FT-3000 Series Transmitter

Inline Electromagnetic Flow Meter
Programming Guide

ONICON
Flow and Energy Measurement

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SECTION 1.0: INTRODUCTION

1.1 PURPOSE OF THIS GUIDE

The purpose of this guide is to provide programming information for the FT-3000 Series transmitter configured with the following output configurations:

FT-3100 Series Transmitter:

- Two (2) digital outputs, one (1) digital input, and one (1) analog output

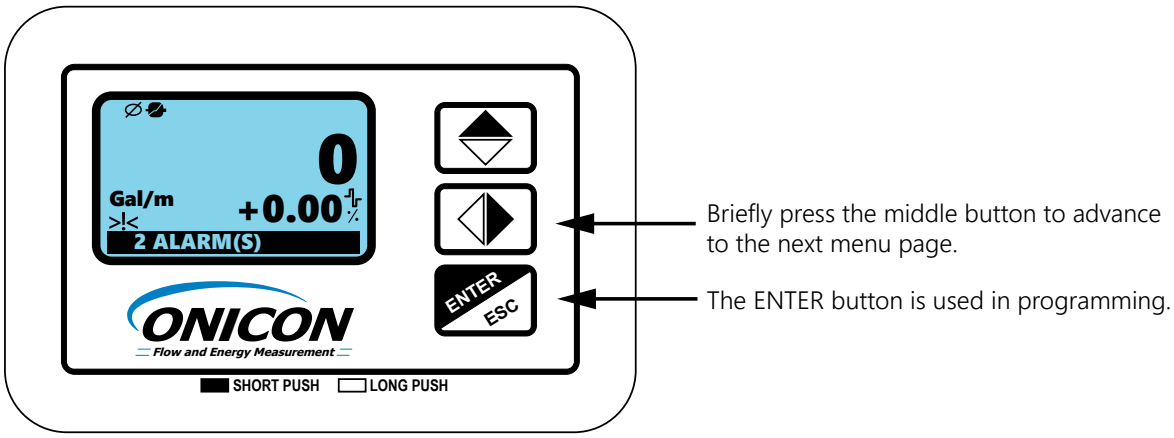
FT-3200 Series Transmitter:

- Two (2) digital outputs, one (1) digital input and one (1) analog output
- Two (2) digital outputs, one (1) digital input and two (2) analog outputs with MODBUS (RS485)

It does not include information on serial communications or data logging. Refer to FT-3000 Series MODBUS Supplement for more details on network installation.

1.2 DISPLAY AND USER INTERFACE

The FT-3000 Series transmitter is equipped with a lighted graphic display and 3-button user interface as shown below.

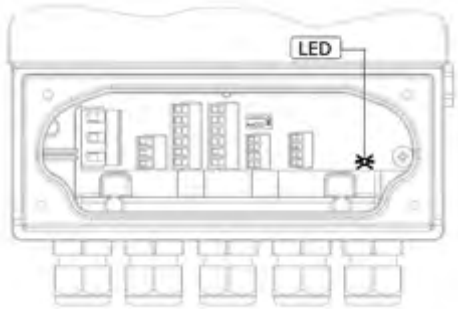


STATUS ICONS

Icon	Description	Icon	Description
∅	Empty Pipe		Signal Error
	Low Flow Alarm		Excitation Error
	High Flow Alarm		General Alarm (Flashing)
	Flow Rate Overflow		Flow Rate Simulation (Flashing)
1	Pulse 1 Overflow	2	Pulse 2 Overflow
>!<	Generic Alarm (Flashing)		Calibration (Flashing)

1.2 DISPLAY AND USER INTERFACE (CONTINUED)

A multicolored LED inside the field wiring compartment provides addition information on the operating status.



Red LED: Alarm
Blue LED: USB comm enabled
Green LED: Normal Operation

1.3 ACCESSING THE PROGRAMMING MENUS

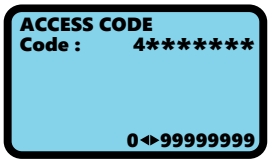
Access to the programming menus is password protected. The factory default access code is 4********. The three user interface push-button functions described below change when operating in the program mode.

Push Button	Short Press (<1 second)	Long Press (>1 second)
	• Increments the numeric value or selected parameter • Returns to the previous menu item	• Decrements the numeric value • Advances to the next menu item
	• Moves the cursor to the right on input fields • Advances to the next menu item • Changes the process data display	• Moves the cursor to the left on input fields • Returns to the previous menu item
	• Enters or leaves the selected function • Enters the program mode • Cancels the selected function in progress	• Exits the current menu • Confirms the selected function to enable the totalizer reset request, when enabled.

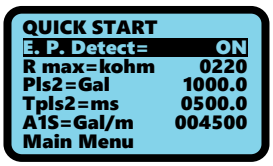
SECTION 2.0: QUICK START MENU

The most commonly used programming functions are available in the Quick Start menu. The menu can be accessed by briefly pressing the key and entering the access code 4*******. Additional programming options are accessed via the Main Menu.

1. From the main screen, quickly press the Enter key.



2. Enter the access code.



3. Enter into the Quick Start menu.

2.1 MENU - QUICK START

Empty Pipe Detector	[E.P.Detect = ON]
Empty Pipe Threshold	[R max = kohm XXXX]
Scaled Pulse Out 2 Volume	[Pls2 = Gal XXX.XXX]
Output 2 Pulse Duration	[Tpls2 = XXXX.X]
Analog Output 1 Full Scale Value	[A1S = Gal/m XXXXXX]
Analog Output 2 Full Scale Value	[A2S = Gal/m XXXXXX]
MAIN MENU	

Empty Pipe Detector [E.P.Detect = ON]

This setting enables or disables the empty pipe detector. The Empty Pipe Detector senses when fluid is drained from the pipe and the flow sensing electrodes are exposed to air. When this occurs, the displayed flow rate will drop to zero and the empty pipe icon will be displayed in the upper left-hand side of the display window. If the current (mA) output alarm is active, the milliamp output will also indicate an alarm condition.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Empty Pipe Threshold [R max = kohm XXXX]

The empty pipe threshold function is used to set the maximum allowable resistance value between the flow sensing electrodes in the transmitter. The transmitter will go into empty pipe alarm when the value is exceeded. The default value is 500. The maximum allowable value is 9,999.

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the resistance. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Scaled Pulse Output 2 [Pls2 = Gal X.XXXX]

This function is only available when output pulse 2 in OUTPUTS menu (menu 7) [Out2 = XXXXX] is set to Pulses+, Pulses- or Pulses±. When active, Scaled Output Pulse 2 sets the unit of measure and the volume or mass that equates to one pulse. This pulse weight setting is limited by the diameter of the flow sensor.

The list of units of measure available for selection can be in US/IMPERIAL or SI units depending on the pulse 2 unit type [Pl2 unit = IMPERIAL] setting in UNITS menu (menu 2). In the same way, the list will show mass units, if mass units are enabled [Mass units = OFF] in menu 2. The tables on the next page show the available units of measure.

2.1 MENU - QUICK START (CONTINUED)

US/IMPERIAL Volume Units	
in^3	Cubic Inch
Gal	US Gallon
ttG	US Gallon x 10,000
ft^3	Cubic Foot
bbl	Standard Barrel
BBL	Barrel of Oil
hf^3	Cubic Foot x 100
Kf^3	Cubic Foot x 1,000
KGL	US Gallon x 1,000
IGL	Imperial Gallon
IKG	Imperial Gallon x 1,000
Aft	Acre Foot
MGL	Mega Gallon (US)
IMG	Imperial Mega Gallon

SI/METRIC Volume Units	
cm^3	Cubic Centimeter
ml	Mililiter
l	Liter
dm^3	Cubic Decimeter
dal	Decaliter
hl	Hectoliter
m^3	Cubic Meter
ML	Megaliter

US/IMPERIAL Mass Units	
Oz	Ounce
Lb	Pound
Ton	Short Ton (2,000 lbs)

SI/METRIC Mass Units	
g	Gram
kg	Kilogram
t	Metric Ton (1,000 kg)

To enter a new value, press enter to access the function and use the right arrow key to move the cursor and the up arrow key to change the entry. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Output 2 Pulse Duration [Tpls2 = ms X.XXXX]

Output 2 pulse duration is only active when scaled pulse output 2 [Pls2= Gal X.XXXX] is active. It is used to set the duration of each pulse. The duration is set in milliseconds with a range of 0.4 to 9999.99.

Note: Pulse durations must match the requirements of the input they are connected to. Very short pulse times may not be counted by the input and long duration pulsed may damage electromechanical registers.

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the pulse duration. Press enter to accept the change and exit the function. Press escape to exit the program mode.

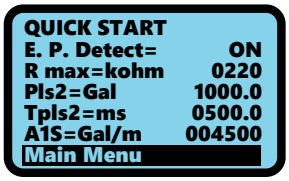
Analog Output 1 Full Scale Value [A1S = Gal/m XXXXXX]
Analog Output 2 Full Scale Value [A2S = Gal/m XXXXXX] (Available for FT-3200 meters only)

This function sets the full scale flow value for the analog output. The maximum allowable flow rate is a function of the diameter of the flow sensor. Regardless of the diameter, the maximum flow rate setting cannot exceed a velocity of 10 m/s.

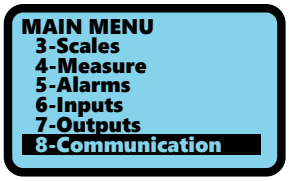
To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the value. Press enter to accept changes and exit the function. Press escape to exit the program mode.

SECTION 3.0: MAIN MENU

The menu can be accessed by briefly pressing the ENTER/ESC key and entering the access code 4*******.



1. From Quick Start menu, push repeatedly until Main Menu is highlighted.



2. Enter into the Main Menu.

3.1 MENU 1 - SENSOR

Sensor Body Model	[S Model = XXX]
Liner Material	[Lining = XXXXXX]
Unit Type	[U type = XXXXXX]
Diameter	[Diam. = in XXX]
KA	[KA = ± XX.XXX]
KZ	[KZ = ± XXXX]
Empty Pipe Detector	[E.P.Detect = ON]
Empty Pipe Threshold	[R max = kohm XXXX]
Elecrode Cleaning	[El. cleaning = MIN]
Sensor Cable Length	[S.cable = ft XXX]
Alarm Delay Interval	[S.err.delay = XXX]

Sensor Body Model [S.Model = XXX]

Enter the numeric code for the type of sensor body connected to the transmitter.

Body Type	Sensor Code
Threaded Steel	011
Threaded Polypropylene	013
Wafer	002
Flanged	004

To change the setting, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the code as per the table above. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.1 MENU 1 - SENSOR (CONTINUED)

Liner Material [Lining = XXXXXX]

Select the sensor body liner material from the following list.

Liner Material*	Code
PTFE	PTFE
Polypropylene	PP
Ebonite	HR

*Disregard all liner material options that are not shown in this list.

To change the setting, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the code as per the table above. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Unit Type [U.type = XXXXXX]

This parameter configures the transmitter for U.S. (imperial) or SI (metric) units. To change the existing setting, press enter to access the function and use the up arrow key to change the setting. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Diameter [Diam. = in XXX]

This must be set to match the nominal diameter of the sensor body connected to the transmitter. If the Unit Type is set to U.S. units, the nominal sizes will be in inches. For SI units, the nominal sizes will be in millimeters.

To enter a new diameter, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the value. Press enter to accept changes and exit the function. Press escape to exit the program mode.

KA [KA = ± XX.XXX]

KA is one of two coefficients of calibration that are derived during the sensor body factory calibration. Both variables must be programmed in to the transmitter to ensure accurate flow measurement. The KA value is provided on the certificate of calibration and on a label on the sensor body.

To enter a new coefficient, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the value. Press enter to accept changes and exit the function. Press escape to exit the program mode.

KZ [KZ = ± XXXX]

KZ is the second of two coefficients of calibration that are derived during the sensor body factory calibration. Both variables must be programmed in to the transmitter to ensure accurate flow measurement. The KZ value is provided on the certificate of calibration and on a label on the sensor body.

To enter a new coefficient, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the value. Press enter to accept changes and exit the function. Press escape to exit the program mode.

3.1 MENU 1 - SENSOR (CONTINUED)

Empty Pipe Detector [E.P.Detect = ON]

This setting enables or disables the empty pipe detector.

The Empty Pipe Detector senses when fluid is drained from the pipe and the flow sensing electrodes are exposed to air. When this occurs, the displayed flow rate will drop to zero and the empty pipe icon will be displayed in the upper left-hand side of the display window. If the current (mA) output alarm is active the milliamp output will also indicate an alarm condition.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Empty Pipe Threshold [R max = kohm XXXX]

The empty pipe threshold function is used to set the maximum allowable resistance value between the flow sensing electrodes in the transmitter. The transmitter will go into empty pipe alarm when the value is exceeded. The default value is 500. The maximum allowable value is 9,999.

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the resistance. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Electrode Cleaning [El. cleaning = MIN]

When enabled, the electrode cleaning function transmits a depolarizing signal to the electrodes in between flow measurement cycles. This function is enabled by default whenever the empty pipe alarm is active. The default setting, when active, is AVG. It should only be used with fluid conductivities >100µS/cm.

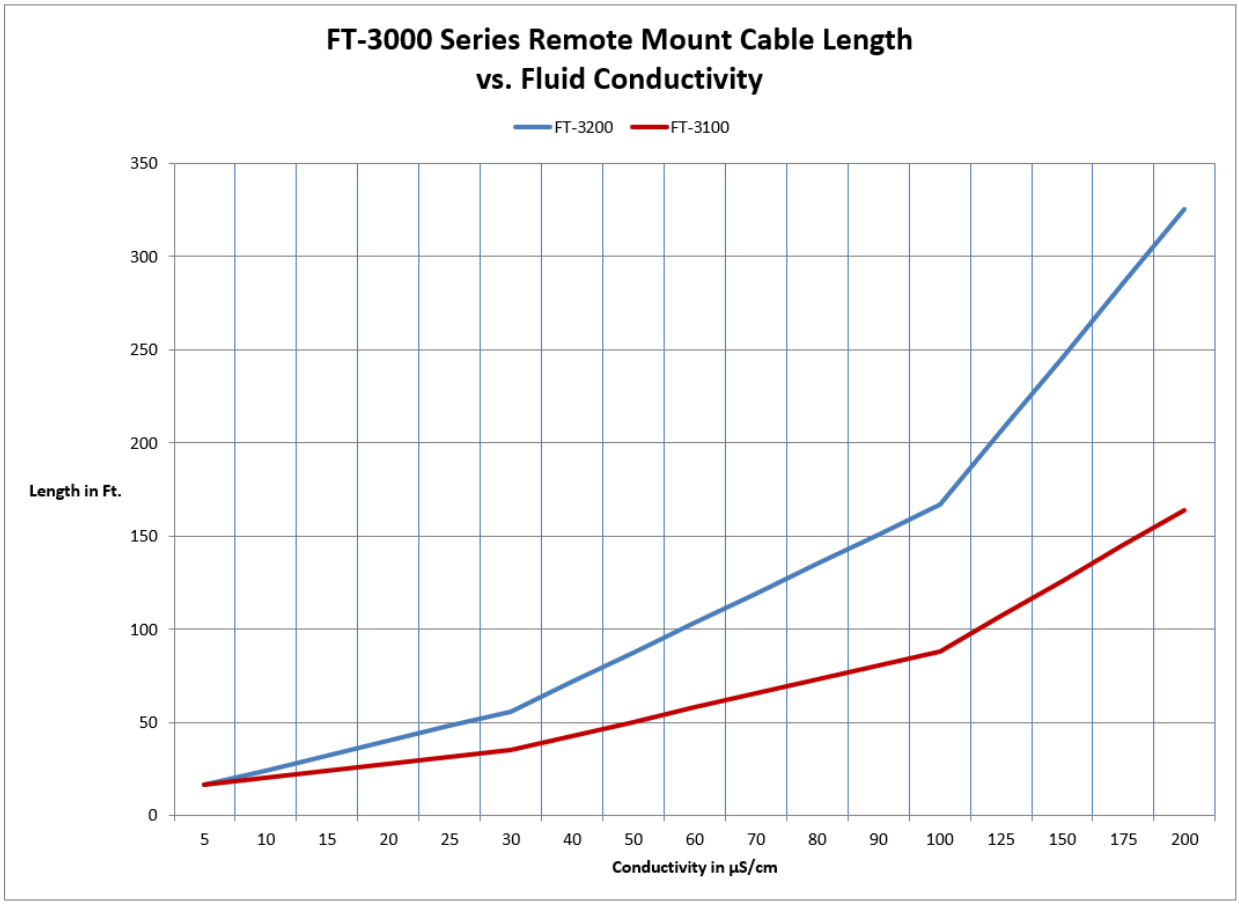
Electrode Cleaning Settings	Code
Off	OFF
Minimum	MIN
Average	AVG
Maximum	MAX

To change the existing setting, press enter to access the function and use the up arrow key to change the setting. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.1 MENU 1 - SENSOR (CONTINUED)

Sensor Cable Length [S.cable = ft XXX]

Enter the remote transmitter cable length. The allowable cable length is a function of the fluid conductivity with a maximum allowable cable length of 164 ft (FT-31XX models) or 325 ft (FT-32XX models). Use of the remote mount transmitter option with conductivity levels of less the 15µS/cm is not recommended. Use the table below to determine the maximum cable length for your installation.



To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the length. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Alarm Delay Interval [S.err.delay = m XXX]

This function delays the activation of empty pipe, excitation error and signal error alarms. The range of the delay interval is from 0 to 500 measurement cycles. For meters up to 10" (250mm) in diameter this equates to 0 to 10 seconds.

For 12" to 20" (300 to 500mm) meters, the interval range is from 0 to 25 seconds. To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the interval. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.2 MENU 2 - UNITS

Diameter Unit Type	[Diam = in]
Remote Mount Cable Unit Type	[S.cable = ft]
Flow Rate Unit Type	[FR unit = IMPERIAL]
Pulse 1 Unit Type	[Pl1 unit = IMPERIAL]
Pulse 2 Unit Type	[Pl2 unit = IMPERIAL]
Total Forward Flow Totalizer Unit Type	[T+unit = IMPERIAL]
Total Forward Flow Totalizer Units	[T+unit = Gal]
Total Forward Flow Totalizer Decimal Point Position	[T+D.P. = X]
Partial Forward Flow Totaliazer Unit Type	[P+unit = IMPERIAL]
Partial Forward Flow Totalizer Units	[P+unit = Gal]
Partial Forward Flow Totalizer Decimal Point Position	[P+D.P. = X]
Total Reverse Flow Totalizer Unit Type	[T-unit = IMPERIAL]
Total Reverse Flow Totalizer Units	[T-unit = Gal]
Total Reverse Flow Totalizer Decimal Point Position	[T-D.P. = X]
Partial Reverse Flow Totalizer Unit Type	[P-unit = IMPERIAL]
Partial Reverse Flow Totalizer Units	[P-unit = Gal]
Partial Reverse Flow Totalizer Decimal Point Position	[P-D.P. = X]
Temperature Unit Type	[Temp.unit = °F]
Mass Units Enable	[Mass units = OFF]
Specific Gravity Coefficient	[Sg = kg/dm^3 X.XXXX]

Diameter Unit Type [Diam. = in]

This function sets the nominal diameter of the sensor body for U.S. (imperial) or SI (metric) units. This setting changes the list of nominal diameters in SENSOR menu (menu 1) [Diam. = ft XXX] from U.S to SI units.

To change the existing setting, press enter to access the function. Use the right arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Remote Mount Cable Unit Type [S.cable = ft]

This function sets the cable length measurement units for U.S. (imperial) or SI (metric). This setting changes the way cable lengths are entered in SENSOR menu (menu 1) [S.cable = ft XXX].

To change the existing setting, press enter to access the function. Use the right arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Flow Rate Unit Type [FR unit = IMPERIAL]

This function sets the list of flow measurement units for U.S (imperial) or SI (metric). To change the existing setting, press enter to access the function. Use the right arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.2 MENU 2 - UNITS (CONTINUED)

Pulse 1 Unit Type [Pl1 unit = IMPERIAL]

This function sets the list of totalizer measurement units for U.S. (imperial) or SI (metric) for output 1. The function is only active when the output 1 function selection [Out1 = XXXXXX] is set for scaled pulse

To change the existing setting, press enter to access the function. Use the right arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Pulse 2 Unit Type [Pl2 unit = IMPERIAL]

This function sets the list of totalizer measurement units for U.S. (imperial) or SI (metric) for output 2. The function is only active when the output 2 function selection [Out2 = XXXXXX] is set for scaled pulse

To change the existing setting, press enter to access the function. Use the right arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Total Forward Flow Totalizer Unit Type [T+ unit = IMPERIAL]

This function sets the list of forward flow totalizer measurement units for U.S (imperial) or SI (metric).

To change the existing setting, press enter to access the function. Use the right arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Total Forward Flow Totalizer Units [T+ unit = Gal]

This function sets measurement unit for the forward flow totalizer.

To change the existing setting, press enter to access the function. Use the up arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Total Forward Flow Totalizer Decimal Point Position [T+ D.P. = X]

This function sets the position of the decimal point when displaying the forward flow total.

To move the decimal point, press enter to access the function. Use the up and/or right arrow keys to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Partial Forward Flow Totalizer Unit Type [P+ unit = IMPERIAL]

This function sets the list of partial forward flow totalizer measurement units for U.S (imperial) or SI (metric).

To change the existing setting, press enter to access the function. Use the right arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.2 MENU 2 - UNITS (CONTINUED)

Partial Forward Flow Totalizer Units [P+ unit = Gal]

This function sets measurement unit for the partial forward flow totalizer.

To change the existing setting, press enter to access the function. Use the up arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Partial Forward Flow Totalizer Decimal Point Position [P+ D.P. = X]

This function sets the position of the decimal point when displaying the forward flow total.

To move the decimal point, press enter to access the function. Use the up and/or right arrow keys to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Total Reverse Flow Totalizer Unit Type [T- unit = IMPERIAL]

This function sets the list of reverse flow totalizer measurement units for U.S (imperial) or SI (metric).

To change the existing setting, press enter to access the function. Use the right arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Total Reverse Flow Totalizer Units [T- unit = Gal]

This function sets measurement unit for the reverse flow totalizer.

To change the existing setting, press enter to access the function. Use the up arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Total Reverse Flow Totalizer Decimal Point Position [T- D.P. = X]

This function sets the position of the decimal point when displaying the reverse flow total.

To move the decimal point, press enter to access the function. Use the up and/or right arrow keys to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Partial Reverse Flow Totalizer Unit Type [P- unit = IMPERIAL]

This function sets the list of partial reverse flow totalizer measurement units for U.S (imperial) or SI (metric).

To change the existing setting, press enter to access the function. Use the right arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode. Table of Contents

Partial Reverse Flow Totalizer Units [P- unit = Gal]

This function sets measurement unit for the partial reverse flow totalizer.

To change the existing setting, press enter to access the function. Use the up arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.2 MENU 2 - UNITS (CONTINUED)

Partial Reverse Flow Totalizer Decimal Point Position [P- D.P. = X]

This function sets the position of the decimal point when displaying the reverse flow total.

To move the decimal point, press enter to access the function. Use the up and/or right arrow keys to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Temperature Unit Type [Temp. unit = °F]

This function sets the measurement units for the on-board temperature sensor.

To change the existing setting, press enter to access the function. Use the right arrow key to change the selection. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Mass Units Enable [Mass units = OFF]

Enables or disables the mass measurement function. When enabled, measurement unit lists for flow rates and totals will be in mass units.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Specific Gravity Coefficient [Sg = kg/dm³ X.XXXX]

This function is only enabled when mass units are enabled. The static value entered here will be used to convert volumetric flow into mass flow.

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the coefficient. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.3 MENU 3 - SCALES

Full Scale Flow Rate 1	[FS1 = Gal/m XXX.X]
Full Scale Flow Rate 2	[FS2 = Gal X.XX.X]
Pulse Output 1 Unit and Multiplier	[Pls1 = X.XXXXX]
Pulse Output 1 Duration	[Tpls1 = ms X.XXXXX]
Pulse Output 2 Unit and Multiplier	[Pls2 = Gal X.XXXXX]
Pulse Output 2 Duration	[Tpls2 = ms X.XXXXX
Frequency Output 1 Full Scale Frequency	[Frq1 = Hz X.XXXXX]
Frequency Output 2 Full Scale Frequency	[Frq2 = Hz X.XXXXX]

Full Scale Flow Rate 1 [FS1= Gal/m XXX.X]

The full scale flow rate 1 function sets the unit of measure and time base for the meter and the maximum flow rate for range 1. This effects the flow rate display and the alarm function. It also sets the unit of measure and time base for the analog output.

The maximum allowable flow rate is a function of the diameter of the flow sensor. Regardless of the diameter, the maximum flow rate setting cannot exceed a velocity of 10 m/s. The following rules apply to the maximum flow rate setting. These may also affect the selection of the unit of measure and the time base.

- The largest numeric value representing flow is 9999. Larger values use units with multipliers.
- The full scale flow rate setting cannot exceed 10 m/s
- The full scale flow rate must be greater than 0.4 m/s

The list of units of measure available for selection can be in US/IMPERIAL or SI units depending on the flow rate unit type [FR unit = IMPERIAL] selected in UNITS menu (menu 2). In the same way, the list will show mass units, if mass units are enabled [Mass units= OFF] in menu 2.

The tables below show the available units of measure.

US/IMPERIAL Volume Units	
in^3	Cubic Inch
Gal	US Gallon
ttG	US Gallon x 10,000
ft^3	Cubic Foot
bbl	Standard Barrel
BBL	Barrel of Oil
hf^3	Cubic Foot x 100
Kf^3	Cubic Foot x 1,000
KGL	US Gallon x 1,000
IGL	Imperial Gallon
IKG	Imperial Gallon x 1,000
Aft	Acre Foot
MGL	Mega Gallon (US)
IMG	Imperial Mega Gallon

Time Base	
s	Seconds
m	Minutes
h	Hours
d	Days

SI/METRIC Volume Units	
cm^3	Cubic Centimeter
ml	Mililiter
l	Liter
dm^3	Cubic Decimeter
dal	Decaliter
hl	Hectoliter
m^3	Cubic Meter
ML	Megaliter

US/IMPERIAL Mass Units	
Oz	Ounce
Lb	Pound
Ton	Short Ton (2,000 lbs)

SI/METRIC Mass Units	
g	Gram
kg	Kilogram
t	Metric Ton (1,000 kg)

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the entry. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.3 MENU 3 - SCALES (CONTINUED)

Full Scale Flow Rate 2 [FS2 = Gal/m XXX.X]

The full scale flow rate 2 function sets the maximum flow rate for range 2, when the autorange function [Autorange = ON/OFF] in MEASURE menu (menu 4) is turned on. Range 2 uses the unit of measure and time base setting from full scale flow rate 1.

The maximum allowable flow rate is a function of the diameter of the flow sensor. Regardless of the diameter, the maximum flow rate setting cannot exceed a velocity of 10 m/s. The following rules apply to the maximum flow rate setting. These may also affect the selection of the unit of measure and the time base.

- The largest numeric value representing flow is 9999. Larger values use units with multipliers.
- The full scale flow rate setting cannot exceed 10 m/s
- The full scale flow rate must be greater than 0.4 m/s

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the entry. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Scaled Pulse Output 1 [Pls1 = Gal X.XXXX]

This function is only available when output pulse 1 in OUTPUTS menu (menu 7) [Out1 = XXXXX] is set to Pulses+, Pulses- or Pulses±. When active, scaled output pulse 1 sets the unit of measure and the volume or mass that equates to one pulse. This pulse weight setting is limited by the diameter of the flow sensor.

The list of units of measure available for selection can be in US/IMPERIAL or SI units depending on the pulse 1 unit type [Pl1 unit = IMPERIAL] setting in UNITS menu (menu 2). In the same way, the list will show mass units, if mass units are enabled [Mass units= OFF] in menu 2. The tables below show the available units of measure.

US/IMPERIAL Volume Units	
in^3	Cubic Inch
Gal	US Gallon
ttG	US Gallon x 10,000
ft^3	Cubic Foot
bbl	Standard Barrel
BBL	Barrel of Oil
hf^3	Cubic Foot x 100
Kf^3	Cubic Foot x 1,000
KGL	US Gallon x 1,000
IGL	Imperial Gallon
IKG	Imperial Gallon x 1,000
Aft	Acre Foot
MGL	Mega Gallon (US)
IMG	Imperial Mega Gallon

SI/METRIC Volume Units	
cm^3	Cubic Centimeter
ml	Mililiter
l	Liter
dm^3	Cubic Decimeter
dal	Decaliter
hl	Hectoliter
m^3	Cubic Meter
ML	Megaliter

US/IMPERIAL Mass Units	
Oz	Ounce
Lb	Pound
Ton	Short Ton (2,000 lbs)

SI/METRIC Mass Units	
g	Gram
kg	Kilogram
t	Metric Ton (1,000 kg)

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the entry. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.3 MENU 3 - SCALES (CONTINUED)

Output 1 Pulse Duration [Tpls1 = ms X.XXXX]

Output 1 pulse duration is only active when scaled pulse output 1 [Pls1 = Gal X.XXXX] is active. It is used to set the duration of each pulse. The duration is set in milliseconds with a range of 0.4 to 9999.99.

Note: Pulse durations must match the requirements of the input they are connected to. Very short pulse times may not be counted by the input and long duration pulsed may damage electromechanical registers.

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the pulse length. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Output 1 Full Scale Frequency [Frq1 = Hz X.XXXXX]

This function is only available when output pulse 1 in OUTPUTS menu (menu 7) [Out1 = XXXXX] is set to Freq+, Freq- or Freq±. When active, output 1 full scale frequency sets maximum frequency for the output. This maximum frequency equals the maximum flow rate set by full scale flow rate 1 [FS1 = Gal/m XXX.X] in SCALES menu (menu 3).

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the pulse length. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Scaled Pulse Output 2 [Pls2 = Gal X.XXXX]

This function is only available when output pulse 2 in OUTPUTS menu (menu 7) [Out2 = XXXXX] is set to Pulses+, Pulses- or Pulses±. When active, scaled output pulse 2 sets the unit of measure and the volume or mass that equates to one pulse. This pulse weight setting is limited by the diameter of the flow sensor.

The list of units of measure available for selection can be in US/IMPERIAL or SI units depending on the pulse 2 unit type [Pl2 unit= IMPERIAL] setting in UNITS menu (menu 2). In the same way, the list will show mass units, if mass units are enabled [Mass units = OFF] in menu 2. The tables below show the available units of measure.

The tables, shown on previous page, for scaled pulse output 1 units of measure also apply to this output.

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the entry. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Output 2 Pulse Duration [Tpls2 = ms X.XXXX]

Output 2 Pulse Duration is only active when scaled pulse output 2 [Pls2 = Gal X.XXXX] is active. It is used to set the duration of each pulse. The duration is set in milliseconds with a range of 0.4 to 9999.99.

Note: Pulse durations must match the requirements of the input they are connected to. Very short pulse times may not be counted by the input and long duration pulsed may damage electromechanical registers.

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the pulse length. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Output 2 Full Scale Frequency [Frq2 = Hz X.XXXXX]

This function is only available when output pulse 2 in OUTPUTS menu (menu 7) [Out2 = XXXXX] is set to Freq+, Freq- or Freq±. When active, output 2 full scale frequency sets maximum frequency for the output. This maximum frequency equals the maximum flow rate set by full scale flow rate 2 [FS2 = Gal/m XXX.X] in SCALES menu (menu 3).

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the pulse length. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.4 MENU 4 - MEASURE

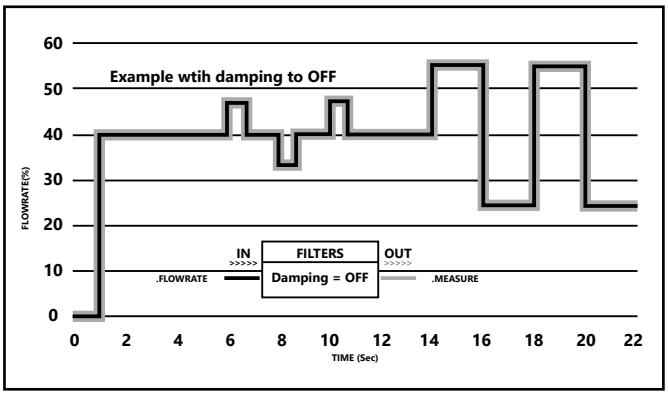
Flow Signal Damping	[Damping=SMART]
Low Flow Cut-off	[Cut-off=%XXX]
Autorange	[Autorange= OFF]
High Immunity Input Filter	[H.im.inp = OFF]

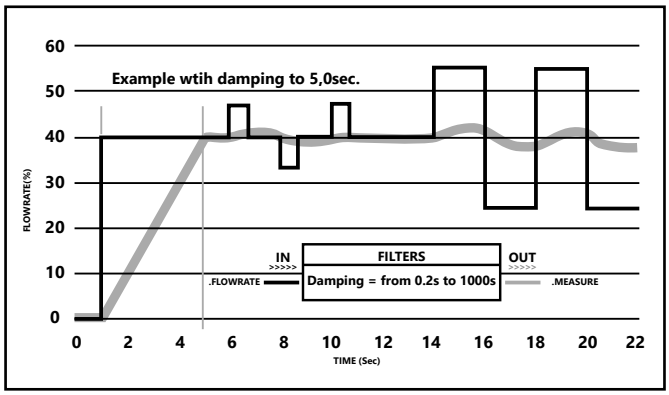
Flow Signal Damping [Damping = SMART]

The flow signal damping function allows the user to smooth out the effects of sudden changes in the flow readings on the display and the output. Damping may be applied using the “Smart” filter or by setting fixed time interval filtering. It is recommended to start with no damping.

Smart filtering automatically adapts to changing flow conditions. This filter will provide significant filtering when large, rapid changes are detected and minimal filtering when flow is more stable. This type of filtering is useful when large changes in flow occur at random intervals.

Time based filtering applies a fixed time constant to the filtering algorithm. Longer time constants increase the damping effect, but they also reduce response time. See examples below. This type of filtering is useful when the variations in flow are relatively constant and repeatable. Damping time interval are 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500 & 1000 seconds.





To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the filter setting. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.4 MENU 4 - MEASURE (CONTINUED)

Low Flow Cut-off [Cut-off = % XXX]

This function sets the low flow cut-off for flow measurement. The meter will report all flow measurements below the threshold as zero flow. This cut-off function is necessary to prevent small random noise signals from being reported as flow. It is based on a percentage of the full scale flow rate 1 [FS1= Gal/m XXX.X] in SCALES menu (menu 3). The allowable settings are between 0 and 25% of full scale. For most applications a value between 0.1 and 1.0% is recommended.

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the cut-off percentage. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Autorange [Autorange = OFF]

When autorange is enabled the meter will operate with two different flow ranges. In order to get the best results, range 1 [FS1= Gal/m XXX.X] in SCALES menu (menu 3) must be larger than range 2 [FS2= Gal/m XXX.X].

When the flow rate increases and reaches the 100% of the full scale 1, then the meter automatically switches to full scale 2. When the flow rate decreases to a value on full scale 2 equal to the 90% of full scale.1, then the meter reverts to full scale 1.

When autorange is enabled, the manual range change function [Range change= OFF] in INPUTS menu (menu 6) cannot be used.

Note: This function does NOT increase the accuracy of the measurement; it only increases the resolution of the 4-20 mA output when the meter is operating at very low flow rates (e.g. The flow rate of a domestic water distribution with much higher daytime flow versus nighttime flow).

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

High Immunity Input Filter [H. im. inp. = OFF]

When enabled, the high immunity input filter will increase filtering at the input circuitry. This filtering is only effective when conductivity levels are greater than 500 µS/cm. It should only be used after all other methods of minimizing noise have been employed as this will affect the flow measurement. The default setting is off.

Note: The use of this filter will reduce flow measurement accuracy.

To change the existing setting, press enter to access the function. Use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.5 MENU 5 - ALARMS

Maximum Forward Flow Alarm Threshold	[Max + = Gal/m OFF]
Maximum Reverse Flow Alarm Threshold	[Max - = Gal/m OFF]
Minimum Forward Flow Alarm Threshold	[Min + = Gal/m OFF]
Minimum Reverse Flow Alarm Threshold	[Min - = Gal/m OFF]
Hysteresis Threshold	[Hysteresis = % XX]
Current Output Alarm State Value	[mA v.alarm = % XXX]
Frequency Output Alarm State Value	[Hz v.alarm = % XXX]

Maximum Forward Flow Alarm Threshold [Max+ = Gal/m OFF]

This function sets the alarm threshold for maximum forward flow. Flow rates above this threshold will trigger the alarm. The threshold value is entered as a flow rate in the engineering units shown. The minimum value must be ≥1% of the full scale maximum flow rate of the meter (10m/s or 32.8ft/s velocity). Alarm threshold values are entered in 1% increments of the full scale limit up to 100%.

Example: In a 6” pipe 32.8 ft/s is equal to 2853 GPM. 1% of this value would be approximately 28.5GPM. Alarm threshold values would be entered in increments of 28.5 GPM.

To enter a value, press enter to access the function. Use the up arrow and right arrow keys change the threshold value. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Maximum Reverse Flow Alarm Threshold [Max - = Gal/m OFF]

This function sets the alarm threshold for maximum reverse flow. Flow rates above this threshold will trigger the alarm. The threshold value is entered as a flow rate in the engineering units shown. The minimum value must be ≥1% of the full scale maximum flow rate of the meter (10m/s or 32.8ft/s velocity). Alarm threshold values are entered in 1% increments of the full scale limit up to 100%.

Example: In a 6” pipe 32.8 ft/s is equal to 2853 GPM. 1% of this value would be approximately 28.5GPM. Alarm threshold values would be entered in increments of 28.5 GPM.

To enter a value, press enter to access the function. Use the up arrow and right arrow keys change the threshold value. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Minimum Forward Flow Alarm Threshold [Min + = Gal/m OFF]

This function sets the alarm threshold for minimum forward flow. Flow rates below this threshold will trigger the alarm. The threshold value is entered as a flow rate in the engineering units shown. The minimum value must be ≥1% of the full scale maximum flow rate of the meter (10m/s or 32.8ft/s velocity). Alarm threshold values are entered in 1% increments of the full scale limit up to 100%.

Example: In a 6” pipe 32.8 ft/s is equal to 2853 GPM. 1% of this value would be approximately 28.5GPM. Alarm threshold values would be entered in increments of 28.5 GPM.

To enter a value, press enter to access the function. Use the up arrow and right arrow keys change the threshold value. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.5 MENU 5 - ALARMS (CONTINUED)

Minimum Reverse Flow Alarm Threshold [Min - = Gal/m OFF]

This function sets the alarm threshold for minimum reverse flow. Flow rates below this threshold will trigger the alarm. The threshold value is entered as a flow rate in the engineering units shown. The minimum value must be ≥1% of the full scale maximum flow rate of the meter (10m/s or 32.8ft/s velocity). Alarm threshold values are entered in 1% increments of the full scale limit up to 100%.

Example: In a 6" pipe 32.8 ft/s is equal to 2853 GPM. 1% of this value would be approximately 28.5GPM. Alarm threshold values would be entered in increments of 28.5 GPM.

To enter a value, press enter to access the function. Use the up arrow and right arrow keys change the threshold value. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Alarm Hysteresis Threshold [Hysteresis = % XXX]

This function is used to define the flow value where the meter exits the minimum or maximum flow alarm state. When flows drop below the threshold for the maximum flow alarm or rises above the minimum flow alarm by more than the hysteresis percentage value, the meter exits the alarm state. It is set as a percentage of the full scale flow rate 1 [FS1 = Gal/m XXX.X] in SCALES menu (menu 3). The range of settings is 0-25% of full scale.

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the threshold percentage. Press enter to accept the change and exit the function. Press escape to exit the program mode.

mA Output Value When in Alarm State [mA v.alarm = % XXX]

This function establishes the 0/4-20mA output level when the meter is in an alarm condition caused by an empty pipe, ADC error or an open coil indication.

The alarm value is set as a percentage of the 0/4 – 20mA output. The valid range is 0-125% of 20mA. For example, a setting of 10% would cause the output to go to 2mA when the meter is in the alarm state. One or more alarm icons will also be displayed in the upper left hand side of the display when this alarm is active.

The default setting is 20% (4mA).

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the value. Press enter to accept changes and exit the function. Press escape to exit the program mode.

Frequency Output Value When in Alarm State [Hz v.alarm = % XXX]

This function establishes the frequency output level for output 1 or output 2 when the meter is in an alarm condition caused by an empty pipe, ADC error or an open coil indication.

This function is only available when either output pulse 1or output pulse 2 in OUTPUTS menu (menu 7) [Out1 = XXXXX] [Out2 = XXXXX] is set to Freq+, Freq- or Freq±.

The alarm value is set as a percentage of the full scale frequency. The valid range is 0 – 125%. The default setting is 0%. One or more alarm icons will also be displayed in the upper left hand side of the display when this alarm is active.

The default setting will cause the frequency output to indicate 0 Hz when in the alarm state.

To enter a new value, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the value. Press enter to accept changes and exit the function. Press escape to exit the program mode.

3.6 MENU 6 - INPUTS

Total Forward Flow Totalizer Reset Enable	[T+ reset = ON]
Partial Forward Flow Totalizer Reset Enable	[P+ reset = OFF]
Total Reverse Flow Totalizer Reset Enable	[T- reset = OFF]
Partial Reverse Flow Totalizer Reset Enable	[P- reset = OFF]
Disable Flow Measurement via Pulse Input	[Meas. lock = OFF]
Activate Autozero Calibration via Pulse Input	[Calibration = OFF]
Change Flow Range via Pulse Input	[Range change = OFF]

Total Forward Flow Totalizer Reset Enable [T+ reset = ON]

When enabled, this function allows the forward flow totalizer to be remotely reset via the transmitter's pulse input.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Partial Forward Flow Totalizer Reset Enable [P+ reset = OFF]

When enabled, this function allows the partial forward flow totalizer to be remotely reset via the transmitter's pulse input.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Total Reverse Flow Totalizer Reset Enable [T- reset = OFF]

When enabled, this function allows the total reverse flow totalizer to be remotely reset via the transmitter's pulse input.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Partial Reverse Flow Totalizer Reset Enable [P- reset = OFF]

When enabled, this function allows the partial reverse flow totalizer to be remotely reset via the transmitter's pulse input.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Disable Totalizers via Pulse Input [Meas. lock = OFF]

When enabled, this function allows the all flow totalizers to be remotely disabled via the transmitter's pulse input.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.6 MENU 6 - INPUTS (CONTINUED)

Activate Autozero Calibration via Pulse Input [Calibration = OFF]

When enabled, this function allows the autozero calibration function to be remotely activated via the transmitter's pulse input.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Change Flow Range via Pulse Input [Range change = OFF]

When enabled, this function allows the pulse input to be used to remotely change the flow range to full scale flow rate 2 [FS2 = Gal/m XXX.X] in SCALES menu (menu 3).

Note: this function cannot be used when the autorange [Autorange = OFF] function in MEASURE menu (menu 4) is enabled.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.7 MENU 7 - OUTPUTS

Digital Output 1 Function Select	[Out1 = XXXXXX]
Digital Output 2 Function Select	[Out2 = XXXXXX]
mA Output 1 Function & Scaling	[Out mA1 = 4_20 +/-]
Analog Output 1 Full Scale Value	[A1S = Gal/m XXXXXX]
Analog Output 2 Full Scale Value	[A2S = Gal/m XXXXXX]

Digital Output 1 Function Select [Out1 = XXXXXX]

The available functions for digital output 1 are listed in the table below.

Digital Output 2 Function Select [Out2 = XXXXXX]

The available functions for digital output 2 are listed in the table below.

Digital Output Functions
OFF: Disables output
MAX AL+: Maximum forward flow rate alarm (Energized = no alarm)
MIN AL+: Minimum forward flow rate alarm (Energized = no alarm)
MAX/MIN+: Maximum or minimum forward flow rate alarms (Energized = no alarm)
MAX AL-: Maximum reverse flow rate alarm (Energized = no alarm)
MIN AL-: Minimum reverse flow rate alarm (Energized = no alarm)
MAX/MIN-: Maximum or minimum reverse flow rate alarms (Energized = no alarm)
MAX/MIN +/-: Maximum and minimum flow rate alarm, either direction (Energized = no alarm)
P. EMPTY: Empty pipe alarm output (Energized = no alarm)
HARDW.AL.: Master alarm for open coil, empty pipe or measurement error (Energized = no alarm)
OVERFLOW: Flow out of range alarm (Energized = no alarm)
ALL ALARMS: Activates when any alarm is active (Energized = no alarm)
EXT. COMM.: Allows the pulse output state (high or low) to be set via MODBUS
F.R. SIGN: Flow direction indication (Energized = reverse (-) flow)
*SCALE: Indicates which scale is active (Energized = Scale2)
FREQ+: Frequency output proportional to forward (+) direction flow rate
FREQ-: Frequency output proportional to reverse (-) direction flow rate
FREQ+/-: Frequency output to forward (+) / reverse (-) direction flow rate
PULSES.+: Scaled pulse output for forward (+) direction flow rate
PULSES-: Scaled pulse output for reverse (-) direction flow rate
PULSES+/-: Scaled pulse output for forward (+) / reverse (-) direction flow rate

*This function is only available when either the autorange [Autorange= OFF] function in menu 4 or the change flow range via pulse input [Range change= OFF] function INPUTS (MENU 6) are active.

To change the setting, press enter to access the function. Use the up and right arrow keys to change the setting. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.7 MENU 7 - OUTPUTS (CONTINUED)

mA Output 1 Function & Scaling [Out mA1 = 4_20 +/-]

The available functions for current (mA) output 1 are listed in the table below. There are three fields to modify when setting up an output:

- Zero scale value: 0 or 4mA
- Full scale value: 20 or 22mA
- Output function: + = forward (+) flow, - = reverse (-) flow, blank = absolute flow, -0+ = zero flow center scale

The values corresponding to the scale points are shown in the following chart:

OUTPUT CURRENT IN mA FOR THE ASSOCIATED % OF FULL SCALE FLOW					
mA Output Configuration Options	**Reverse Flow Value**		**Zero**	**Direct Flow Value**	
	≥ -110%	**-100%**	**0%**	**+100%**	**≥ +110%**
0 - 20 +	0	0	0	20	20
0 - 22 +	0	0	0	20	22
4 - 20 +	4	4	4	20	20
4 - 22 +	4	4	4	20	22
0 - 20 -	20	20	0	0	0
0 - 22 -	22	20	0	0	0
4 - 20 -	20	20	4	4	4
4 - 22 -	22	20	4	4	4
0 - 20	20	20	0	20	20
0 - 22	22	20	0	20	22
4 - 20	20	20	4	20	20
4 - 22	22	20	4	20	22
0 - 20 - 0+	0	0	10	20	20
0 - 22 - 0+	0	1	11	21	22
4 - 20 - 0+	4	4	12	20	20
4 - 22 - 0+	4	4	12	20	22

To change the setting, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the value. Press enter to accept changes and exit the function. Press escape to exit the program mode.

Analog Output 1 Full Scale Value[A1S = Gal/m XXXXXX]
Analog Output 2 Full Scale Value [A2S = Gal/m XXXXXX] (Available for FT-3200 meters only)

This function sets the full scale flow value for the analog output.

The maximum allowable flow rate is a function of the diameter of the flow sensor. Regardless of the diameter, the maximum flow rate setting cannot exceed a velocity of 10 m/s.

To change the setting, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the value. Press enter to accept changes and exit the function. Press escape to exit the program mode.

3.8 MENU 9 - DISPLAY

Display Language	[Language = GB]
Contrast Adjustment	[Contrast = X]
Display/User Interface Inactivity Time Interval	[Disp. times = s XXX]
Display Refresh Frequency	[D. rate = Hz X]
Enable Partial Totalizers	[Part. tot. = OFF]
Enable Negative Totalizers	[Neg. tot. = OFF]
Enable Net Totalizers	[Net tot. = OFF]
Enable Quick Start Menu	[Quick start = ON]
Default Display Page	[Disp. fn. = X]
Default Lock	[Disp. lock = OFF]

Display Language [Language = GB]

Select English (GB) or Italian (IT) for display text.

To change the existing setting, press enter to access the function. Use the up arrow key to change the setting. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Contrast Adjustment [Contrast = X]

Set the desired contrast level to optimize viewing. The allowable range is 0 to 9.

To change the existing setting, press enter to access the function. Use the up arrow key to change the setting. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Display/User Interface Inactivity Time Interval [Disp. times = s XXX]

This function sets the time interval for returning to normal operation following a period of inactivity when using the display/user interface. Allowable settings range from 20 to 255 seconds.

To change the setting, press enter to access the function. Use the right arrow key to move the cursor and the up arrow key to change the value. Press enter to accept changes and exit the function. Press escape to exit the program mode.

Display Refresh Frequency [D. rate = Hz X]

This function sets the display refresh rate. It is used to optimize viewing. It does not affect the data refresh rate. The settings are 1, 2, 5 or 10 Hz.

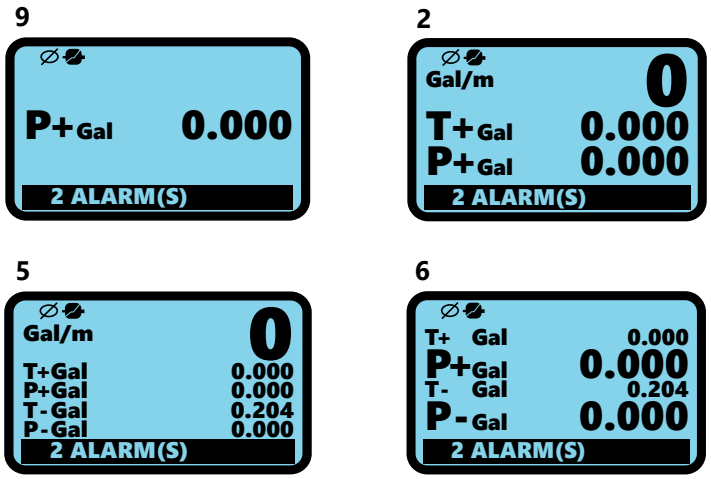
To change the existing setting, press enter to access the function. Use the up arrow key to change the setting. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.8 MENU 9 - DISPLAY (CONTINUED)

Enable Partial Totalizers [Part. tot. = OFF]

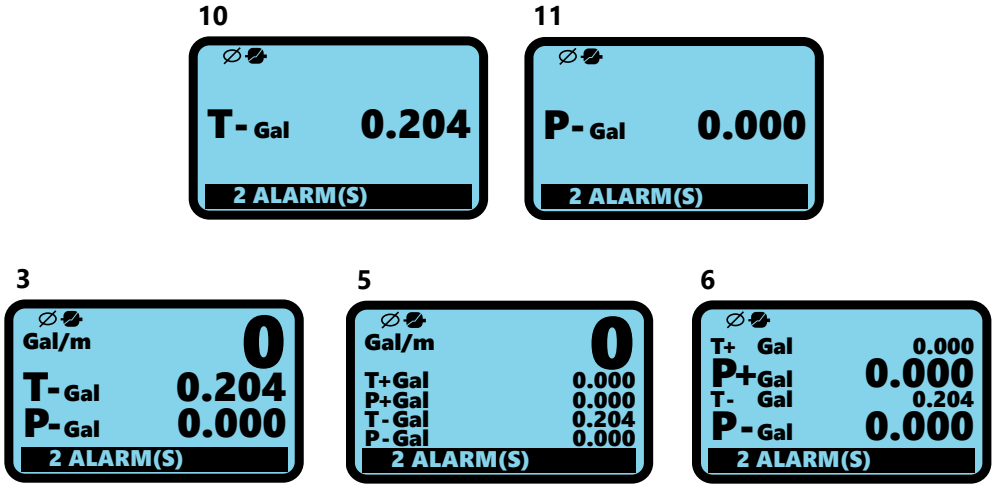
This function enables or disables the display of partial totalizer data. When enabled, the following pages are visible on the display.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.



Enable Negative Totalizers [Neg. tot. = OFF]

This function enables or disables the display of negative totalizer data. When enabled, the following pages are visible on the display.



To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

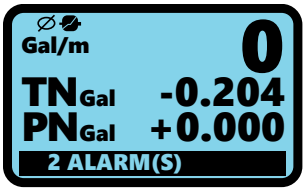
3.8 MENU 9 - DISPLAY (CONTINUED)

Enable Net Totalizers [Net tot. = OFF]

This function enables or disables the display of net totalizer data.

Note: This function is only available when negative totalizers are enabled [Neg. tot.= ON] in DISPLAY menu (menu 9). When enabled, the following page is visible on the display.

4



To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Enable Quick Start Menu [Quick start = ON]

This function enables or disables the display of the quick start menu page.

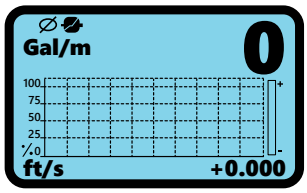
To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.8 MENU 9 - DISPLAY (CONTINUED)

Default Display Page [Disp. fn = X]

This function sets the default display page. This page will be displayed first when the transmitter exits the programming mode or when power is cycled. There are 13 possible display pages. They are numbered 0 -12. The display pages, with their corresponding numbers, are shown below. Not all pages may be enabled on your meter.

0*



To change the existing setting, press enter to access the function. Use the up arrow key to change the setting. Press enter to accept the change and exit the function. Press escape to exit the program mode.

*Factory default settings pages

Default Lock [Disp. lock = OFF]

This function locks the default display page. When enabled, only the default page is visible on the display.

To change the existing setting, press enter to access the function and use the up arrow key to turn the function on or off. Press enter to accept the change and exit the function. Press escape to exit the program mode.

3.9 MENU 11 - FUNCTIONS

Reset Total Forward (+) Totalizer	[T+ reset]
Reset Partial Forward (+) Totalizer	[P+ reset]
Reset Total Reverse (-) Totalizer	[T- reset]
Reset Partial Reverse (-) Totalizer	[P- reset]
Load Factory Default Sensor Body Settings	[Load Sens.f.def]
Load Factory Default Transmitter Settings	[Load Conv.f.def]

To reset the following totals or reload factory defaults, press enter to access the function and use the escape (ESC) key to confirm. Press enter to accept the change and exit the function. Press escape to exit the program mode.

Reset Total Forward (+) Totalizer [T+ reset]

This function resets the total forward (+) totalizer.

Reset Partial Forward (+) Totalizer [P+ reset]

This function resets the partial forward (+) totalizer.

Reset Total Reverse (-) Totalizer [T - reset]

This function resets the total reverse (-) totalizer.

Reset Partial Reverse (-) Totalizer [P - reset]

This function resets the partial reverse (-) totalizer.

Load Factory Default Sensor Body Settings [Load Sens.f.def]

This function loads the factory default operating parameters for the sensor body.

Important Note: Reloading these values will void the factory calibration.

Load Factory Default Transmitter Settings[Load Conv.f.def]

This function loads the factory default operating parameters for the sensor body.

3.10 MENU 12 - DIAGNOSTIC

Self Diagnostic Test	[Self test]
Test Display	[Display test]
Simulate Flow Rate	[Flow sim. = OFF]
Firmware Information	[Firmware info]
Serial Number	[S/N = XXXXXX]
Working Time	[WT = XXXX:XX:XX:XX]

Self Diagnostic Test [Self test]

This function interrupts normal operation and performs a complete test cycle on the measurement input circuits and on the coil excitation circuitry.

At the end of test the transmitter will revert to normal operation. This function is automatically performed whenever power is cycled. This function also restarts the transmitter.

Press enter to activate this function., Press escape when: “CONFIRM EXEC.?” appears on the display to start the test. Press any other key to exit without performing the test.

Test Display [Display test]

This function performs a pixel test on the display.

Press enter to perform the test.

Simulate Flow Rate [Flow sim. = OFF]

This function activates an internal signal that simulates a flow rate. This allows the outputs to be tested. The simulated flow rate is set as a percentage of the full scale flow rate.

When enabled, the following flashing icon is displayed on the upper left side of the display. ▲▼

To enable simulation, press enter to access the function and use the up arrow key to turn the function on. Press enter to accept the change and exit the function

The flow rate simulation percentage can be set by pressing the enter key from any flow display page. Use the right arrow to move the cursor and the up arrow key to change the value. Press enter to accept the flow rate percentage and return to the display

Press the enter key followed by the escape key to end the simulation.

Firmware Information [Firmware info]

Displays a read only record of the current firmware and the date it was loaded.

Serial Number [S/N = XXXXXX]

Display a read only record of the electronics serial number

Working Time [WT = XXXX:XX:XX:XX]

Display of the accumulated operating time for the meter.

For questions regarding this manual, please contact the ONICON Technical Support Department at 727-447-6140.