ProSoft® TECHNOLOGY

Where Automation Connects.


# MVI56E-AFC

**Enhanced Liquid and Gas Flow Computer for ControlLogix®**

December 1, 2022

## RELEASE NOTES

## Your Feedback Please

We always want you to feel that you made the right decision to use our products. If you have suggestions, comments, compliments or complaints about our products, documentation, or support, please write or call us.

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MVI56E-AFC Release Notes
For public use.

December 1, 2022



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# Contents

# 1 Start Here

This document highlights the new features, fixes, enhancements, and known issues for the MVI56E-AFC.

## 1.1 Compatibility

The following table shows the base firmware and operating system kernel versions that are compatible with each application firmware version.

| Application Firmware Image | | Base Firmware Image | | OS Kernel Version |
|---|---|---|---|---|
| 4.06.001 #057 | 19-Aug-2022 | 1.03 #012 | 07-Oct-2022 | 2.6.33.7 #9 |
| 4.06.001 #056 | 30-Jun-2022 | 1.01 #010 | 02-Mar-2018 | 2.6.33.7 #9 |
| 4.06.000 #044 | 07-Mar-2022 | 1.01 #010 | 02-Mar-2018 | 2.6.33.7 #9 |
| 4.05.002 #023 | 31-Mar-2021 | 1.01 #010 | 02-Mar-2018 | 2.6.33.7 #9 |
| 4.05.001 #022 | 25-Feb-2020 | 1.01 #010 | 02-Mar-2018 | 2.6.33.7 #9 |
| 4.05.000 #021 | 24-Sep-2019 | 1.01 #010 | 02-Mar-2018 | 2.6.33.7 #9 |
| 4.04.002 #017 | 30-May-2019 | 1.01 #010 | 02-Mar-2018 | 2.6.33.7 #9 |
| 4.04.001 #014 | 12-Feb-2019 | 1.01 #010 | 02-Mar-2018 | 2.6.33.7 #9 |
| 4.04.000 #012 | 12-Sep-2018 | 1.01 #010 | 02-Mar-2018 | 2.6.33.7 #9 |
| 4.03.000 #020 | 01-Mar-2018 | 1.01 #010 | 02-Mar-2018 | 2.6.33.7 #9 |
| 4.02.000 #010 | 04-Oct-2017 | 1.00 #003 | 15-Feb-2015 | 2.6.33.7 #6 |
| 4.01.000 #016 | 21-Dec-2016 | 1.00 #003 | 15-Feb-2015 | 2.6.33.7 #6 |
| 4.00.000 #034 | 19-Apr-2016 | 1.00 #003 | 15-Feb-2015 | 2.6.33.7 #6 |

## 1.2 About the MVI56E-AFC

ProSoft Technology's in-chassis flow computer solution allows you to monitor gas and liquid meters for flow rates, accumulator values, and other calculation results. All alarm data is displayed on our configuration screens.

This solution eliminates the need for multiple RTUs and standalone flow computers for a multi-well pad application. This solution reduces support and maintenance costs as well as helping to decrease your capital spend. This simplified solution allows you to optimize your resources.

# 2 Release Enhancements and Known Issues

| Release Version | Release Date | Feature Enhancements and Known Issues |
|---|---|---|
| 4.06.001 #057 | 19-Aug-2022 | • RS-485 power-down sequence enhancement to minimize RS-485 network disruption. |
| 4.06.001 | 30-Jun-2022 | • MASC accumulator periods based upon contract day instead of calendar day.<br>• Meter extended totalizer contract period accumulator increment enhancement to only require single boundary transition. |
| 4.06.000 | 07-Mar-2022 | • Mass allocation shrinkage calculations.<br>• API 20.1 Water cut methods (static, live, and density based).<br>• Pressure bias (offset) process input scaling.<br>• Meter stream grouping<br>o Meter stream allocation for up to 16 streams per meter run.<br>o Total 64 global streams that can be allocated to all meter runs. |
| 4.05.002 | 31-Mar-2021 | • Correction to linear pulse count accumulators. |
| 4.05.001 | 25-Feb-2020 | • Correction to serial port library for RS-485/422. |
| 4.05.000 | 24-Sep-2019 | • Mass heating value in US units changed from MBTU/lb. to BTU/lb.<br>• Volumetric heating value in US units changed from MBTU/cf to BTU/cf.<br>• API MPMS Chapter 14.5 3rd Edition (Nov. 1992, Reaffirmed Mar 2006) (GPA standard 2172-09).<br>• Enron history download date stamp adjustment for Cygnet Modbus EFM minimum date stamp (1/1/2000) requirement.<br>• Temperature bias (offset) process input scaling.<br>• Default meter archive extended file size set to 1440 records.<br>• Density process input units addition for g/cm$^3$.<br>• Addition of thermal mass meter physical device type.<br>• Meter contract previous daily and monthly quantity non-resettable accumulator values and totals.<br>• Meter linear regression projected contract daily and monthly non-resettable accumulator values and totals.<br>• Accumulation of multiple meter runs into a single meter run.<br>• Meter configuration asset tag addition. |
| 4.04.000 | 12-Sep-2018 | • Negative mass water product correction.<br>• Volumetric heating value when US units scaling factor correction.<br>• ISO 5167 Parts 3 (nozzles), 4 (Venturi tubes), 5 (cones). |

| Release Version | Release Date | Feature Enhancements and Known Issues |
|---|---|---|
| | | • Differential-pressure meter pipe Reynolds number, including raising minimum limit of viscosity to non-zero 1.0e-6.<br>• Manufactured pulse count for frequency-integration meters.<br>• Record transmitter-calibration activity in the Event Log.<br>• Interpolate discontinuity at high operating pressure of old CPL standards (API 11.2, used with Tables E) near density 637 kg/m3 or relative density 0.637.<br>• Communication channel byte-swap option, for easy I/O via Modbus of character strings and byte arrays.<br>• Correct the availability in the Modbus dictionary of C-prime for liquid differential-pressure meters.<br>• Enron history records are now dynamically configured according to archive configuration; previous static configuration is no longer available.<br>• Implemented connection-idle timeout to compensate for homegrown keep-alive (MB function 7).<br>• Correct the error of initializing default water salinity on meter reset.<br>• Repurpose meter parameter "V-cone/wedge discharge coefficient" to "Override discharge coefficient"; now non-zero value overrides value computed by Standard.<br>• Changes to default archive layout.<br>• Properly export to the Modbus database the “density range” flag for NGL/LPG pressure correction, at meter-relative input register address 49.L (low-order byte). Corrects a bug that has been present in all previous versions of the MVI56E-AFC.<br>• Increase maximum iteration count for the density-correction procedure of NGL/LPG measurement from 10 to 50.<br>• For differential-pressure meters only: Changed C-Prime calculation to be consistent with the expectations of FlowCal. |
| 4.03.000 | 15-Aug-2018 | • Extend serial communication speeds with higher baud selections 28800, 38400, 57600, 115200, 230400.<br>• Process-input sample rate alarm, for compliance with API 21.1/21.2.<br>• Export UDT declaration files (as .L5X) for user-configurable backplane-return and archive-record layouts, importable into the user's Logix project.<br>• Densitometer correction factor.<br>• Repurpose stream parameter "Water density at 60øF" to "Water salinity" (relevant to high-water products: emulsions, produced/injected water).<br>• W&M lock status: make available in Modbus database, record changes in Event Log.<br>• Hardware watchdog.<br>• Some enhancements necessary for obtaining EU certification:<br>o Separate "on-error" accumulator. |

| Release Version | Release Date | Feature Enhancements and Known Issues |
|---|---|---|
| | | o File-object CRCs (extended-archive records, transmitter calibration files).<br>• Heating value via ISO 6976, and Wobbe index.<br>• Alarming enhancements: acknowledgement, pulse fidelity.<br>• Enhancements to module's on-board website, including:<br>o Main page now lists versions of: (1) Application firmware; (2) Base firmware; (3) Operating system.<br>o New page: "Component Integrity" lists hashes &c of firmware components for confirming their validity (required for EU certification).<br>o New page: "Monitor" displays on demand configuration and live results for verification of ongoing operation (required for EU certification).<br>o Firmware update via HTTP now requires (1) W&M switch unlocked, and (2) use of the "web IP" (i.e. unavailable if using the IP of a Modbus TCP/IP server). |
| 4.02.000 | 2-Oct-2017 | • Correction of C-prime calculation<br>o For differential-pressure meters only, changed C-Prime calculation to be consistent with the expectations of FlowCal.<br>• Override of relative density (specific gravity) and heating value<br>o Allows the user to input relative density and heating values instead of using the AGA8-calculated values based on gas analysis data.<br>• Added option for AGA3-2012 or AGA3-1992 used in calculations.<br>• Physical device selection<br>o Added the ability to specify the meter type used for a meter run (Example: coriolis, turbine, ultrasonic, etc.)<br>• User-specified archive parameters<br>o Allows user to pass data from PLC code or other Modbus registers to the MVI56E-AFC, and the values are averaged according to API 21.1 for gas or API 21.2 for Liquids. Can be used to pass parameters not used in calculations (such as Coriolis meter drive gain) to the archive of the module for storage in non-volatile memory on the module. These values are part of the archive record.<br>• Extended meter factor to differential meter types<br>o Allows for the use of a meter factor when a differential meter is used and the primary process input is selected as ‘flow rate’.<br>• Selected archive interface<br>o Changes the external host reading of the meter archive file to be local based on the connection instead of global. This prevents 2 hosts from accessing the archive data and receiving invalid information based on another host request. |

| Release Version | Release Date | Feature Enhancements and Known Issues |
|---|---|---|
| 4.01.000 | 19-Dec-2016 | • Added features to Transmitter Calibration:<br>o Recording of As-Found/As-Left values<br>o Pass through to PLC of Transmitter Calibration data<br>o Allow multiple transmitters in a single session<br>o Display frozen values in transmitter calibration window<br>o Add meter tag to the calibration report<br>o Suffix UTC offset to local reported at date/times<br>o Bug fix for transmitter deselection<br>• Added Authorized User Database with permissions roles<br>• Added Log Event for firmware upgrade for D17 compliance<br>• Added new liquid product type of “water” with temperature compensation<br>• Added option for liquid volumes to select between Gross Volume and Indicated Volume<br>• Updated GPA 2145-09 to GPA 2145-16<br>• Added option for “strict compliance with 11.2.2M” for Directive 17 compliance<br>• Updated GPA TP-27 (API 11.2.4, 2012 edition)<br>• Extended shrinkage factor (SF) to all liquid product types<br>• Implemented Linear meter no-flow cutoff (all product types)<br>• Various bug fixes for EAFC Manager interface to module |
| 4.00.000 | 21-Apr-2016 | • AFC Manager does not recognize when communications to the module have been interrupted. User must click **Communications > Disconnect Module** to change state.<br>• All MVI56E-AFC serial ports support 9600 and 19200 baud rates only. |

# 3 Support, Service & Warranty

## 3.1 Contacting Technical Support

ProSoft Technology, Inc. is committed to providing the most efficient and effective support possible. Before calling, please gather the following information to assist in expediting this process:

1. Product Version Number
2. System architecture
3. Network details

If the issue is hardware related, we will also need information regarding:

1. Module configuration and associated ladder files, if any
2. Module operation and any unusual behavior
3. Configuration/Debug status information
4. LED patterns
5. Details about the interfaced serial, Ethernet or Fieldbus devices

**Note:** For technical support calls within the United States, ProSoft Technology's 24/7 after-hours phone support is available for urgent plant-down issues.

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