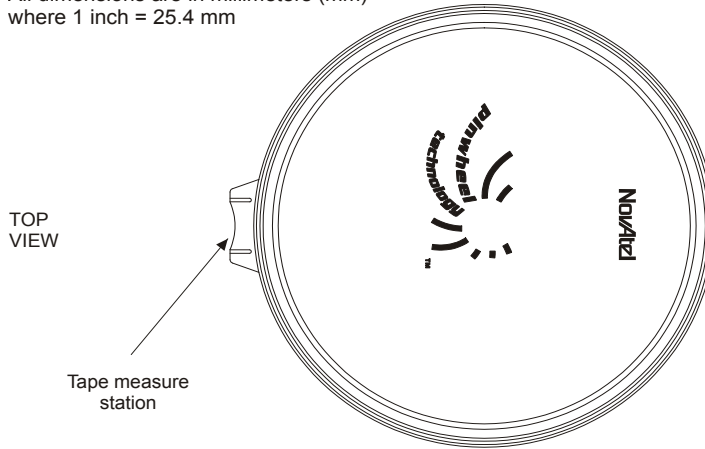


SPECIFICATIONS

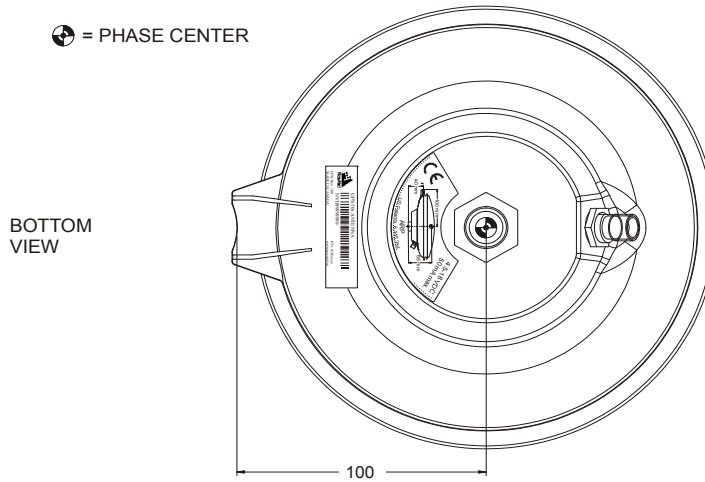
Radio Frequency	
3 dB pass band (typical)	Low Band: 1164 - 1300 MHz High Band: 1525 - 1610 MHz
Out-of-band rejection (typical) L1 ± 100 MHz L2 ± 200 MHz	minimum 30 dBc minimum 50 dBc
Gain at zenith ($\theta = 90^\circ$) (min)	GPS L1, GLO L1, Galileo E1, BeiDou B1: +5 dBic L-Band +4 dBic GPS L2/L5, GLO L2, Galileo E5a/b/E6, BeiDou B2/B3: +3 dBic
Gain roll-off (zenith to horizon)	GPS L1, GLO L1, Galileo E1, BeiDou B1: 12 dB L-Band 12 dB GPS L2/L5, GLO L2, Galileo E5a/b/E6, BeiDou B2/B3: 12 dB
LNA gain (typical)	31 dB
Polarization	Right-Hand Circular
Noise figure (typical)	2.0 dB
L1-L2 differential propagation delay (maximum)	5 ns
Nominal impedance	50 Ω
VSWR	$\leq 2.0:1$
POWER	
Input voltage	+4.5 to +18 VDC
Current (typical)	40 mA
PHYSICAL	
Diameter	185 mm (7.28")
Weight	530 g (17.6 oz)
ENVIRONMENTAL	
Maximum altitude	9000 m (29,527.5 ft)
Operating temperature	-40°C to +85°C (-40°F to +185°F)
Storage temperature	-55°C to +85°C (-67°F to +185°F)
Vibration	Random MIL-STD-810G/CH1, Method 514.7, Category 21 MIL-STD-810G/CH1, Method 514.7, Category 24 MIL-STD-810G/CH1, Method 514.6, Category 4 (Non- Operating) Sinusoidal MIL-STD-810G/CH1, Method 528.1 IEC 60068-2-6, Test Fc
Shock	MIL-STD-810G/CH1, Method 516.7, Procedure I MIL-STD-810G/CH1, Method 516.7, Procedure II
Salt exposure	MIL-STD-810G/CH1, Method 509.6
Water resistance	MIL-STD-810G/CH1, Method 506.6, Procedure 1 IEC 60529, IPX6 & IPX7


MECHANICAL DRAWINGS

All dimensions are in millimeters (mm)
where 1 inch = 25.4 mm

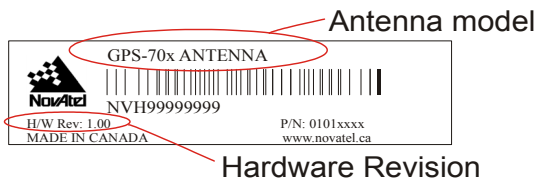


⊕ = PHASE CENTER



 Height = Vertical phase center offset from antenna reference point or antenna reference plane (ARP)

Refer to the *Mechanical Drawings* on the previous panel and the close-up of the label below before reading this section.



i Only integer hardware revisions affect the phase center offsets. For example, the numbers given for hardware revision 2.02 are applicable to an antenna labeled H/W Rev: 2.00, 2.04, 2.12 and so on.

Table 1 shows typical absolute and relative offset numbers for the current GPS-703-GGG antenna model.

Table 1: Phase Center Offset (GPS-703-GGG with TNC)

	Absolute (GEO++) Height
L1	61.5 mm
L2	58.68 mm

NovAtel expects the phase centers of the GPS-704-WB to be comparable by design.

If you need any further advice on this matter, visit our website at www.novatel.com. Other methods of contacting Customer Service can be found on the last panel of this guide.

WARRANTY POLICY

NovAtel Inc. warrants that its Global Navigation Satellite System (GNSS) products are free from defects in materials and workmanship, subject to the conditions set forth below, for the following time periods:

GPSAntenna™ Modules: One (1) Year

Cables and Accessories: Ninety (90) Days

Date of sale shall mean the date of the invoice to the original customer for the product. NovAtel's responsibility respecting this warranty is limited solely to product repair at an authorized NovAtel location only. Determination of repair will be made by NovAtel personnel or by technical personnel expressly authorized by NovAtel for this purpose.

The foregoing warranties do not extend to

- (i) nonconformities, defects or errors in the products due to accident, abuse, misuse or negligent use of the products or use in other than a normal and customary manner, environmental conditions not conforming to NovAtel's specifications, or failure to follow prescribed installation, operating and maintenance procedures,
- (ii) defects, errors or nonconformities in the products due to modifications, alterations, additions or changes not made in accordance with NovAtel's specifications or authorized by NovAtel,
- (iii) normal wear and tear,
- (iv) damage cause by force of nature or act of any third person,
- (v) shipping damage; or
- (vi) service or repair of product by the dealer without prior written consent from NovAtel.


In addition, the foregoing warranties shall not apply to products designated by NovAtel as beta site test samples, experimental, developmental, preproduction, sample, incomplete or out of specification products or to returned products if the original identification marks have been removed or altered.

The warranties and remedies are exclusive and all other warranties, express or implied, written or oral, including the implied warranties of merchantability or fitness for any particular purpose are excluded.

NovAtel shall not be liable for any loss, damage or expense arising directly or indirectly out of the purchase, installation, operation, use or licensing of products or services. In no event shall NovAtel be liable for special, indirect, incidental or consequential damages of any kind or nature due to any cause.

There are no user-serviceable parts in the GNSS Antenna and no maintenance is required. If the unit is faulty, replace with another unit and return the faulty unit to NovAtel Inc. You must obtain a RETURN MATERIAL AUTHORIZATION (RMA) number by calling NovAtel Customer Service at 1-800-NOVATEL (U.S. and Canada only) or 403-295-4900 before shipping any product to NovAtel or a dealer. You may also contact NovAtel Customer Service by email at support@novatel.com. Once you have obtained an RMA number, you will be advised of proper shipping procedures to return any defective product. When returning any product to NovAtel, return the defective product in the original packaging to avoid damage.

WEEE NOTICE

If you purchased your GPS-704-WB 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 utilise 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 ().¹

CE MARKING

The GPS-704-WB is CE marked to demonstrate compliance with the following European Union (EU) Directives:

- 2011/65/EU – Restriction of Hazardous Substances (RoHS)
- 1999/5/EC – Radio and Telecommunications Terminal Equipment (RTTE)

PATENT NOTICE

The GPS-704-WB is manufactured and protected under U.S. Patents #6,445,354 B1, #6,452,560 B2, #6,466,177 B1 and (patent pending) File No 16437-0225.

QUESTIONS OR COMMENTS

If you have any questions or comments regarding your GPS-704-WB antenna, contact NovAtel Customer Service using one of methods provided below.

Email: support@novatel.com
Web: www.novatel.com
Phone: 1-800-NOVATEL (International)
403-295-4900 (U.S. & Canada)
Fax: 403-295-4901



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