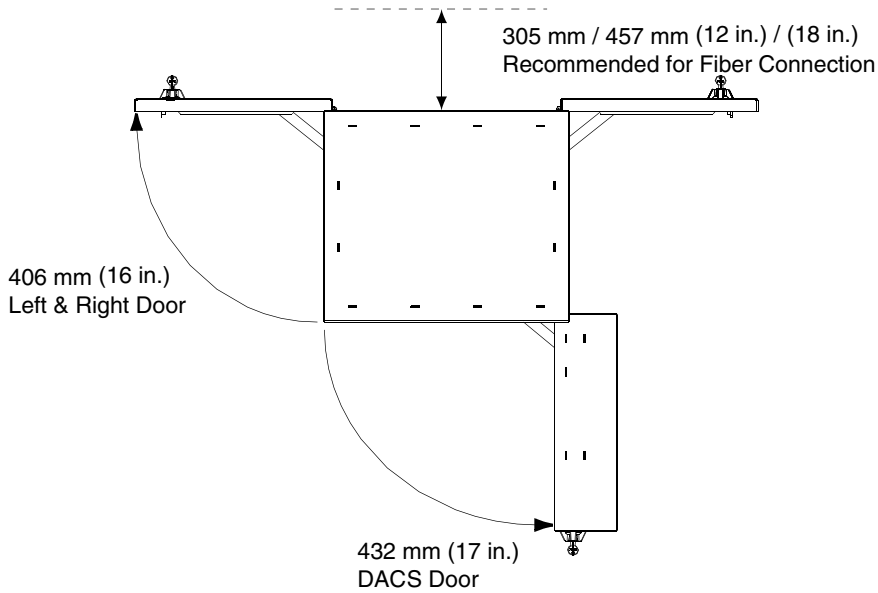


**Figure 4-4** BCU Door Clearances



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## Conduit Sizes

Refer to [Table 4-1](#) for the proper conduit sizes.

**Table 4-1** Conduit Types and Sizes

No.	Designation	Required Size	Hole Size
1	Ethernet	1 inch (25.4 mm)	1 inch (25.4 mm)
2	Power	1-1/4 inch (31.75 mm)	1-1/4 inch (31.75 mm)
3	Fiber Optic	None	Bulkhead connector

## Tools and Materials

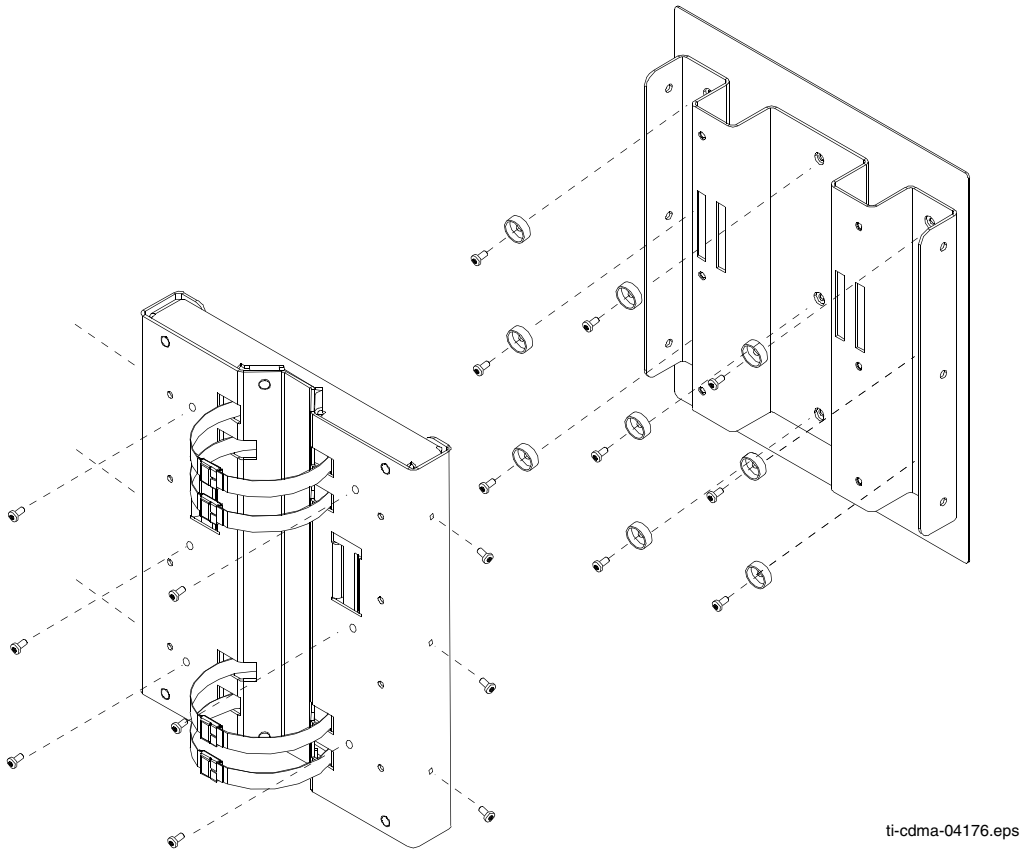
The following tools and materials or equivalent are required to install the BCU.

- Bucklestrap Cutting Tool (Motorola P/N 6604809N01) for pole mounting bracket assembly
- Safety Glasses
- 13/16 Breakaway Torque Wrench 38 in-lb (4.3 N-m)
- Chalk
- Tape Measure
- Electrical Tape
- Crescent Wrench
- Socket Driver
- Metric or Standard Socket Set for 1/4-in or 3/8-in driver
- Power Drill
- Concrete and Wood Drill Bits
- Crimp Tool

## **BCU Wall/Pole Mounting Bracket Assembly Installation**

Figure 4-5 shows the Wall/Pole Mounting Bracket and Mounting Bracket Assembly.

**Figure 4-5** BCU Wall/Pole Mounting Bracket Assembly



## BCU Mounting Bracket Assembly Procedure

### Pole Mount



Perform the following procedure to install the Pole/Wall Mounting Bracket Assembly on a pole.



**WARNING**

Once the BCU is installed, DO NOT use it as a step ladder. It is not designed to support a person hanging from or standing on top of it.

**Procedure 4-1** Procedure to Install Mounting Bracket Assembly on a Pole

<b>1</b>	Slide non-buckle end of strap through openings in Pole Mounting Bracket Assembly.
<b>2</b>	Set Pole Mounting Bracket Assembly with straps at the desired height.
	 <div style="display: inline-block; background-color: #00FFFF; padding: 5px; margin-left: 10px;"><b>NOTE</b></div> <p style="margin-left: 100px;">Initial height is determined by customer. The bottom of the BCU is a minimum of 1 meter from the ground. Adjust Pole/Wall Mounting Bracket Assembly to account for this minimum distance.</p>
<b>3</b>	Wrap strap around the pole, slide non-buckle end through strap loop and around the pole again. Slide end through strap loop and pull snug.
<b>4</b>	Attach Bucklestrap Cutting Tool (slide strap through openings in tool, pull gripper lever to slide strap into spindle head), slide tool towards buckle. Place cutting tool end of tool as close to the buckle as possible.
	 <div style="display: inline-block; background-color: #00FFFF; padding: 5px; margin-left: 10px;"><b>NOTE</b></div> <p style="margin-left: 100px;">The strap can be cut to a more manageable length prior to using the tool. Bucklestrap Cutting Tool is a ratchet spindle and cutter in one.</p>
<b>5</b>	Turn spindle clockwise until strap is tight. Bend the excess strap over tightened strap, cut strap, fold the cut tab into the buckle, then close buckle.
<b>6</b>	Using the tool bend the strap over towards the buckle. Remove tool and use a hammer to bend the strap more.
<b>7</b>	Use the hammer to bend buckle tabs over strap. Use electrical tape to cover over the buckle and straps.
<b>8</b>	Perform <a href="#">step 3</a> through <a href="#">step 8</a> , for the remaining straps.
<b>9</b>	If not already attached to BCU, attach Mounting Bracket to BCU using nine M6 bolts and washers (Refer to <a href="#">Figure 4-5</a> ). Torque bolts to 30 in-lbs (3.4 N-m).

## Wall Mount

Perform the following procedure to install the Pole/Wall Mounting Bracket Assembly on a wall.


### Procedure 4-2 Procedure to Install Mounting Bracket Assembly on a Wall

1	Determine the height at which the Base Control Unit (BCU) will be mounted. Make sure the wall is capable of supporting the weight, check with Site Manager.
2	Use the Wall Mounting Bracket as a template to layout the nine hole locations.
3	Drill starter holes for the anchor bolts at the locations marked.
4	Secure Wall Mounting Bracket to wall using nine M6 bolts and washers. Refer to <a href="#">Figure 4-5</a> . Torque bolts to 30 in-lbs (3.4 N-m).
5	Mount BCU onto Wall Mounting Bracket and secure in place.

## Installing the BCU

Follow the steps in [Procedure 4-3](#) to install the Base Control Unit (BCU).

### Procedure 4-3 Procedure to Install the Pole Mount BCU

1	Perform the procedure for attaching the Pole Mounting Bracket Assembly described in <a href="#">Procedure 4-1</a> .
2	Mount the BCU onto the mounting bracket and secure using 12 screws. Refer to <a href="#">Figure 4-5</a> .
	<div style="display: flex; align-items: center;">  <div style="background-color: #00b050; color: white; padding: 5px 10px; font-weight: bold; text-align: center;">NOTE</div> </div> <p style="text-align: center;">It is recommended that a minimum of two people attach the BCU on the pole mounting bracket.</p>
3	BCU is ready for cabling. Proceed to <a href="#">Procedure 4-6</a> .


Perform [Procedure 4-4](#) to floor mount the BCU on a concrete pad.

### Procedure 4-4 Installing the BCU Plinth on Concrete

1	Position the plinth in the desired position.
2	Mark the hole locations on the floor using the plinth as a template.

**Continued**

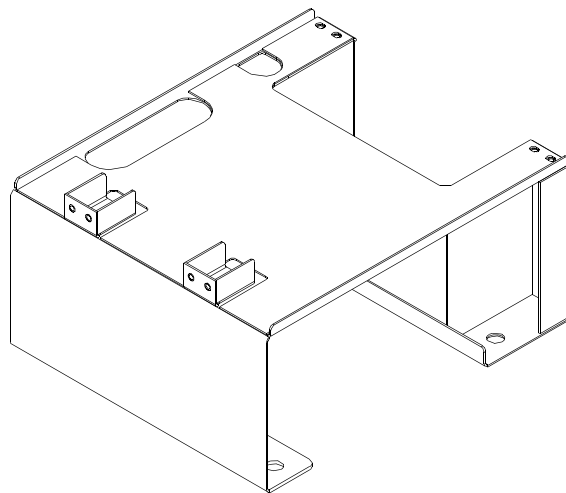
**Procedure 4-4** Installing the BCU Plinth on Concrete (Continued)

<b>3</b>	Set aside the plinth and drill holes where hole locations are marked.
<b>4</b>	Ensure that isolation pad is affixed to bottom of each bracket. Set plinth over holes. Secure plinth to floor using one flat isolation washer and one Hilti—Bolt (HSL-3M 8/20) each. Torque bolts to 65 ft-lbs (8.8 N-m) See <a href="#">Figure 4-7</a> .
<b>5</b>	Verify that plinth is secured to floor.
<b>6</b>	If left and right brackets have not been previously attached to BCU underside, secure brackets to underside of BCU using four bolts, nuts, and washers each. Torque bolts to 10 ft-lbs (13.6 N-m). See <a href="#">Figure 4-8</a>
<b>7</b>	If BCU already has left and right brackets attached to its underside, set the BCU onto the plinth and secure in place using eight screws. Torque the screws to 10 ft-lbs (13.6 N-m). See <a href="#">Figure 4-8</a>
	<div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="background-color: #00b050; color: white; padding: 5px 15px; font-weight: bold; font-size: 1.2em;">NOTE</div> </div> <p>The BCU can only be set on the plinth in one direction. The Customer Interface Compartment seats over the notched end of the plinth.</p>

**Procedure 4-4** Installing the BCU Plinth on Concrete (Continued)

**8** BCU is ready for cabling. Proceed to [Procedure 4-6](#)

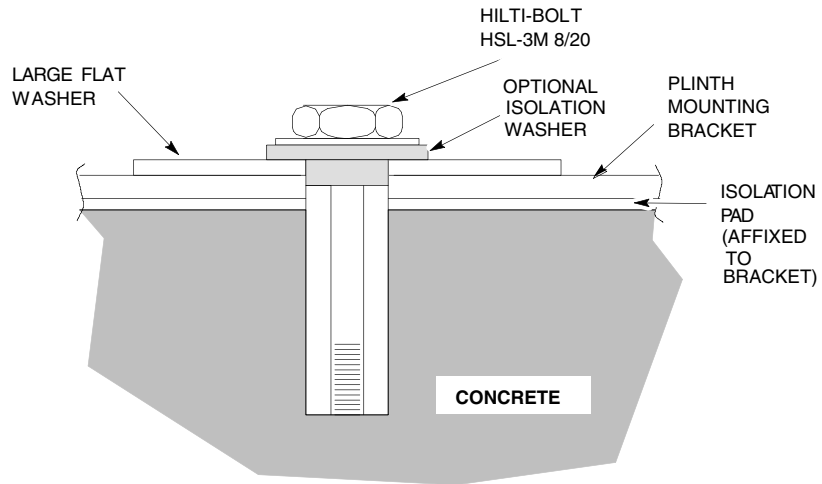
**Figure 4-6** BCU Plinth



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**Figure 4-7** Mounting Bolt Configuration (Concrete)

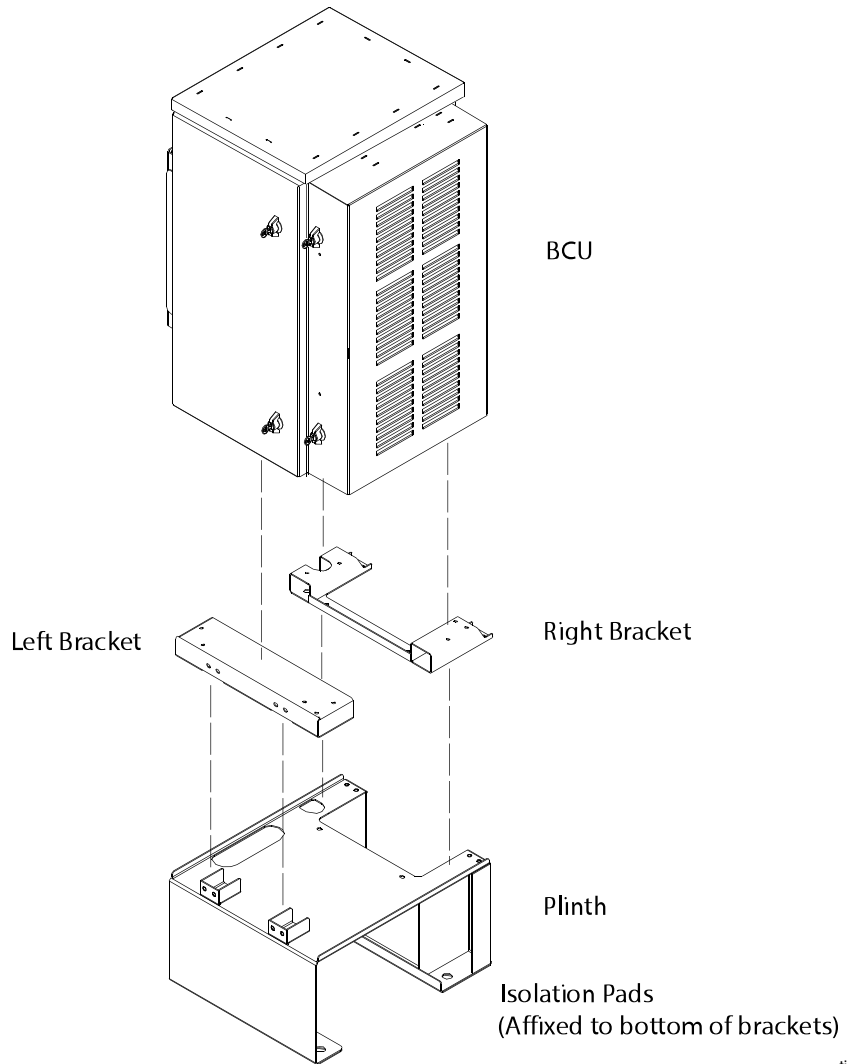
**CONCRETE PAD**



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**Figure 4-8** BCU Attachment to Plinth



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Perform [Procedure 4-5](#) to floor mount the BCU on a raised platform or roof.

**Procedure 4-5** Installing the Plinth on a Raised Platform or Roof Top

<b>1</b>	Verify with the Site Manager that the platform/roof top is capable of supporting the weight of the BCU
<b>2</b>	Position the plinth in the desired position.
<b>3</b>	Mark the hole locations on the platform or roof top using the plinth as a template.

**Continued**

**Procedure 4-5** Installing the Plinth on a Raised Platform or Roof Top (Continued)

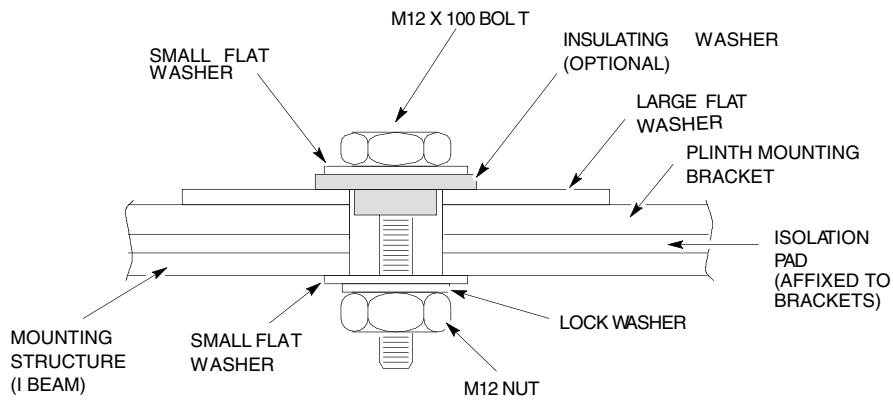
<b>4</b>	Set aside the plinth, and drill holes where hole locations are marked.
<b>5</b>	Set plinth over holes. Secure plinth to platform or roof top using one large flat washer, lock washer, small flat washer, 12M nut, and 12M bolt each. Torque bolts to 65 ft-lbs (88 N-m) See <a href="#">Figure 4-9</a> . If left and right brackets have not been attached to BCU, proceed to <a href="#">step 6</a> . Otherwise, proceed to <a href="#">step 7</a>
<b>6</b>	Attach left and right brackets to underside of BCU using four screws, nuts, and washers each. Torque screws to 10 ft-lbs (13.6 N-m ). See <a href="#">Figure 4-8</a> . Proceed to <a href="#">step 8</a>
<b>7</b>	If BCU already has left and right brackets attached to its underside, set the BCU onto the plinth and secure in place using eight screws. Torque the screws to 10 ft-lbs (13.6 N-m).
	<div style="display: flex; align-items: center;">  <div style="background-color: #00b050; color: white; padding: 5px 10px; font-weight: bold; text-align: center;">NOTE</div> </div> <p>The BCU can only be set on the plinth in one direction. The Customer Interface Compartment seats over the notched end of the plinth.</p>

**Procedure 4-5** Installing the Plinth on a Raised Platform or Roof Top (Continued)

**8** BCU is ready for cabling. Proceed to [Procedure 4-6](#)

**Figure 4-9** Mounting Bolt Configuration (Raised Platform or Roof Top)

ROOFTOP



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## BCU Cable Installation

Perform the procedure in [Procedure 4-6](#) to install the BCU cables.

**Procedure 4-6** BCU Cabling Procedures

**Continued**

**Procedure 4-6** BCU Cabling Procedures (Continued)



**NOTE**

The cable access holes are covered. Remove the wing nuts and covers before routing cables to and from the BCU Customer Interface Compartment.

<b>1</b>	For BCU Ground cable installation, BCU ground is located on the side just behind the Customer Interface compartment door hinge. Attach the 2-hole lug and cable to the ground location on the BCU. Attach other end of ground cable to system ground bus bar.
<b>2</b>	Ensure the AC (or DC) power is disabled at the source before attempting to install the AC (or DC) power cabling. For AC power cable installation, perform <a href="#">Procedure 4-7</a> . For DC power cable installation, perform <a href="#">Procedure 4-8</a>
<b>3</b>	For RF Head DC power cable installation, perform <a href="#">Procedure 4-14</a> .
<b>4</b>	For Fiber Optic cable installation, perform <a href="#">Procedure 4-16</a>
<b>5</b>	For RGPS cable installation, perform <a href="#">Procedure B-1</a> . For Local GPS cable installation, perform <a href="#">Procedure 4-10</a>
<b>6</b>	For Customer Input and Output cable installation, perform <a href="#">Procedure 4-12</a> . To avoid confusion tag the output cables.
<b>7</b>	For Ethernet cable installation (if available), perform <a href="#">Procedure 4-11</a>

# AC or DC Power Cabling Installation

---

## Objective

This section contains the procedure for installing the AC power cable.



### CAUTION

This equipment uses dangerous voltages and is capable of causing death. Use extreme caution when handling and testing this equipment. Earth connection is essential before connecting the power due to the presence of high earth leakage current.

## AC Cable Description

Cable E as listed in [Table 3-1](#) is required for this installation.



### NOTE

The minimum bend radius for this cable is 90 mm.

## Tools Required

The following tools are required to install the AC power cables.

- No. 2 Blade screw driver

## AC Power Connection Procedure

Follow the steps in [Procedure 4-7](#) to connect a 100/240 VAC, Single Phase AC power cable to the Base Control Unit (BCU). The AC power cable will be routed through one and one-half inch conduit to the appropriate access hole on the underside of the BCU. The circuit breaker rating of the AC Surge Protect is 25 A.

Branch Circuit protection to be provided during installation. A Single pole 25A rated circuit breaker or adequately rated fuse shall be used for nominal 110/240 VAC installations." "For supply connections, use wires suitable for at least 75°C" "Unit is intended for installation in Restricted Access Locations"



**CAUTION**

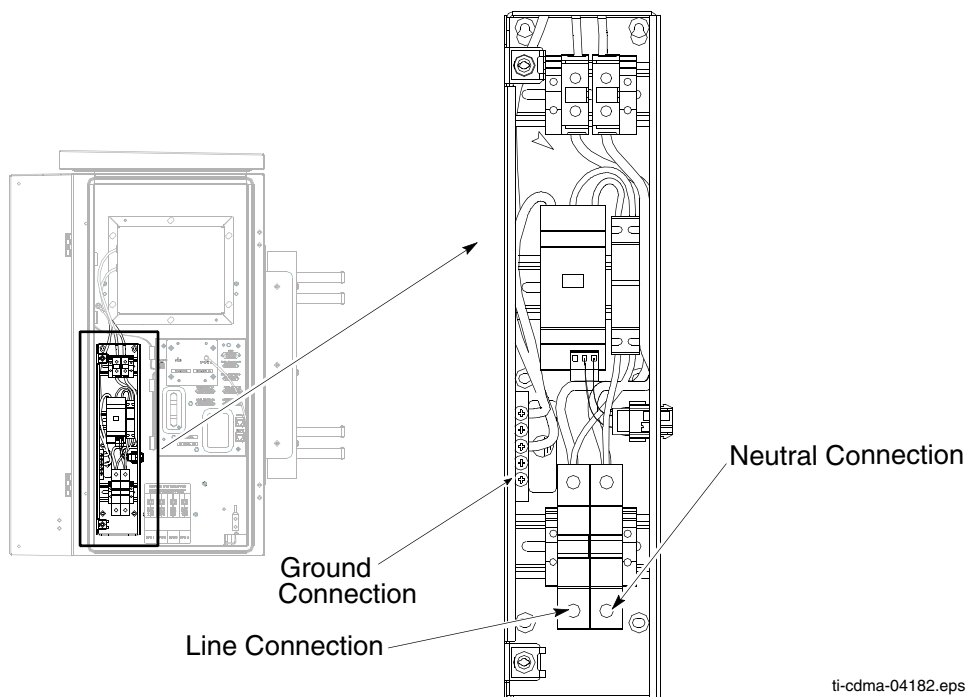
This equipment is designed to permit the connection of the earthed conductor of the DC supply circuit to the earthing conductor at the equipment. If this connection is made, all of the following conditions must be met:

- This equipment shall be connected to directly to the DC supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode conductor is connected.
- This equipment shall be located in the same immediate area (such as, adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same d.c. supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system shall not be earthed elsewhere.
- The DC supply source is to be located within the same premises as the equipment.
- Switching or disconnecting devices shall not be in the earthed circuit conductor between the d.c. source and the point of connection of the earthing.

For supply connections, use wires suitable for at least 75°C. Floating Supply voltage should not exceed 60 VDC for DC powered equipment. Unit is intended for installation in Restricted Access Locations Branch Circuit protection to be provided during installation. A single pole 50A rated circuit breaker or adequately rated fuse shall be used for nominal -48 VDC installations. A Single pole 80A rated circuit breaker or adequately rated fuse shall be used for nominal +27 VDC installations.

**Procedure 4-7** Procedure to Install AC Power Cable

1	Ensure that AC power at the source is disabled before handling cable.
	<div style="display: flex; align-items: center;"> <div style="background-color: #00b050; color: white; padding: 5px 10px; border-radius: 5px;">NOTE</div> </div> <p>AC power cables are supplied by the customer and should already have been laid out at the site.</p>
2	If not already done, route AC power cables through conduit to BCU Customer Interface compartment.
3	In the BCU Customer Interface compartment, open the AC Surge Module cover by loosening two captive screws. AC Surge Module cover is hinged.
4	Loosen screws on AC power terminal block. Insert AC power cables into <b>GROUND,LINE</b> and <b>NEUTRAL</b> and tighten screws. See <a href="#">Figure 4-10</a> Ensure a good connection.
5	Close AC Surge Module cover and secure by tightening two captive screws.
6	If required, enable AC power at the source.

**Figure 4-10** BCU AC Power Connection

## DC Cable Description

Cable M as listed in [Table 3-1](#) is required for this installation.

## DC Power Connection Procedure


Follow the steps in [Procedure 4-8](#) to connect a nominal +27 or —48 VDC power cable to the Base Control Unit (BCU). The DC power cable will be routed through one and one-half inch conduit to the appropriate access hole on the underside of the BCU.

The circuit breaker rating for the +27 DC Surge Protect is 80 A. The circuit breaker rating for the —48 V DC Surge Protect is 50 A.

### **Procedure 4-8** Procedure to Install DC Power Cable

**Continued**

**Procedure 4-8** Procedure to Install DC Power Cable (Continued)

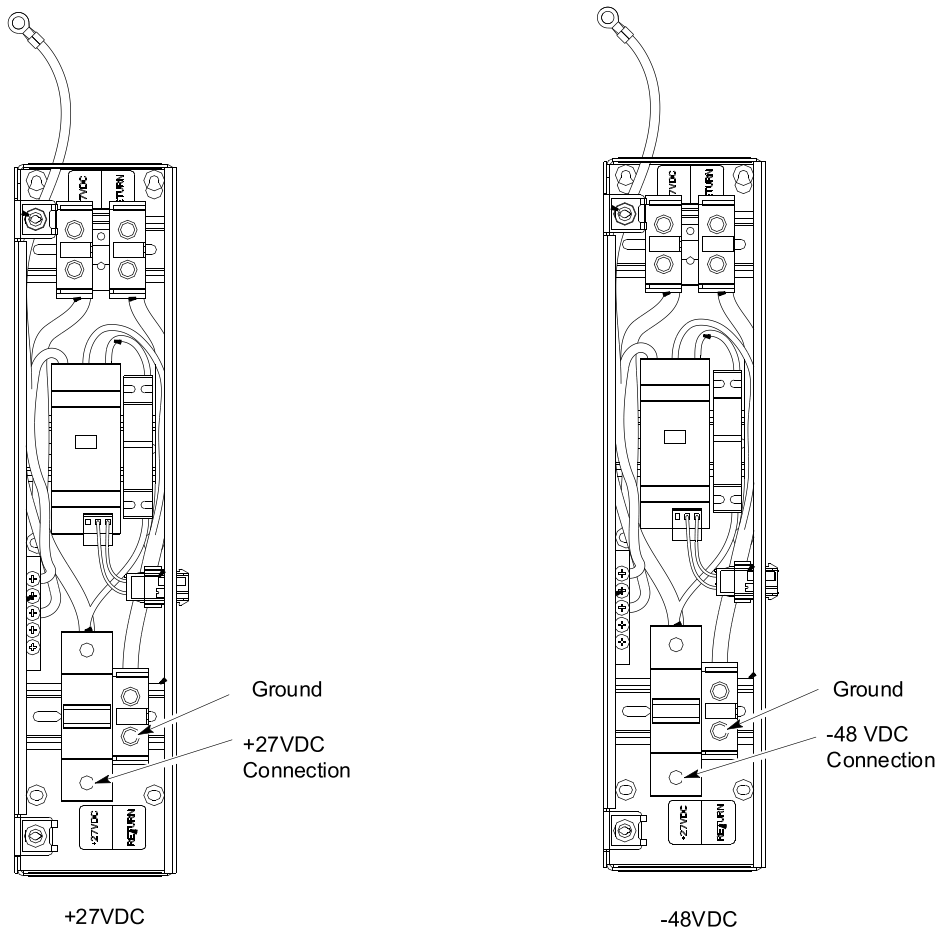
<b>1</b>	<p>Ensure that DC power at the source is disabled before handling cable.</p> <div style="display: flex; align-items: center; margin-top: 10px;">  <div style="background-color: #00b050; color: white; padding: 5px 10px; font-weight: bold; text-align: center;">NOTE</div> </div> <p style="margin-top: 10px;">DC power cables are supplied by the customer and should already have been laid out at the site.</p>
<b>2</b>	<p>If not already done, route DC power cables through conduit to BCU Customer Interface compartment.</p>
<b>3</b>	<p>In the BCU Customer Interface compartment, open the DC Surge Module cover by loosening two captive screws. DC Surge Module cover is hinged.</p>
<b>4</b>	<p>Loosen screws on DC power terminal blocks. Insert DC power cables into <b>+27VDC</b> and <b>RETURN</b> or <b>-48VDC</b> and <b>+0V RETURN</b> and tighten screws. See <a href="#">Figure 4-11</a> Ensure a good connection.</p>
<b>5</b>	<p>Close DC Surge Module cover and secure by tightening two captive screws.</p>



**Procedure 4-8** Procedure to Install DC Power Cable (Continued)

**6** If required, enable DC power at the source.

**Figure 4-11** BCU DC Power Connection



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# Local GPS Cabling Installation

## Objective

The objective of this procedure is to install the Local (RF) Global Positioning System (RF GPS) cabling.

## Tools and Materials

provides the quantities and descriptions of the cables.

- 5/16 Breakaway Torque Wrench 9-in. lb
- Adjustable Torque Ratchet with metric socket set
- Flathead screwdriver
- N-SMA Adapter

## Cable Description

Cable K as listed in [Table 3-1](#) is required for installation.

## Surge Arrestor Installation

Perform the procedure in [Procedure 4-9](#) to install the surge arrester.

### **Procedure 4-9** Procedure to Install Surge Arrestor

<b>1</b>	Open Base Control Unit (BCU) Customer Interface Compartment.
<b>2</b>	Verify that surge arrester is already installed. If not, then remove surge arrester from kit.
<b>3</b>	Install surge arrester in the right side bottom of Customer Interface Compartment, see <a href="#">Figure 4-13</a> .
<b>4</b>	Attaching the ground cable is optional. If not provided, perform the following to make the ground cable for the surge arrester. Get two lug nuts.

**Continued**

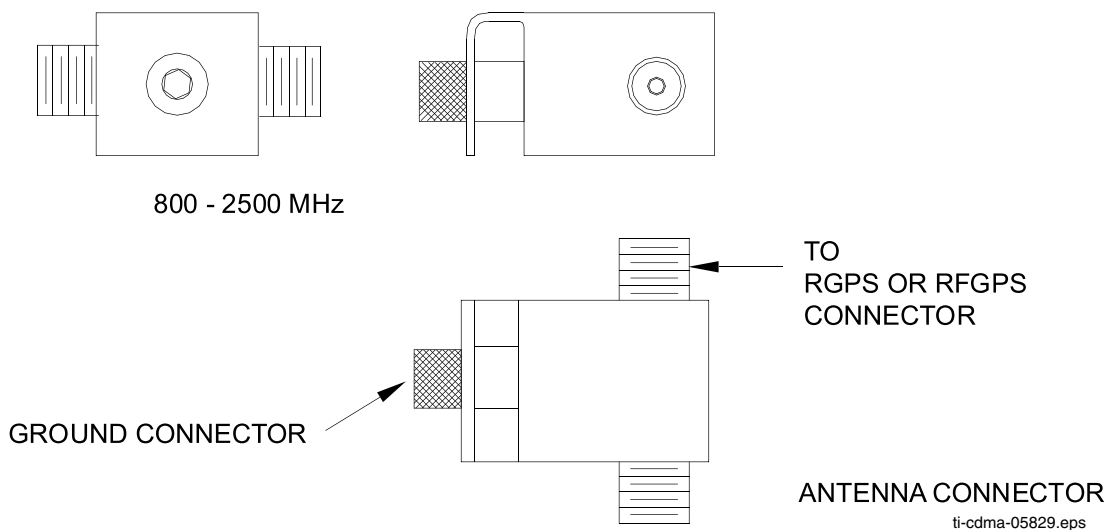
**Procedure 4-9** Procedure to Install Surge Arrestor (Continued)

Crimp one end each of a 6 – 8 inch long, #6 AWG cable to the lug nuts.

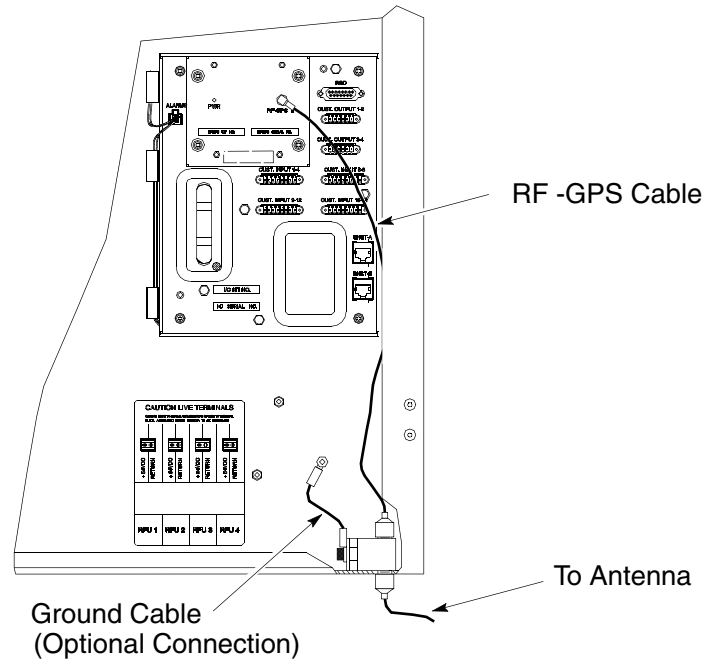
- 5** Unscrew knurled nut from surge arrestor and attach ground lug. Screw knurled nut into surge arrestor and hand tighten. Attach other end of ground cable to the threaded ground connection just above the surge arrestor. See [Figure 4-13](#). Attach self locking nut to secure ground connection to BCU.

**Figure 4-12** Surge Arrestor

RGPS / RFGPS SURGE ARRESTOR



**Figure 4-13** Surge Arrestor Orientation and Ground Location



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## Installing Local GPS Antenna and Cable


Figure 4-14 shows the components of the Local GPS. The Local GPS is connected to the BCU via the Customer Interface compartment.

### Procedure 4-10 Procedure for Installing Local GPS Antenna and Cabling

<b>1</b>	Determine the mounting location (see Local GPS Mounting Considerations, <a href="#">Table 3-8</a> ).
<b>2</b>	Install the mounting kit at the Local GPS location of choice. Use the appropriate mounting bolts for mounting surface.

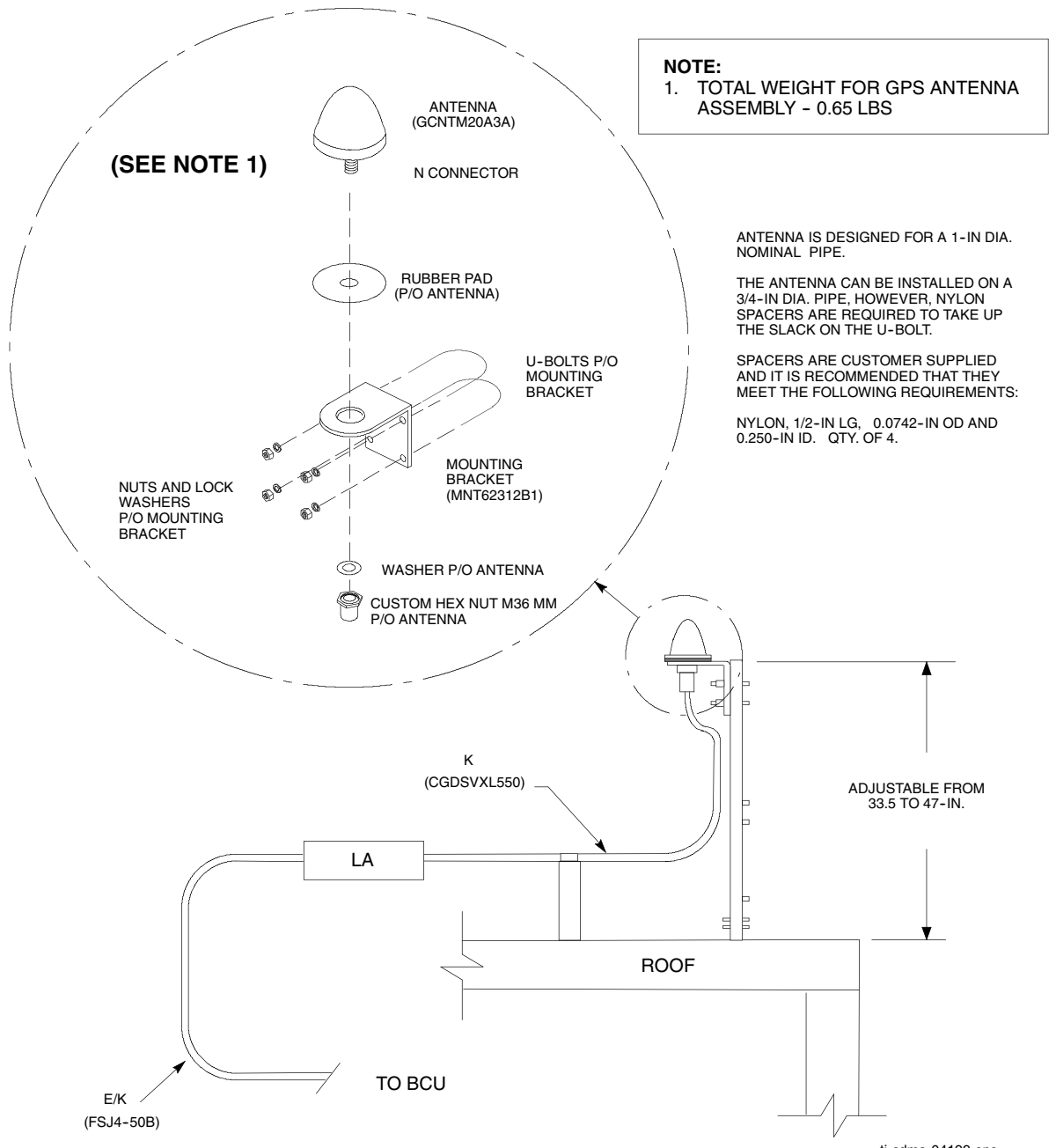
**Continued**

**Procedure 4-10** Procedure for Installing Local GPS Antenna and Cabling (Continued)

<b>3</b>		<div style="border: 1px solid black; padding: 2px; display: inline-block;"><b>WARNING</b></div>
	<p>The roof structure on which the mounting pole is attached should be verified by a qualified structural engineer for the weight of the Local GPS engine and mounting hardware or under adverse conditions for the installation area</p>	
	<p>Mounting the Local GPS antenna and hardware to an inadequate roof surface and/or using inadequate installation methods can result in serious injury.</p>	
<b>4</b>	<p>Attach the Local GPS antenna assembly to the mounting bracket and secure washer and custom nut supplied. See <a href="#">Figure 4-14</a></p>	
<b>5</b>	<p>Attach the grounding kit to the mounting pole with u-bolts and secure using washers and nuts supplied. See <a href="#">Figure 4-14</a></p>	
<b>6</b>	<p>Connect one (1) N connector of the 50 feet superflex cable to the N jack of the RF GPS antenna cable (K) and route the other end of the cable down to the BCU. Make allowances for strain relief.</p>	
<b>7</b>	<p>Route the cable to the underside of the BCU to surge arrester connector (in Customer Interface Compartment). Connect RF GPS cable between RF GPS Module and top of surge arrester.</p>	

**Continued**

**Procedure 4-10** Procedure for Installing Local GPS Antenna and Cabling (Continued)  
**Figure 4-14** Local GPS Installation and Components Diagram



# Ethernet Cabling Installation

## Objective

This section contains the procedure for installing the Ethernet cables.

## Cable Description

Cable J as listed in [Table 3-1](#) is required for installation.

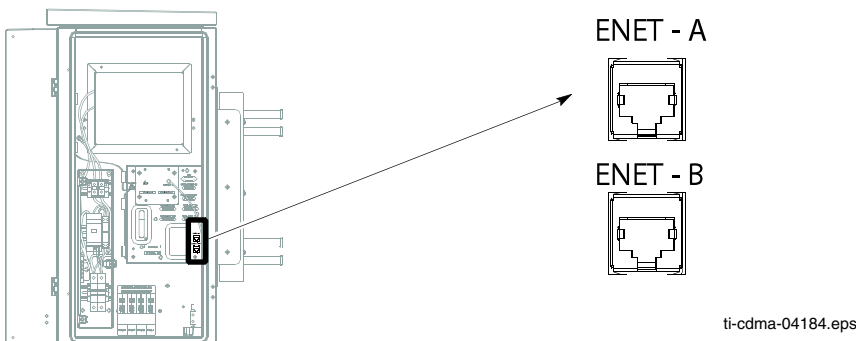
## Installing Ethernet Cables

Follow the steps in [Procedure 4-11](#) to install the ethernet cables.

### Procedure 4-11 Procedure to Install Ethernet Cables

<b>1</b>	<i>If not already done</i> , remove conduit plug at the bottom of the BCU.
<b>2</b>	If Ethernet cables are not present, route one end to Site Termination Equipment. If Ethernet cables are present, route them through conduit and through access hole in the bottom of the BCU.
<b>3</b>	Insert cable connectors in the sockets labeled ENET A and ENET B.
<b>4</b>	If there are no more cables to connect close and lock Customer Interface compartment.

**Figure 4-15** Ethernet Cable Connection



# Customer Input/Output Cabling Installation

## Objective

This section contains the procedures for installing the Customer Defined Input/Output cables.

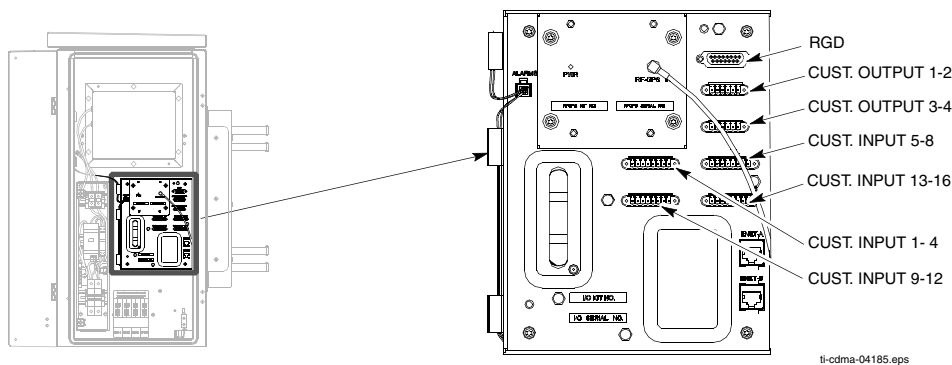
## Cable Descriptions

Cable F as listed in [Table 3-1](#) is required for installation.

## Customer Input and Output Connector Pinouts

This section contains the procedures for installing the Customer Defined Input/Output cables. The CDI/CDO cables will be routed through one inch conduit to the access hole on the underside of the BCU.

**Figure 4-16** Customer Defined Input and Output Connectors



## Customer Defined Input/Output Cable Installation

Follow the procedure in [Procedure 4-12](#) to install the Customer Defined Input/Output Cables

**Continued**