

# ReeR MOSAIC-MA4 Analog Input Expansion Unit



The ReeR MOSAIC (MODular Safety Integrated Controller) MA4 input expansion unit provides four analog inputs. Applications include load cells, pressure switches, temperature measurement, flow and level measurements, etc.

## Features

- Four independent isolated analog inputs programmable with the Mosaic Safety Designer software
- Individual channels can be paired to allow sensor reading redundancy
- LED status and fault diagnostic indicators
- Removable terminal block plus screw contacts
- Connection to MOSAIC-M1S via MSC 5-way ReeR proprietary bus. Bus connector included.



MOSAIC-MA4

**This expansion unit works only with the M1S controller.**

### Safety Data per EN 13849-1

Category	4
Performance level	e
MTTF <sub>d</sub> (years)	30-100
DC <sub>avg</sub>	High

### Safety Data per IEC/EN 62061, IEC/EN 61508

SIL CL	3
SIL	3
HFT	1
DC <sub>avg</sub>	High
SFF	99.8%
PFH <sub>d</sub> (t-20a)	1.53e <sup>-8</sup>

**Safety data is dependent on circuit architecture. See manual for further details.**

### MOSAIC-MA4 Expansion Unit

Part Number	Price	Voltage	Description	Connection
<b>MOSAIC-MA4</b>	\$724.00	24VDC	Input expansion unit providing 4 analog safety inputs	Removable terminal block, screw contacts



### MOSAIC-MA4 Specifications

General Specifications	
Operating Temperature	-10°C to +55°C [14°F to 131°F]
Storage Temperature	-20°C to +85°C [-4°F to 185°F]
Altitude	2000m (max)
Vibration Resistance	Tested to IEC 60068-2-6
Degree of Protection	IP 20
Housing	Polyamide
Weight	240g [8.47 oz]
Agency Approvals and Standard	cULus, CE, TÜV
Terminal Designation per EN 50 005	AWG 12-30 solid/stranded. Use 60/75°C copper (Cu) conductor only.
Wire Fixing	Screw pluggable terminal blocks. Terminal tightening torque 5-7 lb•in (0.6-0.7 N•m).
Specifications	
Nominal Voltage	24VDC
Voltage Range	± 20%
Maximum Consumption	5W
Safety Inputs	4 analog inputs
Resolution	16 bit with 2.5 to 4000 samples per second, selectable via MSD software
Input FBK / Reset	-
Test Outputs	-
OSSD Outputs	-
Signaling Outputs	-
Technical Data	Each channel can detect a 4-20 mA current or a 0-10 VDC voltage, selectable via MSD software

Note: See product manual for complete details.

Note: To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific part number's web page.

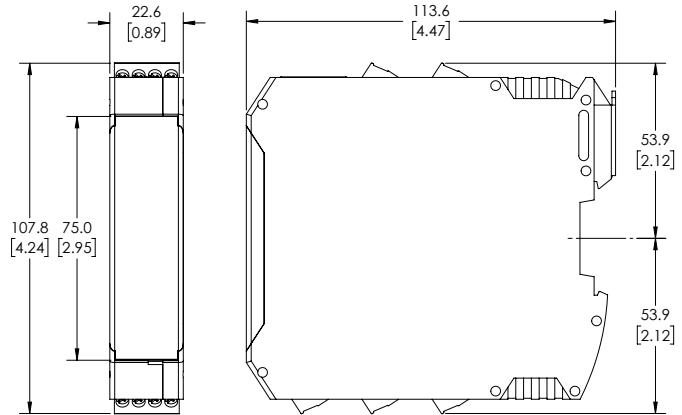
# Electrical Connections to MOSAIC-MA4



- Wire size range: AWG 12-30 (solid/stranded) (UL).
- Use 60/75°C copper (Cu) conductor only.
- Turn off power before making connections.
- The supply voltage must be 24VDC  $\pm$  20% (PELV, in compliance with the standard EN 60204-1 (Chapter 6.4).
- Do not use the MOSAIC to supply external devices.
- The same ground connection (0VDC) must be used for all system components.
- Separate power supplies are recommended for the safety module and for other electrical power equipment (electric motors, inverters, frequency converters) or other sources of disturbance.
- Cables used for connections of longer than 50m [164ft] must have a cross-section of at least 1mm<sup>2</sup> (AWG16).

**This expansion unit works only with the M1S controller.**

## Dimensions mm [inches]



## MA4 Module Connections

Terminal	Signal	Type	Operation	Description
1	24VDC	–	–	24VDC power supply
2	NODE_SEL0	Input	–	Node selection
3	NODE_SEL1	Input		
4	0VDC	–	–	0VDC power supply
9	24VDC_S1	Output	Isolated 24VDC power supply for Sensor 1	Sensor 1 connections
10	IN_S1	Input	4-20 mA Sensor 1 input	
	NEG_S1		0-10 VDC Sensor 1 negative input	
11	OUT_S1	Output	4-20 Sensor 1 output	
	POS_S1	Input	0-10 VDC Sensor 1 positive input	
12	0VDC_S1	Output	Isolated 0VDC reference for Sensor 1	
13	24VDC_S3	Output	Isolated 24VDC power supply for Sensor 3	Sensor 3 connections
14	IN_S3	Input	4-20 mA Sensor 3 input	
	NEG_S3		0-10 VDC Sensor 3 negative input	
15	OUT_S3	Output	4-20 Sensor 3 output	
	POS_S3	Input	0-10 VDC Sensor 3 positive input	
16	0VDC_S3	Output	Isolated 0VDC reference for Sensor 3	
17	24VDC_S2	Output	Isolated 24VDC power supply for Sensor 2	Sensor 2 connections
18	IN_S2	Input	4-20 mA Sensor 2 input	
	NEG_S2		0-10 VDC Sensor 2 negative input	
19	OUT_S2	Output	4-20 Sensor 2 output	
	POS_S2	Input	0-10 VDC Sensor 2 positive input	
20	0VDC_S2	Output	Isolated 0VDC reference for Sensor 2	
21	24VDC_S4	Output	Isolated 24VDC power supply for Sensor 4	Sensor 4 connections
22	IN_S4	Input	4-20 mA Sensor 4 input	
	NEG_S4		0-10 VDC Sensor 4 negative input	
23	OUT_S4	Output	4-20 Sensor 4 output	
	POS_S4	Input	0-10 VDC Sensor 4 positive input	
24	0VDC_S4	Output	Isolated 0VDC reference for Sensor 4	

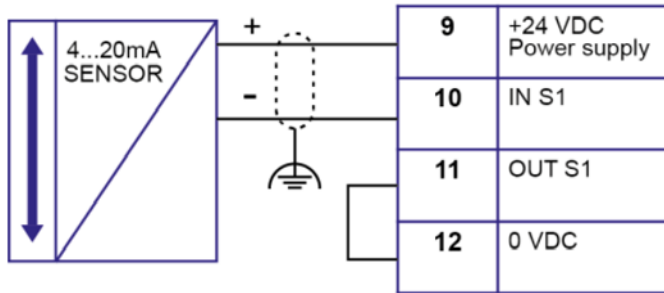
Please see the ReeR MOSAIC Supplemental Manual for basic wiring examples.

# Electrical Connections to MOSAIC-MA4

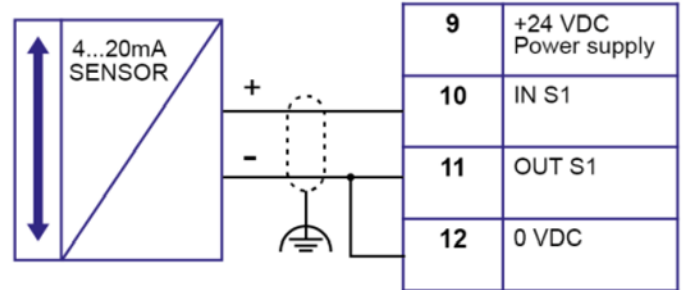


## MOSAIC-MA4 Connection Diagrams

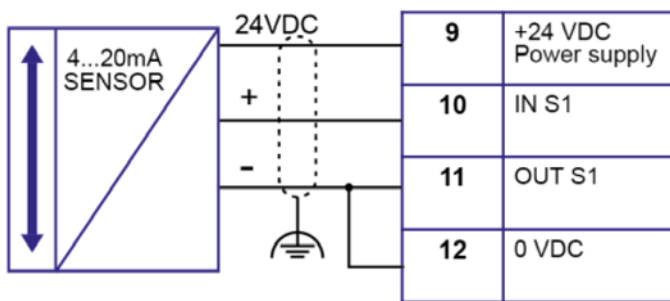
2-wire current sensor



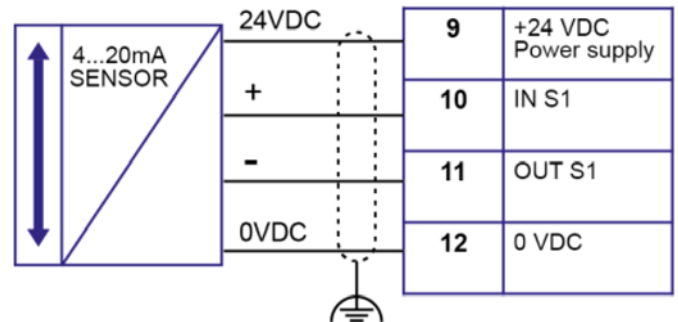
3-wire current sensor with external power supply



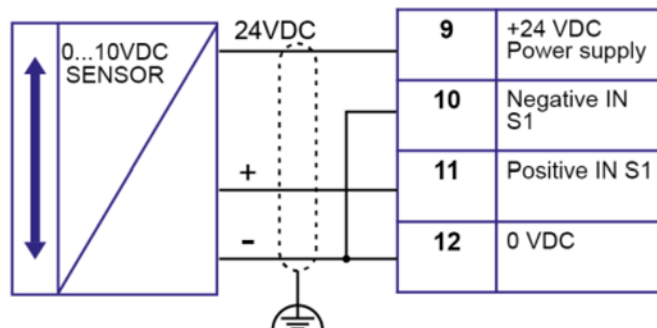
3-wire current sensor



4-wire current sensor



3-wire voltage sensor



# MOSAIC



## MODULAR SAFETY INTEGRATED CONTROLLER

The MOSAIC system is a unique safety controller that's modular, expandable and configurable for managing all safety functions of a single machine or an entire plant. It offers cost reductions with minimal wiring.

### COMMS



#### **MOSAIC-MBEI**

Industrial Fieldbus:  
EtherNet/IP.

#### **MOSAIC-MBEM**

Industrial Fieldbus:  
ModBus TCP/IP.

### DIGITAL INPUTS



#### **MOSAIC-MI8**

8 digital inputs and four test outputs.

#### **MOSAIC-MI16**

16 digital inputs and 4 test outputs.

#### **MOSAIC-MI12T8**

12 digital inputs, 8 test outputs.

### I/O EXPANSION UNIT



#### **MOSAIC-MI8O2**

8 digital inputs, 2 EDM/  
RST inputs, 4 test outputs,  
2 OSSD pairs, and 2 status  
outputs.

#### **MOSAIC-MI8O4**

8 digital inputs, 4 test outputs,  
4 individual or 2 pair OSSD outputs, and  
4 configurable I/O.

### SPEED MONITORING

#### **MOSAIC-MV0**

2 proxy switch inputs.

#### **MOSAIC-MV1T**

1 TTL encoder and  
2 prox switch inputs.

#### **MOSAIC-MV1H**

1 HTL encoder and 2 prox switch inputs.

#### **MOSAIC-MV1S**

1 SIN/COS encoder and 2 prox switch inputs.

#### **MOSAIC-MV2T**

2 TTL encoder and 2 prox switch inputs.

#### **MOSAIC-MV2H**

2 HTL encoder and 2 prox switch inputs.

#### **MOSAIC-MV2S**

2 SIN/COS encoder and 2 prox switch inputs.

# MOSAIC SYSTEM (MOSAIC M1 / M1S)



MOSAIC M1 or M1S controller units are able to interface with up to 14 individual expansion modules (up to a maximum of 4 of any one module type). Controller units can also be used in a stand-alone configuration.

**Blue-highlighted modules work only with the MOSAIC-M1S controller.**

### SAFETY RELAYS

#### **MOSAIC-MR2**

2 relays – 2 NO + 1 NC connectable to 1 OSSD pair + 1 NC contact for external device monitoring. 2 safety relays with guided contacts. Screw contacts.



#### **MOSAIC-MR4**

4 relays – 4 NO + 2 NC connectable to 2 OSSD pair + 2 NC contacts for external device monitoring. 4 safety relays with guided contacts. Screw contacts.

**These extension relays can connect to the outputs on the MOSAIC M1, M1S, or to any of the output cards**

### DIGITAL OUTPUTS

#### **MOSAIC-MO2**

2 EDM/RST inputs, 2 OSSD pairs and 2 status outputs.



#### **MOSAIC-MO4**

4 EDM/RST inputs, 4 OSSD pairs and 4 status outputs.

#### **MOSAIC-MOR4**

4 single-channel outputs or 2 dual-channel outputs.

#### **MOSAIC-MOR4S8**

4 single-channel outputs or 2 dual-channel outputs with 8 status outputs.

#### **MOSAIC-MO4L**

4 individual or 2 pair OSSD outputs, and 4 configurable I/O.

### ANALOG INPUTS

#### **MOSAIC-MA4**

4 analog inputs.



### STATUS OUTPUTS

#### **MOSAIC-MOS8**

8 status outputs.

#### **MOSAIC-MOS16**

16 status outputs.



### ACCESSORIES

#### **MOSAIC-MSC-C**

Safety communication bus connector and terminal end caps. Required to connect additional module to **MOSAIC-M1** or **MOSAIC-M1S**.



#### **MOSAIC-CSU**

Type A USB to Mini-USB cable connects MOSAIC M1 or M1S to PC for configuration with MSD configuration software.



#### **MOSAIC-MCM**

A proprietary removable memory card that can be used to save MOSAIC configuration data for subsequent transfer to a new device without using a PC.



# Safety Products



*Warning: Safety products sold by AutomationDirect are Safety components only. The purchaser/installer is solely responsible for the application of these components and ensuring all necessary steps have been taken to assure each application and use meets all performance and applicable safety requirements and/or local, national and/or international safety codes as required by the application. AutomationDirect cannot certify that our products, used solely or in conjunction with other AutomationDirect or other vendors' products, will assure safety for any application. Any person using or applying any products sold by AutomationDirect is responsible for learning the safety requirements for their individual application and applying them, and therefore assumes all risks, and accepts full and complete responsibility, for the selection and suitability of the product for their respective application.*

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