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# TLS-350 To TLS-450PLUS Console

## Upgrade Instructions

VEEDER-ROOT

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### DAMAGE CLAIMS / LOST EQUIPMENT

Thoroughly examine all components and units as soon as they are received. If any cartons are damaged or missing, write a complete and detailed description of the damage or shortage on the face of the freight bill. The carrier's agent must verify the inspection and sign the description. Refuse only the damaged product, not the entire shipment.

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1. Contact Veeder-Root Customer Service at 800-873-3313 with the specific part numbers and quantities that were missing or received damaged.
2. Fax signed Bill of Lading (BOL) to Veeder-Root Customer Service at 800-234-5350.
3. Veeder-Root will file the claim with the carrier and replace the damaged/missing product at no charge to the customer. Customer Service will work with production facility to have the replacement product shipped as soon as possible.

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## Introduction

Contractor Certification Requirements ....1
Safety Precautions ....1
Safety Warnings ....2
Related Documents ....2
Documents Required To Install Equipment ....2
Reference Manuals ....2

## Removing The Existing Console....3

## Installing The TLS-450PLUS Console

Mounting The Console ....4
Connecting Wiring To Console Modules ....4
Installing I/O, MDIM Or LVDIM Modules ....4
Installing Comm Modules ....5
Precautions Against Static Electricity ....5
Comm Module Slots And Configurable ports ....5
Connecting The Power Wires To The Console ....8

## Initial Startup Procedure

For Sites Without Wireless 2 devices ....10
For Sites With Wireless 2 devices ....10


# Figures


Figure 1. TLS-450PLUS Console Dimensions And Designated Conduit Knockouts ....6
Figure 2. TLS-450PLUS Console - Plug-In Module Bays ....7
Figure 3. TLS-450PLUS Console - Selectable Comm Modules ....8
Figure 4. TLS-450PLUS Console - Fixed Comm Modules ....8
Figure 5. Wiring AC Power To The TLS-450PLUS Console ....9


# Tables


Table 1. Selectable Comm Module Permissible Slots and Port Availability ....8

# Introduction

This manual discusses removal of a TLS-350 console and replacing it with a TLS-450PLUS console. The instructions assume all site monitoring devices have been previously installed and site wiring is complete.

## Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and setup the equipment discussed in this manual:

**Installer Certification (Level 1):** Contractors holding valid Installer Certification are approved to perform wiring and conduit routing; equipment mounting; probe, sensor and carbon canister vapor polisher installation; wireless equipment installation; tank and line preparation; and line leak detector installation.

**Technician Certification (Level 2/3):** Contractors holding valid Technician Certifications are approved to perform installation checkout, startup, programming and operations training, system tests, troubleshooting and servicing for all Veeder-Root Series Tank Monitoring Systems, including Line Leak Detection. In addition, Contractors with the following sub-certification designations are approved to perform installation checkout, startup, programming, system tests, troubleshooting, service techniques and operations training on the designated system.

- Wireless 2
- Tall Tank

**Warranty Registrations** may only be submitted by selected Distributors.

## Safety Precautions

The following safety symbols may be used throughout this manual to alert you to important safety hazards and precautions

| | |
|---|---|
| **EXPLOSIVE**<br>Fuels and their vapors are extremely explosive if ignited. | **FLAMMABLE**<br>Fuels and their vapors are extremely flammable. |
| **ELECTRICITY**<br>High voltage exists in, and is supplied to, the device. A potential shock hazard exists. | **TURN POWER OFF**<br>Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit. |
| **WARNING**<br>Heed the adjacent instructions to avoid damage to equipment, property, environment or personal injury. | **READ ALL RELATED MANUALS**<br>Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does. |
| **USE SAFETY BARRICADES**<br>Unauthorized people in the work area are dangerous. Always use safety cones or safety tape to block access to the work area. | **STATIC SENSITIVE COMPONENTS**<br>Wear grounded anti-static wrist strap before handling the printed circuit board and mounted components. |

## Safety Warnings

**⚠ WARNING**

**This console contains high voltages which can be lethal. It is also connected to low power devices that must be kept intrinsically safe.**

**FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.**

1. **Turn off and tag power at the circuit breaker. Do not connect the console AC power supply wires at the breaker until all devices are connected.**
2. **Attach conduit from the power panel to the console's Power Area knockouts only.**
3. **Comply with all applicable codes including: the National Electrical Code; federal, state, and local codes; and other applicable safety codes.**

**Connecting power wires to a live circuit can cause electrical shock that may result in serious injury or death.**

**Routing conduit for power wires into the intrinsically safe compartment can result in fire or explosion resulting in serious injury or death.**

## Related Documents

### DOCUMENTS REQUIRED TO INSTALL EQUIPMENT

This equipment must be installed according to the applicable installation document:

| Equipment | ATEX Descriptive System Document No. | IECEx Descriptive System Document No. | UL/cUL Control Drawing Document No. |
|---|---|---|---|
| **Associated Apparatus** | | | |
| TLS-450PLUS | 331940-006 | 331940-106 | 331940-008 |
| **Intrinsically Safe Apparatus for Wireless Applications** | | | |
| Tank Gauge Accessories | 331940-005 | 331940-105 | 331940-012 |

### REFERENCE MANUALS

577014-073 TLS-450PLUS Console Site Prep And Installation Manual

## Removing The Existing Console

The key to a successful TLS-450PLUS retrofit installation is the careful removal of the old console and wiring.

The first concern is safety, so if the console is in a public area of the store, barricade off the work area to prevent injuries.

1. Prior to removing the TLS-350 console, print out the current TLS-350 console's setup configuration that will be used to program the TLS-450PLUS.

2. Turn off, tag and lockout the breaker that supplies power to the TLS-350 console.

3. Remove the door screws (with a T-15 Torx driver), open the console and unplug the power connector in the power bay. It's always a good idea to use a multimeter to confirm that the circuit is dead before pulling these wires through the console knockout.

4. Verify all Intrinsically safe wires are labeled and their polarity (if applicable) noted before removing them. Verify all non-intrinsically wiring connections are labeled before removing them.

5. Unplug the high and low voltage connectors from the console. After removing the wires from the connectors, plug them back into the modules.

6. Disconnect and label all wires from the communication modules.

7. Remove both ground wires, the chassis ground and the barrier ground, from the grounding lugs in the console.

8. Loosen the power conduit ring, remove it and pull the wires through the knockout. Once both the high and low voltage wires have been removed, remove the console from the wall. Keep the mounting screws if possible because the mounting holes for the TLS-450PLUS match the mounting holes for the TLS-350.

9. Remove the power and ground wires from the wire bundle if they were run in the same conduit with the High Voltage wires. A separate power conduit will need to be run to the TLS-450PLUS.

# Installing The TLS-450PLUS Console

## Mounting The Console

The TLS-450PLUS has the same mounting bolt pattern and approximate weight as the TLS-350. One major consideration for the placement of the TLS-450PLUS is that the screen is at eye level so it can be seen and touched (see Figure 1).

The TLS-450PLUS doesn't have pre-assigned slots for the Module bay modules so use any of the four slots to accommodate intrinsically safe (USM) or non-intrinsically safe (I/O, MDIM, etc.) modules (see Figure 2). Since the Module Bay modules can be installed in any of these 4 slots, install them where it makes the most sense for conduit connections. Caution! USM wiring inputs are intrinsically safe and conduit containing this wiring must attach to the knockouts above or below the slot in which the USM module(s) is installed.

Never use a drill to open up knockouts. This could potentially result in metal filings getting into the console. It's much easier to just knock out the pre-punched slugs in the console anyway. Remember only knock out the smallest size needed. The console is pre-punched for 3/4" and 1" for Module Bay slots, but up to 1-1/4" may be used if needed. Again, if 1-1/4" conduit is needed, use a punch, not a drill to remove the knockout. Make sure that the conduit fitting ring is tight.

## Connecting Wiring To Console Modules

Refer to the appropriate Control Drawing on page 2 to identify modules that can be installed in the console and the designated devices that can be connected to them.

Try not to have too much wire in the console. Pull unneeded wire back into the wiring trough and loop it neatly.

**Warning! only intrinsically-safe wiring can enter a USM module slot knockout.**

1. Make sure to terminate the ground shields to the ground lug on the module. The other end at the probe or sensor is NOT grounded.
2. Write in the device name for each wire connection on the connector block in the module's wiring label attached to the inside of the door.
3. Make sure to loop the wire neatly under the lip of the module. This will keep wires from interfering with the door when it closes.

## Installing I/O, MDIM Or LVDIM Modules

Avoid too much wire in the console. Pull unneeded wire back into the wiring trough and loop it neatly.

1. Figure 2 illustrates acceptable non-intrinsically safe module positions in the Module Bay of the console. After installing the I/O, MDIM or LVDIM module, remove the connector from the module, loosen the screw, insert the wires and tighten well.
2. Write in the device name for each wire connection on the connector block in the module's wiring label attached to the inside of the door.
3. Loop the wire neatly under the lip of the module.
4. Close the right door and replace and tighten the top and bottom screws on the right side of the door.

# Installing Comm Modules

## PRECAUTIONS AGAINST STATIC ELECTRICITY

Before removing electronic components from their antistatic bags read the following static electricity precautions.

1. Before handling any components, discharge your body's static electric charge by touching a grounded surface or using a grounding strap.
2. Do not remove parts from their antistatic bags until ready to install them.
3. Do not lay parts on the antistatic bags! Only the insides are antistatic.
4. When handling parts, hold them by their edges and their metal mounting brackets.

5. Avoid touching components or edge connectors that plug into slots and wear the antistatic wrist strap (Part No. 576010-908) included in your component replacement kit.
6. Never slide parts over any surface.
7. Avoid plastic, vinyl, and styrofoam in the work area

## COMM MODULE SLOTS AND CONFIGURABLE PORTS

1. The Comm Bay is divided into 5 communication slots numbered from 1 to 5 going from left to right (see Figure 2). Only slots 1-3 are available for user-selectable Comm modules (Figure 3). Slots 4 and 5 are fixed and can not be changed (see Figure 4).

2. Important, to avoid attaching a Comm cable to a non-configurable (NC) port, identify the configurable (C) ports of any Comm module being installed by referring to Table 1. Also verify the Comm cable port connections to Comm modules in slots 4 and 5. Record all Comm port connections for use at setup.
3. Using a T-15 Torx driver, loosen the screw securing the comm module clamp until you can remove the clamp (see Figure 2).
4. Remove the blank cover from underneath the desired comm slot by punching it into the console or by using pliers to remove it from the inside of the console. Be careful not to damage any internal components in the process of removing the blank cover.
5. Place the new Comm module in the slot. Align the edge connector on the back of the board in the center of the vertical connector on the Comm Backplane board and push in the module firmly as far as it can go. The sheet metal bracket of the Comm module slides into the slot and is keyed in the front where the comm module clamp holds it down.
6. After all Comm modules are installed, replace the comm module clamp and the screw that secures it.

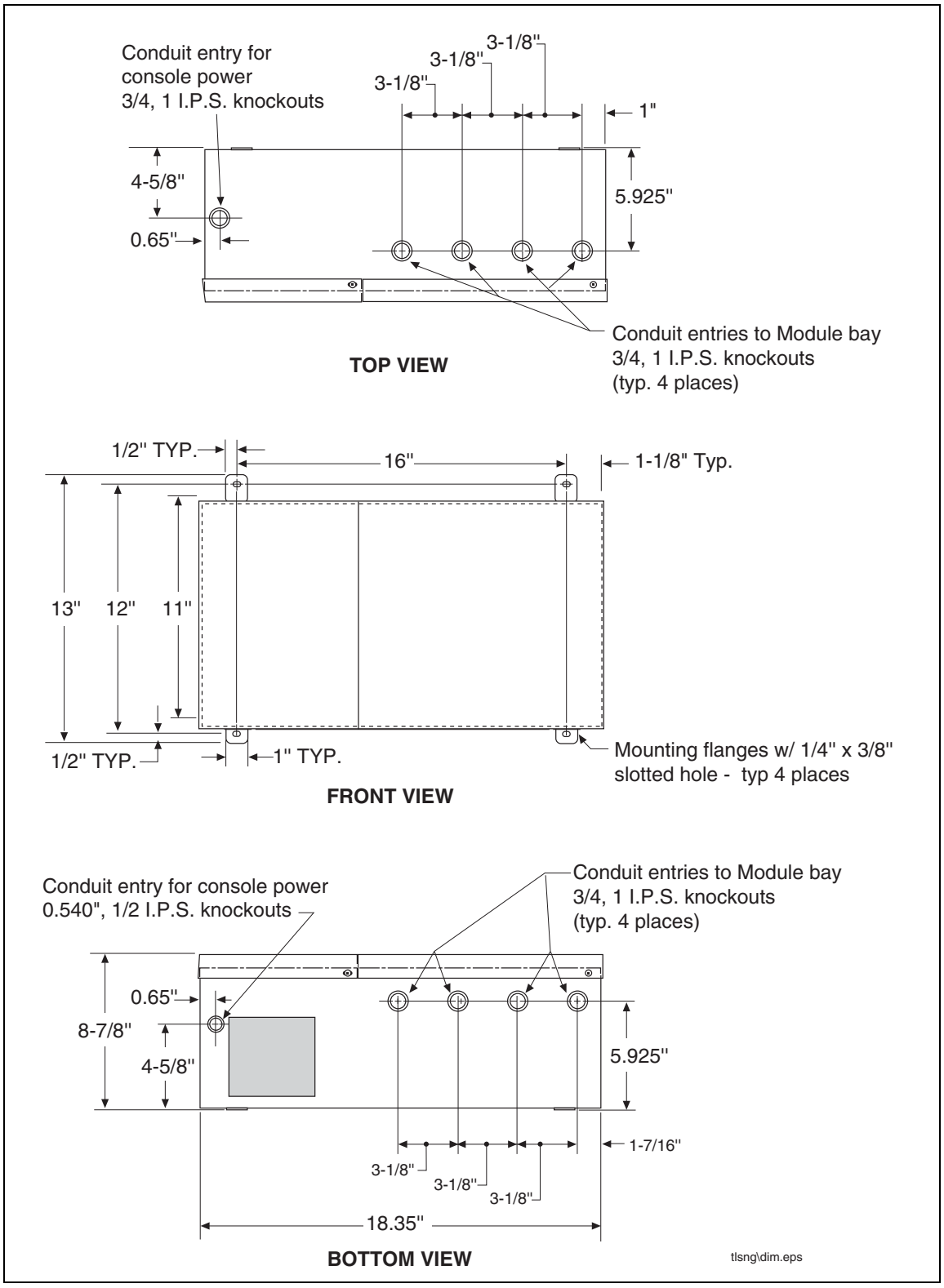



**Figure 1. TLS-450PLUS Console Dimensions And Designated Conduit Knockouts**

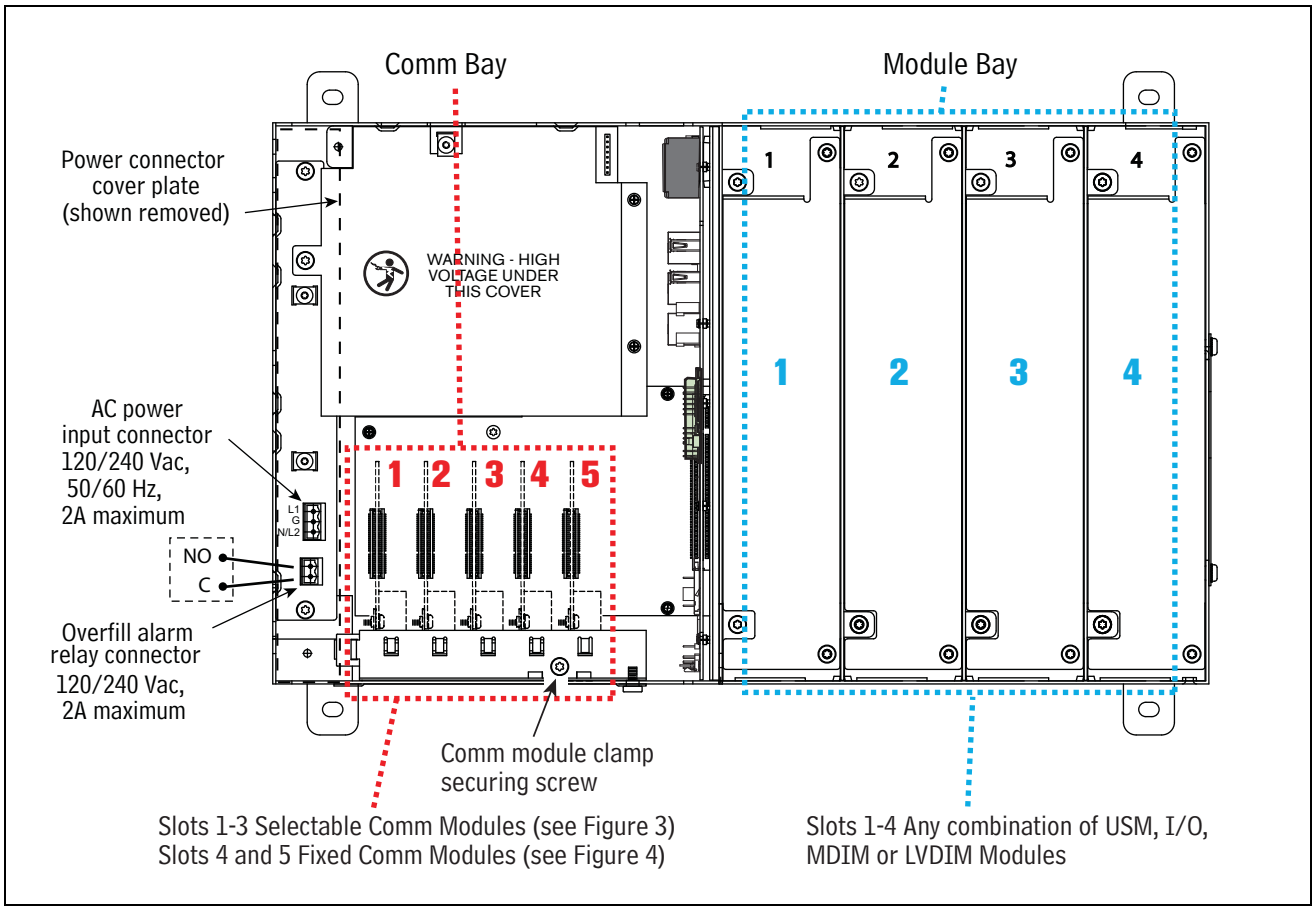



**Figure 2. TLS-450PLUS Console - Plug-In Module Bays**

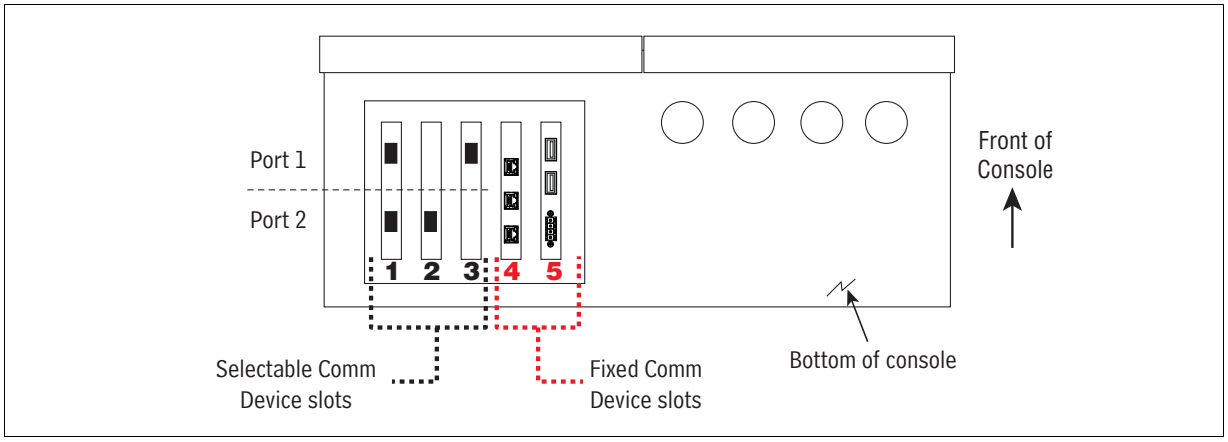



**Figure 3. TLS-450PLUS Console - Selectable Comm Modules**

**Table 1. Selectable Comm Module Permissible Slots and Port Availability**

| Comm Module | Comm Type | Slot 1 | | Slot 2 | | Slot 3 | |
|---|---|---|---|---|---|---|---|
| | | Port | | Port | | Port | |
| | | 1 | 2 | 1 | 2 | 1 | 2 |
| RS-232 Single Port (also EDIM, Satellite S-SAT and Satellite H-JBox apps.) | Serial | NC | C | NC | C | NC | C |
| RS-232 Dual Port (also EDIM, Satellite S-SAT and Satellite H-JBox apps.) | | C | C | C | C | NC | C |
| RS-485 Single Port | | NC | C | NC | C | NC | C |
| RS-485 Dual Port | | C | C | C | C | NC | C |
| RS-232/RS-485 Dual Port | | C (RS-232) | C (RS-485) | C (RS-232) | C (RS-485) | NC | C (RS-485) |
| SiteFax / Modem | | NC | C | NC | C | NC | C |
| CDIM | DIM | C | NC | C | NC | ---- | ---- |

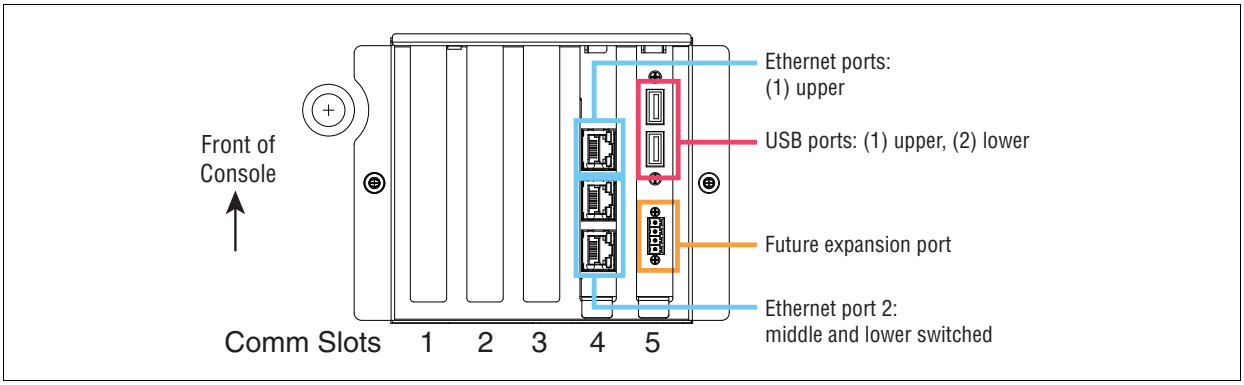



**Figure 4. TLS-450PLUS Console - Fixed Comm Modules**

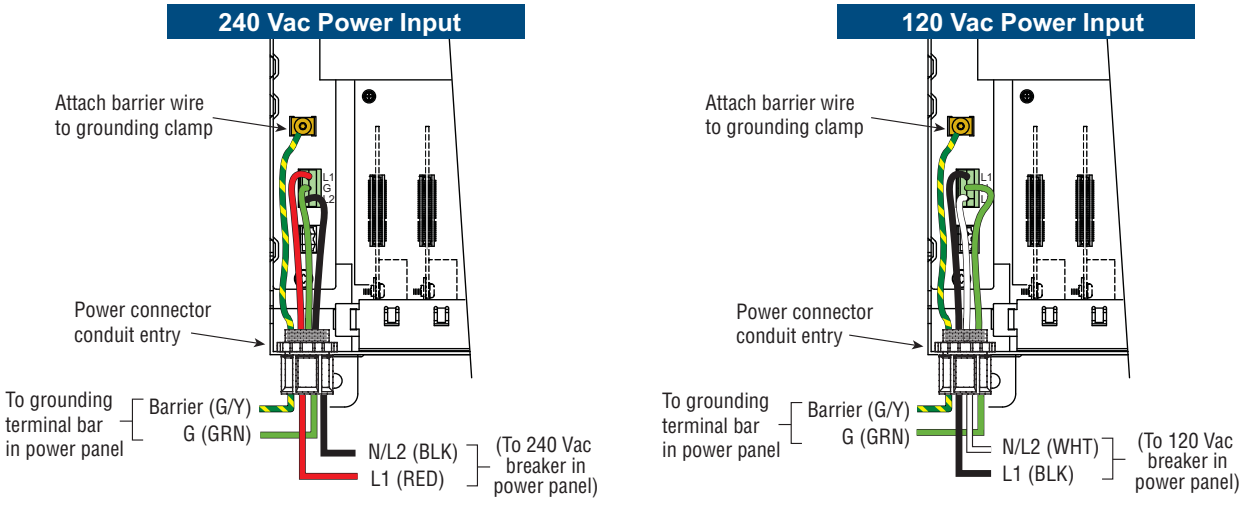
## Connecting The Power Wires To The Console

This section concludes the TLS-450PLUS retrofit installation by connecting power to the console.

1. With the left of the console open, remove the two screws that attach the power connector cover plate (see Figure 2).
2. With the cover removed, notice the power connector already attached to the console. This is where the wires connect.
3. Next, remove the knockouts for console power and install the conduit from the power trough to the console. If local codes require rigid conduit, plan carefully before knocking out these holes. The console is prepunched for ½" conduit. This should be large enough since the only wires going through this conduit will be for L1, neutral, panel ground and earth ground, and possibly 1 relay. Refer to manual 577014-073 for proper wire gauge.

4. Next strip the ends of the power wires brought into the console. Referring to Figure 5 and to the locations printed where the power connector attaches to the console, attach the L1, panel ground and neutral wires (#14 AWG) to the connector block.

5. Next, attach the barrier ground (sized as shown in Figure 5) to the grounding clamp.




POWER WIRING NOTES:

- Barrier ground wire requirements:
  - For UL/cUL approved systems, use a 12 AWG barrier ground wire
  - For ATEX/IECEx approved systems, use a 4 sq. mm barrier ground wire
- Use an ohmmeter to check the electrical resistance between the console's metal case and the power panel's earthing ground wire connection at the 'known good ground'. It should read less than 1 ohm.
- Connect the power supply wires in the power panel to a separate dedicated circuit.
- Electrical rating of power input - 120 or 240 Vac, 50/60 Hz, 2 A maximum.
- See Figure 1 for locations of power conduit knockouts into the console. Power wiring must enter the console through designated knockouts.

**Figure 5. Wiring AC Power To The TLS-450PLUS Console**

6. Plug in the power connector and route the wires so that the cover plate will conceal them when installed.

7. Replace the power connector cover plate using both screws and close the bay door.

8. Reconnect the communication wires to the appropriate comm cards. Wires which are not used on the TLS-450PLUS should be pulled back into the wiring trough. If necessary, seal up the power trough.

9. Return to the panel, remove the lock-out/tag-out device and label the breaker with the supplied self-adhesive label. Re-energize the circuit and start up the unit.

# Initial Startup Procedure

After installing the TLS-450PLUS console follow the appropriate initial startup procedure below:

### FOR SITES WITHOUT WIRELESS 2 DEVICES

1. Power up the TLS-450PLUS and wait 5 minutes until the console's 'Discover Mode' is complete.
2. Setup the TLS-450PLUS.

### FOR SITES WITH WIRELESS 2 DEVICES

1. Power up all wireless devices.
2. Power up the TLS RF console and wait about 5 minutes, before applying power to the TLS-450PLUS.
3. Power up the TLS-450PLUS and wait 5 minutes until the console's 'Discover Mode' is complete.
4. Setup the TLS-450PLUS.

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