



Table of Contents

Section 1 - Introduction	1
Product Description	1
How To Use This Manual	2
Before Beginning Operations	3
Section 2 - Operations	4
Run Mode	4
Keypad Functions	4
Overview	5
Meter Position Disabled/Not Installed	5
Remote Start/Stop	5
Quad OPV	6
Additive Monitoring	6
Master/Slave Communications (Rev. 13 and above firmware)	6
Additive Injector Selection	6
Stand-alone Mode	6
Standby Mode	7
Automated Proving Mode (Rev. 12 and above firmware)	8
Local Ticket Printer	10
Remote Ticket Printer	12
Section 3 - Dynamic Displays	13
Dynamic Displays	13
Section 4 - Program Mode	14
Keypad Functions	14
Entry to Dynamic Displays	14
Dynamic Display Reference (System)	15
00 - Time & Date	15
01 - Flow Rate (Units/Min)	15
02 - Flow Rate (Units/Hr)	16
03 - Meter Factor	16
04 - Temperature Correction	16
05 - Correction for Pressure on Liquid	16
06 - Current Product	16
07 - Temperature	16
08 - API	16
09 - Reference Density	16
10 - Relative Density	16
11 - Pressure and Vapor Pressure	16
12 - Density	17
13 - Valve Position	17
14 - Injector #1 Volume	17
15 - Injector #2 Volume	17
16 - Injector #3 Volume	17
17 - Injector #4 Volume	17
18 - Injector #5 Volume	17
19 - Injector #6 Volume	17
20 - Injector #7 Volume	17
21 - Input Module Status	17
22 - Last Power Failure	17
23 - Injector #1 Rate	17
24 - Injector #2 Rate	18
25 - Injector #3 Rate	18
26 - Injector #4 Rate	18
27 - Injector #5 Rate	18

28 - Injector #6 Rate	18
29 - Injector #7 Rate	18
50, 51, 52, 53, 54, 55 - Communications Diagnostics	18
Dynamic Display Reference (Products)	18
00 - Temperature	18
01 - API	18
02 - Reference Density	18
03 - Relative Density	19
04 - Pressure and Vapor Pressure	19
05 - Density	19
06 - Raw Non-resettable Totals	19
07 - Gross Non-resettable Totals	19
08 - Gross @ Standard Temperature Non-resettable Totals	19
09 - Net Non-resettable Totals	19
10 - Mass Non-resettable Totals	19
11 - Load Average Temperature	19
12 - Load Average Pressure	19
13 - Load Average Density	19
14 - Raw Volume	19
15 - Gross Volume	19
16 - Gross @ Standard Temperature Volume	20
17 - Net Transaction	20
18 - Mass Transaction	20
Dynamic Display Reference (Recipe)	20
00 - Raw Non-resettable Totals	20
01 - Gross Non-resettable Totals	20
02 - Gross @ Standard Temperature Non-resettable Totals	20
03 - Net Non-resettable Totals	20
04 - Mass Non-resettable Totals	20
Dynamic Display Reference (Batch)	20
00 - Batch Number	20
01 - Raw Batch Totals	20
02 - Gross Batch Totals	20
03 - Gross at Standard Temperature Batch Totals	20
04 - Net Batch Totals	21
05 - Mass Batch Totals	21
06 - Raw Batch Totals (Product 1)	21
07 - Gross Batch Totals (Product 1)	21
08 - Gross at Standard Temperature Batch Totals (Product 1)	21
09 - Net Batch Totals (Product 1)	21
10 - Mass Batch Totals (Product 1)	21
11 - Raw Batch Totals (Product 2)	21
12 - Gross Batch Totals (Product 2)	21
13 - Gross at Standard Temperature Batch Totals (Product 2)	21
14 - Net Batch Totals (Product 2)	21
15 - Mass Batch Totals (Product 2)	21
16 - Raw Batch Totals (Product 3)	22
17 - Gross Batch Totals (Product 3)	22
18 - Gross at Standard Temperature Batch Totals (Product 3)	22
19 - Net Batch Totals (Product 3)	22
20 - Mass Batch Totals (Product 3)	22
21 - Raw Batch Totals (Product 4)	22
22 - Gross Batch Totals (Product 4)	22
23 - Gross at Standard Temperature Batch Totals (Product 4)	22
24 - Net Batch Totals (Product 4)	22
25 - Mass Batch Totals (Product 4)	22

26 - Load Average Temperature (Recipe)	22
27 - Load Average Temperature (Product 1)	22
28 - Load Average Temperature (Product 2)	23
29 - Load Average Temperature (Product 3)	23
30 - Load Average Temperature (Product 4)	23
31 - Additive 1 Batch Totals	23
32 - Additive 2 Batch Totals	23
33 - Additive 3 Batch Totals	23
34 - Additive 4 Batch Totals	23
35 - Additive 5 Batch Totals	23
36 - Additive 6 Batch Totals	23
37 - Additive 7 Batch Totals	23
Dynamic Display Reference (Transaction Summary)	23
00 - Raw Transaction Totals (Product 1)	23
01 - Gross Transaction Totals (Product 1)	23
02 - Gross at Standard Temperature Transaction Totals (Product 1)	23
03 - Net Transaction Totals (Product 1)	24
04 - Mass Transaction Totals (Product 1)	24
05 - Raw Transaction Totals (Product 2)	24
06 - Gross Transaction Totals (Product 2)	24
07 - Gross at Standard Temperature Transaction Totals (Product 2)	24
08 - Net Transaction Totals (Product 2)	24
09 - Mass Transaction Totals (Product 2)	24
10 - Raw Transaction Totals (Product 3)	24
11 - Gross Transaction Totals (Product 3)	24
12 - Gross at Standard Temperature Transaction Totals (Product 3)	24
13 - Net Transaction Totals (Product 3)	24
14 - Mass Transaction Totals (Product 3)	24
15 - Raw Transaction Totals (Product 4)	24
16 - Gross Transaction Totals (Product 4)	24
17 - Gross at Standard Temperature Transaction Totals (Product 4)	25
18 - Net Transaction Totals (Product 4)	25
19 - Mass Transaction Totals (Product 4)	25
20 - Load Average Density (Product 1)	25
21 - Load Average Density (Product 2)	25
22 - Load Average Density (Product 3)	25
23 - Load Average Density (Product 4)	25
24 - Additive Injector 1 Transaction Totals	25
25 - Additive Injector 2 Transaction Totals	25
26 - Additive Injector 3 Transaction Totals	25
27 - Additive Injector 4 Transaction Totals	25
28 - Additive Injector 5 Transaction Totals	25
29 - Additive Injector 6 Transaction Totals	25
30 - Additive Injector 7 Transaction Totals	25
Keypad Data Entry	26
Entry to Main Directories	28
Program Subdirectory Selection	28
Specific Subdirectory Selection	29
Sequential Subdirectory Selection	29
Exiting A Subdirectory	29
Program Code Selection	30
Second and Third Digit Selection	30
Sequential Code Selection	31
Exiting Program Mode	31
Main Directories	31
Changing Program Code Parameters	32

Numeric Data.....	32
Options.....	32
Alphanumeric Data.....	32
Viewing the Help Messages	34
Section 5 - Program Codes	35
Program Codes.....	35
System Configuration Directory.....	35
Section 6 - Index	48
Section 7 - Related Publications	52

Section 1 - Introduction

Product Description

The Smith AccuLoad II Sequential Blender is a four component microprocessor-based electronic preset/blending delivery system designed to sequentially control the loading of up to four petroleum or chemical products through each of two separate load arms simultaneously.

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, display of 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 provide the operator with valuable system information while the system is operating. Also available through the dynamic display are the non-resettable totals for each position. The information that is available through the dynamic display is as follows:

- Current Time and Date
- Current Flow Rate (units/min.)
- Current 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 Totals
- Current Gross Transaction Totals
- Current Gross at Standard Temperature Transaction Totals
- Current Net Transaction Totals
- Current Mass Transaction Totals
- Additive Injector 1 Transaction Totals
- Additive Injector 2 Transaction Totals
- Additive Injector 3 Transaction Totals
- Additive Injector 4 Transaction Totals
- Additive Injector 5 Transaction Totals
- Additive Injector 6 Transaction Totals
- Additive Injector 7 Transaction Totals
- Current Valve Status & Commanded Position
- Load Average Temperature
- Load Average Pressure
- Load Average Density
- Raw Non-resettable Totals
- Gross Non-resettable Totals
- Gross at Standard Temperature Non-resettable Totals
- Net Non-resettable Totals
- Mass Non-resettable Totals
- Additive Injector 1 Non-resettable Totals
- Additive Injector 2 Non-resettable Totals
- Additive Injector 3 Non-resettable Totals
- Additive Injector 4 Non-resettable Totals
- Additive Injector 5 Non-resettable Totals
- Additive Injector 6 Non-resettable Totals
- Additive Injector 7 Non-resettable Totals
- Input Module Status
- Last Power Failure - Time and Date
- Injector 1 Rate*
- Injector 2 Rate*
- Injector 3 Rate*
- Injector 4 Rate*
- Injector 5 Rate*
- Injector 6 Rate*
- Injector 7 Rate*

Note: *AccuLoad II-SEQ Rev. 03 and above firmware.

The AccuLoad II, if so programmed, will automatically calculate and adjust the additive pulse output to be stopped at the first trip point of the product with the same number of pulses as if the additive output were stopped at the end of the batch***.

Note: ***AccuLoad II-SEQ Rev. 03 and above firmware.

Section 1 - 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 32 meter positions to an ASCII printer for printing load tickets or it can be used to network up to 32 meter positions to an automation system. Also available is an additional communication port that is EIA-485 interfaced. 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 MN06055L).

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

- Up to seven different additive injectors can be simultaneously paced or controlled through communications per preset position.
- The AccuLoad II will monitor and totalize the volume of additive injected by up to seven of the additive injectors if the additive monitoring option is purchased.
- AccuLoad II, if so programmed will automatically calculate and adjust the additive pulse output to be stopped at the first trip point of the product with the same number of pulses as if the additive output was stopped at the end of the batch.
- A contact is available to start and stop a pump or other electrically operated equipment as well as a program code that will set the time delay of that start or 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.

- Up to four product block valves can be controlled (opened and closed) and sequenced by the AccuLoad II Sequential Blender. The unit will monitor these block valves to ensure that they respond to signals sent to them. If for some reason they do not respond, the AccuLoad II will alarm and shut the system 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 signaled, 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. (See Bulletin SS06014 for Specifications.)

How To Use This Manual

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

This manual is divided into five sections: Introduction, Operations, Dynamic Displays, Program Mode and the Program Codes.

"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.

Section 1 - Introduction

"Program Codes Section" 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 AB06030. For detailed information on each code see Bulletin MN06054L.

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

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 AB06030) is available for recording the values entered in the program for each preset position. 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 2nd digit of 8 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 requires the second contact closure and an external jumper must 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 (preset position 1) will show if the status of the internal memories (Ram, Data, ROMs) are good or bad. Then it will show that the instrument is being initialized. The right-hand display (preset position 2) will display the message "PLEASE STANDBY". After the testing is complete and the instrument is initialized, both displays (preset position 1 and preset position 2) will read as follows before the Ready Mode message is programmed in the instrument:



Ready 1:10:31

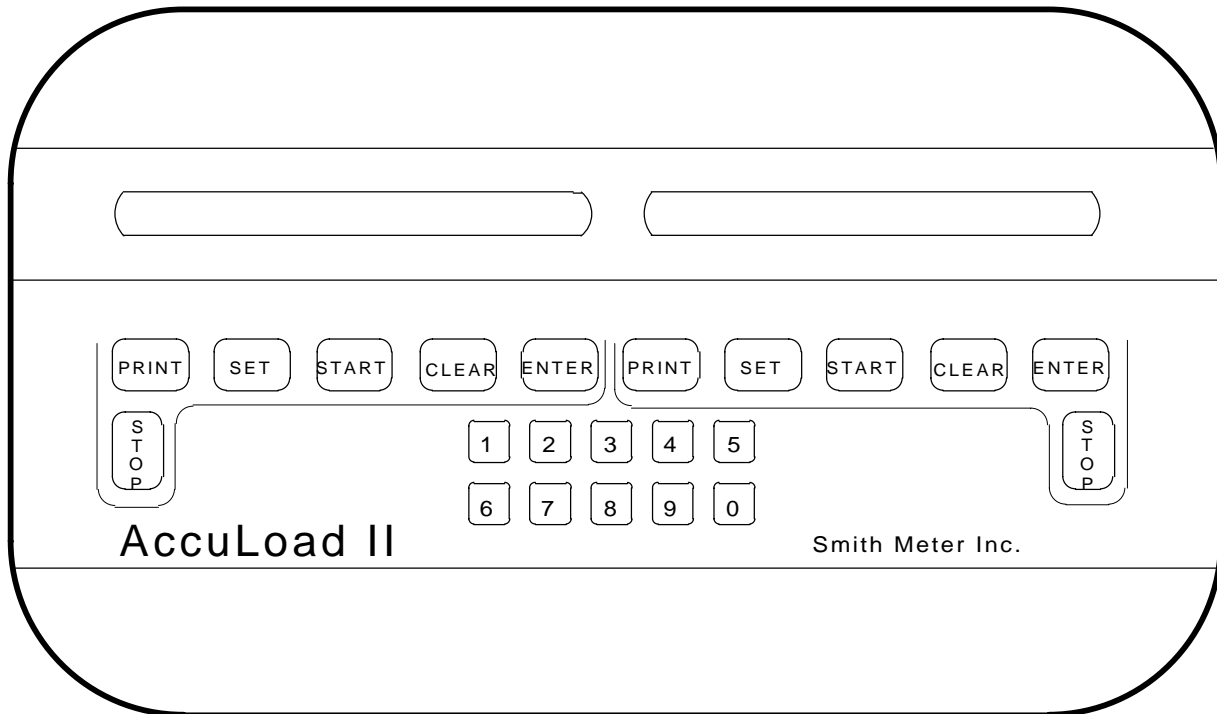
Be sure that AccuLoad II is functioning properly and that the operator has read and understands the instructions

Section 2 - Operations

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.



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 2 - Operations

Overview

The "RUN" Mode for each preset position 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. Normal start-up, flow control and shut-down sequences, along with operator requested stops, will be independent for each preset position.

Preset volumes can not be entered simultaneously to both preset positions since the numeric keypad is shared by both preset positions. In any mode of operation with AccuLoad II, the data entered through the numeric keypad is assumed to be associated with the last preset position function key pressed. For example; if the 'SET' button is pressed for preset position 1, any keypad data entered will be assumed to be for preset position 1 until the next function button is pressed.

Product delivery is controlled by several program code entries made for each preset position. 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 display will read:

Presets Completed

Depending on how AccuLoad II is programmed, the transactions for the preset position used could be ended by removal of the ticket from the ticket printer, pressing the 'PRINT' button associated with that preset position, 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 preset position will display:

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 206 of the Systems

Directory) before the operator can restart the batch. Once the time-out has been reached, the display will then read:

Press Start to Continue

The operator can then press "START" and continue the batch. If program code 206 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.

Meter Position Disabled/Not Installed

The AccuLoad II will contain the necessary software and hardware to operate two meter positions. This may be confusing to an operator if only one of the meter positions is currently connected and operating. For this reason program code 190 of the Systems Directory can be programmed to disable the meter position not currently connected or in use. This program code will be under the High-Security Mode. When selected, the meter not in use will display the following message:

Meter Position Not Used

If the AccuLoad II has been purchased as a single preset position, either preset position #1 or preset position #2 can be programmed as the operating position. The display on the preset position not being used will display the following message:

Meter Position Not Used

Note: The position programmed must match the position that has been wired as the operating preset position.

Remote Start/Stop

Two permissive sense contacts can be programmed in AccuLoad II that can be used for Remote Start/Remote Stop operations (codes 806 and 810). 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

Section 2 - Operations

pressed. (See the Installation Manual MN06037 for jumper positioning).

Quad OPV

The optional Quad OPV is a hardware option that provides one additional dc output for each preset position. This output can either be used as a relay output or a pulse output for an additive injector, remote counter, etc. If used as a pulse output, the pulse rates and type of pulses are programmable in the 300 subdirectory of the Systems 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 capability of the AccuLoad II monitoring 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 863 of the Systems Directory for programming the additive feedback option.

Master/Slave Communications (Rev. 13 and above firmware)

A new feature has been added. Revision 13 firmware has been designed with a Master/Slave type of communications, with the AccuLoad II being the master and the Additive Injector System being the slave. The AccuLoad II constantly interrogates the Additive Injector System for a change in status. The AccuLoad can be operated with communications control over the Smart Additive Injector System or with communications/pulse control. When the AccuLoad II has communication control over the Additive System, it will constantly monitor the Additive System for its status, poll the additive totals, and signal the system when to inject the additive - all through the communications line.

If the AccuLoad II is programmed for communications/pulse control, two lines have to be run between the Additive System and the AccuLoad II - one for the product pulses and one for the communications line. In this case, the AccuLoad II will constantly monitor the Additive System for its status and poll the additive totals. It will not signal the Additive System when to inject additive; this is done by the Additive System counting the pulses and injecting at the rate programmed by the AccuLoad II.

The AccuLoad II communications package has also been designed with a pass-through communications mode. In this mode of operation the supervisory computer can talk to the Additive Injector System through the communication lines that have been run to the AccuLoad II and from the AccuLoad to the Additive Injector System(s).

Additive Injector Selection

Stand-alone Mode

When the AccuLoad II Sequential 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 803 of the Systems Directory has been programmed.

Code Description

803 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 2 or 3):

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

Section 2 - Operations

Where:

Midgrade = The programmed recipe name.
01 = The recipe number selected by the operator.

4. If the correct product 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

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.

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 preset display.

Midgrade P Gal

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.

803 Manual/Auto Additive Injection Option must be programmed to either:

Section 2 - Operations

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:

Zero Standby Mode.

Two Standby and Communication Alarm.

803 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).

Automated Proving Mode (Rev. 12 and above firmware)

A feature has been added to the AccuLoad II-SEQ firmware that provides an automated proving mode of operation. When the automated proving mode is activated the AccuLoad will calculate the meter factor for a proving run based on information that is obtained during the prove. The operator can select the flow rate and meter factor that is being proved through the keypad of the AccuLoad. After the prove is complete the operator enters the prover volume and prover temperature and the AccuLoad will calculate the new meter factor and the operator has the choice of downloading it to the program or to ignore it. The AccuLoad also has the capability of providing an average meter factor over a maximum of six proves. This feature allows the operator to prove the meter on all four products, and four meter factors and associated flow rates for each product without having to enter the program mode for each product and meter factor.

Entry to the Automated Proving Mode will require several conditions to be met.

1. The Automated Proving Mode must be enabled via code 359.
2. The program contact must be open.
3. The Weights and Measures Contact must be closed since it is possible for the meter factor to be altered. Then when normal conditions are met for starting a transaction (pressing the "SET" key or receiving authorization via communications), the Automated Proving Mode will be activated.
4. To initiate the proving sequence, the AccuLoad II will prompt for the prover coefficient of cubical expansion. Note that the most recent value for this entry will be displayed. If this value is acceptable, the operator need only press 'ENTER'.

Prover Coeff 0.0000186005.

5. The AccuLoad II will prompt for the low flow start volume. If low flow start is not desired, enter zero. Note that the low flow start rate used will be the one already entered in the Program Mode. Press 'ENTER'.

Low Flow Start 000 Gal

Section 2 - Operations

6. Next, the AccuLoad II will display the select recipe prompt. If in remote control communications mode, only those recipes allocated will be available for selection.

Select Recipe

Note: If the recipe selected is not a single-product recipe, "Proving requires single-product recipes only" will be displayed.

Press 'SET' until the desired recipe appears or key in the recipe number. Then press 'ENTER'.

7. The operator must next select the meter factor and associated flow rate for proving.

Prove for Factor 1,2,3,4

Enter a "1", "2", "3", or "4" for the meter factor associated flow rate that is required. Note that only those factors currently programmed will be offered as selections. Press 'ENTER' after entering the selection.

8. The selected meter factor and accompanying flow rate will be displayed. Press 'ENTER' to confirm this selection or 'CLEAR' to re-select.

MF1 = 1.0112 FRate = 200

9. Enter the batch amount desired.

Unleaded P Gal

10. Press 'START' to begin flow. The flow rate associated with the selected meter factor will be used as the high flow rate. The batch will be delivered. The flow rate ramp-down from first trip to the end of the batch will be the same as if not proving. Press 'ENTER'.

1200.00 Gal 1200.00

If, after the batch is completed, you press 'PRINT', the display reverts to the Ready Mode display and will not go through the Auto Prove Sequence.

11. When the batch has completed, the AccuLoad II will prompt for the actual prover volume. Enter the prover volume and press 'ENTER'.

Prover Vol 1201.34 Gal

Note: Leading zeros must be entered.

12. AccuLoad II will prompt for the prover temperature. Press 'ENTER' to have the meter factor calculated.

Prover Temp +070.0°F

13. The AccuLoad II will then calculate the meter factor. The new meter factor will be displayed. Press 'ENTER' to download this new meter factor directly into the Program Mode. Press 'CLEAR' for more options.

New MF 1.0101 Download?

(If the 'ENTER' key is pressed, the AccuLoad II will store the newly calculated meter factor as the meter factor for that flow rate in Program Mode.)

Once it is stored, the display will read:

Meter #1 Ready 00:00:00

14. If the meter factor was not downloaded, the operator may select that the newly calculated meter factor be included in a running average of meter factors. (**Note:** A maximum of six proves may be included in the meter factor average.) Press 'ENTER' to include this new meter factor in the running average. Press 'CLEAR' to ignore this meter factor and proceed with the next prove.

New MF 1.0101 Average?

Section 2 - Operations

15. The AccuLoad II will then average all meter factors in the buffer (up to six of them). The average meter factor will be displayed. Press 'ENTER' to download the average meter factor into the Program Mode. Press 'CLEAR' to proceed with the next prove. If a power failure occurs while proving, any meter factors saved in the average buffer will be lost.

```
Avg MF 1.0130 Download?
```

(If the 'ENTER' key is pressed, the AccuLoad II will store the average meter factor as the meter factor for that flow rate in Program Mode.)

16. If a meter factor was downloaded, the AccuLoad II will go return to the ready mode. Otherwise, the AccuLoad II will go back to step 6 to continue proving at this flow rate. Note that if the AccuLoad II is in remote control mode, authorization is required for each batch.
17. Each time a transaction is ended and a new transaction is begun, the AccuLoad II will start a new prove with step 1.
18. In the event that the meter factor is not successfully downloaded, (Weights and Measures contact open, factor out of range), the following display will appear:

```
Mfac 1.0101 REJECTED
```

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 803) and that the permissive senses are met.

Before operation the display will read:

```
Position1 Ready 9:20:33
```

where Position1 Ready is the Ready Mode message which is programmable in code 184 of the Systems Directory. When the operator presses 'SET' the display will either prompt:

```
* PLEASE INSERT TICKET *
```

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

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

```
Select Recipe
```

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

```
Midgrade Recipe No 01
```

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 AccuLoad II will display:

```
Midgrade P Gal
```

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

Section 2 - Operations

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 AccuLoad II's (when the operator presses 'START') valve will be signaled 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 and right-hand sides of the display become counters. The first through the sixth positions become an upcounter (delivery counter). The seventh position becomes a space. The eighth through tenth position displays the units of measurement. The eleventh position becomes a space. The twelfth through the seventeenth position 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 345 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

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.

When the product being loaded reaches 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 signaling 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. The AccuLoad II will also control the opening and closing of the standard two-stage closure valves such as the Smith Model 296 or 299.

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

1000 Gal P 1000 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 206 in the Systems Directory) the display will read:

899 Restart in 10

Section 2 - Operations

(i.e., code 206 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):

** PLEASE STANDBY **

After Power Returns:

Press Start to Continue

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

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

1. The AccuLoad II switches from:

Position1 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:

Position1 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 3 - Dynamic Displays

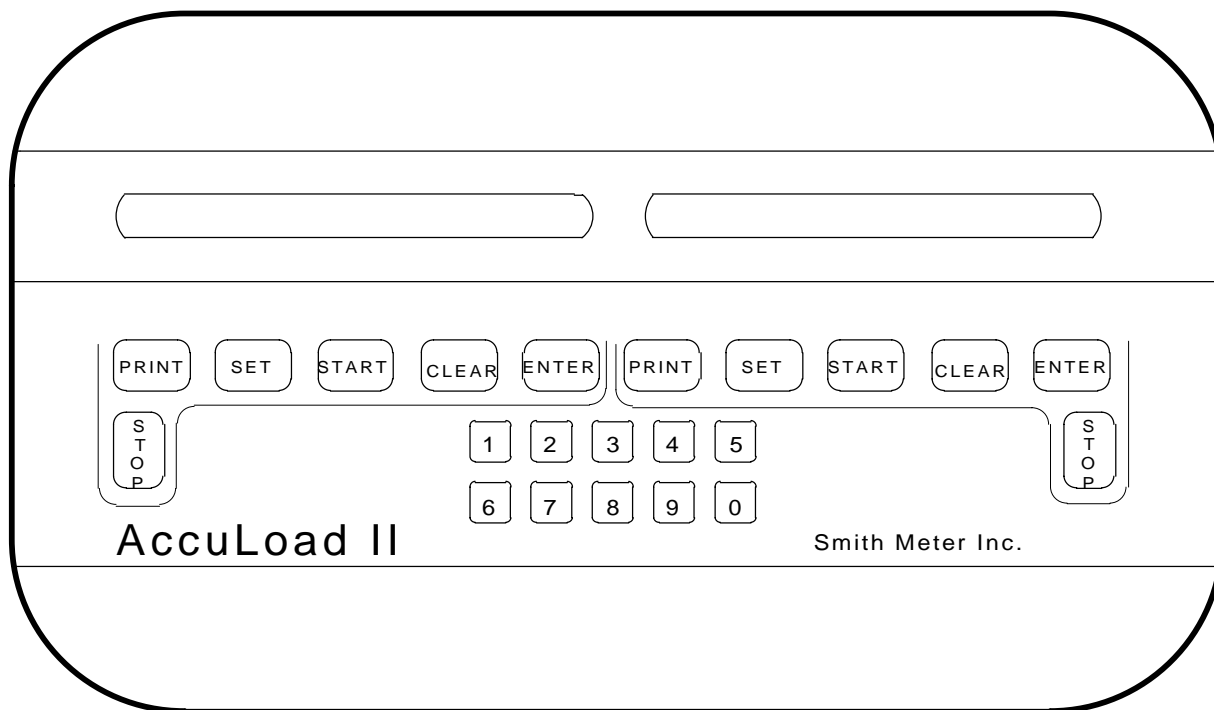
Dynamic Displays

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 are as follows:

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

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. The AccuLoad II will continue to function normally while the display is ON.



Section 4 - Program Mode

Keypad Functions

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

KeyDescription

'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.).

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:

Density 46.1 LB/F3

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

8:56:35 AM 8-26-90

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 Hi = 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).

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:

Grs Total 000000000

Section 4 - Program Mode

- To select a dynamic display from a recipe (i.e., 50202) press 'ENTER 50202'. The dynamic display being displayed is ROM Recipe 02.

Gst Total 000000000

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

Net Total 000000000

- Press 'ENTER'.

Mas Total 000000000

- 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 9) 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

Midgrade Raw 1000.84

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

- To select a dynamic display from a batch (i.e., 6202) press 'ENTER 6202'. The dynamic display being displayed is from batch number 2.

Super Grs 499.82

Where: Super is the description programmed into the recipe that was loaded in batch number 2.

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

Super Gst 499.82

- Press 'ENTER'.

Super Net 0.00

- 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).

Dynamic Display Reference (System)

00 - Time & Date

The current time and date will be displayed.

9:20:05 AM 10-10-88

01 - Flow Rate (Units/Min)

The current flow rate of the product 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 Hi = 600.0 Gal/Min

Section 4 - Program Mode

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

02 - Flow Rate (Units/Hr)

The current flow rate of the product 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 Hi = 36000.0 Gal/Hr

03 - 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

04 - 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

05 - 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

06 - Current Product

The product that is currently being loaded will be displayed.

Line Prod = Regular

07 - Temperature

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

Temperature = + 78.5°F

08 - API

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

API = + 19.9

09 - Reference Density

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

Ref Density = 933.7

10 - Relative Density

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

Rel Density = .9346

11 - 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 4 - Program Mode

12 - Density

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

Density	N/A
---------	-----

13 - Valve Position

The status of the current valve position will be displayed.

Valve Requested Open

14 - Injector #1 Volume

The Additive Injector #1 transaction volume that is currently being loaded will be displayed.

Inj1 Total	10.950
------------	--------

15 - Injector #2 Volume

The Additive Injector #2 transaction volume that is currently being loaded will be displayed.

Inj2 Total	10.950
------------	--------

16 - Injector #3 Volume

The Additive Injector #3 transaction volume that is currently being loaded will be displayed.

Inj3 Total	10.950
------------	--------

17 - Injector #4 Volume

The Additive Injector #4 transaction volume that is currently being loaded will be displayed.

Inj4 Total	10.950
------------	--------

18 - Injector #5 Volume

The Additive Injector #5 transaction volume that is currently being loaded will be displayed.

Inj5 Total	10.950
------------	--------

19 - Injector #6 Volume

The Additive Injector #6 transaction volume that is currently being loaded will be displayed.

Inj6 Total	10.950
------------	--------

20 - Injector #7 Volume

The Additive Injector #7 transaction volume that is currently being loaded will be displayed.

Inj7 Total	10.950
------------	--------

21 - Input Module Status

The status of the input modules in the AccuLoad II will be displayed.

J0P0W0T1V1H1F1R0Y0Z1

Where: 0 = Closed
1 = Open
J = Test Point 9 & 10
P = Program Mode
W = Weights & Measures Mode
T = Input #3
V = Input #2
H = Input #1
F = DC Input
R = Input #6
Y = Input #4
Z = Input #5

22 - Last Power Failure

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

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

23 - Injector #1 Rate*

The current programmed additive pulse rate for end of batch stopping of the additive pulse output #1 and the recalculated additive pulse output for shutting down at the first trip point will be displayed.

INJ1 PROG XXX CAL XXX.XX

Section 4 - Program Mode

24 - Injector #2 Rate*

The current programmed additive pulse rate for end of batch stopping of the additive pulse output #2 and the recalculated additive pulse output for shutting down at the first trip point will be displayed.

```
INJ2 PROG XXX CAL XXX.XX
```

25 - Injector #3 Rate*

The current programmed additive pulse rate for end of batch stopping of the additive pulse output #3 and the recalculated additive pulse output for shutting down at the first trip point will be displayed.

```
INJ3 PROG XXX CAL XXX.XX
```

26 - Injector #4 Rate*

The current programmed additive pulse rate for end of batch stopping of the additive pulse output #4 and the recalculated additive pulse output for shutting down at the first trip point will be displayed.

```
INJ4 PROG XXX CAL XXX.XX
```

27 - Injector #5 Rate*

The current programmed additive pulse rate for end of batch stopping of the additive pulse output #5 and the recalculated additive pulse output for shutting down at the first trip point will be displayed.

```
INJ5 PROG XXX CAL XXX.XX
```

28 - Injector #6 Rate*

The current programmed additive pulse rate for end of batch stopping of the additive pulse output #6 and the recalculated additive pulse output for shutting down at the first trip point will be displayed.

```
INJ6 PROG XXX CAL XXX.XX
```

29 - Injector #7 Rate*

The current programmed additive pulse rate for end of batch stopping of the additive pulse output #7 and the recalculated additive pulse output for shutting down at the first trip point will be displayed.

```
INJ7 PROG XXX CAL XXX.XX
```

*Note: *AccuLoad II-SEQ Rev. 03 and above firmware.*

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 MN06055L).

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 - Reference Density

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

```
Ref Density = 933.7
```

Section 4 - Program Mode

03 - Relative Density

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

Rel Density	=	.9346
-------------	---	-------

04 - 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
----------	-----------

05 - Density

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

Density	N/A
---------	-----

06 - Raw Non-resettable Totals

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

Raw Totals	000009709
------------	-----------

07 - Gross Non-resettable Totals

The Gross non-resettable totals for the product requested will be displayed.

Grs Totals	000009002
------------	-----------

08 - Gross @ Standard Temperature Non-resettable Totals

The Gross @ Standard Temperature non-resettable totals for the product requested will be displayed.

Gst Totals	000008875
------------	-----------

09 - Net Non-resettable Totals

The Net non-resettable totals for the product requested will be displayed.

Net Totals	000008388
------------	-----------

10 - Mass Non-resettable Totals

The Mass non-resettable totals for the product requested will be displayed.

Mas Totals	000053007
------------	-----------

11 - Load Average Temperature

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

Ld Avg Temp	+ 75.0°F
-------------	----------

12 - Load Average Pressure

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

Ld Avg Pres	43.0
-------------	------

13 - Load Average Density

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

Ld Avg Dens	N/A
-------------	-----

14 - Raw Volume

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

Raw Transaction	192.75
-----------------	--------

15 - Gross Volume

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

Grs Transaction	200.00
-----------------	--------

Section 4 - Program Mode

16 - Gross @ Standard Temperature Volume

The Gross @ Standard Temperature compensated volume that is currently being loaded of the product requested will be displayed.

Gst Trans	198.54
-----------	--------

17 - Net Transaction

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

Net Transaction	200.72
-----------------	--------

18 - Mass Transaction

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

Mas Transaction	N/A
-----------------	-----

Dynamic Display Reference (Recipe)

00 - Raw Non-resettable Totals

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

Raw Total	000000000
-----------	-----------

01 - Gross Non-resettable Totals

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

Grs Total	000000000
-----------	-----------

02 - Gross @ Standard Temperature Non-resettable Totals

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

Gst Total	000000000
-----------	-----------

03 - Net Non-resettable Totals

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

Net Total	000000000
-----------	-----------

04 - Mass Non-resettable Totals

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

Mas Total	000000000
-----------	-----------

Dynamic Display Reference (Batch)

00 - Batch Number

The batch number for the last transaction will be displayed.

Dynamic Batch No	1
------------------	---

01 - Raw Batch Totals

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

Super	Raw	1000.22
-------	-----	---------

where Super is the programmed recipe name.

02 - Gross Batch Totals

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

Super	Grs	1000.22
-------	-----	---------

03 - Gross at Standard Temperature Batch Totals

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

Super	Gst	1000.18
-------	-----	---------

Section 4 - Program Mode

04 - Net Batch Totals

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

Super	Net	0.00
-------	-----	------

05 - Mass Batch Totals

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

Super	Mas	0.00
-------	-----	------

06 - Raw Batch Totals (Product 1)

The raw totals 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 Totals (Product 1)

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

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

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

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

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

09 - Net Batch Totals (Product 1)

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

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

10 - Mass Batch Totals (Product 1)

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

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

11 - Raw Batch Totals (Product 2)

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

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

Premium is the programmed name for Product 2.

12 - Gross Batch Totals (Product 2)

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

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

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

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

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

14 - Net Batch Totals (Product 2)

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

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

15 - Mass Batch Totals (Product 2)

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

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

Section 4 - Program Mode

16 - Raw Batch Totals (Product 3)

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

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

Ethanol is the programmed name for Product 3.

17 - Gross Batch Totals (Product 3)

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

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

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

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

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

19 - Net Batch Totals (Product 3)

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

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

20 - Mass Batch Totals (Product 3)

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

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

21 - Raw Batch Totals (Product 4)

The raw totals 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 Totals (Product 4)

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

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

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

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

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

24 - Net Batch Totals (Product 4)

The net totals 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 totals 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.

Super	Tmp Lav	+000.0
-------	---------	--------

27 - Load Average Temperature (Product 1)

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

Regular	Tmp Lav	+000.0
---------	---------	--------

Section 4 - Program Mode

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	+000.0
---------	---------	--------

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	+000.0
---------	---------	--------

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	+000.0
------	---------	--------

31 - Additive 1 Batch Totals

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

Additive 1 =	0.000
--------------	-------

32 - Additive 2 Batch Totals

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

Additive 2 =	0.000
--------------	-------

33 - Additive 3 Batch Totals

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

Additive 3 =	0.000
--------------	-------

34 - Additive 4 Batch Totals

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

Additive 4 =	0.000
--------------	-------

35 - Additive 5 Batch Totals

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

Additive 5 =	0.000
--------------	-------

36 - Additive 6 Batch Totals

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

Additive 6 =	0.000
--------------	-------

37 - Additive 7 Batch Totals

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

Additive 7 =	0.000
--------------	-------

Dynamic Display Reference (Transaction Summary)

00 - Raw Transaction Totals (Product 1)

The raw totals for the last transaction will be displayed.

Raw Trans P1	800.24
--------------	--------

01 - Gross Transaction Totals (Product 1)

The gross totals for the last transaction will be displayed.

Grs Trans P1	800.24
--------------	--------

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

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

Gst Trans P1	0.00
--------------	------

Section 4 - Program Mode

03 - Net Transaction Totals (Product 1)

The net totals for the last transaction will be displayed.

Net Trans P1	N/A
--------------	-----

04 - Mass Transaction Totals (Product 1)

The mass totals for the last transaction will be displayed.

Mas Trans P1	N/A
--------------	-----

05 - Raw Transaction Totals (Product 2)

The raw totals for the last transaction will be displayed.

Raw Trans P2	800.24
--------------	--------

06 - Gross Transaction Totals (Product 2)

The gross totals for the last transaction will be displayed.

Grs Trans P2	800.24
--------------	--------

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

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

Gst Trans P2	0.00
--------------	------

08 - Net Transaction Totals (Product 2)

The net totals for the last transaction will be displayed.

Net Trans P2	N/A
--------------	-----

09 - Mass Transaction Totals (Product 2)

The mass totals for the last transaction will be displayed.

Mas Trans P	N/A
-------------	-----

10 - Raw Transaction Totals (Product 3)

The raw totals for the last transaction will be displayed.

Raw Trans P3	800.24
--------------	--------

11 - Gross Transaction Totals (Product 3)

The gross totals for the last transaction will be displayed.

Grs Trans P3	800.24
--------------	--------

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

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

Gst Trans P3	0.00
--------------	------

13 - Net Transaction Totals (Product 3)

The net totals for the last transaction will be displayed.

Net Trans P3	N/A
--------------	-----

14 - Mass Transaction Totals (Product 3)

The mass totals for the last transaction will be displayed.

Mas Trans P3	N/A
--------------	-----

15 - Raw Transaction Totals (Product 4)

The raw totals for the last transaction will be displayed.

Raw Trans P4	800.24
--------------	--------

16 - Gross Transaction Totals (Product 4)

The gross totals for the last transaction will be displayed.

Grs Trans P4	800.24
--------------	--------

Section 4 - Program Mode

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

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

Gst Trans P4	0.00
--------------	------

18 - Net Transaction Totals (Product 4)

The net totals for the last transaction will be displayed.

Net Trans P4	N/A
--------------	-----

19 - Mass Transaction Totals (Product 4)

The mass totals for the last transaction will be displayed.

Mas Trans P4	N/A
--------------	-----

20 - Load Average Density (Product 1)

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

Ld Av Dn P1	45.6 LB/F3
-------------	------------

21 - Load Average Density (Product 2)

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

Ld Av Dn P2	44.9 LB/F3
-------------	------------

22 - Load Average Density (Product 3)

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

Ld Av Dn P3	00.0 LB/F3
-------------	------------

23 - Load Average Density (Product 4)

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

Ld Av Dn P4	1x00.0 LB/F3
-------------	--------------

24 - Additive Injector 1 Transaction Totals

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

Inj1 Trans	0.000
------------	-------

25 - Additive Injector 2 Transaction Totals

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

Inj2 Trans	0.000
------------	-------

26 - Additive Injector 3 Transaction Totals

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

Inj3 Trans	0.000
------------	-------

27 - Additive Injector 4 Transaction Totals

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

Inj4 Trans	0.000
------------	-------

28 - Additive Injector 5 Transaction Totals

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

Inj5 Trans	0.000
------------	-------

29 - Additive Injector 6 Transaction Totals

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

Inj6 Trans	0.000
------------	-------

30 - Additive Injector 7 Transaction Totals

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

Inj7 Trans	0.000
------------	-------

Section 4 - 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-SEQ are divided into six main directories and nine 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 of the main directories (except Recipe) 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.,).

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.

Section 4 - Program Mode

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.

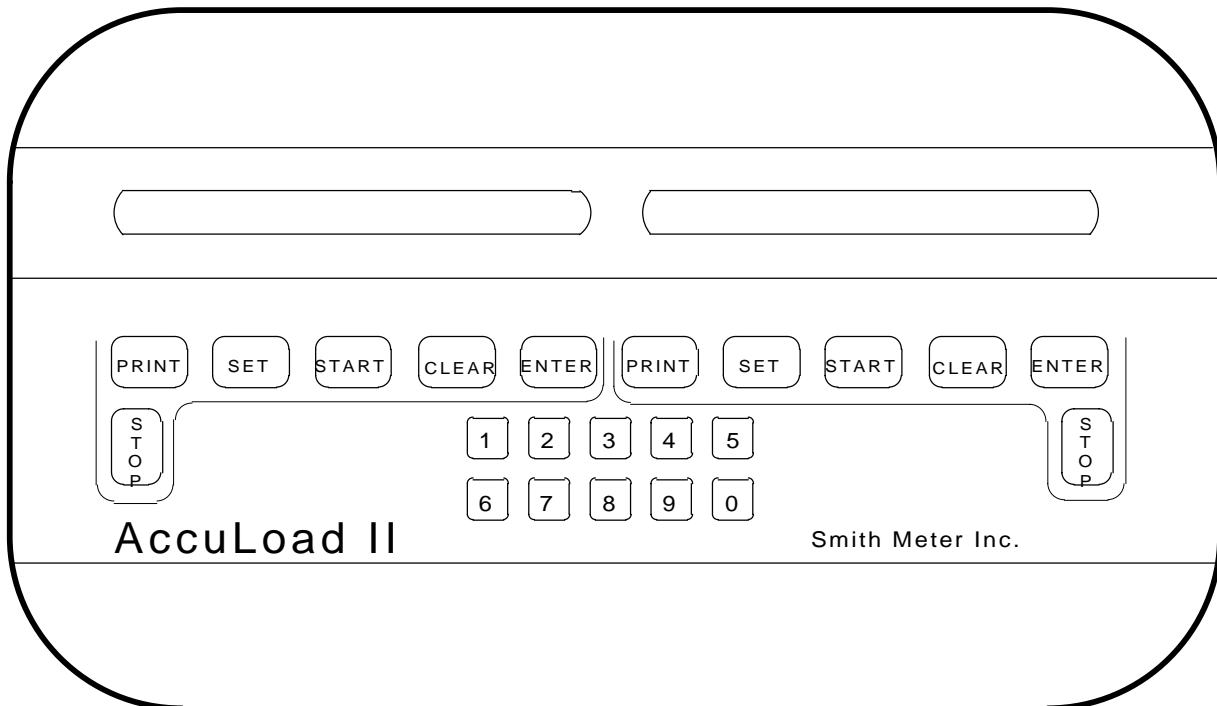
'ENTER' Used to enter the Program Mode security access code, to enter the subdirectory, to enter program data and for exiting the Program Mode.

'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 4 - 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.

```
Position 1    Ready  1:10:31
```

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

```
                
```

3. Enter the 4-digit access code ('0000' preset at factory). For security any digit entered will be displayed as an 'X'.

```
XXXX
```

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

```
Program Mode-Critical=ON
```

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 is made to program a code that would cause a conflict with another code that is already programmed.

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

```
Program Mode-Critical=NO
```

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:

```
System Directories
```

Note: If an incorrect access code was entered, the following prompt will appear:

```
** Error Press Clear **
```

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

```
Position 1 Ready  1:10:31
```

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.

```
System Directories
```

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

```
Product 1 Directories
```

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

```
Product 2 Directories
```

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

```
Enter Dir or Program #
```

Program Subdirectory Selection

Once in the Program Mode of the main directory the subdirectories 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'.

Section 4 - Program Mode

Specific Subdirectory Selection

To enter the directory using its three digit program code, the following steps must be observed.

1. The following prompt is displayed when entry is made into the Program Mode:

```
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 Dir
```

Repeat step 5 until the subdirectory required is reached.

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
```

Section 4 - Program Mode

3. Press 'ENTER'.

```
200 Flow Control Dir
```

Program Code Selection

Once in the Program Mode, the codes can be accessed either by the 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'.

```
0100 Low Flow Amount
```

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

```
135 Invalid Program Code
```

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
```

4. Press 'ENTER'.

```
0100 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'.

```
Enter Program 05
```

Section 4 - Program Mode

7. Enter the second and third digit of the code required (i.e., 05).

Enter Program 05

8. Press 'ENTER'.

010 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 08-23-90 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.

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 2 Auto Recipe

2. Press 'CLEAR'.

Recipe #1 Dir

3. Press 'CLEAR'.

Press Enter to Exit Dirs

4. Press 'ENTER'.

Press Enter to Exit

5. Press 'ENTER'.

Position 1 Ready 17:38:33

Section 4 - 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 AB06030) as well as the Operator Reference (Bulletin MN06054L).

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

1. View the contents of code 204 via one of the methods previously described.

```
204 0600 High Flow Rate
```

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

```
204 0600 High Flow R 450
```

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

```
204 ** STORING DATA **
```

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

```
204 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.

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:

Section 4 - Program Mode

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

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

Section 4 - Program Mode

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.

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: Master Reset without
```

```
Transaction Clearing (CT), 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 MN06054L).

Program Codes

This table lists all the program codes that are found in the Program Mode of the AccuLoad II Sequential Blender operating with the SEQ firmware. The table gives the code number and a brief description of each code. This table is to be used for a quick reference. It

lists all the program codes that are found in the Program Mode of the AccuLoad II-SEQ. If more information is required, refer to Programming Workbook (AB06030) or the Operator Reference Manual (MN06054L).

System Configuration Directory

Code	Description
000	System Configuration Directory
001	Number of Products
002	Number of Additive Injectors
003	AC Output Relay 1 Assignment
004	AC Output Relay 2 Assignment
005	AC Output Relay 3 Assignment
006	AC Output Relay 4 Assignment
007	AC Output Relay 5 Assignment
008	DC Output Relay 1 Assignment
009	DC Output Relay 2 Assignment
010	AC Input 1 Assignment
011	AC Input 2 Assignment
012	AC Input 3 Assignment
013	AC Input 4 Assignment
014	AC Input 5 Assignment
015	AC Input 6 Assignment
016-039	Unassigned at Present
040	Print Configuration
041	Additive System and Pacing Control Selection <i>Note: This code applies to SEQ Rev. 13 and above firmware.</i>
042-089	Unassigned at Present
090	Program Configuration
091-099	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

Section 5 - Program Codes

Code	Description
104	Product 3 Alarm Check/Reset
105	Product 4 Alarm Check/Reset
106	Recipe Alarm Check/Reset
107	Transaction Alarm
108	Ready Mode Alarms
109	Set Time
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: Applies to SEQ-09 and above firmware.</i>
145	Ready/Run Mode Clearable Alarms Selection <i>Note: Applies to SEQ-11 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: Applies to SEQ-09 and above firmware.</i>
186	Power-fail Alarm <i>Note: Applies to SEQ-11 and above firmware.</i>
187-189	Unassigned at Present
190	Meter Position Disable
191-199	Unassigned at Present
200	System Flow Control Directory
201	Low Flow Start Volume
202	Low Flow Start Rate
203	Low Flow Start
204	Zero Flow Timer

Section 5 - Program Codes

Code	Description
205	Overrun Alarm Limit
206	Start Delay After Stop
207	Pump Relay Time Delay
208	Valve Delay to Open
209	PT/VF Time Delay
210	Flow Control Valve
211	Zero Flow Alarm <i>Note: Applies to SEQ-11 and above firmware.</i>
212-239	Unassigned at Present
240	Protection of Program Codes 280-289
241	Flow Control Valve Security
242-279	Unassigned at Present
280	Clean Line Product
281	Clean Line Volume
282	Clean Line Alarm Limit
283	Block Valve Position
284-299	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	Dual Pulse Error Count
342	Dual Pulse Error Reset
343	Dual Pulse Flow Rate Cutoff
344	Display Units
345	Corrected Display
346	Printer 1 Registration

Section 5 - Program Codes

Code	Description
347	Printer 1 Output Resolution
348	Printer 2 Registration
349	Printer 2 Output Resolution
350	Display Resolution
351	Input Resolution
352	Proving Modes
353	Proving Output
354	Proving Output Units
355	Blend Tolerance (Percentage)
356	Blend Tolerance (Volume)
357	Blend Correction
358	Recipes Per Transaction
359	Auto Proving Select <i>Note: This code applies to SEQ Rev. 12 and above firmware.</i>
360-389	Unassigned at Present
390	Input Pulse Type
391	Input Pulse Doubler
392	Transmitter Type
393-399	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	Temperature Offset
444	Density or Temperature Input
445	Density Units
446	Minimum Density OR Minimum Temperature as selected in code 444
447	Maximum Density OR Maximum Temperature as selected in code 444
448	Volume/Mass Conversion
449	Mass Units
450-499	Unassigned at Present

Section 5 - Program Codes

Code	Description
500	System Pressure Directory
501-539	Unassigned at Present
540	Protection of Program Codes 580-589
541	Pressure Units
542	Minimum Pressure Units
543	Maximum Pressure Units
544-599	Unassigned at Present
600	System Read Only Directory
601	Injector 1 Non-resettable Totals
602	Injector 2 Non-resettable Totals
603	Injector 3 Non-resettable Totals
604	Injector 4 Non-resettable Totals
605	Injector 5 Non-resettable Totals
606	Injector 6 Non-resettable Totals
607	Injector 7 Non-resettable Totals
608	Local Storage Transactions
609-639	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

Section 5 - Program Codes

Code	Description
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	Delivery Report
723-739	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 Averages to Print
758	Select the Additive Volumes to Print
759	Define Delivery Report
760	Additive 1 Address <i>Note: This code applies to SEQ Rev. 13 and above firmware.</i>
761	Additive 2 Address <i>Note: This code applies to SEQ Rev. 13 and above firmware.</i>

Section 5 - Program Codes

Code	Description
762	Additive 3 Address <i>Note: This code applies to SEQ Rev. 13 and above firmware.</i>
763	Additive 4 Address <i>Note: This code applies to SEQ Rev. 13 and above firmware.</i>
764	Additive 5 Address <i>Note: This code applies to SEQ Rev. 13 and above firmware.</i>
765	Additive 6 Address <i>Note: This code applies to SEQ Rev. 13 and above firmware.</i>
766	Additive 7 Address <i>Note: This code applies to SEQ Rev. 13 and above firmware.</i>
767-779	Unassigned at Present
780	Number of Prompts
781	Print Transaction
782	Prompts Printed
783-799	Unassigned at Present
800	System Input/Output Directory
801	Additive Injector Stop
802	Additive Injector Output
803	Manual/Auto Additive Injector Selection
804	Restart After Valve Power Restored
805	Valve Power Sense Permissive Message
806	Permissive #1
807	Permissive #1 Message
808	Restart After Permissive Met
809	Prompt Message
810	Permissive #2
811	Permissive #2 Message
812	Restart After Permissive
813	Additive Feedback Alarm Message
814	Additive Injector Stop Volume <i>Note: This code applies to SEQ Rev. 13 and above firmware.</i>
815-839	Unassigned at Present
840	Protection of Program Codes 880-889
841	Additive Injector #1 Feedback
842	Additive Injector #1 Volume
843	Additive Injector #2 Feedback

Section 5 - Program Codes

Code	Description
844	Additive Injector #2 Volume
845	Additive Injector #3 Feedback
846	Additive Injector #3 Volume
847	Additive Injector #4 Feedback
848	Additive Injector #4 Volume
849	Additive Injector #5 Feedback
850	Additive Injector #5 Volume
851	Additive Injector #6 Feedback
852	Additive Injector #6 Volume
853	Additive Injector #7 Feedback
854	Additive Injector #7 Volume
855	Injector Units
856	Additive Injector Feedback Errors
857	Injector #1 Feedback Delay
858	Injector #2 Feedback Delay
859	Injector #3 Feedback Delay
860	Injector #4 Feedback Delay
861	Injector #5 Feedback Delay
862	Injector #6 Feedback Delay
863	Injector #7 Feedback Delay
864	Additive Feedback Alarm
865	Additive Totals Units <i>Note: This code applies to SEQ Rev. 13 and above firmware.</i>
866-879	Unassigned at Present
880	Additive Injector Pulser No. 1
881	Additive Injector Pulser No. 2
882	Additive Injector Pulser No. 3
883	Additive Injector Pulser No. 4
884	Additive Injector Pulser No. 5
885	Additive Injector Pulser No. 6
886	Additive Injector Pulser No. 7
887-889	Unassigned at Present
900	System Diagnostic Directory

Section 5 - Program Codes

Code	Description
901	Diagnostic
902	Diagnostic
903	Diagnostic
904	Diagnostic
905	Diagnostic
906	Diagnostic
907	Diagnostic
908	Diagnostic
909	Diagnostic
910	Diagnostic
911	Unassigned at Present
912	Diagnostic Calibration Event Counter <i>Note: This code applies to SEQ-14 and above firmware.</i>
913	Diagnostic Configuration Event Counter <i>Note: This code applies to SEQ-14 and above firmware.</i>
914-939	Unassigned at Present
940	Protection of Program Codes 980-989
941	Diagnostic
942	Diagnostic
943	Diagnostic
944	Diagnostic
945	Diagnostic
946	Diagnostic
947	Diagnostic
948	Diagnostic
949	Diagnostic
950	Diagnostic
951	Diagnostic
952	Diagnostic
953	Diagnostic
954	Diagnostic
955	Diagnostic
956	Diagnostic
957	Diagnostic

Section 5 - Program Codes

Code	Description
958	Clear Configurable Report <i>Note: AccuLoad II-SEQ Rev. 08 and above firmware.</i>
959-990	Unassigned at Present
991	Diagnostic
992	Diagnostic
993	Diagnostic
994	Diagnostic
995	Diagnostic
996	Diagnostic
997	Diagnostic
998	Copies Codes (Side 1 to Side 2)
999	Programs EEPROM/Default Parameters

Section 5 - 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	Minimum Flow Rate
203	Block Valve Type
204	First High Flow Rate
205	Flow Tolerance
206	Second High Flow Rate
207	First Trip Volume
208	Final (Second) Trip Volume
209	Final (Second) Trip Auto Adjust
210	Low Flow Rate Alarm Limit
211	Block Valve Delay to Close
212	Block Valve Delay to Open
213-239	Unassigned at Present
240	Protection of Program Codes 280-299
241	Block Valve Security
242-299	Unassigned at Present
300	Volume Accuracy Directory
301	Minimum Batch Volume
302-339	Unassigned at Present
340	Protection of Program Codes 380-389
341	Flow Rate for Meter Factor #1
342	Meter Factor #1
343	Flow Rate for Meter Factor #2
344	Meter Factor #2

Section 5 - Program Codes

Code	Description
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
351-389	Unassigned at Present
390	Master Meter Factor
391	Linearized Factor Deviation
392	Meter Factor Variation
393-399	Unassigned at Present
400	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	Low Density Alarm
447	High Density Alarm
448-499	Unassigned at Present
500	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

Section 5 - Program Codes

Code	Description
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	Read Only Directory
601	Raw Non-resettable Totals
602	Gross Non-resettable Totals
603	Gross at Standard Temp. Non-resettable Totals
604	Net Non-resettable Totals
605	Mass Non-resettable Totals
606	Load Average Temperature
607	Load Average Pressure
608	Load Average Density
609-639	Unassigned at Present
640	Protection of Program Codes 680-689
641-699	Unassigned at Present
700	Communications Directory
701	HM Classification
702	HM Classification
703	HM Classification
704-739	Unassigned at Present
740	Protection of Program Codes 780-789
741-799	Unassigned at Present
800	Inputs & Outputs Directory
801-839	Unassigned at Present
840	Protection of Program Codes 880-889
841-899	Unassigned at Present
900	Diagnostics Directory
901-939	Unassigned at Present
940	Protection of Program Codes 980-989
941-999	Unassigned at Present

Recipe Program Codes

Code	Description
__00	Blend Recipe #__ Directory
__01	Blend Recipe
__02	Blend Recipe Name
__03	Product Using Injector #1
__04	Product Using Injector #2
__05	Product Using Injector #3
__06	Product Using Injector #4
__07	Product Using Injector #5
__08	Product Using Injector #6
__09	Product Using Injector #7
__10	Recipe Raw Non-resettable Totals
__11	Recipe Gross Non-resettable Totals
__12	Recipe Gross at Standard Temp. Non-resettable Totals
__13	Recipe Net Non-resettable Totals
__14	Recipe Mass Non-resettable Total
__15	HM Classification
__16	Minimum Preset
__17-__39	Unassigned at Present
__40	Protection of Program Codes __80-__89
__41	Blend Preset Display
__42	Blend Deliver Display
__43	First Component Number to Deliver
__44	First Component Percentage
__45	Second Component Number to Deliver
__46	Second Component Percentage
__47	Third Component Number to Deliver
__48	Third Component Package
__49	Fourth Component Number to Deliver
__50	Fourth Component Percentage
__51	Fifth Component Number to Deliver
__52	Fifth Component Percentage
__53-__99	Unassigned at Present

Section 6 - Index

—A—

Additive 1 Batch Totals	23
Additive 2 Batch Totals	23
Additive 3 Batch Totals	23
Additive 4 Batch Totals	23
Additive 5 Batch Totals	23
Additive 6 Batch Totals	23
Additive 7 Batch Totals	23
Additive Injector 1 Transaction Totals	25
Additive Injector 2 Transaction Totals	25
Additive Injector 3 Transaction Totals	25
Additive Injector 4 Transaction Totals	25
Additive Injector 5 Transaction Totals	25
Additive Injector 6 Transaction Totals	25
Additive Injector 7 Transaction Totals	25
Additive Injector Selection	6
Additive Monitoring	6
Alphanumeric Data	32
API	16, 18
Automated Proving Mode (Rev. 12 and above firmware)	8

—B—

Batch Number	20
Before Beginning Operations	3

—C—

Changing Program Code Parameters	32
Communications Diagnostics	18
Correction for Pressure on Liquid	16
Current Product	16

—D—

Density	17, 19
Dynamic Display Reference (Batch)	20
Dynamic Display Reference (Products)	18
Dynamic Display Reference (Recipe)	20
Dynamic Display Reference (System)	15
Dynamic Display Reference (Transaction Summary)	23
Dynamic Displays	13

—E—

Entry to Dynamic Display	14
Entry to Main Directories	28
Exiting A Subdirectory	29
Exiting Program Mode	31

—F—

Flow Rate	15, 16
-----------------	--------

—G—

Gross	19, 20, 21, 22, 23, 24, 25
Gross @ Standard Temperature Volume	20
Gross at Standard Temperature Batch Totals	20
Gross at Standard Temperature Batch Totals (Product 1) Gross at Standard Temperature Batch Totals (Product 1)	21
Gross at Standard Temperature Batch Totals (Product 2)	21
Gross at Standard Temperature Batch Totals (Product 3)	22
Gross at Standard Temperature Batch Totals (Product 4)	22
Gross at Standard Temperature Transaction Totals (Product 1)	23
Gross at Standard Temperature Transaction Totals (Product 2) Gross at Standard Temperature Transaction Totals (Product 2)	24
Gross at Standard Temperature Transaction Totals (Product 3) Gross at Standard Temperature Transaction Totals (Product 3)	24
Gross at Standard Temperature Transaction Totals (Product 4)	25
Gross Batch Totals	20
Gross Batch Totals (Product 1)	21
Gross Batch Totals (Product 2)	21
Gross Batch Totals (Product 3)	22
Gross Batch Totals (Product 4)	22
Gross Non-resettable Totals	20
Gross Transaction Totals (Product 1)	23
Gross Transaction Totals (Product 2)	24
Gross Transaction Totals (Product 3)	24
Gross Transaction Totals (Product 4)	24

—H—

How To Use This Manual	2
------------------------------	---

—I—

Injector #1 Rate*	17
Injector #1 Volume	17
Injector #2 Rate*	18
Injector #2 Volume	17
Injector #3 Rate*	18
Injector #3 Volume	17
Injector #4 Rate*	18
Injector #4 Volume	17
Injector #5 Rate	18
Injector #5 Volume	17
Injector #6 Rate*	18
Injector #6 Volume	17
Injector #7 Rate*	18
Injector #7 Volume	17
Input Module Status	17

Section 6 - Index

—K—

Keypad Data Entry	26
Keypad Functions	4, 14

—L—

Last Power Failure	17
Load Average Density	19
Load Average Density (Product 1)	25
Load Average Density (Product 2)	25
Load Average Density (Product 3)	25
Load Average Density (Product 4)	25
Load Average Pressure	19
Load Average Temperature	19
Load Average Temperature (Product 1)	22
Load Average Temperature (Product 2)	23
Load Average Temperature (Product 3)	23
Load Average Temperature (Product 4)	23
Load Average Temperature (Recipe)	22
Local Ticket Printer	10

—M—

Main Directories	31
Mass Batch Totals	21
Mass Batch Totals (Product 1)	21
Mass Batch Totals (Product 2)	21
Mass Batch Totals (Product 3)	22
Mass Batch Totals (Product 4)	22
Mass Transaction	20
Mass Transaction Totals (Product 1)	24
Mass Transaction Totals (Product 2)	24
Mass Transaction Totals (Product 3)	24
Mass Transaction Totals (Product 4)	25
Master/Slave Communications Rev. 13 and above firmware	6
Meter Factor	16
Meter Position Disabled/Not Installed	5

—N—

Net Batch Totals	21
Net Batch Totals (Product 1)	21
Net Batch Totals (Product 2)	21
Net Batch Totals (Product 3)	22
Net Batch Totals (Product 4)	22
Net Transaction	20
Net Transaction Totals (Product 1)	24
Net Transaction Totals (Product 2)	24
Net Transaction Totals (Product 3)	24
Net Transaction Totals (Product 4)	25
Numeric Data	32

—O—

Options	32
Overview	5

—P—

Pressure and Vapor Pressure	16, 19
Product Description	1
Program Code Selection	30
Program Subdirectory Selection	28

—Q—

Quad OPV	6
----------------	---

—R—

Raw Batch Totals	20
Raw Batch Totals (Product 1)	21
Raw Batch Totals (Product 2)	21
Raw Batch Totals (Product 3)	22
Raw Batch Totals (Product 4)	22
Raw Non-resettable Totals	20
Raw Transaction Totals (Product 1)	23
Raw Transaction Totals (Product 2)	24
Raw Transaction Totals (Product 3)	24
Raw Transaction Totals (Product 4)	24
Raw Volume	19
Reference Density	16, 18
Relative Density	16, 19
Remote Start/Stop	5
Remote Ticket Printer	12
Run Mode	4

—S—

Second and Third Digit Selection	30
Sequential Code Selection	31
Sequential Subdirectory Selection	29
Specific Subdirectory Selection	29
Stand-alone Mode	6
Standby Mode	7

—T—

Temperature	16, 18
Temperature Correction	16
Time & Date	15

—V—

Valve Position	17
Viewing the Help Messages	34

Section 7 - 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-SEQ

Specifications	Bulletin SS06014
Installation.....	Bulletin MN06037
Operator Guide	Bulletin MN06053
Operator Reference.....	Bulletin MN06054L
Programming Workbook.....	Bulletin AB06030
Communications.....	Bulletin MN06055L

Load Printer

Specifications	Bulletin SS06004
Installation/Operation.....	Bulletin MN06010
Service Bulletin MN06009	

Valves

Model 210 Specifications.....	Bulletin SS03009
Model 210 Installation/Operation	Bulletin MN03010
Model 215 Specifications.....	Bulletin SS03010
Model 215 Installation/Operation	Bulletin MN03006
Model 215 Service.....	Bulletin MN03007

Revisions included in MN06053 Issue/Rev. 0.4 (5/96)

1. Converted file from Word Perfect to Microsoft Word
2. Added paragraph on Page 2 on additive recalculation

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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