L125G-ITS

L1/L2/L5 GNSS ITS Kit Technical Product Data

Features

- High Gain Amplified Roof Antenna
  - Provides 35 dB gain via internal LNA.
- Kit Mounting Hardware
  - Roof Antenna Mounts & Re-Radiating Amplifier Mount included.
- Re-Radiating Variable Gain Amplifier with LCD Screen & Push Button Adjustments
  - Adjustable gain from 0 dB to 30 dB in 1dB increments.

Description

The **L1**/L**2**/L**5** **G**NSS **I**ndoor **T**esting **S**olution (**L125G-ITS**) comes with everything required to build a re-radiating system that can broadcast all major GNSS frequencies indoors. GNSS signals received by the roof antenna are amplified and re-radiated to indoor GNSS receivers, eliminating the need to attach receivers directly to the roof antenna. The **L125G-ITS** consists of an active roof antenna, a passive re-radiating antenna, and a re-radiating amplifier (L125GVGLCDITSAMP) with an external power supply that powers the entire system. 50 ft of LMR400-UF coaxial cable is provided to connect the roof antenna to the re-radiating kit. The **L125G-ITS** will transmit GNSS signals indoors to receivers over 100 feet away, with all necessary mounts and adapters included in the kit.

In the standard Networked (Externally Powered) configuration, the re-radiating amplifier output (**J1**) is DC Blocked.

Use Cases

- To re-radiate signal indoors for GNSS product testing.
- To maintain GNSS signal lock for military vehicles parked indoors.
- To facilitate faster GNSS signal acquisition for military aircraft inside a hardened hangar.
- In combination with one of our splitter devices to create a GPS distribution network.

L125G-ITS

Re-Radiating Amplifier Electrical Specifications, TA=25°C

General Specification

Parameter	Notes	Min	Typ	Max	Unit
Frequency Range	Covers all major GNSS constellations.	1.1		1.7	GHz
Characteristic Impedance	Input and output ports matched to 50Ω.		50		Ω
Req. DC Input V.	Operating Voltage Range.	3.3		15	VDC
Current Draw	Typical current consumption.		36	40	mA

GPS L1 & L2 RF Specification (1)

Parameter	Notes	Min	Typ	Max	Unit
Min Gain	The relative increase in signal power provided by the amplifier when set to minimum gain.	-1	0	1	dB
Max Gain	The relative increase in signal power provided by the amplifier when set to maximum gain.	29	30	31	dB
Input SWR	Input Standing Wave Ratio: S11			2.0:1	-
Output SWR	Output Standing Wave Ratio: S22			2.0:1	-
Noise Figure	The increase in noise power relative to an ideal amplifier.		L1:2.00 L2:4.25		dB
Band Gain Flatness	The difference in loss or gain between the L1 and L2 frequencies.		0.5	1.0	dB
Group Delay	The transmit time for the signal passing through the device.		L1:1.5 L2:2.1		ns
Reverse Isolation	Attenuation applied signals traveling backwards through the amplifier: S12.		L1: -55 L2: -60		dB
Input P1dB	The 1dB compression point.		L1: -21.5 L2: -23.0		dBm
3rd Order Intercept	Third-order intercept point at L1.		-14		dBm

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

External Power Options (Networked Option)		
Source Voltage Options	Voltage Input	Style
	110VAC	Transformer (ITA Type A Wall Mount)
	220VAC	Transformer (ITA Type C Wall Mount)
	240VAC (United Kingdom)	Transformer (ITA Type G Wall Mount)
	Customer Supplied DC 9-32 VDC	MIL-DTL-5015 10SL Two-Pin DC Connector (Includes Mate)
Output Voltage Options (2)	**DC Voltage Out**	**Max Current out For Corresponding Vout**
	3.3 V	110mA
	5V	130mA
	9V	140mA
	12V	180mA
	15V	220mA
	Custom	Custom
Standard DC Configuration without External Power Option		
All Ports Pass DC		
Standard DC Configuration with any External Power Option (AC/DC or Military DC)		
J1 Port DC Blocked with 200Ω load standard		
Antenna Port is DC Pass		
Connector Options	**Connector Style**	**Charge**
	Type N-female	No Charge
	Type SMA-female	No Charge
	Type TNC-female	**No Charge (Standard)**
	Type BNC-female	No Charge
	Other	Contact GPS Networking

(2): With Network Option, any RF port (input or output) can be specified to Pass DC or Block DC

L125G-ITS

L125GPSA-T Roof Antenna Electrical Specifications, TA=25°C

Parameter	Notes	Min	Typ	Max	Unit
Frequency	Receives and amplifies all major GNSS constellations.	1539 1164		1610 1300	MHz
Axial Ratio	Ratio between the major and minor axes of the polarization ellipse.			0.5	dB
LNA Gain	The relative increase in signal power provided by the internal LNA.		35		dB
Antenna Gain	The increase in signal power relative to an isotropic antenna source.		3.4		dBic
GPS L1 Bandwidth	Passband centered at GPS L1 frequency.		71		MHz
GPS L2/L5 Bandwidth	Passband covering the GPS L2/L5 frequencies.		136		MHz
Filtering	Out of band rejection +/-50MHz from band-edge	-35	-45	>-80	dB
Noise Figure	The increase in noise power relative to an ideal amplifier.		3.0		dB
Output SWR	Output Standing Wave Ratio: S22 over the passband.		1.5:1	2.0:1	-
Characteristic Impedance	Output port matched to 50Ω.		50		Ω
Req. DC Input V.	Operating Voltage Range.	2.3		16	VDC
Current Draw	Typical current consumption.			40	mA

Polarization
Right Hand Circular Polarization

Connector Options	Connector Style	Charge
	Type TNC-female	No Charge

L125GRRKPA-T Re-Radiating Antenna Electrical Specifications, TA=25°C

Parameter	Notes	Min	Typ	Max	Unit
Frequency	Receives and amplifies all major GNSS constellations.	1539 1164		1610 1300	MHz
Axial Ratio	Ratio between the major and minor axes of the polarization ellipse.			0.5	dB
Antenna Gain	The increase in signal power relative to an isotropic antenna source.		3.4		dBic
Output SWR	Output Standing Wave Ratio: S22 over the passband.		1.5:1	2.0:1	-
Characteristic Impedance	Output port matched to 50Ω.		50		Ω
Beamwidth	The 3dB angular width of main emission lobe.		120		°

Polarization
Right Hand Circular Polarization

Connector Options	Connector Style	Charge
	Type TNC-female	No Charge

Kit Contents

- **1 x L125GVGLCDITSAMP**
  - Variable gain GNSS reradiating amplifier with LCD screen. Provides 0-30 dB of gain.
- **1 x L125GPSA-T**
  - 35dB active GNSS roof antenna.
- **1 x L125GRRKPA-T**
  - Passive GNSS reradiating antenna.
- **1 x Installation Instructions**
- **1 x L125GRAMB**
  - L-bracket L125GPSA-T mount.
- **1 x L1RAMB**
  - Pipe and flange mounting pole.
- **1 x WRUMT**
  - Reradiation amplifier mount.
- **1 x 50’ LMR-400-UF CABLE T(m)**
- **1 x TNC(m)-TNC(m) RF ADAPTER**
  - Mounts the L125GRRKPA-T antenna to the amplifier.

L125G-ITS

Part Number Configuration

L125G-ITS **N / 5 / 110**

Re-Radiating Kit Type:
L125G-ITS = L1/L2/L5 GNSS Indoor Testing Solution

Connector Options (Type Female Standard):
T= TNC(Standard); **N**= N-type; **S**= SMA; **B**= BNC

DC Output Voltage:
5 = Amplifier Output Voltage (Included antenna requires 2.5 - 15VDC. 5VDC is default voltage)

Source Voltage (Power Supply Options):
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).

When no external power supply option (AC or DC) is selected, Output 1/J1 is Pass DC Standard.
When external power supply option is selected, all outputs are DC blocked standard.

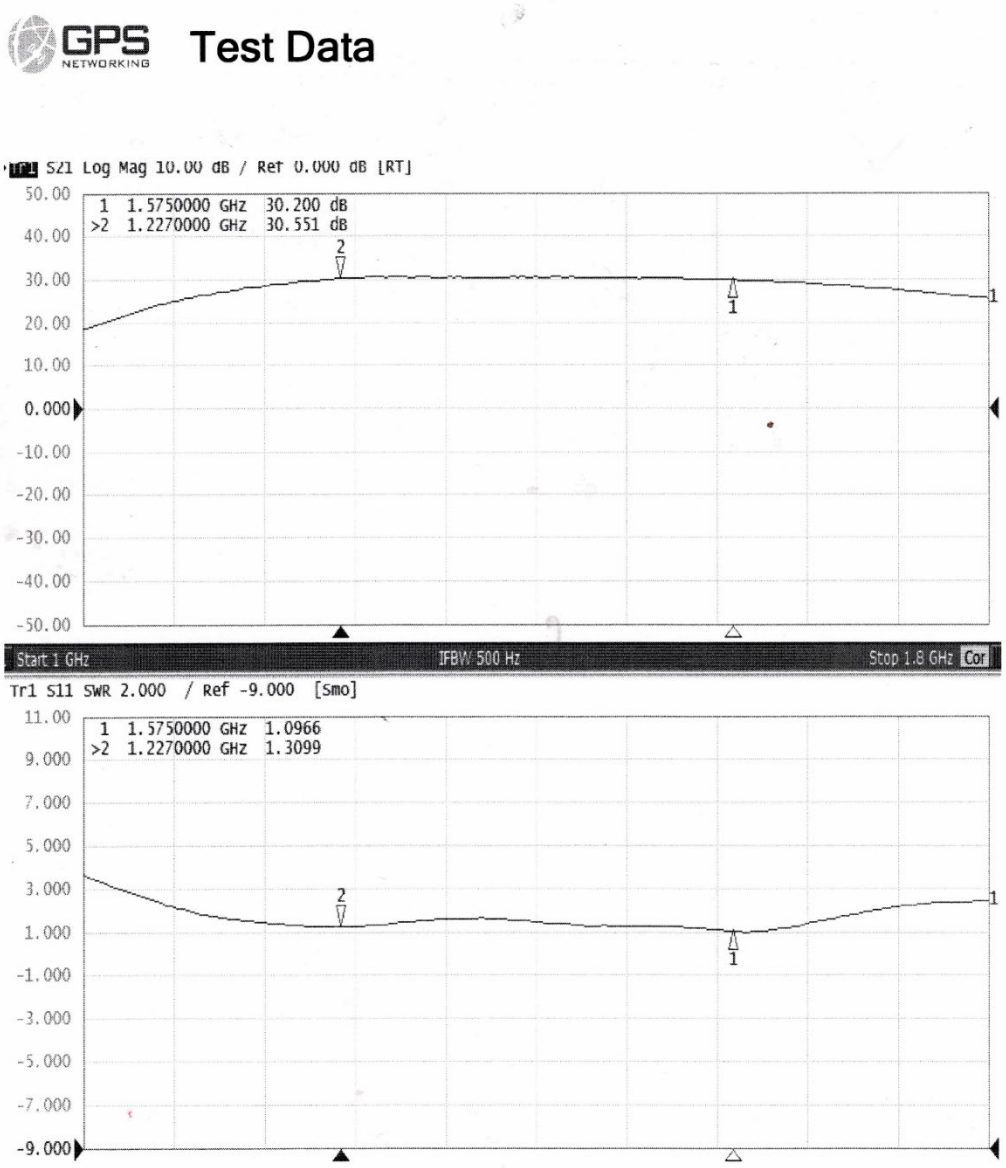
Contact GPS Networking Technical Support at 1-800-463-3063 or salestech@gpsnetworking.com for any questions regarding non-standard configurations and corresponding part numbers.

L125G-ITS

Performance

L125GVGLCDITSAMP (Standard Gain)

Each L125G-ITS kit ships with a test sheet for the included L125GVGLCDITSAMP that verifies critical performance characteristics, such as gain, input VSWR, and amplitude balance; a typical VNA test sheet is shown below



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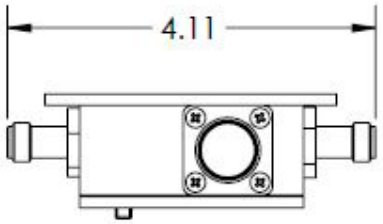

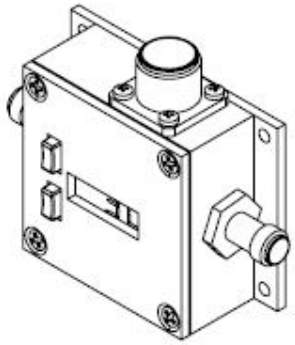

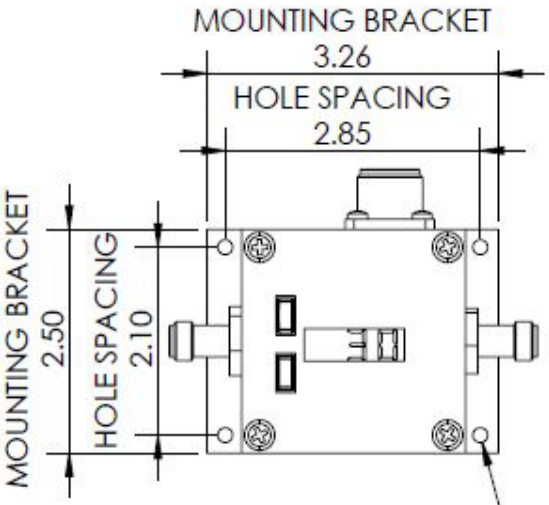

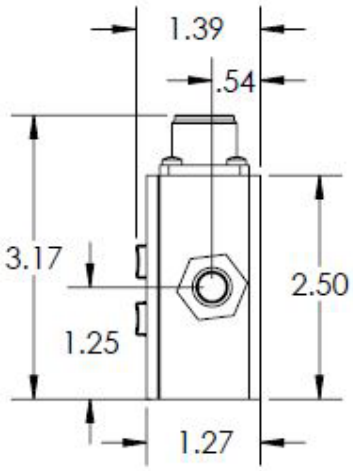

Mechanical
Dimensions:
Depth: 1.27"
Width: Body: 2.5"
Baseplate: 3.26"
Height: Body: 2.5"
Dimensions listed above do not include connectors
Weight: 9.7oz (275g) MAX
Maximum weight is with female N-connector option
Weight will vary by connector type
Operating Temperature Range: -57°C to +87
Housing and Baseplate Finish: Electroless Nickel Plated (MIL-C-26074C, Class 1 0.0001-0.0003 MAX)
Lid Finish: Anodize, Type III, Class 2, Black, per MIL-A-8625

Female TNC connectors shown, other options available
MC - Military DC connector shown, other options available

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Pueblo West, CO 81007

VGLCDAMP					Tolerances: X ± 0.030, XX ± 0.015, XXX ± 0.005, Angle ± 1°
Variable Gain LCD Amplifier					
01-18-2023	MM	Scale:1:2	Rev: 1	Sheet 1 of 1	Units are inches and degrees

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

GPS Networking PN: L125GPSA-T

DRAWING REVISION HISTORY			
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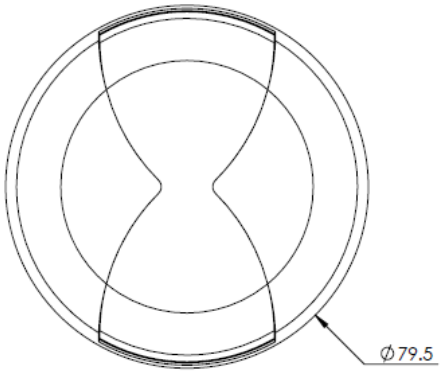
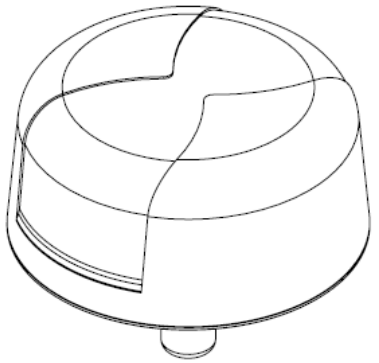
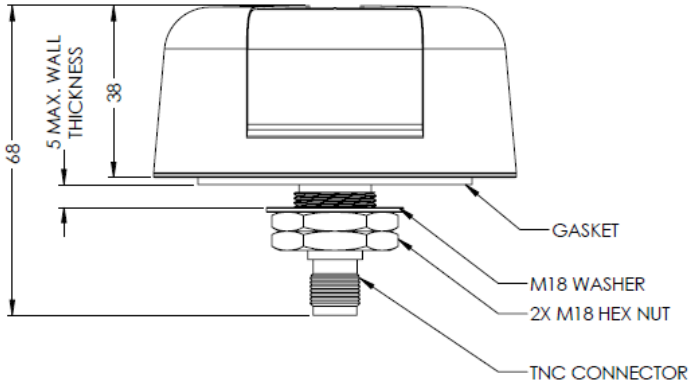






NOTES:

1. MOUNTING TYPE: SCREW MOUNT
2. MAX. MOUNTING THICKNESS: 5 MM
3. DIMENSIONS ARE AFTER MOUNTING.
4. MATERIALS:
   - RADOME: PC
   - BASE: ALUMINUM
   - RADOME COLOR: BLACK
5. CERTIFICATIONS: IP67

ITEM 100-00282-01 REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	INITIAL RELEASE	2023-06-01	MP

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN MM TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± .5° BEND ± 1° ONE PLACE DECIMAL ± 1.0 TWO PLACE DECIMAL ± .50	DRAWN	MP	2023-06-01
	CHECKED	ZX	2023-06-02
	ENG APPR.	NPC	2023-06-05
	MFG APPR.		
INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
THIRD ANGLE PROJECTION	CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY.		
DO NOT SCALE DRAWING			

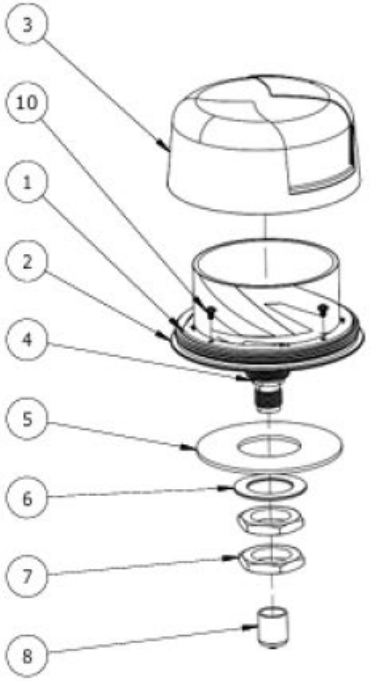
MAXTENA, INC

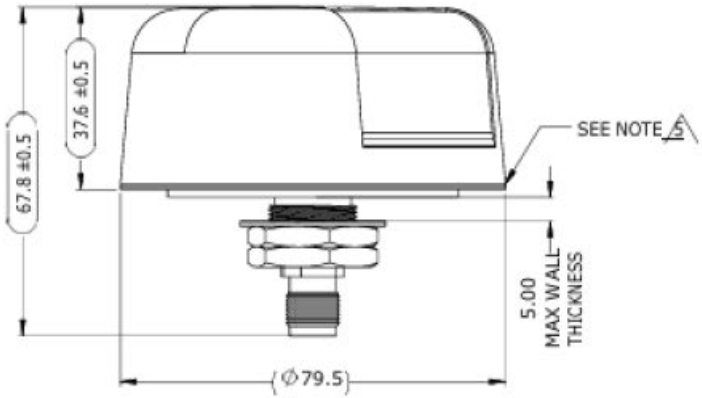
TITLE:
100-00282-01
M10HCT-A-TNC

SIZE	DWG. NO.	REV
B	117-00714-01	1

CAGE CODE: 5KQH7 | SCALE: NONE | SHEET 1 OF 1

GPS Networking PN: L125GRRKPA-T





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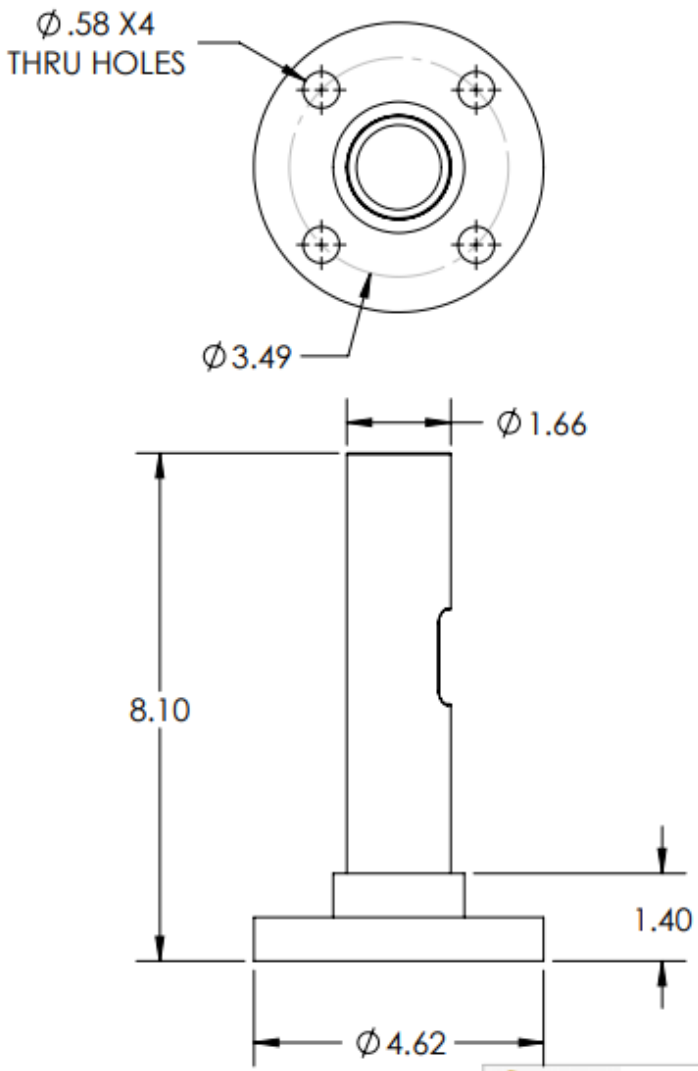

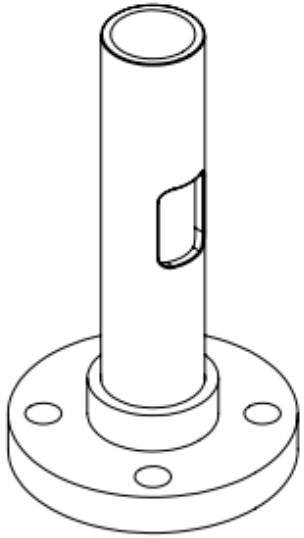

Mechanical
Dimensions:
Width: Body: 1.66"
Mounting Flange: 4.62"
Height: 8.10"
Weight: 13.8oz (390g) MAX
Material: PVC

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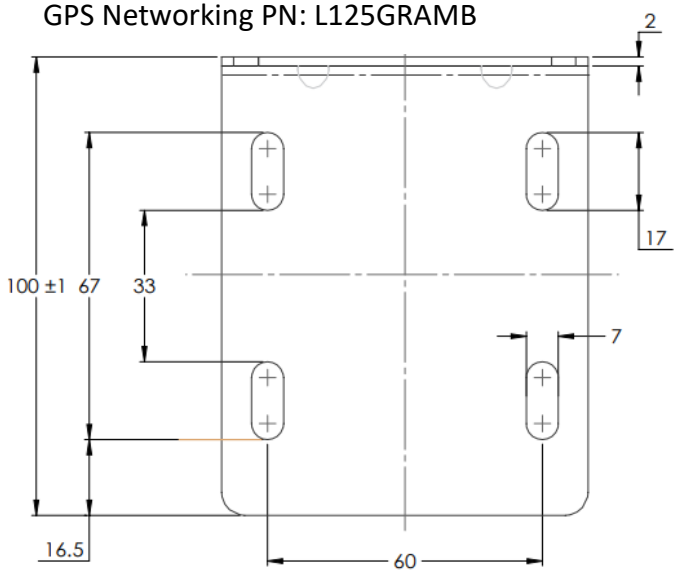
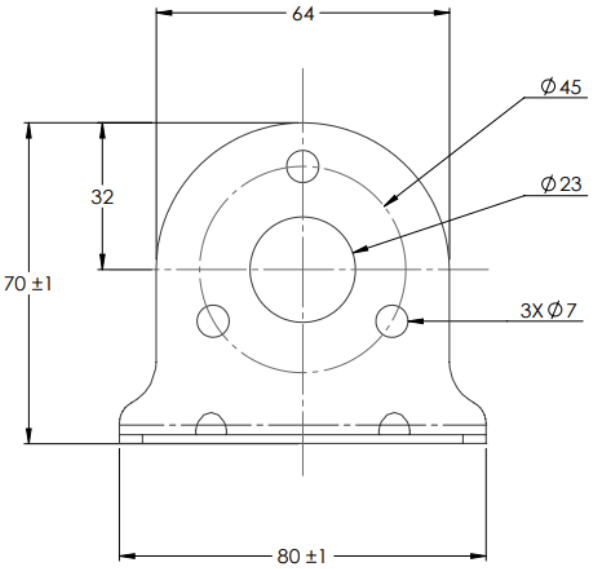
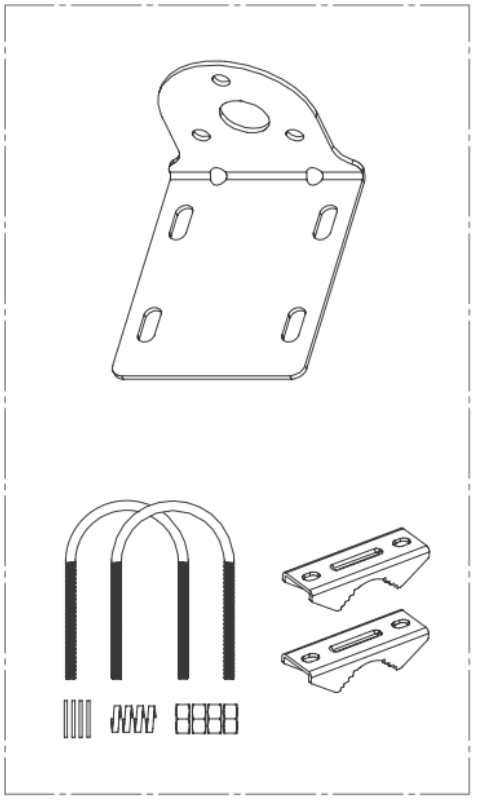
Pueblo West, CO 81007

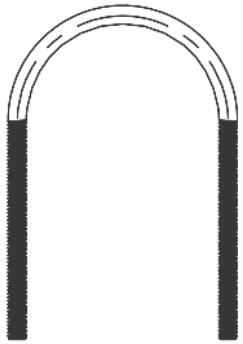
L1RAMB					Tolerances: X ± 0.030 XX ± 0.015 XXX ± 0.005 Angle ± 1°
L1GPSA-N Roof Antenna Mounting Bracket					
04-13-2021	MM	Scale:1:3	Rev: 1	Sheet 1 of 1	Units are inches and degrees

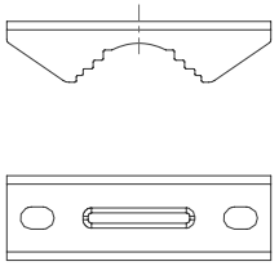
GPS Networking PN: L125GRAMB

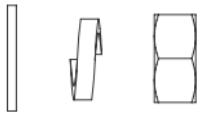












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ITEM 311-00051-01 REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
1	INITIAL RELEASE	2021-06-23	SZ

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MM
TOLERANCES:
FRACTIONAL ±
ANGULAR: MACH ± .5° BEND ±
ONE PLACE DECIMAL ± .2
TWO PLACE DECIMAL ± .10
INTERPRET GEOMETRIC TOLERANCING PER:
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	SZ	2021-06-23
CHECKED	ZX	2021-06-23
ENG APPR.	NPC	2021-06-23
MFG APPR.		
Q.A.		

CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY.

MAXTENA, INC

TITLE:
311-00051-01
MMB-01-10

SIZE B | DWG. NO. 117-00447-01 | REV A

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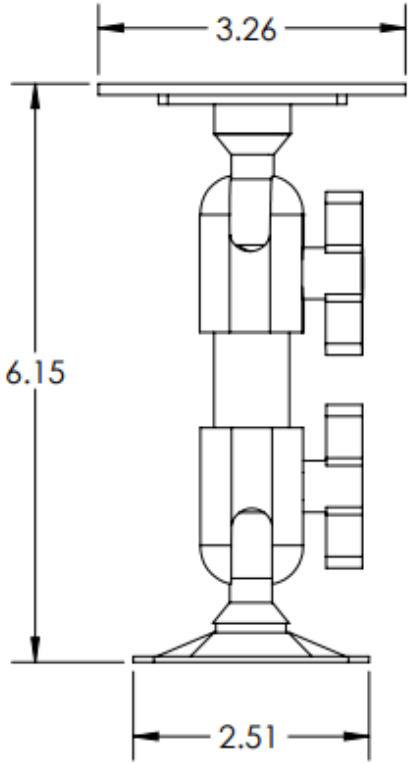

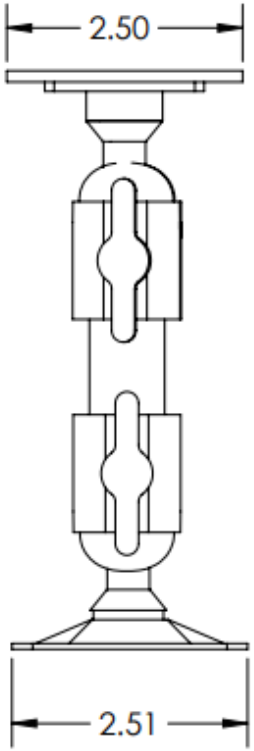

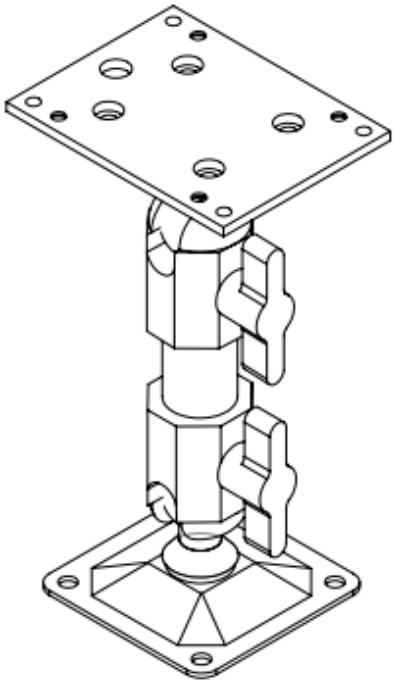

Mechanical
Dimensions:
Depth: 2.51"
Width: Top Plate: 3.26"
Baseplate: 2.51"
Height: 6.15"
Weight: 13.3oz (377g) MAX
Operating Temperature Range:
-57°C to +87
Materials: Aluminum
Zinc
Steel

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WRUMT					Tolerances: X ± 0.030 XX ± 0.015 XXX ± 0.005 Angle ± 1°
GPS UNIVERSAL MOUNT					
04-19-2021	MM	Scale:1:2	Rev: 1	Sheet 1 of 1	Units are inches and degrees