

# MEA-2000 in Serial Control

## Description

This technical note serves as a quick-start guide for configuring and operating the out-of-the-box MEA-2000 with an AFP MRV two-position valve. The actuator can be controlled using either a digital input or serial communication. This guide focuses on serial communication using the AFP Network Protocol and a secondary industry-standard protocol to support rapid integration and commissioning.



## Characteristics

- 30% smaller footprint vs previous model (4.20" x 2.125" x 2.75").
- Intelligent – Detects and adapts to the number of ports in a two-position valve by initialization process. Easy switching from 4 ports to 14 ports with an auto configuration.
- No need for multiple actuator models for the different types of valves: Compatible for MRV and RVP rotary valves.
- Two modes – fast actuation or high torque set by serial command.
- CE approved.
- Compatibility of OEM protocols on request.
- Direct replacement of 2-position electrical actuators in the market.
- AFP\_CLIENT utility software for easy operation and development of the actuator.
- Multiple run time information: track the number of boots, configurations, actuations, etc.
- Energy-efficient: Low standby power with on-demand operation for portable applications.

## Serial Communication Features

- Multiuser
- Compatibility between AFP product family
- Easy to use text command (ASCII)
- Return parameter to confirm command execution

## MEA-2000 Default Configuration

|                                |         |
|--------------------------------|---------|
| Control Mode: Digital          | CMD_010 |
| Selection Mode: 2 Inputs       | CMD_014 |
| Digital Input polarity: Normal | CMD_017 |
| Torque: High                   | CMD_019 |
| Secondary protocol: Active     | CMD_020 |
| ID number: 01                  | CMD_009 |

## Serial Communication Features

| SPECIFICATION                                  | DESCRIPTION                     |                              |
|------------------------------------------------|---------------------------------|------------------------------|
| 8-bit Microcontroller and configuration Memory |                                 |                              |
| USB 2.0                                        | Full Duplex                     | 9600 Bauds                   |
| RS-232                                         | Full Duplex                     | 9600 Bauds                   |
| RS-485 (2 wires)                               | Half Duplex                     | 9600 Bauds                   |
| Operating temperature                          | Fahrenheit (°F)<br>Celsius (°C) | 32°F to 140°F<br>0°C to 60°C |
| CE Conform, RoHS                               |                                 |                              |

## Electrical Specifications

### General Application

| SPECIFICATION                                                       | DESCRIPTION |                           |
|---------------------------------------------------------------------|-------------|---------------------------|
| Supply voltage input<br>(Transient and Reverse polarity protection) | Typical     | 24 Volts DC /<br>1.5 Amp. |
| Standby power consumption                                           | Typical     | 1.6 W.                    |

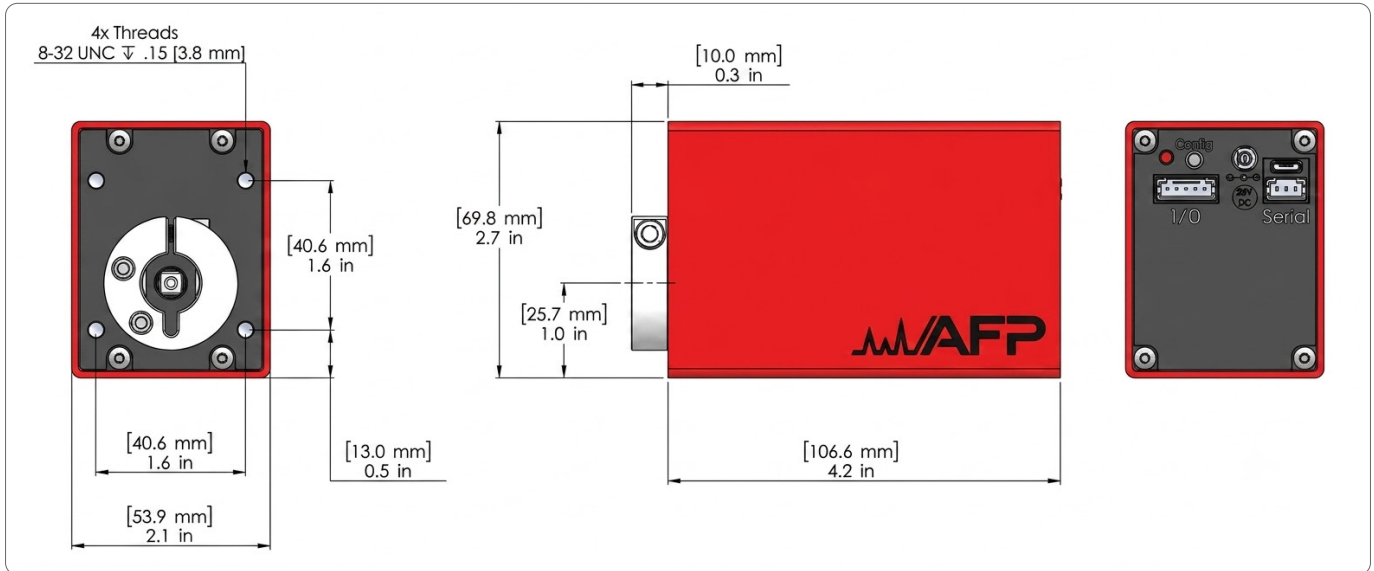
### Digital Input Specifications

| ALL DIGITAL INPUTS          | OPTO ISOLATED             |
|-----------------------------|---------------------------|
| Open collector input        | 5V / 1.0kΩ = 5 mA Typical |
| Dry contact (switch to GND) | Internal pull-up          |

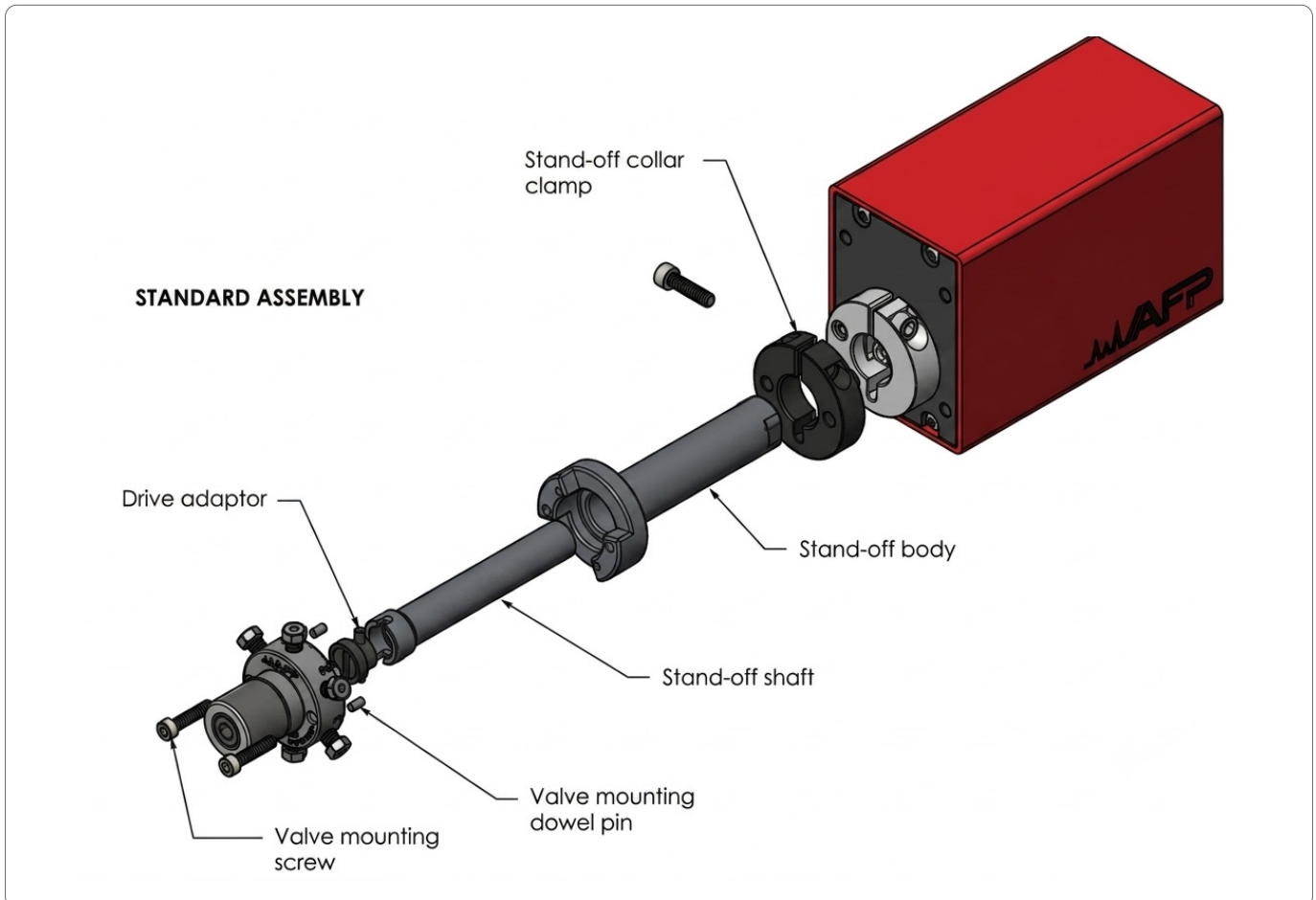
### Digital Output Specifications

| ALL DIGITAL OUTPUTS  | OPTO ISOLATED                      |
|----------------------|------------------------------------|
| Opto isolated output | Internal pull-up 5V / 1.0kΩ = 5 mA |
| Output Voltage       | TTL level +5 Volts                 |
| Output Current       | 5 mA                               |

## Dimensions



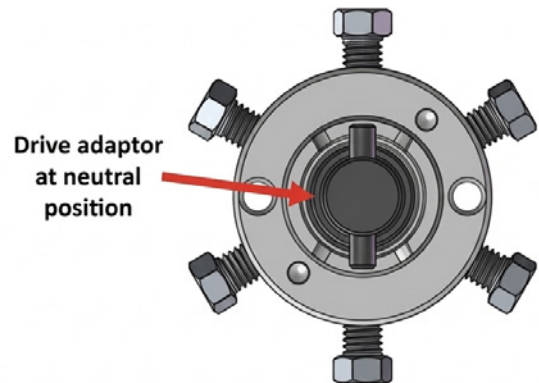
## Standard Assembly



### Before Starting

For your own safety, before installing or changing a valve on the MEA-2000 remove power supply from the actuator.

- If there is a valve already on the MEA, remove the rotary valve by unscrewing the two valve mounting screws from the standoff/close mount valve seat.
- If desired, remove dowel pins ( $\varnothing 3/32'' \times 3/16''$ ) from the previous rotary valve and change them for the dowel pins provided with your new rotary valve.
- Align the rotor using the drive adaptor to the neutral position, as shown in the image.
- Place the new rotary valve with its drive adaptor on the MEA standoff / close mount valve seat. Be sure to line up the valve until the mounting screws can be re-installed, this will align the shaft of the actuator with the valve and standoff.
- Using the valve mounting screw, fix the valve assembly on the standoff/closemount assembly. Tighten with 7/64'' Allen key, mounting screws to 30 lb-in (3.3 N-m).



### Tuning a MEA-2000

#### Configuring the Electrical Actuator

When a valve is changed, you need to inform the MEA-2000. The MEA-2000 controller needs to know the type of valve to deal with. The easiest way to do it is to press the self-adjustment button.

The Self-Adjustment consists of:

- Four actuations with hard stroke ending to sense the valve hard limit.
- Two fine tuning actuations to save and confirm a successful configuration.
- The MEA-2000 will go to the specified port by its control mode and input status.

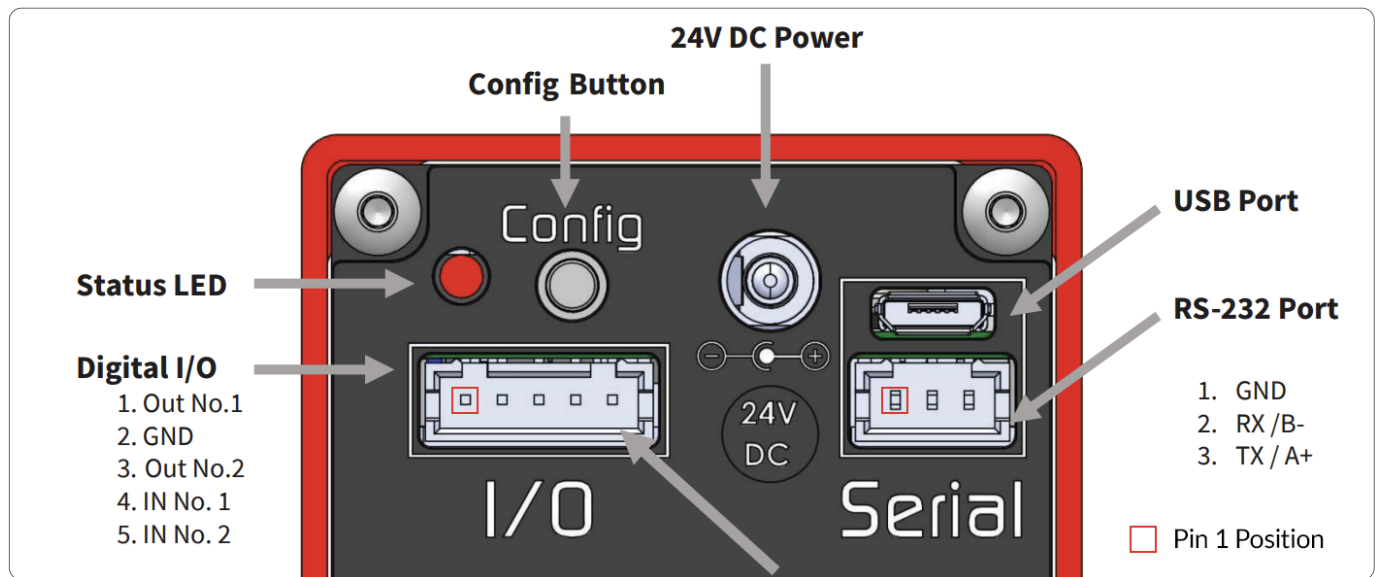
### STATUS LED

Waiting mode is active if the MEA-2000 is waiting the user to press the configuration button. Usually the waiting mode append when the MEA-2000 does not see a valve in the self-adjustment process or when the firmware is updated.

In the waiting mode, the configuration LED is blinking fast. Otherwise, in normal operation the configuration LED is blinking slowly.

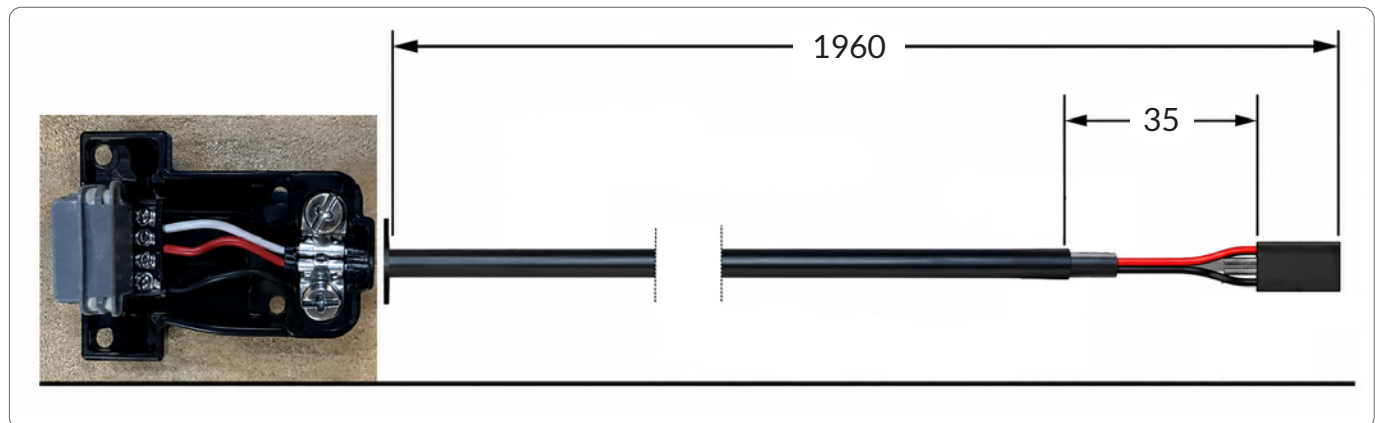
**Note:** If no valve is present, the MEA-2000 will start the initialization process and then return to the installation / flat position.

## MEA-2000 Back Panel



## EA00-9010-1020

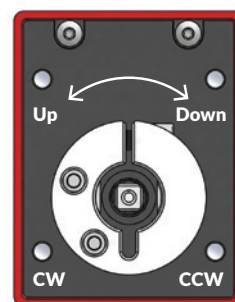
## DB-9 RS-232 Serial Cable



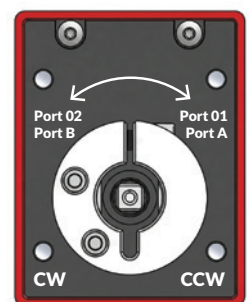
| DB-9 FEMALE |          |             | MEA 3 PIN CONNECTOR |          |
|-------------|----------|-------------|---------------------|----------|
| Wire color  | DB-9 Pin | DB-9 Signal | Serial port pin     | Position |
| Red         | 3        | TX server   | 3                   | Right    |
| White       | 2        | RX server   | 2                   | Center   |
| Black       | 5        | GND         | 1                   | Left     |

## MEA Rotation and Port Positions

The MEA rotation operates like a construction drill. Clockwise rotation causes the MEA port number to go up. Counterclockwise rotation causes the port number to go down. This description is based on looking at the view from the shaft point of view.



All MEA Actuation



2 Positions

## MEA-2000: SERIAL CONTROL ACTUATION

Here are commonly used actuations commands for the AFP\_CLIENT utility software. All examples use the edited button in both AFP communication Protocol. You can also use other communication software and COM port settings at 9600,N,8,1.

### Open Communication Port:

**AFP** AFP\_CLIENT ver 1.3

COM Serial Port Settings

|           |            |         |            |            |                                                                      |             |
|-----------|------------|---------|------------|------------|----------------------------------------------------------------------|-------------|
| COM Port: | Baud Rate: | Parity: | Data Bits: | Stop Bits: | <input checked="" type="radio"/> Open<br><input type="radio"/> Close | I.D. Number |
| COM8      | 9600       | None    | 8          | One        |                                                                      | 01          |

### Changing The Control Mode:

Command Number:010  
Parameter: MODE,SERIAL  
For control by the serial comm.  
Parameter: MODE,DIGITAL  
For control by digital input

Control Mode (010) MODE,SERIAL

### Actuation Using Both Protocols

1. Press the Show MEA Status button to give MEA informations.
2. In the same line both command have the same actuation: CMD\_232 is Toggle position and TO is Toggle position
3. Check and Un-check the “Used secondary protocol” and see in the terminal windows the difference command format.

**MEA Model**

☒ MEA-2000 TWO Positions  
☐ MEA-2100 MULTI Positions

**AFP** **Secondary**

Get Actual Position

CMD\_221 01 CP

One Port Actuation

GOTO Position 1 or A CW

CMD\_232 TOGGLE Position TO

GOTO Position 2 or B CC

MEA Position GOTO Actuation

1 2 3

☒ Used secondary Protocol

## MEA-2000: SERIAL MODE CONFIGURATION

The following are commonly used configuration commands for the AFP\_CLIENT utility software. Some examples use the edited button, while others use the AFP Protocol Command Editor. You can also use other communication software and COM port settings at 9600, N, 8, 1.

### Open Communication Port:

AFP AFP\_CLIENT ver 1.3

COM Serial Port Settings

COM Port:  Baud Rate:  Parity:  Data Bits:  Stop Bits:  ☒ Open ☐ Close I.D. Number

### Changing The Control Mode:

Command Number:010  
Parameter: MODE,SERIAL  
For control by the serial comm.  
Parameter: MODE,DIGITAL  
For control by digital input

Control Mode (010)

U01CMD\_H\_010=MODE,DIGITAL  
\_ACK\_

AFP Protocol Command Editor

I.D.:  Return Param:  Function No:  Function Parameter:

### Changing The Port Number:

Command Number:015  
Parameter: 04,08,16  
For control VALVE number of port

Nb\_Port (015)

Selection Mode (014)

Control Mode (010)

GET  
04  
08  
16

### Changing The Torque Mode:

Command Number:019  
Parameter: MODE,1  
For High Torque /low speed  
Parameter: MODE,2  
For Mid Torque / mid speed input

Torque Mode (019)

U01CMD\_H\_019=MODE,1  
\_ACK\_

AFP Protocol Command Editor

I.D.:  Return Param:  Function No:  Function Parameter: