FOGPSAL-WP

Fiber Optic GPS Antenna Link Technical Product Data

Components

- Fiber Optic Weatherproof Transmitter
- 1U 19” Rackmount Fiber-to-RF Receiver
- L1GPSA-N: GPS L1 Roof Antenna
- L1RAMB: Roof Antenna Mounting Bracket
- Transmitter Power Supply
- Receiver Power Supply

Description

This **F**iber **O**ptic **GPS A**ntenna **L**ink **(FOGPSAL)** is a complete GPS-over-Fiber package that can link the included L1 GPS antenna to distant or electrically isolated receivers for timing and diagnostic purposes. The **FOGPSAL** transmitter receives and encodes RF signals from 1.1 GHz to 1.7 GHz into optical data which is then sent up to 40KM over a customer-supplied single-mode fiber optic cable. The **FOGPSAL** receiver converts the optical pulses back into an RF signal which can be distributed to a network of GPS receivers. This device is designed to replace lossy and expensive long-distance coaxial cable runs.

The **FOGPSAL-WP** transmitter has been designed for exposed rooftop installations while the receiver has been designed for installation in a standard 19” equipment rack with a 1U height. The transmitter features an N-female RF input port and two outputs: an FC/APC simplex fiber output and an N-female RF output for diagnostic purposes. In the standard configuration, the transmitter unit supplies 5 VDC through the RF output port to power a connected antenna or other devices upline from the **FOGPSAL** transmitter. The receiver unit features an FC/APC simplex fiber input and two N-female RF outputs. The two output ports are DC blocked and loaded with 200Ω resistors to simulate antenna current draw which prevents antenna alarm faults on connected GPS receivers. Custom configurations are available upon request.

Use Cases

- Any GNSS application with a long cable run between the roof antenna and the GNSS device.
- To supply a GNSS signal to devices within an electrically isolated environment or other applications where standard RF cable cannot be used. Bunkers, control rooms, etc.
- A **FOGPSAL** unit is often used in large buildings to supply basement cell sites with a GNSS timing signal.

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Electrical Specifications, TA=25°C

General Transmitter and Receiver Specification

Parameter	Notes	Min	Typ	Max	Unit
Frequency Range	Covers all major GNSS constellations.	1.1		1.7	GHz
Characteristic Impedance	Unused ports should be terminated with 50Ω loads.		50		Ω
Req. DC Input V.	Operating Voltage Range.		12		VDC
Current Draw: Tx	Typical current consumption per unit.		172		mA
Current Draw: Rx	Typical current consumption per unit.		72		mA

FOGPSAL GPS L1 & L2 RF Specification (1)

Parameter	Notes	Min	Typ	Max	Unit
Gain	The relative increase in signal power provided by the amplifier.		30		dB
Input SWR	Input Standing Wave Ratio: S11		1.5:1	2.0:1	-
Output SWR	Output Standing Wave Ratio: S22		1.5:1	2.0:1	-
System Noise Figure	The NF of the FOGPSAL system when used with the included L1GPSA antenna.	1.8	2.0	3.0	dB
Gain Flatness	The difference in loss or gain between the L1 and L2 frequencies.		0.5	1.5	dB
Amplitude Balance	The difference in gain or loss between each output port.		0.5	1.0	dB
Isolation	The amount of attenuation between receiver output ports.		L2:17 L1:20		dB
Group delay flatness	The difference in signal delay between the L1 and L2 frequencies.		1	4	ns
Input P1dB	The 1dB compression point.		-20		dBm

Transmitter Diagnostic Port GPS L1 & L2 RF Specification (1)

Parameter	Notes	Min	Typ	Max	Unit
Gain	The relative increase in signal power provided by the amplifier.	2.5	4.0	5.5	dB
Input SWR	Input Standing Wave Ratio: S11		1.5:1	2.0:1	-
Output SWR	Output Standing Wave Ratio: S22		1.5:1	2.0:1	-
L1 Noise Figure	The increase in noise power relative to an ideal amplifier.		3.8	4.3	dB
Gain Flatness	The difference in loss or gain between the L1 and L2 frequencies.		0.5	1	dB
Group delay flatness	The difference in signal delay between the L1 and L2 frequencies.		0.5	1	ns
Input P1dB	The 1dB compression point.		-20		dBm

(1): Performance is slightly reduced around GPS L5. If working on sensitive L5 applications, please request performance data.

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Fiber Optic Link Characteristics

Parameter	Notes	Min	Typ	Max	Unit
Frequency Range	Covers all major GNSS constellations.	0.95		2.6	GHz
Wavelength	The wavelength of the light emitted from the fiber optic transmitter.		1550		nm
Output Power	Strength of fiber optic output signal.		+2.5		dBm
Receive Power	The input optical power range for the fiber optic receiver.	-10		+2.5	dBm
Maximum Range	The maximum length of the fiber optic portion of the system.			40	km

Standard Port Configuration

Port	Transmitter	Receiver
RF Inputs	1 x N-type Female 5VDC Output	N/A
RF Outputs	1 x N-type Female Diagnostic Port DC Blocked w/ 200Ω load resistor	2 x N-type Female DC Blocked w/ 200Ω load resistor
Optical Inputs	N/A	1 x FC/APC
Optical Outputs	1 x FC/APC	N/A
Power	1 x MIL-DTL-5015 10SL-4P	1 x MIL-DTL-5015 10SL-4P

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Part Number Configuration

FOGPSAL - WP - N / *5* / *110*

Base Part:
FOGPSAL = Fiber **O**ptic **G**PS Antenna **L**ink

Form Factor:
RM = Rackmount Transmitter
WP = Weatherproof

Connector:
Type N only

Output Voltage:
5 VDC, XX (Custom: "**XX**")

Source Voltage:
110 = 110VAC, **220** = 220VAC (2 prong Euro), **240** = 240VAC (3 prong UK),
MC = Military DC Connector (User supplies DC voltage range 9-32VDC)

(Military DC Mating Connector is included standard with the MC power option).

Contact GPS Networking Technical Support at 1-800-463-3063 or salestech@gpsnetworking.com for any questions regarding non-standard configurations and corresponding part numbers.

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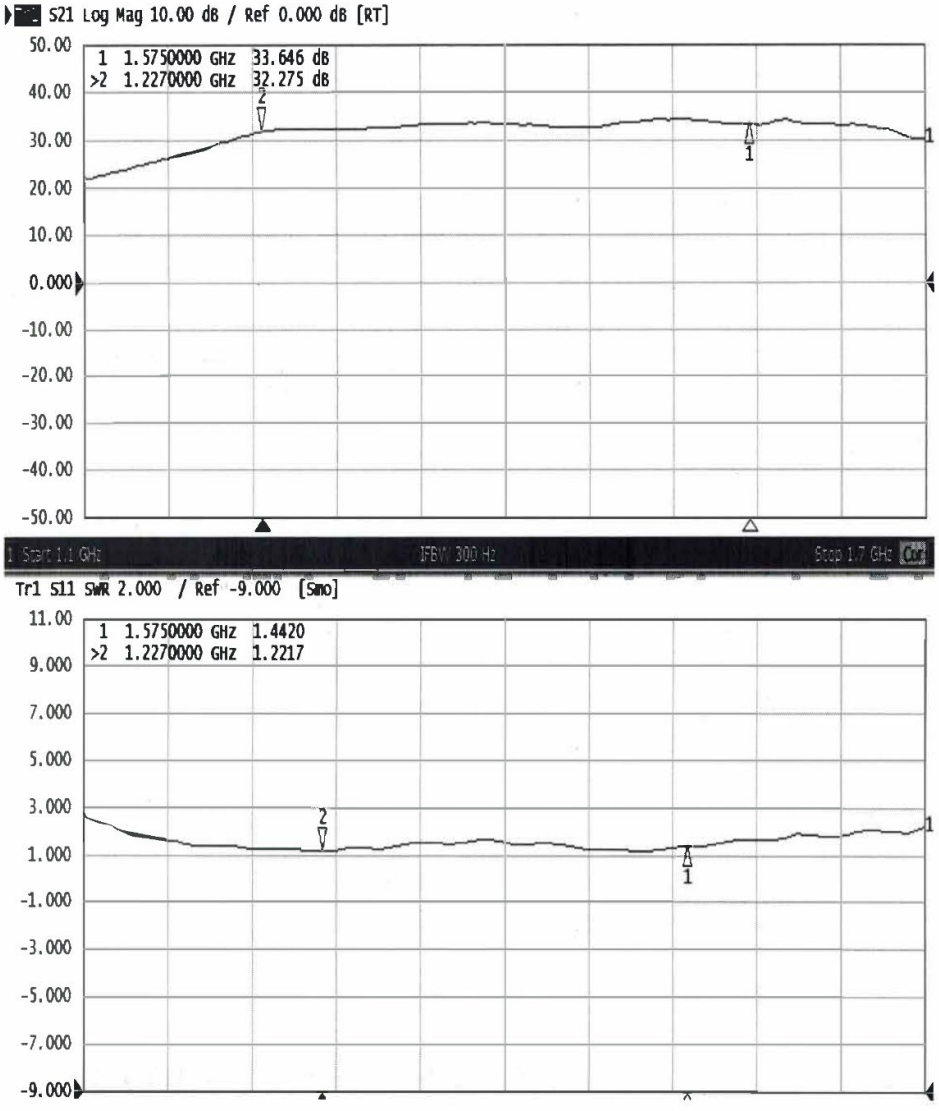
Performance

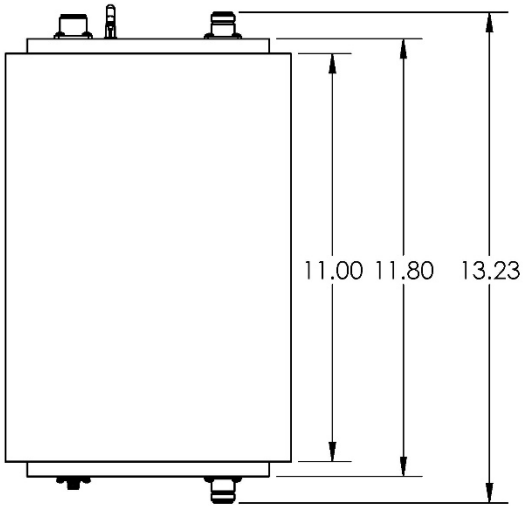
FOGPSAL-WP (Standard Gain)

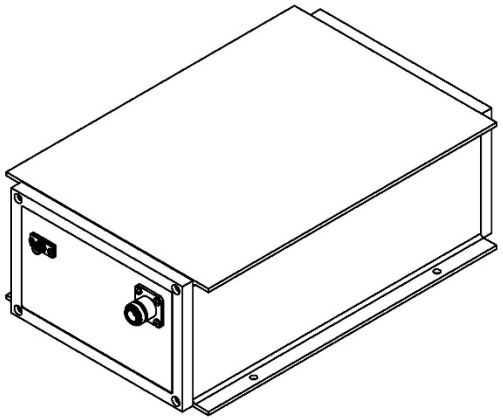
Each pair of **FOGPSAL-WP** transmitter and receiver ships with a test sheet that verifies critical performance characteristics, such as gain, input VSWR, and amplitude balance; a typical VNA test sheet is shown below.

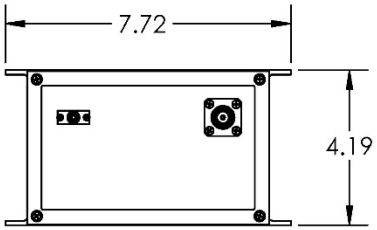
GPS NETWORKING **Test Data**

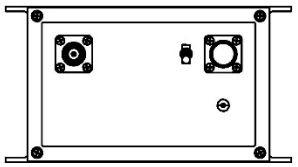


Mechanical







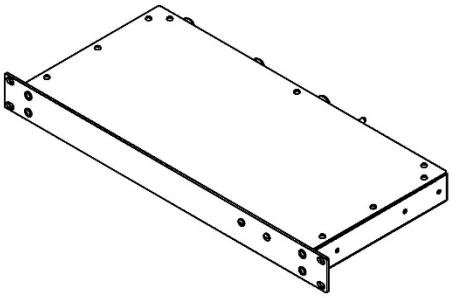


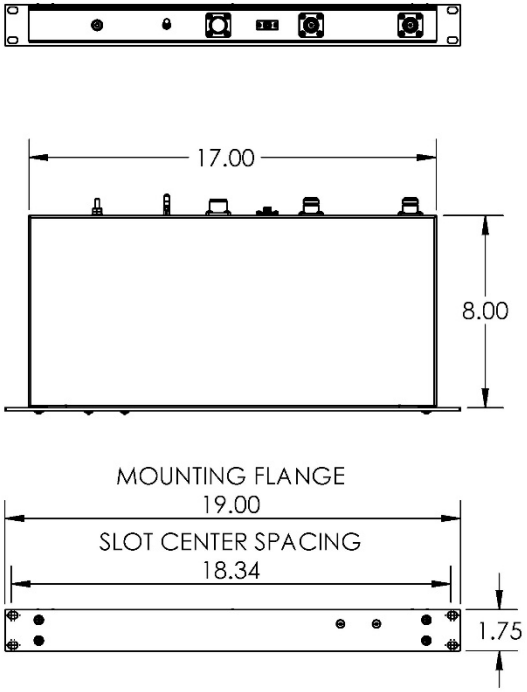
Mechanical
Dimensions:
Depth: 11.80"
Width: 7.72"
Height: 4.19"
Dimensions listed above do not include connectors
Weight: 6lbs 12.8oz (3.085kg) MAX
Maximum weight is with female N-connector option
Weight will vary by connector type
Operating Temperature Range:
-57°C to +87°C
Housing Material:
Aluminum
Panel Coating:
Black Powder Coat

GPS NETWORKING 373 E. Industrial Blvd. Pueblo West, CO 81007	FOGPSAL-WP Transmitter Weatherproof Fiber Optic GPS Antenna Link Transmitter					Tolerances: X ± 0.030 XX ± 0.015 XXX ± 0.005 Angle ± 1°
05/20/25	MM	Scale:1:4	Rev: A	Sheet 1 of 1	Units are inches and degrees	

Contact us at salestech@gpsnetworking.com for 3D models or CAD drawings.

FOGPSAL-WP





Mechanical
Dimensions:
Depth: 8.00"
Width: Body: 17.00"
Mounting Flange: 19.00"
Height: 1.75" (EIA-310 1U)
Dimensions listed above
do not include connectors
Weight: 3lb 8.3oz (1.596kg) MAX
Maximum weight is with female
N-connector option
Weight will vary by connector type
Operating Temperature Range:
-57°C to +87°C
Housing Material:
Aluminum 5052
Front Panel Coating:
Black Wrinkle Powder Coat

GPS NETWORKING 373 E. Industrial Blvd. Pueblo West, CO 81007	FOGPSAL Receiver Fiber Optic GPS Antenna Link Receiver					Tolerances: X ± 0.030 XX ± 0.015 XXX ± 0.005 Angle ± 1°
05-20-25	MM	Scale:1:6	Rev: A	Sheet 1 of 1	Units are inches and degrees	

For sales or technical support contact us at 1-800-463-3063 or salestech@gpsnetworking.com

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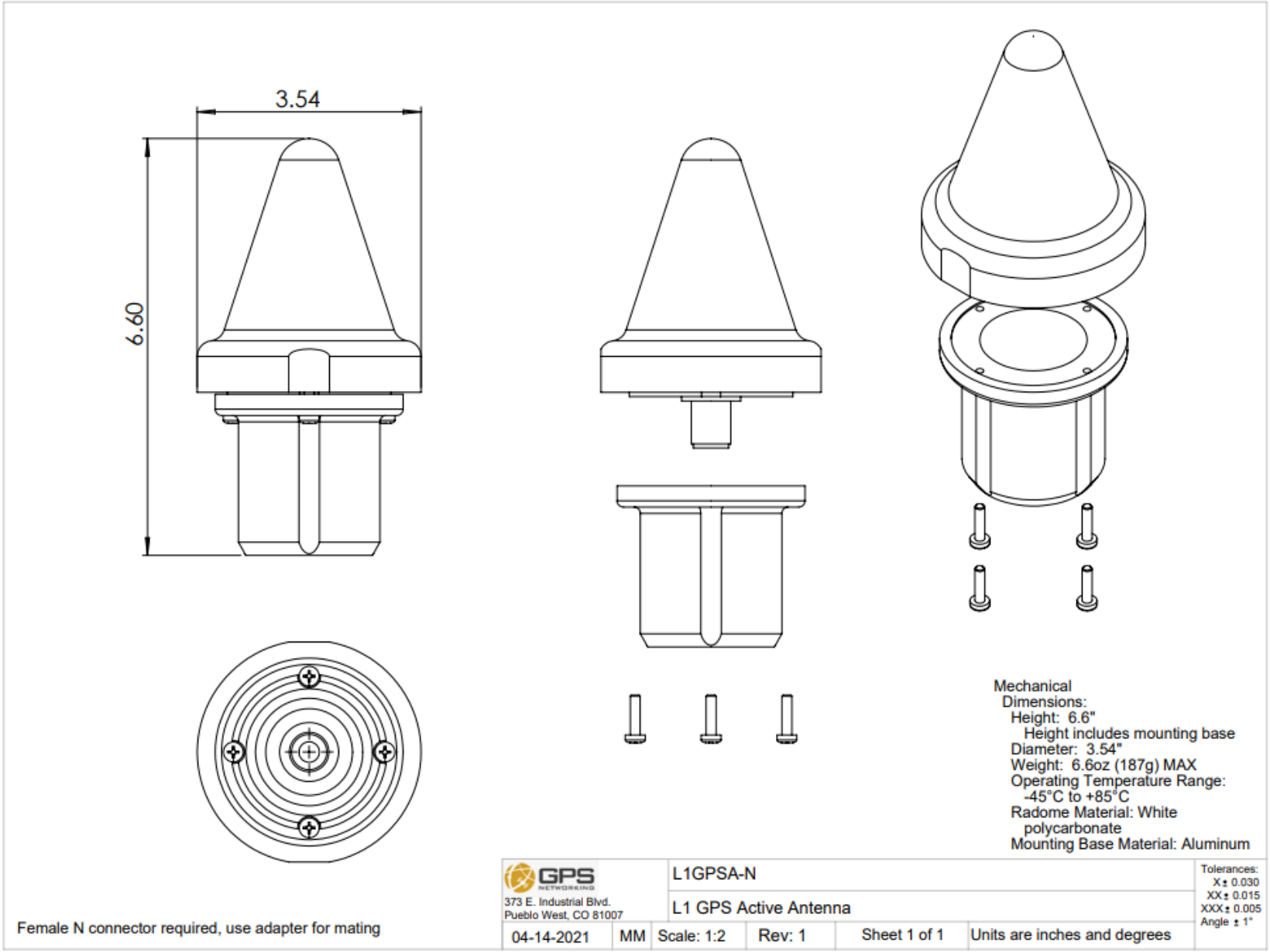
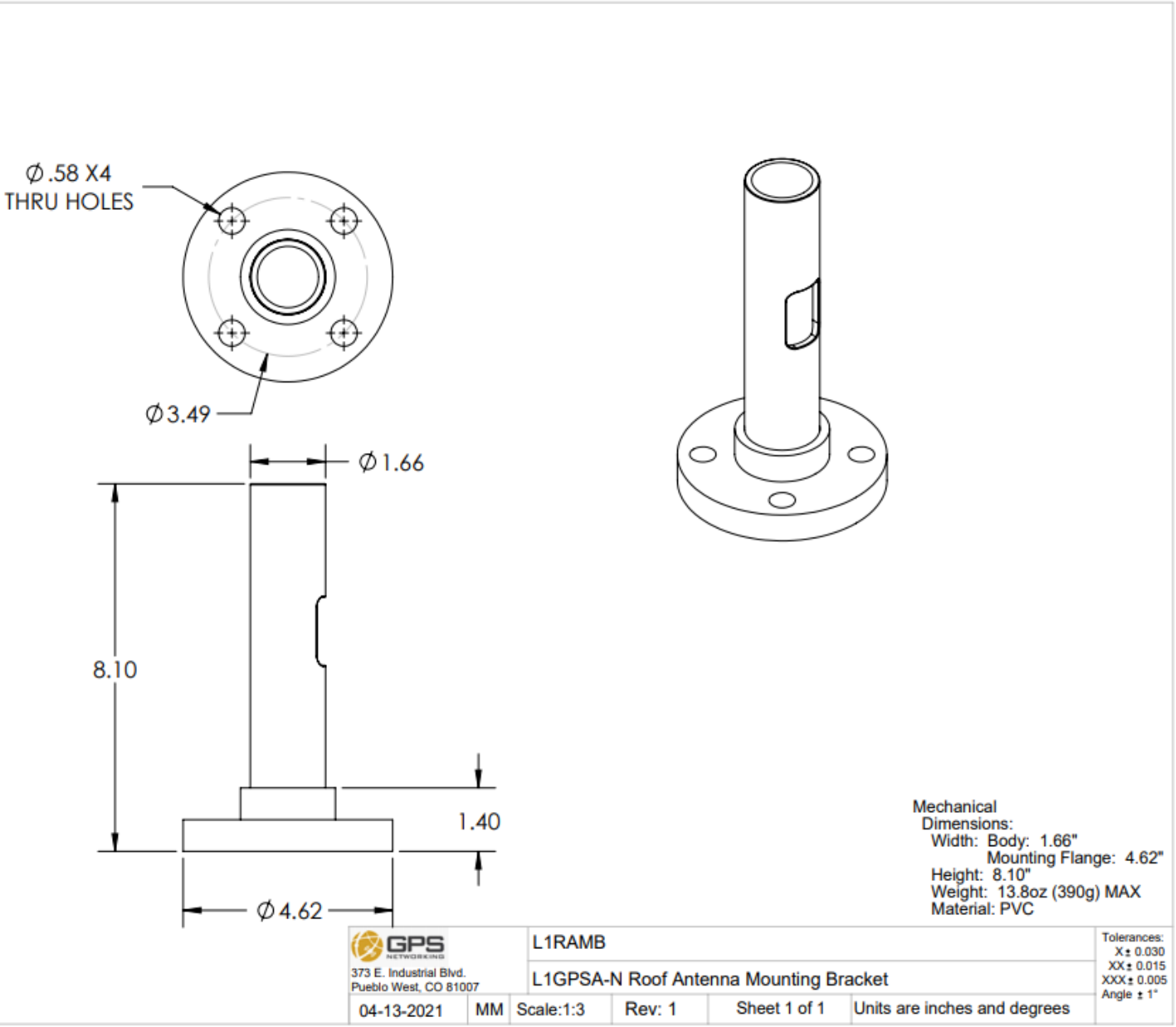

3.54
6.60
Mechanical
Dimensions:
Height: 6.6"
Height includes mounting base
Diameter: 3.54"
Weight: 6.6oz (187g) MAX
Operating Temperature Range:
-45°C to +85°C
Radome Material: White
polycarbonate
Mounting Base Material: Aluminum
Female N connector required, use adapter for mating
GPS NETWORKING
373 E. Industrial Blvd.
Pueblo West, CO 81007
L1GPSA-N
L1 GPS Active Antenna
04-14-2021
MM
Scale: 1:2
Rev: 1
Sheet 1 of 1
Units are inches and degrees
Tolerances:
X ± 0.030
XX ± 0.015
XXX ± 0.005
Angle ± 1°

FOGPSAL-WP


Ø.58 X4
THRU HOLES
Ø3.49
Ø1.66
8.10
1.40
Ø4.62
Mechanical
Dimensions:
Width: Body: 1.66"
Mounting Flange: 4.62"
Height: 8.10"
Weight: 13.8oz (390g) MAX
Material: PVC
GPS NETWORKING
373 E. Industrial Blvd.
Pueblo West, CO 81007
L1RAMB
L1GPSA-N Roof Antenna Mounting Bracket
04-13-2021
MM
Scale:1:3
Rev: 1
Sheet 1 of 1
Units are inches and degrees
Tolerances:
X ± 0.030
XX ± 0.015
XXX ± 0.005
Angle ± 1°