

Field Retrofit of GPS Board and Antenna in 6801 Switch Controls

Table of Contents

Section	Page
Introduction	
Qualified Persons	2
Read this Instruction Sheet	2
Retain this Instruction Sheet.	2
Proper Application	2
Special Warranty Provisions.	3
Safety Information	
Understanding Safety-Alert Messages.	4
Following Safety Instructions	4
Replacement Instructions and Labels	4
Safety Precautions	5

Section	Page
GPS Field Retrofit	7
Field Retrofit Kit	8
Tool List.	8
GPS Installation	9



Introduction

Qualified Persons

WARNING

Only qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead and underground electric distribution equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed
- The proper use of special precautionary techniques, personal protective equipment, insulated and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment

These instructions are intended **ONLY** for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

NOTICE

Thoroughly and carefully read this instruction sheet and all materials included in the product's instruction handbook before installing or operating the 6800 Series Automatic Switch Control. Familiarize yourself with the Safety Information and Safety Precautions on pages 4 through 6. The latest version of this publication is available online in PDF format at sandc.com/en/support/product-literature/.

Retain this Instruction Sheet

This instruction sheet is a permanent part of your 6800 Series Automatic Switch Control. Designate a location where you can easily retrieve and refer to this publication.

Proper Application

WARNING

The equipment in this publication is only intended for a specific application. The application must be within the ratings furnished for the equipment. See S&C Specification Bulletin 1045-31.

Special Warranty Provisions

The standard warranty contained in S&C's standard conditions of sale, as set forth in Price Sheets 150 and 181, applies to the 6800 Series Automatic Switch Control, except that the first paragraph of the said warranty is replaced by the following:

(1) General: The seller warrants to the immediate purchaser or end user for a period of 10 years from the date of shipment that the equipment delivered will be of the kind and quality specified in the contract description and will be free of defects of workmanship and material. Should any failure to conform to this warranty appear under proper and normal use within 10 years after the date of shipment, the seller agrees, upon prompt notification thereof and confirmation that the equipment has been stored, installed, operated, inspected, and maintained in accordance with the recommendations of the seller and standard industry practice, to correct the nonconformity either by repairing any damaged or defective parts of the equipment or (at the seller's option) by shipment of necessary replacement parts. The seller's warranty does not apply to any equipment that has been disassembled, repaired, or altered by anyone other than the seller. This limited warranty is granted only to the immediate purchaser or, if the equipment is purchased by a third party for installation in third-party equipment, the end user of the equipment. The seller's duty to perform under any warranty may be delayed, at the seller's sole option, until the seller has been paid in full for all goods purchased by the immediate purchaser. No such delay shall extend the warranty period.

Replacement parts provided by the seller or repairs performed by the seller under the warranty for the original equipment will be covered by the above special warranty provision for its duration. Replacement parts purchased separately will be covered by the above special warranty provision.

For equipment/services packages, the seller warrants for a period of one year after commissioning that the 6800 Series Automatic Switch Control will provide automatic fault isolation and system reconfiguration per agreed-upon service levels. The remedy shall be additional system analysis and reconfiguration of the IntelliTeam SG Automatic Restoration System until the desired result is achieved.

Warranty of the 6800 Series Automatic Switch Control is contingent upon the installation, configuration, and use of the control or software in accordance with S&C's applicable instruction sheets.

This warranty does not apply to major components not manufactured by S&C, such as batteries and communication devices. However, S&C will assign to the immediate purchaser or end user all manufacturer's warranties that apply to such major components.

Warranty of equipment/services packages is contingent upon receipt of adequate information on the user's distribution system, sufficiently detailed to prepare a technical analysis. The seller is not liable if an act of nature or parties beyond S&C's control negatively impact performance of equipment/services packages; for example, new construction that impedes radio communication, or changes to the distribution system that impact protection systems, available fault currents, or system-loading characteristics.

Safety Information

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to your 6800 Series Automatic Switch Control. Familiarize yourself with these types of messages and the importance of these various signal words:

DANGER

“DANGER” identifies the most serious and immediate hazards that will result in serious personal injury or death if instructions, including recommended precautions, are not followed.

WARNING

“WARNING” identifies hazards or unsafe practices that can result in serious personal injury or death if instructions, including recommended precautions, are not followed.

CAUTION

“CAUTION” identifies hazards or unsafe practices that can result in minor personal injury if instructions, including recommended precautions, are not followed.

NOTICE

“NOTICE” identifies important procedures or requirements that can result in product or property damage if instructions are not followed.

Following Safety Instructions

If you do not understand any portion of this instruction sheet and need assistance, contact the nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C’s website sandc.com, or call the S&C Global Support and Monitoring Center at 1-888-762-1100.

NOTICE

Read this instruction sheet thoroughly and carefully before installing your 6800 Series Automatic Switch Control.



Replacement Instructions and Labels

If additional copies of this instruction sheet are needed, contact the nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting the nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

⚠ DANGER	
 <p style="font-size: small; margin-top: 5px;">© 1982 NEMA</p>	<p>The 6800 Series Automatic Switch Control line voltage input range is 93 to 276 Vac. Failure to observe the precautions below will result in serious personal injury or death.</p> <p>Some of these precautions may differ from your company's operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules.</p>
<ol style="list-style-type: none"> 1. QUALIFIED PERSONS. Access to the 6800 Series Automatic Switch Control must be restricted only to qualified persons. See the "Qualified Persons" section on page 2. 2. SAFETY PROCEDURES. Always follow safe operating procedures and rules. 3. PERSONAL PROTECTIVE EQUIPMENT. Always use suitable protective equipment, such as rubber gloves, rubber mats, hard 	<p style="padding-left: 20px;">hats, safety glasses, and flash clothing, in accordance with safe operating procedures and rules.</p> <ol style="list-style-type: none"> 4. SAFETY LABELS. Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels. 5. MAINTAINING PROPER CLEARANCE. Always maintain proper clearance from energized components.

WARNING

These instructions do not replace the need for utility operation standards. Any conflict between the information in this document and utility practices should be reviewed by appropriate utility personnel and a decision made as to the correct procedures to follow.

The 6800 Series Automatic Switch Controls are connected to switchgear operating at primary voltage levels. High voltage may be present in the wiring to the switch control or the switch control itself during certain failures of the switchgear wiring or grounding system, or because of a failure of the switch itself. For this reason, access to the switch control should be treated with the same safety precautions that would be applied when accessing other high-voltage lines and equipment. Follow all locally approved safety procedures when working on or around this switch control.

Before attempting to access an existing switch installation, check carefully for visible or audible signs of electrical or physical malfunction (do this before touching or operating the switch control or any other part of the installation). These warning signs include such things as smoke, fire, open fuses, crackling noises, loud buzzing, etc. If a malfunction is suspected, treat all components of the installation, including the switch control and associated mounting hardware, as if they were elevated to primary (high) voltage.

Whenever manually reconfiguring the circuit (for example, during repairs), follow your company's operating procedures to disable automatic operation of the IntelliTeam® SG and IntelliTeam® II Automatic Restoration Systems. This prevents any unexpected operation of a team member.

The IntelliTeam SG system can be disabled by pressing the Automatic Restoration CHANGE faceplate button and selecting the **Prohibited** option on the faceplate of any active 6800 Series team member of the team to be disabled.

Adding a GPS upgrade kit and GPS antenna will enable the 6801 Automatic Switch Control to log data with GPS time precision and report the switch-control location. The GPS intermediate board is installed on the front of the processor board under the front panel. See Figure 1. The rear shield and processor board must be removed to install the GPS intermediate board. To install the antenna, a hole must be drilled in the top of the enclosure. The GPS intermediate board is connected to the new Wi-Fi/GPS board installed on the communication plate.

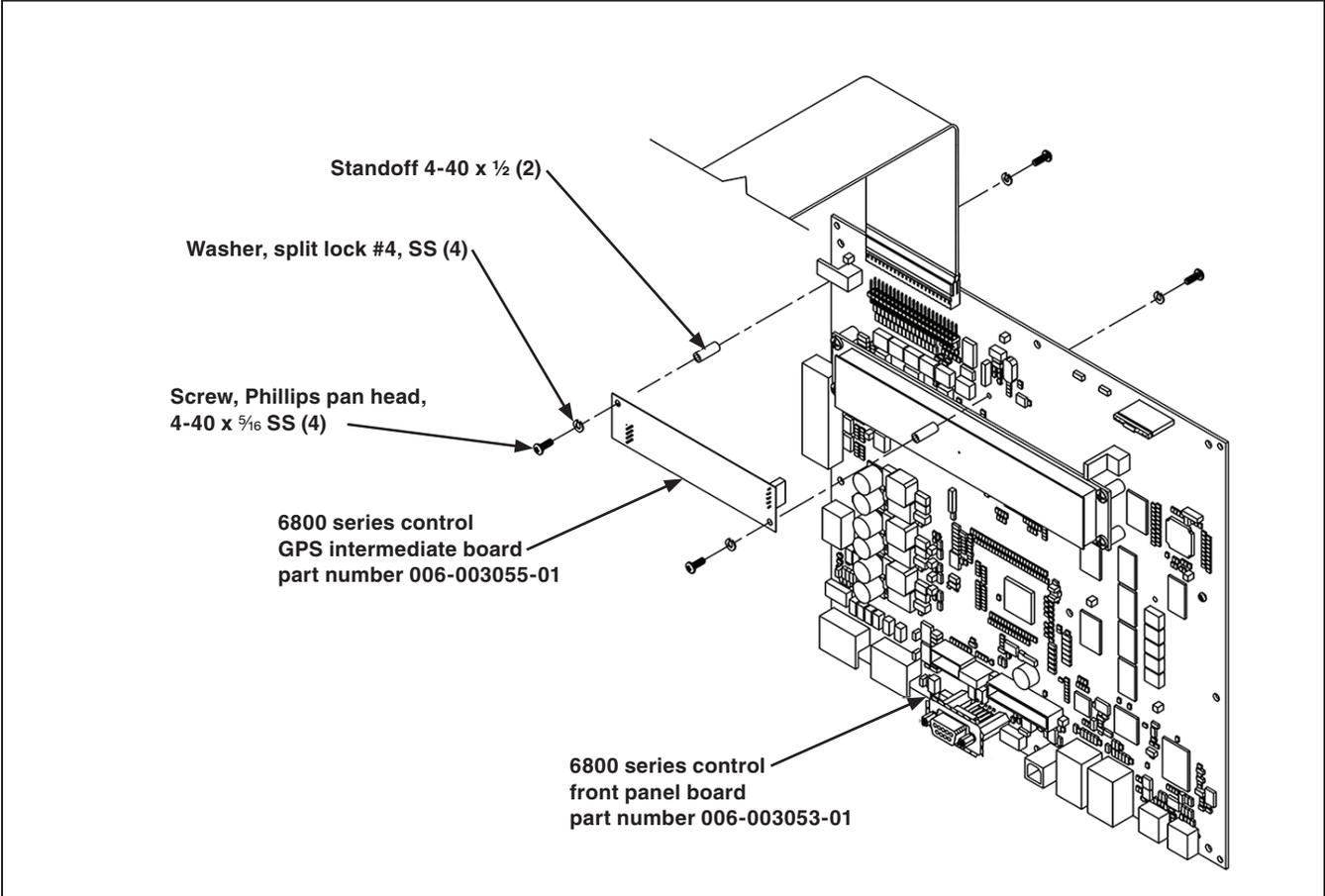


Figure 1. Diagram of the GPS intermediate board installation.

GPS Field Retrofit

Field Retrofit Kit

- Retrofit GPS intermediate board and upgrade kit
Catalog Number 903-002350-02 See Figure 2.
- Active GPS antenna, surface mount
Catalog Number 007-001615-01

Tool List

- Medium Phillips screwdriver
- 1/32-inch nut driver
- 3/4-inch drill bit for metal
- Electric drill

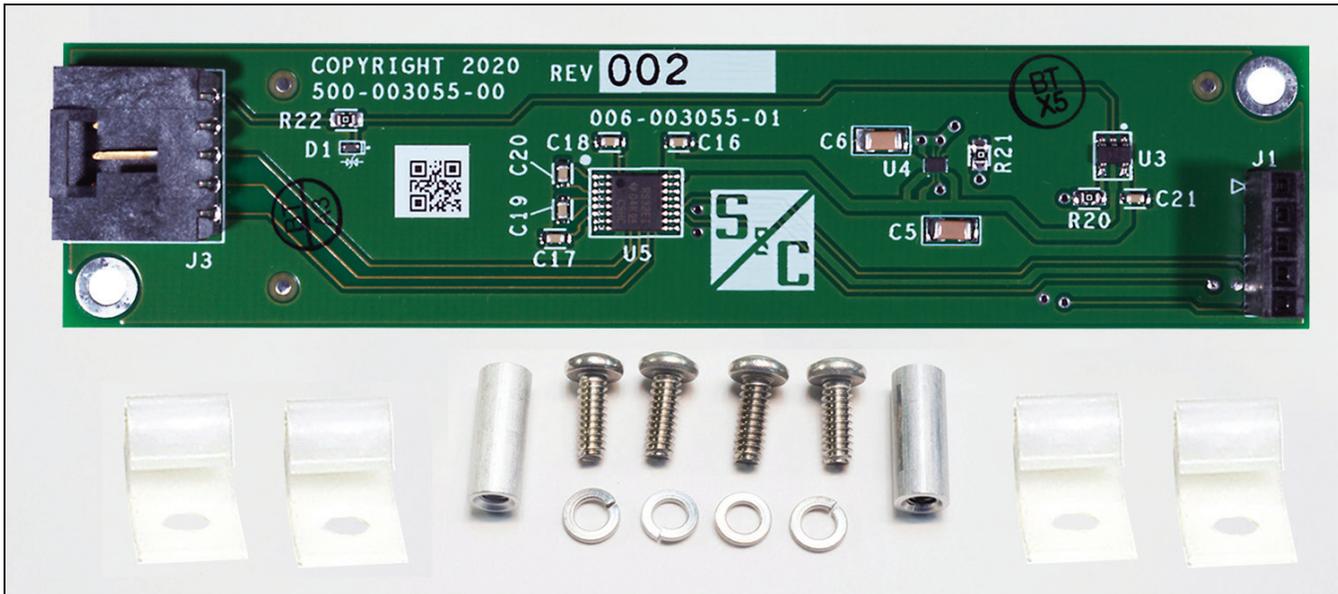


Figure 2. The GPS intermediate board and mounting parts.

Follow these steps to add the GPS intermediate board, communication plate, and antenna:

STEP 1. Observe these electrostatic damage precautions:

- Make sure the control is properly grounded.
- At a minimum, touch a grounded surface before handling each circuit board.
- Never touch soldered terminals on the back of a circuit board.

Note: A circuit board must always be mounted in a control, kept in an anti-static bag, or placed on an electrostatic discharge (ESD)-protected grounding mat. Never set down a board without anti-static protection. For convenience, use a second anti-static ESD bag so a removed board can be immediately put into an ESD bag before the new board is removed from its bag.

STEP 2. Remove all power sources:

- De-energize external ac power, if present, by opening the ac control power fuse. See Figure 3.

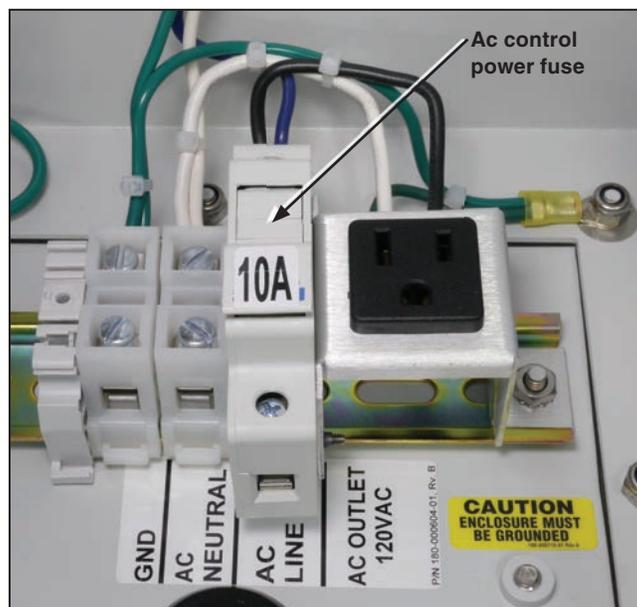


Figure 3. Connection terminal and ac control power fuse.

⚠ WARNING

Electric shock hazard. Disconnect ac control power, sensor power, and battery before proceeding. Failure to do so could result in serious or fatal injury.

⚠ WARNING

Electric shock hazard. Wear high-voltage gloves when handling the field interface connector (FIC) and cable. Failure to do so could result in serious or fatal injury.

GPS Installation

- (b) Disconnect the field interface connector (FIC) at the bottom of the enclosure. See Figure 4.
- (c) Disconnect the battery with the connector plug. See Figure 5.

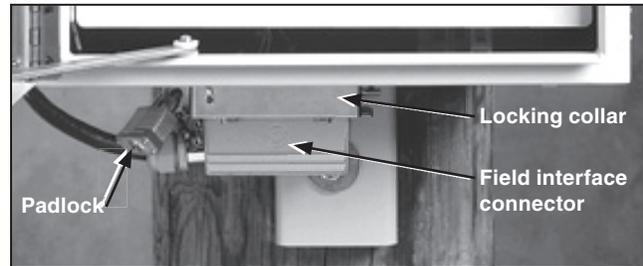


Figure 4. Bottom of switch control enclosure with FIC connector.



Figure 5. The battery connector.

STEP 3. Open the front panel door, and disconnect the data cable and the power cable on the right side. See Figure 6.

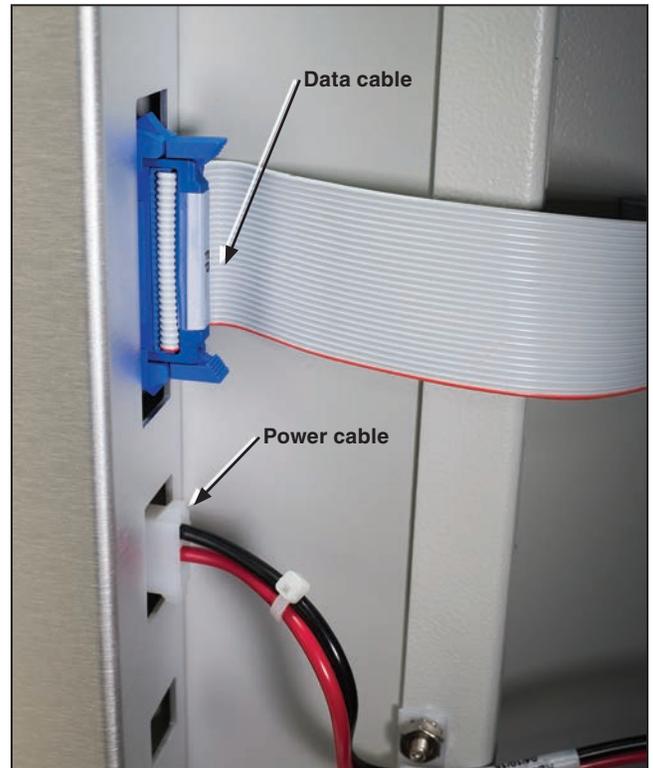


Figure 6. The front panel data connector and the power connector.

GPS Installation

- STEP 4.** Remove the radio connectors at Ports J1, J2, J15, and J16. Remove the four screws that secure the shield, and remove the shield. See Figure 7.
- STEP 5.** Remove the bottom screw, and take the circuit board off the support studs. See Figure 8.



Figure 7. The processor board shield on the back of the front panel door.

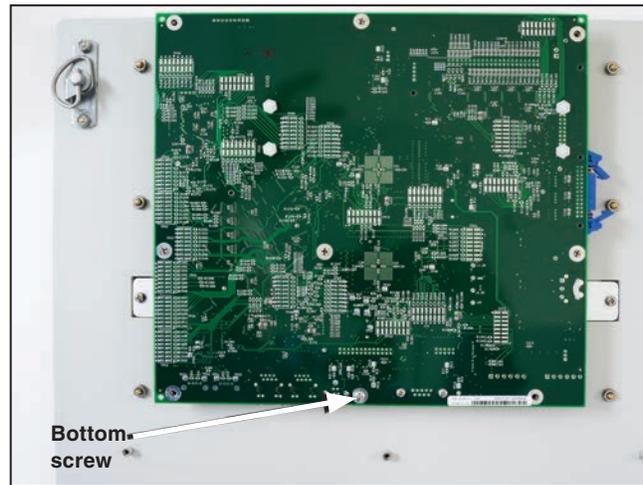


Figure 8. The processor attached to the back of the front panel.

STEP 6. Remove the ribbon cable from connector J12 above the LCD screen. It connects the front panel switches to the processor board. See Figure 9.

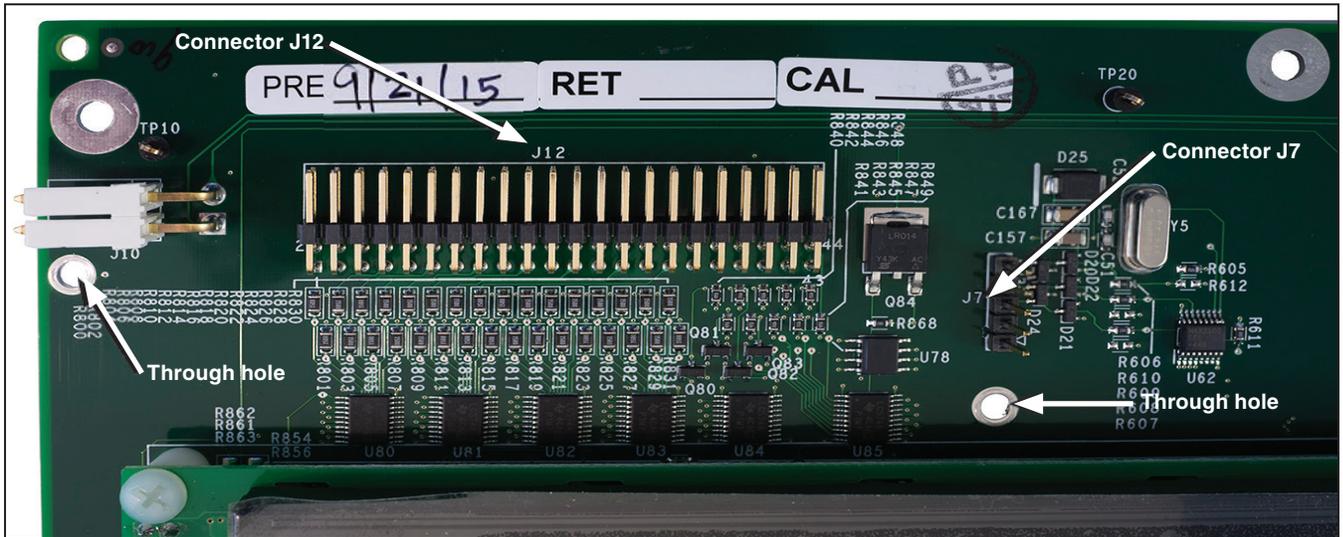


Figure 9. The processor board where the GPS intermediate board will be mounted.

STEP 7. Attach the two standoffs to the component side of the GPS intermediate board using screws and lockwashers. See Figure 10.

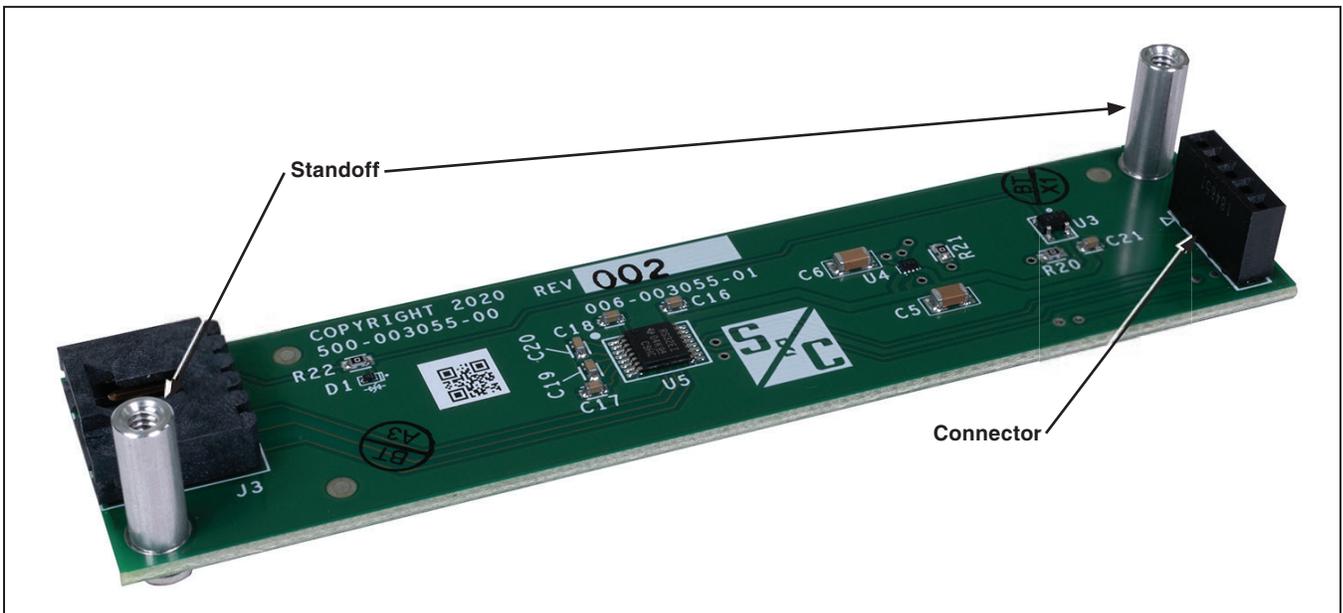


Figure 10. A GPS intermediate board with standoffs attached.

GPS Installation

- STEP 8.** Attach the connector in Figure 10 on page 13 to the connector pins J7 in Figure 9 on page 13. Install the Phillips screws and lockwashers from the back of the processor board in the through holes as indicated in Figure 9 on page 13 and Figure 11.
- STEP 9.** Reattach the ribbon cable from the front panel switches to connector J12 above the LCD screen on the processor board. Be sure the connector attaches to both pin rows. See Figure 9 on page 13.
- STEP 10.** Mount the circuit board on the studs, and reinstall the bottom screw. See Figure 11.
- STEP 11.** Reinstall the cover. Make sure the standoffs are in place, and tighten the screws. See Figure 12.

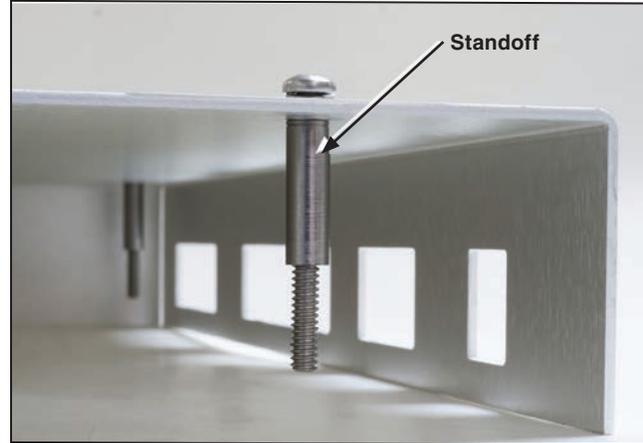


Figure 12. The standoff placed properly under the cover.

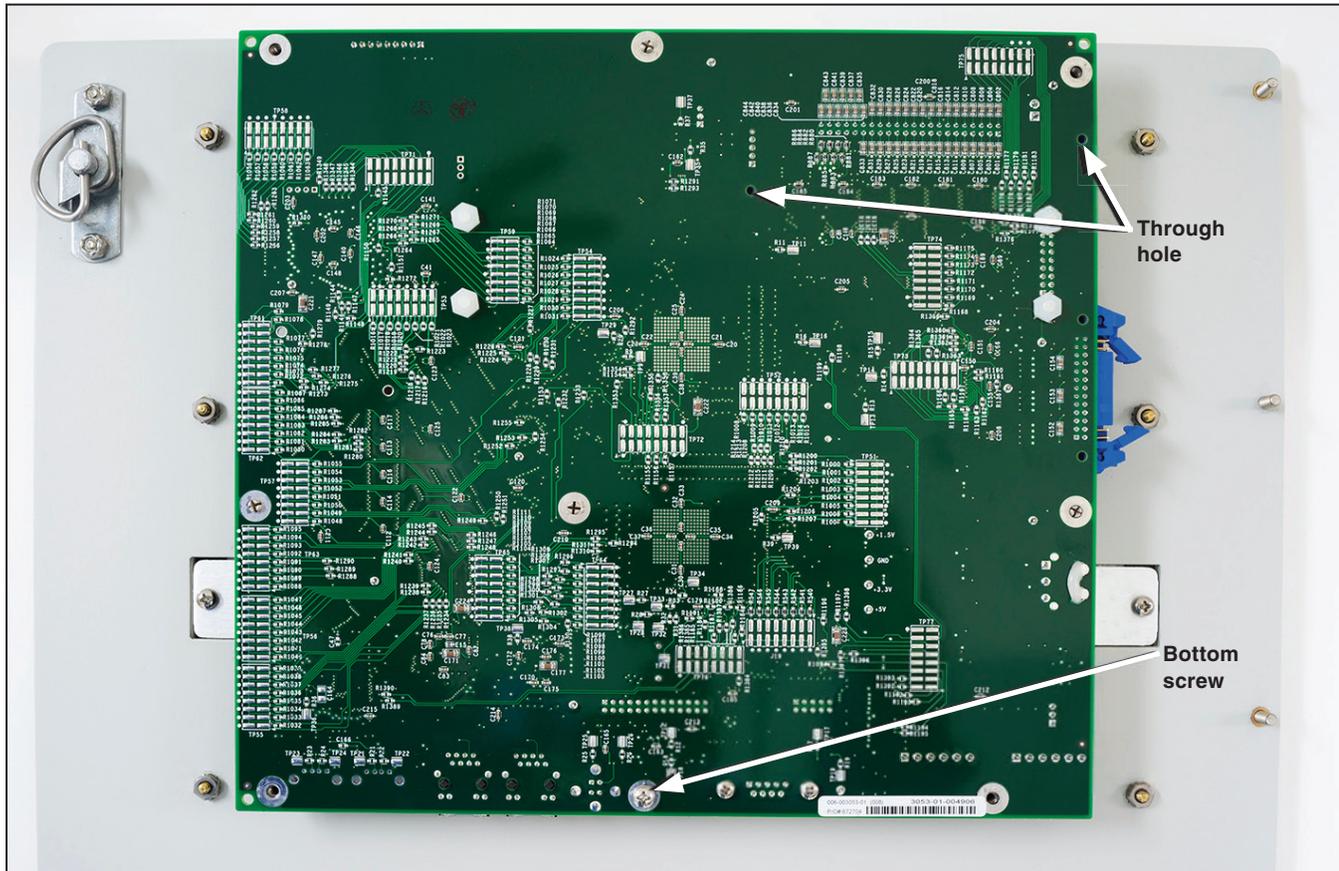


Figure 11. The processor board reattached to the back of the front panel.

STEP 12. Install the GPS antenna to the top of the enclosure. Drill a $\frac{3}{4}$ -inch hole in the enclosure top panel. See Figures 13 and 14. The hole location may be different from what is indicated in the drawing.

NOTICE

Stray metal chips from drilling can cause intermittent misoperation and damage to electronic components. Take precautions to protect the electronic circuits from chips you create while drilling the antenna hole.

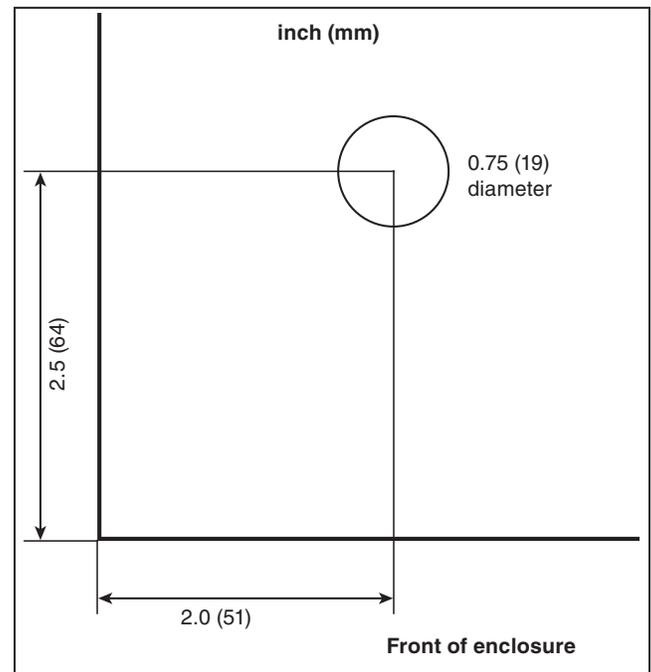


Figure 13. The antenna hole location on the enclosure top.



Figure 14. The exterior view of the installed GPS antenna.

GPS Installation

- STEP 13.** Connect the GPS interface harness to the GPS intermediate board at the right side of the processor board cover. See Figure 15.
- STEP 14.** Remove the four nuts and lockwashers to attach the cable holders, secure the GPS antenna cable and the GPS interface cable with the cable holders, and reinstall the lockwashers and nuts. See Figure 16 on page 17.
- STEP 15.** Reinstall the radio connectors at Ports J1, J2, J15, and J16. See Figure 7 on page 12.

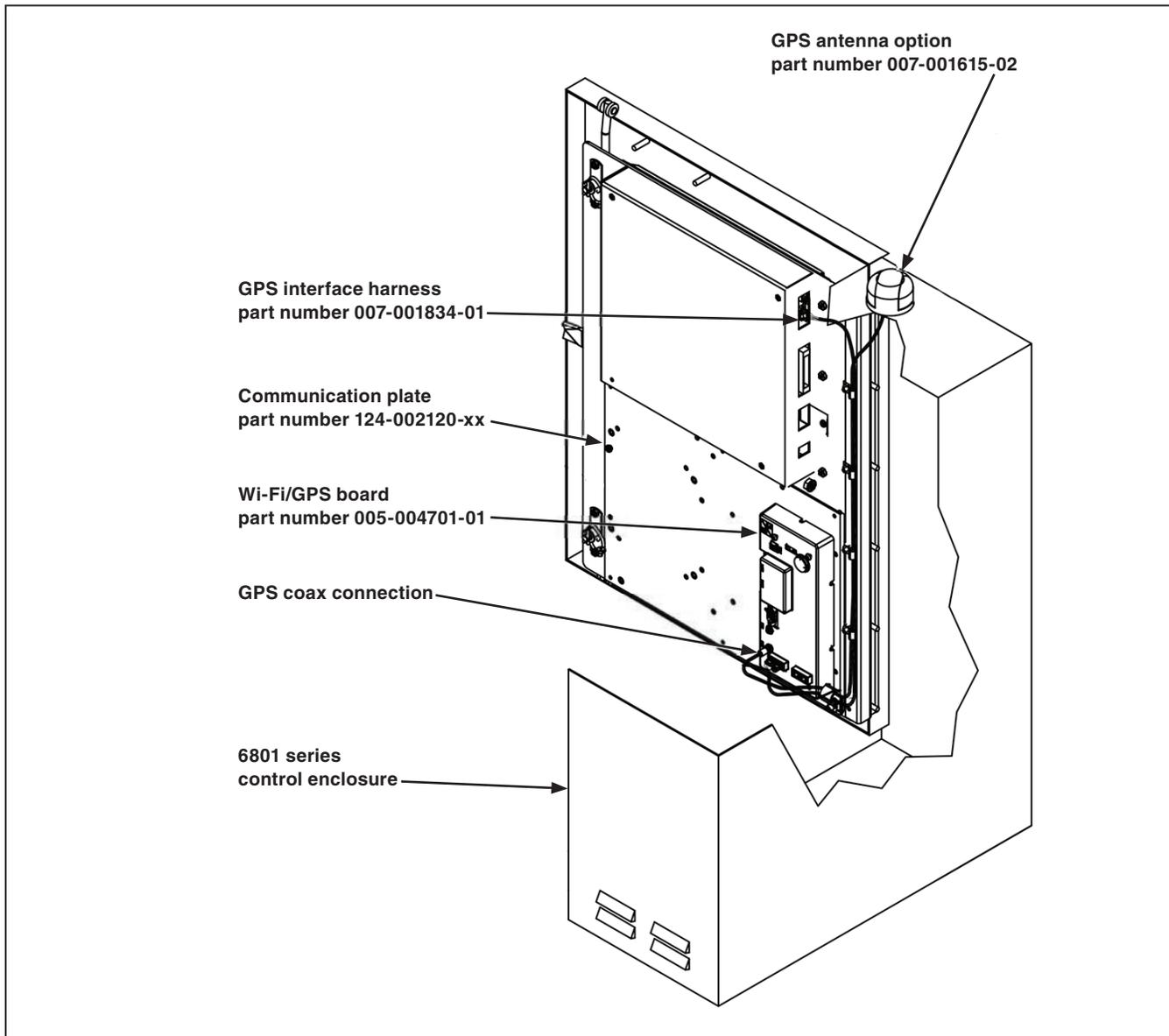


Figure 15. The communication plate, GPS antenna, and cable runs.

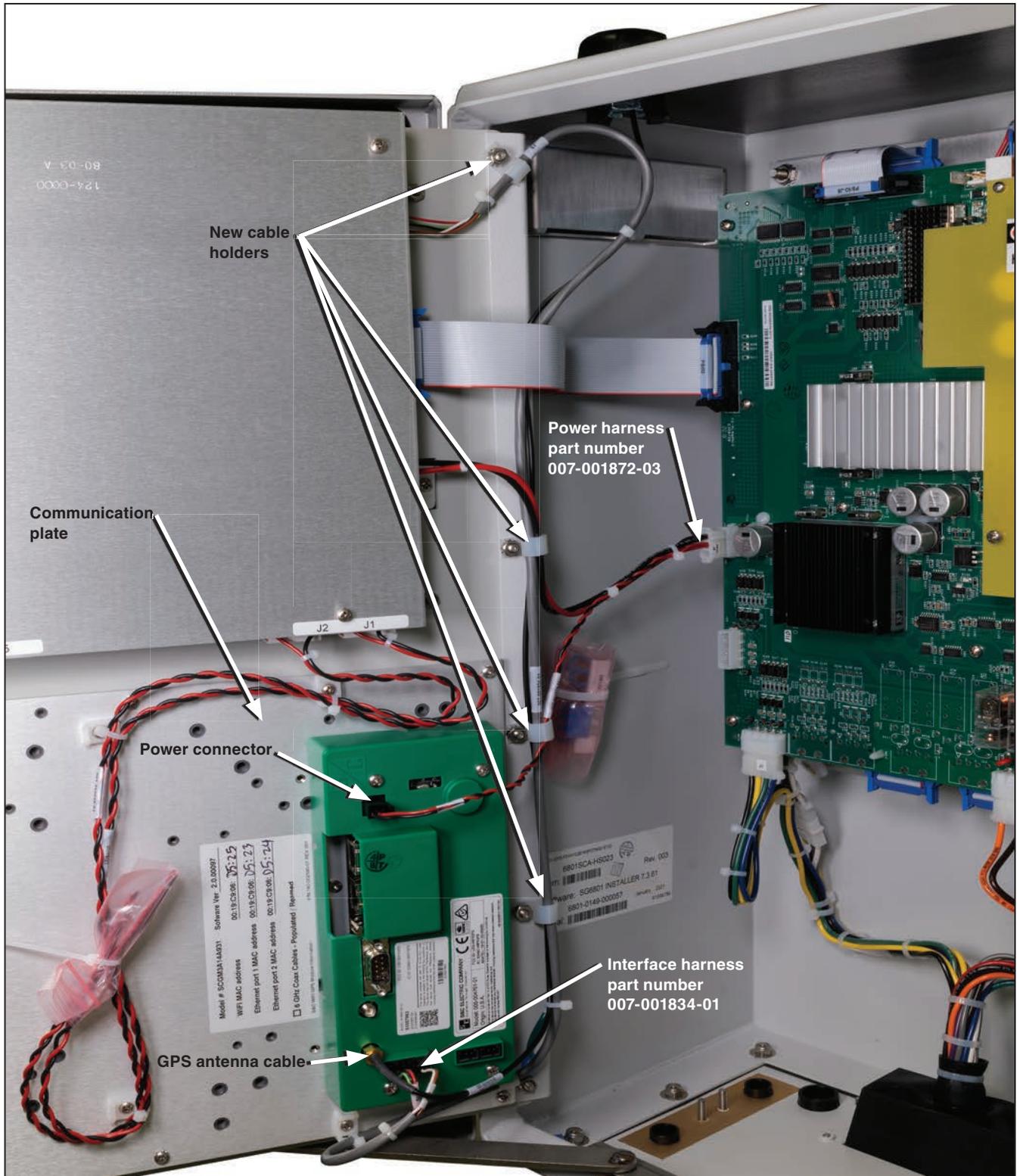


Figure 16. The GPS antenna cable secured by cable clamps and attached to the antenna connector on the Wi-Fi/GPS board.

GPS Installation

- STEP 16.** Reinstall the data cable and the power cable to the processor board. See Figure 6 on page 11.
- STEP 17.** Install the new communication plate that has the Wi-Fi/GPS board below the processor board on the back of the front panel. See Figure 16 on page 17.
- STEP 18.** Connect the new power harness to the power connector on the Wi-Fi/GPS board.
- STEP 19.** Connect the interface harness to the left connector at the bottom of the Wi-Fi/GPS board. See Figure 16 on page 17.
- STEP 20.** Connect the GPS antenna cable to the lower antenna connector on the Wi-Fi/GPS board. See Figure 16 on page 17.
- STEP 21.** Restore all power sources:
- Re-energize external ac power, if present, by closing the control power fuse. See Figure 3 on page 9.
 - Reconnect the FIC at the bottom of the enclosure. See Figure 4 on page 10.

 **WARNING**

Electric shock hazard. Wear high-voltage gloves when handling the FIC connector and cable. Failure to do so could result in serious or fatal injury.

- Reconnect the battery connector plug. See Figure 5 on page 10.

This completes installation of the GPS retrofit kit and GPS antenna.