GUIDANT

Electronic Flow Computer

Smith Meter® microFlow.net™ Liquid

Operator Reference Manual

Bulletin MNFL004 Issue/Rev 0.0 (1/12)

Caution

The default or operating values used in this manual and in the program of the Smith Meter® microFlow.net™ are for factory testing only and should not be construed as default or operating values for your metering system. Each metering system is unique and each program parameter must be reviewed and programmed for that specific metering system application.

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Product Description

The Smith Meter® microFlow.net™ is a micro-processor based single meter, single product electronic flow computer. It is configurable to support a variety of user applications.

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

The dynamic real-time display of the current actual operating conditions of the system provides the operator with valuable system information while the system is operating.

The microFlow.net provides several flow control functions: single or dual pulse input, digital valve control, sampler control support, timed daily reports, continuous totalization, Smith Meter mass meter communications, fraction programmable 6 digit batch totalizers, and 9 digit whole number non-resettable totalizers. Other significant features are as follows:

- Ethernet Connectivity
- Three Multi-drop Serial Communications Ports
- Event Logging / Audit Trail
- User Configurable I/O
- Three Security Levels
- Optional Battery Backed Display per OIML
- Programmable Language/Messages
- API Tables from LPG to Crude Oil
- Batch Recalculation
- Ultra6 Interface Meter

How To Use This Manual

This manual is to be used as a reference guide to the program codes available in the microFlow.net. The directories and subdirectories which contain the program codes are listed above each set of parameters.

The program code explanations frequently list “fatal” or “critical” warnings, or indicate that in some circumstances, the code is “no entry.” A fatal warning is triggered by a selection that the microFlow.net cannot accept and will not allow to be entered. Possible causes include an entry that falls outside an allowable range, or an entry that seriously conflicts with a previous entry. A critical warning signals that a selection is incompatible with a previously configured program code. The microFlow.net will accept the new entry, but the selection will undoubtedly cause a problem in operation and should be changed. “No entry" indicates that a program code is unavailable and will not appear on the menu, because previous selections make it irrelevant. For example, pulse output codes will not appear unless pulse output has been enabled.

The main system directories are as follows:

Configuration Directories
100 – Pulse Outputs
200 – Digital Inputs
300 – Digital Outputs
400 – Analog Inputs

General Purpose Directories
- 10X – Date and Time
- 11X – Units
- 12X – Display
- 13X – Timeouts
- 14X – Control
- 15X – Permissives
- 160 – Security

Flow Control Directories
- 20X – Valve Type
- 21X – Flow Control
- 22X – Alarm Limits
- 23X – Delays/Timers

Volume Accuracy Directories
- 30X…31X – Pulse Input
- 34X…35X – Meter Factors
- 36X…370 – Mass Meter
- 321...322 – S&W
- 331...334 – Ultrasonic Meter

Temperature/Density Directories
- 40X – Temperature
- 41X – Density

Pressure Directories
- 50X – General Purpose
- 51X – Back Pressure
- 52X – Vapor Pressure

Alarm Directories
- 601 – Driver Clearable
- 602 – Power-fail Alarm
- 61X…66X – Configure Alarms
  - 61X – System Alarms
  - 62X – Flow Alarms
  - 63X – Temp/Density Alarms
  - 64X – Meter Alarms
  - 65X…67X – Injector Alarms
  - 68X – User Alarms
  - 69X – User Alarm Messages

Communications Directories

- 70X…71X – Comm Port Configuration
- 72X – Host Interface
- 73X – Reports
- 76X…77X – Prompts

Additive Injector Directories

- 80X – Injector Type
- 81X – Additive Units
- 82X – Injector Control
- 83X – Metered Injector Menu
- 84X – Smart Injector Menu

Recipe Directories

- RR0X – General
- RR1X – Select Recipe

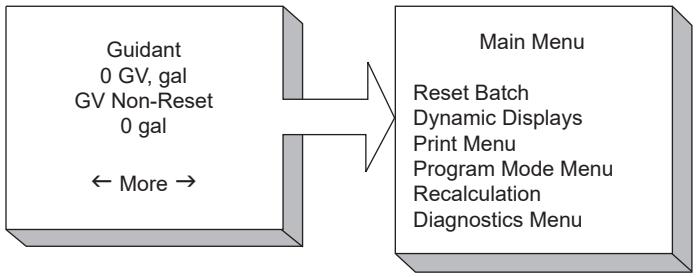
Diagnostic Directories

- Analog Input Test
- Digital Input Test
- Digital Output Test
- Pulse Input Test
- Pulse Output test
- Prove Metered Injector Adds
- Communications Test
- Keypad Test
- Display Pixel Test
- Boolean Algebraic
- Reset Totals
- Reset Dual Pulse
- Erase Event Log
- Erase Batch Log
- Erase Web Pages
- Mass Meter Menu
- Upgrade Firmware
- Factory Initialize
- Factory Diagnostics

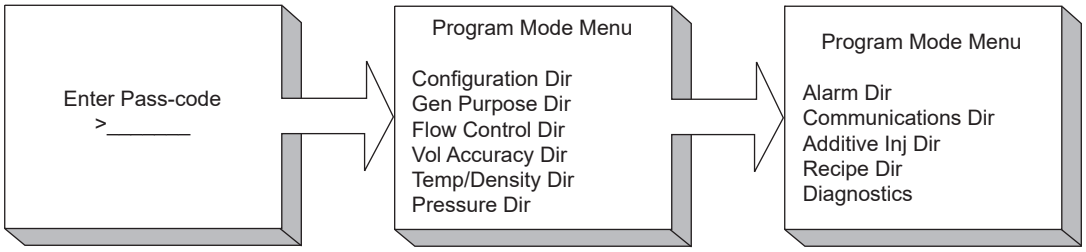
Getting Started

The program codes may be reviewed or altered using both the keypad and display on the face of the microFlow.net or by using Flowmate software through one of the communications ports. The following provides instructions on use of the keypad and display for program code operations. Before starting, refer to the Operations Manual, MN06157, Section II for microFlow.net keypad functions.

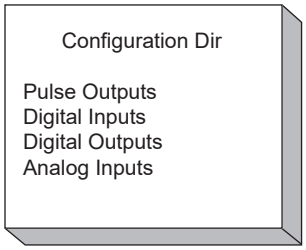
The Program Mode Menu is used for program code manipulation. From the “Run-time” screen the user first goes to the “Main Menu” screen by depressing the ENTER key.



Select “Program Mode Menu” and depress the ENTER key. The microFlow.net will then request the pass-code to allow entry into Program Mode Menu. The default pass-code for a new microFlow.net is “0000”. After entering the proper pass-code the Program Mode Menu screens will be accessible.



There are four (4) Configuration Subdirectories in the microFlow.net:



Pulse Output Subdirectory

If Pulse Output is not enabled, parameters Configuration 102 thru 104 will not be available for entry.

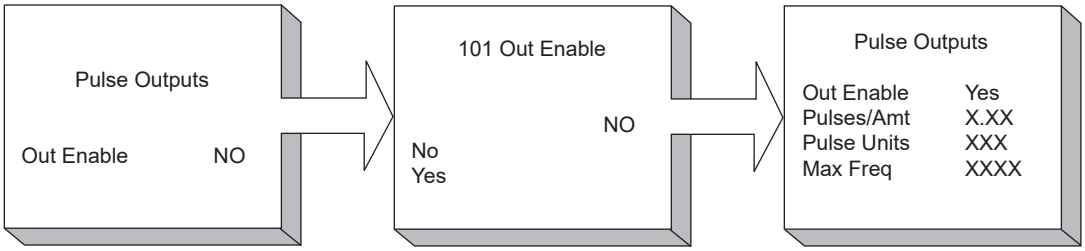
Configuration 101 – Pulse Output Enable

This program code allows a pulse output to be activated for the microFlow.net. Selections are as follows:

- No
- Yes

Steps to ENABLE Pulse Outputs:

- At first Pulse Output screen press ENTER
- On “101 Out Enable” screen select “Yes”
- Press ENTER
- Pulse Output Directory opens for editing



Configuration 102 – Pulse Output Pulses/Amount

This five-digit parameter defines the pulse output resolution, the number of pulses per unit of volume to be gener-ated (e.g., 0.1 will output 1 pulse for every 10 units of volume). The range of this parameter is 0.00 through 999.99.

Note: No entry if Pulse Output Enable = No
Help: “Enter output pulses per unit of volume or mass.”

Configuration 103 – Pulse Output Units

This parameter defines the volume type used to pace the pulse output. Selections are as follows:

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

Critical: Selected units not available.

Help: “Select volume type on which to be based on.

Note: No entry if Pulse Output Enable = No

Configuration 104 – Pulse Output Maximum Frequency

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

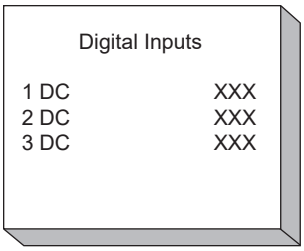
Fatal: Entry is out of specified range.

Help: “Enter frequency output should be limited to (0 to 3500 Hz).”

Note: No entry if Pulse Output Enable = No.

Digital Input Subdirectory

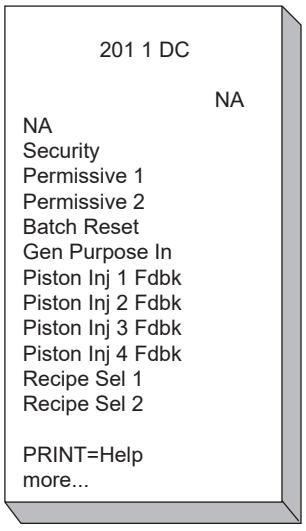
The microFlow.net has provisions for three (3) digital (ON/OFF) inputs.

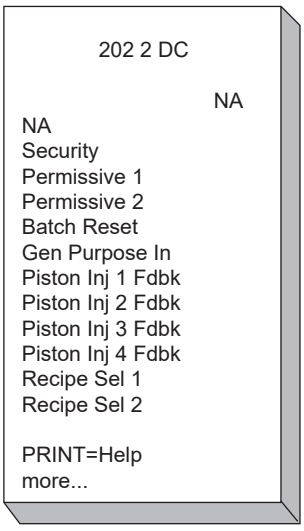


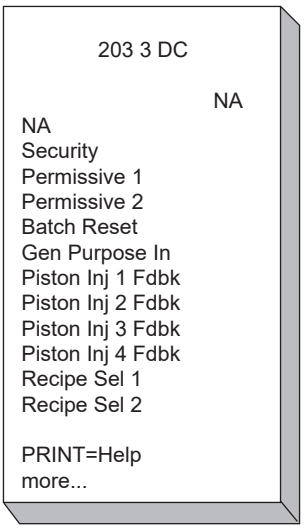
Configuration 201, 202, 203 – Digital Input Functions

These program codes define the function of each digital input. Except for general purpose inputs, duplicate assignments are not allowed. Must be at highest level of security to program or deprogram security input. Injector I/O assignment must match Injector type and digital output assigned for the injector. All Digital Inputs are DC type. Selections are as follows:

- NA
- Security Switch
- Permissive #1
- Permissive #2
- Batch Reset
- General Purpose Input
- Piston Injector 1 Feedback
- Piston Injector 2 Feedback
- Piston Injector 3 Feedback
- Piston Injector 4 Feedback
- Recipe Select 1
- Recipe Select 2

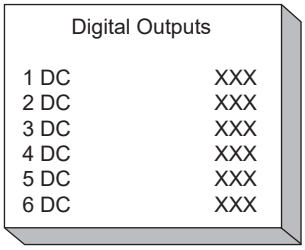






Digital Output Subdirectory

The microFlow.net has provisions for six (6) digital (ON/OFF) outputs. Digital Outputs 1 and 2 are DC type. Digital Outputs 3 through 6 are AC type.



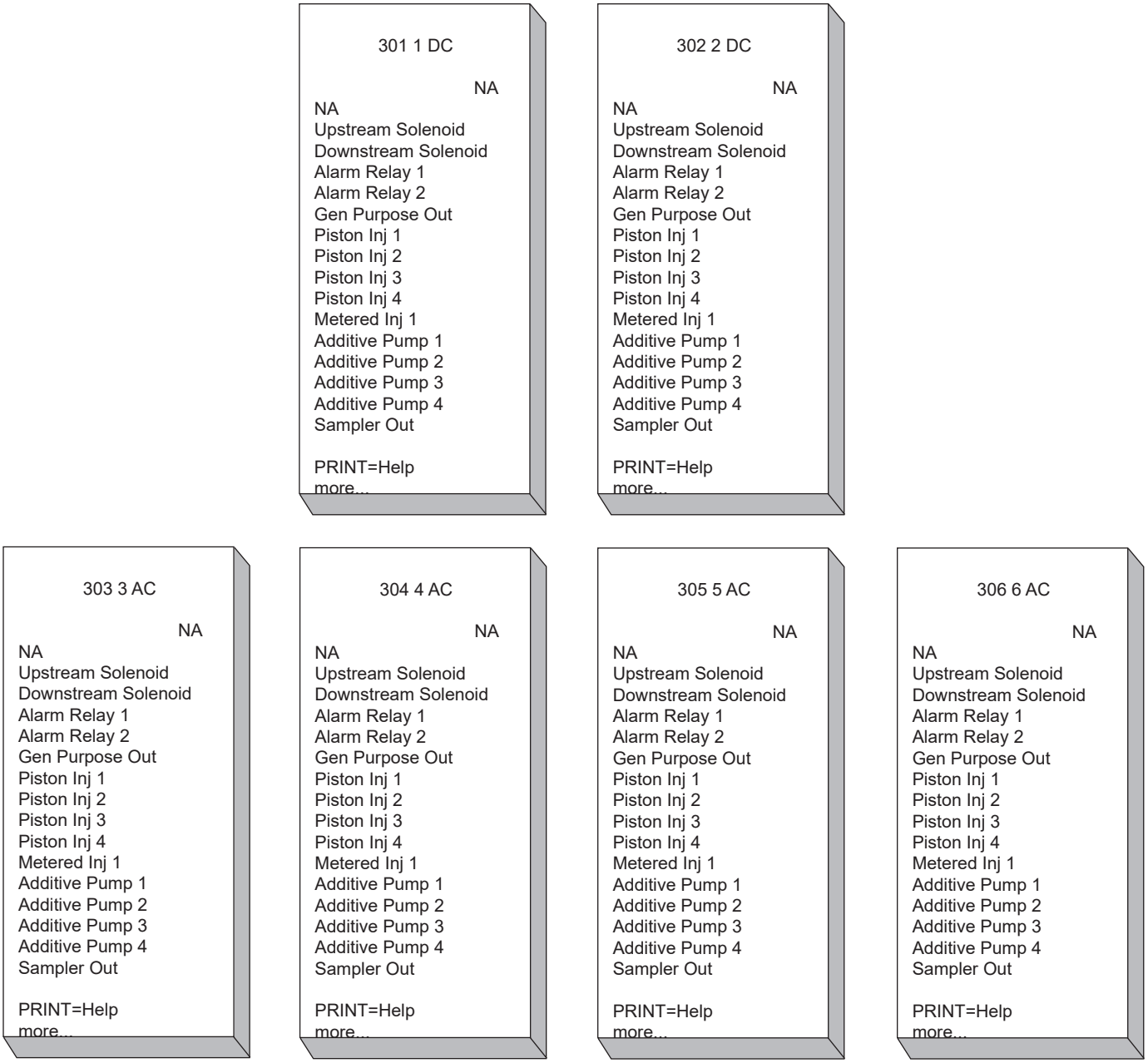
This program code defines the function of a digital output. If a valve is being configured, both upstream and downstream solenoids must be assigned. Except for general purpose outputs, duplicate assignments are not allowed for the same arm (or meter or product). Metered Injector Solenoid is not available with Dual Channel.

Selections are as follows:

- NA
- Upstream Solenoid
- Downstream Solenoid
- Alarm Relay #1
- Alarm Relay #2
- General Purpose Output
- Piston Injector 1
- Piston Injector 2
- Piston Injector 3
- Piston Injector 4
- Metered Injector 1
- Additive Pump #1
- Additive Pump #2
- Additive Pump #3
- Additive Pump #4
- Sampler Out

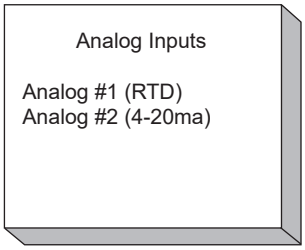
Critical: Output assignments must be unique [except for general purpose function]
Critical: Metered injector pulse input not configured

Critical: Both upstream and downstream solenoids required
Critical: Injector I/O assignment does not match type



Analog Input Subdirectory

The microFlow.net includes two (2) analog inputs. Analog Input #1 is dedicated to a 100 ohm RTD temperature type sensor. Analog Input #2 is a 4-20ma current loop type. This input may represent temperature, density, or pressure.



Configuration 401 – Analog Input #1 (RTD) Function

These program codes define the function of the Analog Input #1. Selections are as follows:

- NA
- Temperature Input

Critical: RTDs can only be temperature inputs

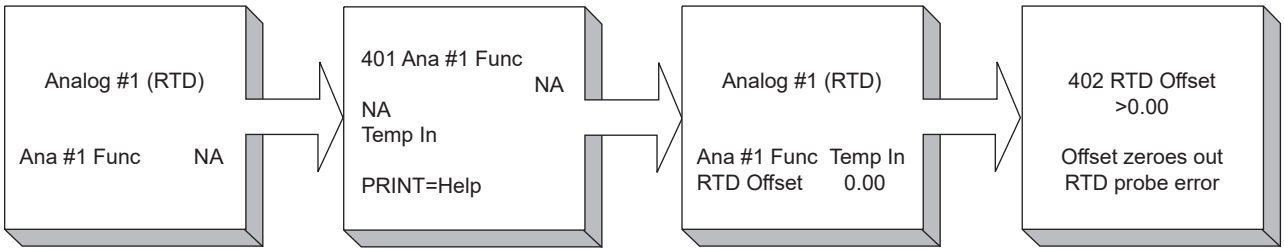
Configuration 402 – RTD Offset

This parameter is used to correct the reading of the RTD input by a fixed amount. The range of this program code is –9.9 to +9.9.

Note: No-entry if Analog Input #1=NA.

Steps for enabling RTD input and Offset

- From Analog Inputs subdirectory select “Analog #1 (RTD)”
- Select “Temp In”, press ENTER
- Select “RTD Offset”, press ENTER
- Enter Offset value, press ENTER



Configuration 411 – Analog Input #2 (4-20 mA) Function

These program codes define the function of the Analog Input #2. Selections are as follows:

- NA
- Temperature Input
- Density
- Pressure
- S&W

Critical: I/O assignments must be unique. Temperature Input cannot be selected if Analog #1 is “Temp In”.

Configuration 412 – Analog Input #2 Low Value

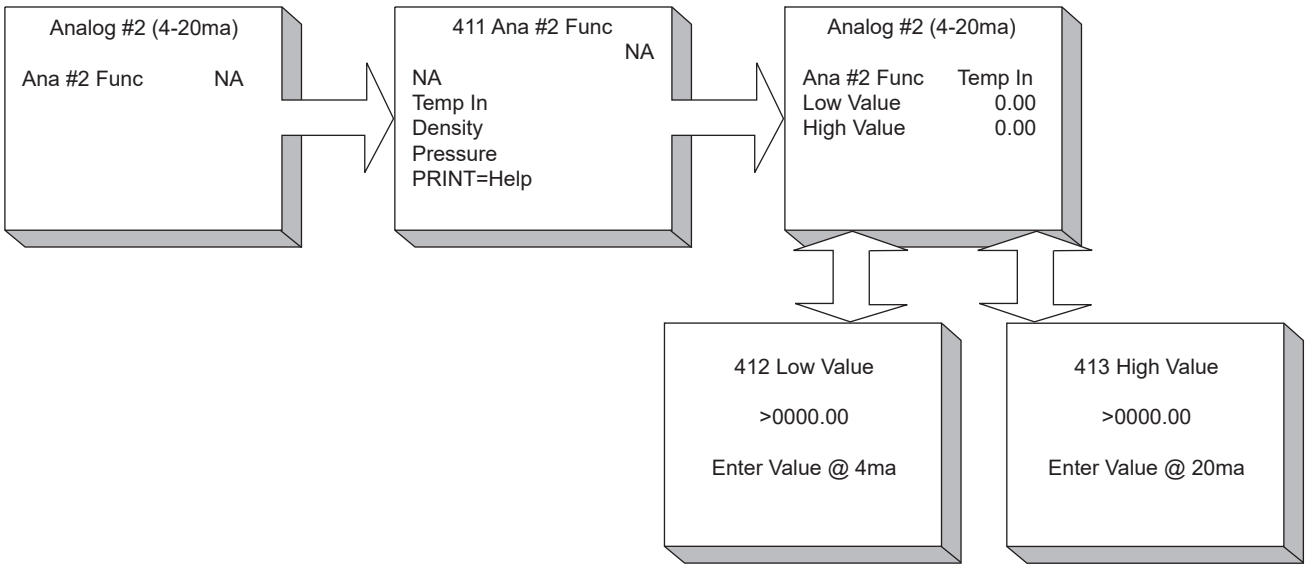
This parameter is used to scale Analog Input #2 by providing the value proportional to 4 mA. The range of this program code is -999.99 to +9999.99.

Configuration 413 – Analog Input #2 High Value

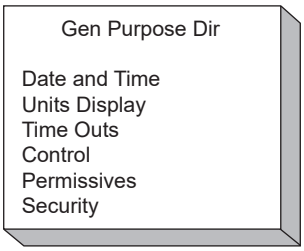
This parameter is used to scale Analog Input #2 by providing the value proportional to 20 mA. The range of this program code is -999.99 to +9999.99.

Critical: Low value must be less than the High Value.

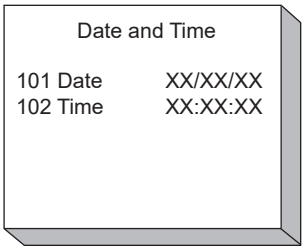
The flowchart below shows the process of enabling and scaling Analog Input #2. This example assumes a 4-20 mA temperature signal as the input.



There are seven (7) General Purpose subdirectories.



Date and Time Subdirectory



General Purpose 101 – Date

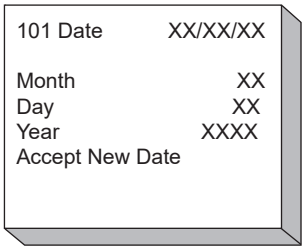
This entry allows the operator to set the date on the microFlow.net. When the month, day, and year have been entered, move to “Accept New Date” and press ENTER. The new date has been accepted.

- Month
- Day
- Year
- Accept New Date

Fatal: Invalid date

Steps to changing microFlow.net Date:

- Select “Month”, press ENTER
- Enter value for month (1-12), press ENTER
- Select “Day”, press ENTER
- Enter value for day of the month (1-31), press ENTER
- Select “Year”, press ENTER
- Enter value for year (4 digit), press ENTER
- Select “Accept New Date”, press ENTER



General Purpose 102 – Time

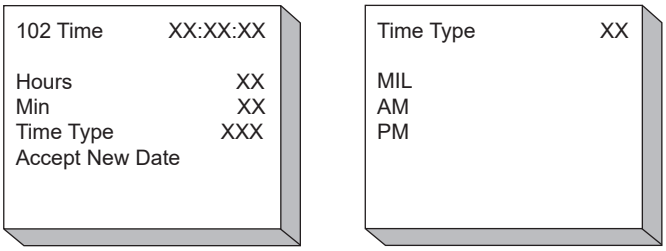
A correction or change to the time can be made through this entry. The Time parameter allows for either an AM/PM format or the military (24 hour) format. To accept the new time, move the cursor to Accept New Time and press "ENTER." The time has been accepted and the screen reverts to the Date and Time display. Selections are as follows:

- Hours
- Min
- Time Type
- Accept New Time

Fatal: Invalid time

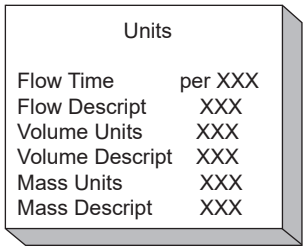
Steps to changing microFlow.net Time:

- Select "Hours", press ENTER
- Enter value for hour (0-24), press ENTER
- Select "Min", press ENTER
- Enter value for minute (0-59), press ENTER
- Select "Time Type", press ENTER
- Select time designation (MIL, AM, PM), press ENTER
- Select "Accept New Time", press ENTER



Units Subdirectory

The parameters in this subdirectory establish the units of measure used by the microFlow.net.



General Purpose 111 – Flow Rate Time

This parameter is used to define the time units used to compute the flow rate. Selections are as follows:

- Per minute
- Per hour

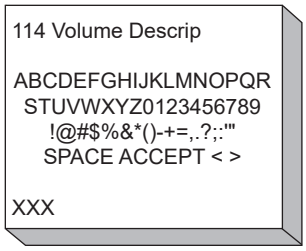
Help: "Enter the time base for flow rate calculation and display."

General Purpose 112 – Flow Rate Descriptor

This parameter allows a (3) three-character alphanumeric message to serve as the flow rate unit identifier (for example, GPM, LPM, BPH). The available characters are as follows:

- ABCDEFGHIJKLMNOPQRSUVWXYZ#*
- 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 < > ( ) ? ! . , ‘ - “ / + = _ END

Enter this parameter by selecting characters using the UP/DOWN and LEFT/RIGHT Arrow keys. Press ENTER for each selected character. When all characters have been entered, select “ACCEPT” and press ENTER to complete the process.



General Purpose 113 – Volume Units

This parameter selects the volume units used to measure product delivery. The factory default is “Gallons.” Selections are as follows:

- Gallons
- Barrels
- Dekaliters
- Liters
- Cubic Meters

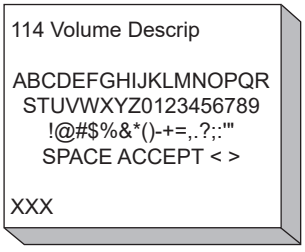
Help: “Select volume units. These are used to select proper conversion factors for calculations.”

General Purpose 114 – Volume Descriptor

This parameter allows a (4) four-character alphanumeric message to serve as the volume unit identifier. The available characters are as follows:

- ABCDEFGHIJKLMNOPQRSUVWXYZ#*
- 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 < > ( ) ? ! . , ‘ - “ / + = _ END

Enter this parameter by selecting characters using the UP/DOWN and LEFT/RIGHT Arrow keys. Press ENTER for each selected character. When all characters have been entered, select “ACCEPT” and press ENTER to complete the process.



General Purpose 115 – Mass Units

This parameter defines the mass units used for product measurement. The factory default is “Pounds.” Selections are as follows:

- Lbs
- Kilograms
- US Tons
- Metric Tons
- Long Tons

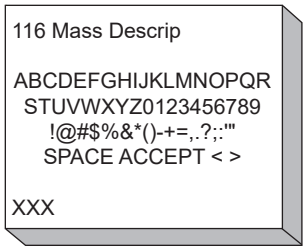
Help: “Select mass units. These are used to select proper conversion factors for calculations.”

General Purpose 116 – Mass Descriptor

This parameter allows a (4) four-character alphanumeric message to serve as the volume unit identifier. The available characters are as follows:

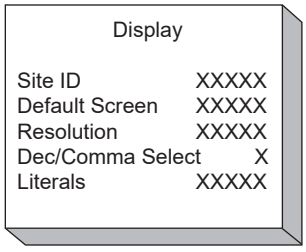
- ABCDEFGHIJKLMNOPQRSUVWXYZ#*
- a b c d e f g h i j k l m n o p q r s t u v w x y z & @
- 0 1 2 3 4 5 6 7 8 9 < > ( ) ? ! . , ‘ - “ / + = _ END

Enter this parameter by selecting characters using the UP/DOWN and LEFT/RIGHT Arrow keys. Press ENTER for each selected character. When all characters have been entered, select “ACCEPT” and press ENTER to complete the process.



Display Subdirectory

This subdirectory sets the customizable attributes of the microFlow.net display.

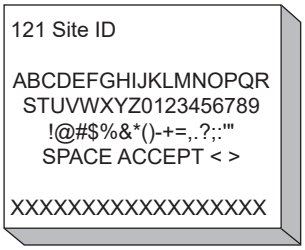


General Purpose 121 – Site ID

This parameter allows a (21) twenty-one character alphanumeric message to serve as the site identifier. The available characters are as follows:

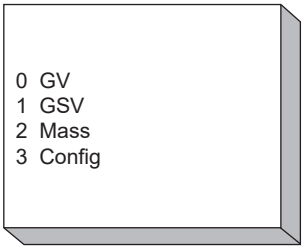
• ABCDEFGHIJKLMNOPQRSUVWXYZ#*
• a b c d e f g h i j k l m n o p q r s t u v w x y z & @
• 0 1 2 3 4 5 6 7 8 9 < > ( ) ? ! . , ‘ - “ / + = _ END

Enter this parameter by selecting characters using the UP/DOWN and LEFT/RIGHT Arrow keys. Press ENTER for each selected character. When all characters have been entered, select “ACCEPT” and press ENTER to complete the process.



General Purpose 122 – Run Display Options

Select batch screen option from the following:



This will be displayed as the default screen.

General Purpose 123 – Display Resolution

This parameter selects the resolution for data shown on the Delivery Screen. Selections are as follows:

• Whole Units
• 10th
• 100th

Help: “Select resolution of volume to be displayed.”

General Purpose 124 – Decimal/Comma

This parameter specifies whether a decimal or a comma is to be used to separate the whole and fractional parts of numeric data. The comma is typically used in European locations. The selected delimiter is used in the program mode and on run screens and dynamic displays local to microFlow.net, in host communications, and on delivery reports. Selections are as follows:

• Decimal
• Comma

Help: “Select delimiter between whole and fractional numbers.”

General Purpose 125 – Default/Translated Literals

This parameter allows the user to initialize all the displays used in the microFlow.net to either the default (factory literals) or the translated literals. Translated literals are only available if the translation has been completed in the FlowMate and downloaded to the microFlow.net. Selections are as follows:

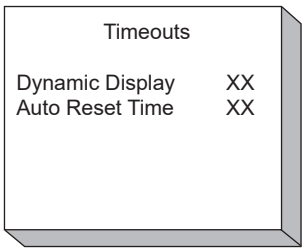
- Default literals
- Translated literals

Note: If a translation has been entered on FlowMate and downloaded to the microFlow.net, the new translation will not appear on the display until “translated literals” is selected here.

Help: Select factory-programmed default literals or literals translated via FlowMate.

Timeouts Subdirectory

The Timeouts Subdirectory contains settings which control when the microFlow.net automatically switches back to the Run Screens.



General Purpose 131 – Dynamic Display Timeout

This program code defines the amount of time, in seconds, that Dynamic Displays will remain before the microFlow.net returns to the Run Screen. A “0” entry for this program code disables the Dynamic Displays. A “99” entry for this program code will cause the Dynamic Display to remain indefinitely, until the operator presses CLEAR. The range of this parameter is 0 to 99 seconds.

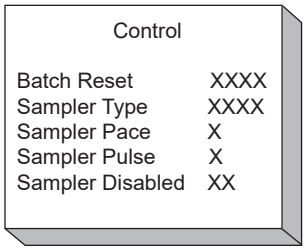
Help: “Time in seconds before exiting displays. “0” disables displays and “99” allows them to remain indefinitely.”

General Purpose 132 – Auto Reset Timer

This program code defines the amount of time, in minutes, before microFlow.net will return to the Run Screen in the absence of key input by the operator. The auto reset feature will remove the microFlow.net from the program mode or end batches in progress when this parameter is set to a non-zero value. The clock starts after each keystroke (unless flowing). If another keystroke is not made in the time set in this code, the unit will revert to the Run display. If the operator’s load has been completed and he hasn’t ended the batch, the microFlow.net will return to the Run mode after the time has expired. The range of this parameter is 0 to 99 minutes. An entry of 0 disables this feature.

Help: Time in minutes with no operator activity before microFlow.net resets to Run Mode. Zero disables this feature.

Control Subdirectory



General Purpose 141 – Batch Reset Enable

This parameter allows the user to select whether the batch reset can be done via the keypad OR not allowing the operator to reset the batch via the keypad.

0 - Enable Keypad

1 - Disable Keypad

General Purpose 142 – Sampler Type

This parameter allows the user to select between disabling the Sampler Type or choosing whether the sampling frequency is set by volume or time. This will allow the MicroFlow to be programmed to take a sample each time a certain volume is accumulated or after a certain time increment is reached. The choices in the directory are shown below:

- Disable
- Volume Pacing
- Time Pacing

Help: “Select volume or time for sampler pacing.”

General Purpose 143 – Sampler Pace

This program code allows the user to select the volume or time in seconds between samples. The range of this parameter is from 0 – 250.

Note: The number selected will correspond to the selection made in parameter 142 (above) to determine whether the pace is set for volume or time.

General Purpose 144 – Sampler Pulse

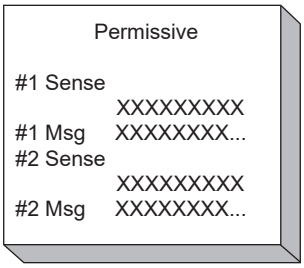
This program code allows the user to set the minimum width of the sampler pulse output via a discrete I/O output signal. The range is between 0 – 50. The sampler pulse output will be incremented in a tenth of a second interval. For example a pulse width of 50 (the highest value able to be entered) will give a 5 second output pulse “on time” until the next sample is taken.

General Purpose 145 – Sampler Disabled

The sampler has the option of being enabled or disabled. This parameter will allow the sampler operation to be disabled. The default setting is set to “No”, meaning that the sampler operation will be programmed on a factory default start up.

Permissive Subdirectory

Program codes in the Permissive Subdirectory determine how the microFlow.net responds to the Permissive #1 and #2 assigned to Digital Inputs. **Permissive program codes are only available for those Permissives assigned to Digital Inputs in the Configuration Directory** (Configuration 201, 202, 203).



General Purpose 151 – Permissive #1 Sense

This parameter defines the conditions under which Permissive #1 is expected to be present in order for operations to be allowed. Selections are as follows:

- N/A
- Batch Reset
- Flow
- Reset & Flow

Note: No entry if digital input not programmed as permissive.
Help: “Select when permissive is to be required for operation”

General Purpose 152 – Permissive #1 Message

These (21) twenty one-character alphanumeric messages will be displayed if Permissive #1 sense entry is de-fined but not present when expected. The data entry allows the following characters to be selected:

- 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 < > ( ) ? ! . , ‘ - “ / + = _ END

Note: No entry if digital input not programmed as permissive.

Enter this parameter by selecting characters using the UP/DOWN and LEFT/RIGHT Arrow keys. Press ENTER for each selected character. When all characters have been entered, select “ACCEPT” and press ENTER to complete the process.

General Purpose 153 – Permissive #2 Sense

This parameter defines the conditions under which Permissive #2 is expected to be present in order for operations to be allowed. Selections are as follows:

- N/A
- Batch Reset
- Flow
- Reset & Flow

Note: No entry if digital input not programmed as permissive.
Help: “Select when permissive is to be required for operation”

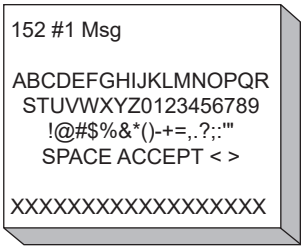
General Purpose 154 – Permissive #2 Message

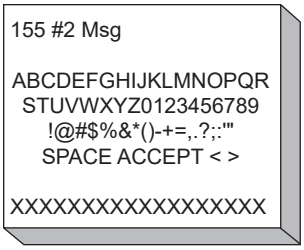
These (21) twenty one-character alphanumeric messages will be displayed if Permissive #2 sense entry is defined but not present when expected. The data entry allows the following characters to be selected:

- 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 < > ( ) ? ! . , ‘ - “ / + = _ END

Note: No entry if digital input not programmed as permissive.

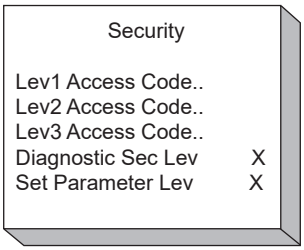
Enter this parameter by selecting characters using the UP/DOWN and LEFT/RIGHT Arrow keys. Press ENTER for each selected character. When all characters have been entered, select “ACCEPT” and press ENTER to complete the process.





Security Subdirectory

This subdirectory establishes access codes and requirements for microFlow.net secure information. Note: The Security Input Access Level program code is only available if the a Digital Input has been assigned to “Security”. See Configuration Directory for Digital Input assignments.



General Purpose 161 – Level 1 Access Code

These four-digit numbers permit entry into the microFlow.net program or Weights and Measures program codes. The access codes must be entered through the microFlow.net keypad after the Program Mode security contact has been closed (if a security contact has been programmed and wired to a switch). If this contact has not been closed, the microFlow.net will not allow entry into the Program Mode. Once the security is set up for the parameters in the unit the operator must enter the program mode at the level assigned to the parameter(s) that are to be changed. The range of these entries is from 0 to 9999.

Critical: Duplicate access codes are not permitted

Critical: Must be at highest level of security

Help: “Enter Access Code for this security level.”

Note: These access codes must be programmed in order, beginning with security level one. Intermediate levels cannot be skipped.
Note: The operator must enter Program Mode at the highest programmed security level to obtain access to these access codes.

General Purpose 162 – Level 2 Access Code

These four-digit numbers permit entry into the microFlow.net program or Weights and Measures program codes. The access codes must be entered through the microFlow.net keypad after the Program Mode security contact has been closed (if a security contact has been programmed and wired to a switch). If this contact has not been closed, the microFlow.net will not allow entry into the Program Mode. Once the security is set up for the parameters in the unit the operator must enter the program mode at the level assigned to the parameter(s) that are to be changed. The range of these entries is from 0 to 9999.

Critical: Duplicate access codes are not permitted

Critical: Must be at highest level of security

Help: "Enter Access Code for this security level."

Note: These access codes must be programmed in order, beginning with security level one. Intermediate levels cannot be skipped.

Note: The operator must enter Program Mode at the highest programmed security level to obtain access to these access codes.

General Purpose 163 – Level 3 Access Code

These four-digit numbers permit entry into the microFlow.net program or Weights and Measures program codes. The access codes must be entered through the microFlow.net keypad after the Program Mode security contact has been closed (if a security contact has been programmed and wired to a switch). If this contact has not been closed, the microFlow.net will not allow entry into the Program Mode. Once the security is set up for the parameters in the unit the operator must enter the program mode at the level assigned to the parameter(s) that are to be changed. The range of these entries is from 0 to 9999.

Critical: Duplicate access codes are not permitted

Critical: Must be at highest level of security

Help: "Enter Access Code for this security level."

Note: These access codes must be programmed in order, beginning with security level one. Intermediate levels cannot be skipped.

Note: The operator must enter Program Mode at the highest programmed security level to obtain access to these access codes.

General Purpose 164 – Level for Security Input

Enter the security level (1-3) to be associated with the security digital input. Valid Range (0-3).

General Purpose 165 – Diagnostics Security Level

This parameter associates a security level with the Program Mode diagnostics. To access these diagnostics, Program Mode must have been accessed with at least the level indicated in this parameter. Selections are as follows:

• Level 1 access

• Level 2 access

• Level 3 access

Critical: Must be at highest level of security

Critical: Access level not valid

Help: "Select security level (1-3) required to enter Diagnostics Directory."

General Purpose 166 – Set Parameter Security Level

This parameter associates a security level with the Program Mode parameters. To access these parameters, Program Mode must have been accessed with at least the level indicated in this parameter. Selections are as follows:

• Level 1 access

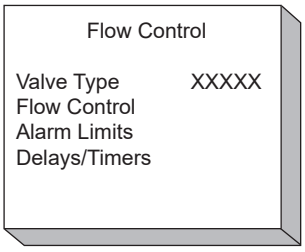
• Level 2 access

• Level 3 access

Critical: Must be at highest level of security

Critical: Access level not valid

Help: "Select security level to assign all parameters."



Valve Type Subdirectory

The Valve Type Subdirectory contains a single program code, Valve Type

Flow Control 201 – Valve Type

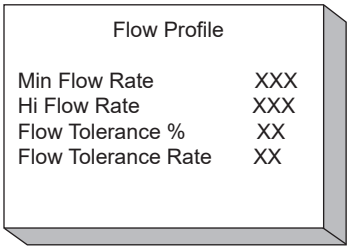
These program codes define the style of flow control valve used. Selections are as follows:

- Digital
- Two-stage

Help: "Select the type of valve used."

Flow Profile Subdirectory

The Flow Profile Subdirectory contains program codes which establish the flow characteristics to which the microFlow.net will control.



Flow Control 202 – Minimum Flow Rate

This four-digit numeric entry defines the minimum flow rate allowed. This value is used in determining digital valve control aspects. The range of this parameter is 0 to 9999. This value should be set to the minimum flow rate from the meter nameplate. The factory default is 0.

Help: "Enter minimum flow rate for digital valve control operations, mass or vol based on pulse input type."

Flow Control 203 – High Flow Rate

This five-digit code sets the high flow rate for the system. The range of this entry is 00001 to 99999 flow units.

Note: "00000" will not allow the valve to open.

Help: "Enter the maximum flow rate for digital valve control operation. A zero entry will not allow the valve to open."

Flow Control 204 – Flow Tolerance Percentage

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

The microFlow.net will calculate the current flow tolerance using this percentage and the current flow rate. This will be compared with the programmed flow tolerance rate, with the larger of the two tolerances determining when to adjust the valve.

Example:

Current Flow Rate 600 GPM

Flow Tolerance 9%

Flow rate can vary 54 GPM (600 GPM x 9% = 54 GPM) without a valve correction signal from the microFlow.net.

Help: “Enter desired flow rate tolerance as a percentage of the current flow rate”

Flow Control 210 – Flow Tolerance Rate

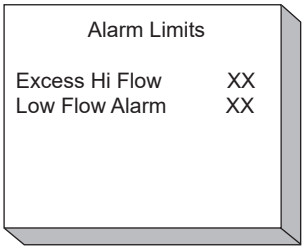
This program code allows for the entry of the minimum flow rate tolerance in units per time. The range of this three-digit numeric entry is from 0 to 999 units per time.

The microFlow.net will calculate the current flow tolerance using the percentage entered in Flow Control 209 and the current flow rate. This will be compared with the programmed flow tolerance rate entered here. The larger of the two tolerances will determine when to adjust the valve.

Help: “Enter a desired flow rate tolerance in units per time (GPM, BPH, etc.), mass or vol based on pulse type.”

Alarm Limits Subdirectory

This subdirectory contains flow related limit set points.



Flow Control 221 – Excess High Flow Rate

This program code sets the maximum percentage by which the flow rate can exceed the product’s high flow rate entry without alarming. This entry must be greater than the Flow Tolerance entry, except when a value of zero is entered to disable excess high flow alarm checking. The excess rate is entered as a percentage of the product high flow rate. The range of this two-digit numeric entry is 00 through 99.

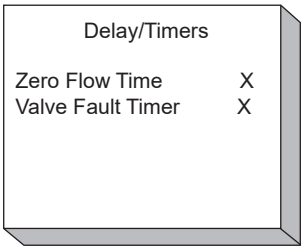
Help: “Enter the highest flow rate allowed in percent above the high flow rate without alarming.”

Flow Control 222– Low Flow Rate Alarm Limit

This three-digit entry defines the set point in units per minute for the low flow alarm. The low flow alarm will be triggered whenever a flow rate is equal to or lower than the limit set and is maintained for eight seconds. The low flow alarm is not triggered in cases where there is no flow. The range of this entry is 000 to 999 flow units.

Help: “Enter the minimum flow rate allowed without a low flow alarm, mass or vol based on pulse input type.”

Delays/Timers Subdirectory



Flow Control 231 – Zero Flow Timer

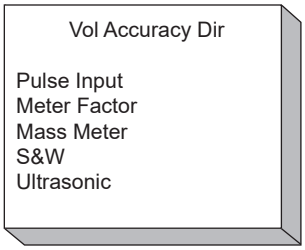
This parameter defines the amount of time, in seconds, that microFlow.net will ignore a zero flow condition before commanding the valve to close. Once this occurs, microFlow.net will require a start command before the batch in progress can be continued. The range of this parameter is 0 to 99 seconds. The factory default is 0.

Help: “Enter time in seconds zero flow is ignored before valve closure. Zero disables this feature.”

Flow Control 232 – Valve Fault Timeout

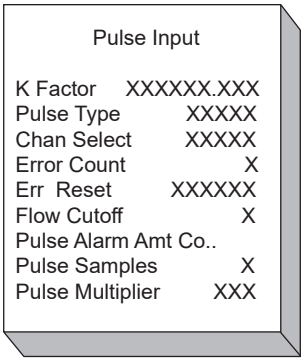
This two-digit program code allows the setting of the amount of time that the microFlow.net will ignore flow after the valve has been commanded to close. If flow persists beyond this time, a “Valve Fault” alarm will occur. The range of this parameter is 0 to 99 seconds.

Help: “Enter time in seconds to ignore flow when valve has been commanded to close. Zero disables this feature.”



Pulse Input Subdirectory

The Pulse Input Subdirectory contains program codes used in characterizing meter pulse inputs to the microFlow.net.



Volume Accuracy 301 – K Factor

This nine-digit numeric entry defines the nominal number of pulses comprising one unit of volume registration. The range of this entry is 000000.001 to 999999.999.

Critical: Security level for parameter must be at top 2 levels.

Fatal: Entry must not be zero

Help: “Enter the number of pulses required for one unit of registration, mass or vol. based on pulse input type.”

Warning: Changing this parameter causes batch reset at program mode exit.

Volume Accuracy 302 – Pulse In Type

This parameter allows the selection of mass pulse input rather than the default of pulses representing volume from the meter. The microFlow.net then totalizes directly in mass. A density input is required to back-calculate volume when using a mass meter. Selections are as follows:

• Volume

• Mass

Help: “Specify whether meter pulses input to microFlow.net represent volume or mass.”

Volume Accuracy 303 – Pulse Input Channel

This parameter allows the selection of either a single or dual channel pulse transmitter. Selections are as follows:

• Single Channel

• Dual Channel

Critical: Transmitter integrity not available with single channel.

Help: “Select single or dual pulse transmitter. Single or channel A: CN5 1(+), 2(-) or 3(+), 4(-) for turbine; channel B or meter injection 6(+), 7(-) or 8(+), 9(-) for turbine.”

*If EPLD is Rev. 0, any pulse frequency input must be single channel when the frequency input is between 3Hz. If ELPD is Rev. 1 or higher, the dual channel input can be selected for all input pulse frequencies (3Hz or higher).

Volume Accuracy 304 – Dual Pulse Error Count

This three-digit numerical entry defines the number of error counts that may be received from a dual pulse comparator without causing a pulse security alarm. The range of this parameter is 0 to 999. The factory default is 0.

Note: No entry if dual pulse not selected.

Help: "Enter the number of dual pulse errors allowed before alarm."

Volume Accuracy 305 – Dual Pulse Error Reset

This program code defines the conditions under which the dual pulse error count will be reset. The factory default is "No reset." Selections are as follows:

- No Reset (No dual pulse error reset)
- Trans End (Reset at end of transaction)
- Power-Up (Reset on power-up)
- Trans & Power (Reset at end of transaction and on power-up)

Note: No entry if dual pulse not selected.

Help: "Select how dual pulse error count is reset."

Volume Accuracy 306 – Dual Pulse Flow Rate Cutoff

This parameter defines the flow rate below which dual pulse errors will not be counted. The range of this four-digit numerical entry is 0 to 999. The factory default is 0.

Note: No entry if dual pulse not selected.

Help: "Enter the flow rate at which dual pulse error counts will be counted, mass or vol based on pulse input type."

Volume Accuracy 307 – Pulse Security Alarm Amount

This program code determines whether pulses received after a Pulse Security Alarm occurs are ignored (no volume or mass is registered). Select "no" to continue to totalize normally after this alarms occurs. Selecting "Ignore" will cause any volume or mass that actually flows through the meter from the point where this alarm occurs to when the valve is completely closed to be ignored. The microFlow.net will ignore any pulses from the meter until the alarm is cleared. Some measurement agencies require this behavior, taking the position that after a pulse security alarm, the consumer cannot be responsible for any measured quality because it may not be reliable. Selection are as follows:

- Count
- Ignore

Help: Select whether pulses received after a Pulse Security Alarm are included in vol/mass totals.

Volume Accuracy 308 – Pulse Period Sample Count

This two-digit entry determines the length of time in 0.1 second increments over which the frequency of the meter pulses is averaged to provide flow rate smoothing. This parameter is intended for meters that produce a varying frequency pulse output when the flow is steady. The range of this two digit entry is 0-20.

Help: Enter number of 1/10th second samples over which the pulse input periods are averaged.

Volume Accuracy 309 – Pulse Multiplier

This entry enables product meter doubling. Selections are as follows:

- X1
- X2

Help: "Select if product meter pulses are multiplied by one or two."

S&W Subdirectory

Volume Accuracy 321 – Maintenance S&W

Allows the user to enter in a maintenance value for the S&W. Range is from 0.000→9.999.

Volume Accuracy 322 – S&W High Alarm Limit

Allows the user to enter a value in which the microFlow will alarm when the S&W is higher than the entered value. Range is from 0.000→9.999.

Ultrasonic Subdirectory

Volume Accuracy 331 – Ultrasonic Meter Type

This parameter will select the type of ultrasonic meter connected to the microFlow

Selections are:

0 – None

1 – Ultra6

Volume Accuracy 332 – Share Temperature with Ultrasonic Meter

The microFlow can send the current temperature to the ultrasonic meter to allow the meter to compensate for the effects of temperature on the meter body. The temperature is sent to the meter using modbus protocol via a serial or TCP/IP link.

Selections are:

0 – No share

1 – Yes share

Volume Accuracy 333 – Share Pressure with Ultrasonic Meter

The microFlow can send the current pressure to the ultrasonic meter to allow the meter to compensate for the effects of pressure on the meter body. The pressure is sent to the meter using modbus protocol via a serial or TCP/IP link.

Selections are:

0 – No share

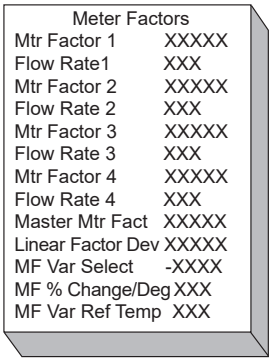
1 – Yes share

Volume Accuracy 334 – Ultrasonic Meter IP Address

When this parameter is non-zero, the microFlow will use modbus over TCP/IP to communicate with the ultrasonic meter at the specified address. Note, this address must be on the same network as specified in the microFlow IP address in the communications directory.

Format for this parameter is - XXX.XXX.XXX.XXX (i.e. 192.168.0.10)

Meter Factor Subdirectory



Volume Accuracy 341 – Meter Factor 1

Volume Accuracy 343 – Meter Factor 2

Volume Accuracy 345 – Meter Factor 3

Volume Accuracy 347 – Meter Factor 4

These program codes and the associated flow rates below allow the entry of the meter factor curve. The microFlow.net will perform linearization to calculate meter factors between the entered flow rates.

If only a single meter factor is used, it must be put into program code 302. The flow rate selected in program code 303 or 305 must be set to “0”. Under these conditions any other meter factors programmed will be ignored. The range of these six-digit numeric entries is 0 to 9.99999.

It is possible to change the meter factor on the fly (while a batch is in process) the microFlow.net will use the new meter factor from the instant it is entered forward. The historical batch logs will calculate an average meter factor value if multiple meter factors are used. Meter factors entered will not “back calculate” any previous totals.

Note: A zero entry in meter factor 1 will be considered an invalid entry. Zero entries in the remaining factors will result in that factor and subsequent factors not being used. (e.g., if a zero entry is made for factor 2, factors 3 and 4 will not be used.)

Fatal: Entry must not be zero [341 only]

Critical: Factor varies more than the Linearized Factor Deviation

Critical: Meter factors must be within 2% of the master meter factor

Help: Meter factor = (actual volume x current factor x k factor) input pulses.

Volume Accuracy 342 – Flow Rate 1

Volume Accuracy 344 – Flow Rate 2

Volume Accuracy 346 – Flow Rate 3

Volume Accuracy 348 – Flow Rate 4

These five-digit entries are the flow rates at which the meter factors (codes 302, 304, 306, 308) are defined beginning with the highest flow rate in program code 303 and descending to the lowest flow rate in program code 309. If only one meter factor is used, program code 303 or 305 must be set at "0". The range of these entries is 0 to 99999 flow units.

Critical: Flow rates must be entered in descending order

Critical: Corresponding meter factor not programmed

Help: “Enter the flow rate corresponding to the meter factor, mass or vol based on pulse input type.”

Volume Accuracy 349 – Master Meter Factor

This program code allows the operator to set a master meter factor. This six-digit entry will be used to restrict meter factors one through four (codes 341, 343, 345 and 347), to plus or minus 2% of the master factor (i.e., the value entered here). This range restriction applies only to meter factors which are programmed for use (i.e., meter factor one always and, if linearizing, all the factors used). Any attempt to enter a meter factor outside the 2% range, if installed, will cause a Critical Warning.

In addition, a master factor entry that causes the current meter factors installed to be out of range will cause those meter factors which are out of range to prompt a Critical Message. This critical condition must be corrected so that all used meter factors are within the 2% range of the master factor before normal Run Mode operations can occur. The range of this entry is 0 to 9.99999. Note that zero disables the master meter factor.

Critical: Meter factor must be within 2% of the master meter factor

Help: “Restricts programmed meter factors to + or –2% of this master factor.”

Volume Accuracy 350 – Linearized Factor Deviation

This code allows the operator to set a maximum deviation between adjacent meter factors. This three-digit entry will be used to restrict deviation between the adjacent meter factors in use to plus or minus the entered percentage (i.e., the value entered here). Any attempt to enter a meter factor outside the entered range will cause a Critical Warning.

A linearized factor deviation entry that results in the current meter factors installed to be out of range will set a program code alarm. The meter factors that are out of range will be indicated by a DA alarm. The meter factors at fault must be corrected so they are within range of the deviation entry before normal Run Mode operations can occur. The value of the linearized factor deviation may range from 0 to 9.99%. Zero disables this feature.

Critical: Meter factor varies more than the Linearized Factor Deviation

Help: “Set the maximum deviation in percent allowed between adjacent meter factors.”

Volume Accuracy 351 – Meter Factor Variation Select

This parameter allows the selection of enabling or disabling the meter factor variation entries (calculations). When enabled, the microFlow.net will calculate and use the meter factor based on the current temperature of the product. The factory default is “Disabled”. Selections are as follows:

• Disabled

• Enabled

Note: No entry if temperature unit not assigned.

Critical: Security level for parameter must be at top 2 levels.

Help: “Enable or disable the use of meter factor variation with temperature.”

Volume Accuracy 352 – Meter Factor Percent Change Per Degree Temperature

This four-digit parameter allows the entry of the meter factor variation with temperature. This four-digit entry represents the meter factor percent change per degree of temperature. The range of this parameter is 0.0001 to 0.9999 percent.

Fatal: Entry is out of specified range.

Help: “Enter the meter factor variation in % change per degree temperature.”

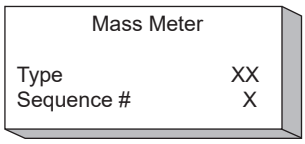
Volume Accuracy 353 – Meter Factor Variation Reference Temperature

This four-digit code allows the entry of the meter factor reference temperature. This entry represents the temperature, in tenths, at which the present meter factor was determined. The range of this entry is 000.1 to 999.9 units.

Fatal: Entry is out of specified range.

Help: “Enter reference temperature for the meter factor % change per degree.”

Mass Meter Subdirectory



Volume Accuracy 361 – Mass Meter Type

This parameter allows the operator to select the mass meter used by the meter. The factory default is “NA.” Selections are as follows:

• NA

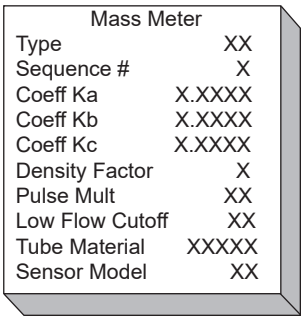
• S-Mass

• Apollo

• Promass

Help: “Select the type of mass meter, S-Mass, Apollo, Promass.”

If an S-Mass meter is selected the Mass Meter Subdirectory is expanded to include mass meter data.



Volume Accuracy 362 – Mass Meter Sequence Number

This entry allows the operator to enter the specific sequence number assigned to a mass meter connected to the microFlow.net. The range of this entry is from 0 to 99999.

Help: “Last five digits of the Micro-Pak serial number, the Final Assembly # for Apollo, or address for Promass.”

Volume Accuracy 363 – S-Mass Coefficient Ka

This entry allows the operator to enter the Constant Ka from the S-Mass meter. This numeric entry has a range of 0.0000 to 63.99999. This parameter specifies the “Ka” value in the equation KaX2+KbX + Kc = Density. See MN0M008 for more information.

Note: No entry if not selected as installed densitometer type.

Help: “Enter the Ka from the S-Mass nameplate.”

Volume Accuracy 364 – S-Mass Coefficient Kb

This entry allows the operator to enter the Constant Kb from the S-Mass meter. This numeric entry has a range of -31.9999 to 31.9999. This parameter specifies the “Kb” value in the equation KaX2+KbX + Kc = Density. See MN0M008 for more information.

Note: No entry if not selected as installed densitometer type.

Help: “Enter the Kb from the S-Mass nameplate.”

Volume Accuracy 365 – S-Mass Coefficient Kc

This entry allows the operator to enter the Constant Kc from the S-Mass meter. This numeric entry has a range of -31.9999 to 31.9999. This parameter specifies the “Kc” value in the equation KaX2+KbX + Kc = Density. See MN0M008 for more information.

Note: No entry if not selected as installed densitometer type.

Help: “Enter the Kc from the S-Mass nameplate.”

Volume Accuracy 366 – S-Mass Density Factor

This factor is used to adjust the period of the tubes for the minute changes in tube frequency that occurs with change in the flow rate. This factor is typically not changed in the field. The setting depends on the sensor size and materials of construction. Factory settings are as follows:

	Stainless Steel	Hastelloy
S25LF	N/A	030
S25	N/A	030
S50	020	028
S100	016	023
S200	019	027

If the Density Factor for your sensor is different from what is shown, consult your Smith Meter representative.

Note: No entry if not selected as installed densitometer type.

Help: “Enter the Density Factor for the S-Mass.”

Volume Accuracy 367 – Mass Meter Pulse Multiplier

The mass meter flow rate pulse output is multiplied by this factor to increase the number of pulses per unit of vol-ume resolution. The maximum frequency for the flow rate pulse output is 2500 Hz. Selections are as follows:

- x 1
- x 2
- x 4
- x 8
- x 16
- x .5

Note: No entry if not selected as installed densitometer type.

Help: Enter the multiplier for the flow pulse output 1, 2, 4, 8, 16, or .5.

Volume Accuracy 368 – Mass Meter Low Flow Cutoff

This entry allows the operator to specify the low flow cutoff point. The range of this numeric entry is from 0 to 99. This is the Low Flow Cutoff for the S-Mass meter. The range is 0 to 99. A value of 10 approximates 1.0% of full scale flow, 20 approximates 2.0% of full flow etc. This function prevents counting extraneous pulses that may be generated while at no flow condition. Factory default is 20. See MN0M008 for more information.

Note: No entry if not selected as installed densitometer type.
Help: "Enter the min. flow to report. 10 = 1% of full scale flow."

Volume Accuracy 369 – Mass Meter Tube Material

This entry allows the operator to specify the type of material from which the mass meter's tubes were constructed. Selections are as follows:

- Stainless
- Hastelloy

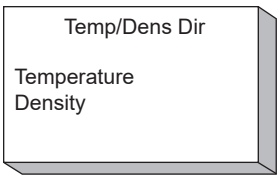
Note: No entry if not selected as installed densitometer type.
Help: "Select the tube material (stainless or hastelloy) for this meter."

Volume Accuracy 370 – Mass Meter Model

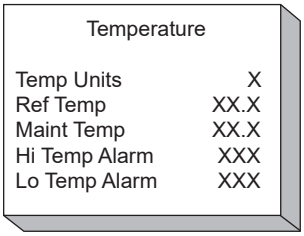
This entry allows the operator to specify the type of sensor contained in the mass meter. Selections are as follows:

- Model 25
- Model 50
- Model 100
- Model 200

Note: No entry if not selected as installed densitometer type.
Help: "Select the sensor model of the meter."



Temperature Subdirectory



Temperature/Density 401 – Temperature Units

This program code selects the temperature scale used by microFlow.net. The factory default is “NA.” Selections are as follows:

- NA
- Fahrenheit
- Celsius

Critical: API table conflicts with selected units

Help: “Select temperature units.”

Temperature/Density 402 – Reference Temperature

The actual uncompensated volume throughput is temperature compensated to its equivalent volume at this four-digit reference temperature in tenth degrees. The most common reference temperatures are 60.0 Deg. F and 15.0 Deg. C. The range of this entry is 0.0 to 999.9.

Note: No-entry if Temperature Units = Not Used.

Help: “Used as base for correction of liquid volume.”

Temperature/Density 403 – Maintenance Temperature

This code allows the entry of a maintenance temperature to be used when a temperature probe is not installed or working, but temperature related calculations are desired. The temperature units are dependent on the entry made in the Temperature Units Select code. This four-digit entry has a range of –999.9 to 999.9 temperature units where –999.9 disables the maintenance temperature.

Note: An entry greater than -999.9 will override the temperature probe or transducer input if installed and will be used in all calculations where temperature is used.

Note: No entry if Temperature Units = Not Used

Help: “Select maintenance temperature if temperature probe is not installed or to override probe”

Temperature/Density 404 – High Temperature Alarm Limit

This code allows the entry of a temperature reading that will cause a high temperature alarm to be generated. The temperature units will be dependent on the entry made in the Temperature Units Select code. This four-digit entry has a range of –999.9 to +999.9 degrees F or C.

Note: An entry of “+999” will disable the alarm.

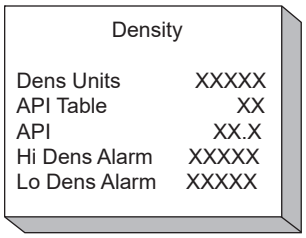
Help: “Enter temperature that will cause an alarm for high temperature.”

Temperature/Density 405 – Low Temperature Alarm Limit

This code allows the entry of a temperature reading that will cause a low temperature alarm to be generated. The temperature units will be dependent on the entry made in the Temperature Units Select code. This four-digit entry has a range of –999.9 to +999.9 degrees F or C.

Note: "-999" will disable the alarm.
Note: No entry if Temperature Units = Not Used
Help: "Enter temperature that will cause an alarm for low temperature."

Density Subdirectory



Temperature/Density 411 – Density Units

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

- NA
- API
- Lb/Ft3 (Pounds/Cubic Feet)
- Kg/M3 (Kilograms/Cubic Feet)

Note: When using temperature compensation, a value (API, Lb/Ft3, or Kg/M3) must be entered in this parameter.
Help: "Select density units. These are used for a live density input and for mass calculation."

Temperature/Density 412 – API Table

This entry selects the API Table and product to be selected. Selections are as follows:

- Not used
- 5A
- 5B
- 5D
- 6
- 6A
- 6B
- 6C
- 6D
- 23
- 23A
- 23B
- 23D
- 23E
- 24
- 24A
- 24B
- 24D
- 24E
- 53
- 53A
- 53B
- 53D
- 54E
- 54
- 54A

- 54B
- 54C
- 54D
- 54E
- BR1A
- BR1P
- BR2P
- 59A
- 59B
- 59D
- 59E
- 60A
- 60B
- 60D
- 60E

Critical: API table conflicts with temperature units

Critical: No density input configured [odd tables only]

Note: No entry if Temperature Units = Not Used.

Help: "Select the API table to be used for temperature compensation."
Note: Tables BR1A, BR1P, and BR2P are Brazilian tables. Tables 59A, 59B, 59D, 60A, 60B, and 60D are ISO 91-2 correction tables.

Temperature/Density 413 – Reference Density

This code has a constant five-digit entry with a floating decimal point. The format is based on table and product selection. The program code format and data entry allows the programmable entry of the Reference Density when Table 54 is selected, Relative Density when Table 24 is selected, API when Table 6 is selected, and temperature coefficient when a C Table is selected. This entry represents the reference value used to calculate the volume correction factor. The range of this value will vary with the table selection chosen.

Note: When Table 6 is selected, the leading digit will be used to show polarity, + = positive and a - = negative. Entry range based on table selection.

Table 6	999.9 to +999.9 API
Table 24	0 to 9.9999 Relative Density
Table 54	0 to 9999.9 Reference Density
C Tables	0 to 0.9999 Percent per Degree Temperature

Note: If the API table selection is changed, the previous five-digit entry for reference will not be converted. This value must be re-entered.
The following are examples of the display when Tables 24, 54 or 6C and 54C are selected.

Table 6B selected: +43.2 API

Table 24 selected: 0.8175 Rel Density

Table 54 selected: 1150.2 Kg/M3

Table 6C or 54C selected: 0.0800 %/Deg. F or Deg. C

Fatal: Entry is out of specified range.

Note: No entry if Density Units = Not Used
Note: No entry if API table is odd
Help: "Enter the product density at reference temperature or the temperature coefficient (for C tables)."

Temperature/Density 414 – High Density Alarm Limit

This code allows the entry of a density reading that will cause a high-density alarm to be generated. The units will be dependent on the entry made in the Density Units Select code. This four-digit entry will be dependent on the API table selection as follows:

–999.9 to +999.9 API

0 to 9999.0 Reference Density

Note: No entry if Density Units = Not Used
Help: "Enter density that will signal an alarm for high product density."

Temperature/Density 415 – Low Density Alarm Limit

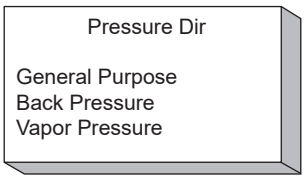
This code allows the entry of a density reading that will cause a low-density alarm to be generated. The units will be dependent on the entry made in the Density Units Select code. This five-digit entry will be dependent on the API table selection as follows:

–999.9 to +999.9 API

0 to 9999.0 Reference Density

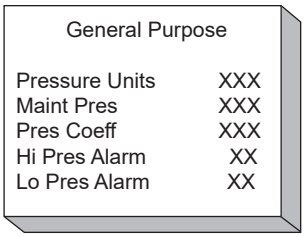
Note: No entry if Density Units = Not Used.

Help: “Enter density that will signal an alarm for low product density.”



Pressure Subdirectory

The subdirectory is used to provide general information regarding the setup of the microFlow.net for pressure aspects. **If "Pressure Units" program code is set to "NA", the remaining codes in this subdirectory will not be available.**



Pressure 501 – Pressure Units

This parameter defines the pressure units used by microFlow.net. The factory default is "NA." Selections are as follows:

- NA
- PSI
- Bar
- Kg/cm2 (Kilograms/square centimeter)
- Kpa (kilopascals)

Help: "Select units of pressure."

Pressure 502 – Maintenance Pressure

This code allows the entry of a maintenance pressure to be used when a pressure transmitter is not installed or is not working, but pressure-related calculations are desired. The pressure units will be dependent on the entry made in the Pressure Units Select code (Pressure 501). This five-digit entry has a range of 0.0 to 9999.9 pressure units. A nonzero value entered here will override an analog pressure input.

Note: No entry if Pressure Units = NA
Help: "Select pressure to be used in CPL calculation."

Pressure 503 – Pressure Coefficient

This code will allow for the entry of a Compressibility Factor that will be used by the system to calculate the CPL. This entry should be zero if a densitometer is installed or a reference density is entered. In these cases, the microFlow.net will calculate the compressibility factor. If, however, API table 6C or 54C is selected, then a compressibility factor must be entered here if pressure compensation is desired, as the microFlow.net has no density with which to calculate the compressibility factor. The factor is used as the following: XXXXX equals the factor entered and it is applied as 0.0000XXXXX.

Note: This value will represent the "F" variable in the CPL equation.
Note: No entry if Pressure Units = NA
Help: "Enter compressibility factor used to calculate CPL [where 0.0000XXXXX is the compressibility factor]."

Pressure 504 – High Pressure Alarm Limit

This code allows the entry of a pressure reading that will cause a high pressure alarm to be generated. The pressure units will be dependent on the entry made in the Pressure Units Select code. This four-digit entry has a range of 0.0 to +9999.

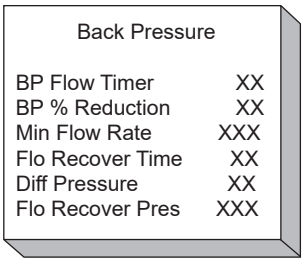
Note: An entry of "+9999" will disable the alarm.
Note: No entry if Pressure Units = NA
Help: "If pressure exceeds this value an alarm will occur."

Pressure 505 – Low Pressure Alarm Limit

This code allows the entry of a pressure reading that will cause a low pressure alarm to be generated. The pressure units will be dependent on the entry made in the Pressure Unit Select code. This four-digit entry has a range of 0.0 to +9999.

Note: "9999" will disable the alarm.
Note: No entry if Pressure Units = NA
Help: "If pressure drops below this value an alarm will occur."

Back Pressure Subdirectory



Pressure 511 – Minimum Back Pressure Flow Rate Timer

This two-digit entry will allow the operator to select the minimum time, in seconds, allowed for the unit to achieve a desired flow rate. If the flow rate is not reached in this time, the flow rate will be lowered by Back Pressure Percent Reduction to increase back pressure. If the flow rate falls below the back pressure minimum flow, an alarm will be issued and the valve will be closed. The range of this entry will be 0 to 99 seconds.

Note: This entry is used for Automatic Flow Optimization (AFO).
Note: "00" disables any back-pressure control (including the differential pressure method.)
Help: "Minimum time in seconds to reach desired flow rate during BP control."

Pressure 512 – Back Pressure Percent Reduction

This two-digit entry will allow the operator to select the percentage of flow rate to be used during insufficient back pressure conditions. (For example, an entry of 90% will cause the flow rate to be reduced to 90% of the current rate during insufficient back pressure conditions.) The range of this entry is 50 percent to 90 percent.

Note: This entry is used for Automatic Flow Optimization (AFO).
Help: "In BP control, the flow rate will be reduced to this percentage of the current flow rate. Range is 50% to 90%"

Pressure 513 – Minimum Back Pressure Flow Rate

This four-digit entry will allow the operator to select the Minimum Back Pressure Flow Rate that will not cause an alarm. That is, any time the flow rate is being controlled because of insufficient back pressure and it falls below this programmed rate, a back pressure alarm will be issued and the valve will be closed. The range of this entry will be 0 to 9999.

Help: "Min flow rate allowed during BP control before alarm, mass or vol based on pulse input type."

Pressure 514 – Back Pressure Flow Recovery Timer

This two-digit numeric entry programs the amount of time the microFlow.net will wait to attempt flow rate recovery if a pressure reading is not available in the system. The range of this timer is from 0 to 99 minutes. Zero will disable the flow recovery feature. This parameter provides a method of flow recovery that does not require the use of a pressure transmitter input.

Help: "Enter the time interval in minutes to attempt flow recovery."

Pressure 515 – Differential Pressure

This four digit entry will allow the operator to select the delta pressure in PSIA, bars, kPa,or kg/cm2 (units depend upon the Pressure Units select entry (Pressure 501). This is the additional pressure to be main-tained above the vapor pressure. If microFlow.net is controlling flow with a two stage valve, no alarm is issued and flow is not halted if the pressure drops below the programmed limit determined by vapor pressure and differ-ential pressure. Therefore this differential pressure feature should not be used with a two stage valve. In this situation, the low pressure alarm must be set high enough to ensure that the pressure does not fall below the product's vapor pressure.

The range of this entry is 0-9999 pressure units. An entry of "0" will disable pressure control of the valve by a pressure transducer.

Note: A non-zero entry here will override ant other programmed type back pressure flow control
Note: No entry if Pressure Units = NA
Help: "Enter back pressure to be maintained above the product vapor pressure."

Pressure 516 – Flow Recovery Pressure

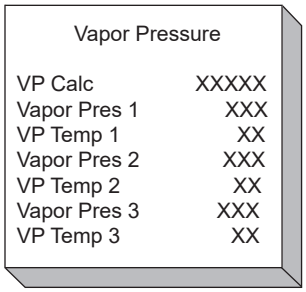
This four digit entry allows the programming of the amount of pressure above the vapor pressure of the product that must be read by the microFlow.net before it will attempt flow recovery to the programmed high flow. This parameter is used in conjunction with a pressure transmitter input. Note: This pressure must be sufficiently higher than the Differential Pressure entered in Pressure 515 to prevent flow rate oscillation.

The range of this entry is 0-9999 pressure units.

Help: "Enter the differential; pressure above vapor pressure to attempt flow recovery."

Vapor Pressure Subdirectory

Note: Pressure and temperature data, points 1,2,3 (Pressure 522-527) are only activated if "Straight Line Approximation" is selected as the "Vapor Pressure Calculation Method".



Pressure 521 – Vapor Pressure Calculation Method

This parameter defines the method that the microFlow.net will use to calculate the vapor pressure of a product. Selections are as follows:

- Straight Line Approximation (Requires points of the curve to be entered in codes 522 through 527).
- As outlined in GPA TP-15 (Gas Processors Association Technical Publication 15). (Uses the reference density of the product in the calculations).

Critical: GPA-TP15 requires corrected density [temperature used, API table selected]

Help: "Choose vapor pressure calculation method."

Pressure 522, 524, 526 – Vapor Pressure 1, 2, 3

These three codes allow the operator to select the vapor pressures, which are used to define the vapor pressure versus temperature curve. This curve is used to calculate the current vapor pressure. The pressure(s) are defined beginning with the lowest pressure ascending to the highest pressure. The range of these five-digit numeric entries is 0000.0 to 9999.9 pressure units. The unit for this entry is dependent on the entry made in the Pressure Units Select Code. The vapor pressure calculation, determined from the entries made here, will be used both for differential back pressure control and in the CPL equation as the “Pe” entry. Therefore, careful consideration should be given in determining these points and their accuracy.

Critical: Vapor pressures must be entered in ascending order

Note: No-entry if Vapor Pressure Calculation Method = GPA-TP15

Help: “Enter vapor pressure at corresponding product temperature.”

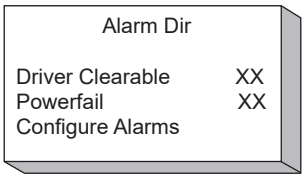
Pressure 523, 525, 527 – Vapor Pressure Temperature 1, 2, 3

These three codes, with three-digit numeric entries, allow the operator to select the temperatures that will be used to define the vapor pressure versus temperature curve. This curve is used to calculate the current vapor pressure. These temperatures correspond with the vapor pressures. The range of these entries is –999 degrees to +999 degrees. The units for these entries are as programmed in the Temperature Units Select Code. The vapor pres-sure calculation, determined from the entries made here, will be used both for differential back pressure control and in the CPL equation as the “Pe” entry. Therefore, careful consideration should be given in determining these points and their accuracy.

Critical: Corresponding vapor pressure not programmed

Note: No-entry if Vapor Pressure Calculation Method = GPA-TP15

Help: “Enter product temperature at corresponding vapor pressure.”



Alarm 601 – Driver Clearable Alarms

This parameter sets the number of alarms that can be cleared without a pass code. It is a two-digit entry with a range of 0-20.

Help: "Enter the number of alarms clearable not requiring a pass code."

Alarm 602 – Powerfail Alarm

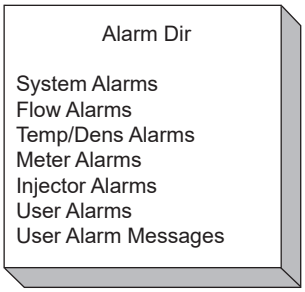
This program code provides the operator with the capability of either enabling or disabling the powerfail alarm. The powerfail alarm is a diagnostic alarm that is not clearable through communications. The factory default for this parameter is "Yes". Selections are as follows:

• Yes

• No

Help: "Select if an alarm indicating loss of power is desired."

Configure Alarms Subdirectory



Alarm 611 to 685 – Alarm Configuration

These parameters allow the actions of each alarm to be configured. Multiple options selected from the following list may be configured for each alarm. The microFlow.net treats all alarm configured to an action as being logically "OR"ed. i.e. If any of the alarms assigned to action are energized, the action is energized. Selections are as follows:

• Allow run/ready clearing

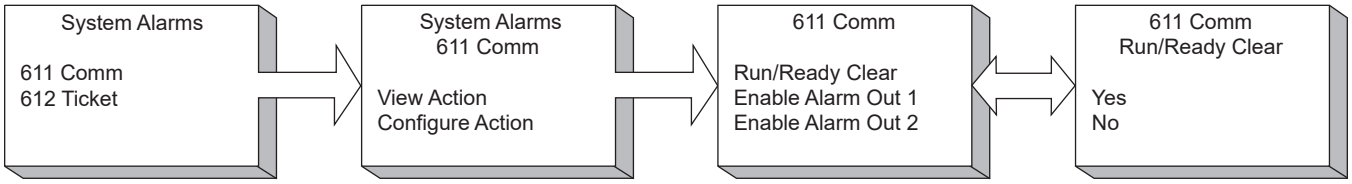
• Energize alarm output 1

• Energize alarm output 2

Note: Through Communications, add to get combination of desired options (i.e., 7 would set up all three options.)
Note: For more information about alarm messages and their equivalent in Blend-Pak injectors, Mini-Pak injectors, and metered injectors, refer to Appendix II – Alarms.

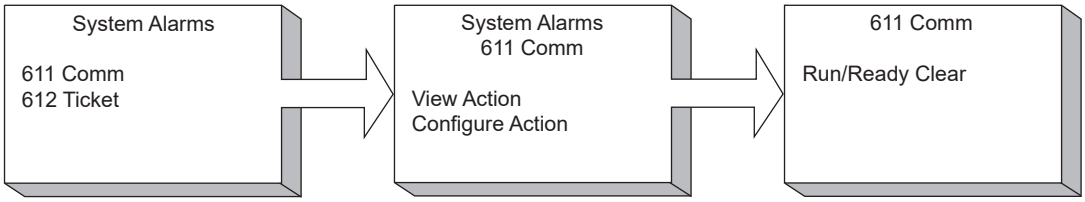
The following examples illustrate the steps required to establish and view the configuration of alarms in a microFlow.net. The Communications Alarm is used for the example, but the steps are typical of any alarm.

Configuring Alarm Actions



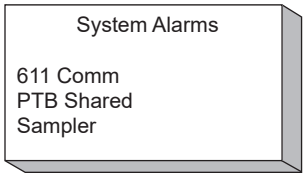
- From the “System Alarms” subdirectory select “611 Comm”, press ENTER
- Select “Configure Action”, press ENTER
- Select desired action, press ENTER (Actions already selected will be marked with an *)
- Select “Yes” to enable the action or “No” to disable the action, press ENTER
- The microFlow.net returns to the previous screen for another selection, repeat or press CLEAR to return to the first screen of the selected alarm subdirectory.

Viewing Alarm Actions



- From the “System Alarms” subdirectory select “611 Comm”, press ENTER
- Select “View Action”, press ENTER
- The microFlow.net displays a list of enabled actions for the alarm. Press CLEAR to return to the first screen of the selected alarm subdirectory.

System Alarms Subdirectory



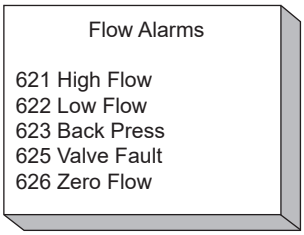
611 CM: Communications Alarm. Indicates a failure on one of the communication channels.

612 PTB Printer: Indicates that the microFlow.net failed to receive the correct response from the PTB printer after the data was sent to be printed. The microFlow.net will continue to resend the data to the printer until the communication port timeout setting expires, the PTB printer alarm will be set at this time.

613 Shared Printer: – Allows one or multiple MicroFlow’s to be connected via 232/485 communications to a host microFlow for printing reports.

614 Sampler Error: Defines an error when the sampler will overspeed. The rate/frequency needs to be adjusted.

Flow Alarms Subdirectory



621 HF: High Flow Alarm. Indicates that the flow rate has exceeded the flow limit set in the excess high flow program code for more than 4 seconds.

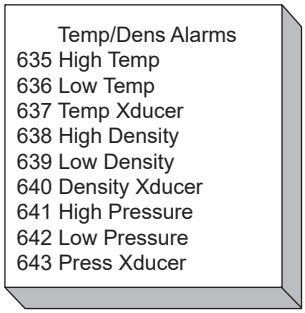
622 LF: Low Flow Alarm. Indicates that the flow rate was at or below the minimum flow rate established by the minimum flow limit program code for longer than eight seconds.

623 BP: Back Pressure Alarm. Indicates insufficient pressure in the system to maintain the minimum back pressure flow rate entry set.

624 VF: Valve Fault Alarm. Indicates that the valve did not close within the time allowed by the valve fault timeout program code after receiving the signal to close.

625 ZF: Zero Flow Alarm. Indicates that the Zero Flow Timer has expired and the microFlow.net has not detected any flow in the system.

Temperature/Density Alarm Subdirectory



635 HT: High Temperature Alarm. Indicates that the temperature probe or transducer is out of range of the high temperature setting.

636 LT: Low Temperature Alarm. Indicates that the temperature probe or transducer is out of range of the low alarm setting.

637 TP: Temperature Transducer Alarm. Indicates a temperature transducer failure or an out-of-range condition (less than 2 mA/0.5 vdc/52.11 Ω or greater than 23 mA/5.5 vdc/220.88 Ω).

638 HD: High Density Alarm. Indicates the density transducer is out of range of the high alarm setting.

639 LD: Low Density Alarm. Indicates that the density transducer is out of range of the low alarm setting.

640 DP: Density Transducer Alarm. Indicates a density transducer failure or an out-of-range condition (less than 2 mA/ or greater than 23 mA.

641 HP: High Pressure Alarm. Indicates the pressure transducer is out of range of the high alarm setting.

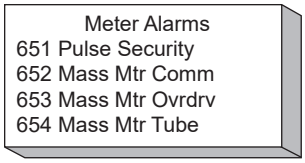
642 LP: Low Pressure Alarm. Indicates that the pressure transducer is out of range of the low alarm setting.

643 DP: Pressure Transducer Alarm. Indicates a pressure transducer failure or an out-of-range condition (less than 2 mA/ or greater than 23 mA.

644 HB: High S&W Alarm. Indicates S&W reading has exceeded the programmed limit.

645 SR: S&W Transducer Alarm. Indicates the S&W sensor has failed or an out-of-range condition (less than 2mA/ greater than 23mA)

Meter Alarms Subdirectory



651 PS: Pulse Security Alarm. Indicates an out of sequence error in the A-B pulse stream.

If this alarm occurs, the transaction must be terminated using one of the methods in Transaction Termination (General Purpose 144). Pressing CLEAR as a run clearable alarm will open the valve, but as soon as pulses start, the PS alarm will reoccur and again shut down the valve.

652 MF: Mass Meter Comm Fail. This alarm is set when any command sent to a mass meter fails both the first and second attempt. The normal polling sequence to each of the mass meters is not interrupted by the occurrence of a mass meter communications alarm. The mass meter in alarm will be skipped in the polling loop until this alarm is cleared.

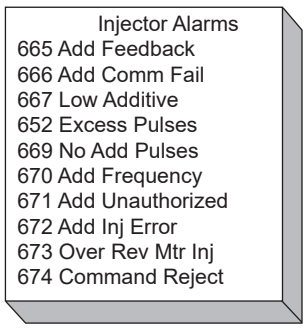
653 MO: Mass Meter Overdrive. This alarm is set when a mass meter reports a status indicating an overdrive condition exists. (This alarm is valid only for S-Mass.)

654 MT: Mass Meter Tube. This alarm is set when a mass meter reports a status indicating a tube imbalance condition exists. (This alarm is valid only for S-Mass.)

655 UC: Ultrasonic Communications Alarm. Indicates communications with the ultrasonic meter has failed.

656 UM: Ultrasonic Meter Fault. Indicates the ultrasonic meter is reporting an alarm condition.

Injector Alarms Subdirectory



665 FA: Additive Feedback Error Alarm. Indicates that the additive feedback has exceeded the programmed number of errors.

666 AC: Additive Communications Failure Alarm. Indicates a failure on the master/slave communications line between the microFlow.net and the Additive Injector Subsystem.

667 KA: Low Additive Alarm. Indicates that not enough additive was injected during one cycle or an average of several cycles.

668 MA: Excess Additive Pulses Alarm. Indicates that too many additive flow meter pulses were detected.

669 NA: No Additive Pulses Alarm. Indicates that the additive flow meter's pulses were not detected

670 RA: Additive Frequency Alarm. The additive volume is too high for the rate selected; a second dose of additive is being requested before delivery of the first dose completes.

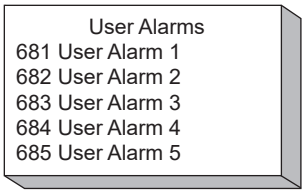
671 UA: Additive Unauthorize Failed Alarm. The unauthorize command failed at the end of the batch for an additive. Authorization may have to be removed manually (by power cycling the additive system) to prevent unwanted additive in subsequent batches/transactions.

672 GA: Additive Injector Error Alarm. Indicates that there is an additive injector error.

673 OR: OverRev Metered Injector Alarm. Indicates that the meter on the metered injector has exceeded its specified maximum frequency.

674 CR: Injector Command Rejected Alarm. Indicates that the command from the microFlow.net to the injector was rejected.

User Alarms Subdirectory



Alarm 681 to 685 – User Alarms

These program codes allow the operator to customize the microFlow.net by defining alarm conditions to a particular system. User alarms may be set through communications or Boolean/algebraic equations, or may be selected from the following:

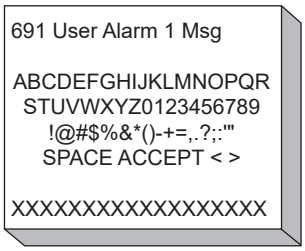
- Allow run/ready mode clearing
- Energize alarm output #1
- Energize alarm output #2

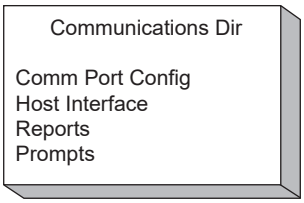
Alarm 691 to 695 – User Alarm Messages

These program codes permit the entry of an 18-character text entry identifying an alarm condition. User alarms can be set through communications or Boolean/algebraic equations. The data entry allows the following characters to be selected:

• 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 < > ( ) ? ! . , ‘ - “ / + = _ END

Enter this parameter by selecting characters using the UP/DOWN and LEFT/RIGHT Arrow keys. Press ENTER for each selected character. When all characters have been entered, select “ACCEPT” and press ENTER to complete the process.



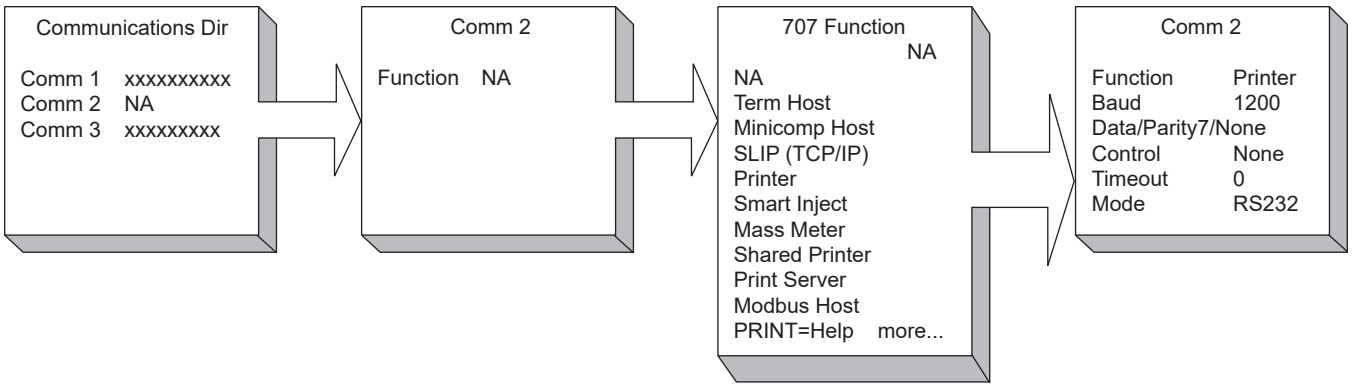


Comm Port Configuration Subdirectory

The Comm Port Configuration subdirectory contains information vital to the operation of the microFlow.net's three (3) serial communications ports. The following example demonstrates the procedure for configuring a previously unassigned Comm Port 2.

- Select "Comm 2" from the Communications Dir menu, press ENTER
- "Function…..NA" will be displayed, press ENTER to configure.

  Note: if the port had been previously assigned the function would be displayed as well as port settings.
- Select function from list, press ENTER
- Selected function and default port settings will be displayed.
- If required, adjust port settings by selecting appropriate parameter and pressing ENTER
- Select desired value, press ENTER
- Selected function and port settings will be displayed.
- When required settings complete press CLEAR to return to the port selection menu.



Communications 701, 707, 713 – Comm Port Function

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

- **Not used** – This communications port is not selected for use
- **Terminal Host Communications** – This port communicates with a terminal type device using a simplified communications protocol
- **Minicomputer Host Communications** – This port communicates with a minicomputer type device using a sophisticated and secure communications protocol
- **SLIP (TCP/IP)** – Serial Line Internet Protocol emulates ethernet TCP/IP protocol over serial (RS-232, RS-485) communications hardware
- **Printer** – Permits the microFlow.net through this communication port to automatically output an end of a transaction report to a printer connected to the microFlow.net
- **Smart Injector Control** – Permits the microFlow.net through this communication port to communicate with and control up to twelve smart additive injector systems

- **Mass Meter** – Assigns a communications channel to an S-Mass or Apollo Meter.
- **Shared Printer** – Allows one or multiple microFlows to be connected via 232/485 communications to a host microFlow for printing reports.
- **Print Server** – The microFlow that acts as the host for printing reports. Allows several microFlows to effectively share a printer by communicating with the “Print Server” microFlow which will have the printer connected to it.
- **Modbus Host** – The microFlow.net communicates with other computer systems using the Modbus protocol. (Available in Rev 0.07 and above).
- **Modbus Master Ultrasonic** – This function is used when an ultrasonic meter is configured and serial communications will be used to send temperature and/or pressure values to the meter and to read the meter status.

Note: Only one port may be configured for mass meter communications.

Critical: An address must not be zero.

Critical: Only two ports may be configured for injector control.

Critical: Only two ports may be configured for host interface.

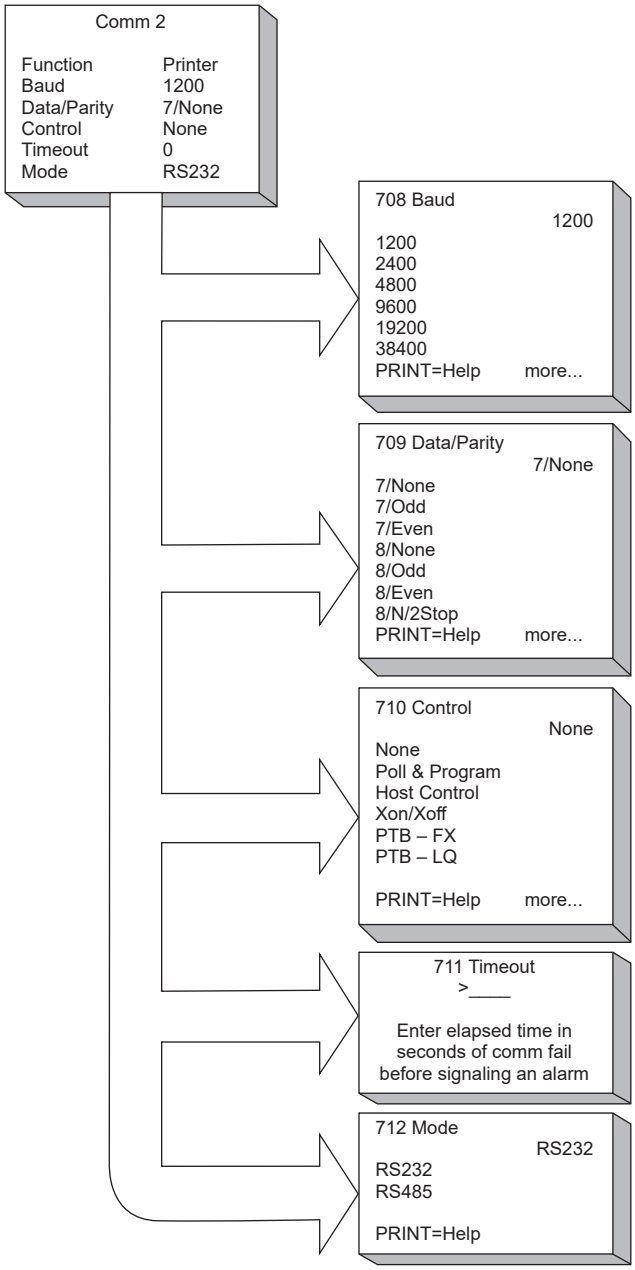
Critical: Only one port may be configured for mass meter.

Critical: Function conflicts with Port Control.

Critical: Only a shared printer or print server can be configured on one microFlow at a time.

Critical: If using printer server, another port has to be configured as a printer.

Port Settings



Communications 702, 708, 714 – Baud Rate

This parameter sets the speed of the associated communications port. The factory default is “38400.” Selections are as follows:

• 1200 baud
• 2400 baud
• 4800 baud
• 9600 baud
• 19200 baud
• 38400 baud

Note: No entry if corresponding function = Not Used.
Help: “Select the baud rate for this communications port”

Communications 703, 709, 715 – Data/Parity

This parameter defines the number of data bits and parity used by the associated communications port. Unless indicated otherwise, one stop bit is used. The factory default is “8/None.” Selections are as follows:

• 7 bits No Parity
• 7 bits Odd Parity
• 7 bits Even Parity
• 8 bits No Parity
• 8 bits Odd Parity
• 8 bits Even Parity
• 8 bits No Parity, 2 Stop bits

Note: No entry if corresponding function = Not Used.
Help: “Select the data format: number of bits per character and type of parity”

Communications 704, 710, 716 – Control

This program code defines the level of control the associated communications port commands. Poll and Program, and Host Control are valid with host communications options. XON/XOFF is valid with printer options. Only one port can have transaction control. The factory default is “Poll & Program.” Selections are as follows:

• **None** – No communications on this port.
• **Poll & Program** – For use with demonstration/FlowMate ports. Allows full program access but does not affect transaction control (acts like a standalone unit).
• **Host Control** – Full programming and prompting control. Transaction control (also requiring authorization from host) Allows use of SB – Set Batch to enter the preset remotely and EB to end the batch remotely. This is designed for pre-dispatch operations where the driver has limited input during the load process and the preset is host-controlled.
• **Xon/Xoff** – For printer ports only. Xon/Xoff flow control.

Critical: Comm port not configured for host communications

Critical: Comm port not configured for printer

Note: No entry if corresponding function = Not Used.
Help: Select the degree of control for this communications port

• **PTB-FX** – Security level designed to support PTB Weights and Measures
• **PTB-LQ** – Agency Approved printer interface

Communications 705, 711, 717 – Timeout

These three-digit codes allow the operator to specify the amount of time, in seconds, before aborting a communications transfer that has halted. The communications alarm will then be set. This entry is also used to abort a printout if waiting for a shared printer on an XON from a printer. If the timer expires while waiting for a shared printer, the shared printer alarm will be set. The range of this entry is from 0 to 999 seconds.

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

Note: No entry if corresponding function = Not Used.
Note: If using shared printing, the timeout may want to be set higher than normal in case two (+) MicroFlows are trying to print at the same time.
Help: “Enter elapsed time in seconds of comm fail before signaling an alarm.”

Communications 706, 712, 718 – Mode

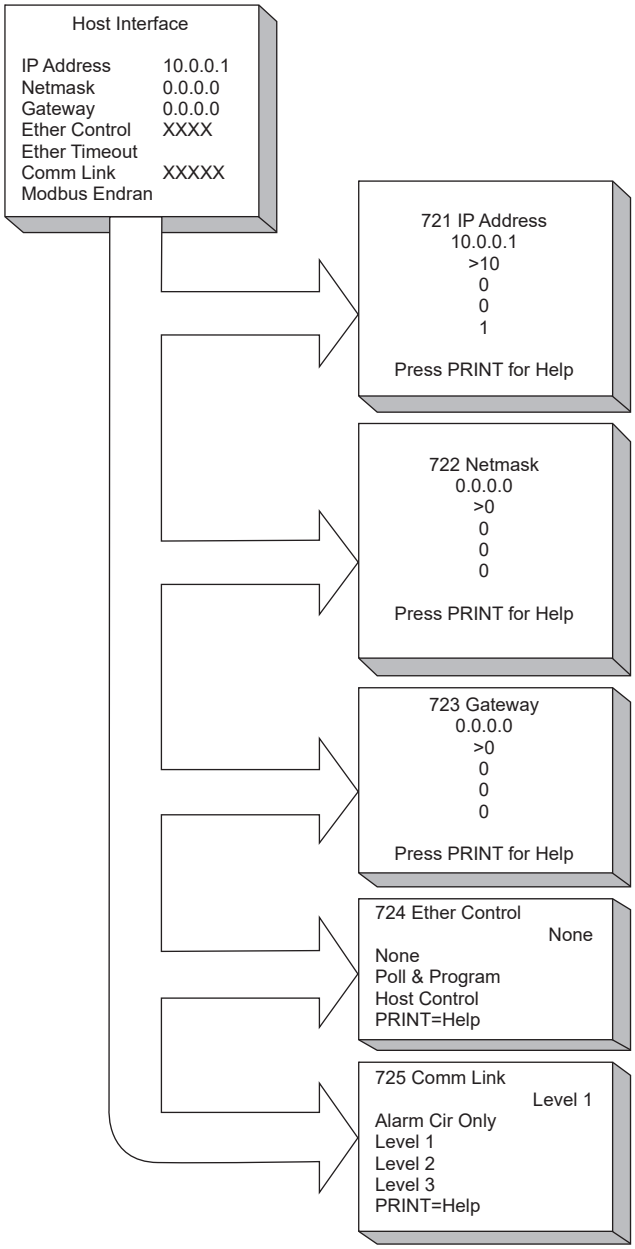
This program code defines the type of serial communications interface assigned to this port. Selections are as follows:

- RS232
- RS485

Note: No entry if corresponding function = Not Used.
Help: “Select if comm. Interface is RS232 or RS485.”

Host Interface Subdirectory

The Host Interface Subdirectory establishes the Ethernet settings required by the microFlow.net.



The IP, Netmask and Gateway Adresses are in the form of four numbers separated by ".". The range of each number (also known as "octet"), is 0-255. The microFlow.net screen for entering these values lists the present octet values vertically.

Communications 721 – IP Address

This code provides a unique Internet Protocol address for each microFlow.net unit. The IP Address code consists of a set of four octets. The range of each octet is 0-255.

If the Ethernet port is used for Mini Host or Term Host, Smith Meters proprietary type communication only the final two digits of the last octet are used to provide a unique address. The range in this case is 0-99.

Help: "Enter the IP address for this device to connect to the internet. The last octet is used for Smith Comms address."

Communications 722 – Netmask Address (Subnet Mask)

This code provides a unique Internet Protocol subnet address for each microFlow.net unit. The IP Subnet Mask Address code consists of a set of four octets. The range of each octet is 0-2 0.

Help: "Enter the IP subnet mask for this IP address."

Communications 723 – Gateway Address

This code provides a unique Gateway address for each microFlow.net unit which allows access to other IP networks. The Gateway Address code consists of a set of four octets. The range of each octet is 0-255.

Help: "Enter the address that allows access to other IP networks."

Communications 724 – Ethernet Control

This program code defines the level of control the associated Ethernet communications port commands. Poll and Program, and Host Control are valid with host communications options. Only one port can have transaction control. Selections are as follows:

- **None** – No communications on this port.
- **Poll & Program** – For use with demonstration/MicroMate ports. Allows full program access but does not affect transaction control (acts like a standalone unit).
- **Host Control** – Full programming and prompting control. Transaction control (also requiring authorization from host) Allows use of SB – Set Batch to enter the preset remotely and EB to end the batch remotely. This is designed for pre-dispatch operations where the driver has limited input during the load process and the preset is host-controlled.

Critical: Comm port not configured for host communications

Note: No entry if corresponding function = Not Used.

Help: "Enter the level of control from the Ethernet port."

Communications 725 – Comm Link Programming

This program code defines which program code parameters can be modified through communications by the access level assigned to those parameters. The factory default is "Level 1 Access." Selections are as follows:

- **Alarm Clearing Only** – This selection allows only the alarms to be reset (cleared) through communications.
- **Level 1 Access Parameters** – This selection allows only the parameters that are assigned level 1 access to be changed through communications.
- **Level 2 Access Parameters** – This selection allows only the parameters that are assigned levels 1 and 2 access to be changed through communications.
- **Level 3 Access Parameters** – This selection allows only the parameters that are assigned levels 1 through 3 access to be changed through communications.

Help: "Select program mode groups modifiable via communications."

Communications 726 – Ethernet Timeout

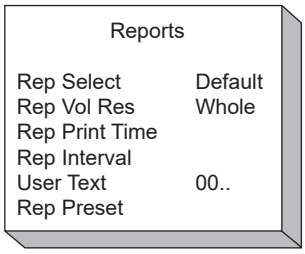
This program code defines the amount of time elapsed that the MicroFlow tries to communicate without getting a response. This can be set from in seconds from 0 to 999.

Communications 727 – Modbus Endian

When retrieving information with floating point numbers, the order of bytes is programmable. The selections of this parameter are as follows:

- Big
- Little 8
- Little 16

Reports Subdirectory



Communications 731 – Report Selection

This program code defines which delivery report will be printed at the completion of a transaction if a printer function is assigned to one or more communications ports. The factory default is “Default.” Selections are as follows:

- Default
- User Configured Report

Note: The user-configured reports are designed on the microMate and downloaded to the microFlow.net.
Note: Even if a user-configured report has been downloaded from the microMate to the microFlow.net, it will not be printed unless it is selected here. If a user-configured report is selected but none has been downloaded, no report will print.
Help: “Select the report type to be printed.”

Communications 732 – Report Volume Resolution

This entry selects the volume resolution to print on default reports. The factory default is “Whole units.” Selections are as follows:

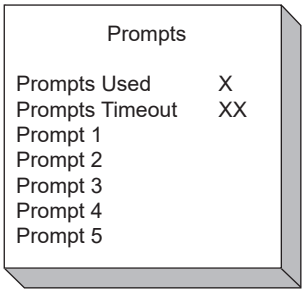
- Whole units
- Tenths
- Hundredths

Note: No entry if no printer configured on any comm port
Help: “Select the volume resolution to print on default reports.”

Communications 735 – User Text

Communications 736 – Rep Preset

Prompts Subdirectory



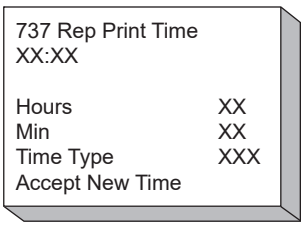
Communications 737 – Report Print Time

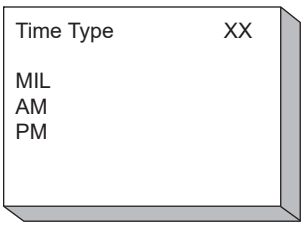
This entry sets the initial print time of the report. Enter the hours, minutes, and time type (AM, PM, or military) the report is to be printed. The report includes a line per batch for all transactions run during the time interval specified.

Note: No entry if no printer configured on any comm. port
Fatal: Invalid time entry

Steps to changing microFlow.net Report Print Time:

- Select “Hours”, press ENTER
- Enter value for hour (0-24), press ENTER
- Select “Min”, press ENTER
- Enter value for min (0-59), press ENTER
- Select ”Time Type”, press ENTER
- Select time designation (MIL, AM, PM), press ENTER
- Select “Accept New Time”, press ENTER

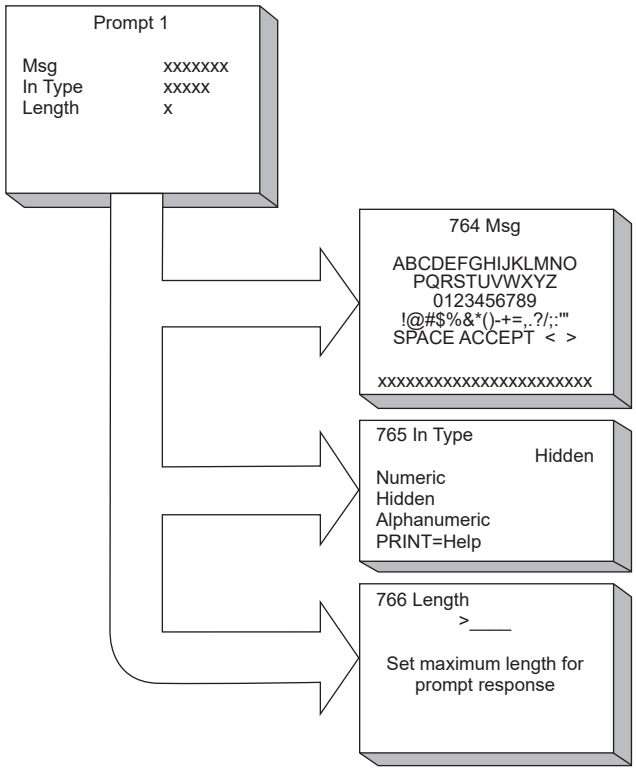




Communications 738 – Report Interval

This parameter sets the interval at which the report will be printed. Once the time of the report has been set using this parameter, the report would print based on that initial time and the interval programmed. The interval is entered in hours with three digits in whole hours. The range of this entry is from 0 to 999.

Note: No entry if no parameter configured on any comm. port
Help: “Enter time interval in hours between printed reports. Zero entry disables this feature.”



Communications 761 – Prompts Used

This program code defines the number of local prompts configured at microFlow.net. These prompts are presented to the operator prior to the preset prompt. The data entered by the operator is stored by microFlow.net and can be printed on a Bill of Lading and retrieved through communications. The range of this program code is 0 to 5.

Help: Zero entry disables this feature

Communications 762 – Prompt Timeout

This two-digit code defines the amount of time, in seconds, that a local prompt will remain displayed at microFlow.net before the prompting sequence is aborted and microFlow.net returns to the ready screen. The range of this parameter is 0 to 99 seconds. If set to zero, microFlow.net will wait indefinitely for data entry in response to a prompt. The factory default is “0”.

Note: No entry if prompts used = 0.

Help: Enter time, in seconds, for display of prompt messages

Communications 764, 767, 770, 773, 776 – Prompt #1, #2, #3, #4, #5 Message

This program code defines the 21-character text entry displayed to the operator as one of the five local prompts. It is important to not leave this message as all blanks, as a blank screen will be presented to the operator if this prompt is activated. The data entry allows the following characters to be selected as part of the display unit prompt:

• 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 # *

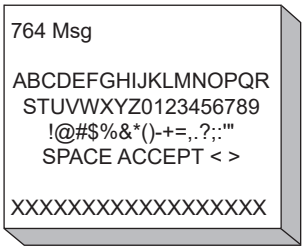
• a b c d e f g h i j k l m n o p q r s t u v w x y z & @

• 0 1 2 3 4 5 6 7 8 9 < > ( ) ? ! . , ‘ - “ / + = END

Note: No entry if prompts used = 0.

Help: “Enter prompt message to be displayed at start of transaction.”

Enter this parameter by selecting characters using the UP/DOWN and LEFT/RIGHT Arrow keys. Press ENTER for each selected character. When all characters have been entered, select “ACCEPT” and press ENTER to complete the process.



Communications 765, 768, 771, 774, 777 – Prompt Input #1, #2, #3, #4, #5 Type

This parameter defines whether numeric or alphanumeric data entered in response to a local prompt will echo to the screen or display Xs in place of digits as a security feature. The factory default is “Numeric.” Selections are as follows:

- Numeric
- Hidden
- Alphanumeric

Note: No entry if prompts used = 0.

Help: “Select type of prompt response desired.”

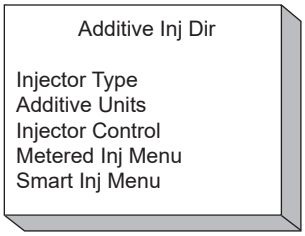
Note: See Application Bulletin AB06062 for details on entering an alphanumeric response to a prompt.

Communications 766, 769, 772, 775, 778 – Prompt #1, #2, #3, #4, #5 Length

This program code defines the maximum length of a response to a local prompt. The single digit code has a range of 0 to 9.

Note: Codes 765, 768, 771, 774, and 777 are associated with codes 763, 766, 769, 772, and 775 respectively.
Note: No-entry if prompts used = 0

Help: “Set maximum length for prompt response.”



Additive 801, 802, 803, 804 – Injector #1, #2, #3, #4 Type

These program codes define the type of additive injector installed at that injector position. microFlow.net supports a mixed implementation of additive injector types. Selections are as follows:

- N/A
- Piston
- Piston with Feedback
- Titan
- Blend-Pak
- Mini-Pak
- Metered Injector

Critical: Metered injector pulse input not configured

Critical: Injector I/O assignment does not match type

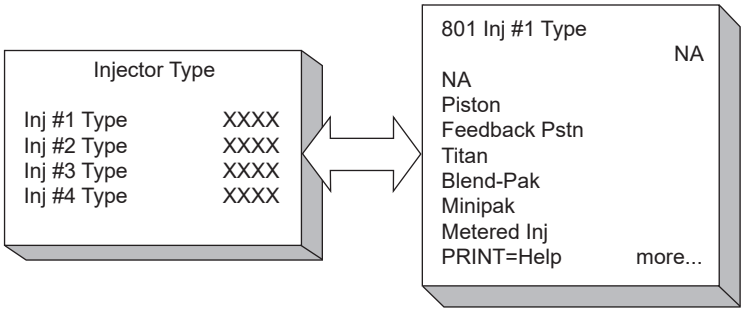
Critical: No communication port configured for smart additive control

Critical: No injector address assigned

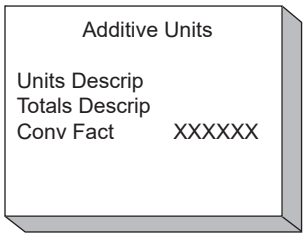
Critical: Metered injector allowed on Injector #1 only

Critical: Piston injector allowed on Injector #1 only

Note: Only smart injectors may be selected on Injectors #2 - #4



Additive Units Subdirectory



Additive 811 – Additive Pacing Units

This program code selects the volume type used to pace the additive injections. The factory default is “IV.”

Selections are as follows:

• IV [Indicated Volume or Raw]

• GV [Gross]

• GST [Gross Standard Temperature]

• GSV [Gross at Standard Temperature and Pressure]

• Mass

Critical: Selected units not available

Help: “Select the product volume type used in the determination of injection points.”

Additive 812 – Additive Injection Units Descriptor

This code allows entry of a three-character message to serve as the additive injection units identifier for the injected products, such as cc or oz. These are the units associated with the programmed additive volume per injection in the recipe directory. The data entry allows the following characters to be selected:

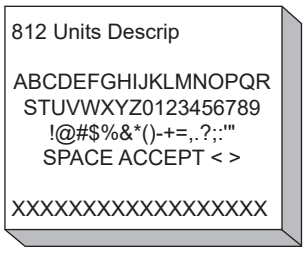
• A B C D E F G H I J K L M N O P Q R S T U V W X Y Z # *

• 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 < > ( ) ? ! . , ‘ - “ / + = _ END

Help: “Enter a descriptor for additive injector units.”

Enter this parameter by selecting characters using the UP/DOWN and LEFT/RIGHT Arrow keys. Press ENTER for each selected character. When all characters have been entered, select “ACCEPT” and press ENTER to complete the process.



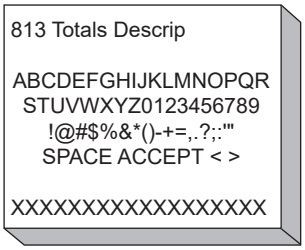
Additive 813 – Additive Totals Units Descriptor

This program code is a 3-character text entry used to define the units in which additive injector volumes are totaled. All additive injector totals available in dynamic displays and via communications will be in these units. The data entry allows the following characters to be selected:

• 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 < > ( ) ? ! . , ‘ - “ / + = _ END

Help: “Enter a descriptor for additive totals units.”

Enter this parameter by selecting characters using the UP/DOWN and LEFT/RIGHT Arrow keys. Press ENTER for each selected character. When all characters have been entered, select “ACCEPT” and press ENTER to complete the process.



Additive 814 – Injection/Totalization Conversion Factor

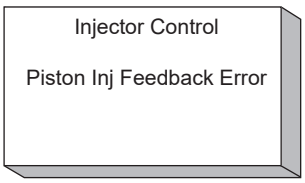
This ten-digit numeric entry is used to convert injection units to totals units. This parameter is an exponential entry, with a range of 0 to 9.999999e+09. The microFlow.net uses this formula for the conversion:

Volume in Injector units / Conversion factor = Volume in Total Units

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

Help: “Enter the number of injection units in each add totals unit (e.g., number of cc’s per gallon).”

Injector Control Subdirectory

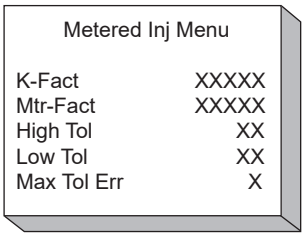


Additive 821 – Piston Injector Feedback Errors

This one-digit numeric entry is used with piston injectors with feedback only. It defines the number of missed feedback signals that can occur before an additive feedback alarm occurs. The range is 0 to 9.

Help: Enter the maximum number of feedback errors allowed for a piston injector before alarming.

Metered Injector Subdirectory



Additive 831 – Metered Injector K Factor

This seven-digit code defines the nominal number of pulses from a meter for one unit of registration. The value must be between 0.001 and 9999.999.

Critical: Entry must not be zero

Critical: Metered injector pulse input not configured

Note: No-entry if additive injector type is not metered injector.

Help: “Enter the K factor in pulses per unit volume for the metered injector.”

Additive 832 – Metered Injector Meter Factor

The meter factor for the additive meters that are being controlled directly by the microFlow.net are programmed in these parameters. If the additives are being controlled through communications and ancillary equipment, no value should be programmed in these parameters. The range of these entries is 0.0000 to 9.9999. Meter factor equals the actual volume times the current meter factor times the K factor, all divided by the input pulses. The factory default is “0.0000”.

Critical: Entry must not be zero

Help: “Enter the meter factor for the metered injector.”

Additive 833 – Metered Injector High Tolerance

These four-digit numeric entries define a percentage in three whole digits, followed by one decimal place, for the amount the actual injected volume can surpass the average volume required to meet the additive needs. The range of this entry is 0 to 999.9. The factory default is “0”.

Help: “Enter the % above the averaged amount before an error is counted.”

Additive 834 – Metered Injector Low Tolerance

These four-digit numeric entries define a percentage in three whole digits, followed by one decimal place, for the amount the actual injected volume can be under the average volume required to meet the additive needs. The range of this entry is 0 to 999.9. The factory default is “0”.

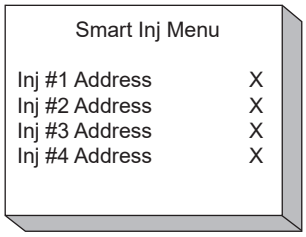
Help: Enter the % below the averaged amount before an error is counted.”

Additive 835 – Metered Injector Maximum Tolerance Error

These two-digit numeric entries allow the operator to set up how many times during the batch that the high and low tolerance percentages can be exceeded continuously before an alarm is set. The range of this entry is from 0 to 99. The factory default is “0”.

Help: “Enter the maximum number of tolerance errors allowed before an alarm is set.”

Smart Injector Subdirectory



Additive 841 to 844 – Smart Injector #1, #2, #3, #4 Address

This three-digit numeric entry is used with any smart injector type. It defines the communications address for the associated injector. When more than one injector is installed at microFlow.net, injector addresses must be unique. The range of this program code is 0 to 999.

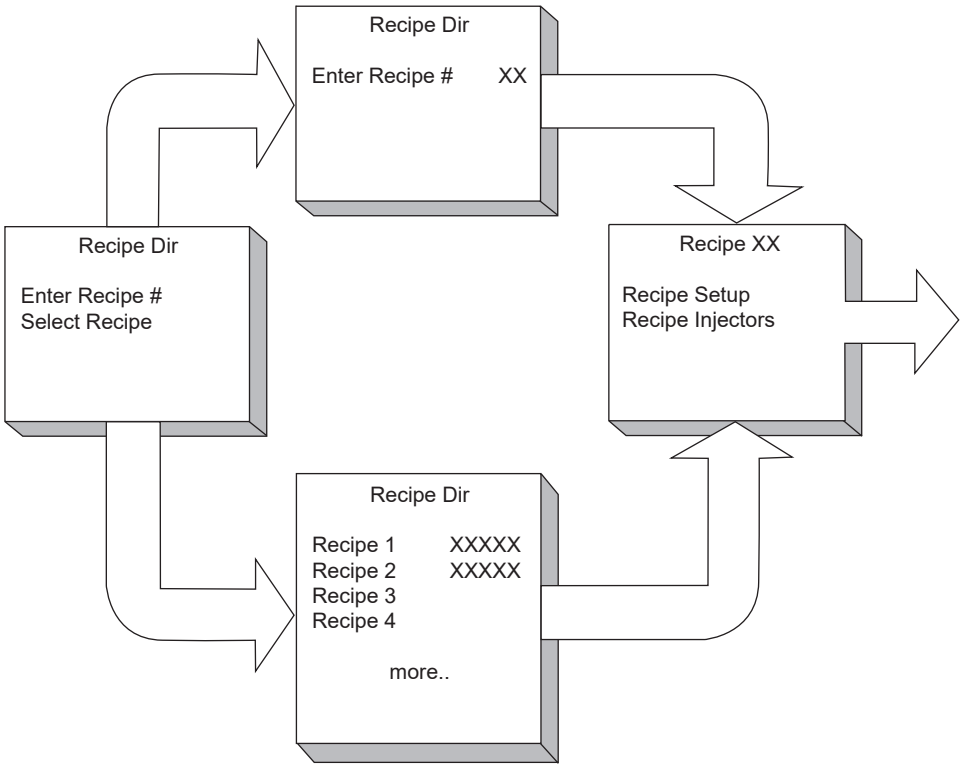
Critical: Injector address must be unique

Note: No entry if corresponding type is not a Smart Injector (Titan, Blend-Pak types).

Help: “Enter the communications address for this smart injector.”

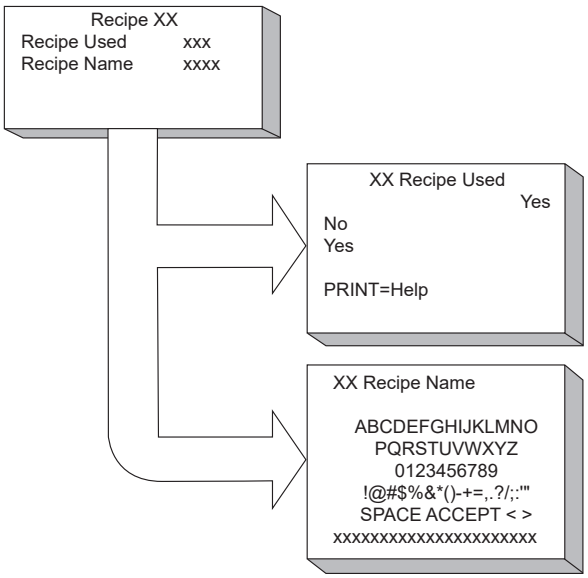
Recipe Subdirectory

The Recipe Directory provides the operator with two methods of accessing the recipes for setup. The recipe desired may be accessed by enter the recipe # or by picking the recipe from a list.



Recipe Setup Subdirectory

The Recipe Setup Subdirectory provides a means to establish recipe identification parameters i.e. Recipe number and name.



Recipe rr01 – Recipe Used (rr = Recipe# 00-4)

This program code indicates whether a recipe is configured for use. Selections are as follows:

• No

• Yes

Critical: At least one recipe must be configured.

Help: Select whether this recipe is to be enabled for use or not.

Recipe rr02 – Recipe Name (rr = Recipe# 00-4)

This program code allows an alphanumeric entry of up to fifteen (15) characters. It is used as an identifier of the recipe in the preset display and on the product receipt ticket. The data entry allows the following characters to be selected as part of the name:

• 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 & @

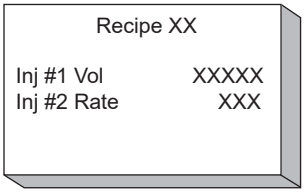
• 0 1 2 3 4 5 6 7 8 9 < > ( ) ? ! . , ‘ - “ / + = _END

Help: Enter an alphanumeric message to identify this recipe.

Enter this parameter by selecting characters using the UP/DOWN and LEFT/RIGHT Arrow keys. Press ENTER for each selected character. When all characters have been entered, select “ACCEPT” and press ENTER to complete the process.

Recipe Injectors Subdirectory

Parameters in this subdirectory establish the values for injector volume and rate for a given recipe.



Recipe rr11, rr13, rr15, rr17 – Injector Volume (rr = Recipe# 00-4)

These six-digit numeric codes define the volume of additive product that will be injected for each cycle of additive injector (e.g., an entry of 000.100 shows that one-tenth of a unit of additive will be injected each cycle of the injector). The range of this program code is 0.000 to 999.999.

For piston or metered injectors, the units for this additive volume are as programmed in system code 831. For smart injectors, this is the number downloaded to the smart injector. The units may be fixed or programmed on the smart injector.

When using a Smart Additive Injector System the additive injector volume is downloaded to the additive injector at the start of each batch.

Some additive injectors do not support the full range that we have offered here. Titan injectors accept only whole numbers for the volume. Gate City injectors (Blend-Pak, and Mini-Pak) accept injector volume in tenths. The microFlow.net will truncate the entry to the format required for the smart injector.

Code	Function
rr11	Injector 1 Volume
rr13	Injector 1 Volume
rr15	Injector 1 Volume
rr17	Injector 1 Volume

Note: No entry if associated injector not configured to arm.
Help: “Enter the additive volume delivered per injection cycle.”

Recipe rr12, 14, 16, 18 – Injector Rate (rr = Recipe# 00-4)

This parameter is used to define the rate at which additive is injected into the product stream during delivery. This is the volume of product per additive injection, typically 40 gallons or 100 liters. The range of this three-digit number entry is 0 to 999 volume units.

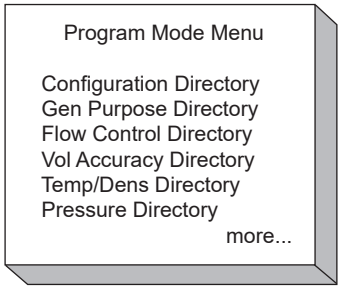
If the injector is a flow controlled injector, the value represents a percentage of the preset amount that this addi-tive will comprise. For example, with a preset of 1000 units and this parameter programmed to 10.0, the result will be 900 units of the component products in the recipe plus 100 units of this additive. The range is 0 to 10.0 percent.

Code	Function
rr12	Injector 1 Rate
rr14	Injector 1 Rate
rr16	Injector 1 Rate
rr18	Injector 1 Rate

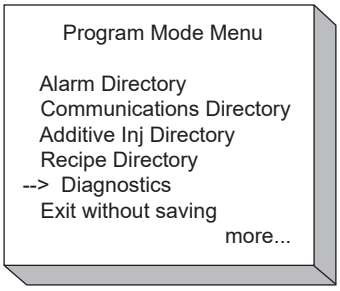
Note: No entry if associated injector not configured.
Help: “Enter the additive injector rate, in product volume per injection.”

Program Mode Diagnostics

The Program Mode Diagnostics are used to troubleshoot or to determine the current status of the microFlow. Program Mode Diagnostics is selected by moving the cursor to “Diagnostics” on the Program Mode menu and pressing “ENTER”. This will display the Diagnostics menu. Note that Program Mode Diagnostics are only available if Program Mode was entered at a security level at or greater than the level entered in General Purpose Parameter 165.



To access the Diagnostics directory arrow up or down until the arrow is beside the Diagnostics Menu.



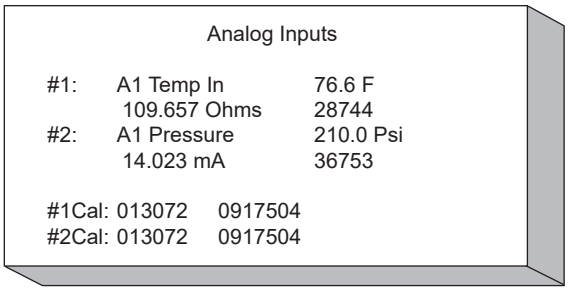
Pressing ENTER with the arrow in front of Diagnostics will display six items of the Diagnostics Menu. Pressing the up and or down arrows will step through the Diagnostics Menu. The available diagnostics in the order that they appear on the menu are as follows:

- Analog Input Test
- Digital Input Test
- Digital Output Test
- Pulse Input Test
- Pulse Output Test
- Prove Metered Injector Additives
- Communications Test
- Keypad Test
- Display Pixel Test
- Boolean/Algebraic
- Reset Totals
- Reset Dual Pulse Errors
- Erase Event Log
- Erase Transaction Log
- Erase Web Pages
- Mass Meter Menu
- Upgrade Firmware
- Factory Initialize

- Factory Diagnostics
    - Watchdog Reset Test
    - Power-up Diagnostics
    - Flow Simulator
    - Field Test Initialize

Analog Input Test

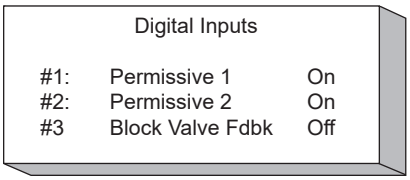
Selecting Analog Input Test and pressing ENTER will display the status of the analog input points in the microFlow.



This screen is used to view the current status of the inputs. The operator can view the function; the current value of the input; the reading of the input in ohms, milliamps, or volts; and the raw analog input value.

Digital Input Test

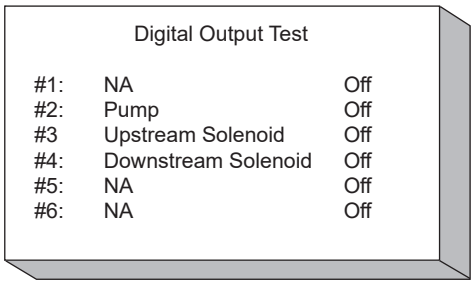
Selecting Digital Input Test and pressing ENTER will display the status of the digital input points in the microFlow.



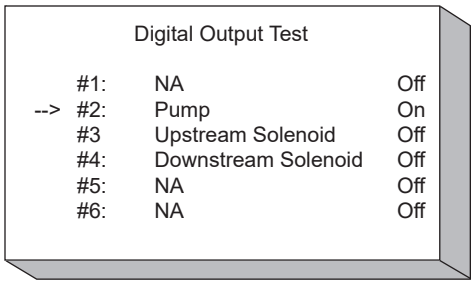
This screen shows the Input number, the function that is programmed in the unit for the input and the status of the input point (i.e., if it is on (closed) or off (open)). Check the inputs by changing the status of the input, then referring to the diagnostic screen to see if the microFlow recognizes the change of state.

Digital Output Test

Select “Digital Output Test” and press ENTER to display the status of the digital output points in the microFlow.



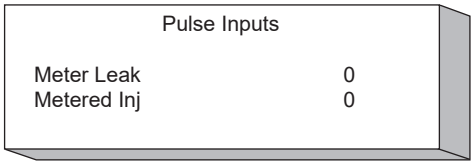
Moving the arrow to the output that is to be tested and pressing ENTER will change the state of the output. An example would be moving the arrow to output #2 Pump and pressing ENTER.



Pulse Input Test

Selecting Pulse Input Test and pressing ENTER will display a screen that indicates the number of pulses received by the respective pulse input. Pressing ENTER clears the pulse count value. This diagnostic should not be used to verify the actual meter pulses received for any batch or transaction. It is intended as a method of verifying pulse input wiring to the respective pulse input on the microFlow. Applying pulse to the respective input will cause the respective counter to increment.

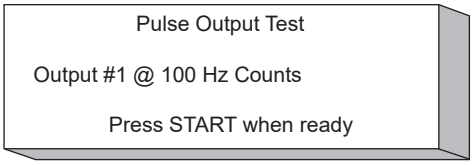
Note: If Dual Pulse is enabled, "Reset Dual Pulse Errors" will appear as a menu option on the screen. Also if a metered injector is used, it will appear in the screen, just as seen below.



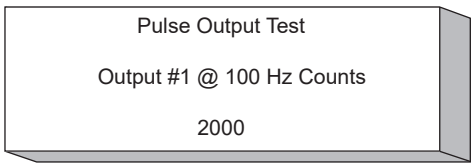
Pressing CLEAR will return the display to the Diagnostic Menu.

Pulse Output Test

Selecting the Pulse Output Test and pressing ENTER will display a screen that shows the pulse output test and the counts that are output from the microFlow to the pulse receiving device. The output sends out pulses at 100 Hz. The output will send out 2000 pulses.



When the test is complete, the receiving device counts should be compared to the diagnostic screen. To start the test when the diagnostic screen is displayed, press the START key.

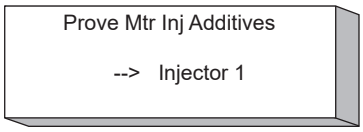


Pressing CLEAR will return the display to the Diagnostic Menu.

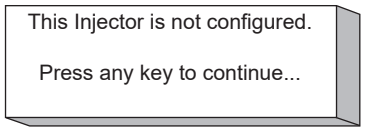
Prove Meter Injector Additives

The microFlow supports additive meter proving. The microFlow controls a metered injector for proving, and then calculates a new meter factor for the metered injector.

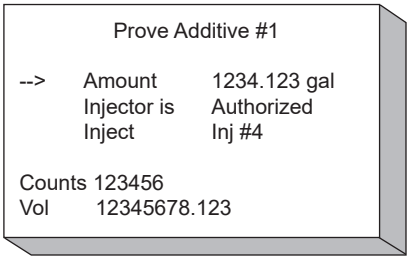
When the operator selects the proving diagnostic, the following screen will appear.



The list will only contain injector 1. Position the cursor beside the appropriate injector and press ENTER. If the selected injector is not configured, the microFlow will display a screen similar to that shown below.



If the injector is configured for operation, the microFlow will display a screen similar to that shown below.



A description of each of the entries is as follows:

Amount (Amt)

This is an input field for the user to specify the volume of additive to be attempted for each test injection. The volume is displayed in the units specified in Additive Directory 812 (Injector Units).

Injector Is:

Press ENTER to authorize the injector, this will also energize the additive pump output.

Inject

This selection initiates an injection. If an injection is already in progress, this selection is ignored. Once the test injection is complete, the selection accepts additional input. This operation is not permitted if the injector is incorrectly programmed. The test injection volume must be valid and the injection must be authorized.

Injection Number

This display-only item is a count of the number of test injections performed on this metered injector for this current diagnostic.

Counts

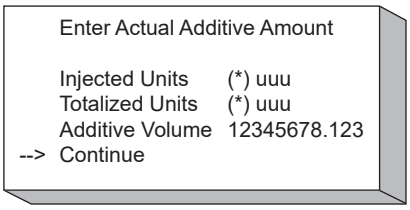
This display-only item is a count of the number of pulses received by the metered injector, starting from when the diagnostic first began. This selection is zeroed when this screen is first entered.

Volume

This display-only item is the current amount of additive as calculated from the parameters programmed for the metered injector and the current number of pulses. The count is displayed in units of totalized additive.

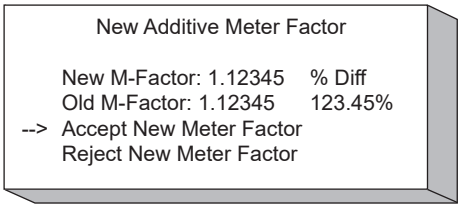
When the test injections are complete, press CLEAR. The microFlow will display a screen similar to that shown

below. Enter the actual amount of additive as measured by an external device (e.g., a graduated cylinder). Select the volume units in which the total is to be displayed. If no test injections have been performed, or if there are no recorded additive pulses or volumes, the CLEAR key will exit the diagnostic altogether.



An asterisk (*) marks the currently selected volume type in which the actual volume units will be entered. One of these selected is always indicated. The actual volume injected is also entered on this screen. When this amount is entered, moving the selection to “Continue” allows the calculation process to proceed. Pressing CLEAR exits this diagnostic.

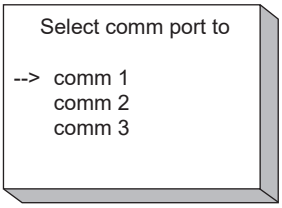
Once the “Continue” option has been selected, the microFlow will calculate a new meter factor based on the volume entered. This new meter factor, the current meter factor, and the choice of accepting this meter factor, are presented on the next screen, as shown below.



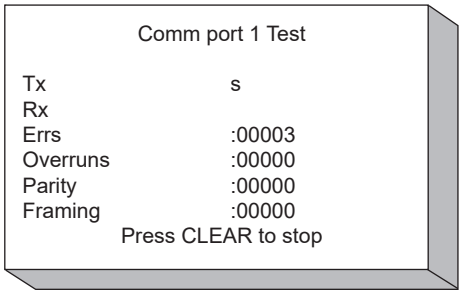
Rejecting the new meter factor exits the diagnostic and erases all proving data. Accepting the new meter factor stores it in the database. Saving the factor in non-volatile memory requires a program mode exit with changes. If the new meter factor is accepted but the unit loses power before exiting program mode, the new meter factor is lost.

Communications Test

Selecting “Communications Test” from the menu allows the operator to run a diagnostic on any of the communication ports on the microFlow. Pressing ENTER with the cursor in front of selection one will activate a popup screen where the operator can select the communications port to be tested.



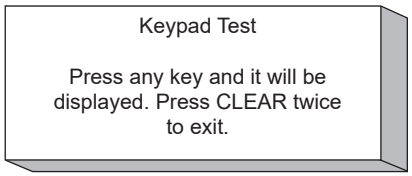
For this test to be completed, the transmit and receive terminals on the comm port must be connected. Once the comm port has been selected for testing by moving the arrow to the required port, pressing ENTER will start the communications test.



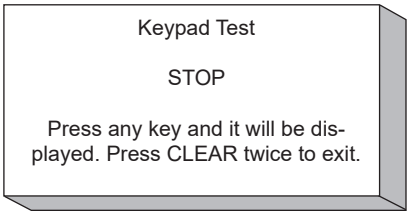
The test will display the characters that are being transmitted on the transmit line. It will also display the characters as they are received back into the instrument. Also displayed are the errors that have occurred during the test, the overruns, the parity, and the framing errors. Pressing CLEAR will end the test and return the unit to the Communications Test menu. The test is identical for the three ports. The only difference in the display will be the communications port number and the channel designation.

Keypad Test

Select “Keypad Test” from the menu to run a diagnostic test on the keypad of the microFlow. Pressing ENTER will display the keypad test screen.



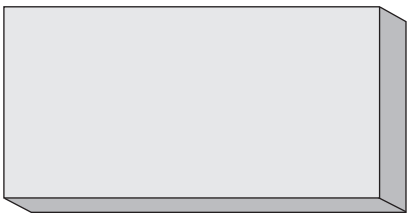
With this screen displayed, any key that is pressed will appear on the screen as the key that was pressed.



To end the test, the CLEAR key must be pressed twice. The first time, CLEAR will appear on the test screen. The second time, the unit will return to the Diagnostic Test menu.

Display Pixel Test

Selecting “Display Pixel Test” and pressing ENTER will initiate the pixel test on the display. All the pixels will be lit, allowing the operator to determine if any of the pixels on the display are not functioning. Pressing CLEAR will terminate the test and return the unit to the Diagnostic menu.



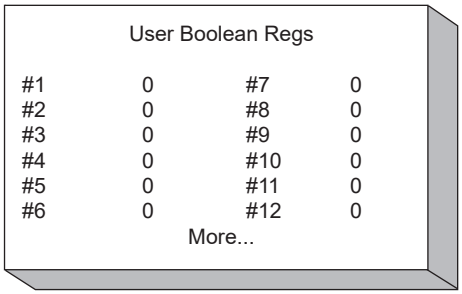
Boolean/Algebraic Processing

Selecting “Boolean/Algebraic Processing” and pressing ENTER will display the following list of Boolean/Algebraic-related diagnostic displays that can be viewed by the operator.

- User Boolean Registers
- User Algebraic Registers
- Equation Line State
- General Purpose Timers

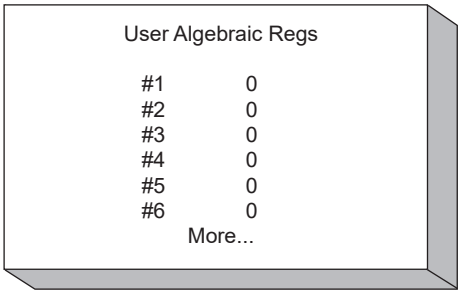
User Boolean Registers

Selecting “User Boolean Registers” and pressing ENTER will display the first twelve user Boolean registers. There are a total of 50 user Boolean registers. The range of these registers is 0 to 255. These registers are set aside for the user. They can be written to by Boolean/Algebraic equations or via communications. The values can be printed on user-defined reports.



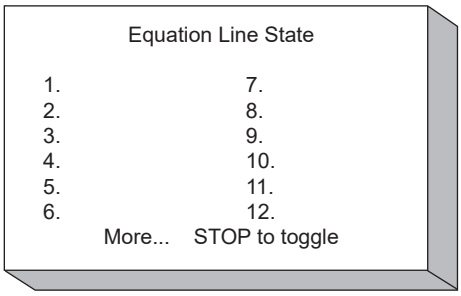
User Algebraic Registers

Selecting “User Boolean Registers” and pressing ENTER will display the first six user algebraic registers.

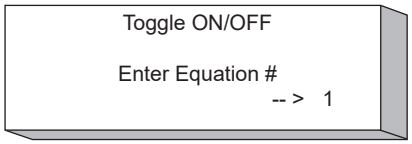


Equation Line State

The Equation Line Status displays the current status of the equations, where “D” indicates that the equation is disabled, “T” is True, and “F” is False. All equations without an “IF” statement will have a “True” status. Those with an “IF” will indicate the result of the “IF” expression: either “True” or “False.”

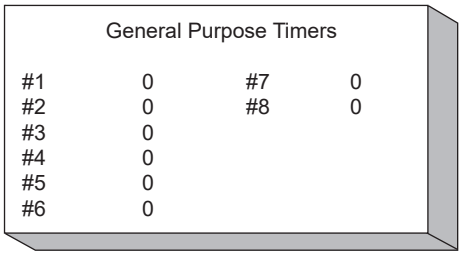


Entering the equation number that is to be disabled and pressing ENTER will change the status on the screen from either T (True) or F (False) to D (Disabled). The equation from that point until enabled will not be active. To enable an equation the same process is followed, except that the screen will indicate that the equation is D (Disabled). Entering the equation number will enable that equation.



General Purpose Timers

Selecting “General Purpose Timers” and pressing ENTER will display nine of the sixteen general purpose timers that can be activated and used through the Boolean and/or algebraic equations.



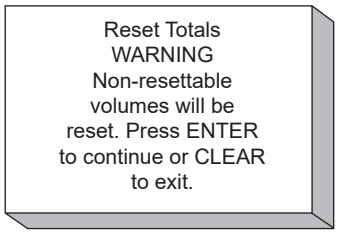
The timers are incremented at these intervals:

Timer Numbers	Resolution	Range
1 - 2	0.1 second	109 minutes
3 - 4	1.0 second	18.2 hours
5 - 6	1.0 minute	45.5 days
7 - 8	1 hour	7.5 years

The operator can clear the times by writing a zero to the database location of the desired timer. Like the user Boolean and user algebraic registers, these timers are reserved strictly for the user. They may be started via Boolean/Algebraic equations or via communications. Timers are very useful in the design of equations as they allow setting a user alarm or taking some other action after an event has persisted for a period of time.

Reset Totals

This diagnostic is used for resetting the non-resettable totals. Pressing ENTER will display the following screen.

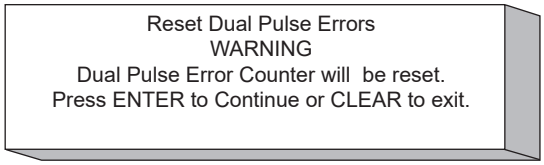


Pressing CLEAR will return the unit to the Diagnostics Menu screen. Pressing ENTER on the screen will reset the non-resettable totals (both product and additive) and return the unit to the Diagnostics Menu screen.

Reset Dual Pulse

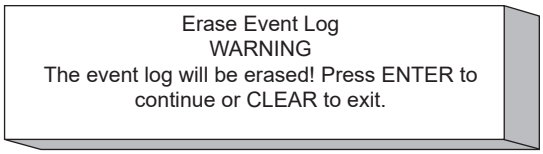
This diagnostic is used for resetting the dual pulse errors if they occur outside of the options programmed in meter code 305 “Dual Pulse Error Reset”. For instance if code 305 is programmed for no automatic reset of the errors this diagnostic would have to be used for resetting the errors if they exceeded the count programmed in meter code 304 “Dual Pulse Error Count”.

To reset the errors, scroll through the menu until the cursor is in front of “Reset Dual Pulse Errors” and press “ENTER”, the following screen will appear.



Erase Event Log

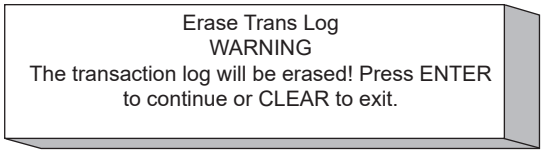
This diagnostic is used for erasing the event log. Pressing ENTER will display the following screen.



Pressing CLEAR will return the unit to the Diagnostics Menu screen without erasing the event log. Pressing ENTER will erase the event log and return the unit to the Diagnostics Menu screen.

Erase Transaction Log

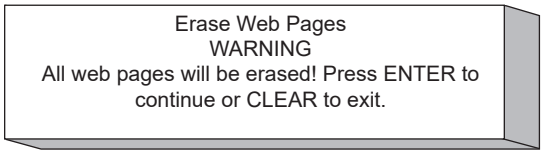
This diagnostic is used to erase the transaction log. Pressing ENTER with the arrow in front of “Erase Transaction Log” will display the following screen.



Pressing CLEAR will return the unit to the Diagnostics Menu screen without erasing the transaction log. Pressing ENTER will erase the transaction log and return the unit to the Diagnostics Menu. Not only will the log be erased, but historic transactions currently archived will no longer be available via communications.

Erase Web Pages

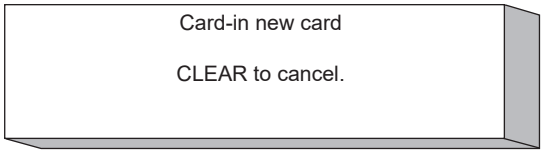
This diagnostic is used to erase the web pages. Pressing ENTER with the arrow in front of “Erase Transaction Log” will display the following screen.



Pressing CLEAR will return the unit to the Diagnostics Menu screen without erasing the web pages. Pressing ENTER will erase the web pages and return the unit to the Diagnostics Menu.

Card Reader Database Update

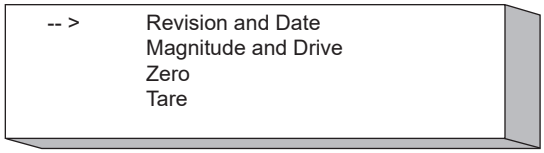
Selecting “Card Reader Database Update” and pressing ENTER will display a screen that prompts the operator to add a new entry to the card reader database of driver IDs. Once the data has been successfully entered, this diagnostic confirms that the card has been read and recorded. Press ENTER to add another card or CLEAR to exit the diagnostic.



Mass Meter Menu

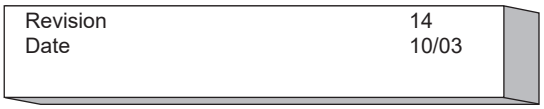
Selecting “Mass Meter Menu” from Program Mode Diagnostics displays the opening mass meter diagnostics screen. Mass meter diagnostics display mass meter information and allow the operator to perform certain maintenance tasks. These diagnostics are only available when a mass meter has been configured for use.

Press ENTER and the following display will then appear.



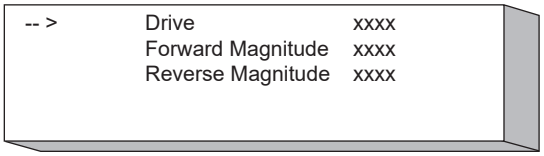
Revision and Date

Selecting “Revision and Date” from the Mass Meter Diagnostics menu displays a screen similar to that shown below. This option indicates the software version and date associated with the mass meter.



Magnitude and Drive

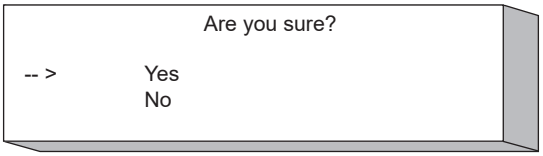
Selecting “Magnitude and Drive” from the Mass Meter Diagnostics menu displays a screen similar to that shown below.



This screen displays the current valves and is dynamically updated. Press CLEAR to return to the Mass Meter Diagnostics menu.

Zero

Selecting “Zero” from the Mass Meter Diagnostics menu displays a screen similar to that shown below.



Position the cursor beside “Yes” and press ENTER to set the meter to zero. The screen will then display “Zeroing in Progress” until the process is complete. Once the meter has been set back to zero, the message will change to “Zeroing Complete – Press Clear to Exit.” Note that there can be no flow in progress when “Zero” is initiated.

Position the cursor beside “No” and press ENTER to abort the zero function and return the display to the Mass Meter Diagnostics menu.

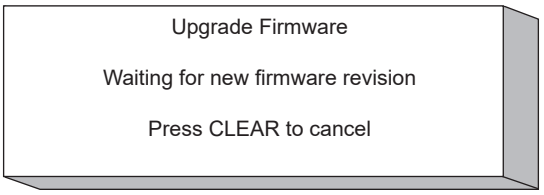
Tare

Selecting “Tare” from the Mass Meter Diagnostics menu displays a screen similar to that shown below.

This screen allows the operator to specify a new tare value for a mass meter. Use the keypad to indicate the new tare value and then press ENTER. The display will return to the Mass Meter Diagnostics menu.

Upgrade Firmware

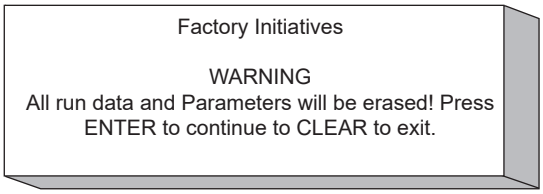
This diagnostic tool will allow a new software revision to be downloaded into the microFlow. In order for a new software revision to be downloaded the Comlink Level must be set to the highest level, unless, the microFlow is in the diagnostic screen shown below, which will override the Comlink Level setting.



Factory Initialize

Selecting “Factory Initialize” and pressing ENTER will display a screen that tells the operator that if ENTER is pressed, all the parameters in the unit will be reset to the default values as they were shipped from the factory.

Caution: Running this diagnostic will change all parameters that have been programmed previously. The only data saved will be that which is stored in the audit trail for Weights and Measures Approvals.



Factory Diagnostics

The Watchdog Reset Test, Powerup Diagnostics, Flow Simulator, and Field Test Init are for factory use only.

Appendix I – Alarms

Table of Equivalent Error Codes	
Blend-Pak Injector – From the Blend-Pak's Point of View	**microFlow.net Equivalent Error Code**
Excess Additive	RA: Additive Frequency Alarm
No Additive Flow	NA: No Additive Pulses Alarm
No Fuel Flow	GA: Additive Injector Error
Low Additive	KA: Low Additive Volume
Leaking Solenoid	MA: Excess Additive Pulses
No Act. Time-Out	GA: Additive Injector Error
Fuel Flow Switch Failure	GA: Additive Injector Error
Low Flow Switch Failure	GA: Additive Injector Error
Flash Vol Alarm	GA: Additive Injector Error
Mini-Pak Injector – From the Mini-Pak Point of View	**microFlow.net Equivalent Error Code**
Additive Cycle Volume Alarm	GA: Additive Injector Error
No Additive Alarm	NA: No Additive Pulses Alarm
Leaking Solenoid	MA: Excess Additive Pulses
Firmware Failure	GA: Additive Injector Error
EEPROM Failure	GA: Additive Injector Error
Metered Injector – If this happens...	**microFlow.net – This alarm occurs...**
Injections are occurring too fast	OR: Overspeed Metered Injector
No additive pulses are registering	NA: No Additive Pulses Alarm
Out of tolerance high	RA: Additive Frequency Alarm
Out of tolerance low	KA: Low Additive Volume
Titan Injector – From the Titan's Point of View	**microFlow.net Equivalent Error Code**
Alarm Low 1	RA: Additive Frequency Alarm
Alarm Low 2	KA: Low Additive Volume
Pulse Detection	NA: No Additive Pulses Alarm
Alarm High	MA: Excess Additive Pulses
Product Pulse Failure	GA: Additive Injector Error
Unclean Product	GA: Additive Injector Error

Injector Alarm Grid on the microFlow.net						
microFlow.net	**Piston**	**Piston w/ Feedback**	**Metered**	**Titan**	**Blend-Pak**	**MiniPak**
FA: Additive Feedback Alarm	N/A	Not displayed	N/A	N/A	N/A	N/A
AC: Additive Communications	N/A	N/A	N/A	Not displayed	Not displayed	Not displayed
KA: Low Additive Volume	N/A	N/A	Not displayed	Alarm Low 2	Low Additive	N/A
MA: Excess Additive Pulses	N/A	N/A	N/A	High Alarm	Leaking Solenoid	Leaking Solenoid
NA: No Additive Pulses Alarm	N/A	N/A	Not displayed	Pulse Detection	No Additive Flow	No Additive
RA: Additive Frequency Alarm	N/A	N/A	Not displayed	Alarm Low 1	Excess Additive	N/A
UA: Add Authorize Failed	N/A	N/A	N/A	Not displayed	Not displayed	Not displayed
GA: Additive Injector Error	N/A	N/A	N/A	Varies	Varies	Varies
OR: Overspeed Metered Injector	N/A	N/A	Not displayed	N/A	N/A	N/A
CR: Injector Command Rejected	N/A	N/A	N/A	Not displayed	Not displayed	Not displayed

Metered Injector Alarms

OR: Overspeed Metered Injector

This alarm occurs if an injection is attempted before the previous one is complete.

NA: No Additive Pulses Alarm

This alarm occurs if an injection is attempted, but the previous injection is still in progress and no pulses have been registered.

RA: Additive Frequency Alarm

This alarm occurs when the meter consistently falls out of programmed tolerance a programmed number of times, and the additive volume is too high.

KA: Low Additive Volume

This alarm occurs when the meter consistently falls out of programmed tolerance a programmed number of times, and the additive volume is too low.

A

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Calculations .....Bulletin TP06006

Technical Support

Contact Information:
Field Service Response Center
24/7 Technical Support/Schedule a Technician: 1-844-203-4014
System Installation Supervision, Start-Up, Training, and Commissioning Services Available

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