MOSAIC

MODULAR **SA**FETY **I**NTEGRATED **C**ONTROLLER

ReeR

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.

MOSAIC SYSTEM

MOSAIC-M1S-USBC

MOSAIC-M1

MOSAIC M1, M1S, or M1S-USBC 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 or MOSAIC-M1S-USBC controller.

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 prox 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.

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, MOSAIC-M1S, or MOSAIC-M1S-USBC.

MOSAIC-MCM, MOSAIC-MCMB
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.

ReeR MOSAIC-M1S
Enhanced Safety Controller

The ReeR MOSAIC (MOdular SAfety Integrated Controller) makes it easy to manage safety systems and sensors. It is modular, expandable, and configurable for managing all safety functions of a single machine or an entire plant. The main MOSAIC-M1S or MOSAIC-M1S-USBC unit is able to control a variety of expansion modules.

MOSAIC-MSC-C five-way ReeR proprietary buss is required to expand the controller. Buss connector not included.

Features

• Able to stand alone or to control other expansion modules
• Eight digital inputs
• Four configurable I/O for start/restart interlock, external device monitoring (EDM) and output status monitoring
• Four individual or two pair output switching signal device (OSSD) signals
• Four test outputs
• 35mm DIN rail mounting
• All functions are configured through the MOSAIC graphical Safety Designer Software via a built-in USB 2.0 connector. Cable sold separately.
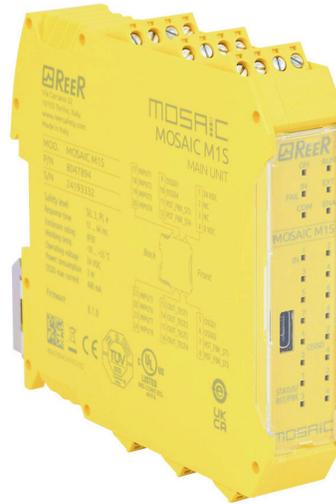
MOSAIC-M1S-USBC

Safety Data per EN 13849-1	
Category	4
Performance level	e
MTTF$_d$ (years)	30-100
DC$_{avg}$	High

Safety Data per IEC/EN 62061, IEC/EN 61508	
SIL CL	3
SIL	3
HFT	1
DC$_{avg}$	High
SFF	99.8%
PFH$_d$ (t-20a)	1.44e^{-8}

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

CE c(UL)us TÜV SÜD

MOSAIC Modular Safety Integrated Controller

Part Number	Price	Voltage	Inputs	Outputs	Configurable I/O	Connection	Programming Port	Drawing
MOSAIC-M1S	$465.00	24VDC	8 digital safety inputs	4 individual or 2 pair OSSD safety outputs, 4 test outputs	4 terminals: FBK_RST or STATUS	Removable terminal blocks, screw contacts	USB-B mini	PDF
MOSAIC-M1S-USBC	$463.00						USB-C	PDF

MOSAIC-M1S 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	260g [9.17 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).
USB Connection	Type B mini-USB connector
Specifications	
Nominal Voltage	24VDC
Voltage Range	± 20%
Maximum Consumption	3W
Digital Inputs	8 PNP active high
Test Outputs	4 test outputs to monitor short circuits
OSSD Outputs	4 individual or 2 pair solid state safety outputs – PNP active high 400ma @ 24VDC max
Configurable I/O	4 terminals to be used for I/O – Input: EDM, feedback, reset, restart – Output: status monitoring
Expansion	
Minimum Number of Modules	1 (MOSAIC-M1S used as stand-alone module) (8 inputs, up to 4 EDM/RST, 4 safety outputs, up to 4 status outputs)
Maximum Number of Modules	15 (MOSAIC-M1S plus 14 expansion modules) (128 inputs, 16 EDM/RST, 32 safety outputs, 48 status outputs) No more than 4 expansion modules of the same type

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.

Safety Electrical Components

Electrical Connections
To MOSAIC-M1S

ReeR

- 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 ± 20% (PELV, in compliance with the standard EN 60204-1 (Chapter 6.4).
- Do not use the MOSAIC to supply power to 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^2 (AWG16).

MOSAIC-M1S and MOSAIC-M1S-USBC Module Connections			
Terminal	Signal	Type	Description
1	24VDC	–	24VDC power supply
2	Not connected	–	–
3	Not connected	–	–
4	0VDC	–	0VDC power supply
5	OSSD1	Output	Static safety output 1
6	OSSD2	Output	Static safety output 2
7	RESTART_FBK1 or STATUS1	Input	Feedback/Restart 1
		Output	SIL 1 / PLc
8	RESTART_FBK2 or STATUS2	Input	Feedback/Restart 2
		Output	SIL 1 / PLc
9	OSSD3	Output	Static safety output 3
10	OSSD4	Output	Static safety output 4
11	RESTART_FBK3 or STATUS3	Input	Feedback/Restart 3
		Output	SIL 1 / PLc
12	RESTART_FBK4 or STATUS4	Input	Feedback/Restart 4
		Output	SIL 1 / PLc
13	OUT_TEST1	Output	Short circuit detected output
14	OUT_TEST2	Output	Short circuit detected output
15	OUT_TEST3	Output	Short circuit detected output
16	OUT_TEST4	Output	Short circuit detected output
17	INPUT1	Input	Digital input 1
18	INPUT2	Input	Digital input 2
19	INPUT3	Input	Digital input 3
20	INPUT4	Input	Digital input 4
21	INPUT5	Input	Digital input 5
22	INPUT6	Input	Digital input 6
23	INPUT7	Input	Digital input 7
24	INPUT8	Input	Digital input 8

Please see ReeR MOSAIC Supplemental Manual for basic wiring examples.

ReeR MOSAIC Accessories

ReeR MOSAIC-MSC-C Connector

The ReeR MOSAIC (MOdular SAfety Integrated Controller) MSC-C Safety Communication Connector with terminal end caps (MSCPC) permits communication between various system units. Required to connect any additional cards to the MOSAIC-M1, MOSAIC-M1S, or MOSAIC-M1S-USBC.

Features

• 5-way connector for communication among MOSAIC modules
• Comes in the box with all expansion modules and is only needed for the MOSAIC-M1, MOSAIC-M1S, or MOSAIC-M1S-USBC unit
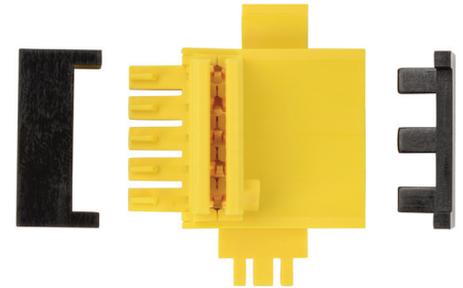
MOSAIC-MSC-C

MOSAIC-MSC-C Connector		
Part Number	Price	Description
MOSAIC-MSC-C	$16.00	Safety communication connector with terminal end caps (MSCPC). Permits communication between various system units.

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.

ReeR MOSAIC-MCM Memory Card

The ReeR MOSAIC (MOdular SAfety Integrated Controller) MCM Memory Card is 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.

MOSAIC-MCM Memory Card			
Part Number	Price	For Use With	Description
MOSAIC-MCM	$43.50	MOSAIC-M1 and M1S	Proprietary removable memory card that can be used to save MOSAIC configuration data for subsequent transfer to a new device without using a PC.
MOSAIC-MCMB	$34.00	MOSAIC-M1S-USBC	

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.

MOSAIC-MCMB

ReeR Programming Cable

The ReeR MOSAIC (MOdular SAfety Integrated Controller) programming cable is an interconnection cable used to connect the MOSAIC-M1, MOSAIC-M1S, or MOSAIC-M1S-USBC to a PC for programming with the MSD configuration software.

MOSAIC CSU Cable					
Part Number	Price	Connector A	Connector B	Cable Length (ft [m])	For Use With
MOSAIC-CSU	$18.00	USB-A	USB-B Mini	5.91 [1.8]	MOSAIC-M1 and MOSAIC-M1S
USB-CBL-AC6	$7.00	USB-A	USB-C	6 [1.83]	MOSAIC-M1S-USBC

Note: See product manual for complete details.

MOSAIC-CSU

Safety Electrical Components

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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