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Micro MV Training

Section 1: Course Description

Our training session is a one day, hands-on workshop that provides the student an opportunity to explore all the features of our flow computers in a safe and guided environment. Our objective is to help our customers become familiar with our products and maximize the investment they make in Dynamic Flow Computers.

1.1   Course Objectives

- •   Identify Hardware Components
- •   Build sample meter configuration
- •   Understand calibration procedures
- •   Retrieve historical information

1.2   Course Overview

- • Introduction: Basic Micro MV overview
- • Technical Data: Flow computer physical & electrical characteristics
- • Communications: Micro MV wiring and communication setup
- • Configuration Software:
  - Overview of Screens
  - Diagnostics Section
  - Snapshot Section
  - Configuration Section
  - Calibration
  - Reporting
  - Additional features
- • Firmware Download (optional)
- • Questions & Answers

1.3   Prerequisites

- •   Students must have basic knowledge of fluid measurement. This class is focused on the flow computer operation and not on fluid measurement.
- •   Participants must bring their own laptop computers and any special equipment they would like to covered in the class, such as calibration equipment. Demo Micro MV units, power supplies, software and handouts will be provided by Dynamic Flow Computers.

Section 2: Micro MV Overview

2.1   Introduction

The Micro MV flow computer handles up to four gas or liquid meter runs. It includes the following flow equations: New API 14.3 (Orifice Plate), ISO 5167, Turbine (AGA7) and V-Cone, Foxboro Mass Meter, Venturi & Wedge. Additionally, it can perform density calculations using AGA8 standards and API tables for liquid applications.

One Rosemount 205 MultiVariable sensor can be connected to each Micro MV flow computer to provide temperature, pressure (up to 3626 PSI) and DP (up to 1000" H_2O).

Micro MV Technical Details:

POWER	
Voltage	7 to 28 VDC
Power Consumption	0.5 Watts
OPERATING CONDITIONS	
Temperature	-40 to 185 °F
Humidity	100%
Housing	NEMA 4X Class 1, Division 1
FEATURES	
Display	Plasma Backlit Display
	4 Lines, 20 Characters per line
	4 Infrared Reflective Sensors
Processor	32 bit Motorola 68332 @ 16.7 MHz
Flash Rom	4 MB @ 70 Nanoseconds
RAM	2 MB
Frequency Input	3 Channels
	Channels 1 & 2 are Sine/Square Wave Capable
	Channel 3 is Square Wave Only
	Square Wave Range is 0-6000 Hz
	Sine Wave Range is 0-1200 Hz
	Signal > 40 mV for Sine Wave
	Signal > 3 Volts for Square Wave
Analog Output	One 16 bit, single ended output, Expandable to four
Digital Input/Output	Three Digital Inputs or Outputs
	Digital Outputs have 0.25 Amp Rating
All inputs and outputs are optically isolated	
Serial	Two RS-485 @ 19200 Baud Variable
	One RS-232 @ 9600 Baud Variable
	One Printer Output
Communication Protocol	Modbus
Rosemount 205 Module	Temperature: -200 thru 1200 °F
	Static Pressure: 0 thru 800 PSI OR
	0 thru 3626 PSI
	Differential Pressure: 0 thru 250" OR
	0 thru 1000"

Section 3: Micro MV Communications

3.1   Communication

The Micro MV flow computer has three serial ports; one RS-232 and two RS-485.

Follow the wiring drawing below to connect the serial cable. If the unit has the optional RS-232E elbow port, no wiring is required other than plugging a serial cable into the DB9 port located in the side elbow.
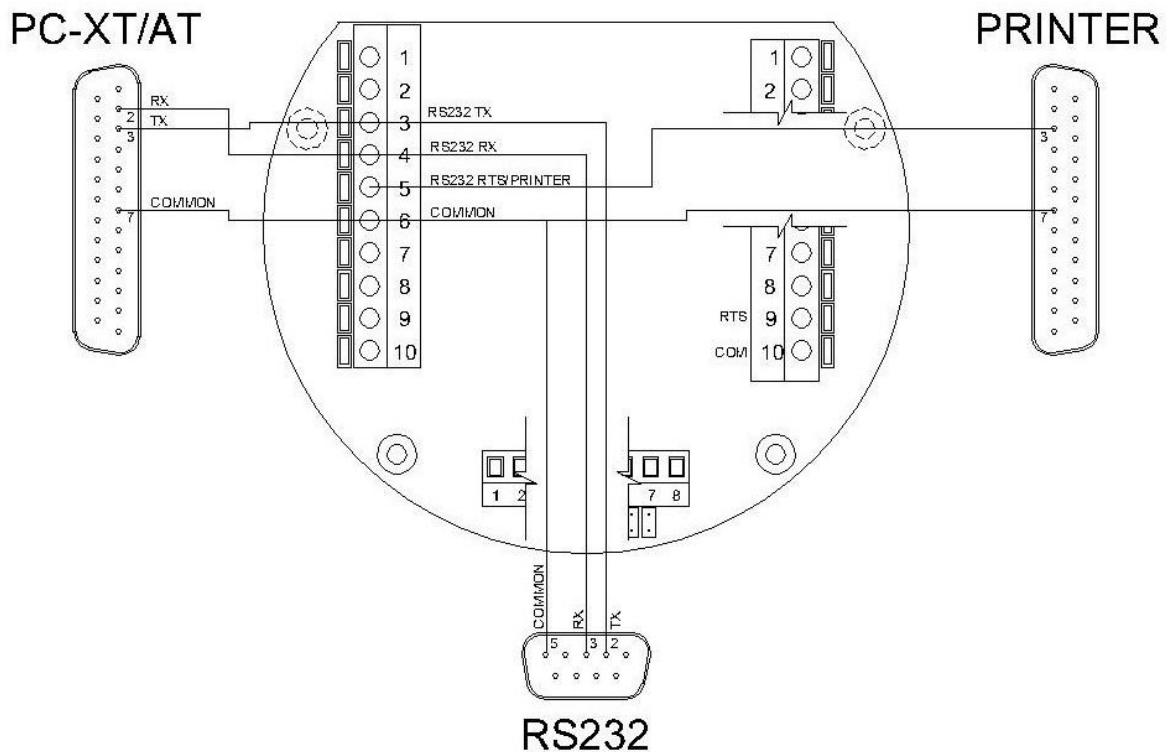
Once the cable is in place, use the Dynacom® software to detect the flow computer. In the Dynacom **Tools** menu, select **Comm Settings** and click on the **Auto Detect** button.

Section 4: Configuration Software

4.1 Dynacom® Configuration Software

In order to calculate flow, it is necessary to enter site parameters such as size of the orifice plate and characteristics at base conditions of the gas or liquid being measured.

The flow computer requires at least Pipe ID, Orifice ID and Gas composition information to calculate gas flow. To get a detailed description of the data entries, please refer to the Operator's Manual.

Default Calibration	**Offset Calibration**	**Full Scale Calibration**
Returns calibration to default factory settings.	Performs a single point adjustment to the variable reading.	Uses a two point calibration sequence for an accurate range calibration.
1. Select multivariable DP, temperature or pressure.	1. Induce live value for temperature, pressure or DP.	1. Induce live value for temperature, pressure or DP.
2. Select Reset calibration method.	2. Select multivariable DP, temperature or pressure.	2. Select multivariable DP, temperature or pressure.
3. Verify the live reading against the flow computer reading.	3. Select offset calibration method, enter offset value and click the 'OK' button.	3. Select full calibration method.
	4. Read induced live values to verify the calibration.	4. Induce the low range signal, enter the first point and then click the 'OK' button.
		5. Induce the high range signal, enter the second point and then click the 'OK' button.
		6. Verify the live reading against the flow computer reading.

Data Collection:
- Previous Hourly Data
- Previous Daily Data
- Last Month Data
- Last Month Daily Data

- Alarm Report
- Audit Report
- PGAS Report
- CFX Report

Additional Features:
- I/O Configuration
- Display Assignments

- Modbus Shift
- PID Control

Section 5: Image File

5.1   Image File Download

An Image file is the firmware of the flow computer and sets it up for a certain application (liquid, gas, prover, etc). The Image file is only done when an application upgrade is required.

- When an Image file is downloaded to the flow computer, all the information in the flow computer is lost (configuration and historical data), so make sure to retrieve all flow computer data before updating the Image file.

An Image file can be downloaded through the **main RS-232 port only**. To download a new Image file, follow these steps:

- Select '**Download Program**' from the Dynacom® Software '**Tools**' menu.
- A pop-up window will appear, asking for the name of the Image file to be downloaded. Type it in or use the Browse button to locate it.
- Once the name has been entered or the file has been selected, click the '**Download**' button.
- A Warning message reminds you that this action will erase ALL the data on the flow computer.
- The Image file download should take about 7 minutes to complete. Once the Image file is in place, the flow computer is ready to be configured (see Section 4 of this training for more information).