

DL4 Console

Installation and Setup Manual



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Introduction

This manual assumes that you are installing the DL4 Console in a site predetermined to have a compatible tank gauge and point of sale system as well as connectivity to the Fuel Management Service. Among the topics covered are:

- Introduction and safety precautions
- Console dimensions and component locations
- Console specifications and features
- Console installation
- Connecting AC power wiring to the console
- Initial startup procedure
- Configuring the DL4 for site monitoring and data transmission

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

Warranty Registrations may only be submitted by selected Distributors.

Related Documents

DOCUMENTS REQUIRED TO INSTALL EQUIPMENT











To install intrinsically safe apparatus, use the specific control drawing that appears on the nameplate of the applicable associated apparatus (DL4 Console).




Associated Apparatus	UL/cUL Control Drawing Document No.	ATEX Descriptive System Document No.	IECEX Descriptive System Document No.
8601 (DL4)	331940-018	331940-017	331940-117

Control drawings can be found on the accompanying Compact Disk (TECH DOCS CD) or on the internet at veeder.com under SUPPORT; VR TECHNICAL DOCUMENTS; DRAWINGS.

Safety Precautions

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

 <p>EXPLOSIVE Fuels and their vapors are extremely explosive if ignited.</p>	 <p>FLAMMABLE Fuels and their vapors are extremely flammable.</p>
 <p>ELECTRICITY High voltage exists in, and is supplied to, the device. A potential shock hazard exists.</p>	 <p>TURN ELECTRICAL POWER OFF Live power to a device creates a potential shock hazard. Turn Off electrical power to the device and associated accessories when servicing the unit.</p>
 <p>WARNING Heed the adjacent instructions to avoid damage to equipment, property, environment or personal injury.</p>	 <p>WEAR EYE PROTECTION Wear eye protection when working with pressurized fuel lines or epoxy sealant to avoid possible eye injury.</p>
 <p>GLOVES Wear gloves to protect hands from irritation or injury.</p>	 <p>INJURY Careless or improper handling of materials can result in 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 boards and mounted components.</p>

 WARNING	
 	<p>FAILURE TO COMPLY WITH THE FOLLOWING WARNINGS AND SAFETY PRECAUTIONS COULD CAUSE DAMAGE TO PROPERTY, ENVIRONMENT, RESULTING IN SERIOUS INJURY OR DEATH.</p> <p>Explosive vapors or flammable liquids could be present near locations where fuels are stored or being dispensed.</p> <p>For use with intrinsically safe devices in Class I, Group D and Class I, Zone 0, Group IIA hazardous locations when installed in accordance with the installation manual and applicable Control Drawing.</p> <p>This console is not explosion proof. Do not install this console in a volatile, combustible, or explosive atmosphere.</p> <p>An explosion or fire resulting in serious injury or death, property loss and equipment damage could occur if the console is installed in a volatile, combustible or explosive atmosphere (Class I, Division 1 or 2) or (Group IIA, Zone 0).</p>

National Electrical Code Compliance

The following information is for general reference and is not intended to replace recommended National Electric Code (NEC) procedures. It is important for the installer to understand that electrical equipment and wiring located in Class I, Division 1 and 2 installations shall comply with the latest appropriate Articles found in the National Electric Code (NFPA 70) and the Code for Motor Fuel Dispensing Facilities and Repair Garages, (NFPA 30A).

POWER WIRING

Wires carrying 120 or 240 Vac from the power panel to the console should be #14 AWG (or larger) copper wire for line, neutral and chassis ground (3). Use one 4 sq. mm (#10 AWG) minimum wire for barrier ground.

DL4 Dimensions and Component Locations

Dimensions

Figure 1 illustrates the DL4 Console's dimensions.

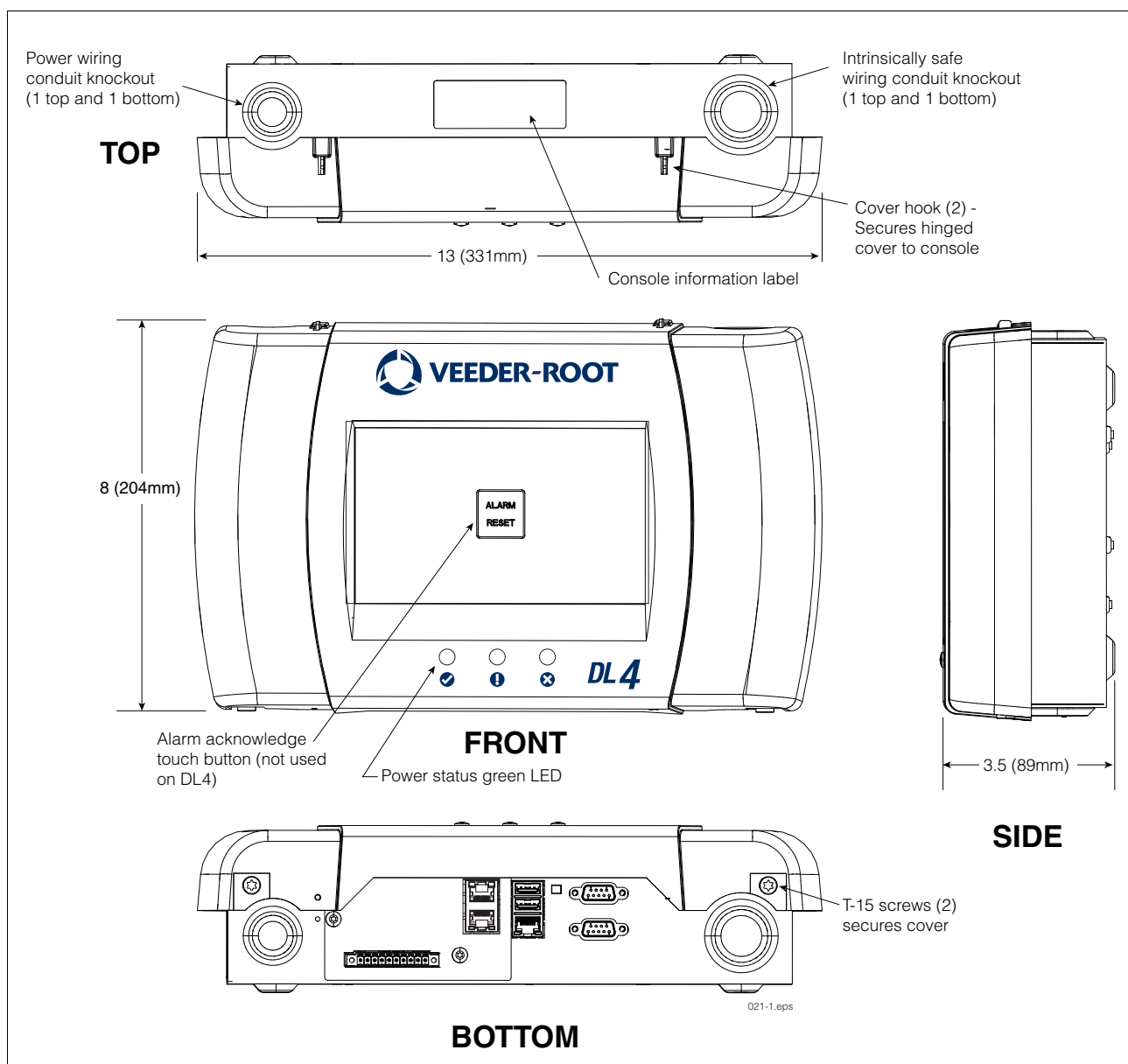


Figure 1. DL4 Console - Dimensions

Component Locations

Figure 2 illustrates the communication ports of the DL4. Figure 3 shows component locations and console mounting holes with cover removed.

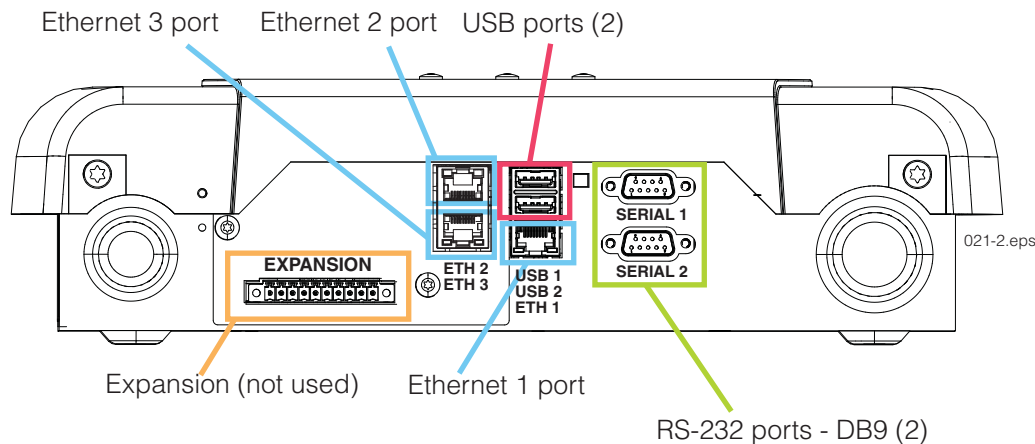


Figure 2. Bottom Panel Communication Connectors

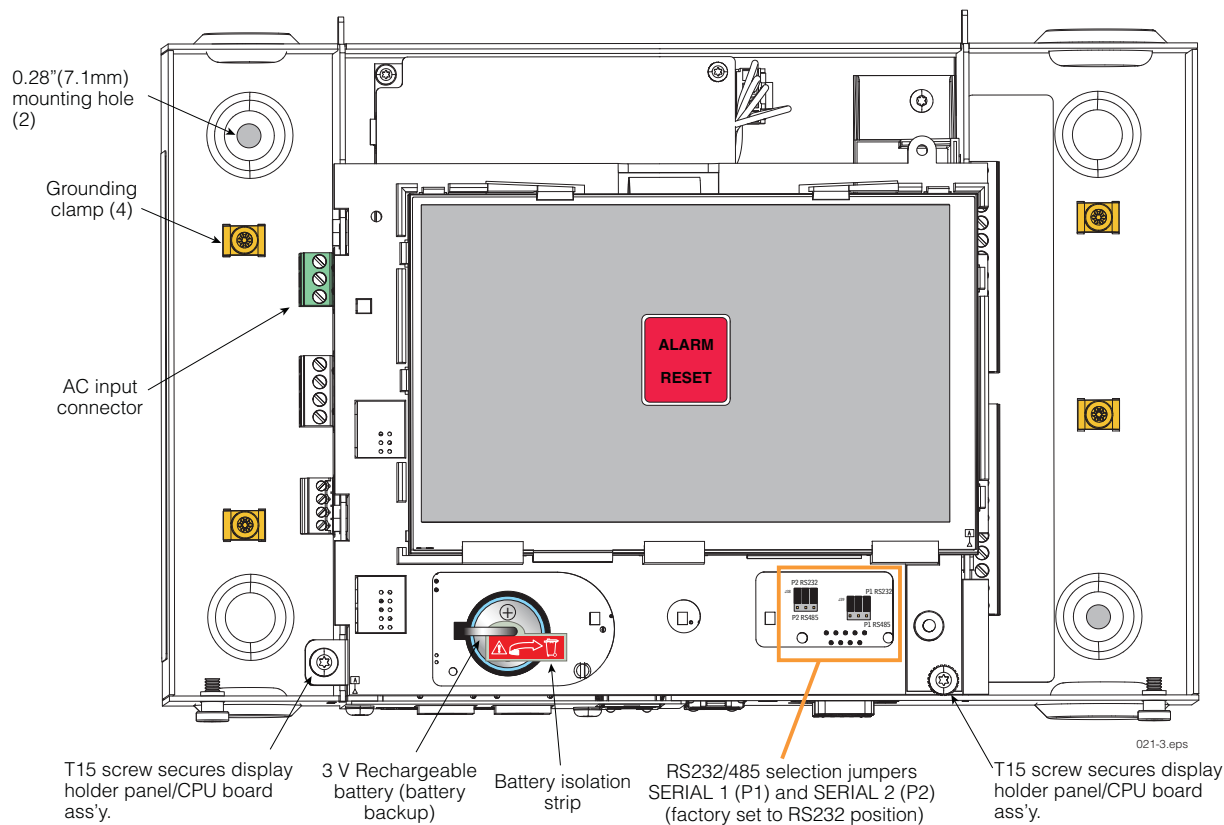


Figure 3. Component Locations with Cover Removed

Figure 4 shows component locations on underside of display holder panel/CPU board assembly. To remove this assembly, remove the two T15 screws securing the assembly, slide the assembly up as far as it will go and lift the assembly out. Disconnect the attached ribbon cable and wire cable to completely remove the assembly.



If necessary to remove the CPU board assembly to replace the SD card or iButton, avoid touching other electronic components on the underside of the CPU board as static electricity may damage them. Wear grounding strap when handling CPU board.

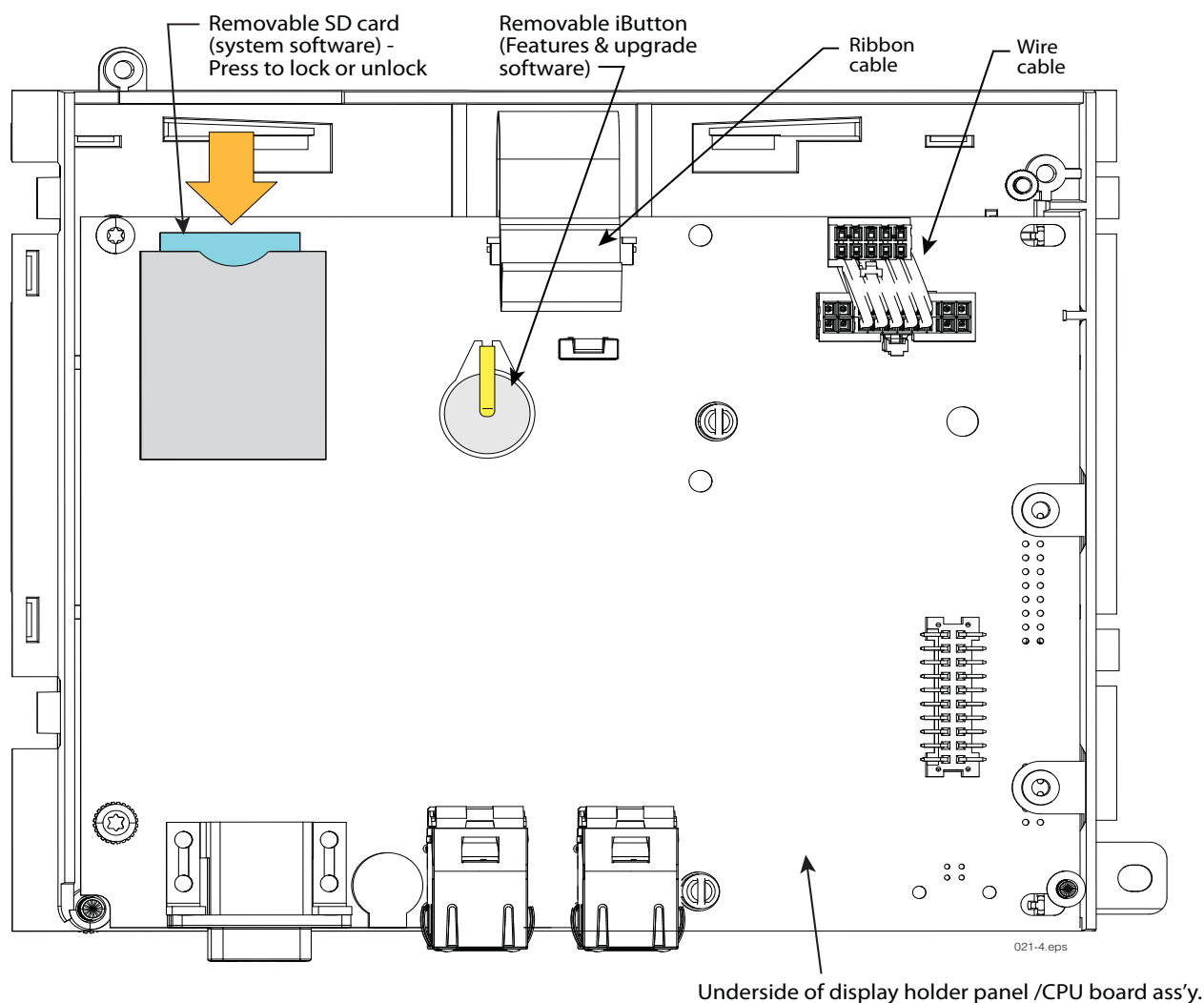
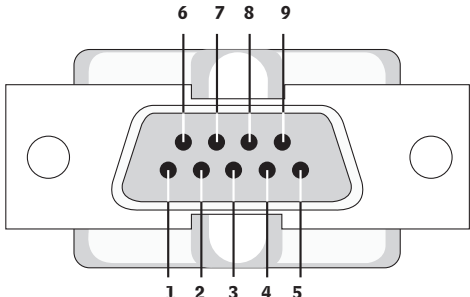
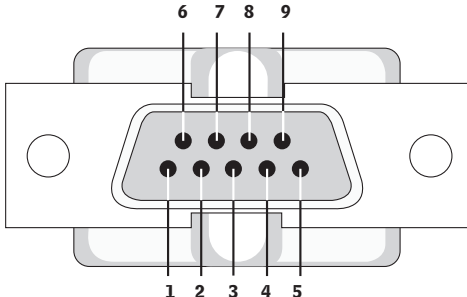


Figure 4. Component Locations - Underside of Display Holder/CPU Board Assembly

Console Specifications and Features

The DL4 console specifications and features are shown in Table 1.

Table 1. DL4 Console Specifications and Features

Feature	Description																																																
Front panel Indicators	3 LED status indicators - The Power (Check) green LED is on when applications are running, flashing when applications are starting, and off when no apps running/no power to DL4. The Warning (!) yellow LED is flashing when a warning condition is active. The Red (X) LED is on when an alarm is active.																																																
Input Power	Universal AC power supply:100 to 249Vac, 50/60Hz, 2A maximum																																																
RS-232 Ports	<p>2 optically isolated serial ports standard, labeled SERIAL 1 supporting full handshaking and SERIAL 2. The RS-232 D-connector is a panel mount, 9-pin female type, wired in a Data Terminal Equipment (DTE) configuration. The system does not require or activate any handshake signals.</p> <p>RS-232 signals are wired to the female D-connectors as follows:</p> <p>SERIAL 1</p> <table><tr><td>Pin</td><td>Signal</td><td>Pin</td><td>Signal</td></tr><tr><td>1</td><td>Data Carrier Detect</td><td>6</td><td>Data Set Ready</td></tr><tr><td>2</td><td>Received Data</td><td>7</td><td>Request to Send</td></tr><tr><td>3</td><td>Transmitted Data</td><td>8</td><td>Clear to Send</td></tr><tr><td>4</td><td>Data Terminal Ready</td><td>9</td><td>Ring Indicator</td></tr><tr><td>5</td><td>Signal Ground</td><td></td><td></td></tr></table> <p>SERIAL 2</p> <table><tr><td>Pin</td><td>Signal</td><td>Pin</td><td>Signal</td></tr><tr><td>1</td><td></td><td>6</td><td></td></tr><tr><td>2</td><td>Received Data</td><td>7</td><td></td></tr><tr><td>3</td><td>Transmitted Data</td><td>8</td><td></td></tr><tr><td>4</td><td></td><td>9</td><td></td></tr><tr><td>5</td><td>Signal Ground</td><td></td><td></td></tr></table>  	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			Pin	Signal	Pin	Signal	1		6		2	Received Data	7		3	Transmitted Data	8		4		9		5	Signal Ground		
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5	Signal Ground																																																
USB Ports	2 powered USB ports, labeled USB 1 and USB 2																																																
Ethernet 1 Port	10/100 Ethernet port. TCP/IP, labeled ETH 1																																																
Ethernet 2/3 Ports	Labeled ETH 2 and ETH 3 (Not Used)																																																

Console Installation

Select an indoor mounting location where you have access to the POS and ATG for connection to the DL4. The console must be protected from severe vibration, extremes in temperature and humidity, rain, and other conditions that could harm computerized electronic equipment. The console's operating temperature range is 32 to 104°F (0 to 40°C), and its storage temperature range is -40 to +162°F (-40 to +74°C).

The mounting surface should be strong enough to support the console's weight of 4 pounds (1.81kg). You should also consider wall space for routing the power wiring conduit and communication cables that must be connected to the console.

To mount the console, remove the two T15 screws in the bottom of the cover (see Figure 1). As you lift up the bottom of the cover it pivots on two tabs that project from the top of the console's chassis into slots in the top of the cover. Lift the cover off the chassis tabs and set it aside. Notice the two 0.28" (7.1mm) diameter mounting holes in the base of the chassis at the left top and right bottom corners (see Figure 3). Locate the chassis on the wall in the desired mounting location, mark the hole locations, drill appropriate pilot holes; and using 1/4-inch (6mm) maximum fasteners (customer supplied), attach the chassis to the mounting surface.

Connecting AC Power Wiring to the DL4

Check the Input Power Rating on the label affixed to the underside of the DL4 console to verify input power requirements.

⚠ WARNING



The DL4 console contains high voltages which can be lethal. It is also connected to low power devices that must be kept intrinsically safe.

1. Turn power off at the circuit breaker. Do not connect the console AC power supply wires at the breaker until all devices are installed.
2. Attach conduit from the power panel to the DL4's Power Area knockouts only.

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



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

1. Pull four wires between the power panel and the console; three #14 AWG or larger color-coded wires for AC line (hot), AC neutral and chassis ground and one 4 sq. mm (#10 AWG) minimum wire for barrier ground.
2. Connect the input 120 or 240 Vac power wires as shown in Figure 5.

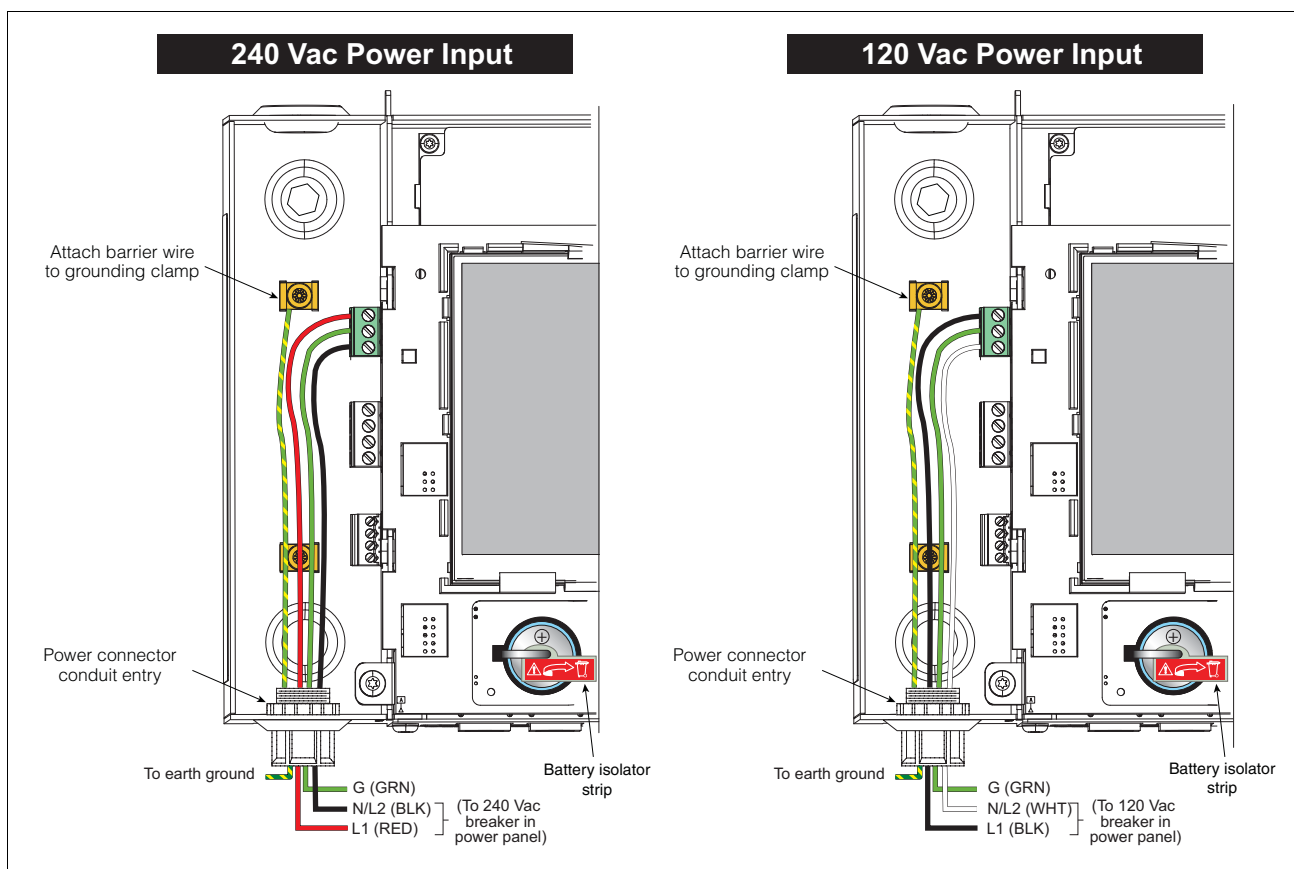


Figure 5. Wiring AC Power to the DL4 Console

Initial Startup Procedure

Once the communication devices, etc., are connected to the console, remove and discard the backup battery isolator strip (see Figure 5).

Replace the front cover. Attach a label to the breaker feeding the console. This allows others to know how to disconnect power to the console when servicing the system. Communicate to facility personnel which breaker feeds the console.

Switch the dedicated circuit breaker ON to apply power to the console.

Configuring DL4 for Site Monitoring and Data Transmission

BIR Protocol DIM

POS SYSTEM REQUIREMENTS AND LIMITATIONS

For sites using the DL4 DIM, the Point of Sales (POS) system must conform to established Veeder-Root protocol and allow the DL4 to collect the metered sales data necessary for it to perform its Business Inventory Reconciliation (BIR) and Wet Stock Management (WSM) tasks. This protocol is separate and distinct from the inventory protocol commonly used by POS and other systems to collect inventory data from Veeder-Root TLS consoles.

The following POS systems are known to have implemented the Veeder-Root protocol and thus support BIR protocol DIM (Dispenser Interface Module).

Table 2. POS Systems Using V-R Protocol*

Forecourt Controller	Protocol Name	TLS-350R	TLS-450
Allied	Station Site Controller (SSC)	X	X
Gilbarco	T-4 (Australia)	X	
PEC	8850	X	
POSTEC	RCC	X	
Wayne	Marketer 2000 (Sweden)	X	

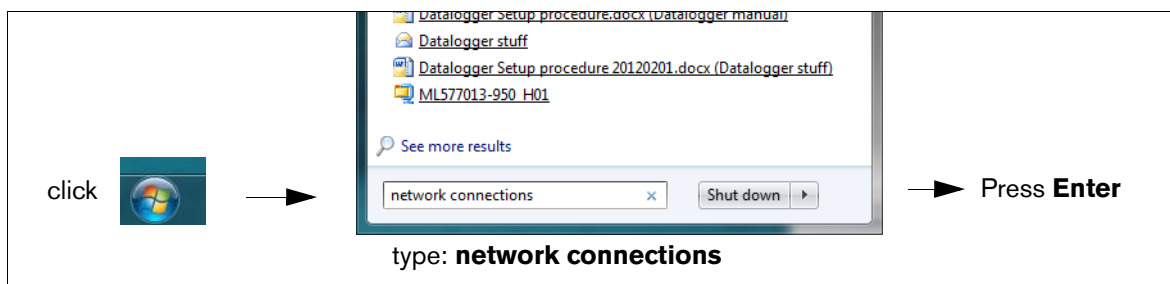
*When the proper hardware/software combinations are used.

DL4 Site Connection and Initialization

After you are connected the DL4 to the appropriate site equipment follow the steps below to setup the DL4.

NOTE: You must wait at least 5 minutes after powering on the DL4 before starting this procedure.

1. Using an ethernet crossover cable, connect a laptop PC to ethernet port ETH 1 on the DL4 (see Figure 2).
2. You must configure the laptop's wired integrated Local Area Network by clicking on the Windows Globe in the lower right of the task bar, and typing in network connections in the 'Search programs and files' field and then pressing Enter (see below):



3. **NOTE: The screen shots contained in this manual are for reference purposes only. The actual settings and data shown in the following examples are dependent on the laptop or PC operating system used to configure this hardware.**

In the Network Connections screen, double click on the wired (not wireless) integrated Local Area Connection. In the example below (Figure 6), you would double-click Local Area Connection 2.

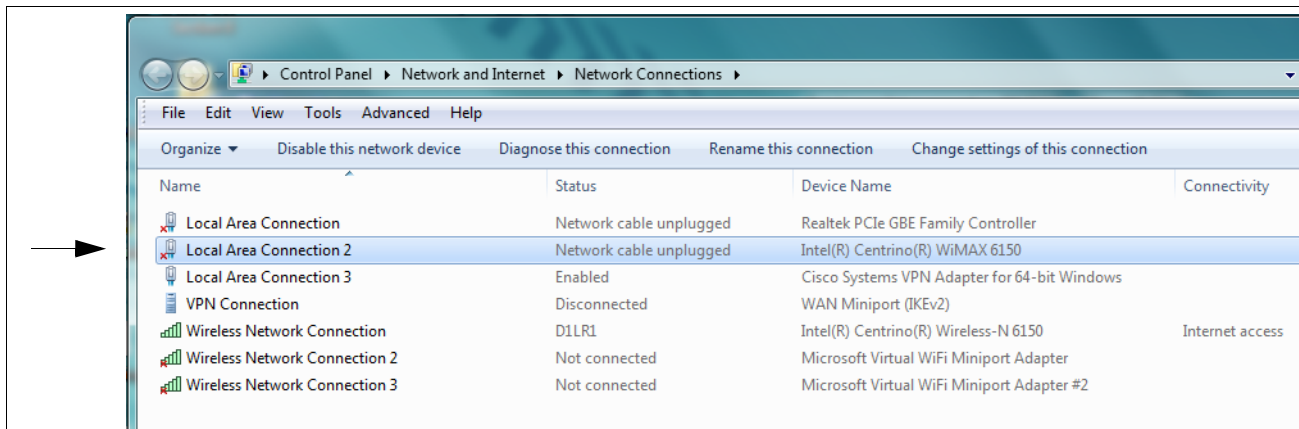


Figure 6. Configuring LAN

4. When the selected Local Area Connection Properties dialog box opens make the selection shown in Figure 7.

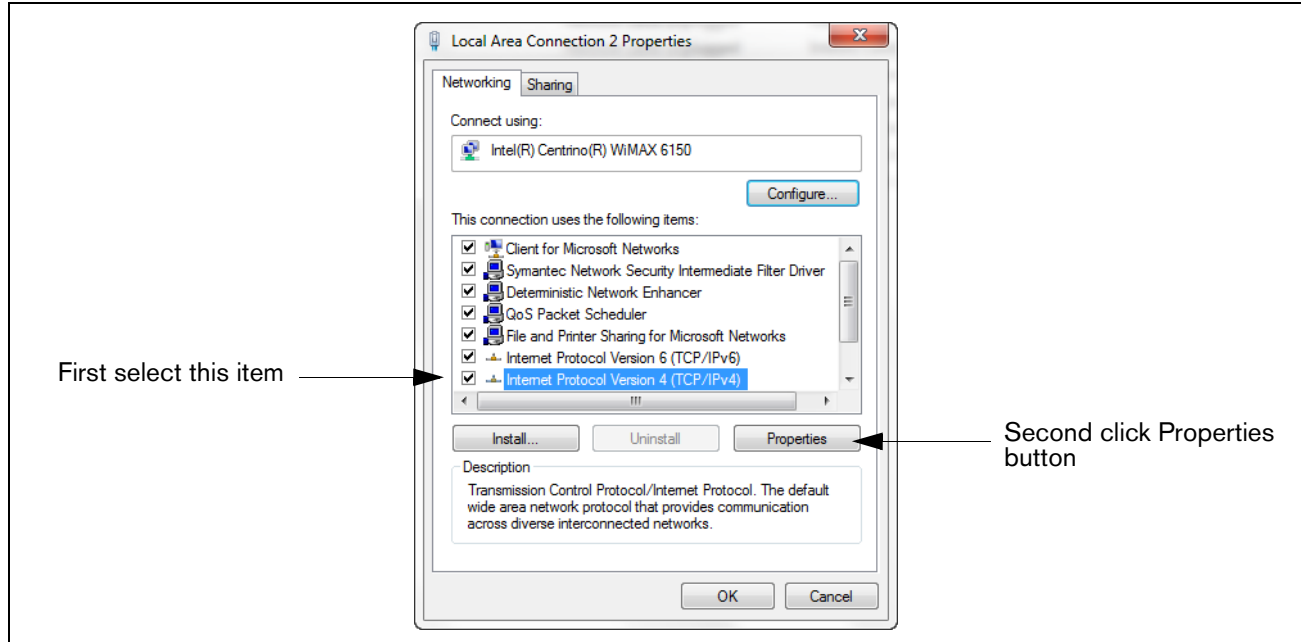


Figure 7. Local Area Connection 'X' Properties dialog box selections

5. When the Internet Protocol Version 4 (TCP/IPv4) Properties dialog box opens make the selections shown in Figure 8.

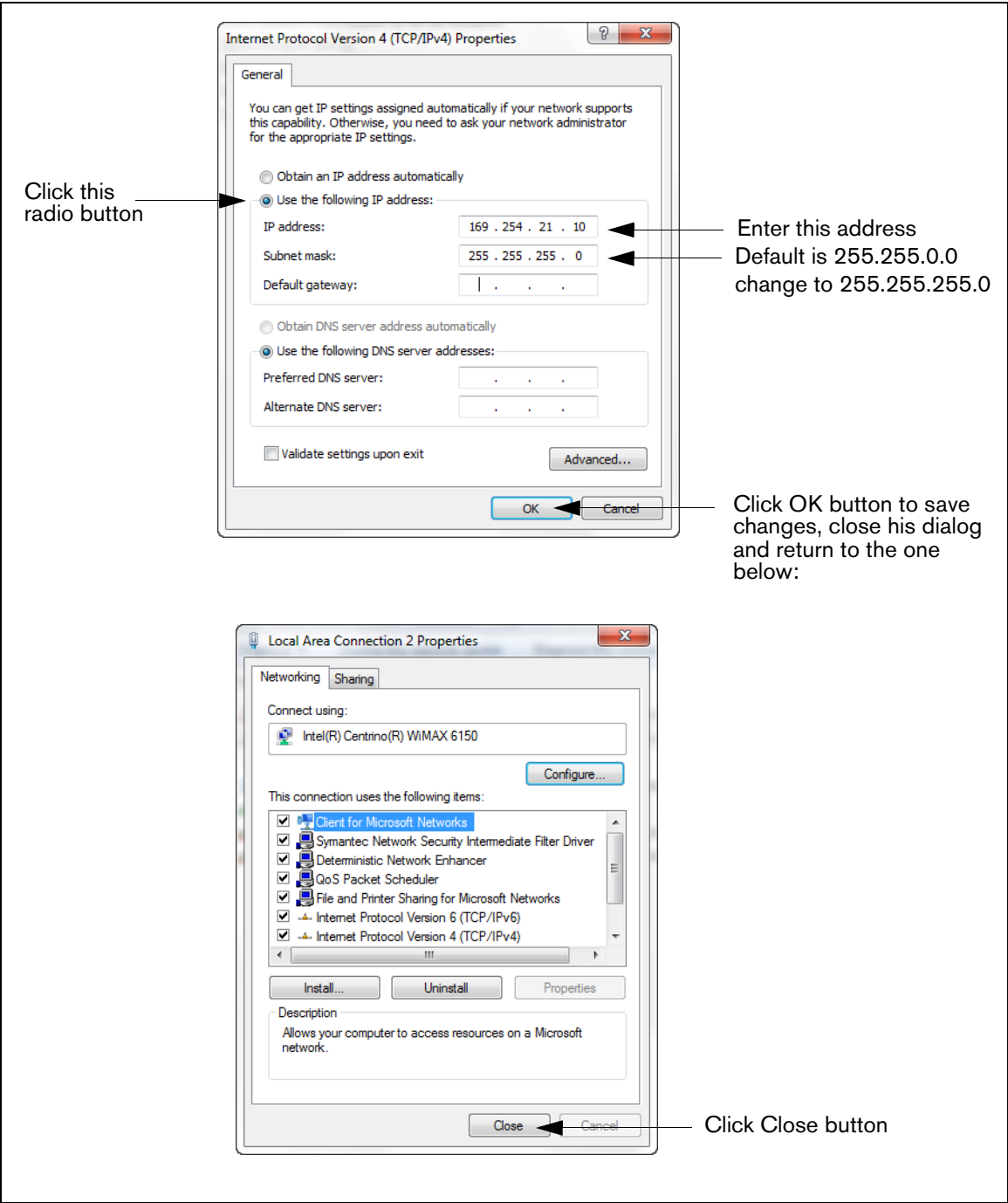


Figure 8. Internet Protocol Version 4 (TCP/IPv4) Properties dialog box selections

6. On the laptop, open an internet browser and enter the IP address **https://169.254.21.12/GeneralSetup** in the browser's address bar. When the login page displays, enter 'guest' for both User name and Password.

NOTE: The DL4 simultaneously runs two applications; one programs the general communication protocols (GeneralSetup), and the other programs how the DL4 gathers its information (DLSetup). Pressing the blue arrow at the top middle of the screen will toggle you between the two programs (see Figure 9). After entering selections/changes to fields on any page, click the Save button to save your entries, or Cancel to discard them. Programming screens used to setup the DL4 are listed in Table 3.

Table 3. DL4 User Interface Screens

GeneralSetup Application Pages		See Example	DLSetup Application Pages		See Example
Communication Setup	Ethernet Port Setup	Step 7.	System Setup	Communication	Step 18.
	Serial Port Setup	Step 8.		FMS Identification	Step 19.
	CDIM Setup	Diag. use only		ATG Commands	Step 13.
	TDIM Setup	Step 12.		DIM Commands	Step 13.
		Site Id Server Setup	Diag. use only		FMS Heartbeat
System Setup	Hostname	Step 13.	Communication Testing	ATG	Step 20.
	Date and Time	Step 15.		POS	Step 21.
	Units	Step 16.		DIM	Diag. use only
		Alarm Filtering	Diag. use only		
Diagnostics	DIM Communica- tions	Step 14.			
	Ping	Diag. use only			
	Traceroute				
DB Backup					
DB Restore					
Download New Version					
Activate/Revert					
Software Mainte- nance	Upgrade Fea- tures				

7. On the "Communication Setup" page (see Figure 9), click on "Ethernet Port Setup" (1) and select the Device type "ETH 1" (2) from the drop-down menu. In the IP Address Type field (3):

If the site is using a static IP address, select "Static IP"; and enter the IP address assigned by your network administrator. Once this is complete, click the "Save" button to keep these settings (see example in Figure 9).

If the site is using a dynamic IP address, select "Dynamic IP" (the remaining parameters will auto-fill once the DL4 is reconnected to the site network). Click "Save" (4) to accept your entries.

NOTE: If you receive an error message after clicking "Save", click "OK" and refresh the page.

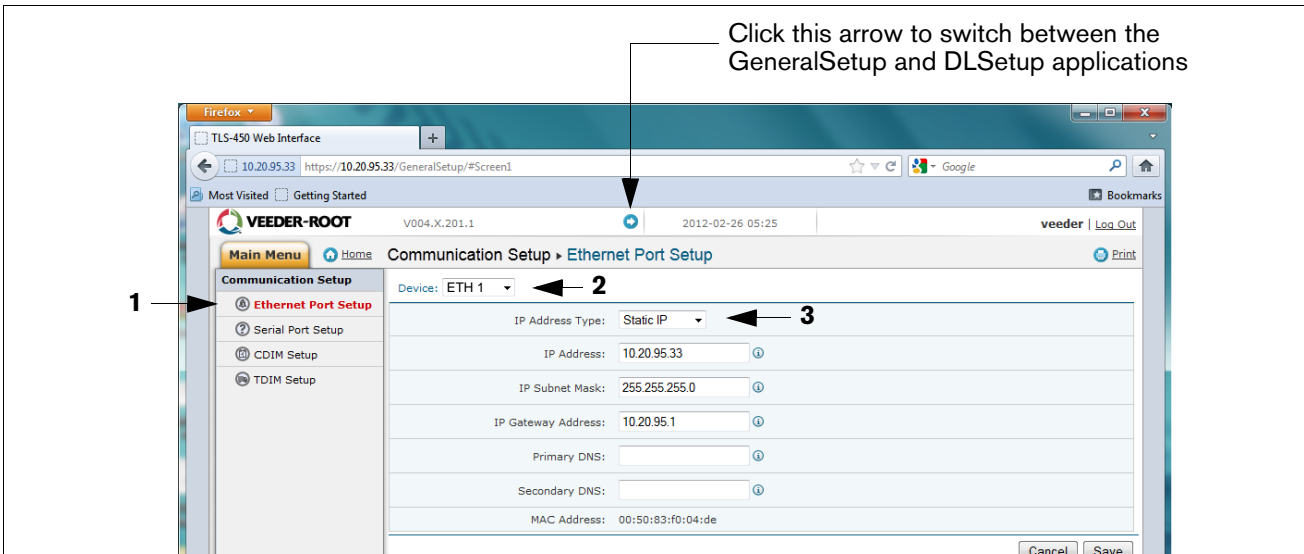


Figure 9. Ethernet Port Setup

8. On the “Communication Setup” page, select “Serial Port” setup and for “Device” select “SERIAL 1” (see Figure 10).

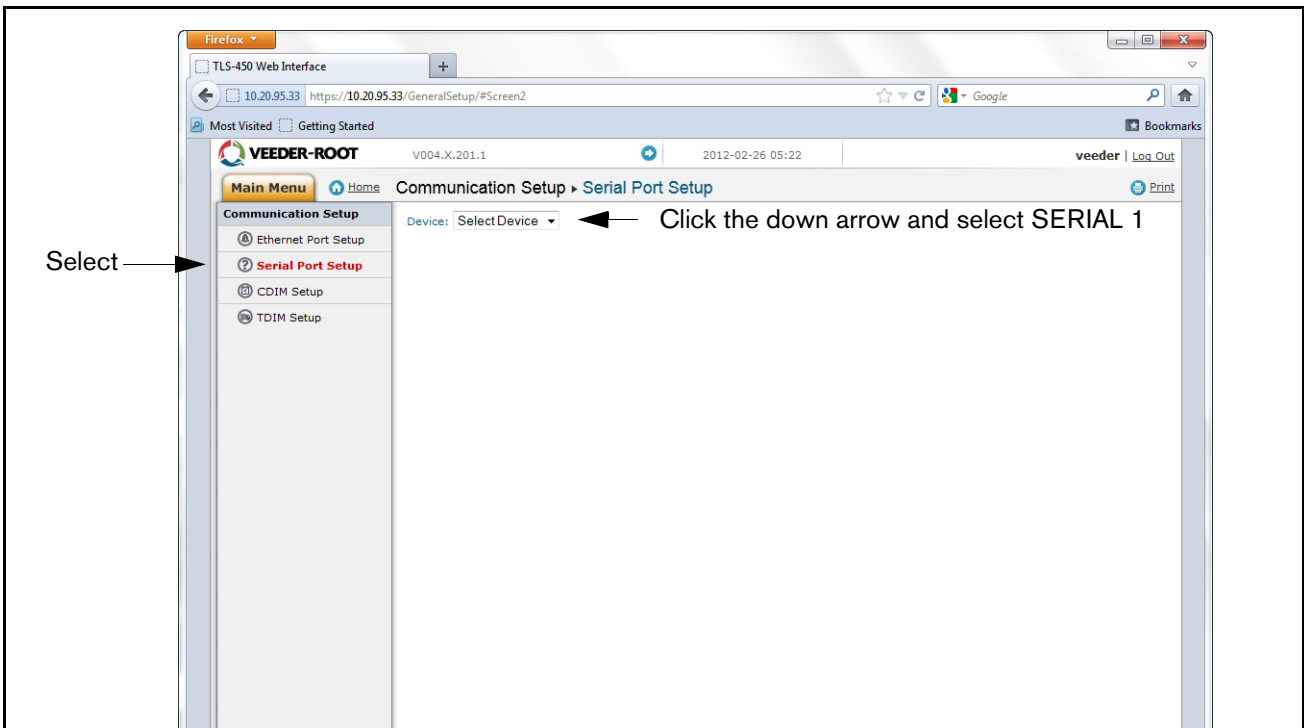


Figure 10. Switching between Data Logger Applications

9. Use this port (SERIAL 1) for the connection to the ATG, and enter “ATG” for the Label. Set the correct communications parameters for the ATG using the drop down menus. For HandShaking, select “No Hand Shaking”. Click the “Save” button to keep these settings (see example in Figure 11).

VEEDER-ROOT V004.X.201.1 2012-02-26 04:35 veeder | Log Out

Main Menu Home Communication Setup ▶ Serial Port Setup Print

Communication Setup

- Ethernet Port Setup
- Serial Port Setup**
- CDIM Setup
- TDIM Setup

Device: SERIAL 1:ATG

General

Card Type: RS 232

Label: ATG

Baudrate: 9600 ← Recommended Baudrate

Stop Bits: One

Byte Size: Seven

Parity: Even

Other

HandShaking: No Hand Shaking ← Select No

Cancel Save

Figure 11. Serial Port Setup, SERIAL 1 - ATG

10. Still on the Serial Port Setup page, in the “Device” field, select “SERIAL 2”. Use this connection for the connection to the POS, and enter “POS” for the Label. Set the correct communications parameters for the POS using the drop down menus. For HandShaking, select “No Hand Shaking”. Click the “Save” button to keep these settings (see example in Figure 12).

Firefox TLS-450 Web Interface 10.20.95.33 https://10.20.95.33/GeneralSetup/#Screen2

VEEDER-ROOT V004.X.201.1 2012-02-26 04:36 veeder | Log Out

Main Menu Home Communication Setup ▶ Serial Port Setup Print

Communication Setup

- Ethernet Port Setup
- Serial Port Setup**
- CDIM Setup
- TDIM Setup

Device: SERIAL 2:POS

General

Card Type: RS 232

Label: POS

Baudrate: 9600 ← Recommended Baudrate

Stop Bits: One

Byte Size: Seven

Parity: Even

Other

HandShaking: No Hand Shaking ← Select No

Cancel Save

Figure 12. Serial Port Setup, SERIAL 2- POS

11. **If the DL4 is not connected to the POS, perform this step. If the DL4 is connected to the POS, skip to step 12.**

Go to the “DLSetup” application by clicking on white arrow in blue circle top center of screen (see Figure 10), and under “System Setup”, click on “ATG Commands (1 in Figure 13)”. Then click on the “+ Add New Command” text at top right of screen (2 in figure). When the Add Command dialog box appears enter the command “i@C300”, add the Description “DIM_EVENTS”, set the Repeat Interval to “60” (3 in figure) and click Save (4 in figure).

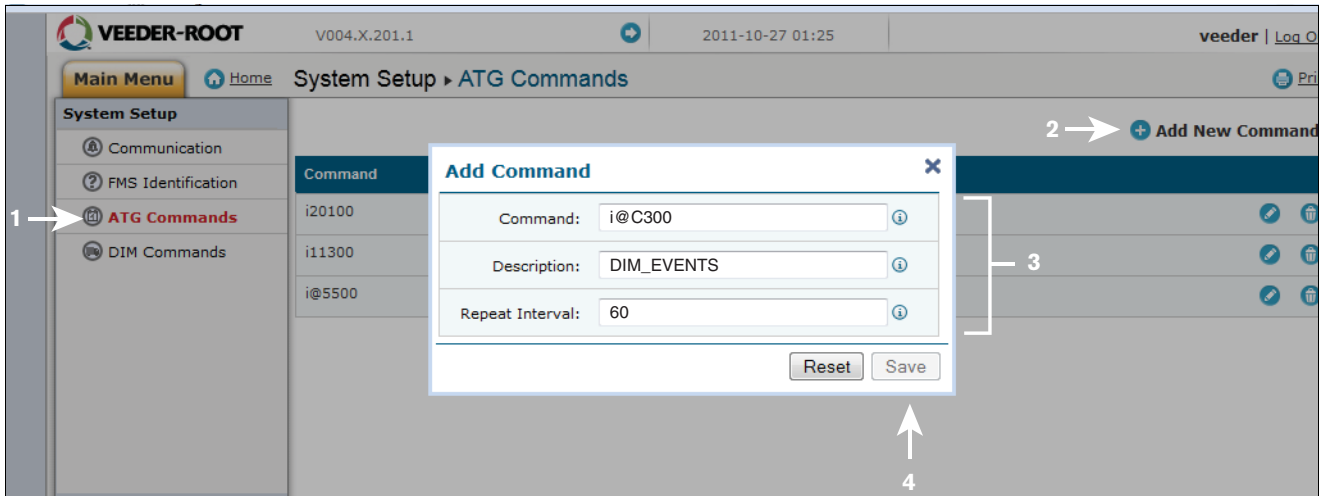


Figure 13. Entering ATG Command

Click on the DIM Command page and then click on the trash can icon on the right end of the i@C300 command line to delete the i@C300 command (see Figure 14). Jump back to the “GeneralSetup” application by clicking on arrow top center of screen.

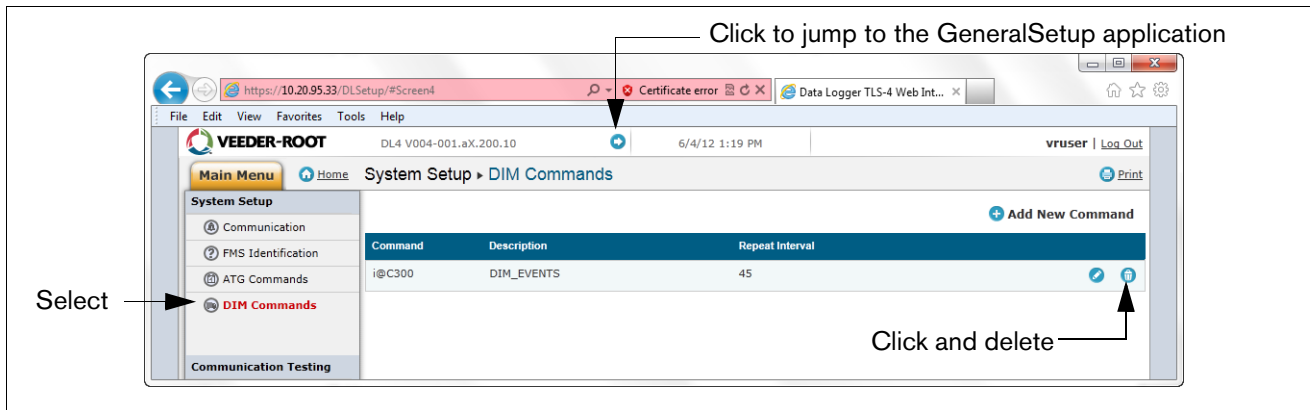


Figure 14. Deleting ATG Command

12. If the DL4 is connected to the POS, perform this step

Select “TDIM” set-up. Select “TDIM (ETH1)” from the drop-down menu. On the “TDIM Enable” drop down, select “TRUE” and type in a label (maximum of 20 characters). Then select the DIM protocol being used and click “Save”. Accept the default Listen Port (unless there is a conflict with another device) and select the desired units (see example in Figure 15). Once this is complete, click on “Save” to keep these settings.

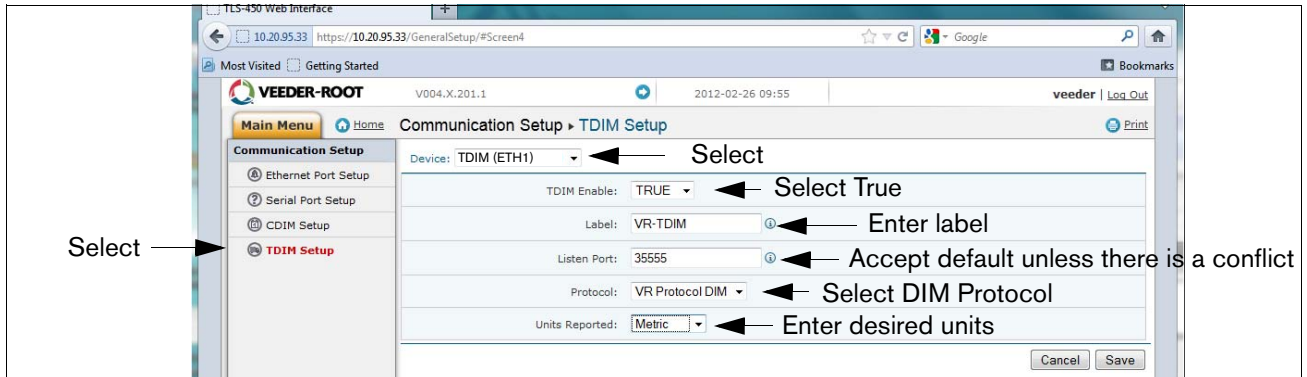


Figure 15. TDIM Setup

13. Select the "System Setup" page and type in the Host name and then click the "Save" button (see example in Figure 16). It is recommended that you use the network name assigned by the network administrator or some other name that identifies the location. While on this page click the Diagnostic Page link (bottom Left).

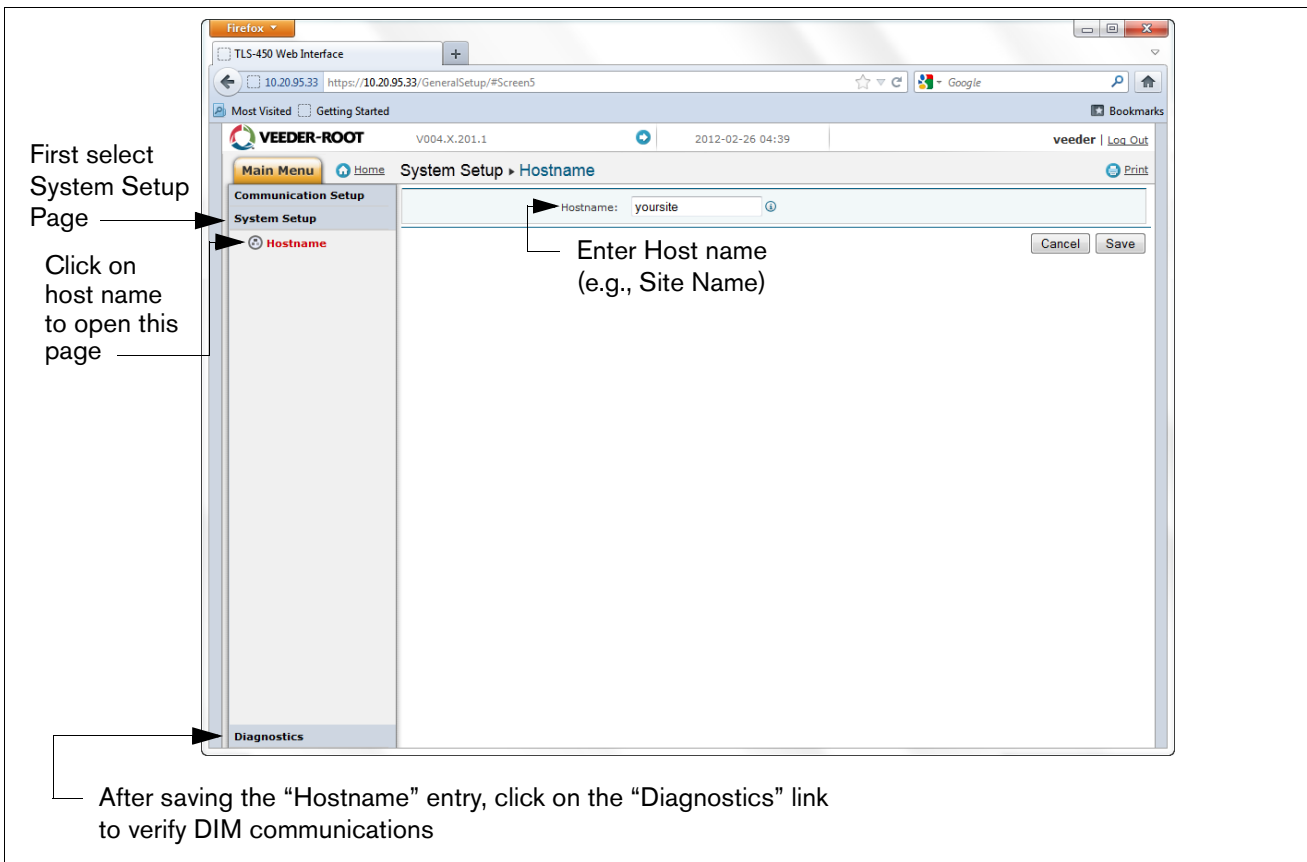


Figure 16. Entering Host name

14. In the "Diagnostics" page (lower left in above figure), click on "DIM Communications" to verify that the DIM communications are successfully being recorded by the DL4. Any transactions occurring after the DL4 was configured will be shown on the screen (see example in Figure 17).

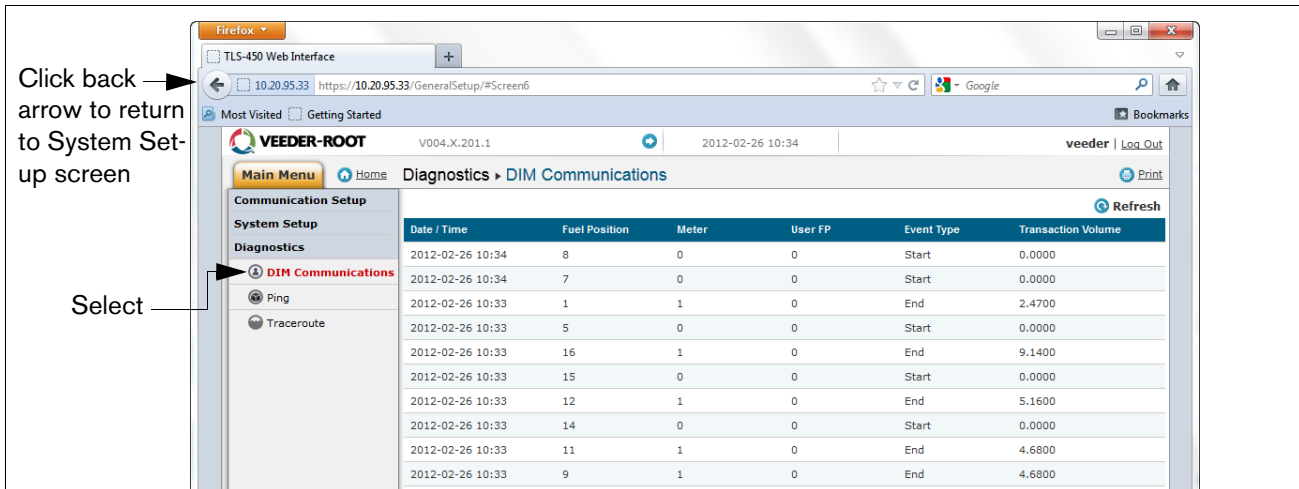


Figure 17. Verifying DIM Communication

15. From the System Setup menu, select Date and Time link to access the current date/time entry screen (see example in Figure 18).

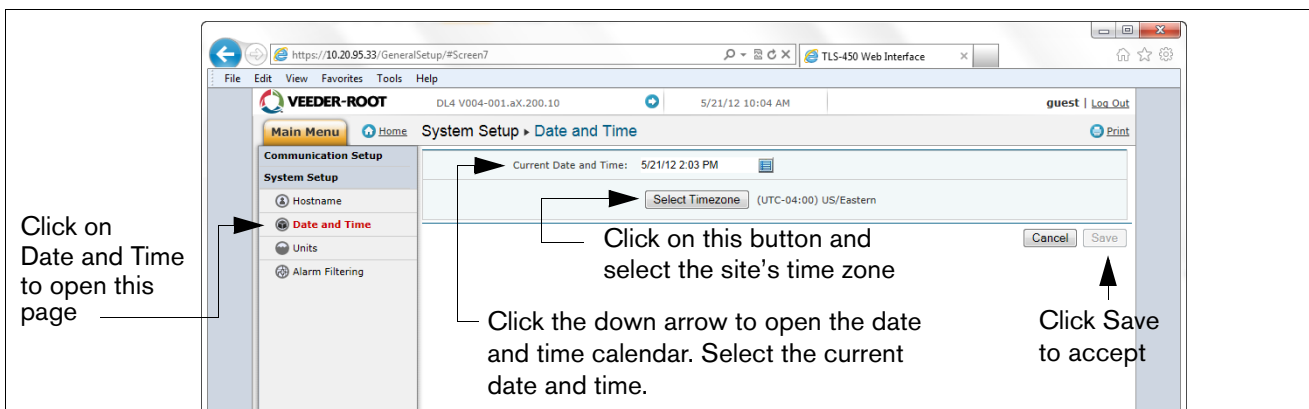


Figure 18. Entering Date and Time

16. From the System Setup menu, click on the Units page(1), select the desired units (2), click Save (3) (see example in Figure 19).

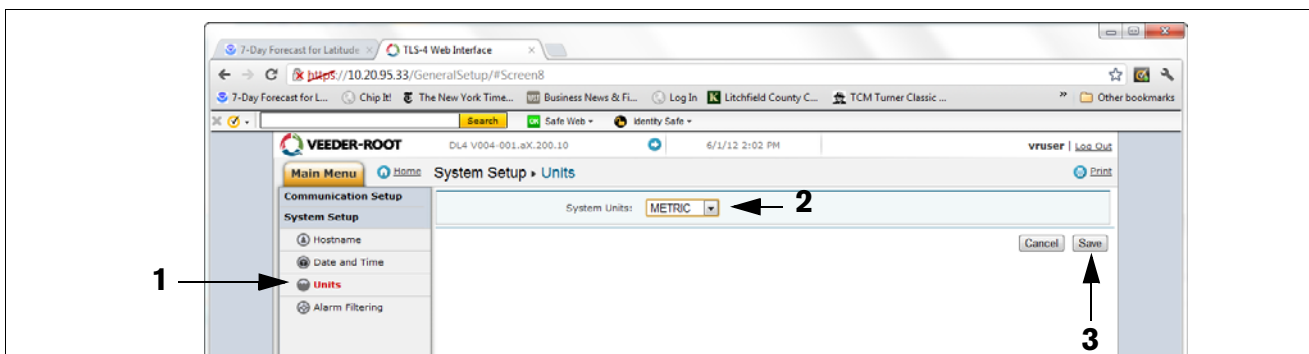


Figure 19. Selecting System Units

17. Click on arrow just to the left of the date to switch to DLSetup application (see Figure 20).

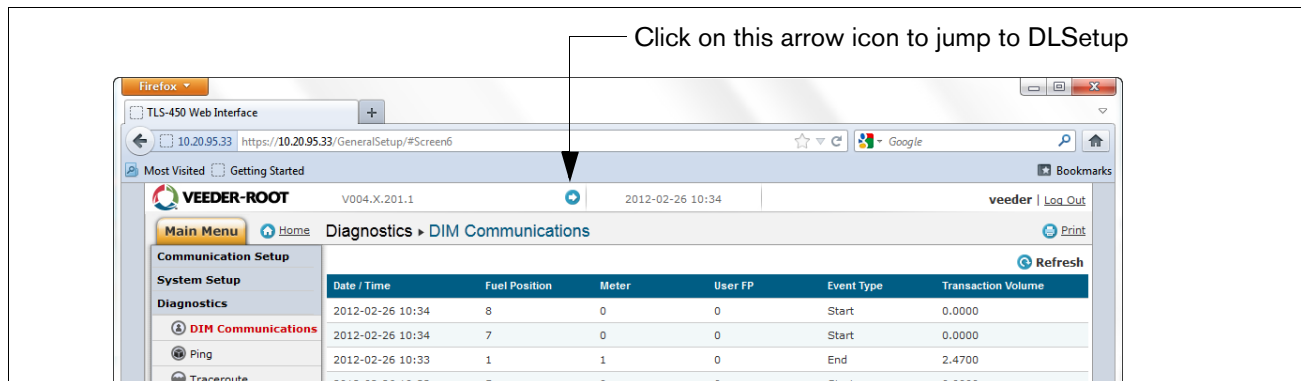
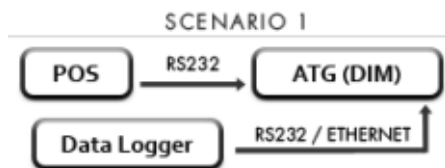


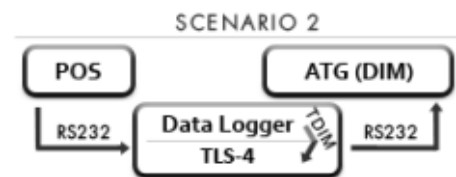
Figure 20. Switching to DL Setup

18. On the DLSetup "Communication" page, under "Environment Configuration" there are three possible configurations:

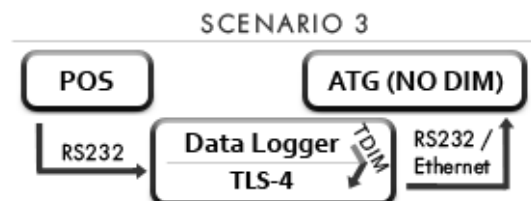
- Scenario 1 - POS connects to ATG (w/DIM), DL4 polls for transactions and inventory from ATG.



- Scenario 2 - POS connects to DL4 and passes transactions through to ATG (w/DIM).



- Scenario 3 - POS connects to DL4 (w/DIM), but transactions do not pass through to ATG (w/o DIM)..



Based on the ATG type at the site and whether it has an available RS232 port, determine which Scenario will be used. To simplify the installation, it is preferable to use Scenario 1 whenever the ATG has a spare RS232 port available.

Scenario 1 - make the selections shown below if the POS is connected to the ATG, and the ATG is providing the DIM function and the DL4 is connected to a spare RS232 port on the ATG (see example in Figure 21).
NOTE: VR Protocol is pre-selected and cannot be changed (currently it is the only supported protocol).

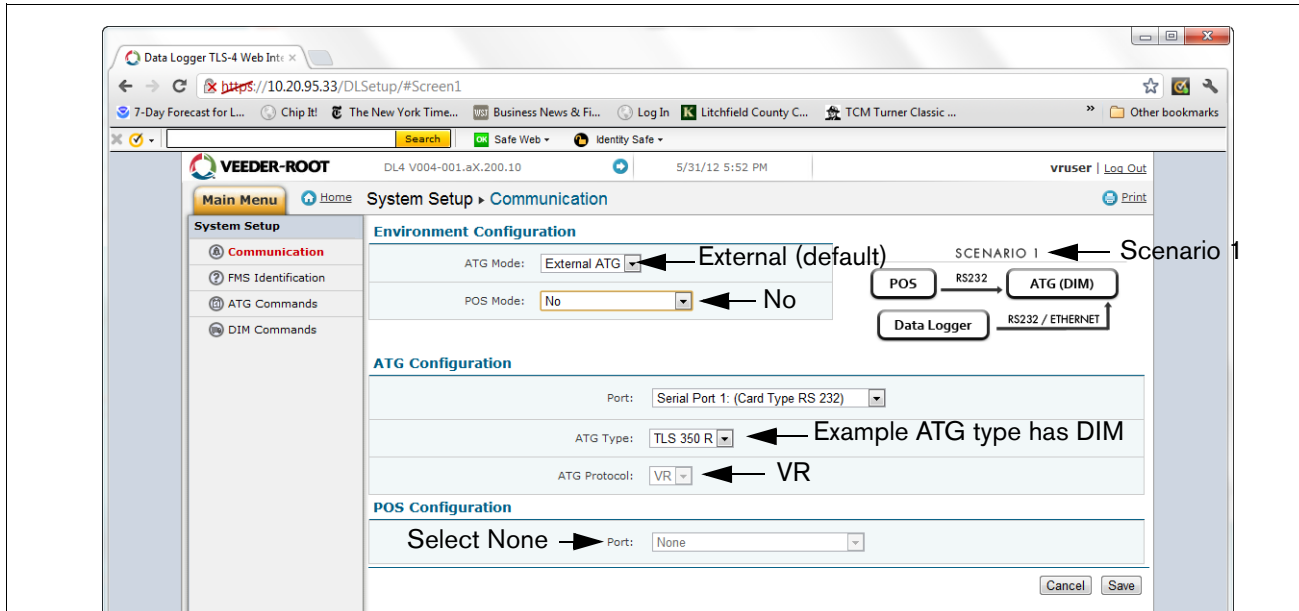


Figure 21. Example Environmental Configuration Page Settings - Scenario 1

Scenario 2 - Make the selections shown below if the DL4 is connected between the POS and the ATG, and the ATG is providing the DIM function, and select applicable ATG (see example in Figure 22).
NOTE: VR Protocol is pre-selected and cannot be changed (currently it is the only supported protocol).

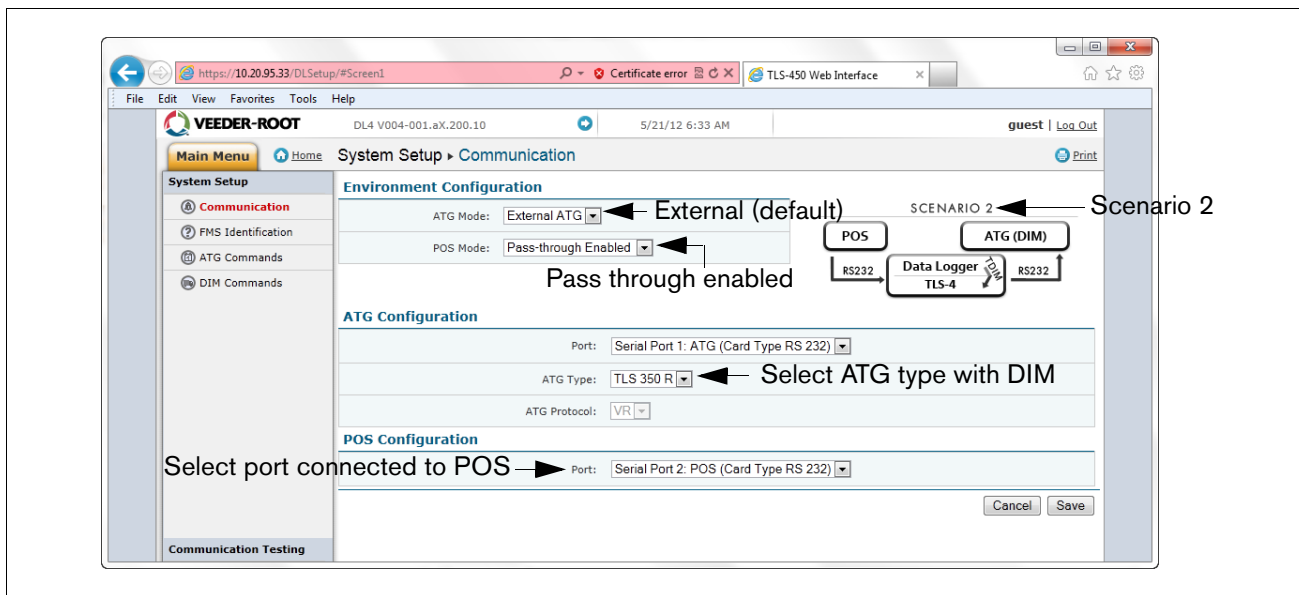


Figure 22. Example Environmental Configuration Page Settings - Scenario 2

Scenario 3 - Make the selections shown below if the DL4 is providing the DIM function. Verify that the connections between the POS, DL4 and ATG are consistent with the scenario illustration shown on the upper right-hand side of the screen. Note: the illustration requires a few seconds to update after you make a change to the screen selections (see example settings in Figure 23). Note: TDIM setup in GeneralSetup must be completed first (ref. Step 12).

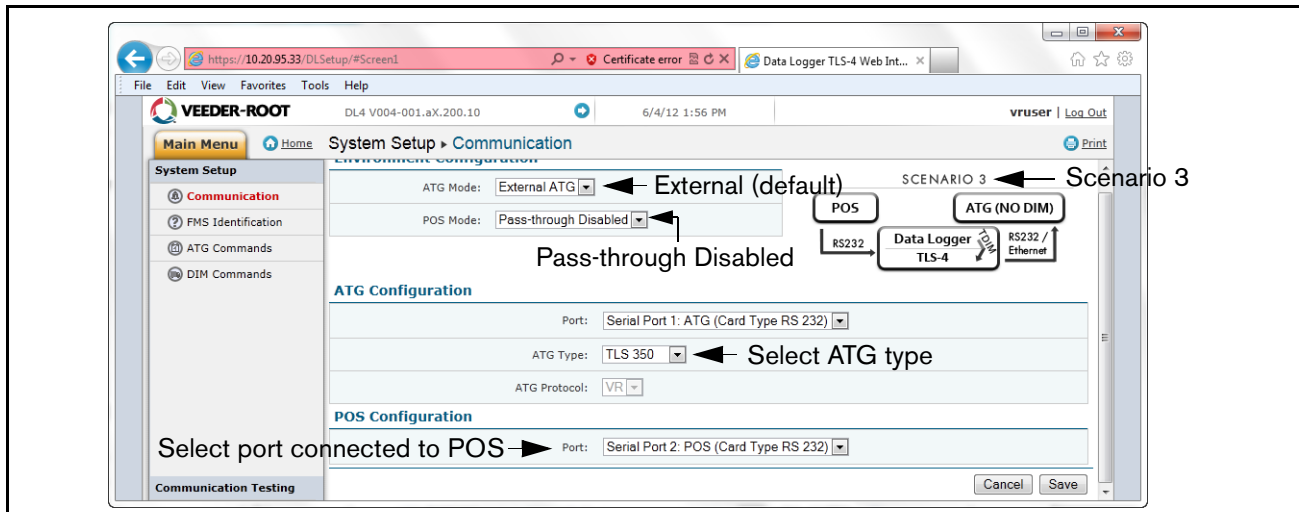


Figure 23. Example Environmental Configuration Page Settings - Scenario 3

Under “ATG Configuration”, select the port that is connected to the ATG on the “Port” drop down menu. Then select the “ATG type” that the DL4 is connected to from the drop down menu. ATG Protocol current only allows “VR” so this selection cannot be changed. Under “POS Configuration”, select the port that is connected to the POS on the “Port” drop down menu. Once you have completed these selections for the installation scenario, click the “Save” button to keep these settings.

19. Select the “FMS Identification” screen and enter the six-digit FMS site identification number. Then click on the “Save” button (see Figure 24).

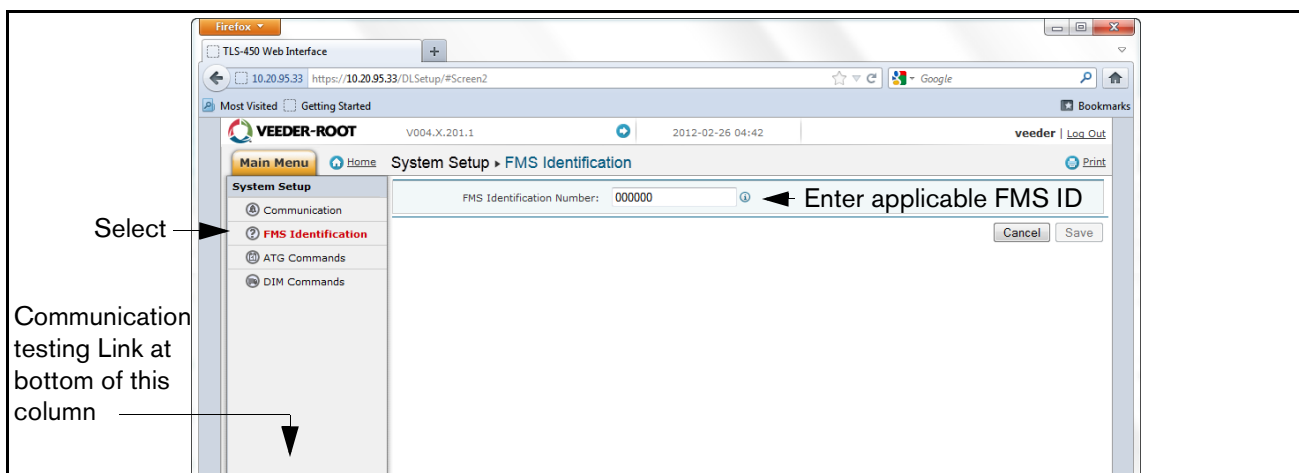


Figure 24. Example FMS ID Entry

20. Wait at least 30 seconds from the completion of the previous step to allow for the system to re-initialize with the new settings. Then click on the “Communication Testing” link at the lower left bottom of the System Setup column (see above figure), then click on “ATG”. Click on the “Inventory” button, which will enter the command

"I20100". After several seconds, a Response should appear providing the current inventory data from the ATG. If no response is received, there is a problem either in the setup parameters or the physical connection to the ATG.

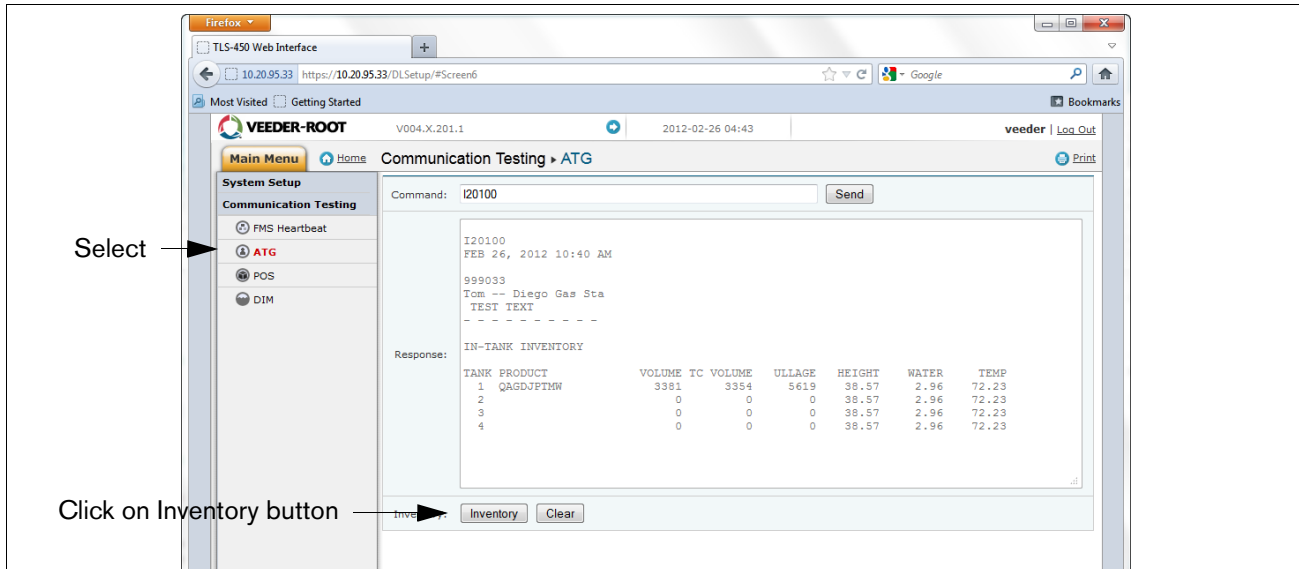


Figure 25. Inventory Command Results

21. If the DL4 is connected in the Pass-Thru mode (Scenario 2) and is accepting commands from the POS and passing them through to the ATG, click on "POS" to detect the POS protocol. Click the "START" button next to "Auto Detect Protocol" and wait for the Protocol Type to appear (see example in Figure 26).

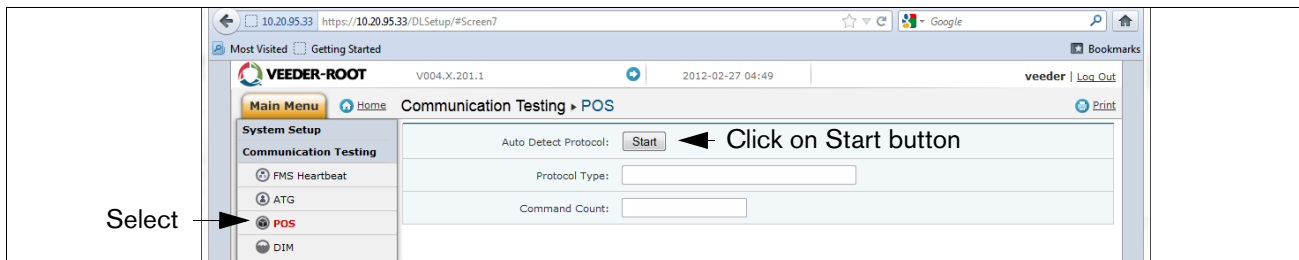


Figure 26. POS Protocol Type Query

Verify that this is the correct protocol that was entered in the DIM setup in Step 12. Then click on the "Stop" button (see example in Figure 27).

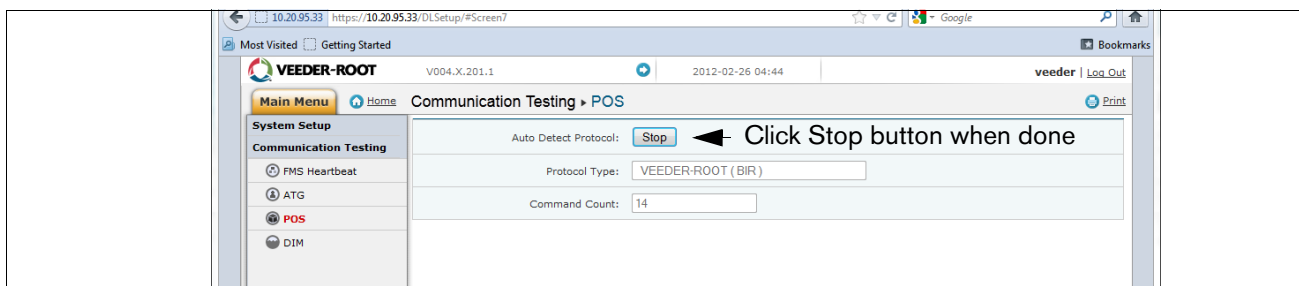


Figure 27. POS Protocol Type Results

22. The DL4 should now be configured to collect inventory and transactional data, which will be periodically retrieved by FMS. To verify connectivity with FMS, reconnect the DL4 to the network or cell modem. Go to the “DLSetup” application’s Communication Testing screen, click on “FMS Heartbeat”, then click on the “Send Heartbeat” button (see Figure 28). Wait for the “Response” text to indicate PASS or FAIL. A PASS confirms that the DL4 is successfully communicating with FMS. A FAIL indicates that the connection has failed and you will need to contact FMS or the network administrator for troubleshooting assistance.

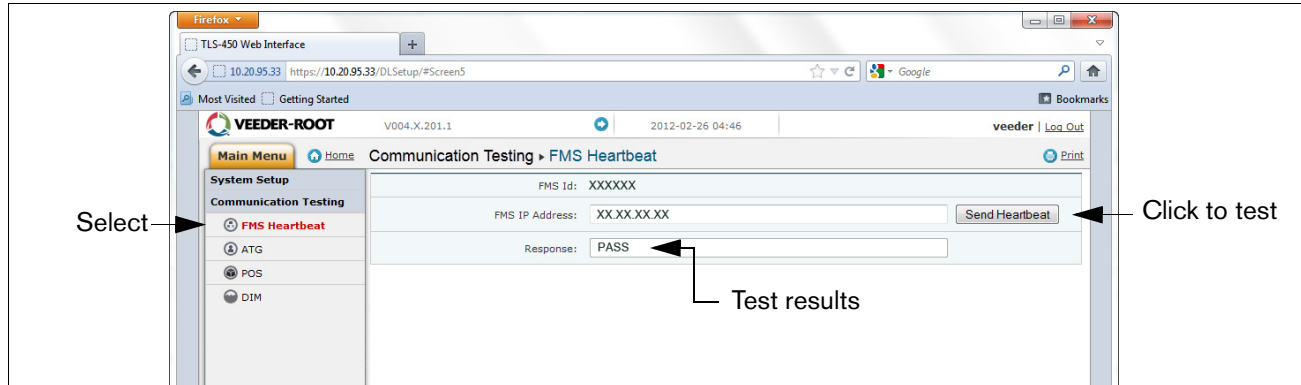


Figure 28. FMS Heartbeat Screen



IMPORTANT! Connectivity between the DL4 and FMS must be verified prior to completing the installation.

23. Return your laptop PC to the network settings originally set prior to the changes you made in Step 5.

