

TLS4/8601 Series Consoles

Troubleshooting Manual

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Introduction

This manual contains instructions to troubleshoot a Veeder-Root TLS4/8601 Series ATG. Also included are USIOM and CPU component replacement instructions.

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, sensor and carbon canister vapor polisher installation; wireless equipment installation; tank and line preparation; and line leak detector installation.

ATG Technician (Level 2/3 or 4) Certification: Contractors holding valid ATG 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








Related Documents

577014-022 TLS4 Certification Site Prep Manual

577014-060 TLS4/8601 Series ATG Alarm Troubleshooting Guide

Safety Precautions

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

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  EXPLOSIVE Fuels and their vapors are extremely explosive if ignited. |  FLAMMABLE Fuels and their vapors are extremely flammable. |
|  ELECTRICITY High voltage exists in, and is supplied to, the device. A potential shock hazard exists. |  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. |
|  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. |  WARNING Heed the adjacent instructions to avoid damage to equipment, property, environment or personal injury. |
|  STATIC SENSITIVE COMPONENTS Wear grounded anti-static wrist strap before handling the printed circuit boards and mounted components. | |

! WARNING

This product is to be installed and operated in the highly combustible environment of a gasoline station where flammable liquids and explosive vapors may be present.

ATTEMPTING TO SERVICE TANK MONITORS AND EQUIPMENT WITHOUT PROPER TRAINING CAN CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN PERSONAL INJURY OR DEATH.

The following hazards exist:

1. Electrical shock resulting in serious injury or death may result if power is on during installation and the device is improperly installed.

Observe the following precautions:

1. Read and follow all instructions in this manual, including all safety warnings.
2. Comply with all applicable codes including: the National Electrical Code; federal, state, and local codes; and other applicable safety codes.
3. Before installing this device, turn Off, tag/lock out power to the system.
4. Substitution of components may impair intrinsic safety.

Component Identification

Figure 1 through Figure 4 show assembly and component locations referenced in the troubleshooting section of this manual.

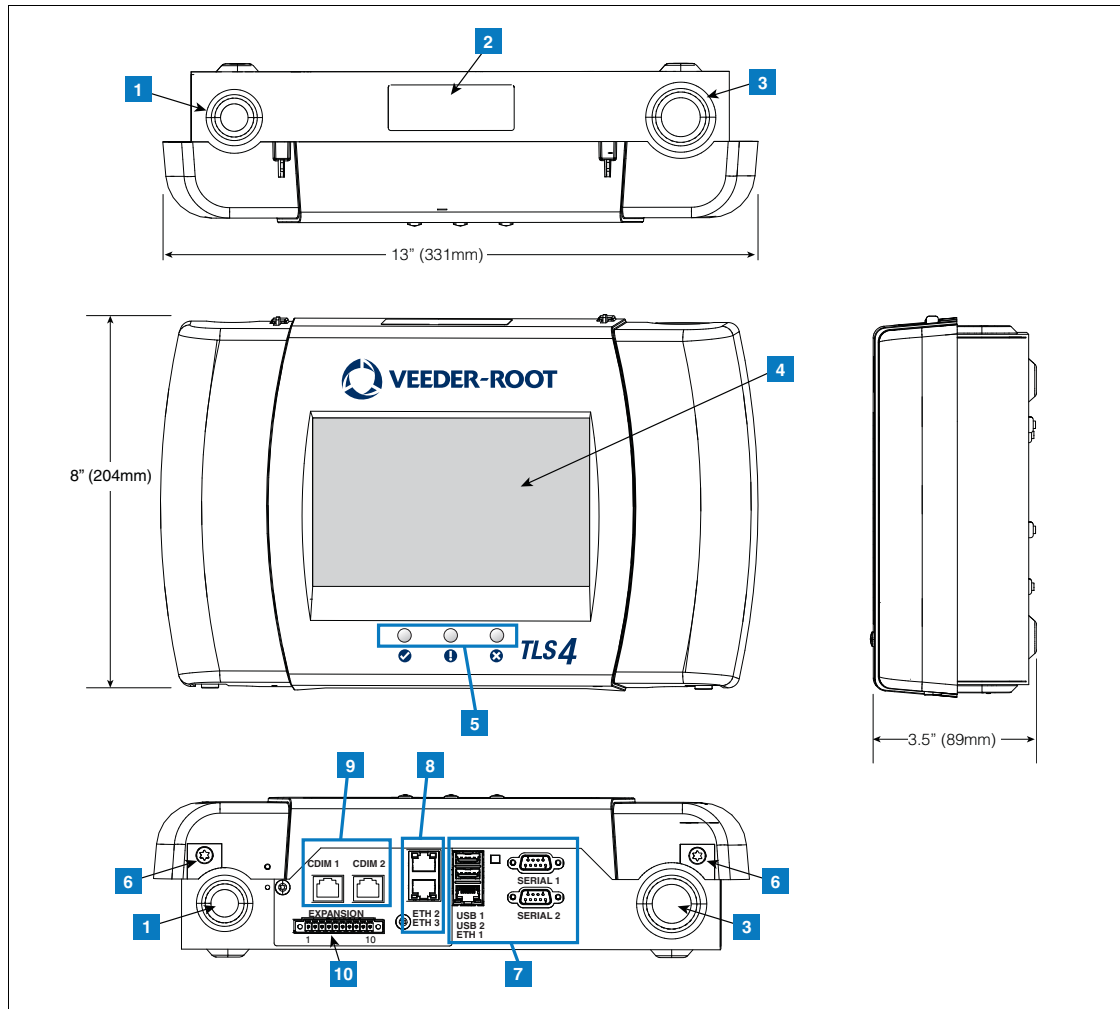


Figure 1. TLS4/8601 Series Console - Dimensions

LEGEND FOR NUMBERED BOXES IN Figure 1

- | | |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| 1. Power conduit knockout (1 top/1 bottom) | 7. Comm ports - Standard: Serial Ports 1 and 2 USB ports 1 and 2 Ethernet port 1 |
| 2. Console label contains input power ratings and Form and Serial numbers | 8. Integrated Ethernet Switch ports 2 and 3 (optional) |
| 3. Intrinsically safe wiring conduit knockout (1 top/1 bottom) | 9. CDIM ports 1 and 2 (optional) |
| 4. Optional touch screen display | 10. Expansion port |
| 5. Status LEDs | |
| 6. T-15 screws secure cover (2 places) | |

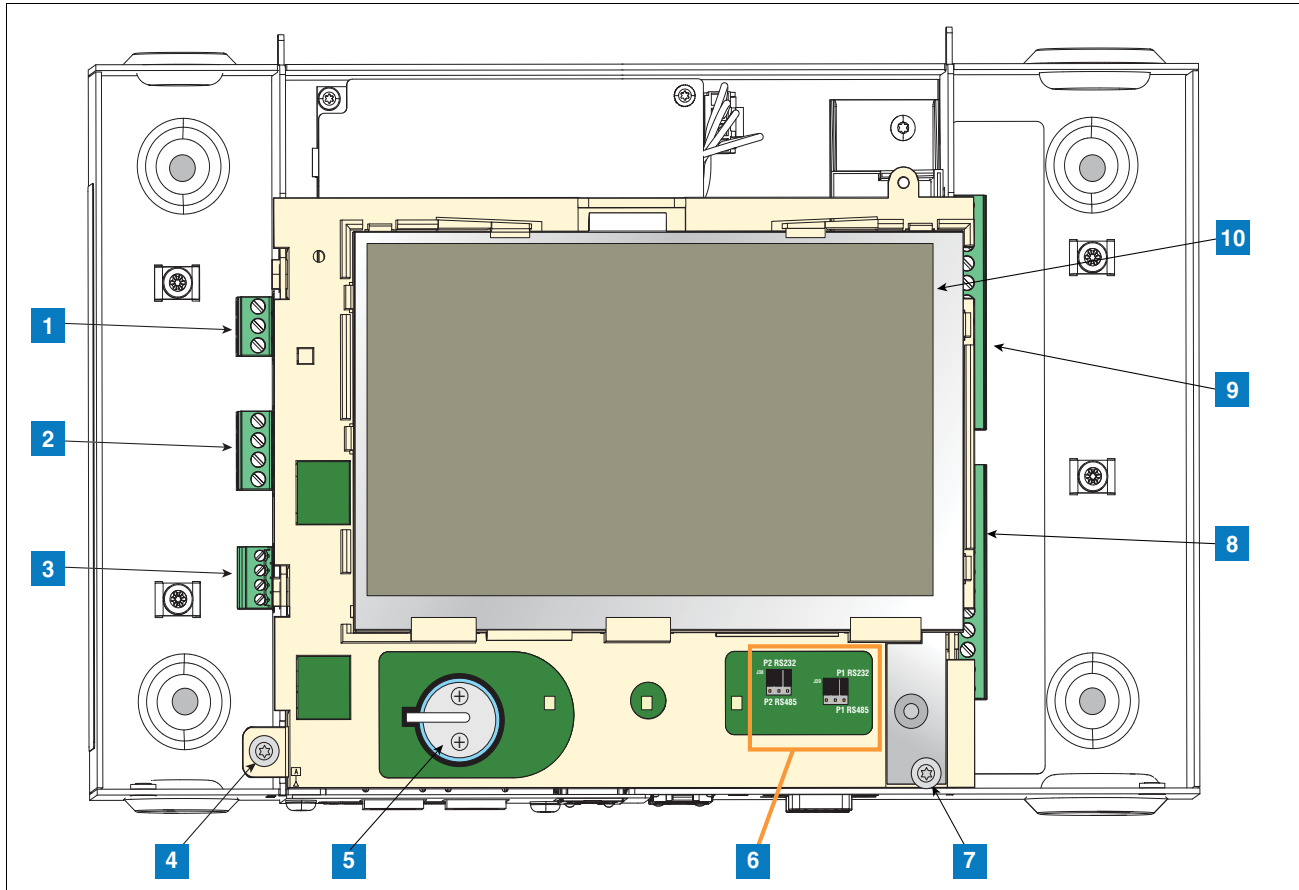
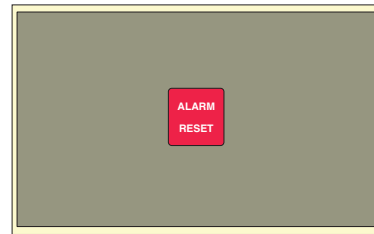


Figure 2. Component Locations (Front Cover Removed)

LEGEND FOR NUMBERED BOXES IN Figure 2

1. AC or DC input power connector (as ordered)
2. High voltage output relay connector
3. Low voltage external input connector
4. T15 screw secures Display/CPU assembly
5. Rechargeable 3V Lithium battery (battery backup)
6. RS232/485 selection jumpers SERIAL 1 (P1) and SERIAL 2 (P2)(factory set to RS232 position)
7. T20 screw secures Display/CPU assembly
8. Optional 6-device intrinsically safe input connector (7 - 12)
9. Standard 6-device intrinsically safe input connector (1 - 6)

10. Optional Graphical User Interface (GUI) display (on non-display consoles, the GUI display is replaced with the Alarm Reset (Ack) button panel shown below)



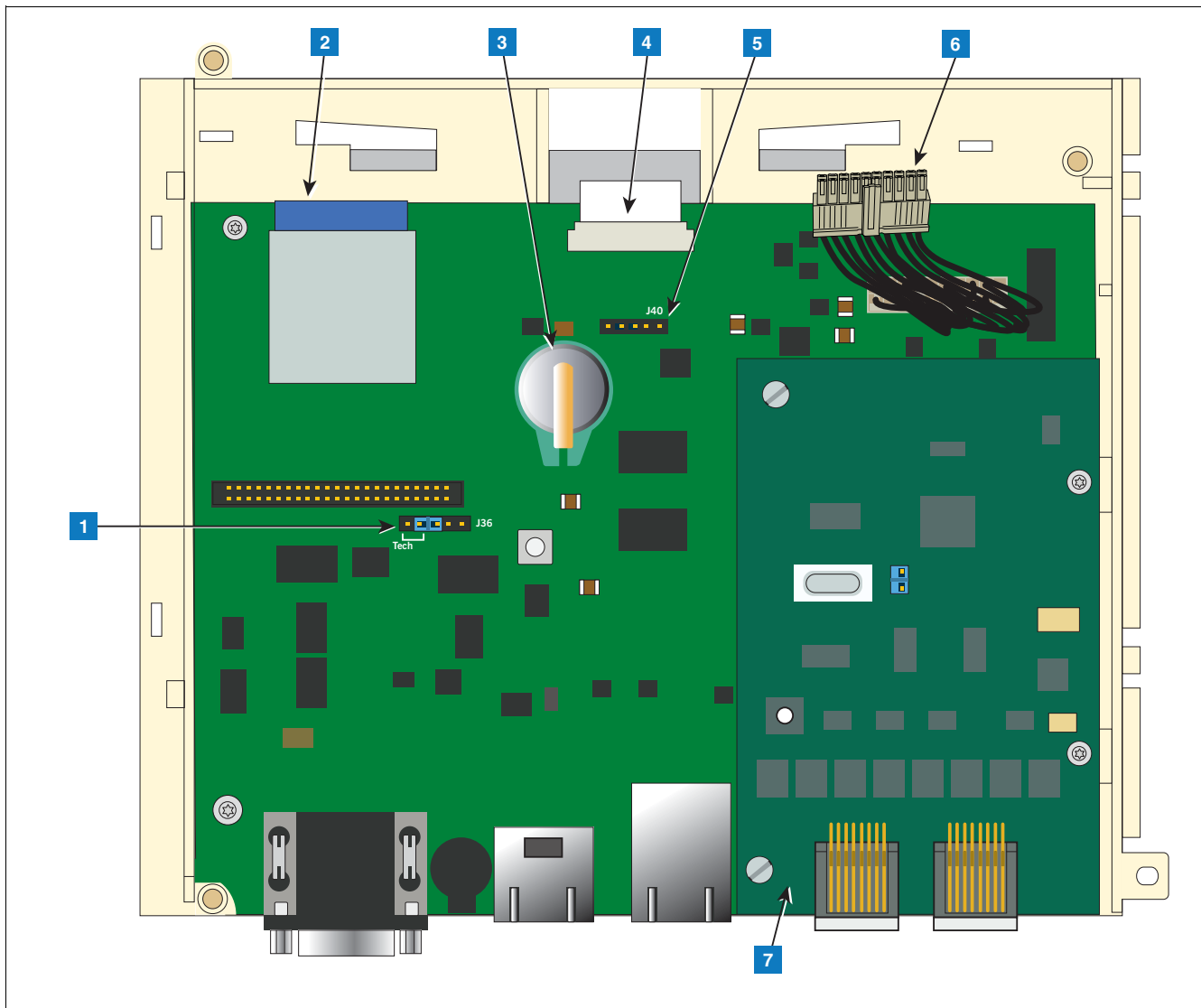


Figure 3. Component Locations Underside Of Display/CPU Board Ass'y.

LEGEND FOR NUMBERED BOXES IN Figure 3

- | | |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| 1. J36 Mode Jumper (shown in Operating Mode Position) | 5. Ack switch cable connector (J40) - Consoles without display only |
| 2. SD Card | 6. 20-pin Display/CPU-to-USIOM board cable |
| 3. Software Features iButton | 7. Optional CDIM card |
| 4. Display ribbon cable connector - Consoles with GUI display only | |

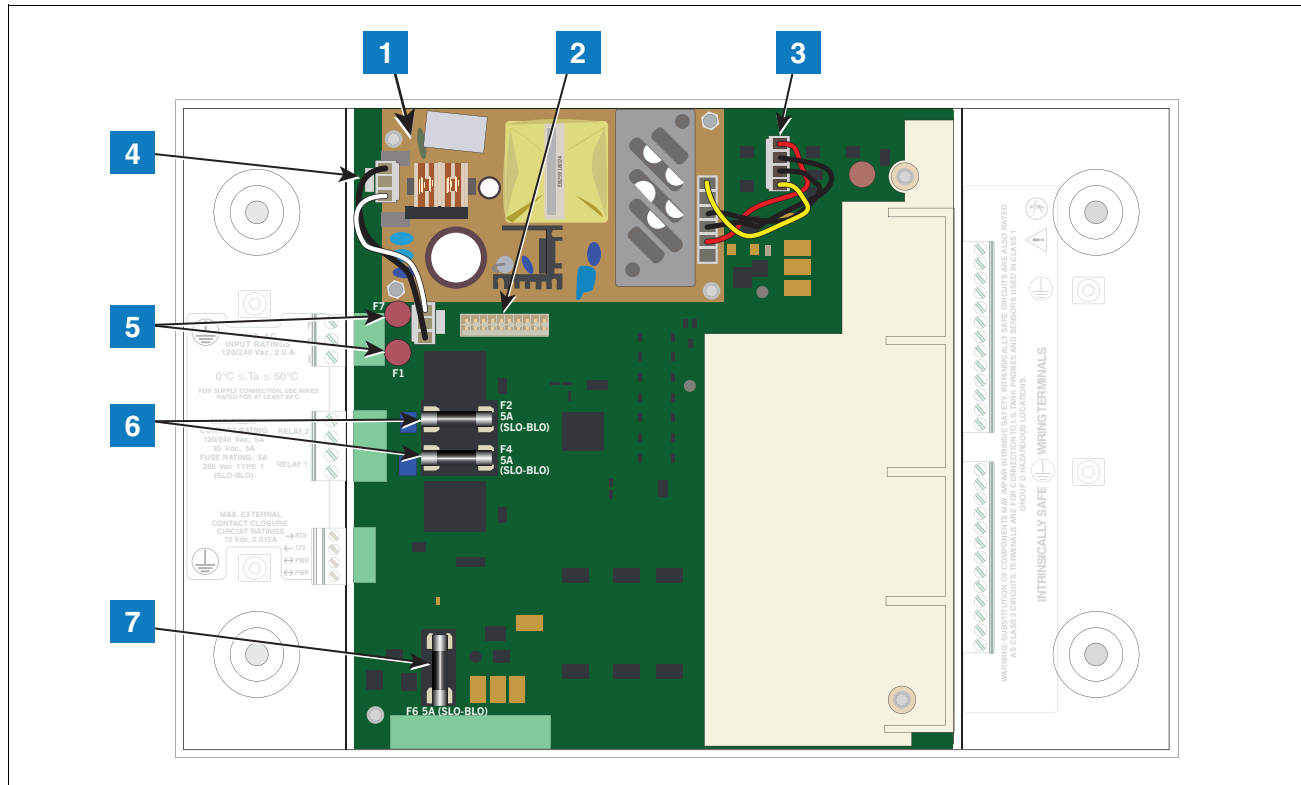


Figure 4. Component Locations USIOM Board

LEGEND FOR NUMBERED BOXES IN Figure 4

- | | |
|----------------------------------------------------------|--------------------------------------------------------------|
| 1. Power Supply Board (protective cover removed) | 5. Fuses F7- 24 Vdc input and F1 - 120/240 Vac or 5Vdc input |
| 2. 20-pin connector for Display/CPU-to-USIOM board cable | 6. Relay output fuses F2 (R2) and F4 (R1) |
| 3. DC Output cable | 7. Fuse F6 24 Vdc (Expansion option) |
| 4. AC input cable | |

Console Wiring Inputs

This section details TLS4 power, communication, and device input connections and requirements.

Table 1. TLS4 Wiring Inputs

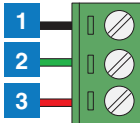
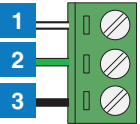
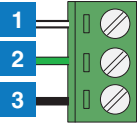
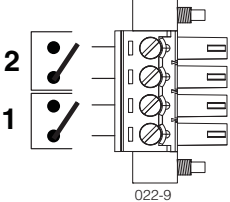
| Connector | Description |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input Power (Item 1, Figure 2) | <p>NOTE: The TLS4/8601 Series console is factory configured for either AC input power or DC input power, <u>but not both</u>.</p> <p>Universal AC power supply: 120 to 240Vac, 50/60Hz, 2A maximum; or DC power supply: +24Vdc, 2A max. and +5Vdc, 4A max. Um <= 250Vrms or 250Vdc</p> <p>240 Vac input: 1 - N/L2 (black), 2 - Ground (green), 3 - L1 (red)</p>  <p>120 Vac Input: 1 - N/L2 (white), 2 - Ground (green), 3 - L1 (black)</p>  <p>+24/+5 Vdc Input: 1 - +24 (white), 2 - Ground (green), 3 - +5 (black)</p>  |
| HV Relay Outputs (Item 2, Figure 2) | <p>2 relay outputs: 120/240 Vac, 5A; 30 Vdc, 5A; Fuse ratings 5A, 250 Vac Type T (Slo-Blo)</p>  |

Table 1. TLS4 Wiring Inputs

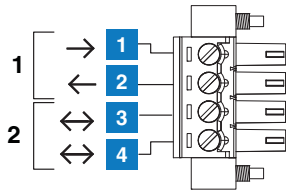
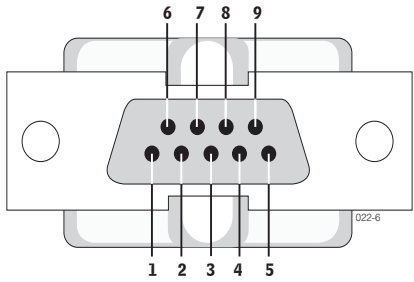
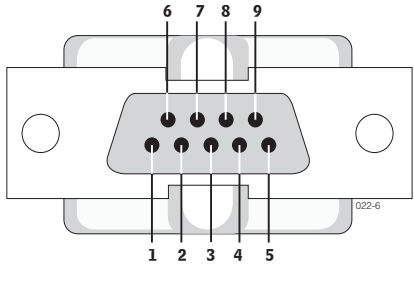
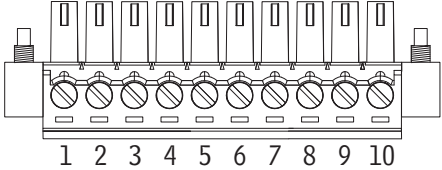
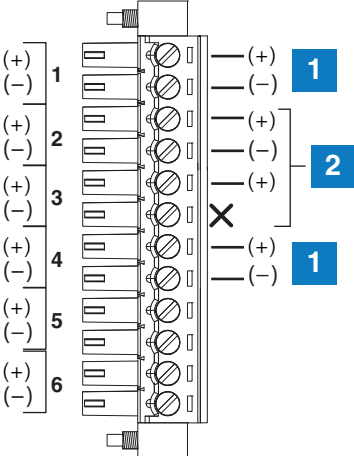
| Connector | Description | | | |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------|-------------------------------------------------------------------------------------|
| Low Voltage Inputs (Item 3, Figure 2) | 1 Low Voltage Inputs: Maximum contact closure circuit ratings 12 Vdc, 0.015A Class I wiring is required for these 12 volt closure circuits. | | | |
| | Legend | Pin | Input |  |
| | Dry Contact Switch | 1 | RTN | |
| | | 2 | 12V | |
| | For Future Use | 3 | PWR STAT | |
| 4 | | PWR INT | | |
| RS-232 Ports (Item 7 in Figure 1) | 2 optically isolated serial ports standard, labeled SERIAL 1 and SERIAL 2 - one supporting full handshaking. | | | |
| | The RS-232 D-connector is a panel mount, 9-pin female type, wired in a Data Terminal Equipment (DTE) configuration. A Data Communication Equipment (DCE) device such as a modem may be connected directly to the interface using a straight-through cable. Handshake signals in the system are configurable. | | | |
| | RS-232 signals are wired to the female D-connectors as follows: | | | |
| | SERIAL1 (Full Handshake) | | | |
| | Pin | Signal | Pin | Signal |
| | 1 | Data Carrier Detect | 6 | Data Set Ready |
| | 2 | Received Data | 7 | Request to Send |
| | 3 | Transmitted Data | 8 | Clear to Send |
| | 4 | Data Terminal Ready | 9 | Ring Indicator |
| | 5 | Signal Ground | | |
| |  | | | |
| | SERIAL 2 | | | |
| | Pin | Signal | Pin | Signal |
| | 1 | | 6 | |
| | 2 | Received Data | 7 | |
| | 3 | Transmitted Data | 8 | |
| | 4 | | 9 | |
| | 5 | Signal Ground | | |
| |  | | | |
| Ethernet Ports | 3 Ethernet ports, labeled ETH 1 Standard, ETH 2 and ETH 3 (provided on an optional integrated switch) (Item 8 in Figure 1) | | | |

Table 1. TLS4 Wiring Inputs

| Connector | Description | | | |
|---------------------------|----------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| CDIM Ports | Optional RJ-45/RJ-485 serial ports, labeled CDIM 1 and CDIM 2 (Item 9 in Figure 1) | | | |
| USB Ports | 2 USB ports, labeled USB 1 and USB 2 (Item 7 in Figure 1) | | | |
| Expansion Port | 10-pin connector VR bus, labeled EXPANSION (Item 10 in Figure 1) | | | |
| | Legend | | |  |
| | Pin | Signal | Pin | Signal |
| | 1 | +W | 6 | Ground |
| | 2 | -W | 7 | +24 Vdc |
| | 3 | +15 Vdc | 8 | +VR Bus |
| | 4 | Ground | 9 | -VR Bus |
| | 5 | N/C | 10 | Ext Reset |
| Intrinsically Safe inputs | 6 (Standard) or 12 (optional) universal intrinsically safe inputs as ordered (Items 8 and 9 in Figure 2) | | | |
| | Item | Description |  | |
| | 1 | Typical 2-wire device | | |
| | 2 | Typical 3-wire device | | |

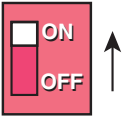



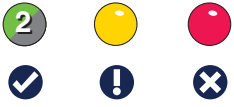
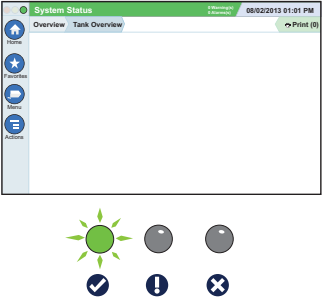
Troubleshooting

Boot-Up Errors

NORMAL FRONT PANEL LED BOOT-UP SEQUENCE

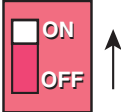
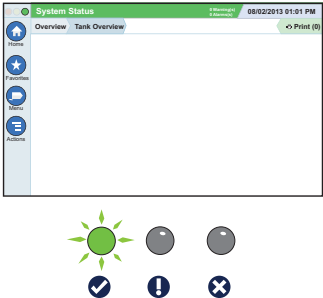
A normal TLS4 boot-up sequence can be followed observing the front panel status LEDs as described in Table 2.

Table 2. Front Panel LED Normal Boot-Up Sequence

| Boot-Up Sequence | Visual Sequence | System Task |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 1. Console powered On at the breaker. |  | |
| 2. The beeper sounds and the Green LED flashes rapidly. |  | Console is loading U-Boot. |
| 3. The beeper is Off and the Green LED flashing slows to 1 second intervals. |  | U-Boot is loading the Operating System (OS). |
| 4. The Yellow and Red LEDs turn On. The Green LED flashes at 1 second intervals. |  | Linux is loaded and starts the drivers for USB, Ethernet, etc. |
| 5. Red/yellow LED's On, the Green LED flashing slows to 2 second intervals. |  | Linux is running and the system is being initialized. |
| 6. Green LED On Steady and the designated Home screen displays. |  | The console completes the boot-up sequence, starts the applications and brings up the GUI. |

BOOT-UP ERROR 1

Table 3. Incorrect Boot-Up Sequence - Missing Serial 2

| Boot-Up Sequence | Visual Sequence | Symptom | Probable Cause | Action |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Console powered On at the breaker |  | Only Serial Port 1 is available in Menu>Setup>Communication>Serial Port setup. | Mode jumper J36 (Item 1 in Figure 3) is not in the Operating Mode position. | Remove the console's cover and the Display/CPU assembly following the assembly removal steps beginning on page 23. Move the Mode jumper J36 on the CPU board to the Operating Mode position (on the 2nd and 3rd pins from the left) as shown in Figure 5. |
| 2. - 5. The console follows the normal boot up sequence, slower than normal - Green LED On Steady and the designated Home screen displays |  | | | |

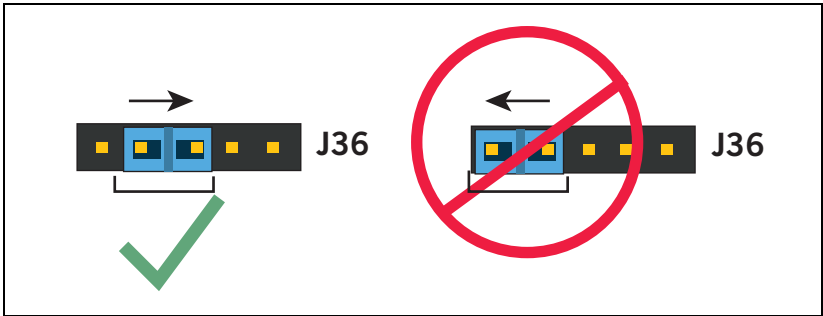
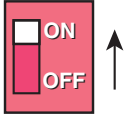

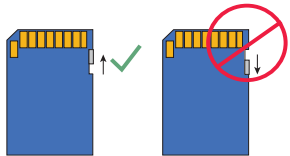


Figure 5. Mode Jumper J36 Operating Mode Position

BOOT-UP ERROR 2

Table 4. Incorrect Boot-Up Sequence - Boot Sequence Stalled

| Boot-Up Sequence | Visual Sequence | Symptom | Probable Cause | Action |
|------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Console Powered On at the breaker. |  | | | |
| 2. Beeper sounds, the Green LED is flashing rapidly. |  | The Green LED keeps flashing, but the boot-up sequence is stuck in this step. | The console cannot read the SD Card, not able to read the RAM, or the SD Card is missing. | <ol style="list-style-type: none"> 1. Remove the console's cover and the Display/CPU assembly following the assembly removal steps beginning on page 23. 2. Confirm SD is present, if not order SD card. If present continue to next step. 3. Remove the SD Card (Item 2 in Figure 3) by pushing in on the SD Card then quickly releasing it letting it spring free of its enclosure's latch so you can slide it out. While you have the SD Card out, check the position of the write protect slide on the side of the SD Card, making sure it is in the position shown below and then reinsert it in its enclosure until it clicks into the enclosure's latch.  <ol style="list-style-type: none"> 4. Reapply power to console. If problem does not go away, replace the SD card. 5. If problem still exists after replacing the SD card, replace the Display/CPU assembly. |

BOOT-UP ERROR 3

Table 5. Incorrect Boot-Up Sequence - Console Does Not Boot

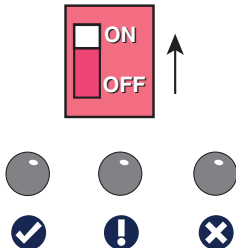
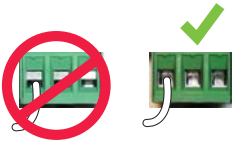
| Boot-Up Sequence | Visual Sequence | Symptom | Probable Cause |
|--------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------|
| 1. Console Powered On at the breaker |  | No beeper sounds. The boot-up sequence fails. All LEDs are Off. | See Table 6 below. |

Table 6. Troubleshooting Procedure For Console Does Not Boot

| PROBABLE CAUSE | ACTION | OK? | ACTION | OK? | ACTION | OK? | ACTION | OK? | ACTION |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------------------------|-----|--------|-----|--------|
| 1. No DC voltage at Pins 3 and 7 of Expansion Port connector (Item 10 in Figure 1). | Measure for +15 VDC and +24VDC at Expansion Port connector (see Table 1 for pin outs). | Yes | 1. Remove the console's cover and the Display/CPU assembly following the assembly removal steps beginning on page 23. 2. Check 20-pin cable (Item 6 in Figure 3) between Display/CPU assembly and USIOM board for loose plugs, wires. | Yes | Replace Display/CPU assembly. | | | | |
| | | No | Go to Probable Causes 2, 3 or 4 below. | | | | | | |

Table 6. Troubleshooting Procedure For Console Does Not Boot

| PROBABLE CAUSE | ACTION | OK? | ACTION | OK? | ACTION | OK? | ACTION | OK? | ACTION |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------------------------------------|-----|--------------------------------------------------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------------------------------|-----|-------------------------------|
| <p>2. Power input plug (Item 1 in Figure 2) is loose.</p> <p>3. The wires in the power input plug are pinched underneath the terminal's screws.</p> <p>4. Wires to the power input plug are attached to the wrong power input terminals.</p> | <p>1. Verify power input plug is fully seated in its connector.</p> <p>2. Verify each of the wires is correctly seated in each of the plug's terminal clamps. If the clamps are not opened all the way when inserting the wires into the plug, the wires can be inserted behind the clamps preventing proper contact.</p> <div data-bbox="354 758 583 898">  </div> <p>3. Verify power input connections (see Table 1).</p> | Yes | Check F1/F7 fuses (Item 5 in Figure 4). | Yes | Verify the AC Input or DC Output cables are attached and securely connected (see Items 3 and 4 in Figure 4). | Yes | Check 20-pin cable (Item 6 in Figure 3) between Display/CPU ass'y and USIOM board for loose plugs, wires. | Yes | Replace Display/CPU assembly. |

Display Is Dark After Boot-Up Sequence

Table 7. Display Dark After Boot-Up

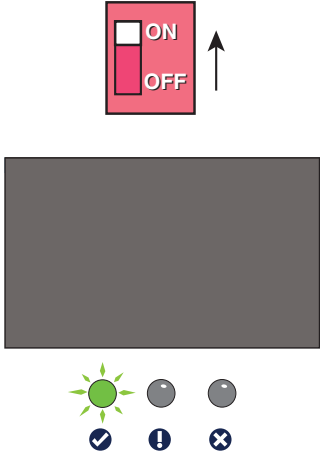

| Boot-Up Sequence | Visual Sequence | Symptom | Probable Cause |
|--------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------------------|
| 1. Console Powered On at the breaker |  | The console follows the normal boot up sequence until step 5 in Table 2 - Green LED is On steady, but the display is dark. | See Table 8 below. |

Table 8. Troubleshooting Procedure For Dark Display

| PROBABLE CAUSE | ACTION | OK? | ACTION |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------------|
| 1. The Display ribbon cable is loose or out of its CPU board connector. | 1. Remove the console's cover and the Display/CPU assembly following the assembly removal steps beginning on page 23. 2. Verify the Display ribbon cable (Item 4 in Figure 3) on the CPU board is securely seated in its connector and that both sides of the locking latch are down against the connector as shown below:  | No | Insert ribbon cable fully into its connector and push down on each side of the locking latch until it rests against the connector. |
| | | Yes | Replace Display/CPU assembly. |

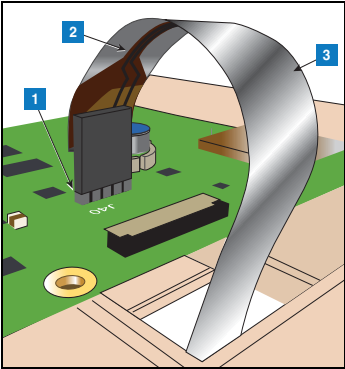
Touch Screen Is Not Working Properly

Table 9. Troubleshooting Procedure For Faulty Touch Screen

| PROBABLE CAUSE | ACTION | OK? | ACTION |
|--------------------------------------------|--------------------------|-----|------------------------------------------------------------------------------------------|
| 1. Bad Display cable, loose display cable. | 1. Reseat display cable. | No | Replace SD card. If changing SD card does not fix problem, replace Display/CPU assembly. |

Acknowledge Switch Not Working Properly

Table 10. Troubleshooting Procedure For Faulty Acknowledge (Ack) Switch

| PROBABLE CAUSE | ACTION | OK? | ACTION | OK? | ACTION |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------------------------|-----|---------------------------|
| 1. The Ack cable plug is loose or not plugged in Ack connector. | Remove the console's cover and the Ack/CPU assembly following the assembly removal steps beginning on page 23. | No | Reseat cable connector. | | |
| | | Yes | Go to next cause. | | |
| 2. Ack cable is broken. | Verify cable is not broken. | Yes | Replace the Ack/CPU assembly. | | |
| | | No | Go to next cause. | | |
| 3. Ack cable connector incorrectly installed. | Verify all pins of Ack cable plug are seated in the Ack switch connector, J40.  | No | Reconnect Ack plug. | | |
| | | Yes | Replace SD Card | No | Replace Ack/CPU assembly. |

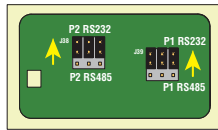
Legend:

1. Connector J40 on CPU board. Notice the cable plug is over all five pins of the connector.
2. Ack cable is attached to the metal shield.
3. Metal shield. Notice the orientation of the shield, Ack cable underneath.

Serial Port(s) - RS-232 Communication Not Working

Table 11. Troubleshooting Procedure For No RS-232 Communication

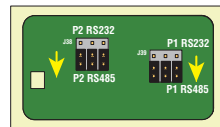
| PROBABLE CAUSE | ACTION | OK? | ACTION |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------|
| 1. Serial communication settings are incorrect, data transfer such as Baud Rate, Parity Setting, Data Bit, and Flow Control. | Verify serial communication settings to make sure settings are correct for data transfer. | No | Correct Serial Port comm settings. |
| | | Yes | Go to next cause. |
| 2. Bad cable connecting TLS4 to serial device. | Verify if cable is bad. | Yes | Replace cable. |
| | | No | Go to next cause. |
| 3. Incorrect DB9 Adapters are used. | Verify serial cable has Straight DB9 adapter on one end and a Null adapter on the other end. | No | Install correct adapter(s). |
| 4. Serial Jumpers are installed in incorrect position(s) (Item 6 in Figure 2). | Remove the console's cover following the Display/CPU assembly removal steps 1 and 2 beginning on page 23. Check all jumpers are in RS-232 position(s) shown below: | No | Put jumper(s) in RS-232 position(s). |
| | | Yes | Replace Display/CPU Assembly. |



Serial Port(s) - RS-485 Communication Not Working

Table 12. Troubleshooting Procedure For No RS-485 Communication

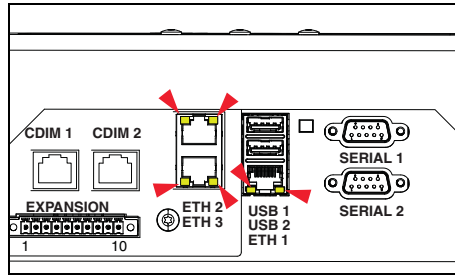
| PROBABLE CAUSE | ACTION | OK? | ACTION |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------|
| 1. Serial communication settings are incorrect for data transfer, e.g., Baud Rate. | Verify Serial communication settings to make sure settings are correct for data transfer. | No | Correct Serial Port comm settings. |
| | | Yes | Go to next cause. |
| 2. Bad cable connecting TLS4 to serial device. | Verify if cable is bad. | Yes | Replace cable. |
| | | No | Go to next cause. |
| 3. Serial Jumpers are installed in incorrect position(s) (Item 6 in Figure 2). | Remove the console's cover following the Display/CPU assembly removal steps 1 and 2 beginning on page 23. Check all jumpers are in RS-485 position(s) shown below: | No | Put jumper(s) in RS-485 position(s). |
| | | Yes | Replace Display/CPU Assembly. |
| 4. Polarity of wiring is wrong. | Check wiring polarity. | Yes | Rewire connections. |
| | | No | Replace Display/CPU assembly. |



No Connection To Ethernet Port 1 (ETH1)

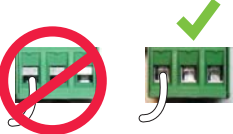
Table 13. Troubleshooting Procedure For No Ethernet Connection At ETH1 Port

| PROBABLE CAUSE | ACTION | OK? | ACTION |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----|----------------------------------------|
| 1. Cable is plugged into the wrong port. | Verify ethernet cable is plugged into ETH1 port (Item 7 in Figure 1). | No | Insert cable in ETH1 port. |
| | | Yes | Go to next cause. |
| 2. Ethernet communication settings, such as, IP Address type, IP Address, etc. | 1. Verify ethernet communication settings are correct. | No | Correct ethernet port 1 comm settings. |
| | | Yes | Go to next cause. |
| | 2. Check if problem ethernet port's Link and Activities LEDs are flashing. | No | Replace Display/CPU Assembly. |
| | | Yes | Go to next cause. |
| | 3. Try to communicate to the maintenance IP address: 169.254.21.12 | | |
| | | No | Go to next cause. |
| 4. Bad cable. | Verify if cable is bad - loose wires, broken wires. | Yes | Replace cable. |
| | | No | Go to next cause. |
| 5. Defective Ethernet signal source. | Verify ethernet signal source, such as hub or switch is bad. | Yes | Replace ethernet source. |
| | | No | Replace Display/CPU Assembly. |



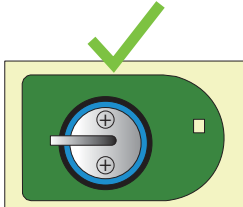
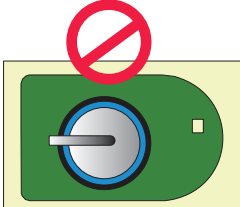
Probe Connected To TLS4 But No Probe Address Under Devices Menu

Table 14. Troubleshooting Procedure For No Probe Address Under Devices Menu

| PROBABLE CAUSE | OK? | ACTION | OK? | ACTION | OK? | ACTION |
|---------------------------------------------------------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------------------------|-----|-------------------|
| 1. Probe wires were connected while the console was ON. | Yes | Re-boot console. | | | | |
| | No | Go to next cause. | | | | |
| 2. Probe wiring installed incorrectly. | | 1. Remove the console's cover following the Display/CPU assembly removal steps 1 and 2 beginning on page 23. 2. Polarity is required for this device. Locate the questionable probe's input wiring connections at the USIOM connector (Items 8 & 9 in Figure 2). Verify the two wires are connected with white to + terminal and black to – terminal. 3. Verify each of the wires is correctly seated in each of the plug's terminal clamps. If the clamps are not opened all the way when inserting the wires into the plug, the wires can be inserted behind the clamps preventing proper contact.  | Yes | Go to next cause. | | |
| | | | No | Correct wiring/plug issue(s). | No | Go to next cause. |
| | | | | | | |
| 3. Probe input in USIOM or bad probe. | | Verify by connecting probe to different input in USIOM. | No | Replace probe. | | |
| | | | Yes | Replace USIOM board. | | |

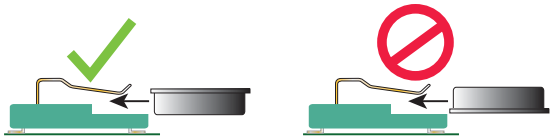
Incorrect Time Displayed After Console Power Loss

Table 15. Troubleshooting Procedure For incorrect Time Displayed After Power Loss

| PROBABLE CAUSE | ACTION | OK? | ACTION |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Bad battery or battery is installed in backwards with '+' side of battery facing down in holder. | 1. Remove the console's cover following steps 1 and 2 in Display/CPU Assembly removal instructions on page 23. 2. Check battery (Item 5 in Figure 2) Is the '+' side of the battery is facing up in the holder as shown below:   | Yes | Remove the battery by gently lifting the retaining clip over the battery as you slide it to the right. Reinstall the battery with the '+' side up, by sliding it from right to left under the retaining clip until it snaps securely into the holder. |
| | | No | Replace battery. |

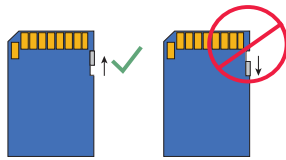
"Could Not Validate IButton" Displays On GUI

Table 16. Troubleshooting Procedure For "Could Not Validate IButton"

| PROBABLE CAUSE | ACTION | OK? | ACTION | OK? | ACTION |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------------------|
| 1. Features iButton is not seated properly in its holder. 2. Features iButton is not programmed. | 1. Remove the console's cover and the Display/CPU assembly following the assembly removal steps beginning on page 23. 2. Check that iButton (Item 3 in Figure 3) on the CPU board is installed correctly as shown below:  | Yes | Replace iButton with one that has been programmed with the required features. | | |
| | | No | Verify iButton is installed correctly. | No | With flange end up, slide the iButton under the clip until it snaps securely into the holder. |
| | | | | Yes | Replace Display/CPU Assembly. |
| 3. Bad Cyclic Redundancy (CRC) check sum error. | Replace Display/CPU Assembly. | | | | |


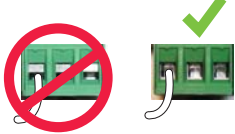
Cannot Save Setup Data, "Data Retrieved" Error Message In Status Bar

Table 17. Troubleshooting Procedure For Can't Save Data

| PROBABLE CAUSE | ACTION |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. SD Card in write protect mode. | 1. Remove the console's cover and the Display/CPU assembly following the assembly removal steps beginning on page 23. 2. Remove the Card (Item 2 in Figure 3) by pushing in on the Card then quickly releasing it letting it spring free of its enclosure's latch so you can slide it out. While you have the Card out, check the position of the write protect slide on the side of the Card, making sure it is in the position shown below and then reinsert it in its enclosure until it clicks into the enclosure's latch.  |


Relay Will Not Change State

Table 18. Troubleshooting Procedure For Relay That Will Not Change State

| PROBABLE CAUSE | ACTION | OK? | ACTION |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------|
| 1. Setup problem - relay is not enabled. | Verify relay is enabled in the GUI. | No | Enable relay. |
| | | Yes | Go to next cause. |
| 2. Connector is not pushed all the way in or incorrect input wiring from external device.  WARNING! When troubleshooting I/O Relays, high voltages could be present on the input wiring. Lock out, tag and shut down the equipment connected to these two relays before attempting to troubleshoot the wiring or fuses to these relays. | 1. Remove the console's cover following steps 1 and 2 in Display/CPU Assembly removal instructions on page 23. Verify the relay plug is pushed all the way into the connector (Item 2 in Figure 2). Verify each of the wires is correctly seated in the plug's terminal clamps. If the clamps are not opened all the way when inserting the wires into the plug, the wires can be inserted behind the clamps preventing proper contact.  | No | Correct wiring connections. |
| | | Yes | Go to next cause. |
| | 2. Verify external wiring into the relay input connector. | No | Correct wiring connection. |
| | | Yes | Go to next cause. |
| 3. Fuse missing or blown. | Remove the Display/CPU assembly following step 3 in the Display/CPU Assembly removal instructions on page 23. Locate the Relay 1 fuse (F4) and the Relay 2 fuse (F2) (see Item 6 in Figure 4). Check fuse(s). | No | Install or replace fuse(s) with the correct type as shown on label next to relay input plug. |
| | | Yes | Replace USIOM board. |

External Input Does Not Recognize External Contact Closure

Table 19. Troubleshooting Procedure For External Input Does Not Recognize External Contact Closure

| PROBABLE CAUSE | ACTION | OK? | ACTION |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------------------------|
| 1. Setup problem - external input is not enabled. | Verify external input is enabled in the GUI. | No | Enable external input. |
| | | Yes | Go to next cause. |
| 2. Incorrect external wiring to external input connector | <p>Remove the console's cover following steps 1 and 2 in Display/CPU Assembly removal instructions on page 23.</p> <p>Verify the external input plug is pushed all the way into the connector (Item 3 in Figure 2). Verify each of the wires is correctly seated in the plug's terminal clamps. If the clamps are not opened all the way when inserting the wires into the plug, the wires can be inserted behind the clamps preventing proper contact.</p> <div data-bbox="690 808 922 945">  </div> | No | Correct wiring connections. |
| | | Yes | Replace USIOM board. |

Component Removal Procedures

In non-display consoles the Ack/CPU assembly is, except for the display screen itself, essentially the same as the Display/CPU assembly. The Display ribbon cable connects to a different CPU board connector than the Ack switch panel cable plug (see Items 4 and 5 in Figure 3). Other than the GUI display and Ack switch panel difference, the additional removal procedures discussed in this section are identical. When troubleshooting non-display consoles, where applicable substitute Ack/CPU assembly for Display/CPU assembly in this manual.

Removing Display/CPU Assembly



1. Turn Off, tag and lockout power to the console.
2. Using masking tape, mark each connected comm cable with the port to which each cable is attached and remove the comm cables.
3. Remove the two T15 torx shoulder screws under the front cover of the console (Item 6 in Figure 1). Tilt the bottom of the cover out as you lift it off of the two hooks in the top of the console's housing.
4. Remove the T15 #8 x .3125 screw (Item 4 in Figure 2) and the T20 #8 x .875 screw (Item 7 in Figure 2) securing the Display/CPU assembly to the console and set them aside. Slide the Display/CPU assembly up as far as it will go and tilt out the bottom of the assembly to access the short 20-pin cable connecting the Display/CPU assembly to the USIOM board in the console. Disconnect the cable plug from its USIOM board socket by pressing against the vertical locking lever in the middle of the plug as you lift it away from the socket.
5. The CPU board is on the underside of the Display/CPU assembly.



Avoid unnecessary contact with the CPU board components to avoid static damage to the board's circuitry.

Removing The SD Card

1. Follow the steps above to remove the Display/CPU or Ack/CPU assembly.

With the Display/CPU assembly removed, set it on a clean surface, display side down. The SD card (Item 2 in Figure 3) is removed by pushing in gently on the end of the card and quickly releasing it so it springs free of its enclosure's latch.

2. When replacing the SD card, always check the read/write-protect switch on the side of the card is in the position shown in Figure 6. Orient the card, contacts down and angled corner to the left, as you gently push the card into its enclosure until it clicks into the enclosure's latch.

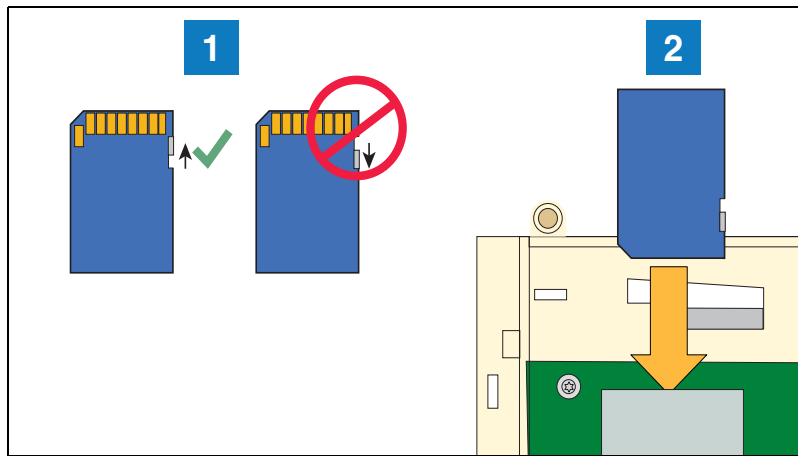


Figure 6. Inserting SD Card In Its CPU board Enclosure

LEGEND FOR NUMBERED BOXES IN Figure 4

1. Check the SD Card read/write slide position.
2. Insert the SD card into its enclosure with the contact side facing the CPU board.

Replacing The Features iButton

1. Remove the Display/CPU Assembly as discussed on page 23.
2. Place the Display/CPU Assembly on a clean surface, display side down.
3. Locate the Features iButton (Item 3 in Figure 3).
4. Slide the iButton out from under the retaining clip until it is free of the holder.
5. With the flanged end up, slide the replacement iButton under the retaining clip until it snaps securely into the holder.

Replacing the Backup Battery

1. Remove the front cover of the TLS4 following step 1 and 2 of the Display/CPU Assembly removal instructions on page 23.
2. Locate the backup battery beneath the display (Item 5 in Figure 2).
3. Slide the battery out from under the retaining clip until it is free of the holder.
4. With the '+' side up, slide the replacement battery under the retaining clip until it snaps securely into the holder.

Replacing the USIOM Board

1. Remove the Display/CPU Assembly as discussed on page 23.
2. Place the Display/CPU Assembly aside on a clean surface.

3. Remove all plugs connected to the USIOM board (see Figure 7).
4. Remove the two T15 #8 x 0.3125 screws securing the expansion comm port plate to the bottom of the console enclosure and set them aside with the comm plate. (see Figure 8).
5. Remove the two T15 #6 x .375 screws securing the I.S. cover and right side of the USIOM board to the console chassis (see Figure 11). Set the plastic I.S. cover, the two T15 screws holding the cover aside.
6. Remove the T15 #6 x 0.375 screw from the lower left corner of the USIOM board (see Figure 10) and set it aside.
7. Remove the two T10 #4 x 0.625 screws from the opposite corners of the power supply board and set them aside (see Figure 9).
8. With your fingers under the two I.S. sockets and your thumbs positioned on top of them, lift/pry the right side of the USIOM board out enough to release the USIOM board from the snap-on retaining post between the two I.S. sockets (see Figure 12).
9. With the USIOM board now free from the retaining post, swing the right side of the USIOM board toward you as you lift it free of the chassis.
10. Install the replacement USIOM board by reversing steps 9 through 3 above.

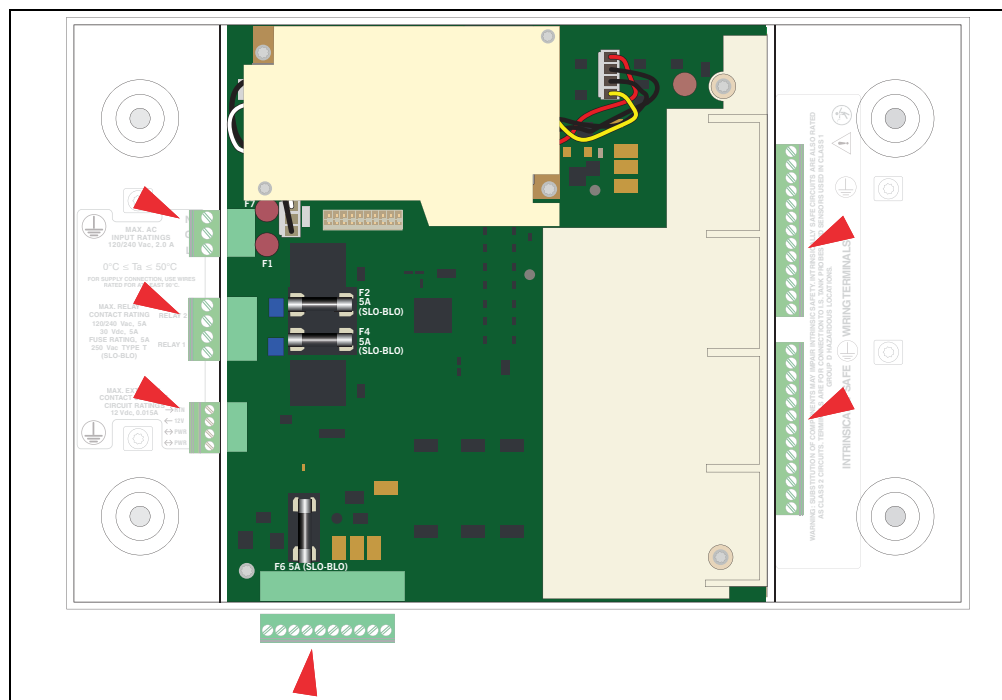


Figure 7. Remove all plugs attached to USIOM board

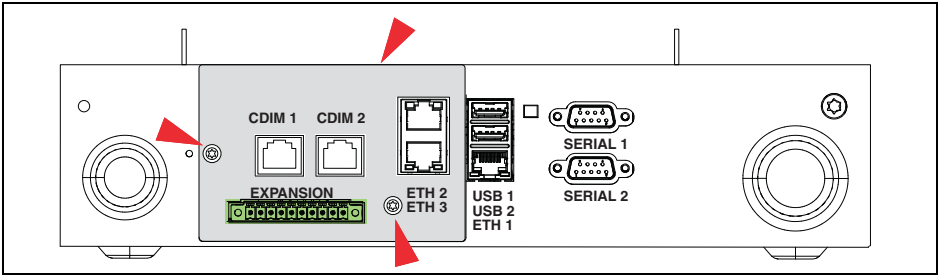


Figure 8. Remove Two T15 Screws Securing Comm Plate

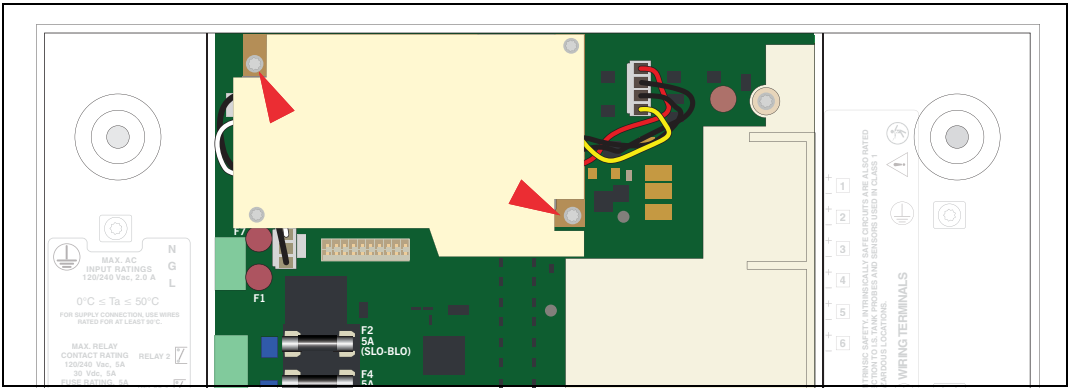


Figure 9. Remove Two Corner T10 Screws From Power Supply Board

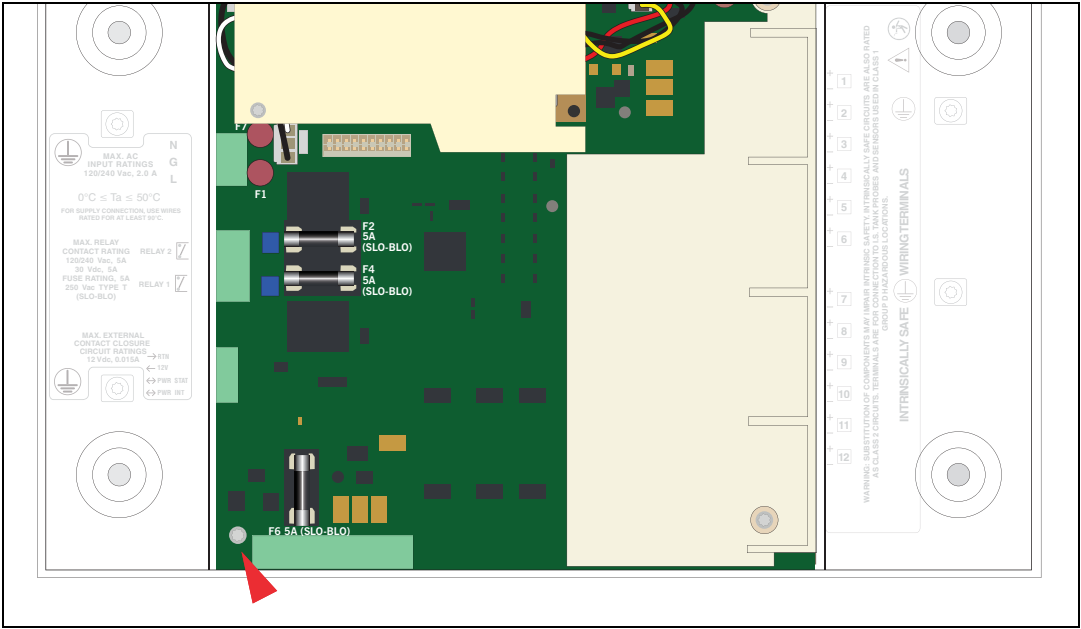


Figure 10. Remove Lower Left Corner USIOM Board T15 Screw

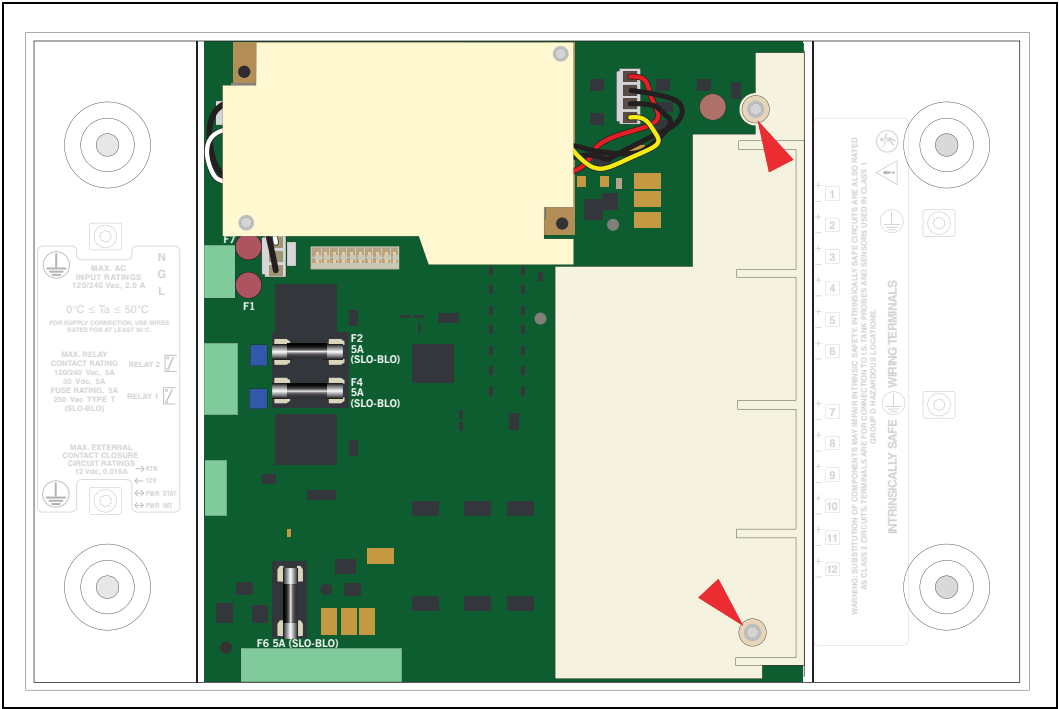


Figure 11. Remove Two T15 Screws Securing I.S. Cover

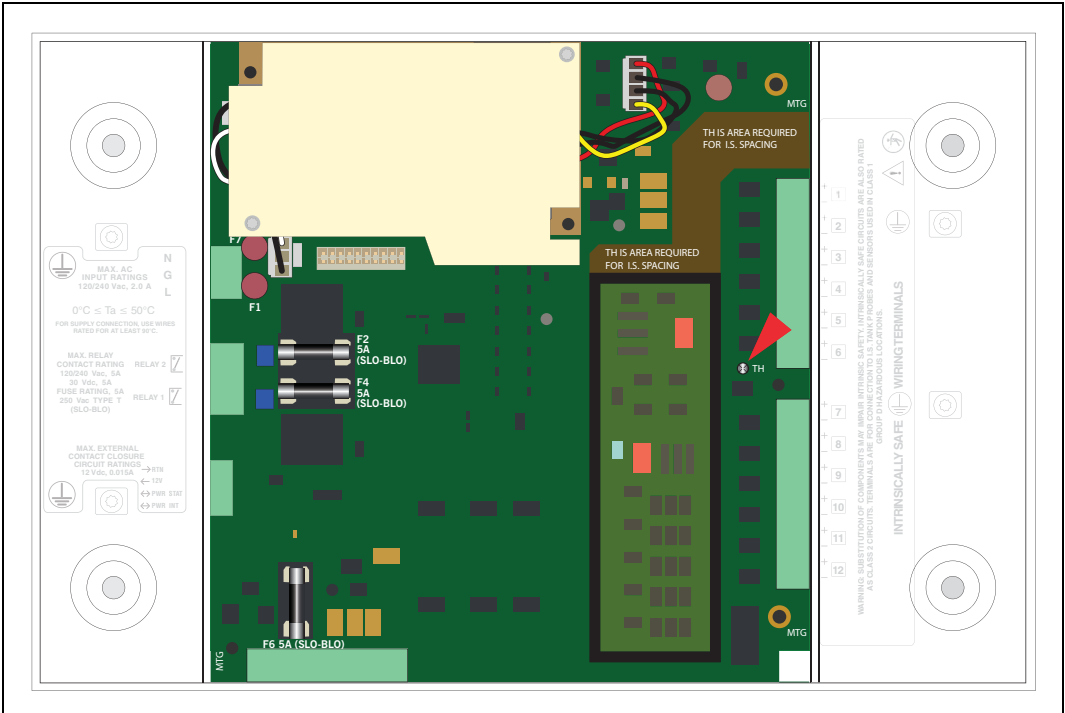


Figure 12. USIOM Board Snap-On Retaining Post

Alarm Troubleshooting

TLS4/8601 Series ATG GUI Alarm Report Screen

The Active Alarm screen is the primary alarm report location and shows all active and unacknowledged TLS alarms and warnings. You access this Active Alarm screen from the Home screen by touching the Status Bar at the top of the screen.

Once in the Alarm Report screen, touching the Status Bar again will acknowledge all selected unacknowledged alarms or the first active alarm if none are selected and turn off the console beeper (if it is turned on).

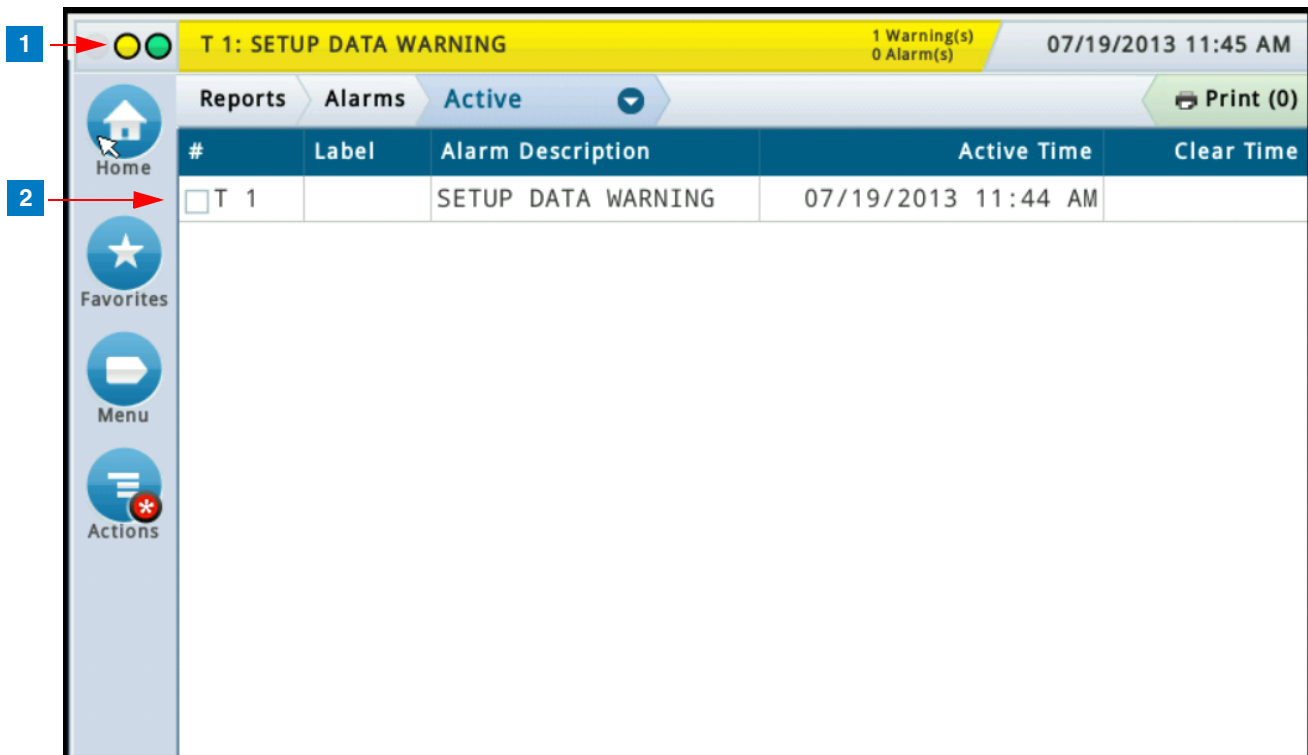


Figure 13. Alarm Report Screen

| Legend for Figure 13 | | | |
|----------------------|-------------|------|-------------------|
| Item | Description | Item | Description |
| 1 | Status Bar | 2 | Alarm Description |

TLS4/8601 Series ATG Parts Identification

The following figure identifies the components on the front of the TLS4/8601 Series ATG.

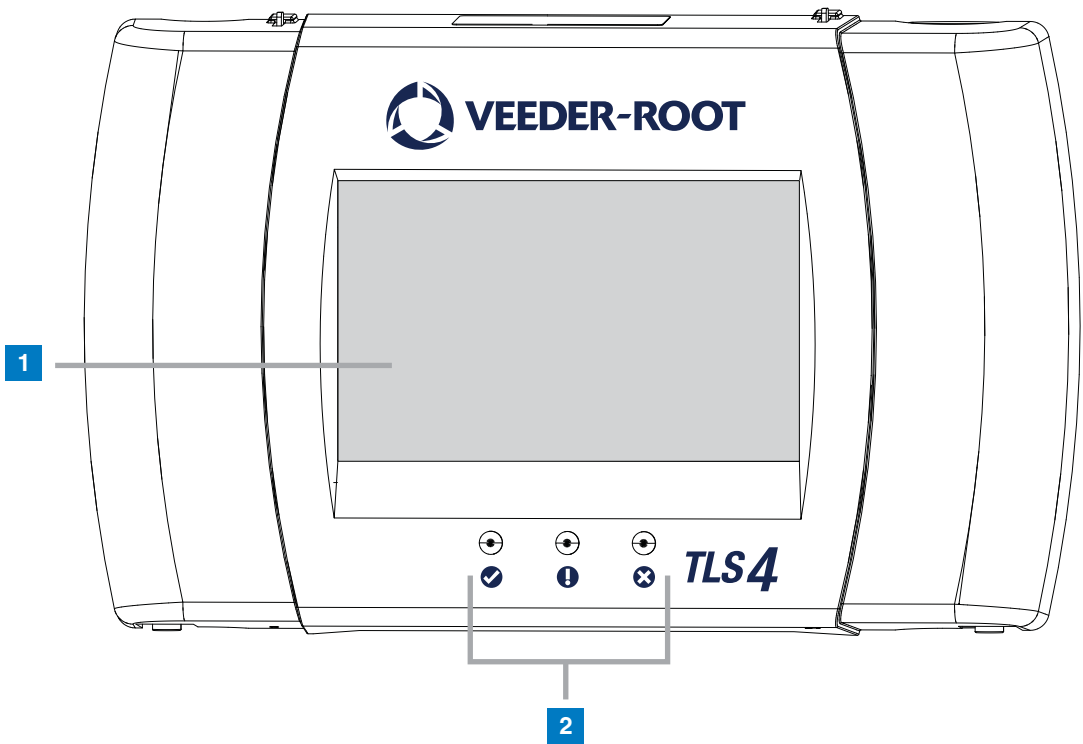


Figure 14. Front Cover Components

| Legend for Figure 14 | | | |
|----------------------|---------------------------|------|--------------------------------------------------------------------------------------------------------------------|
| Item | Description | Item | Description |
| 1 | Optional GUI Touch Screen | 2 | LED Status Indicators: ✓ Green LED - System Normal ! Yellow LED - Active Warning X Red LED - Active Alarm |

Displayed Alarm Messages

A complete list of displayed TLS console alarm messages and a possible cause/action for the alarms are listed in the tables below.

Actual alarms displayed by a particular system depend upon the options installed.

| Message | Short Device ID | Cause | Action |
|-----------------------------|-----------------|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Annual Test Needed Alarm | Q, T | System failed to perform an annual test (0.1 gph [0.38 lph]) in the programmed number of days. | Schedule a 0.1 gph (0.38 lph) test. |
| Annual Test Needed Warning | Q, T | System failed to perform an annual test (0.1 gph [0.38 lph]) in the programmed number of days. | Schedule a 0.1 gph (0.38 lph) test. |
| Annual Line Test Fail Alarm | Q | 0.1 gph (0.38 lph) line test failure. Dispensing halts, if programmed to do so. | Consult PLLD Alarm Quick Help Guide and PLLD diagnostic screens. |
| Annual Leak Test Fail Alarm | T | System failed an annual in-tank leak test. | Rerun in-tank leak test. If second test fails, call for service. |
| Autodial Failed Alarm | Co | System failed to connect to a remote receiver after 'n' tries. | Verify the address book settings for the contact are correct (i.e., modem device number, phone number to dial), verify the receiving device (fax or modem) is operational. Contact technical support for assistance. |
| Cold Temperature Warning | T | Probe temperature drops below -4°F (-15.6°C). | Probe returns to normal operation after probe temperature rises above 0°F (-17.8°C). |
| Continuous Handle On Alarm | Q | Handle signal has been active for a programmed number of hours. | Call for service following the procedures established for your site. |
| CSLD Rate Increase Warning | T | An excessive amount of fluid leaked into the tank during a test period. | Call for service following the procedures established for your site. |
| Delivery Needed Warning | T | Product level dropped below programmed limit. | Call for a delivery. |
| Email Failed Alarm | Co | The console did not successfully send email when configured to email. | Verify the address book settings for the contact are correct (email address of recipient), verify network connectivity is available (Ethernet card is installed). Contact technical support for assistance. |
| Input Alarm | I | External device changed from programmed condition. | Check the operation of the external device. |
| Input Normal | I | (Not displayed, printed out only) External device returned to preset condition. | None |
| Fuel Alarm | L, G, C, H, V | Fuel is present in the area being monitored by the sensor. | Call for service following the procedures established for your site. |
| Fuel Out Alarm | Q | Tank product level below 10-inch (25.4 cm) level - cannot pump when active. | Schedule a delivery. |

| Message | Short Device ID | Cause | Action |
|----------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Generator Off | I | Backup generator shut down, in-tank leak testing resumed. | None |
| Generator On | I | Backup generator switched on, in-tank leak testing halted. | None |
| Gross Test Fail Alarm | Q | 3 gph (11.3 lph) line test failure. Dispensing halts, if programmed to do so, while the alarm is active. | Consult PLLD Alarm Quick Help Guide and PLLD diagnostic screens. |
| Gross Leak Test Fail Alarm | T | In-tank leak (3.0 gph [11.3 lph]) test failed. | Rerun in-tank leak test. If second test fails, call for service. |
| High Liquid Alarm | L | Dispenser Pan/Containment Sump Sensors Liquid reached 8" (203mm) on the dispenser pan sensor or 10" (254mm) on the containment sump sensor. | Immediately follow the alarm reporting procedures established for your site. |
| | | Dual-Float Differentiating Hydrostatic Sensor A sensor in a brine-filled interstice detects an increase in the brine level increase. Liquid is entering the riser pipe, or in a high groundwater area, an outer wall rupture has occurred. | Call for service following the procedures established for your site. |
| | H | The sensor detects a high liquid level. | Call for service following the procedures established for your site. |
| High Product Alarm | T | Product level in tank rose above programmed limit. | Do not allow additional delivery until product is dispensed below preset limit. |
| High Water Alarm | T | Water detected in tank exceeds programmed alarm limit. | Remove water from tank. |
| High Water Warning | T | Water detected in tank exceeds programmed warning limit. | Remove water from tank. |
| Invalid Fuel Level | T | Product level is too low, causing the fuel and water floats to be too close together. | Call for a delivery. |
| Leak Alarm | T | A static in-tank leak test failed. Rerun in-tank leak test. | Rerun in-tank leak test. |
| Leak Test Active | T | In-tank leak test is underway. | Do not dispense fuel from this tank until message disappears. |
| Liquid Warning | L, H | Liquid reached 1 inch (25.4 mm) on the dispenser pan or containment sump sensor. | Immediately follow the alarm reporting procedures established for your site. |
| Line Equipment Alarm | Q | A problem with the pressure measurement equipment has been detected. | Call for service following the procedures established for your site. |
| Low Liquid Alarm | L | The sensor in a brine-filled interstice detects a decrease in the brine level. A hole is in the tank's inner wall, or in low groundwater areas, a hole is in the outer wall. | Call for service following the procedures established for your site. |

| Message | Short Device ID | Cause | Action |
|--------------------------------|-----------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Low Pressure Alarm | Q | Low pump dispense pressure is detected during a dispense. Dispensing halts if programmed to do so. | The next handle up will restart the pump. |
| Low Product Alarm | T | Tank level dropped below the programmed limit. | Call for a delivery. |
| Mag Sensor Communication Alarm | MS | Hardware failure - sensor or interconnecting wiring to console. | Call for service following the procedures established for your site. |
| Mag Sensor Fault Alarm | MS | Monitored parameter exceeded preset threshold. | Call for service following the procedures established for your site. |
| Mag Sensor Fuel Alarm | MS | Monitored parameter exceeded preset threshold. | Call for service following the procedures established for your site. |
| Mag Sensor Fuel Warning | MS | Monitored parameter exceeded preset threshold. | Call for service following the procedures established for your site. |
| Mag Sensor High Liquid Alarm | MS | Monitored parameter exceeded preset threshold. | Call for service following the procedures established for your site. |
| Mag Sensor High Liquid Warning | MS | Monitored parameter exceeded preset threshold. | Call for service following the procedures established for your site. |
| Mag Sensor Install Alarm | MS | Sensor not installed in correct position. | Call for service following the procedures established for your site. |
| Mag Sensor Low Liquid Alarm | MS | Monitored parameter exceeded preset threshold. | Call for service following the procedures established for your site. |
| Mag Sensor Low Liquid Warning | MS | Monitored parameter exceeded preset threshold. | Call for service following the procedures established for your site. |
| Mag Sensor Temperature Warning | MS | Ambient temperature exceeded sensor's operating range (-40 to +122°F [-40 to +50°C]). | Warning removed when temperature returns to within sensor's operating range. |
| Mag Sensor Water Alarm | MS | Monitored parameter exceeded preset threshold. | Call for service following the procedures established for your site. |
| Mag Sensor Water Warning | MS | Monitored parameter exceeded preset threshold. | Call for service following the procedures established for your site. |
| Maximum Product Alarm | T | Product level rose above the programmed limit. | Stop delivery. Do not allow additional delivery until product drops below preset limit. |
| No Dial Tone Alarm | Co | System failed to detect an operational line after 3 tries. | This alarm must stay active until it is confirmed that the alarm has been reported. |
| No CSLD Idle Time Warning | T | System has not had enough idle time over previous 24 hours to run a statistical leak detection test. | Stop dispensing fuel from this tank until CSLD test is complete. |
| Overfill Alarm | T | Fuel level has exceeded a programmed limit. Potential overflow of tank may occur. | Stop delivery. Check for spillage. |
| Printer Out Of Paper | System | Paper roll is empty. | Replace the paper roll with Veeder-Root part number 514100-456 only. |

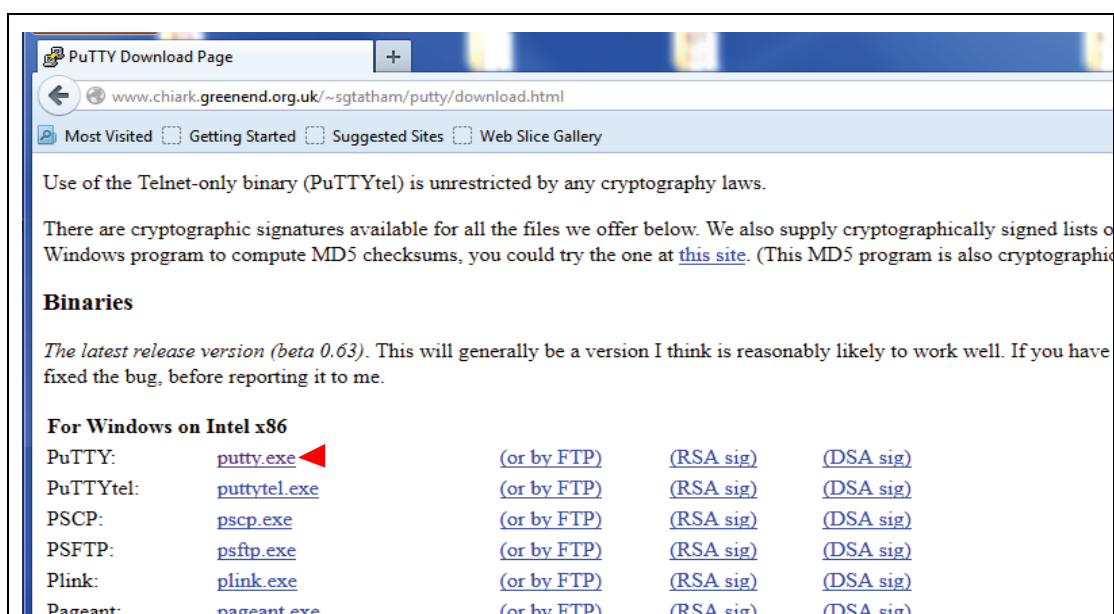
| Message | Short Device ID | Cause | Action |
|-------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Periodic Test Fail Alarm | Q | 0.2 gph (0.76 lph) test failure. Dispensing halts, if programmed to do so. | Consult PLLD Alarm Quick Help Guide and PLLD diagnostic screens. |
| Periodic Test Needed Alarm | Q, T | A periodic in-tank leak (0.2 gph [0.76 lph]) test has not been successfully completed within the programmed number of days. | Schedule a 0.2 gph (0.76 lph) test. |
| Periodic Test Needed Warning | Q, T | A periodic in-tank leak (0.2 gph [0.76 lph]) test has not been successfully completed within the programmed number of days. | Schedule a 0.2 gph (0.76 lph) test. |
| Periodic Leak Test Fail Alarm | T | In-tank leak (0.2 gph [0.76 lph]) test failed. Dispensing halts if programmed to do so. | Rerun in-tank leak test. If second test fails, call for service. |
| Printer Error | System | Printer feed roller release is open. | Push the release lever to the up position. |
| Probe Out | T | Hardware failure - probe or interconnecting wiring to console. | Call for service following the procedures established for your site. |
| Pump Out Alarm | Pm | A relay or external input has a Device Out alarm active and the pump(s) that use that device will not pump gas. Note that if a pump goes into Device out, the Line it is on will go into 'Device Out' as well. | Call for service following the procedures established for your site. |
| Sensor Open Alarm | Q | Pressure sensor reading is less than -8 psi (-51.2 kPa). Only tested while the pump is running. Dispensing halts if programmed to do so. | 3 gph (11.3 lph) test must pass to clear the alarm. Call for service following the procedures established for your site. |
| Sensor Out Alarm | L, G, C, H, V | The sensor setup was performed incorrectly or a sensor is disconnected or is not functioning properly. | Call for service following the procedures established for your site. |
| Setup Data Warning | All Devices | Device setup data problem. | Recheck device setup parameters. |
| Short Alarm | L, G, C, H, V | A short has occurred in the sensor wiring or in the sensor. | Call for service following the procedures established for your site. |
| Shutdown | Q | System shut down line because of failed line leak test, or an alarm assigned to disable the line is active. | Identify offending alarm, and refer to PLLD alarms for corrective action. |
| Siphon Break Active Warning | T | Siphon break valve has shut down manifold for tank test. | Clears when tank test completes. |
| Sudden Loss Alarm | T | System detects loss of fuel during an idle period. | Check for gross leak. |

Console Diagnostics Using The TELTECH Diagnostic Tool

Remote users may connect to the TLS4 using the freeware program putty.exe to run the TLS4 TELTECH diagnostics program discussed in this section.

Downloading and Using Putty

1. The Putty program can be downloaded from the following website:
<http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>
2. Once in the site, click on putty.exe as shown below:



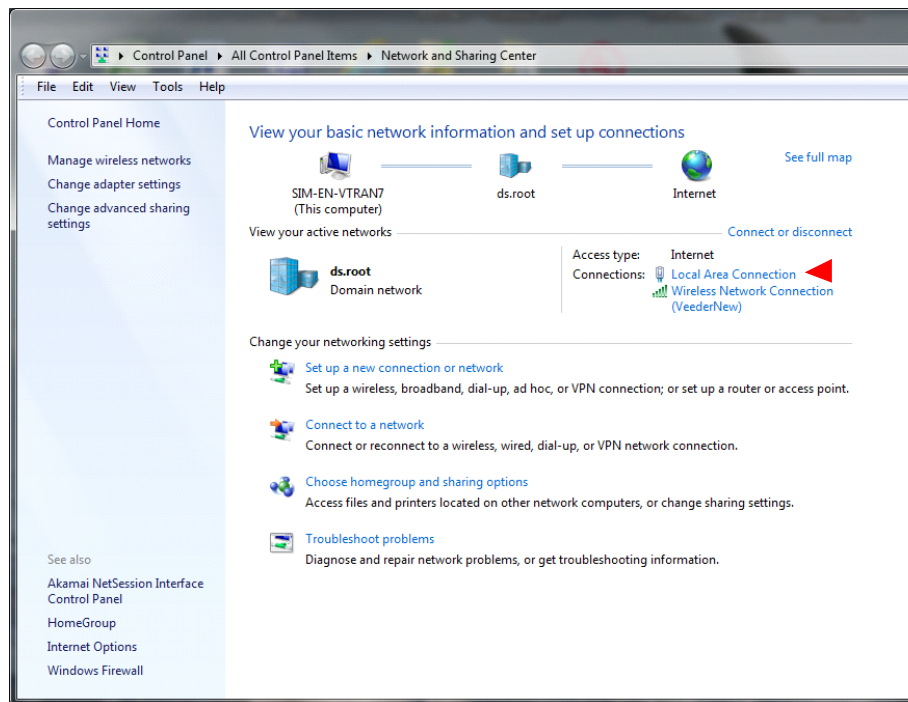
3. Download putty.exe to your desktop. Before using putty and TELTECH, the laptop needs to be setup to connect to the TLS4.

Reconfigure the Laptop PC Prior To Using TELTECH

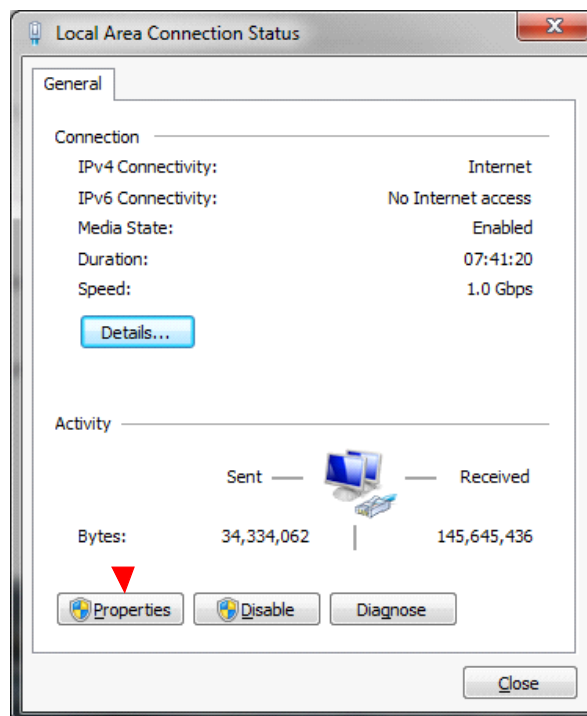
Prior to connecting to the TLS4 using the TELTECH Diagnostic Tool, the IP address of the Laptop/PC has to be reconfigured.

LAPTOP/PC SETUP FOR A WINDOWS 7 OPERATING SYSTEM

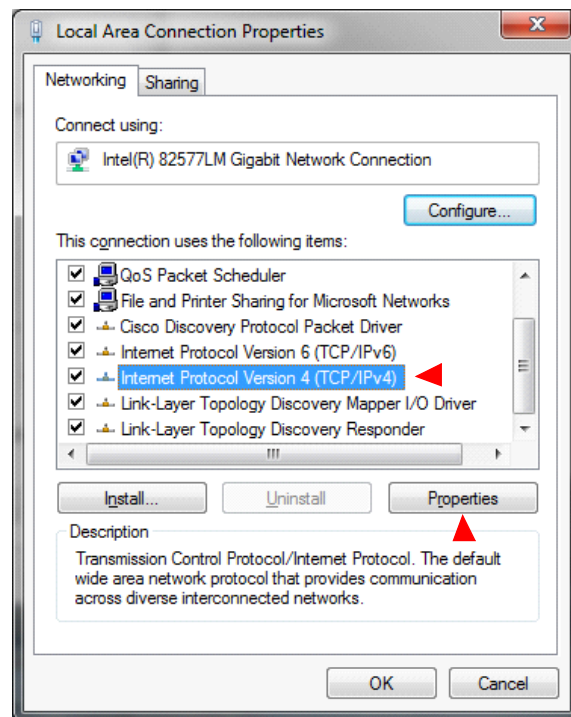
1. From Control Panel, open 'Network and Sharing Center' - click on 'Local Area Connection'.



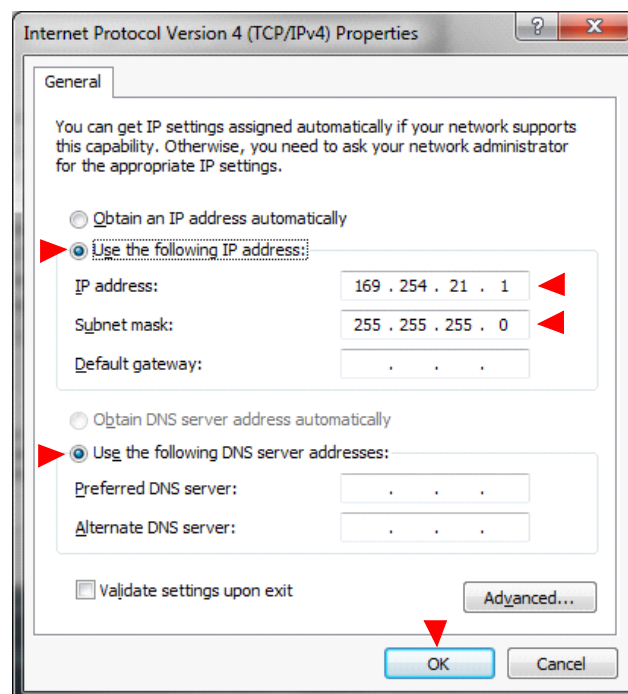
2. The Local Area Connection Status dialog box opens. Click on the **Properties** button.



3. In the Local Area Connection Properties dialog box 'highlight Internet Protocol Version 4 (TCP/IPv4)' and then click the **Properties** button.



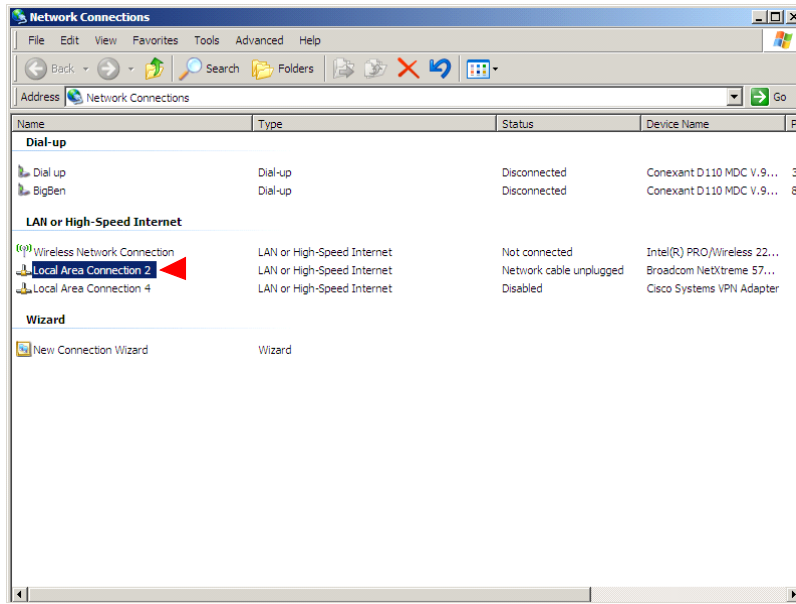
4. In the 'Internet Protocol Version 4 (TCP/IPv4) Properties' dialog box, Check the **Use the following IP address box** and enter the Static IP address shown in the figure (this is the IP address for the Laptop/PC).



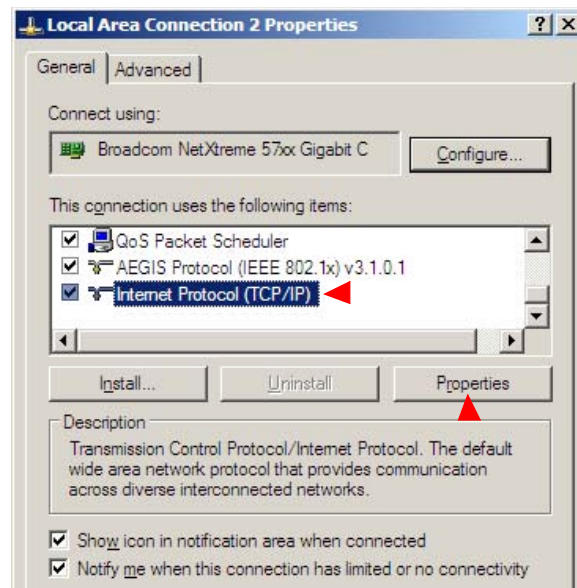
5. Once the IP address is entered, click in the Subnet mask field; the Subnet mask address will fill in automatically, if not, enter 255.255.255.0.
6. Select the 'Use the following DNS server addresses:' radio button.
7. Click the **OK** button to save the settings.
8. Your Laptop/PC is ready to TELTECH to the TLS4 console.
9. When you have finished communicating with the TLS4 console, you will have to reconfigure the laptop/PC to its original TCP/IP settings. Repeat steps 1-4 above. When the 'Internet Protocol Version 4 (TCP/IPv4) Properties' dialog box appears, select the 'Obtain an IP address automatically' radio button (this selection is needed to connect to the internet) and click the **OK** button.

LAPTOP/PC SETUP FOR A WINDOWS XP OPERATING SYSTEM

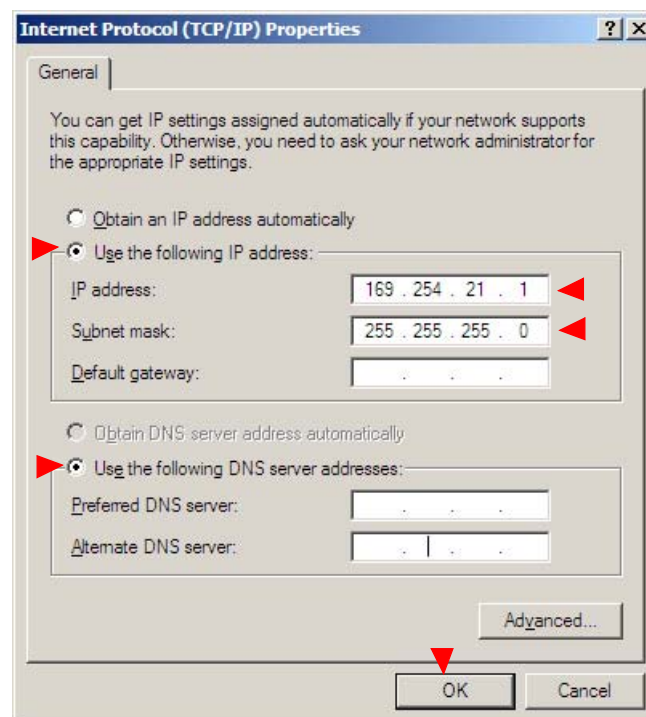
1. From Control Panel, open 'Network Connections' and click on 'Local Area Connection 2'.



2. When the 'Local Area Connection 2 Properties' dialog box appears, select 'Internet Protocol (TCP/IP)', then click on the **Properties** button.



- When the 'Internet Protocol (TCP/IP) Properties' dialog box appears, select 'Use the following IP address' radio button and enter the Static IP address below (this is the default IP address for the TLS4 console). Once the IP address is entered, click in the Subnet mask field; the Subnet mask address will fill in automatically, if not enter 255.255.255.0. Select 'Use the following DNS Server address' radio button. Click **OK** to save the setting.



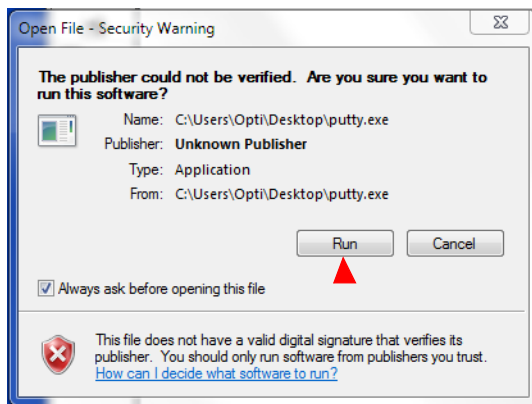
4. Laptop/PC is ready to TELTECH to the TLS4 console.
5. When you have finished communicating with the TLS4 console, you will have to reconfigure the laptop/PC to its original TCP/IP settings. Repeat steps 1-3 above. When the 'Internet Protocol (TVCP/IP) Properties' dialog box appears, select the 'Obtain an IP address automatically' radio button (this selection is needed to connect to the internet) and click the **OK** button.

Using Putty And The TELTECH Diagnostic Tool

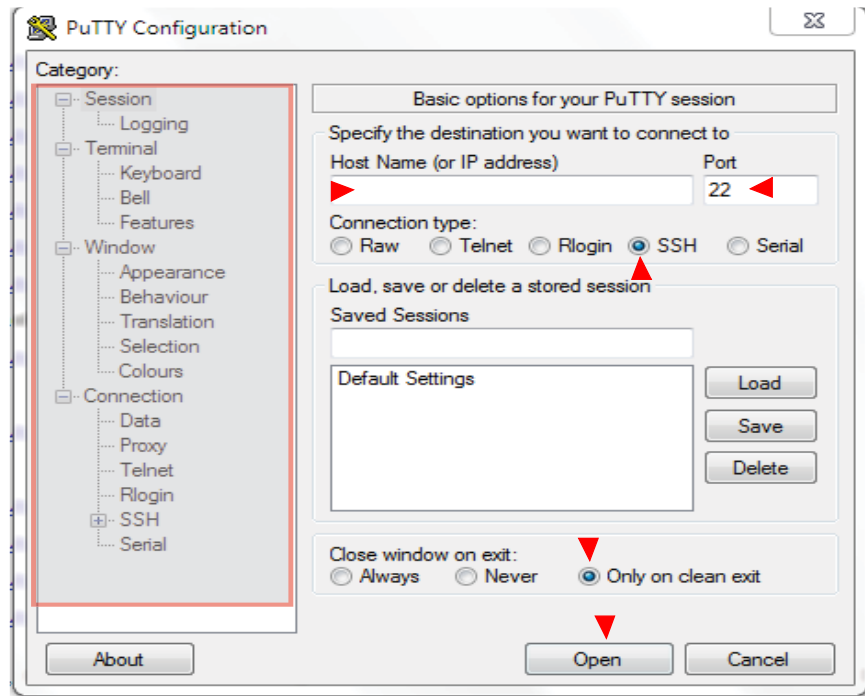
1. Doubleclick on the putty.exe icon you downloaded earlier to open the program.



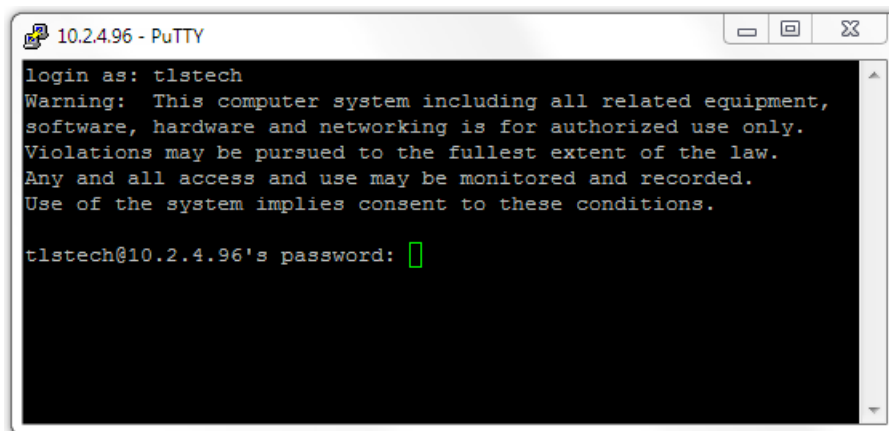
2. Click on **Run**.



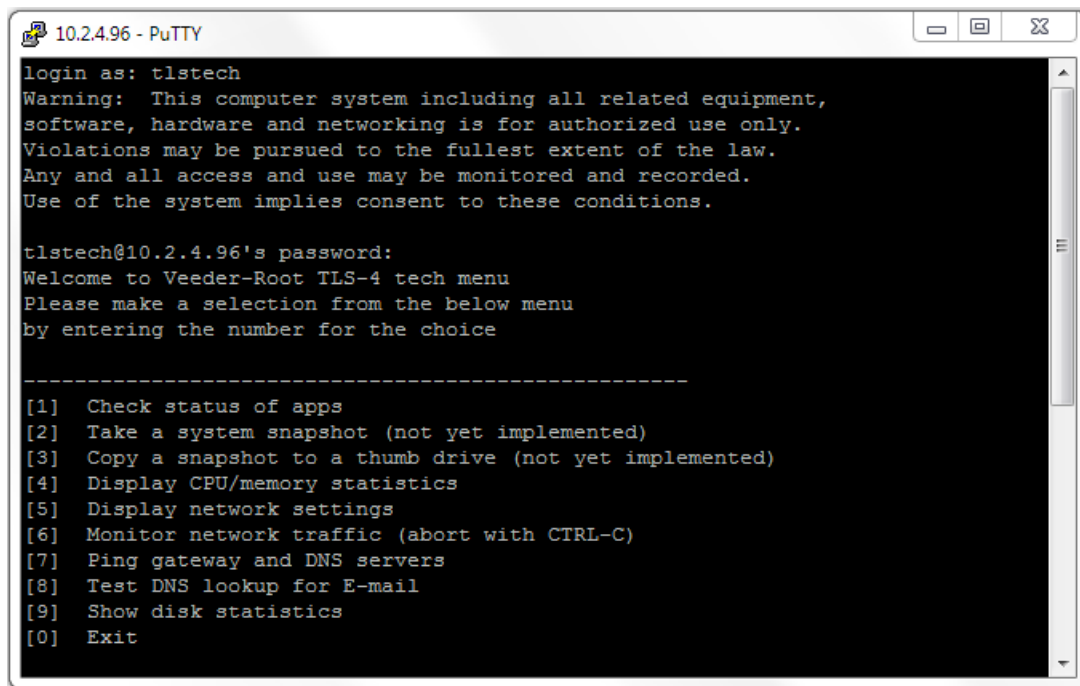
3. Make the selections on the Putty Configuration dialog box as shown below and ignore the Category field selections. In the 'Host Name for IP Address' field, enter the IP address of the TLS4 console (169.254.21.12). Click the **Open** button to save settings and open the TELTECH login screen.



4. When the login screen appears, login as **tlstech**:



5. Enter the password: **tlstech**



The screenshot shows a PuTTY terminal window titled "10.2.4.96 - PuTTY". The terminal output is as follows:

```
login as: tlstech
Warning: This computer system including all related equipment,
software, hardware and networking is for authorized use only.
Violations may be pursued to the fullest extent of the law.
Any and all access and use may be monitored and recorded.
Use of the system implies consent to these conditions.

tlstech@10.2.4.96's password:
Welcome to Veeder-Root TLS-4 tech menu
Please make a selection from the below menu
by entering the number for the choice

-----
[1] Check status of apps
[2] Take a system snapshot (not yet implemented)
[3] Copy a snapshot to a thumb drive (not yet implemented)
[4] Display CPU/memory statistics
[5] Display network settings
[6] Monitor network traffic (abort with CTRL-C)
[7] Ping gateway and DNS servers
[8] Test DNS lookup for E-mail
[9] Show disk statistics
[0] Exit
```

6. When the TLSTECH menu appears, enter the number of a desired choice then press **Enter** to view that result. To exit the program, press 0 then press Enter.

TLSTECH Menu Examples

The TLSTECH menu is shown below and examples of each menu item are shown below.

- [1] Check status of apps
- [2] Take a system snapshot (not yet implemented)
- [3] Copy a snapshot to a thumb drive (not yet implemented)
- [4] Display CPU/memory statistics
- [5] Display network settings
- [6] Monitor network traffic (abort with CTRL-C)
- [7] Ping gateway and DNS servers
- [8] Test DNS lookup for E-mail
- [9] Show disk statistics
- [0] Exit

MENU SELECTION 1**Checking status of apps**

```

1674  mysql  mysqld
2275  exim    sendmail
6033  tlsuser  SOAPServer
6023  tlsuser  TLS4GUI
2366  tlsuser  CommServices
2353  tlsuser  CoreServer
2343  tlsuser  CommandProcesso
2333  tlsuser  DeviceServer
2273  tlsuser  WatchDog
2236  tlsuser  MaintServer
1686  root     httpd
21676 daemon \_ httpd
29299 daemon \_ httpd
26014 daemon \_ httpd

```

MENU SELECTION 4**Display system statistics**

```
Linux 2.6.35.3-433-g0fae922+ (tls4)  08/08/13  _armv7l_  (1 CPU)
```

```
08/08/13 09:35:26
```

```

avg-cpu:  %user  %nice  %system  %iowait  %steal  %idle
           13.75   0.00   15.95   0.18   0.00   70.13

```

```
09:35:26 up 6 days, 33 min,  1 user, load average: 2.78, 2.81, 2.77
```

```

                total      used      free     shared    buffers   cached
Mem:            505792    357612    148180          0     39600    197288
-/+ buffers/cache:      120724    385068
Swap:              0          0          0

```

MENU SELECTION 5

Displaying network settings

Kernel Interface table

```
eth0    Link encap:Ethernet HWaddr 00:50:83:f0:04:99
        inet addr:10.2.1.71 Bcast:10.2.1.255 Mask:255.255.255.0
        inet6 addr: fe80::250:83ff:fef0:499/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
        RX packets:1833262 errors:0 dropped:0 overruns:0 frame:0
        TX packets:440681 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:1000
        RX bytes:142122262 (135.5 MiB) TX bytes:357490031 (340.9 MiB)
        Base address:0x2000
```

```
eth0:9  Link encap:Ethernet HWaddr 00:50:83:f0:04:99
...
```

MENU SELECTION 6

Monitoring network traffic (CTRL-C to abort)

Every 2.0s: /bin/netstat -s | grep -A 7 '^Ip:'

Thu Aug 8 09:36:30 2013

Ip:

```
13598624 total packets received
112 with invalid addresses
0 forwarded
0 incoming packets discarded
13598512 incoming packets delivered
13266813 requests sent out
2 dropped because of missing route
```

MENU SELECTION 7

Pinging gateway and DNS servers

Pinging gateway

```
PING 10.20.95.1 (10.20.95.1): 56 data bytes
64 bytes from 10.20.95.1: icmp_seq=0 ttl=255 time=0.760 ms
64 bytes from 10.20.95.1: icmp_seq=1 ttl=255 time=1.114 ms
64 bytes from 10.20.95.1: icmp_seq=2 ttl=255 time=0.606 ms
--- 10.20.95.1 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.606/0.827/1.114/0.213 ms
```

Pinging name servers

```
PING 10.20.77.5 (10.20.77.5): 56 data bytes
64 bytes from 10.20.77.5: icmp_seq=0 ttl=127 time=0.532 ms
64 bytes from 10.20.77.5: icmp_seq=1 ttl=127 time=0.404 ms
64 bytes from 10.20.77.5: icmp_seq=2 ttl=127 time=0.387 ms
--- 10.20.77.5 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.387/0.441/0.532/0.065 ms
PING 10.28.54.15 (10.28.54.15): 56 data bytes
64 bytes from 10.28.54.15: icmp_seq=0 ttl=124 time=39.489 ms
64 bytes from 10.28.54.15: icmp_seq=1 ttl=124 time=27.339 ms
64 bytes from 10.28.54.15: icmp_seq=2 ttl=124 time=27.159 ms
--- 10.28.54.15 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max/stddev = 27.159/31.329/39.489/5.770 ms
```

MENU SELECTION 8

Testing Internet e-mail MX lookup with configured DNS servers

```
Server:      10.20.77.5
Address:     10.20.77.5#53
```


Non-authoritative answer:

veeder.com mail exchanger = 10 mail.global.frontbridge.com.

Authoritative answers can be found from:

mail.global.frontbridge.com internet address = 216.32.180.190
mail.global.frontbridge.com internet address = 216.32.181.178
mail.global.frontbridge.com internet address = 65.55.88.22
mail.global.frontbridge.com internet address = 207.46.163.30
mail.global.frontbridge.com internet address = 213.199.154.190
mail.global.frontbridge.com internet address = 213.199.154.254
mail.global.frontbridge.com internet address = 213.199.180.150
mail.global.frontbridge.com internet address = 216.32.180.22

Server: 10.28.54.15

Address: 10.28.54.15#53

Non-authoritative answer:

veeder.com mail exchanger = 10 mail.global.frontbridge.com.

Authoritative answers can be found from:

mail.global.frontbridge.com internet address = 216.32.180.22
mail.global.frontbridge.com internet address = 216.32.180.190
mail.global.frontbridge.com internet address = 216.32.181.178
mail.global.frontbridge.com internet address = 65.55.88.22
mail.global.frontbridge.com internet address = 207.46.163.30
mail.global.frontbridge.com internet address = 213.199.154.190
mail.global.frontbridge.com internet address = 213.199.154.254
mail.global.frontbridge.com internet address = 213.199.180.150

MENU SELECTION 9**Showing disk related information**

Disk devices:

| NAME | FSTYPE | SIZE | MOUNTPOINT |
|------------|--------|--------|------------|
| mmcblk0 | | 3.8G | |
| mmcblk0p1 | | 1.9G / | |
| `mmcblk0p2 | | 1.9G | |

Disk usage:

| Filesystem | Type | Size | Used | Avail | Use% | Mounted on |
|------------|--------|------|-------|-------|------|------------|
| rootfs | rootfs | 1.9G | 1013M | 742M | 58% | / |
| /dev/root | ext3 | 1.9G | 1013M | 742M | 58% | / |
| tmpfs | tmpfs | 10M | 4.0K | 10M | 1% | /dev |
| tmpfs | tmpfs | 247M | 228K | 247M | 1% | /tmp |
| tmpfs | tmpfs | 247M | 4.0K | 247M | 1% | /dev/shm |
| tmpfs | tmpfs | 247M | 0 | 247M | 0% | /run |

IO statistics:

03/08/14 08:26:42

| Device: | tps | kB_read/s | kB_wrtn/s | kB_read | kB_wrtn |
|-----------|------|-----------|-----------|---------|---------|
| mmcblk0 | 0.80 | 28.91 | 7.16 | 141526 | 35052 |
| mmcblk0p1 | 1.74 | 28.71 | 7.16 | 140521 | 35044 |
| mmcblk0p2 | 0.03 | 0.14 | 0.00 | 669 | 8 |

