Smith Meter® AccuLoad® IV Demonstration Kit and Virtual Load Rack User Manual

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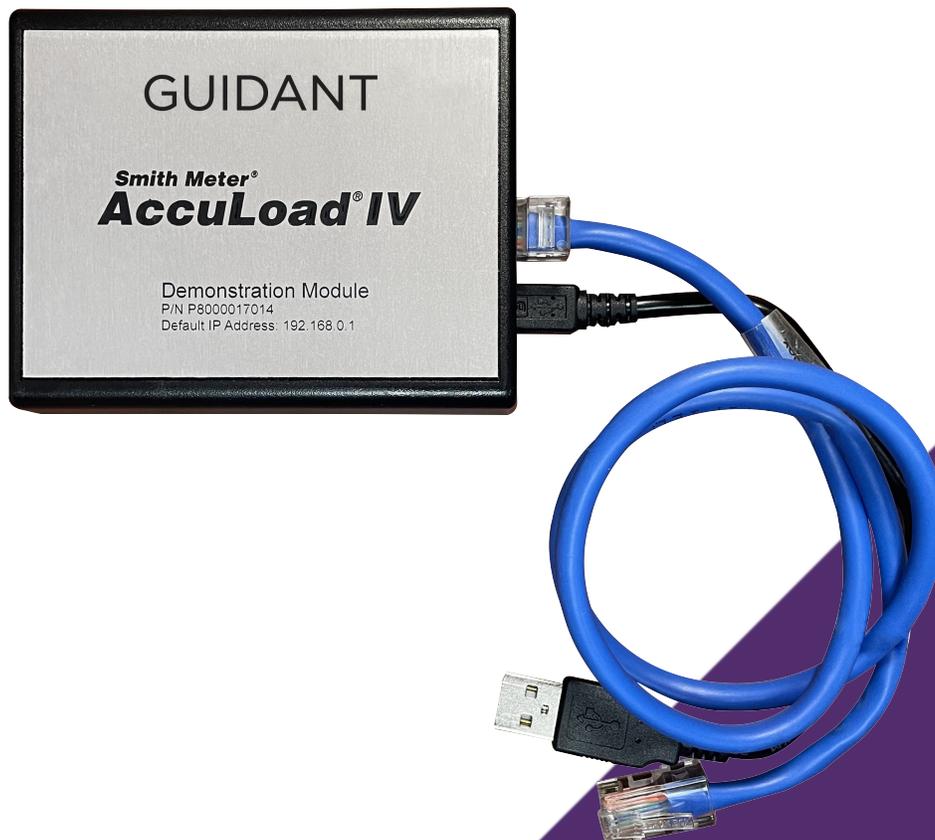
Important

All information and technical specifications in this document have been carefully checked and compiled by the author; however, we cannot completely exclude the possibility of errors. TechnipFMC is always grateful to be informed of any errors; contact us at TechnipFMC.com.

Caution

The default or operating values used in this document and in the configuration parameters of the AccuLoad IV are for factory testing only and should not be construed as default or operating values for your metering system. Each metering system is unique and each configuration parameter must be reviewed and programmed for that specific metering system application.

Disclaimer

TechnipFMC hereby disclaims all responsibility for damages, including but not included to consequential damages arising out of or related to the inputting of incorrect or improper program or default values entered in connection with the AccuLoad IV.

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Literature Library
https://info.smithmeter.com/literature/online_index.html

Contents

1 Overview

The AccuLoad IV Demonstration Kit is a powerful AccuLoad IV simulation platform provided in a small, easily portable package. The kit includes the demonstration module, power supply, and an Ethernet cable.

1.1 Applications

The demonstration kit's primary purpose is to facilitate demonstrations of AccuLoad IV operation and to provide a training tool for customers and end users. It also can be used by automation vendors and integrators to test host communication interfaces to develop custom Boolean equations, as well as verify configuration changes and new firmware revisions prior to deployment in the field.

1.2 Recommended Software

No additional software is required other than a PC with a Web browser (Chrome is preferred); however, AccuMate for AccuLoad IV (available free of charge at https://info.smithmeter.com/literature/online_index.html) is recommended for configuration purposes and is required for some functions, such as creating custom reports and equations.

1.3 Features

The following features are available in the demonstration kit:

- Simulation of valves, product flow, piston injectors, temperature, and other analog inputs, permissive inputs, and alarms

- Simulation of input/output (I/O) that automatically adapts to the current AccuLoad IV configuration - with or without visualization

- Graphical representation of I/O configuration, meter runs, and other I/O as wired into the system

1.4 Supported Configurations

The following loading configurations are supported in the demonstration kit:

- Straight arm

- Sequential blending arm

- Ratio blending arm

- Hybrid blending arm

- Combinations of different arm configurations

- Unloading

Figure 1: AccuLoad IV Ready Screen in browser tab alongside Virtual Load Rack Simulator Visualization
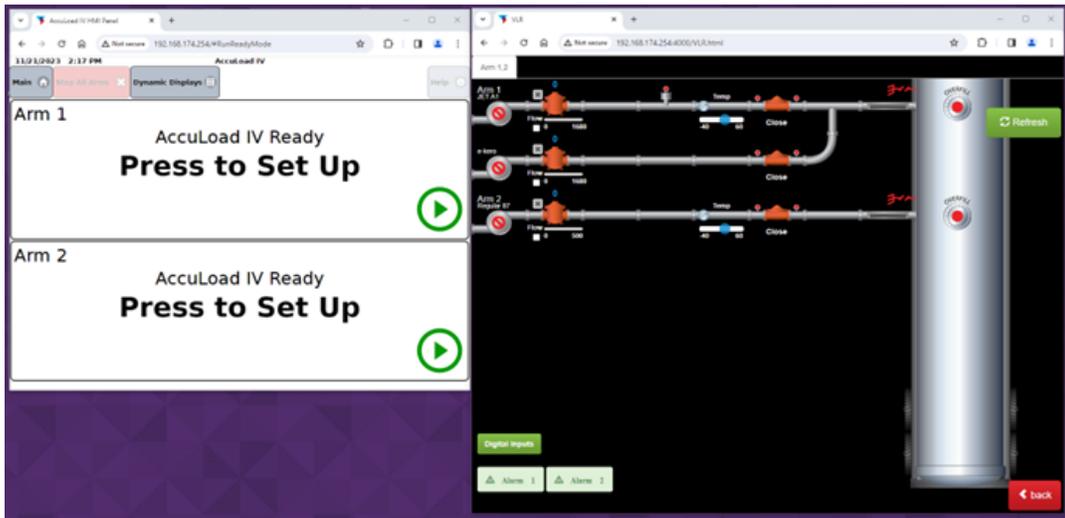
1.5 Simulated Functions

The following functions can be simulated using the demonstration kit:

- Ethernet communications, including host communications, network printers, and notification emails

- Resistance temperature detector (RTD) inputs

- Piston injectors

- Ground/overfill connections

- Alarm outputs

- Digital flow control

- Net volume calculation

- Statuses, alarms, reports, and equations

Functions not supported include serial communications, A4I I/O, metered injectors, and flow-controlled injectors.

2 Setting Up the Demonstration Kit for Use

2.1 Initial Connection

As noted on the product's nameplate, the demonstration kit is shipped with a default Internet Protocol (IP) address of 192.168.0.1. For initial connection, complete the following steps:

1. Ensure that the computer used is set to the same network address range; for example, 192.168.0.10. Administrative rights on the computer may be required.

2. Connect via a direct point-to-point connection using the supplied category 5 (Cat-5) cable (this is the simplest configuration). Alternately, both devices can be connected to a common switch or router.

3. Verify a successful physical connection is established by opening a browser window (Chrome is preferred) and entering the IP address as the uniform resource locator (URL); for example, http://192.168.0.1. If the connection is successful, the browser shows the AccuLoad Ready mode display, similar to Figure 1: AccuLoad IV Ready Screen in browser tab alongside Virtual Load Rack Simulator Visualization on page 2. The Packet InterNet Groper (ping) utility also can be useful to verify the connection.

4. Launch the AccuMate application. From the Quick Access toolbar menu, select New > AccuMate Config File, as shown in Figure 2: AccuMate Configuration on the next page. A new file will be created with the same default IP address of 192.168.0.1. If the demonstration module and PC running AccuMate are properly connected, a connection may be established automatically; if not, selecting Retry Comm in the ribbon's Tools and Options panel should initiate a connection. The status bar shows an Online status if successful.

If connecting the demonstration module to an existing network is needed, or if an IP address other than the default is to be used, complete the following steps:

1. Using AccuMate or via a user interface, connect using the default IP address first, then change the AccuLoad's IP address configuration program codes in the System Communications directory, if necessary.

2. Power cycle the demonstration module to switch to the new IP address.

3. Establish a connection to the alternate (new) network with the PC being used.

4. Enter the new IP address in the browser to establish the connection using the new IP address.

Figure 2: AccuMate Configuration
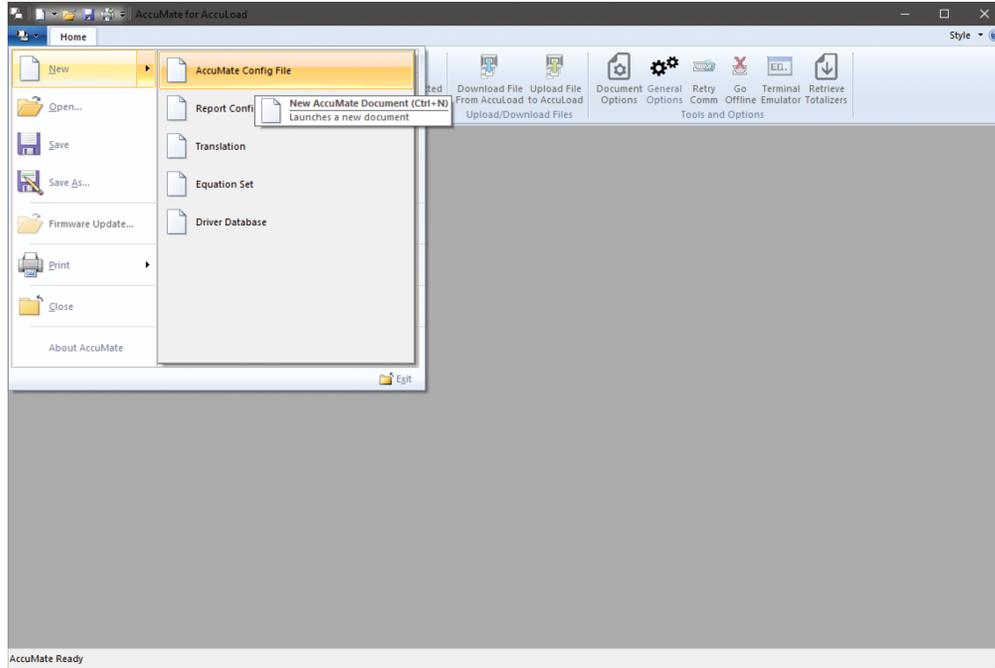
Figure 3: AccuMate Retry Comm
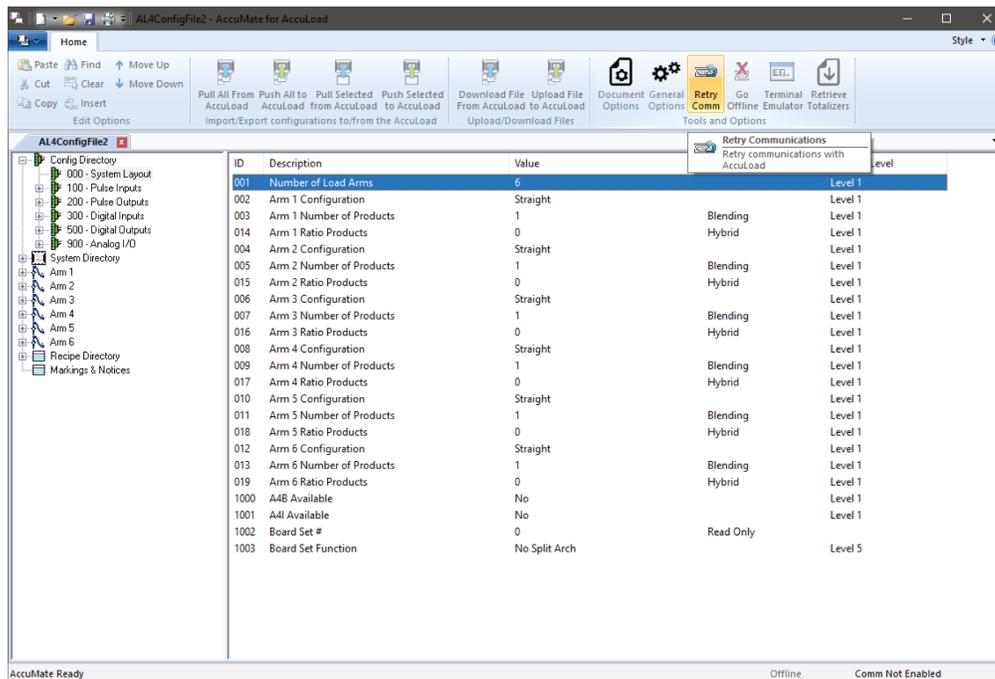
2.2 Assigning a Compatible IP Address to the Demonstration Kit

Two options are available for assigning a compatible IP address to the demonstration kit:

- Static IP (default)

- Dynamic host configuration protocol (DHCP)

2.2.1 Assigning a Static IP Address (Recommended Approach)

1. While online, verify or select the Manual option in System 1700.

Figure 4: Manual Selection
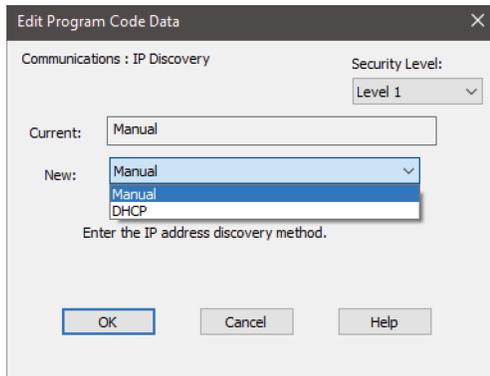
2. Configure an appropriate IP address, net mask, and gateway IP address in the System Communications directory, program codes 735-737. If no gateway is available, enter 0.0.0.0 for the gateway IP address. To complete the operation, wait a few seconds to enable the change to be saved in the AccuLoad, and then select Document Options and change the IP address for the document.

3. Save the file, then power cycle the module and reconnect the browser and AccuMate using the new network/IP address.

Note: IP addresses in the range 10.0.0.x are reserved for the private IP network the AccuLoad IV uses to communicate internally. If it is absolutely necessary to use this address range for the external network, the internal IP address settings in the Communication Directory (1720-1722) must be changed to use a different range of addresses to avoid any conflicts.

2.2.2 Using DHCP to Assign an IP Address (Not Recommended for Demonstration Module)

Because the demonstration module does not have a local display, the only way to determine the DHCP-assigned IP address is through the network. This presents a quandary, as the IP address must be known to establish the web interface. For this reason, selecting DHCP as the means for assigning an IP address is not recommended with the demonstration module. To use DHCP, a DHCP server must be present, providing this service to the network. The server must be configured to either allow unknown devices to connect, or the demonstration module can be added to the server's list of approved devices. To configure the AccuLoad IV to use DHCP, select the DHCP option in System 1700.
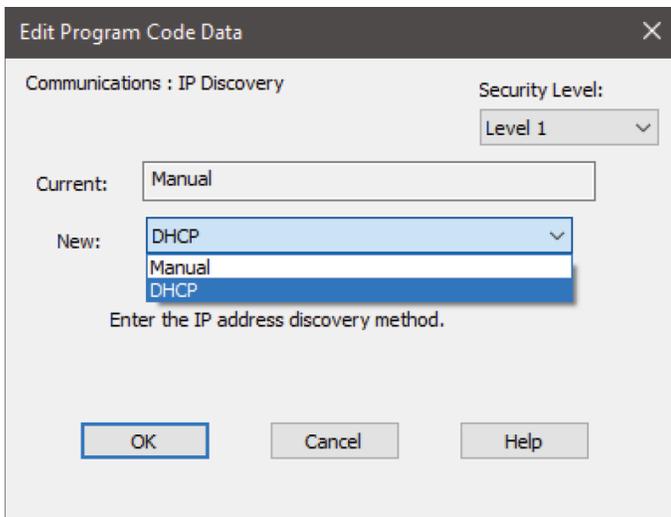
Note: When using DHCP, the protocol server will set the AccuLoad IP address to a valid, unused address in the network's address space. Most DHCP servers will attempt to consistently serve the same IP address to a device when possible, so once it is assigned/known it will usually not change but this is not a reliable means of determining the IP address of the module. Some other means (e.g., looking it up from the server side) may be needed to determine the new IP address.

2.3 Configuring the Demonstration Module

The demonstration module must be set up with a valid configuration prior to simulation. If a configuration file for an existing AccuLoad IV is available, it is possible to download the existing configuration. If you are using a configuration file from an AccuLoad IV installed in the field, it is necessary to:

1. Change the AccuMate file IP addresses in both the Document Settings dialog and the System Communications directory in the configuration to match the demonstration module's IP address.

2. Select the simulation mode in the configuration file.

It is also possible to use one of the AccuLoad's internal, pre-configured field test initialization diagnostics to get to a valid starting point and then configure it for simulation. This option is accessed from the W&M/Calibration option in the Main Menu. See Figure 5: Field Test Initialization Diagnostics below.

Figure 5: Field Test Initialization Diagnostics
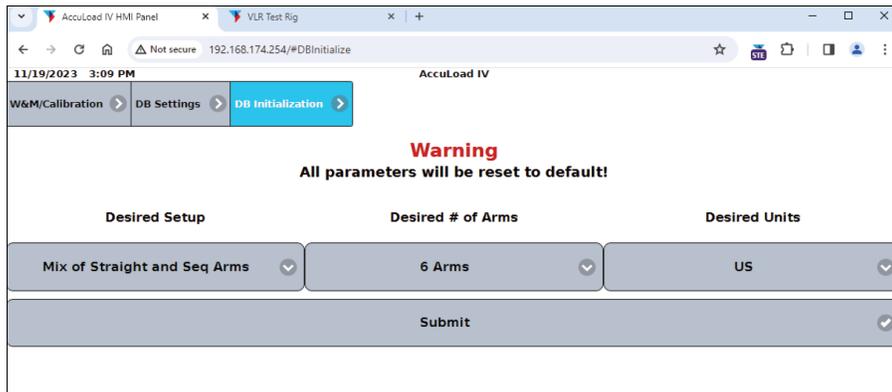
2.4 Using an Internal Simulation

To configure the demonstration module to act as a standalone demonstration kit without requiring a Virtual Loading Rack (VLR), configure the unit so the simulation is done internally to the module. A Web browser is still required to act as the user interface. To configure for internal simulation, select Internal from Program Code 1201 in the System Flow Control directory.

Figure 6: Selecting Internal from Program Code 1201
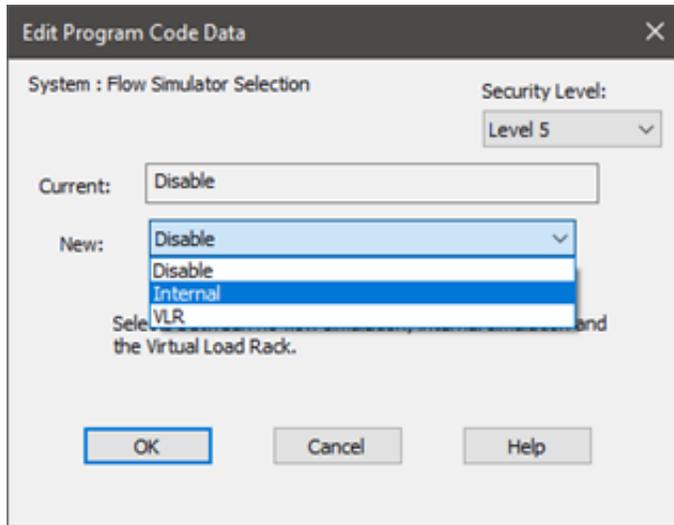
2.4.1 Using the VLR Feature

The VLR is a browser-based Web application that graphically represents simulated external devices and enables additional interaction to enhance the simulation's capabilities. To configure the demonstration module for VLR, select VLR from the list in Program Code 1200 in the System Flow Control Directory.

Figure 7: Selecting VLR in Program Code 1200
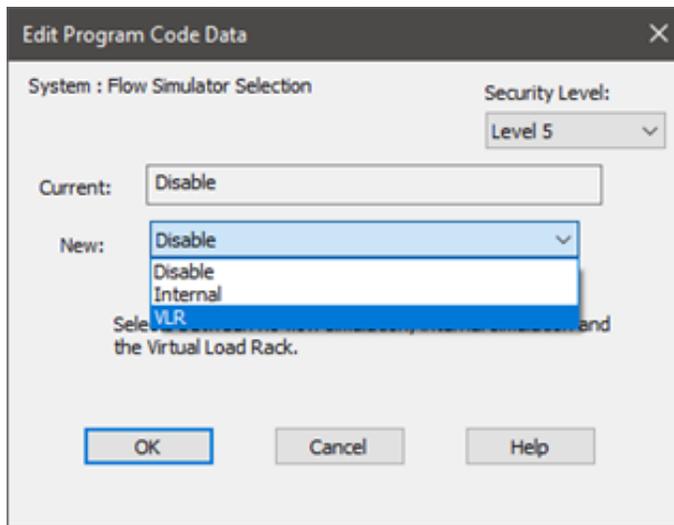
Note: Prior to configuring the simulation selection, the AccuLoad may display an "Arms not Licensed" message. Once the simulation is enabled, the demonstration module must be re-started to clear this message.

2.4.2 Launching VLR manually

1. Open a new browser tab and enter the URL http://192.168.0.1:4000.

    (Replace the default IP address shown above with the actual IP address of the module if it has been changed.)

2. Select VLR in the menu to launch the virtual loading rack.

Figure 8: Selecting VLR
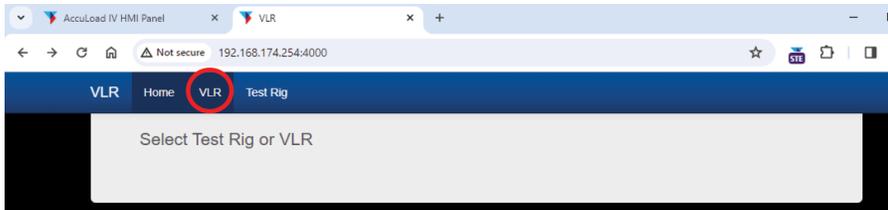
Figure 9: VLR Meter Runs
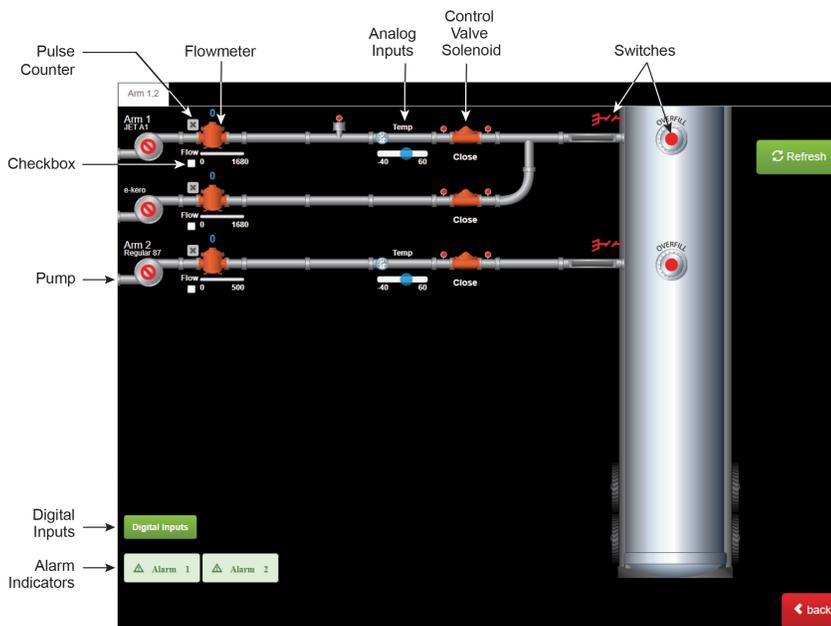
The graphical representation of the meter runs are built from component controls that enable interaction with various types of simulated inputs and outputs, as outlined in the following table:

Control	Explanation
Alarm Indicators	Alarm 1 and Alarm 2 indicators are illuminated when the Alarm 1 or Alarm 2 output is active, respectively.

Control	Explanation
Analog Inputs	Analog inputs are displayed as a slider than can be adjusted to set the engineering value.
Checkbox	The checkbox below the flow indicator simulates interruption of the pulse stream; for example, transmitter failure.
Control Valve Solenoids	The control valve solenoid outputs appear red when inactive and turn green when activated. The overall valve command state (Close, Open, or Lock) is displayed under the valve graphic.
Digital Inputs	This button opens a window where you can set additional digital input states.
Flowmeter	The current flow rate is reflected as a percentage of the high flow rate in the progress bar below the flowmeter. The current pulse count for the batch is shown above the flowmeter.
Pulse Counter	The gray X button at the top-left side of the flowmeter resets the pulse counter.
Pump	The pump graphic is displayed with a red circle when idle and turns green when energized.
Switches	Clicking the ground or overfill switch toggles the state; and the icon is green when the input is active. If not connected, these IO points are displayed in red.

2.4.3 Test Rig Option

As an alternative to the default VLR visualization, the Test Rig version of the VLR replaces the graphical representation of meter runs with a control-panel style array of buttons and sliders, allowing for additional I/O points--such as security switches, user defined I/O, and other functions to be simulated. While the VLR is well suited for demonstrations, the Test Rig may be more suitable to integration or development testing.

Figure 10: Test Rig Option for Simulation

Figure 11: Meter Run Control-Panel Style
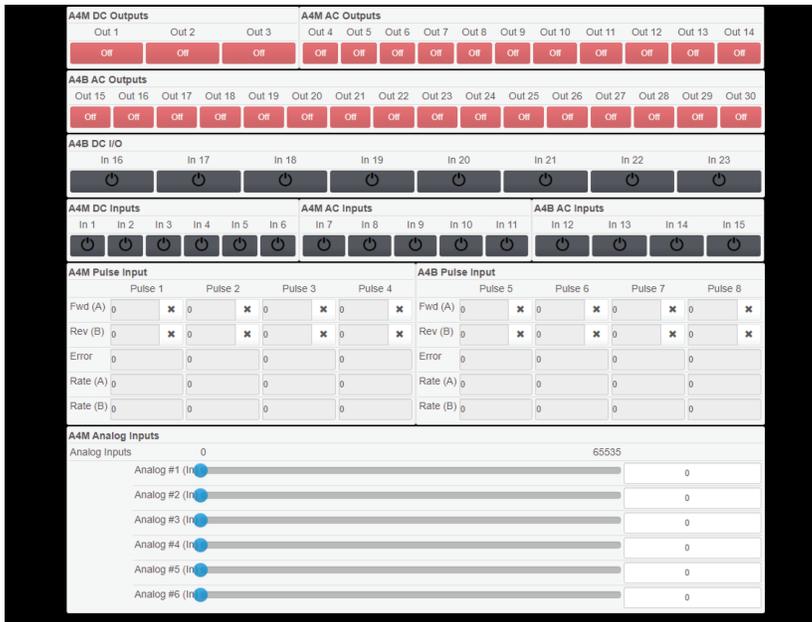
3 Updating the Firmware

The firmware update process for the demonstration module is similar to the installation of the production AccuLoad product; however, installing the demonstration module is more straightforward because no satellite boards need to be updated.

> Note: The browser session should be refreshed after the upgrade is completed.

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This document takes precedence over and supersedes in their entirety all previous versions or revisions.

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