We are pleased to announce the release and availability of the MI/O-67® Fieldbus Platform. Our initial release includes several different protocol options in addition to several modules to ensure a complete system package. Below are some of the general features of the platform.

- MI/O-67® will utilize existing MACConnect® technology with MI/O-67® specific part numbers
- 5 protocols offered for flexibility of different customer systems
- Digital, Analog and PowerPlus™ modules to accommodate any I/O or additional valves needed
- Designed to meet IP67 washdown specifications (with appropriate valve series modifications)

The remainder of this bulletin will outline specific details on each module and provide information on ordering for both the MI/O-67® platform and various MACConnect® valve series for the initial release.

**MI/O-67® Communications Module**

The communications module is the brains of the MI/O-67® platform and will be the minimum required module to implement a fieldbus solution. There will be 5 protocols available upon the initial release:

- EtherNet/IP®
- EtherCAT®
- POWERLINK®
- PROFINET®
- Modbus/TCP®

Each communication module will be capable of driving up to 32 solenoids (32 singles, 16 doubles max or any combination of the two up to 32 solenoids) on the MACConnect® stack. The module has a capability of outputting 8 A max (0.5 A max per channel) to the MACConnect® stack. You can connect up to 12 additional modules to each communication module and have 8A shared across those additional modules. All of the MI/O-67® modules will operate on a 24VDC negative common setup. It will be attached to the MACConnect® stack via a valve series specific adapter.

The communications modules will be available in both a 7/8” 4-pin mini and 7/8” 5-pin mini power configuration and will incorporate two Ethernet M12 ports for pass through communication to other network devices. The valve power is brought in on different pins than the electronics power for isolation purposes and both have the capability to handle up to 8A.
In addition to the hardware information laid out above there will be additional software and training tools available for distributor and customer use. These software tools include a digital manual, IP configuration tool and Add On Instructions (AOI) profiles for each module. The associated configuration files (EDS, ESI, etc.) are available on the MAC Valves website. Videos will be posted to the MAC Valves YouTube® page to show simple configuration tips and techniques.

All modules will attach via binding clip assemblies (4 clips come with each communications module and 2 clips come with each additional module). You will not need to order the clips separately for assembly, except to stock spares. Please note that each MI/O-67® assembly requires an end plate kit (M-M0001-01) and associated MI/O-67® valve series adapter.
**MI/O-67® Digital I/O Module**

The Digital I/O module will help you to differentiate over the competition. While many competitors have digital modules that supply both inputs and outputs in the same module, with the MAC Digital I/O module your customer will be able to change the entire module between NPN and PNP input mode and will also have control over the number of inputs and outputs. The configuration options for I/O include:

- 0 inputs, 16 outputs
- 16 inputs, 0 outputs
- 8 inputs, 8 outputs

Each channel will have 2 I/O points per M12 connector and will have fault detection as a standard. Max output will be 0.5A per channel from the shared 8 A electronics power.
MI/O-67® Analog I/O Modules

The analog I/O modules will also be available on the initial release of the MI/O-67® platform. Unlike the Digital I/O module, these modules are not configurable. Each Analog I/O module comes set at 4 inputs and 4 outputs (one input and one output per M12 connector). You will also need to take note whether your customer is using 4-20 mA or 0-10VDC analog I/O as they are ordered as two separate modules. Each configuration will also include fault detection.
**MI/O-67® PowerPlus™ Module**

The PowerPlus™ module gives you an additional 12 output points at 0.5 A per channel. The setup is similar to the Digital and Analog modules in that there are two outputs per M12 connector. The PowerPlus™ module requires you to bring in up to an additional 6 A of independent power via a 7/8” 5-pin mini power connector to power these additional outputs for valves and other devices.

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**MI/O-67® MAConnect® Series**

There will be three different MAConnect® series adapters available initially which are the 36/46, 42 and 92 series. In the past with smaller MAConnect® series you were limited to 16 solenoids; with the release of the MI/O-67® MAConnect® series part numbering, you can now order up to 32 solenoid outputs as a standard (only 32 solenoid output boards will be available on MI/O-67® MAConnect® series). Please note that on the new 36/46 and 42 series MAConnect® bases there is a limitation of 26 solenoids that may be energized at a given time if you are using 5.4W coils. Additional releases will be sent out as new adapters are developed. As with previous MAConnect® series releases, bases can be wired for single or double solenoid and you will need to order these as such. Note that a single solenoid valve placed on a base wired for double solenoid will consume two outputs.
36/46 Series

BOM for Above Stack:
1. (1) M-M0001-01  End-Plate Kit for MI/O-67®
2. (1) MIO67A-CM-EN-01  MI/O-67® EtherNet/IP® Communications Module
3. (1) M-46019-01  46 Series MI/O-67® MACone® Interface Adapter
4. (16) 46A-LMA-1C-JDAP-1FA  46 Series Valves with MI/O-67® Bases
5. (1) M-46018-01-16  46 Series MACone® End-Plate Kit
BOM for Above Stack:

1. (1) M-M0001-01  End-Plate Kit for MI/O-67®
2. (1) MIO67A-CM-EN-01  MI/O-67® EtherNet/IP® Communications Module
3. (1) M-42023-01-08  42 Series MI/O-67® MAConnect® Interface Adapter
4. (7) 42A-AMA-D11-GDAP-1DJ  42 Series Middle Station Valves with MI/O-67® Bases
5. (1) 42A-AMA-D31-GDAP-1DJ  42 Series End Station Valve with MI/O-67® Base
BOM for Above Stack:

1. (1) M-M0001-01  
   End-Plate Kit for MI/O-67®

2. (1) MIO67A-DG-01-01  
   MI/O-67® Digital I/O Module

3. (1) MIO67A-CM-EN-01  
   MI/O-67® EtherNet/IP® Communications Module

4. (1) M-92048-01-06  
   92 Series MI/O-67® MAConnect® Interface Adapter

5. (5) 92B-BAB-B1K-DM-DDAP-1DM  
   92 Series Middle Station Valves with MI/O-67® Bases

6. (1) 92B-BAB-B3K-DM-DDAP-1DM  
   92 Series End Station Valve with MI/O-67® Base
BOM for Above Stack:

1. (1) M-M0001-01 End-Plate Kit for MI/O-67®
2. (1) MIO67A-DG-01-01 MI/O-67® Digital I/O Module
3. (1) MIO67A-PP-01-01 MI/O-67® PowerPlus™ Module
4. (1) MIO67A-AN-01-01 MI/O-67® 0-10 VDC Analog I/O Module
5. (1) MIO67A-AN-02-01 MI/O-67® 4-20 mA Analog I/O Module
6. (1) MIO67A-CM-EN-01 MI/O-67® EtherNet/IP® Communications Module
7. (1) M-92048-01-06 92 Series MI/O-67® MAConnect® Interface Adapter
8. (5) 92B-BAB-B1K-DM-DDAP-1DM 92 Series Middle Station Valves with MI/O-67® Bases
9. (1) 92B-BAB-B3K-DM-DDAP-1DM 92 Series End Station Valve with MI/O-67® Base
How To Order
MI/O-67® Module

MIO67A - CM - XX - XX

Protocol
EN EtherNet/IP
EC EtherCAT
PL POWERLINK
PN PROFINET
MB MODBUS/TCP

Power Connector
01 7/8” 5 Pin Power Connector
02 7/8” 4 Pin Power Connector

Additional Modules
MIO67A-DG-01-01 Configurable Digital I/O
MIO67A-AN-01-01 0-10 VDC Analog I/O
MIO67A-AN-02-01 4-20 mA Analog I/O
MIO67A-PP-01-01 Power Plus
M-M0001-01 End Plate Assembly
N-M0001 Binding Clip Assembly
How To Order
92 Series MAConnect® for MI/O-67®

92B - X X X - X X X - DX - D XX X - X XX

Valve Function
0  Base Only
A  Sgl Sol Sgl Pressure
B  Dbl Sol Sgl Pressure
C  Sgl Sol Dual Pressure
D  Dbl Sol Dual Pressure
E  Dbl Sol 3 Pos Closed Center
F  Dbl Sol 3 Pos Open Center
G  Dbl Sol 3 Pos Press Center
H  Dbl Sol 3 Pos Dual Press Press Cen
J  Dbl Sol 3 Pos Dual Press Close Cen
K  Dbl Sol 3 Pos Dual Press Open Cen
L  Sgl Sol Sgl Press w/Mem Spring
N  Sgl Sol Dual Press w/Mem Spring

Body Type and Exhaust Options
0  Base Only
A  Plug-In Std Exh
C*  Plug-In w/Pilot Exh to Main Exhaust

Body Electrical Options
0  Base Only
A  No Light in Top
B  Light in Top
F  Suppression Diode, Blocking Diode & Light

Port Size and Thread Type
0  Valve Only
B  1/4" NPTF
C  3/8" NPTF
E  1/4" BSPPPL
F  3/8" BSPPPL
H  1/4" BSPTR
J  3/8" BSPTR

Manifold Configuration
0  Valve Only
1  Side Cyl. Ports (Middle Station)
2  Bottom Cyl. Ports (Middle Station)
3  Side Cyl. Ports (End Station)
4  Bottom Cyl. Ports (End Station)
5  Side Cyl. Ports- Selector Manifold (Middle Station)

Int/Ext Pilot
MAConnect® Plug-In for MI/O-67®
0  Valve Only
J  Sgl. Solenoid Plug-In (32 Outputs)
K  Dbl. Solenoid Plug-In (32 Outputs)
S  Sgl. Solenoid Plug-In (32 Outputs)
T  Dbl. Solenoid Plug-In (32 Outputs)

Order Example
1  M-M0001-01  MI/O-67® End Plate Assembly
1  MIO67A-CM-EN-01  MI/O-67® EtherNet/IP
1  M-92043-01-07  Interface Adapter (Int Pilot, NPT Threads, For 7 Valves) Assembly
6  92B-AAB-C1J-DM-DDAP-1DM  6 Middle Station Valves, Sgl Sol, Light In Top, Int Pilot, Side Cyl, 3.8" NPTF
1  92B-AAB-C3J-DM-DDAP-1DM  1 End Station Valve, Sgl Sol, Light In Top, Int Pilot, Side Cyl, 3/8" NPTF

Note:
MI/O-67® Modules Are Always On The Left With The Stack To The Right And Cylinder Ports Facing You.
How To Order

MI/O-67® 92 Series Pilot Valve

**DX - D XX P - X XX**

- **Pilot Style**
  - DM: Muffled Exhaust
  - DP: Piped Exhaust
  - DU: Pilot Exhaust Out Main Exhaust

- **Voltage**
  - DA: 24 VDC (5.4W)
  - FB: 24 VDC (1.8W)
  - FF: 24 VDC (2.4W)

- **Valve/Base Connector**
  - P: Plug-In

- **Manual Operator**
  - 0: No Operator
  - 1: Recessed Non-Locking
  - 2: Recessed Locking
  - 3: Non-Locking Extended
  - 4: Locking Extended

- **Electrical Connector**
  - DM: Plug-In
  - DN: Plug-In w/ Diode

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How To Order

MI/O-67® Interface Adapter for 92 Series

**M - 92048 - XX - XX X**

- **Pilot**
  - 01: Internal Pilot
  - 02: External Pilot

- **Stations**
  - 01: Adapter As Individual Part
  - 02 thru 32: Number Of Stations If Factory Gang

- **Threads**
  - Blank: NPTF Threads
  - P: BSPPL Threads
  - T: BSPTR Threads
How To Order
36 Series MAConnect® for MI/O-67®

36A - X X X - X X - J XX P - X XX

Body Type
0 Base Only
J Base Mount Body Universal Valve N.C.
K Base Mount Body Universal Valve N.O.
L Base Mount Body N.C. Only Valve

Electrical Type
0 Valve Only
M MAConnect®

Port Size and Thread Type
0 Valve only
A 1/8" NPT
C 1/8" BSPPL
E 1/8" BSPTR
F 5/32" O.D. Tube Receptacle

Base Electrical
0 Valve Only
1 Plug-In (32 Outputs)

Manifold Configuration
0 Valve Only
E N.C. Man Side Cyl. Port
F N.O. Man Side Cyl. Port
G N.C. Man Bot Cyl. Port & Reg w/ Slotted Stem
H N.O. Man Bot Cyl. Port & Reg w/ Slotted Stem
J N.C. Man Bot Cyl. Port & Reg w/ Adjusting Knob
K N.O. Man Bot Cyl. Port & Reg w/ Adjusting Knob
S N.C. Man Bot Cyl. Port & Reg w/ Locking Stem
T N.O. Man Bot Cyl. Port & Reg w/ Locking Stem

Voltage
DA* 24 VDC (5.4w) Max Cv = 0.3
DC 24 VDC (2.4w)
DE 24 VDC (1.8w)
MA* 24 VDC (5.4w) Max Cv = 0.23

Order Example
1 M-M0001-01 MI/O-67® End Plate
1 MIO67A-CM-EN-01 MI/O-67® EtherNet/IP
1 M-46019-01 MI/O-67® Interface Adapter w/ NPTF Ports
6 36A-JMA-1E-JDAP-FA 6 Middle Station Valves, Normally Closed Universal w/ Normally Closed Manifold And NPTF Ports
1 M-46018-01-06 End Plate Assembly w/ NPTF Ports For 6 Valves

* A Maximum Of 26 Solenoids Can Be Energized At The Same Time When Using a 5.4w Coil.

Note:
MI/O-67® Modules Are Always On The Left With The Stack To The Right And Cylinder Ports Facing You.
How To Order
MI/O-67® End Plate Kit for 36 Series

M - 46018 - XX - XX X

- Ports
  - 01 Standard Inlet and Exhaust Ports (1/4")
  - 02 thru 32

- Number of Stations
  - 01 Adapter As Individual Part
  - 02 thru 32 Number Of Stations If Factory Gang

- Threads
  - Blank
  - NPTF Threads
  - P
  - BSPPL Threads
  - T
  - BSPT Threads

How To Order
MI/O-67® Interface Adapter for 36 Series

M - 46019 - XX X

- Ports
  - 01 Standard Inlet and Exhaust Ports (1/4")

- Threads
  - Blank
  - NPTF Threads
  - P
  - BSPPL Threads
  - T
  - BSPT Threads
How To Order
46 Series MAConnect® for MI/O-67®

46A - X X X - X X - J XX P - X XX

Body Type
0 Base only
L Base mount body
M Base mount body w/ gauge port
N* Base mount body double solenoid
P* Base mount body double solenoid w/ gauge port

*Must Order 5.4W (Voltage Code) For Double Solenoids

Electrical Type
0 Valve Only
M MAConnect®

Port Size and Thread Type
0 Valve only
A 1/8" NPT
C 1/8" BSPPL
E 1/8" BSPTR
F 5/32" O.D. Tube Receptacle

Base Electrical
0 Valve Only
1 Sgl Sol Plug-In (32 Outputs)
2 Dbl Sol Plug-In (32 Outputs)

Manifold Configuration
0 Side Cylinder Ports
C Side Cylinder Ports w/ Flow Controls
D Side Cylinder Ports w/ Reg. (Slotted Stem)
E Bottom Cylinder Ports w/ Reg. (Slotted Stem) & Flow Controls
F Bottom Cylinder Ports w/ Reg. (Slotted Stem) & Flow Controls
G Bottom Cylinder Ports w/ Reg. (Locking Slotted Stem)
H Bottom Cylinder Ports w/ Reg. (Locking Slotted Stem) & Flow Controls
J Bottom Cylinder Ports w/ Reg. (adjusting knob)
K Bottom Cylinder Ports w/ Reg. (adjusting knob) & flow controls
L Bottom Cylinder Ports
M Bottom Cylinder Ports w/flow controls

Valve / Base Connector
P Plug-In

Manual Operator
0 No Operator
1 Recessed Non-locking
2 Recessed Locking
3 Extended Non-Locking
4 Extended Locking

Voltage
DA* 24 VDC (5.4w)
DC 24 VDC (2.4w)
DE 24 VDC (1.8w)
DJ 24 VDC (1.3w)
MA* 24 VDC (5.4w)

*Max Cv = 0.23

Electrical Connector
FA Base Plug-In
FB Base Plug-In w/ Diode
FD Base Plug-In w/ LED
FE Base Plug-In w/ Diode and LED

Order Example
1 M-M0001-01 MI/O-67® End Plate
1 MIO67A-CM-EN-01 MI/O-67® EtherNet/IP
1 M-46019-01 MI/O-67® Interface Adapter w/ NPTF Ports
6 46A-LMA-1C-JDAP-FA 6 Middle Station Valves, w/ 32 Outputs And NPTF Ports
1 M-46018-01-06 End Plate Assembly w/ NPTF Ports For 6 Valves

Note:
MI/O-67® Modules Are Always On The Left With The Stack To The Right And Cylinder Ports Facing You.

*A Maximum Of 26 Solenoids Can Be Energized At The Same Time When Using a 5.4w Coil.
How To Order
MI/O-67® End Plate Kit for 46 Series

M - 46018 - XX - XX X

- Ports: 01 Standard Inlet and Exhaust Ports (1/4")
- 01 Adapter As Individual Part
- Blank
- Threads: NPTF Threads

How To Order
MI/O-67® Interface Adapter for 46 Series

M - 46019 - XX X

- Ports: 01 Standard Inlet and Exhaust Ports (1/4")
- Threads: Blank

- P: BSPPL Threads
- T: BSPTR Threads
# How To Order

## 42 Series MAConnect® for MI/O-67®

<table>
<thead>
<tr>
<th>Valve Function</th>
<th>Pilot Exhaust Options</th>
<th>Internal / External Pilot And Body Plug-In</th>
<th>Port Size and Thread Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Base Only</td>
<td>0 Base Only</td>
<td>0 Valve Only</td>
<td>0 Valve Only</td>
</tr>
<tr>
<td>A 2 Position Sgl Press Sgl Solenoid</td>
<td>M Pilot Exh Muffled</td>
<td>A Int Pilot Sgl Press</td>
<td>A #10-32</td>
</tr>
<tr>
<td>B 2 Position Sgl Press Dbl Solenoid</td>
<td>P Pilot Exh Piped #10-32</td>
<td>B Int Pilot Dual Press (From #3)</td>
<td>B M5 (NPTF thru ports)</td>
</tr>
<tr>
<td>C 2 Position Dual Press Sgl Solenoid</td>
<td>R Pilot Exh Piped M5</td>
<td>C Int Pilot Dual Press (From #5)</td>
<td>D 6mm O.D. Tube Receptacle (NPTF thru ports)</td>
</tr>
<tr>
<td>D 2 Position Dual Press Dbl Solenoid</td>
<td>U Pilot Exh Out Main Ex</td>
<td>D Ext Pilot From Base</td>
<td>E 1/4&quot; O.D. Tube Receptacle (NPTF thru ports)</td>
</tr>
<tr>
<td>E 3 Position Closed Center</td>
<td></td>
<td></td>
<td>F M7 (NPTF thru ports)</td>
</tr>
<tr>
<td>F 3 Position Open Center</td>
<td></td>
<td></td>
<td>G M5 (BSPPL thru ports)</td>
</tr>
<tr>
<td>H 3 Position Dual Press Press Center</td>
<td></td>
<td>Single Solenoid</td>
<td>J 6mm O.D. Tube Receptacle (BSPPL thru ports)</td>
</tr>
<tr>
<td>R 2 Position Sgl Solenoid Universal</td>
<td></td>
<td>Double Solenoid</td>
<td>K 1/4&quot; O.D. Tube Receptacle (BSPPL thru ports)</td>
</tr>
<tr>
<td>S 2 Position Dual Solenoid Universal</td>
<td></td>
<td></td>
<td>L M7 (BSPPL thru ports)</td>
</tr>
</tbody>
</table>

### Note:
MI/O-67® Modules Are Always On The Left With The Stack To The Right And Cylinder Ports Facing You.

**Order Example**

1. M-M001-01 MI/O-67® End Plate
2. MIO67A-CM-EN-01 MI/O-67® EtherNet/IP
3. M-42023-01-06 MI/O-67® Interface Adapter, 6 Stations w/ NPTF Ports
4. 42A-AMA-A11-GDAP-1DJ 5 Middle Station Valves w/ #10-32 Ports
5. 42A-AMA-A31-GDAP-1DJ End Station Valve w/ NPTF Threads And #10-32 Cylinder Ports
6. M-42023-01-06 MI/O-67® Interface Adapter, 6 Stations w/ NPTF Ports
7. 42A-AMA-A11-GDAP-1DJ 5 Middle Station Valves w/ #10-32 Ports
8. 42A-AMA-A31-GDAP-1DJ End Station Valve w/ NPTF Threads And #10-32 Cylinder Ports

**Manifold Configuration**

0 Valve Only
1 Side Cyl. Ports (Middle Station)
2 Bottom Cyl. Ports (Middle Station)
3 Side Cyl. Ports (End Station)
4 Bottom Cyl. Ports (End Station)

**Int/Ext Pilot MAConnect® Plug-In for MI/O-67®**

0 Valve Only
1 Int Pilot Sgl. Solenoid Plug-In (32 Outputs)
2 Int. Pilot Dbl. Solenoid Plug-In (32 Outputs)
5 Ext. Pilot Sgl. Solenoid Plug-In (32 Outputs)
6 Ext. Pilot Dbl. Solenoid Plug-In (32 Outputs)
**How To Order**

**MI/O-67® 42 Series Solenoid Assembly**

**Voltage**
- DA: 24 VDC (1.0W)
- DC: 24 VDC (1.8W)
- DD: 24 VDC (2.5W)
- DF: 24 VDC (4.0W)

**Manual Operator**
- 1: Recessed Non Locking
- 2: Recessed Locking
- 3: Extended Non Locking
- 4: Extended Locking

**Electrical Connector**
- DJ: Base/Manifold Plug-In
- DP: Base/Manifold Plug-In w/ LED Light
- DR: Base/Manifold Plug-In w/ Suppression Diode
- DS: Base/Manifold Plug-In w/ Suppression Diode And LED Light
- FB: Base/Manifold Plug-In (For Double Solenoid 2 And 3 Position Valves)

**Valve/Base Connector**
- P: Plug-In

**How To Order**

**MI/O-67® Interface Adapter for 42 Series**

**Stations**
- 01: Adapter As Individual Part
- 02 thru 32: Number Of Stations If Factory Gang

**Pilot**
- 01: Internal Pilot
- 02: External Pilot

**Threads**
- Blank
- P: NPTF Threads
- T: BSPTR Threads

**Note:** A Maximum Of 26 Solenoids Can Be Energized At The Same Time When Using a 5.4w Coil.