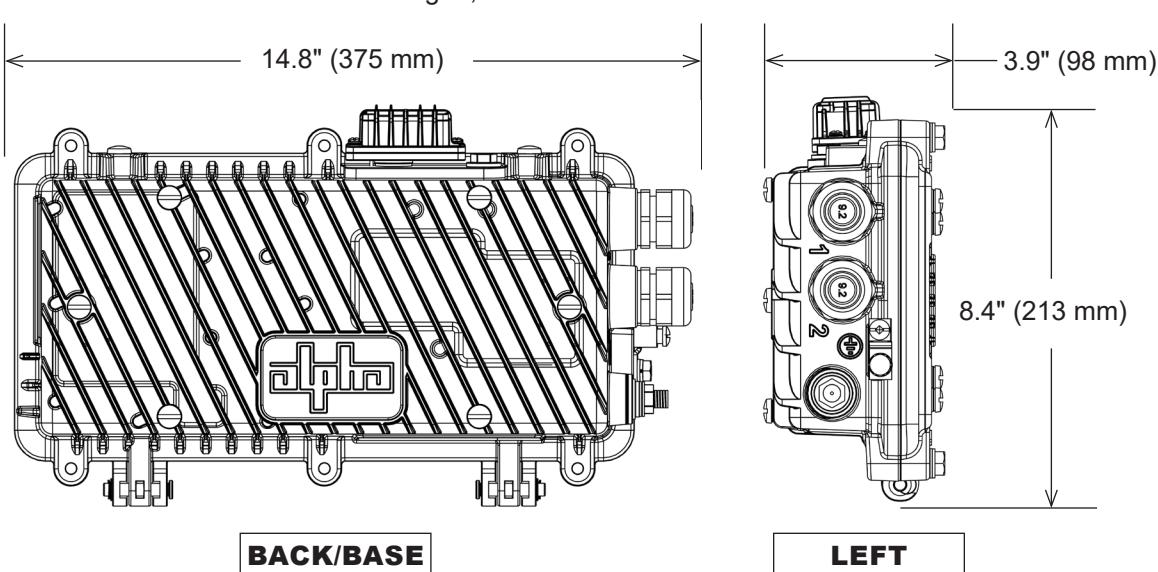
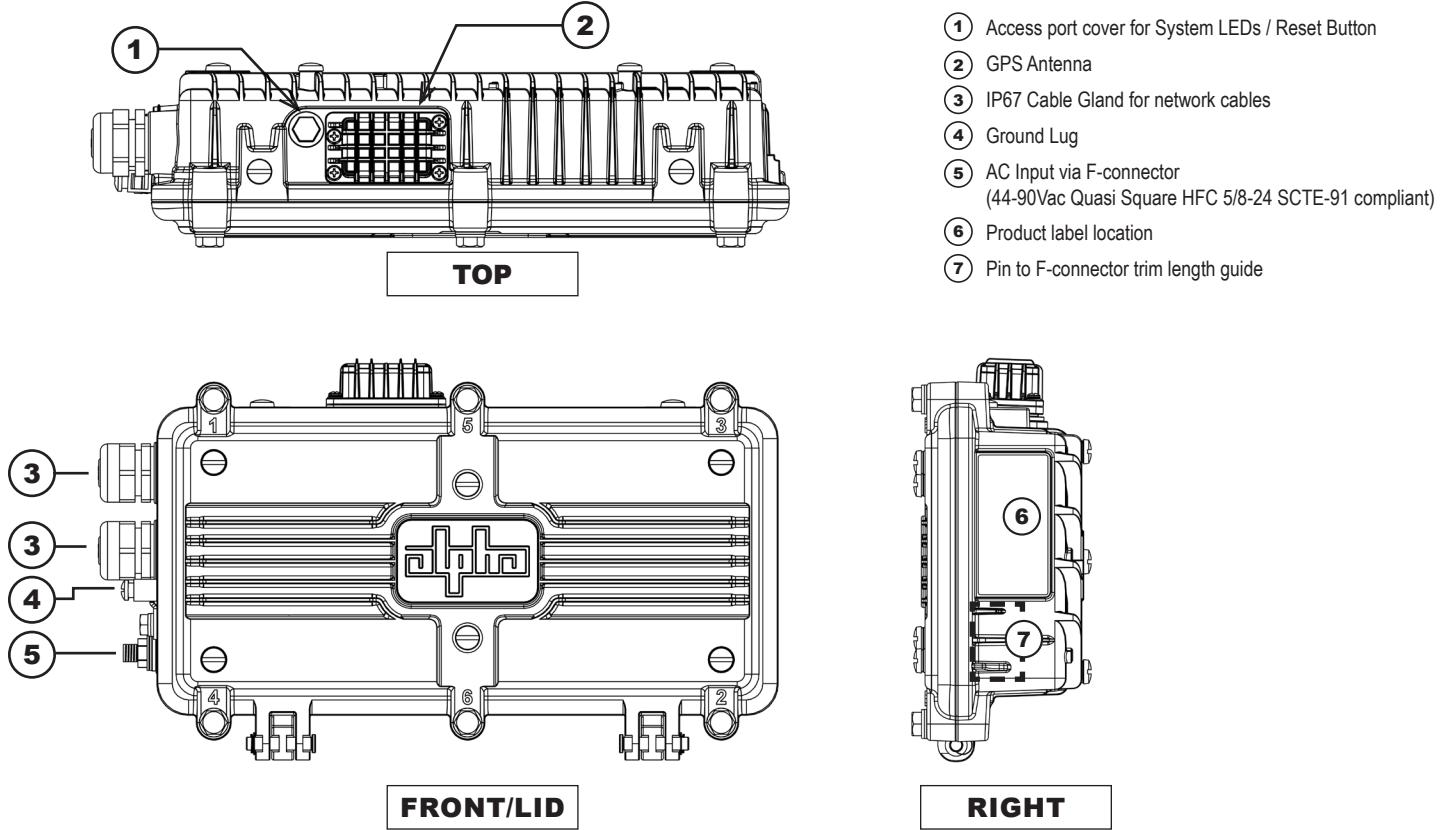


Quick Start Guide, AlphaGateway™ SMG-HP, Model AG100D-PoE+

The AlphaGateway™ SMG-HP AG100D-PoE+ provides 2 x 10/100/1000 BASE-T Ethernet ports with support for IEEE802.3af/at PoE/PoE+, with a power output of 30W per port. The included DOCSIS® 3.1 cable modem provides power system status monitoring and up to 1 gigabit connectivity.

The unit connects to the HFC (Hybrid Fiber-Coaxial) Access network through a power-passing tap at any location within the HFC voltage range (44–90Vac Quasi Wave), and transforms the HFC power to a voltage suitable for connected devices.

AlphaGateway SMG-HP Connections



NOTICE:

Each connected Ethernet device will register as a distinct CPE device; these may need fixed IP addresses depending upon the usage model.

Ensure that unused ports are covered with plugs. Remove only the plugs necessary for installation.

For other mounting options, refer to the SMG-HP Technical Manual (*Alpha p/n 018-357-B0*).

Pre-Installation

Tools Required (User-Supplied):

Torque Wrench with:

7/16" (11 mm) Socket

1/2" (13 mm) Socket

Open-ended 7/16" (11 mm) torque wrench

Flat blade screwdriver (to remove nylon screws during bracket installation)

SMG-HP Grounding

1. Locate the ground lug mounting location **[1]** and install the ground lug hardware as shown in Fig. 4. Tighten the hex head nut to 44 in-lbs (5 Nm).

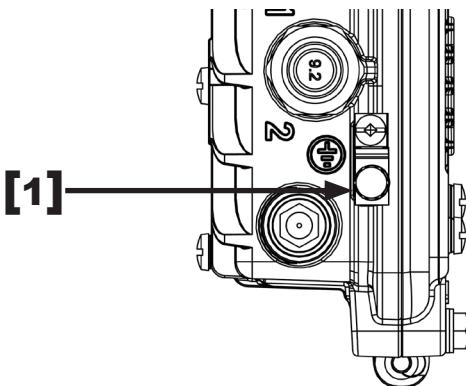


Fig. 3, Ground Lug Location

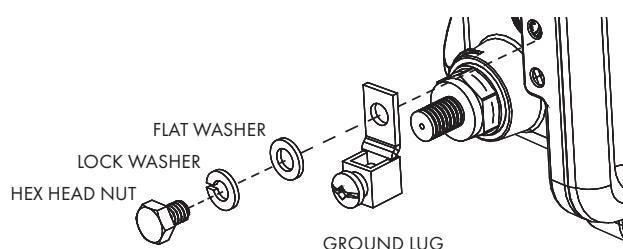


Fig. 4, Ground Lug Installation Reference

2. Properly ground the SMG-HP by connecting a #6 AWG wire from the grounding lug on the body of the unit to the strand ground in accordance with local electrical codes. Apply anti-oxidant compound (e.g., Noalox® or equivalent) to the ground connection. Bond the grounding system to other grounded electrical equipment located within 20 ft using #6 AWG bonding conductor.

NOTICE:

Alpha Technologies Services, Inc. assumes no responsibility or liability for failure of the installer to comply with the requirements of applicable local and national codes. Where allowed, exothermic welding may be used as an alternative to compression grounding methodologies.

NOTICE:

Follow national, local and MSO/employer grounding standards.

NOTICE:

For 24/7 technical support, call:

1 800 863 3364

Strand Mount Installation Procedure

1. Remove the two nylon screws from the top (or back, e.g., if hanging the SMG-HP horizontally) of the enclosure.
2. Take the two strand mount brackets from the strand bracket installation kit (3" bracket kit, *Alpha p/n 746-627-25*, 2.5" bracket kit, *Alpha p/n 746-627-27* or 2" bracket kit, *Alpha p/n 746-627-22*), and attach the strand mounting clamp hardware as shown in the stack-up below [2]. The clamp may be reversed to accommodate either 1/4" or 3/8" diameter strand. Repeat for the second bracket.
3. Verify the proper orientation as shown below and fasten the bracket with the hex head bolts, lock washers, and flat washers as shown in [3], torquing both brackets to 46 in-lbs (5.25 Nm).
4. Verify the clamp is oriented to fit the strand and hang the SMG-HP on the strand torquing to 84 in-lbs (9.5 Nm). Repeat for the second bracket.

 **NOTICE:**

For installations of units in confined spaces (e.g., *vault installations*) the unit may be fastened to the steel mounting rod via the hardware stack-up shown in item [4].

 **NOTICE:**

When hung vertically, the SMG-HP must hang from the strand with the hinges facing down.

5. Properly ground the SMG-HP by connecting a #6 AWG wire from the ground lug mount to the strand ground per local code. Apply anti-oxidant compound (e.g., Noalox® or equivalent) to the ground connection.
6. Refer to "Connection and Start-Up" and follow the procedures to connect, start-up and verify operation of the SMG-HP.

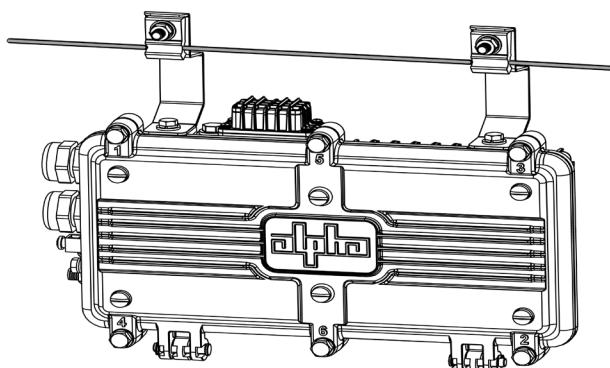
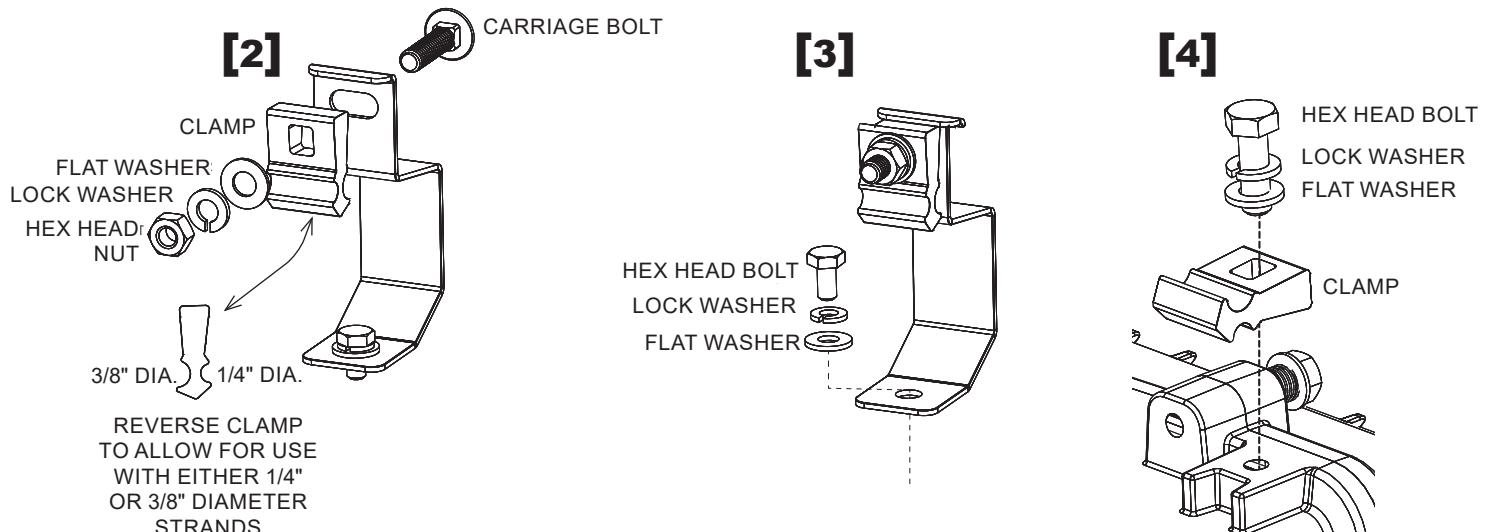


Fig. 5, Completed Assembly and Installation, Vertical Configuration

Horizontal Configuration

This method is recommended for installations in areas with space limitations within the communications space between poles, or when a connected application device (e.g., WiFi AP, camera) is mounted directly to the SMG-HP's lid.

1. Remove the two nylon screws from the back of the enclosure.
2. Take the two strand mount brackets from the strand bracket installation kit (3" bracket kit, *Alpha* p/n 746-627-25, 2.5" bracket kit, *Alpha* p/n 746-627-27 or 2" bracket kit, *Alpha* p/n 746-627-22), and attach the strand mounting clamp hardware as shown in the stack-up below [1]. The clamp may be reversed to accommodate either 1/4" or 3/8" diameter strand. Repeat for the second bracket.
3. Verify the proper orientation as shown below and fasten the bracket with the hex head bolts, lock washers, and flat washers as shown in [2], torquing both brackets to 46 in-lbs (5.25 Nm).
4. Verify the clamp is oriented to fit the strand and hang the SMG-HP on the strand torquing to 84 in-lbs (9.5 Nm). Repeat for the second bracket.
5. Properly ground the SMG-HP by connecting a #6 AWG wire from the ground lug mount to the strand ground per local code. Apply anti-oxidant compound (e.g., Noalox® or equivalent) to the ground connection.
6. Refer to Section 2.4, "Connection and Start-Up" and follow the procedures to connect, start-up and verify operation of the SMG-HP.

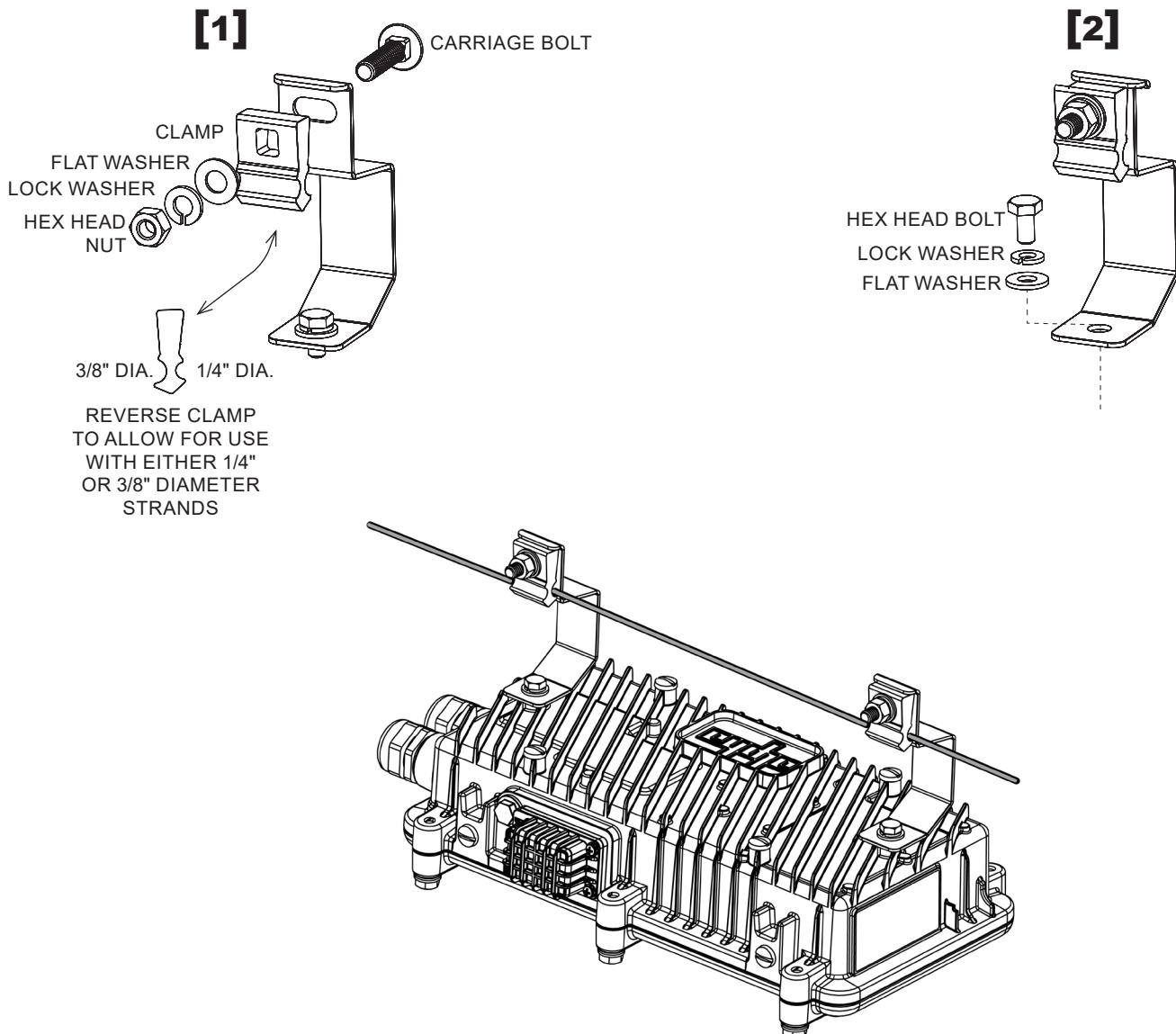


Fig. 6, Strand Mounting Bracket Installation, Horizontal Configuration

Connection and Start-Up



WARNING! ELECTRICAL HAZARD

Low impedance grounding is mandatory for personnel safety and critical for the proper operation of the cable system.



WARNING! ELECTRICAL HAZARD

Prior to connection, the technician must verify the coax cable being connected to the SMG-HP is not energized.

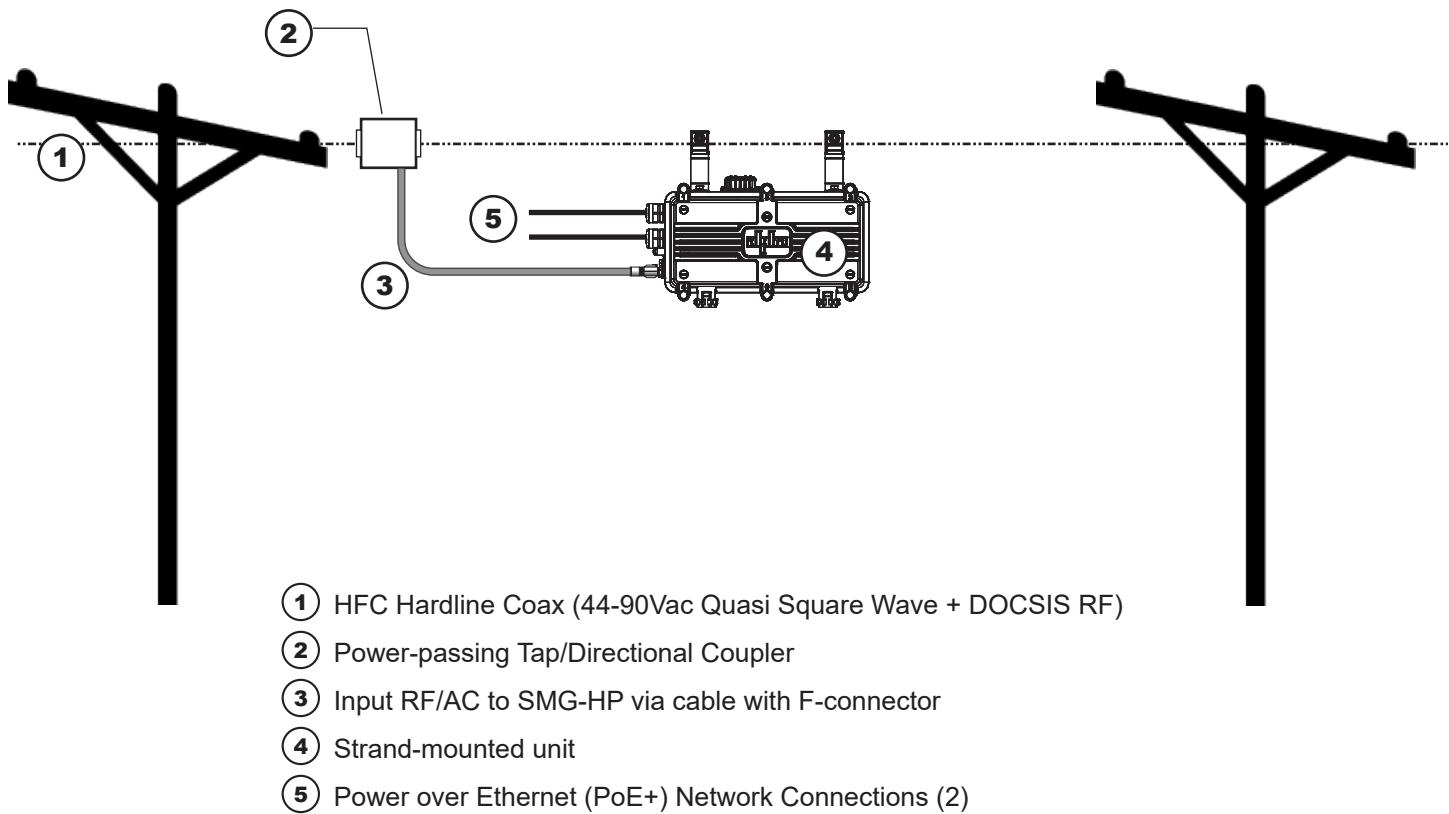


Fig. 7, Connection Diagram

Connection Procedure

NOTICE:

To ensure no power issues are encountered, such as shorting the center conductor, connect the drop cable to the SMG-HP first, then connect the drop cable to the power passing tap.

1. Connect the coax to the Pin to F-connector, and with an open-ended torque wrench, torque to 35 in-lbs (4.0 Nm).
2. Connect the other end of the coax cable to the Power-passing tap.
3. The unit will power up at this time.

NOTICE:

For 24/7 Technical Support, call:

1 800 863 3364

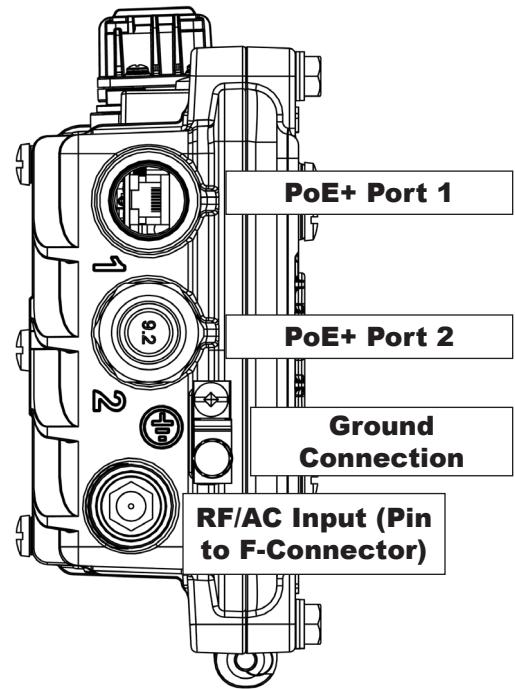


Fig. 8, Input/Output Ports

Start-Up

1. Use a torque wrench with 1/2" (13mm) socket to remove the inspection port cover and observe the system LEDs (See Fig. 9).
2. After applying power, the Power LED will light, followed by the DS (Downstream) LED, followed by the US (Upstream) LED and finally the OL (Online) LED. The indicators (all Green, on solid) should all be illuminated.
3. Once verified, replace the inspection port cover; tighten to 44 in-lbs (5 Nm).

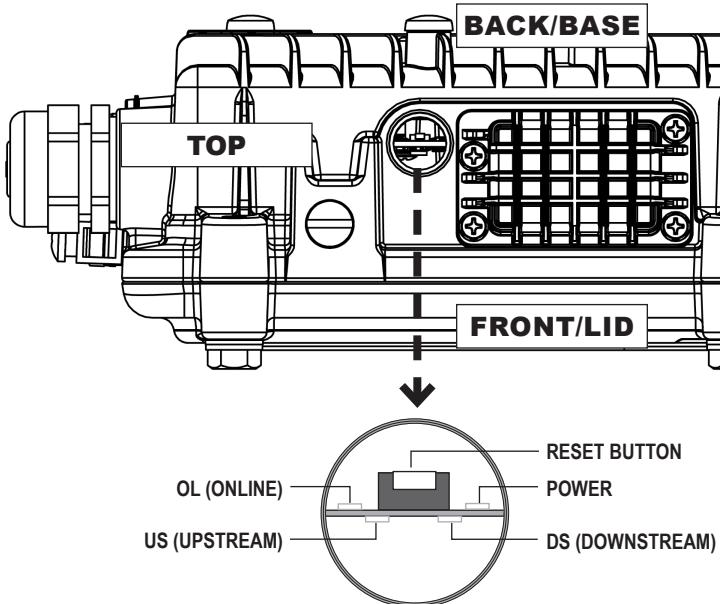


Fig. 9, Inspection Port Location and System LED detail

Ethernet Cable Connector Assembly

NOTICE:

Verify all pieces of the assembly are present and used in the correct sequence to prevent the ingress of water into the SMG-HP.

1. Remove (and save) the sealing plug from the sealing nut. Remove the sealing nut, insert and cage from the port.
2. Route the cable through the sealing nut [5] and clamping cage [4] and connect to Ethernet connector.
3. Open the split sealing insert [3] and place it over the cable.
4. Slide the clamping cage [4] over the sealing insert.
5. Verify Ethernet connectivity LEDs are active, then slide the assembly into the fixed cable port. Verify the sealing insert has fit flush into the fixed cable port.
6. Tighten the sealing nut to 44 in-lbs (5 Nm) to fasten the assembly together.
7. Repeat for each port used.
8. Re-torque nuts of unused ports.

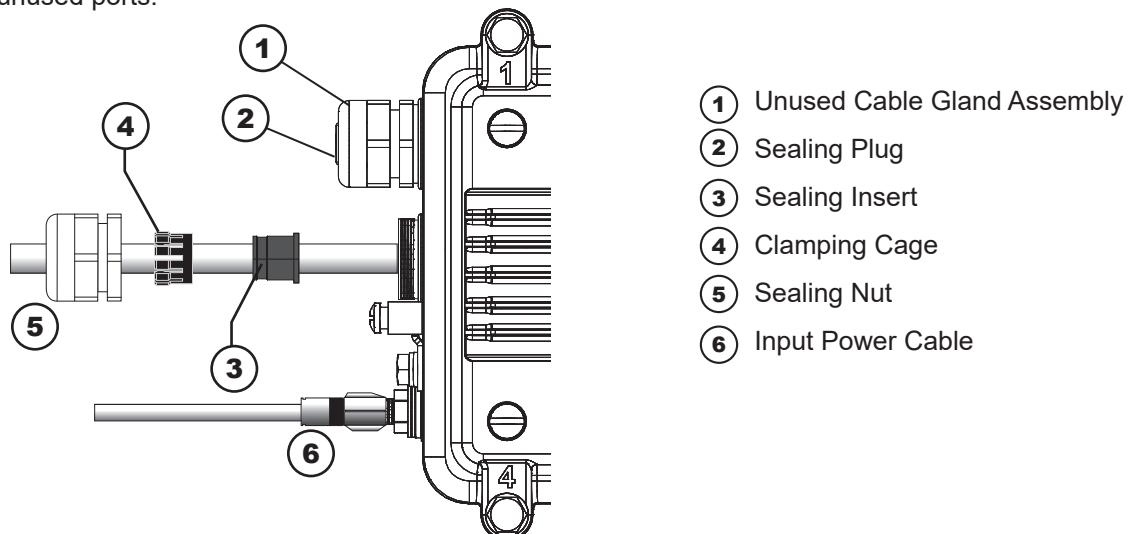


Fig. 10, Cable Gland Assembly, Input and Output cables

The cable gland base is factory-installed and tightened to 70 in-lbs (8 Nm).
Do not remove.

Tighten the cable gland sealing nut to 44 in-lbs (5 Nm).

The Pin to F-connector is factory-installed and tightened to 70 - 85 in-lbs (8 - 9.6 Nm).

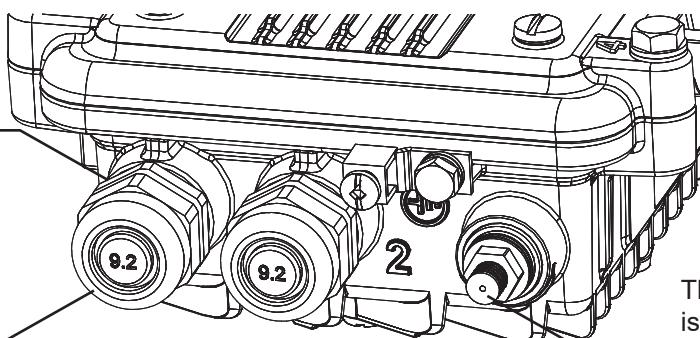


Fig. 11, Torque Values for Cable Glands and Pin to F-Connector

Verification of Ethernet Status

The PoE controller will disable power to the Ethernet connection ports until a valid PoE powered device is connected to the port. When such a connection is made, the Link/Activity LED (green) will either be on solid (indicating Link), or blinking to indicate activity and the PoE+ Status LED (orange) will be illuminated.

NOTICE:

The Ethernet activity green LED is independent of the orange PoE LED, and will function with standard Ethernet connectivity, even if the orange LED is off.

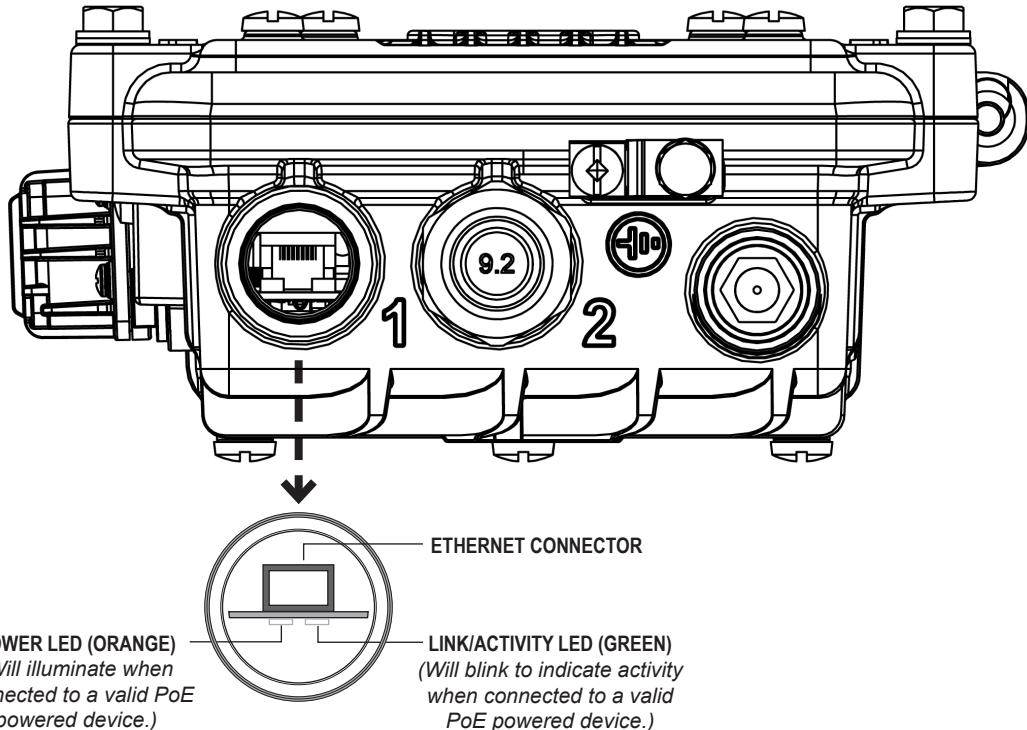


Fig. 12, Ethernet Connector LEDs (Applicable to both Ports)

Alternate Installation Methods

Surface Mount Installation

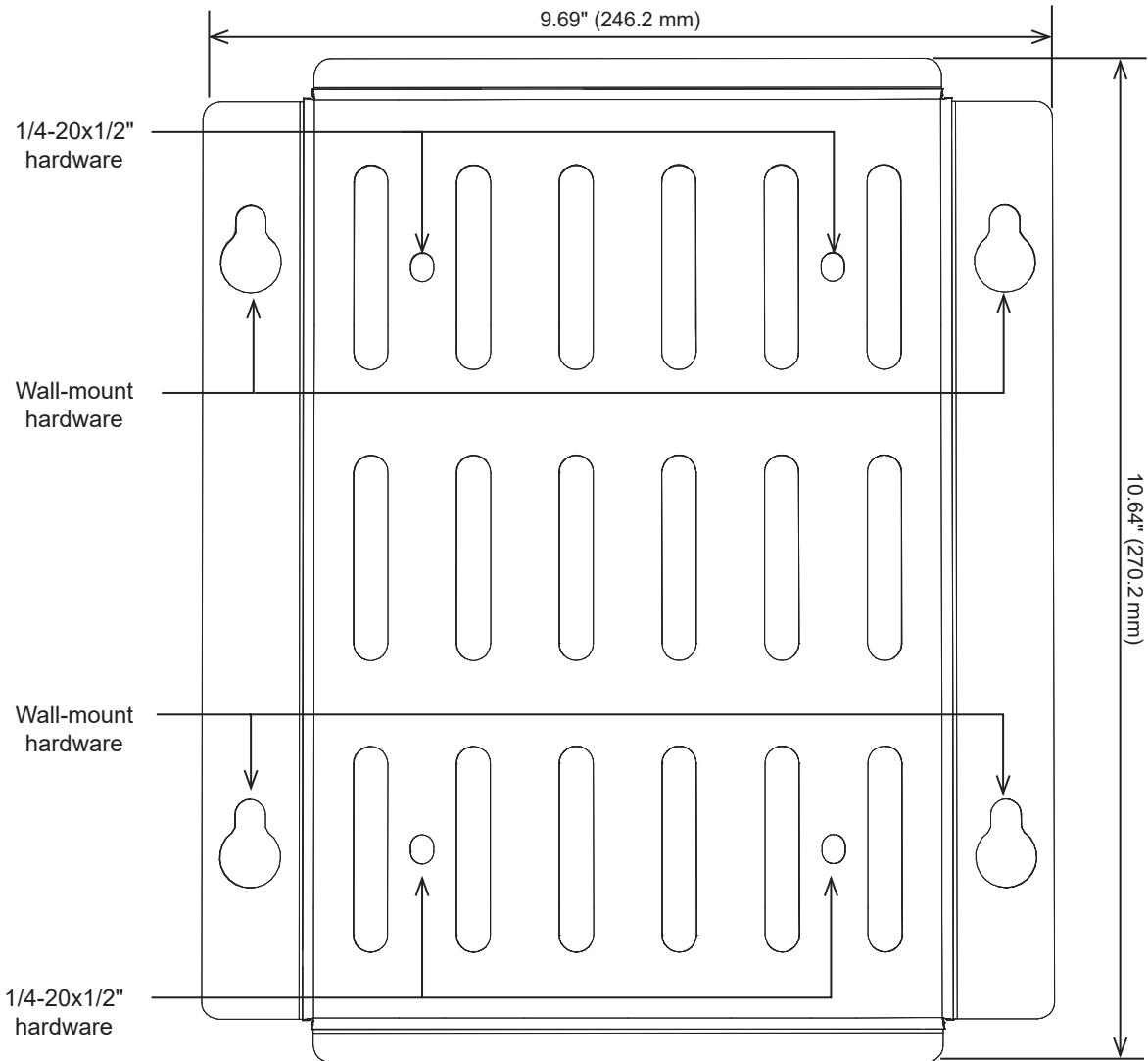


Fig. 13, Gateway Wall Mount Bracket

Tool for Installation:

- Torque Wrench with:
 - 7/16" (11 mm) Socket
 - 1/2" (13 mm) Socket
 - Open-ended 7/16" (11 mm) wrench
 - Slot head screwdriver (to remove nylon screws during bracket installation)
 - Hand Drill
1. Align the bracket (*Alpha p/n 746-645-20*) into the desired installation position on the wall. Mark the four holes where the 5/16" (M8) hex head screws will be drilled into the wall.
 2. Drill four pilot holes into the wall using the wall mount bracket as a template. If mounting to drywall, a stud should be located and used to secure any two of the hex head screws.
 3. Attach the SMG-HP to the surface mount bracket per the following procedure:

Alternate Installation Methods, *continued*

Surface Mount Installation, *continued*

 **NOTICE:**

Note the orientation of the bracket. The SMG-HP must be installed on the bracket as shown.

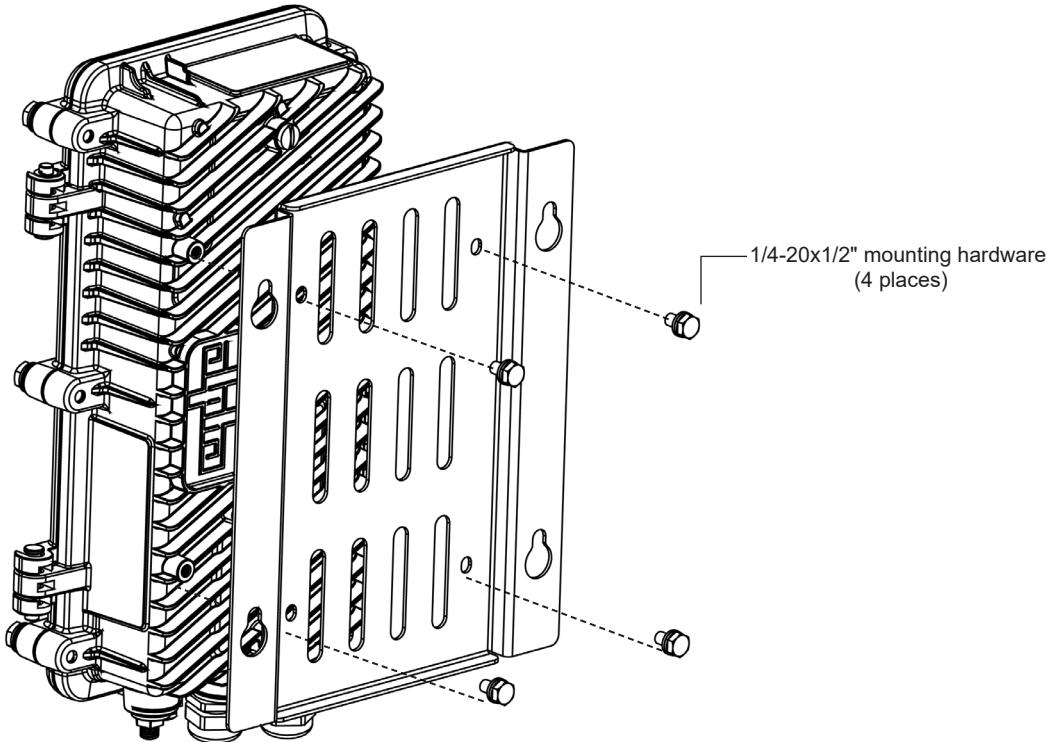


Fig. 14, Attaching the SMG-HP to the bracket

4. Use a standard screwdriver to remove the four nylon protection screws from the back of the enclosure.
5. Using the four 1/4-20x1/2" bolts and flat/lock washers, mount the unit to the surface mount bracket.
6. Use the 7/16" (11 mm) socket to torque each to a value between 44 and 53 in-lbs (5 to 6 Nm). The Pin to F connector must be facing down with the hinges on the enclosure facing right.
7. Mount the unit and bracket on the surface by partially screwing in the top two 5/16" lag bolts without washers and hang the unit by the bracket with the key-holes. Install the other two lag bolts with washers and tighten all four.
8. Properly ground the SMG-HP by connecting a #6 AWG wire from the ground lug mount to the strand ground per local code. Apply anti-oxidant compound (e.g., Noalox® or equivalent) to the ground connection.
9. Refer to "Connection and Start-Up" and follow the procedures in the succeeding sections to connect, power up and verify operation of the SMG-HP.

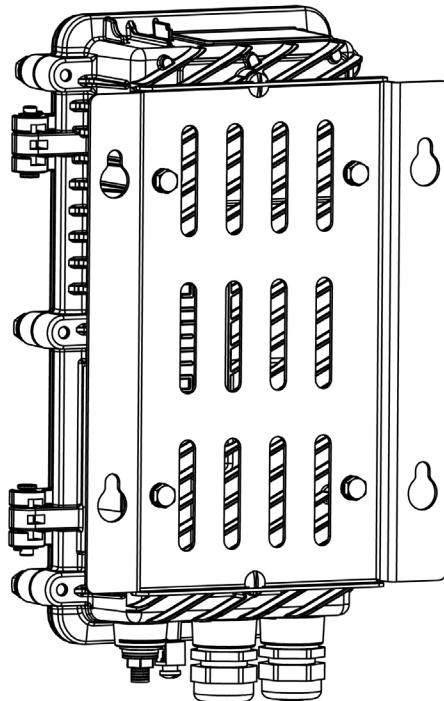


Fig. 15, SMG-HP and Bracket ready for surface mounting

Alternate Installation Methods, continued

Pole Mount Installation

Tools for Installation:

Torque Wrench with:

7/16" (11 mm) Socket

1/2" (13 mm) Socket

Open-ended 7/16" (11 mm) wrench

Slot head screwdriver (to remove nylon screws during bracket installation)

Hand Drill

Customer-supplied stainless steel (or better) banding equipment

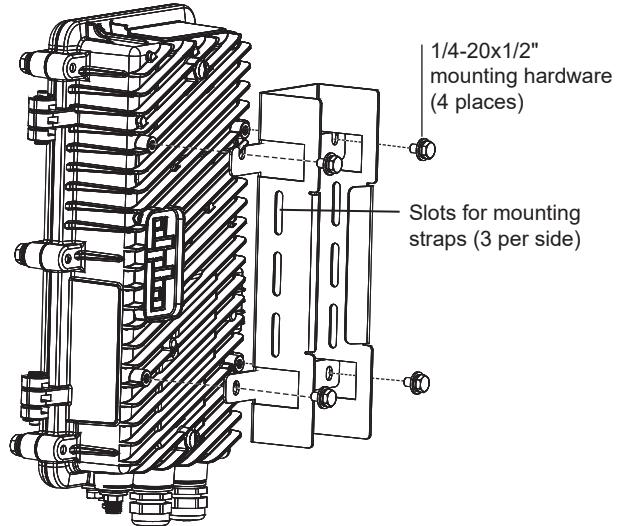


Fig. 16, Pole-Mount Installation Configuration

1. Secure the pole mount bracket (*Alpha p/n 746-861-20*) to the pole using the metal straps.
2. In the top two mounting bracket holes of the SMG-HP, partially tighten two of the 1/4-20x1/2" bolts, split washers, and flat washers, leaving a few millimeters of space between the flat washer and the enclosure.
3. Line up the unit and place it so that the 1/4"-20 bolts rest on the top slots of the bracket. Then secure it to the bracket by tightening the four 1/4-20x1/2" bolts, split washers, and flat washers using the 7/16" (11 mm) socket, torquing to a value between 44 – 53 in-lbs (5 – 6 Nm). The Pin to F-connector must be facing down with the hinges on the enclosure facing right.

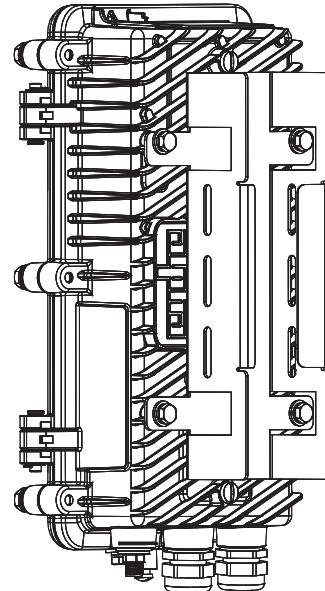


Fig. 17, SMG-HP and Bracket Installed

Alternate Installation Methods, *continued*

Pole Mount Installation, *continued*

4. Attach SMG-HP and bracket to the pole with stainless steel (or better) banding.
5. Properly ground the SMG-HP by connecting a #6 AWG wire from the ground lug mount to the strand ground per local code. Apply anti-oxidant compound (e.g., Noalox® or equivalent) to the ground connection.
6. Refer to "Connection and Start-Up" and follow the procedures to connect, power up and verify operation of the SMG-HP.

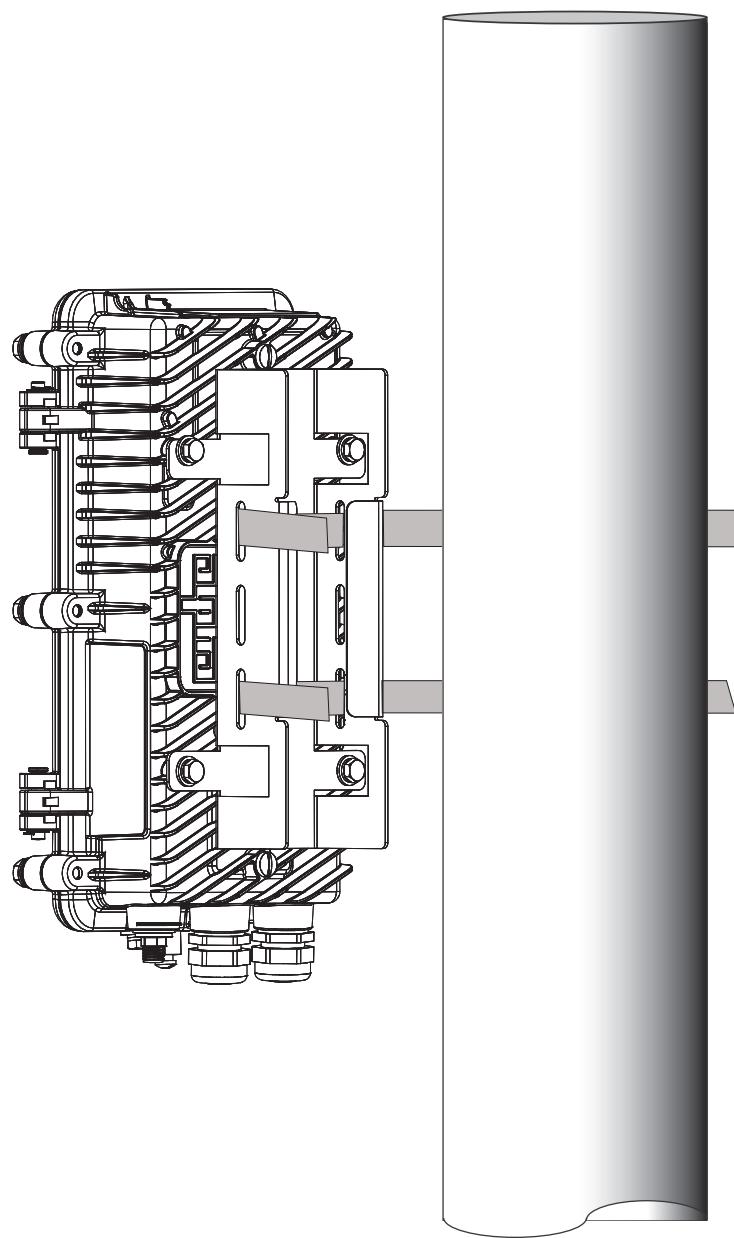


Fig. 18, SMG-HP, Bracket and Pole

Environmental Specifications and Agency Certifications

SYSTEM MANAGEMENT

LEDs (Internal)	System Power / DOCSIS® (Downstream, Upstream, Online) / CPE (Link, Activity)
Management Protocols	SNMPv1, 2c, 3, HTTPS, SSH
Remote Output Power Control	On, Off, Reset (per port)
Remote PoE Port Status	Link up/down, link speed, power up/down, PoE device class, PoE power consumption
Remote PoE Device Status	MAC address, IPv4/IPv6 address
System Management (SNMP)	Standard DOCSIS® & Mib2 SNMP MIB support (e.g. sysDescription, sysObjectID, ifTable) CM, other sub-components, GPS, ports and services (when applicable)
Environmental Status Parameters (SNMP)	Input Voltage / Power, Output Voltage / Power, Current (Per Port)
Alarming	SCTE-HMS MIBs and alarming
Network Quality of Service	RFC 2544, Y.1564, and Y.1731 for turn up, remote monitoring, and remote troubleshooting of key Ethernet metrics, e.g. latency, frame loss, jitter
HTTPS	HTTPS Web Interface (Diagnostics & Device Management)
CLI	SSH for Diagnostics and Device Management
TR-069	TR-181 for Lan/Wan/Device Management
Advanced diagnostic features	Full spectrum capture (CableLabs® MIBs)

AGENCY CERTIFICATIONS

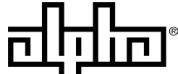
Enclosure Protection	UL50E / NEMA Type 6 / IEC 60529 IP67	
Safety	IEC/EN 60950-1: ED2 IEC/EN 60950-22: ED1	Safety CB report (global)
	UL/CSA® 60950-1 UL/CSA® 60950-22: ED1	NRTL/C Cert (US/CAN), Safety - General Requirements
EMC Emissions	FCC Class B (FCC CFR 47 Part 15 Class B)	EMC Emissions requirements (US)
	ICCCES-003	EMC Emissions requirements (Canada)
	CISPR 32 (IEC/EN 55032)	Electromagnetic compatibility of multimedia equipment - Emission requirements (EU/Global)
EMC Immunity	CISPR 24 (IEC/EN 55024)	- Information technology equipment - Immunity characteristics - Limits and methods of measurement
	CISPR 35 (IEC/EN 55035)	Electromagnetic compatibility of multimedia equipment - Immunity requirements - (EU/Global)
Surge Immunity	IEC 61000-4-5	Surge Immunity: 4kV/2kA on COAX input port, 4kV on Ethernet port (1.2x50/8x20)
	UL/CSA® 60950-1	Line Cross: 277Vac on Ethernet ports
RoHS	RoHS Directive 2011/65/EU Compliant	Restriction of Hazardous Substances Directive

Notice of FCC Compliance

Per FCC CFR 47 PART 15:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



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