



GNSS ANTENNA

GyrAnt



GyrAnt is a versatile, high-performance antenna (GrAnt) that combines the Inertial Measurement Unit (IMU) and the GNSS antenna. It can be mounted on flat surfaces with four screws or mounted on standard poles (5/8-11 or 1-14 inches thread).

The GyrAnt antenna provides a high-quality 3D position, velocity, and attitude solution because of a combination of the absolute accuracy of GNSS positioning and the stability of IMU gyro and accelerometer measurements. It is made of low-cost inertial MEMS-based sensors and is suitable for autonomous navigation of vehicles passing by obstacles, like city canyons and under bridges.

IMU consists of three gyro sensors, three accelerometers oriented in mutually orthogonal axes, all placed in the water-resistant aluminum antenna housing. IMU provides measurements of angular velocity and acceleration. The system improves standalone position and velocity measurements of the GNSS receiver and provides the attitude. The JAVAD GNSS receivers firmware contains an algorithm of integration of the position with IMU. For standalone cases, it allows to bridge GNSS gaps up to 10 - 20 seconds with a precision better than 10 m.

GyrAnt can track GPS, GLONASS, and GALILEO signals and can be used as a standalone unit to provide the user with inertial data through the CAN and RS-422 port.

DATA SHEET

VERSION 2.5 JUNE 16, 2021

Specifications

SIGNAL	
Capability	GPS L1/L2/L5 GLONASS L1/L2/L3 GALILEO E1/E5ab BEIDOU B1/B2 WAAS L1/L5, EGNOS, MSAS, GAGAN QZSS L1/L2/L5
Frequency	1565~1610 MHz 1165~1253 MHz
ELECTRICAL	
Antenna Gain	1565~1610 MHz - 5.0 dB typ. 1165~1253 MHz - 4.0 dB typ.
Axial Ratio	3.0 dB max.
Output Impedance	50 Ohm
Noise Figure	1565~1610 MHz - 1.7 dB typ. 1165~1253 MHz - 1.7 dB typ.
DC voltage	3.0~15.0VDC 45mA@5.0V typ.
On-board power supply	+8 to +40 V DC
Power Consumption	0.5 Watt
CANH and CANL lines international termination resistor	120 Ohm, optional
ENVIRONMENTAL	
Operating Temperature	-49 °F ~ 185 °F (-45 °C ~ +85 °C)
Storage Temperature	-58 °F ~185 °F (-50°C ~ +85°C)
Humidity	Waterproof
MECHANICAL	
Antenna type	Microstrip
Connectors	TNC. The tightening torque for the coaxial connector nuts that secure the RF cable to the TNC type of RF connector must be 4.1 - 6.1 in-lbs (0.46 - 0.69 NM) RS422/CAN (see pinout below)
Weight	1.24 lbs (565 g)
Dimensions	5.511x5.511x 2.44 inches (140 x 140 x 62 mm)
Enclosure	Radome: ABS, Base: Aluminum
Color	Green
Mounting	5/8-11 or 1-14 inches mount, or 4 holes M5
INPUT/OUTPUT	
RS422	up to 460.8 Kbps
CAN	2.0 0.5 Mbps
IMU PERFORMANCE SPECIFICATIONS¹ (AUTONOMOUS)	
Angular velocity	0.3 degrees/sec (rms)
Acceleration	0.025 m/sec/sec (rms)
Attitude accuracy degradation ²	< 0.02 rad per minute
Latency	~10 ms

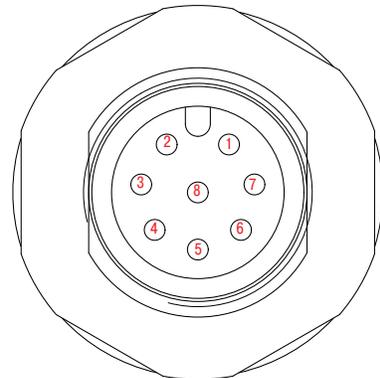
1. Accuracy is defined for Temp=23° C
2. Degradation of the attitude accuracy caused by outages of GPS measurements estimated for noise-like errors is shown in the table:

Time outage, [sec]	Velocity vector degradation [m/sec]	Horizontal position degradation [m]	Vertical position degradation [m]	Roll degradation, [degree]	Pitch degradation, [degree]	Heading degradation, [degree]
5	0.4	0.9	0.2	0.1	0.1	0.2
15	1.2	8.5	1.1	0.2	0.3	0.5
60	6.5	170.0	16.0	0.5	0.6	0.8

RS422/CAN Connector

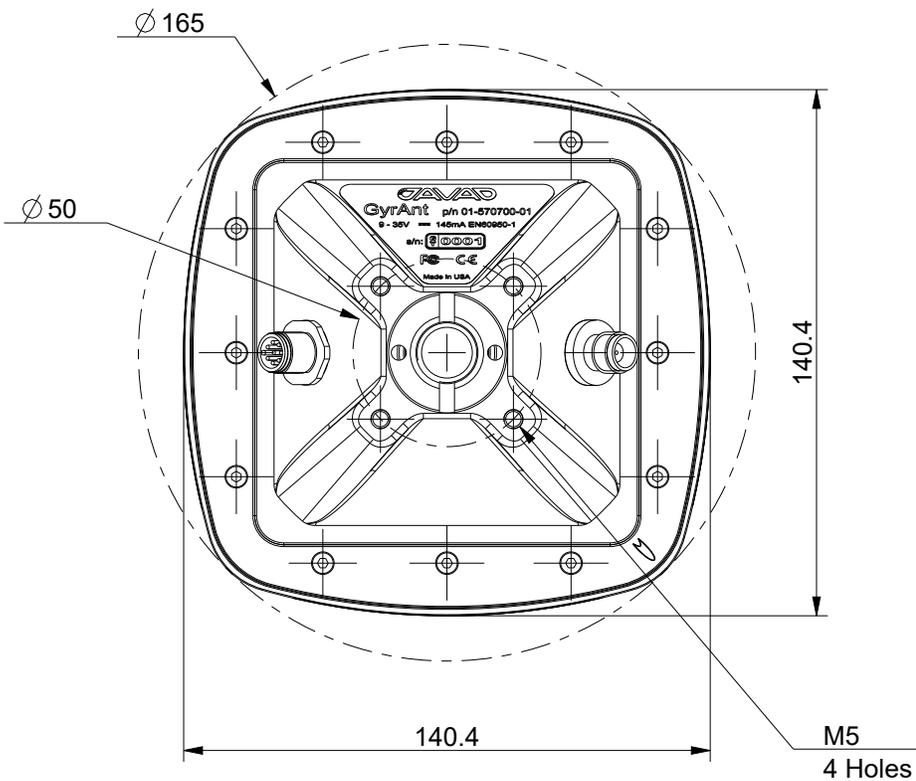
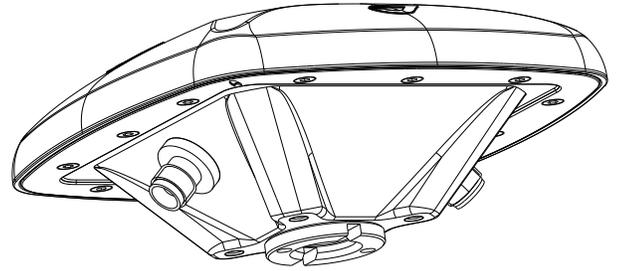
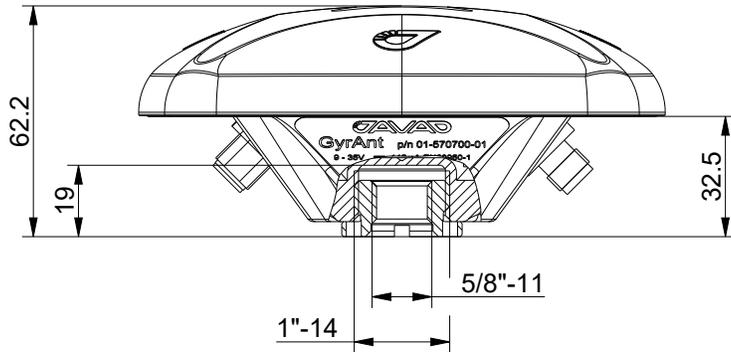
The connector is a sealed M12, 8 pin Male receptacle, FM, M16x1.5, flying lead connector Binder-USA p/n 09-3481-700-08.

#	SIGNAL NAME	DIR	DETAILS
1	PWR IN	P	Bus power, + 10 to +35 V DC, 250 mA
2	GND	-	Ground
3	422_TX+	O	Port TX+ line
4	422_TX-	O	Port TX- line
5	422_RX+	I	Port RX+ line
6	422_RX-	I	Port RX- line
7	CAN_H	I/O	CAN_H bus line (dominant high)
8	CAN_L	I/O	I/O CAN_H bus line (dominant low)



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Dimensions



* All dimensions are in mm

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