

TLS-4XX Series Consoles

Module Replacement Instructions

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WARRANTY

Please see next page, iii.

Warranty

TLS-450 MONITORING SYSTEMS.

We warrant that this product shall be free from defects in material and workmanship for a period of one (1) year from the date of installation or twenty-four (24) months from the date of invoice, whichever occurs first. During the warranty period, we or our representative will repair or replace the product, if determined by us to be defective, at the location where the product is in use and at no charge to the purchaser. **LAMPS AND FUSES ARE NOT COVERED UNDER WARRANTY.**

We shall not be responsible for any expenses incurred by the user.

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If "Warranty" is purchased as part of the Fuel Management Service, Veeder-Root will maintain the equipment for the life of the contract in accordance with the written warranty provided with the equipment. A Veeder-Root Fuel Management Services Contractor shall have free site access during Customer's regular working hours to work on the equipment. Veeder-Root has no obligation to monitor federal, state or local laws, or modify the equipment based on developments or changes in such laws.

MODULES, KITS, OTHER COMPONENTS (PARTS PURCHASED SEPARATE OF A COMPLETE CONSOLE).

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We shall not be responsible for any expenses incurred by the user.

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Introduction

This manual contains procedures for installation or replacement of the following TLS-4XX console modules:

Table 1. Module Bay Modules

Part No.	Item
332812-003	Universal 8 Sensor/Probe Interface Module
332812-002	Universal 12 Sensor/Probe Interface Module
332812-001	Universal 16 Sensor/Probe Interface Module
332813-001	Universal Input/Output Interface Module
332812-005	MDIM Module
332812-004	LVDIM Module

Table 2. Communication Bay Modules

Part No.	Item
332818-001	SiteFax/Modem Single Port Module
332816-001	Ethernet Single Port Module
332817-001	USB Single Port Module
332913-001	USB/Ethernet Dual Port Module
332866-001	RS-232 Single Port Module (also used for EDIM or Satellite S-SAT or Satellite H-JBox Modules apps.)
332868-001	RS-232 Dual Port Module (also used for EDIM or Satellite S-SAT or Satellite H-JBox Modules apps.)
332867-001	RS-485 Single Port Module
332869-001	RS-485 Dual Port Module
333140-001	CDIM Module

Table 3. Technician Programming Kit

Part No.	Item
330020-634	One USB/Ethernet Dual Interface Module and Five Communication Module Blank Covers

The above parts are for the TLS system designed and manufactured by Veeder-Root. This manual assumes all preliminary site preparation is completed, and that field wiring from the console to the sensor junction box is in place.

If site preparation is necessary, refer to the TLS-4XX Site Preparation and Installation manual, or contact your Veeder-Root representative for assistance.

Also included in this manual is the procedure for upgrading software features.

Related Manuals

577013-879 TLS-4XX Installation & Site Prep
577013-918 TLS-4XX Troubleshooting Guide
577013-961 TLS-4XX Upgrade Instructions
577013-940 TLS-4XX Setup and Operations Screens Manual
577013-401 POS Application Guide

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

TLS-450 Technician Certification: Contractors holding valid TLS-450 Technician Certifications are approved to perform installation checkout, startup, programming and operations training, troubleshooting and servicing for all Veeder-Root TLS-450 Series Tank Monitoring Systems, including Line Leak Detection and associated accessories.

Warranty Registrations may only be submitted by selected Distributors.






Before You Begin





Before you begin component replacement, read the following guidelines:

- To avoid electrical shock, be sure AC power to the console is Off when performing the procedures in this manual.

Safety Precautions

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

 <p>ELECTRICITY High voltage exists in, and is supplied to, the device. A potential shock hazard exists.</p>	 <p>TURN POWER OFF Live power to a device creates a potential shock hazard. Turn Off power to the device and associated accessories when servicing the unit.</p>
 <p>INJURY Careless or improper handling of tools can cause bodily injury.</p>	 <p>READ ALL RELATED MANUALS 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.</p>
 <p>STATIC SENSITIVE COMPONENTS Wear grounded anti-static wrist strap before handling the printed circuit board and mounted components.</p>	

 WARNING	
  	<p>This system operates on 120/240 Vac power. Serious injury or death from electrical shock could occur if the power ON/OFF warnings in this manual are not heeded.</p> <p>FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.</p> <ol style="list-style-type: none"> 1. Read and follow all instructions in this manual, including all safety warnings. 2. Remove rings from hands, metal watch bands and bracelets, and loose hanging neck jewelry before performing these procedures. 3. Do not modify or use service parts other than those provided by Veeder-Root.

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.
2. Do not remove parts from their antistatic bags until you are 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 your work area.

Before Turning Off Power

Before powering off the console perform a system backup:

1. Insert the V-R Backup thumb drive (P/N 330020-607) in the external USB port on the USB/Ethernet card, P/N 332913-001 (see item 2 in Figure 1).



Figure 1. USB/Ethernet board - V-R thumb drive ports

LEGEND FOR NUMBERED BOXES IN Figure 1

- | | |
|----|---------------------------------------|
| 1. | USB/Ethernet board bracket |
| 2. | V-R thumb drive plugged into USB port |

- 2. Touch the Diagnostics button on the Home Screen (see item 2 in Figure 2).

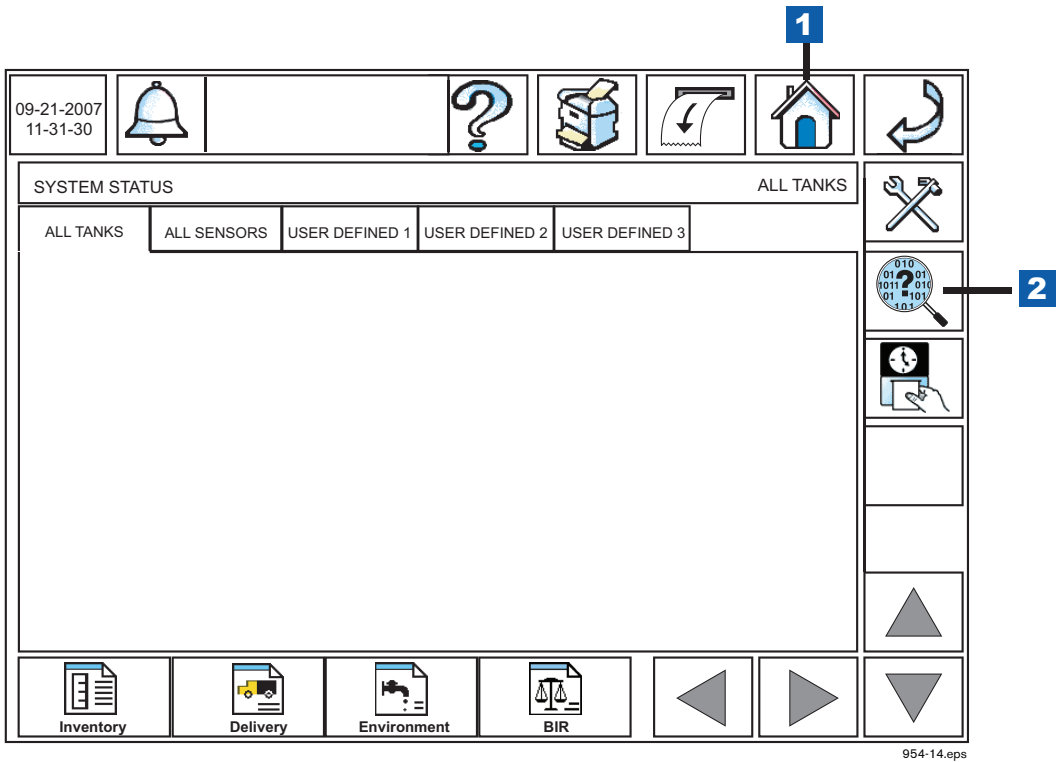


Figure 2. Accessing Diagnostic Main Screen from the Home Screen

LEGEND FOR NUMBERED BOX IN Figure 2	
1.	Home Screen access button
2.	Diagnostic Main Screen access button

- 3. Touch the Software Maintenance button on the Diagnostic Maintenance screen (see Figure 3) to open the Software Maintenance - Backup Restore tab screen (see Figure 4).



Figure 3. Software Maintenance button

4. Touch the Backup button (item 1 in Figure 4) to begin the system backup process.

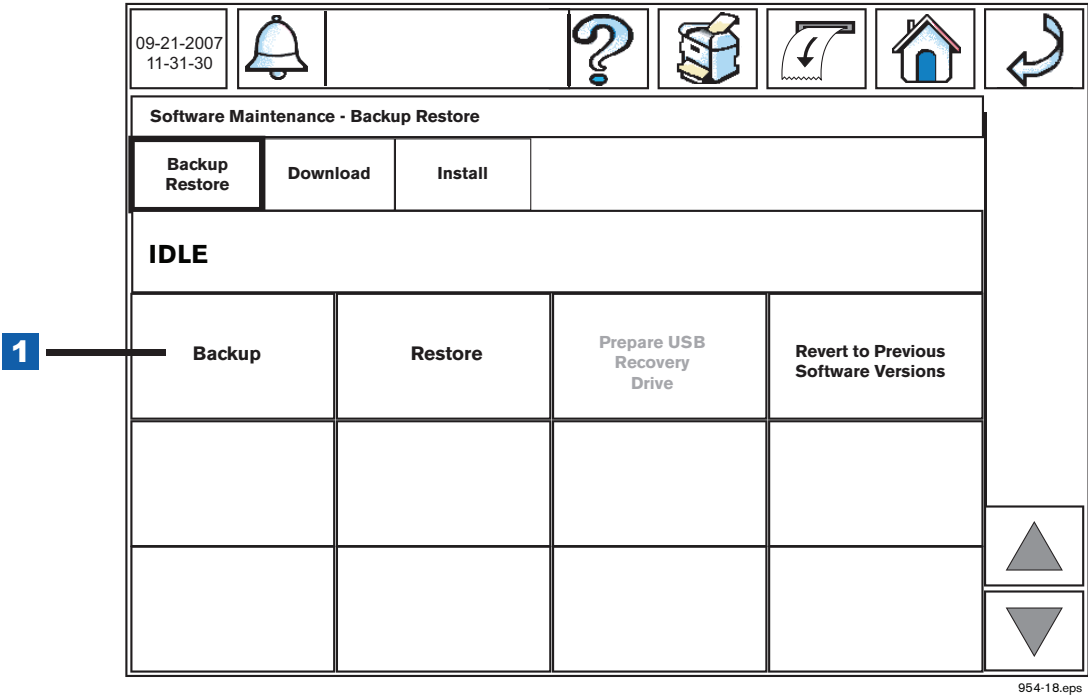


Figure 4. Initiating a System Backup

LEGEND FOR NUMBERED BOX IN Figure 4	
1.	Backup button

5. After the 'Backup Completed Successfully' message displays, you can safely remove the V-R Backup thumb drive.

Console Module Locations

Figure 5 illustrates the maximum number of modules allowed in each of the two bays of the console.

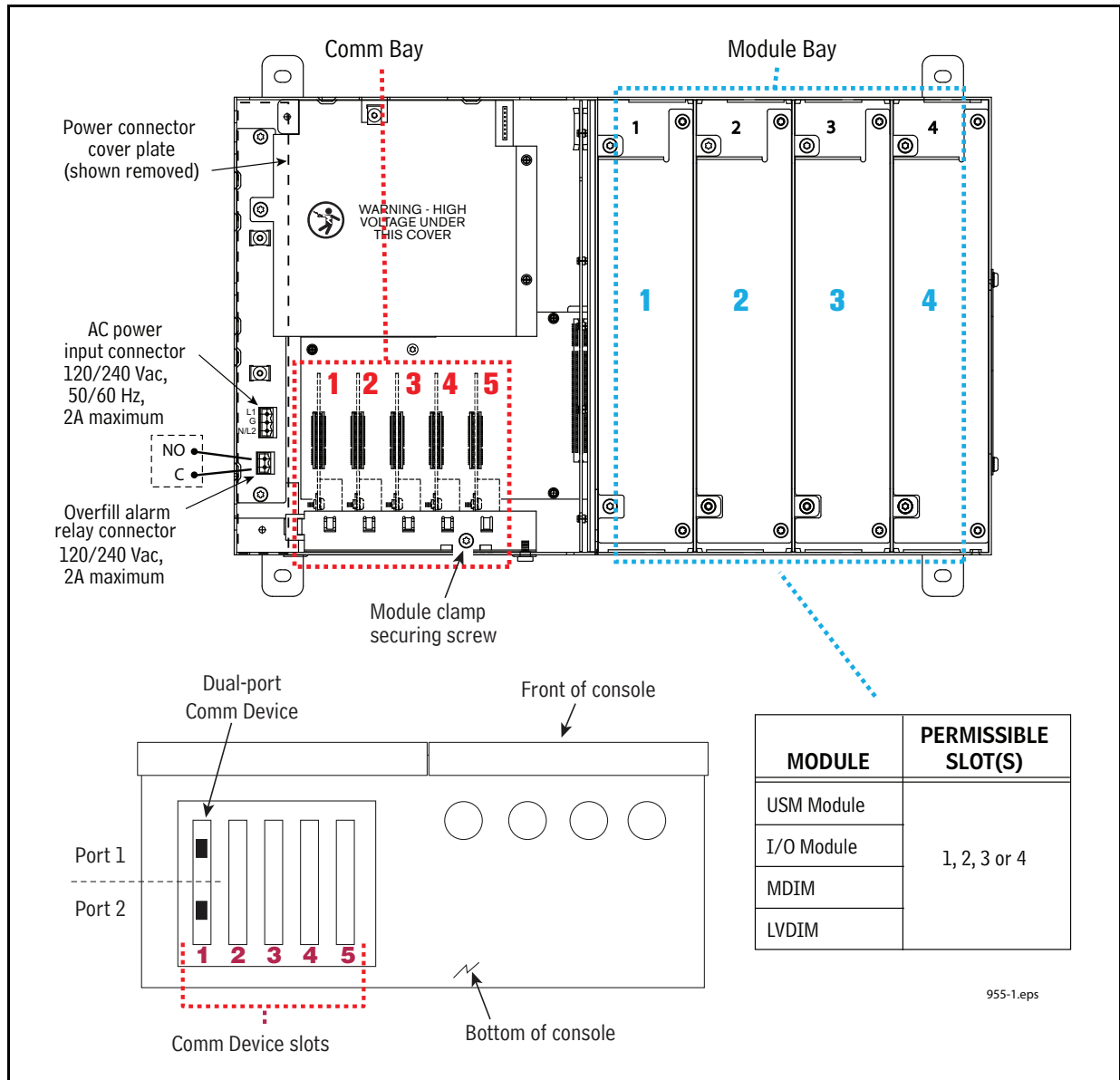


Figure 5. TLS-450 console plug-in module bays

Console Comm Modules

Table 4 lists the permissible slots and configurable ports for all Comm modules.

Cables to the console's Comm modules attach to connectors on each module's end plate, and are accessible through an opening in the base of the console (see Figure 1).

Table 4. Comm Module Permissible Slots and Port Availability

Comm Module	Comm Type	Slot 1		Slot 2		Slot 3		Slot 4		Slot 5	
		Port		Port		Port		Port		Port	
		1	2	1	2	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	C ¹	NC	----	----
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)	C ¹	NC	----	----
SiteFax / Modem		NC	C	NC	C	NC	C	----	----	----	----
Ethernet	TCPIP	----	----	----	----	----	----	NC	C	NC	C
Ethernet / USB Dual Port	TCPIP/USB	----	----	----	----	----	----	NC	C (TCPIP)	C (USB)	C (TCPIP)
USB	USB	----	----	----	----	----	----	----	----	C	NC
CDIM ²	DIM	C	NC	C	NC	----	----	C	NC	----	----

¹Limited RS-232 availability (only RX, TX and Enable are active and this port is without full handshaking capability)

²Slot 4 is preferred.

Installation

Installing/Removing an Interface Module



1. Switch Off power to the console.
2. Open both front doors of the console (see Figure 6).

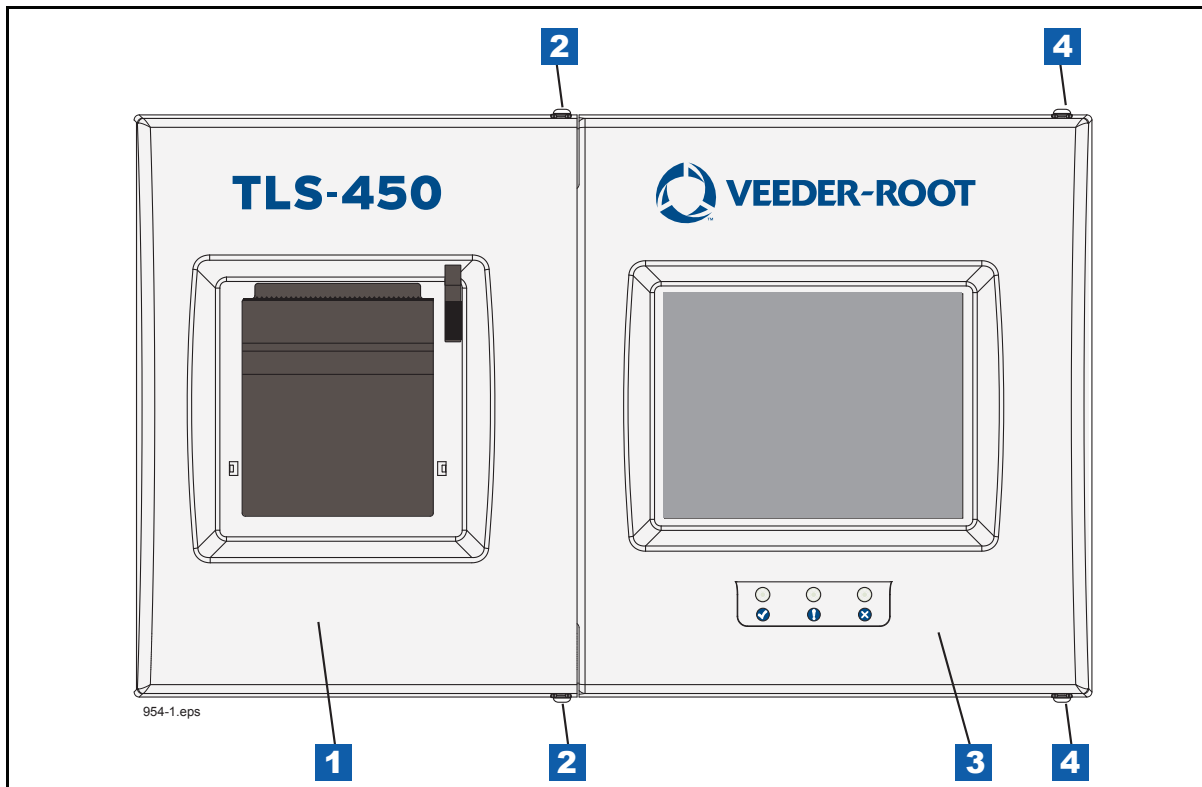


Figure 6. Front doors

LEGEND FOR NUMBERED BOXES IN Figure 6

- | | |
|--|---|
| 1. Left (Printer) door | 3. Right (Display) door. |
| 2. Using a T-15 Torx driver, remove the top and bottom screws securing left door and swing door to left. | 4. Using a T-15 Torx driver, remove the top and bottom screws securing right door and swing door to left. |

3. Each Interface slot is numbered from 1 to 4 from left to right as shown in Figure 5.
4. An empty slot will have a blank cover in place of an actual module. Modules and covers are secured by two torx head screws. Use a T-15 torx driver to remove the securing screws.
5. Once the two torx head screws securing the module are removed, grasp the module or module blank cover by its 3.5 inch 'handle' and pull it out of the slot.
6. Once a module is removed it must be replaced with another module or you must install a module blank cover (P/N 332580-001) in the opening.

Installing a USM Module(s)

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

The TLS-450 doesn't have pre-assigned slots for the Module bay modules so you can use any of the four slots to accommodate intrinsically safe (USM) or non-intrinsically safe (I/O, MDIM, etc.) modules (see Figure 5). 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 you install the USM module.

Never use a drill to open up the knockout; this could potentially result in metal filings getting into the console and causing electrical shorts to Module Bay modules. Remember to knock out the smallest size needed. The pre-punched knockout sizes are $\frac{3}{4}$ " and 1" for Module Bay slots, but you may use up to 1-1/4" if needed. Normally this is only when direct burial cable has been used. Make sure that the conduit fitting ring is tight.



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



1. Switch off power to the console.
2. Referencing Figure 6, open the left and right doors of the console.
3. Figure 5 illustrates acceptable Intrinsically-Safe USM module positions in the Module Bay of the console. After installing the USM module, remove a connector from the USM module, loosen the screws, insert your wires and tighten well. Don't let loose wires on the connector drive you crazy when you begin the startup and probes or sensors are missing – make sure these wires are tight in the connector block. Connect all probe and sensor wires and then reconnect your block to the USM module.

Make sure that you terminate the ground shields to the ground lug on the module. Remember, the other end at the probe or sensor is NOT grounded.

CAUTION: Any slot that does not have an interface module installed must have a blank module cover installed (P/N 332580-001).

4. 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.
5. Make sure that you loop the wire neatly under the lip of the module. This will keep your wires from interfering with the door when it closes.
6. Close and secure the right and left doors of the console.

MODULE POSITION

- Record on the circuit directory (on the inside front panel of the console) the type of module you are installing in this slot.
- Once a particular type of module has been installed in that slot, the system will always look for that type of module in this particular slot.

CONNECTOR POSITION

- Identify all connectors according to their slot location using the self-adhesive numbering labels supplied with each module.
- Once a device has been wired to certain terminals on the connector and the system has been programmed, the terminal position may not be changed without reprogramming the system.

Installing an I/O, MDIM or LVDIM Module(s)



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

Warning! intrinsically-safe wiring cannot enter a I/O, MDIM or LVDIM module's slot knockout.



1. Switch off power to the console.
2. Referencing Figure 6, open the left and right doors of the console.
3. Figure 5 illustrates acceptable Non-intrinsically Safe module positions in the Module Bay of the console.

CAUTION: Any slot that does not have an interface module installed must have a blank module cover installed (P/N 332580-001).

4. Remove the connector from the module, loosen the screw, insert your wires and tighten the screw.
5. 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.
6. Make sure that you loop the wire neatly under the lip of the module. This will keep your wires from interfering with the door when it closes.
7. Close and secure the right and left doors of the console.
8. For MDIM and LVDIM modules only, connect applicable interface wiring to these modules as defined in the POS Application Guide 577013-401.

MODULE POSITION

- Record on the circuit directory (on the inside front panel of the console) the type of module you are installing in this slot.
- Once a particular type of module has been installed in that slot, the system will always look for that type of module in this particular slot.

CONNECTOR POSITION

- Identify all connectors according to their slot location using the self-adhesive numbering labels supplied with each module.
- Once a device has been wired to certain terminals on the connector and the system has been programmed, the terminal position may not be changed without reprogramming the system.

Installing a Comm Module



1. Switch Off power to the console.
2. Using a T-15 Torx driver, remove the two screws (see item 2s in Figure 6) and open the left front door of the console.
3. The Comm Bay is divided into 5 communication slots numbered from 1 to 5 going left to right (see Figure 5).
4. Communication modules are only allowed in specific communication slots defined in Table 4.
5. Using a T-15 Torx driver, loosen the screw securing the Comm module clamp until you can remove the clamp (see Figure 5).

6. Identify the Comm module you have and would like to install. Check to see that the required communication slot is not occupied by another Comm module. If it is, use a communication slot that is not occupied as allowed in Table 4.
7. Remove the Comm panel blank cover (item 3 in Figure 7) from the desired slot by punching it out towards the inside of the console or 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.
8. Place the new Comm module in the slot. As you align the edge connector on the back of the board in the center of the vertical connector on the Comm Backplane board, push the board firmly in 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.
9. Replace the Comm module clamp (item 4 in Figure 7) and tighten the screw.
10. Connect applicable interface cable(s) to bottom of CDIM and EDIM (RS-232) modules as defined in the POS Application Guide 577013-401.

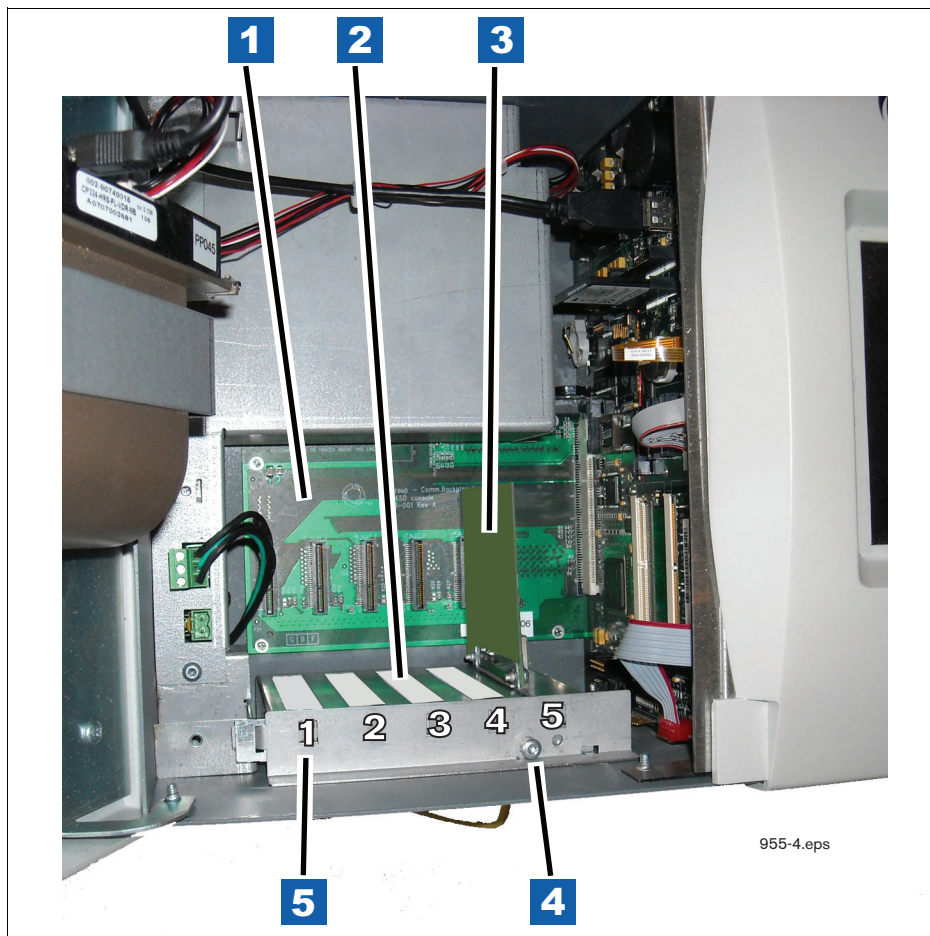


Figure 7. Comm Module Bay

LEGEND FOR NUMBERED BOXES IN Figure 7

- | | |
|----------------------------------|--------------------------------------|
| 1. Comm Backplane board | 4. Screw securing comm module clamp. |
| 2. Comm panel blank cover (typ.) | 5. Comm module slot 1. |
| 3. Comm module shown in slot 5. | |

Use of Technicians Programming Kit (P/N 330020-634)



1. Switch Off power to the console.
2. Open both front doors of the console (see Figure 6).
3. The Comm Bay is divided into 5 communication slots numbered from 1 to 5 going left to right (see Figure 7).
4. Communication modules are only allowed in specific communication slots defined in Figure 5 above.
5. Loosen the #8 taptite screw securing the comm module clamp until you can remove the clamp (item 4 in Figure 7).
6. The technician programming kit contains a special Ethernet/ USB communication module that enables specific technician features on the console. The technician Ethernet/USB communication module is only activated when placed on the 5th communication slot. If an existing communication module exists in slot 5, it must be removed at this time. Once the existing communication slot is removed skip to step 8 below.
7. If slot 5 of the console is not occupied, then remove the Comm panel blank cover in the desired slot by punching it out towards the inside of the console or using pliers to remove it from the inside of the console (item 2 in Figure 7). Be careful not to damage any internal components in the process of removing the blank cover.
8. Place the technician programming Ethernet/USB communication module in slot 5. As you align the edge connector on the back of the board in the center of the vertical connector on the Comm Backplane board, push the board firmly in as far as it will 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.
9. Replace the comm module clamp and tighten the #8 taptite screw. The technician programming Ethernet/ USB Communication module may now be used.
10. Once the technician programming Ethernet/ USB communication module is no longer needed it must be removed.
11. Loosen the #8 taptite screw securing the comm module clamp until you can remove the clamp (item 4 in Figure 7). Remove the technician programming Ethernet/ USB communication module from slot 5.
12. If an existing communication module was removed from the console, it must now be replaced.
13. If slot 5 was empty and a blank cover was removed then, a communication module blank cover must be placed where the hole was created by punching out the blank cover. Blank covers were provided with the technician programming kit.
14. Replace the comm module clamp and tighten the #8 taptite screw.
15. Close all console doors.

Installing Software Features

Before installing a software feature upgrade, perform a system backup using a V-R Backup thumb drive (P/N 330020-607) following the procedure described in "Before Turning Off Power" on page 4.

Note: The V-R Backup thumb drive is different from a V-R Software Upgrade thumb drive - the two are not interchangeable.

Software Features Installation Procedure

1. Get the USB Adapter and upgrade i-button from the upgrade kit. Remove the plastic end cap from the USB Adapter and Insert the i-button in the adapter as shown in Figure 8 below.

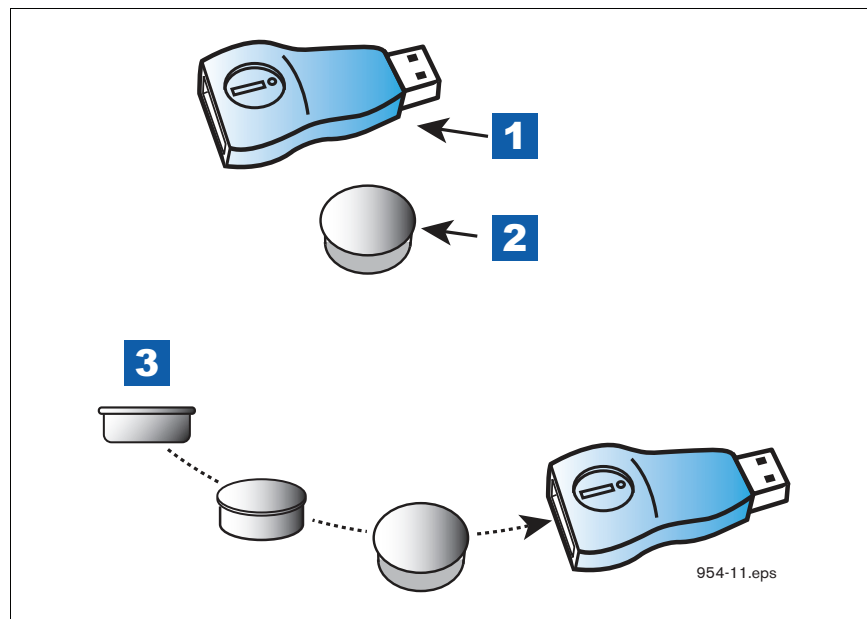


Figure 8. Inserting i-Button into USB Adapter

LEGEND FOR NUMBERED BOXES IN Figure 8

- | | |
|----------------|----------------------------------|
| 1. USB adapter | 3. Insert i-Button, large end up |
| 2. i-Button | |

2. Replace the plastic retaining cap on the adapter after inserting the i-Button.
3. Plug the USB Adapter into the USB port of the console's Ethernet/USB card and follow the required Feature Upgrade procedure. When you have completed the Feature Upgrade procedure remove the thumb drive.

If the console does not have an Ethernet/USB card, continue to step 4.

4. Turn off power to the console.
5. Using a T-15 Torx driver, remove the two #8 taptite screws the left door of the console (ref. item 2 in Figure 5).

6. Disconnect the Printer's USB cable from its connector on the CPU board and insert the USB Adapter into the CPU USB connector as shown in Figure 9 below.
7. Close the door.
8. Turn on power to the console and follow the required Feature Upgrade procedure. When you have completed the Feature Upgrade procedure reverse the steps 4 through 7 above to remove the thumb drive and reattach the printer cable to its CPU board USB connector.
9. Close the door and replace the two #8 taptite screws.

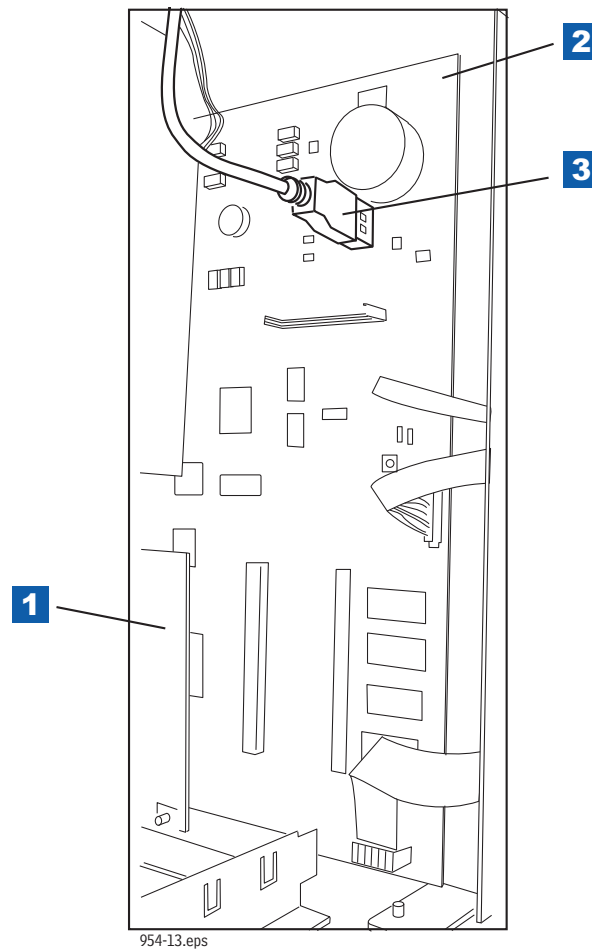


Figure 9. Locating Printer's USB connector

LEGEND FOR NUMBERED BOXES IN Figure 9

- | | |
|---------------------|--------------------------|
| 1. Comm module | 3. Printer USB connector |
| 2. Top of CPU board | |

Feature Upgrade Procedure

1. On the console's Home Screen, touch the Diagnostics button to display the Diagnostics Main Screen (see Figure 2).
2. Touch the Software Maintenance button on the Diagnostic Maintenance screen (see Figure 3).
3. When the Software Maintenance - Backup Restore screen displays touch the Download tab. Touch the check boxes beside the feature(s) you wish to download to the console from the i-button (item 1 in Figure 10).
4. Once you have selected the desired features to download, touch the Download button to begin the download process (item 2 in Figure 10).

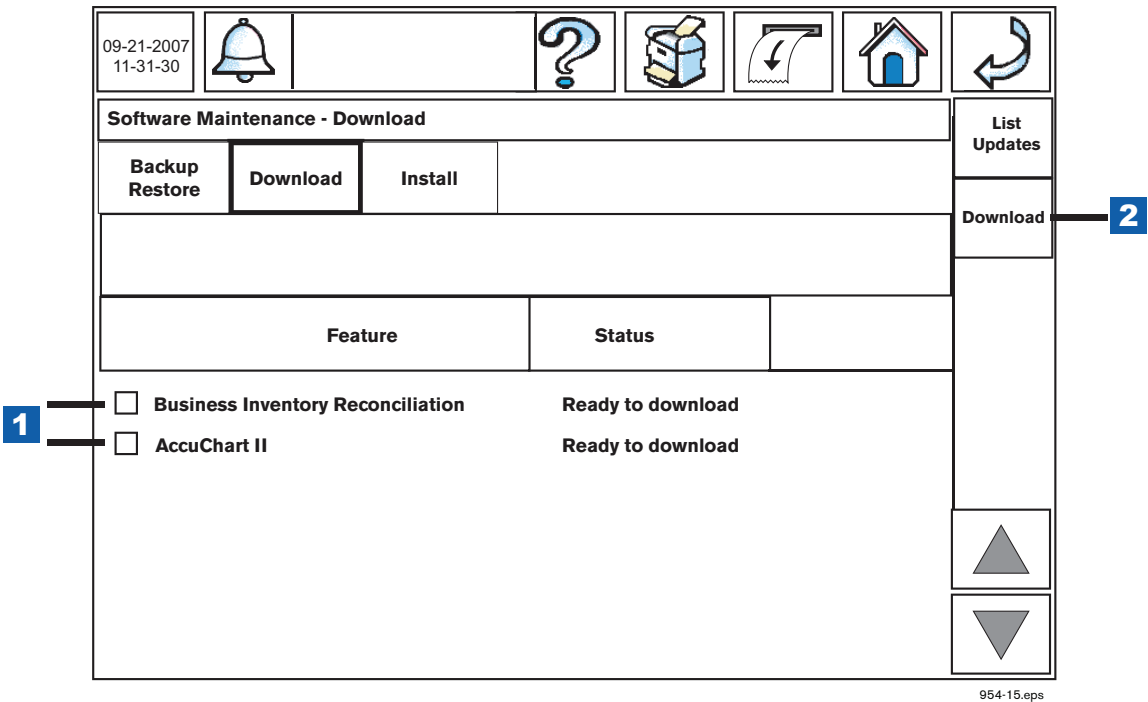


Figure 10. Downloading Software Features from the USB Adapter

LEGEND FOR NUMBERED BOXES IN Figure 10	
1.	Select Feature(s) to download
2.	Download button

5. Once the download process completes, touch the Install tab. Touch the check boxes beside the feature(s) you wish to install (item 1s in Figure 11). Once you have selected the desired features to install, touch the Install button (item 2 in Figure 11).

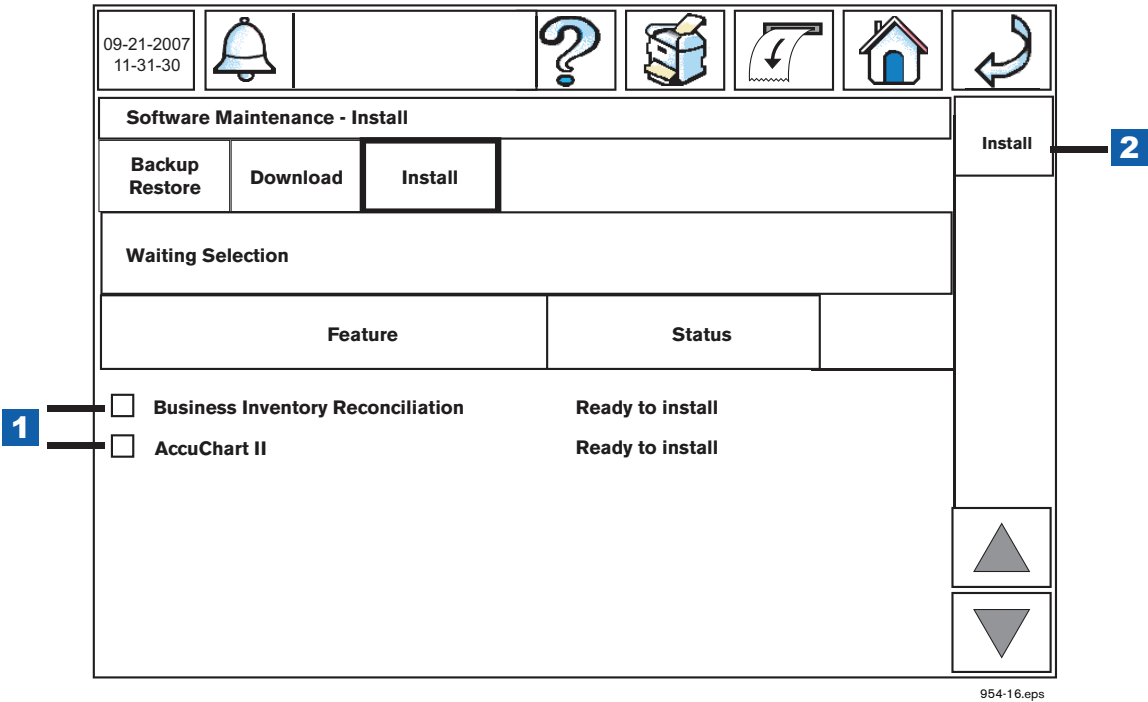


Figure 11. Installing Software Features

LEGEND FOR NUMBERED BOXES IN Figure 11	
1.	Select Feature(s) to install
2.	Install button

6. After the selected features are installed the console will need to restart. Allow the console to restart.

Verify Features Installed

- 1. Touch the Home screen button. Touch the Diagnostic Main Screen Access button on the Home Screen (see Figure 2).
- 2. Touch the About button on the Diagnostic Main Screen (see Figure 12).



Figure 12. About button

3. Verify that the features you installed are listed in the About screen's feature list (see example in Figure 13).

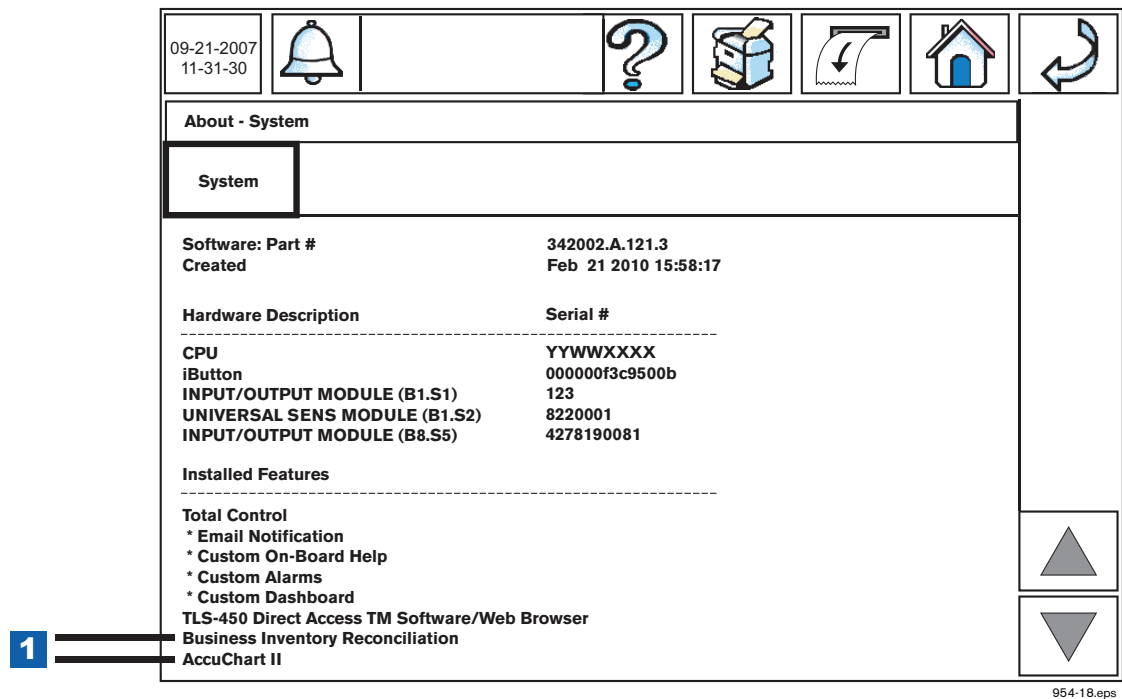


Figure 13. Verifying Installed Software Features

LEGEND FOR NUMBERED BOXES IN Figure 13	
1.	Check to see that installed features are visible in the System installed Features list.

4. After completing a software feature upgrade, perform a system backup using the V-R Backup thumb drive (P/N 330020-607).

Note: The V-R Backup thumb drive is different from a V-R Software Upgrade thumb drive - the two are not interchangeable.

- 5.

