Pub #105238revB

FieldLink™ process networking solutions

Junction Module (JM™) Enclosure with:

FOUNDATION Fieldbus Input/Output Module w/Hawkeyes (JMX04____)

These I/O Modules are designed to function as FOUNDATION Fieldbus nodes with termination points for connecting the two provided FF compatible Hawkeye point sensors (HK5077SR; HK5077SG), as well as outputs to operate ultra low power (Piezo) devices such as solenoid valves and relays.

Inputs and Outputs

- Two (2) Discrete Inputs
- Two (2) Discrete Outputs

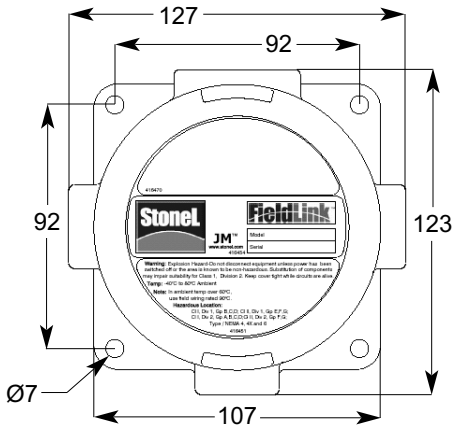
Features

- LED input displays for Inputs 1 & 2
- Date of Last Service
- Pre-determined output Fail State

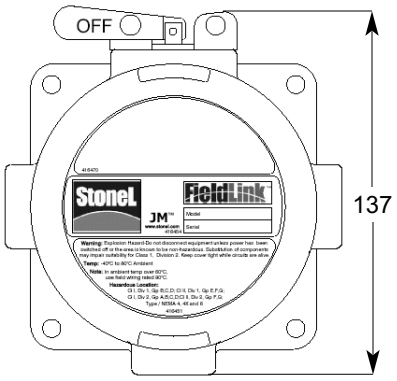
(See Page 4&5 for detailed wiring instructions)

JM Enclosure Dimensions (in mm)

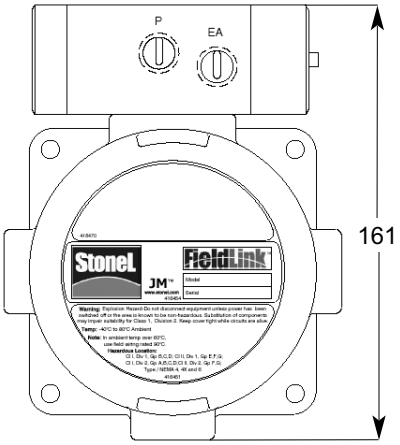
Standard Enclosure

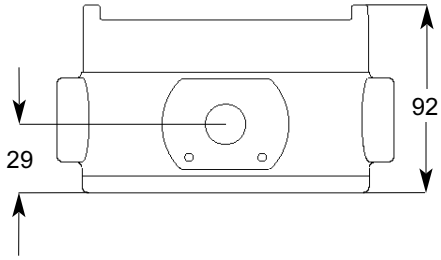


Switched Enclosure



Enclosure w/Cyclone Valve





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JM Model Options

Example: JMX043AEN

JM

Function

X04 I/O Module (2 DI/2 DO), F/Fieldbus (H1)
(only w/ Solenoid 11,3A,3G)

Solenoid

11 No Solenoid

Pilot	Type	Brass	SS
1-Solenoid	2-Postn,5-Way	2H	2B
1-IS Piezo	2-Postn,5-Way	3G	3A
2-Solenoids	2-Postn,5-Way	2L	2E

Enclosure

C Clear Cover
E Epoxy Coated Aluminum

Conduit Entries

3 (3) 1/2" NPT
N (4) 1/2" NPT
6 (3) M20
M (4) M20
9 (3) 3/4" NPT
T (4) 3/4" NPT

General Specifications

Operating Life	Unlimited
Materials of Construction	
Housing and Cover	Marine grade anodized aluminum epoxy coating
Clear Cover	Lexan® Polycarbonate
Elastomer Seals	Buna-N
Fasteners	Stainless Steel
Warranty	
Complete Assemblies	Two Years

Lexan is a registered trademark of General Electric Corporation.

Temperature Range	-40° to +80° C (-40° to 176° F)
Enclosure Protection	NEMA 4, 4X & 6; IP67

Hazardous Area Ratings
Intrinsic Safety (FISCO)
Class I, Div. 1 and 2, Groups A,B,C,D
Class II, Div. 1 and 2, Groups E,F,G
Explosion Proof (Aluminum Cover)
Class I, Div. 1 and 2, Groups B,C,D
Class II, Div. 1 and 2, Groups E,F,G
Non-incendive (Clear Cover)
Class I, Div. 2, Groups A,B,C,D
Class II, Div. 2, Groups E,F,G
(Not all units carry approvals, consult factory)

Mounting Instructions

Mounting The JM Enclosure

1. Locate the position where the JM enclosure will be mounted. Ensure that there is sufficient room to operate the disconnect switch levers and to remove the cover.
2. Attach the JM enclosure to a wall or other stationary flat surface using the mounting holes provided.
3. Secure the cover until hand tight

Attaching Conduit and Fittings

1. Conduit entries are provided for the convenient attachment of threaded conduit and threaded conduit fittings. Attach threaded fittings and conduits securely.
2. Follow all applicable NEC codes and other regulations.

Installing & Removing Cover

1. To insure NEMA 4, 4X. 6 and hazardous location ratings are maintained the cover **must be** completely closed and the O-Ring sealed to keep out water.

Specifications

Communication Protocol:	Foundation Fieldbus (H1)
Configuration:	(2) Discrete Inputs for low power dry contact switches capable of operating at <.045mA @ 6.5VDC or solid state PNP capable of operating at <1mA @ 6.5 VDC (2) Discrete Outputs for bus powered discrete devices that operate at ultra low power such as Piezo solenoid valves and relays. Limited to 2.0mA @ 6.5 VDC
Function Blocks	2 DI; 2 DO
Indication	Input 1 = Red LED Input 2 = Green LED
Voltage:	9-32 VDC (Bus Voltage)
Output Voltage:	6.5 VDC
Max. Output Current:	2.0mA @ 6.5 VDC
Current Draw:	16mA

Standard Channel Assignments

Channel 1 (DI1) - Discrete Input 1 (Red LED);	1 = True; 0 = False
Channel 2 (DI2) - Discrete Input 2 (Green LED);	1 = True; 0 = False
Channel 3 (DO1) - Discrete Output 1 (OUT 1);	1 = True; 0 = False
Channel 4 (DO2) - Discrete Output 2 (OUT 2);	1 = True; 0 = False

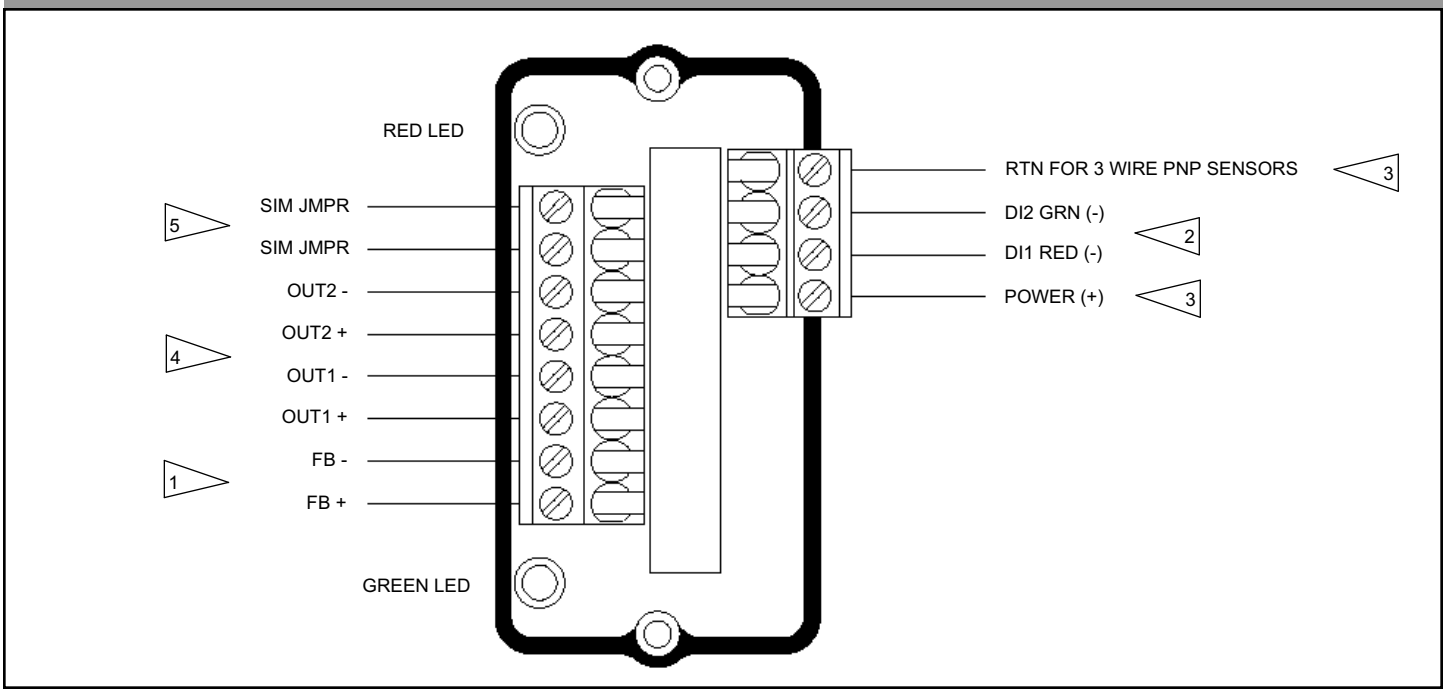
Special Channel Assignments

Channel 8 (DO1) - Discrete Output 1 (OUT 1) with state report from Discrete Input 1 (READBACK_D)
Channel 9 (DO2) - Discrete Output 2 (OUT 2) with state report from Discrete Input 2 (READBACK_D)

Valve Control Single Block Mode

Channel 10 (DO1) - Discrete Output 1 (OUT 1) with state report Discrete Inputs 1&2 (READBACK_D):
READBACK_D Values:
0 = None
1 = Discrete Input 1 is True
2 = Discrete Input 2 is True
3 = Both Discrete Inputs 1&2 are True

Wiring Diagram and Installation Notes



WIRING NOTES:

1. FOUNDATION Fieldbus bus communications connection points.
2. Bus powered Discrete Input connection points for the HK5077SR and HK5077SG. The Red LED is local indication of discrete input DI1 RED on/off status. Connect the White/Red Stripe lead (Load) of the HK5077SR to DI1 RED (-) terminal. The Green LED is local indication of discrete input DI2 GRN on/off status. Connect the White/Green Stripe lead (Load) of the HK5077SG to DI1 GREEN (-) terminal.
3. Connect the Blue leads (-) of the HK5077SR and HK5077SG to the “RTN FOR 3 WIRE PNP SENSORS” terminal and the Brown leads (+) to the “POWER +” terminal.

<u>NOTE</u>: The Discrete Inputs (DI) are not galvanically isolated from the FOUNDATION signal wires. Therefore, the DI connections should not be attached to ground. If the cable runs to the DI’s are long or can be exposed to electrical noise, external Opto-isolators on the DI wires may be needed to provide isolation.

4. Connection points for Bus powered discrete outputs to operate ultra low power (Piezo) devices such solenoid valves and relays. Limited to 2.0mA @ 6.5VDC. For models with a pneumatic valve, coil is pre-wired to Output 1 (Channel 3).
5. These connection points not used by the consumer.

HK5077SR/G Sensor Specifications & Wiring Diagrams

Specifications for Sourcing (PNP) Sensors:	
Supply Voltage:	6 to 28 VDC
Max Continuous Current:	200 mA
Quiescent Current:	160 µA
Min Switching Current:	2.0 mA
Max Leakage Current:	0.6 µA
Maximum Voltage Drop:	0.65 VDC
Nominal Sensing Distance:	4 mm (Mild Steel Target)
	3 mm (Stainless Steel Target)

Temp Range:	- 40° F to 180° F (- 40° C to 80° C)
Housing Material & Fasteners:	316 Stainless Steel
Conduit Connection:	1/2"NPT
Wiring:	36" (1 meter) length
	18 gauge multi-strand
Enclosure Protection:	NEMA 4, 4X & 6 / IP. 67

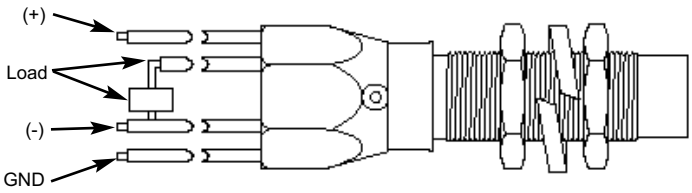
To Bench Test a Hawkeye 3-Wire Sensor: Use StoneL Light Read Tester. Or use a 24 VDC power supply with series load resistor (2K - 6K Ω).

Sensor Wiring - Connect sensors per wiring diagram below.

WARNING:

FAILURE TO USE A SERIES LOAD RESISTOR WHEN BENCH TESTING SENSORS WITH A POWER SUPPLY WILL RESULT IN PERMANENT DAMAGE TO THE UNIT.

HK5077SG and HK5077SR



HK5077SG

Wire Color	Signal
Brown	(+)
White/ Green Stripe	Load
Blue	(-)
Green	Case Ground*

HK5077SR

Wire Color	Signal
Brown	(+)
White/ Red Stripe	Load
Blue	(-)
Green	Case Ground*

* Case Ground not required for circuit operation

Cyclone Pneumatic Valve Specifications

The Cyclone Pneumatic Valve is a pilot operated 5-way spring return which may be used for single and double-acting actuators. It features a direct-acting solenoid with manual override for the pilot. The porting is sized to tolerate contaminant's up to 40 microns in size which may be found in conventional pneumatic systems.

The Cyclone Pneumatic Valve is O-ring sealed on the Junction Module (JM) enclosure to maintain it's temporary submergibility rating.

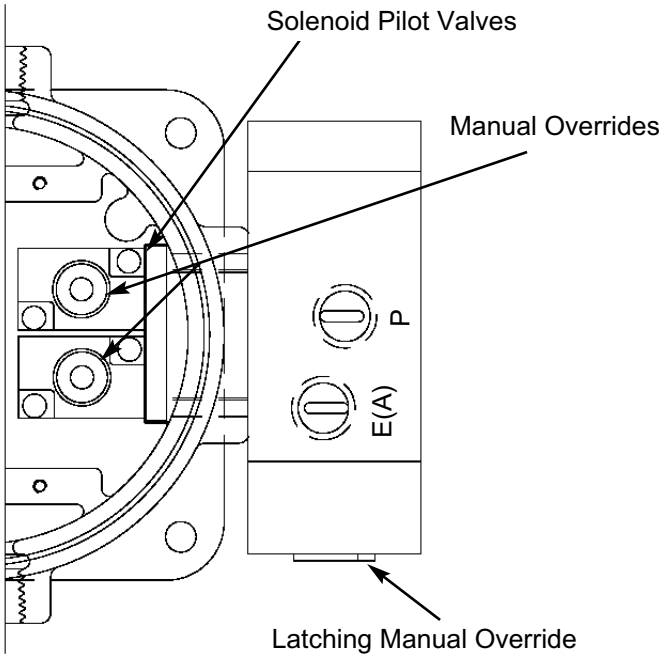
24 VDC Pilot	
Power	1.8 Watts
Current draw	75 mA @24VDC
Temperature	-18°C to +50°C
Filtration Requirements	40 Microns
Pressure Range	25 to 120 PSI
Cv	0.75 (10.7 Kv)
Piezo Pilot	
Current draw	2mA @6.5VDC
Temperature	-10°C to +60°C
Filtration Requirements	30 Microns
Pressure Range	25 to 120 PSI
Cv	0.75 (10.7 Kv)
Porting	1/4" NPT
Valve Body Material	360 brass or 303 Stainless
Operating Life	1 million cycles

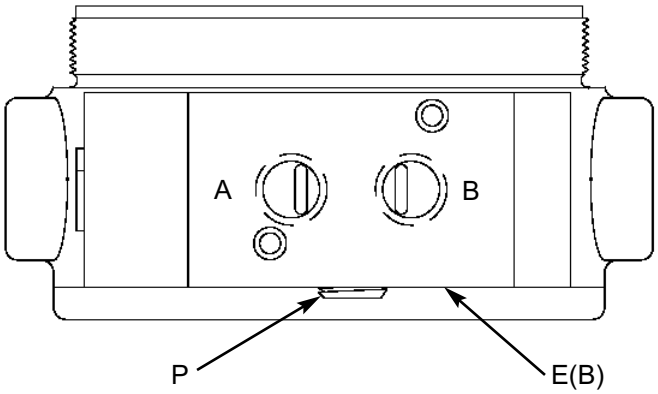
Manual Overrides:
One internal momentary and One external locking.

Variable Speed Adjustment: Each cylinder port is internally ported to a unique exhaust port (EA for exhaust of port A and EB for exhaust of port B). To vary actuator speed flow restrictors may be added to EA or EB to reduce exhaust flow and actuator speed in either direction.

Single-Acting Vent to Atmosphere or Refresh:
Exhaust (EA or EB) and secondary ports (A or B) may be blocked for single-acting operation with the actuator venting directly to atmosphere. Alternatively, the secondary port may be plumbed to the actuator supplying air to the spring side of the actuator and preventing it from ingesting atmospheric contaminant's.

Pneumatic Porting

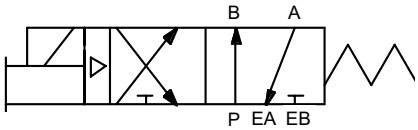




P - Pressure Port (1/4 " NPT)
A - Cylinder Port (1/4" NPT)
B - Cylinder Port (1/4" NPT)
E(A) - Exhaust for Cylinder Port A (1/4" NPT)
E(B) - Exhaust for Cylinder Port B (1/4" NPT)

Schematics

Single Coil: 5 way with Pneumatic pilot



Dual Coil: Shuttle Piston with 2 Pneumatic pilots (2 Position Valve with position detente