ONRAMP WIRELESS

TOTAL REACH NETWORK

Solar-Powered Outdoor Base Station Installation Guide

On-Ramp Wireless Inc.
10920 Via Frontera, Suite 200
San Diego, CA 92127
U.S.A.

Solar-Powered Outdoor Base Station Installation Guide

010-0034-01 Rev. A

April 3, 2015

Contents

Figures

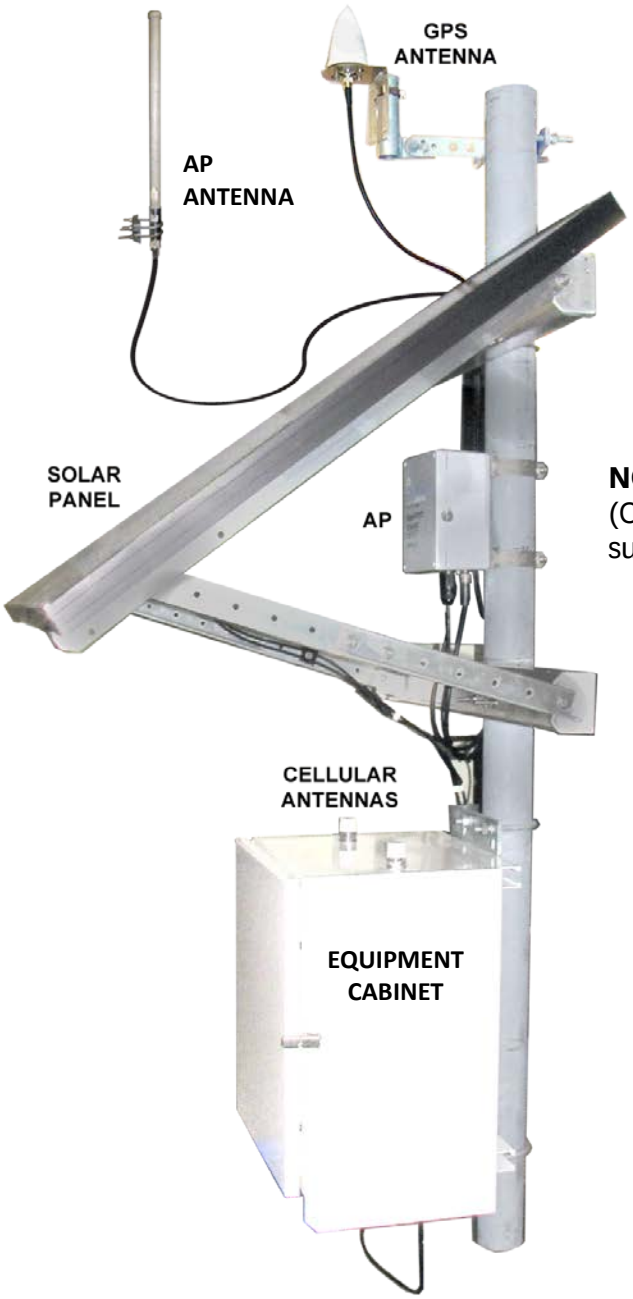
Tables

Revision History

Revision	Release Date	Change Description
A	April 3, 2015	Initial release.

1 Introduction

This manual instructs installers on how to assemble and install the On-Ramp Wireless Total Reach Network Solar AP Base Station in the field. It is ***strongly recommended*** that installers read through all instructions BEFORE starting assembly and installation.



NOTE: The 4" outer diameter (O.D.) pipe shown in photo is supplied by the customer.

Figure 1. Fully Assembled On-Ramp Wireless Solar AP Base Station

1.1 Reference Documentation

Related and relevant documents for this manual are as follows:

- *Access Point Deployment Guide (010-0006-00)*
- *Backhaul Selection and Configuration Manual (010-0032-00)*

2 Assembly Procedures

All components required to assemble the Solar AP Base Station are pre-delivered to the installation contractor. The components inside the equipment cabinet are pre-installed at the factory with two exceptions: the cellular modem and the two batteries. These will be installed later in the procedure.

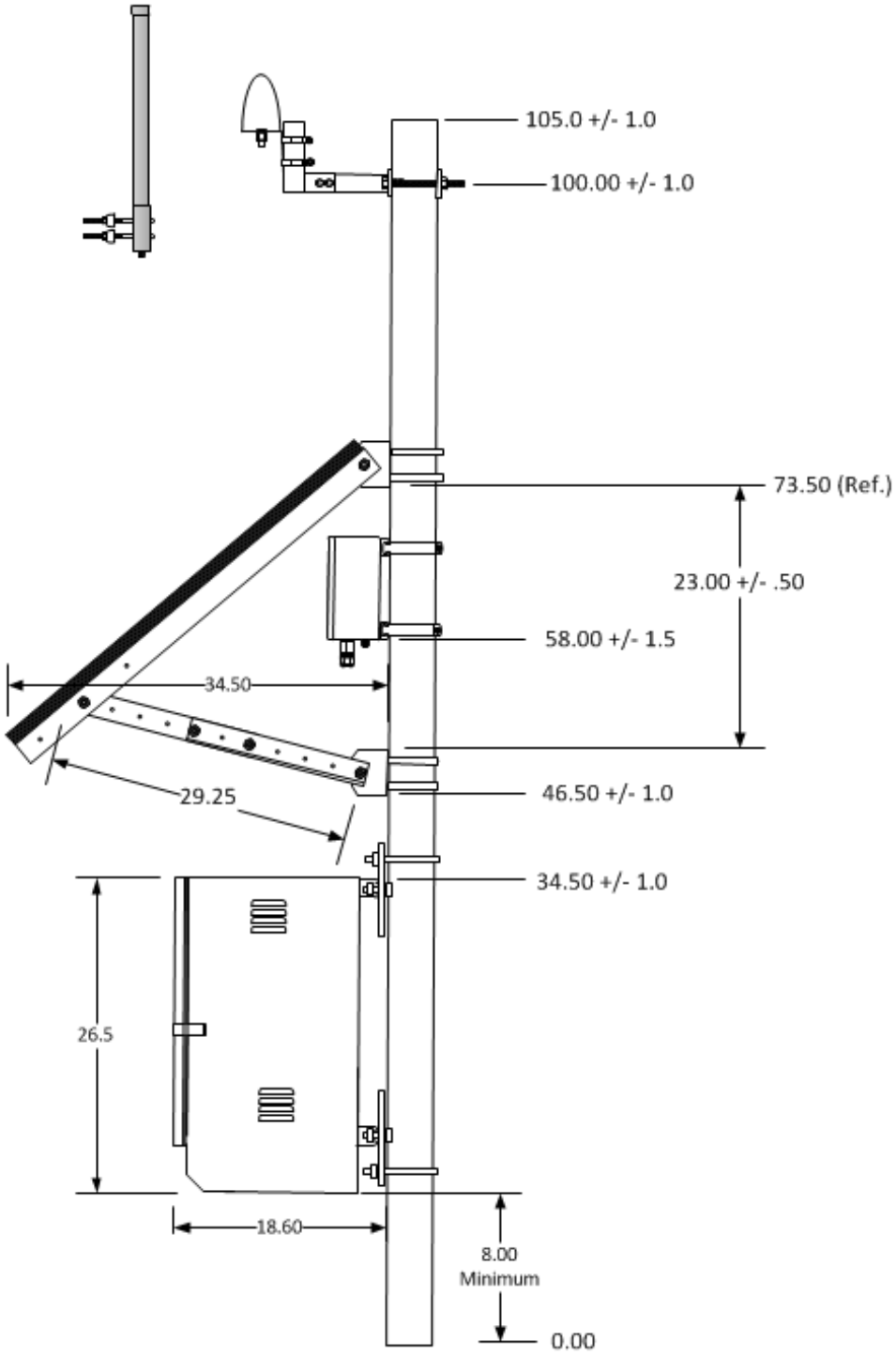
The overall assembly process is as follows:

1. Mark the elevations on mounting pole.
2. Attach the equipment cabinet (large white box).
3. Attach the GPS antenna.
4. Attach AP antenna
5. Attach the AP (small gray box).
6. Attach the solar panel brackets.
7. Add solar panel.
8. Route cables; seal connectors.
9. Test and install batteries.
10. Install modem.
11. Perform start-up.

2.1 Solar AP Base Station Assembly

1. Mark the mounting pole with the recommended elevations for all pole-mounting hardware as shown below.

   NOTE: Allow 8” minimum from the bottom of the pole to the bottom of the cabinet as shown for structure mounting.



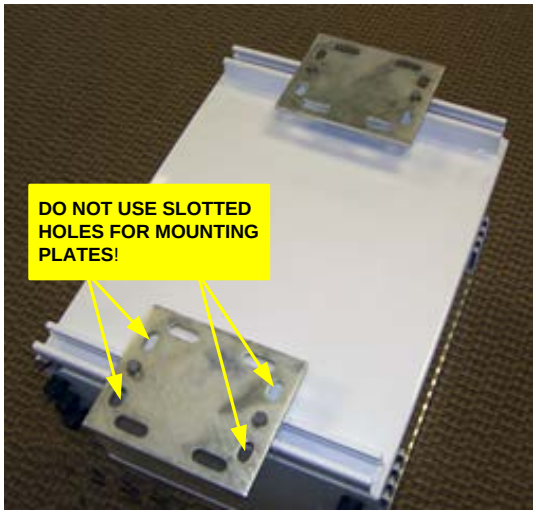
2. Open the hardware kit. See Figure A.
3. Insert two 3/8” Unistrut nuts each in the upper and lower mounting channels (Figure B).

A 

B 

4. Locate the cabinet mounting plates in the hardware kit.
5. Bolt the upper and lower mounting plates to the AP cabinet (Figure C). The plates should be centered on the cabinet. Figure D shows the detail of the mounting plate bolted to the spring-loaded nuts inside the channel.

   NOTE: Torque 3/8” bolts to 28 ft lbs. DO NOT OVER TORQUE or the strut may be damaged.

C 

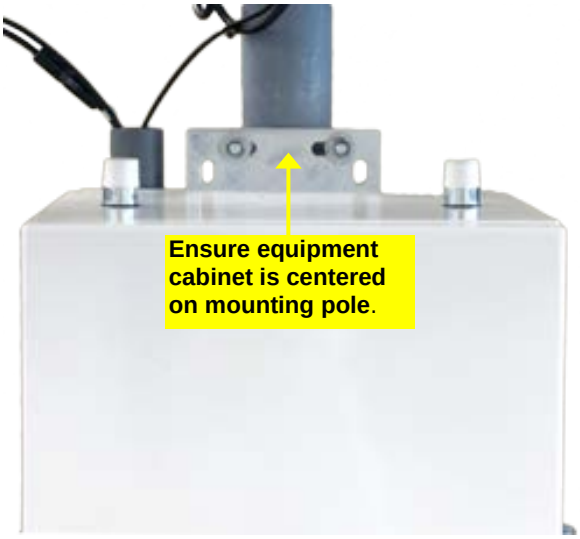
D 

6. Using the U-bolts and hardware found in the hardware kit (Figure E) mount the equipment cabinet to the pole at the correct elevation. Be sure the unit is centered on the pole, as shown in Figures F and G.
7. Tighten the U-bolt nuts to 40 ft. lbs.

E

F

G



8. Mount a piece of 2” Schedule 40 PVC conduit to the equipment cabinet using the two pipe clamps found in the hardware kit. The conduit is 27” long, +/- 1.0”. See Figure H.

H

2.1.1 GPS Antenna

In this section you will prepare the GPS antenna for installation.

1. Assemble the GPS antenna and bracket as shown below. **NOTE:** The figure shows the GPS antenna and with the connecting cable.

2. Locate and assemble the GPS bracket. See the figure below.

3. Mount the GPS antenna as indicated in the steps below. See the following figure.

- ❒ Mount the GPS antenna bracket assembly to the pole at the elevation specified in the work order.
- ❒ Attach the GPS antenna assembly to the GPS bracket.
- ❒ Connect the GPS antenna cable to the antenna but do not route it yet.
- ❒ Adjust angle of antenna to plumb after pole is mounted to structure.

2.1.2 Attaching the AP

1. Locate the AP brackets and associated hardware as shown in Figure A.

A

2. Bolt each channel piece to back of the AP as shown in Figure B.
3. Attach the 4” pipe brackets through the upper and lower channels and bolt together at the proper elevation level on the mounting pole (Figure C).

   NOTE: Position the AP more to the right of the mounting pole (when viewed from behind) to accommodate the cable routing clamps (Figure C).

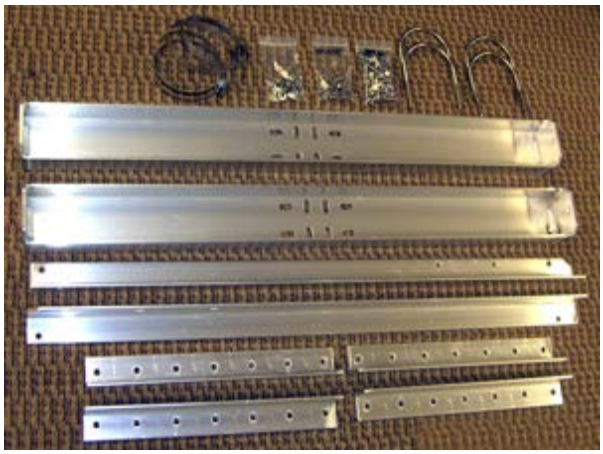
B

C

4. Locate the Lightning Protector (AL6-NMNFBW-9) in the Hardware Kit. Attach it to the antenna connector on the AP (Figure D).

D

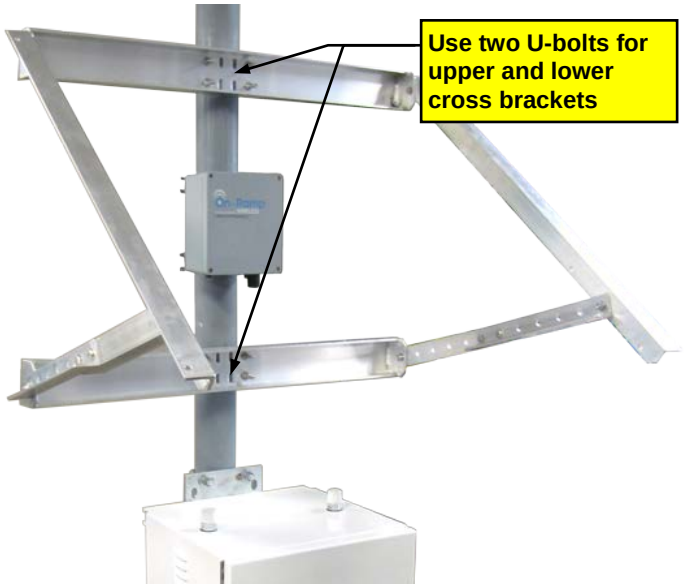
5. Locate the Solar Panel Mounting Kit, and ensure all hardware is present as shown in Figure E.



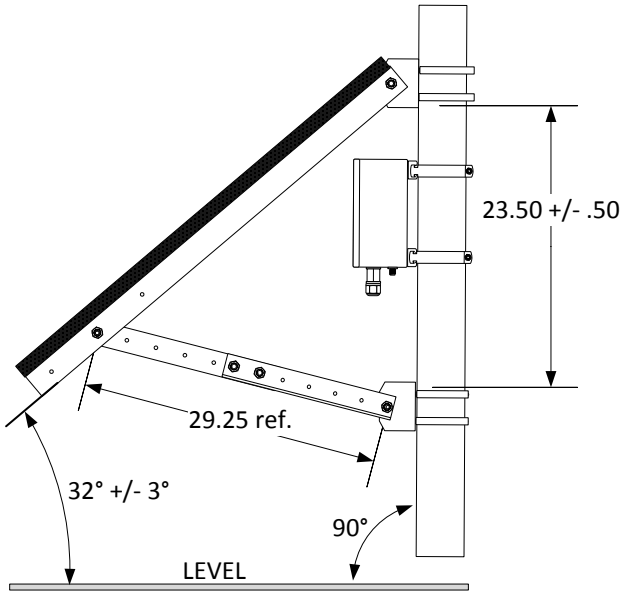
E

2.1.3 Solar Panel Brackets

1. Install the upper cross bracket first using two U-bolts. See Figure A.
2. Install the lower cross bracket using two U-bolts as shown in Figure A.
3. Install the remaining brackets as shown in Figure B.



A



B

2.1.4 AP Antenna

NOTE: The AP antenna is a required installation item that is selected to meet sight specific requirements. Work with your ORW sales representative to select the correct antenna for each site.

1. Locate the AP antenna and mounting clamps. Note the antenna mounting clamps will accommodate a pipe with a maximum diameter of 2 inches.
2. Locate the AP antenna mounting bracket. This is an item procured by the customer as required for the specific site.
3. Attach the AP antenna mounting bracket at the height specified per the site plan.
4. The bracket must position the antenna a minimum of 24 inches from the pole when side mounting the antenna parallel to the pole. It is recommended that the AP antenna be mounted as high as possible at the site.

2.1.5 Solar Panel Installation and Adjustment

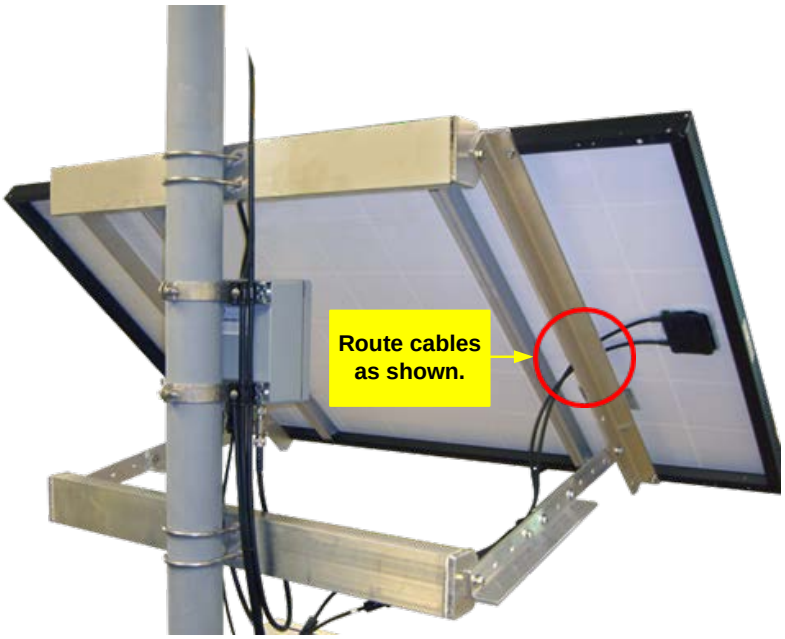
This section describes attaching and adjusting the solar panel.

CAUTION: The solar panel surface is fragile! Keep cardboard or a blanket on top of the solar panel during the installation until instructed to remove it.

1. Place the solar panel on top of the brackets attached earlier using the four bolts supplied with the solar panel mounting kit. There are two bolts for each side of the solar panel that align to holes on the mounting bracket.

   CAUTION: Cover the solar panel with cardboard or a blanket during this procedure to prevent it from generating electricity. DO NOT CONNECT solar panel cables to cabinet cables yet. Circuit damage could occur.

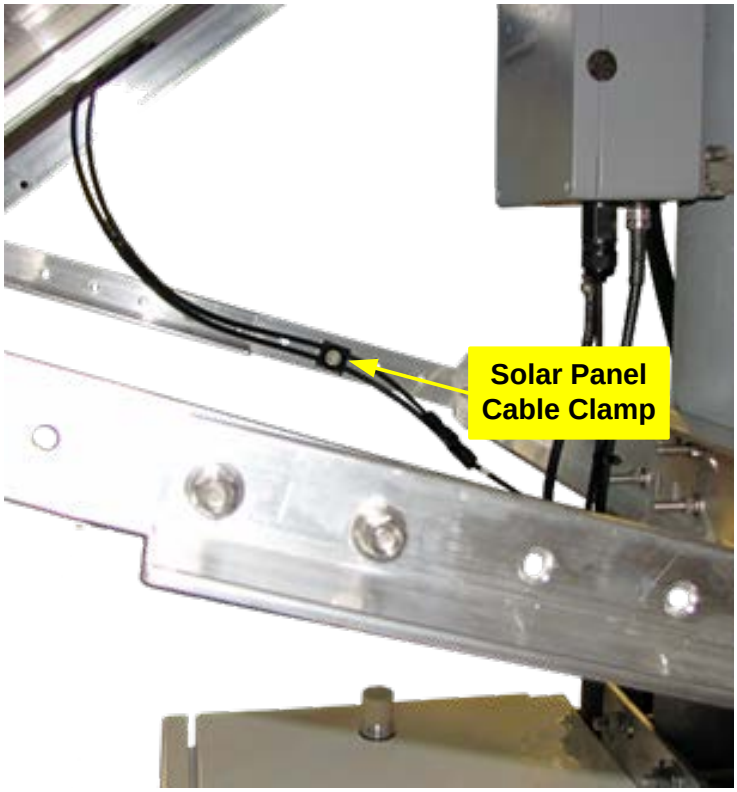
   NOTE: The solar panel cables must be positioned to the right, as viewed from the back of the structure. Route these cables as shown below.



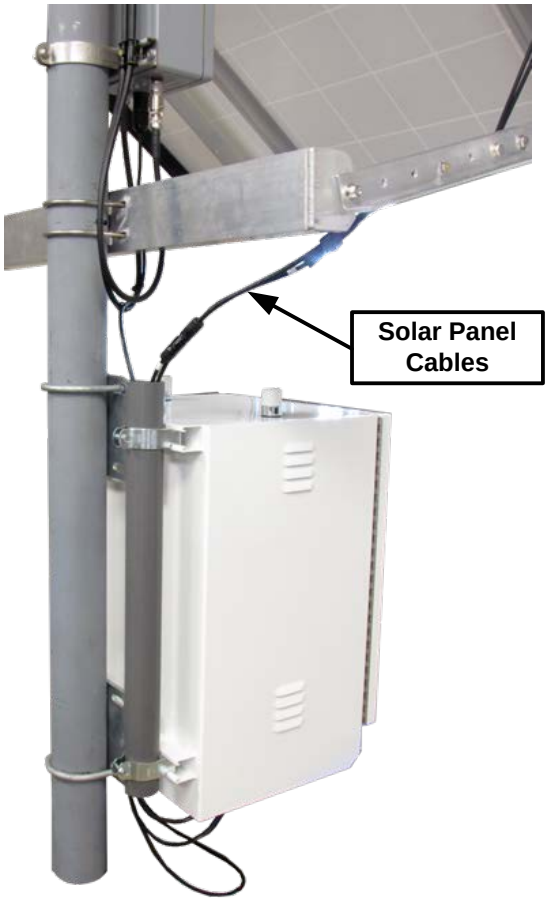
2. Locate the single cable clamp kit (shown below).

   NOTE: There are three cable clamps in the clamp kit. Use the smallest cable clamp in this location.

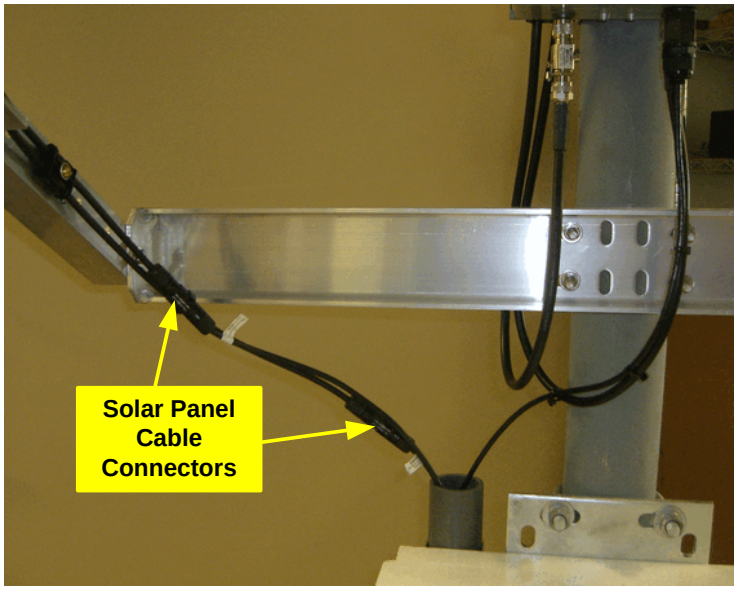
3. Use a single cable clamp to secure the solar panel cables to the frame.



4. Route the two solar panel power cables from the bottom of the equipment cabinet up through the 2” conduit on the back of the equipment cabinet.



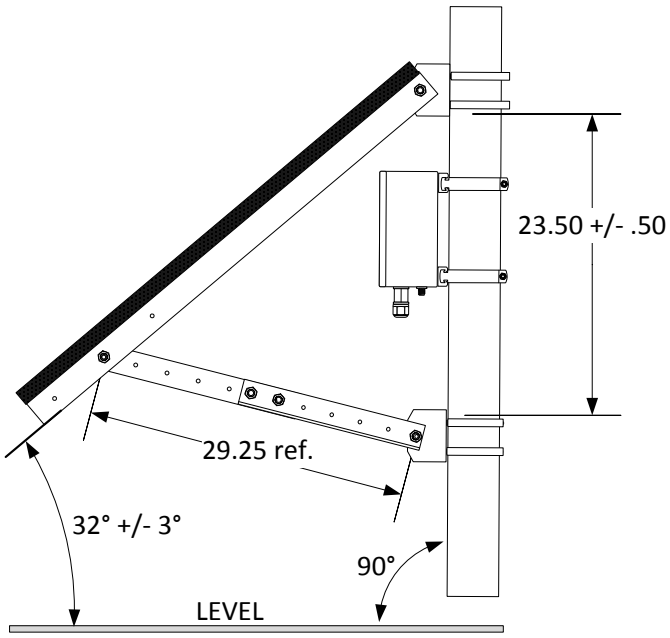
5. **WITH THE SOLAR PANEL STILL COVERED**, connect the panel cables to the equipment cabinet cables as shown below.



2.1.6 Adjusting the Solar Panel

Adjust the angle of the solar panel by removing the side bracket bolts and repositioning the brackets to the desired angle.

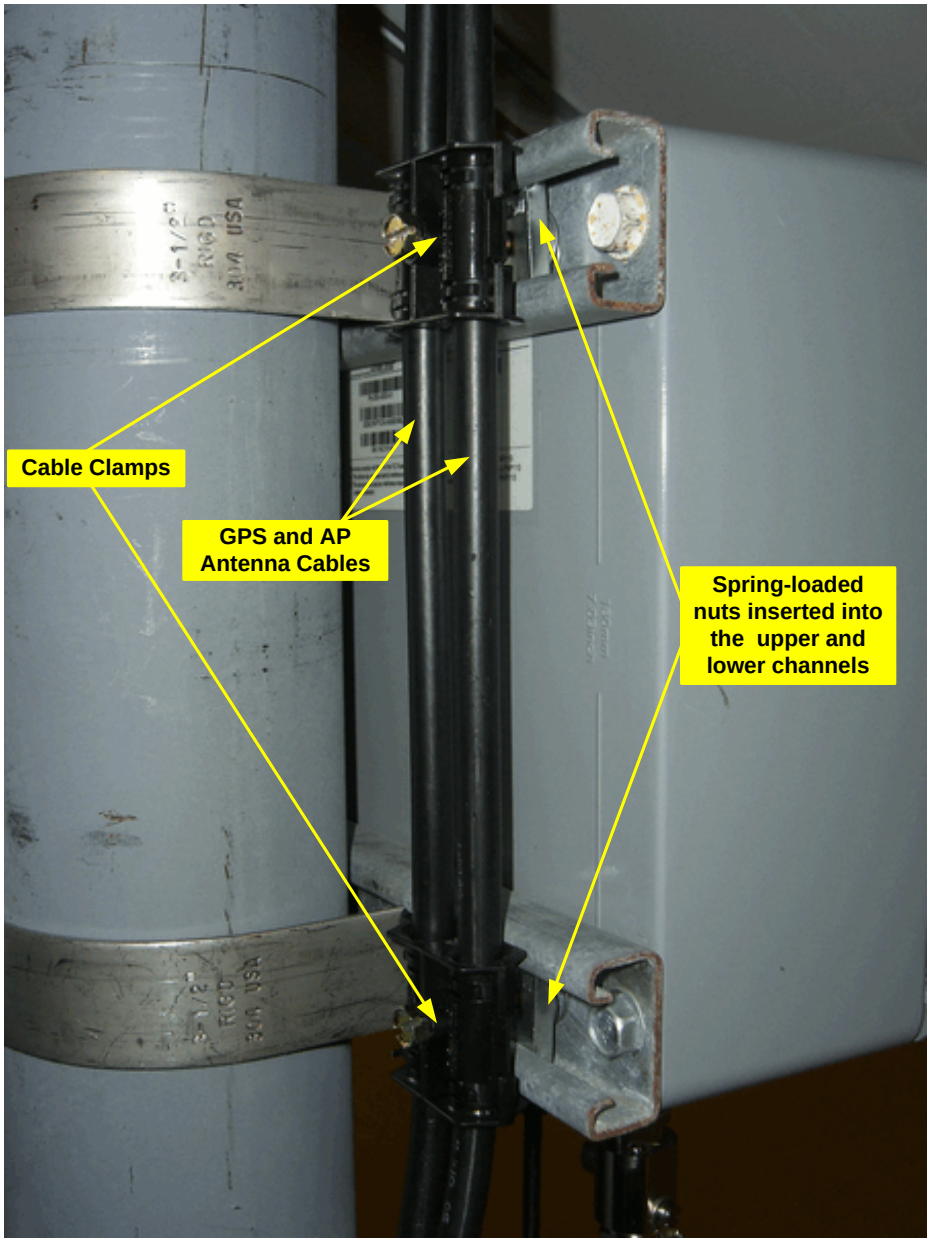
NOTE: Panel should be facing south and set at an angle of 32° +/- 3°. Note the positions of the brackets and the bolt-hole count, as shown below.



2.2 Cable Routing and Weatherproofing

This section describes positioning, connecting, and weatherproofing all cables and connectors.

1. Locate the cable clamp kit.
2. Insert one spring-loaded ¼-20 nut into the upper and lower channels holding the AP as shown in the following figure.



3. Clip the GPS and AP antenna cables into the cable clamps. Then, with the hardware provided, fasten the clamps to the AP brackets to secure the cables, as shown above.

4. Route the Ethernet cable from the equipment cabinet and solar panel through the conduit, as shown below.

5. Refer to the wiring guide in Appendix A for cable routing. Cables connect as follows:
   - ❒ Install AP Antenna to lightning protector on AP.
   - ❒ Connect GPS antenna to GPS connector on AP.
   - ❒ Install cable from equipment cabinet through the gland and into Ethernet port on AP as shown in the following figure. Do not over-tighten the gland. Ensure the Ethernet connector housing does not turn when tightening the gland.

6. Weatherproof all exposed coaxial cable connectors using an industry-approved method. These methods include, adhesive lined shrink tubing, self-amalgamating tape, self-bonding silicone tape, or butyl mastic tape and electrical tape (shown below).

2.3 Battery Installation Preparation

2.3.1 Battery Safety Precautions

CAUTION: Care must be taken when handling and connecting the batteries. Refer to the battery manufacturer's website, www.sunxtender.com, for full safety information.

Lead acid batteries can produce explosive mixtures of hydrogen and oxygen. Take the following precautions:

- Never install batteries in an airtight or sealed enclosure and make sure installation is adequately ventilated.
- Charge batteries in accordance with the instructions given in the manufacturer's manual.
- Keep all sparks, flames and cigarettes away from batteries.
- Connect cables tightly to the terminals to avoid sparks.
- Wear proper eye and face protection when installing and servicing batteries.
- Avoid contact of the electrolyte with skin, eyes or clothing.
- Never remove or damage vent valves.
- In the event of an accident, flush with water and call a physician immediately.
- Do not place metal objects across battery terminals.
- Remove all metallic items such as watches, bracelets and rings when installing or servicing batteries.
- Wear insulating gloves when installing or servicing batteries.
- Use insulating tools when installing or servicing batteries.

2.3.2 Pre-Installation Battery Testing

Testing and installing the product's two sealed lead-acid batteries are described here.

NOTE: Follow the procedure below to test a battery BEFORE installing it to ensure that it is fully charged.

1. Use a DC volt meter to verify that the battery voltage for each battery is above 12.5 Volts. If the voltage for either battery is below 12.5 Volts, that battery must be charged before installation.

   NOTE: It is recommended that the battery be fully charged within 48 hours of installation.

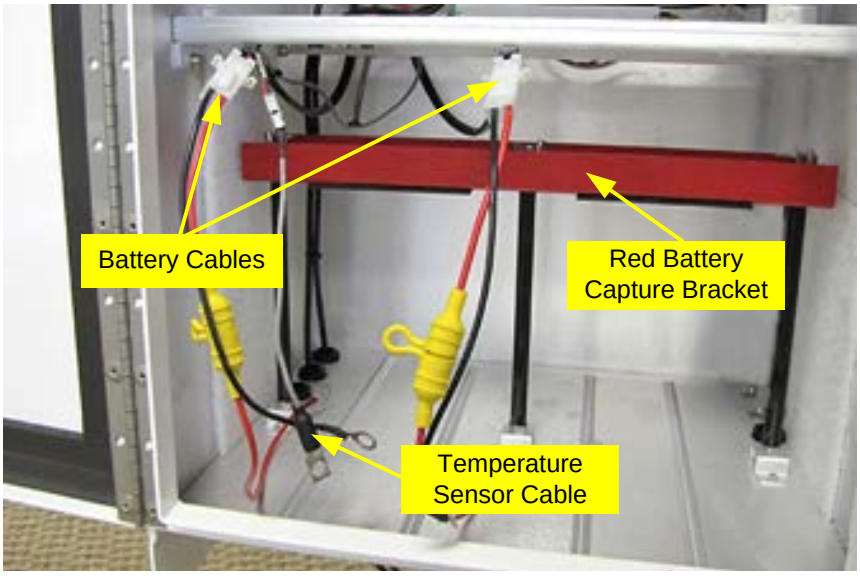
2. Make a note of the readings for each battery. If the voltage reading for the batteries are *greater than 12.5 Volts AND within .25 Volts* of each other, proceed with the battery installation described in the next section.

   If the difference between the two readings is greater than .25 Volts, replace or charge both batteries prior to installation. Once they are recharged verify voltages again and ensure that they meet the above criteria. If one of them is still lower than the other by .25 volts or more then replace the lower voltage battery. This is important for proper operation of the Solar AP Base Station.

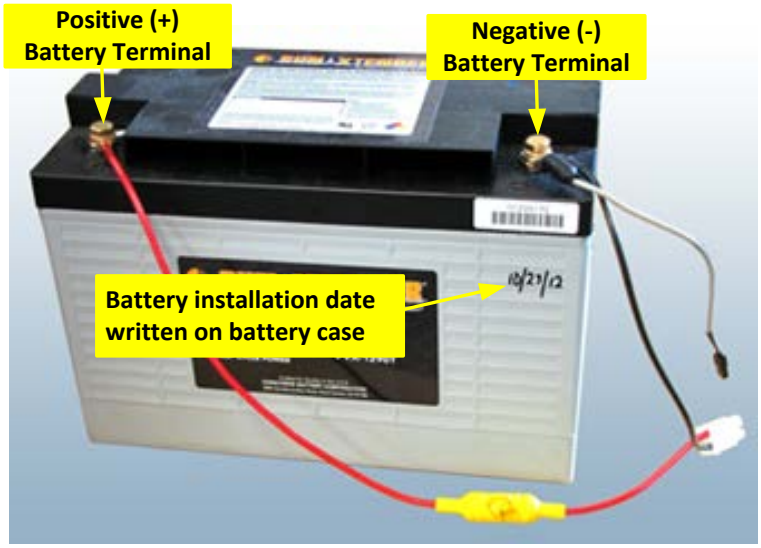
2.4 Battery Installation

CAUTION: DO NOT move or transport the equipment cabinet with the battery installed as serious damage will occur! If the equipment cabinet must be moved or transported, remove the battery first.

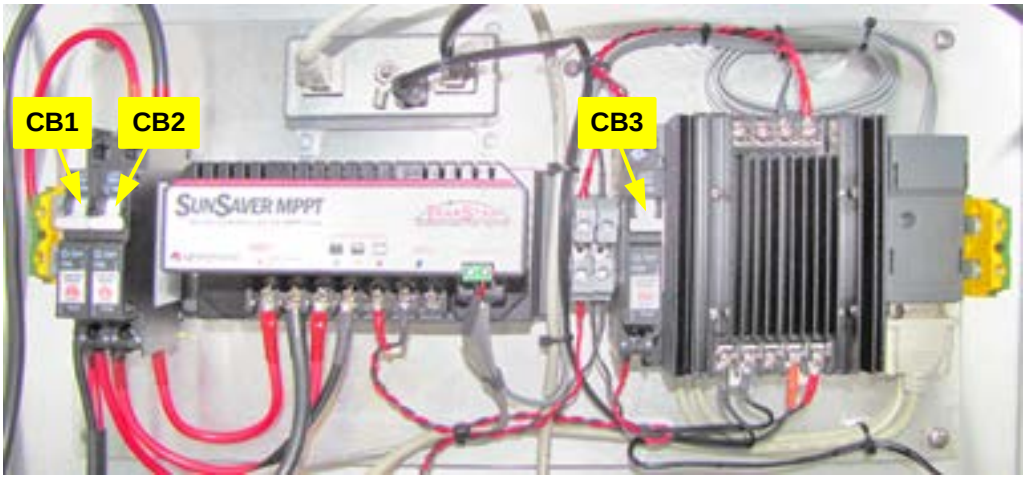
1. Open the equipment cabinet door of the Solar AP Base Station.
   NOTE: The solar panel should still be covered at this point.
2. Look for the plastic bag taped to the bottom of the cabinet containing the battery leads and temperature sensor cable.
3. Unscrew and remove the red battery capture bracket.



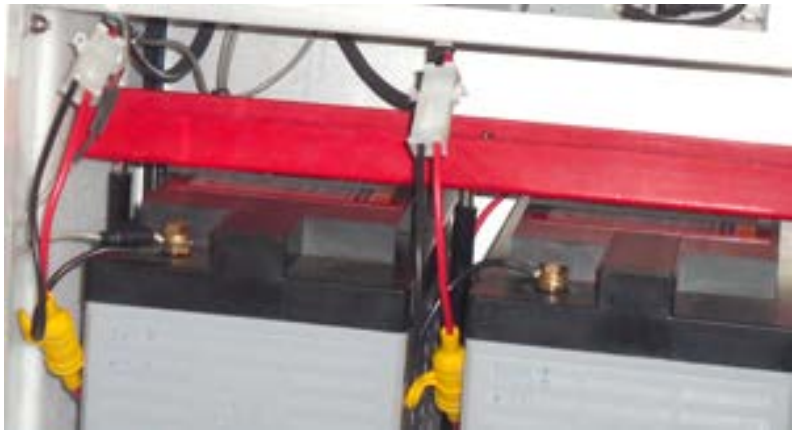
4. Using a permanent marker, write the installation date on each battery case where it will be visible after installation.
5. Next, connect the cables as indicated in the figure below:
   - ❒ Connect the RED wire battery lug to the POSITIVE (+) battery terminal.
   - ❒ Connect the temperature sensor wire to the NEGATIVE battery terminal.
   - ❒ Connect the BLACK wire battery lug to the NEGATIVE (–) battery terminal.



6. Ensure ALL circuit breakers (CB1, CB2, CB3) are turned OFF (i.e., the switches are positioned down). See the following figure.



7. Place the battery with the temperature sensor in the cabinet on the left side. Insert the POSITIVE-terminal end of the battery first, towards the back of the cabinet. The battery terminals will be on the left side of the battery. See the figure below.



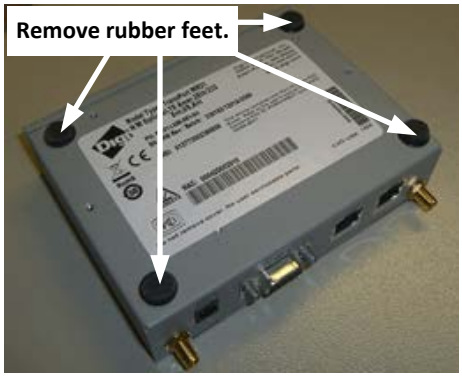
8. Install the second battery with the same orientation as the first battery.
9. Secure battery bracket by FIRST HAND-TIGHTENING THE CENTER wing nut. Then tighten the left and right wing nuts to secure the capture bracket evenly across both batteries.
10. Connect both battery cables and the temperature sensor cable connectors as shown in the figure above.

2.5 3G/4G Wireless Modem Installation

The 3G/4G wireless modem is installed inside the Base Station's equipment cabinet. The modem and wireless data service, with a fixed IP address, must be purchased by the customer. For modem manufacture, model and configuration details, refer to the *Backhaul Selection and Configuration Manual (010-0032-00).*

NOTE: The information provided in this section is based on the On-Ramp Wireless' recommended Digi WR-21 modem. Other 3/4G modems and backhaul solutions may be installed but On-Ramp Wireless will not be able to provide configuration, installation, and troubleshooting support for these devices.

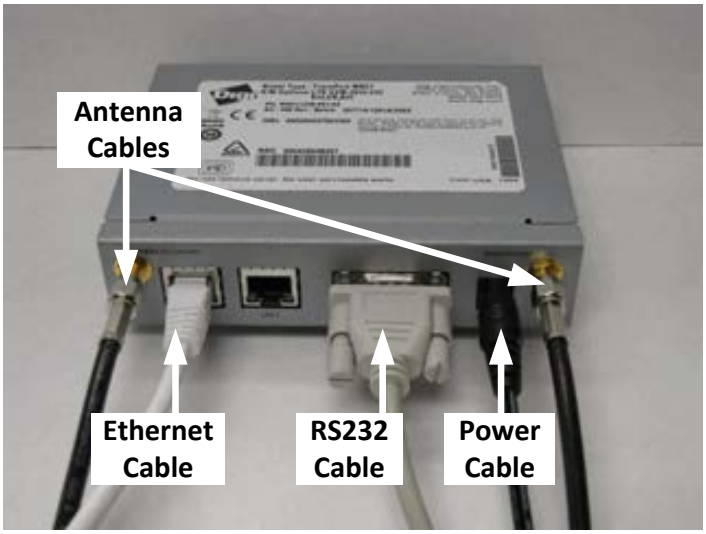
1. On the bottom of the modem, remove the rubber feet and carefully peel off the label and stick it onto the top side of the modem.



2. Inside the equipment cabinet, locate the bag containing two pieces of 1-inch hook-and-loop tape.

3. Apply each piece of the the hook-and-loop tape to the bottom of the modem (the side where you removed the rubber feet).

4. Locate the modem cables on the shelf inside the cabinet.
5. Connect all cables (2 antenna cables, Ethernet cable, RS232 cable, and power cable) to the modem as shown in the following picture.



NOTE: When connecting the power cable, make sure that the locking tabs on the power connector are fully inserted into the modem. Twist the power cable ¼ turn clockwise so that the tabs lock into place as shown below.

6. After connecting all of the cables to the modem, secure the modem to the bottom shelf of the equipment cabinet using the hook-and-loop tape.

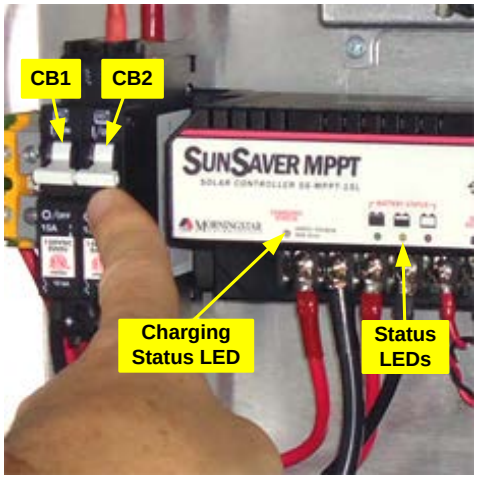
3 Operation

Before mounting the Solar AP Base Station on the structure, ensure that it operates properly by following the procedure below.

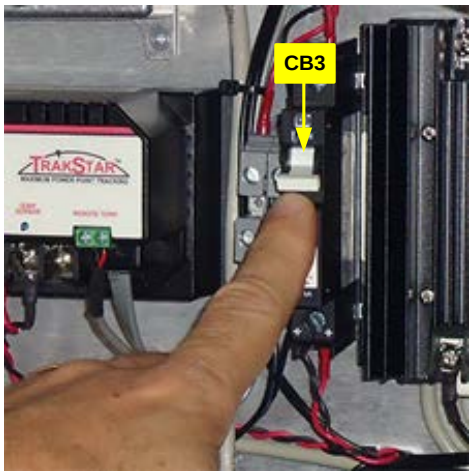
1. Uncover the solar panel.
2. Perform the following actions as shown in the following figure:
   a. Power on circuit breaker CB1. The SunSaver Charging Status LEDs will cycle for approximately three seconds. Ensure that the Full or Medium Battery Status LED is on.

      NOTE: If Low LED is lit, the battery is not fully charged and must be replaced with a fully charged battery prior to completing the installation.

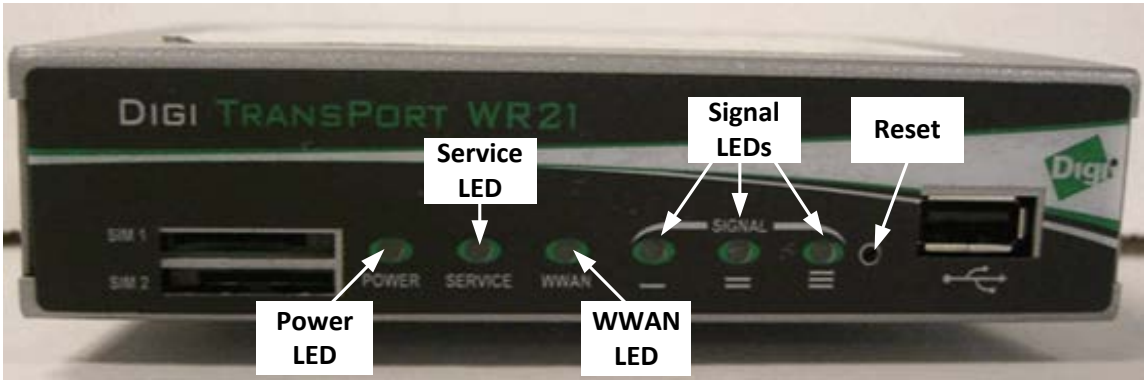
   b. Turn on circuit breaker CB2.
   c. Verify that the Charging Status LED is solid green with off "heartbeat" every five seconds; or, solid off with green "heartbeat" flashes every five seconds. The Charging Status LED should never be red. If it turns red, refer to Chapter 4: Troubleshooting Guide.



3. Turn on circuit breaker CB3 on the right side of the equipment cabinet (as shown below).



4. Verify that the modem powers on by checking the LEDs on the modem. Depending on signal strength, it may take between 1 to 5 minutes for the “Service LED” to turn green. If the modem fails to establish a link, refer to section 4.2 to troubleshoot the issue.



5. Verify that the AP's green Status LED is on. If the Status LED is *not* on, refer to Chapter 4: Troubleshooting Guide.

6. Follow the AP configuration instructions found in the *AP Deployment Guide (010-0006-00)* for instructions on verifying operation of the AP on an On-Ramp Wireless Total Reach Network.

4 Troubleshooting Guidelines

4.1 System Troubleshooting

The following table provides system troubleshooting guidelines.

Table 1. System Troubleshooting Guidelines

Problem	Action
SunSaver Charging Status LED turns red	A red charging status LED indicates a failure with either the solar panel and or the controller. Verify the solar panel or panel cables have not been damaged during shipment. Turn off first circuit breaker (CB1) and disconnect solar panel cables. Turn on breaker CB1. If status LED continues to light up red, potential problem exists with SunSaver Charge Controller. If LED becomes green with solar panel disconnected, a potential fault exists with the solar panel. Replace faulty component.
SunSaver Battery Status LED	Although it is acceptable for the battery to be partially charged, it is recommended that battery be fully charged at first install. If the Low battery LED is on, the battery should either be recharged or replaced by a fully charged battery.
Modem does not acquire signal	If modem fails to establish a link after power up, verify that both antenna cables are connected to the antennas. If modem still does not acquire, use a cell phone to verify the carrier's signal is actually available at installation site.
AP does not power up	When AP is powered, Status LED illuminates. If this fails to happen, first verify that Load circuit breaker is turned on. Verify POE Ethernet cable is properly connected to the AP Ethernet port. Check Ethernet cable for damage.
No power to SunSaver Charge Controller	If there is no power to the SunSaver Charge Controller with circuit breaker CB1 on, verify that both battery cables have been properly connected. The system will not operate with a single battery.
AP does not acquire GPS	Verify that GPS antenna and AP antenna cables are connected and have not been swapped. Refer to the AP Deployment Guide (010-0006-00) for further instructions on troubleshooting and maintaining the AP.

4.2 Modem Troubleshooting

NOTE: The information provided in this section is based on the On-Ramp Wireless' recommended Digi WR-21 modem. Other 3/4G modems and backhaul solutions may be installed but On-Ramp Wireless will not be able to provide configuration, installation, and troubleshooting support for these devices.

Use the following table to help troubleshoot any modem issues for the Digi WR-21.

Table 2. Modem Troubleshooting Guidelines

LED/Button	Color and Light Pattern	Activity Indicated
Power LED	Green	Power is applied.
	Not illuminated	No power.

LED/Button	Color and Light Pattern	Activity Indicated
Ethernet Link LED (on the Ethernet connector at the rear of the unit)	Flashing green	The link is up and there is Ethernet traffic on the link.
Service LED	Solid green	Cellular link is up.
	Flashing green	Data is being sent or received.
WWAN LED	Blinking green	Flashes to show which network mode the unit is operating in: ■ Off = no service ■ 1 blink = GPRS mode ■ 2 blinks = EDGE mode ■ 3 blinks = UMTS mode ■ 4 blinks = HSDPA mode ■ 5 blinks = HSUPA mode ■ 6 blinks = LTE mode ■ On steady = CDMA mode
Signal Strength LEDs	0-3 Green LEDs	■ 0 LEDs illuminated: ≤ -113 dBm (effectively no signal) ■ 1 LED illuminated: ≥ -112 dBm and ≤ -87 dBm (weak signal) ■ 2 LEDs illuminated: ≥ -86 dBm and ≤ -71 dBm (medium strength signal) ■ 3 LEDs illuminated: ≥ -70 dBm and ≤ -51 dBm (strong signal)
Reset button		Single press: Performs equivalent of a power-cycle. Press and hold: Resets device configuration settings to factory defaults (factory reset). **WARNING!!** **DO NOT reset modem to factory defaults prior to contacting On-Ramp Wireless support.**

The following picture points out the LEDs on the modem.

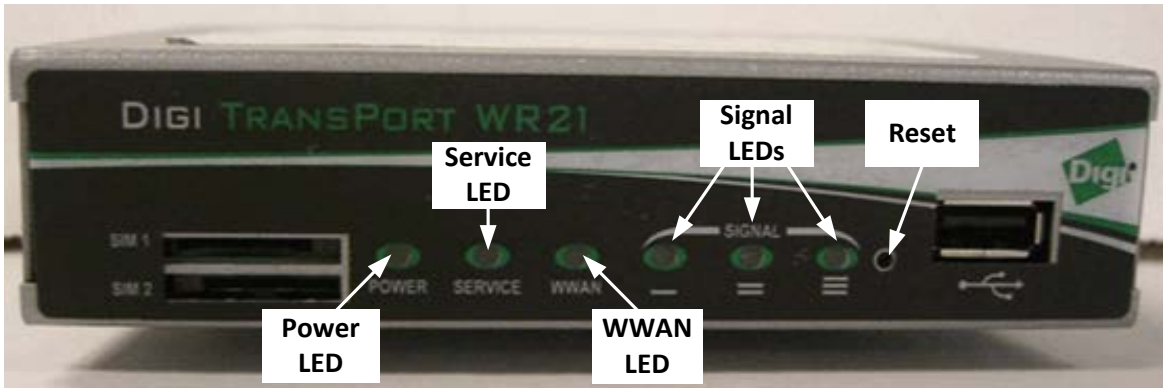


Figure 2. Modem Indicators

5 Preventive Maintenance

The following table shows the recommended preventive maintenance schedule for the Solar AP Base Station. Contact On-Ramp Wireless Customer Support:

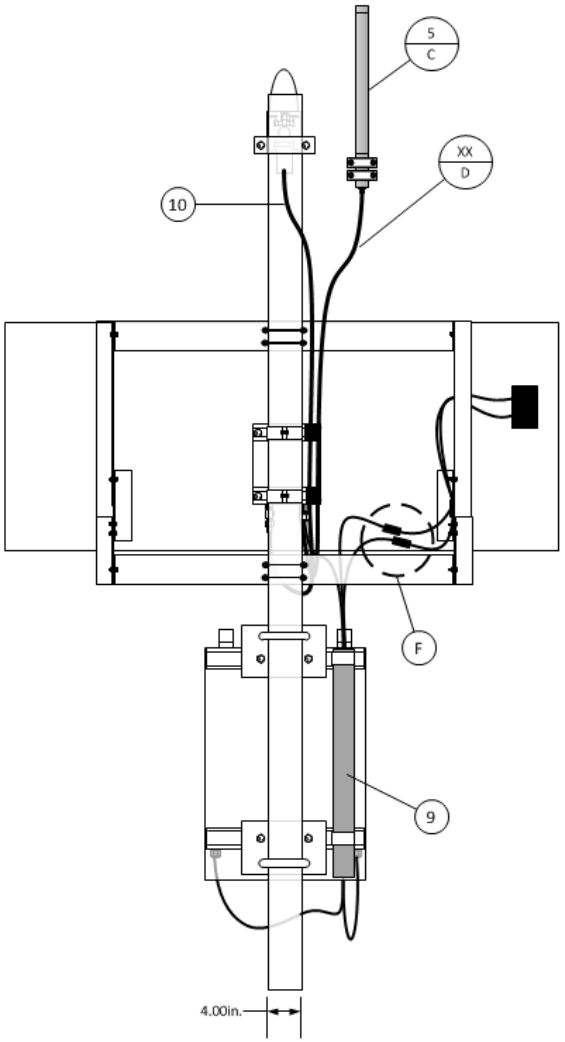
CAUTION: When performing annual maintenance, take appropriate precautions to avoid electrical shock.

For additional assistance, contact On-Ramp Wireless Customer Support at (858) 592-6008 or email support@onrampwireless.com.

Table 3. Preventive Maintenance Schedule

Task	Frequency
1. Remove, clean, and re-install air filters.	Annually
2. Check that all connections are secure and that there are no loose or broken wires.	Annually
3. Check the base station cabinet for any water intrusion and remove it.	Annually
4. Check the seals around the base station door and ensure that none are worn or damaged.	Annually
5. Check for and clean away any corrosion from the battery terminals. **CAUTION:** Wear protective gear while performing this step.	Annually
6. Perform battery checks for proper voltage. Check battery charge status LEDs on front of SunSaver Charge Controller and confirm that either charge status LED Med or Full is lit. If Lo LED is lit, look for the date the battery was installed. It should be written on the white or light-colored part of the battery case. If the date is longer than 5 years, replace the battery.	Annually
7. Check the date that the batteries were installed. If it has been longer than 3 years since the batteries were installed, replace the battery. **NOTE:** Battery replacement is recommended every 3 years.	Annually
8. Clean the solar panel glass surface only with a soft cloth using mild detergent and water.	As Needed

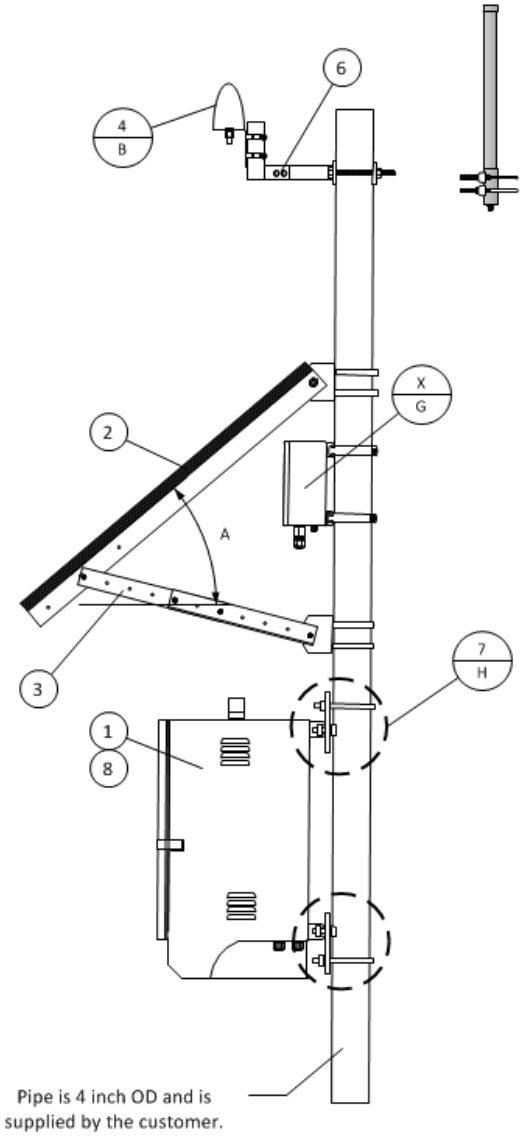
Appendix A Assembly and Schematic Drawings



ITEM NO.	DESCRIPTION	WEIGHT	DIMENSIONS (IN.)
X	ACCESS POINT	8 lb.	9 X 8 X 4.5 DP
1	ENCLOSURE W/ CONTROLS	50 lb.	26.5X19WX18D
2	245W SOLAR PANEL	75 lb.	65.5X34X1.8
3	SOLAR PANEL MOUNT	45 lb.	4 X 2 C CHANNEL
4	GPS ANTENNA	2.4 lb	3" DIA X 4" TALL
5	AP ANTENNA (2.4 GHZ) WITH BRACKETS	3.0 lb.	32L X 1.75 DIA
6	ANTENNA MOUNT, M-TOW, HDG	5.5 lb.	N/A
7 H	Kit Pole mounting, 4" OD, 3 ½ in pipe	18.9 lb.	82 IN
8	BATTERY , 12VDC 129 AHR X 2	75 lb. EA.	STD ITEM
9	CONDUIT, 27 INCH, 2 IN ID, SCH 40 PVC	1 lb.	27" X 2" ID
10	LMR-400 x 82in. W/NM CONNECTORS	5.4 Lb.	82 IN
XX	LMR-400 x 25 FT W/NM CONNECTORS	VARRIES	25 FT min.

A. FACE TOWARDS EQUATOR, SOUTHERN CALIFORNIA FIXED TILT ANGLE = 30-35° FROM HORIZONTAL
B. REQUIRES OPEN VIEW OF SKY, MOUNT LEVEL
C. ANTENNA MUST BE LEVEL AND PLUMB AND BE MOUNTED PER SIGHT INSTALL PLAN WITH A MINIMUM OFF-SET OF 24" FROM MOUNTING STRUCTURE.
D. LENGTH OF THIS CABLE WILL BE DETERMINED BY THE SIGHT PLAN AND COULD BE LONGER OR SHORTER THAN SPECIFIED IN THE ABOVE BOM. THE INSTALLATION CONTRACTOR SUPPLIES THIS PART.
E. WEATHERPROOF ALL COAXIAL CONNECTIONS
F. THE CONNECTORS FOR THE SOLAR PANEL SHOULD BE HEAT SHRINK SEALED WITH ADHESIVE LINED UV RATED HS.
G. THIS ITEM IS SOLD SEPARATLY AND IS NOT AN ITEM ON THIS BOM. IT IS SHOWN FOR LOCATING REFERENCE.
H. THIS KIT CONTAINS ALL OF THE HARDWARE REQUIRED TO MOUNT EVERYTHING TO THE POLE.

Figure 3. Parts Locations, Sheet 1



ITEM NO.	DESCRIPTION	WEIGHT	DIMENSIONS (IN.)
X	ACCESS POINT	8 lb.	9 X 8 X 4.5 DP
1	ENCLOSURE W/ CONTROLS	50 lb.	26.5X19WX18D
2	245W SOLAR PANEL	75 lb.	65.5X34X1.8
3	SOLAR PANEL MOUNT	45 lb.	4 X 2 C CHANNEL
4	GPS ANTENNA	2.4 lb	3" DIA X 4" TALL
5	AP ANTENNA (2.4 GHZ) WITH BRACKETS	3.0 lb.	32L X 1.75 DIA
6	ANTENNA MOUNT, M-TOW, HDG	5.5 lb.	N/A
7 H	Kit Pole mounting, 4" OD, 3 ½ in pipe	18.9 lb.	82 IN
8	BATTERY , 12VDC 129 AHR X 2	75 lb. EA.	STD ITEM
9	CONDUIT, 27 INCH, 2 IN ID, SCH 40 PVC	1 lb.	27" X 2" ID
10	LMR-400 x 82in. W/NM CONNECTORS	5.4 Lb.	82 IN
XX	LMR-400 x 25 FT W/NM CONNECTORS	VARRIES	25 FT min.

A. FACE TOWARDS EQUATOR, SOUTHERN CALIFORNIA FIXED TILT ANGLE = 30-35° FROM HORIZONTAL
B. REQUIRES OPEN VIEW OF SKY, MOUNT LEVEL
C. ANTENNA MUST BE LEVEL AND PLUMB AND BE MOUNTED PER SIGHT INSTALL PLAN WITH A MINIMUM OFF-SET OF 24" FROM MOUNTING STRUCTURE.
D. LENGTH OF THIS CABLE WILL BE DETERMINED BY THE SIGHT PLAN AND COULD BE LONGER OR SHORTER THAN SPECIFIED IN THE ABOVE BOM. THE INSTALLATION CONTRACTOR SUPPLIES THIS PART.
E. WEATHERPROOF ALL COAXIAL CONNECTIONS
F. THE CONNECTORS FOR THE SOLAR PANEL SHOULD BE HEAT SHRINK SEALED WITH ADHESIVE LINED UV RATED HS.
G. THIS ITEM IS SOLD SEPARATLY AND IS NOT AN ITEM ON THIS BOM. IT IS SHOWN FOR LOCATING REFERENCE.
H. THIS KIT CONTAINS ALL OF THE HARDWARE REQUIRED TO MOUNT EVERYTHING TO THE POLE.

Figure 4. Parts Locations, Sheet 2

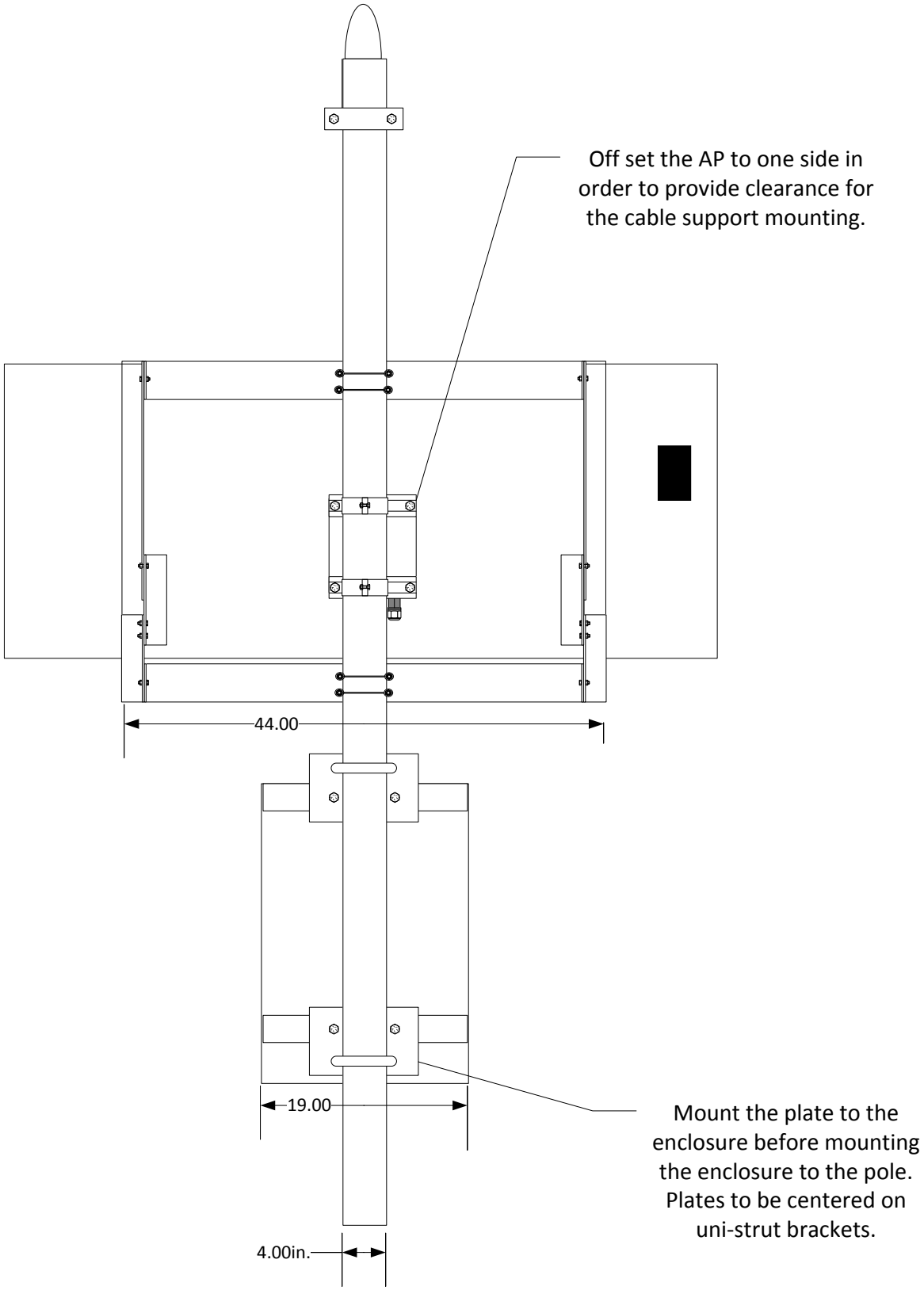


Figure 5. Mounting Elevations, Sheet 1

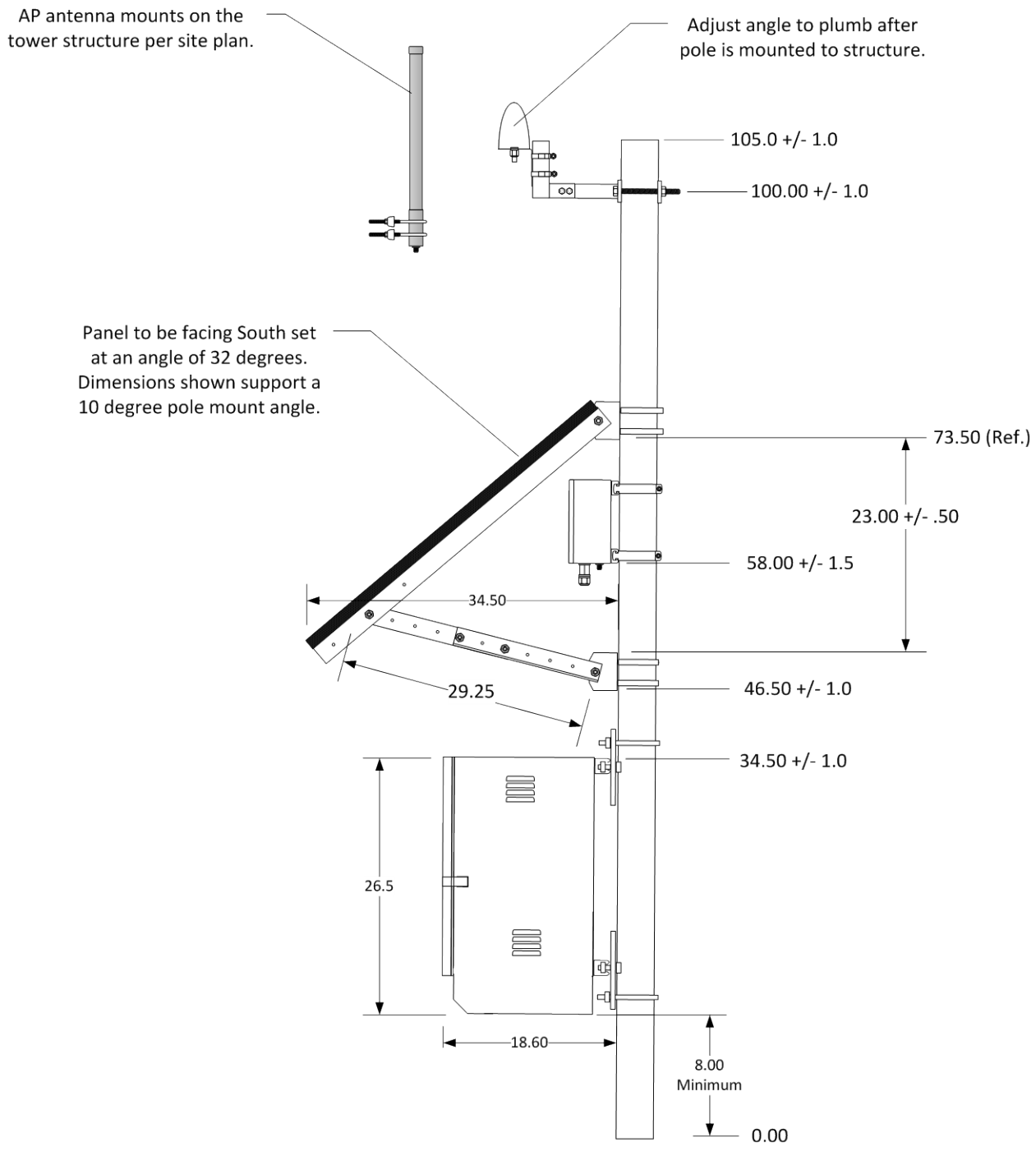


Figure 6. Mounting Elevations, Sheet 2

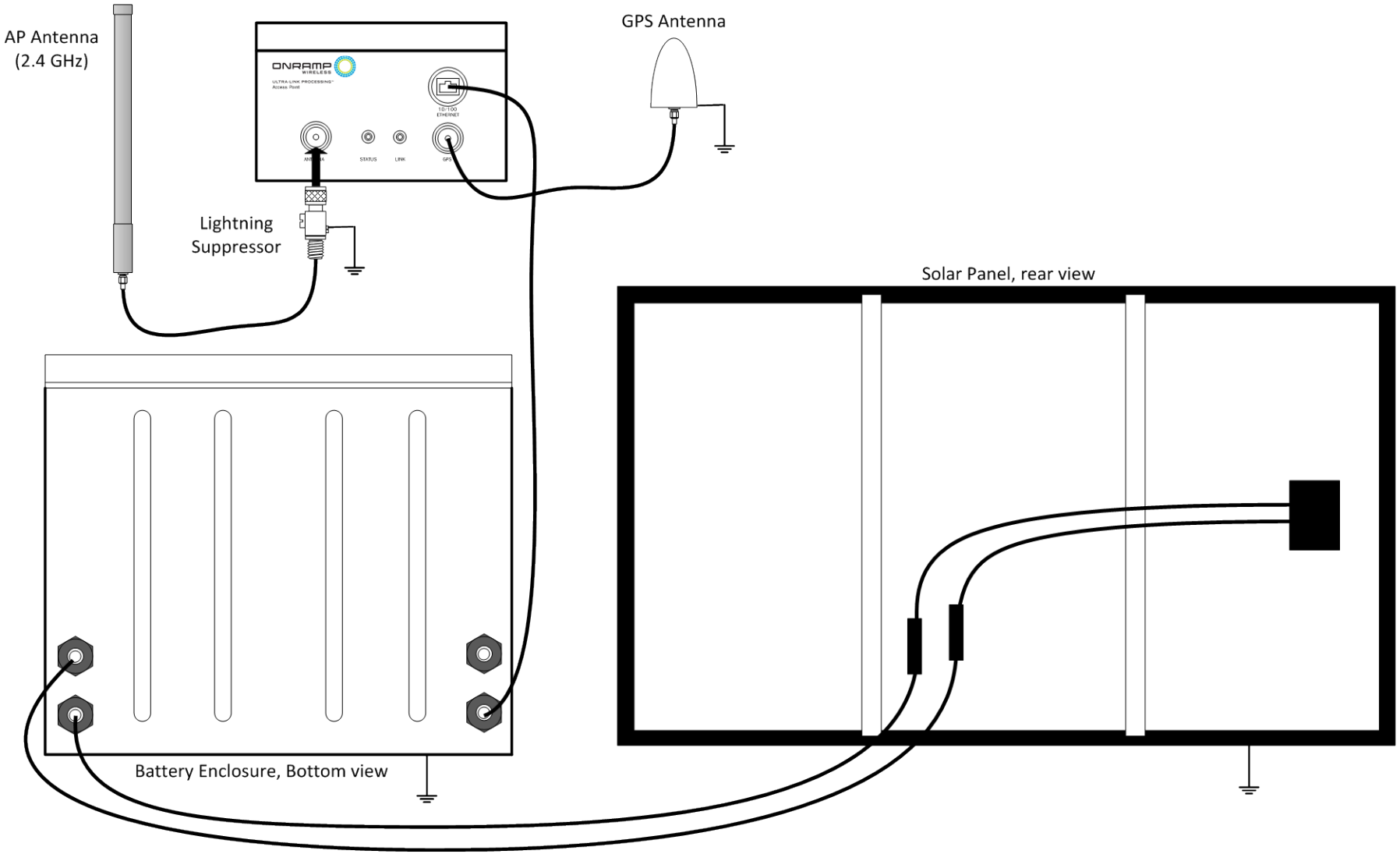


Figure 7. Wiring Diagram

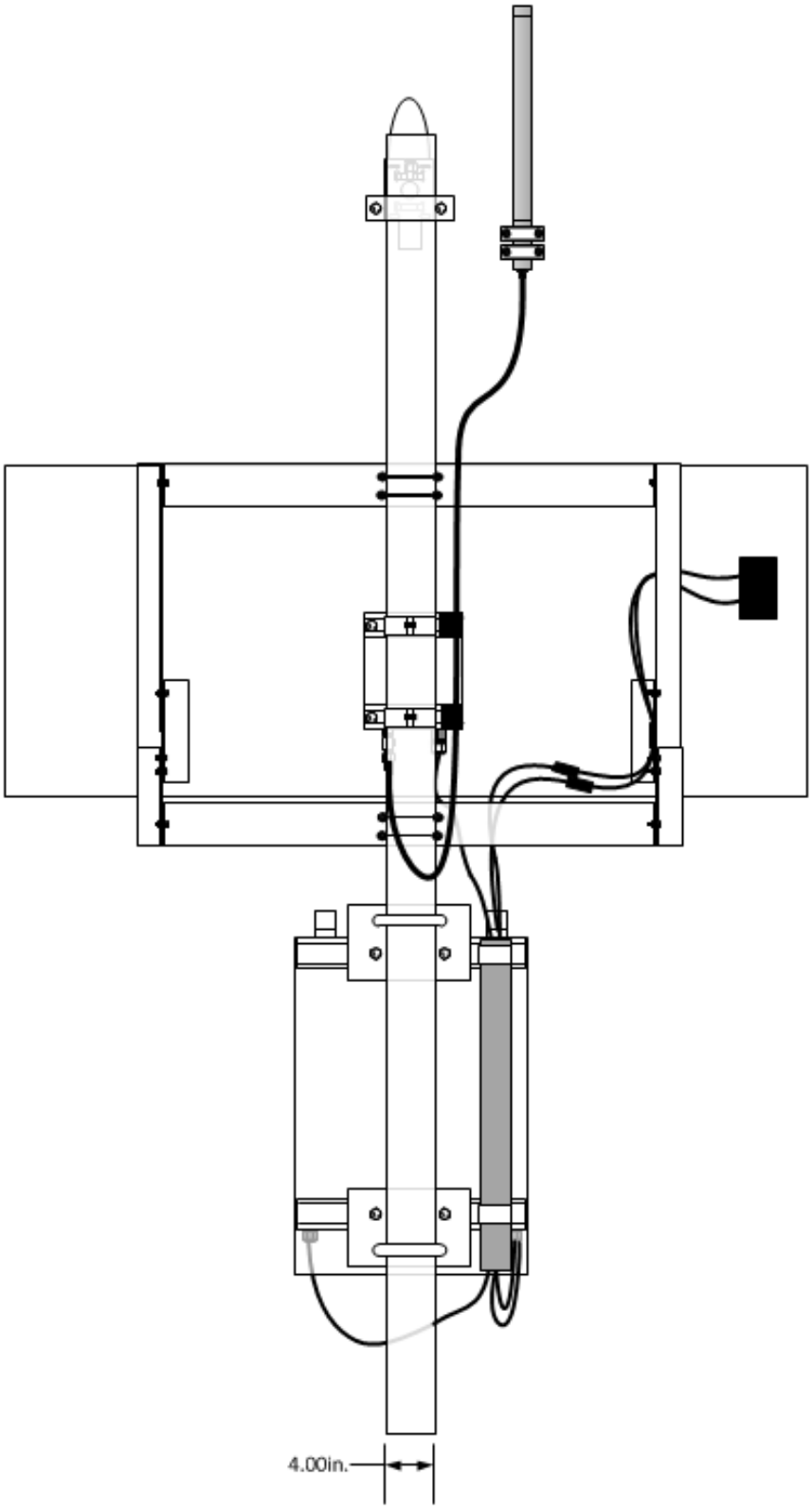


Figure 8. System Cabling, Sheet 1

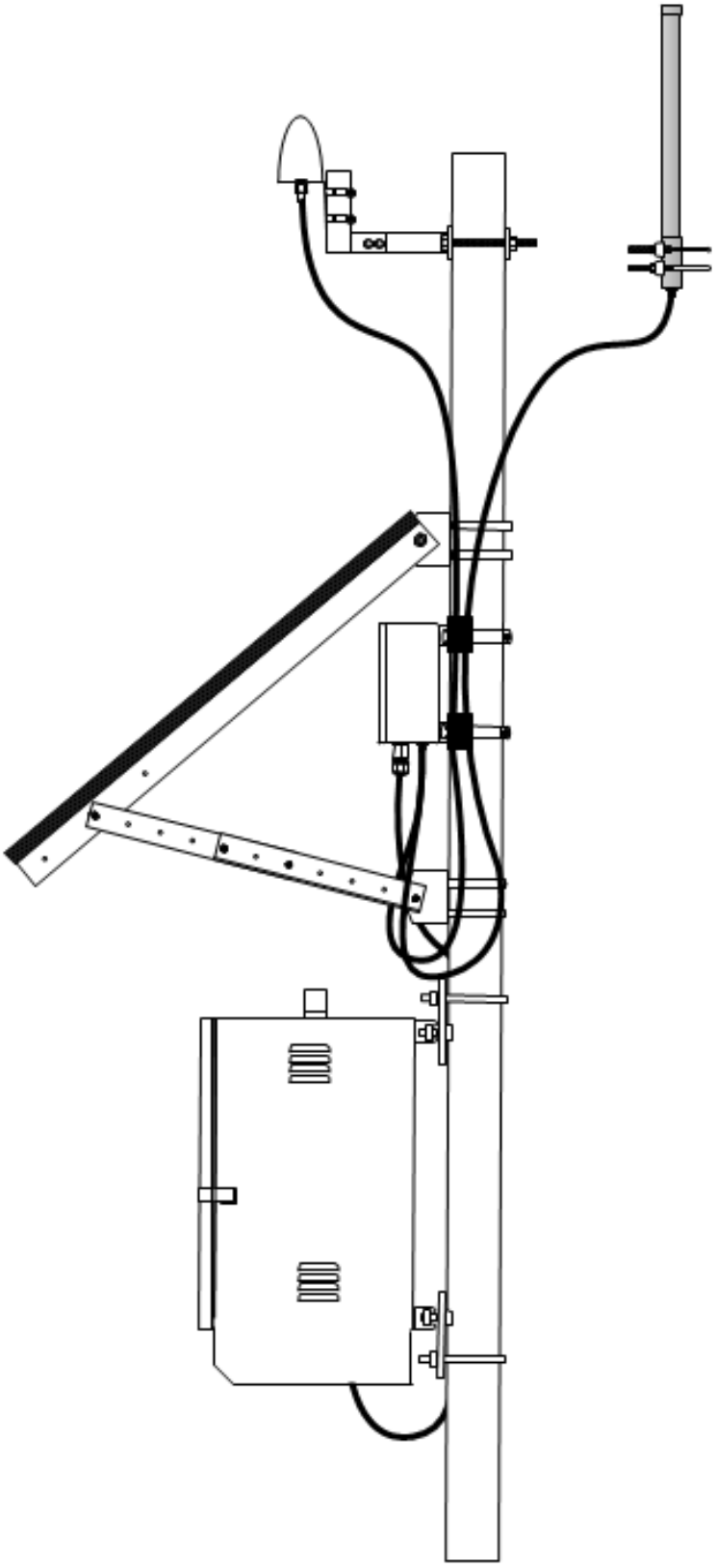


Figure 9. System Cabling, Sheet 2

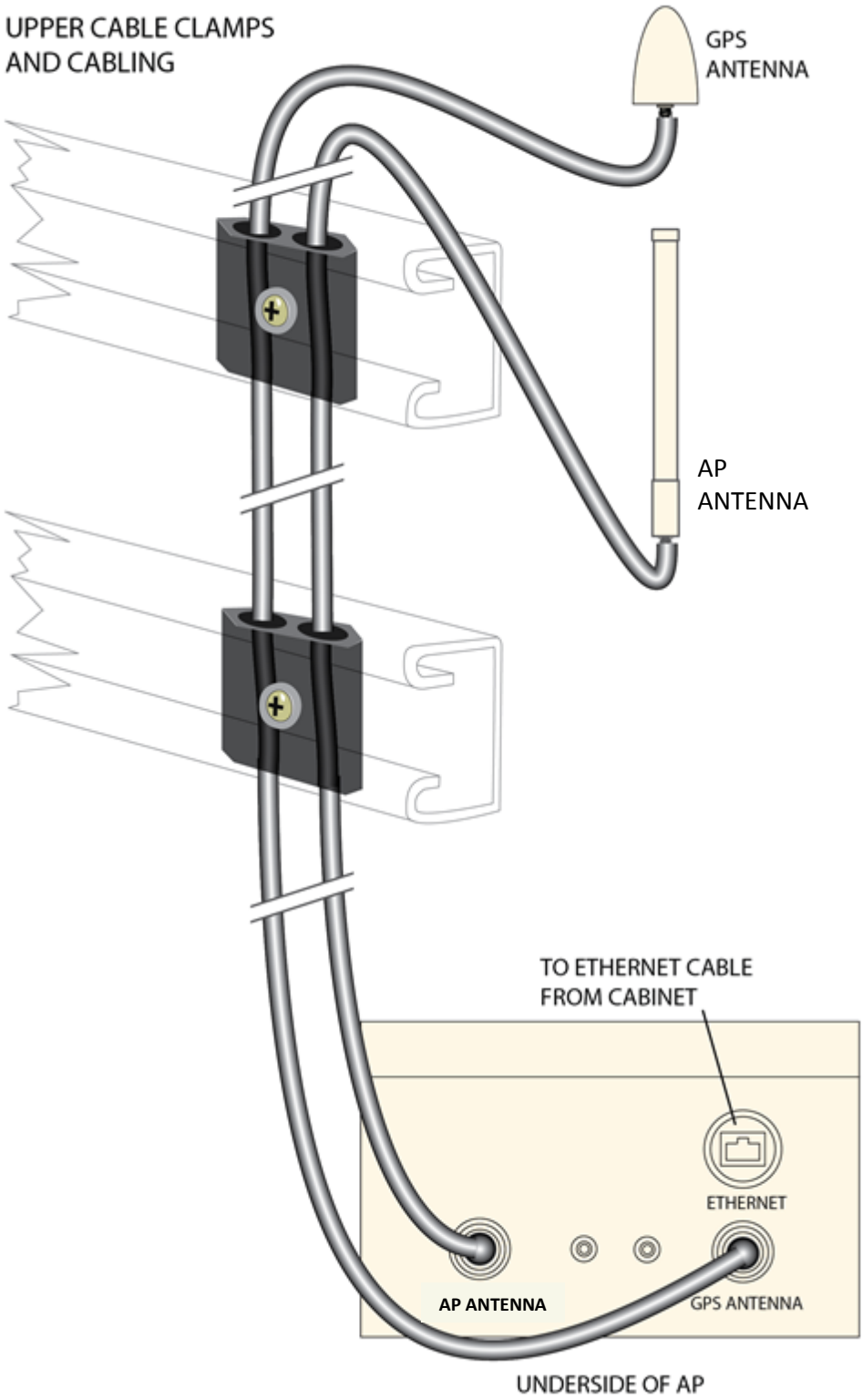


Figure 10. Upper Cable Clamp Cabling Detail