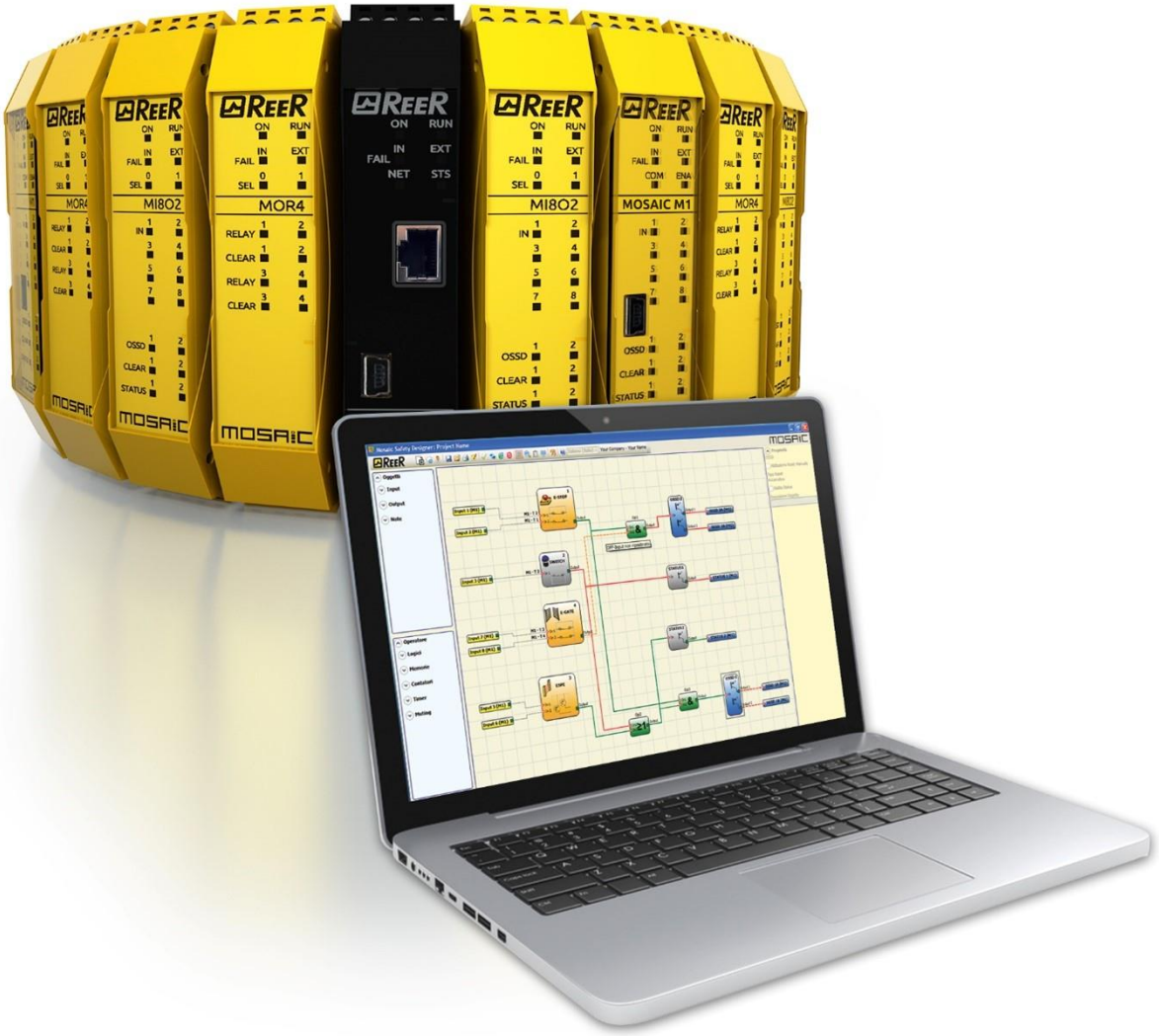
MOSAIC

MODULAR SAFETY INTEGRATED CONTROLLER

MOSAIC M1S COM RV, MOSAIC M1S RV, MI804 RV, MA4 V, MBC V

ADDENDUM TO MANUAL 8540780



Installation and use

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10153 Torino, Italy
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(Copy of the original instructions)

Introduction

The present addendum should be understood as an integration of manual 8540780: *"MOSAIC Instruction Manual"* and is applicable to the special MOSAIC modules MOSAIC M1S COM RV, MOSAIC M1S RV, MI804 RV, MA4 V, MBC V.

This modules have been designed to operate in environments with potentially explosive atmospheres and comply with the following Standards:

Applicable standards

The MOSAIC modules MOSAIC M1S COM RV, MOSAIC M1S RV, MI804 RV, MA4 V, MBC V are manufactured in accordance with the following European Directives:

- **2006/42/EC** "Machinery Directive"
- **2014/30/EU** "Electromagnetic Compatibility Directive"
- **2014/35/EU** "Low Voltage Directive"
- **2011/65/EU** "Restriction on the use of certain hazardous substances in electrical and electronic equipment"

and are built respecting the following Standards:

CEI EN 61131-2	Programmable controllers, part 2: Equipment requirements and tests
EN ISO 13489-1	Safety of machinery: Safety related parts of control systems. General principles for design
EN 61496-1	Safety of machinery: Electro-sensitive protective equipment. Part 1: General requirements and tests.
EN 61508-1	Functional safety of electrical/electronic/programmable electronic safety-related systems: General requirements.
EN 61508-2	Functional safety of electrical/electronic/programmable electronic safety-related systems: Requirements for electrical/electronic/programmable electronic safety-related systems.
EN 61508-3	Functional safety of electrical/electronic/programmable electronic safety-related systems: Software requirements.
EN 61508-4	Functional safety of electrical/electronic programmable electronic safety related systems: Definitions and abbreviations.
EN 62061	Safety of machinery. Functional safety of safety-related electrical, electronic and programmable electronic control systems
EN 81-20	Safety rules for the construction and installation of lifts. Lifts for the transport of persons and goods. Passenger and goods passenger lifts
EN 81-50	Safety rules for the construction and installation of lifts. Examinations and tests. Design rules, calculations, examinations and tests of lift components
UL 121201	*(modules M1S COM RV, MOSAIC M1S RV, MI804 RV, MA4 V, MBC V)* Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, Edition 9, Revision Date 04/01/2021
CSA C22.2 No. 213-17	*(modules M1S COM RV, MOSAIC M1S RV, MI804 RV, MA4 V, MBC V)* Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, Edition 3, Revision Date 04/01/2021
EN IEC 60079-0:2018	*(modules M1S COM RV, MOSAIC M1S RV, MI804 RV, MA4 V, MBC V)* Explosive Atmospheres - Part 0: Equipment - General Requirements
EN 60079-7:2015	*(modules M1S COM RV, MOSAIC M1S RV, MI804 RV, MA4 V, MBC V)* Electrical Apparatus for Explosive Gas Atmospheres - Part 7: Increased Safety "E"

Table 1

English

Special modules M1S COM RV, MOSAIC M1S RV, MI804 RV, MA4 V, MBC V

The subject modules meet the following Atex Standards:

2014/34/EU	Equipment and Protective Systems intended for use in Potentially Explosive Atmospheres
EN IEC 60079-0:2018	Explosive atmospheres - part 0: Equipment - General Requirements
EN 60079-7:2015	Electrical Apparatus for Explosive Gas Atmospheres - Part 7: Increased Safety "E"
UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, Edition 9, Revision Date 04/01/2021
CSA C22.2 No. 213-17	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, Edition 3, Revision Date 04/01/2021

Specific Conditions of Use

- The equipment shall only be used in an area of at least pollution degree 2, as defined in EN 60664-1.
- The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP54 in accordance with EN IEC 60079-0.
- Transient protection shall be provided that is set at a level not exceeding 140 % of the peak rated voltage value at the supply terminals to the equipment.
- Vertical Limited position for all models. MOSAIC M1S COM RV shall be installed only on the right of other modules.
- The maximum ambient temperature must be observed in the final application at a distance of 40 mm from the device.

Technical Characteristics

MOSAIC M1S RV	
PARAMETER	**VALUE**
Rated voltage	24 VDC ± 20%
Dissipated power	3W max
Digital INPUTS (No./description)	8 / PNP active high - max current consumption 4mA
INPUT FBK/RESTART (No./description)	4 / EDM control / possible Automatic or Manual operation with RESTART button - max current consumption 4mA
Test OUTPUT (No./description)	4 / to check for short-circuits - overloads
Digital OUTPUT (No./description)	4 / programmable - PNP active high
OSSD (No./description)	4 single channels (or 2 double channels) / cat. 4, 400mA@24VDC max Interface type C class 3 (ZVEI CB24I)

MOSAIC M1S COM RV	
PARAMETER	**VALUE**
Rated voltage	24 VDC ± 20%
Dissipated power	4W max
Digital INPUTS (No./description)	8 / PNP active high - max current consumption 4mA
INPUT FBK/RESTART (No./description)	4 / EDM control / possible Automatic or Manual operation with RESTART button - max current consumption 4mA
Test OUTPUT (No./description)	4 / to check for short-circuits - overloads
Digital OUTPUT (No./description)	4 / programmable - PNP active high
OSSD (No./description)	4 single channels (or 2 double channels) / cat. 4, 400mA@24VDC max Interface type C class 3 (ZVEI CB24I)
Supported fieldbus protocol	EtherNet/IP - MODBUS/TCP - PROFINET - EtherCAT

English

MI8O4 RV	
PARAMETER	**VALUE**
Rated voltage	24 VDC ± 20%
Dissipated power	3W max
Digital INPUTS (No./description)	8 / PNP active high - max current consumption 4mA
INPUT FBK/RESTART (No./description)	4 / EDM control / possible Automatic or Manual operation with RESTART button - max current consumption 4mA
Test OUTPUT (No./description)	4 / to check for short-circuits - overloads
Digital OUTPUT (No./description)	4 / programmable - PNP active high
OSSD (No./description)	4 single channels (or 2 double channels) / cat. 4, 400mA@24VDC max Interface type C class 3 (ZVEI CB24I)

MA4 V	
PARAMETER	**VALUE**
Rated voltage	24 VDC ± 20%
Dissipated power	5W max
Channels number / description	4 / fully isolated (500 VDC) Each channel can be configured as Voltage input or Current input
Current output sensors	
Range	4 … 20 mA (0 … 20 mA)
Conversion bits	16
Resolution (minimum current variation relevable)	381 nA
Sample rate (Samples per second)	User selectable. Allowable values: 2.5, 5, 10, 16.6, 20, 50, 60, 100, 200, 400, 800, 1000, 2000, 4000
Conversion internal resistance	200 Ω
Max input current	23 mA
Voltage output sensors	
Range	0 … 10 V
Conversion bits	16
Resolution (minimum voltage variation relevable)	152 uV
Sample rate (Samples per second)	Selezionabile dall'utente. Valori selezionabili: 2.5, 5, 10, 16.6, 20, 50, 60, 100, 200, 400, 800, 1000, 2000, 4000
Conversion internal resistance	250 kΩ

MBC V	
PARAMETER	**VALUE**
Rated voltage	24 VDC ± 20%
Dissipated power	5W max

ENVIRONMENTAL CONDITIONS	
PARAMETER	**VALUE**
Environmental temperature	-40°C ≤ Ta ≤ +65°C
Storage temperature	-40°C ≤ Ts ≤ +85°C
Relative humidity	10% … 95%
Max. altitude (above sea level)	2000m

English

Special Modules Marking

The special modules will be marked as follows:

II 3G Ex ec IIC T5 Gc with -40°C ≤ Tamb ≤ +50°C
II 3G Ex ec IIC T4 Gc with -40°C ≤ Tamb ≤ +65°C

Electrical connections

- Warning – connect or disconnect only in a non-hazardous area.
- Install safety units in an enclosure with a protection class of at least IP54.
- Connect the module when it is not powered.
- The supply voltage to the units must be 24Vdc ±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.

Instructions concerning connection cables

- Wire size range: AWG 12…30, (solid/stranded) (UL).
- Use >81°C copper (Cu) conductor only.
- We recommend the use of separate power supplies 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 must have a cross-section of at least 1mm^2 (AWG16).

Software MSD

Refer to manual 8540780: *"MOSAIC Instruction Manual"* to comprehend the features of the programming software *"Mosaic Safety Designer"*.

English

ACCESSORIES AND SPARE PARTS

MODEL (SCREW)	DESCRIPTION	CODE
MOSAIC M1S RV	MOSAIC main unit (8 inputs / 4 single OSSD)	1100023
MOSAIC M1S COM RV	MOSAIC main unit (8 inputs / 4 single OSSD / fieldbus)	1100037
MI8O4 RV	MOSAIC I/O expansion unit (8 inputs / 4 single OSSD)	1100027
MA4 V	MOSAIC analog input expansion unit (4 channels)	1100033
MBC V	MOSAIC CANopen interface unit	1100035

MODEL (CLAMP)	DESCRIPTION	CODE
MOSAIC M1SC RV	MOSAIC main unit (8 inputs / 4 single OSSD)	1100024
MOSAIC M1SC COM RV	MOSAIC main unit (8 inputs / 4 single OSSD / fieldbus)	1100038
MI8O4C RV	MOSAIC I/O expansion unit (8 inputs / 4 single OSSD)	1100028
MA4C V	MOSAIC analog input expansion unit (4 channels)	1100034
MBCC V	MOSAIC CANopen interface unit	1100036

EU DECLARATION OF CONFORMITY (1)

CE

Dichiarazione di Conformità UE / EU Declaration of Conformity

Torino, 08/02/2024

REER SpA - via Carcano 32
10153 - Torino - Italy

dichiara che il controllore integrato MOSAIC costituisce un dispositivo di sicurezza realizzato in conformità alle seguenti Direttive Europee:
declares that the integrated controller MOSAIC is a safety device complying with the following European Directives:

2006/42/EC	"Direttiva Macchine" *"Machine Directive"*
2014/30/EU	"Direttiva Compatibilità Elettromagnetica" *"Electromagnetic Compatibility Directive"*
2014/35/EU	"Direttiva Bassa Tensione" *"Low Voltage Directive"*
2011/65/EU	"Limitazioni sull'uso di sostanze pericolose nelle Apparecchiature Elettriche ed Elettroniche" *"Restriction of the use of certain hazardous substances in Electrical and Electronic Equipment"*

ed è conforme alle seguenti norme:
and complies with the following standards:

EN 61131-2 (2007)	Controllori programmabili - Parte 2: Specifiche e prove delle apparecchiature. *Programmable controllers - Part 2. Equipment requirements and tests.*
EN ISO 13849-1 (2015)	Sicurezza del macchinario: Parti dei sistemi di comando legate alla sicurezza. Parte 1: Principi generali per la progettazione. *Safety of machinery:- Safety-related parts of control systems - Part 1: General principles for design.*
EN IEC 61496-1 (2020)	Sicurezza del macchinario: Dispositivi Elettrosensibili di protezione, Parte 1: Requisiti generali e tests. *Safety of machinery : Electro sensitive protective equipment, Part 1: General requirements and tests.*
EN 61508-1 (2010)	Sicurezza funzionale di impianti elettrici/elettronici/programmabili legati alla sicurezza: Requisiti generali. *Functional safety of electrical/electronic programmable electronic safety related systems: General requirements.*
EN 61508-2 (2010)	Sicurezza funzionale di impianti elettrici/elettronici/programmabili legati alla sicurezza: Requisiti per impianti elettrici/elettronici/programmabili legati alla sicurezza. *Functional safety of electrical/electronic/programmable electronic safety related systems:* *Requirements for electrical/electronic/programmable electronic safety-related systems.*
EN 61508-3 (2010)	Sicurezza funzionale di impianti elettrici/elettronici/programmabili legati alla sicurezza: Requisiti Software. *Functional safety of electrical/electronic programmable electronic safety related systems: Software requirements.*
IEC 62061 (2021)	Sicurezza del macchinario. Sicurezza funzionale dei sistemi di comando e controllo elettrici, elettronici e programmabili correlati alla sicurezza. *Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems.*
EN 81-20 (2020)	Regole di sicurezza per la costruzione e l'installazione di Ascensori. Ascensori per il trasporto di persone e cose. Parte 20: Ascensori per persone e cose accompagnate da persone. *Safety rules for the construction and installation of lifts. Lifts for the transport of persons and goods. Passenger and goods passenger lifts.*
EN 81-50 (2020)	Regole di sicurezza per la costruzione e l'installazione di Ascensori. Verifiche e prove. Parte 50: Regole di progettazione, calcoli, verifiche e prove dei componenti degli ascensori. *Safety rules for the construction and installation of lifts. Examinations and tests.* *Design rules, calculations, examinations and tests of lift components*

raggiungendo il livello di sicurezza pari a: SIL 3 / SILCL 3 / PL e/ Cat. 4 / Tipo 4 (v. standard corrispondenti)
reaching a safety level corresponding to: SIL 3 / SILCL 3 / PL e / Cat. 4 / Type 4 (see related standards)

ed è identico all'esemplare esaminato ed approvato con esame di tipo CE da:
and is identical to the specimen examined and approved with a CE - type approval by:

TÜV SÜD Product Service GmbH – Zertifizierstelle – Ridlerstraße 65 – 80339 – München – Germany
N.B. number: 0123 – Certificate No. Z10 024820 0077 Rev. 01

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Technical Director

Simone Scaravelli
Amministratore Delegato
Managing Director

English

EU DECLARATION OF CONFORMITY (2)

Dichiarazione di Conformità UE / EU Declaration of Conformity

Torino, 28/02/2024

REER SpA - via Carcano 32
10153 - Torino - Italy

dichiara che i seguenti moduli MOSAIC: **MOSAIC M1S COM RV, MOSAIC M1S RV, MI804 RV, MA4 V, MBC V** sono dispositivi di sicurezza realizzato in conformità alle seguenti Direttive Europee Atex:

declares that the following MOSAIC modules: ***MOSAIC M1S COM RV, MOSAIC M1S RV, MI804 RV, MA4 V, MBC V*** *are safety devices manufactured in compliance with the following Atex European Directives:*

2014/34/EU	Regolamentazione di Attrezzature e Impianti per Atmosfera Esplosiva *Regulation for equipment and protective systems intended for use in potentially explosive atmospheres*

Riferimento alle pertinenti norme armonizzate utilizzate o riferimenti alle altre specifiche tecniche in relazione alle quali è dichiarata la conformità:
References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:

EN IEC 60079-0:2018	Atmosfere Esplosive - Parte 0: Apparecchiature - Prescrizioni Generali *Explosive Atmospheres - Part 0: Equipment - General Requirements*
EN 60079-7:2015	Costruzioni Elettriche per Atmosfere Esplosive per la presenza di Gas – Parte 7: Sicurezza aumentata "E" *Electrical Apparatus for Explosive Gas Atmospheres - Part 7: Increased Safety "E"*

Inoltre, per il mercato USA-CANADA i prodotti in oggetto rispettano le seguenti normative:
Furthermore, for the USA-CANADA market, the aforementioned products comply with the following regulations:

UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, Edition 9, Revision Date 04/01/2021
CSA C22.2 No. 213-17	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations, Edition 3, Revision Date 04/01/2021

Condizioni di utilizzo specifiche / *Specific Conditions of Use*

- L'apparecchiatura deve essere utilizzata esclusivamente in un'area con un grado di inquinamento minimo pari a 2, come richiesto dalla norma EN 60664-1.
- L'apparecchiatura deve essere installata in un involucro che garantisca una protezione minima all'ingresso di IP 54, in conformità alla norma EN IEC 60079-0.
- La protezione dai transitori deve essere impostata a un livello non superiore al 140% del valore di tensione nominale di picco ai terminali di alimentazione dell'apparecchiatura.
- Posizione verticale limitata per tutti i modelli: MOSAIC M1S COM RV deve essere installato solo a destra di altri moduli.
- La temperatura ambiente massima deve essere rispettata nell'applicazione finale a una distanza ≥ 25 mm e ≤ 50 mm dal dispositivo.
- *The equipment shall only be used in an area of at least pollution degree 2, as defined in EN 60664-1.*
- *The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP 54 in accordance with EN IEC 60079-0.*
- *Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value at the supply terminals to the equipment.*
- *Vertical Limited position for all models: MOSAIC M1S COM RV shall be installed only on the right of other modules.*
- *The maximum ambient temperature must be observed in the final application at a distance ≥ 25mm and ≤50mm from the device.*

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English

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English