

Smith Meter Inc

An **FMC EnergySystems** business

AccuLoad II™-RBU

Operator Guide

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Bulletin MN06065



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Section I - Introduction

Product Description

The Smith AccuLoad II-RBU is a microprocessor based electronic instrument/in-line blender delivery system designed to simultaneously control the blending and loading of up to four petroleum or chemical products through one load arm.

The AccuLoad II is designed to provide dependable service over a wide range of operating conditions. It is easy to operate and maintain, provides optimum measurement accuracy, displays current operating conditions, is easy to communicate with, and performs many loading system control functions.

Ease of operation and service permits rapid training of operators and service personnel. All entries into AccuLoad II are made quickly and easily through the rugged external keypad. Every keystroke is monitored and assistance is provided by auto prompting displays. Built-in "Help Messages" provide valuable information to aid in the programming of the instrument without resorting to a thick manual. Service is simplified with self-diagnostics that show parameters in need of adjustment or hardware that is malfunctioning.

Optimum measurement accuracy is attained through the continuous linearization of the meter factor with changes in flow rates. The AccuLoad II is also capable of maintaining back pressure on the measurement system using either automatic flow optimization or a pressure transmitter. Volumetric correction is calculated directly from published API equations providing precise volumetric measurement results. Precise temperature, pressure compensation, and density correction are options that are available in the instrument.

The dynamic real time display of the current actual operating conditions of the system provides the operator with valuable system information while the system is operating. Also available through the dynamic display are the non-resettable totals. Some of the information that is available through the dynamic display is as follows:

- Current Time and Date
- Current System & Product Flow Rate (units/min.)
- Current System & Product Flow Rate (units/hour)
- Current Temperature
- Current API
- Reference Density

- Relative Density at Reference
- Current Pressure and Vapor Pressure
- Current Meter Factor
- Current CTL
- Current CPL
- Current Density
- Current Raw Transaction Volumes
- Current Gross Transaction Volumes
- Current Gross at Standard Temperature Transaction Volumes
- Current Net Transaction Volumes
- Current Mass Transaction Totals
- Additive Injector 1 Transaction Volumes
- Additive Injector 2 Transaction Volumes
- Additive Injector 3 Transaction Volumes
- Additive Injector 4 Transaction Volumes
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- Raw Non-resettable Volumes
- Gross Non-resettable Volumes
- Gross at Standard Temperature Non-resettable Volumes
- Net Non-resettable Volumes
- Mass Non-resettable Totals
- Additive Injector 1 Non-resettable Volumes
- Additive Injector 2 Non-resettable Volumes
- Additive Injector 3 Non-resettable Volumes
- Additive Injector 4 Non-resettable Volumes
- Additive Injector 5 Non-resettable Volumes
- Additive Injector 6 Non-resettable Volumes
- Additive Injector 7 Non-resettable Volumes
- Additive Injector 8 Non-resettable Volumes
- Input Module Status
- Additive Injector 1 Pulse Rate
- Additive Injector 2 Pulse Rate
- Additive Injector 3 Pulse Rate
- Additive Injector 4 Pulse Rate
- Additive Injector 5 Pulse Rate
- Additive Injector 6 Pulse Rate
- Additive Injector 7 Pulse Rate
- Additive Injector 8 Pulse Rate
- Current Blend Ratio per Product
- Last Power Failure - Time and Date

Section I - Introduction

Significant communication capability is available from the standard AccuLoad II. The instrument is programmable for Polling, Polling and Authorization or complete Remote Control via communications. The EIA-232 communication port can be used to multi-drop up to 16 AccuLoad IIs to an ASCII printer for printing load tickets or it can be used to network up to 16 AccuLoad IIs to an automation system. Also available is an additional communication port that is EIA 485 interfascable. When used with a smart printer; one that will signal when it is out of paper, cover is open etc., the AccuLoad II can alarm and display the reason for the printer not working. The "speak when spoken to" protocol of AccuLoad II is modeled after the ISO Standard 1155. This allows quick access by an automation computer for operational and transaction information. The AccuLoad II also has a built-in communication analyzer to aid in the development and troubleshooting of communications. For additional information on the AccuLoad II communications, see the Communications Manual (Bulletin MN06069L).

The AccuLoad II Ratio Blender provides several loading system control functions: Additive Injection, Additive Pump, Pump Control, Alarm Control, Set Stop, Valve Control, Back Pressure Control, Automatic Adjustment of Final Trip Point.

- Up to eight different additive injectors can be simultaneously paced.
- The AccuLoad II will monitor and totalize the volume of additive injected by up to eight of the additive injectors if the Additive Monitoring option is purchased.
- A contact is available to stop a pump or other electrically operated equipment as well as a program code that will set the time delay of that stop.
- A programmable Alarm Contact is available. It can be closed on a Valve Fault, on any alarm or not at all depending on how it is programmed.
- The AccuLoad II contains the intelligence to control a Smith Model 210 or 215 Digital Control Valve which will provide low flow start and multi-stage shut-down.
- AccuLoad II contains the intelligence to automatically reduce the flow of product and ensure the flow is within the pumping capabilities of the system.

- AccuLoad II, if so programmed, will automatically adjust the final trip point of the batch (Preset).

Critical functions such as: minimum flow rate, excess flow rate, temperature detection, preset volume overrun and memory retention are monitored by internal circuits. Any failure will signal closure of the valve. Should the valve fail to close within 10 seconds after having been signalled, a contact is closed. This can be wired through external relays to shut off the pump and/or kill power circuits.

Environmental fluctuations within specified limits have virtually no effect on the operation of this control system. AccuLoad II is available in an explosion-proof housing for hazardous locations and a non-explosion-proof housing for non-hazardous locations. (See Bulletin SS06017 for specifications.)

How To Use This Manual

This manual is to be used as a guide for AccuLoad II-RBU firmware.

This manual is divided into seven sections: Introduction, Operations, Dynamic Displays, Program Mode, Program Codes, Index, and Related Publications.

"Operations" describes the daily operation of AccuLoad II and what is required of an operator to effectively load the product.

"Dynamic Displays" describes the information that can be displayed by AccuLoad II while in the "READY" state or in the Run Mode.

"Program Mode" describes how to get into the Program Mode, Program Directory Selection, Program Code Selection, how to change a program parameter and how to view the "Help Messages".

"Program Codes" gives an outline description of each program code available in the instrument. For a brief description of each code, the information or options required for each code, and a place to record the parameters entered in each preset position see Bulletin AB06034. For detailed information on each code see Bulletin MN06066L.

The examples presented in this manual are for clarity and your convenience. The values might vary for your particular installation and/or operation.

Section I - Introduction

Before Beginning Operations

Before actual operations begin, it is essential that valid entries are made for all program codes. To assist in programming the AccuLoad II, a Programming Workbook (Bulletin AB06034) is available for recording the values entered in the program codes. Access to the program codes is limited to authorized personnel by use of a security code and two contact closures. The first contact closure will allow the operator to view all program codes and change the program codes that have a second digit of zero through three. The second contact closure is required to change the program codes that have a second digit of four through seven. This additional security is for Weights & Measures purposes. A program code with the second digit of eight will be programmable in either the Program or Weights and Measures protection mode.

Any program code with a second digit of nine has a special high-security protection. This also requires the second contact closure and an external jumper to be attached to test points 9 and 10 on the computer board.

The AccuLoad II contains two side by side one line by 24 character, 5X7 dot matrix vacuum fluorescent displays. When powered on, both displays will illuminate. The left-hand display will show if the status of the internal memories (Ram, Data, ROM's) are good or bad. Then it will show that the instrument is being initialized. The right-hand display will display the message "PLEASE STANDBY". After the testing is complete and the instrument is initialized, the left-hand display will read as follows before the ready mode message is programmed in the instrument:

Ready 1:10:31

Where: Ready is a programmable message programmed in code 184 of the Systems Directory.

The right-hand display will read:

AccuLoad II-RBU

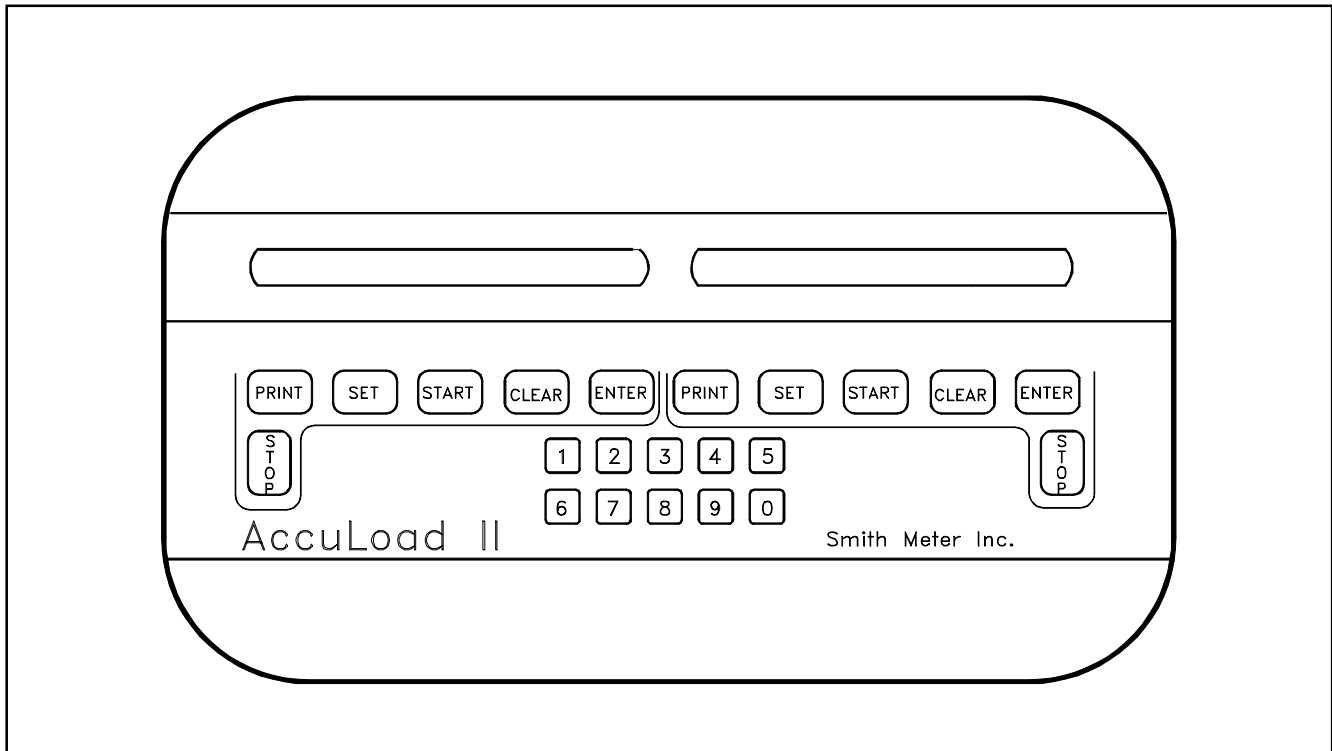
Be sure that AccuLoad II is functioning properly and that the operator has read and understands the instructions contained in this manual.

Section I - Introduction

Run Mode

This is the normal driver controlled mode of operation where a preset volume of product is preset into AccuLoad II. The flow is then initiated, controlled, and stopped by AccuLoad II at the end of the batch.

All preset and control operations can be performed either locally through the keypad or through communications. The operation described in this section is based on AccuLoad II being operated locally through the keypad. For information on operating through communications refer to the AccuLoad II Communications Manual MN06069L.



Keypad Functions

The pushbuttons on the keypad perform the following preset functions in the Run Mode:

- '0' - '9'** Used for presetting the quantity to be delivered.
- 'CLEAR'** Used to clear incorrect entries and to exit from the dynamic displays.
- 'ENTER'** Used for dynamic displays and selecting the recipe required for loading.

- 'PRINT'** Signals completion of transaction when "Print Key" option is selected in program code 301 of the Systems Directory.
- 'SET'** Used to initiate the preset sequence and sequencing through recipes.
- 'START'** Used to start the delivery (providing all external permissive senses are satisfied).
- 'STOP'** Used to stop the delivery at any time.

Section II - Operations

Overview

The "RUN" mode permits the operator to select the recipe, the preset volume and start the preset volume or to observe the dynamic variables such as flow rate, temperature, volume correction factors, transaction totals and non-resettable totals.

Product delivery is controlled by several program code entries. Functions such as: first high flow rate, second high flow rate, low flow start, first and second trip points will be automatically controlled and monitored per their program entries. Safety and volume accuracy functions such as excess high flow, low flow, overrun and temperature probe failure are also monitored per their program values. If at any time an alarm occurs while in the Ready State or the Run Mode, AccuLoad II will attempt to shut down the flow and a message indicating an alarm condition will alternate with the current display.

When the delivery is completed, the left-hand display will read:

Preset Completed

Depending on how AccuLoad II is programmed, the transactions for the preset position used could be ended by removing the ticket from the ticket printer, pressing the "PRINT" button or by a communication command. If the "STOP" button for the preset position is pressed during flow, and if the STOP/START delay is programmed, the left-hand display will read:

100 Restart in 5

where 100 is the volume of product that has been delivered and the 5 is the number of seconds (that have been programmed in code 209 of the Systems Directory) before the operator can restart the batch. Once the time-out has been reached, the left-hand display will then read:

Press Start to Continue

The operator can then press "START" and continue the batch. If program code 209 is programmed to disable the time-out, the display will read:

Press Start to Continue

as soon as the operator presses "STOP". Then it will alternate with the preset display.

Remote Start/Stop

Two permissive sense contacts can be programmed in AccuLoad II that can be used for Remote Start/Remote Stop operations (codes 807 and 811). To use these permissive sense contacts as Remote Start or Remote Stop, hardware jumpers must be installed on the keypad and computer boards in the proper position for correct operation. When AC power is applied to the contacts, AccuLoad II will respond as though the "START" or "STOP" button has been pressed. (See the Installation Manual MN06064 for jumper positioning).

Quad OPV

The optional Quad OPV is a hardware option that provides two additional DC outputs. This output can either be used as a relay output or a pulse output, remote counter, etc. If used as a pulse output, the pulse rates and type of pulses are programmable in the 300 subdirectory of the Products Directory. The pulse rates are programmable between 000.1 units per pulse and 999.9 units per pulse with a maximum frequency of 500 Hz. The programmable options for the type of pulses are Raw, Gross, GST, Net and Mass.

Additive Monitoring

The additive injector feedback option provides the AccuLoad II with the capability to monitor the additive products that are being injected. The AccuLoad II monitors the injector feedback switches for a change of state and counts the errors and alarms if no change is detected within a programmable period.

Note: See program codes 841 through 866 of the Systems Directory for programming the Additive Feedback option.

Section II - Operations

Additive Injector Selection

Stand-alone Mode

When the AccuLoad II Ratio Blender is in the Stand-alone mode of operation the additive selection can be programmed to be either automatic or manual, depending on how code 804 of the Systems Directory has been programmed.

Code Description

804 Manual/Auto Additive Injector option must be programmed to either:

Zero for auto injectors - the additive outputs that are programmed in the AccuLoad II will automatically be selected for each batch.

One for manual injectors in the standby mode only at the beginning of each transaction.

Two for manual injectors prompting at the beginning of each transaction.

Three for manual injectors prompting at the beginning of each batch.

The operation will be as follows for manual selection (code 1, 2 or 3):

The following examples show the left-hand display only.

1. Select recipe.
2. The driver or operator is required to enter a recipe number (1 through 24). The display will read:

Select Recipe 1

where 1 is the recipe number entered by the driver or operator.

3. After the recipe has been selected press "ENTER". The following will be displayed:

Midgrade Recipe No 01

Where:

Midgrade = The programmed recipe name.

01 = The recipe number selected by the operator.

4. If the correct recipe is displayed press "ENTER". The display will read:

Select Injector #1 0 = Off

5. The driver or operator is required to enter a "1" to select the additive. If selected the display would read:

Select Injector #1 1 = On

Note: If an error was made in selecting the additive to be "on", pressing "CLEAR" will select the additive "off".

6. After additive injector #1 has been selected to either "on" or "off" press "ENTER". The following will be displayed:

Select Injector#2 0 =Off

7. The driver or operator repeats steps 2 and 3 until all the programmed additive outputs have been selected as either "ON" or "OFF". Press "ENTER" to store the additives that have been selected. The display will read:

Injectors on = #1,2,3,4,5,6,7,8

Indicating which of the additive outputs have been selected. If none of the additives have been selected the display will read:

No Injectors Selected

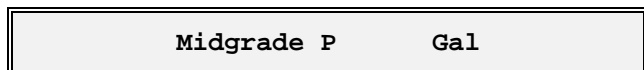
Note: If the selections are incorrect press "CLEAR" and the original display will be displayed (see step 1) and the process can begin again.

Section II - Operations

Note: Any additive output that has a zero entry programmed in its corresponding program code will always be disabled and will not appear in the selection process.

Note: Additives selected manually will override the additives that are programmed in the recipe that is being loaded.

8. Once the driver or operator verifies that the additives that have been selected and are displayed in step 4 are correct press "ENTER". The display will light up momentarily and then go to the pre-set display.



When the additives are selected the loading process is the same as previously described.

Standby Mode

When the AccuLoad II is in the Standby Mode of operation, the additive selection can be programmed to be either automatically or manually selected, depending on how the unit is programmed. The following program codes in the Systems Directory must be programmed correctly for additive selection in the Standby Mode.

Communications EIA - 232

Code Description

- 701** EIA - 232 Communication Type must be programmed to either:

One EIA Type Terminal.

Two EIA Type Minicomputer.

- 702** EIA - 232 Communication Control must be programmed to either:

Two Poll and Authorize.

Three Remote Control.

Note: If programmed two (Poll and Authorize) the additive will be selected for each transaction. If programmed three (Remote Control) the additive will be selected for each batch.

- 742** Communications Time-out must have a value other than "000" programmed into it.

- 743** Communications Alarm Mode must be programmed to either:

Zero Standby Mode.

Two Standby and Communication Alarm.

- 804** Manual/Auto Additive Injection option must be programmed to either:

Zero for auto injectors where the additives that are programmed in the AccuLoad II will automatically be selected for each batch.

One for manual injectors at the beginning of each transaction or batch depending on how code 702 is programmed.

Communications EIA - 485

Code Description

- 705** EIA - 485 Communication Type must be programmed to either:

One EIA Type Terminal.

Two EIA Type Minicomputer.

- 706** EIA - 485 Communication Control must be programmed to either:

Two Poll and Authorize.

Three Remote Control.

Note: If programmed two (Poll and Authorize) the additive will be selected for each transaction. If programmed three (Remote Control) the additive will be selected for each batch.

- 742** Communications Time-out must have a value other than "000" programmed into it.

- 743** Communications Alarm Mode must be programmed to either:

Section II - Operations

Zero Standby Mode.

Two Standby and Communication Alarm.

804 Manual/Auto Additive Injection option must be programmed to either:

Zero for auto injectors where the additives that are programmed in the AccuLoad II will automatically be selected for each batch.

One for manual injectors at the beginning of each transaction or batch depending on how code 702 is programmed.

The driver or operator selection of the additives is the same as described in the Stand-alone Mode (see above).

Local Ticket Printer

The description for operation with a local ticket printer described below assumes: code 301 in the Systems Directory is programmed for Local Tray Switch, the additive injectors are selected for automatic (code 804) and that the permissive senses are met.

Before operation the left display will read:

Blender Ready 9:20:33

where "Blender Ready" is the Ready Mode message which is programmable in code 184 of the Systems Directory. The right-hand display will read:

AccuLoad II-RBU

When the operator presses "SET" the display will prompt:

Select Recipe

The driver or operator is required to enter a recipe number (1 through 24) and press "ENTER". The left-hand display will indicate the recipe name and number that has been selected.

Midgrade Recipe No 01

The right-hand display will indicate:

Select Recipe

If the recipe that is displayed is correct press "ENTER". If the recipe that is displayed is not correct press "CLEAR" and the AccuLoad II will return to the "Select Recipe" display. If the recipe is correct and "ENTER" has been pressed the left-hand display will read:

* PLEASE INSERT TICKET *

Note: This prompt is programmable in the 800 Systems Directory.

The right-hand display will read:

Select Recipe

If the ticket has been inserted before the "SET" button is being pressed, AccuLoad II will display on the left:

Midgrade P Gal

and on the right display:

Enter Preset Amount

Section II - Operations

A predetermined volume to be loaded is entered at the keypad. AccuLoad II will check this volume against the Maximum Preset Volume (program code 302 in the Systems Directory) and the Minimum Preset Volume (program code 303 in the Systems Directory) when the operator presses "START". If the volume is more than the minimum preset volume and less than the maximum preset volume, AccuLoad II will signal the valve to open to start the product flowing. If the volume is less than the minimum preset volume allowable, the message:

Preset Batch Volume is below the

Minimum required. Press

CLEAR to CONTINUE.

will scroll across the display until the "CLEAR" button is pressed. If the volume is more than the maximum preset volume allowable, the message:

Preset Batch Volume exceeds the

Maximum Permitted. Press

CLEAR to CONTINUE.

will scroll across the display until the "CLEAR" button is pressed. Press "CLEAR" again to clear the volume entered from the display. Another entry can then be made using a volume that is between the minimum and maximum allowable preset volume as programmed.

If the permissive senses are programmed and met and an allowable preset volume is entered into the AccuLoad II, when the operator presses "START", the valve will be signalled to open to begin loading the product. The volume entered is now locked into that preset position and all of the loading controls, except "STOP" and the Dynamic Displays, are inhibited.

At this time, the left-hand display becomes a counter. The first through the sixth positions become an up-counter (delivery counter). The seventh position becomes a space. The eighth through the tenth positions display the units of measurement. The eleventh position becomes a space. The twelfth through the seventeenth positions continuously display the original preset volume. The eighteenth position becomes a space. The nineteenth through the twenty-fourth positions become a downcounter (preset counter).

11000 Gal P99999 88000

If AccuLoad II is programmed for a blank downcounter (code 306 in the Systems Directory), the last five positions will be blanked during the loading of the product.

11000 Gal P99999

AccuLoad II can be programmed (code 342 in the Systems Directory) so that the preset display, delivery display, or both will alternate at a two second rate with the current correction being applied to the delivered volume (i.e., Grs, Raw, Gst @ Ref. Temp, Net @ Ref. Temp, or Mass). For example:

11000 Gal P99999 88000

will alternate with:

11000 Gal<Gst 60F 88000

if the current correction being applied to the delivery is Gross at Standard Temperature and the programmed reference temperature is 60 degrees Fahrenheit.

Section II - Operations

The right-hand display displays the recipe that is being loaded. When the products being loaded reach a predetermined (First Stage Trip code 207 in the Product Directory) value, the valve is signaled to close. If a Smith Model 210 or 215 valve is being used, the flow will ramp down in multiple steps to assist the valve in preventing line shock. When the preset quantity is nearly reached, a final trip (code 208 in the Product Directory) occurs signalling the valve to close completely. If so programmed, AccuLoad II will automatically adjust the final stage trip point (code 209 in the Product Directory) to assure accurate delivery of the preset quantity for each load.

When the batch has been completed the AccuLoad II display will alternate between:

99999 Gal P 99999 0

AND

Preset Completed

until the transaction is terminated by removing the ticket or another batch is preset.

During normal loading, if the need arises to stop flow, the red "STOP" key can be pressed to close the valve. At this point the current batch delivery may be terminated by pressing the "SET" button. The preset display will appear and a new preset batch can be entered or the transaction may be terminated. To return the system to normal loading (i.e., return to the volume remaining to be delivered), press "START". If the "Start After Stop Delay" is programmed (code 209 in the Systems Directory) the display will read:

899 Restart in 10

(i.e., code 209 is programmed for 10 seconds) when the 10 seconds have elapsed the display will alternate between the preset display:

899 Gal P 1000 101

AND

Press Start to Continue

until the "START" button is pressed to resume the load. This reopens the valve to load the remainder of the preset volume.

Caution: The "STOP" button is for operator convenience only and is not intended to be used as an "Emergency Stop" or as substitute for an emergency stop device.

If a power failure is experienced, any transaction in process will not be allowed to continue. The valve will close and remain closed until after power is restored. The display will go through the initialization process and then read:

Press Start to Continue

The operator then can restart the load to complete the batch by pressing "START".

Before power failure:

100 Gal P 1000 900

As power fails (left display):

*** Low Line Voltage ***

As power fails (right display):

** Waiting for Reset **

After power returns the left display reads:

Press Start to Continue

Section II - Operations

After power returns the right display will display the recipe that was being loaded:

Midgrade

After "START" is pressed the batch will continue from the point of the power failure.

The operator can print a ticket for either a single or a multiple batch transaction. The upcounter display will accumulate the total delivery until the transaction is terminated by printing the ticket, up to six preset batches, five digits up to 99,999 volume units.

Remote Ticket Printer (Print Key)

When operating with a remote ticket printer or a shared printer the following occurs:

1. The AccuLoad II left-hand display switches from:

Blender Ready 8:07:15

to

Select Recipe

when the "SET" button is pressed. The operator would then follow the same steps that have been described in the description for the Local Ticket Printer.

2. At the end of the batch the AccuLoad II display will alternate between:

1000 Gal P 1000 0

AND

Preset Completed

until the transaction is terminated by the operator by pressing the "PRINT" button. When the "PRINT" button is pressed the display will return to:

Blender Ready 8:15:15

All other operations for the Remote Printer or the Shared Printer are the same as described for operation with the Local Printer.

Section II - Operations

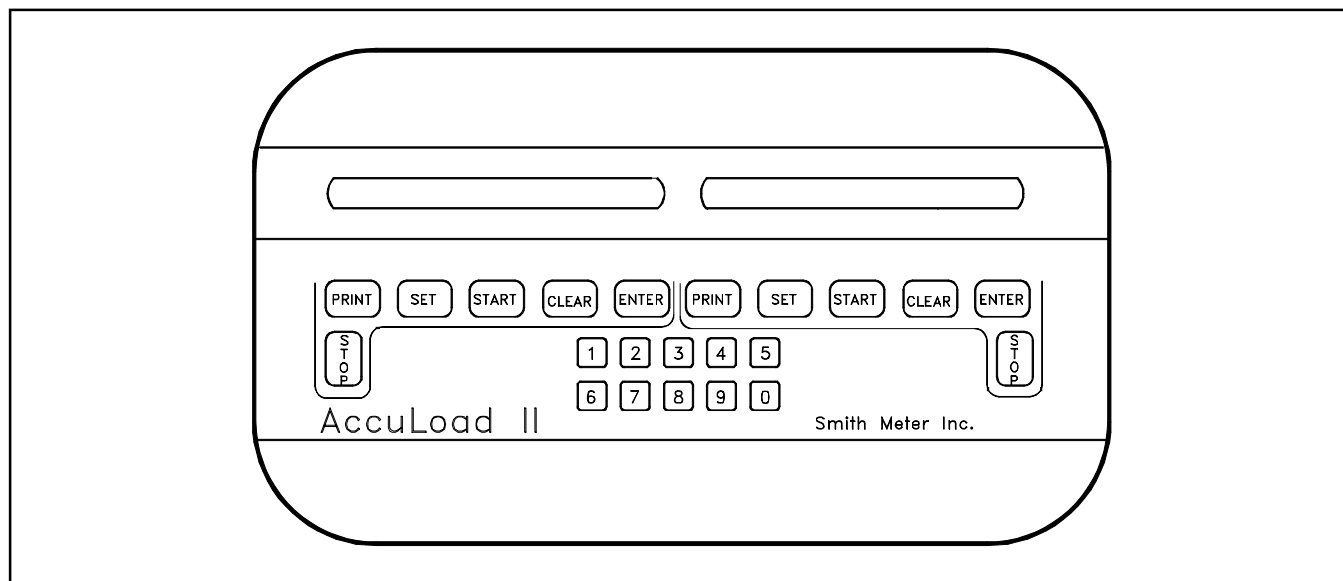
Dynamic Displays

This section describes informational displays which can be viewed while in the Run Mode. These displays are "dynamic" in the sense that the displayed values reflect current actual conditions and will continuously update while being viewed.

A dynamic display is selected by pressing "ENTER" and either a three, four, or five digit number depending on the Dynamic Display Directory to be viewed. The Dynamic Display Directories and number of digits required for viewing shown on the chart at right.

The dynamic displays will remain displayed for the time period that is programmed in program code 111 (00-99 seconds) of the Systems General Purpose Directory. If a "00" is entered in code 111 the display will remain until the "CLEAR" button is pressed. "99" will disable the dynamic displays. The AccuLoad II will continue to function normally while the display is ON.

Directory Number	Description	Number of Digits for Entry
0	System	3
1	Product #1	3
2	Product #2	3
3	Product #3	3
4	Product #4	3
5	Recipe	5
6	Batch	4
7	Summary	3



Section III - Dynamic Displays

Keypad Functions

The pushbuttons on the keypad perform the following functions when accessing the dynamic displays:

Key	Description
'0' - '9'	Used to enter the dynamic display number for the system, Product 1, Product 2, Product 3, Product 4, Recipe, Batch and Summary.
'CLEAR'	Used to exit the dynamic display.
'ENTER'	Used to enter the dynamic display desired for viewing and for sequencing through the displays in order.

Note: The pushbuttons not listed above are not used for viewing the dynamic displays.

Entry to Dynamic Displays

To access the dynamic displays for the System, Products and Summary the operator must enter a three digit number (i.e., "000", "110", "205" etc.).

Note: To read the dynamic displays on the right-hand display, enter a "9" in front of the dynamic display number.

The first digit determines which set of dynamic displays will be viewed. The second and third digits represent the number of the dynamic display. The display identifiers for these dynamic displays are as follows:

- 0 - System
- 1 - Product #1
- 2 - Product #2
- 3 - Product #3
- 4 - Product #4
- 7 - Summary

EXAMPLE 012

Where: 0 = Display Identifier
 12 = Dynamic Display

The dynamic display from the systems display that is represented by 012 is:

Add 8 = 0000121555 Oz

1. To select a dynamic display for the current system conditions (i.e., 000) press "ENTER 000".

After the first zero is entered the display will read:

System Dyn Display

After the second and third zeros are entered the display will read:

8:56:35 AM 8-26-92

2. To step through the dynamic displays, press "ENTER" and AccuLoad II will step through the dynamic displays sequentially each time "ENTER" is pressed.

Flow = 615.0 Gal/Min

3. Press "ENTER".

Flow = 36900.0 Gal/Hr

4. To revert back to the preset display, press "CLEAR".

600 Gal P 1000 400

Note: All dynamic displays can be viewed individually by simply entering the three digit number indicating the product and the dynamic display required (i.e., 112).

Section III - Dynamic Displays

To access the dynamic displays for the recipes the operator must enter a five digit number (i.e., 50100).

The first digit represents the recipe dynamic displays. The second and third digits represent the recipe (01 through 24) displays that are to be displayed. The fourth and fifth digits identify a specific dynamic display.

EXAMPLE 50101

**Where: 5 = Display Identifier
(Recipe)
01 = Recipe #
01 = Dynamic Display**

The dynamic display from the recipe display that is represented by 50101 is from recipe 01 and is:

Raw Total 000000311

1. To select a dynamic display from a recipe (i.e., 50202), press "ENTER 5". The display will read:

Recipe Dyn Display

2. "ENTER 02" for the recipe number. The display will read:

Recipe 02 Dyn Display

3. "ENTER 02" for dynamic display 02, the display will read:

Recipe 02 Dyn Display 02

then it will automatically switch to:

Grs Total 000000300

4. To step through the dynamic displays, press "ENTER" and AccuLoad II will step through the dynamic displays sequentially each time "ENTER" is pressed.

Gst Total 000000296

5. Press "ENTER".

Net Total 000000000

6. To revert back to the preset display, press "CLEAR".

600 Gal P 1000 400

Note: All recipe dynamic displays can be viewed individually by simply entering the five digit number indicating the recipe number and dynamic display required (i.e., 52401).

To access the dynamic displays for batch the operator must enter a four digit number (i.e., 6101).

The first digit represents the batch dynamic displays. The second digit represents the batch (1 through 6) displays that are to be displayed. The third and fourth digits identify a specific dynamic display (See Batch Display Reference).

EXAMPLE 6101

**Where: 6 = Display Identifier
(Batch)
1 = Batch #
01 = Dynamic Display**

The dynamic display from the batch display that is represented by 6101 is from batch number 1 and is:

Raw Batch 1000.84

where Midgrade is the description programmed into the recipe that was loaded in batch number 1.

1. To select a dynamic display from a batch (i.e., 6202) press "ENTER 6", the display will read:

Batch 2 Dyn Display

2. "ENTER 2" for the batch number, the display will read:

Batch 2 Dyn Display

Section III - Dynamic Displays

3. "ENTER 01" for the dynamic display number, the display will read:

Batch 2 Dyn Display01

then the display will automatically switch to:

Raw Batch 1001.08

4. To step through the dynamic displays, press "ENTER" and AccuLoad II will step through the dynamic displays sequentially each time "ENTER" is pressed.

Grs Batch 1000.25

5. Press "ENTER".

Gst Batch 998.28

6. To revert back to the preset display, press "CLEAR".

600 Gal P 1000 400

Note: All batch dynamic displays can be viewed individually by simply entering the four digit number indicating the batch number and dynamic display required (i.e., 6103).

Section III - Dynamic Displays

Dynamic Display Reference (System)

00 - Time & Date

The current time and date will be displayed.

9:20:05 AM 10-10-92

01 - System Flow Rate (Units/Min)

The current system flow rate of the recipe requested in units per minute will be displayed.

Note: An "*" in front of the flow rate indicates the flow is being controlled lower than selected because back pressure or auto flow control is not sufficient to maintain the desired flow.

Flow = 1000.0 Gal/Min

Note: + or - means that the flow rate has been adjusted upward (+) or downward (-).

02 - System Flow Rate (Units/Hr)

The current system flow rate of the recipe requested in units per hour will be displayed.

Note: An "*" in front of the flow rate indicates the flow is being controlled lower than selected because back pressure or auto flow control is not sufficient to maintain the desired flow.

Flow = 60000.0 Gal/Hr

Note: + or - means that the flow rate has been adjusted upward (+) or downward (-).

03 - Current Recipe

The recipe that is currently being loaded will be displayed:

Current Recipe=Midgrade

04 - Current Products

The products that are currently being loaded will be displayed.

Current Products 1 2 3 4

05 - Injector #1 Volume

The additive injector #1 non-resettable totals will be displayed.

Add 1 = 0000121555 Oz

06 - Injector #2 Volume

The additive injector #2 non-resettable totals will be displayed.

Add 2 = 0000024260 Oz

07 - Injector #3 Volume

The additive injector #3 non-resettable totals will be displayed.

Add 3 = 000004590 Oz

08 - Injector #4 Volume

The additive injector #4 non-resettable totals will be displayed.

Add 4 = 000005540 Oz

Section III - Dynamic Displays

09 - Injector #5 Volume

The additive injector #5 non-resettable totals will be displayed.

Add 5 = 000005850 Oz

10 - Injector #6 Volume

The additive injector #6 non-resettable totals will be displayed.

Add 6 = 000006120 Oz

11 - Injector #7 Volume

The additive injector #7 non-resettable totals will be displayed.

Add 7 = 000008225 Oz

12 - Injector #8 Volume

The additive injector #8 non-resettable totals will be displayed.

Add 8 = 000006720 Oz

13 - Injector #1 Pulse Rate (Units/Injection)

The additive injector #1 pulse rate will be displayed.

Inj1 Prg 40 Cal 39.20

Note: The first number (40) indicates the programmed value. The second number indicates the recalculated value. (This applies to dynamic displays 13-20).

14 - Injector #2 Pulse Rate (Units/Injection)

The additive injector #2 pulse rate will be displayed.

Inj2 Prg 50 Cal 49.00

15 - Injector #3 Pulse Rate (Units/Injection)

The additive injector #3 pulse rate will be displayed.

Inj3 Prg 40 Cal 39.20

16 - Injector #4 Pulse Rate (Units/Injection)

The additive injector #4 pulse rate will be displayed.

Inj4 prg 50 Cal 49.00

17 - Injector #5 Pulse Rate (Units/Injection)

The additive injector #5 pulse rate will be displayed.

Inj5 Prg 0 Cal 0.00

18 - Injector #6 Pulse Rate (Units/Injection)

The additive injector #6 pulse rate will be displayed.

Inj6 Prg 0 Cal 0.00

19 - Injector #7 Pulse Rate (Units/Injection)

The additive injector #7 pulse rate will be displayed.

Inj7 Prg 0 Cal 0.00

20 - Injector #8 Pulse Rate (Units/Injection)

The additive injector #8 pulse rate will be displayed.

Inj8 Prg 0 Cal 0.00

21 - Last Power Failure

The last time the AccuLoad II experienced a power failure will be displayed.

PF: 3:04:36 PM 11-08-89

Section III - Dynamic Displays

22 - Flow Rate for Each Product

The current flow rate (units as programmed) for each of the products being loaded will be displayed.

```
Flow 500 300 100 100
```

Note: + or - means that the flow rate has been adjusted upward (+) or downward (-).

23 - Current Blend Ratio for Each Product

The current blend ratio for each of the products being loaded will be displayed.

```
CBR 50.0 30.0 10.0 10.0
```

The numbers on the following dynamic displays need to be entered manually. You cannot step through the displays by pressing the ENTER key.

50, 51, 52, 53, 54, 55 - Communications Diagnostics

These real time diagnostics are used to facilitate diagnoses of communication problems while the AccuLoad II is being controlled remotely. For a detailed description of the displays, refer to the AccuLoad II Communications Manual (Bulletin MN06069L).

81 - Relay Status

The status of AC relays 1 through 6 will be displayed.

```
A1 B1 C1 D1 E1 F1 G1 H1
```

Where:

0 = Open	D = Relay #4
1 = Closed	E = Upstream (Product #1)
A = Relay #1	F = Downstream (Product #1)
B = Relay #2	G = Relay #6
C = Relay #3	H = Relay #5

82 - Relay Status

The status of the AC relays seven through twelve will be displayed.

```
I1 J1 K1 L1 M1 N1 P1 Q1
```

Where:

0 = Open	L = Relay #10
1 = Closed	M = Upstream (Product #2)
I = Relay #7	N = Downstream (Product #2)
J = Relay #8	P = Relay #12
K = Relay #9	Q = Relay #11

83 - Input Module Status

The status of the AC and DC inputs will be displayed. (DC input 1, AC inputs 1-6)

```
J0P0W0A1B1C1D1E0F0G0
```

Where:

0 = Closed	B = AC Input #2
1 = Open	C = AC Input #1
J = Test points 9 & 10	D = DC Input #1
P = Program Mode	E = AC Input #6
W = Weights & Measures Mode	F = AC Input #4
A = AC Input #3	G = AC Input #5

84 - Input Module Status

The status of the AC and DC inputs will be displayed. (DC input 2, AC inputs 7-12).

```
J0P0W0H1I1K1L1M0N0Q1
```

0 = Closed	I = AC Input #8
1 = Open	K = AC Input #7
J = Test points 9 & 10	L = DC Input #2
P = Program Mode	M = AC Input #12
W = Weights & Measures Mode	N = AC Input #10
H = AC Input #9	Q = AC Input #11

Section III - Dynamic Displays

Dynamic Display Reference (Products)

00 - Temperature

The current temperature of the product requested being measured and used for compensation will be displayed.

Temperature = + 78.5°F

01 - API

The current API of the product requested being used for compensation will be displayed.

API = + 19.9

02 - Product Flow Rate (Units/Min)

The product's current flow rate in units per minute will be displayed.

Flow Hi = 500.0 Gal/Min

Where: Hi = High Flow
Lo = Low Flow
Mn = Minimum Flow
Q1 = Step 1 of shut-down
Q2 = Step 2 of shut-down
Q3 = Step 3 of shut-down
ST = Not Flowing

Note: + or - means that the flow rate has been adjusted upward (+) or downward (-).

03 - Product Flow Rate (Units/Hour)

The product's current flow rate in units per hour will be displayed.

Flow Hi = 30000 Gal/Hr

Where: Hi = High Flow
Lo = Low Flow
Mn = Minimum Flow
Q1 = Step 1 of shut-down
Q2 = Step 2 of shut-down
Q3 = Step 3 of shut-down
ST = Not Flowing

Note: + or - means that the flow rate has been adjusted upward (+) or downward (-).

04 - Reference Density

The current reference density of the product requested being used will be displayed.

Ref Density = 933.7 Kg/M3

05 - Relative Density

The current relative density of the product requested being used will be displayed.

Rel Density = 0.09346

06 - Density

The current density of the product requested being used will be displayed.

Density N/A

07 - Pressure and Vapor Pressure

If used, the current pressure and vapor pressure of the product requested will be displayed.

P = 45.0 VP = 10.0

Section III - Dynamic Displays

08 - Meter Factor

The current meter factor of the product requested being used to correct the raw volume to the gross volume will be displayed.

Meter Factor = 1.0376

09 - Temperature Correction

The current correction for temperature on liquid factor being used to correct the gross volume to the gross @ standard temperature volume of the product requested will be displayed.

CTL = 0.9927

10 - Correction for Pressure on Liquid

The current correction factor being used to correct the Gst (Gross @ Standard Temperature) volume to a net volume based on the current pressure of the product requested will be displayed.

CPL = 1.0110

11 - Raw Non-resettable Volumes

The raw non-resettable volume for the product requested will be displayed.

Raw Total 000009709

12 - Gross Non-resettable Volumes

The gross non-resettable volume for the product requested will be displayed.

Grs Total 000009002

13 - Gross @ Standard Temperature Non-resettable Volumes

The gross @ standard temperature non-resettable volume for the product requested will be displayed.

Gst Total 000008875

14 - Net Non-resettable Volumes

The net non-resettable volume for the product requested will be displayed.

Net Total 000008388

15 - Mass Non-resettable Totals

The mass non-resettable total for the product requested will be displayed.

Mas Total 000053007

16 - Load Average Temperature

The load average temperature of the product requested for the current transaction will be displayed.

Load Avg Temp + 75.0°F

17 - Load Average Pressure

The load average pressure of the product requested for the current transaction will be displayed.

Ld Avg Pres 43.0 Psi

Section III - Dynamic Displays

18 - Load Average Density

The load average density of the product requested for the current transaction will be displayed.

Ld Avg Den N/A

24 - Mass Transaction

The mass that is currently being loaded of the product requested will be displayed.

Mas Transaction N/A

19 - Load Average Meter Factor

The load average meter factor of the product requested for the current transaction will be displayed.

Load Avg Mfac = 0.9998

25 - Valve Position

The status of the current valve position will be displayed.

Valve Requested Open

20 - Raw Volume

The raw transaction volume that is currently being loaded of the product requested will be displayed.

Raw Transaction 192.75

26 - Current Blend Ratio

The current blend ratio of the product requested will be displayed.

Current 24.9% of Batch

21 - Gross Volume

The gross volume that is currently being loaded of the product requested will be displayed.

Grs Transaction 200.00

27 - Desired Blend Ratio

The desired blend ratio of the product requested will be displayed.

Desired 25.0% of Batch

22 - Gross @ Standard Temperature Volume

The gross @ standard temperature compensated volume that is currently being loaded of the product requested will be displayed.

Gst Transaction 198.54

23 - Net Transaction

The net volume that is currently being loaded of the product requested will be displayed.

Net Transaction 200.72

Section III - Dynamic Displays

Dynamic Display Reference (Recipe)

00 - Recipe Name

The programmed name for the recipe requested will be displayed.

Recipe 01 Midgrade

01 - Raw Non-resettable Volumes

The raw non-resettable total for the recipe requested will be displayed.

Raw Total 000005236

02 - Gross Non-resettable Volumes

The gross non-resettable total for the recipe requested will be displayed.

Grs Total 000005231

03 - Gross @ Standard Temperature Non-resettable Volumes

The gross at standard temperature non-resettable total for the recipe selected will be displayed.

Gst Total 000005221

04 - Net Non-resettable Volumes

The net non-resettable total for the recipe selected will be displayed.

Net Total 000005223

05 - Mass Non-resettable Totals

The mass non-resettable total for the product requested will be displayed.

Mas Total 000033924

Section III - Dynamic Displays

Dynamic Display Reference (Batch)

00 - Product Delivered

The product delivered for the batch requested will be displayed.

Recipe 01	Midgrade
-----------	----------

01 - Raw Batch Volume

The raw total for the recipe requested for that batch will be displayed.

Raw Batch	1000.22
-----------	---------

02 - Gross Batch Volume

The gross total for the recipe requested for that batch will be displayed.

Grs Batch	1000.22
-----------	---------

03 - Gross at Standard Temperature Batch Volume

The gross at standard temperature batch total for the recipe requested for that batch will be displayed.

Gst Batch	0.00
-----------	------

04 - Net Batch Volume

The net total for the recipe requested for that batch will be displayed.

Net Batch	0.00
-----------	------

05 - Mass Batch Totals

The mass total for the recipe requested for that batch will be displayed.

Mass Batch	3244.98
------------	---------

06 - Raw Batch Volume (Product 1)

The raw total for product 1 of the recipe requested for that batch will be displayed.

Regular Raw	499.97
-------------	--------

Regular is the programmed name for product 1.

07 - Gross Batch Volume (Product 1)

The gross total for product 1 of the recipe requested for that batch will be displayed.

Regular Grs	499.97
-------------	--------

08 - Gross at Standard Temperature Batch Volume (Product 1)

The gross at standard temperature total for product 1 of the recipe requested for that batch will be displayed.

Regular Gst	499.95
-------------	--------

09 - Net Batch Volume (Product 1)

The net total for product 1 of the recipe requested for that batch will be displayed.

Regular Net	0.00
-------------	------

Section III - Dynamic Displays

10 - Mass Batch Totals (Product 1)

The mass total for product 1 of the recipe requested for that batch will be displayed.

Regular Mas	0.00
-------------	------

15 - Mass Batch Totals (Product 2)

The mass total for product 2 of the recipe requested for that batch will be displayed.

Premium Mas	0.00
-------------	------

11 - Raw Batch Volume (Product 2)

The raw total for product 2 of the recipe requested for that batch will be displayed.

Premium Raw	500.25
-------------	--------

16 - Raw Batch Volume (Product 3)

The raw total for product 3 of the recipe requested for that batch will be displayed.

Ethanol Raw	199.68
-------------	--------

Premium is the programmed name for product 2.

Ethanol is the programmed name for product 3.

12 - Gross Batch Volume (Product 2)

The gross total for product 2 of the recipe requested for that batch will be displayed.

Premium Grs	500.25
-------------	--------

17 - Gross Batch Volume (Product 3)

The gross total for product 3 of the recipe requested for that batch will be displayed.

Ethanol Grs	199.68
-------------	--------

13 - Gross at Standard Temperature Batch Volume (Product 2)

The gross at standard temperature total for product 2 of the recipe requested for that batch will be displayed.

Premium Gst	500.23
-------------	--------

18 - Gross at Standard Temperature Batch Volume (Product 3)

The gross at standard temperature total for product 3 of the recipe requested for that batch will be displayed.

Ethanol Gst	199.67
-------------	--------

14 - Net Batch Volume (Product 2)

The net total for product 2 of the recipe requested for that batch will be displayed.

Premium Net	0.00
-------------	------

19 - Net Batch Volume (Product 3)

The net total for product 3 of the recipe requested for that batch will be displayed.

Ethanol Net	0.00
-------------	------

Section III - Dynamic Displays

20 - Mass Batch Totals (Product 3)

The mass total for product 3 of the recipe requested for that batch will be displayed.

Ethanol	Mas	0.00
---------	-----	------

21 - Raw Batch Volume (Product 4)

The raw total for product 4 of the recipe requested for that batch will be displayed.

MTBE	Raw	199.51
------	-----	--------

MTBE is the programmed name for product 4.

22 - Gross Batch Volume (Product 4)

The gross total for product 4 of the recipe requested for that batch will be displayed.

MTBE	Grs	199.51
------	-----	--------

23 - Gross at Standard Temperature Batch Volume (Product 4)

The gross at standard temperature total for product 4 of the recipe requested for that batch will be displayed.

MTBE	Gst	199.50
------	-----	--------

24 - Net Batch Volume (Product 4)

The net total for product 4 of the recipe requested for that batch will be displayed.

MTBE	Net	0.00
------	-----	------

25 - Mass Batch Totals (Product 4)

The mass total for product 4 of the recipe requested for that batch will be displayed.

MTBE	Mas	0.00
------	-----	------

26 - Load Average Temperature (Recipe)

The load average temperature for the recipe requested for that batch will be displayed.

Recipe Ld Temp	+063.8°F
----------------	----------

27 - Load Average Temperature (Product 1)

The load average temperature for product 1 of the recipe requested for that batch will be displayed.

Regular Ld Temp	+086.3°F
-----------------	----------

28 - Load Average Temperature (Product 2)

The load average temperature for product 2 of the recipe requested for that batch will be displayed.

Premium Tmp Lav	+041.3°F
-----------------	----------

29 - Load Average Temperature (Product 3)

The load average temperature for product 3 of the recipe requested for that batch will be displayed.

Ethanol Tmp Lav	+062.5°F
-----------------	----------

30 - Load Average Temperature (Product 4)

The load average temperature for product 4 of the recipe requested for that batch will be displayed.

MTBE Tmp Lav	+063.5°F
--------------	----------

Section III - Dynamic Displays

31 - Recipe Load Average Density

The load average density of the recipe loaded for this batch will be displayed.

Recipe Avg den 0.0 Lb/F3

32 - Load Average Density (Product 1)

The load average density of product 1 for the batch will be displayed.

Regular Avg Den 45.6 Lb/F3

33 - Load Average Density (Product 2)

The load average density of product 2 for the batch will be displayed.

Premium Avg Den 44.9 Lb/F3

34 - Load Average Density (Product 3)

The load average density of product 3 for the batch will be displayed.

Ethanol Avg Den 00.0 Lb/F3

35 - Load Average Density (Product 4)

The load average density of product 4 for the batch will be displayed.

MTBE Avg Den 00.0 Lb/F3

36 - Additive 1 Batch Volume

The total for additive 1 of the recipe requested for that batch will be displayed.

Add 1 = 455.000 Oz

37 - Additive 2 Batch Volume

The total for additive 2 of the recipe requested for that batch will be displayed.

Add 2 = 350.000 Oz

38 - Additive 3 Batch Volume

The total for additive 3 of the recipe requested for that batch will be displayed.

Add 3 = 455.00 Oz

39 - Additive 4 Batch Volume

The total for additive 4 of the recipe requested for that batch will be displayed.

Add 4 = 350.000 Oz

40 - Additive 5 Batch Volume

The total for additive 5 of the recipe requested for that batch will be displayed.

Add 5 = 0.000 Oz

41 - Additive 6 Batch Volume

The total for additive 6 of the recipe requested for that batch will be displayed.

Add 6 = 0.000 Oz

42 - Additive 7 Batch Volume

The total for additive 7 of the recipe requested for that batch will be displayed.

Add 7 = 0.000 Oz

Section III - Dynamic Displays

43 - Additive 8 Batch Volume

The total for additive 8 of the recipe requested for that batch will be displayed.

Add 8 = 0.000 Oz

Dynamic Display Reference (Transaction Summary)

00 - Raw Transaction Volume (Product 1)

The raw total for the last transaction will be displayed.

Regular Raw 800.24

01 - Gross Transaction Volume (Product 1)

The gross total for the last transaction will be displayed.

Regular Grs 800.24

02 - Gross at Standard Temperature Transaction Volume (Product 1)

The gross at standard temperature total for the last transaction will be displayed.

Regular Gst 0.00

03 - Net Transaction Volume (Product 1)

The net total for the last transaction will be displayed.

Regular Net N/A

04 - Mass Transaction Totals (Product 1)

The mass total for the last transaction will be displayed.

Regular Mas N/A

05 - Raw Transaction Volume (Product 2)

The raw total for the last transaction will be displayed.

Premium Raw 800.24

06 - Gross Transaction Volume (Product 2)

The gross total for the last transaction will be displayed.

Premium Grs 800.24

07 - Gross at Standard Temperature Transaction Volume (Product 2)

The gross at standard temperature total for the last transaction will be displayed.

Premium Gst 0.0

08 - Net Transaction Volume (Product 2)

The net total for the last transaction will be displayed.

Premium Net N/A

Section III - Dynamic Displays

09 - Mass Transaction Totals (Product 2)

The mass total for the last transaction will be displayed.

Premium Mas N/A

15 - Raw Transaction Volume (Product 4)

The raw total for the last transaction will be displayed.

MTBE Raw 800.24

10 - Raw Transaction Volume (Product 3)

The raw total for the last transaction will be displayed.

Ethanol Raw 800.24

16 - Gross Transaction Volume (Product 4)

The gross total for the last transaction will be displayed.

MTBE Grs 800.24

11 - Gross Transaction Volume (Product 3)

The gross total for the last transaction will be displayed.

Ethanol Grs 800.24

17 - Gross at Standard Temperature Transaction Volume (Product 4)

The gross at standard temperature total for the last transaction will be displayed.

MTBE Gst 0.00

12 - Gross at Standard Temperature Transaction Volume (Product 3)

The gross at standard temperature total for the last transaction will be displayed.

Ethanol Gst 0.00

18 - Net Transaction Volume (Product 4)

The net total for the last transaction will be displayed.

MTBE Net N/A

13 - Net Transaction Volume (Product 3)

The net total for the last transaction will be displayed.

Ethanol Net N/A

19 - Mass Transaction Totals (Product 4)

The mass total for the last transaction will be displayed.

MTBE Mas N/A

14 - Mass Transaction Totals (Product 3)

The mass total for the last transaction will be displayed.

Ethanol Mas N/A

20 - Additive Injector 1 Transaction Volume

The total for additive injector 1 for the last transaction will be displayed.

Injector 1 455.000 Oz

Section III - Dynamic Displays

21 - Additive Injector 2 Transaction Volume

The total for additive injector 2 for the last transaction will be displayed.

Injector 2	350.00 Oz
------------	-----------

22 - Additive Injector 3 Transaction Volume

The total for additive injector 3 for the last transaction will be displayed.

Injector 3	455.00 Oz
------------	-----------

23 - Additive Injector 4 Transaction Volume

The total for additive injector 4 for the last transaction will be displayed.

Injector 4	350.000 Oz
------------	------------

24 - Additive Injector 5 Transaction Volume

The total for additive injector 5 for the last transaction will be displayed.

Injector 5	0.000 Oz
------------	----------

25 - Additive Injector 6 Transaction Volume

The total for additive injector 6 for the last transaction will be displayed.

Injector 6	0.000 Oz
------------	----------

26 - Additive Injector 7 Transaction Volume

The total for additive injector 7 for the last transaction will be displayed.

Injector 7	0.000 Oz
------------	----------

27 - Additive Injector 8 Transaction Volume

The total for additive injector 8 for the last transaction will be displayed.

Injector 8	0.000 Oz
------------	----------

28 - Raw Transaction Volume

The raw total for the first recipe of the transaction will be displayed.

Raw Trans	500.77
-----------	--------

Note: If the same recipe is used more than once in a transaction, the totals will be summed over the transaction. (This note applies to all dynamic displays that follow (28 - ...)).

29 - Gross Transaction Volume

The gross total of the last transaction will be displayed.

Grs Trans	500.41
-----------	--------

30 - Gross at Standard Temperature Transaction Volume

The gross at standard temperature total for the last transaction will be displayed.

Gst Trans	499.42
-----------	--------

Section III - Dynamic Displays

31 - Gross at Standard Temperature and Pressure Transaction Volume

The gross at standard temperature and pressure total for the last transaction will be displayed.

Net Trans	499.56
------------------	---------------

32 - Mass Transaction Totals

The mass total for the last transaction will be displayed.

Mas Trans	3244.98
------------------	----------------

Note: The last five dynamic displays will be repeated up to six times if using six unique recipes for the transaction (five dynamic displays per unique recipe).

Section IV - Program Mode

Keypad Data Entry

All programming information is entered via the keypad or through communications. This document will describe information being entered via the keypad. The program codes for AccuLoad II-RBU are divided into 6 main directories and 9 subdirectories for each main directory except for the recipe directory which has 24 subdirectories, one for each recipe. The main directories are as follows:

1. System
2. Product 1
3. Product 2
4. Product 3
5. Product 4
6. Recipe

The nine subdirectories for each main directory are as follows:

Code	Description
000	Configuration Directory*
100	General Purpose Directory
200	Flow Control Directory
300	Volume Accuracy Directory
400	Temperature & Density Directory
500	Pressure Directory
600	Read Only Data Directory
700	Communications Directory
800	Inputs & Outputs Directory
900	Diagnostics Directory

Note: * Systems Directory only. Under special high-security, requires jumper on computer board to program.

These subdirectories are then subdivided into three sections; low security, high-security and special high-security. Under program protection are the codes that are low security items or those which do not affect volume accuracy such as: the status of the various alarms, accumulative totalizers, date and time and various other read only codes. The second digit of these codes will always be zero through three. The criteria for entering the Program Mode and changing a parameter under this protection will consist of the following:

1. The program contact is closed.
2. The access code for the AccuLoad II has been correctly entered.

The Weights and Measures codes, codes which are involved in volume accuracy are high-security codes. The second digit of these codes will always be four through seven. The criteria for entering the Program Mode and changing these codes will consist of the following:

1. The program contact is closed.
2. The Weights and Measures contact is closed.
3. The access code for the AccuLoad II has been correctly entered.

Note: These codes can be viewed while the Program Contact is closed but can not be changed.

Program codes that have a second digit of eight can be protected by either the program contact or by both the program contact and the Weights and Measures contact. The security requirements of these codes may vary under various Weights and Measures agencies' guidelines. The criteria for entering the Program Mode and changing these codes will vary depending on how code X40 is programmed, where X equals the subdirectory number of the codes (i.e., 440, 640 etc.).

Section IV - Program Mode

Under the special high-security mode of protection are codes whose use may be sensitive under various Weights and Measures agencies' guidelines or affect volume accuracy. The second digit of these codes will always be a nine. The criteria for entering the Special High-Security mode and programming the codes will consist of the following:

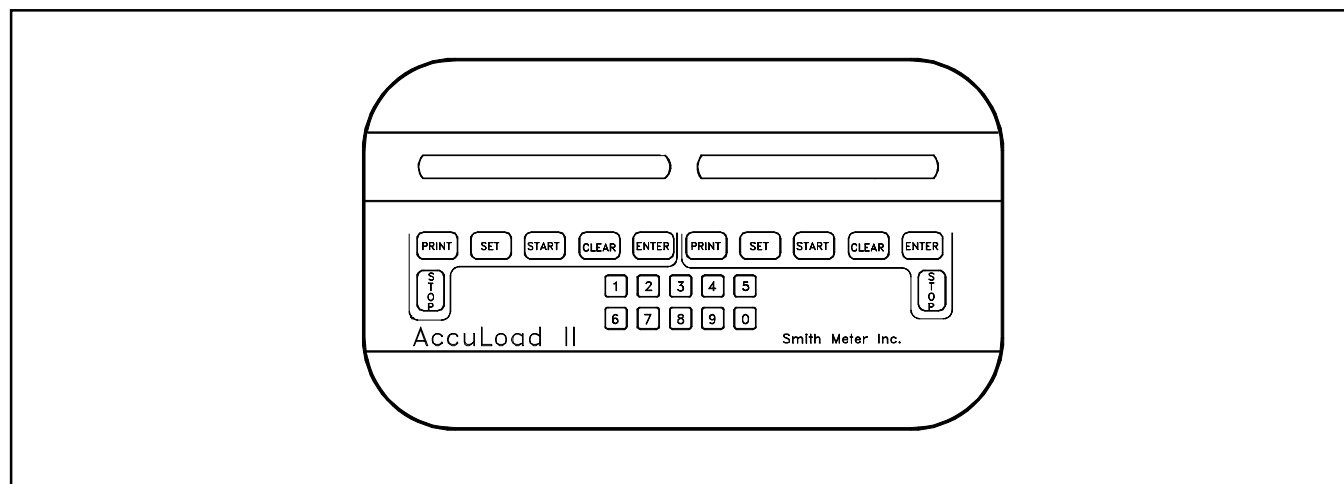
1. The program contact is closed.
2. The Weights and Measures contact is closed.
3. The access code for the AccuLoad II has been correctly entered.
4. A board level hardware jumper is installed between TP9 and TP10 on the computer board. These points are located on the lower left half of the board.

EXAMPLE 121

Where: 1 = Subdirectory
2 = Code Protection
1 = Number

The pushbuttons on the keypad perform the following functions while the instrument is in the Program Mode:

'0' - '9'	Used to enter the access code, program codes and data entries.
'CLEAR'	Used for clearing incorrect entries, getting from a program code to the directory (i.e., code 105 to 100), for getting to an Exit point or used to stop the scrolling display.
'ENTER'	Used to enter the Program Mode security access code, to enter the subdirectory, to enter program data and for exiting the Program Mode.
'START'	Not used in the Program Mode.
'SET'	Used for stepping through the directories, subdirectories and the program codes in sequence.
'PRINT'	Used for Help Messages.
'STOP'	Not used in the Program Mode.



Section IV - Program Mode

Entry to Main Directories

1. Close the Program Mode contact (unless already permanently wired closed). This will provide the first step for access to program codes with a second digit of zero through three.

Note: *Weights & Measures codes can be viewed but not changed unless the Weights and Measures contact is also closed either before entry into Program Mode or while in the Program Mode.*

Left display:

Smith Ready 1:10:31

Right display:

AccuLoad II-RBU

2. Press "ENTER", twice. This clears the display.

Left display:

Right display:

Enter Access Code

3. Enter the four digit access code ("0000" preset at factory). For security any digit entered will be displayed as an "X".

Left display:

XXXX

Right display:

Enter Access Code

4. Press "ENTER". This checks for the proper access code. If it is correct, the following will be displayed.

Left display:

Program Mode-Critical=ON

Right display:

Program Mode

This is where the operator selects whether he wants the critical messages that are available in the Program Mode to be displayed if an attempt to program a code that would cause a conflict with another code that is already programmed is made.

If the critical messages are not to be displayed, press "ENTER". This will toggle the critical messages to "NO".

Left display:

Program Mode-Critical=NO

Right display:

Program Mode

The critical messages will not be displayed when programming the instrument.

5. Press "SET" to enter into the main directory, the following will be displayed:

Left display:

System Directories

Right display:

Program Mode

Note: *If an incorrect access code was entered in step 3, the following prompt will appear:*

Section IV - Program Mode

Left display:

**** Error Press Clear ****

Right display:

Enter Access Code

Press "CLEAR" the display will return to "READY".

Left display:

Smith 1 Ready 1:10:31

Right display:

AccuLoad II-RBU

Repeat Steps 2, 3 and 4 to re-enter the Program Mode.

Once in the main directories the operator can step through them until the directory required is reached. To step through the main directories the following procedure should be used:

1. The following prompt is displayed when entry is made into the main directories:

Left display:

System Directories

Right display:

Program Mode

2. Press "SET" and the second main directory will be displayed:

Left display:

Product 1 Directories

Right display:

Program Mode

3. Press "SET" again and the next main directory will be displayed:

Left display:

Product 2 Directories

Right display:

Program Mode

4. When the main directory required is reached, press "ENTER" and the following prompt will be displayed:

Left display:

Enter Dir or Program #

Right display:

Product 2 Directory

Section IV - Program Mode

Program Subdirectory Selection

Once in the Program Mode of the main directory the subdirectory can be accessed either by their three digit code or by pressing "SET" twice, which will enter the instrument into the first program subdirectory. The other directories can then be stepped through sequentially by continuing to press "SET".

Specific Subdirectory Selection

To enter the directory using its three digit program code, the following steps must be used:

1. The following prompt is displayed on the left display when entry is made into the Program Mode. The right-hand display will display the directory you are working in and is not shown in the following procedures.

Enter Dir or Program #

2. Enter the subdirectory number required (i.e., 200).

Enter Dir or Program 200

Note: If an error is made when entering the number of the directory required, the "CLEAR" button can be pressed to clear the wrong number and a new number can then be entered.

3. Press "ENTER".

200 Flow Control Dir

4. Press "CLEAR" to get to the exit prompt.

Press Enter to Exit Dirs

5. Press "CLEAR" again to get to the directory entry prompt.

Enter Dir or Program #

6. Enter the new directory number (i.e., 400).

Enter Dir or Program 400

7. Press "ENTER".

400 Temp & Density Dir

Sequential Subdirectory Selection

To enter the subdirectory and use the "SET" button to sequentially step through the subdirectories, the following steps must be observed:

1. The following prompt is displayed when entry is made into one of the main directories:

Enter Dir or Program #

2. Enter the subdirectory number required (i.e., 100).

Enter Dir or Program 100

Note: If an error is made when entering the number of the directory required, the "CLEAR" button can be pressed to clear the wrong number and a new number can then be entered.

3. Press "ENTER" and the first subdirectory will be displayed:

100 General Purpose Dir

4. Press "SET" and the second subdirectory will be displayed:

200 Flow Control Dir

5. Press "SET" again and the third subdirectory will be displayed:

300 Volume Accuracy Directory

Repeat step 5 until the subdirectory required is reached.

Section IV - Program Mode

Exiting A Subdirectory

To exit a subdirectory and to enter the next subdirectory, follow the steps listed below:

1. From the last program code in the subdirectory.

```
180 Gasohol = Prod Msg
```

2. Press "SET".

```
Press Enter to Exit Dir
```

3. Press "ENTER".

```
200 Flow Control Dir
```

Program Code Selection

Once in the Program Mode, the codes can be accessed either by their three digit number, going to the subdirectories and then into the code using the second and third digits, or sequentially once in the program codes.

Note: Weights & Measures codes can be viewed but not changed unless the Weights and Measures contact was closed before entry into Program Mode.

1. From entry into the Program Mode.

```
Enter Dir or Program #
```

2. Enter the desired program code using the keypad (i.e., 111).

```
Enter Dir or Program 111
```

3. Press "ENTER".

```
111 00 Dynamic Time-Out
```

4. If another code is required, press "CLEAR" the following display will appear:

```
100 General Purpose Dir
```

5. Press "CLEAR" again.

```
Press Enter to Exit Dirs
```

6. Press "CLEAR" again.

```
Enter Dir or Program #
```

7. Enter the new code (i.e., 201).

```
Enter Dir or Program 201
```

8. Press "ENTER".

```
201 Low Flow Amount
```

Note: If a code that is currently unassigned (e.g., "135" Systems Directory) is entered, the following prompt will appear:

Second and Third Digit Selection

If it is desired to review or change a code that is in the same directory that has been accessed, the following steps should be observed:

1. From the subdirectory.

```
200 Flow Control Dir
```

2. Press "ENTER".

```
Enter Program #
```

3. Enter the second and third digit of the code required (i.e., 0110).

```
Enter Program 01
```

Section IV - Program Mode

4. Press "ENTER".

201 Low Flow Amount

5. To access another code in the same directory, press "CLEAR" to get back to the directory.

200 Flow Control Dir

6. Press "ENTER".

200 Enter Program #

7. Enter the second and third digit of the code required (i.e., 09).

200 Enter Program 09

8. Press "ENTER".

209 Stop/Start Delay

Sequential Code Selection

If it is desired to review the codes in numerical sequence, press "SET" to advance by one code rather than entering the program code.

1. From entry into the Program Mode

106 No Alarms Present

2. Press "SET" ...

107 No Alarms Present

3. Press "SET" ...

108 No Alarms Present

4. Press "SET" again ...

109 17:24 Mil Time

5. Press "SET" again ...

110 08-23-92 Date

Etc...

Note: When using this method of stepping through the program codes, the instrument will skip invalid codes and only display the valid codes.

EXAMPLE:

111 00 Dynamic Time-Out

Press "SET".

140 0 Weights & Measures

Note: If "SET" is pressed and held AccuLoad II will scroll through the program codes.

Section IV - Program Mode

Exiting Program Mode

To return to the Run Mode, either open the Program Mode contact and press "SET" or follow the steps listed below. The steps are broken down into two divisions, the first being if in the main directories one or two and the second being if in the last main directory three.

Main Directories


If exiting from the main directory (Recipe Directory) the following steps should be followed:

1. From the program code or subdirectory.



101 0 Recipe Enabled

2. Press "CLEAR".



Recipe 1 Dir Midgrade 2

3. Press "CLEAR".



Press Enter to Exit Dirs


4. Press "ENTER".

Left display:



Press Enter to Exit

Right display:



Program Mode

5. Press "ENTER".

Left display:



Smith Ready 17:38:33

Right display:



AccuLoad II-RBU

Section IV - Program Mode

Changing Program Code Parameters

The program codes represent parameters that can be changed to either enhance the performance of AccuLoad II or can be changed because of application changes. There are three types of parameters in AccuLoad II: the codes that require numerical data, the codes where choices have to be made as to option 1, 2, 3 etc., and the codes where alphanumeric data is entered. Once a code has been selected, its programmed contents can be changed by entering a new value through the keypad.

Numeric Data

The numeric data is entered into the program codes via the keypad just as numbers are entered into a calculator. The number of digits for each entry is listed in the Programming Workbook (Bulletin AB06034) as well as the Operator Reference (Bulletin MN06066L).

EXAMPLE: To change the parameters for the high flow rate for product 1.

Note: Only the left display is shown in the following examples as the right display will indicate the directory that you are working in.

1. View the contents of code 205 via one of the methods previously described.

205 0600 High Flow Rate

2. To specify a new First High Flow Rate enter the rate required (i.e., 450).

205 0600 High Flow R 450

3. Press "ENTER" to store the new value, the display will read as follows while data is being stored:

205 ** STORING DATA **

4. After the data is stored the display will then read:

205 0450 High Flow Rate

Note: If an incorrect value is entered on the screen and has not been stored, the value can be cleared by pressing "CLEAR" twice and a new value can then be entered.

Options

The codes that have a number of options (i.e., 1, 2, 3, etc.) are changed by entering the number that correlates to the option that is required for the application.

EXAMPLE: To change the parameters for the transaction control (Systems Directory):

1. View the contents of code 301 via one of the methods previously described.

301 0 Local Tray Switch

2. To specify a different option, enter the new one digit number of the option desired (i.e., 1).

301 0 Local Tray Switch1

3. Press "ENTER" to store the new option, the display will read ** STORING DATA ** while the new option is being stored.

301 ** STORING DATA **

4. After the data is stored the display will then read:

301 1 Print Key

Note: An entry other than "0" through "3" will result in an error message being scrolled across the display "Fatal: Entry is out of specified range". Press "CLEAR" to stop the scrolling message and to return to the original display. Press "CLEAR" again to clear the number that was in error and then retry.

Section IV - Program Mode

Alphanumeric Data

The codes that require alphanumeric data entered in them are the codes that will display Product Messages, Prompt Messages or Permissive Messages on the displays of AccuLoad II or will provide information to be printed out on the Bill of Lading Emulation. When adding or changing information in these alphanumeric program codes, the keys listed below perform the following functions:

Key	Description
"ENTER"	Enters the data into the instrument's memory.
"1"	Positions the cursor so that it is pointing at the character to be changed or added.
"2"	Increments the character one position.
"3"	Decrements the character one position.
"4"	Increments the character from one block of characters to another. An example of this is changing from uppercase letters to lowercase letters. The blocks of characters that are available in AccuLoad II are as follows:

- A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
- a b c d e f g h i j k l m n o p q r s t u v w x y z
- 0 1 2 3 4 5 6 7 8 9
- + ! " # \$ % & ' () , - . / : ; < = > @ [^ _ '{ } ° ? * space

1. View the contents of code 180 (Product Directory) via one of the methods previously described.

180 = Prod Msg

2. To change/add information press "1", this will position the cursor so that it is pointing to the position to be changed.

180 < = Prod Msg

3. To add the description "Unleaded" as the Product message press "4", this will advance the blocks of characters to "A".

180 A< = Prod Msg

4. Press "4" to advance the blocks of characters to "a".

180 a< = Prod Msg

5. Press "3" to decrement the character.

180 z = Prod Msg

6. Repeat step 5 until the desired letter is displayed "U".

180 U< = Prod Msg

7. Press "1" to move the cursor to the next position.

180 U < = Prod Msg

8. Press "4" until the group of characters that is desired is displayed (i.e., 0).

180 U0< = Prod Msg

9. Press "3" to decrement the character.

180 Uz< = Prod Msg

10. Repeat step 9 until the desired letter is displayed "n".

180 Un< = Prod Msg

Section IV - Program Mode

11. Press "1" to move the cursor to the next position.

```
180 Un < = Prod Msg
```

12. Press "4" until the group of characters that is required is displayed (i.e., a).

```
180 Una< = Prod Msg
```

13. Press "2" to increment the character.

```
180 Unb< = Prod Msg
```

14. Repeat step 13 until the desired letter is displayed "l".

```
180 Unl< = Prod Msg
```

15. Continue advancing and changing/adding characters until the desired message is displayed.

```
180 Unleaded = Prod Msg
```

16. Advance the arrow (Press "1") until only the message is displayed. The arrow will wrap if "1" is continued to be pressed.

```
180 U<leaded = Prod Msg
```

17. Press "ENTER" to store the message, the display will read as follows while the data is being stored.

```
180 ** STORING DATA **
```

18. After the data is stored the display will then read:

```
180 Unleaded = Prod Msg
```

Note: If "ENTER" is not pressed the data is not stored in memory and will revert to the previous display.

Section IV - Program Mode

Viewing the Help Messages

The AccuLoad II 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 by simply pressing the "PRINT" key while in the Program Mode. The "Help Messages" will scroll across the left display when the "PRINT" key is pressed. The message will continue to scroll across the display until the "CLEAR" key is pressed.

EXAMPLE: To view the help message for program code 301 (Transaction Control - Systems Directory).

1. View the contents of code 301 via one of the methods previously described.

```
301 0 Local Tray Switch
```

2. To view the "Help Message" press the "PRINT" key. The message will scroll across the display.

```
Select method of Transaction
```

```
Control: Remote, Local Print
```

3. To return to the program code press the "CLEAR" key.

```
301 0 Local Tray Switch
```

Note: A description of the contents and range of entries for the individual codes can be found in *Operator Reference Manual (Bulletin MN06066L)*.

Section V - Program Codes

System Configuration Directory

Code	Description
000	System Configuration Directory
001	Number of Products
002	Number of Additive Injectors
003	A/C Output Relay 1 Terminals 89 & 90
004	A/C Output Relay 2 Terminals 91 & 92
005	A/C Output Relay 3 Terminals 93 & 94
006	A/C Output Relay 4 Terminals 95 & 96
007	A/C Output Relay 5 Terminals 87 & 88
008	A/C Output Relay 6 Terminals 84 & 85
009	A/C Output Relay 7 Terminals 124 & 125
010	A/C Output Relay 8 Terminals 126 & 127
011	A/C Output Relay 9 Terminals 128 & 129
012	A/C Output Relay 10 Terminals 130 & 131
013	A/C Output Relay 11 Terminals 121 & 122
014	A/C Output Relay 12 Terminals 119 & 120
015	D/C Output Relay 1 Terminals 9 & 10 (w/o Quad OPV), Terminals 11 & 10 (on/Quad OPV)
016	D/C Output Relay 2 Terminals 57 & 58 (on Quad OPV), Terminals 15 & 14 (on/Quad OPV)
017	D/C Output Relay 3 Terminals 13 & 12 on Quad OPV
018	D/C Output Relay 4 Terminals 17 & 16 on Quad OPV
019	A/C Input 1 Terminals 98 & 101
020	A/C Input 2 Terminals 99 & 101
021	A/C Input 3 Terminals 100 & 101
022	A/C Input 4 Terminals 103 & 105
023	A/C Input 5 Terminals 104 & 105
024	A/C Input 6 Terminals 73 & 74
025	A/C Input 7 Terminals 106 & 109
026	A/C Input 8 Terminals 107 & 109
027	A/C Input 9 Terminals 108 & 109

Section V - Program Codes

Code	Description
028	A/C Input 10 Terminals 110 & 112
029	A/C Input 11 Terminals 111 & 112
030	A/C Input 12 Terminals 75 & 76
031	RTD #1 Terminals 14, 15, 16, & 17
032	RTD #2 Terminals 62, 63, 64 & 65
033	4-20 Channel #1 Terminals 19 & 20
034	4-20 Channel #2 Terminals 22 & 23
035	4-20 Channel #3 Terminals 68 & 69
036	4-20 Channel #4 Terminals 71 & 72
037	Additive Injector #1 Plumbing
038	Additive Injector #2 Plumbing
039	Additive Injector #3 Plumbing
040	Additive Injector #4 Plumbing
041	Additive Injector #5 Plumbing
042	Additive Injector #6 Plumbing
043	Additive Injector #7 Plumbing
044	Additive Injector #8 Plumbing
045-089	Unassigned at Present
090	Program the Input/Output Configuration
091	Print Configuration
092-099	Unassigned at Present
100	System General Purpose Directory
101	System Alarm Check/Reset
102	Product 1 Alarm Check/Reset
103	Product 2 Alarm Check/Reset
104	Product 3 Alarm Check/Reset
105	Product 4 Alarm Check/Reset
106	Recipe Alarms Check/Reset
107	Transaction Alarms
108	Ready Mode Alarms
109	Set Time

Section V - Program Codes

Code	Description
110	Set Date
111	Dynamic Display Time-out
112-139	Unassigned at Present
140	Protection of Program Codes 180-189
141	Local Mode Alarm Clearing
142	Decimal or Comma Selection
143	Alarm Relay
144	Run & Ready Mode Initialization <i>Note: This code applies to RBU-05 and above firmware.</i>
145	Ready/Run Mode Clearable Alarms Selection <i>Note: This code applies to RBU-08 and above firmware.</i>
146-179	Unassigned at Present
180	Programming Access Code
181	Transaction Security ID
182	Transaction Security Prompt Message
183	Auto Reset Timer
184	Ready Mode Message
185	Run & Ready Mode Customized Display <i>Note: This code applies to RBU-05 and above firmware.</i>
186	Power Failure Alarm <i>Note: This code applies to RBU-07 and above firmware.</i>
187-199	Unassigned at Present
200	System Flow Control Directory
201	Low Flow Start Volume
202	Low Flow Start Percentage
203	Low Flow Start Rate
204	Low Flow Start
205	System First High Flow Rate
206	System Second High Flow Rate
207	System Overrun Alarm Limit
208	Zero Flow Timer
209	Start Delay After Stop
210	Pump Relay Time Delay

Section V - Program Codes

Code	Description
211	Valve Delay to Open
212	Zero Flow Alarm <i>Note: This code applies to RBU-08 and above firmware.</i>
213-239	Unassigned at Present
240	Protection of Program Codes 280-289
241-279	Unassigned at Present
280	Clean Line Product
281	Clean Line Volume
282	Clean Line Alarm Limit
283	Ratio Adjustment Factor
284	Ratio Adjustment Timer
285-299	Unassigned at Present
300	System Volume Accuracy Directory
301	Transaction Control
302	Maximum Preset Volume
303	Minimum Preset Volume
304	Auto Preset
305	Auto Preset Increment
306	Blank Downcounter
307	Volumes for Local Storage
308-339	Unassigned at Present
340	Protection of Program Codes 380-389
341	Display Units
342	Corrected Display Indicator
343	Display Resolution
344	Proving Modes
345	Proving Output
346	Proving Output Units
347	Recipes Per Transaction
348	Blend Tolerance (Percentage)
349	Blend Tolerance (Volume)

Section V - Program Codes

Code	Description
350	Combinated Pulse Output <i>Note: This code applies to RBU-02 and above firmware.</i>
351	Combinated Pulse Output Resolution <i>Note: This code applies to RBU-02 and above firmware.</i>
352	Combinated Pulse Output Maximum Frequency <i>Note: This code applies to RBU-02 and above firmware.</i>
353	Resolution of Volumetric Totals on Printed Report <i>Note: This code applies to RBU-08 and above firmware.</i>
354	Number of Batches Per Transaction <i>Note: This code applies to RBU-11 and above firmware.</i>
354-389	Unassigned at Present
390	Input Pulse Type
391-399	Unassigned at Present
400	System Temperature & Density Directory
401-439	Unassigned at Present
440	Protection of Program Codes 480-489
441	Temperature Units
442	Reference Temperature
443	Density Units
444	Volume/Mass Conversion
445	Mass Units
446-499	Unassigned at Present
500	System Pressure Directory
501-539	Unassigned at Present
540	Protection of Program Codes 580-589
541	Pressure Units
542-599	Unassigned at Present
600	System Read Only Directory
601	Injector 1 Non-resettable Volume
602	Injector 2 Non-resettable Volume
603	Injector 3 Non-resettable Volume
604	Injector 4 Non-resettable Volume
605	Injector 5 Non-resettable Volume

Section V - Program Codes

Code	Description
606	Injector 6 Non-resettable Volume
607	Injector 7 Non-resettable Volume
608	Injector 8 Non-resettable Volume
609	Local Storage Transactions
610-639	Unassigned at Present
640	Protection of Program Codes 680-689
641-699	Unassigned at Present
700	System Communication Directory
701	EIA-232 Communication Type
702	EIA-232 Communication Control
703	EIA-232 Baud Rate
704	EIA-232 Data Format
705	EIA-485 Communication Type
706	EIA-485 Communication Control
707	EIA-485 Baud Rate
708	EIA-485 Data Format
709	Communication Address
710	Printer Output Message #1
711	Printer Output Message #2
712	Printer Output Message #3
713	Printer Output Message #4
714	Printer Output Message #5
715	Prompt Message #1
716	Prompt Message #2
717	Prompt Message #3
718	Prompt Message #4
719	Prompt Message #5
720	Meter ID
721	Print Summary
722	Print Volumes
723	Report Summary HM Classification

Section V - Program Codes

Code	Description
724	Delivery Report Display <i>Note: This code applies to RBU-01 and above firmware.</i>
725-739	Unassigned at Present
740	Protection of Program Codes 780-789
741	Communication Link Programming
742	Communications Time-out
743	Communications Alarm Mode
744	Prompt Time-out
745	Prompt Data Entry #1
746	Prompt Data Entry #2
747	Prompt Data Entry #3
748	Prompt Data Entry #4
749	Prompt Data Entry #5
750	Start Key Enable/Disable
751	Shared Printer Out Alarm
752	Shared Printer Out Timer
753	EIA-232 Printer Security
754	EIA-485 Printer Security
755	Shared Printer Security Alarm
756	Select Volumes to Print
757	Select Load Parameters to Print
758	Select the Additive Volumes to Print
759	Define Delivery Report <i>Note: This code applies to RBU-01 and above firmware.</i>
760-779	Unassigned at Present
780	Number of Prompts
781	Print Transaction
782	Prompts Printed
783-789	Unassigned at Present
790	High-Security Communications Programming
791-799	Unassigned at Present

Section V - Program Codes

Code	Description
800	System Input/Output Directory
801	Additive Injector Stop
802	Additive Injector Stop Volume
803	Additive Injector Output
804	Manual/Auto Additive Injector Selection
805	Restart After Valve Power Restored
806	Valve Power Sense Permissive Message
807	Permissive #1
808	Permissive #1 Message
809	Restart After Permissive #1 Met
810	Prompt Message
811	Permissive #2
812	Permissive #2 Message
813	Restart After Permissive #2 Met
814	Additive #1 Message
815	Additive #2 Message
816	Additive #3 Message
817	Additive #4 Message
818	Additive #5 Message
819	Additive #6 Message
820	Additive #7 Message
821	Additive #8 Message
822-839	Unassigned at Present
840	Protection of Program Codes 880-889
841	Additive Injector #1 Feedback
842	Additive Injector #1 Volume per Cycle
843	Additive Injector #2 Feedback
844	Additive Injector #2 Volume per Cycle
845	Additive Injector #3 Feedback
846	Additive Injector #3 Volume per Cycle
847	Additive Injector #4 Feedback

Section V - Program Codes

Code	Description
848	Additive Injector #4 Volume per Cycle
849	Additive Injector #5 Feedback
850	Additive Injector #5 Volume per Cycle
851	Additive Injector #6 Feedback
852	Additive Injector #6 Volume per Cycle
853	Additive Injector #7 Feedback
854	Additive Injector #7 Volume per Cycle
855	Additive Injector #8 Feedback
856	Additive Injector #8 Volume per Cycle
857	Injector Units
858	Additive Injector Conversion Factor
859	Additive Injector Feedback Errors
860	Injector #1 Feedback Delay
861	Injector #2 Feedback Delay
862	Injector #3 Feedback Delay
863	Injector #4 Feedback Delay
864	Injector #5 Feedback Delay
865	Injector #6 Feedback Delay
866	Injector #7 Feedback Delay
867	Injector #8 Feedback Delay
868	Minimum Units 4-20 Channel #1
869	Maximum Units 4-20 Channel #1
870	Minimum Units 4-20 Channel #2
871	Maximum Units 4-20 Channel #2
872	Minimum Units 4-20 Channel #3
873	Maximum Units 4-20 Channel #3
874	Minimum Units 4-20 Channel #4
875	Maximum Units 4-20 Channel #4
876-899	Unassigned at Present

Section V - Program Codes

Code	Description
900	System Diagnostic Directory
901	Diagnostic Display Test
902	Diagnostic Keypad Test
903	Diagnostic RTD #1 & #2 Test
904	Diagnostic 4-20 mA Channel 1 & 3
905	Diagnostic 4-20 mA Channel 2 & 4
906	Diagnostic Internal Temperature
907	Diagnostic Power Supply Test
908	Diagnostic Firmware Version
909	Diagnostic AccuLoad II Model Number
910	Diagnostic ACM Model Number
911	Diagnostic System Messages
912	Diagnostic Calibration Event Counter <i>Note: This code applies to RBU-10 and above firmware.</i>
913	Diagnostic Configuration Event Counter <i>Note: This code applies to RBU-10 and above firmware.</i>
914-939	Unassigned at Present
940	Protection of Program Codes 980-989
941	Diagnostic Communication Test - EIA-232 No Echo Back
942	Diagnostic Communication Test - EIA-232 With Echo
943	Diagnostic Communication Test - EIA-485 No Echo Back
944	Diagnostic Communication Test - EIA-485 With Echo
945	Diagnostic Meter Pulse Channel 1 Active
946	Diagnostic Meter Pulse Channel 1 Contact
947	Diagnostic Meter Pulse Channel 2 Active
948	Diagnostic Meter Pulse Channel 2 Contact
949	Diagnostic Meter Pulse Channel 3 Active
950	Diagnostic Meter Pulse Channel 3 Contact
951	Diagnostic Meter Pulse Channel 4 Active
952	Diagnostic Meter Pulse Channel 4 Contact
953	Diagnostic Contact Input Test
954	Diagnostic High-Speed Prover Product 1

Section V - Program Codes

Code	Description
955	Diagnostic High-Speed Prover Product 2
956	Diagnostic High-Speed Prover Product 3
957	Diagnostic High-Speed Prover Product 4
958	Diagnostic Pulse Out 1 Test
959	Diagnostic Pulse Out 2 Test
960	Diagnostic Pulse Out 3 Test
961	Diagnostic Pulse Out 4 Test
962	Clear Local Storage
963	Diagnostic Contact Output
964	Clear Configurable Report <i>Note: This code applies to RBU-04 and above firmware.</i>
965-990	Unassigned at Present
991	Diagnostic Relay Cycle Test
992	Diagnostic Ram Test
993	Diagnostic Power-up Diagnostics
994	Diagnostic See Operator Reference Manual
995	Diagnostic See Operator Reference Manual
996	Diagnostic Watchdog
997	Diagnostic Relay Select Test #1
998	Diagnostic Relay Select Test #2
999	Diagnostic See Operator Reference Manual

Section V - Program Codes

Product Program Codes

Code	Description
100	Product General Purpose Directory
101-139	Unassigned at Present
140	Protection of Program Codes 180-189
141	Product Selection
142-179	Unassigned at Present
180	Product Message
181-199	Unassigned at Present
200	Product Flow Control Directory
201	Excess Flow Rate
202	Overrun Alarm Limit
203	Minimum Flow Rate
204	High Flow Rate
205	Flow Tolerance
206	Zero Flow Timer
207	First Trip Volume
208	Final (Second) Trip Volume
209	Final (Second) Trip Auto Adjust
210	Low Flow Rate Alarm Limit
211	PT/VF Time Delay
212-239	Unassigned at Present
240	Protection of Program Codes 280-289
241	Flow Control Valve Security
242-279	Unassigned at Present
280	Flow Adjustment Tolerance
281	Flow Adjustment Timer
282-299	Unassigned at Present
300	Product Volume Accuracy Directory
301	Minimum Batch Volume
302-339	Unassigned at Present
340	Protection of Program Codes 380-389

Section V - Program Codes

Code	Description
341	Flow Rate for Meter Factor #1
342	Meter Factor #1
343	Flow Rate for Meter Factor #2
344	Meter Factor #2
345	Flow Rate for Meter Factor #3
346	Meter Factor #3
347	Flow Rate for Meter Factor #4
348	Meter Factor #4
349	Meter Factor % Change/Deg.
350	Meter Factor Reference Temperature
351	Pulse Output
352	Pulse Resolution Output
353	Input Resolution
354	Dual Pulse Error Count
355	Dual Pulse Error Reset
356	Dual Pulse Flow Rate Cutoff
357-389	Unassigned at Present
390	Master Meter Factor
391	Linearized Factor Deviation
392	Meter Factor Variation
393	Transmitter Type
394-399	Unassigned at Present
400	Product Temperature & Density Directory
401-439	Unassigned at Present
440	Protection of Program Codes 480-489
441	API Table & Product
442	Reference Density
443	Low Temperature Alarm
444	High Temperature Alarm
445	Maintenance Temperature
446	Temperature Offset
447	Low Density Alarm

Section V - Program Codes

Code	Description
448	High Density Alarm
449-499	Unassigned at Present
500	Product Pressure Directory
501	Minimum Back Pressure Flow Rate Setting
502	Differential Pressure
503	Minimum Back Pressure Flow Rate Timer Setting
504	BP Reduction
505	Low Pressure Alarm
506	High Pressure Alarm
507-539	Unassigned at Present
540	Protection of Program Codes 580-589
541	Compressibility Factor
542	Vapor Pressure Calculation
543	Low Vapor (P1) Pressure
544	Low Product Vapor Pressure (P1) Temperature
545	Middle Vapor Pressure (P2)
546	Middle Product Vapor Pressure (P2) Temperature
547	High Vapor Pressure (P3)
548	High Product Vapor Pressure (P3) Temperature
549	Maintenance Pressure
550-599	Unassigned at Present
600	Product Read Only Directory
601	Raw Non-resettable Volume
602	Gross Non-resettable Volume
603	Gross at Standard Temp. Non-resettable Volume
604	Net Non-resettable Volume
605	Mass Non-resettable Total
606	Load Average Temperature
607	Load Average Pressure
608	Load Average Density
609	Load Average Meter Factor
610-639	Unassigned at Present

Section V - Program Codes

Code	Description
640	Protection of Program Codes 680-689
641-699	Unassigned at Present
700	Communications Directory
701	HM Classification for Printout
702	HM Classification for Printout
703	HM Classification for Printout
704	HM Classification for Printout
705-739	Unassigned at Present
740	Protection of Program Codes 780-789
741-799	Unassigned at Present
800	Product Inputs & Outputs Directory
801-839	Unassigned at Present
840	Protection of Program Codes 880-889
841-899	Unassigned at Present
900	Product Diagnostics Directory
901-939	Unassigned at Present
940	Protection of Program Codes 980-989
941-999	Unassigned at Present

Section V - Program Codes

Recipe Program Codes

Code	Description
__00	Blend Recipe #__ Directory
__01	Blend Recipe
__02	Blend Recipe Name
__03	Recipe Raw Non-resettable Volume
__04	Recipe Gross Non-resettable Volume
__05	Recipe Gross at Standard Temp. Non-resettable Volume
__06	Recipe Net Non-resettable Volume
__07	Recipe Mass Non-resettable Total
__08	HM Classification
__09	Minimum Preset
__10	Product #1's high 2nd high and low flow rates
__11	Product #2's high 2nd high and low flow rates
__12	Product #3's high 2nd high and low flow rates
__13	Product #4's high 2nd high and low flow rates
__14-__39	Unassigned at Present
__40	Protection of Program Codes __80 - __89
__41	Blend Preset Display
__42	Blend Deliver Display
__43	Product #1 Percentage
__44	Product #2 Percentage
__45	Product #3 Percentage
__46	Product #4 Percentage
__47	Product using Injector #1
__48	Product using Injector #2
__49	Product using Injector #3
__50	Product using Injector #4
__51	Product using Injector #5
__52	Product using Injector #6
__53	Product using Injector #7
__54	Product using Injector #8

Section V - Program Codes

Code	Description
__55	Recipe Correction Factor
__80	Clean Line Deduct
__81	Additive Injector Pulser No. 1
__82	Additive Injector Pulser No. 2
__83	Additive Injector Pulser No. 3
__84	Additive Injector Pulser No. 4
__85	Additive Injector Pulser No. 5
__86	Additive Injector Pulser No. 6
__87	Additive Injector Pulser No. 7
__88	Additive Injector Pulser No. 8

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Section VII - Related Publications

The following literature can be obtained from the Smith Meter Literature Department. Please reference the appropriate bulletin number and title when ordering.

Smith Meter Inc.
1602 Wagner Avenue
P.O. Box 10428
Erie, Pennsylvania 16514

AccuLoad II-RBU

Specifications	SS06017
Programming Workbook.....	AB06034
Installation.....	MN06064
Operator Guide	MN06065
Operator Reference.....	MN06066L
Communications.....	MN06069L

Revisions included in MN06065 Issue/Rev. 0.3 (8/97):

Added "Code 354 - Number of Batches Per Transaction" to System Directory
Converted manual from WordPerfect to Microsoft Word.

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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