DATASHEET

Enhanced Liquid & Gas Flow Computer for ControlLogix®

MVI56E-AFC

ProSoft Technology's MVI56E-AFC in-chassis flow computer solution allows you to augment a Rockwell Automation ControlLogix® platform with a standalone In-Chassis flow computer for custody transfer and allocation measurement of oil, gas, and water.

The MVI56E-AFC provides measurement compliance with industry standards such as AGA, API, GPA, ISO, providing a powerful measurement solution.

This solution eliminates the need for separate RTUs or standalone flow computers for the measurement of oil and gas applications where ControlLogix® is performing the automation of a site. This simplified solution allows you to optimize your resources, decrease your capital spend, and reduce support and maintenance costs associated with your well-pad automation.

In addition, our flow computer sits in a ControlLogix® system, allowing you to take advantage of Rockwell Automation's distributed I/O capability and ProSoft's wireless radios to greatly reduce wiring to your transmitters and I/O devices.

Features

- **Meter runs:** The module can calculate up to 16 meter runs with four streams per run simultaneously, making it cost-effective, since more meters can be connected to a single flow computer.
- **Modbus capabilities:** Remote configuration and diagnostics via Ethernet (Modbus® TCP/IP). Flexible serial port configurations allow for either two Modbus slave ports or one Modbus slave and one Modbus Master port. All data, including configuration, calculated results, and historical archives, are available using either the Modbus TCP/IP server or Modbus slave serial ports.
- **Customized Modbus Data Mapping:** Remapping to a virtual slave enables data concentration, reducing bandwidth load on the communication system.
- **Auditability:** Our configuration software provides the ability to download and view archives and events. Audit Scan captures process inputs and calculated results as "snapshots", allowing verification of calculations. The Event Log records significant events and alarms. Hourly and daily archives are configurable historical records of user-selected data. The data can be viewed online, printed, or saved to a file in .txt or .csv format. Archive data can be exported to Flow-Cal .cfx format. Meter calibration and verification are stored on the module.
- **Meter proving:** Allows for meter proving with 3 configurable prover types.
- **Security:** Password protection schemes are available to control user access and log meter calibration and verification activities.

Configuration

The EAFC Manager is a free Windows 7-based configuration, reporting, and monitoring tool provided with all E-AFC modules. Project configurations may be uploaded, downloaded, and saved to the PC under user-selectable file names.

General Specifications

- The module is recognized by the processor as an Input/Output module
- The included Add-On Instruction (AOI) files are used for data transfers between the module and processor, reducing configuration time
- Configuration is downloaded over Ethernet by way of the Modbus TCP/IP servers, or delivered by user-defined ladder

Functional Specifications

The MVI56E-AFC module operates as a powerful flow computer module, augmenting the operation of the ControlLogix® processor by providing a dedicated and accurate set of flow calculations.

- Calculates flow rates, accumulated volumes, accumulated mass, and accumulated energy
- Calculation results are transferred to processor memory and may also be transferred to a SCADA host using Modbus serial or Modbus TCP/IP
- User-configurable, allowing each of the meter runs to be individually set up to meet the specific requirements of an application

Archiving

- Supports data archiving and event logging
- Data archiving is available for each meter run, hourly for two days (48 records) and daily for one month (35 records) under default configuration, with optional extended archives up to 1,440 hourly (60 days) and 1,440 daily. The actual number of archives is dependent upon the size set by the user for each archive type.
- Event logging feature provides storage of up to 2,000 station events

Configurable Options

- User-selectable units for totalizers and flow rates on a per-channel basis
- Roll-over value for resettable and non-resettable totalizers for every meter channel
- Process analog input units and ranges (pressure, temperature, differential pressure, density) from analog input modules and pulse inputs from pulse/frequency input modules in a ControlLogix chassis
- Fluid selection provides a choice of several liquid groups or gas measurement, using AGA or ISO calculations
- Event log reports for all security-sensitive configuration data (for example, orifice diameter) are date- and time-stamped. This data can be saved to disk for importing into any spreadsheet or printed as a hard copy.

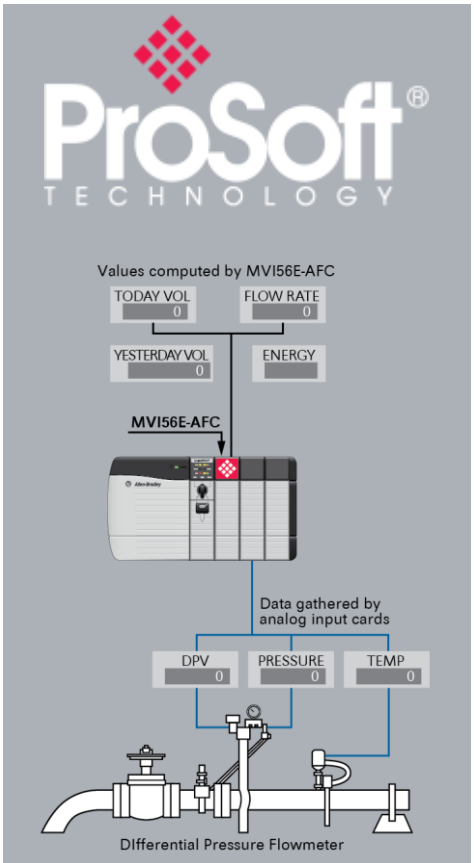
Modbus Interface

- SCADA communication is provided by the Modbus TCP/IP server and Modbus slave serial ports
- Modbus table may be re-mapped as a virtual Modbus slave for user-assigned contiguous register polling by a SCADA client/master (up to 20,000 registers)
- Poll remote devices (such as a Gas Chromatograph) by utilizing the Modbus Master serial port

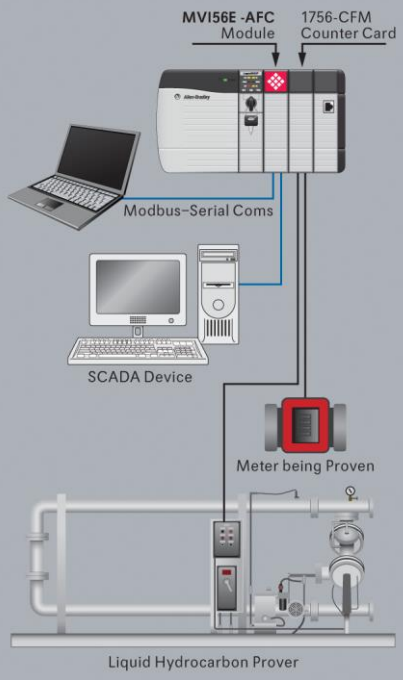
System Requirements - EAFC Manager

This configuration software is designed for Microsoft Windows 7. Minimum hardware requirements for a Windows 7 system are as listed below. More advanced operating systems have significantly higher minimum requirements regardless of EAFC Manager minimum requirements.

- 1 GHz or faster 32-bit (x86) or 64-bit (x64) processor
- 1 GB RAM (32-bit) or 2 GB RAM (64-bit)
- 16 GB available hard drive space (32-bit) or 20GB (64-bit)
- Assigned IP Address



Typical Prover Configuration



Hardware Specifications

Specification	Description
Backplane Current Load	800 mA @ 5 VDC 3 mA @ 24 VDC
Operating Temperature	32°F to 140°F (0°C to 60°C)
Storage Temperature	-40°F to 185°F (-40°C to 85°C)
Shock Vibration	30g operational, 50g non-operational 5g from 10 to 150 Hz
Relative Humidity	5% to 95% RH, with no condensation
LED Indicators	Module Status, Backplane Transfer Status, Application Status, Serial Activity
Ethernet port	
1 Ethernet Application Port	10/100 Mbps, RJ45 Link and Activity LED Auto crossover (Auto MDIX)
Serial Application Ports (P1 & P2)	
2 Serial Application Ports	RJ45 (DB-9M with supplied cable) RS-232, RS-485, RS-422 jumper selectable RS-232 handshaking configurable 500V optical isolation from backplane Full hardware handshaking control, providing radio, modem and multi-drop support
Shipped with Unit	RJ45 to DB-9M cables for each port 6-foot DB-9F to DB-9F null modem cable

Measurement Compliance Standards

- API MPMS Chapter 14.3 (AGA Report No. 3), 2012 or 1992 ed.
- ISO 5167, Part 2, 3, 4, and 5 (2003 ed).
- ISO 6976
- AGA Report No. 7
- API MPMS Chapter 14.2 (AGA Report No, 8), Ed. 2 (1994), Detail Characterization Method (for compressibility factor and densities) and Appendix C.3 (for energy content)
- API MPMS Chapter 14.9 (AGA Report No. 11) (Coriolis mass meters)
- AGA Report No. 9 (Ultrasonic meters)
- API MPMS Chapter 11.1, 2004 ed. (complete)
- API MPMS Chapter 11.2 (CPL for lower-density liquids)
- GPA Technical Paper 27 (CTL and density correction for lower-density liquids)
- GPA Technical Paper 15 (vapor pressure for lower-density liquids)
- API MPMS Chapter 12.2 Parts 1, 2 and 3
- API MPMS Chapter 20.1 (measurement of liquids with high water content)
- API MPMS Chapter 21.1 (gases), 2013 Edition
- API MPMS Chapter 21.2 (liquids)
- GPA 2145-16
- GPSA Engineering Data Book (SI)
- GPSA Engineering Data Book (FPS)

Agency Approvals & Certifications

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MVI56E-AFC

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