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® utilizes existing MACnect® 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 outlines specific details on each module and provides information on ordering for both the MI/O-67® platform and various MACnect® valve series.

**MI/O-67® Communications Module**

The Communications Module is the brains of the MI/O-67® platform and is the minimum required module to implement a fieldbus solution. There are 5 protocols available:

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

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

The Communications Modules is available in both a 7/8” 4-pin mini and 7/8” 5-pin mini power configuration and incorporates 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 are additional software and training tools available for distributor and customer use. These software tools include digital manuals, IP configuration tool, Webconfig tool, and Add On Instructions (AOI) profiles for each module. The associated configuration files (EDS, ESI, etc.) are available on both the MAC Valves website and through our authorized distributors - MAC Distribution Network (MDN) – www.macvalves.com/distributors. Videos are posted to the MAC Valves YouTube® page to show simple configuration tips and techniques - https://www.youtube.com/channel/UCo0r68iGvJYBqogfAW7wJQ

All modules 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 stocking 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.
The Digital I/O module allows for flexibility and configurability in a single part number. With the MAC Digital I/O module you can 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 (configurable through dip switches):

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

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

The Analog I/O modules are available in either current (4-20 mA) or voltage (0-10 VDC) for the MI/O-67® platform. Like the Digital I/O module, these modules are also dip switch configurable for inputs and outputs. Each Analog I/O module comes with a selectable input or output per M12 connector. Each module also includes fault detection as standard.
**MI/O-67® PowerPlus™ Module**

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

**MI/O-67®MAConnect® Series**

There are three different MAConnect® series adapters available 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 now can utilize 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 added 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.

With further inquiries please reach out to your local MAC distributor ([www.macvalves.com/distributor](http://www.macvalves.com/distributor)) to provide technical assistance and with support in ordering of MI/O-67® and the accompanied MAConnect® series valves.
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® MAConnect® 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 MAConnect® 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-01-02  MI/O-67® Configurable 0-10 VDC Analog I/O Module w/ 24VDC Power
5. (1) MIO67A-AN-02-02  MI/O-67® Configurable 4-20 mA Analog I/O Module w/ 24VDC Power
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. (3) 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-AN-01-02 Configurable 0-10 VDC Analog I/O with 24 VDC Power
MIO67A-AN-02-02 Configurable 4-20 mA Analog I/O with 24 VDC Power
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
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" BSPPL
F  3/8" BSPPL
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)

External Pilot
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-92048-01-07  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

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

Valve / Base Connector
P Plug-In

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

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

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

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-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
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
  P
  T

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
  P
  T
# 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
- **A**: 1/8" NPT
- **C**: 1/8" BSPL
- **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**: Bottom Cylinder Ports w/ Reg. (Slotted Stem)
- **E**: Bottom Cylinder Ports w/ Reg. (Slotted Stem) & Flow Controls
- **F**: Bottom Cylinder Ports w/ Reg. (Locking Slotted Stem)
- **G**: Bottom Cylinder Ports w/ Reg. (Locking Slotted Stem) & Flow Controls
- **H**: Bottom Cylinder Ports w/ Reg. (adjusting knob)
- **J**: Bottom Cylinder Ports w/ Reg. (adjusting knob) & flow controls
- **K**: Bottom Cylinder Ports
- **L**: Bottom Cylinder Ports w/flow controls

### Voltage
- **DA**: 24 VDC (5.4w) Max Cv = 0.3
- **DC**: 24 VDC (2.4w)
- **DE**: 24 VDC (1.8w)
- **DJ**: 24 VDC (1.3w)
- **MA**: 24 VDC (5.4w) Max Cv = 0.23

### Order Example
1. M-M0001-01 MI/O-67® End Plate
2. MIO67A-CM-EN-01 MI/O-67® EtherNet/IP
3. M-46019-01 MI/O-67® Interface Adapter w/ NPTF Ports
4. 46A-LMA-1C-JDAP-FA 6 Middle Station Valves, w/ 32 Outputs And NPTF Ports
5. M-46018-01-06 End Plate Assembly w/ NPTF Ports For 6 Valves

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

### Electrical Connector
- **0**: No Connector
- **1**: Base Plug-In
- **2**: Base Plug-In w/ Diode
- **3**: Base Plug-In w/ LED
- **4**: Base Plug-In w/ Diode and LED

### 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 46 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
  P
  T
  NPTF Threads
  BSPPL Threads
  BSPTR 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
  T
  NPTF Threads
  BSPPL Threads
  BSPTR Threads
How To Order
42 Series MAConnect® for MI/O-67®

42A - X X X - X X X - GXXP - X XX

Solenoid Assembly

Valve Function

0 Base Only
A 2 Position Sgl Press Sgl Solenoid
B 2 Position Sgl Press Dbl Solenoid
C 2 Position Dual Press Sgl Solenoid
D 2 Position Dual Press Dbl Solenoid
E 3 Position Closed Center
F 3 Position Open Center
H 3 Position Dual Press Press Center
R 2 Position Sgl Solenoid Universal
S 2 Position Dual Solenoid Universal

Pilot

Exhaust Options

0 Base Only
M Pilot Exh Muffled
P Pilot Exh Piped #10-32
R Pilot Exh Piped M5
U Pilot Exh Out Main Exh

Internal / External Pilot And Body Plug-In

0 Base Only

Single Solenoid

A Int Pilot Sgl Press
B Int Pilot Dual Press (From #3)
C Int Pilot Dual Press (From #5)
D Ext Pilot From Base

Double Solenoid

E Int Pilot Sgl Press w/ LED
F Int Pilot Dual Press (From #3) w/ LED
G Int Pilot Dual Press (From #5) w/ LED
H Ext Pilot From Base w/ LED
J Int Pilot Sgl Press w/ LED and Diode
K Int Pilot Dual Press (From #3) w/ LED and Diode
L Int Pilot Dual Press (From #5) w/ LED and Diode
M Ext Pilot From Base w/ LED and Diode

Port Size and Thread Type

0 Valve Only
A #10-32
B M5 (NPTF thru ports)
D 6mm O.D. Tube Receptacle (NPTF thru ports)
E 1/4" O.D. Tube Receptacle (NPTF thru ports)
F M7 (NPTF thru ports)
G M5 (BSPPL thru ports)
J 6mm O.D. Tube Receptacle (BSPPL thru ports)
K 1/4" O.D. Tube Receptacle (BSPPL thru ports)
L M7 (BSPPL thru ports)
M M5 (BSPTR thru ports)
P 6mm O.D. Tube Receptacle (BSPTR thru ports)
R 1/4" O.D. Tube Receptacle (BSPTR thru ports)
S M7 (BSPTR thru 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)

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

Order Example

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-M0001-01</td>
<td>MI/O-67® End Plate</td>
</tr>
<tr>
<td>MIO67A-CM-EN-01</td>
<td>MI/O-67® EtherNet/IP</td>
</tr>
<tr>
<td>M-42023-01-06</td>
<td>MI/O-67® Interface Adapter, 6 Stations w/ NPTF Ports</td>
</tr>
<tr>
<td>42A-AMA-A11-GDAP-1DJ</td>
<td>5 Middle Station Valves w/ #10-32 Ports</td>
</tr>
<tr>
<td>42A-AMA-A31-GDAP-1DJ</td>
<td>End Station Valve w/ NPTF Threads And #10-32 Cylinder Ports</td>
</tr>
</tbody>
</table>
How To Order
MI/O-67® 42 Series Solenoid Assembly

G XX P - X XX

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

Valve/Base Connector
P Plug-In

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)

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

How To Order
MI/O-67® Interface Adapter for 42 Series

M - 42023 - 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