

**Dynamic Flow Computers, Inc.**  
**12603 Southwest Freeway, Suite 320**  
**Stafford, TX 77477**

**Ph: (281) 565-1118 • Fax: (281) 565-1119**

**[www.dynamicflowcomputers.com](http://www.dynamicflowcomputers.com)**

# **E-Chart 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 E-Chart overview
- Technical Data: Flow computer physical & electrical characteristics
- Communications: E-Chart 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 E-Chart units, power supplies, software and handouts will be provided by Dynamic Flow Computers.

## Section 2: E-Chart Overview

### 2.1 Introduction

The E-Chart flow computer handles one meter run and optional additional auxiliary meter. It includes the following flow equations: New API 14.3, ISO 5167, Turbine (AGA7) and V-Cone, Slotted DP Meter. Additionally, it can perform density calculations using AGA8 standards.

One Rosemount 205 MultiVariable sensor can be connected to each E-Chart flow computer to provide temperature, pressure (up to 3626 PSI) and DP (up to 1000" H<sup>2</sup>O).

E-Chart Technical Details:

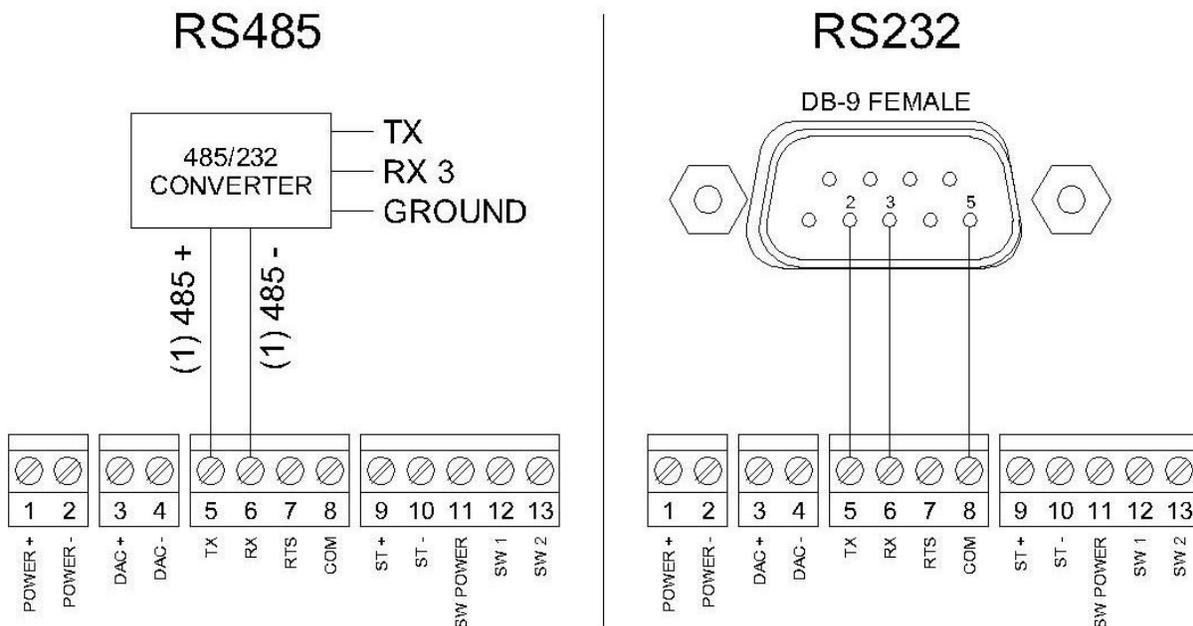
<b>POWER</b>	
Voltage	7 to 24 VDC
Power Consumption	0.3 Watts
<b>OPERATING CONDITIONS</b>	
Temperature	-40 to 185 °F
Humidity	100%
Housing	NEMA 4X Class 1, Division 1
<b>FEATURES</b>	
Display	Graphical Plasma Display 8 Lines, 16 Characters per line (64x128)
Processor	32 bit Motorola 68332 @ 16.7 MHz
Flash Rom	4 MB @ 70 Nanoseconds
RAM	2 MB
Frequency Input	1 Channel Square Wave Range 0-6000 Hz > 3 Volts Wave
Analog Output	One 16 bit, single ended output
Digital Input/Output	1 Digital Input 2 Digital Outputs Digital Outputs have 0.25 Amp Rating
All inputs and outputs are optically isolated	
Serial	One Serial Port configurable as RS-485 or RS-232
Communication Protocol	Modbus
PID Control	Flow Loop and Pressure Loop
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: E-Chart Communications

### 3.1 Communication

The E-Chart flow computer has two serial ports. The main port can be used as RS-232 or RS-485. The second port is optional and can only be used as RS-232.

Follow the wiring drawing below to connect the serial cable. If the unit has the second optional 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<sup>®</sup> 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<sup>®</sup> 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.

#### Calibration Reset

Returns calibration to default factory settings.

1. Select multivariable DP, temperature or pressure.
2. Select Reset calibration method.
3. Verify the live reading against the flow computer reading.

#### Offset Calibration

Performs a single point adjustment to the variable reading.

1. Induce live value for temperature, pressure or DP.
2. Select multivariable DP, temperature or pressure.
3. Select offset calibration method, enter offset value and click the 'OK' button.
4. Read induced live values to verify the calibration.

#### Full Scale Calibration

Uses a two point calibration sequence for an accurate range calibration.

1. Induce live value for temperature, pressure or DP.
2. Select multivariable DP, temperature or pressure.
3. Select full calibration method.
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<sup>®</sup> 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).