Program Mode

To configure any parameter or setup the MFT B-Series meter the user invokes *Program Mode* by pressing the **P** key and entering one of the two access codes followed by the **E** key (for ENTER). To exit *Program Mode* press the **H** key (for HOME) one or more times depending on how deep into the menus you are. If the meter is in *Program Mode* and the user has not pressed any keys after three (3) minutes, the meter will automatically exit from *Program Mode* and return to *Run Mode*. Any changes made to the meter configuration while in *Program Mode* will be automatically saved to EEPROM when *Program Mode* is exited either by auto exit or manual user exit (pressing the **H** key). The saved changes will be persistent between reboots/power cycle of the meter.

There are two (2) access codes that can be used depending on the level of parameter changes needed.

1. For Basic Meter Setup use access code **'123456'**.
2. For Advanced Meter Setup use access code **'654321'**.

Both access codes can be changed by the user. The meter is shipped from the factory with the Basic Meter Setup access code defined as '123456' and the Advanced Meter Setup access code defined as '654321'.

The Basic Meter Setup is used to configure the essential parameters to get the meter operational quickly. The Advanced Meter Setup includes the Basic Meter Setup menu as well as other menus to setup the advanced features of the meter. The Basic Meter Setup menu includes the following parameters:

> **Meter Tag Name**
> **Flow Units**
> **Flow Area**
> **Probe Depth (for INSERTION meters)**
> **Analog Output #1 Range**
> **Analog Output #2 Range**
> **Setup Run Mode Display**

If the access code for the Advanced Meter Setup is entered, the user has the option to select between *Menu Scroll* or *Quick Jump* navigation modes.

```
1: MENU SCROLL
2: QUICK JUMP
```

Menu Scroll mode allows the user to scroll and select from a list of *Program Mode* menus. The *Quick Jump* mode lets the user enter the option number associated with the desired *Program Mode* menu to quickly invoke it. The **'1'** key is pressed to select *Menu Scroll* mode and **'2'** is pressed to select *Quick Jump* mode.

The following example shows *Menu Scroll* mode displaying the Assign Digital Output Menu.

```
PROG MODE OPTION
>8 ASSIGN DOUT ^v
```

The following example shows *Quick Jump* mode with Option #8 (Assign Digital Output Menu) entered.

```
Enter PRG Option
1-26>8
```

Notice in the *Menu Scroll* Menu Selection screen, the Menu Option Name includes the Option # to familiarize the user with the Option #'s associated with the Menu Options.

Program Mode Menu Options

The following Table lists the Option #s, the Menu Option and the Menu Items (parameters) included in each *Program Mode* Menu.

If the user enters the Basic Meter Setup access code (default '123456') when *Program Mode* is invoked, only the BASIC SETUP menu will be accessed. If the user needs to access other setup menus before making the meter operational, the Advanced Setup access code (default '654321') needs to be used to invoke *Program Mode*.

Option #	Menu	Parameters

1	Basic Meter Setup (BASIC SETUP)	[Display] Meter Type Is (IN-LINE FLOW/INSERTION FLOW)
		Tag Name **[H]**
		Flow Units **[H]**
		Flow Area <Wizard> **[H]**
		  Duct Profile (ROUND/RECTANGLE)
		  <ROUND>
		    Inside Diameter

		<RECTANGLE>
		  Duct Width
		  Duct Height
		 Flow Area (calculated from Duct Profile) **[H]**
		 (can override with manual entry)
		Probe Depth (for INSERTION meter only)
		Analog Output 1 (FLOW RATE/VELOCITY/TEMPERATURE/PID)
		AO1 at 4mA **[H]**
		AO1 at 20mA **[H]**
		Analog Output 2 (FLOW RATE/VELOCITY/TEMPERATURE/PID)
		AO2 at 4mA
		AO2 at 20mA
		Run Mode Display (SCROLLED/STATIC)
		<SCROLLED>
		Scrolled Vars
		  (SCROLL ALL/FLOW ONLY/FLOW+TOT/FLOW+VEL/
		   TAG+FLOW/TAG+FLOW+VEL/FLOW+TOT+VEL/
		   FLOW+TEMP/FLOW+TEMP+VEL)
		Scroll Interval
		<STATIC>
		Static Vars
		  (FLOW ONLY/FLOW+TOT/FLOW+VEL/TAG+FLOW/
		   FLOW+TEMP)

2	Flow Cutoff (FLOW CUTOFF)	Flow Cutoff SW (OFF/ON) Lo Flow Cutoff
3	Flow Correction Factor and Time Constant (FLOW CF/TC)	[Display] Sensor Blockage CF is (for INSERTION type only) Field Calib CF **[H]** Flow TC Sec **[H]**
4	Setup Flow Totalizer Reset (RESET TOTAL)	Totalizer Reset (MAN RESET/AUTO RESET) <MAN RESET> Reset Flow Total (YES/NO) **[H]** <AUTO RESET> Total Reset Cnt Reset Flow Total (YES/NO) **[H]**
5	Setup Analog Output #1 (AOUT 1)	Analog Output 1 (FLOW RATE/VELOCITY/TEMPERATURE/PID) AO1 at 4mA **[H]** AO1 at 20mA **[H]**
6	Setup Analog Output #2 (AOUT 2)	Analog Output 2 (FLOW RATE/VELOCITY/TEMPERATURE/PID) AO2 at 4mA AO2 at 20mA

7	Setup Run Mode Display
	(RUN DISPLAY)
		Run Mode Display (SCROLLED/STATIC)
		<SCROLLED>
		Scrolled Vars
		  (SCROLL ALL/FLOW ONLY/FLOW+TOT/FLOW+VEL/
		   TAG+FLOW/TAG+FLOW+VEL/FLOW+TOT+VEL/
		   FLOW+TEMP/FLOW+TEMP+VEL)
		Scroll Interval
		<STATIC>
		Static Vars

		(FLOW ONLY/FLOW+TOT/FLOW+VEL/TAG+FLOW/ FLOW+TEMP)
8	Setup Relay Output (ASSIGN DOUT)	Select Relay # Assign Relay To (ALARM OUTPUT/TOT PULSE OUT/PURGE OUTPUT) <ALARM OUTPUT> See Setup Alarm <TOT PULSE OUT> See Setup Pulse Output <PURGE OUT> See Setup Sensor Purge
9	Setup Alarm (ALARM SETUP)	Select Alarm # (x) Set Alarm x (OFF/ON) Alarm x Trigger (VELOCITY/FLOW RATE/TEMPERATURE/GLOBAL EVENT) Alarm x Trip (LOW SETPOINT/HI SETPOINT/LO AND HI SP) <LOW SETPOINT> LO Alarm Setpt <HI SETPOINT> HI Alarm Setpt <LO AND HI SP> LO Alarm Setpt HI Alarm Setpt Continue with Relay Setup (NO/YES) <YES> [Display] Alarm x Assigned to DO n Relay n State (NORMALLY OPN/NORMALLY CLS)
10	Setup NE-43 Alarm (NE-43 ALRM)	NE-43 Alarm Type (LOW OUTPUT/HIGH OUTPUT)
11	Setup Pulse Output (PULSE OUT)	Pulse Output (OFF/ON) <ON> [Display] Pulse Output Assigned to DOm Flow Volume per Pulse Pulse Width
12	Setup Sensor Purge (PURGE TIMR)	Purge Timer (OFF/ON) **[H]** <ON> [Display] Purge Output Assigned to DOn Purge Time msec **[H]** Hold Time msec **[H]** Purge Intv min **[H]**
13	Setup Flow Calibration Parameters (CALIB DATA)	[Display] Sensor SN Cal Flow Unit [Display] Factory STP Ref User Ref Temp **[H]** User Ref Press **[H]** Cal Curve Type (VELOCITY MAP/MULTIPLE CAL) <VELOCITY MAP> VM Reference (INTERNAL/EXTERNAL)

		Gas Mol Wt
		[Display] New Ref Density
		Gas Name
		# VM Data Sets (x)
		Flow Data for S1
		# Data Pts At S1 (y)
		   Raw Signal S1-1
		   Flow Signal S1-1
		    :
		   Raw Signal S1-y
		   Flow Signal S1-y
		    :
		Flow Data for Sx
		# Data Pts at Sx (n)
		   Raw Signal Sx-1
		   Flow Data Sx-1
		    :
		   Raw Signal Sx-n
		   Flow Data Sx-n

14	Calibrate Outputs
	(CALIB AOUT)
		Set 4.000 mA to Out 1 **[H]**
		Set 20.000 mA Out 1 **[H]**
		[Display] AO1 Calib Coeff
		Set 4.000 mA Out 2
		Set 20.000 mA Out 2
		[Display] AO2 Calib Coeff
		Chk NE-43 Alarms (YES/NO)
		<YES>
		  Low Alarm Check
		  High Alarm Check
		Enter (mA) to output
		[Display] (requested) mA and equivalent V

15	Variable Flow Correction Data
	(VRMS DATA)
		Enter # of Flow Data Sets n **[H]**
		Enter Flow Data Set i to Change
		   Ref Value Ri (Vrms-i) **[H]**
		   Test Data Di (VdsAve-i) **[H]**

16	Remote Correction Factor Data
	(REMOTE CF)
		Remote CF (OFF/ON)
		<ON>
		Enter # of Remote CF Data Points n
		   Enter ExtInput.RemCF-D1
		   Enter ExtInput.RemCF-X1
		    :
		   Enter ExtInput.RemCF-Dn
		   Enter ExtInput.RemCF-Xn

17	Select Gas Calibration Curve (CAL CURVE)	Curve Sel Mode (MANUAL SELECT/EXT INPUT LEV) <MANUAL SELECT> Cal Curve #
18	Setup Data Logging (DATA LOG)	Enable Data Log (OFF/ON) <ON> Log Interval Sec

19	Setup Modbus Communication (MODBUS COM)	Dev Modbus Addr Modbus Mode (MODBUS RTU/MODBUS ASCII) Modbus Baud Rate (9600/14400/19200/38400/57600) Register Order (BYTE #12 34/BYTE #34 12)
20	Setup External Input (EXT AINPUT)	Ext Input Usage (CAL DATA SW/VM REFERENCE/PURGE COMMAND/ PID EXT. REF/REMOTE CF) <VM REFERENCE> Scale Unit Inp Val At 4mA Inp Val At 20mA Filter TC
21	Setup PID Data (PID SETUP)	PID State (OFF/ON) PID Operation (MANUAL/AUTOMATIC) PID Control To (VELOCITY/FLOW RATE) PID Setpt Ref (INTERNAL/EXTERNAL) PID Setpoint Prop Gain (KP) Integral TC Derivative TC PID Low Limit PID HIGH Limit
22	Manual PID Adjust (PID CONTRL)	Manual PID Adjust
23	Setup Drift Check (DRIFT CHCK)	Auto Drift Check (OFF/ON) **[H]** Drift Chk Intrvl **[H]** % FS at Zero **[H]** Duration at Zero **[H]** % FS at Mid **[H]** Duration at Mid **[H]** % FS at Span **[H]** Duration at Span **[H]**
24	Change User Password (CHANGE PW)	Basic Setup Code Adv Setup Code
25	Update FROM EEPROM (GET EEPROM)	Load From EEPROM (NO/YES)
26	Set Bootup Output Delay (BOOTUP DLY)	Bootup Out Delay

Note, the items in the Table above marked with **[H]** indicate parameters (or methods) that are available through the HART interface.

While the meter is in *Program Mode*, it is recommended that the meter be taken offline if it is used in a critical process or feedback control since some menu options will temporarily suspend the meter's output. When these menus are invoked, the following screen will be displayed to remind the user that the meter's output will not be updated:

```
! WARNING !
OUTPUT WILL STOP
```

While the user is viewing/changing the parameters in that menu, the meter output will be frozen at the last value before the menu option was invoked. If this prompt does not appear, the meter will continue to operate normally while the user is navigating the menu items. When the user exits the menu option, meter update will resume and the following prompt will be displayed:

```
OUTPUT UPDATE
IS RESUMED ......
```

Note, if a parameter is changed which will affect the reported output, the meter's output will jump as soon as the new parameter is accepted or the output update is resumed.