Micro Motion® Menu Maps for HART Device Descriptions

Configuration and Use Manual Supplement
About this supplement

The Field Communicator uses HART device descriptions to communicate with Micro Motion transmitters. Micro Motion is updating its device descriptions to the new “dashboard” style. The latest dashboards are available as Device Installation Kits on the Emerson web site.

This supplement provides menu maps for the dashboards. These menu maps replace the Field Communicator menu maps in your transmitter’s Configuration and Use Manual.
Contents

Chapter 1  RFT9739 Transmitters ...................................................... 1
Chapter 2  9739 MVD Transmitters .................................................... 10
Chapter 3  Model 1500 Transmitters with Analog Outputs ..................... 25
Chapter 4  Model 1700 Transmitters with Analog Outputs ..................... 40
Chapter 5  Model 1700 Transmitters with Intrinsically Safe Outputs .......... 56
Chapter 6  Model 2200S Transmitters ............................................... 72
Chapter 7  Model 2400S Transmitters with Analog Outputs ................. 84
Chapter 8  Model 2500 Transmitters with Configurable Input/Outputs ....... 98
Chapter 9  Model 2700 Transmitters with Analog Outputs ................. 115
Chapter 10 Model 2700 Transmitters with Intrinsically Safe Outputs ...... 133
Chapter 11 Model 2700 Transmitters with Configurable Input/Outputs ...... 151
Chapter 1
RFT9739 Transmitters

Figure 1-1  On-Line menu
Figure 1-2  Overview menu

On-Line Menu >
1 Overview

Check Status
1 Refresh Alerts
2 Dev Status:
3 Comm Status:

Primary Purpose Variables
2 Mass Flow Rate
   Volume Flow Rate
   Density

Shortcuts
3
1 Device Information
2 Totalizer Control
3 Zero Calibration
4 Variables
5 Trends

Device Information
1 Identification
2 Mat. of Construction
3 Security Events

Identification
1 Tag
2 Model
3 Xmtr Software Rev
4 Final Asmbly Num
5 Sensor Serial Num
6 HART DD Information

Security Events
3
1 Number of Configuration Writes
2 Number of Calibration Parameters
RFT9739 Transmitters

Figure 1-3  Configure menu: Top level

On-Line Menu >
1 Configure

Manual Setup
1 Characterize
2 Measurements
3 Inputs/Outputs
4 Info Parameters
5 Communications

Alert Setup
1 DO Fault Action
2 Control Output
3 Slug Duration
4 Set Up Events

Figure 1-4  Configure menu: Manual Setup

On-Line Menu >
2 Configure >
1 Manual Setup

Characterize
1 Flow Cal
2 D1
3 D2
4 TC
5 K1
6 K2
7 FD

Measurements
1 Flow
2 Density
3 Temperature
4 Set Up Special Units
5 Set Up External Compensation

Inputs/Outputs
1 Set Up mA Output 1
2 Set Up mA Output 2
3 Set Up Frequency Output
4 Map Variables

Info Parameters
1 Transmitter Info
2 Sensor Information

Communications
1 Polling Address
2 Tag
3 Device Identification
4 Comm Status:
Figure 1-5  Configure menu: Manual Setup: Measurements

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      2 Measurements

Flow
1 Flow Direction
2 Flow Damping
3 Mass Flow Cutoff
4 Mass Flow Unit
5 Volume Flow Cutoff *
6 Volume Flow Unit *
7 Mass Factor
8 Volume Factor

Density
1 Density Unit
2 Density Damping
3 Density Factor
4 Slug Low Limit
5 Slug High Limit
6 Slug Duration

Temperature
1 Temperature Unit
2 Temp Damping

Special Units
1 Mass Special Units
2 Volume Special Units

Set Up External Compensation
1 Pressure Configuration
2 External Pressure

Pressure Configuration
1 Pressure Unit
2 Flow Cal Pressure
3 Flow Press Factor
4 Dens Press Factor

External Pressure
1 Field Device Tag
2 Pressure Polling
3 4 mA Pressure
4 20 mA Pressure

Additional options
Figure 1-6  Configure menu: Manual Setup: Inputs/Outputs
Figure 1-7  Configure menu: Alert Setup

On-Line Menu >
  2 Configure >
    2 Alert Setup

Alert Setup
  1 DO Fault Action
  2 Control Output
  3 Slug Duration
  4 Set Up Events

Set Up Events
  1 Event 1
  2 Event 2

Event 1
  1 Event 1 Variable
  2 Event 1 Type
  3 Event 1 Setpoint

Event 2
  1 Event 2 Variable
  2 Event 2 Type
  3 Event 2 Setpoint
Figure 1-8  Service Tools menu: Top level
Figure 1-9  Service Tools menu: Variables
Figure 1-10  Service Tools menu: Maintenance

On-Line Menu > 3 Service Tools > 4 Maintenance

Routine Maintenance
1 Trim mA Output 1
2 Trim mA Output 2

Zero Calibration
1 Mass Flow Rate
2 Volume Flow Rate
3 Zero Time
4 Zero Value
5 Standard Deviation
6 Perform Auto Zero

Density Calibration
1 Density
2 Dens Pt1 (Air)
3 Dens Pt2 (Water)
4 Dens Pt3 T-Series

Temperature Calibration
1 Temperature
2 Temp Cal Factor
3 Offset Calibration
4 Slope Calibration

Diagnostic Variables
1 Drive Gain
2 LPO Amplitude
3 RPO Amplitude
4 Tube Frequency
5 Live Zero

Figure 1-11  Service Tools menu: Simulate

On-Line Menu > 3 Service Tools > 5 Simulate

Simulate
1 Simulate Outputs

Simulate Outputs
1 mA Output 1 Loop Test
2 mA Output 2 Loop Test
3 Frequency Output Test
Chapter 2
9739 MVD Transmitters

Figure 2-1  On-Line menu

On-Line Menu

1. Overview
   1. Check Status
   2. Primary Purpose Variables
   3. Shortcuts

2. Configure
   1. Manual Setup
   2. Alert Setup

3. Service Tools
   1. Alerts
   2. Variables
   3. Trends
   4. Maintenance
   5. Simulate
Figure 2-2  Overview menu

On-Line Menu >
1 Overview

1. Check Status
   1 Refresh Alerts
   2 Dev Status:
   3 Comm Status:

2. Primary Purpose Variables
   Mass Flow Rate
   Volume Flow Rate
   Density

3. Shortcuts
   1 Device Information
   2 Totalizer Control
   3 Zero Calibration
   4 Variables
   5 Trends

4. Device Information
   1 Identification
   2 Mat. of Construction
   3 Revisions
   4 Licenses

   1. Identification
      1 Tag
      2 Model
      3 Final Asmly Num
      4 Transmitter Serial Num
      5 Date
      6 Descriptor
      7 Message

   3. Revisions
      1 Universal
      2 Field Device
      3 DD Revision
      4 Xmtr Software Rev
      5 ETO Number
Figure 2-3  Configure menu: Top level

On-Line Menu >
1 Configure

- Manual Setup
  1 Characterize
  2 Measurements
  3 Display
  4 Inputs/Outputs
  5 Info Parameters

- Alert Setup
  1 Inputs/Outputs Fault Actions
  2 Alert Severity
  3 Discrete Events
Figure 2-4  Configure menu: Manual Setup

On-Line Menu >
2 Configure >
1 Manual Setup

Characterize
1 Sensor Type
2 Sensor Tag Parameters

Measurements
1 Flow
2 Density
3 Temperature
4 Special Units
5 External Compensation
6 Petroleum Measurement *
7 Gas Standard Volume
8 Conc Measure (CM) **

Display
1 Update Period
2 Display Variables
3 Decimal Places

Inputs/Outputs
1 mA Output 1
2 mA Output 2
3 Frequency Output
4 Discrete Output
5 Discrete Input
6 Milliamp Input
7 Communications
8 Map Variables

Info Parameters
1 Transmitter Info
2 Sensor Information

* Displayed only if the petroleum measurement application is enabled on your transmitter. Menu numbers are adjusted as required.
** Displayed only if the concentration measurement application is enabled on your transmitter.
Figure 2-5  Configure menu: Manual Setup: Characterize

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      1 Characterize

Characterize
  1 Sensor Type
  2 Sensor Tag Parameters

Sensor Type
  1 Curved Tube
  2 Straight Tube

Sensor Tag Parameters
  1 FlowCal
  2 D1
  3 D2
  4 TC
  5 K1
  6 K2
  7 FD

Density Parameters
  1 D1
  2 D2
  3 K1
  4 K2
  5 FD

Flow Parameters
  1 Flow FCF
  2 FTG
  3 FFQ
Figure 2-6  Configure menu: Manual Setup: Measurements

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      2 Measurements

Flow
1 Flow Direction
2 Flow Damping
3 Mass Flow Cutoff
4 Mass Flow Unit
5 Volume Flow Cutoff *
6 Volume Flow Unit *
7 Mass Factor
8 Volume Factor

Density
1 Density Unit
2 Density Damping
3 Density Cutoff
4 Density Factor
5 Slug Low Limit
6 Slug High Limit
7 Slug Duration

Temperature
1 Temperature Unit
2 Temp Damping

Special Units
1 Mass Special Units
2 Volume Special Units

External Compensation
1 Pressure Unit
2 Enable Press Comp
3 Flow Cal Pressure
4 Static Pressure
5 Flow Press Factor
6 Dens Press Factor
7 Enable Ext Temp
8 External Temperature
9 External Polling

* Displayed only if Volume Flow Type = Liquid
Figure 2-7  Configure menu: Manual Setup: Measurements (continued)

On-Line Menu >
  2 Configure >
   1 Manual Setup >
    2 Measurements

---

Petroleum Measurement *
  1 2540 CTL Table type
  2 TEC
  3 Ref Temperature
  4 Petroleum Msmt Setup

---

Gas Standard Volume
  1 Volume Flow Type
  2 Gas Density
  3 GSV Cutoff
  4 Gas Vol Flow Unit
  5 Base Volume Unit
  6 Base Volume Time
  7 Gas Vol Flow Conv
  8 Gas Vol Flow Label
  9 Gas Vol Total Label

---

Conc Measure (CM) **
  1 CM Configuration
  2 Matrix Configuration
  3 Reset Matrix Data
  4 Enter Matrix
  5 Trim CM Process Variables

---

CM Configuration
  1 Enable CM
  2 Lock/Unlock CM Matrices
  3 Active Matrix
  4 Matrix Name
  5 Derived Variable

---

Matrix Configuration
  1 Matrix Being Configured
  2 Matrix Name
  3 Concentration Units
  4 Extrapolation Alarm
  5 Reference Temperature
  6 Water Reference Temperature
  7 Water Reference Density

---

* Displayed only if the petroleum measurement application is enabled on your transmitter. Menu numbers are adjusted as required.

** Displayed only if the concentration measurement application is enabled on your transmitter.
Figure 2-8  Configure menu: Manual Setup: Display

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      3 Display

1. Update Period

2. Display Variables
   - 1 Display Variables (1-5)
   - 2 Display Variables (6-10)
   - 3 Display Variables (11-15)

3. Decimal Places
   - 1 For Process Variables
   - 2 For Totalizer Variables
   - 3 For Diagnostic Variables
Figure 2-9  Configure menu: Manual Setup: Inputs/Outputs

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      4 Inputs/Outputs

mA Output 1
  1 Primary Variable
  2 mA Output Settings
  3 MA01 Fault Settings

mA Output Settings
  1 PV LRV
  2 PV URV
  3 PV Min Span
  4 PV LSL
  5 PV USL
  6 PV MAO Cutoff
  7 PV Added Damping

mA Fault Settings
  1 MAO Fault Action
  2 MAO Fault Level

mA Output 2
  1 Secondary Variable
  2 mA Output Settings
  3 MA02 Fault Settings

mA Output Settings
  1 PV LRV
  2 PV URV
  3 PV Min Span
  4 PV LSL
  5 PV USL
  6 PV MAO Cutoff
  7 PV Added Damping

mA Fault Settings
  1 MAO Fault Action
  2 MAO Fault Level

Frequency Output
  1 FO Settings
  2 FO Fault Parameters
  3 FO Scaling
  4 Power Source

FO Settings
  1 Third Variable
  2 Max Pulse Width
  3 FO Polarity

FO Fault Parameters
  1 Third Variable
  2 FO Fault Action
  3 FO Fault Level

FO Scaling *
  1 FO Scaling Method
  2 Set FO Scaling

Additional options

* Options vary depending on FO Scaling Method.
Figure 2-10  Configure menu: Manual Setup: Inputs/Outputs (continued)

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      4 Inputs/Outputs

Discrete Output
  1 DO Assignment
  2 DO Polarity
  3 DO Fault Action
  4 Flow Switch Source
  5 Flow Switch Setpoint

Discrete Input
  1 Polarity

Milliamp Input
  1 mA Input URV
  2 mA Input LRV
  3 mA Input Variable Assignment
  4 mA Input Level

Communications
  1 HART Communications
  2 HART Burst Mode
  3 Set Up RS-485 Port

HART Communications
  1 HART Address
  2 Tag
  3 Device Identification

HART Burst Mode
  1 Burst Mode
  2 Burst Option
  3 Field Device Var 1 - 4

Set Up RS-485 Port
  1 Protocol
  2 Modbus Slave Address

Map Variables
  1 Primary Variable
  2 Secondary Variable
  3 Third Variable
  4 Fourth Variable
**Figure 2-11  Configure menu: Alert Setup**

- **Input/Output Fault Action**
  1. MA Output 1
  2. MA Output 2
  3. FO Fault Parameters
  4. Discrete Output
  5. Digital Communications

- **Alert Severity**
  1. Fault Timeout
  2. Set Alert Severity
  3. View Alert Severity

- **Discrete Events**
  1. Discrete Event 1
  2. Discrete Event 2
  3. Discrete Event 3
  4. Discrete Event 4
  5. Discrete Event 5
  6. Assign Discrete Action
  7. Read Discrete Action
  8. Review Discrete Actions

- **Discrete Event x**
  1. Discrete Event Var
  2. Discrete Event Type
  3. Setpoint A
  4. Setpoint B
Figure 2-12  Service Tools menu: Top level

On-Line Menu > 3 Service Tools

- 1 Alerts
  1 Refresh Alerts
  2 Alert Name
  3 Additional Information for Above

- 2 Variables
  1 Variable Summary
  2 Process Variables
  3 Mapped Variables
  4 External Variables
  5 Totalizer Control
  6 Outputs

- 3 Trends
  1 Process Variables
  2 Diagnostic Variables

- 4 Maintenance
  1 Routine Maintenance
  2 Zero Calibration
  3 Density Calibration
  4 Temperature Calibration
  5 Diagnostic Variables
  6 Modbus Data

- 5 Simulate
  1 Simulate Outputs
  2 Simulate Sensor
Figure 2-13  Service Tools menu: Variables

On-Line Menu > 3 Service Tools > 2 Variables

- **Variable Summary**
  - **Process Variables**
    - 1 Mass Flow Rate
    - 2 Volume Flow Rate *
    - 3 GSV Flow Rate
    - 4 Density
    - 5 Temperature
  - **Mapped Variables**
    - 1 PV
    - 2 SV
    - 3 TV
    - 4 QV
  - **External Variables**
    - 1 External Temperature
    - 2 External Pressure

- **Totalizer Control**
  - 1 All Totalizers
  - 2 Mass
  - 3 Gas Standard Volume

- **All Totalizers**
  - 1 Start Totalizers
  - 2 Stop Totalizers
  - 3 Reset All Totals
  - 4 Mass Total
  - 5 Volume Total *
  - 6 GSV Total

- **Mass**
  - 1 Mass Flow Rate
  - 2 Mass Total
  - 3 Mass Inventory
  - 4 Reset Total

- **Volume** *
  - 1 GSV Flow Rate
  - 2 GSV Total
  - 3 GSV Inventory
  - 4 Reset Total

- **Outputs**
  - 1 Current (mA output 1)
  - 2 Current (mA output 2)
  - 3 Frequency
  - 4 DO State

* If Volume Flow Type = GSV, GSV variables are displayed.
Figure 2-14  Service Tools menu: Maintenance

On-Line Menu >
3 Service Tools >
4 Maintenance

Routine Maintenance
1 Trim mA Output 1
2 Trim mA Output 2

Zero Calibration
1 Mass Flow Rate
2 Volume Flow Rate
3 Zero Time
4 Zero Value
5 Standard Deviation
6 Perform Auto Zero
7 Restore Factory Zero

Density Calibration
1 Density
2 Dens Pt1 (Air)
3 Dens Pt2 (Water)
4 Dens Pt3 T-Series
5 Dens Pt4 T-Series
6 Flowing Dens (FD)

Temperature Calibration
1 Temperature
2 Temp Cal Factor

Diagnostic Variables
1 Sensor Model
2 Drive Gain
3 Input Voltage
4 LPO Amplitude
5 RPO Amplitude
6 Board Temperature
7 Tube Frequency
8 Live Zero
Figure 2-15 Service Tools menu: Simulate

- On-Line Menu >
  3 Service Tools >
  5 Simulate

- Simulate
  1 Simulate Outputs
  2 Simulate Sensor

  - Simulate Outputs
    1 mA Output 1 Loop Test
    2 mA Output 2 Loop Test
    3 Frequency Output Test
    4 Discrete Output Test

  - Simulate Sensor
    1 Simulate Primary Purpose Variables
    2 Mass Flow Rate *
    3 Density *
    4 Temperature *

* Displayed only if sensor simulation is enabled.
Chapter 3
Model 1500 Transmitters with Analog Outputs

Figure 3-1  On-Line menu

On-Line Menu

1. Overview

2. Configure
   1. Manual Setup
   2. Alert Setup

3. Service Tools
   1. Alerts
   2. Variables
   3. Trends
   4. Maintenance
   5. Simulate
If GSV is enabled, GSV Flow Rate is displayed.

** Requires HART 7.
Figure 3-3  Configure menu: Top level

On-Line Menu >
1 Configure

Manual Setup
1 Characterize
2 Measurements
3 Inputs/Outputs
4 Info Parameters
5 HART*
6 Security

Alert Setup
1 I/O Fault Actions
2 Alert Severity
3 Discrete Events

* Requires HART 7.
Figure 3-4 Configure menu: Manual Setup
Model 1500 Transmitters with Analog Outputs

Figure 3-5 Configure menu: Manual Setup (continued)

On-Line Menu >
2 Configure >
1 Manual Setup

Info Parameters
1 Transmitter Info
2 Sensor Information

Transmitter Info
1 Tag
2 Long Tag **
3 Xmtr Serial Num
4 Message
5 Descriptor
6 Date

Sensor Information
1 Sensor Type
2 Sensor Serial Num
3 Tube Wetted Mat.
4 Tube Lining
5 Sensor Flange

HART**
1 Burst Mode *

Burst Message 1 - 3
1 Mode
2 Option
3 Message Contents
3 Configure Update Rate

Security
1 Write Protect
2 Lock/Unlock Device **

* Options are different, depending on HART version.
** Requires HART 7.
Figure 3-6  Configure menu: Manual Setup: Characterize
Figure 3-7  Configure menu: Manual Setup: Measurements

On-Line Menu >
  2 Configure >
   1 Manual Setup >
    2 Measurements

Flow
1. Flow Direction
2. Flow Damping
3. Mass Flow Unit
4. Mass Flow Cutoff
5. Mass Factor
6. Volume Flow Unit *
7. Volume Flow Cutoff *
8. Volume Factor

Density
1. Density Unit
2. Density Damping
3. Density Cutoff
4. Density Factor
5. Slug Duration
6. Slug Low Limit
7. Slug High Limit

Temperature
1. Temperature Unit
2. Temp Damping

Update Rate
1. Update Rate
2. 100 Hz Variable

LD Optimization
1. Update Rate
2. 100 Hz Variable

Special Units
1. Mass Special Units
2. Volume Special Units *

* If Volume Flow Type is GSV, GSV options are displayed.
Figure 3-8  Configure menu: Manual Setup: Measurements (continued)
Figure 3-9  Configure menu: Manual Setup: Inputs/Outputs

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      3 Inputs/Outputs

Channels
  1 Channel A
  2 Channel C

Channel C
  1 Frequency Output
  2 Discrete Output

mA Output
  1 Primary Variable
  2 mA Output Settings
  3 mA Fault Settings

mA Output Settings
  1 PV LRV
  2 PV URV
  3 PV Min Span
  4 PV LSL
  5 PV USL
  6 PV MAO Cutoff
  7 PV Added Damping

mA Fault Settings
  1 mA0 Fault Action
  2 mA0 Fault Level

Frequency Output
  1 FO Settings
  2 FO Fault Parameters
  3 FO Scaling

FO Settings
  1 Third Variable
  2 Max Pulse Width
  3 FO Polarity

FO Fault Parameters
  1 Third Variable
  2 FO Fault Action
  3 FO Fault Level

FO Scaling
  1 FO Scaling Method
  2 TV Frequency Factor
  3 TV Rate Factor
  4 Set FO Scaling

* Options vary depending on FO Scaling Method.
Figure 3-10  Configure menu: Manual Setup: Inputs/Outputs (continued)

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      3 Inputs/Outputs

Discrete Output
1  DO Assignment
2  DO Polarity
3  DO Fault Action
4  Flow Switch Source
5  Flow Switch Setpoint
6  Hysteresis (0.1-10.0)

Variable Mapping
1  Primary Variable
2  Secondary Variable
3  Third Variable
4  Fourth Variable

* Requires HART 7.

Communications
1  HART Address
2  Tag
3  Long Tag*
4  Device Identification
5  Dev ID (CP)
6  mA Output Action
7  Set Up RS-485 Port

Set Up RS-485 Port
1  Protocol
2  Baud Rate
3  Parity
4  Stop Bits
5  Modbus Slave Address
Figure 3-11  Configure menu: Alert Setup

On-Line Menu >
  2 Configure >
    2 Alert Setup

1. I/O Fault Actions
   1. mAO Fault Action
   2. mAO Fault Level
   3. FO Fault Action
   4. FO Fault Level
   5. Comm Fault Action

2. Alert Severity
   1. Fault Timeout
   2. Set Alert Severity
   3. View Alert Severity

3. Discrete Events
   1. Discrete Event 1
   2. Discrete Event 2
   3. Discrete Event 3
   4. Discrete Event 4
   5. Discrete Event 5
   6. Assign Discrete Action
   7. Read Discrete Action
   8. Review Discrete Actions

Discrete Event x
   1. Discrete Event Var
   2. Discrete Event Type
   3. Setpoint A
   4. Setpoint B
Figure 3-12  Service Tools menu: Top level

On-Line Menu > 3 Service Tools

1. Alerts
   1. Refresh Alerts
   2. Alert Name

2. Variables
   1. Variable Summary
   2. Process Variables
   3. Mapped Variables
   4. External Variables
   5. Totalizer Control
   6. Outputs

3. Trends
   1. Process Variables
   2. Diagnostic Variables

4. Maintenance
   1. Routine Maintenance
   2. Zero Calibration
   3. Density Calibration
   4. Temperature Calibration
   5. Diagnostic Variables
   6. Modbus Data

5. Simulate
   1. Simulate Outputs
   2. Simulate Sensor
## Figure 3-13  Service Tools menu: Variables

### On-Line Menu > 3 Service Tools > 2 Variables

<table>
<thead>
<tr>
<th>Category</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable Summary</strong></td>
<td>Mass Flow Rate</td>
</tr>
<tr>
<td></td>
<td>Volume Flow Rate</td>
</tr>
<tr>
<td></td>
<td>Density</td>
</tr>
<tr>
<td><strong>Process Variables</strong></td>
<td>Mass Flow Rate</td>
</tr>
<tr>
<td></td>
<td>Volume Flow Rate *</td>
</tr>
<tr>
<td></td>
<td>Density</td>
</tr>
<tr>
<td></td>
<td>Temperature</td>
</tr>
<tr>
<td><strong>Mapped Variables</strong></td>
<td>PV</td>
</tr>
<tr>
<td></td>
<td>SV</td>
</tr>
<tr>
<td></td>
<td>TV</td>
</tr>
<tr>
<td></td>
<td>QV</td>
</tr>
<tr>
<td><strong>External Variables</strong></td>
<td>External Temperature</td>
</tr>
<tr>
<td></td>
<td>External Pressure</td>
</tr>
<tr>
<td><strong>Totalizer Control</strong></td>
<td>All Totalizers</td>
</tr>
<tr>
<td></td>
<td>1 Start Totalizers</td>
</tr>
<tr>
<td></td>
<td>2 Stop Totalizers</td>
</tr>
<tr>
<td></td>
<td>3 Reset All Totals</td>
</tr>
<tr>
<td></td>
<td>4 Mass Total</td>
</tr>
<tr>
<td></td>
<td>5 Volume Total *</td>
</tr>
<tr>
<td><strong>Mass</strong></td>
<td>Mass Flow Rate</td>
</tr>
<tr>
<td></td>
<td>Mass Total</td>
</tr>
<tr>
<td></td>
<td>Mass Inventory</td>
</tr>
<tr>
<td></td>
<td>Reset Total</td>
</tr>
<tr>
<td><strong>Volume</strong></td>
<td>Volume Flow Rate</td>
</tr>
<tr>
<td></td>
<td>Volume Total</td>
</tr>
<tr>
<td></td>
<td>Volume Inventory</td>
</tr>
<tr>
<td></td>
<td>Reset Total</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td>mA Output</td>
</tr>
<tr>
<td></td>
<td>Frequency Output</td>
</tr>
<tr>
<td></td>
<td>DO State</td>
</tr>
</tbody>
</table>

* If Volume Flow Type = GSV, GSV variables are displayed.
Figure 3-14  Service Tools menu: Maintenance

On-Line Menu >
3 Service Tools >
4 Maintenance

Routine Maintenance
1 Trim mA Output
2 Locate Device*
3 Device Reset*
4 Meter Verification **

Density Calibration
1 Density
2 Dens Pt1 (Air)
3 Dens Pt2 (Water)
4 Dens Pt3 T-Series
5 Dens Pt4 T-Series
6 Flowing Density

Temperature Calibration
1 Temperature
2 Temp Cal Factor

Diagnostic Variables
1 Sensor Model
2 Drive Gain
3 LPO Amplitude
4 RPO Amplitude
5 Tube Frequency
6 Live Zero
7 Fld Verification Zero
8 Additional

Zero Calibration
1 Mass Flow Rate
2 Volume Flow Rate
3 Zero Time
4 Zero Value
5 Standard Deviation
6 Perform Auto Zero
7 Restore Factory Zero

Manual Verification
1 Start
2 Upload Data Results from Device
3 Show Results Table
4 Show Results Plot
5 Most Recent Test Results

Manual Verification
1 Start
2 Upload Data Results from Device
3 Show Results Table
4 Next Run
5 Hrs Until Next Run
6 Set Recurring Hours
7 Turn Off Schedule

Modbus Data
1 Read Modbus Data
2 Write Modbus Data

* Requires HART 7.
** Displayed only if meter verification is enabled.
Figure 3-15  Service Tools menu: Simulate

On-Line Menu >
  3 Service Tools >
    5 Simulate

1
   Simulate Outputs
    1  mA Output Loop Test
    2  Frequency Output Test
    3  Discrete Output Test

2
   Simulate Sensor
    1  Simulate Primary Purpose Variables
    2  Mass Flow Rate
    3  Density
    4  Temperature
Chapter 4
Model 1700 Transmitters with Analog Outputs

Figure 4-1  On-Line menu

On-Line Menu

1. Overview

2. Configure
   1. Manual Setup
   2. Alert Setup

3. Service Tools
   1. Alerts
   2. Variables
   3. Trends
   4. Maintenance
   5. Simulate
Figure 4-2  Overview menu

On-Line Menu >
1 Overview

- Dev Status:
- Comm Status:
- Mass Flow Rate
- Status
- Volume Flow Rate*
- Density
- Status
- Device Information

Device Information
1 Identification
2 Revisions
3 Mat. of Construction
4 Licenses

Identification
1 Tag
2 Long Tag**
3 Model
4 Xmtr Serial Num
5 Sensor Serial Num
6 CP Serial Num**
7 Date
8 Descriptor
9 Message

Revisions
1 Universal
2 Field Device
3 Hardware
4 DD Revision
5 Transmitter Software
6 Core Processor S/W
7 Eng to Order Num

Mat. of Construction
1 Tube Wetted Mat.
2 Tube Lining
3 Sensor Flange

* If GSV is enabled, GSV Flow Rate is displayed.
** Requires HART 7.
Model 1700 Transmitters with Analog Outputs

Figure 4-3  Configure menu: Top level

On-Line Menu >
1 Configure

Manual Setup
1 Characterize
2 Measurements
3 Display
4 Inputs/Outputs
5 Info Parameters
6 HART*
7 Security*

Alert Setup
1 I/O Fault Actions
2 Alert Severity
3 Discrete Events

* Requires HART 7.
Figure 4-4  Configure menu: Manual Setup

- On-Line Menu >
  2 Configure >
  1 Manual Setup

- Additional options

- Characterize
  1 Sensor Type
  2 Sensor Tag Parameters

- Measurements
  1 Flow
  2 Density
  3 Temperature
  4 Update Rate
  5 LD Optimization
  6 Special Units
  7 External Pressure/
    Temperature
  8 GSV

- Display
  1 Language
  2 Display Variable Menu Features
  3 Offline Variable Menu Features
  4 Backlight
  5 Display Variables
  6 Decimal Places

- Inputs/Outputs
  1 Channels
  2 mA Output 1
  3 Frequency Output
  4 Discrete Output
  5 Communications
  6 Variable Mapping
Figure 4-5 Configure menu: Manual Setup: (continued)

- On-Line Menu >
  - 2 Configure >
    - 1 Manual Setup

<table>
<thead>
<tr>
<th>Info Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Transmitter Info</td>
</tr>
<tr>
<td>2 Sensor Information</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transmitter Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tag</td>
</tr>
<tr>
<td>2 Long Tag **</td>
</tr>
<tr>
<td>3 Xmt Serial Num</td>
</tr>
<tr>
<td>4 Message</td>
</tr>
<tr>
<td>5 Descriptor</td>
</tr>
<tr>
<td>6 Date</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sensor Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sensor Type</td>
</tr>
<tr>
<td>2 Sensor Serial Num</td>
</tr>
<tr>
<td>3 Tube Wetted Mat.</td>
</tr>
<tr>
<td>4 Tube Lining</td>
</tr>
<tr>
<td>5 Sensor Flange</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HART**</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Burst Mode *</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Burst Message 1 - 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mode</td>
</tr>
<tr>
<td>2 Option</td>
</tr>
<tr>
<td>3 Message Contents</td>
</tr>
<tr>
<td>3 Configure Update Rate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Write Protect</td>
</tr>
<tr>
<td>2 Lock/Unlock Device **</td>
</tr>
</tbody>
</table>

* Options are different, depending on HART version.
** Requires HART 7.
Figure 4-6  Configure menu: Manual Setup: Characterize

On-Line Menu >
2 Configure >
1 Manual Setup >
1 Characterize

1
Sensor Type
1 Curved Tube
2 Straight Tube

Curved Tube

Sensor Type

Straight Tube

Sensor Tag Parameters
1 FlowCal
2 D1
3 D2
4 TC
5 K1
6 K2
7 FD

Sensor Tag Parameters
1 Flow Parameters
2 Density Parameters

Flow Parameters
1 Flow FCF
2 FTG
3 FFQ

Density Parameters
1 D1
2 D2
3 DT
4 DTG
5 K1
6 K2
7 FD
8 DFQ1
9 DFQ2
Figure 4-7  Configure menu: Manual Setup: Measurements

On-Line Menu >
2 Configure >
1 Manual Setup >
2 Measurements

- Flow
  1. Flow Direction
  2. Flow Damping
  3. Mass Flow Unit
  4. Mass Flow Cutoff
  5. Volume Flow Unit *
  6. Volume Flow Cutoff *
  7. Mass Factor
  8. Volume Factor

- Density
  1. Density Unit
  2. Density Damping
  3. Density Cutoff
  4. Density Factor
  5. Slug Duration
  6. Slug Low Limit
  7. Slug High Limit

- Temperature
  1. Temperature Unit
  2. Temp Damping

- Update Rate
  1. Update Rate
  2. 100 Hz Variable

- Special Units
  1. Mass Special Units
  2. Volume Special Units

* If Volume Flow Type is GSV, GSV options are displayed.
Figure 4-8  Configure menu: Manual Setup: Measurements (continued)
Figure 4-9  Configure menu: Manual Setup: Display

- **On-Line Menu >**
  - 2 Configure >
  - 1 Manual Setup >
  - 3 Display

1. **Language**

2. **Display Variable Menu Features**
   1. Totalizer Reset
   2. Start/Stop Totals
   3. Auto Scroll
   4. Scroll Time *
   5. Refresh Rate
   6. Status LED Blinking

3. **Offline Variable Menu Features**
   1. Offline Menu
   2. Alert Menu
   3. Acknowledge All
   4. Offline Passcode
   5. Alert Passcode
   6. Offline Passcode

4. **Backlight**
   1. Control

5. **Display Variables**
   1. Display Variables (1-5)
   2. Display Variables (6-10)
   3. Display Variables (11-15)

6. **Decimal Places**
   1. For Process Variables
   2. For Totalizer Variables
   3. For Diagnostic Variables

* Displayed only if Auto Scroll is enabled. Menu numbers are adjusted as required.
Figure 4-10  Configure menu: Manual Setup: Inputs/Outputs

- On-Line Menu >
  - 2 Configure >
    - 1 Manual Setup >
      - 4 Inputs/Outputs

Channels
1  Channel A
2  Channel B
3  Channel C

Channel B
- 1 Frequency Output
- 2 Discrete Output

mA Output
1  Primary Variable
2  mA Output Settings
3  mA Fault Settings

mA Output Settings
- 1 PV LRV
- 2 PV URV
- 3 PV Min Span
- 4 PV LSL
- 5 PV USL
- 6 PV MAO Cutoff
- 7 PV Added Damping

mA Fault Settings
1  mAO Fault Action
2  mAO Fault Level

Frequency Output
- 1 FO Settings
- 2 FO Fault Parameters
- 3 FO Scaling

FO Settings
1  Third Variable
2  Max Pulse Width
3  FO Polarity

FO Fault Parameters
1  Third Variable
2  FO Fault Action
3  FO Fault Level

FO Scaling *
1  FO Scaling Method
2  TV Frequency Factor
3  TV Rate Factor
4  Set FO Scaling

* Options vary depending on FO Scaling Method.
Figure 4-11  Configure menu: Manual Setup: Inputs/Outputs (continued)

On-Line Menu >
 2 Configure >
  1 Manual Setup >
   4 Inputs/Outputs

Discrete Output
1 DO Assignment
2 DO Polarity
3 DO Fault Action
4 Flow Switch Source
5 Flow Switch Setpoint
6 Hysteresis (0.1-10.0)

Variable Mapping
1 Primary Variable
2 Secondary Variable
3 Third Variable
4 Fourth Variable

Communications
1 HART Address
2 Tag
3 Long Tag*
4 Device Identification
5 Dev ID (CP)
6 mA Output Mode
7 Set Up RS-485 Port

Set Up RS-485 Port
1 Protocol
2 Baud Rate
3 Parity
4 Stop Bits
5 Modbus Slave Address

* Requires HART 7.
Figure 4-12  Configure menu: Alert Setup

On-Line Menu >
  2 Configure >
  2 Alert Setup

I/O Fault Actions
1  mA0 Fault Action
2  mA0 Fault Level
3  FO Fault Action
4  FO Fault Level
5  Comm Fault Action

Alert Severity
1  Fault Timeout
2  Set Alert Severity
3  View Alert Severity

Discrete Events
1  Discrete Event 1
2  Discrete Event 2
3  Discrete Event 3
4  Discrete Event 4
5  Discrete Event 5
6  Assign Discrete Action
7  Read Discrete Action
8  Review Discrete Actions

Discrete Event \(x\)
1  Discrete Event Var
2  Discrete Event Type
3  Setpoint A
4  Setpoint B
Figure 4-13  Service Tools menu: Top level

On-Line Menu >
3 Service Tools

1. Alerts
   1. Refresh Alerts
   2. Alert Name

2. Variables
   1. Variable Summary
   2. Process Variables
   3. Mapped Variables
   4. External Variables
   5. Totalizer Control
   6. Outputs

3. Trends
   1. Process Variables
   2. Diagnostic Variables

4. Maintenance
   1. Routine Maintenance
   2. Zero Calibration
   3. Density Calibration
   4. Temperature Calibration
   5. Diagnostic Variables
   6. Modbus Data

5. Simulate
   1. Simulate Outputs
   2. Simulate Sensor
**Figure 4-14  Service Tools menu: Variables**

On-Line Menu >  
3 Service Tools >  
2 Variables

**Variable Summary**  
Mass Flow Rate  
Volume Flow Rate  
Density

**Process Variables**  
1 Mass Flow Rate  
2 Volume Flow Rate *  
3 Density  
4 Temperature

**Mapped Variables**  
1 PV  
2 SV  
3 TV  
4 QV

**External Variables**  
1 External Temperature  
2 External Pressure

**Totalizer Control**  
1 All Totalizers  
2 Mass  
3 Volume *

**All Totalizers**  
1 Start Totalizers  
2 Stop Totalizers  
3 Reset All Totals  
4 Mass Total  
5 Volume Total *

**Mass**  
1 Mass Flow Rate  
2 Mass Total  
3 Mass Inventory  
4 Reset Total

**Volume ***  
1 Volume Flow Rate  
2 Volume Total  
3 Volume Inventory  
4 Reset Total

**Outputs**  
1 mA Output  
2 Frequency Output  
3 DO State

* If Volume Flow Type = GSV, GSV variables are displayed.
Figure 4-15  Service Tools menu: Maintenance

On-Line Menu >
3 Service Tools >
4 Maintenance

Routine Maintenance
1  Trim mA Output
2  Locate Device*
3  Device Reset*
4  Meter Verification **

Density Calibration
1  Density
2  Dens Pt1 (Air)
3  Dens Pt2 (Water)
4  Dens Pt3 T-Series
5  Dens Pt4 T-Series
6  Flowing Dens (FD)
7  Flowing Dens (FD)

Temperature Calibration
1  Temperature
2  Temp Cal Factor

Diagnostic Variables
1  Sensor Model
2  Drive Gain
3  LPO Amplitude
4  RPO Amplitude
5  Tube Frequency
6  Live Zero
7  Fld Verification Zero
8  Additional

Manual Verification
1  Start
2  Upload Data Results from Device
3  Show Results Table
4  Show Results Plot
5  Most Recent Test Results

Manual Verification
1  Start
2  Upload Data Results from Device
3  Show Results Table
4  Next Run
5  Hrs Until Next Run
6  Set Recurring Hours
7  Turn Off Schedule

Zero Calibration
1  Mass Flow Rate
2  Volume Flow Rate
3  Zero Time
4  Zero Value
5  Standard Deviation
6  Perform Auto Zero
7  Restore Factory Zero

Additional
1  Core Processor Input Voltage
2  Board Temperature
3  Power On Time

Modbus Data
1  Read Modbus Data
2  Write Modbus Data

* Requires HART 7.
** Displayed only if meter verification is enabled.
Figure 4-16  Service Tools menu: Simulate

On-Line Menu >
  3 Service Tools >
  5 Simulate

- Simulate Outputs
  1  mA Output Loop Test
  2  Frequency Output Test
  3  Discrete Output Test

- Simulate Sensor
  1  Simulate Primary Purpose Variables
  2  Mass Flow Rate
  3  Density
  4  Temperature
Chapter 5
Model 1700 Transmitters with Intrinsically Safe Outputs

Figure 5-1  On-Line menu

On-Line Menu

1. Overview

2. Configure
   1. Manual Setup
   2. Alert Setup

3. Service Tools
   1. Alerts
   2. Variables
   3. Trends
   4. Maintenance
   5. Simulate
Figure 5-2  Overview menu

On-Line Menu >
1 Overview

Device Information
1 Identification
2 Revisions
3 Mat. of Construction
4 Licenses
5 Weights and Measures**

Identification
1 Tag
2 Long Tag***
3 Model
4 Xmtr Serial Num
5 Sensor Serial Num
6 CP Serial Num***
7 Date
8 Descriptor
9 Message

Revisions
1 Universal
2 Field Device
3 Hardware
4 DD Revision
5 Transmitter Software
6 Core Processor S/W
7 Eng to Order Num

Mat. of Construction
1 Tube Wetted Mat.
2 Tube Lining
3 Sensor Flange

Weights and Measures
1 Cstdy Transfr Approval
2 W&M Software Version
3 Core Firmware
4 Xmtr Firmware

* If GSV is enabled, GSV Flow Rate is displayed.
** Displayed only if Weights & Measures application is enabled.
*** Requires HART 7.
Figure 5-3  Configure menu: Top level

On-Line Menu >
1 Configure

1 Manual Setup
   1 Characterize
   2 Measurements
   3 Display
   4 Inputs/Outputs
   5 Info Parameters
   6 HART*
   7 Security*

2 Alert Setup
   1 I/O Fault Actions
   2 Alert Severity
   3 Discrete Events

* Requires HART 7.
Figure 5-4 Configure menu: Manual Setup

On-Line Menu >
  2 Configure >
    1 Manual Setup

Characterize
  1 Sensor Type
  2 Sensor Tag Parameters

Measurements
  1 Flow
  2 Gas Ref Density
  3 Temperature
  4 Update Rate
  5 LD Optimization
  6 Special Units
  7 External Pressure/Temperature
  8 GSV

Display
  1 Language
  2 Display Variable Menu Features
  3 Offline Variable Menu Features
  4 Backlight
  5 Display Variables
  6 Decimal Places

Inputs/Outputs
  1 Channels
  2 mA Output 1
  3 Frequency Output
  4 Discrete Output
  5 Communications
  6 Variable Mapping

Additional options
Figure 5-5  Configure menu: Manual Setup: Manual Setup (continued)

- On-Line Menu >
  - 2 Configure >
    - 1 Manual Setup

- Info Parameters
  1 Transmitter Info
  2 Sensor Information

- Transmitter Info
  1 Tag
  2 Long Tag **
  3 Xmtr Serial Num
  4 Message
  5 Descriptor
  6 Date

- Sensor Information
  1 Sensor Type
  2 Sensor Serial Num
  3 Tube Wetted Mat.
  4 Tube Lining
  5 Sensor Flange

- HART**
  1 Burst Mode *

- Burst Message 1 - 3
  1 Mode
  2 Option
  3 Message Contents
  3 Configure Update Rate

- Security
  1 Write Protect
  2 Lock/Unlock Device **

* Options are different, depending on HART version.
** Requires HART 7.
Figure 5-6  Configure menu: Manual Setup: Characterize

On-Line Menu >
  2 Configure >
    1 Manual Setup >
    1 Characterize

Sensor Type
  Curved Tube
  Straight Tube

Sensor Tag Parameters
  1 FlowCal
  2 D1
  3 D2
  4 TC
  5 K1
  6 K2
  7 FD

Flow Parameters
  1 Flow FCF
  2 FTG
  3 FFQ

Density Parameters
  1 D1
  2 D2
  5 K1
  6 K2
  7 FD
Figure 5-7  Configure menu: Manual Setup: Measurements

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      2 Measurements

Flow
1  Flow Direction
2  Flow Damping
3  Mass Flow Cutoff
4  Mass Flow Unit
5  Volume Flow Cutoff *
6  Volume Flow Unit *
7  Mass Factor
8  Volume Factor

Gas Ref Density
1  Density Unit
2  Density Damping
3  Density Cutoff *
4  Density Factor
5  Slug High Limit
6  Slug Low Limit
7  Slug Duration

Temperature
1  Temperature Unit
2  Temp Damping

Update Rate
1  Update Rate

LD Optimization
1  Update Rate
2  100 Hz Variable Set Up

Special Units
1  Mass Special Units
2  Volume Special Units

* If Volume Flow Type is GSV, GSV options are displayed.
Figure 5-8  Configure menu: Manual Setup: Measurements (continued)

On-Line Menu >
2 Configure >
   1 Manual Setup >
      2 Measurements

-7
External Pressure/
Temperature
   1 Pressure
   2 Temperature
   3 External Polling

-1
Pressure
   1 Pressure Unit
   2 Pressure Compensation
   3 Compensation Pressure
   4 Flow Cal Pressure
   5 Flow Press Factor
   6 Dens Press Factor

-2
Temperature
   1 Temperature Unit
   2 External Temperature
   3 Correction Temperature

-3
External Polling
   1 Poll Control
   2 Ext Dev Tag 1
   3 Polled Variable 1
   4 Ext Dev Tag 2
   5 Polled Variable 2

-8
GSV
   1 Volume Flow Type
   2 Gas Ref Density
   3 Gas Vol Flow Cutoff
   4 Gas Vol Flow Unit
   5 Gas Density Unit
Figure 5-9  Configure menu: Manual Setup: Display

- **Language**
- **Display Variable Menu**
  - Features
    1. Totalizer Reset
    2. Start/Stop Totals
    3. Auto Scroll
    4. Scroll Time *
    5. Refresh Rate
    6. Status LED Blinking
- **Offline Variable Menu**
  - Features
    1. Offline Menu
    2. Alert Menu
    3. Acknowledge All
    4. Offline Passcode
    5. Alert Passcode
    6. Offline Passcode
- **Backlight**
  - 1. Control
- **Display Variables**
  - 1. Display Variables (1-5)
  - 2. Display Variables (6-10)
  - 3. Display Variables (11-15)
- **Decimal Places**
  - 1. For Process Variables
  - 2. For Totalizer Variables
  - 3. For Diagnostic Variables

* Displayed only if Auto Scroll is enabled. Menu numbers are adjusted as required.
Figure 5-10  Configure menu: Manual Setup: Inputs/Outputs

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      4 Inputs/Outputs

- Additional options -

Channels
  1 Channel A
  2 Channel B

Channel B
  1 Frequency Output
  2 Discrete Output

mA Output
  1 Primary Variable
  2 mA Output Settings
  3 mA Fault Settings

mA Output Settings
  1 PV LRV
  2 PV URV
  3 PV Min Span
  4 PV LSL
  5 PV USL
  6 PV MAO Cutoff
  7 PV Added Damping

mA Fault Settings
  1 mAO Fault Action
  2 mAO Fault Level

Frequency Output
  1 FO Settings
  2 FO Fault Parameters
  3 FO Scaling

FO Settings
  1 Third Variable
  2 Max Pulse Width
  3 FO Polarity

FO Fault Parameters
  1 Third Variable
  2 FO Fault Action
  3 FO Fault Level

FO Scaling *
  1 FO Scaling Method
  2 TV Frequency Factor
  3 TV Rate Factor
  4 Set FO Scaling

* Options vary depending on FO Scaling Method.
Figure 5-11 Configure menu: Manual Setup: Inputs/Outputs (continued)

On-Line Menu >
  2 Configure >
  1 Manual Setup >
  4 Inputs/Outputs

Discrete Output
1 DO Assignment
2 DO Polarity
3 DO Fault Action
4 Flow Switch Source
5 Flow Switch Setpoint
6 Hysteresis (0.1-10.0)

Variable Mapping
1 Primary Variable
2 Secondary Variable
3 Third Variable
4 Fourth Variable

* Requires HART 7.

Communications
1 HART Address
2 Tag
3 Long Tag*
4 Device Identification
5 Dev ID (CP)
6 mA Output Action
Figure 5-12  Configure menu: Alert Setup

On-Line Menu >
  2 Configure >
  2 Alert Setup

I/O Fault Actions
1  MAO Fault Action
2  MAO Fault Level
3  FO Fault Action
4  FO Fault Level
5  Comm Fault Action

Alert Severity
1  Fault Timeout
2  Set Alert Severity
3  View Alert Severity

Discrete Events
1  Discrete Event 1
2  Discrete Event 2
3  Discrete Event 3
4  Discrete Event 4
5  Discrete Event 5
6  Assign Discrete Action
7  Read Discrete Action
8  Review Discrete Actions

Discrete Event x
1  Discrete Event Var
2  Discrete Event Type
3  Setpoint A
4  Setpoint B
Figure 5-13  Service Tools menu: Top level

On-Line Menu >
3 Service Tools

Alerts
1  Refresh Alerts
2  Alert Name

Variables
1  Variable Summary
2  Process Variables
3  Mapped Variables
4  External Variables
5  Totalizer Control
6  Outputs

Maintenance
1  Routine Maintenance
2  Zero Calibration
3  Density Calibration
4  Temperature Calibration
5  Diagnostic Variables
6  Modbus Data

Simulate
1  Simulate Outputs
2  Simulate Sensor

Trends
1  Process Variables
2  Diagnostic Variables
Figure 5-14  Service Tools menu: Variables

On-Line Menu >  
3 Service Tools >  
2 Variables

Variable Summary
- Mass Flow Rate
- Volume Flow Rate
- Density

Process Variables
1 Mass Flow Rate
2 Volume Flow Rate *
3 Density
4 Temperature

Mapped Variables
1 PV
2 SV
3 TV
4 QV

External Variables
1 External Temperature
2 External Pressure

Totalizer Control
1 All Totalizers
2 Mass
3 Volume *

All Totalizers
1 Start Totalizers
2 Stop Totalizers
3 Reset All Totals
4 Mass Total
5 Volume Total *

Mass
1 Mass Flow Rate
2 Mass Total
3 Mass Inventory
4 Reset Total

Volume *
1 Volume Flow Rate
2 Volume Total
3 Volume Inventory
4 Reset Total

Outputs
1 Current
2 Frequency Output
3 DO State

* If Volume Flow Type = GSV, GSV variables are displayed.
Figure 5-15  Service Tools menu: Maintenance

On-Line Menu >
3 Service Tools >
4 Maintenance

Routine Maintenance
1 Trim mA Output
2 Locate Device*
3 Device Reset*
4 Meter Verification **

Density Calibration
1 Density
2 Dens Pt1 (Air)
3 Dens Pt2 (Water)
4 Dens Pt3 T-Series
5 Dens Pt4 T-Series
6 Flowing Dens (FD)
7 Flowing Dens (FD)

Temperature Calibration
1 Temperature
2 Temp Cal Factor

Diagnostic Variables
1 Sensor Model
2 Drive Gain
3 LPO Amplitude
4 RPO Amplitude
5 Tube Frequency
6 Live Zero
7 Fld Verification Zero
8 Additional

Additional
1 Core Processor Input Voltage
2 Board Temperature
3 Power On Time

Modbus Data
1 Read Modbus Data
2 Write Modbus Data

* Requires HART 7.
** Displayed only if meter verification is enabled.

Manual Verification
1 Start
2 Upload Data Results from Device
3 Show Results Table
4 Show Results Plot
5 Most Recent Test Results

Manual Verification
1 Start
2 Upload Data Results from Device
3 Show Results Table
4 Next Run
5 Hrs Until Next Run
6 Set Recurring Hours
7 Turn Off Schedule

Zero Calibration
1 Mass Flow Rate
2 Volume Flow Rate
3 Zero Time
4 Zero Value
5 Standard Deviation
6 Perform Auto Zero
7 Restore Factory Zero

Model 1700 Transmitters with Intrinsically Safe Outputs
Figure 5-16  Service Tools menu: Simulate

On-Line Menu >
  3 Service Tools >
    5 Simulate

Simulate Outputs
  1 mA Output Loop Test
  2 Frequency Output Test
  3 Discrete Output Test

Simulate Sensor
  1 Simulate Primary Purpose Variables
  2 Mass Flow Rate
  3 Density
  4 Temperature
Chapter 6

Model 2200S Transmitters

Figure 6-1  On-Line menu

On-Line Menu

Overview
1 Check Status
2 Primary Purpose Variables
3 Shortcuts

Configure
2 Alert Setup

Service Tools
1 Alerts
2 Variables
3 Trends
4 Maintenance
5 Simulate
Model 2200S Transmitters

Figure 6-2  Overview menu

On-Line Menu >
  1 Overview

- Check Status
  1 Refresh Alerts
  2 Dev Status:
  3 Comm Status:

- Primary Purpose Variables
  Mass Flow Rate
  Volume Flow Rate
  Density

- Shortcuts
  1 Device Information
  2 Totalizer Control
  3 Zero Calibration
  4 Variables
  5 Trends

- Device Information
  1 Product Information
  2 Mat. of Construction

- Product Information
  1 Device Tag
  2 Model
  3 Xmr Software Rev
  4 Option Board
  5 ETO Number
  6 Final Asmbly Num
  7 Sensor Serial Num
  8 HART DD Information

- Mat. of Construction
  1 Sensor Material
  2 Sensor Liner
  3 Flange
Figure 6-3  Configure menu: Top level

On-Line Menu >
1 Configure

Manual Setup
1 Characterize
2 Measurements
3 Display
4 Inputs/Outputs
5 Info Parameters
6 Communications

Alert Setup
1 Fault Timeout
2 mA/AO Fault Action
3 Fault Level (Direct)
4 Flt Lvl (Adapter-Barrier)
5 Comm Fault Action
6 Set Alert Severity
7 View Alert Severity
Figure 6-4  Configure menu: Manual Setup

On-Line Menu >
2 Configure >
1 Manual Setup

- Characterize
  1 Sensor Type
  2 Sensor Tag Parameters

- Measurements
  1 Flow
  2 Density
  3 Temperature
  4 Set Up Special Units
  5 Set Up External Compensation
  6 Set Up GSV

- Display
  1 Display Variable Menu Features
  2 Offline Variable Menu Features
  3 Set Up Display Variables
  4 Set Up Decimal Places

- Inputs/Outputs
  1 Set Up mA Output
  2 Map Variables

- Info Parameters
  1 Transmitter Info
  2 Sensor Information

  - Transmitter Info
    1 Device Tag
    2 Final Asmblg Num
    3 Message
    4 Descriptor
    5 Date

  - Sensor Information
    1 Sensor Type
    2 Sensor Serial Num
    3 Sensor Material
    4 Sensor Liner
    5 Flange

- Communications
  1 HART Address
  2 Device Tag
  3 Device Identification
  4 Set Up Burst Mode

- Set Up Burst Mode
  1 Burst Mode
  2 Burst Option
  3 Field Device Var 1 – 4
Figure 6-5  Configure menu: Manual Setup: Characterize

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      1 Characterize

Characterize
  1 Sensor Type
  2 Sensor Tag Parameters

Sensor Type
  1 Curved Tube
  2 Straight Tube

Sensor Tag Parameters
  1 FlowCal
  2 D1
  3 D2
  4 TC
  5 K1
  6 K2
  7 FD

Flow Parameters
  1 Flow FCF
  2 FTG
  3 FFQ

Density Parameters
  1 D1
  2 D2
  3 DT
  4 DTG
  5 K1
  6 K2
  7 FD
  8 DFQ1
  9 DFQ2
Micro Motion Menu Maps for HART Device Descriptions

Figure 6-6  Configure menu: Manual Setup: Measurements

On-Line Menu＞
2 Configure＞
1 Manual Setup＞
2 Measurements

Flow
1 Flow Direction
2 Flow Damping
3 Mass Flow Cutoff
4 Mass Flow Unit
5 Volume Flow Cutoff *
6 Volume Flow Unit *
7 Mass Factor
8 Volume Factor

Density
1 Density Unit
2 Density Damping
3 Density Cutoff
4 Density Factor
5 Slug High Limit
6 Slug Low Limit
7 Slug Duration

Temperature
1 Temperature Unit
2 Temp Damping

Set Up Special Units
1 Mass Special Units
2 Volume Special Units

Set Up External Compensation
1 Pressure Unit
2 Enable Press Comp
3 Flow Cal Pressure
4 Static Pressure
5 Flow Press Factor
6 Dens Press Factor
7 Enable Ext Temp
8 Static Temperature

Set Up GSV
1 Volume Flow Type
2 Gas Density
3 GSV Flow Cutoff
4 GSV Flow Unit

* Displayed only if Volume Flow Type = Liquid. Menu numbers are adjusted as required.
Figure 6-7  Configure menu: Manual Setup: Display

On-Line Menu >
2 Configure >
1 Manual Setup >
3 Display

Display Variable Menu
Features
1 Totalizer Reset
2 Start/Stop Totals
3 Auto Scroll
4 Scroll Time *
5 Update Period

Offline Variable Menu
Features
1 Offline Menu
2 Alert Menu
3 Acknowledge All
4 Offline Passcode
5 Alert Passcode

Set Up Display Variables
1 Display Variables (1-5)
2 Display Variables (6-10)
3 Display Variables (11-15)

Set Up Decimal Places
1 For Process Variables
2 For Totalizer Variables
3 For Diagnostic Variables

* Displayed only if Auto Scroll is enabled. Menu numbers are adjusted as required.
Figure 6-8  Configure menu: Manual Setup: Inputs/Outputs

On-Line Menu >
2 Configure >
1 Manual Setup >
4 Inputs/Outputs

Set Up mA Output
1 Enter mA Msmt Pt
2 Primary Variable
3 mA Output Settings
4 mA Fault Settings

mA Output Settings
1 PV LRV
2 PV URV
3 PV Min Span
4 PV LSL
5 PV USL
6 PV MAO Cutoff
7 PV Added Damping

mA Fault Settings
1 MAO Fault Action
2 Fault Level (Direct)
3 Flt Lvl (Adapter-Barrier)

Map Variables
1 Primary Variable
2 Secondary Variable
3 Third Variable
4 Fourth Variable
Model 2200S Transmitters

Figure 6-9  Service Tools menu: Top level

On-Line Menu >
3 Service Tools

Alerts
1 Refresh Alerts
2 Alert Name
3 Additional Information for Above

Variables
1 Variable Summary
2 Process Variables
3 Mapped Variables
4 External Variables
5 Totalizer Control
6 Outputs

Trends
1 Process Variables
2 Diagnostic Variables

Maintenance
1 Routine Maintenance
2 Zero Calibration
3 Density Calibration
4 Temperature Calibration
5 Diagnostic Variables

Simulate
1 Simulate Outputs
2 Simulate Sensor
Figure 6-10  Service Tools menu: Variables

On-Line Menu >
  3 Service Tools >
  2 Variables

1 Variable Summary

Process Variables
1 Mass Flow Rate
2 Volume Flow Rate *
3 Density
4 Temperature

Mapped Variables
1 PV
2 SV
3 TV
4 QV

External Variables
1 External Temperature
2 External Pressure

Totalizer Control
1 All Totalizers
2 Mass
3 Volume *

All Totalizers
1 Start Totalizers
2 Stop Totalizers
3 Reset All Totals
4 Mass Total
5 Volume Total *

Mass
1 Mass Flow Rate
2 Mass Total
3 Mass Inventory
4 Reset Total

Volume *
1 Volume Flow Rate
2 Volume Total
3 Volume Inventory
4 Reset Total

Outputs
1 Current (Direct)
2 Current (Adapter-Barrier)
3 PV MAO (Direct)
4 PV MAO (Adapter-Barrier)
5 PV % Range
6 Fault Level (Direct)
7 Flt Lvl (Adapter-Barrier)

* If Volume Flow Type = GSV, GSV variables are displayed.
Figure 6-11  Service Tools menu: Maintenance

On-Line Menu >
  3 Service Tools >
  4 Maintenance

- Routine Maintenance
  1 Trim mA Output

- Zero Calibration
  1 Mass Flow Rate
  2 Volume Flow Rate
  3 Zero Time
  4 Zero Value
  5 Standard Deviation
  6 Perform Auto Zero

- Density Calibration
  1 Density
  2 Dens Pt1 (Air)
  3 Dens Pt2 (Water)
  4 Dens Pt3 T-Series
  5 Dens Pt4 T-Series
  6 Flowing Dens (FD)

- Temperature Calibration
  1 Temperature
  2 Temp Cal Factor

- Diagnostic Variables
  1 Sensor Model
  2 Drive Gain
  3 Input Voltage
  4 LPO Amplitude
  5 RPO Amplitude
  6 Board Temperature
  7 Tube Frequency
  8 Live Zero
Figure 6-12  Service Tools menu: Simulate

On-Line Menu >
  3 Service Tools >
    5 Simulate

Simulate
  1 Simulate Outputs
  2 Simulate Sensor

Simulate Outputs
  1 mA Output Loop Test

Simulate Sensor
  1 Simulation Mode
  2 Mass Flow Rate
  3 Density
  4 Temperature
Chapter 7
Model 2400S Transmitters with Analog Outputs

Figure 7-1  On-Line menu

- **Overview**
  1. Check Status
  2. Primary Purpose Variables
  3. Shortcuts

- **Configure**
  1. Manual Setup
  2. Alert Setup

- **Service Tools**
  1. Alerts
  2. Variables
  3. Trends
  4. Maintenance
  5. Simulate
Figure 7-2  Overview menu

On-Line Menu >

1 Overview

Check Status
1 Refresh Alerts
2 Dev Status:
3 Comm Status:

Primary Purpose
Variables
2 Mass Flow Rate
Volume Flow Rate
Density

Shortcuts
1 Device Information
2 Totalizer Control
3 Zero Calibration
4 Variables
5 Trends
6 Meter Verification *

Device Information
1 Identification
2 Mat. of construction
3 Licenses

Identification
1 Tag
2 Long Tag
3 Model
4 Xmtr Serial Num
5 Sensor Serial Num
6 Date
7 Descriptor
8 Message

Mat. of Construction
1 Tube Wetted Material
2 Tube Lining
3 Sensor Flange

* Displayed only if meter verification is enabled.
Figure 7-3  Configure menu: Top level

On-Line Menu >
  1 Configure

Manual Setup
  1 Characterize
  2 Measurements
  3 Display
  4 Inputs/Outputs
  5 Info Parameters
  6 Communications

Alert Setup
  2 Configure Alerts
  2 Discrete Output
  3 Discrete Events
Figure 7-4  Configure menu: Manual Setup

On-Line Menu >
  2 Configure >
    1 Manual Setup

Characterize
  1 Sensor Type
  2 Sensor Tag Parameters

Measurements
  1 Flow
  2 Density
  3 Temperature
  4 LD optimization
  5 Set up Special Units
  6 External Pressure/Temperature
  7 Set up GSV

Inputs/Outputs
  1 Set Up Channels
  2 Set Up mA Output
  3 Set Up Frequency Output
  4 Set Up Discrete Output
  5 Set Up Discrete Input
  6 Map Variables

Info Parameters
  1 Transmitter Info
  2 Sensor Information

Communications
  1 HART Address
  2 Tag
  3 Device Identification
  4 Set Up Burst Mode

Display
  1 Display Variable Menu Features
  2 Offline Variable Menu Features
  3 Backlight
  4 Set up Display Variables
  5 Set up Decimal Places
Figure 7-5  Configure menu: Manual Setup: Characterize

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      1 Characterize

Characterize
  1 Sensor Type
  2 Sensor Tag Parameters

Sensor Type
  1 Curved Tube
  2 Straight Tube

Curved Tube ——— Sensor Type ——— Straight Tube

Sensor Tag Parameters
  1 FlowCal
  2 D1
  3 D2
  4 TC
  5 K1
  6 K2
  7 FD

Sensor Tag Parameters
  1 Flow Parameters
  2 Density Parameters

Flow Parameters
  1 Flow FCF
  2 FTG
  3 FFQ

Density Parameters
  1 D1
  2 D2
  3 DT
  4 DTG
  5 K1
  6 K2
  7 FD
  8 DFQ1
  9 DFQ2
Figure 7-6  Configure menu: Manual Setup: Measurements

On-Line Menu >
2 Configure >
1 Manual Setup >
2 Measurements

**Flow**
1 Flow Direction
2 Flow Damping
3 Mass Flow Cutoff
4 Mass Flow Unit
5 Volume Flow Cutoff *
6 Volume Flow Unit *
7 Mass Factor
8 Volume Factor

**Density**
1 Density Unit
2 Density Damping
3 Density Cutoff
4 Density Factor
5 Slug High Limit
6 Slug Low Limit
7 Slug Duration

**Temperature**
1 Temperature Unit
2 Temp Damping

**Set Up Special Units**
1 Mass Special Units
2 Volume Special Units

**External Pressure/ Temperature**
1 Pressure Unit
2 Enable Press Comp
3 Flow Cal Pressure
4 Static Pressure
5 Flow Press Factor
6 Dens Press Factor
7 Enable Ext Temp
8 Static Temperature
9 External Polling

**Set Up GSV**
1 Volume Flow Type
2 Gas Density
3 Gas Vol Flow Cutoff
4 Gas Vol Flow Unit

* Displayed only if Volume Flow Type = Liquid. Menu numbers are adjusted as required.
Figure 7-7  Configure menu: Manual Setup: Display

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      3 Display

Display Variable Menu
Features
1 Totalizer Reset
2 Start/Stop Totals
3 Auto Scroll
4 Scroll Time *
5 Update Period

Offline Variable Menu
Features
1 Offline Menu
2 Alert Menu
3 Acknowledge All
4 Offline Passcode
5 Alert Passcode

Backlight
1 Control
2 Intensity (0-63)

Set Up Display Variables
1 Display Variables (1-5)
2 Display Variables (6-10)
3 Display Variables (11-15)

Set Up Decimal Places
1 For Process Variables
2 For Totalizer Variables
3 For Diagnostic Variables

*  Displayed only if Auto Scroll is enabled.
   Menu numbers are adjusted as required.
Figure 7-8  Configure menu: Manual Setup: Inputs/Outputs

On-Line Menu >
2 Configure >
1 Manual Setup >
4 Inputs/Outputs

Set Up Channels
1 Channel A
2 Channel A Power
3 Channel B
4 Channel B Power

Set Up mA Output
1 Primary Variable
2 mA Output Settings
3 Milliamp Fault Settings

mA Output Settings
1 PV LRV
2 PV URV
3 PV Min Span
4 PV LSL
5 PV USL
6 PV AO Cutoff
7 PV Added Damping

Milliamp Fault Settings
1 MAO Fault Action
2 MAO Fault Level

Set Up Frequency Output
1 FO Settings
2 FO Fault Parameters
3 FO Scaling

FO Settings
1 Third Variable
2 Max Pulse Width
3 FO Polarity

FO Fault Parameters
1 Third Variable
2 FO Fault Action
3 FO Fault Level

FO Scaling *
1 FO Scaling Method
2 Set FO Scaling

* Options vary depending on FO Scaling Method.
Model 2400S Transmitters with Analog Outputs

Figure 7-9 Configure menu: Manual Setup: Inputs/Outputs (continued)

On-Line Menu >
  2 Configure >
    1 Manual Setup >
    4 Inputs/Outputs

Set Discrete Output
  1 DO Assignment
  2 DO Polarity
  3 DO Fault Action
  4 Flow Switch Source
  5 Flow Switch Setpoint
  6 Hysteresis (0.1 – 10.0)

Set Discrete Input
  1 DI Assignment
  2 DI Polarity

Map Variables
  1 Primary Variable
  2 Secondary Variable
  3 Third Variable
  4 Fourth Variable
Figure 7-10  Configure menu: Manual Setup: Alert Setup
Figure 7-11  Service Tools menu: Top level

On-Line Menu > 3 Service Tools

Alerts
1 Refresh Alerts
2 Alert Name
3 Additional Information for Above

Variables
1 Variable Summary
2 Process Variables
3 Mapped Variables
4 External Variables
5 Totalizer Control
6 Outputs

Maintenance
1 Routine Maintenance
2 Zero Calibration
3 Density Calibration
4 Temperature Calibration
5 Diagnostic Variables

Simulate
1 Simulate Outputs
2 Simulate Sensor

Trends
1 Process Variables
2 Diagnostic Variables
Figure 7-12  Service Tools menu: Variables

On-Line Menu >
3 Service Tools >
2 Variables

1 Variable Summary

2 Process Variables
1 Mass Flow Rate
2 Volume Flow Rate *
3 Density
4 Temperature

3 Mapped Variables
1 PV
2 SV
3 TV
4 QV

4 External Variables
1 External Temperature
2 External Pressure

5 Totalizer Control
1 All Totalizers
2 Mass
3 Volume *

6 Outputs
1 Current
2 Frequency
3 DO State

All Totalizers
1 Start Totalizers
2 Stop Totalizers
3 Reset All Totals
4 Mass Total
5 Volume Total *

Mass
1 Mass Flow Rate
2 Mass Total
3 Mass Inventory
4 Reset Total

Volume *
1 Volume Flow Rate
2 Volume Total
3 Volume Inventory
4 Reset Total

Current (MAO1)
1 Current
2 PV AO
3 PV % Range

Frequency
1 Frequency
2 Present Freq Output

* If Volume Flow Type = GSV, GSV variables are displayed.
Figure 7-13  Service Tools menu: Maintenance

On-Line Menu >
3 Service Tools >
4 Maintenance

Routine Maintenance
1 Trim mA Output
2 Meter Verification *

Density Calibration
1 Density
2 Dens Pt1 (Air)
3 Dens Pt2 (Water)
4 Dens Pt3 T-Series
5 Dens Pt4 T-Series
6 Flowing Dens (FD)

Meter Verification **
1 Run Meter Verification
2 View Test Results
3 Schedule Meter Verification

Temperature Calibration
1 Temperature
2 Temp Cal Factor
3 Offset Calibration
4 Slope Calibration

Zero Calibration
1 Mass Flow Rate
2 Volume Flow Rate
3 Zero Time
4 Zero Value
5 Standard Deviation
6 Perform Auto Zero
7 Restore Factory Zero

Diagnostic Variables
1 Sensor Model
2 Drive Gain
3 Input Voltage
4 LPO Amplitude
5 RPO Amplitude
6 Board Temperature
7 Tube Frequency
8 Live Zero

* Displayed only if meter verification is enabled.
** Displayed only if Smart Meter Verification is enabled. For earlier versions, the Meter Verification Method is launched.
Figure 7-14  Service Tools menu: Simulate

On-Line Menu >
  3 Service Tools >
    5 Simulate

Simulate
  1 Simulate Outputs
  2 Simulate Sensor

Simulate Outputs
  1 mA Output Loop Test
  2 Frequency Output Test
  3 Discrete Output Test

Simulate Sensor
  1 Simulation Mode
  2 Mass Flow Rate
  3 Density
  4 Temperature
Chapter 8
Model 2500 Transmitters with Configurable Input/Outputs

Figure 8-1  On-Line menu

On-Line Menu

1. Overview

2. Configure
   1. Manual Setup
   2. Alert Setup

3. Service Tools
   1. Alerts
   2. Variables
   3. Trends
   4. Maintenance
   5. Simulate
Figure 8-2  Overview menu

On-Line Menu >  
1 Overview

1  Dev Status:  
2  Comm Status:  
3  Mass Flow Rate  
4  Status  
5  Volume Flow Rate*  
6  Status  
7  Density  
8  Status  
9  Device Information

Device Information
1  Identification  
2  Revisions  
3  Mat. of Construction  
4  Licenses  
5  Weights and Measures**

Identification
1  Tag  
2  Long Tag***  
3  Model  
4  Xmtr Serial Num  
5  Sensor Serial Num  
6  CP Serial Num***  
7  Date  
8  Descriptor  
9  Message

Mat. of Construction
1  Tube Wetted Mat.  
2  Tube Lining  
3  Sensor Flange

Weights and Measures
1  Cstdy Transfr Approval  
2  W&M Software Version  
3  Core Firmware  
4  Xmtr Firmware

*  If GSV is enabled, GSV Flow Rate is displayed.  
**  Displayed only if Weights & Measures application is enabled.  
***  Requires HART 7.
Figure 8-3  Configure menu: Top level

On-Line Menu >
1 Configure

1 Manual Setup
   1 Characterize
   2 Measurements
   3 Inputs/Outputs
   4 Info Parameters
   5 HART**
   6 Security**

2 Alert Setup
   1 I/O Fault Actions
   2 Alert Severity
   3 Discrete Events
   4 CM Alerts*

* Displayed only if the concentration measurement application is enabled.
** Requires HART 7
Figure 8-4  Configure menu: Manual Setup

On-Line Menu >
  2 Configure >
    1 Manual Setup

1. Characterize
   1 Sensor Type
   2 Sensor Tag Parameters

2. Measurements
   1 Flow
   2 Density
   3 Temperature
   4 Update Rate
   5 LD Optimization
   6 Special Units
   7 External Pressure/
   Temperature
   8 Petroleum Measurement*
   9 GSV
   10 Conc Measure (CM)**

3. Inputs/Outputs
   1 Channels
   2 mA Output 1
   3 mA Output 2
   4 Frequency Output
   5 Discrete Output
   6 Discrete Input
   7 Communications
   8 Variable Mapping

* Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.
** Displayed only if concentration measurement is enabled on your transmitter.
Figure 8-5  Configure menu: Manual Setup (continued)

- Options are different, depending on HART version.
- Requires HART 7.
Figure 8-6  Configure menu: Manual Setup: Characterize
Figure 8-7  Configure Menu: Manual Setup: Measurements

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      2 Measurements

Flow
1  Flow Direction
2  Flow Damping
3  Mass Flow Unit
4  Mass Flow Cutoff
5  Mass Factor
6  Volume Flow Unit *
7  Volume Flow Cutoff *
8  Volume Factor

Density
1  Density Unit
2  Density Damping
3  Density Cutoff
4  Density Factor
5  Slug Duration
6  Slug Low Limit
7  Slug High Limit

Temperature
1  Temperature Unit
2  Temp Damping

Update Rate
1  Update Rate
2  100 Hz Variable

LD Optimization
1  Update Rate
2  100 Hz Variable

Special Units
1  Mass Special Units
2  Volume Special Units*

* If Volume Flow Type is GSV, GSV options are displayed.
Figure 8-8  Configure menu: Manual Setup: Measurements (continued)

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      2 Measurements

External Pressure/ Temperature
  1 Pressure
  2 Temperature
  3 External Polling

Pressure
  1 Pressure Unit
  2 Pressure Compensation
  3 Compensation Pressure
  4 Flow Cal Pressure
  5 Flow Press Factor
  6 Dens Press Factor

Temperature
  1 Temperature Unit
  2 External Temperature
  3 Correction Temperature

External Polling
  1 Poll Control
  2 Ext Dev Tag 1
  3 Polled Variable 1
  4 Ext Dev Tag 2
  5 Polled Variable 2

Petroleum Measurement *
  1 2540 CTL Table type
  2 TEC
  3 Ref Temperature
  4 Petroleum Msmt Setup

GSV
  1 Volume Flow Type
  2 Gas Ref Density
  3 GSV Cutoff
  4 GSV Flow Unit
  5 Gas Density Unit

Conc Measure (CM)**
  1 CM Configuration
  2 Matrix Configuration
  3 Enter Matrix
  4 Trim CM Process Variables
  5 Reset Matrix Data

* Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.
** Displayed only if concentration measurement is enabled on your transmitter.
Model 2500 Transmitters with Configurable Input/Outputs

Figure 8-9  Configure menu: Manual Setup: Inputs/Outputs

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      4 Inputs/Outputs

Channels
1  Channel A
2  Channel A Power
3  Channel B
4  Channel B Power
5  Channel C
6  Channel C Power

Channel B
1  Frequency Output
2  AO2
3  Discrete Output 1

Channel B Power
1  External
2  Internal

Channel C
1  Frequency Output
2  AO2
3  Discrete Output 1

Channel C Power
1  External
2  Internal
Figure 8-10  Configure menu: Manual Setup: Inputs/Outputs (continued)

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      4 Inputs/Outputs

mA Output 1
  1 Primary Variable
  2 mA Output Settings
  3 MA01 Fault Settings

mA Output Settings
  1 PV LRV
  2 PV URV
  3 PV Min Span
  4 PV LSL
  5 PV USL
  6 PV MA01 Cutoff
  7 PV Added Damping

mA Output 2
  1 Secondary Variable
  2 mA Output Settings
  3 MA02 Fault Settings

mA Output Settings
  1 SV LRV
  2 SV URV
  3 SV Min Span
  4 SV LSL
  5 SV USL
  6 SV MA02 Cutoff
  7 SV Added Damping

MA01 Fault Settings
  1 MA01 Fault Action
  2 MA01 Fault Level

MA02 Fault Settings
  1 MA02 Fault Action
  2 MA02 Fault Level
Figure 8-11  Configure menu: Manual Setup: Inputs/Outputs (continued)

On-Line Menu >
  Configure >
    Manual Setup >
      Inputs/Outputs

- Additional options -

**Frequency Output**
- 1 FO Settings
- 2 FO Fault Parameters
- 3 FO Scaling

**FO Settings**
- 1 Third Variable
- 2 Max Pulse Width
- 3 FO Polarity
- 4 Mode

**FO Fault Parameters**
- 1 Third Variable
- 2 FO Fault Action
- 3 FO Fault Level

**FO Scaling** *
- 1 FO Scaling Method
- 2 TV Pulses/Unit
- 3 Set FO Scaling

**Discrete Output**
- 1 DO 1 Assignment
- 2 DO 1 Polarity
- 3 DO 1 Fault Action
- 4 DO 2 Assignment
- 5 DO 2 Polarity
- 6 DO 2 Fault Action
- 7 Flow Switch Source
- 8 Flow Switch Setpoint
- 9 Hysteresis (0.1-10.0)

**Discrete Input**
- 1 DI Assignment
- 2 DI Polarity

* Options vary depending on FO Scaling Method.
Figure 8-12  Configure menu: Manual Setup: Inputs/Outputs (continued)

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      4 Inputs/Outputs

Communications
  1 HART Address
  2 Tag
  3 Long Tag *
  4 Device Identification
  5 Dev ID (CP)
  6 mA Output Action
  7 Set Up RS-485 Port

Set Up RS-485 Port
  1 Protocol
  2 Baud Rate
  3 Parity
  4 Stop Bits
  5 Modbus Slave Address

Variable Mapping
  1 Primary Variable
  2 Secondary Variable
  3 Third Variable
  4 Fourth Variable

* Requires HART 7.
Figure 8-13  Configure menu: Alert Setup

On-Line Menu >  
  2 Configure >  
  2 Alert Setup

I/O Fault Actions  
1 MAO1 Fault Action  
2 MAO1 Fault Level  
3 MAO2 Fault Action  
4 MAO2 Fault Level  
5 FO Fault Action  
6 FO Fault Level  
7 Comm Fault Action

Alert Severity  
1 Fault Timeout  
2 Set Alert Severity  
3 View Alert Severity

Discrete Events  
1 Discrete Event 1  
2 Discrete Event 2  
3 Discrete Event 3  
4 Discrete Event 4  
5 Discrete Event 5  
6 Assign Discrete Action  
7 Read Discrete Action  
8 Review Discrete Actions

Discrete Event x  
1 Discrete Event Var  
2 Discrete Event Type  
3 Setpoint A  
4 Setpoint B

CM Alerts  
1 Density Low Extrapolation Limit  
2 Density High Extrapolation Limit  
3 Temp Low Extrapolation Limit  
4 Temp High Extrapolation Limit
Figure 8-14  Service Tools menu: Top level

On-Line Menu > 3 Service Tools

1 Alerts
   1 Refresh Alerts
   2 Alert Name

2 Variables
   1 Variable Summary
   2 Process Variables
   3 Mapped Variables
   4 External Variables
   5 Totalizer Control
   6 Variables (PM) *
   7 Variables (CM) **
   8 Inputs/Outputs

3 Trends
   1 Process Variables
   2 Diagnostic Variables

4 Maintenance
   1 Routine Maintenance
   2 Zero Calibration
   3 Density Calibration
   4 Temperature Calibration
   5 Diagnostic Variables
   6 Modbus Data

5 Simulate
   1 Simulate Outputs
   2 Simulate Sensor

* Displayed only if the petroleum measurement application is enabled on your transmitter. Menu numbers are adjusted as required.

** Displayed only if the concentration measurement application is enabled on your transmitter. Menu numbers are adjusted as required.
Figure 8-15  Service Tools menu: Variables

On-Line Menu > 3 Service Tools > 2 Variables

Variable Summary
1. Mass Flow Rate
2. Volume Flow Rate
3. Density

Process Variables
1. Mass Flow Rate
2. Volume Flow Rate *
3. Density
4. Temperature

Mapped Variables
1. PV
2. SV
3. TV
4. QV

External Variables
1. External Temperature
2. External Pressure

Totalizer Control
1. All Totalizers
2. Mass
3. Volume *
4. CM Volume at Reference Temperature ***
5. CM Net Mass ***
6. CM Net Volume ***
7. Temp Corrected Volume (PM) **
8. Custody Transfer ****

Additional options

* If Volume Flow Type = GSV, GSV variables are displayed.
** Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.
*** Displayed only if concentration measurement is enabled on your transmitter. Menu numbers are adjusted as required.
**** Displayed only if the Weights & Measures application is installed on your transmitter.
Figure 8-16  Service Tools menu: Variables (continued)

On-Line Menu >
  3 Service Tools >
    2 Variables

Variables (PM) *
1  Density at Reference Temperature
2  Average Observed Density
3  Volume Flow at Reference Temperature
4  Average Observed Temperature
5  CTL

Variables (CM) **
1  Standard Volume Flow Rate
2  Standard Net Volume Flow Rate
3  Net Mass Flow Rate
4  Density at Reference
5  Concentration
6  Density (Fixed SG Units)

Inputs/Outputs
1  mA Output 1 (MA01)
2  mA Output 2 (MA02)
3  Frequency Output
4  DO State 1
5  DO State 2
6  DI State

*  Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.

**  Displayed only if concentration measurement is enabled on your transmitter. Menu numbers are adjusted as required.
Figure 8-17  

Service Tools menu: Maintenance

On-Line Menu >
3 Service Tools >
4 Maintenance

Density Calibration
1 Density
2 Dens Pt1 (Air)
3 Dens Pt2 (Water)
4 Dens Pt3 T-Series
5 Dens Pt4 T-Series
6 Flowing Density

Temperature Calibration
1 Temperature
2 Temp Cal Factor

Diagnostic Variables
1 Sensor Model
2 Drive Gain
3 LPO Amplitude
4 RPO Amplitude
5 Tube Frequency
6 Live Zero
7 Fld Verification Zero
8 Additional

Additional
1 Core Processor Input Voltage
2 Board Temperature
3 Power On Time

Modbus Data
1 Read Modbus Data
2 Write Modbus Data

* Requires HART 7.
** Displayed only if meter verification is enabled.

Routine Maintenance
1 Trim mA Output 1
2 Trim mA Output 2
3 Locate Device*
4 Device Reset*
5 Meter Verification **

Manual Verification
1 Start
2 Upload Data Results from Device
3 Show Results Table
4 Show Results Plot
5 Most Recent Test Results

Manual Verification
1 Start
2 Upload Data Results from Device
3 Show Results Table
4 Next Run
5 Hrs Until Next Run
6 Set Recurring Hours
7 Turn Off Schedule

Zero Calibration
1 Mass Flow Rate
2 Volume Flow Rate
3 Zero Time
4 Zero Value
5 Standard Deviation
6 Perform Auto Zero
7 Restore Factory Zero
Figure 8-18  Service Tools menu: Simulate

On-Line Menu >
   3 Service Tools >
      5 Simulate

1. Simulate Outputs
   1. mA Output 1 Loop Test
   2. mA Output 2 Loop Test
   3. Frequency Output Test
   4. Discrete Output 1 Test
   5. Discrete Output 2 Test

2. Simulate Sensor
   1. Simulate Primary Purpose Variables
   2. Mass Flow Rate
   3. Density
   4. Temperature
Chapter 9
Model 2700 Transmitters with Analog Outputs

Figure 9-1  On-Line menu

On-Line Menu

1. Overview
2. Configure
   1. Manual Setup
   2. Alert Setup
3. Service Tools
   1. Alerts
   2. Variables
   3. Trends
   4. Maintenance
   5. Simulate
Figure 9-2  Overview menu

On-Line Menu >
1 Overview

1 Dev Status:
2 Comm Status:
3 Mass Flow Rate
4 Status
5 Volume Flow Rate*
6 Status
7 Density
8 Status
9 Device Information

Identification
1 Tag
2 Long Tag***
3 Model
4 Xmtr Serial Num
5 Sensor Serial Num
6 CP Serial Num***
7 Date
8 Descriptor
9 Message

Device Information
1 Identification
2 Revisions
3 Mat. of Construction
4 Licenses
5 Weights and Measures**

Revisions
1 Universal
2 Field Device
3 Hardware
4 DD Revision
5 Transmitter Software
6 Core Processor S/W
7 Eng to Order Num

Mat. of Construction
1 Tube Wetted Mat.
2 Tube Lining
3 Sensor Flange

Weights and Measures
1 Cstdy Trnsfr Approval
2 W&M Software Version
3 Core Firmware
4 Xmtr Firmware

* If GSV is enabled, GSV Flow Rate is displayed.
** Displayed only if Weights & Measures application is enabled.
*** Requires HART 7.
Figure 9-3  Configure menu: Top level

On-Line Menu >
1 Configure

Manual Setup
1  Characterize
2  Measurements
3  Display
4  Inputs/Outputs
5  Info Parameters
6  Burst Mode**
7  Security**

Alert Setup
1  I/O Fault Actions
2  Alert Severity
3  Discrete Events
4  CM Alerts*

*  Displayed only if the concentration measurement application is enabled.
**  Requires HART 7
Figure 9-4  Configure menu: Manual Setup

On-Line Menu >
  Configure >
  1 Manual Setup

Measurements
1 Flow
2 Density
3 Temperature
4 Update Rate
5 LD Optimization
6 Special Units
7 External Pressure/
  Temperature
8 Petroleum Measurement*
9 GSV
10 Conc Measure (CM)**

Display
1 Language
2 Display Variable Menu
  Features
3 Offline Variable Menu
  Features
4 Backlight
5 Display Variables
6 Decimal Places

Inputs/Outputs
1 Channels
2 mA Output 1
3 Frequency Output
4 Discrete Output
5 Communications
6 Variable Mapping

Characterize
1 Sensor Type
2 Sensor Tag Parameters

--- Additional options ---

* Displayed only if petroleum
  measurement is enabled on your
  transmitter. Menu numbers are
  adjusted as required.

** Displayed only if concentration
  measurement is enabled on your
  transmitter.
Figure 9-5  Configure menu: Manual Setup (continued)

On-Line Menu >
  2 Configure >
   1 Manual Setup

---

**Options are different, depending on HART version.**

**Requires HART 7.**
Figure 9-6  Configure menu: Manual Setup: Characterize

On-Line Menu >
  2 Configure >
  1 Manual Setup >
  1 Characterize

Sensor Type
  1 Curved Tube
  2 Straight Tube

Curved Tube  Sensor Type  Straight Tube

Sensor Tag Parameters
  1 FlowCal
  2 D1
  3 D2
  4 TC
  5 K1
  6 K2
  7 FD

Flow Parameters
  1 Flow FCF
  2 FTG
  3 FFQ

Density Parameters
  1 D1
  2 D2
  3 DT
  4 DTG
  5 K1
  6 K2
  7 FD
  8 DFQ1
  9 DFQ2
Figure 9-7 Configure menu: Manual Setup: Measurements

On-Line Menu >
  2 Configure >
  1 Manual Setup >
  2 Measurements

Flow
1 Flow Direction
2 Flow Damping
3 Mass Flow Unit
4 Mass Flow Cutoff
5 Mass Factor
6 Volume Flow Unit *
7 Volume Flow Cutoff *
8 Volume Factor

Temperature
1 Temperature Unit
2 Temp Damping

Update Rate
1 Update Rate
2 100 Hz Variable

Density
1 Density Unit
2 Density Damping
3 Density Cutoff
4 Density Factor
5 Slug Duration
6 Slug Low Limit
7 Slug High Limit

LD Optimization
1 Update Rate
2 100 Hz Variable

Special Units
1 Mass Special Units
2 Volume Special Units *

* If Volume Flow Type is GSV, GSV options are displayed.
Model 2700 Transmitters with Analog Outputs

Figure 9-8  Configure menu: Manual Setup: Measurements (continued)

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      2 Measurements

External Pressure/Temperature
  1 Pressure
  2 Temperature
  3 External Polling

Pressure
  1 Pressure Unit
  2 Pressure Compensation
  3 Compensation Pressure
  4 Flow Cal Pressure
  5 Flow Press Factor
  6 Dens Press Factor

Temperature
  1 Temperature Unit
  2 External Temperature
  3 Correction Temperature

External Polling
  1 Poll Control
  2 Ext Dev Tag 1
  3 Polled Variable 1
  4 Ext Dev Tag 2
  5 Polled Variable 2

Petroleum Measurement *
  1 2540 CTL Table type
  2 TEC
  3 Ref Temperature
  4 Petroleum Msmt Setup

GSV
  1 Volume Flow Type
  2 Gas Ref Density
  3 GSV Cutoff
  4 GSV Flow Unit
  5 Gas Density Unit

Conc Measure (CM) **
  1 CM Configuration
  2 Matrix Configuration
  3 Enter Matrix
  4 Trim CM Process Variables
  5 Reset Matrix Data

* Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.

** Displayed only if concentration measurement is enabled on your transmitter.
**Figure 9-9  Configure menu: Manual Setup: Display**

- **On-Line Menu**:
  - 2 Configure
  - 1 Manual Setup
  - 3 Display

1. **Language**

2. **Display Variable Menu Features**
   - 1 Totalizer Reset
   - 2 Start/Stop Totals
   - 3 Auto Scroll
   - 4 Scroll Time *
   - 5 Refresh Rate
   - 6 Status LED Blinking

3. **Offline Variable Menu Features**
   - 1 Offline Menu
   - 2 Alert Menu
   - 3 Acknowledge All
   - 4 Offline Passcode
   - 5 Alert Passcode
   - 6 Offline Passcode

4. **Backlight**
   - 1 Control

5. **Display Variables**
   - 1 Display Variables (1-5)
   - 2 Display Variables (6-10)
   - 3 Display Variables (11-15)

6. **Decimal Places**
   - 1 For Process Variables
   - 2 For Totalizer Variables
   - 3 For Diagnostic Variables

* Displayed only if Auto Scroll is enabled. Menu numbers are adjusted as required.
Figure 9-10  Configure menu: Manual Setup: Inputs/Outputs

- On-Line Menu >
  - 2 Configure >
    - 1 Manual Setup >
      - 4 Inputs/Outputs

- Channels
  - 1 Channel A
  - 2 Channel B
  - 3 Channel C

- Channel B
  - 1 Frequency Output
  - 2 Discrete Output

- mA Output
  - 1 Primary Variable
  - 2 mA Output Settings
  - 3 mA Fault Settings

  - mA Output Settings
    - 1 PV LRV
    - 2 PV URV
    - 3 PV Min Span
    - 4 PV LSL
    - 5 PV USL
    - 6 PV MAO Cutoff
    - 7 PV Added Damping

  - mA Fault Settings
    - 1 mAO Fault Action
    - 2 mAO Fault Level

- Frequency Output
  - 1 FO Settings
  - 2 FO Fault Parameters
  - 3 FO Scaling

  - FO Settings
    - 1 Third Variable
    - 2 Max Pulse Width
    - 3 FO Polarity

  - FO Fault Parameters
    - 1 Third Variable
    - 2 FO Fault Action
    - 3 FO Fault Level

  - FO Scaling *
    - 1 FO Scaling Method
    - 2 TV Frequency Factor
    - 3 TV Rate Factor
    - 4 Set FO Scaling

* Options vary depending on FO Scaling Method.
Figure 9-11  Configure menu: Manual Setup: Inputs/Outputs (continued)

- On-Line Menu >
  - 2 Configure >
    - 1 Manual Setup >
      - 4 Inputs/Outputs

- Discrete Output
  1. DO Assignment
  2. DO Polarity
  3. DO Fault Action
  4. Flow Switch Source
  5. Flow Switch Setpoint
  6. Hysteresis (0.1-10.0)

- Variable Mapping
  1. Primary Variable
  2. Secondary Variable
  3. Third Variable
  4. Fourth Variable

- Communications
  1. HART Address
  2. Tag
  3. Long Tag* (Requires HART 7)
  4. Device Identification
  5. Dev ID (CP)
  6. mA Output Mode
  7. Set Up RS-485 Port

- Set Up RS-485 Port
  1. Protocol
  2. Baud Rate
  3. Parity
  4. Stop Bits
  5. Modbus Slave Address
Figure 9-12  Configure menu: Alert Setup

On-Line Menu >
  2 Configure >
    2 Alert Setup

I/O Fault Actions
1  MAO1 Fault Action
2  MAO1 Fault Level
3  MAO2 Fault Action
4  MAO2 Fault Level
5  FO Fault Action
6  FO Fault Level
7  Comm Fault Action

Alert Severity
1  Fault Timeout
2  Set Alert Severity
3  View Alert Severity

Discrete Events
1  Discrete Event 1
2  Discrete Event 2
3  Discrete Event 3
4  Discrete Event 4
5  Discrete Event 5
6  Assign Discrete Action
7  Read Discrete Action
8  Review Discrete Actions

Discrete Event x
1  Discrete Event Var
2  Discrete Event Type
3  Setpoint A
4  Setpoint B

CM Alerts
1  Density Low Extrapolation Limit
2  Density High Extrapolation Limit
3  Temp Low Extrapolation Limit
4  Temp High Extrapolation Limit
On-Line Menu > 3 Service Tools

1. Alerts
   1. Refresh Alerts
   2. Alert Name

2. Variables
   1. Variable Summary
   2. Process Variables
   3. Mapped Variables
   4. External Variables
   5. Totalizer Control
   6. Variables (PM)*
   7. Variables (CM)**
   8. Inputs/Outputs

3. Trends
   1. Process Variables
   2. Diagnostic Variables

4. Maintenance
   1. Routine Maintenance
   2. Zero Calibration
   3. Density Calibration
   4. Temperature Calibration
   5. Diagnostic Variables
   6. Modbus Data

5. Simulate
   1. Simulate Outputs
   2. Simulate Sensor

* Displayed only if the petroleum measurement application is enabled on your transmitter.
** Menu numbers are adjusted as required.
- Menu numbers are adjusted as required.
Figure 9-14 Service Tools menu: Variables

On-Line Menu >
3 Service Tools >
2 Variables

Variable Summary
1 Mass Flow Rate
2 Volume Flow Rate
3 Density

Process Variables
1 Mass Flow Rate
2 Volume Flow Rate *
3 Density
4 Temperature

Mapped Variables
1 PV
2 SV
3 TV
4 QV

External Variables
1 External Temperature
2 External Pressure

Totalizer Control
1 All Totalizers
2 Mass
3 Volume *
4 CM Volume at Reference Temperature ***
5 CM Net Mass ***
6 CM Net Volume ***
7 Temp Corrected Volume (PM) **
8 Custody Transfer ****

Additional options

* If Volume Flow Type = GSV, GSV variables are displayed.
** Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.
*** Displayed only if concentration measurement is enabled on your transmitter. Menu numbers are adjusted as required.
**** Displayed only if the Weights & Measures application is installed on your transmitter.

All Totalizers
1 Start Totalizers
2 Stop Totalizers
3 Reset All Totals
4 Mass Total
5 Volume Total *

Mass
1 Mass Flow Rate
2 Mass Total
3 Mass Inventory
4 Reset Total

Volume *
1 Volume Flow Rate
2 Volume Total
3 Volume Inventory
4 Reset Total
Figure 9-15  Service Tools menu: Variables (continued)

On-Line Menu >
  3 Service Tools >
    2 Variables

Variables (PM) *
1  Density at Reference
  Temperature
2  Average Observed Density
3  Volume Flow at Reference
   Temperature
4  Average Observed
   Temperature
5  CTL

Variables (CM) **
1  Standard Volume Flow Rate
2  Standard Net Volume Flow
   Rate
3  Net Mass Flow Rate
4  Density at Reference
5  Concentration
6  Density (Fixed SG Units)

Outputs
1  mA Output
2  Frequency Output
3  DO State

* Displayed only if petroleum measurement is
  enabled on your transmitter. Menu numbers
  are adjusted as required.
** Displayed only if concentration measurement
  is enabled on your transmitter. Menu
  numbers are adjusted as required.
Figure 9-16  Service Tools menu: Maintenance

On-Line Menu >
3 Service Tools >
4 Maintenance

Routine Maintenance
- 1. Trim mA Output 1
- 2. Trim mA Output 2
- 3. Locate Device*
- 4. Device Reset*
- 5. Meter Verification **

Density Calibration
- 3. Density
- 2. Dens Pt1 (Air)
- 3. Dens Pt2 (Water)
- 4. Dens Pt3 T-Series
- 5. Dens Pt4 T-Series
- 6. Flowing Density

Temperature Calibration
- 4. Temperature
- 2. Temp Cal Factor

Manual Verification
- 1. Start
- 2. Upload Data Results from Device
- 3. Show Results Table
- 4. Show Results Plot
- 5. Most Recent Test Results

Diagnostic Variables
- 1. Sensor Model
- 2. Drive Gain
- 3. LPO Amplitude
- 4. RPO Amplitude
- 5. Tube Frequency
- 6. Live Zero
- 7. Fld Verification Zero
- 8. Additional

Additional
- 1. Core Processor Input Voltage
- 2. Board Temperature
- 3. Power On Time

Zero Calibration
- 2. Mass Flow Rate
- 2. Volume Flow Rate
- 3. Zero Time
- 4. Zero Value
- 5. Standard Deviation
- 6. Perform Auto Zero
- 7. Restore Factory Zero

Modbus Data
- 6. Read Modbus Data
- 2. Write Modbus Data

* Requires HART 7.
** Displayed only if meter verification is enabled.
Figure 9-17  Service Tools menu: Simulate

On-Line Menu >
3 Service Tools >
5 Simulate

1. Simulate Outputs
   1. mA Output Loop Test
   2. Frequency Output Test
   3. Discrete Output Test

2. Simulate Sensor
   1. Simulate Primary Purpose Variables
   2. Mass Flow Rate
   3. Density
   4. Temperature
Chapter 10
Model 2700 Transmitters with Intrinsically Safe Outputs

Figure 10-1  On-Line menu

```
On-Line Menu

1. Overview

2. Configure
   1. Manual Setup
   2. Alert Setup

3. Service Tools
   1. Alerts
   2. Variables
   3. Trends
   4. Maintenance
   5. Simulate
```
Figure 10-2  Overview menu

On-Line Menu >
  1 Overview

1 Dev Status:
2 Comm Status:
3 Mass Flow Rate
4 Status
5 Volume Flow Rate*
6 Status
7 Density
8 Status
9 Device Information

Device Information
  1 Identification
  2 Revisions
  3 Mat. of Construction
  4 Licenses
  5 Weights and Measures**

Identification
  1 Tag
  2 Long Tag***
  3 Model
  4 Xmtr Serial Num
  5 Sensor Serial Num
  6 CP Serial Num***
  7 Date
  8 Descriptor
  9 Message

Revisions
  1 Universal
  2 Field Device
  3 Hardware
  4 DD Revision
  5 Transmitter Software
  6 Core Processor S/W
  7 Eng to Order Num

Mat. of Construction
  1 Tube Wetted Mat.
  2 Tube Lining
  3 Sensor Flange

Weights and Measures
  1 Cstdy Trnsfr Approval
  2 W&M Software Version
  3 Core Firmware
  4 Xmtr Firmware

*  If GSV is enabled, GSV Flow Rate is displayed.
** Displayed only if Weights & Measures application is enabled.
*** Requires HART 7.
Figure 10-3  Configure menu: Top level

On-Line Menu >
  1 Configure

  Manual Setup
  1 Characterize
  2 Measurements
  3 Display
  4 Inputs/Outputs
  5 Info Parameters
  6 HART**
  7 Security**

  Alert Setup
  1 I/O Fault Actions
  2 Alert Severity
  3 Discrete Events
  4 CM Alerts*

* Displayed only if the concentration measurement application is enabled.
** Requires HART 7
Figure 10-4  Configure menu: Manual Setup

On-Line Menu >
  2 Configure >
    1 Manual Setup

Measurements
1 Flow
2 Density
3 Temperature
4 Update Rate
5 LD Optimization
6 Special Units
7 External Pressure/
  Temperature
8 Petroleum Measurement*
9 GSV
10 Conc Measure (CM)**

Display
1 Language
2 Display Variable Menu
  Features
3 Offline Variable Menu
  Features
4 Backlight
5 Display Variables
6 Decimal Places

Inputs/Outputs
1 Channels
2 mA Output 1
3 mA Output 2
4 Frequency Output
5 Discrete Output
6 Discrete Input
7 Communications
8 Variable Mapping

* Displayed only if petroleum measurement is
  enabled on your transmitter. Menu numbers
  are adjusted as required.

** Displayed only if concentration measurement
  is enabled on your transmitter.
Figure 10-5  Configure menu: Manual Setup (continued)

Options are different, depending on HART version.

** Requires HART 7.
Figure 10-6  Configure menu: Manual Setup: Characterize

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      1 Characterize

Sensor Type
1  Curved Tube
2  Straight Tube

Curved Tube  Sensor Type  Straight Tube

Sensor Tag Parameters
1  FlowCal
2  D1
3  D2
4  TC
5  K1
6  K2
7  FD

Sensor Tag Parameters
1  Flow Parameters
2  Density Parameters

Flow Parameters
1  Flow FCF
2  FTG
3  FFQ

Density Parameters
1  D1
2  D2
3  DT
4  DTG
5  K1
6  K2
7  FD
8  DFQ1
9  DFQ2
Figure 10-7  Configure menu: Manual Setup: Measurements

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      2 Measurements

Flow
1  Flow Direction
2  Flow Damping
3  Mass Flow Unit
4  Mass Flow Cutoff
5  Mass Factor
6  Volume Flow Unit *
7  Volume Flow Cutoff *
8  Volume Factor

Temperature
3  1 Temperature Unit
   2 Temp Damping

Update Rate
4  1 Update Rate
   2 100 Hz Variable

LD Optimization
5  1 Update Rate
   2 100 Hz Variable

Special Units
6  1 Mass Special Units
   2 Volume Special Units *

*  If Volume Flow Type is GSV, GSV options are displayed.
Figure 10-8  Configure menu: Manual Setup: Measurements (continued)

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      2 Measurements

Petroleum Measurement *
  1 2540 CTL Table type
  2 TEC
  3 Ref Temperature
  4 Petroleum Msmt Setup

GSV
  1 Volume Flow Type
  2 Gas Ref Density
  3 GSV Cutoff
  4 GSV Flow Unit
  5 Gas Density Unit

Conc Measure (CM) **
  1 CM Configuration
  2 Matrix Configuration
  3 Enter Matrix
  4 Trim CM Process Variables
  5 Reset Matrix Data

* Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.  
** Displayed only if concentration measurement is enabled on your transmitter.

External Pressure/ Temperature
  1 Pressure
  2 Temperature
  3 External Polling

Pressure
  1 Pressure Unit
  2 Pressure Compensation
  3 Compensation Pressure
  4 Flow Cal Pressure
  5 Flow Press Factor
  6 Dens Press Factor

Temperature
  1 Temperature Unit
  2 External Temperature
  3 Correction Temperature

External Polling
  1 Poll Control
  2 Ext Dev Tag 1
  3 Polled Variable 1
  4 Ext Dev Tag 2
  5 Polled Variable 2
Figure 10-9  Configure menu: Manual Setup: Display

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      3 Display

1. Language

Display Variable Menu
  Features
  1 Totalizer Reset
  2 Start/Stop Totals
  3 Auto Scroll
  4 Scroll Time *
  5 Refresh Rate
  6 Status LED Blinking

2. Display Variables
  1 Display Variables (1-5)
  2 Display Variables (6-10)
  3 Display Variables (11-15)

4. Backlight
   1 Control

5. Decimal Places
   1 For Process Variables
   2 For Totalizer Variables
   3 For Diagnostic Variables

3. Offline Variable Menu
   Features
   1 Offline Menu
   2 Alert Menu
   3 Acknowledge All
   4 Offline Passcode
   5 Alert Passcode
   6 Offline Passcode

* Displayed only if Auto Scroll is enabled. Menu numbers are adjusted as required.
Figure 10-10 Configure menu: Manual Setup: Inputs/Outputs
Figure 10-11 Configure menu: Inputs/Outputs (continued)

On-Line Menu >
2 Configure >
   1 Manual Setup >
4 Inputs/Outputs

--- Additional options ---

Frequency Output
1 FO Settings
2 FO Fault Parameters
3 FO Scaling

FO Settings
1 Third Variable
2 Max Pulse Width
3 FO Polarity
4 Mode

FO Fault Parameters
1 Third Variable
2 FO Fault Action
3 FO Fault Level

FO Scaling *
1 FO Scaling Method
2 TV Pulses/Unit
3 Set FO Scaling

Discrete Output
1 DO 1 Assignment
2 DO 1 Polarity
3 DO 1 Fault Action
4 DO 2 Assignment
5 DO 2 Polarity
6 DO 2 Fault Action
7 Flow Switch Source
8 Flow Switch Setpoint
9 Hysteresis (0.1-10.0)

* Options vary depending on FO Scaling Method.
Figure 10-12 Configure menu: Inputs/Outputs (continued)

On-Line Menu >
  2 Configure >
    1 Manual Setup >
      4 Inputs/Outputs

Communications
  1 HART Address
  2 Tag
  3 Long Tag *
  4 Device Identification
  5 Dev ID (CP)
  6 mA Output Action

Variable Mapping
  1 Primary Variable
  2 Secondary Variable
  3 Third Variable
  4 Fourth Variable

* Requires HART 7.
Figure 10-13 Service Tools menu: Alert Setup

On-Line Menu >
  2 Configure >
    2 Alert Setup

I/O Fault Actions
1 MAO1 Fault Action
2 MAO1 Fault Level
3 MAO2 Fault Action
4 MAO2 Fault Level
5 FO Fault Action
6 FO Fault Level
7 Comm Fault Action

Alert Severity
1 Fault Timeout
2 Set Alert Severity
3 View Alert Severity

Discrete Events
1 Discrete Event 1
2 Discrete Event 2
3 Discrete Event 3
4 Discrete Event 4
5 Discrete Event 5
6 Assign Discrete Action
7 Read Discrete Action
8 Review Discrete Actions

Discrete Event x
1 Discrete Event Var
2 Discrete Event Type
3 Setpoint A
4 Setpoint B

CM Alerts
1 Density Low Extrapolation Limit
2 Density High Extrapolation Limit
3 Temp Low Extrapolation Limit
4 Temp High Extrapolation Limit
Figure 10-14 Service Tools menu: Top level

On-Line Menu >
3 Service Tools

1 Alerts
   1 Refresh Alerts
   2 Alert Name

2 Variables
   1 Variable Summary
   2 Process Variables
   3 Mapped Variables
   4 External Variables
   5 Totalizer Control
   6 Variables (PM) *
   7 Variables (CM) **
   8 Outputs

3 Trends
   1 Process Variables
   2 Diagnostic Variables

4 Maintenance
   1 Routine Maintenance
   2 Zero Calibration
   3 Density Calibration
   4 Temperature Calibration
   5 Diagnostic Variables
   6 Modbus Data

5 Simulate
   1 Simulate Outputs
   2 Simulate Sensor

* Displayed only if the petroleum measurement application is enabled on your transmitter. Menu numbers are adjusted as required.
** Displayed only if the concentration measurement application is enabled on your transmitter. Menu numbers are adjusted as required.
Figure 10-15 Service Tools menu: Variables

On-Line Menu >
3 Service Tools >
2 Variables

Variable Summary
1 Mass Flow Rate
2 Volume Flow Rate
3 Density
4 Temperature

Process Variables
1 Mass Flow Rate
2 Volume Flow Rate *
3 Density
4 Temperature

Mapped Variables
1 PV
2 SV
3 TV
4 QV

External Variables
1 External Temperature
2 External Pressure

Totalizer Control
1 All Totalizers
2 Mass
3 Volume *
4 CM Volume at Reference Temperature ***
5 CM Net Mass ***
6 CM Net Volume ***
7 Temp Corrected Volume (PM) **
8 Custody Transfer ****

Additional options

* If Volume Flow Type = GSV, GSV variables are displayed.
** Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.
*** Displayed only if concentration measurement is enabled on your transmitter. Menu numbers are adjusted as required.
**** Displayed only if the Weights & Measures application is installed on your transmitter.
Figure 10-16 Service Tools menu: Variables (continued)

On-Line Menu >
3 Service Tools >
2 Variables

Variables (PM) *
1 Density at Reference Temperature
2 Average Observed Density
3 Volume Flow at Reference Temperature
4 Average Observed Temperature
5 CTL

Variables (CM) **
1 Standard Volume Flow Rate
2 Standard Net Volume Flow Rate
3 Net Mass Flow Rate
4 Density at Reference Concentration
5 Concentration
6 Density (Fixed SG Units)

Outputs
1 mA Output 1 (MA01)
2 mA Output 2 (MA02)
3 Frequency Output
4 DO State 1

* Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.

** Displayed only if concentration measurement is enabled on your transmitter. Menu numbers are adjusted as required.
Figure 10-17 Service Tools menu: Maintenance

On-Line Menu > 3 Service Tools > 4 Maintenance

Routine Maintenance
1 Trim mA Output 1
2 Trim mA Output 2
3 Locate Device*
4 Device Reset*
5 Meter Verification **

Density Calibration
1 Density
2 Dens Pt1 (Air)
3 Dens Pt2 (Water)
4 Dens Pt3 T-Series
5 Dens Pt4 T-Series
6 Flowing Density

Temperature Calibration
1 Temperature
2 Temp Cal Factor

Diagnostic Variables
1 Sensor Model
2 Drive Gain
3 LPO Amplitude
4 RPO Amplitude
5 Tube Frequency
6 Live Zero
7 Fld Verification Zero
8 Additional

Additional
1 Core Processor Input Voltage
2 Board Temperature
3 Power On Time

Zero Calibration
1 Mass Flow Rate
2 Volume Flow Rate
3 Zero Time
4 Zero Value
5 Standard Deviation
6 Perform Auto Zero
7 Restore Factory Zero

Manual Verification
1 Start
2 Upload Data Results from Device
3 Show Results Table
4 Show Results Plot
5 Most Recent Test Results

Manual Verification
1 Start
2 Upload Data Results from Device
3 Show Results Table
4 Next Run
5 Hrs Until Next Run
6 Set Recurring Hours
7 Turn Off Schedule

Modbus Data
1 Read Modbus Data
2 Write Modbus Data

* Requires HART 7.
** Displayed only if meter verification is enabled.
Figure 10-18 Service Tools menu: Simulate

On-Line Menu >
  3 Service Tools >
    5 Simulate

1. Simulate Outputs
   1. mA Output 1 Loop Test
   2. mA Output 2 Loop Test
   3. Frequency Output Test
   4. Discrete Output 1 Test

2. Simulate Sensor
   1. Simulate Primary Purpose Variables
   2. Mass Flow Rate
   3. Density
   4. Temperature
Chapter 11
Model 2700 Transmitters with Configurable Input/Outputs

Figure 11-1 On-Line menu

On-Line Menu

1. Overview

2. Configure
   1. Manual Setup
   2. Alert Setup

3. Service Tools
   1. Alerts
   2. Variables
   3. Trends
   4. Maintenance
   5. Simulate
Figure 11-2  Overview menu

On-Line Menu >
1 Overview

1 Dev Status:
2 Comm Status:
3 Mass Flow Rate
4 Status
5 Volume Flow Rate*
6 Status
7 Density
8 Status
9 Device Information

Device Information
1 Identification
2 Revisions
3 Mat. of Construction
4 Licenses
5 Weights and Measures**

Identification
1 Tag
2 Long Tag***
3 Model
4 Xmtr Serial Num
5 Sensor Serial Num
6 CP Serial Num***
7 Date
8 Descriptor
9 Message

Revisions
1 Universal
2 Field Device
3 Hardware
4 DD Revision
5 Transmitter Software
6 Core Processor S/W
7 Eng to Order Num

Mat. of Construction
1 Tube Wetted Mat.
2 Tube Lining
3 Sensor Flange

Weights and Measures
1 Cstdy Tnsfr Approval
2 W&M Software Version
3 Core Firmware
4 Xmtr Firmware

* If GSV is enabled, GSV Flow Rate is displayed.
** Displayed only if Weights & Measures application is enabled.
*** Requires HART 7.
Figure 11-3  Configure menu: Top level

On-Line Menu >
1 Configure

1. Manual Setup
   1. Characterize
   2. Measurements
   3. Display
   4. Inputs/Outputs
   5. Info Parameters
   6. HART**
   7. Security**

2. Alert Setup
   1. I/O Fault Actions
   2. Alert Severity
   3. Discrete Events
   4. CM Alerts*

* Displayed only if the concentration measurement application is enabled.
** Requires HART 7
Figure 11-4  Configure menu: Manual Setup

On-Line Menu >
  2 Configure >
  1 Manual Setup

- Additional options - - - -

Characterize
  1 Sensor Type
  2 Sensor Tag Parameters

Measurements
  1 Flow
  2 Density
  3 Temperature
  4 Update Rate
  5 LD Optimization
  6 Special Units
  7 External Pressure/
    Temperature
  8 Petroleum Measurement*
  9 GSV
  10 Conc Measure (CM)**

* Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.

** Displayed only if concentration measurement is enabled on your transmitter.

Display
  1 Language
  2 Display Variable Menu Features
  3 Offline Variable Menu Features
  4 Backlight
  5 Display Variables
  6 Decimal Places

Inputs/Outputs
  1 Channels
  2 mA Output 1
  3 mA Output 2
  4 Frequency Output
  5 Discrete Output
  6 Discrete Input
  7 Communications
  8 Variable Mapping
Figure 11-5  Configure menu: Manual Setup (continued)

On-Line Menu >
2 Configure >
1 Manual Setup

Info Parameters
1 Transmitter Info
2 Sensor Information

Transmitter Info
1 Tag
2 Long Tag **
3 Xmtr Serial Num
4 Message
5 Descriptor
6 Date

Sensor Information
1 Sensor Type
2 Sensor Serial Num
3 Tube Wetted Mat.
4 Tube Lining
5 Sensor Flange

HART**
1 Burst Mode *

Burst Message 1 - 3
1 Mode
2 Option
3 Message Contents
3 Configure Update Rate

Security
1 Write Protect
2 Lock/Unlock Device **

* Options are different, depending on HART version.
** Requires HART 7.
Figure 11-6  Configure menu: Manual Setup: Characterize
Figure 11-7  Configure menu: Manual Setup: Measurements

On-Line Menu >
2 Configure >
1 Manual Setup >
2 Measurements

Flow
1  Flow Direction
2  Flow Damping
3  Mass Flow Unit
4  Mass Flow Cutoff
5  Mass Factor
6  Volume Flow Unit *
7  Volume Flow Cutoff *
8  Volume Factor

Density
1  Density Unit
2  Density Damping
3  Density Cutoff
4  Density Factor
5  Slug Duration
6  Slug Low Limit
7  Slug High Limit

Temperature
3  1  Temperature Unit
   2  Temp Damping

Update Rate
4  1  Update Rate
   2  100 Hz Variable

LD Optimization
5  1  Update Rate
   2  100 Hz Variable

Special Units
6  1  Mass Special Units
   2  Volume Special Units *

* If Volume Flow Type is GSV, GSV options are displayed.
Model 2700 Transmitters with Configurable Input/Outputs

Figure 11-8  Configure menu: Manual Setup: Measurements (continued)

On-Line Menu >
2 Configure >
1 Manual Setup >
2 Measurements

External Pressure/ Temperature
1 Pressure
2 Temperature
3 External Polling

Pressure
1 Pressure Unit
2 Pressure Compensation
3 Compensation Pressure
4 Flow Cal Pressure
5 Flow Press Factor
6 Dens Press Factor

Temperature
1 Temperature Unit
2 External Temperature
3 Correction Temperature

External Polling
1 Poll Control
2 Ext Dev Tag 1
3 Polled Variable 1
4 Ext Dev Tag 2
5 Polled Variable 2

Petroleum Measurement *
1 2540 CTL Table type
2 TEC
3 Ref Temperature
4 Petroleum Msmt Setup

GSV
1 Volume Flow Type
2 Gas Ref Density
3 GSV Cutoff
4 GSV Flow Unit
5 Gas Density Unit

Conc Measure (CM) **
1 CM Configuration
2 Matrix Configuration
3 Enter Matrix
4 Trim CM Process Variables
5 Reset Matrix Data

* Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.
** Displayed only if concentration measurement is enabled on your transmitter.
Figure 11-9  Configure menu: Manual Setup: Display

- **On-Line Menu**
  - 2 Configure
    - 1 Manual Setup
      - 3 Display

1. **Language**
2. **Display Variable Menu**
   - Features
     - 1 Totalizer Reset
     - 2 Start/Stop Totals
     - 3 Auto Scroll
     - 4 Scroll Time *
     - 5 Refresh Rate
     - 6 Status LED Blinking
3. **Offline Variable Menu**
   - Features
     - 1 Offline Menu
     - 2 Alert Menu
     - 3 Acknowledge All
     - 4 Offline Passcode
     - 5 Alert Passcode
     - 6 Offline Passcode
4. **Backlight**
   - 1 Control
5. **Display Variables**
   - 1 Display Variables (1-5)
   - 2 Display Variables (6-10)
   - 3 Display Variables (11-15)
6. **Decimal Places**
   - 1 For Process Variables
   - 2 For Totalizer Variables
   - 3 For Diagnostic Variables

* Displayed only if Auto Scroll is enabled. Menu numbers are adjusted as required.
Figure 11-10 Configure menu: Manual Setup: Inputs/Outputs

On-Line Menu >
  2 Configure >
    1 Manual Setup >
    4 Inputs/Outputs

--- Additional options ---

Channels
1 Channel A
2 Channel A Power
3 Channel B
4 Channel B Power
5 Channel C
6 Channel C Power

Channel B
- 1 Frequency Output
- 2 AO2
- 3 Discrete Output 1

Channel B Power
- 1 External
- 2 Internal

Channel C
- 1 Frequency Output
- 2 AO2
- 3 Discrete Output 1

Channel C Power
- 1 External
- 2 Internal
Figure 11-11 Configure menu: Manual Setup: Inputs/Outputs (continued)
Figure 11-12 Configure menu: Manual Setup: Inputs/Outputs (continued)

- On-Line Menu >
  2 Configure >
    1 Manual Setup >
      4 Inputs/Outputs

- Additional options

**Frequency Output**
1. FO Settings
2. FO Fault Parameters
3. FO Scaling

**Discrete Output**
1. DO 1 Assignment
2. DO 1 Polarity
3. DO 1 Fault Action
4. DO 2 Assignment
5. DO 2 Polarity
6. DO 2 Fault Action
7. Flow Switch Source
8. Flow Switch Setpoint
9. Hysteresis (0.1-10.0)

**Discrete Input**
1. DI Assignment
2. DI Polarity

**FO Settings**
1. Third Variable
2. Max Pulse Width
3. FO Polarity
4. Mode

**FO Fault Parameters**
1. Third Variable
2. FO Fault Action
3. FO Fault Level

**FO Scaling**
1. FO Scaling Method
2. TV Pulses/Unit
3. Set FO Scaling

* Options vary depending on FO Scaling Method.
Figure 11-13 Configure menu: Manual Setup: Inputs/Outputs (continued)

On-Line Menu >
2 Configure >
1 Manual Setup >
4 Inputs/Outputs

Communications
1  HART Address
2  Tag
3  Long Tag *
4  Device Identification
5  Dev ID (CP)
6  mA Output Action

Variable Mapping
1  Primary Variable
2  Secondary Variable
3  Third Variable
4  Fourth Variable

* Requires HART 7.
Figure 11-14 Configure menu: Alert Setup

On-Line Menu >
   2 Configure >
      2 Alert Setup

I/O Fault Actions
1 MAO1 Fault Action
2 MAO1 Fault Level
3 MAO2 Fault Action
4 MAO2 Fault Level
5 FO Fault Action
6 FO Fault Level
7 Comm Fault Action

Alert Severity
1 Fault Timeout
2 Set Alert Severity
3 View Alert Severity

Discrete Events
1 Discrete Event 1
2 Discrete Event 2
3 Discrete Event 3
4 Discrete Event 4
5 Discrete Event 5
6 Assign Discrete Action
7 Read Discrete Action
8 Review Discrete Actions

Discrete Event x
1 Discrete Event Var
2 Discrete Event Type
3 Setpoint A
4 Setpoint B

CM Alerts
1 Density Low Extrapolation Limit
2 Density High Extrapolation Limit
3 Temp Low Extrapolation Limit
4 Temp High Extrapolation Limit
Figure 11-15 Service Tools menu: Top level

On-Line Menu > 3 Service Tools

1. Alerts
   1. Refresh Alerts
   2. Alert Name

2. Variables
   1. Variable Summary
   2. Process Variables
   3. Mapped Variables
   4. External Variables
   5. Totalizer Control
   6. Variables (PM) *
   7. Variables (CM) **
   8. Inputs/Outputs

3. Trends
   1. Process Variables
   2. Diagnostic Variables

4. Maintenance
   1. Routine Maintenance
   2. Zero Calibration
   3. Density Calibration
   4. Temperature Calibration
   5. Diagnostic Variables
   6. Modbus Data

5. Simulate
   1. Simulate Outputs
   2. Simulate Sensor

* Displayed only if the petroleum measurement application is enabled on your transmitter. Menu numbers are adjusted as required.

** Displayed only if the concentration measurement application is enabled on your transmitter. Menu numbers are adjusted as required.
Figure 11-16 Service Tools menu: Variables

- **Variable Summary**
  - Mass Flow Rate
  - Volume Flow Rate
  - Density

- **Process Variables**
  1. Mass Flow Rate
  2. Volume Flow Rate *
  3. Density
  4. Temperature

- **Totalizer Control**
  1. All Totalizers
  2. Mass
  3. Volume *
  4. CM Volume at Reference Temperature ***
  5. CM Net Mass ***
  6. CM Net Volume ***
  7. Temp Corrected Volume (PM) **
  8. Custody Transfer ****

- **Mapped Variables**
  1. PV
  2. SV
  3. TV
  4. QV

- **External Variables**
  1. External Temperature
  2. External Pressure

* If Volume Flow Type = GSV, GSV variables are displayed.
** Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.
*** Displayed only if concentration measurement is enabled on your transmitter. Menu numbers are adjusted as required.
**** Displayed only if the Weights & Measures application is installed on your transmitter.
Figure 11-17 Service Tools menu: Variables (continued)

Variables (PM) *
1. Density at Reference Temperature
2. Average Observed Density
3. Volume Flow at Reference Temperature
4. Average Observed Temperature
5. CTL

Variables (CM) **
1. Standard Volume Flow Rate
2. Standard Net Volume Flow Rate
3. Net Mass Flow Rate
4. Density at Reference
5. Concentration
6. Density (Fixed SG Units)

Inputs/Outputs
1. mA Output 1 (MA01)
2. mA Output 2 (MA02)
3. Frequency Output
4. DO State 1
5. DO State 2
6. DI State

* Displayed only if petroleum measurement is enabled on your transmitter. Menu numbers are adjusted as required.

** Displayed only if concentration measurement is enabled on your transmitter. Menu numbers are adjusted as required.
Figure 11-18 Service Tools menu: Maintenance

On-Line Menu >
3 Service Tools >
4 Maintenance

Routine Maintenance
1 Trim mA Output 1
2 Trim mA Output 2
3 Locate Device*
4 Device Reset*
5 Meter Verification **

Density Calibration
1 Density
2 Dens Pt1 (Air)
3 Dens Pt2 (Water)
4 Dens Pt3 T-Series
5 Dens Pt4 T-Series
6 Flowing Density

Temperature Calibration
1 Temperature
2 Temp Cal Factor

Diagnostic Variables
1 Sensor Model
2 Drive Gain
3 LPO Amplitude
4 RPO Amplitude
5 Tube Frequency
6 Live Zero
7 Fld Verification Zero
8 Additional

Additional
1 Core Processor Input Voltage
2 Board Temperature
3 Power On Time

Manual Verification
1 Start
2 Upload Data Results from Device
3 Show Results Table
4 Show Results Plot
5 Most Recent Test Results

Manual Verification
1 Start
2 Upload Data Results from Device
3 Show Results Table
4 Next Run
5 Hrs Until Next Run
6 Set Recurring Hours
7 Turn Off Schedule

Zero Calibration
1 Mass Flow Rate
2 Volume Flow Rate
3 Zero Time
4 Zero Value
5 Standard Deviation
6 Perform Auto Zero
7 Restore Factory Zero

Modbus Data
1 Read Modbus Data
2 Write Modbus Data

* Requires HART 7.
** Displayed only if meter verification is enabled.
Figure 11-19 Service Tools menu: Simulate

On-Line Menu >
  3 Service Tools >
    5 Simulate

Simulate Outputs
  1  mA Output 1 Loop Test
  2  mA Output 2 Loop Test
  3  Frequency Output Test
  4  Discrete Output 1 Test
  5  Discrete Output 2 Test

Simulate Sensor
  1  Simulate Primary Purpose Variables
  2  Mass Flow Rate
  3  Density
  4  Temperature