Geo-Satellite Antenna with GPS
GEO-ANT-GPS

Users Manual

Operations & Maintenance Manual

Part No. 8800-1215 Rev 1.0
September 17, 2018

Sutron Corporation | 22400 Davis Drive | Sterling, VA 20164 | 703.406.2800 | www.sutron.com | sales@sutron.com

Table of Contents

1. Scope of Supply

GEO-ANT-GPS	1 Geostationary Antenna with GPS
GEO-ANT-GPS-K1	1 Geostationary Antenna with GPS 1 Antenna mounting bracket (Top) 1 Antenna mounting bracket (Bottom) 5 Antenna mounting screws (flanged, 316 stainless steel) 1 Antenna mounting bracket kit
GEO-ANT-GPS-K2	1 Geostationary Antenna with GPS 1 Antenna mounting bracket (Top) 1 Antenna mounting bracket (Bottom) 5 Antenna mounting screws (flanged, 316 stainless steel) 1 Antenna mounting bracket kit 1 LMR 400 NEMA male -NEMA male cable, 5 meters or 16.4 feet 1 Moisture proof moldable tape
GEO-ANT-GPS-K3	1 Geostationary Antenna with GPS 1 Antenna mounting bracket (Top) 1 Antenna mounting bracket (Bottom) 5 Antenna mounting screws (flanged, 316 stainless steel) 1 Antenna mounting bracket kit 1 LMR 400 NEMA male -NEMA male cable, 5 meters or 16.4 feet 1 LMR 195 SMA male -SMA male cable, 5 meters or 16.4 feet 2 Moisture proof moldable tape

Note: Antenna mounting bracket (bottom) along with bracket kit, allows mounting on a 2.5” OD pipe

Ordering Numbers

Model	Description
GEO-ANT-GPS	Geostationary Antenna with GPS
GEO-ANT-GPS-K1	Geostationary Antenna with GPS and mounting bracket
GEO-ANT-GPS-K2	Geostationary Antenna with GPS, mounting bracket, UHF RF cable
GEO-ANT-GPS-K3	Geostationary Antenna with GPS, mounting bracket, UHF RF and GPS cables

Parts list

Antenna (1)

Top Bracket (1)

Bottom Bracket (1)

LMR 400 RF cable (1)

U-bolts (2)
Flanged screws (5)
Flat washers (4)
Split Washers (4)
Hex nuts (4)

Moisture-proof tape (1 or 2)

LMR 195 RF cable (1)

2. General Safety Information

- Read this manual before using GEO-ANT-GPS for the first time and become familiar with the installation and operation of the antenna.
- Operate Antenna with proper power level settings on the transmitter.
- Do not open Antenna. There are no user serviceable parts inside.
- Have a defective GEO-ANT-GPS checked and repaired by the Sutron repair center. Do not attempt to repair GEO-ANT-GPS yourself.

Symbol	Description
	Do not dispose in trash.

3. Introduction

Sutron's Geo Antenna is a rugged yet simple antenna to use for satellite communications. This antenna is ideally designed for Data Collection Platform (DCS) usage on the Environmental satellites around the world including GOES, METEOSAT, HIMAWARI and FENYUN and others. The antenna has a broad beamwidth pattern minimizing the pointing requirements and simplifying installation for the customer. The compact shape will offer advantages in applications where typical Yagi antennas will be damaged from wildlife or foliage etc.

4. Installing GEO-ANT-GPS

Antenna installation and aiming

Always mount the antenna with a clear view of the sky with no structures, trees, buildings in the path between the antenna and satellite. Also, never mount the antenna adjacent to a vertical tower. If mounted on a tower, the antenna must be either at the top of the tower or mounted on a radial tower arm to move the antenna at least 5 feet away from the vertical tower structure. Always orient the arm and antenna where the antenna view to the satellite is unobstructed by the tower.

1. Attach the antenna to the top bracket using three (3) flanged screws
2. Attach the top bracket and bottom bracket using two (2) flanged screws
3. Attach the bottom bracket to a 2½" metal pipe, using the two (2) U-bolts, flat and split washers and bolts
4. Connect one end of the LMR 400 RF cable to the RF input port of antenna, and another end of the cable to the transmitter
5. Connect one end of the LMR 195 RF SMA cable to the GPS input on the antenna, and another end to the transmitter's GPS port, if integrated GPS antenna is required.
6. Use 10" moisture- proof tape to seal the connector to prevent moisture entry. After wrapping the tape, mold to form a smooth surface and force out air.
7. Using an antenna aiming guide, point the antenna towards the sky using the calculated Azimuth and elevation angles. Pointing need not be accurate for Sutron antenna.
    a. A typical antenna pointing guide can be found here: http://www.sutron.com/wp-content/uploads/2013/12/AntennaPointingGuide_TelephoneDefinitions.pdf ; If using Sutron's LinkComm, try the "antenna aim" feature in the app.

Antenna power setting

1. The satellite transmitter output power must be set to follow the EIRP requirements specified for the associated satellite to be used. For example, for GOES operation, the recommended EIRP is 37 to 41 dBm for 300 baud service and 43 to 47 dBm for 1200 baud service. Never configure the system to exceed the maximum power.
2. For Sutron antenna and provided RF cable, transmit power shall be set to "Dome" antenna option in LinkComm.
3. Any antenna's transmit power must be set according to the following equation:

$$Tx\ Power\ (dBm) = Max\ EIRP\ + Cable\ loss - \ Antenna\ gain$$

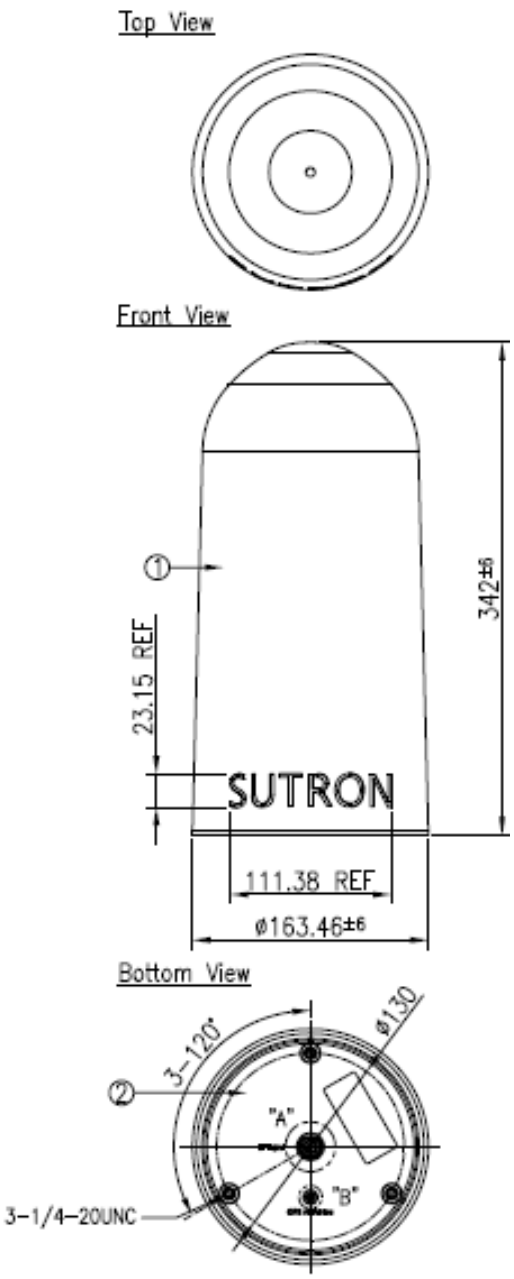
For example, if Max EIPR is 41 dBm, cable loss is 1 dB and antenna gain is 5 dB:

$$Tx\ power = 41 + 1 - 5 = 37\ dBm$$

$$Watts = \frac{10^{\left(\frac{37}{10}\right)}}{1000} = \ 5.0$$

4. If using Sutron Satlink3 and LinkComm, for 1 dB cable loss, following settings can be followed:
    a. For 300 baud rate – 2.5W
    b. For 1200 baud rate – 10 W

The dimensions for SL3-1 are shown in the figure below along with the locations of the mounting ears.



5. Appendix A – Specifications

Subject to change without notice

Polarization	Right Hand Circular
Gain	5.2 dBi Nominal
Frequency	401-403 MHz (RF Antenna)
3dB Beamwidth	110^0 Nominal
VSWR	1.5 max (RF Antenna) 2.0 max (GPS Antenna)
Impedance	50 ohms (RF and GPS port)
Axial Ration	1.2 dB typ.
Connector	Type-N Female (RF Antenna) SMA Female (GPS Antenna)
Temperature Range	-40^0 C to $+85^0$ C
Weight	1.75 lbs (794 gms) – Antenna only
Dimensions (Antenna)	Cylindrical – height 13.33 " (33.86 cms) – diameter 6.41 " (16.28 cms)
IP Rating	IP 67

6. Appendix B – Sutron Customer Service Policy

Dear Customer:

Thank you for making the important decision to purchase Sutron equipment. All Sutron equipment is manufactured and tested to the highest quality standards as set by Sutron's Quality Assurance Department. Our Customer Service Representatives have years of experience with equipment, systems and services. We have electronic technicians with field and applications experience, not limited to technical school training.

Sutron Equipment Repairs

Sutron maintains a Repair Department at the Virginia factory (22400 Davis Drive, Sterling, VA 20164).

- Average turn-around time for repairs ranges from ten to thirty days after Sutron receives equipment for repair.
- Prior to returning any equipment for repair, please call Customer Service at (703) 406-2800 for a Return Material Authorization (RMA) number. Then send the faulty equipment back to the Virginia factory**.
- Sutron Customer Service will repair Sutron-manufactured equipment sent to us for repair within 30 days of the time we receive the item or that repair is free of charge.*
- Please provide our Customer Service Representative with your email address when receiving the RMA number so that we can email you when your equipment is received at Sutron and again when it is shipped back to you. Expedited repairs can be completed within one (1) week for an additional expedite fee of $200.00.
- Repaired equipment is warranted for a period of 180 days after the repair shipment date.***
- We appreciate your cooperation in achieving a quick turn-around by promptly providing cost approval decisions, Purchase Order and credit card information once we have supplied you with a repair estimate.

If you would like to learn more about Sutron products, please email sales@sutron.com. Thank you again for your business,
Paul Delisi pdelisi@sutron.com Customer Service Manager Sutron Corporation
* Note: The 30 day guarantee applies to currently manufactured Sutron products. The 30 day guarantee does not apply to the following: bulk shipments of 10 or more repair items, third party or buy-ship products, shipments awaiting payment authorizations, cases where delays are caused by international customs, shipping or other regulations. Additionally, the 30 day guarantee is exclusive of domestic and international transit times.*
** Transportation charges for equipment returns are the responsibility of the Customer.

Customer Phone Support

Customer Service Representatives routinely handle a wide variety of questions every day. If questions arise, please feel free to contact me or one of the Customer Service Representatives. We are available from 7:00 am to 6:00 pm Monday through Friday and will be happy to take your call.

We can answer most sensor and interface questions on the first call. If we cannot quickly answer a question on an interface, we will work with you until we find a solution.

Sometimes a problem is application related. Although we pride ourselves on handling 95% of application related questions over the phone, we maintain constant contact with our Integrated Systems Division and Engineering Division for additional assistance.

Training

Training is an important part of the Sutron Customer Service philosophy. Without the proper training, you cannot take advantage of the benefits and advantages that Sutron equipment provides. We often supply on-site introductory training at your facility. We also hold a 3 day training seminar 2-4 times each year at our Sutron headquarters in Sterling Va. Contact me or your Sutron Regional Sales Manager for details.

On-Site Visits

Of course not all problems can be fixed over the phone. Sometimes a customer needs an on-site technician to identify site related problems or troubleshoot a network. Sutron can provide these services

at a reasonable cost. Call for details. If you would like to learn more about Sutron products email sales@sutron.com

Thanks again for your order,

Paul Delisi
Customer Service Manager
Sutron Corporation
pdelisi@sutron.com

7. Appendix C – Commercial Warranty

Sutron Manufactured Equipment

THE SUTRON CORPORATION WARRANTS that the equipment manufactured by its manufacturing division shall conform to applicable specifications and shall remain free from defects in workmanship and material for a period ending two years from the date of shipment from Sutron's plant.

Sutron's obligation under this Warranty shall be limited to repair at the factory (22400 Davis Drive, Sterling, VA 20164), or at its option, replacement of defective product. In no event shall Sutron be responsible for incidental or consequential damages, whether or not foreseeable or whether or not Sutron has knowledge of the possibility of such damages. This warranty shall not apply to products that have been damaged through negligence, accident, misuse, or acts of nature such as floods, fires, earthquakes, lightning strikes, etc.

Sutron's liability, whether in contract or in tort, arising out of warranties or representations, instructions or defects from any cause, shall be limited exclusively to repair or replacement parts under the aforesaid conditions.

Sutron requires the return of the defective electronic products or parts to the factory to establish claim under this warranty. The customer shall prepay transportation charges to the factory. Sutron shall pay transportation for the return of the repaired equipment to the customer when the validity of the damage claim has been established. Otherwise, Sutron will prepay shipment and bill the customer. All shipments shall be accomplished by best-way surface freight. Sutron shall in no event assume any responsibility for repairs or alterations made other than by Sutron. Any products repaired or replaced under this warranty will be warranted for the balance of the warranty period or for a period of 90 days from the repair shipment date, whichever is greater. Products repaired at cost will be warranted for 90 days from the date of shipment.

Non-Sutron Manufactured Equipment

The above Warranty applies only to products manufactured by Sutron. Equipment provided, but not manufactured by Sutron, is warranted and will be repaired to the extent of and according to the current terms and conditions of the respective equipment manufacturers.

Repair and Return Policy

Sutron maintains a repair department at the factory, 22400 Davis Drive, Sterling, VA 20164. Turnaround time normally ranges from 10-30 days after Sutron receives equipment for repair. **Call Customer Service at (703) 406-2800 for a Return Material Authorization (RMA) number.** Return the defective equipment to the factory, transportation charges paid.

Extended Warranty and On-Site Maintenance

Extended warranty and on-site maintenance contracts are available. Price quotations may be obtained from Sutron customer service representatives.

8. Appendix D – Approvals and Certifications

CE

This product complies with the following European community Directives.

2011/65/EU

Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

EN 50581:2012

2014/53/EU

Directive of the European Parliament and of the Council of 16 April 2014 on the harmonization of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC.

EN 301 489-1 V1.9.2 : 2011-09
EN 301 489-3 V1.6.1 : 2013-08
EN 300 220-2 v3.2.0 : 2017-09

Declaration of Conformity (P/N: 8800-1216) can be obtained by contacting Sutron.

FCC

Warning Statement

This product complies with FCC 47 CFR, part 15-2018 Rules. Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device

This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This antenna must not be co-located or operating in conjunction with any other antenna that is not preapproved.

ISED

This product complies with ISED (formerly Industry Canada), ICES-003:2016, Issue 6.