**Important**

All information and technical specifications in this documentation 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 on the website.

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**Caution**

The default or operating values used in this manual and in the program 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 program parameter must be reviewed and programmed for that specific metering system application. In addition, the default security level for most parameters is level 1 (open access); select parameters default to level 4 or level 5 (Audit Trail logging). It is a user requirement to evaluate all parameter security level settings to ensure compliance with local weights and measures jurisdictions, see section 2.9 (Security) for details.

**Disclaimer**

TechnipFMC hereby disclaims any and all responsibility for damages, including but not limited 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:

http://info.smithmeter.com/literature/online_index.html
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1 – Introduction

1.1. Product Description
The Smith Meter AccuLoad provides reliable and accurate control and measurement of liquid petroleum blending and transfer operations. While primarily intended for use in refined petroleum distribution terminals, it’s easily configured for a wide variety of liquid transfer applications.

Using the AccuLoad, an operator can select the desired amount of any one of up to 50 recipes and the AccuLoad will control and monitor the pumps, valves, and additive injectors to efficiently and safely transfer the precise amount. During the transfer, all process parameters are monitored to provide an accurate total of the amount of each component of the recipe delivered.

In addition to the real-time control of the loading process, the AccuLoad calculates averages and live quantities of all products and additives delivered. These values are kept in the runtime database which can be monitored by a supervisory host system. When a transaction is complete, the AccuLoad stores a detailed record in its internal transaction log for subsequent printing or retrieval.

The AccuLoad IV is available in multiple hardware configurations as shown below:

AccuLoad IV-ST – 1 or 2 load arms, up to six products, Ex-Proof Class I Div 1 / Zone 1 rated.

AccuLoad IV-QT – Up to 6 load arms, up to six products, Ex-Proof Class I Div 1 / Zone 1 rated.
AccuLoad IV NEMA4 - 1 or 2 load arms, Weather tight Class I Div 2 rated.

Features common to all of the above packages:
- Capable of transferring up to six different products on each arm
- Simultaneous operation of all arms
- Up to 24 additive injectors
  - Metered
  - Piston
  - Smart
- Arms are individually configurable for a variety of operations:
  - Straight (single product)
  - Sequential Blending
  - Ratio Blending
  - Side-stream Blending
  - Hybrid (sequential/ratio) Blending
  - Wild-stream Blending
  - Unloading
- Single or dual channel meter pulse inputs representing volume or mass
- Modbus or Smith communications for monitoring/control via Ethernet or serial link
- Proximity card reader interface and driver ID database for access control
- Real-time diagnostic data displays
- Calculation of temperature, pressure and density compensation factors according to API guidelines for a broad spectrum of petroleum products from LPG to asphalt as well as custom defined products
- Multi-lingual user interface
- User configurable BOL
- Event, transaction and audit trail logs
- Five-point meter linearization
- Built-in driver prompting
- Five levels of passcode protection for parameter access
- Arms can be operated independently or grouped for “Bay” operation
- Arms can be configured to swing to either side of a lane
Because the AccuLoad provides the flexibility to support all of these variations and features it must be tailored to fit the specific application. The parameters which make up the configuration are stored in a database in the AccuLoad and once the initial setup is done, it remains permanently stored. The parameter database can be modified using the front panel touchscreen, by using AccuMate (a Windows compatible companion program) or through a communications port using a web browser.

Regardless of the method used to access the configuration, the basic steps involved in configuring the AccuLoad for initial operation is as follows:

- Set the number and type of load arms
- Select the I/O points (analog, pulse, digital) to be connected to the process equipment
- Select the units of measure
- Set the flow control parameters
- Define the products to be transferred
- Define any additive injectors
- Set up parameter security pass codes

There are a significant number of additional features available which are described in detail in the remainder of this document. Once the configuration has been completed, the AccuLoad is ready for operation.

1.2. Load Arm Types

1.2.1. Straight
A straight arm is used to deliver a single product through a single meter.

![Figure 1.2.1: Typical straight arm - single product meter run configuration](image)

1.2.2. Sequential Blending
Sequential blending is done by loading multiple products, one at a time, into a vessel (e.g., a tanker truck). This is most commonly done with products that mix very easily.

Prerequisites:

- The load arm must be designated as a sequential blending arm and all required I/O assignments (such as meter inputs, block valves, and flow control valve etc.).
- A recipe which defines the percentage of each product to be blended
Operation:

The AccuLoad accomplishes sequential blending of multiple products as follows:

The ratio of varying products is designated in the recipe as a percentage of the total preset. These percentages must total 100%. When the operator enters the preset, the AccuLoad automatically calculates the actual volumes of each product to be delivered. Each of these is delivered as a type of “mini-batch,” complete with individual high flow rates, first trip volumes, and so on. The order of product delivery is included in the recipe definition.

If an incorrect product volume is delivered, the volumes of the remaining products are adjusted accordingly. If this adjustment creates a blend tolerance alarm, the operator will be prompted to stop or continue the batch. An exception to this rule is when another delivery of the same product is specified in the recipe. In this case, the volume of that product’s next delivery only is adjusted to maintain the correct blend ratio and preset amount.

![Sequential blending arm - six product, single meter configuration](image)

**Figure 1.2.2: Sequential blending arm - six product, single meter configuration**

1.2.3. Ratio Blending

In ratio blending multiple products flow simultaneously during delivery to a vessel (e.g., a tanker truck). Ratio blending is used primarily when loading speed is an issue, or when the component products do not easily mix.

The AccuLoad IV accomplishes ratio blending of multiple products in the following manner. All products required for the recipe are delivered simultaneously through their own meters (and their own corresponding pumps and control valves). Two-stage valves are not used for ratio blending; only digital or analog valves are acceptable. The ratio of the component products is designated in the recipe as a percentage of the total preset. These percentages must total 100%.

When the operator enters the preset, the AccuLoad IV automatically calculates the actual volumes of each product to be delivered. As stated above, products are delivered simultaneously, each through its own meter. Flow rates are adjusted for optimal blend accuracy while conforming to the programmed system flow profile using Smith Meter’s exclusive control algorithm. Should flow rate variations occur, the profile is dynamically adjusted to attain the best possible mix.
1.2.4. **Hybrid Blending**

The AccuLoad IV supports hybrid blending which is defined as a combination of sequential blending and ratio blending. A typical hybrid blending arm configuration may be three sequential products and one or two ratio products. The sequential products flow one at a time and in most cases one of the ratio products would flow simultaneously with each of the sequential products. The ratio product(s) can be plumbed either upstream or downstream of the sequential product meter. On a hybrid arm there must be at least one sequential product configured.

The Hybrid Blending arm type is also used to support in-line blending (also referred to as wild stream blending). This feature is intended to be used in applications where it is desired to continuously blend two or more products where a preset volume is not normally used. In this configuration, the AccuLoad IV will monitor the flow through the main product line and adjust the amount of blend product based on the amount of main product flow. For more information on Wild Stream Blending, refer to application bulletin **AB06072**.
Figure 1.2.4: Hybrid blending arm - four products, three meters (two sequential products)

1.2.5. Side Stream Blending

The AccuLoad supports side-stream blending, which is defined as two-product ratio blending where the minor of the two products is metered and is controlled by a valve, and the main product is free-flowing. Another meter and its corresponding control valve are located downstream of where the two products merge. The AccuLoad also supports side-stream blender arm proving. For more information on side-stream blending, refer to Application Bulletin AB06054.

Figure 1.2.5: Side-stream blending arm – two products, two meters, upstream plumbed blend point
1.2.6. **Unloading**

This arm type allows a truck compartment to be unloaded without entering a preset volume. Implementing this feature requires that a load arm be identified as “unloading”. For more information on unloading, refer to Application Bulletin [AB06055](#).

![Unloading arm - multiple products, one meter, air elimination](image1)

*Figure 1.2.6: Unloading arm – multiple products, one meter, air elimination*

1.2.7. **"Straight Arm With Vapor Recovery System (Straight with 'VRS')"**

This arm type supports delivering a single product while monitoring the amount of vapor recovered. This feature requires a load arm type to be programmed as “Straight with VRS”. Two meters are required for this application to determine the amount of vapor recovered while loading light density products. The AccuLoad provides a vapor product total and a net mass total between the liquid product meter and the vapor product meter in the system. For additional information refer to [AB06073](#).

![Straight arm with vapor recovery system – one product meter, plus one Coriolis meter on the vapor recovery line back to storage](image2)

*Figure 1.2.7: Straight arm with vapor recovery system – one product meter, plus one Coriolis meter on the vapor recovery line back to storage*
1.3. I/O Assignments
The specific I/O points used to connect the AccuLoad to the field equipment are assigned by the user. The types of I/O supported by the AccuLoad are:

- Meter pulse inputs (product or additive meters)
- Pulse outputs
- Analog I/O (4-20 mA, 1-5 VDC)
- Discrete I/O (AC and DC)
- The function associated with each I/O point is configured by the user. For example, if an AC output signal is needed for pump control, the AccuLoad allows the user to select any one of the AC outputs to be assigned that function. These selections are made in the “Configuration” section of the parameter database.

The analog I/O requires the correct type of module to be installed in the unit as well as the correct setting in the configuration database. There are six slots available on the A4M board for analog I/O modules.

The AccuLoad accepts meter pulse inputs which represent increments of mass or volume depending on the type of meter. The AccuLoad supports single channel and dual channel meter connection with optional transmitter integrity. (Note using dual-pulse meter inputs and transmitter integrity reduces the total number of meter inputs available).

1.4. Units of Measure
In the AccuLoad the units of measure are set by the user. These include the volume, mass, temperature, pressure and density. These parameters are set in the System section of the configuration database and affect the operation of all arms configured in the AccuLoad.

1.5. Flow Control
The AccuLoad gives the user full control of the flow profile used during delivery. A typical profile consists of a period of lower flow rate delivery at the beginning of the transfer (low flow start) and then the flow rate is increased for most of the delivery (high flow rate) and then finally the flow rate is reduced in stages at the end of the transfer (ramp down).

![Flow Control Diagram](image)

There are parameters provided in the Flow Control sections of the configuration database which allow the flow rate during each of these phases of the transfer to be tailored to meet the safety, efficiency, and hydraulic requirements of the installation.
1.6. **Product Definition**

The AccuLoad supports up to 6 base products to be transferred. The Arm -> Meter -> Product sections of the configuration database define the characteristics of each product. This includes the meter factor curve, temperature and pressure compensation information, vapor pressure, etc. A complete and detailed description of the fluid being measured helps the AccuLoad to calculate the transferred quantities more accurately.

1.7. **Additive Injection**

The AccuLoad supports up to 24 additive injectors which can be a mix of piston, metered or smart. There are parameters in the System->Additives section of the configuration database which allow the type and arrangement of the injectors to be selected. Once the available injectors are defined, the pacing of the additive injection is controlled by parameters in the Recipe section of the configuration database. The I/O required to connect the injectors is defined in the configuration and/or the communications sections of the database.
2 – Operations

The AccuLoad has two primary modes of operation “Run” mode and “Program” mode. In general, the Run mode is used to perform transfers and the Program mode is used to configure and maintain the AccuLoad.

This description assumes operation of the AccuLoad using the front panel touch screen, for information on AccuLoad remote control options refer to the AccuLoad IV Smith Communications Manual MN06204L or the AccuLoad IV Modbus Communications Manual MN06202.

2.1. Run Mode Overview

The AccuLoad powers up in the Run mode which is the normal operational mode used primarily to initiate loading or unloading transactions. The secondary function provided in Run mode is Dynamic data display.

At power-up, the AccuLoad is in the Run mode and will display the “Ready” screen as shown below:

*Ready Screen with no transactions in progress (six arm configuration, daytime display).*
Run Screen with transactions in progress (two arm configuration).

This screen allows the operator to control and monitor transactions. During a typical transaction, the driver will perform the general sequence of steps as follows:

- Enter the response(s) to any prompt(s)
- Select the desired recipe to deliver
- Enter the amount to be delivered
- Start the transfer
- Confirm the end of the transfer

There are many parameters in the configuration database which allow customization of the AccuLoad operation. For instance, the number and type of any prompt messages are selectable. The following description is just one example of a typical loading sequence and does not attempt to explain the many options available.

The following shows the sequence of starting a typical loading transaction on Arm 2.

Press the highlighted area to select the arm for the transaction.
Press the input field for the Driver ID entry.

Using the pop-up keypad, enter the driver ID and press the (OK) button to confirm. Pressing the (Cancel) button will cancel the entry and return to the previous screen. Press the (backspace) button to delete characters entered in error. Press the (information) button for help with the entry.

Press Next to continue.
Press the data entry field to enter the PIN number.

Enter the PIN number and press ✅ (OK) to accept the entry. Press ❌ (Cancel) to return to the prompt.
The default recipe for this arm is displayed. To change the recipe, press the Recipe button.

Press the recipe to be loaded from the drop-down list and press Submit.
Once the correct recipe has been selected, press Next.

Either press the preset amount field to display the numeric keypad to allow direct entry of a new preset amount, or alternately press the plus/minus buttons to increment or decrement the preset amount by the programmed amount.

Once the correct preset amount has been entered, press the ‘Next’ button.

The AccuLoad displays the preset amount and the recipe for confirmation. If everything is correct, press ‘Start’ to begin the flow of product.
Once the transaction is started, the AccuLoad will display the status of the transaction in the arm's status panel area, as shown in the following:

To stop flow on the arm, press the Stop icon (red square in circle) on the delivery display for the arm.

*Note: Press the button at the top of the screen to stop flow on all arms:
When the batch has completed, another batch in this transaction can be started (total accumulates) or the transaction can be ended.

If the transaction is ended, the AccuLoad returns to the Ready screen and prints a transaction report (if configured to do so).

2.2. Alarm Reporting

The AccuLoad will post an alarm when an error condition is detected. For example, an alarm is generated if the flow rate exceeds the allowed range or if the valve malfunctions.

A complete listing of the alarms can be found in this manual in Section 8 – Program Code Reference and in the Smith Communications manual MN06204L. The default actions taken by the AccuLoad when an alarm occurs are:

- Post a message on the display
- Shut down flow on the associated arm
- Record the occurrence in the alarm log

Typical alarm message on Ready screen.
There are configurable options which can be set for each default alarm type as follows:

- Allow Run mode clearing
- Energize alarm relay output number one
- Energize alarm relay output number two
- Notify via email
- Allow flow to continue

2.2.1. Allow Run/Ready Mode Clearing
This option controls whether the selected alarm can be cleared while in the Run mode. If enabled, this will allow the driver to clear the alarm without entering program mode (no passcode required).

2.2.2. Energize Alarm Relay Output One/Two
This selection will determine if the alarm output will be energized when an alarm occurs. This option requires that the particular digital output has been configured as an alarm output.

2.2.3. Notify Via Email
Selecting this option results in the AccuLoad issuing an email message to the designated recipient upon the occurrence of this alarm. Multiple parameters in the communications section of the configuration database (System Communications directory, parameters 742-747) must be set up for this option to function correctly.

2.2.4. Allow Flow to Continue
By default, the AccuLoad will stop flow for all alarms. This option will override the default and allow flow to continue.

2.3. Permissive Inputs
The AccuLoad can be configured to monitor the status of digital inputs for permissive control. Up to two inputs can be configured as System Permissives and affect all arms. Up to three can be configured that are specific to a particular arm (Arm Permissives). Typically, these would be used to monitor safety systems (grounding, overfill etc.) and stop flow and display a message to the operator if a problem is detected.

Important: The AccuLoad should never be relied upon to act as the primary safety system control for the flow valve and pump controls, i.e. emergency stop, overfill, ground protection, etc.

These should always be handled by separate systems specifically designed for that application. For example Safety systems specifically to meet SIL requirements. Any power control circuits from these external systems shall be wired in series ahead of the AccuLoad to remove power to the ancillary devices. See MN06201 for connection details.

For example, to enable a permissive input to monitor the status of the ground detection system for example, the following would be required:

- Configure a digital input as a system permissive or as an arm permissive input.
- Define a message to be displayed to the operator when the permissive signal is lost. For example, the message might be “Connect Ground”.
- Configure at what time(s) the AccuLoad should monitor the permissive input state. Available options are:
  - **Transaction Start** – Permissive only checked immediately after authorization
  - **Continuous** – Permissive must be met continuously during the batch
  - **Start Pressed** – Permissive must be met whenever flow is started
Batch Start – Permissive must be met to start a batch

- Once configured as above, if this permissive is lost during a batch, the flow will be stopped. There is another configuration parameter which controls the way the flow is resumed with options as follows:
  - Manual – Start must be pressed to restart flow
  - Automatic – Flow will be started as soon as the permissive signal is restored

For this example (ground fault detection) the Continuous option would be used so that the AccuLoad will prohibit loading any time the ground is not connected. Either restart option could be used.

With this configuration, the operator would be able to enter the loading information without connecting the ground. However, the batch would not start and the message “Connect Ground” would be displayed if the operator tried to start the batch. Also, if the ground permissive signal is lost anytime during the batch, the AccuLoad would stop flow and display the “Connect Ground” message.

2.4. Main Menu Operation

The main menu is the starting point for all non-transaction related operation of the AccuLoad. To get to the Main menu from the Ready screen press the Main button in the top left corner of the screen as shown.

Note: If a transaction is in progress, the Main menu is not available.

From the ready screen, press the Main button in the top left of the screen.

2.5. Program Mode Overview

To modify the AccuLoad configuration, enter Program Mode by pressing the Program Mode option from the main menu.
Program mode provides a means to modify the AccuLoad configuration database. Modifying the configuration via program mode allows the end user to customize the behavior of the AccuLoad to meet the operational requirements of the installation.

The AccuLoad can be configured to require a passcode and/or an external enable contact input before granting access to make parameter changes. In general, Program mode access should be controlled since the settings in the database can affect critical measurement and operational functions. Local Weights & Measures jurisdictions may require password protection of some or all of the operating parameters that are accessible via Program Mode.

A complete description of the security features provided by the AccuLoad can be found in section 2.9.

Detailed information regarding the individual parameters that can be configured in Program Mode is included this manual; see Section 8 – Program Code Reference.

**Note:** If security passcodes have been enabled, the AccuLoad will display a prompt to enter the passcode before granting access to the Program mode.

### 2.5.1. Program Mode Top Level Menu

From the top level Program Mode menu, the selections are:

- Config
- System
- Bays
- Arms
- Recipes
- Split Architecture
- Cancel and Exit
- Save and Exit
2.6. **Configuration Overview**

The Configuration (often called 'Program Mode') database is organized in sections as follows:

- **Config** – The Config directory contains options defining the load arm layout and how I/O points are connected to meters, valves, pumps, injectors, etc.

**Subdirectories in the Config directory:**

- System Layout
- Pulse Inputs
- Pulse Outputs
- Digital Inputs
- Digital Outputs
- Analog I/O

**System** – This section is used to set operating parameters which affect the operation of the entire AccuLoad.

**Subdirectories include:**

- General Purpose
- Flow Control
- Volume Accuracy
- Temperature/Density
- Pressure
- Alarms
- Communications
- Additives
- Security

- **Bays** – This section is for configuration of items that is specific to dual bays controlled by one AccuLoad i.e. swing arm applications

  ![Bays Diagram]

  **Subdirectories include:**
  - Bay 1
  - Bay 2

- **Arms** – (one section for each up to 6 maximum) This section is used to set parameters which affect the operation of a single arm.

  ![Arms Diagram]

  **Subdirectories include:**
  - General Purpose
  - Flow Control
  - Volume Accuracy
  - Communications
  - Meters
  - Products

- **Recipes** – (one section for each of 50 recipes maximum.) This section is used to pre-define specific combinations of products and additives that can be selected for delivery by the AccuLoad.

  ![Recipes Diagram]
Subdirectories include:
- Product Blend
- Recipe Additives

• Split Architecture

Subdirectories include:
- Configuration
- Board Addresses

2.6.1. Example – Database Modification Using Front Panel or Browser

The following sequence of screens shows an example of entering program mode, changing a parameter (the “AccuLoad ID”) and then exiting.

At the Main menu, press Program Mode. Note the AccuLoad Unit ID “AccuLoad IV” displayed in the middle of the top line of the display.

Enter the security passcode (optional depending on security configuration, see Section 2.)
If the passcode is correct, the top-level Program Mode menu is displayed. From here press the System menu.

The System top level menu is displayed. From here press the General Purpose menu. Note the “bread crumb” bar across the top shows each menu level as it entered. Pressing any of the bread crumb menu levels will navigate directly back to that menu level.

Select the Unit ID parameter which is currently set to read “AccuLoad IV”.

The current setting for the Unit ID parameter is displayed with a keyboard to enter a new value.
The current setting for the Unit ID parameter is displayed with a keyboard to enter a new value.

Change the Unit ID to “AL IV Unit ID”
Press the “check mark button” to accept the changes
The Unit ID has been edited.

Press the far left bread crumb to return to the top level program mode menu.
The Unit ID displayed at the top of the screen is still “AccuLoad IV” since the change has not been saved to the database.

Press Save and Exit to permanently save the change in the AccuLoad database.

After exiting Program Mode, the Unit ID displayed at the top of the screen is changed to “AL IV Unit ID”. This illustrates the process of modifying a parameter in the AccuLoad database using the built-in menu system. The parameters in the configuration database can also be changed through communications using the AccuMate program running on a PC or by using the Modbus protocol. These other methods are described in the AccuLoad IV Smith Communications manual MN06204, and the AccuLoad IV Modbus Communications manual MN06202.
2.7. Directory Map

This outline shows the top-level organization of directories and subdirectories for the AccuLoad’s Program Mode database. Note that the configuration code range is used for making program code changes via Communications see [MN06202](#).

**Configuration Directories**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>000</td>
<td>Load Arm Configuration Directory</td>
</tr>
<tr>
<td>100</td>
<td>Pulse Input Directory</td>
</tr>
<tr>
<td>200</td>
<td>Pulse Output Directory</td>
</tr>
<tr>
<td>300</td>
<td>Digital Input Directory</td>
</tr>
<tr>
<td>500</td>
<td>Digital Output Directory</td>
</tr>
<tr>
<td>900</td>
<td>Analog Input and Output Directory</td>
</tr>
</tbody>
</table>

**System Directories**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>General Purpose Directory</td>
</tr>
<tr>
<td>200</td>
<td>Flow Control Directory</td>
</tr>
<tr>
<td>300</td>
<td>Volume Accuracy Directory</td>
</tr>
<tr>
<td>400</td>
<td>Temperature/Density Directory</td>
</tr>
<tr>
<td>500</td>
<td>Pressure Directory</td>
</tr>
<tr>
<td>600</td>
<td>Alarm Configuration Directory</td>
</tr>
<tr>
<td>700</td>
<td>Communications Directory</td>
</tr>
<tr>
<td>800</td>
<td>Additive Directory</td>
</tr>
</tbody>
</table>

**Load Arm Directories**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>General Purpose Directory</td>
</tr>
<tr>
<td>200</td>
<td>Flow Control Directory</td>
</tr>
<tr>
<td>300</td>
<td>Volume Accuracy Directory</td>
</tr>
<tr>
<td>700</td>
<td>Communications Directory</td>
</tr>
</tbody>
</table>

**Meter Directories**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>Flow Control Directory</td>
</tr>
<tr>
<td>300</td>
<td>Volume Accuracy Directory</td>
</tr>
<tr>
<td>400</td>
<td>Temperature/Density Directory</td>
</tr>
<tr>
<td>500</td>
<td>Pressure Directory</td>
</tr>
</tbody>
</table>

**Product Directories**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>General Purpose Directory</td>
</tr>
<tr>
<td>200</td>
<td>Flow Control Directory</td>
</tr>
<tr>
<td>300</td>
<td>Volume Accuracy Directory</td>
</tr>
<tr>
<td>400</td>
<td>Temperature/Density Directory</td>
</tr>
<tr>
<td>500</td>
<td>Pressure Directory</td>
</tr>
</tbody>
</table>

**Bay Directories**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>General Purpose Directory</td>
</tr>
<tr>
<td>700</td>
<td>Communications</td>
</tr>
</tbody>
</table>

**Recipe Directories**

Recipes 01 through 50
2.8. Viewing the Help Messages
The AccuLoad features unique “Help” messages that allow the operator to have at his fingertips the ability to review what is required or what the options are for an individual program code. Click on the icon next to a program code to see the help message for that parameter.

2.9. Security
The AccuLoad provides a comprehensive set of features to control access to the parameters in the configuration database including:

- Security switch inputs
- Passcodes
- Communications
- Diagnostics

2.9.1. Security Levels
The AccuLoad can be configured to use up to five levels of security to control access to parameters. Security level one is the least privileged and level five is the most. For example, a technician could be allowed to change a small set of parameters by using the level one passcode to enter program mode and a Weights & Measures official could have complete access by using the level five passcode to enter program mode.

2.9.2. Security Level Activation
A security level is activated by assigning a passcode in the Security section of the System directory in the configuration database. It’s not required that all security levels be activated but if one security level is activated then Level 5 security level must also be programmed to assure the proper functionality of the audit trail log.

Each parameter in the database can be individually assigned any active security level. The AccuLoad will not allow a parameter to be changed unless the user has entered program mode using the passcode of the assigned level or higher.

The factory default security level for most parameters is level 1. Meter K factors, linearization factors, and a few other settings that typically need to be secured are set to level 5 by default.

2.9.3. Parameter Security Level Assignment
This controls who can access those parameters in Program Mode, and also affects how change events are logged. Parameter changes are normally recorded in the Event Log; parameters assigned to Level 4 or 5 are tracked in the Audit Trail Log.

The individual assignment of parameter security levels is handled using the companion “AccuMate” application. See MN06205 for operational details of the AccuMate program.

Note: The operator must enter the password for the highest security level programmed in the unit to access any data on the security menu.

The “Set Parameter Security” option in the Security menu can be used from the display interface to globally set all non-metrological parameters to a certain security level, for example level 3.

2.9.4. Security Switches
The AccuLoad may be configured to require one or two security contact inputs to be activated before database changes can be made. These are typically wired to key switches and provide additional protection options. If one of the two security switches are set for a certain security level, then that switch must be active to access that level of security (in addition to any passcode that may be configured for the level).
2.9.5. **Communications Security**
Parameter changes can be performed via communications and the AccuLoad allows the security level associated with requests received on a communications port to be assigned a security level. The parameter which sets the communications security level is called "Comm Link Programming" (Code 731 from AccuMate) and is found in the System->Communications->Host Interface directory. If no communication parameter change access is allowed by the authority having jurisdiction, then the parameter must be set to Alarm Clear Only, otherwise it will be set to a security level, usually level 4 or 5 to have the events recorded in the audit trail.

2.9.6. **Diagnostics Security**
The security level required to access the diagnostic functions is also programmable. The "Diagnostic Security Level" is set in the System->Security directory. If this parameter is set, the AccuLoad will prompt for a passcode before granting access to the diagnostic screens.

2.9.7. **Example: Security Configuration**
The AccuLoad is shipped from the factory with no security configured, so initially there is no need for a passcode or user supplied (optional) key switch signal to enter program mode, and once in program mode all parameters (including security settings) are read/write accessible. Be aware that changes to security settings require entry to program mode at the highest currently configured level.

In this example use the following access categories:

- **Weights & Measures officials/Measurement/Proving personnel – external contact input and passcode.** This group should have read/write access to all settings including meter factors and K factors and other metrologically significant parameters. This group should be the only group permitted to change security related settings. Both a passcode and activation of the security switch input are required to gain access at this level.
- **Maintenance Technicians – passcode only.** This group should have read/write access to all non-metrologically significant parameters, functional diagnostics, etc. Operators – passcode only. This group has read/write access to non-metrological parameters only.

Since there are three groups with different access requirements, this will require configuring three different security levels in the AccuLoad. Assuming the AccuLoad is factory default and no security has been previously configured, the follow steps are used to configure the AccuLoad for this example.

- Enter program mode (no passcode needed).
- Set a passcode for levels 5, 2 and 1.
- Select Security 1 for the function of the digital input connected to the first security key switch (Configuration -> Digital Inputs).
- Set the security level associated with the first security switch input. In this case, use “Level 5” to make it the Proving personnel key switch.
- Use the "Set Parameter Security" function in the Security menu to set all parameters to “Level 2.”
- Assure that the security levels for the meter factors and K factors are at the highest level (Level 5) so changed are audited and protected by the switch.
- Set the security level for non-metrological product, recipe, flow control and alarm program codes to “Level 1.”
- Ensure the key switch input is wired.
- Exit program mode.
Now the AccuLoad will require the correct passcode and an active key switch input before granting the read/write access to program mode at “Level 5.” For “Level 1” and “Level 2”, only the correct passcode is required.

For complete control, the security level associated with communications should be set. For this example, setting the Comm Link Programming parameter in the communications section of the database to “Level 2” is appropriate. This would allow full access to the configuration database via the AccuMate except for the meter factors and K factors.

**Note:** Authorities Having Jurisdiction (AHJ) may require parameters other than those that are set by factory default to be set to either level 4 or 5 to be logged in the audit trail. This will be determined at commissioning (Initial verification).

For information on changing parameter security level assignment see the AccuMate Manual MN06205.
This section describes informational displays that can be viewed while in the Run or Ready Mode. These displays are “dynamic” in the sense that the displayed values reflect current actual conditions and continuously update while being viewed. The following shows how to navigate the menus to view the current flow rate of Product 2 on Arm 2.

Press the Dynamic Displays button.

**Dynamic Display Selection Menu** – Pressing the Load Arm Dynamic Displays from the selection menu displays the arm selection menu.

Pressing arm button results in the presentation of the following options.
Load Arm 1 - Dynamic Display selection menu – Press Product to view data by product.

Arm->Load Arm 1->Products Dynamic Display menu

Dynamic Displays->Load Arms->Load Arm 1->Products->Product 2 data display.

**Note:** System directory parameter 313 - Dynamic Display Timeout can be used to automatically return to the Ready screen after a period of inactivity while viewing a Dynamic Display screen.

### 3.1. Dynamic Display Categories

Dynamic display data is grouped into five categories: **System, Load Arm, Recipe, Injector, and Diagnostics**. Displays may be accessed by selecting Dynamic Displays from the Ready screen. The load arm dynamic displays are further divided into eight sub-categories: product, batch, transaction, blend, density sampling, recipes, injector rates, and flow controlled additives.
3.1.1. System Dynamic Displays

System dynamic displays show all data that is common to the entire AccuLoad. A listing of system dynamic displays, as well as the format in which the information appears, is set forth in the table below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Display Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Flow Rate in Units/Min for Arm 1</td>
<td>Flow (Arm 1) XXXXX.X Gal/Min</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Min for Arm 2</td>
<td>Flow (Arm 2) XXXXX.X Gal/Min</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Min for Arm 3</td>
<td>Flow (Arm 3) XXXXX.X Gal/Min</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Min for Arm 4</td>
<td>Flow (Arm 4) XXXXX.X Gal/Min</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Min for Arm 5</td>
<td>Flow (Arm 5) XXXXX.X Gal/Min</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Min for Arm 6</td>
<td>Flow (Arm 6) XXXXX.X Gal/Min</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Hour for Arm 1</td>
<td>Flow (Arm 1) XXXXXXX.X Gal/Hr</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Hour for Arm 2</td>
<td>Flow (Arm 2) XXXXXXX.X Gal/Hr</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Hour for Arm 3</td>
<td>Flow (Arm 3) XXXXXXX.X Gal/Hr</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Hour for Arm 4</td>
<td>Flow (Arm 4) XXXXXXX.X Gal/Hr</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Hour for Arm 5</td>
<td>Flow (Arm 5) XXXXXXX.X Gal/Hr</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Hour for Arm 6</td>
<td>Flow (Arm 6) XXXXXXX.X Gal/Hr</td>
</tr>
<tr>
<td>Current Recipe for Arm 1</td>
<td>Recipe (Arm 1) NNNNNNNNNNN</td>
</tr>
<tr>
<td>Current Recipe for Arm 2</td>
<td>Recipe (Arm 2) NNNNNNNNNNN</td>
</tr>
<tr>
<td>Current Recipe for Arm 3</td>
<td>Recipe (Arm 3) NNNNNNNNNNN</td>
</tr>
<tr>
<td>Current Recipe for Arm 4</td>
<td>Recipe (Arm 4) NNNNNNNNNNN</td>
</tr>
<tr>
<td>Current Recipe for Arm 5</td>
<td>Recipe (Arm 5) NNNNNNNNNNN</td>
</tr>
<tr>
<td>Current Recipe for Arm 6</td>
<td>Recipe (Arm 6) NNNNNNNNNNN</td>
</tr>
<tr>
<td>Preset and delivered for Arm 1</td>
<td>Arm 1 Preset XXXXX Del XXXXX</td>
</tr>
<tr>
<td>Preset and delivered for Arm 2</td>
<td>Arm 2 Preset XXXXX Del XXXXX</td>
</tr>
<tr>
<td>Preset and delivered for Arm 3</td>
<td>Arm 3 Preset XXXXX Del XXXXX</td>
</tr>
<tr>
<td>Preset and delivered for Arm 4</td>
<td>Arm 4 Preset XXXXX Del XXXXX</td>
</tr>
<tr>
<td>Preset and delivered for Arm 5</td>
<td>Arm 5 Preset XXXXX Del XXXXX</td>
</tr>
<tr>
<td>Preset and delivered for Arm 6</td>
<td>Arm 6 Preset XXXXX Del XXXXX</td>
</tr>
</tbody>
</table>

3.1.2. Load Arm Dynamic Displays

Load Arm dynamic displays are divided into the following categories: Product, Batch, Transaction, Blend, Ratio Blend Data, Recipes, Injector Rates, and Flow Controlled Additives. Product dynamic displays show all data associated with a specific product.
### 3.1.3. Product Dynamic Displays

If Product Dynamic Displays is selected, a menu appears listing all products associated with that load arm. (If only one product is available on the selected load arm, this screen is omitted.) Each load arm can accommodate up to six products.

If user-defined names have been assigned to these products, they will appear on this menu. If no user-defined name has been configured, the products will be listed as Product 1, Product 2, etc.

A listing of product dynamic displays, as well as the format in which the information appears, is set forth in the table below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Display Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Flow Rate in Units/Min</td>
<td>Flow (Arm 1) XXXXX.X Gal/Min</td>
</tr>
<tr>
<td>Current Flow Rate in Units/Hour</td>
<td>Flow XXXXXXX.X Gal/Hr</td>
</tr>
<tr>
<td>Current and Average Temperature</td>
<td>Temperature Cur Avg XXXX.XF</td>
</tr>
<tr>
<td>Current and Average Density @ Observed Temperature</td>
<td>Dens Cur Avg XXXX.XKg/M3</td>
</tr>
<tr>
<td>Average API @ Reference Temperature</td>
<td>Avg Dens @ ref temp XXXX.XAPJ</td>
</tr>
<tr>
<td>Average Reference Density @ Reference Temperature</td>
<td>Avg Dens @ ref temp XXXX.Xkg/m3</td>
</tr>
<tr>
<td>Average Relative Density @ Reference Temperature</td>
<td>Avg Rel Dens @ ref temp XXXXX</td>
</tr>
<tr>
<td>Relative Density @ 60°F and Current Pressure</td>
<td>Avg Rel Dens @ 60°F and PRS X.XXXX</td>
</tr>
<tr>
<td>Reference Density @ Reference Density Temperature</td>
<td>Ref Dens @ ref dens temp XXXX.Xkg/m3</td>
</tr>
<tr>
<td>Current Reference Density @ Reference Temperature</td>
<td>Cur Ref Dens @ ref temp XXXX.Xkg/m3</td>
</tr>
<tr>
<td>Batch Average Pressure</td>
<td>Batch Avg Press XXXX.X PSI</td>
</tr>
<tr>
<td>Batch Average Vapor Pressure</td>
<td>Avg Vapor Press XXXX.X PSI</td>
</tr>
<tr>
<td>Current and Average Meter Factor</td>
<td>Mfac Cur Avg XXXXXXX XXXXXXX</td>
</tr>
<tr>
<td>Batch Average CTPL</td>
<td>Batch Avg CTPL X.XXXX</td>
</tr>
<tr>
<td>Batch Average CTL</td>
<td>Batch Avg CTL X.XXXX</td>
</tr>
<tr>
<td>Batch Average CPL</td>
<td>Batch Avg CPL X.XXXX</td>
</tr>
<tr>
<td>Actual Percentage of Batch</td>
<td>Actual Blend % XXX%</td>
</tr>
<tr>
<td>Desired Percentage of Batch</td>
<td>Desired Blend % XXX%</td>
</tr>
<tr>
<td>Instantaneous Blend Percentage</td>
<td>Instantaneous Blend % XXXX</td>
</tr>
<tr>
<td>Deviation Count (Error Between Desired and Actual Volume)</td>
<td>Deviation Count XXXX.XX</td>
</tr>
<tr>
<td>Indicated (Raw) Volume</td>
<td>IV Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Gross Batch Volume</td>
<td>GV Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Gross at Standard Temperature Batch</td>
<td>GST Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Gross at Standard Temperature and Pressure Batch</td>
<td>GSV Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Description</td>
<td>Display Format</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Recipe Name and Number</td>
<td>Recipe XX NNNNNNNNN</td>
</tr>
<tr>
<td>Indicated (Raw) Batch Volume</td>
<td>IV Batch XXXXXXX.X Gal</td>
</tr>
<tr>
<td>Gross Batch Volume</td>
<td>GV Batch XXXXXXX.X Gal</td>
</tr>
<tr>
<td>Gross at Standard Temperature</td>
<td>GST Batch XXXXXXX.X Gal</td>
</tr>
<tr>
<td>Gross at Standard Temperature and Pressure</td>
<td>GSV Batch XXXXXXX.X Gal</td>
</tr>
<tr>
<td>Mass Batch Amount</td>
<td>Mass Batch XXXXXXX.X Gal</td>
</tr>
<tr>
<td>Batch Average Temperature</td>
<td>Batch Avg Temp XXX.X°F</td>
</tr>
<tr>
<td>Batch Average Density</td>
<td>Batch Avg Dens XXX.X Lb/F3</td>
</tr>
<tr>
<td>Batch Average Pressure</td>
<td>Batch Avg Press XXX.X Psi</td>
</tr>
<tr>
<td>Batch Average Meter Factor</td>
<td>Batch Avg Mtr Factor X.XXXX</td>
</tr>
<tr>
<td>Batch Average CTL</td>
<td>Batch Avg CTL X.XXXX</td>
</tr>
<tr>
<td>Batch Average CPL</td>
<td>Batch Avg CPL X.XXXX</td>
</tr>
<tr>
<td>Additive 1 Batch Total</td>
<td>Add 1 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 2 Batch Total</td>
<td>Add 2 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 3 Batch Total</td>
<td>Add 3 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 4 Batch Total</td>
<td>Add 4 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 5 Batch Total</td>
<td>Add 5 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 6 Batch Total</td>
<td>Add 6 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 7 Batch Total</td>
<td>Add 7 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 8 Batch Total</td>
<td>Add 8 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 9 Batch Total</td>
<td>Add 9 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 10 Batch Total</td>
<td>Add 10 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 11 Batch Total</td>
<td>Add 11 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 12 Batch Total</td>
<td>Add 12 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 13 Batch Total</td>
<td>Add 13 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 14 Batch Total</td>
<td>Add 14 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 15 Batch Total</td>
<td>Add 15 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 16 Batch Total</td>
<td>Add 16 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 17 Batch Total</td>
<td>Add 17 Batch XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Additive 18 Batch Total</td>
<td>Add 18 Batch XXXXXXX.XX Gal</td>
</tr>
</tbody>
</table>

### 3.1.4. **Batch Dynamic Displays**

Batch Dynamic Displays, from the Load Arm Dynamic Displays menu, shows all data associated with a specific batch.

A listing of batch dynamic displays, as well as the format in which the information appears, is set forth in the following table:
3.1.5. **Transaction Dynamic Displays**

Transaction Dynamic Displays, from the Load Arm Dynamic Displays menu, shows all data associated with a specific batch. Only those additive injectors configured for this load arm will be included in the transaction dynamic displays.

A listing of batch dynamic displays, as well as the format in which the information appears, is set forth in the table below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Display Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicated (Raw) Transaction Volume</td>
<td>IV Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Gross Transaction Volume</td>
<td>GV Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Gross at Standard Temperature Volume</td>
<td>GST Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Gross at Standard Temperature and Pressure</td>
<td>GSV Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Mass Transaction Volume</td>
<td>Mass Trans XXXXXXX.XX Lbs</td>
</tr>
<tr>
<td>Transaction Average Temperature</td>
<td>Trans Avg Temp XXX.X°F</td>
</tr>
<tr>
<td>Transaction Average Density</td>
<td>Trans Avg Dens XXX.X Lb/F³</td>
</tr>
<tr>
<td>Transaction Average Pressure</td>
<td>Trans Avg Press XXX.X Psi</td>
</tr>
<tr>
<td>Transaction Average Meter Factor</td>
<td>Trans Avg Mfr Factor X.XXXX</td>
</tr>
<tr>
<td>Transaction Average CTL</td>
<td>Trans Avg CTL X.XXX</td>
</tr>
<tr>
<td>Transaction Average CPL</td>
<td>Trans Avg CPL X.XXX</td>
</tr>
<tr>
<td>Injector 1 Transaction Total</td>
<td>Add 1 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 2 Transaction Total</td>
<td>Add 2 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 3 Transaction Total</td>
<td>Add 3 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 4 Transaction Total</td>
<td>Add 4 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 5 Transaction Total</td>
<td>Add 5 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 6 Transaction Total</td>
<td>Add 6 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 7 Transaction Total</td>
<td>Add 7 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 8 Transaction Total</td>
<td>Add 8 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 9 Transaction Total</td>
<td>Add 9 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 10 Transaction Total</td>
<td>Add 10 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 11 Transaction Total</td>
<td>Add 11 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 12 Transaction Total</td>
<td>Add 12 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 13 Transaction Total</td>
<td>Add 13 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 14 Transaction Total</td>
<td>Add 14 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 15 Transaction Total</td>
<td>Add 15 Trans XXXXXXX.XX Gal</td>
</tr>
<tr>
<td>Injector 16 Transaction Total</td>
<td>Add 16 Trans XXXXXXX.XX Gal</td>
</tr>
</tbody>
</table>
### 3.1.6. Blend Dynamic Displays

Blend dynamic displays show all data associated with a specific sequential blending transaction. Selecting “Blend” from the Dynamic Displays menu results in the following:

![Blend Dynamic Display](image)

### 3.1.7. Ratio Blend Data Dynamic Displays

Ratio blend data dynamic displays show all data associated with a specific ratio blending transaction. Selecting “Ratio Blend” from the Dynamic Displays menu gives the following display:

![Ratio Blend Dynamic Display](image)

### 3.1.8. Density Sampling Dynamic Displays

Density sampling dynamic displays apply only to unloading arms. The screen displays up to ten density samples taken during the batch. Selecting “Density Sampling” from the Dynamic Displays menu results in a screen like that shown.

![Density Sampling Dynamic Display](image)
Each of the samples is a flow weighted average over the delta volume programmed in product parameter 415. The last complete density sample is considered the density of the pure uncontaminated product when the contaminant percentage is calculated.

### 3.1.9. Recipe Dynamic Displays

Recipe dynamic displays show all data associated with a programmed recipe.

A listing of recipe dynamic displays, as well as the format in which the information appears, is set forth in the table below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Display Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recipe 1 Current Pulse Rate</td>
<td>Inj 1 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 2 Current Pulse Rate</td>
<td>Inj 2 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 3 Current Pulse Rate</td>
<td>Inj 3 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 4 Current Pulse Rate</td>
<td>Inj 4 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 5 Current Pulse Rate</td>
<td>Inj 5 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 6 Current Pulse Rate</td>
<td>Inj 6 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 7 Current Pulse Rate</td>
<td>Inj 7 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 8 Current Pulse Rate</td>
<td>Inj 8 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 9 Current Pulse Rate</td>
<td>Inj 9 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 10 Current Pulse Rate</td>
<td>Inj 10 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 11 Transaction Total</td>
<td>Inj 11 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 12 Transaction Total</td>
<td>Inj 12 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 13 Transaction Total</td>
<td>Inj 13 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 14 Transaction Total</td>
<td>Inj 14 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 15 Transaction Total</td>
<td>Inj 15 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 16 Current Pulse Rate</td>
<td>Inj 16 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Recipe 17 Current Pulse Rate</td>
<td>Inj 17 Prg XXX Cal XXXX.XX</td>
</tr>
</tbody>
</table>

### 3.1.10. Injector Dynamic Displays

Injector dynamic displays show all data associated with specific injectors. Twenty-four injectors are available for use, but the AccuLoad will display only those that are configured.

If the Injector dynamic displays are accessed from the main Dynamic Display menu, then all additive injectors configured for the AccuLoad will be included in the displays. However, if the Injector Rates dynamic displays are accessed from the Load Arm dynamic displays, then only the additive injectors configured for the particular load arm will be displayed.

A listing of injector dynamic displays, as well as the format in which the information appears, is set forth in the table below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Display Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injector 1 Current Pulse Rate</td>
<td>Inj 1 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 2 Current Pulse Rate</td>
<td>Inj 2 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 3 Current Pulse Rate</td>
<td>Inj 3 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 4 Current Pulse Rate</td>
<td>Inj 4 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 5 Current Pulse Rate</td>
<td>Inj 5 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 6 Current Pulse Rate</td>
<td>Inj 6 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 7 Current Pulse Rate</td>
<td>Inj 7 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 8 Current Pulse Rate</td>
<td>Inj 8 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 9 Current Pulse Rate</td>
<td>Inj 9 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 10 Current Pulse Rate</td>
<td>Inj 10 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 11 Transaction Total</td>
<td>Inj 11 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 12 Transaction Total</td>
<td>Inj 12 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 13 Transaction Total</td>
<td>Inj 13 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 14 Transaction Total</td>
<td>Inj 14 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 15 Transaction Total</td>
<td>Inj 15 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 16 Current Pulse Rate</td>
<td>Inj 16 Prg XXX Cal XXXX.XX</td>
</tr>
<tr>
<td>Injector 17 Current Pulse Rate</td>
<td>Inj 17 Prg XXX Cal XXXX.XX</td>
</tr>
</tbody>
</table>
### 3.1.11. Flow Controlled Additives Dynamic Displays

The screens below and to the right are examples of the information that is available on the display for all configured flow controlled additives. If additives are not temperature compensated, Batch Average CTL, current and average temperature, GST values, GSV values, and Mass values are not displayed.

![Dynamic Displays](image)

### 3.2. Dynamic Displays Diagnostics Menu

Diagnostics options from the dynamic displays menu allows the operator to view current conditions, identify causes of system errors, and analyze data collected by the AccuLoad. Diagnostic options available are:

![Diagnostics Menu](image)

**Note:** The diagnostics available through the Dynamic Displays menu are run-time diagnostics only. Program mode diagnostics are accessed from the Main Menu.
The Diagnostics menu available through the Dynamic Display consists of the following:

- Active Alarms
- Alarm History
- Non-Resettable Volumes
- Event Log
- Transaction Log
- Audit Trail
- Digital Input
- Digital Output
- Analog I/O
- Pulse Inputs
- Pulse Outputs
- Reset Dual Pulse Errors
- Solenoid Actuation Count
- Valve Closure Data
- Meter Pulse Inputs
- Boolean Algebraic
- Add-Pak Diagnostics
- Engineering
- Network Diagnostic
- Update Driver Data
- Update Firmware
- Update License
- Force Update
- Exit

3.2.1. Active Alarms

Displays all currently active alarms associated with any of the arms.

The active alarms can be cleared from this display by pressing the Clear button. The AccuLoad will then ask for the passcode. When the passcode is entered, the alarm will clear.
3.2.2. Alarm History

The Diagnostics menu provides the selection “Alarm History” where the most recent alarms can be viewed. Press the “Alarm History” button, then select a load arm, and the historical alarms will be displayed. The alarms will be listed in order of occurrence.

This is an alarm history for the arm. The Event Log screen provides a more complete history of alarms for all arms.

Pressing the up and down arrow buttons will allow the operator to page through the Alarm History displays. If “More…” is not displayed, then there is only one screen of alarms in the alarm history.

3.2.3. Non-Resettable Volumes

The Diagnostics menu provides the selection “Non-Resettable Volumes” where the product, additive injector and recipe totalizer amounts can be viewed:

Product volumes are displayed per arm as follows:
Additive injector values are displayed as follows:

![Image of dynamic display showing additive injector values]

Press Recipes, then select a specific recipe to view that recipe's totalizers:

![Image of dynamic display showing recipe totalizers]

3.2.4. Event Log

The View Only Diagnostics menu option “Event Log” is where past events can be viewed. The “Event Log” includes alarms, transaction start and end events, and program mode parameter changes. Each entry includes the date/time of the event and the associated detailed event description.

![Image of dynamic display showing event log entries]

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3.2.5. Transaction Log

The Transaction Log displays the details of a current or past transaction. Totals for the transaction and for each batch can be viewed:

![Transaction Log Example]

Note: Additive totals will be displayed only for those injectors used in the transaction.

3.2.6. Audit Trail

The audit trail provides the date, time, and description of Program Mode changes that are relevant to Weights & Measures. Note that only changes to parameters secured at the two highest security levels programmed are logged in the audit trail, so all metrologically significant program codes should be set to the highest two levels. Reference Security Section 2.9 for further details.
3.2.7. Digital Inputs

This diagnostic provides information on digital input states.

3.2.8. Digital Outputs

It is possible to monitor the state of the outputs on the AccuLoad via this diagnostic. With the proper access level, outputs from this diagnostic to assist in startup and troubleshooting can be toggled.
3.2.9. Analog I/O

From the Analog I/O diagnostic, the data associated with the analog inputs and outputs can be viewed. In addition, given a sufficient level of access, it is possible to override the analog output engineering values manually from this diagnostic for startup and troubleshooting purposes.

3.2.10. Pulse Inputs

From the Pulse Input diagnostic, the pulse counts associated with the meter pulse inputs can be viewed. In addition, given a sufficient level of access it is possible to access a ‘test’ mode that permits the resetting of the pulse counts manually for startup and troubleshooting purposes.

3.2.11. Pulse Outputs

From the Pulse Outputs diagnostic, it is possible to enter a frequency and a specific pulse count for testing and start/stop each of the output pulse streams.
3.2.12. Reset Dual Pulse Errors

From the Reset Dual Pulse Errors diagnostic, it is possible to clear any built up error pulse counts that have accumulated for an arm.

3.2.13. Solenoid Actuation Diagnostic Counters

The AccuLoad IV provides counters to track the upstream and downstream solenoid actuations. Separate counters will be available for both the upstream and downstream solenoid of each meter. The counter will be incremented each time the solenoid is energized. The counters can also be cleared or set to a specific value via this diagnostic (with sufficient security access).

Note: The counters will be cleared by a factory initialization of firmware upgrade. The registers may also be read and modified (set or cleared) via communications.

3.2.14. Valve Closure Diagnostics

This command retrieves the time it takes for the product flow control valve to completely close, retrieves the volume of product that has been delivered after the STOP button (or remote stop) has been pressed and indicates the flow rate. This command will also measure the volume and time if there is a loss of permissive resulting in valve closure or if a communication command is issued to stop the batch.
Select a meter to view the time, volume and flow rate of the valve closure.

### 3.2.15. Meter Pulse Inputs

Selecting this diagnostic will result in a screen that indicates the number of pulses received by the respective pulse input. This diagnostic should not be used to verify the actual meter pulses received for any batch or transaction. It is intended as a method of verifying pulse input wiring to the respective pulse input on the AccuLoad. Applying pulses to the respective input will cause the respective counter to increment.

**Note:** If Dual Pulse is enabled, “Reset Dual Pulse Errors” will appear as a menu option on the screen. See description “Reset Dual Pulse Errors”.

### 3.2.16. Boolean/Algebraic

The Diagnostics menu provides the selection “Boolean Algebraic” to view Boolean/Algebraic registers and their results. General-purpose timers can also be viewed from this diagnostic.

Boolean Algebraic Equation line status with User Boolean and Float values:

See the AccuMate online help.
3.2.17. Engineering Diags

This diagnostic screen is a combination of the analog and digital input low level status for factory testing.

3.2.18. Network Diags

Displays Network Diagnostics for each of the network interfaces in the AccuLoad IV.

3.2.19. Update Driver Database

This diagnostic allows for direct addition of new driver information to the database. New driver information can be added manually or by presenting a previously unused card to the reader while in this diagnostic.
3.2.20. Update Firmware

This diagnostic is intended to provide a mechanism to authenticate a firmware upgrade. Upgrades can be accomplished without using this diagnostic if the communications interface being used has sufficient privileges. In the case where the configuration does not permit updates from being initiated automatically, this diagnostic allows the ‘confirmation’ of the desire to upgrade via the AccuLoad VI.

Note: If the Firmware Lock function located under the W&M Calibration menu (see section 5) is enabled, firmware updates are inhibited until the Firmware Lock is disabled. This action will then be recorded in the Audit trail.
Page intentionally left blank.
4 – Reports / Logs

By pressing Reports/Logs from the Main Menu, it is possible to generate printed reports and view the AccuLoad’s historical data logs.

4.1. Summary Reports

This selection allows for printing summary data of all throughput during a designated period. Specify an arm, start, and end time/date to define the period to use for the report, and press ‘Print Report’ to generate the summary.

4.2. Audit Trail

This selection provides a means to view the audit trail log and optionally print a subset of the entries in the log. All changes to parameters set to Access level 4 or 5 (see section 2.9) are recorded in this log.
4.3. Alarm History

This selection provides a means to view the alarm history.

```
4.4. Transaction Log

This selection provides a means to view a list of the transactions that have been completed and optionally view the details or print entries in the log:
```
4.5. Event Log

This selection provides a means to view and optionally print the event log. All events, such as alarms, transaction start/end, and changes to parameters set to Access level 3 or below (see section 2.9) are recorded in this log.

4.6. Prove Log

This selection provides a means to view the historic prove data, if the AccuLoad’s ‘Auto-Proving mechanism is used to generate linearization curves for the meters.
A list of the prove data for the arm is presented. It is then possible to view or print the prove details from this diagnostic.
5 – Weights & Measures / Calibration Menu

The features available within this section of the user interface menu affect the calibration information and metrologically significant data storage and hence are protected by the Weights & Measures security requirements. The Level 5 access code (if configured) will be required to perform these functions. Additionally, if the user has programmed an input for a W&M security switch, it must be active. See manual MN06201 for connection details for this optional switch.

5.1. DB Settings (Database Settings)

DB Initialization – From this screen it is possible to reconfigure the database to one of a list of possible desired starting points. Note that this option will reset all previous program code configuration values in the database and return the AccuLoad to one of a fixed set of initial states. Options include:

- Mix of Straight and Seq Arms
- Ratio Blending (1 or 2 arms)
- Factory Default
- Hybrid Blending (1-3 arms)

The number of arms (1-6) and the desired system of units (US or SI) can also be configured as part of the reconfiguration. Once these options are selected, select Submit to reconfigure the database.
5.2. **Set Trans # (Set Transaction Number)**

This option allows the operator to specify what value the Transaction ID for the next transaction run will be. This is to allow the operation to have continuous transaction identifiers in the case of an upgrade or replacement of an existing preset.

**Note:** all existing transactions in the AccuLoad for the arm will be erased since the prevention of duplicate transaction IDs cannot be guaranteed otherwise.

To change the starting transaction number, select the arm and enter the desired ID in the text field, then select Continue.

![Set Trans # Screen](image)

Press Continue once more to complete the process, or Cancel to return to the screen and exit without changes.

5.3. **Erase Event Log**

This option erases all records in the Event Log:

![Erase Event Log Screen](image)
A confirmation dialog will appear:

![Warning]

If Continue is pressed, all entries in the Event Log will be erased. In either case after a selection is made control returns to the W&M/Calibration menu. This activity will be logged in the Audit Trail.

5.4. Erase Transaction Log

This option erases all records in the Transaction Log:

![Erase Transaction Log]

A confirmation dialog will appear.

![Warning]

This activity will be logged in the Audit Trail.

5.5. Proving

Press Proving from the W&M/Calibration menu to begin a proving operation.
Enter the volumetric coefficient of expansion for the steel (typically can be found on the nameplate of the prover).

Enter the desired preset based on the can size and press Next. Start the prove run as for a normal delivery.
At the end of the run, the data is presented allowing for multiple actions, including calculating the meter factor based on the prover neck reading and temperature, aborting the run and discarding the data associated with the run, accepting the run, and starting a new run.

Enter the volume in the prover can and the prover temperature reading, then select **Calculate** to generate the new factor based on the run (this can take some time):
To accept the new meter factor, press Accept Last Run Meter Factor. To employ additional runs, press Start Next Run. After multiple runs, the option to Accept Avg Meter Factor can also be used. To see all the data associated with the prove run, press the View button:

Once the prove operation is completed successfully and the appropriate meter factor has been accepted, the AccuLoad will return to the Weights & Measures menu.

### 5.6. Metered Injector Proving

Proving of additive meters is required to ensure accurate additive injection through metered injectors. To prove a metered injector, the flow out of the injector is collected in a calibrated container while the injector is activated to deliver additive to fill the container. Then the amount delivered into the container is compared to the amount indicated by the number of pulses counted by the AccuLoad and a meter factor is calculated.

The AccuLoad has built-in Metered Injector Proving support which provides a simple and efficient way to ensure the accuracy of metered injectors.

**Process of proving an additive meter:**

1. Arrange the plumbing out of the injector to flow into a graduated vessel
2. Clear any active alarms
3. Access the Metered Injector Proving screen shown above from the main menu (W&M/Calibration->Metered Injector Proving)
4. Select the injector to prove from the drop-down list (A in the figure above)
5. Select the option for a single or multiple injections
   a. Single – The injections are manually controlled by the operator with one injection of the amount entered in “Amount of Injection” each time the operator presses the Inject button
   b. Multiple – The AccuLoad automatically performs enough individual injections of the amount entered in “Amount of Injection” to deliver the amount entered in “Total Injection Amount”
6. Enter the Amount of Injection (see above)
7. Enter the Total Injection Amount if using the Multiple Injections method (see above)
8. Press the Reset Pulse Counts to clear the proving data if starting a new prove
9. Press Start to move to the next screen to where the additive flow is initiated. The next screen will display the count of additive meter pulses and the amount of flow represented by the pulses. For multiple injections, these totals will increment for each injection.
10. If using the Single Injection method, press the Inject button the required number of times required for the size of the proving vessel. If using the Multiple Injection method, the AccuLoad will perform the selected number of injections automatically.

11. Once the injection(s) are complete, press Next to move to the next screen to enter the amount of additive indicated by the calibrated vessel.

12. On the calculations screen, enter the Actual Delivered Amount as read from the proving vessel and select the correct units for this amount, then press the Calculate button. The AccuLoad will calculate the new meter factor and also display the percentage change between the old meter factor and the new meter factor.
5.7. **Reset Totals**

From this menu selection, the totalizers in the AccuLoad can be reset. It is possible to reset the totalizers for all arms at once, or for individual load arm if desired.

As with the other functions a confirmation dialog will appear. If continue is pressed, the totalizers for the selected arm(s) will be cleared.

5.8. **Firmware Lock**

This option allows an installation to prevent certain features from being accessible unless ‘unlocked’ via a Weights & Measures only accessible re-enable selection. Disabled features include the ability to update the firmware, access to the factory service port, and the ability to upload or download configuration files from AccuMate (equations, configurable reports, etc.).
6 – Device Settings

This menu provides several options for configuring how the device operates, primarily related to the user interface and display. Options are as shown below:

![Device Settings Menu]

6.1. Screen Style

This selection allows the user to configure the display style – Day, Night, or Auto. Day Style utilizes dark text and icons on a white background, easier to read in daylight. Night style utilizes a black background, easier to view in darkness. In Auto, the AccuLoad will transition from Day to Night style based on a preset time of 8:00 AM to 6:00 PM.

6.2. MMI Settings

This selection is only valid in a Split Architecture configuration. It redirects the interface to the local database server to allow modification of the MMI settings. See the Split Architecture application bulletin for more information regarding MMI configuration.

6.3. Screen Test

This diagnostic is designed to validate each pixel on the display. When pressed, the entire screen will cycle from all black, to all red, to all green, to all blue, to all white. This will repeat until the screen is pressed again to return to the menu.
7 – Device Information

This selection provides details about the AccuLoad IV firmware and software:
The main system directories are as follows:

**Config (Configuration) Directories**
- 000 - System Layout
- 100 - Pulse Inputs
- 200 - Pulse Outputs
- 300 - Digital Inputs
- 500 - Digital Outputs
- 900 - Analog I/O

**System Directories**
- 100 - General Purpose
- 200 - Flow Control
- 300 - Volume Accuracy
- 400 - Temperature/Density
- 500 - Pressure
- 600 - Alarm Configuration
- 700 - Communications
- 800 - Additive Security

**Bay Directories**
- 100 - General Purpose
- 700 - Communications

**Arms Directories**
- 100 - General Purpose
- 200 - Flow Control
- 300 - Volume Accuracy
- 700 - Communications

**Meter Directories**
(Located in the Load Arm directory)
- 200 - Flow Control
- 300 - Volume Accuracy
- 400 - Temperature/Density
- 500 - Pressure

**Product Directories**
(Located in the Load Arm directory)
- 100 - General Purpose
- 200 - Flow Control
- 300 - Volume Accuracy
- 400 - Temperature/Density
- 500 - Pressure

**Recipe Directories**
Product Blend
Recipe Additives

**Split Architecture Directories**

This section describes the individual program codes within the directories. The directories and subdirectories are listed above each set of parameters. Please note that the numbers in parentheses are reference numbers for communications. In the database, pick list items have a reference number for communications (e.g., (2)). Through communications, a 2 would be sent to the AccuLoad to select that option for the parameter.

The program code explanations frequently list “fatal” or “critical” warnings, or indicate that in some circumstances, the code is “no entry.” A fatal warning is triggered by a selection that the AccuLoad cannot accept and will not allow to be entered. Possible causes include an entry that falls outside an allowable range, or an entry that seriously conflicts with a previous entry. A critical warning signals that a selection is incompatible with a previously configured program code. The AccuLoad will accept the new entry, but the conflict will have to be resolved prior to operation. “No entry” indicates that a program code is unavailable and will not appear on the menu, because previous selections make it irrelevant. For example, ratio blending program codes will not appear when sequential blending has been chosen.
## 8.1. Configuration Directories

### System Layout Directory

**System Layout Directory includes:**

- Number of Load Arms
- Arm 1 - 6 Configuration
- Arm 1 - 6 Number of Products
- Arm 1 - 6 Ratio Products
- A4B Available
- A4I Available
- Board Set Number
- Board Set Function

<table>
<thead>
<tr>
<th>Configuration:</th>
<th>Index:</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Layout: Number of Load Arms</td>
<td>None</td>
<td>1 - 6&lt;br&gt;• AccuLoad S - 1 or 2&lt;br&gt;• AccuLoad Q - 6 maximum</td>
</tr>
</tbody>
</table>

**Description:** This parameter defines the number of load arms associated with this AccuLoad.

**Critical(s):**

Insufficient meter pulse inputs, A4B required. Configuration requires more meters than are available.

**Fatal:** Entry is out of specified range.

<table>
<thead>
<tr>
<th>Configuration:</th>
<th>Index:</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Layout: Arm</td>
<td>Arm</td>
<td>None</td>
</tr>
<tr>
<td>Configuration - 002, 005, 008, 011, 014, 017</td>
<td></td>
<td>Default: Straight Product</td>
</tr>
</tbody>
</table>

**Description:** These parameters determine the functionality of Arms 1 - 6 respectively.

**Selection:**

- (0) Straight Product Arm
- (1) Sequential Blending Arm
- (2) Ratio Blending Arm
- (3) Side-Stream Blender
- (4) Unloading
- (5) Hybrid Blending
- (6) Straight with VRS

**Critical(s):**

Unloading requires inputs DE Head High Flow, Low Flow and Stop.
## Number of Products

<table>
<thead>
<tr>
<th>Configuration: System Layout: Arm Number of Products</th>
<th>Index: Arm</th>
<th>Range: 1 - 6 Default: 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration - 003, 006, 009, 012, 015, 018</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter defines the number of products assigned to the arm. Valid entries are 1 - 6.

**Critical(s):**
- Straight product configuration requires single product.
- Ratio blending configuration requires more than one product.
- Block valves required for all products, [sequential blending configuration]
- Configuration requires more meters than are available.
- Number of products must be two when side-stream blending.
- Ratio blending limited to two products.
- "Straight with VRS" requires this parameter to be programmed to 2.

## Number of Ratio Products

<table>
<thead>
<tr>
<th>Configuration: System Layout: Arm Number of Ratio Products</th>
<th>Index: Arm</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration - 004, 007, 010, 013, 016, 019</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid Type Blending Arms Only</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** The parameter specifies the number of products on a hybrid load arm that do not share a meter. Product runs with separate metering, whether upstream or downstream of a shared meter, are considered ratio products. Each ratio product for the hybrid arm requires a digital or analog valve for flow control. Each sequential product requires a block valve, unless there is only one sequential product. This parameter does not require an entry if the loading arm is not programmed as a hybrid loading arm.

**Critical(s):**
- Control valves required for all hybrid arm ratio products.
- Block valves required for all hybrid arm sequential products (if more than one sequential product).
- Entry for the Ratio Products must be less than "Arm Number of Products".

## A4B Available

<table>
<thead>
<tr>
<th>Configuration: System Layout: A4B Available</th>
<th>Index: None</th>
<th>Range: Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 051</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter should be set to "No" for the AccuLoad ST and N4 models which do not have an A4B module. It should be set to "Yes" for the AccuLoad Q and SA models which have the A4B module.

**Selections:**
- No - for the AccuLoad ST and N4 models which do not have an A4B module
- Yes - for the AccuLoad QT and SA models which have the A4B module

**Help:** Enter No for ST and N4 models, enter Yes for QT and SA models.
### Configuration: System Layout: A4I Available

**Configuration 052**

<table>
<thead>
<tr>
<th>Index: None</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• [None]</td>
</tr>
<tr>
<td></td>
<td>• One A4I board</td>
</tr>
<tr>
<td></td>
<td>• Two A4I boards</td>
</tr>
</tbody>
</table>

**Description:** This parameter must be set to indicate the number of optional A4I modules installed in the unit.

**Selections:**
- No (None)
- One board
- Two boards

### Configuration: System Layout: Board Set Number

**Configuration 053**

<table>
<thead>
<tr>
<th>Index: None</th>
<th>Range: 0 - 99</th>
</tr>
</thead>
</table>

**Description:** This parameter must be set to the number of board sets in the system.

### Configuration: System Layout: Board Set Function

**Description:**

**Selections:**
- No Split Arch
- No HMI
- HMI A
- HMI B
8.1.1. 100 – Pulse Inputs Directory

Pulse Inputs Configuration Directory includes:
• Pulse Input Tag
• Pulse Input Function
• Pulse Input Arm
• Pulse Input Meter

The AccuLoad ST and N4 models have a total of 8 pulse inputs available for use. The AccuLoad QT model supports up to 14 pulse inputs. The AccuLoad automatically assigns pulse inputs for the product meters. Only pulse inputs not required for the product meters are user configurable. Because the AccuLoad must have at least one product meter input, at a minimum pulse inputs 1 and 2 are reserved for connection to a product meter.

Pulse Inputs 3 - 14
Configurable Pulse Input parameters include Tag. Function, Pulse Input Arm, Pulse Input Meter.

This section describes the parameters which are used to configure the pulse inputs.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 101</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description: The tag will be used as the label for this pulse input. The default tag describes the connection terminals associated with this pulse input.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Configuration: Pulse Inputs: Pulse Input Function</th>
<th>Index: Pulse Input</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description: This parameter defines the purpose of this pulse input.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Selections:
• NA
• Freq Densitometer
• Meter Inj 1 - 4
• Flow Cntrl Inj 1 - 4

Critical(s):
• Input assignments must be unique.
• Injector I/O assignment does not match type.
• No digital output assigned for this injector.
• This input cannot be a frequency densitometer.
• Pulse input already allocated for meter pulses.
• Insufficient configurable pulse inputs [no A4B].
• Only one densitometer allowed per arm/meter.
<table>
<thead>
<tr>
<th>Configuration: Pulse Inputs: Pulse Input Arm</th>
<th>Index: Pulse Input</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 103</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter identifies which arm the pulse input is associated with. For example, if a pulse input is designated as a metered injector, this parameter will define which arm the metered injector is associated.

**Critical(s):**
- Load arm not configured.
- Only one densitometer allowed per arm/meter.

<table>
<thead>
<tr>
<th>Configuration: Pulse Inputs: Pulse Input Meter</th>
<th>Index: Pulse Input</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 104</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Pulse input 1 - 14 can be assigned to one of the following meters.

**Selection:**
- Meter 1
- Meter 2
- Meter 3
- Meter 4
- Meter 5
- Meter 6

**Critical(s):**
- Meter not configured.
- Only one densitometer allowed per arm/meter.
### 8.1.2. 200 – Pulse Outputs Directory

**Pulse Outputs 1 - 5**

**Pulse Outputs Configuration Directory includes:**
- Pulse Output Tag
- Pulse Output Arm
- Pulse Output Meter
- Pulse Output Pulses/Amount
- Pulse Output Units
- Pulse Output Maximum Frequency

<table>
<thead>
<tr>
<th>Configuration: Pulse Outputs: Pulse Output Tag</th>
<th>Index:</th>
<th>Range: 10 character</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 201</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter defines the tag associated with this pulse output used on diagnostic screens. The default tag is the terminal connections associated with this pulse output (ie A4M TBK4:7,8).

<table>
<thead>
<tr>
<th>Configuration: Pulse Outputs: Pulse Output Arm</th>
<th>Index:</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 202</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This program code sets which arm this output represents. The output will be active when flow is active during a batch, and represents volume. The number of pulses is determined by Configuration 203 – Pulse/Volume, and volume type is determined by Configuration 204 – Pulse Out Units.

**Selections:**
- Not used
- Arm 1 Pulses
- Arm 2 Pulses
- Arm 3 Pulses
- Arm 4 Pulses
- Arm 5 Pulses
- Arm 6 Pulses

**Critical(s):**
- Load arm not configured.

<table>
<thead>
<tr>
<th>Configuration: Pulse Output: Pulse Output Meter</th>
<th>Index:</th>
<th>Range: 0 - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 203</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter defines the meter associated with this pulse output.

**Selections:**
- Combined Meters (Ratio Blending Only)
- Meter 1 Pulses
- Meter 2 Pulses
- Meter 3 Pulses
- Meter 4 Pulses
- Meter 5 Pulses
- Meter 6 Pulses
### Configuration: Pulse Output: Pulse Output Pulse/Amount

<table>
<thead>
<tr>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.00 - 999.99</td>
</tr>
</tbody>
</table>

**Description:** This five-digit parameter defines the pulse output resolution, the number of pulses per unit of volume to be generated (e.g., 0.1 will output 1 pulse for every 10 units of volume).

### Configuration: Pulse Output: Pulse Output Pulse Units

<table>
<thead>
<tr>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse Output</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

**Description:** This parameter defines the volume type used to pace the pulse output.

**Selections:**
- IV [Indicated Volume or Raw]
- GV [Gross]
- GST [Gross Standard Temperature]
- GSV [Gross at Standard Temperature and Pressure]
- Mass

**Critical:**
- Selected units not available.

### Configuration: Pulse Output: Pulse Output Maximum Frequency

<table>
<thead>
<tr>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse Output</td>
<td>0 - 3500 Hz.</td>
</tr>
</tbody>
</table>

**Description:** This four-digit entry limits the pulse output frequency for Pulse Output #1 to a fixed range (0 to 3500 Hz) to avoid over-speeding the device attached to the pulse output. All of the intended pulses will eventually be transmitted; the total period will be increased if required to ensure the correct number of pulses is output. A 0 entry disables this feature.

**Fatal:**
- Entry is out of specified range.
8.1.3. 300 – DC & AC Digital Input Function Directories

Refer to the Installation Manual MN06201 for Terminal Assignments.

Digital Inputs 1 - 43

Digital Inputs Configuration Directory includes:
- Digital Input Tag
- Digital Input Function
- Digital Input Arm
- Digital Input Product

The availability of the digital inputs depends on the hardware being used in the AccuLoad. The inputs available are as follows:

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Inputs Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIV-ST</td>
<td>Digital Input 1 – Digital Input #11 (6-DC and 5-AC)</td>
</tr>
<tr>
<td>ALIV-QT</td>
<td>Digital Input 1 – Digital Input #23 (14-DC and 9-AC)</td>
</tr>
<tr>
<td></td>
<td>Digital Input 16 – 23 can be configured as inputs or outputs, if configured as outputs not available in these parameters.</td>
</tr>
<tr>
<td>A4I (Opt.)</td>
<td>Digital Input #24 – Digital Input #33 (10-DC)</td>
</tr>
<tr>
<td></td>
<td>Available as an option on both the ALIV-ST and ALIV-QT hardware.</td>
</tr>
<tr>
<td>A4I2 (Opt.)</td>
<td>Digital Input #34 – Digital Input #43 (10-DC)</td>
</tr>
<tr>
<td></td>
<td>Available as an option on the ALIV-QT hardware.</td>
</tr>
</tbody>
</table>

The AccuLoad also allows unused channels on installed A4I board(s) to be used for general-purpose I/O. One input is available for each A4I channel not being used for Add-Pak injector control. The A4I set to address 100 is mapped to Digital Inputs #24-33 and a 2nd A4I at address 200 would be mapped to Digital Inputs #34-43.

Example – If 1 A4I is installed and 6 Add-Pak injectors are programmed for use, 4 channels on the A4I are available for use as general purpose inputs. If additives 5,6,7,8,9 and 10 (corresponding to A4I channels 1-6) are programmed for Add-Pak injectors then channels 7-10 on the A4I (Digital Inputs #30-#33) could be used for other features.

These program codes define the function for a digital input. Except for general purpose inputs, duplicate assignments are not allowed. Inputs 1 through 6 are DC inputs, and 7 through 15 are AC. Selections are as follows:

<table>
<thead>
<tr>
<th>Configuration: Pulse Inputs: Digital Input Tag</th>
<th>Index:</th>
<th>Range: 10 character</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 301</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: This parameter defines the tag associated with this digital input used on diagnostic screens. The default tag is the terminal connections associated with this digital input (ie A4M TBK4:1,2)
### Configurations: Digital Inputs: DC & AC Digital Input Function

<table>
<thead>
<tr>
<th>Configuration 302</th>
<th>Index:</th>
<th>Range: 1 - 43</th>
</tr>
</thead>
</table>

**Description:** Assign a function to one of the digital inputs. Inputs 7 - 15 are AC; all others are DC.

**Selections:**
- Not used
- Security 1 - 2
- Permissive 1 - 2
- First/Second High Flow
- Remote Start
- Remote Stop
- Remote Stop Arm
- Transaction Reset
- General Purpose Input
- Printer Tray Switch
- Block Valve Feedback
- Piston Injector 1 – 24 Feedback
- System Permissive 1 - 3
- Swing Arm – Side A and Side B
- DE Head Stop Flow [not available if no unloading arms]
- DE Head Low Flow [not available if no unloading arms]
- DE Head High Flow [not available if no unloading arms]
- Bay A Permissive 1 and 2 [not available if Bays not assigned]
- Bay B Permissive 1 and 2 [not available if Bays not assigned]
- Metered Injector Prove Remote
- Recipe Select 1 – 3

**Critics:**
- Must be at highest level of security [to program or de-program security inputs]
- Input assignments must be unique [except general purpose inputs; block valve feedback (check arm and product); permissive #1 (check arm); permissive #2 (check arm)]
- Injector I/O assignment does not match type [injector feedbacks only]
- No digital output assigned for this injector [injector feedbacks only]
- Block valves used with sequential blending only
- A4B required for this digital I/O point.
- This I/O currently configured as an Add-Pak injector. [Inputs 24 – 43 only]

**Notes:**
- Additive injector selections available dependent on Configuration Code 020. (Only 12 are available with AccuLoad IV-S hardware.)

### Configurations: Digital Inputs: Digital Input Arm

<table>
<thead>
<tr>
<th>Configuration 303</th>
<th>Index: Digital Input</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
</table>

**Description:** Some digital input functions are specific to an arm which is selected by this parameter.

**Selections:**
- Arm 1 – Arm 6

**Critical(s):**
- No DE Head High Flow, Low Flow, Stop Inputs on this arm.
- Load arm not configured.

**Notes:**
- Some digital input functions are system-based and the arm entry is not used, and will not appear on the AccuLoad Program Mode menus in these cases. These functions include security inputs, general purpose inputs, remote stop (master), and piston injector feedback inputs.
### Configuration: Digital Inputs: Digital Input Product

<table>
<thead>
<tr>
<th>Configuration 305</th>
<th>Index: Digital Input</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
</table>

**Description:** Assign a product to one of the digital input functions from the list above.

**Selections:**
- Product 1 – Product 6
  These entries can only be configured for a Sequential Blending arm.

**Critical(s):**
- Only one block valve feedback per product.
- Product not configured.
8.1.4. 500 – DC & AC Digital Output Function Directories

Refer to the Installation Manual MN06201 for Terminal Assignments.

These program code define the functionality of the digital outputs. Except for General-Purpose outputs, duplicate assignments are not allowed for the same arm (or meter or product). If a digital valve is being configured, both upstream and downstream solenoids must be assigned. Outputs 1-3 are DC (located on the A4M board). Outputs 4-30 are AC.

The Bi-State Expansion (A4B) hardware, provides 8 additional DC channels mapped to output(s) 31-38.

The AccuLoad also allows unused channels on installed A4I (Add-Pak) board(s) to be used for general-purpose I/O. Two digital outputs are available for each A4I channel not being used for Add-Pak injector control. The A4I set to address 100 maps to Digital Output #39-58.

**Example** – If 1 A4I is installed and 6 Add-Pak injectors are programmed for use, 8 channels on the A4I are available for use as general purpose outputs. If additives 5,6,7,8,9 and 10 are programmed for Add-Pak injectors (corresponding to A4I channels 1-6) then A4I channels 7-10 are available for General Purpose I/O. You could then assign Digital Outputs #51-58 (which map to those A4I channels) to the desired functions. If a second A4I is installed, the outputs map to Digital Output #59-78.

**Note:** If the A4I I/O is controlled via serial communications; it is recommended that it not be used for any time-sensitive function. Do NOT use these outputs for control valve or injector solenoids. Response should be satisfactory for pump outputs and block valve control.

The number of additive pumps, piston injectors, and metered injectors is dependent on Configuration Code 020 and shared additives and on the hardware. (AccuLoad hardware allows for 24.) The number of metered injectors depends on the number of load arms selected and choices for dual pulse and transmitter integrity. (See Installation Manual MN06201 for pulse input table, manual.)

**Note:** For selection (97) Vapor Line Valve, this is available for Straight with VRS arm type. If configured, the AccuLoad will open the vapor line valve when the main product valve is open and close the vapor line valve when the main product valve is closed.
<table>
<thead>
<tr>
<th>Configuration: Digital Outputs: Digital Output Tag</th>
<th>Index:</th>
<th>Range: 10 character</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 501</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter defines the tag associated with this digital input used on diagnostic screens. The default tag is the terminal connections associated with this digital input (i.e. A4M TBK5:1,2)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 502</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Selections:**
- Not used
- Pump
- Upstream Solenoid
- Downstream Solenoid
- Alarm Relay 1 – 2
- General Purpose Output
- Block Valve [not selectable if no sequential blending]
- Stop Relay
- Additive Pump 1 – 24
- Piston Injector 1 – 24
- Metered Injector 1 – 4
- Shared Additive 1 – 24 Solenoid
- Shared System Flush 1 – 4
- Flow Controlled Injector 1 – 4 Upstream Solenoid
- Flow Controlled Injector 1 – 4 Downstream Solenoid
- Vapor Line Valve

**Criticals:**
- Output assignments must be unique [except for general purpose function, block valve, up and downstream solenoids, and pump in multi-arm/multi-meter modes]
- Metered injector pulse input not configured
- Both upstream and downstream solenoids required
- Injector I/O assignment does not match type
- Too many additive pumps defined
- Too many additive injectors defined
- Block valves used with sequential blending only
- This I/O point is configured for Add-Pak Injector
- Smart Injector communications must be configured to use Add-Pak I/O
- Upstream/Downstream Solenoid function not supported on Add-Pak hardware
- Digital valve solenoids not supported on A4I hardware
- Smart Inject comm port required for A4I I/O
- Upstream and downstream solenoids not available for vapor recovery line
- Pump not available for Vapor Recovery Line

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 503</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry defines the arm associated with the digital output function.

**Selections:**
- Arm 1 – Arm 6

**Critical:** Load Arm not configured.
### Configuration: Digital Outputs: DC & AC Digital Output Meter

| Configuration 504 | Index: Digital Output | Range: DC 1 - 3, AC 4 - 78 |

**Description:** This entry defines the arm associated with the digital output function.

**Selections:**
- Meter 1 – Meter 6
This entry is only valid for a Ratio Blending arm. (In other configurations, only Meter 1 exists for the arm; hence, the arm entry determines which meter is intended.)

**Critical(s):** Meter not configured.

---

### Configuration: Digital Outputs: DC & AC Digital Output Product

| Configuration 505 | Index: Digital Output | Range: DC 1 - 3, AC 4 - 78 |

**Description:** Assign a product to one of the digital output functions from the list above.

**Selections:**
- Product 1 – Product 6
These entries are used only if the entry for the related Digital Output Function is “Block Valve Feed-back.”

**Critical:** Product not configured.
8.1.5. 900 – Analog I/O Directories

<table>
<thead>
<tr>
<th>Configuration: Analog I/O: Analog I/O Tag</th>
<th>Index: Analog I/O</th>
<th>Range: 10 character</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 901</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description: This entry defines the arm associated with the Analog I/O point. This entry is only valid for a Ratio Blending arm. (In other configurations, only Meter 1 exists for the arm; hence, the arm entry determines which meter is intended.) ie TP1001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Configuration: Analog I/O: Analog I/O Function</th>
<th>Index: Analog I/O</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 902</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description: These program codes define the function of the analog inputs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selections:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Not Used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Temperature Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Density Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pressure Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Analog Valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Flow Rate Output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• General Purpose Output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Injector 1 – 4 Analog Valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Injector 1 – 4 Temperature Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• General Purpose Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical(s):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• RTDs can only be temperature inputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I/O assignments must be unique (per load arm or meter)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Function and type must both be input or output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Only one densitometer allowed per arm/ meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• This injector is not configured as a flow controlled injector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Duplicate assignments are not allowed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Configuration: Analog I/O: Analog I/O Arm</th>
<th>Index: Analog I/O</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration 903</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description: This entry defines the arm associated with the Analog I/O point. This entry is only valid for a Ratio Blending arm. (In other configurations, only Meter 1 exists for the arm; hence, the arm entry determines which meter is intended.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selections:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Arm 1 - 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load arm not configured.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The AccuLoad leaves the factory with default values programmed for Cal 1 and Cal 2 counts for the six analog I/O points, to achieve the highest possible accuracy, it is a user requirement to program the calibration numbers marked on the individual modules.
### Configuration: Analog I/O: Analog I/O Meter

<table>
<thead>
<tr>
<th>Index: Analog I/O</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
</table>

**Description:** This entry defines the meter associated with the Analog I/O point.

**Selections:**
- Meter 1 - 6

**Criticals:**
- Meter not configured.
- Meter must be set to 1 when this input is assigned to a side-stream blending arm.
- Density cannot be configured for the vapor recovery meter.
- Analog valve not available for vapor recovery line.

### Configuration: Analog I/O: Analog I/O Type

<table>
<thead>
<tr>
<th>Index: Analog I/O</th>
<th>Selections:</th>
</tr>
</thead>
</table>
- Analog I/O #1: A4M TB5:1(RTD+), 2(SIG+), 3(SIG-), 4(RTD-)
- Analog I/O #2: A4M TB5:5(RTD+), 6(SIG+), 7(SIG-), 8(RTD-)
- Analog I/O #3: A4M TB5:9(RTD+), 10(SIG+), 11(SIG-), 12(RTD-)

**Description:** These program codes define the type of analog module used.

**Selections:**
- Not Used
- 4-20 mA Input
- 1-5 Vdc Input
- RTD
- 4-20 mA Output
- 1-5 Vdc Output

**Criticals:**
- RTDs can only be temperature inputs.
- Function and type must both be input or output.
- Analog type must be programmed.

### Configuration: Analog I/O: Analog I/O Calibration 1 Counts

<table>
<thead>
<tr>
<th>Index: Analog I/O</th>
<th>Range: 0 - [12288] - 65535</th>
</tr>
</thead>
</table>

**Description:** These five-digit program codes are used to calibrate the analog input module. Calibration factors can be found on the top label of the input modules. Calibration 1 counts must be less than Calibration 2 counts. When these values are assigned based on the values from the label on the Analog Input/Output Modules, maximum accuracy will be attained.

**Critical:** Cal1 must be less than Cal2

### Configuration: Analog I/O: Analog I/O Calibration 2 Counts

<table>
<thead>
<tr>
<th>Index: Analog I/O</th>
<th>Range: 0 - [53248] - 65535</th>
</tr>
</thead>
</table>

**Description:** These five-digit program codes are used to calibrate the analog input module. Calibration factors can be found on the top label of the input modules. Calibration 2 counts must be greater than Calibration 1 counts. When these values are assigned based on the values from the label on the Analog Input/Output Modules, maximum accuracy will be attained.

**Critical:** Cal1 must be less than Cal2

**Note:** The AccuLoad leaves the factory with default values programmed for Cal 1 and Cal 2 counts for the six analog I/O points, to achieve the highest possible accuracy, it is a user requirement to program the calibration numbers marked on the individual modules.
<table>
<thead>
<tr>
<th>Configuration: Analog I/O: Analog I/O</th>
<th>Index: Analog I/O</th>
<th>Range: -999.99 - [0.00] - 9999.99</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low Value</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Configuration 909</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> These entries define the lower ranges of the analog input, expressed as engineering values corresponding to the defined function of the input. The Low entry represents the engineering value at 4mA (or 1v for a V-In module) and the High entry represents the engineering value at 20mA (or 5v). (This varies with the assigned function,) Low Value must be less than High Value.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Low value must be less than high value (unless density input and units are API)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fatal:</strong> Entry is out of specified range.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Notes:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• These entries are not valid if a RTD temperature probe is selected as the Transducer Type for that input.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td><strong>High Value</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Configuration 910</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> These entries define the lower and upper ranges of the analog input, expressed as engineering values corresponding to the defined function of the input. The Low entry represents the engineering value at 4mA (or 1v for a V-In module) and the High entry represents the engineering value at 20mA (or 5v). High Value must be greater than the Low Value.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Low value must be less than high value (unless density input and units are API)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fatal:</strong> Entry is out of specified range.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Notes:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• These entries are not valid if a RTD temperature probe is selected as the Transducer Type for that input.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configuration: Analog I/O: Analog RTD Offset</td>
<td>Index: Analog I/O</td>
<td>Range: -9.9 - [0.00] - 9.9</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td><strong>RTD Offset</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Configuration 911</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> This parameter is used to correct the reading of the RTD input by a fixed amount.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Notes:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• This offset is applied to inputs configured as an RTD only. Note also that it is a single-point offset value.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8.2. System Directories

100 - General Purpose Directories
200 - Flow Control Directories
300 - Volume Accuracy Directories
400 - Temperature/Density Directories
500 - Pressure Directories
600 - Alarms Directories
700 - Communications
800 - Additives
Security

8.2.1. 100 - General Purpose Directory

General Purpose Directory includes:
- Date Format
- Date
- Time Format
- Time
- MAC Address
- Firmware Revision
- Maximum Available Arms
- Unit ID
- Flow Rate Time
- Flow Rate Descriptor
- Dynamic Display Timeout
- Auto Reset Timer
- Remote Browser
- Remote Browser Timeout
- Decimal/Comma Select
- Default/Translated Literals
- Start Button Disable
- Stop Button Disable
- Transaction ID
- Transaction ID Message
- Number of Batches/Transaction
- Bay Transactions
- Permissive 1 - 3 Sense
- Permissive 1 - 3 Message
- Permissive 1 - 3 Restart

<table>
<thead>
<tr>
<th>System:General Purpose:Date Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 101</td>
</tr>
</tbody>
</table>

**Description:** This entry allows the operator to select the format used to display/print dates on the AccuLoad.

**Selections:**
- Month/Day/Year
- Day/Month/Year

**Fatal:** Invalid Date.
### System: General Purpose: Date

**Description:** This entry allows the operator to select the date.

**Selections:**
- Month/Day/Year

### System: General Purpose: Time

**System 102**

**Description:** This entry allows the operator to select the format used to display/print dates on the AccuLoad.

- 12 Hour
- 24 Hour

**Fatal:**
- Entry out of range.
- Invalid Time

**Note:** Date, time and date/time formats are read-only via communications; the SD command (smith protocol) or Extended Services (Modbus protocols) must be used to set the date & time via communications.

### System: General Purpose: Time

**Description:** This entry allows the operator to select the time.

**Selections:**
- Hour/Minute/AM or PM

### System: General Purpose: Unit MAC Address

<table>
<thead>
<tr>
<th><strong>System 103</strong></th>
</tr>
</thead>
</table>

**Description:** This displays the MAC Address of the Ethernet interface. It is read-only.

### System: General Purpose: Firmware Revision

<table>
<thead>
<tr>
<th><strong>System 104</strong></th>
</tr>
</thead>
</table>

**Description:** This displays the revision level of the firmware running in the unit. It is read-only.

### System: General Purpose: Maximum Arms

<table>
<thead>
<tr>
<th><strong>System 105</strong></th>
</tr>
</thead>
</table>

**Description:** This displays the maximum number of arms this unit will support. It is read-only.
<table>
<thead>
<tr>
<th>System: General Purpose: Unit ID</th>
<th>Index: None</th>
<th>Range: Text 28 characters max.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System 111</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This sets the Unit ID which is</td>
<td></td>
<td></td>
</tr>
<tr>
<td>displayed in the center of the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>top line of the display.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System: General Purpose: Flow Rate Time</th>
<th>Index: None</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System 112</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This parameter is used to define the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>time units used to compute the flow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Selections:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• [per minute]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• per hour</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System: General Purpose: Flow Rate Descriptor</th>
<th>Index: None</th>
<th>Range: Text - maximum 7 characters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System 113</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This parameter allows an alphanumeric message</td>
<td></td>
<td></td>
</tr>
<tr>
<td>to serve as the flow rate units identifier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(for example, GPM, LPM, BPH).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System: General Purpose: Dynamic Display Timeout</th>
<th>Index: System</th>
<th>Range: [0] - 99 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System 121</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This program code defines the amount of time,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in seconds, that dynamic displays will remain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>displayed before the AccuLoad automatically</td>
<td></td>
<td></td>
</tr>
<tr>
<td>returns to the run or ready screen. A zero</td>
<td></td>
<td></td>
</tr>
<tr>
<td>entry for this program code will cause the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dynamic display to remain indefinitely, until</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the operator manually exits the dynamic display</td>
<td></td>
<td></td>
</tr>
<tr>
<td>menu.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System: General Purpose: Auto Reset Time</th>
<th>Index: None</th>
<th>Range: [0] - 99 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System 122</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This program code defines the amount of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>time, in minutes, before AccuLoad will</td>
<td></td>
<td></td>
</tr>
<tr>
<td>return to the ready screen in the absence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of input by the operator. The auto reset</td>
<td></td>
<td></td>
</tr>
<tr>
<td>feature will remove the AccuLoad from the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>program mode or end transactions in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>progress when this parameter is set to a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>non-zero value. The clock starts after each</td>
<td></td>
<td></td>
</tr>
<tr>
<td>button press (unless flowing). If another</td>
<td></td>
<td></td>
</tr>
<tr>
<td>button press is not made in the time set in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>this code, the unit will revert to the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ready display. If the delivery has been</td>
<td></td>
<td></td>
</tr>
<tr>
<td>completed and the transaction has not been</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ended, the AccuLoad will return to the Ready</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mode after the time has expired. An entry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of 0 disables this feature.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System: General Purpose: Remote Browser</td>
<td>Index: None</td>
<td>Range:</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>Description:</strong> This parameter is used to allow/disallow remote access to the AccuLoad over the network from a browser.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Selections:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Enable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Disable</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Help:</strong> Select whether to enable/disable remote browsing.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System: General Purpose: Remote Browser Timeout</th>
<th>Index: None</th>
<th>Range: [0] - 999</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Help:</strong> Enter time in minutes for the remote browser idle timeout. Zero allows remote browsers to remain idle indefinitely.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System: General Purpose: Decimal/Comma Select</th>
<th>Index: None</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> This parameter specifies whether a decimal or a comma is to be used to separate the whole and fractional parts of numeric data. The comma is typically used in European markets. The selected delimiter is used in the program mode and on run screens and dynamic displays local to AccuLoad, in host communications, and on delivery reports.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Selections:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Decimal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Comma</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System: General Purpose: Default/Translated Literals</th>
<th>Index: None</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> This parameter selects the default (English) language or a custom translation to be displayed and printed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Selections:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Default</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Translated</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• If a translation has been entered on AccuMate and downloaded to the AccuLoad, the new translation will not appear on the display until &quot;translated literals&quot; is selected here.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### System: General Purpose: Start Key Disable

**System 133**

**Description:** Allows the enabling/disabling of the "START" button on the touch panel and remote start input. When this parameter is set to disabled, the only method for starting a batch will be through the communication remote start command.

**Selections:**
- [No] (Enabled)
- Yes (Disabled)

**Note(s):**
- If the touch panel "START" is disabled at the AccuLoad and communications is in polling only, the AccuLoad will not be able to start a transaction until the parameters are properly set.
- The "START" Button Enabled selection will not prohibit starting the batch via communications.

### System: General Purpose: Stop Button Disable

**System 134**

**Description:** This program code allows the STOP button on the AccuLoad front panel to be disabled for wild stream blending operations. It is only available when the AccuLoad has at least one arm configured with a wild stream meter. (i.e. the AccuLoad is not in control of one product stream). Arms that are not configured with any wild stream meter will always stop when the STOP button is pressed, regardless of this setting.

**Selections:**
- [No]
- Yes

**Warning:** Disabling the STOP button for wild stream arms prevents an operator from using the STOP button to shut down flow on product streams that ARE being controlled by the AccuLoad.

**Important:** The AccuLoad STOP button should never be relied on for Emergency Stop functionality, all control power should be routed through systems specifically designed for this purpose ahead of the AccuLoad, see MN06201 for wiring details.

**Note:** Allowing the STOP button to function on a wild stream blending arm could result in an out-of-spec blend if STOP is pressed during the blending operation.

### System: General Purpose: Transaction ID

**System 135**

**Index:** None  
**Range:** [0] - 1000000000  
**Description:** This nine-digit security number provides an additional security level for operation of the AccuLoad. If this code is programmed with any number other than 000000000, the driver or operator is required to enter this security ID before a transaction can be started. A 0 entry disables this feature.

### System: General Purpose: Transaction ID Message

**System 136**

**Index:** None  
**Range:** Text - 28 characters maximum  
**Description:** This code allows a 28-character alphanumeric entry to prompt during the preset operations to enter a security ID. This message should not be programmed as blanks.
### System: General Purpose: Number of Batches / Transaction
**System 137**

<table>
<thead>
<tr>
<th>Description</th>
<th>Index: None</th>
<th>Range: 1 - [5] - 10</th>
</tr>
</thead>
</table>

**Fatal:** Entry out of specified range.

**Note:** Enter the number of batches per transaction.

**Warning:** Changing this value deletes all stored transaction data. Re-entering the same number will not clear local storage because the size of the transaction hasn't changed. Do not use System Code 136 to purge transactions; the Erase Transaction Log has been provided for this purpose. For more information on Erase Transaction Log, refer to Section V in this manual.

### System: General Purpose: Bay Transactions
**System 138**

<table>
<thead>
<tr>
<th>Description</th>
<th>Index: None</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Help:** Select Yes to have a single transaction recorded for all arms assigned to a bay. See application bulletin for more information.

### System: General Purpose: System Permissive 1, 2, 3 Sense
**System 161, 164, 167**

<table>
<thead>
<tr>
<th>Description</th>
<th>Index: 1 - 3</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Selections:**
- [N/A] - Permissive is disabled
- Transaction Start - Permissive input is only checked immediately after authorization
- Continuous - Permissive input must be asserted continuously during the batch
- Start Pressed - Permissive input must be asserted whenever flow is started
- Batch Start - Permissive input must be asserted to start a batch

**Important:** Select permissive sense for loading.

### System: General Purpose: Permissive 1, 2, 3 Messages
**System 162, 165, 168**

<table>
<thead>
<tr>
<th>Description</th>
<th>Index: 1 - 3</th>
<th>Range: Text - 28 characters max.</th>
</tr>
</thead>
</table>

**Description:** These 28-character alphanumeric messages will be displayed if a permissive sense entry, corresponding with the message, is defined but not present when expected.
### System: General Purpose: Permissive 1, 2, 3 Restart

**System 163, 166, 169**

| Index: 1 - 3 | Range: |

**Description:** Select whether batch will restart automatically or START button will be required after permissive is restored.

**Selections:**
- [Manual]
- Auto

**Important:** Select permissive sense for loading.

---

### 8.2.2. 200 - Flow Control Directory

**Flow Control Directory includes:**
- Solenoid Alarm Count
- Solenoid Count Clear
- Leakage Alarm Limit
- Revers Flow Limit
- Flow Simulator
- VLR Simulator

---

### System: Flow Control: Solenoid Alarm Count

**System 201**

<table>
<thead>
<tr>
<th>Index: System</th>
<th>Range: 0 - 1000000000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disable Value: 0</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** The AccuLoad provides counters to indicate the number of times the upstream and downstream solenoids have been energized. This parameter sets the solenoid actuation count which when exceeded will cause a "SC: Solenoid Count" alarm to occur (alarms 666). This alarm will only be set when the load arm is idle. Separate counters are available for both the upstream and downstream solenoid of each meter. The counter will be incremented each time the solenoid is energized. Clearing the alarm will not occur again until the count has been cleared and the threshold exceeded again. The range of this parameter is 0 to 999999999. The factory default setting is 0 (which disables this feature.)

The counters are viewable from the AccuLoad's Diagnostic Menu.

The registers may be manually or automatically cleared either through the front panel or through communications.

**Note:** The counters will be cleared by a factory initialization or firmware upgrade.

---

### System: Flow Control: Solenoid Count Clear

**System 202**

| Index: System | Range: |

**Description:** This program code determines whether the solenoid actuation counts maintained by the AccuLoad are reset when the Solenoid Counts alarm is cleared.

**Selections:**
- [Manual]
- Automatic

If Manual (the default) is selected, the counts are not cleared automatically when the alarm is cleared. If Automatic is selected, then when the Solenoid Counts alarm is cleared, the counts are reset to zero immediately.

If Manual is selected, the counts can be reset manually using the diagnostic or alternately via communications using the 'SC' command.
### System: Flow Control: Leakage Alarm Limit
**System 203**

| Index: System | Range: [0.0] - 999.9 |

**Description:** This parameter indicates the maximum leakage limit in delivery units between transactions. Leakage amounts greater than the value entered in this parameter will activate a leakage alarm. The range of this parameter is 0 to 999.9. The factory default setting is 0 (which disables this feature).

### System: Flow Control: Reverse Flow Limit
**System 204**

| Index: System | Range: [0.0] - 999.9 |

**Description:** This parameter indicates the maximum reverse flow limit. When sufficient reverse flow occurs during a batch to exceed this programmed limit, then a Reverse Flow Alarm is activated. The range of this parameter is 0 to 999.9. The factory default setting is 0 (which disables this feature).

### System: Flow Control: Flow Simulator
**System 205**

| Index: System | Range: |

**Description:** Enables/disables the built-in flow simulator which simulates flow based on the programmed flow profile. This feature is used for testing or training.

**Selections:**
- [Disable]
- Enable

**Note:** This feature shall not be enabled during normal operation; changes to this option are logged in the audit trail.

### System: Flow Control: VLR Simulator
**System 206**

| Index: System | Range: |

**Description:** Enables/disables the built-in virtual load rack simulation feature.

**Selections:**
- [Disable]
- Enable

**IMPORTANT:** The VLR software shall be disabled on operational units; changes to this option are logged in the audit trail.
### 8.2.3. 300 - Volume Accuracy Directory

**Volume Accuracy Directory includes:**
- Pulse Transmitter Select
- Transmitter Integrity
- Reverse Volume - Batch
- Reverse Volume - Non-Resets
- Volume Units
- Mass Units
- Volume Descriptor
- Mass Descriptor
- Pulse Input Type
- Maximum Preset
- Minimum Preset
- Auto Preset
- Auto Preset Increment
- Transaction Termination
- Recipes per Transaction
- Transaction Start
- Prove Type
- Auto Prove
- Prover Output
- Run Display Options
- Preset Amount
- Preset Amount Type
- Delivery Amount Type
- Display Resolution
- Delivered Amount Display
- Update Leakage

<table>
<thead>
<tr>
<th>System: Volume Accuracy: Pulse Transmitter Select</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System 301</strong></td>
</tr>
</tbody>
</table>

**Index:** None  
**Range:**

**Description:** Selects the transmitter pulse train type in use.

**Selections:**
- Single
- [Dual]

**Help:** Select a single or dual pulse xmitter, PT1 1(+),2(-) for single channel or A; 3(+),4(-) for channel B

<table>
<thead>
<tr>
<th>System: Volume Accuracy: Transmitter Integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System 302</strong></td>
</tr>
</tbody>
</table>

**Index:** None  
**Range:**

**Description:** Selects whether transmitter integrity is in use (/A, /B).

**Selections:**
- [No]
- Yes

**Help:** If Yes, /A and /B inputs are required for each meter channel. Meter 1 requires PT1 5(+),6(-) for /A and 7(+),8(-) for /B
### System: Volume Accuracy: Reverse Volume - Batch

**System 303**

**Description:** Selects whether reverse flow is accounted for (subtracted from batch amount) when calculating batch amounts.

**Selections:**
- Ignore
- Totalize

**Help:** Select if reverse amounts should count toward batch totals

### System: Volume Accuracy: Reverse Volume - Non-Resets

**System 304**

**Description:** Selects whether reverse flow is accounted for (subtracted) when updating non-resettable totalizers.

**Selections:**
- Ignore
- Totalize

**Help:** Select if reverse amounts should count toward non-resettable totals

### System: Volume Accuracy: Volume Units

**System 301**

**Description:** This parameter selects the volume units used to measure product delivery. The factory default is "Gallons."

**Selections:**
- gal - Gallons
- bbl - Barrels
- Dekaliters
- Liters
- m\(^3\) - Cubic Meters

**Help:** Select volume units. These are used to select proper conversion factors for calculations.

### System: Volume Accuracy: Mass Units

**System 302**

**Description:** This parameter defines the mass units used for product measurement. The factory default is "Pounds."

**Selections:**
- lb - Pounds
- kg - Kilograms
- US Tons
- Metric Tons
- Long Tons

**Help:** Select mass units. These are used to select proper conversion factors for calculations.
<table>
<thead>
<tr>
<th>System: Volume Accuracy: Volume Descriptor</th>
<th>Index:</th>
<th>Range: Text - 4 characters max</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 313</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This code allows a four-character entry message to serve as the display unit identifier of the volumetric measurement units that will be displayed on the display and the reports.

<table>
<thead>
<tr>
<th>System: Volume Accuracy: Mass Descriptor</th>
<th>Index:</th>
<th>Range: Text - 4 characters max</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 314</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This code allows a four-character entry message to serve as the display unit identifier of the volumetric measurement units that will be displayed on the display and the reports.

<table>
<thead>
<tr>
<th>System: Volume Accuracy: Pulse In Type</th>
<th>Index:</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 315</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter allows the selection of mass pulse input rather than the default of pulses representing volume from the meter. The AccuLoad then totalizes directly in mass. A density input is required to back-calculate volume when using a meter that produces pulses based on mass flow.

**Selections:**
- [Volume]
- Mass

<table>
<thead>
<tr>
<th>System: Volume Accuracy: Maximum Preset</th>
<th>Index:</th>
<th>Range: 0 - 999999</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 321</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This six-digit entry establishes the largest volume that can be preset. If a preset amount greater than this limit is entered, an error message will be displayed on any attempt to start a batch with more than the maximum preset value. The factory default is "0".

**Note:** "0" disables the maximum preset volume check.

<table>
<thead>
<tr>
<th>System: Volume Accuracy: Minimum Preset</th>
<th>Index:</th>
<th>Range: 0 - 999999</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 322</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This six-digit entry will allow for the setting of the minimum preset amount. An error message will be displayed on any attempt to start a batch with less than the minimum preset value. The factory default is "0".

**Note:** "0" disables the minimum preset volume

<table>
<thead>
<tr>
<th>System: Volume Accuracy: Auto Preset</th>
<th>Index:</th>
<th>Range: 0 - [200] - 999999</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 323</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** The value in this parameter will automatically be filled in as the preset amount. The preset amount can be changed by the operator during the preset setup process. This can be useful for an operation that usually delivers the same batch amount.

**Note:** "0" disables the Auto Preset.
|-------------------------------------------------|--------|-------------------------|

**Description:** This sets the amount by which the preset amount is increased or decreased by each press of the + or - buttons next to the preset input field. See figure on page 18.

<table>
<thead>
<tr>
<th>System: Volume Accuracy: Transaction Termination</th>
<th>Index:</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** This program code defines the primary method used to terminate a transaction. Communications can always be used to terminate a transaction if the AccuLoad is programmed for Poll & Authorize or Remote Control operations. The factory default is "End Transaction" button.

**Selections:**
- User Interface
- Communications Only
- Trans Reset Input
- Printer Tray
- Card Reader

- **End Transaction** - For transactions that may be remotely authorized and terminated via the user interface: The ticket printer tray switch is ignored. The "End Transaction" button is used to end the transaction. (The transaction may also be terminated via communications.)
- **Communications control only** – For transactions that will be authorized and terminated remotely (i.e., through communications): The "End Transaction" button is disabled and the ticket printer tray switch is ignored.
- **Transaction reset input** – For transactions that will be authorized and terminated by a master reset input, the "End Transaction" button is disabled. The ticket printer tray input is used to authorize and end the transaction.
- **Printer Tray Switch Input** – For transactions that will be authorized and terminated by a switch input from a load printer: The "End Transaction" button is disabled. The switch input, when active, authorizes the AccuLoad to load. When the input de-activates, the transaction is ended. The AccuLoad will not allow loading to continue or restart until the input is re-activated (a ticket is put in the printer).
- **Card Reader** – For transactions that will be authorized and terminated by the insertion and removal of the card from the card reader. The transaction is ended when the card is pulled.

**Critical (s):**
- No comm port selected for communications control.
- Transaction reset input required for each arm configured.
- Printer tray switch input required for each arm configured.
- Printer tray switch input is configured [if other method is selected].
- Option not allowed if bays are configured. [Printer tray switch input]

<table>
<thead>
<tr>
<th>System: Volume Accuracy: Recipes per Transaction</th>
<th>Index:</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** Allows either single recipe transactions or multiple recipes per transaction. If programmed for a single recipe, the AccuLoad will only prompt the driver for a recipe at the beginning of the transaction. The driver can load multiple batches of the recipe but only that recipe for the transaction. If programmed for multiple recipes, the driver will be prompted for the recipe at the beginning of each batch.

**Selections:**
- Single Recipe per Transaction
- [Multiple] Recipes per Transaction
### System: Volume Accuracy: Transaction Start

**System 327**

**Description:** This parameter selects whether a transaction requires operator intervention to begin and end the transaction. In Manual Mode, a transaction is started by the operator interaction with the user interface (touch screen) and ended when the operator presses the "End Transaction" button. Using the Auto mode for this parameter, the Auto Preset and Auto Reset timer are used to continuously run batches that are initiated by a Remote Start input and can be stopped by a Remote Stop input without operator intervention. If a Remote Stop input is not used the batch would run until the Auto Preset value was reached. The Auto mode is intended to be used in an unattended operation.

**Selections:**
- [Manual] Operation
- Automatic Operation

### System: Volume Accuracy: Prove Type

**System 331**

**Description:** Selects whether auto-proving will be done as "Net proving" or "Gross proving". If set to net, both the volume of the liquid will be compensated for temperature as well as the volume of the proving can. If set to gross, the effect of temperature on the liquid will be ignored.

**Selections:**
- [Net Proving]
- Gross Proving

### System: Volume Accuracy: Auto Prove Select

**System 332**

**Description:** This parameter is used to enable or disable the Automated Proving Mode. The default for this program code will be disabled. Select one of the three security options to enable the automated prove and associated security. Once selected and the security activated, the beginning of the next transaction will launch the auto prove. Once the prove is completed and the meter factor calculated, the operator has the choice of downloading the calculated meter factor into the software or ignoring it.

**Selections:**
- [Disabled]
- Security input not required
- Security input 1 required
- Security input 2 required

**Critical:** Security input not configured

**Note:** Auto proving is described in MN06146.

### System: Volume Accuracy: Prover Output

**System 333**

**Selections:**
- [Auto Prove Meter]
- Pulse Input 1 - 14
### Volume Accuracy: High Speed Prover Pulse Output

**Description:** This parameter defines which pulse input is echoed to the high speed prover pulse output terminals. The feature is designed to ease proving operations by redirecting the selected meter to a pair of terminals which can be field-wired for proving personnel access. Although with both the A4M and A4B boards present there could be two PIB III boards installed, only one output at a time will be activated. This will allow the outputs to be wired in parallel to provide a common connection point external to the AccuLoad for proving personnel access, independent of the meter currently being proved. Select 0 in this parameter to utilize this functionality. Alternately, any individual pulse input can be configured to be echoed to the high speed prover output. Selections are as follows:

- Echo meter selected via Auto Proving
- Echo pulse input #1 - 6 - EAAI
- Echo pulse input #7 - 12 - BSE

**Critical:** Security input not configured

### Volume Accuracy: Run Display

**Description:** This parameter defines which arrangement the AccuLoad IV will use for the delivery display. The default delivery display contains a transaction counter and a preset downcounter. A downcounter starts at the preset volume and counts down to zero, indicating the remaining volume throughout the batch. The US W&M display uses a smaller font for this downcounter, and prefixes it with a "Remain" prompt. The "Blank Downcounter" option prevents the downcounter from appearing. Selections are as follows:

- Default Display
- Blank Downcounter
- US Weights and Measures Display

**Note:** This option will have no effect while the AccuLoad IV is in the proving mode.

### System: Volume Accuracy: Preset Amount Type

**System 341**

**Description:** This program code selects the registration type used to enter the preset value. This registration type is also used for the downcounter display.

**Selections:**
- IV - Indicated volume
- [GV - Gross volume]
- GST volume
- GSV volume
- Mass

**Note:** Selected units not available.

### Batch Reverse Flow Accumulation

**Index:** Pulse Input  
**Selection:** Ignore or Count

**Description:** This program code allows for the detection and accumulation of reverse flow when using a dual-pulse transmitter (quadrature detection).

- Ignore (do not include reverse flow in totals)
- Count (include reverse flow in batch totals)

If this option is enabled (by selecting ‘1’) then measured flow in the reverse direction is accumulated and the amount is deducted from the batch amount.

This feature requires Dual Pulse meter inputs. This feature is not available when Transmitter Integrity is selected. Meter pulse input wiring is as for dual pulse meters with integrity, however / A is not required to be wired to the Pulse Input Board to use this feature.

**Critical(s):**
- Cannot totalize reverse flow with transmitter integrity (hardware limitation).

**Note(s):**
- Meters are typically not proved in the reverse direction and this amount may not be accurate. Reverse flow is typically considered an error and should not be part of normal operation.
### System: Volume Accuracy: Delivery Amount Type

<table>
<thead>
<tr>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
</table>

**Description:** This code establishes how the delivery registration display (up-counter) will appear during operation. Five possible selections are available that are dependent on the needs of the operation.

**Selections:**
- IV - Indicated volume
- GV - Gross volume
- GST volume
- [GSV volume]
- Mass

**Note:** Selected units not available.

### System: Volume Accuracy: Display Resolution

<table>
<thead>
<tr>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
</table>

**Description:** This program codes selects the resolution that will be used by AccuLoad for the delivery up-counter and down-counter during normal operations. The factory default is "Whole."

**Selections:**
- Whole units
- 10ths - Tenths
- [100ths - Hundredths]

### System: Volume Accuracy: Delivered Amount/Upcounter

<table>
<thead>
<tr>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
</table>

**Description:** This parameter selects whether the up-counter represents the batch delivered amount or the transaction delivered amount on the delivery screen.

**Selections:**
- [Transaction]
- Batch

### System: Volume Accuracy: Update Leakage

<table>
<thead>
<tr>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
</table>

**Description:** Leakage (flow that occurs between transactions) may be added to the non-resettable totals either dynamically or at the start of the next transaction. The factory default is "Trans Start" which indicates that the non-resettable totals will be updated with leakage at the start of the next transaction. To have the non-resettable totals updated as the leakage occurs, choose "Dynamic". To insure the true end of transaction non-resettable totals are retrieved (i.e. not including leakage which may have occurred after the transaction was ended), review the VT host command in the Smith communications manual (MN06204).

**Selections:**
- [Transaction Start]
- Dynamic
### 8.2.4. 400 - Temperature / Density Directory

**Temperature / Density Directory includes:**
- Temperature Units
- Reference Temperature
- Density Units
- Density Prompt

<table>
<thead>
<tr>
<th>System: Temperature/Density: Temperature Units</th>
<th>Index:</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 401</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This program code selects the temperature scale used by AccuLoad.

**Selections:**
- [NA]
- [°F] - Fahrenheit
- °C - Celsius

**Critical:** API table conflicts with selected units

**Note:** A zero entry, signifying No Temperature Selected, will disable all temperature-related calculations.

<table>
<thead>
<tr>
<th>System: Temperature/Density: Reference Temperature</th>
<th>Index:</th>
<th>Range: 0 - [60.0] - 999.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 402</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter defines the reference temperature from which temperature corrections are made. Typical entry units are 60°F, and 15°C.

**Note:** Temperature units are defined in a separate parameter.

**Critical:** API table conflicts with selected units

<table>
<thead>
<tr>
<th>System: Temperature/Density: Density Units</th>
<th>Index:</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 411</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This selection allows the operator to choose which density scale will be used if there is a densitometer installed. It is used to convert volume to mass.

**Selections:**
- NA
- [°API]
- Lb/Ft³ (Pounds/Cubic Feet)
- Kg/M³ (Kilograms/Cubic Meter)
- Relative Density

**Note:** When using temperature compensation, a value (API, Lb/Ft³, or Kg/M³) must be entered in this parameter.

<table>
<thead>
<tr>
<th>System: Temperature/Density: Density Prompt</th>
<th>Index:</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 412</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter defines whether the operator will be prompted for a density entry prior to starting a batch.

**Selections:**
- [No]
- Always
- In Standby
### 8.2.5. 500 - Pressure Directory

**Pressure Directory includes:**
- Pressure Units
- Atmospheric Pressure

<table>
<thead>
<tr>
<th>System:Pressure:Pressure Units</th>
<th>Index:</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 501</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter defines the pressure units used by AccuLoad.

**Selections:**
- NA
- [psi]
- bar
- kg/cm² (Kilograms/square centimeter)
- kPa (kilopascals)

**Note:** If "NA" is selected, signifying no pressure transducer installed, any associated parameters will be removed from the menus in Program Mode.

<table>
<thead>
<tr>
<th>System:Pressure:Atmospheric Pressure</th>
<th>Index:</th>
<th>Range: [0.000] - 999.999</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 502</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the local atmospheric pressure used in GPA TP-15 (gauge pressure) vapor pressure calculations. This should be set to the average local atmospheric air pressure.
8.2.6. 600 - Alarms Directory

Alarm Directory includes:
- Driver Alarm Clearing
- Powerfail Alarm
- Program Alarm Outputs
- Alarm Configuration for each alarm
- User Alarm Configuration and
- User Alarm Messages for each user alarm

Alarm Responses
- Additive Clean Line
- Additive Comm Failure
- Additive Comm Totals
- Additive Excess Pulses
- Additive Feedback Error
- Additive Frequency Alarm
- Additive High Temperature Alarm
- Additive Injector Error
- Additive Low Temperature Alarm
- Additive Pulse Security
- Additive Temperature Probe
- Additive Unauthorize Failed Alarm
- Additive Xmit Integrity
- Add-Pak Diagnostic (x2)
- Add-Pak Power Fail (x2)
- A4I/AICB Auto Detect (x2)
- A4I/AICB Comm Failed (x2)
- Arm Overrun Alarm
- Arm Zero Flow Alarm
- Back Pressure Alarm
- Bay A Excess Active Arms
- Bay B Excess Active Arms
- Blend High Alarm
- Blend Low Alarm
- Block Valve Alarm
- Card Removed Alarm
- Clean Line Alarm
- Communications Alarm
- CTL Calculation Alarm
- DE Head Alarm
- Density Transducer Alarm
- Email Error
- F.A. Sening COP Alarm
- High Density Alarm
- High Flow Alarm
- High Pressure Alarm
- High Temperature Alarm
- Injector Auto Detect
- Injector Solenoid Counts
- Injector Command Rejected
- Low Additive Alarm
- Low Density Alarm
- Low Flow Alarm
- Low Pressure Alarm
- Low Temperature Alarm
- Mass Meter Comm Fail
- Network Printer Alarm
- No Additive Pulses Alarm
- Overspeed Injector
- Predict Overrun Alarm
- Pressure Transducer Alarm
- Product Overrun
- Product Solenoid Counts
- Product Stop Alarm
- Product Zero Flow
- Promass Meter Alarm
- PTB Printer Alarm
- Pulse Security Alarm
- Report Storage Full Alarm
- Reverse Flow
- Shared Printer Alarm
- Storage Full Alarm
- Temperature Probe Alarm
- Ticket Alarm
- Transmitter Integrity Alarm
- Valve Fault Alarm

User Alarm Configuration
- User Alarms 1 - 10
- Report Storage Full Alarm

User Alarm Messages
- User Alarms 1 - 10 Messages
- Report Storage Full Alarm
### System: Default Alarms: Driver Alarm Clearing

**System 601**

<table>
<thead>
<tr>
<th>Index:</th>
<th>Range: 0 - [5] - 20</th>
</tr>
</thead>
</table>

**Description:** This parameter defines the number of alarms that can be cleared in the Run and Ready modes without entering a passcode. In addition, the alarms to be cleared must be configured to be clearable in the Run/Ready mode. When this number of alarms has been cleared, subsequent alarms require a passcode entry to clear, even if they are programmed for Run/Ready mode clearing.

### System: Default Alarms: Powerfail Alarm

**System 602**

<table>
<thead>
<tr>
<th>Index: None</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** This program code provides the operator with the capability of either enabling or disabling the powerfail alarm. The powerfail alarm is a diagnostic alarm that is not clearable through communications.

**Selections:**
- [Enable]
- Disable

### System: Default Alarms: Program Alarm Output

**System 603**

<table>
<thead>
<tr>
<th>Index:</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** The AccuLoad provides two digital outputs which are energized when an alarm occurs. This parameter controls whether programming error alarms will activate these outputs.

**Selections:**
- [BOTH] - Both relays enabled
- ALRM1 - Output Relay #1 Only
- ALRM2 - Output Relay #2 Only
- NONE - No Relays Enabled

### Alarm Actions

The action(s) taken when an alarm occurs and if a passcode is required to clear the alarm can be selected for each individual alarm type. The options are as follows:

- Allow run/ready clearing - no need for a passcode to clear the alarm
- Energize alarm relay #1 - if configured, alarm output #1 will be asserted
- Energize alarm relay #2 - if configured, alarm output #2 will be asserted
- Send Notification Email - if configured, an email notification will be sent*
- Allow Flow to Continue - do not stop the flow when the alarm occurs

*If this option is checked and a valid server and user is configured, an email will be issued by the AccuLoad to the address specified in the email Notification Destination.
The combination of these program codes and new options will provide the information required to transmit email notifications on specified events, and check for replies to alarm events that signal the alarm should be cleared remotely. Replies will only be accepted from the programmed email Notification Destination address. To clear the alarm remotely, “Reply” to the notification. The reply message sent must contain the alarm message in the body of the response message (nothing else needs to be included). The AccuLoad will recognize the message sent to it by the alarm message previously send and will clear the appropriate alarm (if it is clearable).

<table>
<thead>
<tr>
<th>System:Alarms:Default Alarms:Alarm Actions</th>
<th>Index: per built-in Alarm</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> These parameters allow the actions of each alarm to be configured. Multiple options selected from the following list may be configured for each alarm.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Selections:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Allow Run/Ready Mode Clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Energize Alarm Output 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Energize Alarm Output 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Send via Email</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Allow Flow to Continue</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> Through Communications, add binary bits to get combination of desired options (e.g., 7 would set up the first three options.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> Allow Flow to Continue is available with Unlimited Preset arms only.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

System 695 and 696

Index: per User Alarm
Range: 1 - 10; 18 characters maximum

Description: These program codes allow the operator to customize the AccuLoad by defining alarm conditions to a particular system. User alarms may be set through communications or Boolean/algebraic equations, or may be selected from the following:
- Allow Run/Ready Mode Clear
- Energize Alarm Output 1
- Energize Alarm Output 2
- Notify via email
- Allow Flow to Continue

8.2.7. 700 - Communications Directory

Communications Directory includes:
- Arm Addresses
- Printer Control
- Host Interface
- Card/Nedap Reader
- Serial Port Config
- Prompts

8.2.7.1. Arm 1 - 6 Addresses

System: Communications: Arm Address
System 701 - 706

Index: Arm
Range: 1 - 99

Description: This two-digit entry defines the communications address associated with this load arm. For multiple AccuLoads on a shared serial communications line, all addresses must be unique.

Critical: Address must not be zero.
Critical: Addresses must be unique.
Fatal: Entry out of specified range
Note: Load Arm 3 – 6 Address - Not used on AccuLoad-ST hardware.
### 8.2.7.2. Printer Control

<table>
<thead>
<tr>
<th>System: Communications: Printer Control: Printer Standby</th>
<th>Index: None</th>
</tr>
</thead>
</table>
| **Description:** This parameter defines how the AccuLoad reacts when a transaction report fails to print. If "Standby" is selected, the AccuLoad will silently enter printer standby mode (no alarm will be set or displayed) when a transaction report fails to print within the programmed communications port timeout. An event will be logged in the event log indicating that the transaction report is pending. A printer standby flag will be available via communications (see EE command) which will indicate when there are pending transaction reports.

If "Standby & Alarm" is selected and Network Printing or PTB printing is being used, the AccuLoad will set the "NP: Network Printer" or "PP: PTB Printer" alarm respectively and will enter printer standby mode. These alarms are configurable in the Alarms Directory and therefore do not necessarily need to stop flow. If choosing this option, be sure to configure the alarm appropriately. No alarm will be set if using serial printing with XON/XOFF or no flow control.

If "Alarm + No Trans" is selected, the AccuLoad will set the associated printer alarm as above but will not enter standby mode. Although the alarm may be cleared, the AccuLoad will not allow a new transaction to start on that arm until the pending transaction has been successfully printed.

**Selections:**
- [NA]
- Silent Standby
- Standby and Alarm
- Alarm and No Transaction

**Critical:** Select if desired to protect transaction reports not printed and if alarm should be set when the report is not printed.

---

<table>
<thead>
<tr>
<th>System: Communications: Printer Control: Auto Reprint</th>
<th>Index: None</th>
</tr>
</thead>
</table>
| **Description:** The AccuLoad may be configured to automatically reprint pending transaction reports using this parameter. The AccuLoad will always attempt to print a transaction report when the transaction is ended. If a report is successfully printed and there are pending reports, then the pending reports will be printed as well.

**Selections:**
- [No]
- Yes

The AccuLoad will only reprint pending reports on idle arms. If a transaction is in progress on an arm, then the pending reports on that arm will not be printed until the arm becomes idle. If any report fails to print, the printing of any remaining reports will be aborted.

---

<table>
<thead>
<tr>
<th>System: Communications: Printer Control: Auto Tear Off</th>
<th>Index: None</th>
</tr>
</thead>
</table>
| **Description:** When enabled, the AccuLoad will function with a printer's auto tear off feature. The tear off feature is when a printer automatically advances the paper to the tear off position after a form feed is received (a form feed is at the end of the print job).

**Selections:**
- [No]
- Yes
## 8.2.7.3. Host Interface

**System: Communications: Host Interface: Comm Link Programming**

| Index: System |

**Description:** Defines which parameters can be modified through communications by the access level assigned to those parameters. The factory default is "Level 1 Access."

**Selections:**
- **Alarm Clearing Only** - This selection allows only the alarms to be reset (cleared) through communications.
- **Level 1 Access Parameters**
- **Level 2 Access Parameters**
- **Level 3 Access Parameters**
- **Level 4 Access Parameters**
- **Level 5 Access Parameters** - These selections limit the parameters that can be changed through communications to those assigned a security level at or below the option selected.

**System: Communications: Host Interface: Modbus Endian**

| Index: None |

**Description:** This program code defines the byte order for floating point values returned by Modbus communications. AccuLoad supports three variations of byte ordering when sending floating point values via Modbus protocols. The factory default and AccuLoad native byte order is "Big."

**Selections:**
- **Big** endian - bytes are ordered most significant first
- **Little 8** endian - bytes are ordered least significant first

**System: Communications: Host Interface: Timeout Action**

| Index: None |

**Description:** Standby mode allows the AccuLoad to continue to allow transactions in the case where host control has been lost.

**Selections:**
- **Alarm**
- **Standby**
- **Alarm and Standby**
<table>
<thead>
<tr>
<th>System: Communications: Host Interface: IP Discovery</th>
<th>Index: None</th>
</tr>
</thead>
</table>

**System 734**

**Description:** This setting selects whether the AccuLoad is configured with a fixed Ethernet IP address or it should obtain an address automatically from a DHCP server on the network.

**Selection:**
- [Manual]
- DHCP

<table>
<thead>
<tr>
<th>System: Communications: Host Interface: IP Address</th>
<th>Index: None</th>
<th>Range: 000.000.000.000</th>
</tr>
</thead>
</table>

**System 735**

**Description:** Sets the network communications address associated with the AccuLoad. For multiple AccuLoads on a shared communications line, all addresses must be unique. The decimal range of each octet in this entry is 000 - 255.

- **4 octet numeric entry – 255.255.255.255**

<table>
<thead>
<tr>
<th>System: Communications: Host Interface: Netmask</th>
<th>Index: None</th>
<th>Range: 000.000.000.000</th>
</tr>
</thead>
</table>

**System 736**

**Description:** The netmask (sometimes called a subnet mask) is a four octet address used to define a network. This address uses the same format as the IP address. A typical netmask is 255.255.255.0. This means that the first three octets describe a particular network and the last octet describes a specific device. If the AccuLoad is assigned IP address 192.168.0.1 and a printer has IP address 192.168.0.9, then the two devices are on the same network because the first three octets of each address are the same. In order to increase the number of devices on a particular network, simply adjust the netmask. In the previous examples, the netmask allowed 256 devices to be connected to the network. If more devices are needed on a network, then the netmask of 255.255.254.0 would allow 512 devices to be connected to the network. Similarly, a network of 255.255.253.0 would allow 1024 devices to be connected and so on.

- **4 octet numeric entry – 255.255.255.255**

<table>
<thead>
<tr>
<th>System: Communications: Host Interface: Gateway</th>
<th>Index: None</th>
<th>Range: 000.000.000.000</th>
</tr>
</thead>
</table>

**System 737**

**Description:** The Gateway address is another four octet address that also uses the same format as the IP address. A Gateway provides an exit route for all addresses that are not part of the local network. The Gateway address typically belongs to a network device such as a router. The router can then connect to another local network or to the internet. The entry for 'System 737-Gateway' should be the IP address for the router that your AccuLoad IV.net uses to connect to any IP addresses not in your local subnet. If you don’t have a router and are not connected to external networks, you can leave this entry 0.0.0.0.

- **4 octet numeric entry – 255.255.255.255**
### System: Communications: Host Interface: Ethernet Host Control

**Index:** None

**Description:** This program code determines what level of control is exhibited by a host interfaced to the AccuLoad via the Ethernet interface.

**Selections:**
- Polling Only
- [Poll & Program]
- Poll & Authorize
- Remote Control

The highest level of control programmed among this entry and the serial port entries is assumed to be the desired level of control for the AccuLoad.

### System: Communications: Host Interface: Ethernet Timeout

**Index:** None

**Range:** [0] - 999

**Description:** This entry specifies the timeout value in seconds for the host communication protocols via Ethernet/TC-IP network (Smith I/P, Modbus TCP) before a communications alarm will be generated. A zero entry disables the time out action. Range is 0-999

- 3 digit numeric entry

### System: Communications: Host Interface: Host User Text Archived

**Index:** None

**Help Message:** When this option is selected, the 8 32-character user text fields available for writing/reading by the host (via BW/BR commands) are stored along with the final transaction data when a transaction ends. This allows a host to not just place relevant text on the immediate bill of lading/receipt ticket, but also allows the AccuLoad.net to recall the data and to reprint the ticket later with the same information.

**Selections:**
- Not Saved
- Saved

Enabling this option (selecting 'Saved') will reduce the total number of transactions that can be archived at the AccuLoad in the transaction log since it increases the size of each stored transaction.

### System: Communications: Host Interface: DNS Server IP

**Index:** None

**Range:** 000.000.000.000

Sets the IP address of the primary DNS server on the Ethernet network.

The DNS (Domain Name Service) provides a mechanism for Internet devices to obtain the IP address of another device on the network using a text based name instead of a numeric address.

This IP address will be used by the AccuLoad to resolve host names if host names are entered instead of IP addresses for the remote servers (specifically, the SMTP & POP3 servers and network printers at this time).
Enter the host name for the SMTP (Simple Mail Transfer Protocol) server that provides the email account set up for the AccuLoad.

**Examples:**
- If using DNS - smtp.yourmailserver.com
- If using IP address - 192.168.0.98

To utilize the email features, an email account must be set up for each AccuLoad on a mail service provider that supports SMTP (and optionally POP3) access.

Enter up to 28 characters of text

Enter the server name or IP address of the SMTP server

---

**System: Communications: Host Interface: POP3 Server Name**

**System 743**

**Index:** None  
**Range:** Text - 28 characters max.

**Description:** Enter the host name or IP address of the POP3 (Post Office Protocol - 3) server that provides the email account to which the AccuLoad should send email notifications of alarms conditions.

**Examples:**
- If using DNS - pop.yourmailserver.com
- If not using DNS - 192.168.0.99

---

**System: Communications: Host Interface: Email Account User Name**

**System 744**

**Index:** None  
**Range:** Text - 28 characters

**Description:** Enter the user name on the email account to use to send email notifications.

---

**System: Communications: Host Interface: Email Account Password**

**System 745**

**Index:** None  
**Range:** Text - 28 characters

**Description:** Enter the password for the email account used to send email notifications.

---

**System: Communications: Host Interface: Email Notify Address**

**System 746**

**Index:** None  
**Range:** Text - 28 characters

**Description:** Enter the email address where notification emails will be sent when an alarm configured for notification occurs. The AccuLoad.net must have access to an SMTP server that is capable of forwarding emails to the destination for this feature to operate.
<table>
<thead>
<tr>
<th>System: Communications: Host Interface: Email Address for Reply (FROM address)</th>
<th>Index: None</th>
<th>Range: Text - 28 characters</th>
</tr>
</thead>
</table>

**Description:** Enter the email address to be used in the <FROM> field of notification emails sent by this AccuLoad. For example, if the email server is at yourmailhere.com, and the Email account name is AL3NET_1, then the reply-to address would be AL3NET_1@yourmailhere.com

<table>
<thead>
<tr>
<th>System: Communications: Host Interface: Network Printer</th>
<th>Index: None</th>
<th>Range: Text - 28 characters</th>
</tr>
</thead>
</table>

**Description:** Enter the IP address (or printer name if DNS server is available and the printer has a name in the domain) of the network printer where the AccuLoad.net is to send print jobs. The network printer can be used in place of or in conjunction with serial printer options.

<table>
<thead>
<tr>
<th>System: Communications: Host Interface: BlueTooth Master Enable / Disable</th>
<th>Index: None</th>
</tr>
</thead>
</table>

**Description:** This parameter is to select the Master AccuLoad when interfacing via the Smith Meter/Sening Cross Over prevention (COP) system via a Bluetooth interface. One and only one of the AccuLoads sharing a Bluetooth module should be configured as a master.

**Selections:**
- [Disabled] (AccuLoad is not designated as a master)
- [Enabled] (Designate this AccuLoad as the Bluetooth master)

### 8.2.7.4. Card / Nedap Reader

<table>
<thead>
<tr>
<th>System: Communications: Card/Nedap Reader: HMI Card Reader</th>
<th>Index: None</th>
</tr>
</thead>
</table>

**Description:** Used to specify whether card reader is connected directly to the AccuLoad or remotely (on the HMI).

**Selections:**
- [No]
- [Yes]
### System: Communications: Card Reader: Card ID Validation

**System 761**

**Index:** System

**Description:** This parameter defines the type of operator validation required by the card reader prior to initiating a transaction. The factory default is "ID Stamp Only." If "Standalone/Standby" is selected, the AccuLoad operates as if "ID Stamp Only" was selected while under host control.

**Selections:**
- [ID Stamp Only]
- ID Stamp and Card-In Required
- Standalone/Standby
- Validate Always

**Note:** If an MMI port is configured and no card reader is being used, this parameter should be set to (0) ID Stamp Only; otherwise, card data will be expected.

### System: Communications: Card Reader: Card ID Timeout

**System 762**

**Index:** System

**Range:** 0 - 99 minutes

**Description:** This entry indicates the period that new card data will remain valid when no transactions are in progress. On new card data, this timer is reset to 1 and begins to increment each minute until either a transaction is started or the timer reaches the value programmed and expires. On expiration, the card data is erased. If programmed for any validation selection other than ID stamp only, loading will be prevented until a valid card is again presented to the reader, or until the next message from the card reader containing successfully read data is received.

Once a transaction is started within the card data valid timeout period, other transactions may be started on other arms. Only when all transactions on all arms in the unit have been ended, will the valid card status be removed. A value of zero for this program entry indicates the timer should never expire. The card data will remain valid until a transaction is started and will remain valid until all transactions are ended.

**Critical:** Card reader must be attached to MMI if using an MMI.

### System: Communications: Card Reader: Card Reader Configuration

**System 763**

**Index:** System

**Description:** This selects the operating mode of the card reader. Momentary is used when a card will be "swiped" to access the AccuLoad. The captive option requires the card to be continuously present in front of the card reader to remain valid.

**Selections:**
- [Momentary]
- Captive Card mode

**Note:** A new option has also been added to System 315 – Transaction Termination to allow selection of card removal as a means of ending a transaction. This is to ensure that in Captive Card mode the operator cannot leave his card behind, as the transaction cannot be ended until the card is removed.
### System: Communications: Card/Nedap Reader: Card Authorization

**System 764**

**Description:** Select if it is desired for a valid card to allow multiple transactions to be started or only for the next transaction that is started.
- [All Arms]
- [Single Transaction]

**Note:** Single Trans authorization is not available with "captive card" reader option (773).

### System: Communications: Card/Nedap Reader: Vehicle ID Tag

**System 765**

**Description:** Used to select which of the standard AccuLoad prompts should be used to prompt the driver for the vehicle ID tag when it is not electronically read from the trailer.

**Selections:**
- [N/A]
- Prompt 1
- Prompt 2
- Prompt 3
- Prompt 4
- Prompt 5
8.2.7.5. Serial Port Configuration 1 - 4

<table>
<thead>
<tr>
<th>System:Communications:Serial Port Configuration:Function</th>
<th>Index: Serial comm port</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 711</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: This program code defines the function of the communications port. The factory default is "Minicomp Host" on comm port 1. Selections are as follows:

- **N/A** – This communications port is not selected for use.
- **Term Host** – This communications port communicates with a terminal type device using a simplified communications protocol
- **[Minicomp Host]** – This communications port communicates with a minicomputer type device using a sophisticated and secure communications protocol
- **Modbus Host**
- **Printer** – Permits the AccuLoad through this communication port to automatically output an end of a transaction report to a printer connected to the AccuLoad
- **Shared Printer** – Same as number (4) above except the output report will go to a shared printer connected to one or more AccuLoads. (This requires special wiring. See the Installation manual for further details.)
- **Smart Inj/AICB/A4I** – Permits the AccuLoad through this communication port to communicate with and control up to twenty-four smart additive injector systems
- **E+H Promass** – Assigns a communication channel to an E+H Promass Coriolis Meter.
- **Smith Meter Card Reader** – Assigns a communications channel to the Smith Meter Card Reader Interface board, allowing passage of card data to a host computer
- **Nedap Reader** – For connection to a Nedap access control device
- **F.A. Sening COP** – Enables the interface to the F.A. Sening cross over prevention.

The communications port control must be correctly configured for the selected function.

**Fatal:** Baud rates below 9600 are no longer supported. (They remain in the select list for backward compatibility).

**Critical:** Shared printing is only possible on port 1

**Critical:** An address must not be zero.

**Critical:** A maximum of two ports may be configured for injector control.

**Critical:** A maximum of two ports may be configured for printer functions.

**Critical:** A maximum of two ports may be configured for host interface.

**Critical:** Modbus requires 8-bit data.

**Critical:** Function conflicts with Port Control.

**Note:** It is possible to program multiple host control ports for redundancy purposes. Note that only one host control port should be issuing control commands at any one time. It is up to the automation system to prevent conflicts when using this feature.

<table>
<thead>
<tr>
<th>System:Communications:Serial Port Config:Baud Rate</th>
<th>Index: Serial port</th>
<th>Range: 1200 - [57600] - 115200</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 712</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: Sets the speed of the associated communications port.

Selections:

- 9600, 19200, 38400, [57600], or 115200 baud.
**System: Communications: Serial Port Config: Data/Parity**

**System 713**

**Index:** Serial port  

**Range:**

**Description:** This parameter defines the number of data bits and parity used by the associated communications port. Unless indicated otherwise, one stop bit is used.

**Selections:**
- 7 bits No Parity
- 7 bits Odd Parity
- 7 bits Even Parity
- [8 bits No Parity]
- 8 bits Odd Parity
- 8 bits Even Parity
- 8 bits No Parity, 2 Stop bits

**Critical:** Modbus requires 8-bit data.

---

**System: Communications: Serial Port Config: Control**

**System 714**

**Index:** Serial port  

**Range:**

**Description:** This program code sets the level of control the associated communications port commands. Polling Only, Poll and Authorize, and Remote Control are valid with host communications options. XON/XOFF is valid with printer options. Only one port can have transaction control. The factory default is "Poll & Program." Selections are as follows:

- N/A – No communications on this port.
- Polling Only – No transaction control, display control or programming allowed via this port. Able to read program code values and run data from the unit.
- Poll & Authorize – Full programming/prompting control. Transaction control requiring authorization from host. Allows use of AccuLoad communications commands such as AU Authorize Transaction and AP Authorize Transaction and Preset for host authorization. Designed for terminals where the driver enters desired preset volume after authorization.
- Remote Control – Full programming and prompting control. Transaction control (also requiring authorization from host) allows use of SB – Set Batch to enter the preset remotely and EB to end the batch remotely. This is designed for pre-dispatch operations where the driver has limited input during the load process and the preset is host-controlled.
- XON/XOFF – For printer ports only. XON/XOFF flow control.
- [Poll & Program] – For use with AccuMate ports. Allows full program access but does not affect transaction control (acts like a standalone unit).
- PTB-FX – Security level designed to support PTB Weights and Measures Agency-approved printer interface.
- PTB-LQ – Security level designed to support PTB Weights and Measures Agency-approved printer interface.

**Critical:** Comm port not configured for host communications.

**Critical:** Comm port not configured for printer.

---

**System: Communications: Serial Port Config: Timeout**

**System 715**

**Index:** None  

**Range:** [0] - 999 seconds

**Description:** These three-digit codes allow the operator to specify the amount of time, in seconds, before aborting a communications transfer that has halted. The communications alarm will then be set. This entry is also used to abort a printout if waiting for a shared printer on an XON from a printer. If the timer expires while waiting for a shared printer, the shared printer alarm will be set.

If the port is configured for host communication, zero disables the communications timeout and the accompanying alarm. If the port is configured for a printer, the timeout cannot be disabled.

**Critical:** No entry if corresponding function = Not Used.

**Critical:** Comm port not configured for printer.

**Note:** Enter elapsed time in seconds of comm fail before signaling an alarm.
### System: Communications: Serial Port Config: Serial Interface

<table>
<thead>
<tr>
<th>Index: Serial port</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** Sets the serial port for RS-232 or RS-485

**Selections:**
- [RS-232]
- RS-485

### System: Communications: Serial Port Config: RS-485 Duplex

<table>
<thead>
<tr>
<th>Index: Serial port</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** Sets the mode of RS-485 serial communications.

**Selections:**
- [Full Duplex] - 4-wire
- Half Duplex - 2-wire

### System: Communications: Serial Port Config: Termination Resistors

<table>
<thead>
<tr>
<th>Index: Serial port</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** Enables or disables the on-board termination resistors for RS-485 serial ports

**Selections:**
- [Disabled]
- Enabled

## 8.2.7.6. Prompts

### System: Communications: Prompts: Prompt Mode

<table>
<thead>
<tr>
<th>Index: None</th>
<th></th>
</tr>
</thead>
</table>

**System 771**

**Description:** This program code selects when prompts will be displayed.

**Selections:**
- [Transaction Start]
- Standby

### System: Communications: Prompts: Prompts Used


**System 772**

**Description:** Sets the number of built-in prompts to present to the operator at the start of the transaction setup screen sequence. The response(s) entered by the operator get stored as part of the transaction record by the AccuLoad and can be printed on the Transaction Report and/or retrieved through communications.

### System: Communications: Prompts: Prompt Timeout

<table>
<thead>
<tr>
<th>Index: None</th>
<th>Range: 0 [30] - 99 seconds</th>
</tr>
</thead>
</table>

**System 773**

**Description:** This two-digit entry defines the amount of time, in seconds, that a local prompt will remain displayed at AccuLoad before the prompting sequence is aborted and AccuLoad returns to the ready screen. If set to zero the AccuLoad will wait indefinitely for data entry in response to a prompt. The factory default is "0".
### Prompt Validation

**System**: Communications: Prompts  
**Index**: None

**Description**: Selects how the AccuLoad validates (using the built-in driver database) the data entered by the operator in response to a prompt. Options 1 and 2 are used only if no card reader is installed on the system. If Option 3 is selected, a card reader must be in place because with that option, ID validation is performed by using the card data. Once the card data has been verified, the PIN is compared with the previously defined PIN for that card in the database.

**Selections**:
- [None]
- ID
- ID & PIN
- PIN

**Critical**: Selection invalid when using Card Reader (for Options 1 and 2 above).

**Critical**: Prompt Response Type cannot be alphanumeric for PIN entry.

**Critical**: Card Validation must be enabled in 761 for this option (for Option 3 above).

### Prompt Message

**System**: Communications: Prompts  
**Index**: Per Prompt, 5 max.  
**Range**: Text - 28 characters max.

**Description**: Defines the message displayed on the screen to prompt the operator for information.

### Prompt Input Type

**System**: Communications: Prompts  
**Index**: Per Prompt, 5 max.  

**Description**: This parameter defines whether numeric or alphanumeric data entered in response to a local prompt will echo to the screen or display Xs in place of digits as a security feature.

**Selections**:
- [Numeric] - shown on screen
- Hidden - numeric, X's shown on screen
- Alphanumeric

### Prompt Length

**System**: Communications: Prompts  
**Index**: Per Prompt, 5 max.  
**Range**: 0 - [9] - 25 characters

**Description**: Sets the maximum length of a response to a prompt.
8.2.8.  800 - Additive Directory

Additives (common) Menu
- Number of Injectors
- Additive Selection Method
- Additive Pacing Units
- Additive Stop Option
- Additive Stop Amount
- Additive Stop Disable
- Additive Stop Pump Action
- Additive Injection Units
- Additive Totals Units
- Inject to Totals Convert
- Clean Line Additive
- Piston Feedback Errors
- Piston Stop Action
- Alarm Pulse Count
- Alarm Pulse time
- FC Inj Additive Totals
- FC Inj Channel Select
- FC Inj Error Count
- FC Inj Error Reset
- FC Inj Error Amount
- Injection Window Percentage

Flow Controlled Injectors (1-4)
- Injector Minimum Flow
- Injector Maximum Flow
- Injector Flow Tolerance
- Injector Second Trip Amount
- Injector Valve Type
- Analog Valve Kp
- Analog Valve Ki
- Analog Valve Kd
- Analog Valve PID Interval
- Additive API Table
- Additive Reference Density
- Reference Density Units
- Additive Shared Temperature Input
- Additive Maintenance Temperature
- Additive High Temperature Alarm
- Additive Low Temperature Alarm
- Injector Flow Timeout
- Injector Flow Rate Cutoff (Dual Pulse)

Additive Config Menu (1 - 24)
- Injector Tag
- Injector Type
- Injector Arm
- Injector Plumbing
- Injector Address
- Injector K Factor
- Injector Meter Factor
- Injector High Tolerance
- Injector Low Tolerance
- Injector Maximum Tolerance Errors
## 8.2.8.1. Additives (common)

### System: Additives: Additives
- **Common: Number of Injectors**
  - **System 801**
  - **Index:** None
  - **Range:** 0 - [24]

**Description:** The total number of injectors controlled by this AccuLoad

### System: Additives: Additives
- **Common: Additive Selection Method**
  - **System 802**
  - **Index:** System

**Description:** This parameter defines how additive injectors will be selected for delivery. Only those additives programmed for a recipe will be available. The selection of available additives may be further limited with a communications command from an automation system.

**Selections:**
- **[Automatic]** – No selection is required or allowed when presetting. All the injectors that are programmed, less those disabled via automation communications, will automatically pulse when the unit is loading
- **Transaction** – Manual selection of the injectors at the start of the transaction. At the start of each transaction, the operator will be prompted to select the desired injectors prior to presetting
- **Batch** – Manual selection of the injectors at the start of each batch. At the start of each batch, the operator will be prompted to select the desired injectors prior to presetting
- **Standby Transaction**
- **Standby Batch**

### System: Additives: Additives
- **Common: Additive Pacing Units**
  - **System 803**
  - **Index:** System
  - **Range:** Default: [IV]

**Description:** This program code selects the volume type used to pace the additive injectors.

**Selections:**
- **[Indicated volume (IV)]**
- **Gross volume (GV)**
- **GST volume (GST)**
- **GSV volume (GSV)**
- **Mass**

**Critical:** Selected units not available.

### System: Additives: Additives
- **Common: Additive Stop Option**
  - **System 804**
  - **Index:** None

**Description:** This parameter defines when the additive injection will stop for each batch. It also determines whether the rate will be recalculated so that the total amount of additive expected for the preset volume will be delivered before the down-counter reaches the volume in System 805 – Additive Stop Amount.

**Selections:**
- **[End of Batch]** – Stop volume is ignored. Additive is delivered until end of batch
- **No recalculation** – Additive is delivered as above but injection halts when only stop volume remains
- **Recalculation** – Proper additive volume for entire preset volume is "squeezed" so that the correct additive amount for preset is delivered when the stop volume is reached.

**Note:** See System 806: Additive Stop Volume Disable for those individual additives that deliver to the end of the batch.
### System:Additives:Additives Common:Additive Stop Amount

<table>
<thead>
<tr>
<th>Description</th>
<th>Index: None</th>
<th>Range: [0] - 999</th>
</tr>
</thead>
<tbody>
<tr>
<td>This four-digit entry allows the operator to select the amount of product remaining to be delivered when the additive injectors will be shut down. This code is used only in conjunction with Injector Option 1 and 2 of parameter 803. The range of this code is 0 to 9999.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> See System 806: Additive Stop Volume Disable for those individual additives that deliver to the end of the batch.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### System:Additives:Additives Common:Additive Stop Disable

<table>
<thead>
<tr>
<th>Description</th>
<th>Index: System</th>
<th>Range: 1 - 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>This parameter allows the programming of the additive stop volume to be ignored for specified additives. Select the additives that will NOT be stopped at the additive stop volume by scrolling through the list on the AccuLoad display.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Selections:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Additive 1 - 24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additives that will ignore the stop volume will be highlighted and a 'check mark' icon will appear on that additive in the list.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### System:Additives:Additives Common:Additive Stop Pump Action

<table>
<thead>
<tr>
<th>Description</th>
<th>Index: System</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>This program code determines when the additive pump is de-energized while an additive stop amount is configured and active for the associated injector.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Selections:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• [End of Batch]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• When Stop Amount reached (after last injection completes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If the Additive Stop Disable option is configured for the associated injector, this option has no effect and the pump will remain on until end of batch (default operation).</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> This option cannot be guaranteed to give the desired results when used with smart injectors that perform their own pump control.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### System:Additives:Additives Common:Additive Injection Units

<table>
<thead>
<tr>
<th>Description</th>
<th>Index: None</th>
<th>Range: Text - 3 characters max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>This code allows entry of a three-character identifier for the injected additive volume units, such as cc or oz. These are the units associated with the programmed additive volume per injection in the recipe directory.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### System:Additives:Additives Common:Additive Totals Units

<table>
<thead>
<tr>
<th>Description</th>
<th>Index: None</th>
<th>Range: Text - 3 characters max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>This code allows entry of a three-character identifier for the injected additive volume units, such as cc or oz. These are the units associated with the programmed additive volume per injection in the recipe directory.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### System: Additives: Additives

#### Common: Injection/Totalization Conversion Factor

**System 813**

<table>
<thead>
<tr>
<th>Index: System</th>
<th>Range: 0 - 9999999000</th>
</tr>
</thead>
</table>

**Description:** This ten-digit numeric entry is used to convert injection units to totals units. The AccuLoad uses this formula for the conversion:

\[
\text{Volume in Injector units} / \text{Conversion factor} = \text{Volume in Total Units}
\]

**Example:** If injection units are in cc., and injector totals are to be displayed in liters, the value would be 1000. (1.00 e+03).

#### Common: Clean Line Additive

**System 814**

<table>
<thead>
<tr>
<th>Index: System</th>
<th>Range: 0 - 999</th>
</tr>
</thead>
</table>

0 disables alarm

**Description:** Sets the tolerance for the additive stop volume. If the batch is ended before the programmed stop volume has been completely delivered, this entry determines if an alarm will occur. An alarm will occur at batch end if the volume delivered since the last injection is short of the stop volume by more than this entry. A 0 entry disables the alarm.

**Example:** If injection units are in cc., and injector totals are to be displayed in liters, the value would be 1000. (1.00 e+03).

#### Common: Piston Injector Feedback Errors

**System 815**

<table>
<thead>
<tr>
<th>Index: System</th>
<th>Range: 0 - 9</th>
</tr>
</thead>
</table>

0 disables the alarm

**Description:** This one-digit numeric entry is used with piston injectors with feedback only. It defines the number of missed feedback signals that can occur before an additive feedback alarm occurs. A 0 entry disables the alarm.

#### Common: Piston Injector Stop Action

**System 816**

<table>
<thead>
<tr>
<th>Index: System</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** This parameter determines whether any active piston injector outputs are de-energized if the batch is stopped prematurely via the user interface, an alarm, or loss of permissive. This does not affect the state of the piston injector solenoid output at batch end or transaction end.

**Selections:**

- [No Action]
- De-energize

#### Common: Alarm Pulse Count

**System 817**

<table>
<thead>
<tr>
<th>Index: System</th>
<th>Range: 0 - 999</th>
</tr>
</thead>
</table>

**Description:** This parameter determines the threshold of leakage pulses allowed without an alarm. This parameter is for metered injectors. When set to 0, the count defaults to 10.
### System:Additives:Additives

**Common:Alarm Pulse Time**

**System 818**

**Index:** System  
**Range:** 0 - 999 minutes

**Description:** This parameter defines the amount of time in minutes between automatic resets of the Injector Alarm Pulse Count. If set to 0, the count is not reset.

---

**System:Additives:Additives**

**Common:Include Flow-Controlled Inj Additive Totals**

**System 835**

**Index:** System  
**Range:** 0 - 999 sec

**Description:** Due to the large percentages and delivered amounts typically associated with flow-controlled additives, these meters are typically custody transfer so they can be segregated/reported independently from the combined (product + additive) total usually reported when additives are plumbed downstream. Select whether to treat this flow-control additive specially and NOT include the additive volume in the reported product total. Default is to include additive volumes in the totals reported for the product.

**Selections:**
- [Include in Product]
- Not Included

---

**System:Additives:Additives**

**Common:Flow Rate Controlled Inj Channel Select**

**System 836**

**Index:** None  
**Range:**

**Description:** Selects single or dual channel pulse inputs for flow controlled additive meters.

**Selections:**
- [Single Channel]
- Dual Channel

**Note:** If the meter pulse input type in Configuration 101 - Transmitter Channel Selection is programmed for 0 – Single Channel, then this program code must also be 0 – Single Channel.

---

**System:Additives:Additives**

**Common:Flow Rate Controlled Inj Error Count**

**System 837**

**Index:** None  
**Range:** 0 - 999

**Description:** Sets the maximum number of dual pulse error counts allowed before a dual pulse error alarm occurs. The count is maintained for each flow-controlled additive separately and the alarm is generated only if the error count for any one injector pulse stream exceeds the error count programmed here. An entry of 0 disables the alarm.
### System:Additives:Additives

**Common: Flow Rate Controlled Inj**

**Pulse Error Reset**

**System 838**

<table>
<thead>
<tr>
<th>Index: None</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** This program code defines the conditions under which the dual pulse error count will be reset for the flow-controlled additives.

**Selections:**
- [No Reset]
- Transaction End
- Power-Up
- Transaction & Power-Up

### System:Additives:Additives

**Common: Flow Rate Controlled Inj**

**Error Amount**

**System 840**

<table>
<thead>
<tr>
<th>Index: None</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** This program code determines if error pulses accumulated after a Pulse Security alarm occurs are counted towards the flow-controlled additive amount delivered.

**Note:** Select ‘0 – Count’ to continue to totalize normally after this alarm occurs; Select ‘1 – Ignore’ to ignore all pulses after an alarm occurs. Selecting ‘1 – Ignore’ will cause any volume or mass that actually flows through the meter from point where this alarm occurs to when the valve is completely closed to be ignored. The AccuLoad will ignore any pulses from the meter until the alarm is cleared.

Some measurement agencies require this behavior.
### 8.2.8.2. Additives Configuration Menu - Injector 1 - 24

<table>
<thead>
<tr>
<th>System:Additives:Additives</th>
<th>Index: Injector 1 - 24</th>
<th>Range: Text - 10 characters maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration:Injector Tag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System 845</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> Enter a name for this injector</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System:Additives:Additives</th>
<th>Index: Injector 1 - 24</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration: Injector Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System 846</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> These program codes define the type of additive injector installed at that injector position. AccuLoad supports a mixed implementation of additive injector types.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Selections:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Piston</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Piston Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Titan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Blend-Pak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Mini-Pak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Smith Smart Injector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Metered Injector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Add-Pak-AICB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Shared Injector 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Shared Injector 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Shared Injector 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Shared Injector 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Flow Rate Controlled Injector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Add-Pak 2-Stroke injector</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metered injector pulse input not configured.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injector I/O assignment does not match type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No comm port configured for smart additive control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No injector address assigned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Only four metered injectors may be configured</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add-Pak channel already assigned as auxiliary I/O point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additive 1 must be a metered injector type to configure Shared Injector 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow Rate Controlled Injectors limited to injectors 1-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow Rate Controlled Injector pulse input not configured</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration: Additive Arm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System 847</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> These entries specify the arm with which the associated additive injector is used.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Selections:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Arm 1 - Arm 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### System:Additives:Additives Configuration:Additive Plumbing

**System 848**

<table>
<thead>
<tr>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
</table>

**Description:** Selects which meters run(s) this injector is plumbed into.

**Selections:**
- Meter 1 - Meter 6
- Downstream (None)

### System:Additives:Additives Configuration:Additive Injector Address

**System 849**

<table>
<thead>
<tr>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
</table>

**Description:** This three-digit numeric entry is used with any smart injector type. It defines the communications address for the associated injector. When more than one injector is installed at AccuLoad, injector addresses must be unique.

**Critical:** Injector address must be unique.

**Critical:** If A4I Board #1 is present [determined by seeing if Injectors 5 through 14 are Add-Pak], then no injector may have address 100 through 110.

**Critical:** If A4I Board #2 is present [determined by seeing if Injectors 15 through 24 are Add-Pak], then no injector may have address 200 through 210.

**Note:** No entry if corresponding type is not a Smart Injector (Smith Meter, Titan, Gate City types).

**Note:** No entry if the injector is an Add-Pak type. If the injector is an Add-Pak type, this entry will be set automatically.

### System:Additives:Additives Configuration:Metered Injector K Factor

**System 850**

<table>
<thead>
<tr>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
</table>

**Description:** This seven-digit value defines the nominal number of pulses from a meter for one unit of registration.

**Critical:** Entry must not be zero.

**Critical:** Metered injector pulse input not configured.

### System:Additives:Additives Configuration:Metered Injector Meter Factor

**System 851**

<table>
<thead>
<tr>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
</table>

**Description:** The meter factor for the additive meters that are being controlled directly by the AccuLoad are programmed in these parameters. If the additives are being controlled through communications and ancillary equipment, no value should be programmed in these parameters. Meter factor equals the actual volume times the current meter factor times the K factor, all divided by the input pulses. The factory default is "0.0000".

**Critical:** Entry must not be zero.

**Critical:** Enter the meter factor for the metered injector.
8.2.8.3. Flow Controlled Injector 1 - 4

System:Additives:Flow Controlled Injector:Injector Minimum Flow
System 881
Index: Injector 1 - 4
Range: 0 - 9999
Description: This four-digit numeric entry defines the lowest programmed flow rate for the additive. This will be the final stage flow rate for the additive when the valve is signaled to close at the completion of a preset. The range of this entry is 0 to 9999 units per time measurement.

System:Additives:Flow Controlled Injector:Maximum Flow Rate
System 882
Index: Injector 1 - 4
Range: 0 - 99999
Description: This four-digit numeric entry defines the maximum flow rate being controlled for this additive during loading. The range of this entry is from 0 to 9999 flow units. Example: Current Flow Rate: 130 GPM Flow Tolerance: ±5%
Flow rate may vary ±6.5 GPM (130 GPM × 5% = 6.5 GPM without a valve correction)
Note: Additive will not flow if additive maximum flow is zero.
### System:Additives:Flow Controlled

#### Injector:Flow Tolerance Percentage

**System 883**

**Index:** Injector 1 - 4  
**Range:** 0 - 9

**Description:** This single-digit entry designates the percentage of the currently requested flow rate that the flow rate of the additive may vary before the AccuLoad initiates a valve correction. The range of this one-digit numeric entry is from 0 to 9%.

#### Injector:Injector Second Trip Amount

**System 884**

**Index:** Injector 1 - 4  
**Range:** 0 - 99.9

**Description:** This three-digit numeric entry defines the preset amount in tenths remaining for this additive at the final valve closure signal for the product. The range of this entry is from 0.0 to 99.9 units.

#### Injector:Injector Additive Valve Type

**System 885**

**Index:** Injector 1 - 4

**Selections:**
- Digital
- Analog

#### Injector:Analog Valve Kp (PID, Proportional Gain Factor)

**System 886**

**Index:** Injector 1 - 4  
**Range:** 0 - 999.999

**Description:** This entry defines the PID proportional gain factor for analog valve control. The range of this entry is 0.000 to 999.999. This entry is used only with analog valves.

#### Injector:Analog Valve Ki (PID, Integral Gain Factor)

**System 887**

**Index:** Injector 1 - 4  
**Range:** 0 - 999.999

**Description:** This entry defines the PID integral gain factor for analog valve control. The range of this entry is 0.000 to 999.999. This entry is used only with analog valves.

#### Injector:Additive Kd (PID, Derivative Gain Factor)

**System 888**

**Index:** Injector 1 - 4  
**Range:** 0 - 999.999

**Description:** This entry defines the PID derivative gain factor for analog valve control. The range of this entry is 0.000 to 999.999. This entry is used only with analog valves.
### System: Additives: Flow Controlled Injector: Analog Valve PID Interval

**System 889**

**Index:** Injector 1 - 4  
**Range:** 0 - 9.9

**Description:** This entry defines the time interval, in seconds, between PID calculations. The range of this entry is 0.0 to 9.9.

### System: Additives: Flow Controlled Injector: Additive API Table

**System 890**

**Index:** Injector 1 - 4  
**Range:**

**Description:** This entry allows the operator to select the appropriate calculation to be used to temperature compensate the additive. This parameter applies only when the injector is configured as a flow rate controlled injector with temperature compensation.

**Selections:**
- None
- API 2004 - crude oils
- API 2004 - refined products
- API 2004 - C tables special
- API 2004 - Lube Oils
- API E Tables - LPG, NGL
- API 1952 (6,23,24,53,54)
- PTB-1 - Ethanol/Bio Blend
- PTB-3 - Ethanol/Bio Blend
- EPA-RFS2 (E100)
- EPA-RFS2 (B100)
- Aromatics (ASTM D1555)
- Brazil ABNT5992 (RefDen)
- Brazil ABNT5992 (RefGrade)
- Brazil ABNT5992 (LiveDen)
- Brazil BR1A
- Brazil BR1P
- Brazil BR2P
- NH3 - Ammonia

**Critical:** This API table not available for flow controlled injectors. [Odd-numbered API tables, Brazil tables and 24E]

### System: Additives: Flow Controlled Injector: Additive Reference Density

**System 891**

**Index:** Injector 1 - 4  
**Range:** -9999.9 – +9999.9

**Description:** This code has a constant five-digit entry with a floating decimal point. The format is based on table and product selection. The program code format and data entry allows the programmable entry of the Reference Density when Table 54 is selected, Relative Density when Table 24 is selected, API when Table 6 is selected, and temperature coefficient when a C Table is selected. This entry represents the reference value used to calculate the volume correction factor. The range of this value will vary with the table selection chosen.

**Note:** When Table 6 is selected, the leading digit will be used to show polarity, + = positive and a - = negative.

**Fatal:** Entry is out of specified range.
### System: Additives: Flow Controlled

#### Injector: Reference Density Units

**System 892**

**Description:** This entry allows the operator to indicate whether an additive is to share a temperature probe already assigned to another arm / meter or additive, and to select a specific probe to be shared. This eliminates having to configure multiple analog inputs for temperature.

**Selections:**
- NA
- API
- Lb/′F³ (Pounds/Cubic Feet)
- Kg/M³ (Kilograms/Cubic Meter)
- Relative Density

#### Injector: Additive Shared Temperature Input

**System 893**

**Description:** This entry allows the operator to indicate whether an additive is to share a temperature probe already assigned to another arm / meter or additive, and to select a specific probe to be shared. This eliminates having to configure multiple analog inputs for temperature.

**Selections:**
- Not Used
- Arm 1 Meter 1 – 6
- Arm 2 Meter 1 – 6
- Arm 3 Meter 1 – 6
- Arm 4 Meter 1 – 6
- Arm 5 Meter 1 – 6
- Arm 6 Meter 1 – 6
- Flow Rate Injector 1 – 4

**Critical:** Temperature probe already assigned to additive.

#### Injector: Additive Maintenance Temperature

**System 894**

**Description:** This code allows the entry of a maintenance temperature to be used when a temperature probe is not installed or working, but temperature related calculations are desired. The temperature units are dependent on the entry made in the Temperature Scale Select code. This four-digit entry has a range of –999.9 to 999.9 temperature units where –999.9 disables the maintenance temperature.

**Note:** An entry greater than -999.9 will override the temperature probe or transducer input if installed and will be used in all calculations where temperature is used. **Note:** This feature may be disallowed in certain weights and measures jurisdictions.
**System:Additives:Flow Controlled Injector:Additive High Temperature Alarm Limit**  
System 895  

**Description:** This code allows the entry of a temperature reading that will cause a high temperature alarm to be generated. The temperature units will be dependent on the entry made in the Temperature Scale Select code. This four-digit entry has a range of –999.9 to +999.9 degrees F or C.  

**Note:** An entry of "+999" will disable the alarm.  

**Index:** Injector Flow 1 - 4  
**Range:** -999.9 – +999.9

---

**System:Additives:Flow Controlled Injector:Additive Low Temperature Alarm Limit**  
System 896  

**Description:** This code allows the entry of a temperature reading that will cause a low temperature alarm to be generated. The temperature units will be dependent on the entry made in the Temperature Scale Select code. This four-digit entry has a range of –999.9 to +999.9 degrees F or C.  

**Note:** "-999" will disable the alarm.  

**Index:** Injector Flow 1 - 4  
**Range:** -999.9 – +999.9

---

**System:Additives:Flow Controlled Injector:Injector Flow Timeout**  
System 897  

**Description:** This parameter determines the maximum amount of time in seconds allowed to reach the desired rate for a flow rate controlled additive before an alarm will be issued. If the desired flow is not reached before this timeout expires a low additive alarm will occur. A zero entry disables the feature.  

**Help:** Enter time in seconds to reach desired flow rate before an alarm occurs. Zero disables.  

**Index:** Injector Flow 1 - 4  
**Range:** 0 - 9999

---

**System:Additives:Flow Controlled Injector:Rate Cutoff**  
System 898  

**Description:** This parameter defines the additive flow rate below which dual pulse errors will not be counted. Entry is volume or mass based upon System 305 – Pulse In Type. The range of this entry is 0-9999. This parameter has no effect if flow controlled additive pulse inputs are not configured for dual channel transmitters in System 836 – Flow Controlled Additive Channel Select.  

**Index:** Injector Flow 1 - 4  
**Range:** 0 - 9999
## 8.2.8.4. Security Directory

<table>
<thead>
<tr>
<th>System:Security:Access Codes</th>
<th>Index: Security Level 1 - 5</th>
<th>Range: 0000 - 9999</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>These four-digit numbers permit entry into the AccuLoad's program or Weights and Measures program codes. The access codes must be entered through the AccuLoad IV user interface after the Program Mode security contact has been closed (if the optional security switch input feature has been programmed and wired to a switch). If this contact has not been closed, the AccuLoad IV will not allow entry into the Program Mode. Once the security is set up for the parameters in the unit the operator must enter the program mode at the level assigned to the parameter(s) that are to be changed. The range of these entries is from 0 to 9999.</td>
<td></td>
</tr>
</tbody>
</table>
| **Critical (s):** | • Duplicate access codes are not permitted  
 • Must be at highest level of security  
 • A Level 5 access code must be entered at a minimum to utilize this feature. |
| **Note (s):** | • A Level 5 access code must be entered at a minimum to utilize this feature.  
 • The operator must enter Program Mode at the highest programmed security level to obtain access to these access codes. |

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>System 190</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Enter the desired access code for this security level.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>System 191</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Enter the desired access code for this security level.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>System 192</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Enter the desired access code for this security level.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>System 193</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Enter the desired access code for this security level.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System:Security:Security Level 5 Password</th>
<th>Index: System Security</th>
<th>Range: 0 (none) - 43</th>
</tr>
</thead>
<tbody>
<tr>
<td>System 194</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Enter the desired access code for this security level.</td>
<td></td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>System 195</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Select the digital input to use for the Security Input #1 function.

**Selections:**
- No Security Input
- Digital Input 1 - 43

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System 196</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Select the digital input to use for the Security Input #2 function.

**Selections:**
- No Security Input
- Digital Input 1 - 43

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System 197</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry selects the security level associated with Security Input #1. Access up to this level will be available with the activation of this input (and passcode if configured).

**Selections:**
- No Security
- Security Level 1 - 5

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System 198</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry selects the security level associated with Security Input #2. Access up to this level will be available with the activation of this input (and passcode if configured).

**Selections:**
- No Security
- Security Level 1 - 5

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System 199</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry selects the level of security required to enter the diagnostics menu.

**Selections:**
- No Security
- Security Level 1 - 5

|----------------------------------------|-------------|--------------|

**Description:** Used to set the security of all configuration database parameters to the specified level.
### 8.3. Bay Directories

#### 8.3.1. Bay 1-2

- Bay Permissive 1 Sense
- Bay Permissive 1 Message
- Bay Permissive 1 Restart
- Bay Permissive 2 Sense
- Bay Permissive 2 Message
- Bay Permissive 2 Restart
- Bay ID
- Report Select
- Summary Report Print Time
- Summary Report Interval
- Report Totals Resolution
- Report Pages
- Report HM Class

<table>
<thead>
<tr>
<th>Bays:Bay Permissive 1 Sense</th>
<th>Index: Bays 1 and 2</th>
<th>Range: 1 - 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bays: 101, 104</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Enables and defines the conditions under which a bay permissive is expected to be present in order for loading operations to be allowed. Bay permissives affect all arms currently assigned to (or in the case of swing arms, positioned on) that bay.

**Selections:**
- [N/A] - Permissive is disabled
- Transaction Start - Permissive input is only checked immediately after authorization
- Continuous - Permissive input must be asserted continuously during the batch
- Start Pressed - Permissive input must be asserted whenever flow is started
- Batch Start - Permissive input must be asserted to start a batch

<table>
<thead>
<tr>
<th>Bays:Bay Permissive Messages</th>
<th>Index: Bays 1 and 2</th>
<th>Range: 1 - 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bays 102, 105</td>
<td></td>
<td>28 character maximum</td>
</tr>
</tbody>
</table>

**Description:** These 28 character alphanumeric messages will be displayed if a permissive sense entry, corresponding with the message is defined but not present when expected. The data entry allows 28 character maximum.

<table>
<thead>
<tr>
<th>Bays:Bay Permissive Restart</th>
<th>Index: Bays 1 and 2</th>
<th>Range: 1 - 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bays 103, 106</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** These parameters will determine how a restart is mediated after a permissive is lost and then restored.

**Selections:**
- Manual – Start button must be pressed to restore
- Automatic – Flow will be started automatically as soon as the permissive is restored.

<table>
<thead>
<tr>
<th>Bays:Bay ID</th>
<th>Index: Bays 1 and 2</th>
<th>Range: Text - 28-character max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bays 111</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry allows the operator to enter or edit a 28-character bay identification. The ID is used on default reports and is available for configurable reports.
### 8.3.2. Communications

<table>
<thead>
<tr>
<th>Bays:Report Select</th>
<th>Index: Bays 1 and 2</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** This program code defines which delivery report will be printed at the completion of a transaction on the bay if a printer function is assigned to one or more communications ports. The same report will be printed at each port if multiple ports are configured for printer options.

**Selections:**
- Default
- User Config 1
- User Config 2

<table>
<thead>
<tr>
<th>Bays:Summary Report Print Time</th>
<th>Index: Bays 1 and 2</th>
<th>Range: Text - 6-character max.</th>
</tr>
</thead>
</table>

**Description:** This entry defines the initial time at which the AccuLoad will generate the summary report for the bay. This report summarizes all transaction data on the bay for the interval defined in the Summary Report Interval parameter.

<table>
<thead>
<tr>
<th>Bays:Summary Report Interval</th>
<th>Index: Bays 1 and 2</th>
<th>Range: 0 - 999</th>
</tr>
</thead>
</table>

**Description:** This entry defines the interval of time covered by the Summary Report. Used in conjunction with the Summary Report Print Time, a new report is generated at the interval specified in this program code. The range of this entry is 0 – 999 hours. If set to zero, the summary report is disabled.

<table>
<thead>
<tr>
<th>Bays:Report Totals Resolution</th>
<th>Index: Bays 1 and 2</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** This entry selects the amount resolution to print on default reports. There are three available options.

**Selections:**
- Whole
- 10ths
- 100ths

<table>
<thead>
<tr>
<th>Bays:Report Pages</th>
<th>Index: Bays 1 and 2</th>
<th>Range:</th>
</tr>
</thead>
</table>

**Description:** This entry selects which pages will be printed on reports. There are four available options.

**Selections:**
- Batch and Transaction
- Batch Only
- Transaction Only
- No Report
Bays:Report HM Class

<table>
<thead>
<tr>
<th>Index: Bays 1 and 2</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
</table>

**Description:** This entry allows the operator to select which product's Hazardous Materials (HM) Classification will be printed on the summary page of the report.

**Selections:**
- Arm 1 - 6

---

8.4. **Arms Directories**

**Arm 1-6**

- 100 - General Purpose
- 200 - Flow Control
- 300 - Volume Accuracy
- 700 - Communications
- Meter directories for this arm
- Product directories for this arm

---

8.4.1. **100 - General Purpose Directory**

<table>
<thead>
<tr>
<th>Arms:General Purpose:Permissive Sense</th>
<th>Index: Arm Permissive (1-2)</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 101, 104</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Defines the states when permissive inputs are required to allow loading operations.

**Selections:**
- N/A
- Transaction Start – Permissive only checked immediately after authorization
- Continuous – Permissive must be met continuously during the batch
- Start Pressed – Permissive must be met whenever flow is started
- Batch Start – Permissive must be met to start a batch

---

<table>
<thead>
<tr>
<th>Arms:General Purpose:Permissive Message</th>
<th>Index: Arm Permissive (1-2)</th>
<th>Range: Text - 28 Characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 102, 105</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Messages displayed if the permissive input corresponding with the message, is defined but not present when expected.
### Arms: General Purpose: Permissive Restart

<table>
<thead>
<tr>
<th>Index: Arm Permissive (1-2)</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 103, 106</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Determines how a restart is initiated after a permissive is lost and then restored.

**Selections:**
- Manual – Start must be pressed to restore flow
- Automatic – Flow will be started automatically as soon as the permissive is restored

### Arms: General Purpose: Load Arm ID

<table>
<thead>
<tr>
<th>Index: Arm</th>
<th>Range: Text - 28 Characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 111</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Used to identify the load position. It is included on the AccuLoad’s display in Ready mode. The Load Arm ID can also be included on the delivery report.

### Arm: General Purpose: Load Arm Ready Message

<table>
<thead>
<tr>
<th>Index: Arm</th>
<th>Range: Text - 28 Characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 112</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Enter the message to be displayed for the arm when it is idle (at the Ready screen).

### Arms: General Purpose: Bay Assignment

<table>
<thead>
<tr>
<th>Index: Arm</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 113</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Allows the operator to assign a load arm to a bay.

**Selections:**
- Independent
- Bay A
- Bay B
- Swing Arm

### Arms: General Purpose: Unlimited Preset

<table>
<thead>
<tr>
<th>Index: Arm</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 116</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Enables an alternative method of product delivery for specialized applications where the goal is to continuously blend two or more products. This feature can optionally also be used in situations where a main product stream is not under the control of the AccuLoad but component products being blended into the main product ARE being controlled by the AccuLoad (wild stream blending).

When configured for unlimited preset with a wild stream meter, the desired flow rates will not be based on a programmed high flow rate or low flow start rate. Instead the desired flow rate for the controlled products will be based on the flow rate of the wild stream. The AccuLoad will attempt to adjust the flow rates for the controlled products to produce the programmed blend ratio.

If all products are controlled (no wild stream meter), the desired flow rates will be based on the programmed high flow rate or low flow rate. In this configuration, the high flow rate will not be exceeded.

**Selections:**
- No
- Yes
### Arms: General Purpose: Transaction

<table>
<thead>
<tr>
<th><strong>Description</strong></th>
<th><strong>Index</strong></th>
<th><strong>Range</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reset Time</strong></td>
<td>Arm</td>
<td>0 - 999 hours</td>
</tr>
<tr>
<td><strong>Arms 117</strong></td>
<td></td>
<td>0 to disable</td>
</tr>
<tr>
<td><strong>Description</strong>: The time period between automatic resetting of the current transaction in Unlimited Preset mode. The current transaction will be terminated and a new transaction will be started when the period expires. Only affects and is only available with arms configured for Unlimited Preset.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Description</strong></th>
<th><strong>Index</strong></th>
<th><strong>Range</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reset Start Hour</strong></td>
<td>Arm</td>
<td>0 - 23</td>
</tr>
<tr>
<td><strong>Arms 118</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description</strong>: Specifies the hour of the day when the transaction reset period begins.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 8.4.2. 200 - Arm Flow Control Directory

- Low Flow Start Rate
- Low Flow Start Amount
- Low Flow Start Percentage
- Low Flow Start Condition
- High Flow Rate
- 2nd High Flow Rate
- 1st/2nd High Flow
- 1st/2nd High Flow Preset
- Start/Stop Delay
- Overrun Alarm Limit
- Zero Flow Timer
- Valve Delay to Open
- Pump Delay to Off
- Valve Fault Timeout
- Clean Line Amount
- Clean Line Product
- Clean Line Alarm Limit
- Clean Line Blend
- Ratio Factor Adjust
- Ratio Factor Time
- Block Valve Position
- Valve Close Delay
- Additive Stop Amount
- Additive (During) Low Flow Start

<table>
<thead>
<tr>
<th><strong>Description</strong></th>
<th><strong>Index</strong></th>
<th><strong>Range</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flow Control: Low Flow Start Rate</strong></td>
<td>Arm</td>
<td>0.0 - 9999.9</td>
</tr>
<tr>
<td><strong>Arms 201</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description</strong>: Designates the flow rate used during low flow start, i.e., for the volume of product defined by the low flow start volume or low flow start percentage parameters.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical</strong>: Low flow start rate can't be less than the minimum flow rate (checks all products configured).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Description</strong></th>
<th><strong>Index</strong></th>
<th><strong>Range</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flow Control: Low Flow Start Amount</strong></td>
<td>Arm</td>
<td>0.0 - 9999.9</td>
</tr>
<tr>
<td><strong>Arms 202</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description</strong>: Defines the amount of product to be delivered at the low flow start rate. If both low flow start amount and low flow start percentage are defined, the larger of the two will be used for low flow start.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arms: Flow Control</td>
<td>Description</td>
<td>Index</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>Low Flow Start Percentage</td>
<td>Defines the percentage of the preset volume to be delivered during low flow start. If both low flow start percentage and low flow start volume are defined, the larger of the two will be used for low flow start.</td>
<td>Arm</td>
</tr>
<tr>
<td>Arms 203</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Flow Start Condition</td>
<td>Selects if the low flow start should be performed only at the start of a delivery or every time flow starts.</td>
<td>Arm</td>
</tr>
<tr>
<td>Arms 204</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Flow Rate</td>
<td>For ratio blending arms, this rate will be divided among the products being delivered according to the percentages assigned in the recipe selected for loading. For other arm types, the high flow rate is set per product.</td>
<td>Arm</td>
</tr>
<tr>
<td>Arms 205</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd High Flow Rate</td>
<td>For ratio blending arms, sets a second high flow rate which is selectable by a digital input. This flow rate would be typically selected for smaller trucks.</td>
<td>Arm</td>
</tr>
<tr>
<td>Arms 206</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st/2nd High Flow</td>
<td>Selects when the 1st/2nd High Flow input is monitored as follows:</td>
<td>Arm</td>
</tr>
<tr>
<td>Arms 207</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First/Second High Flow Preset</td>
<td></td>
<td>Arm</td>
</tr>
<tr>
<td>Arms 208</td>
<td>Disable: 0</td>
<td></td>
</tr>
</tbody>
</table>
**Description:** Preset amounts above this value will deliver at the first or standard high flow rates programmed. Presets less than this amount will deliver at the second high flow rate (as if the second high flow switch input had been activated). Any batch with a preset amount less than or equal to this entry will use the rates programmed in Product 203 – Second High Flow Rate and Load Arm 206 – Second High Flow Rate in place of the rates programmed in Product 202 – High Flow Rate and Load Arm 205 – High Flow Rate. This program code does not require nor preclude the use of a first/second high flow switch. The second high flow rate will be used if either the second high flow switch is active or the preset amount is at or below the value in this entry. An entry of 0 disables the feature. The range of this entry is units.

**Note:** The load arm high flow rate values only apply to ratio blending arms.

<table>
<thead>
<tr>
<th>Arms:Flow Control:Start Stop Delay</th>
<th>Index: Arm</th>
<th>Range: 0 - 999 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 211</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> Sets the number of seconds delay before allowing flow to be re-started after flow was stopped during a batch.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arm:Flow Control:Overrun Alarm Limit</th>
<th>Index: Arm</th>
<th>Range: 0 - 99 units delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 212</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> Sets the alarm threshold for product delivered in excess of the preset amount.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 213</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> Sets the alarm threshold for the amount of time the AccuLoad will wait for flow to begin after opening the flow control valve. Once this alarm occurs, the flow control valve will be commanded closed. The alarm must be cleared prior to attempting to restart flow.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arms:Flow Control:Valve Delay to Open</th>
<th>Index: Arm</th>
<th>Range: 0 - 99 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 214</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> Sets the amount of time between asserting the pump control signal and opening the flow control valve. This can be used to allow the pump to pressurize the line, providing for better valve response.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arms:Flow Control:Pump Delay to Off</th>
<th>Index: Arm</th>
<th>Range: [0] - 99 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 215</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> Sets a time delay between flow stop and de-asserting the pump control signal. Upon a normal or operator-requested stop, the pump output will remain active for this delay before turning off. Alarm shutdown will not be delayed; the pump output will be turned off immediately.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arms:Flow Control:Valve Fault Timeout</th>
<th>Index: Arm</th>
<th>Range: [0] - 99 Seconds Disable: 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 216</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> Sets the alarm threshold for the amount of time that the AccuLoad will ignore flow after the valve has been commanded to close. If flow persists beyond this time, a &quot;Valve Fault&quot; alarm will occur.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Arms: Flow Control: Valve Fault Amount

| Index: Arm | Range: [0] - 99 Delivery units Disable: 0 |

**Description:** Sets the alarm threshold for the amount of flow that the AccuLoad will ignore after the valve has been commanded to close. If flow exceeds this amount, a “Valve Fault” alarm will occur.

### Arms: Flow Control: Clean Line Amount

| Index: Arm | Range: [0] - 999 Delivery units |

**Description:** Specifies the amount of clean line flush product to be delivered to fill the pipe/load arm at the end of every batch. This amount is determined by calculating the amount of product to fill the pipe/load arm from the control valve(s) to the end of the loading arm.

### Flow Control: Clean Line Product

| Index: Arm | Range: 1 - 6 Default: Product 1 |

**Description:** Selects the product that will be used as the clean line product. The clean line product will be delivered at the end of every batch whether the designated clean line product is part of the recipe being delivered or not. The purpose is to have the line packed with the clean line product at the end of a delivery.

**Critical:** Clean line product must be Product 1 when configured for side-stream blending.

### Flow Control: Clean Line Alarm Limit

| Index: Arm | Range: 0 - 99 Delivery units |

**Description:** Sets the alarm threshold for the number of delivery units that the clean line amount can fall short of the programmed amount before causing an alarm. For example, if the clean line amount is set for 100 gallons and the maximum clean line alarm limit is programmed for 5 gallons, the clean line amount can range between 95 gallons and 100 gallons without causing an alarm.

### Arms: Flow Control: Clean Line Blend Adjust

| Index: Arm | Range: |

**Description:** When a clean line product is used, it will be the first portion of the next delivery which can cause the blend to be out of tolerance initially. If this parameter is enabled, the control valve for the clean line product will not be opened at the start of the batch, to reduce the time to get the blend corrected.

**Selections:**
- No
- Yes

**Note:** Applies only to ratio blending arms.

### Arms: Flow Control: Ratio Factor Adjust

| Index: Arm | Range: 0.1 - 99.9 Default: 0.0 |

**Description:** Sets the ratio adjustment factor used to adjust the response of the blend valves to help maintain the programmed blend ratio during loading. This factor is used to magnify the difference between the programmed blend ratio and the current blend ratio so that the programmed blend ratio can be achieved more quickly.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 232</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the time in seconds between flow rate calculations based on programmed and current blend ratios. If this results in a desired flow rate outside the tolerance of the current flow rate, then the control valves will be adjusted. This value should be determined based on the hydraulic conditions that exist for the system.

<table>
<thead>
<tr>
<th>Arms:Flow Control: Block Valve Position</th>
<th>Index: Arm</th>
<th>Range: [0] - 3 Default: 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 233</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** For sequential blending arms this entry selects the position of the block valve at the end of a transaction and when the STOP button is pressed. The valve can either be left open (for relief of thermal expansion) or closed. This code applies only to electric motor-operated valves.

**Selections:**
- 0 - Valve is closed when STOP is pressed and at the end of the transaction
- 1 - Valve is open when STOP is pressed and closed at the end of the transaction
- 2 - Valve is closed when STOP is pressed and open at the end of the transaction
- 3 - Valve is open when STOP is pressed and open at the end of the transaction

**Note:** Applies to sequential blending only.

<table>
<thead>
<tr>
<th>Arms:Flow Control: Valve Close Delay</th>
<th>Index: Arm</th>
<th>Range: 0 - 999 Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 234</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** For unloading arms. This parameter determines the amount of time in seconds the valve will remain open after the stop switch input is de-asserted. This prevents the valve from closing during the period when the gear pump may be engaged.

<table>
<thead>
<tr>
<th>Arms:Flow Control: Additive Stop Amount</th>
<th>Index: Arm</th>
<th>Range: [0] - 9999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 241</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This program code allows an arm-specific additive stop quantity (in delivery units) to be specified. If a nonzero value is programmed both here and in System 805 – Additive Stop Amount, this value supersedes the system value.

**Help:** Enter load arm preset amount left to be delivered before injector shutdown (in preset type)

<table>
<thead>
<tr>
<th>Arm:Flow Control: Additive Low Flow Start</th>
<th>Index: Arm</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 242</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Description:** This program code determines when additive pacing begins.

**Selections:**
- **Batch Start** - Additive pacing begins immediately at the start of the batch
- **After Low Flow** - Additive pacing begins after Low Flow start volume has been delivered

This option allows for a delay between additive pump startup and first injection to assure sufficient pressure has been established in the additive system.

**Critical:** Low flow start condition must be “Batch Start.”

**Note:** Feature is not available for flow controlled additives.

---

### 8.4.3. 300 - Volume Accuracy Directory

<table>
<thead>
<tr>
<th>Arms: Volume Accuracy: Blend Tolerance (Percentage)</th>
<th>Index: Arm</th>
<th>Range: 0.0 % - 9.9 % [1.0]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 301</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the alarm threshold for blend error as a percentage of the total batch. If the delivered amount of each product is within plus or minus the blend percentage of the total delivery, no blend alarm will occur. For example, assume a blend tolerance of 2%, a preset of 1000 gallons, and a recipe consisting of four products with each making up 25% (250 gal) of the total. If 1000 gallons are delivered, the blend tolerance would be 20 gallons (2% of 1000 gallons). If any product delivered less than 230 gallons (250 – 20) a blend low alarm will be set. If any product delivered more than 270 gallons (250 + 20), a blend high alarm will be set. (This is true only if all 1000 gallons are delivered.)

**Note:** A blend tolerance entry of zero allows no tolerance, causing an alarm to occur unless all components are delivered exactly.

<table>
<thead>
<tr>
<th>Arms: Volume Accuracy: Blend Tolerance (Amount)</th>
<th>Index: Arm</th>
<th>Range: 0.1 - 99.9 delivery units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 302</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the alarm threshold for blend error as a fixed volume. This volume represents the maximum delivered volume of each product in the blend over or under the target volume that will be allowed by AccuLoad without causing an alarm. The range of this entry is 00.1 to 99.9 units.

**Note:** If both a blend tolerance volume and a blend tolerance percentage are entered, the AccuLoad will use the larger of the two for a specific batch. It is recommended that the volume tolerance be programmed here to override the percentage for very small batches to reduce nuisance alarms.

<table>
<thead>
<tr>
<th>Arms: Volume Accuracy: Blend Correction</th>
<th>Index: Arm</th>
<th>Range: Default: No Blend Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms 303</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Description:** Sets the type of Blend Correction on a sequential load arm, that will be allowed in case of a product overrun. Three possible selections are available.

**Selections:**
- **[No Blend Correction].** If a product overrun occurs during the loading process, which would cause a blend alarm, no correction will be allowed and the transaction must be ended.
- **Self-Corrected Blend.** If a product overrun occurs during the loading process, the AccuLoad will automatically try to correct the blend if the product in error is being loaded as another component of the blend (i.e., error in component 2 – Regular, Regular also being loaded as component 5). If the component in error is not repeated as one of the components that has not been loaded, the transaction will have to be ended.
- **Self-Corrected Blend/Complete Batch.** If a product overrun occurs during the loading process, the AccuLoad IV will automatically try to correct the blend if the product in error is being loaded as another component of the blend. If the component in error is not repeated as one of the components that has not been loaded, the driver/operator will have the choice of ending the batch or completing the loading of the original preset amount.

---

### Arms: Volume Accuracy: Blend Alarm Timeout

**Index:** Arm  
**Range:** 0 - 999 Seconds

**Description:** For "Unlimited Preset" arms and arms using the timed blend algorithm this sets the alarm threshold for the amount of time an "out of tolerance" blend condition can exist. The blend tolerance is determined by the values in both Load Arm 301 - Blend Tolerance Percentage and in Load Arm 302 - Blend Tolerance Amount. Both tolerance limits must be exceeded before the AccuLoad begins the out-of-tolerance condition timer.

**Note:** A zero value will result in an immediate alarm if the blend goes out of tolerance.

---

### Arms: Volume Accuracy: Blend Alarm Minimum Amount

**Index:** Arm  
**Range:** 0 - 9999 delivery units

**Description:** For unlimited preset arms and arms using the timed blend algorithm, this program code inhibits the blend tolerance alarm checking at batch start until this amount has been delivered. In unlimited preset arms, this volume or mass allows time for the blend stream to catch up with wild stream. For arms using the timed blend algorithm, this is used to suppress blend tolerance checking until after low flow start is completed if the blend makes impossible to maintain blend during low flow start.

---

### Arms: Volume Accuracy: Blend Correction Amount

**Index:** Arm  
**Range:** 0 - 999.99 delivery units

**Description:** Sets the deadband for the deviation from the target blend that is allowed before the AccuLoad attempts to adjust/correct the blend on an Unlimited Preset or timed blend algorithm arm (in order to prevent continuous valve adjustment). If this amount is exceeded, the AccuLoad will attempt to adjust the flow rate of the products such that the blend will be on spec within the time specified in Load Arm 307 - Blend Correction Time.

---

### Arms: Volume Accuracy: Blend Correction Time

**Index:** Arm  
**Range:** 1 - 999 seconds

**Description:** This program code determines how quickly the AccuLoad attempts to bring the blend percentage of an Unlimited Preset or timed blend algorithm arm back to ideal conditions once the deviation from the desired percentages exceeds the value in Load Arm 306 - Blend Correction Amount.
### Arms:Volume Accuracy:Blend Error Reset

**Arms 308**

**Description:** This program code determines at what points the accumulated blend errors are reset to 0 when an arm is configured for Unlimited Preset operation.

**Selections:**
- Batch Start
- Blend Alarm Cleared
- Batch Start and Alarm
- No Reset

### Arms:Volume Accuracy:Blend Algorithm

**Arms 309**

**Description:** This program code determines which algorithm will be used for ratio blend applications. The “Ratio Adj Factor” is the traditional ratio blend method and uses the ratio adjust factor to control how quickly the blend is corrected. The “Timed” blend algorithm will attempt to correct the blend within a programmable amount of time. The “Timed” blend algorithm is independent of batch size and therefore works best when batch sizes can vary significantly. The “Timed” blend algorithm will also make blend corrections during low flow start. This parameter can also be used for an unlimited preset arm.

### Arms:Volume Accuracy:Ratio Product Minimum Flow

**Arms 321**

**Description:**

**Selections:**
- Maintain min rate
- Allow valve to close

**Critical:** Option available with Timed Blend Algorithm only.

**Factory Default:** "Maintain min rate" (lowest flow rate allowed will be the programmed minimum flow rate – Product 201).

### Arms:Volume Accuracy:Minimum Valve Close Time

**Arms 322**

**Critical:** Option available only with "allow valve to close" option selected in Arm 321 - Ratio Product Minimum Flow.

**Note:** If zero is entered, then the valve will be allowed to open and close as often as necessary to maintain blend.

### 8.4.4. 700 - Communications Directory

### Arms:Communications:Report Selection

**Arms 701**
| **Description:** This program code defines which delivery report will be printed at the completion of a transaction.  
**Selections:**  
- Default  
- User Configured Report 1 and 2  
**Note:** Default Report – see appendix IV  
**Note:** The user-configured reports are designed on the AccuMate and downloaded to the AccuLoad.  
**Note:** Even if a user-configured report has been downloaded from the AccuMate to the AccuLoad, it will not be printed unless it is selected here. If a user-configured report is selected but none has been downloaded, no report will print.  
**Note:** The same report will be printed at each port if multiple ports are configured for printer options.  

| **Arms:Communications:Summary Report Print Time** | **Index:** Arm | **Range:** 0 - 999  
**Arms 702**  
**Description:** Sets the initial print time of the summary report. Enter the hours, minutes, and time type (AM, PM, or military) the summary report is to be printed. The summary report includes a line per batch for all transactions run during the time interval specified.  
**Fatal:** Invalid time entry  

| **Arms:Communications:Summary Report Interval** | **Index:** Arm | **Range:** 0 - 999 hours  
**Disable:** 0  
**Arms 703**  
**Description:** Sets the number of hours between printings of the summary report. Once the time of the report has been set using the Summary Report Print Time parameter, the report will automatically print each interval starting from that time.  

| **Arms:Communications:Report Totals Resolution** | **Index:** Arm | **Range:**  
**Arms 704**  
**Description:** This entry selects the volume resolution to print on default reports.  
**Selections:**  
- Whole units  
- Tenths  
- Hundredths  

| **Arms:Communications:Report Pages** | **Index:** Arm | **Range:** Default: Batch and Transaction Pages  
**Arms 705**  
**Description:** Selects which pages will be printed on reports. The default report for a straight product load arm consists of a single page report with both batch and transaction data on that page.  
**Selections:**  
- [Batch and transaction pages] – one page per batch plus a summary page for the transaction  
- Batch page only – one page per batch only; no transaction summary  
- Transaction page only – transaction summary only; no batch details  
- No transaction report – printer only used for summary reports
### Arms:Communications:Report HM Classification

<table>
<thead>
<tr>
<th>Index: Arm</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
</table>

**Description:** Selects which products' HM Classification message will be printed on the transaction summary page of the default transaction report.
- Product 1 - 6

### Arms:Communications:Arm Tag ID

<table>
<thead>
<tr>
<th>Index: Arm</th>
<th>Range: Text 8 characters max.</th>
</tr>
</thead>
</table>

**Description:** This parameter is used to enter a unique tag name for the load arm. Enter up to 8 characters of text.

---

**8.5. Meter Directories**

- 200 - Flow Control Directory
- 300 - Volume Accuracy Directory
- 400 - Temperature / Density Directory
- 500 - Pressure Directory

---

**8.5.1. 200 - Flow Control Directory**

<table>
<thead>
<tr>
<th>Index: Arm</th>
<th>Range: Text 20 characters max.</th>
</tr>
</thead>
</table>

**Description:** This parameter is used to enter a unique tag name for the meter.

---

<table>
<thead>
<tr>
<th>Index: Meter</th>
<th>Range: Default: Digital</th>
</tr>
</thead>
</table>

**Description:** This parameter selects the type of control valve used by AccuLoad IV.

**Selections:**
- [Digital]
- Two-Stage
- Analog
- Wild Stream

**Critical:** Two-stage valve not allowed with ratio blending
**Critical:** No analog valve output configured
**Critical:** Upstream/downstream solenoids required
<table>
<thead>
<tr>
<th>Arms:Meter:Flow Control:Analog Valve (Kp)</th>
<th>Index: Meter</th>
<th>Range: 0.000 - 999.999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 203</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This three-digit entry is the PID proportional gain factor for analog valve control. The range of this entry is from (used only with analog valves).

**Note:** This entry is used only with analog valves.

<table>
<thead>
<tr>
<th>Arms:Meter:Flow Control:Analog Valve Ki</th>
<th>Index: Meter</th>
<th>Range: 0.000 - 999.999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 204</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This three-digit entry is the PID integral gain factor for analog valve control.

**Note:** This entry is used only with analog valves.

<table>
<thead>
<tr>
<th>Arms:Meter:Flow Control:Analog Valve Kd</th>
<th>Index: Meter</th>
<th>Range: 0.000 - 999.999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 205</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This three-digit entry is the PID derivative gain factor for analog valve control. (It is used only with analog valves.)

**Note:** This entry is used only with analog valves.

<table>
<thead>
<tr>
<th>Arms:Meter:Flow Control:Analog Valve PID Interval</th>
<th>Index: Meter</th>
<th>Range: 0.0 - 99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 206</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the time interval in seconds between PID calculations.

**Note:** This entry is used only with analog valves.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 211</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** For ratio blending arms, sets the alarm threshold for the maximum time the AccuLoad will allow between commanding the flow control valve open and the start of flow. An entry of zero causes AccuLoad IV to disable the zero flow alarm.

**Note:** No entry if not a ratio blender. Use the arm zero flow timer for other arm types.

<table>
<thead>
<tr>
<th>Arms:Meter:Flow Control:Overrun Alarm Limit</th>
<th>Index: Meter</th>
<th>Range: [0] - 99 delivery units Disable: 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 212</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** For ratio blending arms, this sets the alarm threshold for the number of delivery units that may be delivered in excess of the target amount before an alarm occurs.

**Note:** This parameter only applies to ratio blender arms, for other arm types use the arm overrun alarm limit parameter.
<table>
<thead>
<tr>
<th>Arms:Meter:Flow Control:Flow Adjust Tolerance</th>
<th>Index: Meter</th>
<th>Range: 0 to 9.9%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 213</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Set the dead band tolerance used on ratio blending arms when making flow rate adjustments. This is intended as a tighter flow tolerance than in Product 204. This tolerance is only applied when the flow rate has been adjusted (from low flow to high flow, to improve the blend). The purpose of the tighter tolerance is to closely match the desired flow rate. Note that this tight tolerance is only in effect for the time specified in the following parameter. For a desired flow rate Q, the tolerance band is defined as Q +/- (Q * t) where t is the percentage entered for this tolerance.

**Note:** Applies only to ratio blender arms.

<table>
<thead>
<tr>
<th>Arms:Meter:Flow Control:Flow Adjust Timer</th>
<th>Index: Meter</th>
<th>Range: 0.0 - 99.9 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 214</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the time in seconds for the flow rate adjustment tolerance to be in effect.

**Note:** Applies only to ratio blending arms.

<table>
<thead>
<tr>
<th>Arms:Meter:Flow Control:Meter Plumbing</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 215</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry defines the plumbing of a minor product meter for a hybrid blending arm.

**Selections:**
- Ratio (downstream of the main product meter)
- Side Stream (upstream of the main product meter)

If the ratio product is plumbed side stream it can share the same temperature probe and densitometer as the sequential product if desired.

This entry is used for hybrid blending arms only; it is not used for any other arm types.

<table>
<thead>
<tr>
<th>Arms:Meter:Flow Control:Ramp Down Tolerance (Q1)</th>
<th>Index: Meter</th>
<th>Range: [0] - 99% Disable: 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 216</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the alarm threshold for flow rate error during the first stage of the end-of-batch ramp down and is used to predict a valve fault condition as the batch ends. If during the first stage of the end-of-batch ramp down, the flow rate is not decreasing within the percentage entered for this parameter, a "PO: Predict Overrun" alarm will occur which will stop the batch and turn the pump off. Note this tolerance should be greater than the programmed product flow tolerance % (Product 204) and needs to be large enough to allow for normal flow rate fluctuations during ramp down otherwise false alarms may occur.

<table>
<thead>
<tr>
<th>Arms:Meter:Flow Control:Ramp Down Tolerance (Q2)</th>
<th>Index: Meter</th>
<th>Range: [0] - 99% Disable: 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 217</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the alarm threshold for flow rate error during the second stage of the end-of-batch ramp down and is used to predict a valve fault condition as the batch ends. If during the second stage of the end-of-batch ramp down, the flow rate is not decreasing within the percentage entered for this parameter, a "PO: Predict Overrun" alarm will occur which will stop the batch and turn the pump off. Note this tolerance should be greater than the programmed product flow tolerance % (Product 204) and needs to be large enough to allow for normal flow rate fluctuations during ramp down otherwise false alarms may occur.
## 8.5.2. 300 - Volume Accuracy Directory

<table>
<thead>
<tr>
<th><strong>Arms:Meter:Volume Accuracy:</strong></th>
<th><strong>Index:</strong></th>
<th><strong>Range:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>K-Factor</strong></td>
<td>Meter</td>
<td>0.001 to 99999.999</td>
</tr>
</tbody>
</table>

**Description:** Sets the nominal number of pulses representing one unit of volume registration.

**Critical:** Security level for parameter must be at top 2 levels.

**Fatal:** Entry must not be zero.

<table>
<thead>
<tr>
<th><strong>Arms:Meter:Volume Accuracy:</strong></th>
<th><strong>Index:</strong></th>
<th><strong>Range:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dual Pulse Error Count</strong></td>
<td>Meter</td>
<td>[0] - 999</td>
</tr>
</tbody>
</table>

**Description:** Sets the alarm threshold for dual pulse errors before posting a pulse security alarm.

**Note:** Requires dual channel pulse meter input.

<table>
<thead>
<tr>
<th><strong>Arms:Meter:Volume Accuracy:</strong></th>
<th><strong>Index:</strong></th>
<th><strong>Range:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dual Pulse Error Reset</strong></td>
<td>Meter</td>
<td>Default: No Reset</td>
</tr>
</tbody>
</table>

**Description:** Sets the conditions which reset the dual pulse error count.

**Selections:**
- No Reset
- Transaction End
- Power-Up
- Transaction and Power-Up

**Note:** Clearing a pulse security alarm does not reset the error count.

<table>
<thead>
<tr>
<th><strong>Arms:Meter:Volume Accuracy:</strong></th>
<th><strong>Index:</strong></th>
<th><strong>Range:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dual Pulse Flow Rate Cutoff</strong></td>
<td>Meter</td>
<td>[0] - 9999</td>
</tr>
</tbody>
</table>

**Description:** Sets the flow rate below which dual pulse errors are not counted.

**Note:** Requires dual channel pulse meter input.

<table>
<thead>
<tr>
<th><strong>Arms:Meter:Volume Accuracy:</strong></th>
<th><strong>Index:</strong></th>
<th><strong>Range:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pulse Security Alarm Amount</strong></td>
<td>Meter</td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This program code determines whether pulses received after a Pulse Security Alarm occurs are ignored (no volume or mass is registered). Select "no" to continue to totalize normally after this alarm occurs. Select "yes" to ignore all pulses after an alarm occurs. Selecting "yes" will cause any volume or mass that actually flows through the meter from the point where this alarm occurs to when the valve is completely closed to be ignored. The AccuLoad will ignore any pulses from the meter until the alarm is cleared. Some measurement agencies require this behavior, taking the position that after a pulse security alarm, the consumer cannot be responsible for any measured quantity because it may not be reliable.
### 8.5.3. 400 - Temperature/Density Directory

<table>
<thead>
<tr>
<th>Arms:Meter:Volume Accuracy: Pulse Period Sample Count</th>
<th>Index: Meter</th>
<th>Range: [0] - 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 306</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the amount of time in 0.1 second increments over which the frequency of the meter pulses is averaged to provide flow rate smoothing. This parameter is intended for meters that produce a varying frequency pulse output when the flow is steady.

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density: Freq Densitometer Type</th>
<th>Index: Meter</th>
<th>Range: Default: N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 402</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter allows the operator to select the frequency densitometer used by the meter. The factory default is "N/A."

**Selections:**
- NA
- Linear
- Solartron
- Sarasota
- UGC
- Other

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density: Share Temperature Input</th>
<th>Index: Meter</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 403</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Selects a temperature input defined for another meter to be used with this meter. For example, a single temperature probe may be used to supply temperature for several arms without having to use multiple analog inputs.

**Selections:**
- Not Used
- Arm 1 - 6, Meter 1 - 6
- Flow Rate Injector 1 - 4

**Critical:** Selected meter has no I/O point configured for temperature.

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density: Share Density Input</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 404</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Selects a density input defined for another meter to be used with this meter. For example, a single density probe may be used to supply density for several arms without having to use multiple analog inputs.

**Selections:**
- Not Used
- Arm 1 - 6 Meter 1 - 6
- Flow Rate Injector 1 - 4

**Critical:** Selected meter has no I/O point configured for density.
<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density:</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass Meter Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter 405</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This parameter allows the operator to select the type of mass meter used.

**Selections:**
- NA
- Promass

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density:</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass Meter Address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter 406</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the address used for serial communications with this mass meter.

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density:</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear Densitometer A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter 425</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the value for the A coefficient used in the equation to calculate the density. - Density = A*freq + B

**Note:** Scientific notation is used for this value.

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density:</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear Densitometer B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter 426</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the value for the B coefficient used in the equation to calculate the density. - Density = A*freq + B

**Note:** Scientific notation is used for this value.

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density:</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear Densitometer DCF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter 427</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** The Density Correction Factor is used to correct the density reading from a densitometer. The density received by the AccuLoad is multiplied by the DCF before it is used for volume calculations.
### 8.5.4. 400 - Solatron Densitometer

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density:</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solartron Calibration Cert Units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter 431</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry allows the user to select the calibration units used for the Solatron Densitometer.

**Selections:**
- English (Fahrenheit, PSI, Lb/Ft³)
- Metric (Celsius, Bar, Kg/m³)

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density:</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solartron DCF</td>
<td></td>
<td>-9.9999 - 9.9999</td>
</tr>
<tr>
<td>Meter 432</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry allows the operator to enter the density correction factor for computing the calculated density from the actual density.

**Selections:**
- English (Fahrenheit, PSI, Lb/Ft³)
- Metric (Celsius, Bar, Kg/m³)

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density:</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solartron K0, K1, K2</td>
<td></td>
<td>-1e+37 and 1e+38</td>
</tr>
<tr>
<td>Meter 433, 434, 435</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry allows the operator to enter the Constant K0, K1, K2 from the Solatron densitometer. Enter the base number (six digits) and two digits for the exponent. This exponential numeric entry has a range of −1e37 to 1e38.

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density:</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solartron K18, K19, K20a, K20b, K21a, K21b</td>
<td></td>
<td>-1e+37 and 1e+38</td>
</tr>
<tr>
<td>Meter 436, 437, 438, 439, 440</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry allows the operator to enter the Constant K18, K19, K20a, K20b, K21a, K21b from the Solatron densitometer. Enter the base number (six digits) and two digits for the exponent. This exponential numeric entry has a range of −1e37 to 1e38.

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density:</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solartron Tcal</td>
<td></td>
<td>9999.9999 - 9999.9999</td>
</tr>
<tr>
<td>Meter 442</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry allows the operator to enter the temperature that the densitometer was calibrated at the factory. The range of this entry is −9999.999 to 9999.999 (limit of three decimal points).
### 8.5.5. 400 - Sarasota Densitometer

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density: Sarasota Calibration Units</th>
<th>Index: Meter</th>
<th>Range: Default: English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 447</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry allows the user to select the calibration units used for the Sarasota Densitometer. The factory default is "English."

**Selections:**
- English (Fahrenheit, PSI, Lb/Ft³)
- Metric (Celsius, Bar, Kg/m³)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 448</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry allows the operator to enter the density correction factor for computing the calculated density from the actual density. The range of six-digit numeric entry is -9.9999 to 9.9999.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 449</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry allows the operator to enter the calibration constant for the spool on the Sarasota densitometer. The range of this exponential numeric entry is from -9.999999 to 9.999999.

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density: Sarasota D0</th>
<th>Index: Meter</th>
<th>Range: -9999.999 - 9999.99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 450</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry allows the operator to enter the constant D0 from the Sarasota densitometer. The range of this eight-digit numeric entry is -9999.999 to 9999.999.

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density: Sarasota T0</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter 451</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** This entry allows the operator to enter the T0 constant from the Sarasota densitometer. This constant is in microseconds. The range of this eight-digit numeric entry is -9999.999 to 9999.999.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarasota Tcoef</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter 452</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description: This entry is used for entering the temperature coefficient constant from the Sarasota densitometer in microseconds/degree F. The range of this exponential numeric entry is –9.999999 to 9.999999.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density: Sarasota Tcal</th>
<th>Index: Meter</th>
<th>Range: -9999.999 - 9999.999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarasota Tcal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter 453</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description: This entry allows the operator to enter the temperature that the densitometer was calibrated at the factory. The range of this eight-digit numeric entry is –9999.999 to 9999.999.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarasota Pcoef</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter 454</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description: This entry is used for entering the pressure coefficient constant from the Sarasota densitometer in microseconds/PSIG. The range of this exponential numeric entry is –9.999999 to 9.999999.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density: Sarasota Pcal</th>
<th>Index: Meter</th>
<th>Range: -9999.999 - 9999.999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarasota Pcal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter 455</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description: This entry allows the operator to enter the pressure that the densitometer was calibrated at the factory. The range of this eight-digit numeric entry is –9.999999 to 9.999999.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 8.5.6. 400 - UGC Densitometer

<table>
<thead>
<tr>
<th>Arms:Meter:Temperature/Density: UGC Calibration Cert Units</th>
<th>Index: Meter</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>UGC Calibration Cert Units</td>
<td></td>
<td>Default: English</td>
</tr>
<tr>
<td>Meter 459</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description: This entry allows the user to select the calibration units used for the UGC Densitometer.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Selections:**
- [English] (Fahrenheit, PSI, gr/cc)
- Metric (Celsius, Bar, gr/cc)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UGC DCF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meter 460</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description: This entry allows the operator to enter the density correction factor for computing the calculated density from the actual density.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Arms::Meter::Temperature/Density:

**UGC K0, K1, K2, Kt1, Kt2, Kt3**

| Index: Meter | Range: $-1e+37$ and $1e+38$ |

**Description:** This entry allows the operator to enter the Constant K0, K1, K2, Kt1, Kt2, Kt3 from the UGC densitometer. Enter the base number (six digits) and then two digits for the exponent. The range of this exponential entry is $-1e37$ to $1e38$.

**Arms::Meter::Temperature/Density:**

**UGC Tc**

| Index: Meter | Range: -999.9999 - 999.9999 |

**Description:** This entry allows the operator to enter the temperature that the densitometer was calibrated at the factory. The range of this eight-digit numeric entry is $-999.9999$ to $999.9999$.

**Arms::Meter::Temperature/Density:**

**UGC Pc**

| Index: Meter | Range: -999.9999 - 999.9999 |

**Description:** This entry allows the operator to enter the temperature that the densitometer was calibrated at the factory. The range of this eight-digit numeric entry is $-999.9999$ to $999.9999$.

**Arms::Meter::Temperature/Density:**

**UGC Kp1**

| Index: Meter | Range: $-1e+37$ and $1e+38$ |

**Description:** This entry allows the operator to enter the Pressure Constant Kp1 from the UGC densitometer. Enter the base number (six digits) and then two digits for the exponent. The range of this exponential numeric entry is $-1e37$ to $1e38$.

**Arms::Meter::Temperature/Density:**

**UGC Kp2, Kp3**

| Index: Meter | Range: $-1e+37$ and $1e+38$ |

**Description:** This entry allows the operator to enter the Constant Kp2, Kp3 from the UGC densitometer. Enter the base number (six digits) and then two digits for the exponent. The range of this exponential numeric entry is $-1e37$ to $1e38$.

---

#### 8.5.7. 400 - Other Densitometer

**Arms::Meter::Temperature/Density:**

**Other Densitometer Calibration Units**

| Index: Meter | Range: Default: English |

**Description:** This entry allows the user to select the calibration units used for the Solartron Densitometer. The factory default is "English."

**Selections:**
- [English] (Fahrenheit, PSI, Lb/Ft3)
- Metric (Celsius, Bar, Kg/m³)
Description: This entry allows the operator to enter the density correction factor for computing the calculated density from the actual density. The range of this six-digit numeric entry is \(-9.9999 \text{ to } 9.9999\).

Description: This code allows the operator to enter the constant "a" or "b" by which the density will be calculated according to the following formula:

\[
\text{Density} = aT^2 + bT + c
\]

Where: \( T \) is the period of the incoming signal and \( a, b, \) and \( c \) are the programmed constants.

Nine digits must be entered for constant \( a \). The first seven digits represent the base number and the last two numbers represent the exponent. The +/- button may be used to set the sign of the base and the exponent field. The range of this exponential numeric entry is...

---

8.5.8. 500 - Pressure Directory

Description: Selects a pressure input defined for another meter to be used with this meter. For example, a single pressure probe may be used to supply pressure for several arms without having to use multiple analog inputs.

Selections:
* Not Used
* Arm 1 - 6, Meter 1 - 6

Critical: Selected meter has no I/O point configured for pressure.
8.6. **Product Directories**

General Purpose Directory  
Flow Control Directory  
Volume Accuracy Directory  
Temperature / Density Directory  
Pressure Directory

8.6.1. **100 - Arm: Products: General Purpose Directory**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 101</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Enter a name for this product.

<table>
<thead>
<tr>
<th>Arms:Product:General Purpose: HM Classification Part 1 and Part 2</th>
<th>Index: Product</th>
<th>Range: Text - 30 characters each</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 102, 103</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Enter the Hazardous Materials (HM) Classification text printed on the BOL.

8.6.2. **200 - Arm: Products: Flow Control Directory**

<table>
<thead>
<tr>
<th>Arms:Products:FlowControl: Minimum Flow Rate</th>
<th>Index: Product</th>
<th>Range: [0] - 9999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 201</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the lowest (final stage) flow rate for the product. This will be the flow rate when the valve is signaled to close at the completion of a preset.

<table>
<thead>
<tr>
<th>Arms:Products:FlowControl: High Flow Rate</th>
<th>Index: Product</th>
<th>Range: [0] - 99999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 202</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets the maximum flow rate for this product during loading.

| Arms:Products:FlowControl:Second High Flow Rate | Index: Product | Range: [0] - 99999  
Disables: 0 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 203</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Sets a second high flow rate that is selectable by a digital input. This flow rate would normally be used in situations where the size of the deliveries varies and a lower high flow rate is needed for the smaller batches.  
**Note:** Not used with a two-stage flow control valve.
### Arms:Products:Flow Control:Flow Tolerance Percentage

**Product 204**  
**Index:** Product  
**Range:** 0 - 9%

**Description:** Sets the threshold for making a valve adjustment as a percentage of the requested flow rate.

**Example:**
Current Flow Rate 600 GPM Flow Tolerance 9%
Flow rate can vary by ± 54 GPM (600 GPM x 9% = 54 GPM) without a valve correction signal from the AccuLoad.

The AccuLoad will calculate the current flow deviation as a percentage of the target flow rate. This will be compared with the programmed flow tolerance rate (below), with the larger of the two tolerances determining when to adjust the valve.

### Arms:Products:Flow Control:Flow Tolerance Rate

**Product 205**  
**Index:** Product  
**Range:** 0 - 999 flow rate units

**Description:** Sets the threshold for making a valve adjustment as a number of flow rate units. For example, if this parameter is set to 20, the AccuLoad will adjust the flow control valve anytime the actual flow rate varies more than 20 flow rate units from the target flow rate.

The AccuLoad will calculate the current flow tolerance using the percentage entered in Product 204 and the current flow rate. This will be compared with the programmed flow tolerance rate entered here. The larger of the two tolerances will determine when to adjust the valve.

### Arms:Products:Flow Control:First Trip Amount

**Product 206**  
**Index:** Product  
**Range:** [0] - 9999 delivery units

**Description:** Sets remaining amount of delivery when the flow rate ramp-down should begin.

### Arms:Products:Flow Control:Second Trip Amount

**Product 207**  
**Index:** Product  
**Range:** [0.0] - 99.9 delivery units

**Description:** Sets the remaining amount (in tenths) of delivery when the flow rate ramp-down ends and the valve is completely closed. 0.0 to 99.9 units.

### Arms:Products:Flow Control:Second Trip Auto Adjust

**Product 208**  
**Index:** Product  
**Range:** 1 - 9

**Description:** This one-digit numeric entry defines the number of batches to be included in the average used to calculate the second adjustment. For a preset, this is the number of batches run.

This parameter provides the operator an automatic method of adjusting the final trip point of the valve. The use of this parameter is ideal when starting up the system or when system hydraulics are changed during maintenance. The AccuLoad will automatically set up the second trip amount (Product 207) when this parameter is used.

If for some reason the system parameters change and the second trip amount needs adjusted, the operator must get into the Program Mode and reset the auto adjust to again automatically adjust the final stage trip point.

**Note:** The batch volumes must be sufficient to allow the AccuLoad to reach high flow before the first trip point is encountered.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> Sets the alarm threshold for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the maximum percentage by which the flow rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>can exceed the product's high flow rate. This</td>
<td></td>
<td></td>
</tr>
<tr>
<td>entry must be greater than the Flow Tolerance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>entry, except when a value of zero is entered</td>
<td></td>
<td></td>
</tr>
<tr>
<td>to disable excess high flow alarm checking.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The excess rate is entered as a percentage of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the product high flow rate.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arms:Products:Flow Control:Low Flow Rate Alarm Limit</th>
<th>Index: Product</th>
<th>Range: [0] - 999</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product 210</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> Sets the alarm threshold for the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>low flow rate alarm which will be posted whenever a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>flow rate is equal to or lower than the limit set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and is maintained for eight seconds. The low flow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>alarm is not triggered in cases where there is no</td>
<td></td>
<td></td>
</tr>
<tr>
<td>flow.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arms:Products:Flow Control:Block Valve Delay to Open</th>
<th>Index: Product</th>
<th>Range: 0 - 99 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product 211</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> Sets a time delay (in seconds) for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the opening of the product block valve prior to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>delivery of the product. If an input is programmed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for block valve feedback and the feedback does not</td>
<td></td>
<td></td>
</tr>
<tr>
<td>indicate the valve is open within the programmed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>delay, a block valve alarm will be triggered. The</td>
<td></td>
<td></td>
</tr>
<tr>
<td>range of this two-digit numeric entry is 01 to 99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>seconds. For example, if the Block Valve Delay to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open entry is set to 05 seconds, the AccuLoad would</td>
<td></td>
<td></td>
</tr>
<tr>
<td>allow 5 seconds for the block valve to open or else</td>
<td></td>
<td></td>
</tr>
<tr>
<td>an alarm would be triggered if the valve had not</td>
<td></td>
<td></td>
</tr>
<tr>
<td>been opened. If no block valve feedback input has</td>
<td></td>
<td></td>
</tr>
<tr>
<td>been configured, the AccuLoad assumes that the valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>has opened after the programmed delay.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Zero not allowed without block valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>feedback.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> Applies only to sequential blender arms.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arms:Products:Flow Control:Block Valve Delay to Close</th>
<th>Index: Product</th>
<th>Range: 0 - 99 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product 212</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> Sets a time delay (in seconds) for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the closing of the product block valve after the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>product has been delivered. If an input is configured</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for block valve feedback and the feedback does not</td>
<td></td>
<td></td>
</tr>
<tr>
<td>indicate that the valve has closed within the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>programmed delay, a block valve alarm will be</td>
<td></td>
<td></td>
</tr>
<tr>
<td>triggered. The range of this two-digit numeric entry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>is 01 to 99 seconds. For example, if the block valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>delay entry were set to 05 seconds once the delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>was completed, the AccuLoad would allow 5 seconds for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the block valve to close, and then an alarm would be</td>
<td></td>
<td></td>
</tr>
<tr>
<td>triggered. If no input is configured for block valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>feedback, the AccuLoad assumes that the valve has</td>
<td></td>
<td></td>
</tr>
<tr>
<td>closed after the programmed delay.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Zero not allowed without block valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>feedback.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> Applies only to sequential blender arms.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Arms:Products:Flow Control:Product Stop Amount**

**Product 213**

**Index:** Product  
**Range:** 0-999 delivery units

**Description:** Sets the shut down point of the ratio product. When the remaining batch amount (preset type) is equal to or less than this programmed value the ratio product valve will shut down. The flow rates for the ratio product with an early shutdown will be set up such that its requirement towards the batch will be satisfied before the stop volume is met. This feature can be used in lieu of specifying a clean line product and clean line volume in the arm directory. Operation of this parameter is identical to the additive stop amount, except that the stop amount pertains to a product and not an additive.

**Note:** Using this feature will likely result in a period during the batch where the component percentages do not remain at the desired blend ratio. Assuming the batch completes normally, the blend percentages will be accurate.

**Note:** If the clean line volume as specified in the arm flow control directory (Code 221) is greater than the value programmed here then the ratio product will complete its delivery prior to the beginning of the clean line delivery. The clean line amount in the arm control directory (Code 221) will take precedence over this parameter if its value is greater than the value programmed here.

**Note:** Applies only to ratio products on hybrid arms.

**Arms:Products:Flow Control:Product Stop Alarm**

**Product 214**

**Index:** Product  
**Range:** 0 - 999.9  
**Disable:** 0

**Description:** Sets the amount of under-run allowed for the product stop programmed in Product 213 - Product Stop Amount before an alarm occurs.

**Note:** Due to the conflicting goals of maintaining the correct product percentage ratios throughout the batch while accommodating a product stop amount, it may be desirable to program this amount to a larger value to avoid spurious alarms. The AccuLoad will favor an accurate final blend percentage and preset over a precise stop amount.

**Note:** Applies only to ratio products on hybrid arms.

### 8.6.3. 300 - Accuracy Directory

**Arms:Products:Volume Accuracy: Minimum Batch Amount**

**Product 301**

**Index:** Product  
**Range:** 1 to 99999 delivery units

**Description:** Sets a minimum batch size for this product. This value is used to calculate the minimum preset for the recipe. An error message, "The minimum preset for this recipe is *.*" will be displayed. Any attempt to start a batch with a product volume less than the minimum batch size for that product will not be allowed.

**Note:** * indicates the summation of all the minimum batches of the components of the recipe according to the percentages programmed for that recipe.

**Note:** Not applicable to straight arms.
<table>
<thead>
<tr>
<th>Arms:Products:Volume Accuracy: Meter Factor 1 through 5</th>
<th>Index: Product</th>
<th>Range: 0 - 9.99999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 311, 313, 315, 317, 319</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> The meter factors (1 - 5) and the associated flow rates below allow the entry of the meter factor curve. The AccuLoad will perform linearization to calculate meter factors between the entered flow rates.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GV =</strong> Meter factor * IV</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> If only a single meter factor is used, it must be put into program code 311. The flow rate selected in program code 312 or 314 must be set to &quot;0&quot;. Under these conditions any other meter factors programmed will be ignored. The range of these six-digit numeric entries is 0 to 9.99999.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Note:</strong> A zero entry in meter factor 1 will be considered an invalid entry. Zero entries in the remaining factors will result in that factor and subsequent factors not being used. (e.g., if a zero entry is made for factor 2, factors 3 and 4 will not be used.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fatal:</strong> Entry must not be zero [311 only]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Factor varies more than the Linearized Factor Deviation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Meter factors must be within 2% of the master meter factor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Security level for parameter must be at top 2 levels.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arms:Products:Volume Accuracy: Flow Rate 1 through 5</th>
<th>Index: Product</th>
<th>Range: 0 - 99999 flow rate units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 312, 314, 316, 318, 320</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Description:</strong> These five-digit entries are the flow rates at which the meter factors (codes 311, 313, 315, 317, 319) are defined beginning with the highest flow rate in program code 303 and descending to the lowest flow rate in program code 316. If only one meter factor is used, program code 311 or 313 must be set at &quot;0&quot;. The range of these entries is 0 to 99999 flow units.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Flow rates must be entered in descending order.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Corresponding meter factor not programmed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Security level for parameter must be at top 2 levels.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 331</td>
<td></td>
<td>Disable: 0</td>
</tr>
<tr>
<td><strong>Description:</strong> This program code allows the operator to set a master meter factor which restricts meter factors one through four (codes 302, 304, 306 and 308), to plus or minus 2% of the master factor (i.e., the value entered here). This range restriction applies only to meter factors which are programmed for use (i.e., meter factor one always and, if linearizing, all the factors used). Any attempt to enter a meter factor outside the 2% range, if installed, will cause a Critical Warning. In addition, a master factor entry that causes the current meter factors installed to be out of range will cause those meter factors which are out of range to prompt a Critical Message. This critical condition must be corrected so that all used meter factors are within the 2% range of the master factor before normal Run Mode operations can occur.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Meter factor must be within 2% of the master meter factor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical:</strong> Security level for parameter must be at top 2 levels.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Linearized Factor Deviation

**Product 332**

**Description:** Sets a maximum allowable deviation between adjacent meter factors. Any attempt to enter a meter factor outside this range will cause a Critical Warning.

A linearized factor deviation entry that results in the current meter factors installed to be out of range will set a program code alarm. The meter factors that are out of range will be indicated by a DA alarm. The meter factors at fault must be corrected so they are within range of the deviation entry before normal Run Mode operations can occur.

**Critical:** Meter factor varies more than the Linearized Factor Deviation.

**Critical:** Security level for parameter must be at top 2 levels.

### Meter Factor Variation Select

**Product 333**

**Description:** Enables or disables meter factor variation based on the temperature of the product. The factory default is "Disabled."

**Selections:**
- [Disabled]
- [Enabled]

**Note:** The magnitude of the variation is determined by the meter factor percent change per degree temperature parameter below.

**Critical:** Security level for parameter must be at top 2 levels.

### Meter Factor Percent Change Per Degree Temperature

**Product 334**

**Description:** The amount in percentage that the meter factor varies for each degree change in temperature.

**Note:** Has no effect if Program Code 333 is disabled or temperature units are not assigned.

**Critical:** Security level for parameter must be at top 2 levels.

### Meter Factor Variation Reference Temperature

**Product 335**

**Description:** Sets the meter factor variation reference temperature. This entry represents the temperature, in tenths, at which the present meter factor was determined.

**Note:** Not applicable if Program Code 333 is disabled or temperature units are not assigned.

**Critical:** Security level for parameter must be at top 2 levels.
### 8.6.4.  400 - Temperature/Density Directory

| Product 401 | Index: Product | Range: \(-999.99\) - \(+999.99\) degrees
| Disable: 999.99 |
|-------------|----------------|-----------------------------------------------|
| **Arms:** Products: Temperature/Density: High Temperature Alarm Limit |
| **Description:** Sets the alarm threshold for a high temperature alarm to be posted. |
| **Note:** An entry of "+999" will disable the alarm. |

| Product 402 | Index: Product | Range: \(-999.99\) - \(+999.99\) degrees
| Disable: -999.99 |
|-------------|----------------|-----------------------------------------------|
| **Arms:** Products: Temperature/Density: Low Temperature Alarm Limit |
| **Description:** Sets the alarm threshold for a low temperature alarm to be posted. |

| Product 403 | Index: Product | Range: \(-999.9\) to \(+999.9\) degrees
<p>| Disable: -999.9 |
|-------------|----------------|-----------------------------------------------|
| <strong>Arms:</strong> Products: Temperature/Density: Maintenance Temperature |
| <strong>Description:</strong> Maintenance temperature is used when a temperature probe is not installed or working, but temperature related calculations are desired. |
| <strong>Note:</strong> An entry greater than -999.9 will override the temperature probe or transducer input if installed and will be used in all calculations where temperature is used. Note that this may not be allowed in all weights &amp; measures jurisdictions.. |
| <strong>Note:</strong> Not applicable if Temperature Units = Not Used |</p>
<table>
<thead>
<tr>
<th>Description</th>
<th>Product 411</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> This program code selects the temperature correction method used for the product being delivered.</td>
<td></td>
</tr>
<tr>
<td><strong>Selections:</strong></td>
<td></td>
</tr>
<tr>
<td>• None</td>
<td></td>
</tr>
<tr>
<td>• API 2004 crude oils</td>
<td></td>
</tr>
<tr>
<td>• API 2004 refined products</td>
<td></td>
</tr>
<tr>
<td>• API 2004 C Tables Special</td>
<td></td>
</tr>
<tr>
<td>• API 2004 Lube Oils</td>
<td></td>
</tr>
<tr>
<td>• API E Tables - LPG, NGL</td>
<td></td>
</tr>
<tr>
<td>• API 1952 (6,23,24,53,54)</td>
<td></td>
</tr>
<tr>
<td>• PTB-1 ethanol/bio blend</td>
<td></td>
</tr>
<tr>
<td>• PTB-3 ethanol/bio blend</td>
<td></td>
</tr>
<tr>
<td>• EPA-RFS2 (E100) - ethanol</td>
<td></td>
</tr>
<tr>
<td>• EPA-RFS2 (B100) - biodiesel</td>
<td></td>
</tr>
<tr>
<td>• Aromatics (ASTM D1555)</td>
<td></td>
</tr>
<tr>
<td>• Brazil ABNT5992 (Refden)</td>
<td></td>
</tr>
<tr>
<td>• Brazil ABNT5992 (RefGrade)</td>
<td></td>
</tr>
<tr>
<td>• Brazil ABNT5992 (LiveDen)</td>
<td></td>
</tr>
<tr>
<td>• Brazil BR1A</td>
<td></td>
</tr>
<tr>
<td>• Brazil BR1P</td>
<td></td>
</tr>
<tr>
<td>• Brazil BR2P</td>
<td></td>
</tr>
<tr>
<td>• NH3 - Ammonia</td>
<td></td>
</tr>
</tbody>
</table>

The old tables (API 1952) allow for non-60F/15C reference temperatures. In addition, the reference density may be at a different temperature from the reference temperature. For example, the reference temperature may be 30C and the reference density's temperature may be 15C. Product parameter #414 may be used to enter the reference density's temperature. The API 1952 tables may be used for Asphalt temperature compensation. Old Tables 6, 24 and 54 may be used in place of ASTM D4311 (Asphalt temperature compensation). ASTM D4311 uses a reference density of 1028.1 kg/m3 or 920.9 kg/m3.

**Critical:** API table conflicts with temperature units

**Critical:** No density input configured [odd tables only]

**Critical:** Live density is not available with PTB Ethanol blend calculation.

(PTB) available with 11.06 and higher. Table Aromatic available with 11.08 and higher.

**Note:** Eth and B100 (EPA-RFS2) equations for “Standardization of Volumes for renewable fuels per EPA 40 CFR Part 80 regulation of Fuels and Fuel additives”. A Reference Density entry is not required when using these equations; EPA –RFS2 uses a C of E of 0.000630 for ethanol and 0.000458 for B100 in these equations that can be entered for Reference Density entry if volume to mass conversion is required.
### Product 412

**Description:** This entry specifies the reference density of the product (density at standard temperature/pressure) when not using a densitometer.

Entry range based on table selection.

- **Table 6:** 999.9 to +999.9 API
- **Table 24:** 0 to 9.9999 Relative Density
- **Table 54, 60:** 0 to 9999.9 Reference Density
- **Eth/Gas (PTB):** 0 to 9999.9 kg/m$^3$

**Note:** If the API table selection is changed, the previous five-digit entry for reference will not be converted. This value must be re-entered.

**Note:** The valid range for the E tables is 0.3500 to 0.6880 relative density @ 60°F or 351.7 to 687.8 kg/m$^3$ @ 15°C or 331.7 to 683.6 kg/m$^3$ @ 20°C per GPA TP-27 and API 11.2.4.

The following are examples of the display when Tables 24, 54 or 6C and 54C are selected.

- Table 6B selected: +43.2 API
- Table 24 selected: 0.8175 Rel Density
- Table 54 selected: 1150.2 Kg/M3

**Critical:** Reference density is required for ethanol blends.

**Note:** For Eth/Gas (PTB) tables enter density @ 15°C in units of kg/m$^3$, regardless of what the reference temperature (System 402) is programmed for.

**Fatal:** Entry is out of specified range.

### Product 413

**Description:** This entry allows the user to specify the units associated with the value entered in Product 413 – Reference Density

**Selections:**
- NA
- °API
- lb/ft$^3$
- kg/m$^3$
- Relative Density
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 414</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: In some applications, the temperature used to obtain the reference density may not always be the same as the base temperature used for volume correction. The AccuLoad will allow entering a separate reference temperature for the reference density. Volumes will continue to be corrected to the programmed reference temperature in System Directory 402. This feature will only be available with the API 2004 tables (i.e. 6A\B\D, 24A\B\D, 54A\B\D, 60A\B\D), old tables and aromatics. For example, this parameter will allow entering a reference density measured at 15°C and correcting volumes to 30°C or enter a reference density measured at 60°F and correct volumes to 86°F.

Critical: Reference density must be 15°C or 59°F for PTB ethanol blends.

<table>
<thead>
<tr>
<th>Arms:Products:Temperature/Density:Coefficient of Expansion</th>
<th>Index: Product</th>
<th>Range: 0 - 999.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 415</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: This entry, in units of percent per degree of temperature, specifies the amount of expansion as a percentage for the product when using a ‘C’ type table. For example, a Coefficient of Expansion with a value of 0.0010720 would be entered as a percentage value of 0.107200.

<table>
<thead>
<tr>
<th>Arms:Products:Temperature/Density:Densitometer Type</th>
<th>Index: Product</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 416</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: This entry specifies whether a live densitometer is used and if so, whether it is providing a density corrected to reference temperature or is providing the observed density at line conditions.

Selections:
- No Densitometer
- Observed Density
- Corrected Density

<table>
<thead>
<tr>
<th>Arms:Products:Temperature/Density:Calculate Current Reference Density</th>
<th>Index: Product</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product 421</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description: This entry enables calculation of a real-time reference density from current temperature and live (observed) density. An average reference density calculation for the delivery is always included, but if the reference density needs to be monitored during the delivery, enable this option.

Selections:
- No
- Yes
<table>
<thead>
<tr>
<th>Product</th>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>422</td>
<td>Product</td>
<td>-999.9 - +999.9 API for other density units 0 - 9999.0</td>
</tr>
<tr>
<td>423</td>
<td>Product</td>
<td>-999.9 - +999.9 API for other density units 0 - 9999.0</td>
</tr>
<tr>
<td>424</td>
<td>Product</td>
<td>-999.9 - +999.9 API for other density units 0 - 9999.0</td>
</tr>
<tr>
<td>431</td>
<td>Product</td>
<td>0 - 99999 delivery units</td>
</tr>
<tr>
<td>432</td>
<td>Product</td>
<td>0 - 9999.9 density units</td>
</tr>
<tr>
<td>441</td>
<td>Product</td>
<td>-1e+37 and 1e+38</td>
</tr>
</tbody>
</table>

**Description:**
- **Arms:Products:Temperature/Density:High Density Alarm Limit**
- **Product 422**

Sets the alarm threshold for the high density alarm.

**Note:** Not applicable if Density Units = Not Used.

- **Arms:Products:Temperature/Density:Low Density Alarm Limit**
- **Product 423**

Sets the alarm threshold for the low density alarm.

- **Arms:Products:Temperature/Density:Maintenance Density**
- **Product 424**

This program code allows for the entry of a maintenance density in situations where the densitometer fails, etc. and the density value must be entered via the user interface or communications.

- **Arms:Products:Temperature/Density:Delta Amount**
- **Product 431**

This parameter applies to unloading arms only, and specifies the batch quantity between density samples –999.9 to +999.9 API used to calculate the percentage of contaminant during unloading. A maximum of ten samples are taken over the course of a batch. Each of the samples is a flow-weighted average over the amount defined by this entry. The density sample for the 10th delta amount delivered (or the last complete sample if less than 10) will be considered the density of the pure uncontaminated product when the contaminant percentage is calculated.

- **Arms:Products:Temperature/Density:Contaminant Density**
- **Product 432**

This parameter applies to unloading arms only, and specifies the density value assumed for the contaminant (such as water) that may be present in an unloading operation. It is used in the calculation to determine the percentage of contaminant present during the unloading operation.

- **Arms:Products:Temperature/Density:PTB kOE Method 1**
- **Product 441**

This entry is the coefficient required to implement the PTB kOE method 1 algorithm for ethanol/biodiesel blends.
**Arms:Products:Temperature/Density:PTB A1 Method 3 A1, A2, A3 Coefficients**

**AProduct 442, 443, 444**

**Index:** Product  
**Range:** -1e+37 and 1e+38

**Description:** These parameters provide temperature compensation of ethanol and gasoline blends using the PTB equation. The AccuLoad will allow entering the coefficients used in the equation to allow for other blends as new data is available from PTB.

- > -1.12345e-09

**Critical:** A1, A2 and A3 constants are required for ethanol blends.

---

**Arms:Products:Temperature/Density:Aromatic Hydrocarbon Product**

**Arms 461**

**Index:** Product  
**Range:** -1e+37 to +1e+38

**Description:** This program code specifies the industrial aromatic hydrocarbon or cyclohexane product being delivered. Temperature compensation will be performed according to the ASTM D 1555 standard. This entry is only applicable if API table (product parameter #411) is programmed for "Aromatic" and temperature units (system parameter #401 are programmed.

For impure products, product parameter #424 may be used to enter the density of the mixture. Otherwise the density of the pure product will be used in the calculations.

- Benzene
- Cumene
- Cyclohexane
- Ethylbenzene
- Styrene
- Toluene
- m-Xylene
- O-Xylene
- p-Xylene
- 300-350°F Aromatic
- 350-400°F Aromatic

---

**Arms:Products:Temperature/Density:Aromatic Hydrocarbon Reference Density**

**Arms 46–2**

**Index:** Product  
**Range:** 0 -9999.99

**Description:** This parameter is used to enter the reference density of an aromatic hydrocarbon product that is considered impure. If 0 is entered, the density of the pure product will be used in the calculations. Reference density should be entered in density units of kg/m³ and should be based at the programmed reference temperature (system parameter #402) or the reference density’s temperature (product parameter #414).

**Note:** If "300-350°F Aromatic" or "350-400°F Aromatic" product is selected, the reference density for the product must be entered. Otherwise the conversion of volume and mass will not be available (i.e. if volume pulse input, mass will not be available. If mass pulse input, volume will not be available.

---

**8.6.5. 500 - Pressure Directory**

**Arm:Product:Pressure:High Pressure Alarm Limit**

**Product 501**

**Index:** Product  
**Range:** [0] - 9999 pressure units

**Description:** Sets the alarm threshold for the High Pressure Alarm to be generated.
### Low Pressure Alarm Limit

**Product 502**

**Index:** Product  
**Range:** [0] - 9999 pressure units  
**Description:** Sets the alarm threshold for the Low Pressure Alarm to be generated.

### Maintenance Pressure

**Product 503**

**Index:** Product  
**Range:** 0.0 - 9999.9 pressure units  
**Disable:** 0.0  
**Description:** Sets a pressure to be used when a pressure transmitter is not installed or is not working, but pressure-related calculations are desired.

### Pressure Coefficient

**Product 504**

**Index:** Product  
**Range:** 0 - 99999  
**Description:** This code will allow for the entry of a Compressibility Factory that will be used by the system to calculate the CPL. This entry should be zero except when API 2004 C Tables is selected for the API table and pressure compensation is required as the AccuLoad has no density with which to calculate the compressibility factor. The factor is used as the following: XXXXX equals the factor entered and it is applied as 0.0000XXXXX.

**Note:** This value will represent the "F" variable in the CPL equation.

### Differential Pressure

**Product 511**

**Index:** Product  
**Range:** [0] - 9999 pressure units  
**Disable:** 0  
**Description:** Sets the additional pressure to be maintained above the vapor or back pressure. In this situation, the low-pressure alarm must be set high enough to ensure that the pressure does not fall below the product’s vapor pressure.

**Note:** A non-zero entry here will override any other programmed type of back pressure flow control.

### Minimum Back Pressure Flow Rate

**Product 512**

**Index:** Product  
**Range:** [0] - 9999 flow rate units  
**Description:** Sets the minimum flow rate allowed when reducing the flow rate to maintain the minimum back pressure. The AccuLoad will post an alarm if the flow rate would need to be reduced below this level to maintain the target back pressure.

### Minimum Back Pressure Flow Rate Timer

**Product 513**

**Index:** Product  
**Range:** 0 - 99 seconds  
**Disable:** 0  
**Description:** Sets the minimum time, in seconds, allowed for the unit to achieve a desired flow rate. If the flow rate is not reached in this time, the flow rate will be lowered by a percentage cause of insufficient back pressure. If the flow rate falls below the back pressure minimum flow, an alarm will be issued and the valve will be closed.

If a differential pressure is entered in Product 511, this pressure must be attained within this time period after a flow rate change. If not, the flow rate will be lowered due to insufficient back pressure.

**Note:** This entry is used for Automatic Flow Optimization (AFO).
## Arms:Products:Pressure:Back

### Pressure Percent Reduction

**Product 514**

**Index:** Product  
**Range:** 50 - 90%

**Description:** This two-digit entry will allow the operator to select the percentage of flow rate to be used during insufficient back pressure conditions or insufficient flow conditions. (For example, an entry of 90% will cause the flow rate to be reduced to 90% of the current rate during insufficient back pressure conditions.)

**Note:** This entry is used for Automatic Flow Optimization (AFO).

---

## Arms:Products:Pressure:Back

### Back Pressure Flow Recovery Pressure

**Product 515**

**Index:** Product  
**Range:** [0] - 9999

**Description:** Sets the amount of pressure above the vapor pressure of the product that will trigger the AccuLoad to attempt flow recovery to the programmed high flow.

**Note:** This function requires a pressure input and this pressure must be sufficiently higher than the differential pressure entered in Product 511 to prevent flow rate oscillation.

---

## Arms:Products:Pressure:Back

### Pressure Flow Recovery Timer

**Product 516**

**Index:** Product  
**Range:** [0] - 99 minutes  
Disable: 0

**Description:** Sets the time the AccuLoad will wait to attempt flow rate recovery if a pressure reading is not available. This parameter provides a method of flow recovery that does not require the use of a pressure transmitter input.

---

## Arms:Products:Pressure:Vapor

### Pressure Calculation Method

**Product 521**

**Index:** Product  
**Range:**

**Description:** This parameter defines the method that the AccuLoad will use to calculate the vapor pressure of a product.

**Selections:**
- Straight Line Approximation (Requires points of the curve to be entered in codes 522 through 527).
- GPA TP-15 (absolute)

**Critical:** GPA-TP15 requires corrected density [temperature used, API table selected]

---

## Arms:Products:Pressure:Vapor

### Pressures 1 - 3

**Arms 522, 524, 526**

**Index:** Product  
**Range:** [0.0] - 9999.9

**Description:** These three parameters are used to define the vapor pressure portion of the vapor pressure versus temperature curve used to calculate the current vapor pressure. The pressure(s) are defined lowest to highest. The vapor pressure calculation, determined from the entries made here, will be used both for differential back pressure control and in the CPL equation as the "Pe" entry. Therefore, careful consideration should be given in determining these points and their accuracy.

**Critical:** Vapor pressures must be entered in ascending order.
### Pressure Temperatures 1 - 3

**Product 523, 525, 527**

**Index:** Product  
**Range:** -999 - +999 degrees

**Description:** These three parameters are used to define the temperature portion of the vapor pressure versus temperature curve used to calculate the current vapor pressure. These temperatures correspond with the vapor pressures. The vapor pressure calculation, determined from the entries made here, will be used both for differential back pressure control and in the CPL equation as the "Pe" entry. Therefore, careful consideration should be given in determining these points and their accuracy.

**Critical:** Corresponding vapor pressure not programmed.

**Note:** Not used for Vapor Pressure Calculation Method = GPA-TP15

### 8.7. Recipe Directories

#### Product Blend

#### Recipe Additives

### 8.7.1. Product Blend

**Recipes:Product Blend:Recipe Used**

**Index:** Recipe  
**Range:** 1 - 6

**Description:** This program code indicates whether a recipe is configured for use.

**Selections:**
- Not Used
- Load Arm 1 - 6

**Critical:** Load Arm not configured.

**Note:** Load Arms 3 through 6 are not available on the AccuLoad-ST hardware.

**Recipes:Product Blend:Recipe Name**

**Index:** Recipe  
**Range:** Text - 20 characters max.

**Description:** Assigns a name for this recipe

**Recipes:Product Blend:HM Classification**

**Index:** Recipe  
**Range:** 1 - 6

**Description:** Selects a product Hazardous Materials (HM) Classification for this recipe. This HM Classification will print on the load ticket for this recipe. HM Classifications are defined in the individual product directories.

**Selections:**
- Product 1 - 6

**Critical:** Product not configured.
<table>
<thead>
<tr>
<th>Recipes:Product Blend:Product Delivery Order 1 - 6</th>
<th>Index: Recipe</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recipes 11, 13, 15, 17, 19, 21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

**Sequential Blending:** These parameters define the order of delivery of the sequentially blended products in this recipe. This applies to sequential blending arms and the sequentially delivered products on a hybrid arm.

**Selections:**
- Not Used
- Product 1 - 6

**Critical:** First component must be programmed [~04 only]

**Note:**
- Applies to sequential blending arms and hybrid arms only
- For hybrid arms, the ratio products are counted first.

<table>
<thead>
<tr>
<th>Recipes:Product Blend:Product Percentage 1 - 6</th>
<th>Index: Recipe</th>
<th>Range: 0.0 - 100.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recipes 12, 14, 16, 18, 20, 22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** These parameters set the percentage of each product in a recipe as a percentage of the total batch that is to be contributed by this product. The percentages of the six products (ratio blending) or six components (sequential blending) must add up to one hundred percent; otherwise, a critical warning will be issued. For example, 0 would mean that this product is not to be included in the recipe, and 100.0 would mean that the recipe was to consist entirely of this product.

**Hybrid Blending:** Program product percentages for the ratio products first. The remaining parameters can be used to specify the percentages for the sequential products.

**Critical:** Component percentages must sum to 100%.

**Critical:** Component percentage not used with straight product.

**Critical:** Component percentage not used with ratio blending [13, 15; others depend on number of product selection for ratio blend for this load arm]

<table>
<thead>
<tr>
<th>Recipes:Product Blend:Clean Line Deduct</th>
<th>Index: Recipe</th>
<th>Range: 1 - 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recipes 31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description:** Selects the product from which the clean line volume is to be deducted. In the Ready Mode, when a recipe is selected and a preset amount is entered, the preset is divided among the products according to the percentages programmed in the recipe. The clean line volume is deducted from the preset volume of the product selected here. If the product selected is not part of this recipe, a critical warning will be issued. The range of this entry is one through six. For example, assume a recipe with 50% of products 1 and 2. A preset of 1000 gallons is entered. This preset is divided among products according to the percentages programmed in the recipe. The clean line volume is deducted from the preset volume of the product selected here. If the product selected is not part of this recipe, a critical warning will be issued. The range of this entry is one through six.

**Selections:**
- Product 1 - 6

**Critical:** Product not used in recipe.

**Critical:** Clean Line Deduct must be Product 1 when recipe is assigned to a side-stream blending arm.
**Recipes: Product Blend: Clean Line Product**

| Recipes 32 | Index: Recipe | Range: 1 - 6 |

**Description:** This parameter specifies the product used to 'pack' the load arm and meter run at the end of the batch. This allows the operator to set a clean line product on a per-recipe basis.

If Load Arm parameter "221 Clean Line Amount" is greater than zero and if "Recipe 32 - Clean Line Prd" is not set to "NA", the product as programmed in here in "Recipe 32 - Clean Line Prd" will be the clean line product. In other words, the clean line product programmed in the recipe directory will take precedence over the clean line product programmed in the arm directory provided that the recipe clean line product is not "NA". If the recipe clean line product is programmed as "NA" then the clean line product will be that as programmed in the arm directory ("222 Clean Line Product").

**Selections:**
- Not Used
- Product 1 - 6

**Critical:** Product cannot be a side stream product (ratio product plumbed upstream of the sequential product meter) on a hybrid arm.

**Critical:** Product greater than the number of products available for this arm.

---

**Recipe: Product Blend: Ratio Delivery Mode**

| Recipes 33 | Index: Recipe | Range: |

**Description:** This program code allows for a ratio plumbed arm configuration to deliver products one after the other instead of concurrently. Recipes where ratio percentages are difficult to achieve concurrently due to system hydraulics, or where endothermic reactions could significantly affect results may be configured to deliver each product successively with this program code.

**Selections:**
- Concurrent – Products are set up to flow simultaneously (traditional ratio blending) mixing in the arm as they are flowing into the vessel.
- Successive – Products are set up to flow one after the other (sequentially) and mixing once they are in the vessel.

If this option is set to ‘1 – Successive’ then the product order of delivery must also be specified (as for a sequential blending arm).

---

### 8.7.2. Recipe Additives

| Recipes: Recipe Additives: Additive Amount/Cycle | Index: Recipe | Range: 0.000 - 9999.999 |

**Description:** Defines the volume of additive product that will be injected for each cycle of additive injector (e.g., an entry of 000.100 shows that one-tenth of a unit of additive will be injected each cycle of the injector).

For piston or metered injectors, the units for this additive volume are as programmed in system code 881. For smart injectors, this is the number downloaded to the smart injector. The units may be fixed or programmed on the smart injector.

When using a Smart Additive Injector System, the additive injector volume is downloaded to the additive injector at the start of each batch.

Some additive injectors do not support the full range that we have offered here. Titan injectors accept only whole numbers for the volume. Smith and Gate City injectors (Blend-Pak, Mini-Pak, and AccuTroller) accept injector volume in tenths. The AccuLoad will truncate the entry to the format required for the smart injector.
### Recipes:Recipe Additives:Additive Rate

<table>
<thead>
<tr>
<th>Index: Recipe</th>
<th>Range: 0 - 999 delivery units or 0 - 20%</th>
</tr>
</thead>
</table>

**Description:** Defines the rate at which additive is injected into the product stream during delivery. This is the volume of the main product per additive injection, typically 40 gallons or 100 liters.

If the injector is a flow controlled injector, the value represents a percentage of the preset amount that this additive will comprise. For example, with a preset of 1000 units and this parameter programmed to 10.0, the result will be 900 units of the component products in the recipe plus 100 units of this additive. The range is 0 to 20.0 percent.

### Recipes:Recipe Additives:Product Using Additive

<table>
<thead>
<tr>
<th>Index: Recipe</th>
<th>Range: 1 - 24</th>
</tr>
</thead>
</table>

**Description:** This entry is used to select whether this injector is to be used with this recipe and with which products it will be used. Each of the 24 possible injectors may be used with the products being loaded in this recipe.

- **Product 1 - 24**
  This program code allows the operator to select which products use a respective injector in a blender. Products using an injector are marked with an asterisk. The number of products shown on the display is dependent on the number of products configured for the respective load arm.

### 8.8. Split Architecture Directories

#### Split Architecture:Configuration:Board Set ID

<table>
<thead>
<tr>
<th>Index: Recipe</th>
<th>Range: Text - 28 characters max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split Architecture 101</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

#### Split Architecture:Configuration:Stop Button action

<table>
<thead>
<tr>
<th>Index: Recipe</th>
<th>Range: Text - 28 characters max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split Architecture 102</td>
<td></td>
</tr>
</tbody>
</table>

**Selections:**
- Arms on Both HMIs
- Arms on HMI only
<table>
<thead>
<tr>
<th>Split Architecture: Configuration</th>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle Arm Alarm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split Architecture 103</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selections:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Stop Arms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Don't Stop Arms</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Split Architecture: Configuration</th>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle Arm Alarm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split Architecture 104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selections:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Disabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Enabled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Split Architecture: Board</th>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addresses: Board Set ID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split Architecture 121</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Split Architecture: Board</th>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addresses: Board Set ID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split Architecture 122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Split Architecture: Card</th>
<th>Index</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reader: Mode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split Architecture 721</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selections:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Momentary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Captive</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Split Architecture: Card Reader: Baud Rate

<table>
<thead>
<tr>
<th>Index: Recipe</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split Architecture 722</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

**Selections:**
- 9600
- 19200
- 38400
- 57600
- 115200

### Split Architecture: Card Reader: Data/Parity

<table>
<thead>
<tr>
<th>Index: Recipe</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split Architecture 723</td>
<td></td>
</tr>
</tbody>
</table>

**Description:**

**Selections:**
- 7 Data No Parity
- 7 Data Odd Parity
- 7 Data End Parity
- 8 Data No Parity
- 8 Data Odd Parity
- 8 Data Even Parity
- 8 Data No Parity 2 Stop

### Split Architecture: Card Reader: Timeout

<table>
<thead>
<tr>
<th>Index: Recipe</th>
<th>Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split Architecture 724</td>
<td>0 - 99</td>
</tr>
</tbody>
</table>

**Description:**
## 9 – Appendix I – Alarms

### Smart Additive Inject Alarm Cross Reference

<table>
<thead>
<tr>
<th>Blend-Pak Injector – From the Blend-Pak’s Point of View</th>
<th>AccuLoad III AccuLoad IV Equivalent Error Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess Additive</td>
<td>RA: Additive Frequency Alarm</td>
</tr>
<tr>
<td>No Additive Flow</td>
<td>NA: No Additive Pulses Alarm</td>
</tr>
<tr>
<td>No Fuel Flow</td>
<td>GA: Additive Injector Error</td>
</tr>
<tr>
<td>Low Additive</td>
<td>KA: Low Additive Volume</td>
</tr>
<tr>
<td>Leaking Solenoid</td>
<td>MA: Excess Additive Pulses</td>
</tr>
<tr>
<td>No Act. Time-Out</td>
<td>GA: Additive Injector Error</td>
</tr>
<tr>
<td>Fuel Flow Switch</td>
<td>GA: Additive Injector Error</td>
</tr>
<tr>
<td>Low Flow Switch Failure</td>
<td>GA: Additive Injector Error</td>
</tr>
<tr>
<td>Flash Vol Alarm</td>
<td>GA: Additive Injector Error</td>
</tr>
<tr>
<td>Communication Error to Additive Injector</td>
<td>CT: Additive Communication Totals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mini-Pak Injector/AccuTroller – From the Mini-Pak/ AccuTroller’s Point of View</th>
<th>AccuLoad IV Equivalent Error Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additive Cycle Volume Alarm</td>
<td>GA: Additive Injector Error</td>
</tr>
<tr>
<td>No Additive Alarm</td>
<td>NA: No Additive Pulses Alarm</td>
</tr>
<tr>
<td>Leaking Solenoid</td>
<td>MA: Excess Additive Pulses</td>
</tr>
<tr>
<td>Firmware Failure</td>
<td>GA: Additive Injector Error</td>
</tr>
<tr>
<td>EEPROM Failure</td>
<td>GA: Additive Injector Error</td>
</tr>
<tr>
<td>Communication Error to Additive Injector</td>
<td>CT: Additive Communication Totals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Titan Injector – From the Titan’s Point of View</th>
<th>AccuLoad IV Equivalent Error Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm Low 1</td>
<td>RA: Additive Frequency Alarm</td>
</tr>
<tr>
<td>Alarm Low 2</td>
<td>KA: Low Additive Volume</td>
</tr>
<tr>
<td>Pulse Detection</td>
<td>NA: No Additive Pulses Alarm</td>
</tr>
<tr>
<td>Alarm High</td>
<td>MA: Excess Additive Pulses</td>
</tr>
<tr>
<td>Product Pulse Failure</td>
<td>GA: Additive Injector Error</td>
</tr>
<tr>
<td>Unclean Product</td>
<td>GA: Additive Injector Error</td>
</tr>
</tbody>
</table>

### Table of Equivalent Error Codes

<table>
<thead>
<tr>
<th>Add-Pak (AICB)</th>
<th>AccuLoad IV Equivalent Error Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injections occurring too fast</td>
<td>OR: Overspeed Injector</td>
</tr>
<tr>
<td></td>
<td>CR: Inj Command Rejected</td>
</tr>
<tr>
<td>No additive pulses occurring</td>
<td>NA: No Add Pulses</td>
</tr>
<tr>
<td>Out of tolerance high</td>
<td>RA: Additive Frequency Alarm</td>
</tr>
<tr>
<td>Out of tolerance low</td>
<td>KA: Low Additive Volume</td>
</tr>
<tr>
<td>Excess additive pulses</td>
<td>MA: Excess Additive Pulse</td>
</tr>
<tr>
<td>Additive total at least 10 times greater than expected injection volume per injection</td>
<td>CT: Additive Communication Totals</td>
</tr>
<tr>
<td>Faulty ROM or RAM</td>
<td>D1: Add-Pak Diagnostic Alarm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Metered Injector – If this happens</th>
<th>AccuLoad IV – This alarm occurs...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injections are occurring too fast  (before the previous one is complete)</td>
<td>OR: Overspeed Metered Injector</td>
</tr>
<tr>
<td>No additive pulses are registering (no pulses have been registered from previous injection)</td>
<td>NA: No Additive Pulses Alarm</td>
</tr>
<tr>
<td>Out of tolerance high (meter constantly out of tolerance on high side)</td>
<td>RA: Additive Frequency Alarm</td>
</tr>
<tr>
<td>Out of tolerance low (meter constantly out of tolerance on low side)</td>
<td>KA: Low Additive Volume</td>
</tr>
<tr>
<td>Excess Additive Pulses</td>
<td>MA: Excess Additive Pulses</td>
</tr>
</tbody>
</table>
### AccuLoad IV DA Alarms

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm Program Error</td>
<td>This alarm indicates a conflict or inconsistency in arm configuration.</td>
</tr>
<tr>
<td>Arm Recipe Program Error</td>
<td>This alarm indicates a conflict or inconsistency in arm recipe selection.</td>
</tr>
<tr>
<td>A4B Comm Fail</td>
<td>This alarm indicates a failure on the A4B.</td>
</tr>
<tr>
<td>Display Failure</td>
<td>This alarm indicates a failure in data transmission to the display.</td>
</tr>
<tr>
<td>Flash Corrupt on Power Up</td>
<td>This alarm indicates that flash memory failed to successfully complete the power up testing sequence.</td>
</tr>
<tr>
<td>Flash Memory Error</td>
<td>This alarm indicates a flash memory failure.</td>
</tr>
<tr>
<td>Meter Program Error</td>
<td>This alarm indicates a conflict or inconsistency in meter configuration.</td>
</tr>
<tr>
<td>Passcode Reset</td>
<td>This alarm indicates that the passcode has been reset.</td>
</tr>
<tr>
<td>Product Program Error</td>
<td>This alarm indicates a conflict or inconsistency in product configuration.</td>
</tr>
<tr>
<td>RAM Bad</td>
<td>When displayed, this alarm indicates a RAM failure.</td>
</tr>
<tr>
<td>RAM Corrupt on Power Up</td>
<td>This alarm indicates that RAM failed to successfully complete the power up testing sequence.</td>
</tr>
<tr>
<td>Recipe Program Error</td>
<td>The alarm indicates a conflict or inconsistency in recipe configuration.</td>
</tr>
<tr>
<td>ROM Bad</td>
<td>When displayed, this alarm indicates a ROM failure.</td>
</tr>
<tr>
<td>System Program Error</td>
<td>This alarm indicates a conflict or inconsistency in system configuration.</td>
</tr>
<tr>
<td>Watchdog Alarm</td>
<td>Indicates an internal check feature has detected a possible operational problem in the microprocessor that may have affected information stored in memory. A complete review of all program codes stored in memory must be made to confirm their correctness.</td>
</tr>
</tbody>
</table>


## 10 – Appendix II – Metered Injector Map on the AccuLoad® IV

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 NA</td>
<td>A4M - A4B</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>2 NA</td>
<td>A4M - A4B</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>3 NA</td>
<td>A4M - A4B</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>4 NA</td>
<td>A4M - A4B</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>5 101</td>
<td>A4I #1</td>
<td>Out</td>
<td>1 Pump = 1 Solenoid = 2</td>
<td>A4I 1 = 24</td>
<td>A4I 1 = 39</td>
<td>A4I 2 = 40</td>
<td></td>
</tr>
<tr>
<td>7 103</td>
<td>A4I #1</td>
<td>Out</td>
<td>3 Pump = 5 Solenoid = 6</td>
<td>A4I 3 = 26</td>
<td>A4I 5 = 43</td>
<td>A4I 6 = 44</td>
<td></td>
</tr>
<tr>
<td>8 104</td>
<td>A4I #1</td>
<td>Out</td>
<td>4 Pump = 7 Solenoid = 8</td>
<td>A4I 4 = 27</td>
<td>A4I 7 = 45</td>
<td>A4I 8 = 46</td>
<td></td>
</tr>
<tr>
<td>15 201</td>
<td>A4I #2</td>
<td>In</td>
<td>1 Pump = 1 Solenoid = 2</td>
<td>A4I 1 = 34</td>
<td>A4I 1 = 59</td>
<td>A4I 2 = 60</td>
<td></td>
</tr>
<tr>
<td>17 203</td>
<td>A4I #2</td>
<td>In</td>
<td>3 Pump = 5 Solenoid = 6</td>
<td>A4I 3 = 36</td>
<td>A4I 5 = 63</td>
<td>A4I 6 = 64</td>
<td></td>
</tr>
<tr>
<td>18 204</td>
<td>A4I #2</td>
<td>In</td>
<td>4 Pump = 7 Solenoid = 8</td>
<td>A4I 4 = 37</td>
<td>A4I 7 = 65</td>
<td>A4I 8 = 66</td>
<td></td>
</tr>
<tr>
<td>19 205</td>
<td>A4I #2</td>
<td>In</td>
<td>5 Pump = 9 Solenoid = 10</td>
<td>A4I 5 = 38</td>
<td>A4I 9 = 67</td>
<td>A4I 10 = 68</td>
<td></td>
</tr>
<tr>
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<td>A4I #2</td>
<td>In</td>
<td>7 Pump = 13 Solenoid = 14</td>
<td>A4I 7 = 40</td>
<td>A4I 13 = 71</td>
<td>A4I 14 = 72</td>
<td></td>
</tr>
<tr>
<td>22 208</td>
<td>A4I #2</td>
<td>In</td>
<td>8 Pump = 15 Solenoid = 16</td>
<td>A4I 8 = 41</td>
<td>A4I 15 = 73</td>
<td>A4I 16 = 74</td>
<td></td>
</tr>
<tr>
<td>23 209</td>
<td>A4I #2</td>
<td>In</td>
<td>9 Pump = 17 Solenoid = 18</td>
<td>A4I 9 = 42</td>
<td>A4I 17 = 75</td>
<td>A4I 18 = 76</td>
<td></td>
</tr>
</tbody>
</table>

Note: Add-Pak parameters and mappings are fixed and set automatically.

Note: If one Add-Pak injector is programmed to operate, then all addresses are reserved and are unable to be used for any other injector for the entire system in an address bank. Banks are 100 through 110 and 200 through 210. Note that the addresses 100 and 200 are system addresses for the entire A4I board.

Note: Special attention should be paid to the Configuration 020 parameter (Number of Injectors). This number provides the number of injectors that will be used starting at Injector #1 and running sequentially to #24. If an injector number is not programmed up, its position is still counted.

Example: Only two injectors are needed and these are Add-Paks. Injector positions numbers 5 and 6 are configured as Add-Pak injectors. The parameter CF 020 must be set to at least 6, since the accounting starts at injector #1 and continues sequentially to #6. Injectors #1 through #4 count against this number, even though they are not currently configured.
11 – Appendix III – Default Blending Arm Batch Page Report
12 – Appendix IV – Default Straight Product Arm Report

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable DOT regulations.
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