

Technical Overview



MOX 603 Modular I/O

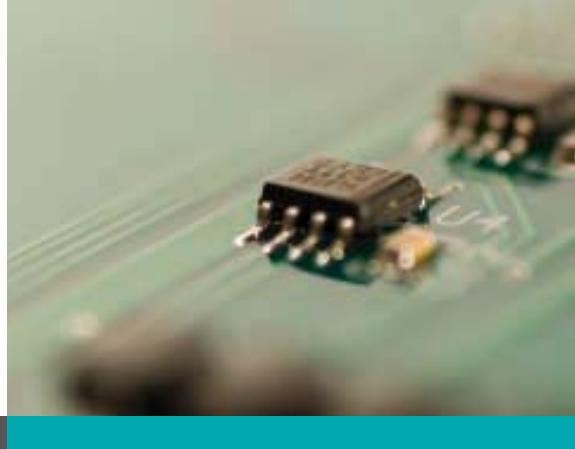
MOX



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Features



The MOX 603 Modular I/O System offers one of the most industry capable I/O solutions available today. Designed around current needs and future desires, it will meet almost every user's particular needs.

The wide range of I/O modules include numerous digital and analog modules. Each one offers comprehensive configuration options. Being microprocessor based allows them to manage their own communications parameters, error conditions and user options. This inbuilt intelligence allows the modules to be installed in stand-alone mode or multi-module rack based configuration.

All MOX 603 I/O Modules are software configurable. Module type recognition allows a once off configuration that ensures incorrectly installed modules are identified, reducing the likelihood of damage to field equipment. Further levels of safety are achieved through a mechanical keying system allowing only the correct module to be installed in a configured base.

The MOX 603 Modular I/O System provides true redundancy at all levels. Independent paths are provided for both power and communications. This is then passed through to adjacent modules if connected. In rack configuration, dual Communications Processor modules ensure the redundancy is continued to the Primary and Standby Controllers.

Field devices may also be connected to dual redundant I/O Modules. Some bottom wired modules of the same type, placed on an MX603-2023-01 dual base can be configured for redundancy with the modules running appropriately in Primary / Standby Mode. This redundant solution delivers maximum availability to any application using the MOX 603 I/O solution.

**INTELLIGENT
MICROPROCESSOR
BASED PLATFORM**

**OPEN SYSTEMS
ARCHITECTURE**

**TRUE REDUNDANCY
BUILT IN AT EVERY LEVEL**

**IMMEDIATE
INTEGRATION WITH THE
ENTIRE RANGE OF MOX
CONTROLLERS**

**SOLID CONSTRUCTION
FOR EXTREME
OPERATING CONDITIONS**

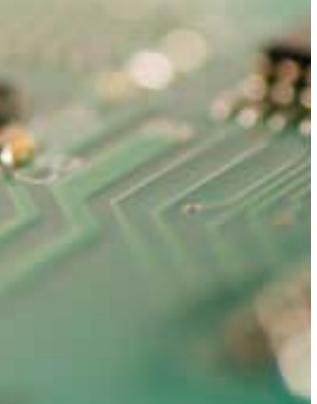
**WIDE OPERATING
TEMPERATURE RANGE**

**USER CONFIGURABLE,
MODULE SPECIFIC
OPTIONS**

**SHORT CIRCUIT AND
OPEN WIRE DETECTION
ON SPECIFIC MODULES**

**AUTOMATIC
FAULT DETECTION**

**IECEx CERTIFIED MODULES
AVAILABLE FOR EXPLOSIVE
ATMOSPHERES**



The wide range of I/O modules include numerous digital and analog modules. Each one offers comprehensive configuration options.

MOX 603 Modular I/O System



Applications

The MOX 603 Modular I/O System is designed to meet the most demanding I/O and process control needs. Product safety and high reliability are paramount. All modules are tested to derived methods of US military specifications as well as compliance with internationally recognised standards.

The solid construction also ensures that all modules are ready to withstand the rigors of any industrial installation.

The MOX 603 Modular I/O System has been designed around the expansion I/O requirements for the entire range of MOX controllers. For this reason, the industry groups utilising these products have featured heavily in design considerations and in the development of the product range.

In MOX Field Controller applications requiring a small amount of expansion I/O, such as in pumping stations, wellhead controllers or other RTU applications, the MOX 603 Modular I/O may be utilised in stand-alone configuration. Single modules or multiple cascaded modules may be installed as required and connected via Ethernet or Modbus RS485.

If a single module is installed and, at a later date, a second I/O module is required, the new base may be cascaded directly with the existing base. The power will be immediately available and the supplied voltage and communications ports will be immediately connected, without disruption to the existing installation.

The MOX Open Controller is typically installed in heavy industry applications, such as boiler controllers, chemical plants and others that by their very nature, require large amounts of field I/O.

The MOX 603 Modular I/O installed in Rack Configuration Mode, fulfills this requirement.

A Rack Based MOX 603 Modular I/O installation requires an I/O Communications Processor to communicate with the host controller over MoxBUS, Ethernet or another Open Systems Communications method. A second I/O Communications Processor then adds dual redundant communications for connection to a host controller, hot standby pair.

DESIGNED AND TESTED TO RECOGNISED INTERNATIONAL STANDARDS

DEVELOPED FOR SMALL, MEDIUM OR LARGE-SCALE INSTALLATIONS

STANDALONE CONFIGURATION FOR ONE OR MORE I/O MODULES

RACK CONFIGURATION FOR LOCAL OR REMOTE I/O INSTALLATIONS

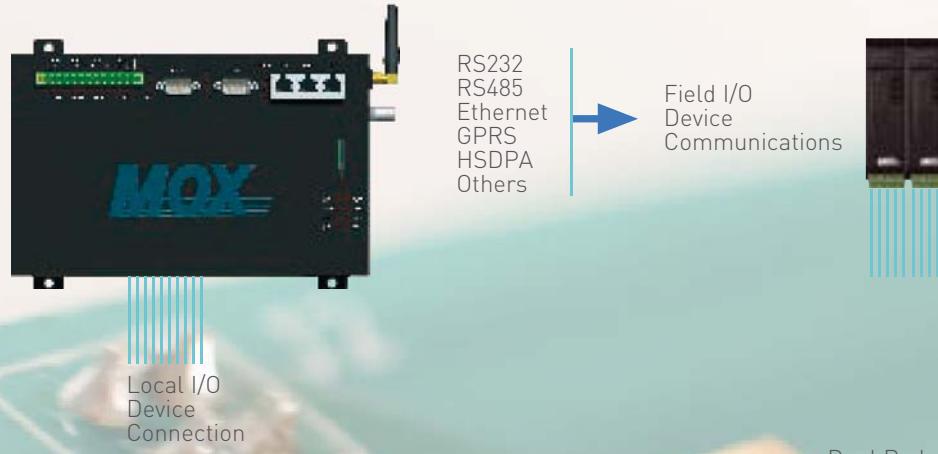
OPEN SYSTEMS COMMUNICATIONS CATTERS FOR THIRD PARTY CONTROLLERS



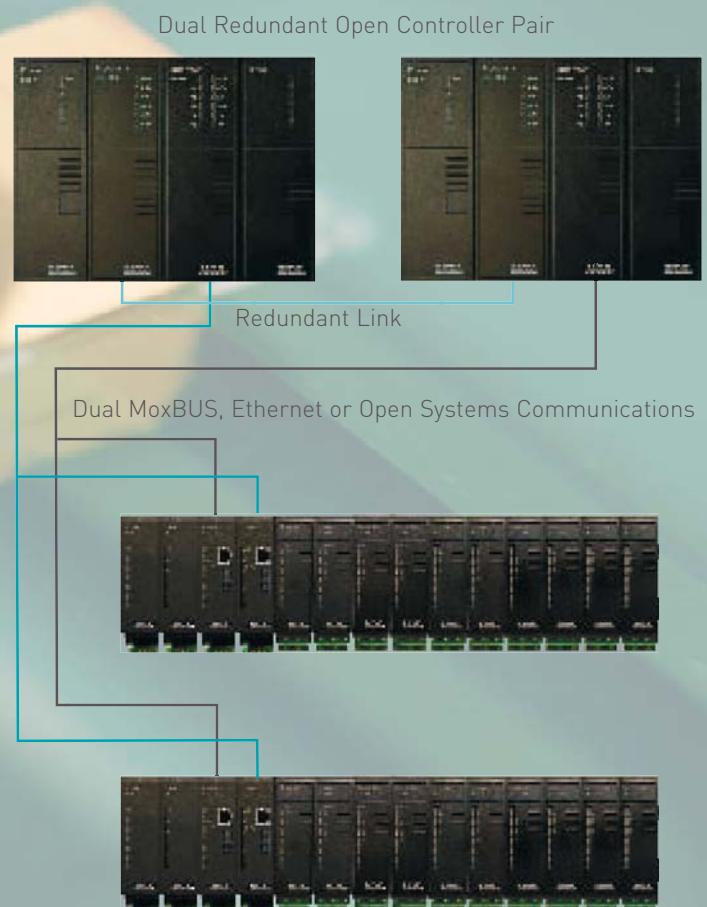
Product safety and high reliability are paramount.

MOX Field Controller with Standalone I/O

MOX Field Controller



MOX Open Controller in Hot Standby Configuration



Architecture



A MOX 603 Modular I/O Module is designed in two parts; a system base and signal module. The system offers a level of isolation by allowing pre-wiring of the field devices to the removable terminal strips. I/O Modules are hot swappable and may be inserted or removed without the need to isolate module power or field devices. Physical guides and module safety keying allow the module to slide into the correct position quickly, safely and without risk of damage.

The MOX 603 Modular I/O base may be DIN Rail mounted. A two position mounting clip provides a simple yet secure attachment to standard 35mm DIN Rail that may then be directly mounted to a panel. A solid and secure installation of the module is also completed by using the mounting screws that attach to the threaded sockets in the Base.

There are 5 rack base types used for different applications. The MX603-2022-01 is the standard base used for all bottom wired modules except for the thermocouple module, which has its own associated base (MX603-2008-01). All front wired modules use the MX603-2020-01 base. The MX603-2023-01 dual base is used for redundantly connected module pairs. Any of these can be cascaded together to form a rack where both power and communications are transferred through the base to other modules. The fifth base type is the stand alone base.

The Standalone Base contains two removable terminal strips on either side of the base. Each terminal strip provides an independent RS485 serial port and a 24V power connection point. Dual power and dual communication paths are provided through each base.

The Communications Processor available options include RJ45 Ethernet Port, Optical Fibre Port, MoxBUS Port and RS485 or RS232 Serial Ports. These communication options extend the connectivity of the MOX 603 Modular I/O system.

MODULAR TWO PART CONSTRUCTION WITH INHERENT SCALABILITY

DIP SWITCH ADDRESSABLE

MODULE INSERTION GUIDES AND SAFETY KEYING

MODULE SCREW LOCKS

FRONT PANEL OPERATION AND STATUS LEDS

STANDARD 35MM DIN RAIL MOUNTED



A MOX 603 Modular I/O Module is designed in two parts; a System Base and a Signal Module.

Standalone I/O



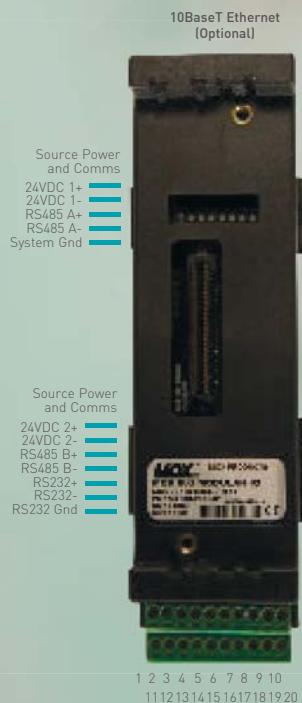
Rack I/O



Front Wired I/O



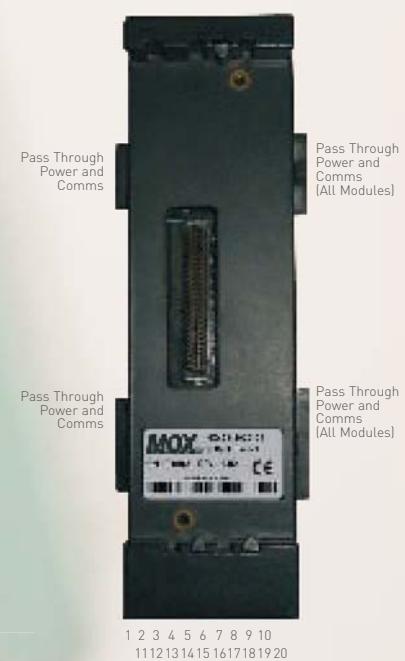
Standalone Base



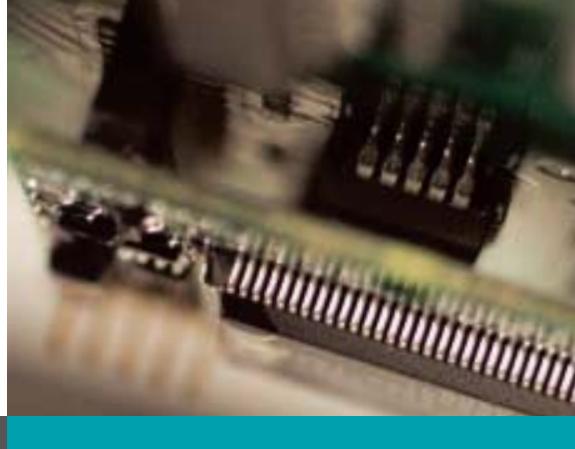
Rack Base



Front Wired Module Base



Rack Base



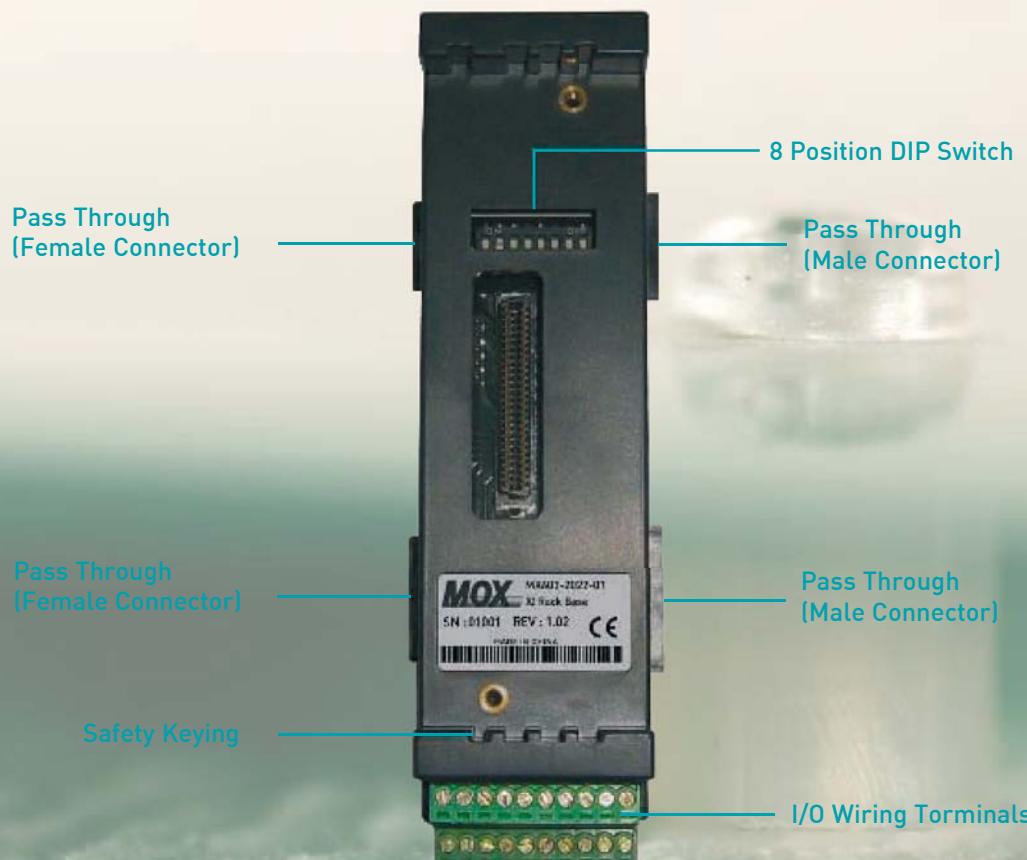
MX603-2022-01

The MX603-2022-01 base is used for all bottom-wired I/O modules except for the TC module MX603-0508-813. The MX603-2022-01 base can be cascaded with other rack type I/O bases so that power and communications can be connected through to other I/O modules.

For module-powered I/O applications, the 24VDC power is supplied from the I/O wiring terminals and is isolated from the power on the I/O rack bases. Module addressing for communications with the rack's Communications Processor can easily be made via the 8-position DIP switch.

Front wired I/O modules use the simpler MX603-2020-01 base.

For installations where I/O modules are to be mounted in explosive atmospheres, the IECEx certificated base MX603-7020-01 can be used in conjunction with the front-wired IONITY range of I/O modules.



Dual Rack Base

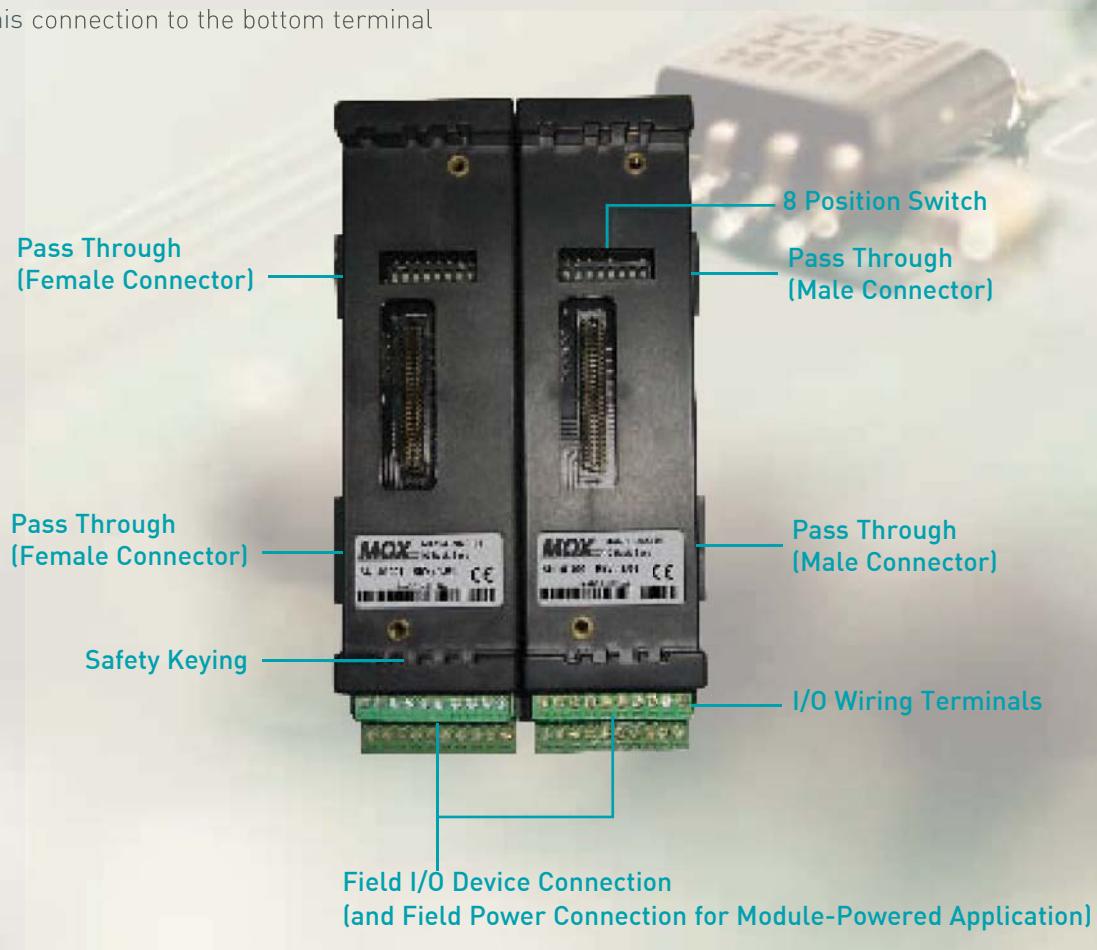
MX603-2023-01

The MX603-2023-01 is a dual base. It is used for bottom-wired I/O modules connected in redundancy applications. When two identical modules are placed on this dual base they are connected for redundancy purposes. This base can be cascaded with other rack type I/O bases so that power and communications can be connected through to other I/O modules.

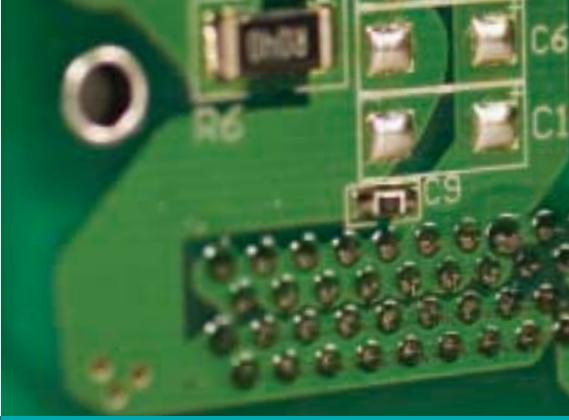
24VDC field power can be connected to the bottom terminal connectors for certain module-powered modules. This connection to the bottom terminal

connectors must be the same power supply connection to the field devices otherwise it may result in power ground potential differences. When making these connections, +24VDC goes to pin 9 and -24VDC goes to pin 10. Both bases of the dual rack base would be connected in this way.

The bases can easily be addressed via the 8-position DIP switches when setting the addressing for communication with the rack's Communications Processor. They are set to the same address for each dual rack base.



Host Control



The MOX 603 Modular I/O System is ideally suited to the entire range of MOX controllers. The capability of the system even extends beyond this to many third party products. Every I/O module in the range contains two RS485 ports and one RS232 port which are user accessible when used in Standalone configuration. All Ethernet modules also provide the capability of communicating over a 10 Mbps Ethernet link.

In Rack Configuration, the MOX 603 I/O Communications Processor provides the interface between the Host Controller and the I/O modules. The Open Systems architecture of the MOX 603 Modular I/O System means the Communications Processor will utilise one of the many standard protocols to communicate with the Host Controller, including Modbus, Modbus TCP/IP, ProfiBUS or the MOX proprietary high speed protocol, MoxBUS.

The MOX 603 Power Supply module provides power to the MOX 603 I/O across dual paths. The MOX I/O Communications Processor module receives power via the module's base.

By installing dual redundant I/O Communications Processors, your solution will contain dual paths for communications to the I/O Modules as well as dual paths to the host controller hot standby pair.

Each MOX 603 I/O Module provides comprehensive information to the user so that the operational status may be monitored and controlled more efficiently. The wide range of module specific diagnostic information may be accessed from a PC using software such as the MoxIDE Integrated Development Environment.

The host controller may be configured to retrieve the diagnostic information from the I/O module either directly or via the I/O Communications Processor, depending upon the configuration. The Communications Processor uses this information to efficiently manage the complete rack of I/O.

**DIRECT INTERFACE TO
MOX CONTROLLERS**

**SUITABLE FOR USE
WITH THIRD PARTY
CONTROLLERS**

**OPEN SYSTEMS
PROTOCOLS AVAILABLE**

**DUAL REDUNDANT
COMMUNICATIONS**

**LARGE QUANTITY
OF DIAGNOSTIC
INFORMATION**



The MOX 603 Modular I/O System is ideally suited to the entire range of MOX Controllers.

MOX 603 I/O Rack Cabling



Specifications



MOX 603 Modular I/O General Specifications

Environmental Specifications

Operating Temperature Range	-20 to 70 °C
Storage Temperature Range	-40 to 85 °C
Humidity (non-condensing)	5 to 95%

Standalone / Rack I/O

Mechanical Specifications

Base

Width	40 mm
Height	140 mm
Height (with terminal strips)	150 mm

Depth

Module

Width	40 mm
Height	114 mm
Depth	80 mm

Front Wired I/O

Mechanical Specifications

Base

Width	40 mm
Height	140 mm
Depth	26 mm

Module

Width	40 mm
Height	114 mm
Depth	93 mm

Standalone I/O Communications

Serial RS485 Communications

Available Ports	2 x RS485
Protocol Supported	Modbus RTU slave
Wiring Configuration	2 x 3 wire on separate bus
Isolation (module to module)	1200 Vrms, 1 minute
Supported Baud Rates	2400, 4800, 9600, 19200, 38400, 57600, 115200
Factory Setting	57600, 8 data bits, 1 stop bit, no parity.

Cable Recommendation

Modules Per Network

Serial RS232 Communications

Available Port	1 x RS232
Protocol Supported	Modbus RTU slave
Wiring Configuration	3 wire connection
Supported Baud Rates	2400, 4800, 9600, 19200, 38400, 57600, 115200
Factory Setting	9600, no parity, 8 data bits, 1 stop bit
Cable Recommendation	Shielded, twisted pair with drain wire desirable

Ethernet Communications

Available Port	1 x 10BaseT Ethernet
Protocol Supported	Modbus TCP/IP slave
Wiring Configuration	RJ45
Supported Baud Rates	10 Mbps
Cable Recommendation	Cat-5 UTP
Modules Per Network	250 maximum

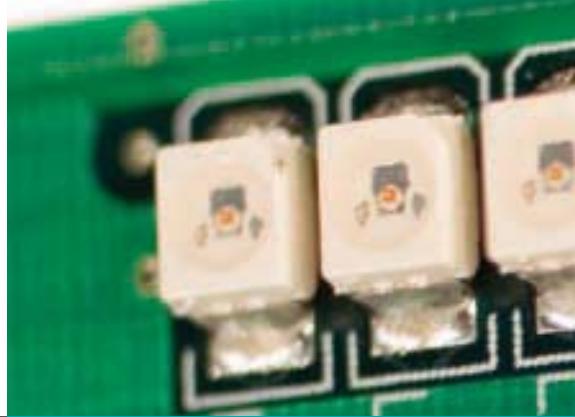


Diagnostic Information

Information Type	Description
Module Type	The individual type value of the MOX I/O Module.
Version Number	The module version number, used to tell the program the format in which the information is saved.
COM Configuration	The user-configurable baud rates and package format of each port. The default values are 57600, 8 data bits, 1 stop bit, no parity.
Ethernet Configuration	Whether the Ethernet port is supported or not, the IP address and the selected protocol. The default values are No Ethernet, 192.168.0.1:502 and Modbus TCP/IP.
Primary/Secondary	Whether the MOX I/O module is currently in primary or standby mode.
Channel Type	The individual I/O channel user parameters including filter time. The default values are standard without filtering.
Running Time	How much time the module has been running since powered on.
Scan Times	The number of cycles the module has scanned as well as the last scan cycle time in msec.
Package Number	The number of correctly received query packets, replied packets and faulted packets by each communications port.
Error Conditions	Various Error Conditions as shown below.

Variable Type	Error Condition	Variable Type	Error Condition
Serial Port Status (1-3)	0: no error 1: disabled 2: port cannot be opened 3: no connection to master	Primary Module Status	0: no error 4: primary module is not functioning
Ethernet Port Status	0: no error 1: disabled	Standby Module Status	0: no error 4: standby module is not functioning
I/O Module Error Status	0: no error 0xFF: EEPROM CRC check bad 0xFE: module type isn't defined 0xFD: version error	Field Wiring Status	Module specific, including open circuit detection, short circuit detection and others

Standalone Solutions



The MOX 603 Modular I/O product range includes standalone configurations to suit solutions requiring a small amount of expansion I/O, such as in pumping stations, wellhead controllers or other common RTU applications.

To expand a standalone I/O installation, simply connect additional modules by cascading the base units. With dual 24Vdc power and RS485 communication buses, additional modules can be added and are available immediately without disruption to the existing installation.

MOX 603 Standalone I/O modules are cascaded together in a similar manner to Rack-based I/O, with the key difference that each standalone I/O module communicates independently with the host controller. The cascaded modules are each individually identifiable with a station address and a set of Modbus registers.

The MOX 603 Standalone I/O modules handle both power conditioning and communication processing functions internally. Terminal connectors on the side of the base unit accept two sources of 24Vdc external power. The dual power supply is then passed through bus connectors to any connected modules.

MOX 603 Standalone I/O modules are available in Standalone Serial or Standalone Ethernet variants.

**DESIGNED FOR
SYSTEMS REQUIRING
SMALL I/O EXPANSION**

**I/O MODULES
ACT AS MODBUS
SLAVE DEVICES**

**SERIAL AND
ETHERNET
CONNECTIVITY**

**PASS-THROUGH
POWER AND RS485
COMMUNICATIONS**



Standalone Serial I/O

MX603 - XXXX - XX5

Standalone Serial I/O modules provide two RS485 ports and a single RS232 port for Modbus communications. The RS232 port can be used for point to point serial communications.

The RS45 port allows the I/O module to be used in a multi-drop network of up to 31 devices.

The two RS45 ports are propagated through to cascaded modules.

Serial RS232 to Standalone I/O



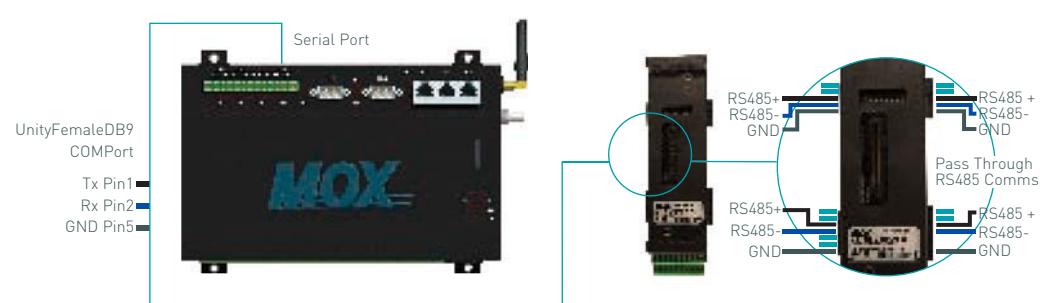
Standalone Ethernet I/O

MX603 - XXXX - XX6

In addition to RS232 and RS45 serial ports, the Standalone Ethernet I/O modules also allow the ability to communicate over a 10 Mbps Ethernet connection.

The modules support Modbus over TCP/IP.

Serial RS45 to Standalone I/O



Ethernet to Standalone I/O



Rack Solutions

Communications Processor MX603 – 30XX

Overview

The MOX 603 Modular I/O system is available in Standalone or Rack Configuration. In Rack Configuration, the MOX 603 Communications Processor (CP) modules provides the interface between the MOX 603 I/O modules and a host controller, such as the MOX Open Controller or MOX Unity Field Controller.

Communications

Various MOX CP Modules are available for connectivity via Serial RS232, Serial RS485, Ethernet, ProfiBUS or MoxBUS communications. Several combination modules are also available.

The MOX CP modules utilise an open systems architecture giving third party host controllers an open interface and therefore virtually unlimited connectivity to the MOX 603 Modular I/O system.

To maintain efficient communications, it is recommended that each Communications Processor (CP Module) controls a maximum of 10 interconnected I/O modules.

Architecture

The MOX CP Module may be installed in single or dual redundant configurations. Various levels of redundancy may be achieved depending on the capability of the host controller and on the particular CP modules selected. For complete redundancy, a system will contain dual communications paths between the I/O Modules and a redundant pair of host controllers as well as redundant power supplies.



OPEN SYSTEMS ARCHITECTURE

**CONTROLS A MAXIMUM OF 10
INTERCONNECTED I/O MODULES**

**INSTALLED IN SINGLE OR DUAL
REDUNDANT CONFIGURATIONS**

Serial RS232 CP Module MX603-3005

1 x RS232 Port

1 x additional RS485 Port

Suitable for applications requiring an economic and flexible I/O solution for point to point communications. Using RS232, a 15m distance limitation applies.



Serial RS485 CP Module MX603-3007

2 x RS485 Ports

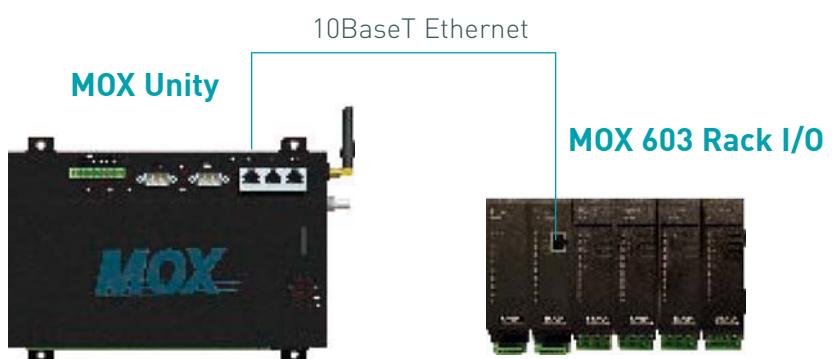
Suitable for applications requiring an economic and flexible I/O solution. With RS485, Remote I/O may be installed up to a distance of 1.2km from the host controller. A recommended maximum of 12 remote drops is supported.



10BaseT Ethernet CPE Module MX603-3010

1 x 10BaseT Ethernet Port

Suitable where an Ethernet connection to host controller is required. Standard Ethernet TCP/IP rules apply to the installation distance and configuration. A recommended maximum of 12 remote drops is supported.



Rack Solutions



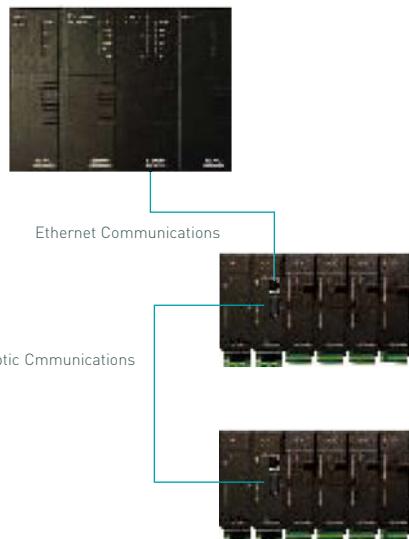
Combination Ethernet and Fibre Optic CPE Module MX603-3012

1 x 10BaseT Ethernet Port

1 x 100BaseTX Fibre Optic Port

Suitable for installations requiring a high speed deterministic I/O architecture but with the added flexibility of a mixed I/O solution. A connection between a single host controller and field I/O will be established with the CPE Module via Ethernet or Fibre.

MOX Open Controller



Module Combination Ethernet and MoxBUS MX603-3014

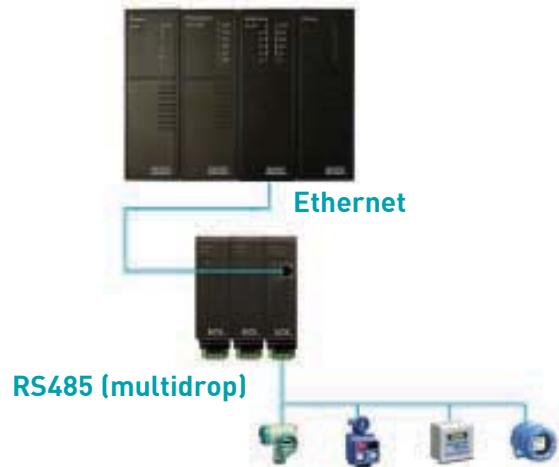
1 x MoxBUS High Speed I/O Bus Port

1 x 10 BaseT Ethernet Port

2 x RS485 Port

The CP Gateway Module is designed to be directly connected to the MOX Open Controller. The MOX Open Controller would have access to serial port field devices over the RS485 connection. Because RS485 is a multidrop topology, the CP gateway acts as a data concentrator so that many field devices are accessed through this single device.

MOX Open Controller



MX603-30xx

Communications Specifications

User Communication Options	1 x RJ45 10Mbps Ethernet Port 1 x MoxBUS SMA Port 2 x RS485 Multi-drop Serial Ports with up to 115200bps Rate
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Visual Indicators

Module Power and Status LEDs
1 x Fault Indicator LED
1 x RJ45 Ethernet Port Status LED
1 x SMA Port Status LED

Voltage Requirements

Rack Base	+5VDC
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Diagnostic Information

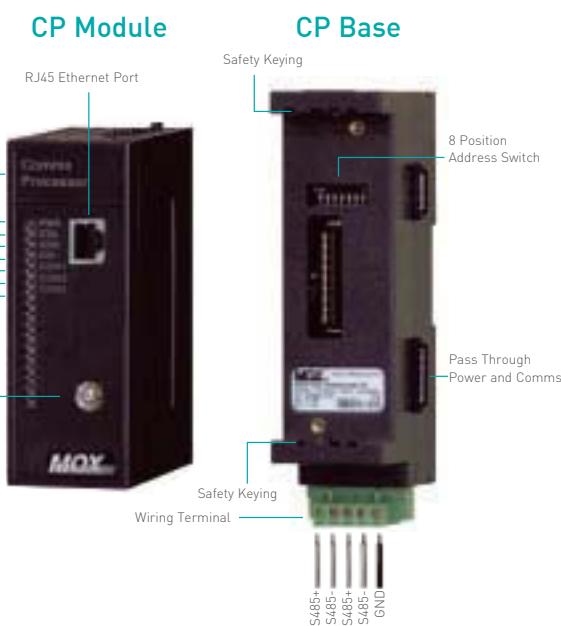
Power Dissipation	$\leq 3.5 \text{ W}$
Hot-swappable	Yes

Configurable Parameters

RS485 Communications Rate	Up to 115200bps
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Environmental Conditions

Operating Temperature	-20 to 70°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing



Safety Keying

Module Top	0	1	0	1
Base Top	1	0	1	0
Module Bottom	1	0	1	1
Base Bottom	0	1	0	0

Rack Solutions

CPP PROFIBUS MX603-3020

The MOX Communications Processor PROFIBUS [CPP] module is designed as a slave device on a PROFIBUS DP network and communicates with a PROFIBUS DP master.

As a member of the MOX 603 Communications Processor series, the MOX CPP acts as an I/O data exchange device between large-scale MOX 603 I/O module networks and the MOX Open Controller (OC) or another certified PROFIBUS DP master.

The advantages of using MOX CPP modules include the ability for controllers to drive more I/O devices as well as improved data exchange speed. MOX CPP modules can utilize the running and diagnostic information retrieved from I/O devices to efficiently manage the entire I/O network.

The MOX CPP module has two PROFIBUS DP slave ports, which support redundant connections to primary and standby controllers.

The MOX CPP module is powered by a MOX 603 PSU and is hot swappable. This allows the user to insert or remove a module without isolating the module's connected power or field devices.

MoxCon is the MOX configuration software used to configure the MOX CPP module. It allows control and data access from the connected I/O modules.



2 PROFIBUS PORTS

PROFIBUS DP SLAVE

REDUNDANCY SUPPORT

USER SELECTABLE ADDRESSING

NETWORK STATUS LEDS



Power Specifications

Power Dissipation <3W

Communications Specifications

PROFIBUS Ports 2

Isolation

PROFIBUS Port to System 1000Vrms

MOXBUS to System 1000Vrms

Configurable Parameters

Station Address User

Selectable

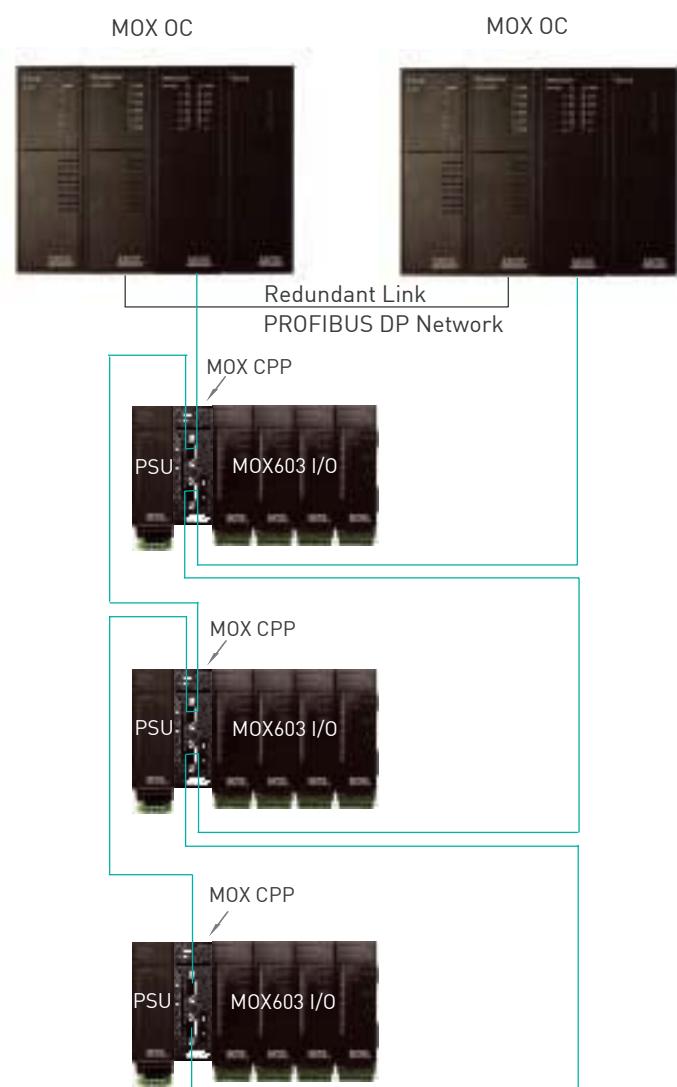
Environmental Conditions

Operating Temperature -20 to 70°C

Storage Temperature -40 to 85°C

Relative Humidity 5 to 95%

non-condensing



MX603 PSU Module



MX603-4001

Functional Overview

The MOX 603 Power Supply Unit (PSU) provides a clean and stable power supply for connected MOX 603 rack based I/O modules.

The industrial DC-DC power supply accepts a 24VDC input and provides a regulated supply to the interconnected modules.

Multiple MOX 603 PSU modules may be installed in a single rack to ensure the required level of redundancy is achieved.

Application

- At least one MOX MX603-4001 Power Supply Module is necessary in every rack of MOX 603 Modular I/O. In systems where increased reliability is required, an additional MX603-4001 module may be installed. This configuration provides a true redundant power solution for mission critical applications. In addition, the dual power bus of the MOX 603 Modular I/O adds to the reliability of the solution.
- The maximum number of MOX 603 I/O modules that can be interconnected in a rack configuration is restricted by two key factors, communications efficiency and power requirements.
- For installations where the Power Supply Module is to be mounted in explosive atmospheres, the IECEx certified MX603-9001 Power Supply Module can be used in conjunction with the IECEx certified MX603-9101 base.



**INPUT VOLTAGE
24VDC**

**REVERSE INPUT
PROTECTION**

**PROVIDES DUAL
REDUNDANT POWER BUS
FOR INTERCONNECTED
RACK BASED I/O**

**MULTIPLE PSU
MODULES PROVIDE
MULTIPLE LEVELS
OF REDUNDANCY**

Usage Notes

Sufficient power must be supplied to the MOX 603 PSU to power all interconnected I/O modules.

An external 24VDC power supply rated to 50W (or higher) is recommended.

Performance Specifications

Power Supply	External 24Vdc Supply
Power Bus Capacity	4A Max per Bus

Environmental Specifications

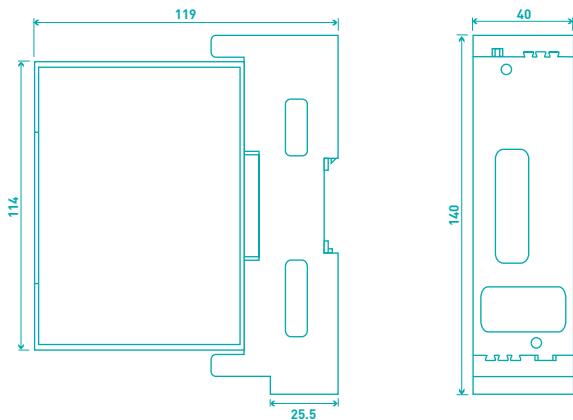
Operating Temperature	-20 to 70 °C
Storage Temperature	-40 to 85 °C
Humidity	5 to 90% non-condensing

Mechanical Specifications

Base	
Width	40 mm
Height	140 mm
Height (with terminal strips)	150 mm
Depth	39 mm

Module	
Width	40 mm
Height	114 mm
Depth	80 mm

MOX 603 PSU Schematic



Standard 35mm DIN Rail Mounting (EN 50022).
Allow for bottom-entry terminal strip and cabling.

Safety Keying

Module Top	0	1	0	1
Base Top	1	0	1	0
Module Bottom	1	1	0	1
Base Bottom	0	0	1	0

Terminal Connector Assignments

1	2	3	4	5
24Vin+	24Vin-			Shield

Digital In

8 Channel Digital Input – 24VDC
MX603 – 0108 – 11X

Performance Specifications

Number of Channels	8
Guaranteed OFF Input Voltage	<5 VDC
Guaranteed ON Input Voltage	>10 VDC
Minimum Pulse Width Detected	6 ms
Maximum Switching Frequency (no-filtering)	80 Hz
Maximum Input Voltage	30 VDC

Maximum Power Consumption

Rack Based	1.2 W
Standalone Serial	2.6 W
Standalone Ethernet	2.7 W

Isolation

Channel to System	5000 Vrms
Channel to Channel	1500 Vrms

Configurable Parameters

Input Filter	User defined value (0 to 5000 ms)
Latch Inputs	Enable / disable
Latch Polarity	Latch on high / latch on low
Pulse Counting	Enable / disable
Frequency Function	Enable / disable

**8 DISCRETE
ISOLATED INPUTS**

**24VDC FIELD
VOLTAGE SOURCES**

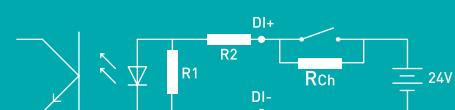
**LOW SPEED PULSE
COUNTING OPTION**

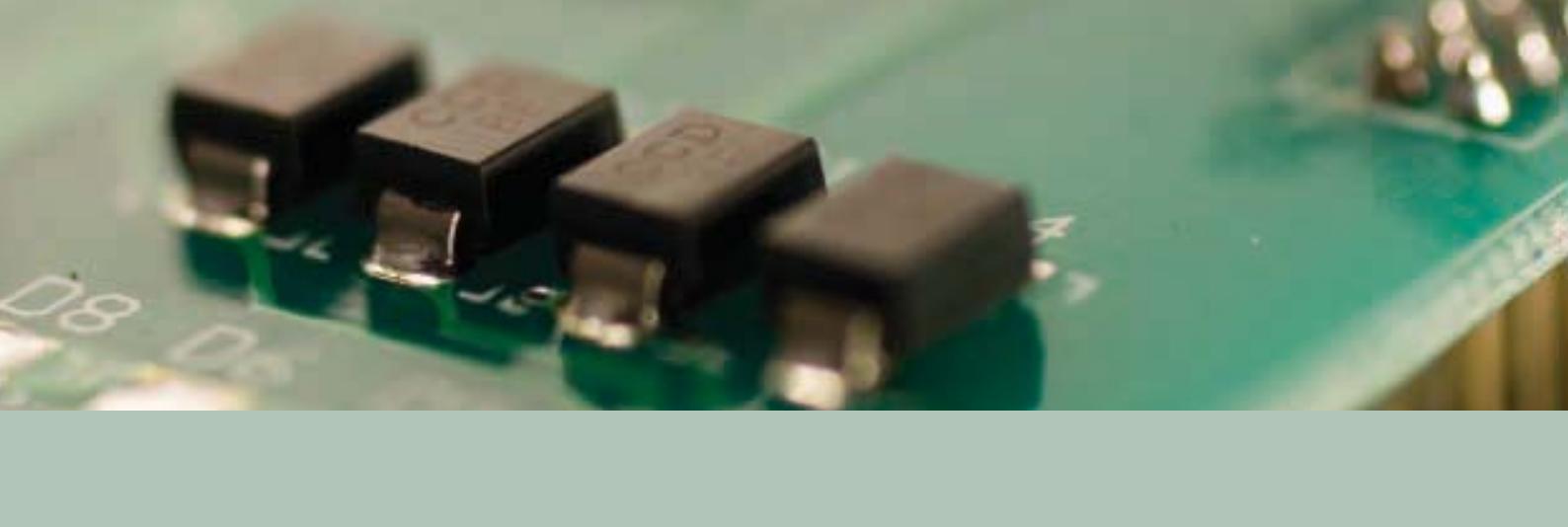
HOT SWAPPABLE

**REDUNDANT
CAPABILITY**

**INPUT OPEN
WIRING DETECTION**

Equivalent Circuit



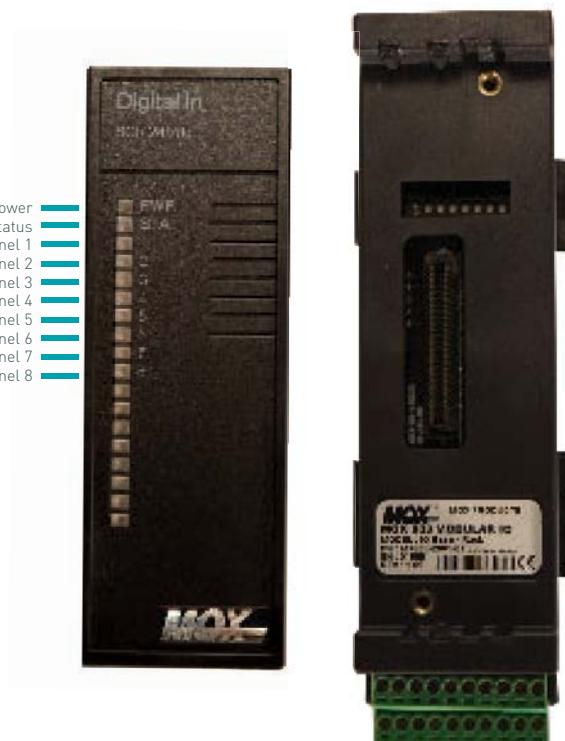


The MOX 603 Digital Input Module provides an interface to ON/OFF field devices such as, proximity and limit switches, pushbuttons, and other sources. Each input will sense and convert a switched input signal into levels used by the Host Controller. Front panel LEDs indicate the module power and operational status as well as the signal status of each individual channel.

The MX603-0108-11x is an 8 channel, 24VDC Digital

Input Module. It contains 8 individually isolated input channels each of which will sense a sustained signal above 10VDC and switch the input to the ON state. The inputs will not be affected by severe voltage transients and are designed to prevent false switching during such events.

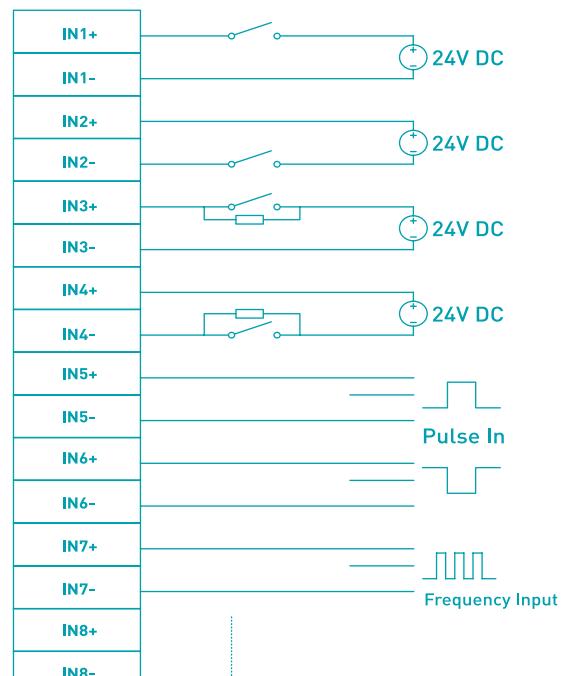
The module is available in Standalone Serial (-115), Standalone Ethernet (-116) and Rack Based (-113) Configurations.



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10
IN1+	IN2+	IN3+	IN4+	IN5+	IN6+	IN7+	IN8+	N/A	N/A
11	12	13	14	15	16	17	18	19	20
IN1-	IN2-	IN3-	IN4-	IN5-	IN6-	IN7-	IN8-	N/A	N/A

Wiring Diagram



Safety Keying

Module Top	0	1	0	1
Base Top	1	1	0	0
Module Bottom	1	0	1	1
Base Bottom	0	1	0	0

Digital In



16 Channel Digital Input MX603 - 0116 - 13X

Performance Specifications

Number of Channels	16
Maximum Switching Frequency (no-filtering)	80 Hz
Minimum Pulse Width Detected	6 ms

Maximum Power Consumption

Rack Based	1.6 W
Standalone Serial	3.5 W
Standalone Ethernet	3.7 W

Isolation

Channel to System	500 Vrms*
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Configurable Parameters

Input Filter	User defined value (0 to 5000 ms)
Latch Inputs	Enable / disable
Latch Polarity	Latch on high / latch on low
Pulse Counting	Enable / disable
Frequency Function	Enable / disable

* Indicates minimum isolation. This figure may vary between standalone serial, ethernet and rack based I/O modules.

16 MODULE-POWERED
DISCRETE NON-ISOLATED
INPUTS WITH
COMMON GROUND

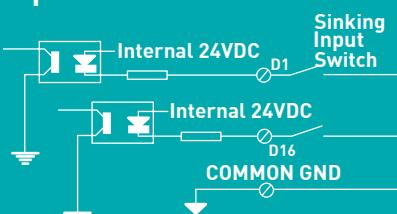
USER CONFIGURABLE
INPUT FILTERS

LOW SPEED PULSE
COUNTING OPTION

HOT SWAPPABLE

REDUNDANT
CAPABILITY

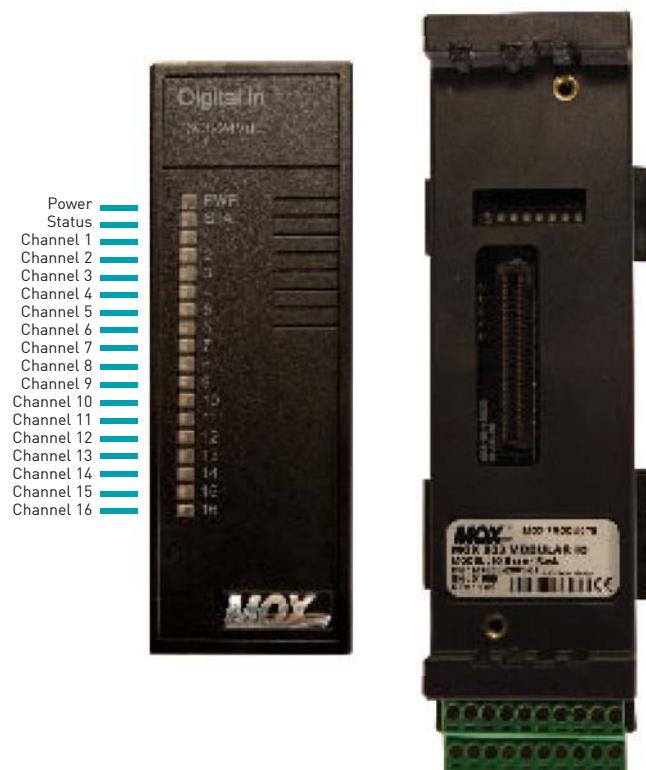
Equivalent Circuit





The MOX 603 16 Channel Digital Input Module is a versatile high density 24 VDC module accepting 16 non-isolated discrete inputs. All inputs are module-powered for use with dry contact sinking input switches.

The MOX 603 16 Channel Digital Input Module provides an interface to general ON/OFF inputs from field devices (eg. Relay contacts, sensors, proximity and limit switches, operator push buttons, selectors).



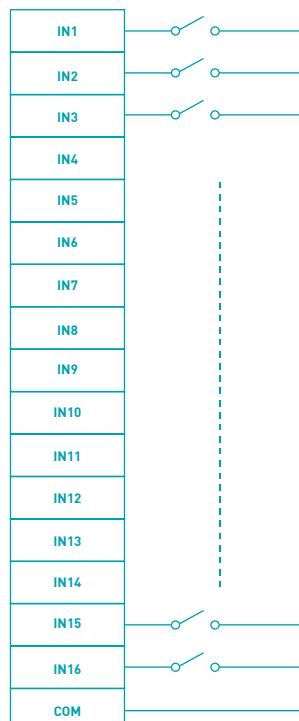
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10
IN1	IN3	IN5	IN7	IN9	IN11	IN13	IN15	N/A	N/A
11	12	13	14	15	16	17	18	19	20
IN2	IN4	IN6	IN8	IN10	IN12	IN14	IN16	COM	N/A

User configurable input filters provide continuous, frequency, pulse, latch high and latch low configurations to perform the duties of several basic I/O modules.

The module is available in Standalone Serial (-135), Standalone Ethernet (-136) and Rack Based (-133) Configurations.

Wiring Diagram



Safety Keying

Module Top	0	1	0	1
Base Top	1	0	1	0
Module Bottom	1	1	1	0
Base Bottom	0	0	0	1

Digital In



16 Channel 110/115VAC Input Module MX603-0116-253

Performance Specifications

Number of Channels	16
Frequency Range	50-60Hz
Maximum Input Voltage	270VAC
ON Level	> 80VAC
OFF Level	< 30VAC
Minimum Pulse Width Detected	18ms
Power dissipation within module	< 1W
Visual Indicators	1xLED per Channel, Power and Status

Isolation

Channel to System	1500Vrms
Channel to Channel	1500Vrms

Configurable Parameters

Input Filter	Selectable
Latch Inputs	Enable / disable
Latch Polarity	Latch on high / latch on low
Pulse Counting	Enable / disable
Frequency Function	Enable / disable
Environmental	
Operating Temperature	-20 to 70 °C
Storage Temperature	-40 to 85 °C
Relative Humidity	5 to 95% non-condensing

16 DISCRETE ISOLATED INPUTS

INTELLIGENT MICROPROCESSOR
BASED I/O MODULE

WIDE OPERATING TEMPERATURE
RANGE: -20 TO 70 DEG C

HOT SWAPPABLE

INDIVIDUALLY CONFIGURABLE
CHANNELS

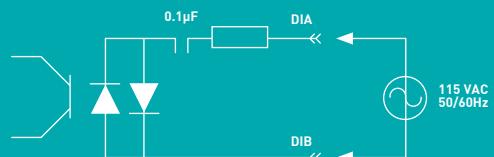
SMART INPUT FILTERS

REAL TIME OR LATCHED INPUTS

SELECTABLE FREQUENCY
AND COUNTER FUNCTIONS

FRONT WIRING FOR EASE
OF CONNECTION

Equivalent Circuit





The MOX 603 Modular I/O range continues to expand with more solutions for high performance local and remote I/O requirements.

Functional Overview

The MOX 603 16 Channel AC Digital Input Module is a versatile high density module accepting 16 discrete input channels with a range of 90 to 250VAC. All input channels are individually isolated and have high isolation from the system. Inputs require field power from a separate AC supply.



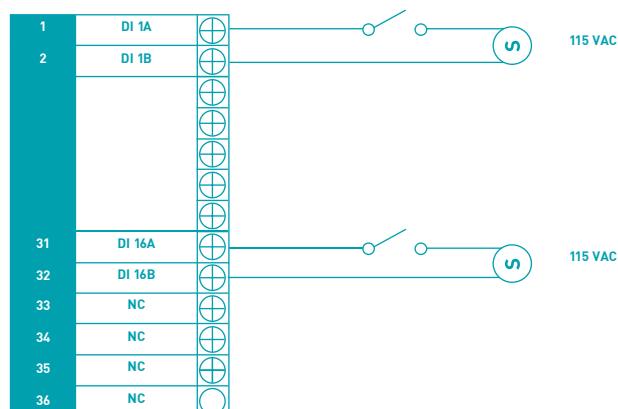
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12
D11A	DI1B	D12A	DI2B	DI3A	DI3B	DI4A	DI4B	DI5A	DI5B	DI6A	DI6B
13	14	15	16	17	18	19	20	21	22	23	24
D17A	D17B	DI8A	DI8B	DI9A	DI9B	DI10A	DI10B	DI11A	DI11B	DI12A	DI12B
25	26	27	28	29	30	31	32	33	34	35	36
DI13A	DI13B	DI14A	DI14B	DI15A	DI15B	DI16A	DI16B	NC	NC	NC	NC

Application

- Suitable for general ON/OFF inputs from AC field devices (eg. Relay contacts, sensors, proximity and limit switches, operator push buttons, selectors).
- Smart input filters provide continuous, frequency, pulse, latch high and latch low configurations to perform the duties of several basic I/O modules.
- Suitable for industries requiring AC input signals. The wide range of input voltage simplifies the selection of equipment. The same module may be used for different input voltage signals.

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Digital In



16 Channel 230VAC Input Module MX603-0116-263

Performance Specifications

Number of Channels	16
Frequency Range	50-60Hz
Maximum Input Voltage	300VAC
ON Level	> 168VAC
OFF Level	< 68VAC
Minimum Pulse Width Detected	18ms
Power dissipation within module	< 1W
Visual Indicators	1x LED per Channel, Power and Status

Isolation

Channel to System	1500Vrms
Channel to Channel	1500Vrms

Configurable Parameters

Input Filter	Selectable
Latch Inputs	Enable / disable
Latch Polarity	Latch on high / latch on low
Pulse Counting	Enable / disable
Frequency Function	Enable / disable
Environmental	
Operating Temperature	-20 to 70 °C
Storage Temperature	-40 to 85 °C
Relative Humidity	5 to 95% non-condensing

16 DISCRETE ISOLATED INPUTS

INTELLIGENT MICROPROCESSOR
BASED I/O MODULE

WIDE OPERATING TEMPERATURE
RANGE: -20 TO 70 DEG C

HOT SWAPPABLE

INDIVIDUALLY CONFIGURABLE
CHANNELS

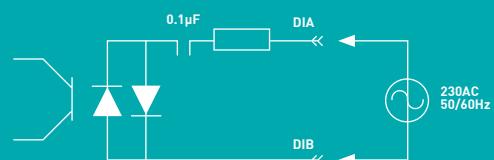
SMART INPUT FILTERS

REAL TIME OR LATCHED INPUTS

SELECTABLE FREQUENCY
AND COUNTER FUNCTIONS

FRONT WIRING FOR EASE
OF CONNECTION

Equivalent Circuit



The MOX 603 Modular I/O range continues to expand with more solutions for high performance local and remote I/O requirements.

Functional Overview

The MOX 603 16 Channel AC Digital Input Module is a versatile high density module accepting 16 discrete input channels with a range of 180 to 250VAC. All input channels are individually isolated and have high isolation from the system. Inputs require field power from a separate AC supply.



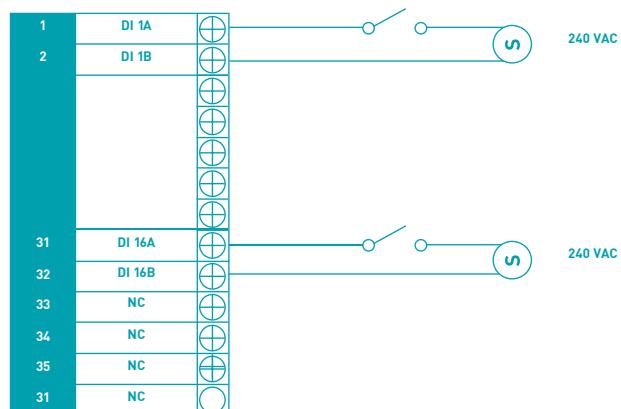
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12
D11A	DI1B	DI2A	DI2B	DI3A	DI3B	DI4A	DI4B	DI5A	DI5B	DI6A	DI6B
13	14	15	16	17	18	19	20	21	22	23	24
D17A	D17B	DI8A	DI8B	DI9A	DI9B	DI10A	DI10B	DI11A	DI11B	DI12A	DI12B
25	26	27	28	29	30	31	32	33	34	35	36
DI13A	DI13B	DI14A	DI14B	DI15A	DI15B	DI16A	DI16B	NC	NC	NC	NC

Application

- Suitable for general ON/OFF inputs from AC field devices (eg. Relay contacts, sensors, proximity and limit switches, operator push buttons, selectors).
- Smart input filters provide continuous, frequency, pulse, latch high and latch low configurations to perform the duties of several basic I/O modules.
- Suitable for industries requiring AC input signals. The wide range of input voltage simplifies the selection of equipment. The same module may be used for different input voltage signals.

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Digital In

16 Channel Digital Input Dry Contact
MX603-0116-273

Performance Specifications

Number of Channels	16
Maximum Switching Frequency	80Hz
Minimum Pulse Width Detected	6ms
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Maximum Power Consumption

Power Dissipation (5V)	1W
Power Dissipation (24V)	3W

Isolation

Group to Group	1000Vrms
Channels to System	2500Vrms

Configurable Parameters

Input Filter	User Definable
Latch Inputs	Enable / Disable
Latch Polarity	Latch on high / latch on low
Pulse Counting	Enable / Disable
Frequency Function	Enable / Disable

Environmental Conditions

Operating Temperature	-20 to 70°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

16 DISCRETE GROUP-ISOLATED INPUTS WITH COMMON GROUND

USER CONFIGURABLE FILTERS

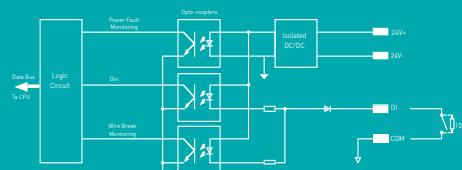
LOW SPEED PULSE COUNTING OPTION

HOT SWAPPABLE

WIRE BREAK AND POWER FAULT DIAGNOSTIC

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit



The MX603-0116-273 16 Channel 24VDC Module Powered Digital Input device is a versatile high density module accepting 16 group-isolated discrete inputs. All inputs are module-powered for use with dry contact sinking input switches.

The MX603-0116-273 16 Channel 24VDC Digital Input Module is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. Each group of four channels is isolated from each other and all channels are isolated from one another. Power fault and wire break diagnostic information is user configurable.



Terminal Connector Assignments

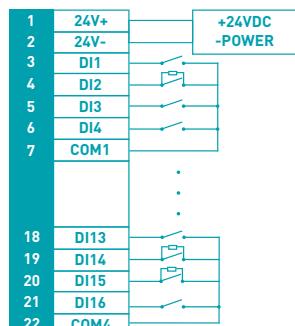
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
24V+	24V-	DI1	DI2	DI3	DI4	COM1	DI5	DI6	DI7	DI8	COM2	DI9	DI10	DI11	DI12	COM3	DI13
19	20	21	22	23	24	25	26										
DI14	DI15	DI16	COM4	NC	NC	NC											

This module suits applications where field devices have relay contacts, sensors, proximity or limit switches, operator push buttons or selectors. The module provides an intelligent interface between the field devices and the host controller.

User configurable inputs provide continuous, counter and frequency, latch high and latch low configurations that perform the duties of several basic I/O modules integrated into one module.

This module is available in Rack Based (-273) Configuration.

Wiring Diagrams



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Digital In

16 Channel Digital Input Dry Contact
MX603-5116-273

Performance Specifications

Number of Channels	16
Maximum Switching Frequency	80Hz
Minimum Pulse Width Detected	6 ms
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Explosive Atmosphere Specifications

IECEx Certification	Ex nA II T4 Gc -20°C ≤ Ta ≤ +55°C IEC 60079-0 : 2007-10 (edition 5) IEC 60079-15 : 2005-03 (edition 3)
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Maximum Power Consumption

Power Dissipation (5V)	<1 W
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Isolation

Group to Group	1000Vrms
Channels to System	2500Vrms

Configurable Parameters

Input Filter	User Definable
Latch Inputs	Enable / Disable
Latch Polarity	Latch on high / latch on low
Pulse Counting	Enable / Disable
Frequency Function	Enable / Disable

Environmental Conditions

Operating Temperature	-20 to 55°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

16 DISCRETE GROUP-ISOLATED INPUTS WITH COMMON GROUND

IECEx CERTIFIED FOR EXPLOSIVE ATMOSPHERES

USER CONFIGURABLE FILTERS

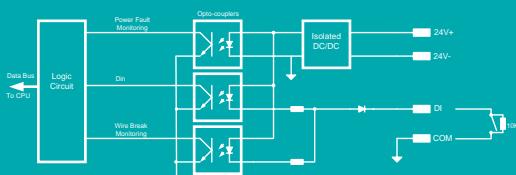
LOW SPEED PULSE COUNTING OPTION

HOT SWAPPABLE

WIRE BREAK AND POWER FAULT DIAGNOSTIC

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit



The MX603-5116-273 16 Channel 24VDC Module Powered Digital Input device is a versatile high density module accepting 16 group-isolated discrete inputs. All inputs are module-powered for use with dry contact sinking input switches. It is IECEx certified for explosive atmospheres.

The MX603-5116-273 16 Channel 24VDC Digital Input Module is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. Each group of four channels is isolated from each other and all channels are isolated from one another. Power fault and wire break diagnostic information is user configurable.



Terminal Connector Assignments

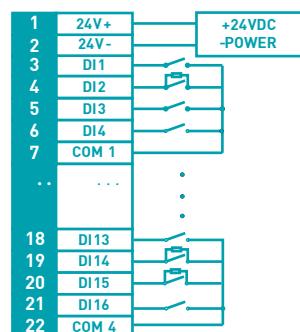
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
24V+	24V-	DI1	DI2	DI3	DI4	COM1	DI5	DI6	DI7	DI8	COM2	DI9	DI10	DI11	DI12	COM3	DI13
19	20	21	22	23	24	25	26										
DI14	DI15	DI16	COM4	NC	NC	NC											

This module suits applications where field devices have relay contacts, sensors, proximity or limit switches, operator push buttons or selectors. The module provides an intelligent interface between the field devices and the host controller.

User configurable inputs provide continuous, counter and frequency, latch high and latch low configurations that perform the duties of several basic I/O modules integrated into one module.

This module is available in Rack Based (-273) Configuration.

Wiring Diagrams



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Digital In



32 Channel Digital Input
MX603 – 0132 – 133

Performance Specifications

Number of Channels	32
Minimum Pulse Width Detected	6 ms
Maximum Switching Frequency: (no-filtering)	80 Hz

Isolation

Channel to System	1000 Vrms
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Power Dissipation within Module:

(5Vdc Source)	<1.0W
(24Vdc Source)	<10.0W

Configurable Parameters

Input Filter Time Constant	User defined value (0 to 5000 ms)
Latch Inputs	Enable / disable
Pulse Counting	Enable / disable
Frequency Function	Enable / disable

**32 MODULE-POWERED
DISCRETE NON-ISOLATED
INPUTS WITH
COMMON GROUND**

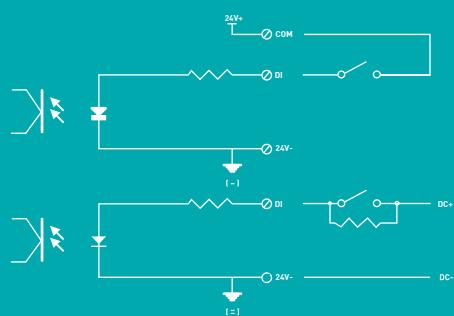
**INDEPENDANT
USER CONFIGURABLE
CHANNELS**

**ROTARY ADDRESS
SWITCH ON MODULE**

HOT SWAPPABLE

**DRY CONTACT AND
LEVEL INPUT TYPES**

Equivalent Circuit





The MOX 603 32 Channel Digital Input Module is a versatile high density 24 VDC module accepting up to 32 non-isolated discrete inputs. The module is powered from the 603 rack bus power supply as well as an external 24Vdc power supply. The inputs may be dry contact sinking input switches or voltage level inputs. The MOX 603 32 Channel Digital Input Module provides an interface to general ON/OFF inputs from field devices (eg. Relay contacts, sensors, proximity and limit switches, operator push buttons, selectors).



Terminal Connector Assignments

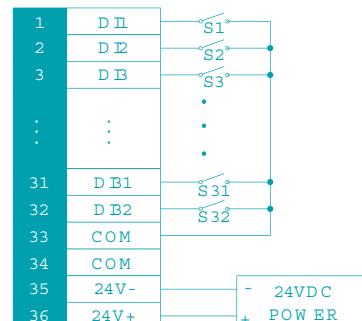
1	2	3	4	5	6	7	8	9	10	11	12
IN1	IN2	IN3	IN4	IN5	IN6	IN7	IN8	IN9	IN10	IN11	IN12
13	14	15	16	17	18	19	20	21	22	23	24
IN13	IN14	IN15	IN16	IN17	IN18	IN19	IN20	IN21	IN22	IN23	IN24
25	26	27	28	29	30	31	32	33	34	35	36
IN25	IN26	IN27	IN28	IN29	IN30	IN31	IN32	COM	COM	24-	24+

User configurable input filters provide continuous, frequency, pulse, latch high and latch low configurations to perform the duties of several basic I/O modules.

Module front wiring and rotary address switch allow for simple configuration and installation. A total of 34 LEDs are used to indicate individual channel status as well as power and module status.

The module is available in Rack Based (-133) Configuration.

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Digital In



32 Channel Digital Input MX603-0132-233

Performance Specifications

Number of Inputs	32
Minimum Pulse Width Detected	6 ms
Maximum Switching Frequency	80 Hz
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Maximum Power Consumption

Power Dissipation (5VDC system)	<1.0 W
Power Dissipation (24VDC for channel inputs)	<3.0W

Isolation

Channels to System	5000Vrms
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Sensor Selection Data

Input Voltage	Nominal Value: 24VDC For a high (1) input: 10V to 30V For a low (0) input: -3V to 5V With a high (1): 2mA
Input Current	Between 1ms and 5ms
Connection of 2-wire Proximity Switch	Permissible Quiescent Current: Max. 0.5mA

Configurable Parameters

Channel Type	Only Discrete Input, Only Enable Counter, Enable Counter and Frequency, Only Enable Latch High, Only Enable Latch Low User Definable
Filter Time	

Environmental Conditions

Operating Temperature	-20 to 70°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

32 INPUTS WITH COMMON GROUND

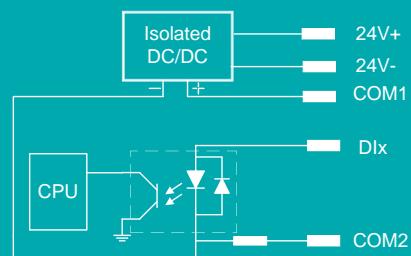
USER CONFIGURABLE PARAMETERS

DRY CONTACT OR VOLTAGE INPUT OPERATION

2, 3 OR 4 WIRE PROXIMITY SWITCH CONNECTION

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit





The MX603-0132-233 32 Channel Digital Input device is a versatile high density 24VDC module accepting up to 32 non-isolated inputs. The module is powered from the 603 rack bus power supply and depending upon use can be also connected to an external 24VDC power supply. The inputs may be dry contact sinking input switches, voltage level inputs or 2, 3 or 4 wire proximity switch connections.

The MX603-0132-233 32 Channel Digital Input Module provides an interface to general ON/OFF inputs from field devices (eg. Relay contacts, sensors, proximity and limit switches, operator push buttons, selectors).



Terminal Connector Assignments

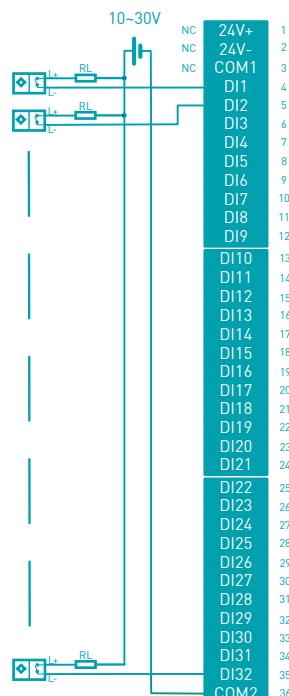
1	2	3	4	5	6	7	8	9	10	11	12
24V+	24V-	COM1	DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI8	DI9
13	14	15	16	17	18	19	20	21	22	23	24
DI10	DI11	DI12	DI13	DI14	DI15	DI16	DI17	DI18	DI19	DI20	DI21
25	26	27	28	29	30	31	32	33	34	35	36
DI22	DI23	DI24	DI25	DI26	DI27	DI28	DI29	DI30	DI31	DI32	COM2

User configurable input filters provide continuous frequency, pulse, latch high and latch low configurations to perform the duties of several basic IO modules.

Module front wiring and rotary address switch allow for simple configuration and installation. A total of 34 LEDs are used to indicate individual channel status as well as power and module status.

This module is available in Rack Based (-233) Configuration.

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Digital In



32 Channel Digital Input
MX603-5132-133

Performance Specifications

Number of Channels	32
Minimum Pulse Width Detected	6 ms
Maximum Switching Frequency:	80 Hz
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Explosive Atmosphere Specifications

IECEx Certification	Ex nA II T4 Gc -20°C ≤ Ta ≤ +55°C IEC 60079-0 : 2007-10 (edition 5) IEC 60079-15 : 2005-03 (edition 3)
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Maximum Power Consumption

Power Dissipation	<1.0 W
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Isolation

Channel to System	1000Vrms
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Configurable Parameters

Channel status	Activate, deactivate
Channel Type	Only Discrete Input, Only Enable Counter, Enable Counter and Frequency, Only Enable Latch High, Only Enable Latch Low
Filter Time	User Definable

Environmental Conditions

Operating Temperature	-20 to 55°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

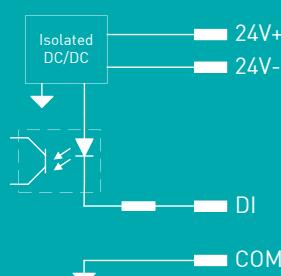
32 INPUTS WITH COMMON GROUND

IECEx CERTIFIED FOR EXPLOSIVE ATMOSPHERES

USER CONFIGURABLE PARAMETERS

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit





The MX603-5132-133 32 Channel Digital Input device is a versatile high density 24VDC module accepting up to 32 non-isolated inputs. The module is powered from the 603 rack bus power supply as well as an external 24VDC power supply. The inputs may be dry contact sinking input switches or voltage level inputs. It is IECEx certified for explosive atmospheres.

The MX603-5132-133 32 Channel Digital Input Module provides an interface to general ON/OFF inputs from field devices (eg. Relay contacts, sensors, proximity and limit switches, operator push buttons, selectors).



Terminal Connector Assignments

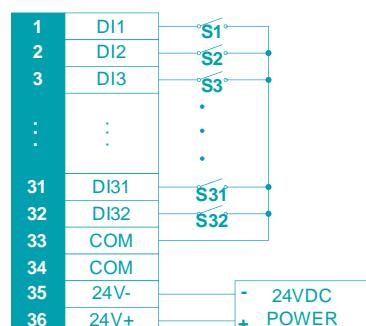
1	2	3	4	5	6	7	8	9	10	11	12
DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI8	DI9	DI10	DI11	DI12
13	14	15	16	17	18	19	20	21	22	23	24
DI13	DI14	DI15	DI16	DI17	DI18	DI19	DI20	DI21	DI22	DI23	DI24
25	26	27	28	29	30	31	32	33	34	35	36
DI25	DI26	DI27	DI28	DI29	DI30	DI31	DI32	COM	COM	24V-	24V+

User configurable input filters provide continuous frequency, pulse, latch high and latch low configurations to perform the duties of several basic IO modules.

Module front wiring and rotary address switch allow for simple configuration and installation. A total of 34 LEDs are used to indicate individual channel status as well as power and module status.

This module is available in Rack Based (-133) Configuration.

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Counter

4 Channel Counter Input
MX603 – 0104 – 12X

Performance Specifications

Number of Channels	4
Maximum Input Frequency	100 kHz
Frequency/Count Resolution	32 bit
Guaranteed OFF Input Voltage	< 5VDC
Maximum Input Voltage	30 VDC

Maximum Power Consumption

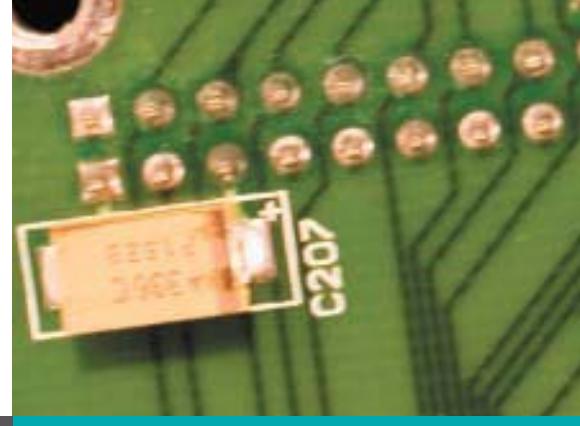
Rack Based	1.3 W
Standalone Serial	3.0 W
Standalone Ethernet	3.1 W

Isolation

Channel to Channel	1500Vrms
Channels to System	1500Vrms

Configurable Parameters

Channel Status	Activate/ deactivate
Sample Period	10 ms to 200 s
Counter	Period / continuous
Counting Direction	Up/ down
Counter Command	Start/ stop/ reload
Quadrature	Enable / disable
Triggering	Rising edge / falling edge
Counter Alarms	Predefined value reached
Frequency Alarms	High, high-high, low, low-low
Frequency Alarms Deadband	User defined value



4 INDIVIDUALLY ISOLATED QUADRATURE INPUTS

SUPPORTS SIGNAL FREQUENCIES TO 100 KHZ

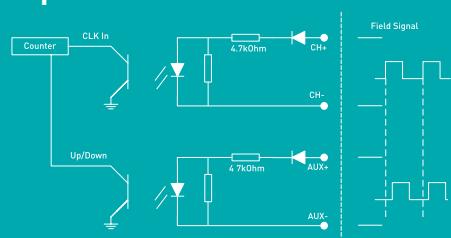
32 BIT RESOLUTION

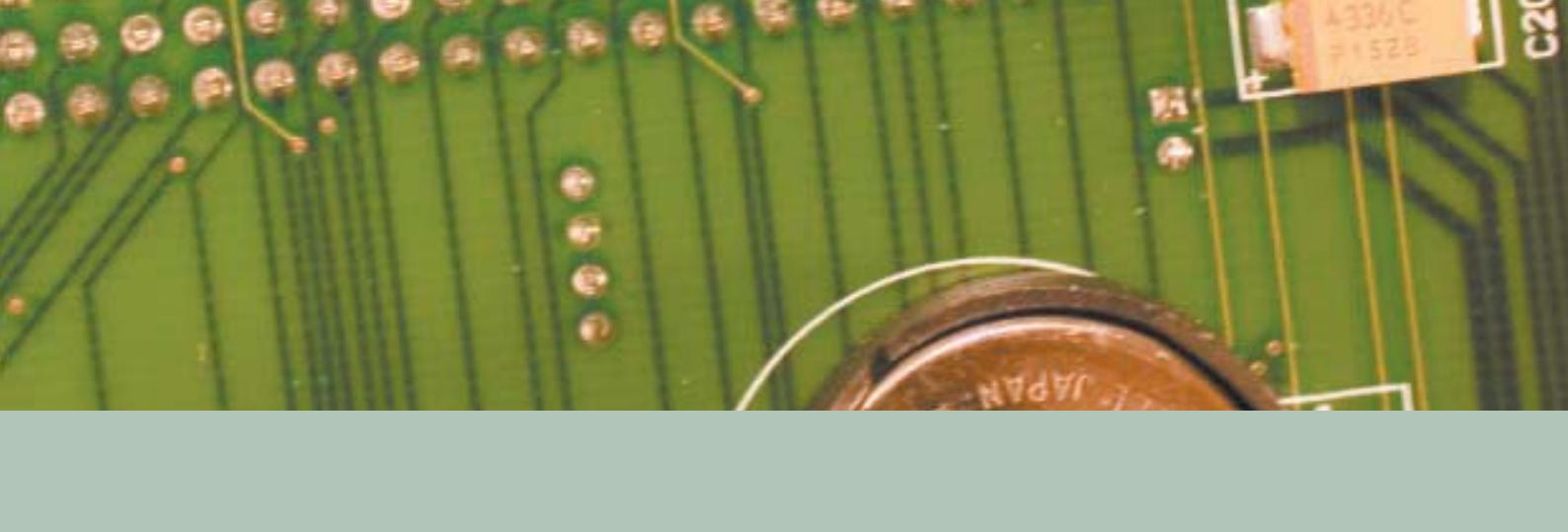
INVERSE WIRING PROTECTION

ALL CHANNELS INDIVIDUALLY CONFIGURABLE FOR DIFFERENT MODES

HOT SWAPPABLE

Equivalent Circuit





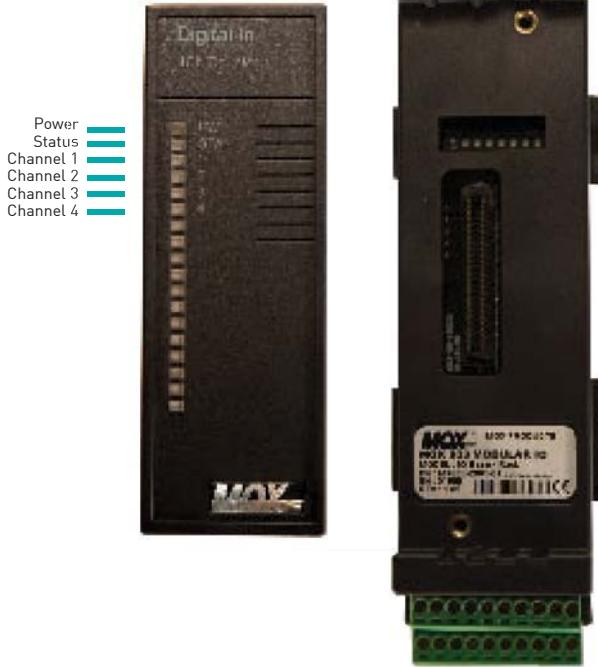
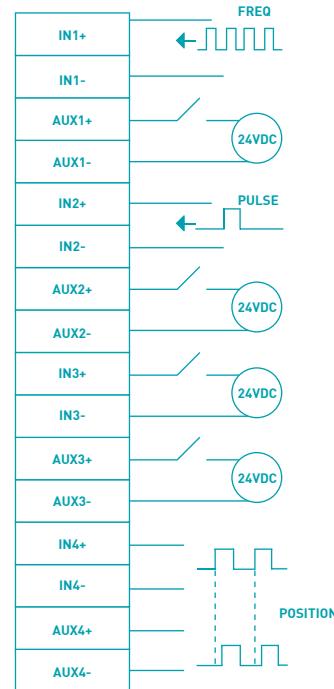
The MOX 603 4 Channel Counter Module is a high speed module providing 4 isolated counter / frequency channels with each channel accepting discrete pulse inputs. Each channel can be individually configured for various modes for pulse counting, frequency measurement and directional data from quadrature encoding devices.

The module provides an interface to monitor high speed equipment (e.g. Motors, accumulators, position and speed sensors, micro-switches).

Four individually isolated inputs can provide direct position detection from quadrature encoders.

The module is available in Standalone Serial (-125), Standalone Ethernet (-126) and Rack Based (-123) Configurations.

Wiring Diagram



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10
IN1+	AUX1+	IN2+	AUX2+	IN3+	AUX3+	IN4+	AUX4+	N/A	N/A
11	12	13	14	15	16	17	18	19	20
IN1-	AUX1-	IN2-	AUX2-	IN3-	AUX3-	IN4-	AUX4-	N/A	N/A

Safety Keying

Module Top	1	0	1	1
Base Top	0	1	0	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Counter

8 Channel Counter
MX603-0108-173

Performance Specifications

Number of Inputs	8
Maximum Input Frequency	100 kHz
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Maximum Power Consumption

Power Dissipation	3.0 W
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Isolation

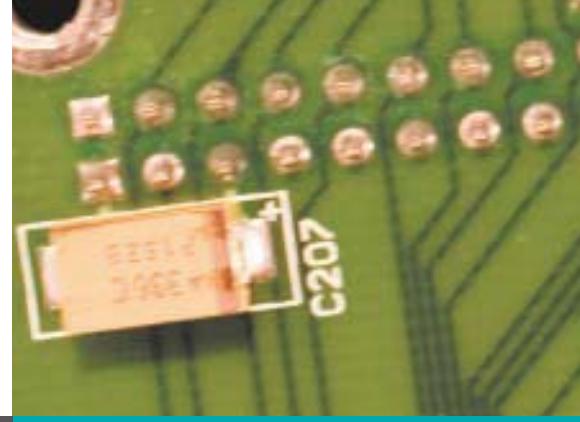
Channel to Channel	1500Vrms
Channels to System	1500Vrms

Configurable Parameters

Channel status	Activate, deactivate
Sample Period	100ms to 200s
Counter type	Period or continuous
Counter direction	Up or down
Counter command	Start, stop or reload
Quadrature mode	Enable or disable
Triggering type	Rising or falling edge
Counter alarms	Predefined value reached
Frequency alarms	High, high-high, low, low-low
Frequency alarms deadband	User definable

Environmental Conditions

Operating Temperature	-20 to 70°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

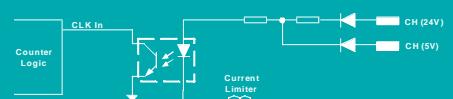


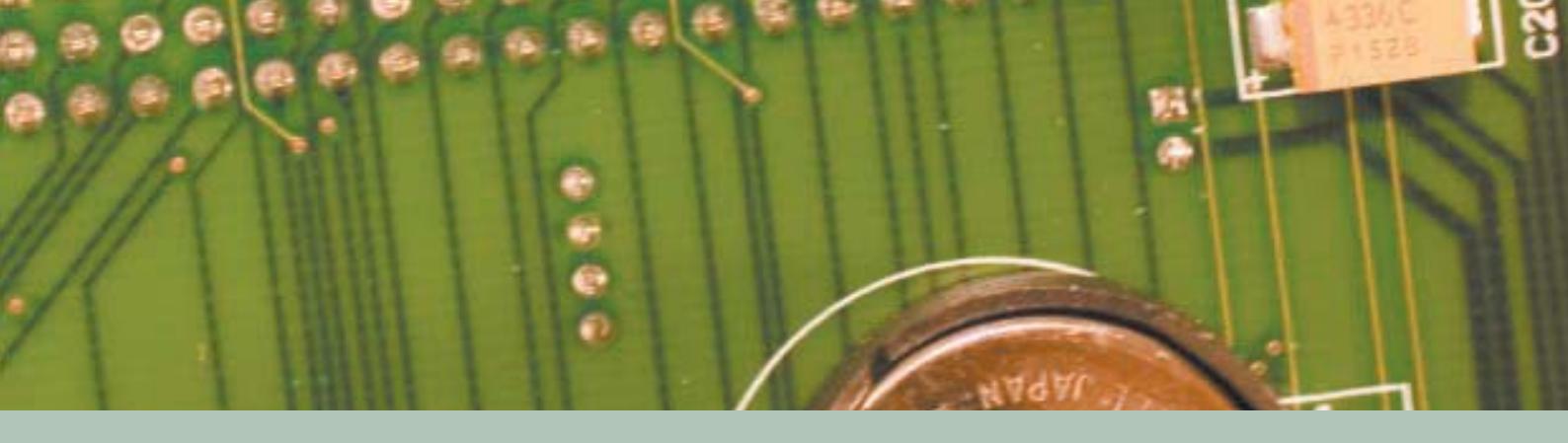
8 DUAL VOLTAGE INPUTS WITH COMMON GROUND

USER CONFIGURABLE PARAMETERS

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit





The MX603-0108-173 8 Channel Counter device is a versatile high density module accepting 8 inputs. Inputs are dual voltage rated and can either be 5V or 24V input type.

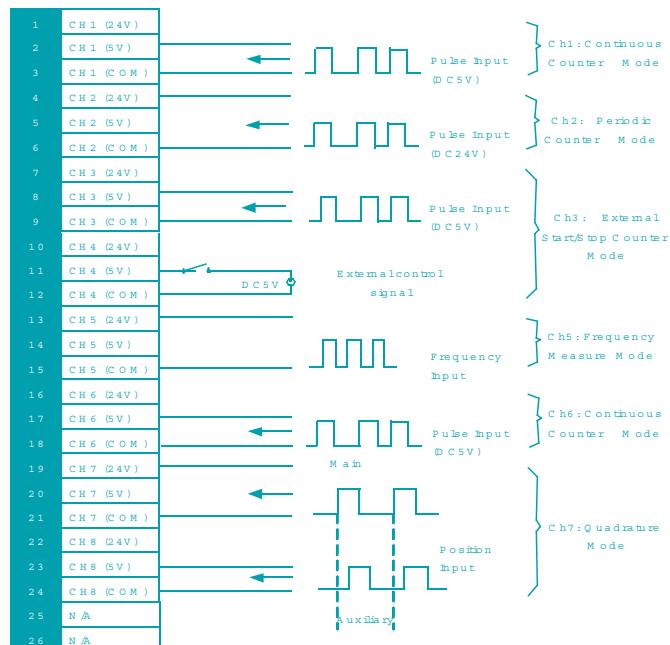
The MX603-0108-173 8 Channel Counter Module is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. Each channel has a good measure of isolation from other channels and also isolation from the system.

This module suits applications where a counter, a frequency measurer or rotation position measurer is needed. The module can accept either 5V or 24V input signals from high speed output switching devices, quadrature encoders, pulse generators, proximity switches or similar devices.

This module is available in Rack Based (-173) Configuration.



Wiring Diagrams



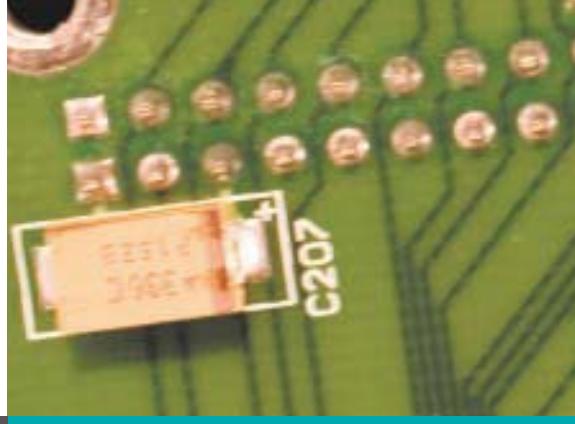
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CH1 (24V)	CH1 (5V)	CH1 (COM)	CH2 (24V)	CH2 (5V)	CH2 (COM)	CH3 (24V)	CH3 (5V)	CH3 (COM)	CH4 (24V)	CH4 (5V)	CH4 (COM)	CH5 (24V)	CH5 (5V)	CH5 (COM)	CH6 (24V)	CH6 (5V)	CH6 (COM)
19	20	21	22	23	24	25	26										
CH7 (24V)	CH7 (5V)	CH7 (COM)	CH8 (24V)	CH8 (5V)	CH8 (COM)	N/A	N/A										

Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Counter



8 Channel Counter
MX603-5108-173

Performance Specifications

Number of Inputs	8
Maximum Input Frequency	100 kHz
Visual Indicators	1 x LED per Channel plus Power and Status LEDs
Maximum Input Voltage	30VDC

Explosive Atmosphere Specifications

IECEx Certification	Ex nA II T4 Gc -20 °C ≤ Ta ≤ +55 °C IEC 60079-0 : 2007-10 (edition 5) IEC 60079-15 : 2005-03 (edition 3)
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Maximum Power Consumption

Power Dissipation	3.0 W
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Isolation

Channel to Channel	1500VRms
Channels to System	1500VRms

Configurable Parameters

Channel status	Activate, deactivate
Operating Mode	Continuous Counter (CC), Periodic Counter (PC), Continuous Quadrature Counter (CQC), Periodic Quadrature Counter (PQC), External Start/Stop Counter (EC), Frequency Measurement (FM)
Counter direction	Up or down
Counter Period Unit and Length	User Definable
Frequency alarms deadband	User definable

Environmental Conditions

Operating Temperature	-20 to 55°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

8 DUAL VOLTAGE INPUTS WITH COMMON GROUND

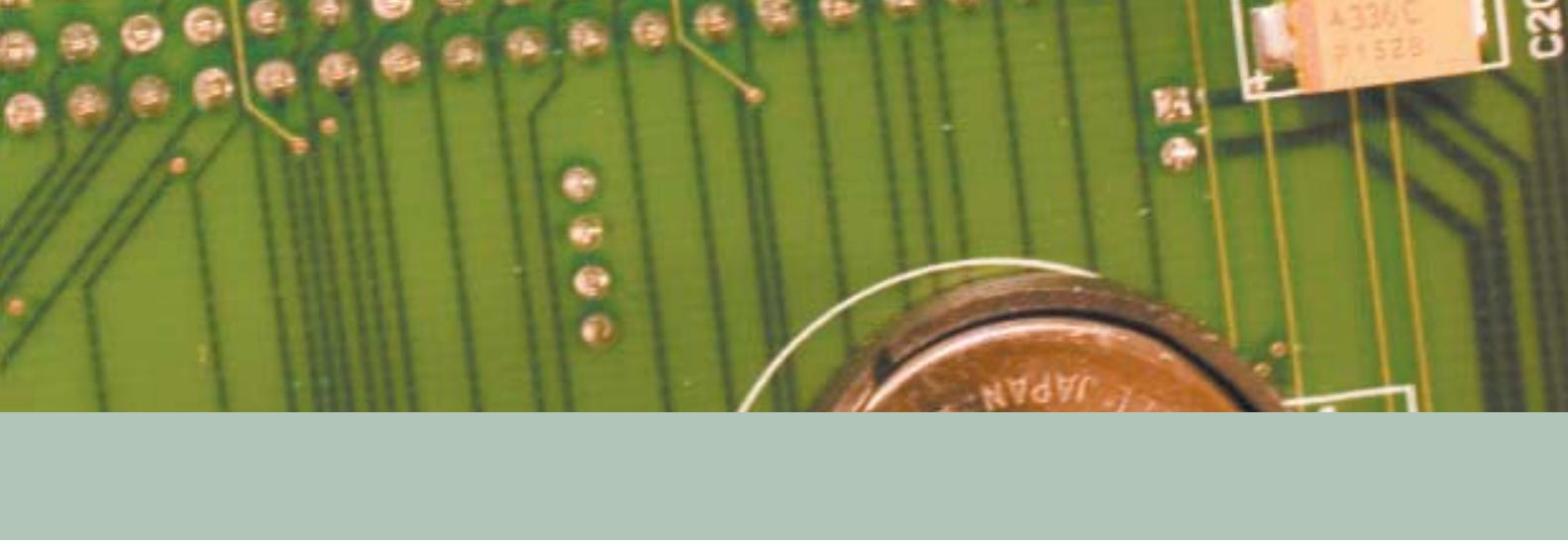
IECEx CERTIFIED FOR EXPLOSIVE ATMOSPHERES

USER CONFIGURABLE PARAMETERS

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit





The MX603-5108-173 8 Channel Counter device is a versatile high density module accepting 8 inputs. Inputs are dual voltage rated and can either be 5V or 24V input type. It is IECEx certified for explosive atmospheres.

The MX603-5108-173 8 Channel Counter Module is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. Each channel has a good measure of isolation from other channels and also isolation from the system.



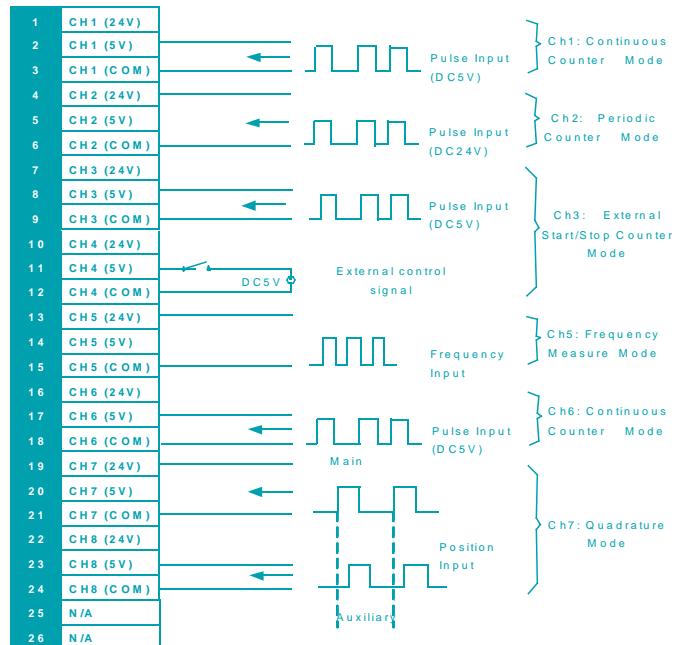
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CH1 [24V]	CH1 [5V]	CH1 (COM)	CH2 [24V]	CH2 [5V]	CH2 (COM)	CH3 [24V]	CH3 [5V]	CH3 (COM)	CH4 [24V]	CH4 [5V]	CH4 (COM)	CH5 [24V]	CH5 [5V]	CH5 (COM)	CH6 [24V]	CH6 [5V]	CH6 (COM)
19	20	21	22	23	24	25	26										
CH7 [24V]	CH7 [5V]	CH7 (COM)	CH8 [24V]	CH8 [5V]	CH8 (COM)	N/A	N/A										

This module suits applications where a counter, a frequency measurer or rotation position measurer is needed. The module can accept either 5V or 24V input signals from high speed output switching devices, quadrature encoders, pulse generators, proximity switches or similar devices.

This module is available in Rack Based (-173) Configuration.

Wiring Diagrams



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Digital SOE Input

8 Channel Digital SOE Input
MX603 – 0108 – 14X

Performance Specifications

Number of Channels	8
Guaranteed OFF Input Voltage	< 5 VDC
Guaranteed ON Input Voltage	> 10 VDC
Maximum Input Voltage	30 VDC
Event Capture Resolution	0.1 ms
Time Stamp Accuracy	± 1ms
Event History Buffer	256 events

Power Dissipation Within Module

Rack Based	< 3.5 W
Standalone	< 3.8 W

Isolation

Channel to System	1500 Vrms
Channel to Channel	1500 Vrms

Configurable Parameters

Channel Status	Active / inactive
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8 INDIVIDUALLY ISOLATED SOE INPUTS

INDEPENDENT CONFIGURABLE CHANNELS

EVENT CAPTURE RESOLUTION OF 0.1MS

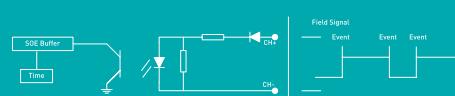
TIME STAMP ACCURACY OF 1MS

256 EVENT HISTORY

INVERSE WIRING PROTECTION

HOT SWAPPABLE

Equivalent Circuit





The MOX 603 Digital SOE Module provides rapid Sequence of Events Capture for Eight Digital Input Channels. The purpose of the module is to provide an exact picture of the chain of events that occur in the event of a process upset.

The Digital SOE Module can accurately record the events that take place, in the precise order in which they occurred. A time stamp, accurate to 1ms will be attached to the event.

Each channel of the Digital SOE Module may be individually configured as an active or inactive channel. When a channel is configured as an active channel, it will scan the incoming signal continuously and determine when to generate an event based on the behavior of the signal. Events are generated every time a signal changes from one state to another

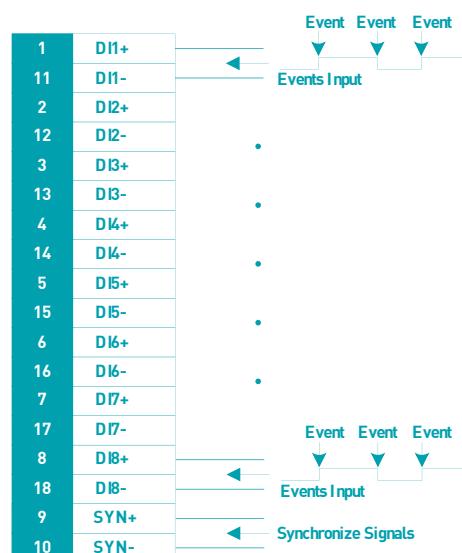
The module is available in Standalone Serial (-145), Standalone Ethernet (-146) and Rack Based (-143) Configurations.



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10
IN1+	IN2+	IN3+	IN4+	IN5+	IN6+	IN7+	IN8+	SYN+	SYN-
11	12	13	14	15	16	17	18	19	20
IN1-	IN2-	IN3-	IN4-	IN5-	IN6-	IN7-	IN8-	N/A	N/A

Wiring Diagram



Safety Keying

Module Top	0	0	1	1
Base Top	1	1	0	0
Module Bottom	1	0	1	1
Base Bottom	0	1	0	0

Digital SOE Input

12 Channel Digital SOE Input

MX603-0112-143

Performance Specifications

Number of Inputs	12
Off Voltage	<5VDC
On Voltage	>10VDC
Typical Wetting Current (@24VDC)	6 mA
Maximum Input Voltage	30 VDC
Resolution	0.1 ms
Accuracy	±1 ms
Maximum Number of History Events	256
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Maximum Power Consumption

Power Dissipation	<3.5 W
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Isolation

Channel to Channel	3000VRms
Channels to System	3000VRms

Configurable Parameters

Activate Channel	Activate, Deactivate
Chatter Mode Count	User Definable
Filter Time (ms)	User Definable
Debounce Time (ms)	User Definable

Environmental Conditions

Operating Temperature	-20 to 70°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

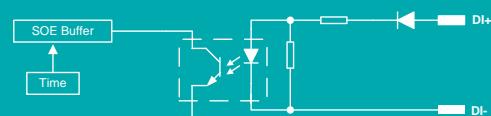
12 SOE INPUTS

USER CONFIGURABLE
PARAMETERS

FRONT WIRING FOR EASE
OF CONNECTION

256 HISTORY EVENTS

Equivalent Circuit





The MX603-0112-143 12 Channel SOE module provides 12 isolated discrete input channels which accept digital signals and then stamp the events with precise times. The SOE module maintains the sequence of the events that are generated from the field, and converts and transfers them to the controlling system. The module supports Extended Modbus/ModNet protocol to communicate with other devices.

The 12 channel discrete inputs are all current sink inputs. The voltage range of the inputs are 0 to 30VDC. If the input voltage is lower than 5VDC, the channel is off.



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Sync+	Sync-	DI1+	DI1-	DI2+	DI2-	DI3+	DI3-	DI4+	DI4-	DI5+	DI5-	DI6+	DI6-	DI7+	DI7-	DI8+	DI8-
19	20	21	22	23	24	25	26										
DI9+	DI9-	DI10+	DI10-	DI11+	DI11-	DI12+	DI12-										

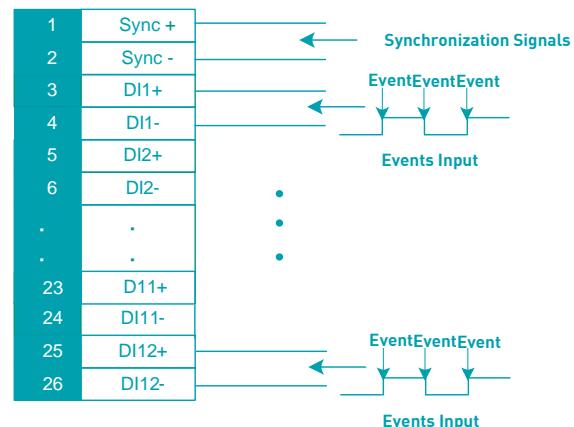
If the input voltage is higher than 10VDC, the channel is on. The normal sink current is 6 mA at 24 VDC.

The module uses a synchronization channel to acquire a synchronization signal from the host controller.

Other features include the recording 256 events, history events are deleted from the SOE buffer by the host controller, rising and falling edge triggering, normal digital input function, diagnostic information availability and inverse wiring protection.

This module is available in Rack Based (-143) Configuration.

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Digital SOE Input

12 Channel Digital SOE Input

MX603-5112-143

Performance Specifications

Number of Inputs	12
Off Voltage	<5VDC
On Voltage	>10VDC
Typical Wetting Current (@24VDC)	6 mA
Maximum Input Voltage	30 VDC
Resolution	0.1 ms
Accuracy	±1 ms
Maximum Number of History Events	256
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Explosive Atmosphere Specifications

IECEx Certification	Ex nA II T4 Gc -20°C ≤ Ta ≤ +55°C IEC 60079-0 : 2007-10 (edition 5) IEC 60079-15 : 2005-03 (edition 3)
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Maximum Power Consumption

Power Dissipation	<3.5 W
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Isolation

Channel to Channel	3000VRms
Channels to System	3000VRms

Configurable Parameters

Channel status	Activate, deactivate
Chatter Mode Count	User Definable
Filter Time	User Definable
Debounce Time	User Definable

Environmental Conditions

Operating Temperature	-20 to 55°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

12 SOE INPUTS

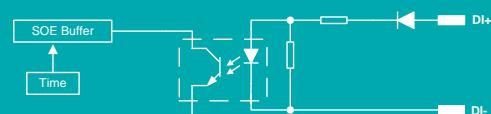
IECEx CERTIFIED FOR EXPLOSIVE ATMOSPHERES

USER CONFIGURABLE PARAMETERS

FRONT WIRING FOR EASE OF CONNECTION

256 HISTORY EVENTS

Equivalent Circuit





The MX603-5112-143 12 Channel SOE module provides 12 isolated discrete input channels which accept digital signals and then stamp the events with precise times. The SOE module maintains the sequence of the events that are generated from the field, and converts and transfers them to the controlling system. The module supports Extended Modbus/ModNet protocol to communicate with other devices. It is IECEx certified for explosive atmospheres.

The 12 channel discrete inputs are all current sink inputs. The voltage range of the inputs are 0 to 30VDC. If the input voltage is lower than 5VDC, the channel is off.



Terminal Connector Assignments

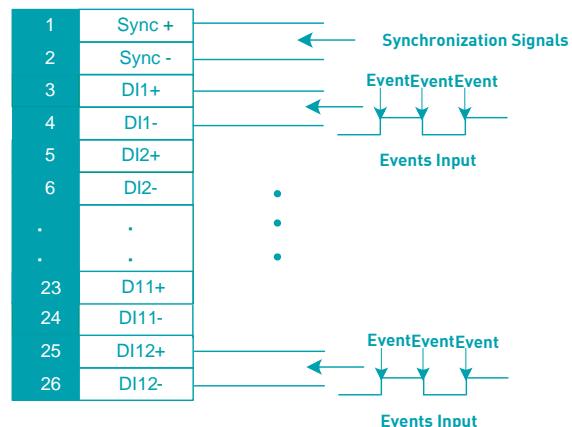
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Sync+	Sync-	DI1+	DI1-	DI2+	DI2-	DI3+	DI3-	DI4+	DI4-	DI5+	DI5-	DI6+	DI6-	DI7+	DI7-	DI8+	DI8-
19	20	21	22	23	24	25	26										
DI9+	DI9-	DI10+	DI10-	DI11+	DI11-	DI12+	DI12-										

If the input voltage is higher than 10VDC, the channel is on. The normal sink current is 6 mA at 24 VDC.

The module uses a synchronization channel to acquire a synchronization signal from the host controller. Other features include the recording 256 events, history events are deleted from the SOE buffer by the host controller, rising and falling edge triggering, normal digital input function, diagnostic information availability and inverse wiring protection.

This module is available in Rack Based (-143) Configuration.

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Digital Out

8 Channel Digital Output - Relay

MX603-0208-31X

Performance Specifications

Number of Channels	8
Maximum Switching Voltage	250 VAC 30 VDC
Output Current Rating	1 A per channel
Surge Current per Channel	10 A for 10 ms every 2 s
Output Delay Time	< 10 ms

Maximum Power Consumption

Rack Based	2.3 W
Standalone Serial	4.1 W
Standalone Ethernet	4.2 W

Isolation

Channel to System	2000 Vrms
Channel to Channel	1500 Vrms

Configurable Parameters

Pre-defined Output State	ON / OFF
Drive on Fail-safe	User defined / last value
Output	Discrete / momentary pulse / continuous pulse
Pulse Width	User defined value (20 to 5100 ms)

8 FULLY
ISOLATED RELAY
SWITCHED OUTPUTS

250 VAC / 30 VDC

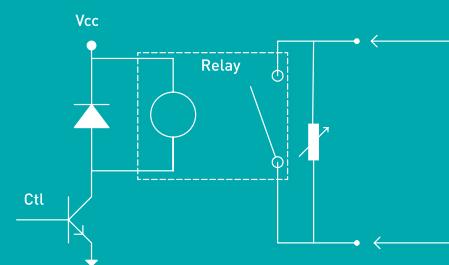
DISCRETE OR
PULSED OUTPUTS

1 A PER
CHANNEL RATING

HOT SWAPPABLE

REDUNDANT
CAPABILITY

Equivalent Circuit





The MOX 603 Digital Output Modules provide a control interface to ON/OFF field devices such as, pumps, valves, motors, pilot lights and other devices. Each output will convert levels set by the Host Controller into 8 independent relay outputs. Front panel LEDs indicate the module power and operational status as well as the signal status of each individual channel.

The MX603-0208-31x is an 8 channel, Relay Digital Output Module. It contains 8 individually isolated output channels, each of which is capable of driving

up to 250VAC or 30VDC. The user should limit the current flow through each channel to not exceed 1.0A. The outputs will not be affected by severe voltage transients and are designed to prevent damage to the module or controller.

The module is available in Standalone Serial (-315), Standalone Ethernet (-316) and Rack Based (-313) Configurations.



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10
OUT1A	OUT2A	OUT3A	OUT4A	OUT5A	OUT6A	OUT7A	OUT8A	N/A	N/A
11	12	13	14	15	16	17	18	19	20
OUT1B	OUT2B	OUT3B	OUT4B	OUT5B	OUT6B	OUT7B	OUT8B	N/A	N/A

Safety Keying

Module Top	0	0	1	1
Base Top	1	1	0	0
Module Bottom	1	1	0	1
Base Bottom	0	0	1	0

Digital Out

12 Channel Relay Output
Mx603-0212-113

Performance Specifications

Number of Channels	12
Maximum AC output voltage range	250 VAC
Maximum DC output voltage range	30 VDC
Output Current Rating	2A / point
Surge current per point	10A for 10ms every 2 s
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Isolation

Channel to System	2000 Vrms
Channel to Channel	1000 Vrms

Configurable Parameters

Predefined value	Off, On
Failsafe value	Last value, predefined value
Output type	Discrete output, single or continuous pulse
Pulse Width	Pulse low, pulse high user definable

Environmental Conditions

Operating Temperature	-20 to 70°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

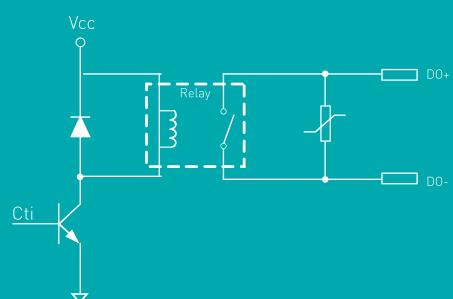
12 FULLY ISOLATED RELAY SWITCHED OUTPUTS

USER CONFIGURABLE CHANNEL TYPE

EASILY SWITCH USER SUPPLIED POWER TO FIELD DEVICES

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit



The MX603-0212-113 12 Channel Digital Output Relay device is a versatile high density module allowing the switching of 12 user supplied outputs to field devices.

The MX603-0212-113 12 Channel Digital Output device is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. Channel output type is user configurable.

This module suits applications for field devices such as pumps, valves, motors, pilot lights and other

devices. The module provides an intelligent interface between the On/Off field devices and the host controller.

User configurable outputs provide discrete output, single pulse or continuous pulse output configurations that perform the duties of several basic I/O modules integrated into one module.

This module is available in Rack Based (-113) Configuration.



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
N/A	N/A	D01+	D01-	D02+	D02-	D03+	D03-	D04+	D04-	D05+	D05-	D06+	D06-	D07+	D07-	D08+
19	20	21	22	23	24	25	26									
D09+	D09-	D010+	D010-	D011+	D011-	D012+	D012-									

Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Digital Out

16 Channel Digital Output - Module Powered MX603 - 0216 - 1XX

Performance Specifications

Number of Channels	16
Output Voltage	24 VDC
Maximum Output Current	100 mA per channel 1 A per module
Maximum OFF State Leakage Current	0.025 mA @ 25°C

Maximum Power Consumption

Rack Based	< 1.5 W
Standalone Serial	< 3.2 W
Standalone Ethernet	< 3.3 W
Field Signal Power	< 24 W

Isolation

Channel to System	500 Vrms*
-------------------	-----------

Configurable Parameters

Pre-defined Output State	ON / OFF
Drive on Fail-safe	User defined / last value
Output Type	Discrete / momentary pulse / continuous pulse
Pulse Width	User defined value (20 to 5100 ms)

* Indicates minimum isolation. This figure may vary between standalone serial, ethernet and rack based I/O modules.

16 MODULE-POWERED
DISCRETE NON-ISOLATED
OUTPUTS WITH
COMMON GROUND

CHANNEL OVERLOAD
PROTECTION

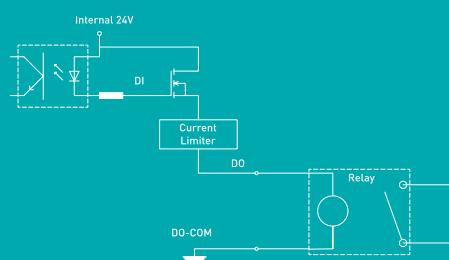
INDIVIDUAL CHANNELS
CAN PROVIDE
STATUS FEEDBACK

DISCRETE OR
PULSED OUTPUTS

HOT SWAPPABLE

REDUNDANT
CAPABILITY

Equivalent Circuit



The MOX 603 16 Channel Digital Output module is a versatile high density 24 VDC module providing 16 discrete outputs. All outputs are module-powered for use with or without external relays. Read-back functionality is available on some modules to provide status feedback for individual channels.

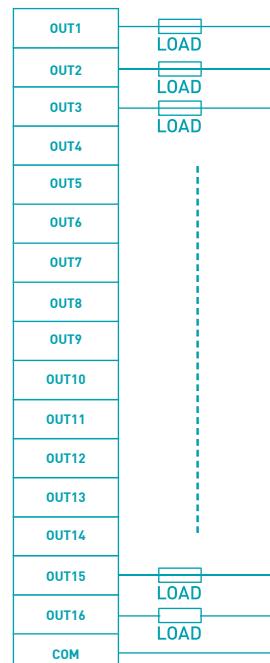
The module provides a control interface to general ON/OFF outputs to field devices (eg. Relays, solenoids, valves, pumps, motors).

Individual channels can be configured to provide discrete, momentary or pulse outputs. Pulse width can be configured from 20 to 5100 milliseconds.

The module is available without read-back functionality in Standalone Serial (-125), Standalone Ethernet (-126) and Rack Based (-123) Configurations. The module is available with read-back functionality in Standalone Serial (-135), Standalone Ethernet (-136) and Rack Based (-133) Configurations.



Wiring Diagram



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10
OUT1	OUT3	OUT5	OUT7	OUT9	OUT11	OUT13	OUT15	N/A	N/A
11	12	13	14	15	16	17	18	19	20
OUT2	OUT4	OUT6	OUT8	OUT10	OUT12	OUT14	OUT16	COM	N/A

Safety Keying

Module Top	0	1	1	1
Base Top	1	0	0	0
Module Bottom	1	0	0	0
Base Bottom	0	1	1	0

Digital Out

32 Channel Digital Output
MX603 - 0232 - 123

Performance Specifications

Number of Channels	32
Current per Channel	100mA max
Output Voltage	24Vdc max
Leakage Current	25uA max @25degC

Isolation

Channel to System	2500Vrms
-------------------	----------

Power Dissipation Within Module

(5Vdc Source)	< 1.0W
(24Vdc Source)	< 10.0W

Configurable Parameters

Pre-defined Output State	ON/OFF
Drive on Fail-safe	User defined/ last value
Output Type	Discrete/momentary pulse/ continuous pulse
Pulse Width	User defined (20 - 5100ms)

32 MODULE-POWERED
DISCRETE NON-ISOLATED
INPUTS WITH
COMMON GROUND

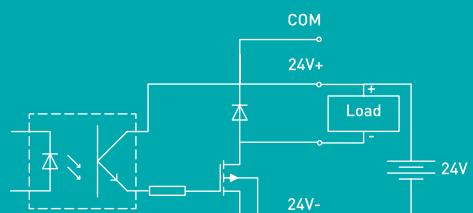
INDEPENDANT USER
CONFIGURABLE
CHANNELS

ROTARY ADDRESS
SWITCH ON MODULE

HOT SWAPPABLE

SHORT CIRCUIT
PROTECTION

Equivalent Circuit





The MOX 603 32 Channel Digital Output Module is a versatile high density 24 VDC module driving up to 32 non-isolated discrete outputs. The module is powered from the 603 rack bus power supply as well as an external 24Vdc power supply.

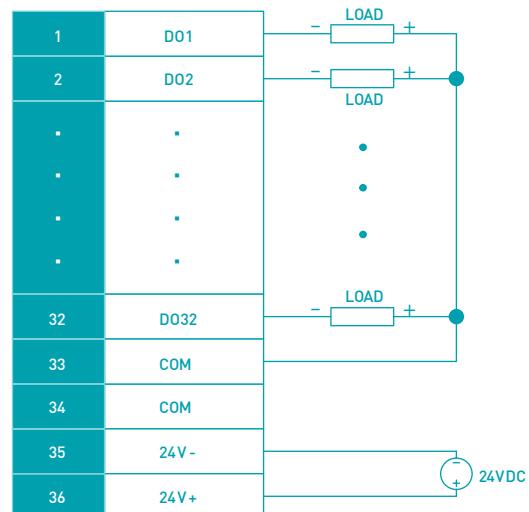
The MOX 603 32 Channel Digital Output Module provides an interface to drive general purpose ON/OFF field devices (eg. Motor contactors, relays, solenoid, light, alarm, etc).

Module front wiring and rotary address switch allow for simple configuration and installation. A total of 34 LEDs are used to indicate individual channel status as well as power and module status.

The module is available in Rack Based (-123) Configuration.



Wiring Diagram



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12
OUT1	OUT2	OUT3	OUT4	OUT5	OUT6	OUT7	OUT8	OUT9	OUT10	OUT11	OUT12
13	14	15	16	17	18	19	20	21	22	23	24
OUT13	OUT14	OUT15	OUT16	OUT17	OUT18	OUT19	OUT20	OUT21	OUT22	OUT23	OUT24
10	10	10	10	10	10	10	10	10	10	10	10
OUT25	OUT26	OUT27	OUT28	OUT29	OUT30	OUT31	OUT32	COM	COM	24-	24+

Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Digital Out



32 Channel Digital Output

MX603-5232-123

Performance Specifications

Number of Outputs	32
Minimum Output Current per Channel	100mA
Maximum Output Voltage	24VDC
Off Leakage Current(@ 25°C)	<25uA
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Explosive Atmosphere Specifications

IECEx Certification	Ex nA II T4 Gc -20°C ≤ Ta ≤ +55°C IEC 60079-0 : 2007-10 (edition 5) IEC 60079-15 : 2005-03 (edition 3)
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Maximum Power Consumption

Power Dissipation	<1.0 W
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Isolation

Channels to System	2500VRms
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Configurable Parameters

Predefined Value	Off or on
Fail Safe Value of Channel	Last Value or Predefined Value
Channel Type	Discrete Output, Single Pulse, Continuous Pulse
Pulse Width High or Low	User Definable

Environmental Conditions

Operating Temperature	-20 to 55°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

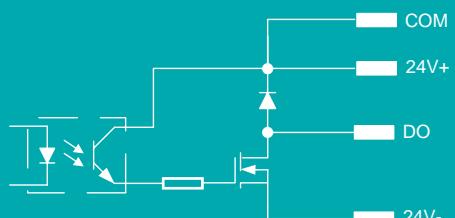
32 NON-ISOLATED OUTPUTS

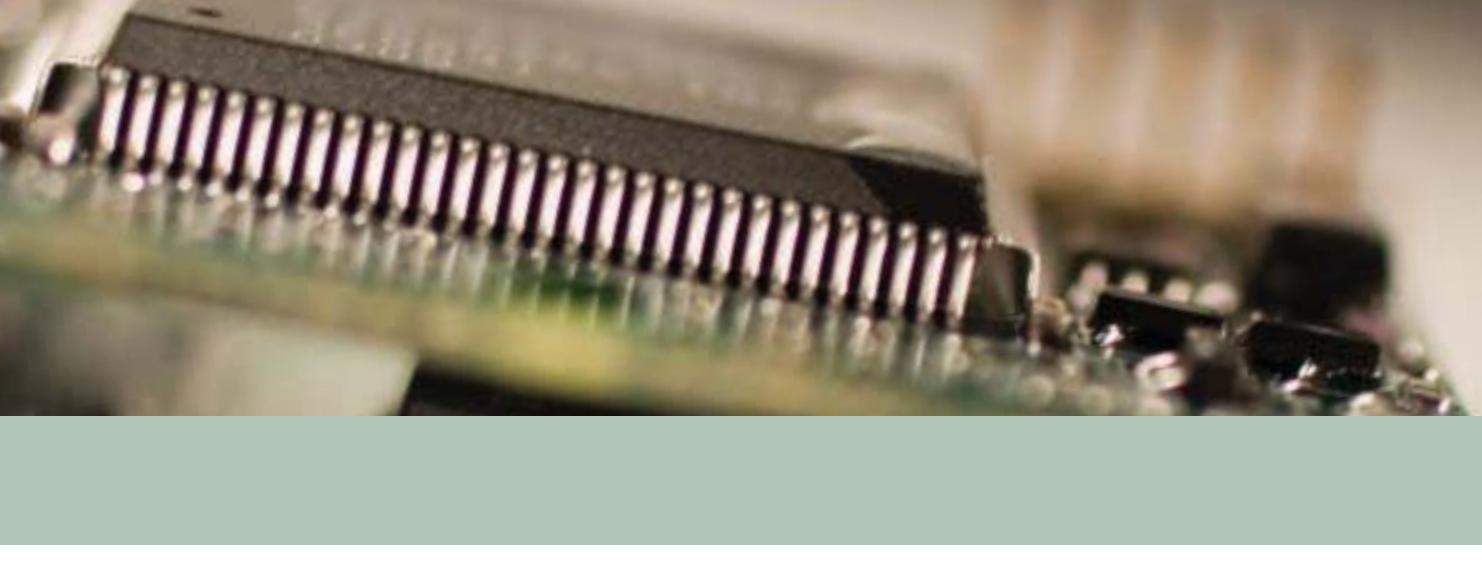
IECEx CERTIFIED FOR EXPLOSIVE ATMOSPHERES

USER CONFIGURABLE PARAMETERS

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit





The MX603-5232-123 32 Channel Digital Output Module is a versatile high density 24 VDC module driving up to 32 non-isolated discrete outputs. The module is powered from the 603 rack bus power supply as well as an external 24 VDC power supply. It is IECEx certified for explosive atmospheres.

The MX603-5232-123 32 Channel Digital Output Module provides an interface to drive general purpose On/Off field devices (eg. Motor contacts, relays, solenoids, lights, alarms, etc).



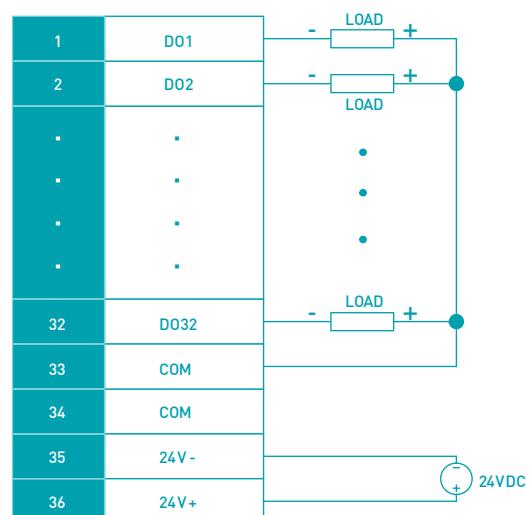
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12
D01	D02	D03	D04	D05	D06	D07	D08	D09	D010	D011	D012
13	14	15	16	17	18	19	20	21	22	23	24
D013	D014	D015	D016	D017	D018	D019	D020	D021	D022	D023	D024
10	10	10	10	10	10	10	10	10	10	10	10
D025	D026	D027	D028	D029	D030	D031	D032	COM	COM	24V-	24V+

Module front wiring and rotary address switch access allow for simple configuration and installation. A total of 34 LEDs are used to indicate individual channel status as well as power and module status.

The module is available in Rack Based (-123) Configuration.

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Analog In

8 Channel Analog Input – 4~20mA Isolated
MX603 – 0308 – 61X

Performance Specifications

Number of Channels	8
Nominal Signal Range (span)	4 to 20 mA
Full Signal Range	0.5 to 22 mA
ADC Resolution	16 bit
Input Resistance	< 300Ω @ 20 mA
Accuracy	± 0.02 mA @ 25°C

Line Fault Detection

Over Current Protection	Yes
Open Circuit Current	< 0.5 mA

Temperature Stability

(– 20°C to +70°C)	± 0.006 % of span per °C
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Maximum Power Consumption

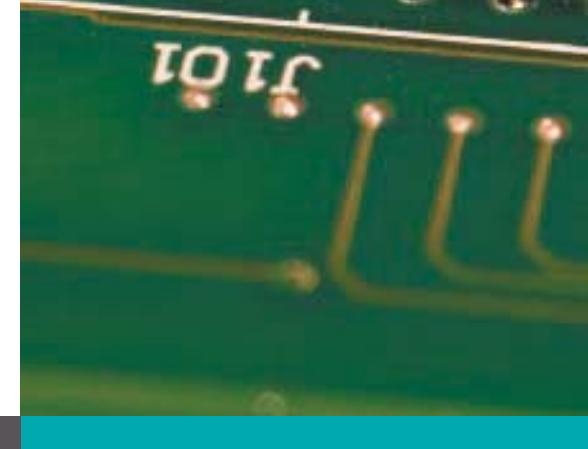
Rack Based	< 1.0W
Standalone Serial	< 2.4W
Standalone Ethernet	< 2.5W

Isolation

Channel to System	1000 Vrms
Channel to Channel	1000 Vrms

Configurable Parameters

Alarms	High / high-high / low / low-low
Alarm Deadband (hysteresis)	User defined
Input Filter Time Constant	User defined
Channel Status	Active / inactive



8 INDIVIDUALLY ISOLATED INPUT CHANNELS FOR 2-WIRE TRANSMITTERS

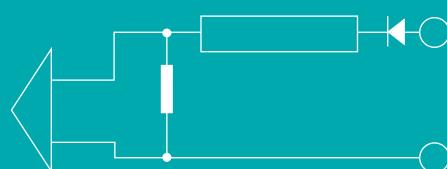
16 BIT RESOLUTION

OPEN CIRCUIT AND OVER CURRENT DETECTION

INVERSE WIRING PROTECTION

HOT SWAPPABLE

Equivalent Circuit





The MOX 603 Analog Input Module provides an interface to variable signal field devices such as, level detectors, flow meters, density gauges, speed indicators and other sources. Each input will sense and convert a varying input signal into a corresponding numerical value which may then be used by the Host Controller. Front panel LEDs indicate the module power and operational status as well as the input status for each individual channel.

MX603-0308-61x is an 8 channel, 4~20mA Analog

Input Module. It contains 8 individually isolated input channels each of which will convert a varying current signal to an equivalent value using the inbuilt 16 bit Analog to Digital Converter. The module inputs will simultaneously reject 50Hz and 60Hz noise thus improving the overall reliability of the module.

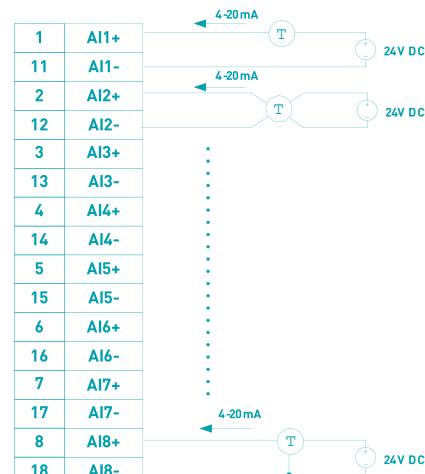
The module is available in Standalone Serial, (-615), Standalone Ethernet (-616) and Rack Based, (-613) Configurations.



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10
IN1+	IN2+	IN3+	IN4+	IN5+	IN6+	IN7+	IN8+	N/A	N/A
11	12	13	14	15	16	17	18	19	20
IN1-	IN2-	IN3-	IN4-	IN5-	IN6-	IN7-	IN8-	N/A	N/A

Wiring Diagram



Safety Keying

Module Top	0	0	1	1
Base Top	1	1	0	0
Module Bottom	1	1	1	0
Base Bottom	0	0	0	1

Analog In

8 Channel Analog Input – 4~20mA
MX603 – 0308 – 64X

Performance Specifications

Number of Channels	8
Nominal Signal Range (span)	4 to 20 mA
Full Signal Range	0.5 to 22 mA
ADC Resolution	16 bit
Input Resistance	< 300 Ω @ 20 mA
Accuracy	± 0.02 mA @ 25°C

Line Fault Detection

Over Current Protection	Yes
Open Circuit Current	< 0.5 mA

Temperature Stability

(– 20°C to +70°C)	± 0.006 % of span per °C
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Maximum Power Consumption

Rack Based	< 0.9 W
Standalone Serial	< 3.3 W
Standalone Ethernet	< 3.4 W
Field Signal Power	< 1.0 W

Isolation

Channel to System	500 Vrms*
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Configurable Parameters

Alarms	High / high-high / low / low-low
Alarm Deadband (hysteresis)	User defined
Input Filter Time Constant	User defined
Channel Status	Active / inactive

* Indicates minimum isolation. This figure may vary between standalone serial, ethernet and rack based I/O modules.

8 ANALOG INPUT CHANNELS WITH COMMON GROUND FOR 2-WIRE TRANSMITTERS

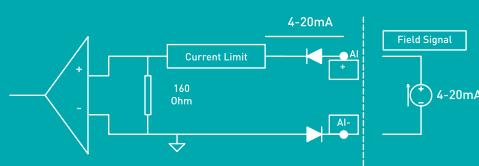
OPEN CIRCUIT AND SHORT CIRCUIT DETECTION

OVER CURRENT INPUT PROTECTION

INVERSE WIRING PROTECTION

HOT SWAPPABLE

Equivalent Circuit for 4~20mA AI

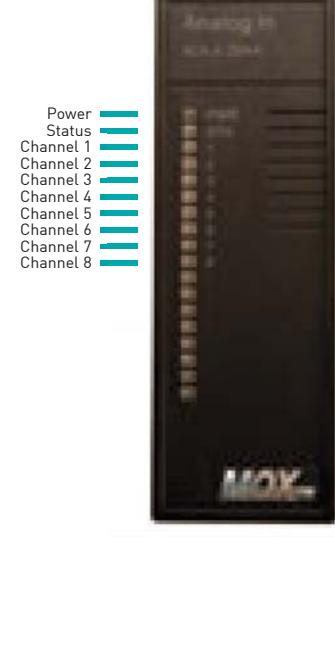


The MX603-0308-64x is an 8 channel, 4~20mA non-isolated Analog Input Module. It provides 8 input channels with a common ground with each channel converting a varying current signal to an equivalent value using the inbuilt 16 bit Analog to Digital

Converter. The module inputs will simultaneously reject 50Hz and 60Hz noise thus improving the overall reliability of the module.

The module is available in Standalone Serial (-645), Standalone Ethernet (-646) and Rack Based (-643) Configurations.

Wiring Diagram



Terminal Connector Assignments

For MX603-2022/2023-01 Base

1	2	3	4	5	6	7	8	9	10
IN1+	IN2+	IN3+	IN4+	IN5+	IN6+	IN7+	IN8+	24V+	24V-
11	12	13	14	15	16	17	18	19	20
IN1-	IN2-	IN3-	IN4-	IN5-	IN6-	IN7-	IN8-	COM	N/A

Safety Keying

Module Top	1	0	1	1
Base Top	0	1	0	0
Module Bottom	1	0	0	1
Base Bottom	0	1	1	0

Analog In

8 Channel Analog Input – 4~20mA Module-Powered
MX603 – 0308 – 63X

Performance Specifications

Number of Channels	8
Nominal Signal Range (span)	4 to 20 mA
Full Signal Range	0.5 to 22 mA
ADC Resolution	16 bit
Input Resistance	< 300 Ω @ 20 mA
Accuracy	± 0.02 mA @ 25 °C

Line Fault Detection

Over Current Protection	Yes
Open Circuit Current	< 0.5 mA

Temperature Stability

(– 20°C to +70°C)	± 0.006 % of span per °C
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Maximum Power Consumption

Rack Based	< 1.0 W
Standalone Serial	< 11 W
Standalone Ethernet	< 11 W
Field Signal Power	< 8.5 W

Isolation

Channel to System	500 Vrms*
-------------------	-----------

Configurable Parameters

Alarms	High / high-high / low / low-low
Alarm Deadband (hysteresis)	User defined
Input Filter Time Constant	User defined
Drive on Fail-safe	User defined
Channel Status	Active / inactive

* Indicates minimum isolation. This figure may vary between standalone serial, ethernet and rack based I/O modules.

8 ANALOG INPUT CHANNELS WITH COMMON GROUND FOR 2-WIRE TRANSMITTERS

MODULE POWERED

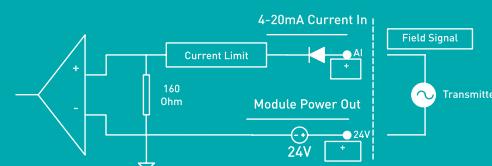
OPEN CIRCUIT AND SHORT CIRCUIT DETECTION

OVER CURRENT INPUT PROTECTION

INVERSE WIRING PROTECTION

HOT SWAPPABLE

Equivalent Circuit for 4~20mA AI



The MX603-0308-63x is a module-powered 8 channel, 4~20mA non-isolated Analog Input Module. It provides 8 input channels with a common ground with each channel converting a varying current signal to an equivalent value using the inbuilt 16 bit

Analog to Digital Converter. The module inputs will simultaneously reject 50Hz and 60Hz noise thus improving the overall reliability of the module.

The module is available in Standalone Serial (-635), Standalone Ethernet (-636) and Rack Based (-633) Configurations.



Terminal Connector Assignments

For MX603-2022/2023-01 Base

1	2	3	4	5	6	7	8	9	10
IN1+	IN2+	IN3+	IN4+	IN5+	IN6+	IN7+	IN8+	24V+	24V-
11	12	13	14	15	16	17	18	19	20
24V+	N/A	N/A							

Wiring Diagram



Safety Keying

Module Top	0	1	1	1
Base Top	1	0	0	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	0

Analog In

8 Channel Analog Input – 1~5V
MX603 – 0308 – 42X

Performance Specifications

Number of Channels	8
Nominal Signal Range	1 to 5 VDC
A/D Resolution	16 bit
Accuracy	±5 mV @ 25 °C

Temperature Stability

(– 20 °C to +70 °C)	± 0.006 % of span per °C
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Other Input Specifications

Line Fault Detection	< 0.2 VDC
Full Signal Range	0.2 to 5.5 V

Maximum Power Consumption

Rack Based	1.1 W
Standalone Serial	3.4 W
Standalone Ethernet	3.5 W
Field Signal Power	0.5 W

Isolation

Channel to System	500 Vrms*
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Configurable Parameters

Alarms	High / high-high / low / low-low
Alarm Deadband (hysteresis)	User defined
Input Filter Time Constant	User defined
Channel Status	Active / inactive

* Indicates minimum isolation. This figure may vary between standalone serial, ethernet and rack based I/O modules.

8 NON-ISOLATED
ANALOG INPUTS WITH
COMMON GROUND

16 BIT A/D
RESOLUTION

50/60HZ
NOISE REJECTION

OPEN CIRCUIT AND
SHORT CIRCUIT
DETECTION

OVER VOLTAGE
INPUT PROTECTION

HOT SWAPPABLE

REDUNDANT
CAPABILITY

Equivalent Circuit
for 1~5V AI





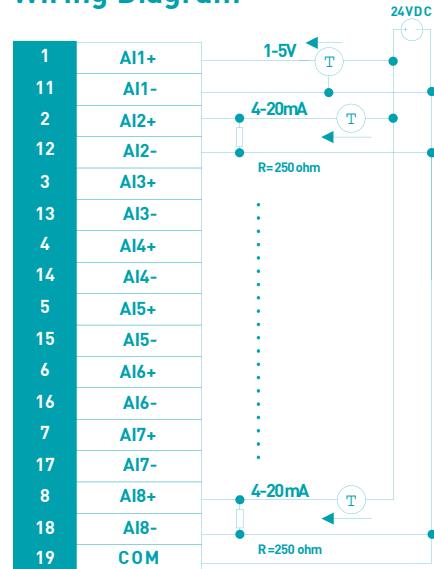
The MX603-0308-42x is an 8 channel, 1~5V non-isolated Analog Input Module. It provides 8 input channels with a common ground with each channel converting a varying current signal to an equivalent value using the inbuilt 16 bit Analog to Digital Converter. The module inputs will simultaneously reject 50Hz and 60Hz noise thus improving the overall

reliability of the module. This module is recommended for applications that require redundant analog inputs.

The module is available in Standalone Serial (-425), Standalone Ethernet (-426) and Rack Based (-423) Configurations.



Wiring Diagram



Terminal Connector Assignments

For MX603-2022/2023-01 Base

1	2	3	4	5	6	7	8	9	10
VI1+	VI2+	VI3+	VI4+	VI5+	VI6+	VI7+	VI8+	24V+	24V-
11	12	13	14	15	16	17	18	19	20
VI1-	VI2-	VI3-	VI4-	VI5-	VI6-	VI7-	VI8-	COM	N/A

Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	0	1
Base Bottom	0	1	1	0

Analog In

12 Channel 4-20mA Analog Input
Mx603-0312-113

Performance Specifications

Number of Channels	12
Nominal Signal Range	4-20mA
Full signal range	0.5-22mA
ADC resolution	24 Bit
Accuracy	$\pm 0.020\text{mA}$ @ 25°C
Input resistance	< 250Ω at 20mA
Temperature stability (-20°C to +70°C)	$\pm 0.006\%$ of span per $^\circ\text{C}$
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Line Fault Detection/Protection

Low current detection	Yes
Over current protection	Yes

Maximum Power Consumption

Module power dissipation	5VDC for system, < 1.6W
--------------------------	-------------------------

Isolation

Channel to System	1000 Vrms
Permissible potential difference between channels	< 400VDC

Configurable Parameters

Channel Status	Activate, deactivate
Filter time	User definable

Environmental Conditions

Operating Temperature	-20 to 70°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

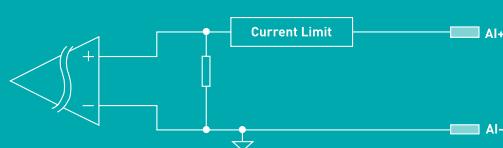
12 FULLY ISOLATED ANALOG INPUTS FOR 2-WIRE TRANSMITTERS

LINE FAULT DETECTION AND OVER CURRENT PROTECTION

24 BIT RESOLUTION

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit





The MX603-0312-113 12 Channel Analog 4-20mA Isolated Input device is a versatile high density module allowing 12 2-wire inputs from field transmitters.

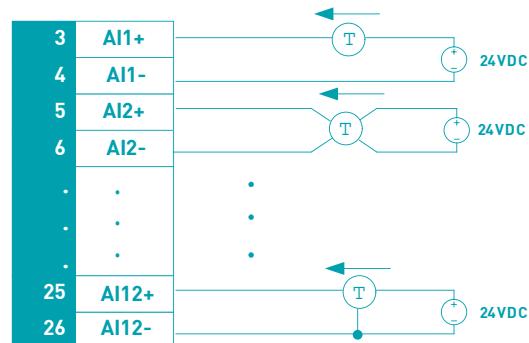
The MX603-0312-113 12 Channel Analog Input device is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. User configurable filters provide a way of smoothing the inputs from the field devices.

This module suits applications for field devices such as level indicators, flow meters, density gauges, speed indicators and other sources. The module provides an intelligent interface between a variable signal from a field device and the host controller.

This module is available in Rack Based (-113) Configuration.



Wiring Diagram



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
N/A	N/A	AI1+	AI1-	AI2+	AI2-	AI3+	AI3-	AI4+	AI4-	AI5+	AI5-	AI6+	AI6-	AI7+	AI7-	AI8+	A18-
19	20	21	22	23	24	25	26										
AI9+	AI9-	AI10+	AI10-	AI11+	AI11-	AI12+	AI12-										

Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Analog In

12 Channel 4-20mA Analog Input
Mx603-5312-113

Performance Specifications

Number of channels	12
Nominal signal range	4-20mA
Full signal range	0.5-22mA
ADC resolution	24 Bit
Accuracy	$\pm 0.020\text{mA}$ @ 25°C
Input resistance	< 200Ω at 20mA
Temperature stability (-20°C to +55°C)	$\pm 0.006\%$ of span per °C
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Explosive Atmosphere Specifications

IECEx Certification	Ex nA II T4 Gc -20°C \leq Ta \leq +55°C IEC 60079-0 : 2007-10 (edition 5) IEC 60079-15 : 2005-03 (edition 3)
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Line Fault Detection/Protection

Low current detection	Yes
Over current protection	Yes

Maximum Power Consumption

Module power dissipation	<1.6W
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Isolation

Channel to system	1000Vrms
Permissible potential difference between channels	<400VDC

Configurable Parameters

Channel status	Activate, deactivate
Filter time	User definable

Environmental Conditions

Operating Temperature	-20 to 55°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

12 FULLY ISOLATED ANALOG INPUTS FOR 2-WIRE TRANSMITTERS

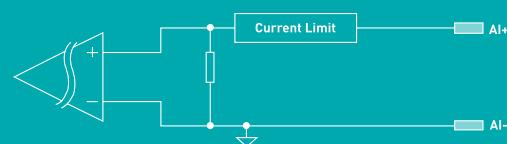
IECEx CERTIFIED FOR EXPLOSIVE ATMOSPHERES

LINE FAULT DETECTION AND OVER CURRENT PROTECTION

24 BIT RESOLUTION

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit





The MX603-5312-113 12 Channel Analog 4-20mA Isolated Input device is a versatile high density module allowing 12 2-wire inputs from field transmitters. It is IECEx certified for explosive atmospheres.

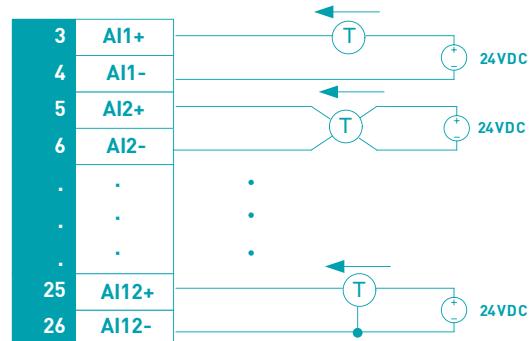
The MX603-5312-113 12 Channel Analog Input device is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. User configurable filters provide a way of smoothing the inputs from the field devices.

This module suits applications for field devices such as level indicators, flow meters, density gauges, speed indicators and other sources. The module provides an intelligent interface between a variable signal from a field device and the host controller.

This module is available in Rack Based (-113) Configuration.



Wiring Diagram



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
N/A	N/A	AI1+	AI1-	AI2+	AI2-	AI3+	AI3-	AI4+	AI4-	AI5+	AI5-	AI6+	AI6-	AI7+	AI7-	AI8+	AI8-
19	20	21	22	23	24	25	26										
AI9+	AI9-	AI10+	AI10-	AI11+	AI11-	AI12+	AI12-										

Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Analog In

12 Channel 1-5V Analog Input

Mx603-0312-123

Performance Specifications

Number of Channels	12
Nominal Signal Range	1-5VDC
Full signal range	0.2-5.5VDC
ADC resolution	24 Bit
Accuracy	±5mV @ 25°C
Input resistance	> 1MΩ
Temperature stability (-20°C to +70°C)	± 0.006% of span per °C
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Line Fault Detection/Protection

Over range input voltage	Yes
Open circuit voltage	< 0.2VDC

Maximum Power Consumption

Module power dissipation	5VDC for system, < 1.6W
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Isolation

Channel to System	1000 Vrms
Permissible potential difference between channels	< 400VDC

Configurable Parameters

Channel Status	Activate, deactivate
Filter time	User definable

Environmental Conditions

Operating Temperature	-20 to 70°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

12 FULLY ISOLATED ANALOG INPUTS FOR 2-WIRE TRANSMITTERS

LINE FAULT DETECTION

24 BIT RESOLUTION

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit





The MX603-0312-123 is a 12 Channel, 1-5V Isolated Analog Input device. It is a versatile high density module allowing 12 2-wire inputs from field transmitters.

The MX603-0312-123 12 Channel Analog Input device is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. User configurable filters provide a way of smoothing the inputs from the field devices.



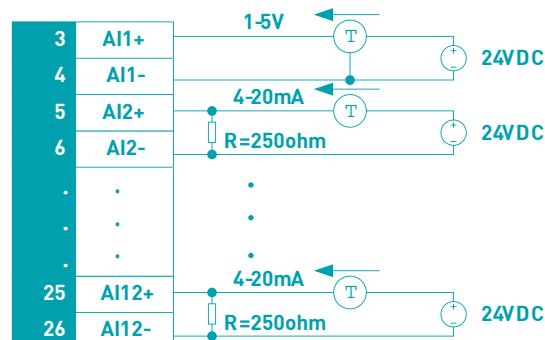
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
N/A	N/A	AI1+	AI1-	AI2+	AI2-	AI3+	AI3-	AI4+	AI4-	AI5+	AI5-	AI6+	AI6-	AI7+	AI7-	AI8+	A18-
19	20	21	22	23	24	25	26										
AI9+	AI9-	AI10+	AI10-	AI11+	AI11-	AI12+	AI12-										

This module suits applications for field devices where mixed signals arrive at the module in the form of 1-5V or 4-20mA. The 4-20mA signals can then be easily converted to the 1-5V format by use of an external resistor. The module provides an intelligent interface between a variable signal from a field device and the host controller.

This module is available in Rack Based (-123) Configuration.

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Analog In

12 Channel 1-5V Analog Input

Mx603-5312-123

Performance Specifications

Number of channels	12
Nominal signal range	1-5VDC
Full signal range	0.2-5.5VDC
ADC resolution	24 Bit
Accuracy	±5mV @ 25°C
Input resistance	> 1MΩ
Temperature stability (-20°C to +55°C)	± 0.006% of span per °C
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Explosive Atmosphere Specifications

IECEx Certification	Ex nA II T4 Gc -20°C ≤ Ta ≤ +55°C IEC 60079-0 : 2007-10 (edition 5) IEC 60079-15 : 2005-03 (edition 3)
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Line Fault Detection Specifications

Open circuit voltage	< 0.2VDC
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Maximum Power Consumption

Module power dissipation	<1.6W
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Isolation

Channel to system	1000VRms
Permissible potential difference between channels	< 400VDC

Configurable Parameters

Channel status	Activate, deactivate
Filter time	User definable

Environmental Conditions

Operating Temperature	-20 to 55°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

12 FULLY ISOLATED ANALOG INPUTS FOR 2-WIRE TRANSMITTERS

IECEx CERTIFIED FOR EXPLOSIVE ATMOSPHERES

LINE FAULT DETECTION

24 BIT RESOLUTION

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit





The MX603-5312-123 is a 12 Channel, 1-5V Isolated Analog Input device. It is a versatile high density module allowing 12 2-wire inputs from field transmitters. It is IECEx certified for explosive atmospheres.

The MX603-5312-123 12 Channel Analog Input device is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. User configurable filters provide a way of smoothing the inputs from the field devices.

This module suits applications for field devices where mixed signals arrive at the module in the form of 1-5V or 4-20mA. The 4-20mA signals can then be easily converted to the 1-5V format by use of an external resistor. The module provides an intelligent interface between a variable signal from a field device and the host controller.

This module is available in Rack Based (-123) Configuration.



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
N/A	N/A	AI1+	AI1-	AI2+	AI2-	AI3+	AI3-	AI4+	AI4-	AI5+	AI5-	AI6+	AI6-	AI7+	AI7-	AI8+	AI8-
19	20	21	22	23	24	25	26										
AI9+	AI9-	AI10+	AI10-	AI11+	AI11-	AI12+	AI12-										

Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Analog In

12 Channel 4-20mA Analog Input
MX603-0312-133

Performance Specifications

Number of Channels	12
Nominal Signal Range	4-20mA
Full Signal Range	0.5-22mA
ADC resolution	24 Bits
Accuracy	+0.020mA @ 25°C
Input Resistance	100Ω
Temperature Stability (-20°C to +70°C)	+0.006% of span per °C
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Line Fault Detection/Protection

Low Current Detection	Yes
Over Current Protection	Yes

Maximum Power Consumption

Module Power Dissipation	5VDC for system, < 1.6W
Each Channel Group Power Dissipation	< 2W

Isolation

Channel to System	1000VRms
Channel Group to Channel Group	1000VRms

Configurable Parameters

Channel Status	Activate, deactivate
Filter Time	User definable

Environmental Conditions

Operating Temperature	-20 to 70°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

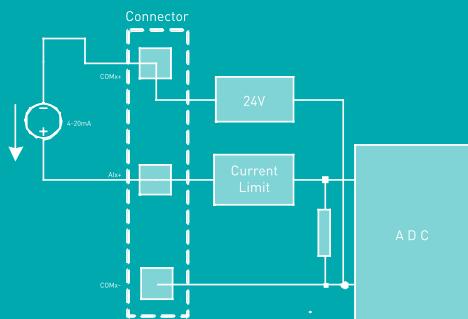
12 CHANNEL GROUP ISOLATED ANALOG INPUTS FOR 2-WIRE AND 4-WIRE TRANSMITTERS

LINE FAULT DETECTION AND OVER CURRENT PROTECTION

24 BITS RESOLUTION

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit - 2 Wire Connection





The MX603-0312-133 12 Channel Analog 4-20mA Group Isolated Input device is a versatile high density module allowing 12 inputs from 2-wire or 4-wire field transmitters.

The MX603-0312-133 12 Channel Analog Input device is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. User configurable filters provide a way of smoothing the inputs from the field devices.



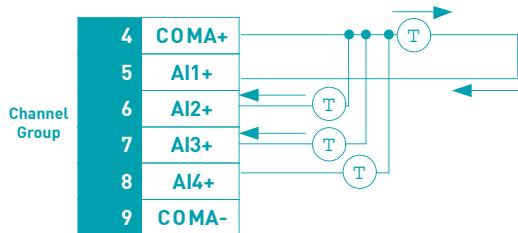
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
24V+	24V-	N/A	COMA+	AI1+	AI2+	AI3+	AI4+	COMA-	N/A	N/A	COMB+	AI5+	AI6+	AI7+	AI8+	COMB-	N/A
19	20	21	22	23	24	25	26										
N/A	COMC+	AI9+	AI10+	AI11+	AI12+	COMC-	N/A										

This module suits applications for field devices such as level indicators, flow meters, density gauges, speed indicators and other sources. The module provides an intelligent interface between a variable signal from a field device and the host controller.

This module is available in Rack Based (-133) Configuration.

Wiring Diagram 2 Wire Connection



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Analog In

12 Channel 4-20mA Analog Input
MX603-5312-133

Performance Specifications

Number of Channels	12
Number of Channel Groups	3
Nominal Signal Range	4-20mA
Full Signal Range	0.5-22mA
ADC Resolution	24 Bits
Accuracy	$\pm 0.020\text{mA}$ @ 25°C
Input Resistance	<100 Ω
Temperature Stability (-20°C to +55°C)	$\pm 0.006\%$ of span per °C
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Explosive Atmosphere Specifications

IECEx Certification	Ex nA II T4 Gc -20°C \leq Ta \leq +55°C IEC 60079-0 : 2007-10 (edition 5) IEC 60079-15 : 2005-03 (edition 3)
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Line Fault Detection/Protection

Low Current Detection	Yes
Over Current Protection	Yes
Maximum Input Voltage	30V

Maximum Power Consumption

Module Power Dissipation	<1.6W
Auxiliary Power for 2-Wire Instrument	
Input Voltage	24V \pm 10%
2-Wire Instrument Load	<7500hm

Isolation

Channel to System	1000Vrms
Channel Group to Channel Group	1000Vrms

Configurable Parameters

Channel Status	Activate, deactivate
Filter Time	User definable

Environmental Conditions

Operating Temperature	-20 to 55°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

12 CHANNEL GROUP ISOLATED
ANALOG INPUTS
FOR 2-WIRE AND
4-WIRE TRANSMITTERS

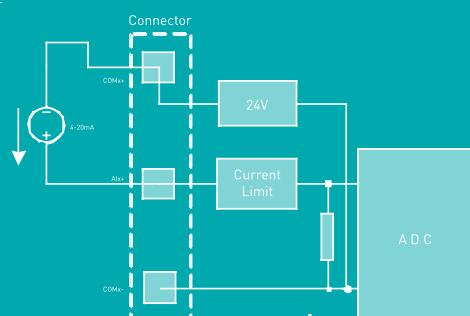
IECEx CERTIFIED FOR
EXPLOSIVE ATMOSPHERES

LINE FAULT DETECTION AND
OVER CURRENT PROTECTION

24 BITS RESOLUTION

FRONT WIRING FOR EASE
OF CONNECTION

Equivalent Circuit - 2 Wire Connection



The MX603-5312-133 12 Channel Analog 4-20mA Group Isolated Input device is a versatile high density module allowing 12 inputs from 2-wire or 4-wire field transmitters. It is IECEx certified for explosive atmospheres.

The MX603-5312-133 12 Channel Analog Input device is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. User configurable filters provide a way of smoothing the inputs from the field devices.

This module suits applications for field devices such as level indicators, flow meters, density gauges, speed indicators and other sources. The module provides an intelligent interface between a variable signal from a field device and the host controller.

This module is available in Rack Based (-133) Configuration.



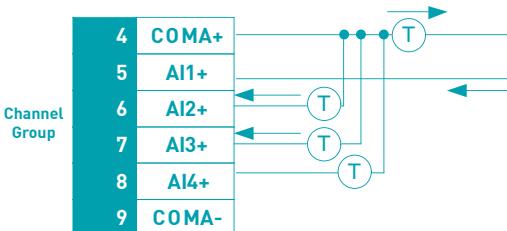
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
24V+	24V-	N/A	COMA+	AI1+	AI2+	AI3+	AI4+	COMA-	N/A	N/A	COMB+	AI5+	AI6+	AI7+	AI8+	COMB-	N/A
19	20	21	22	23	24	25	26										
N/A	COMC+	AI9+	AI10+	AI11+	AI12+	COMC-	N/A										

Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Wiring Diagram 2 Wire Connection



Thermocouple

8 Channel Analog Input – Thermocouple/mV
MX603 – 0508 – 81X

Performance Specifications

Number of Channels	8
Resolution	16 bit
THC Inputs	B, E, J, K, N, R, S, and T
Input Type	Range

Thermocouples:

B	0 to +1820 °C
E	- 270 to +1000 °C
J	-210 to +1200 °C
K	-270 to +1372 °C
N	-270 to +1300 °C
R&S	-50 to +1768 °C
T	-270 to +400 °C
mV	-12 to +78 mV

Temperature Stability	±0.006 % of span / °C
Accuracy	±0.1 % @ 25 °C

Maximum Power Consumption

Rack Based	1.8 W
Standalone Serial	3.3 W
Standalone Ethernet	3.4 W

Isolation

Channel to System	1000 Vrms
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Configurable Parameters

Sensor Type	User selectable
Alarms	High / low
Alarm Deadband (hysteresis)	User defined
Input Filter Time Constant	User defined
Drive on Open Circuit Fault	Disabled / upscale / downscale
Channel Status	Active / inactive
Cold Junction Compensation	Disabled / internal / external

8 INPUT CHANNELS

THERMOCOUPLE AND MV

COLD JUNCTION COMPENSATION (INTERNAL OR EXTERNAL)

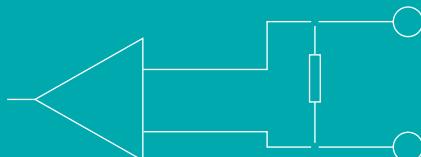
BUILT-IN THERMOCOUPLE LINEARISATION

CHANNELS INDEPENDENTLY CONFIGURABLE

OPEN CIRCUIT FIELD WIRING DETECTION

HOT SWAPPABLE

Equivalent Circuit





The MX603-0508-81x is an 8 channel Thermocouple and mV Analog Input Module.

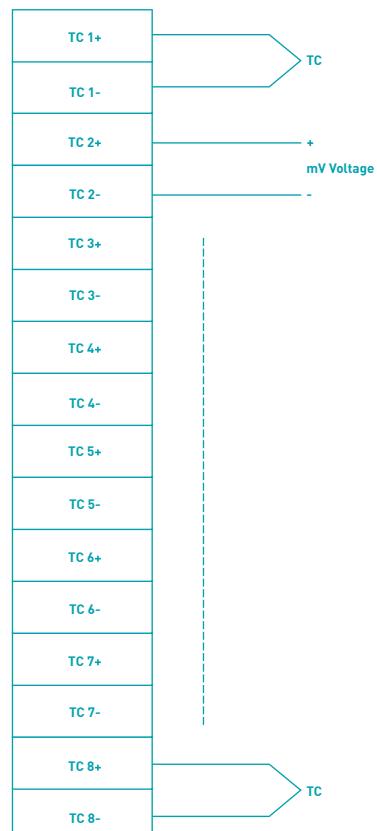
It contains 8 individually isolated input channels each of which will detect low level thermocouple signals and mV inputs into equivalent values for use in the Host Controller.



The input range is -12mV to 78mV or -12mV to 30mV in high resolution mode

The module is available in Standalone Serial (-815), Standalone Ethernet (-816) and Rack Based (-813) Configurations.

Wiring Diagram



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10
TC1+	TC2+	TC3+	TC4+	TC5+	TC6+	TC7+	TC8+	N/A	N/A
11	12	13	14	15	16	17	18	19	20
TC1-	TC2-	TC3-	TC4-	TC5-	TC6-	TC7-	TC8-	N/A	N/A

Safety Keying

Module Top	1	0	0	1
Base Top	0	1	1	0
Module Bottom	1	1	0	1
Base Bottom	0	0	1	0

Thermocouple

12 Channel Analog Input – Thermocouple/mV
MX603 – 0512 – 823

Performance Specifications

Number of Channels	12
Voltage range per channel	-12mV to 78mV
ADC resolution	24 Bit
Accuracy	± 0.1% @ 25°C
Temperature stability (-20°C to +70°C)	± 0.006% of span per °C
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Maximum Power Consumption

Module power dissipation	< 3.3 W
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Isolation

Channel to System	2500 Vrms
Permissible potential difference between channels	< 400VDC

Configurable Parameters

Check Line Status	User definable time
Channel status	Activate, deactivate
Sensor Type	J, K, T, E, N, B, R, S, mV
Filter time	User definable

Environmental Conditions

Operating Temperature	-20 to 70°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

12 FULLY ISOLATED ANALOG INPUTS FOR 2-WIRE TRANSMITTERS

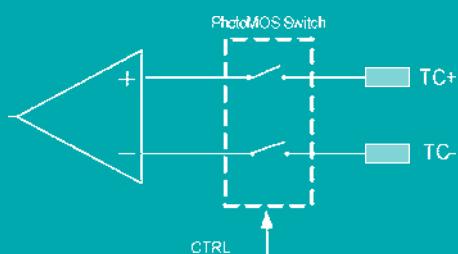
OPEN CIRCUIT DETECTION

8 DIFFERENT THERMOCOUPLE INPUT TYPES OR MV INPUT

24 BIT RESOLUTION

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit





The MX603-0512-823 is a 12 Channel, Isolated Analog Input device. It is a versatile high density module allowing 12 2-wire inputs.

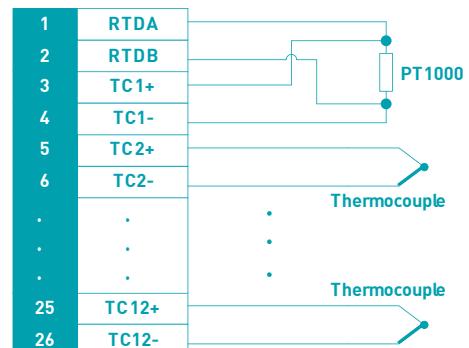
The MX603-0512-823 12 Channel Analog Input device is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. User configurable filters provide a way of smoothing the inputs from the field devices.

This module suits applications where mixed signals arrive at the module in the form of straight thermocouple connection or mV signal from a device. The first channel on the 12 channel TC module can be configured for RTD input. The remaining 11 channels are either thermocouple or mV input channels. The module provides an intelligent interface between the field environment and input device and the host controller.

This module is available in Rack Based (-823) Configuration.



Wiring Diagram



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
RTDA	RTDB	TC1+	TC1-	TC2+	TC2-	TC3+	TC3-	TC4+	TC4-	TC5+	TC5-	TC6+	TC6-	TC7+	TC7-	TC8+
19	20	21	22	23	24	25	26									
TC9+	TC9-	TC10+	TC10-	TC11+	TC11-	TC12+	TC12-									

Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Thermocouple

12 Channel Analog Input – Thermocouple/mV
MX603-5512-823

Performance Specifications

Number of channels	12
Voltage range per channel	-12mV to +78mV
ADC resolution	24 Bit
Accuracy	±0.1% @ 25°C
Temperature stability (-20°C to +70°C)	± 0.006% of span per °C
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Explosive Atmosphere Specifications

IECEx Certification	Ex nA II T4 Gc -20°C ≤ Ta ≤ +55°C IEC 60079-0 : 2007-10 (edition 5) IEC 60079-15 : 2005-03 (edition 3)
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Maximum Power Consumption

Module power dissipation	<3.3W
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Isolation

Channel to system	2500Vrms
Permissible potential difference between channels	< 400VDC

Configurable Parameters

Check Line Status	User definable time
Channel status	Activate, deactivate
Sensor Type	J, K, T, E, N, B, R, S, mV
Filter time	User definable

Environmental Conditions

Operating Temperature	-20 to 55°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

12 FULLY ISOLATED ANALOG INPUTS FOR 2-WIRE TRANSMITTERS

IECEx CERTIFIED FOR EXPLOSIVE ATMOSPHERES

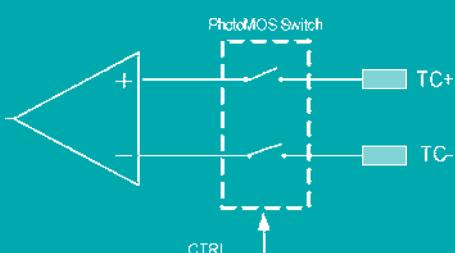
OPEN CIRCUIT DETECTION

8 DIFFERENT THERMOCOUPLE INPUT TYPES OR MV INPUT

24 BIT RESOLUTION

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit





The MX603-5512-823 is a 12 Channel, Isolated Analog Input device. It is a versatile high density module allowing 12 2-wire inputs. It is IECEx certified for explosive atmospheres.

The MX603-5512-823 12 Channel Analog Input device is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. User configurable filters provide a way of smoothing the inputs from the field devices.

This module suits applications where mixed signals arrive at the module in the form of straight thermocouple connection or mV signal from a device. The first channel on the 12 channel TC module can be configured for RTD input. The remaining 11 channels are either thermocouple or mV input channels. The module provides an intelligent interface between the field environment and input device and the host controller.

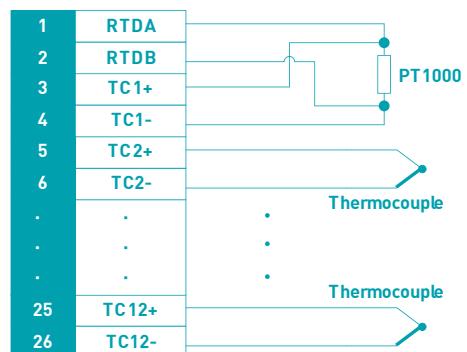
This module is available in Rack Based (-823) Configuration.



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
RTDA	RTDB	TC1+	TC1-	TC2+	TC2-	TC3+	TC3-	TC4+	TC4-	TC5+	TC5-	TC6+	TC6-	TC7+	TC7-	TC8+	TC8-
19	20	21	22	23	24	25	26										
TC9+	TC9-	TC10+	TC10-	TC11+	TC11-	TC12+	TC12-										

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

RTD

4 Channel Analog Input – RTD/Ω MX603 – 0604 – 91X

Performance Specifications

Number of Channels	4
Resolution	16 bit

RTD Inputs

0.00385 series inputs:	PT100, PT200, PT500, PT1000
0.00428 series inputs:	Cu50, Cu100
Ω inputs:	0 to 400 Ω
RTD Excitation Current	200 uA (nom)
Accuracy	±0.1 % @ 25 °C
Temperature Stability	±0.006 % of span / °C

Power Dissipation Within Module

Rack Based	< 1.5 W
Standalone Serial	< 3.1 W
Standalone Ethernet	< 3.2 W

Isolation (where applicable)

Channel to System	1000 Vrms
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Configurable Parameters

Sensor Type	User selectable
Alarms	High / low
Alarm Deadband	User defined value
Input Filter Time Constant	User defined value
Channel Status	Active / inactive
Offset (2-wire RTD mode)	User defined

4 INPUT CHANNELS

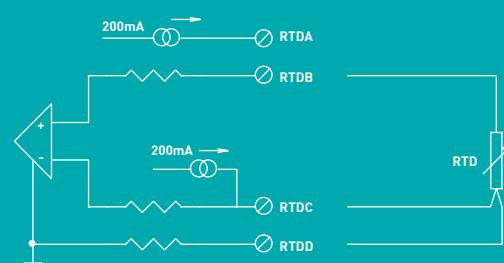
RTD AND Ω

2-, 3- AND 4-WIRE
RTD FORMAT

CHANNELS
INDEPENDENTLY
CONFIGURABLE

HOT SWAPPABLE

Equivalent Circuit



The MX603-0604-91x is a 4 channel Resistance Temperature Detector and direct resistance Analog Input Module. It contains 4 individually isolated input channels each of which has the ability to monitor 10 different RTD input types and ranges. The inputs may be individually

wired in 2, 3 or 4 wire mode independently of the other inputs.

The module is available in Standalone Serial (-915), Standalone Ethernet (-916) and Rack Based (-913) Configurations.



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10
RTD'A	RTD1C	RTD2A	RTD2C	RTD3A	RTD3C	RTD4A	RTD4C	N/A	N/A
11	12	13	14	15	16	17	18	19	20
RTD13	R-D1D	RTC23	R-D2D	RTD33	R-D3D	RTC43	R-D4D	N/A	N/A

Safety Keying

Module Top	1	0	0	1
Base Top	0	1	1	0
Module Bottom	1	0	1	1
Base Bottom	0	1	0	0

RTD

12 Channel Analog Input – RTD/Ω MX603 – 0612 – 923

Performance Specifications

Number of Channels

12

Resolution

24 bit

RTD Inputs (3-wire)

0.00385 series inputs:

PT100, PT200, PT500, PT1000

0.00428 series inputs:

Cu50, Cu100

Ω inputs:

0 to 400 Ω

Excitation Current

210uA

Accuracy

±0.1 % @ 25°C

Temperature Stability

PT1000, PT500, PT200, PT100, 0-400Ω: ±0.0075% of span per °C

Cu100, Cu50: 0.011% of span per °C

Power Dissipation Within Module

< 1.5W

Isolation

Channel to System

1000 Vrms

Configurable Parameters

Sensor Type

User selectable

Alarms

High and low

Alarm Deadband

User defined value

Input Filter Time Constant

User defined value

Channel Status

Active / inactive

12 INPUT CHANNELS

RTD AND Ω INPUTS

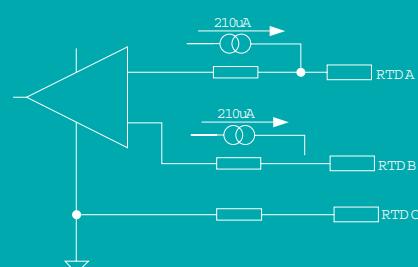
3-WIRE RTD FORMAT

**CHANNELS
INDEPENDENTLY
CONFIGURABLE**

HOT SWAPPABLE

**HIGH CHANNEL TO
SYSTEM ISOLATION**

Equivalent Circuit





The MX603-0612-923 is a 12 channel Resistance Temperature Detector and direct resistance Analog Input Module. It contains 12 input channels each of which has the ability to monitor Platinum and Copper RTD input types as well as a direct resistance input type.

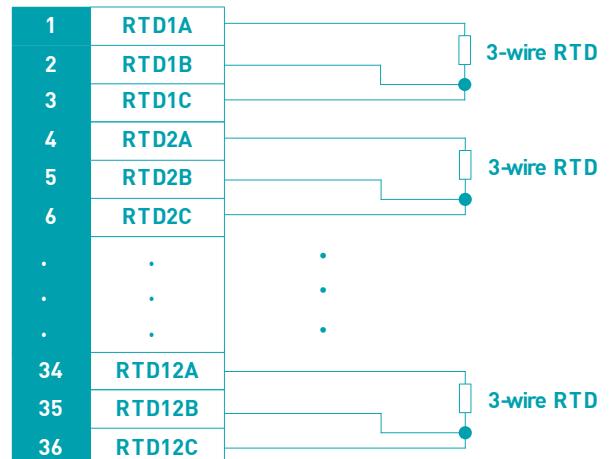


The different types provide a variety of available temperature ranges that may be read. The inputs may be wired in 3 wire mode and individually configured.

Module front wiring and rotary address switch allow for simple configuration and installation. A total of 14 LEDs are used to indicate individual channel status as well as power and module status.

The module is available in Rack Based Configuration.

Wiring Diagram



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12
RTD1A	RTD1B	RTD1C	RTD2A	RTD2B	RTD2C	RTD3A	RTD3B	RTD3C	RTD4A	RTD4B	RTD4C
13	14	15	16	17	18	19	20	21	22	23	24
RTD5A	RTD5B	RTD5C	RTD6A	RTD6B	RTD6C	RTD7A	RTD7B	RTD7C	RTD8A	RTD8B	RTD8C
10	10	10	10	10	10	10	10	10	10	10	10
RTD9A	RTD9B	RTD9C	RTD10A	RTD10B	RTD10C	RTD11A	RTD11B	RTD11C	RTD12A	RTD12B	RTD12C

Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

RTD

12 Channel Analog Input – RTD/Ω

MX603-5612-923

Performance Specifications

Number of Channels	12
RTD Input Type	PT100, PT200, PT500, PT1000, Cu100, Cu50, 0 to 400Ω
Excitation Current	210µA
Accuracy (@25°C)	±0.1%
Resolution of ADC chip	24 Bits
Accuracy	±0.020mA @ 25°C
Temperature Stability (-20°C to +55°C)	PT1000, PT500, PT200, PT100, 0-400Ω: ± 0.0075% of span per °C Cu100, Cu50: ± 0.011% of span per °C
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Explosive Atmosphere Specifications

IECEx Certification	Ex nA II T4 Gc -20°C ≤ Ta ≤ +55°C
	IEC 60079-0 : 2007-10 (edition 5)
	IEC 60079-15 : 2005-03 (edition 3)

Maximum Power Consumption

Module Power Dissipation	<1.5W
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Isolation

Channel to System	1000Vrms
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Configurable Parameters

Channel Status	Activate, deactivate
Check line status	User Definable
Filter Times	User Definable

Environmental Conditions

Operating Temperature	-20 to 55°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

12 INPUT CHANNELS

IECEx CERTIFIED FOR
EXPLOSIVE ATMOSPHERES

RTD AND Ω INPUTS

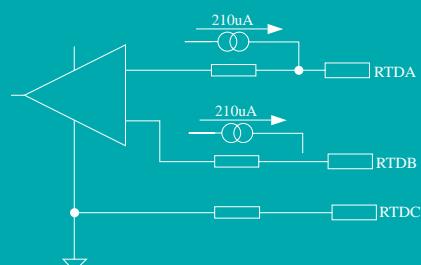
3-WIRE RTD FORMAT

CHANNELS
INDEPENDENTLY
CONFIGURABLE

HOT SWAPPABLE

HIGH CHANNEL TO
SYSTEM ISOLATION

Equivalent Circuit





The MX603-5612-923 is a 12 Channel Resistance Temperature Detector and direct resistance Analogue Input Module. It contains 12 input channels each of which has the ability to monitor Platinum and Copper RTD input types as well as direct resistance input type. It is IECEx certified for explosive atmospheres.

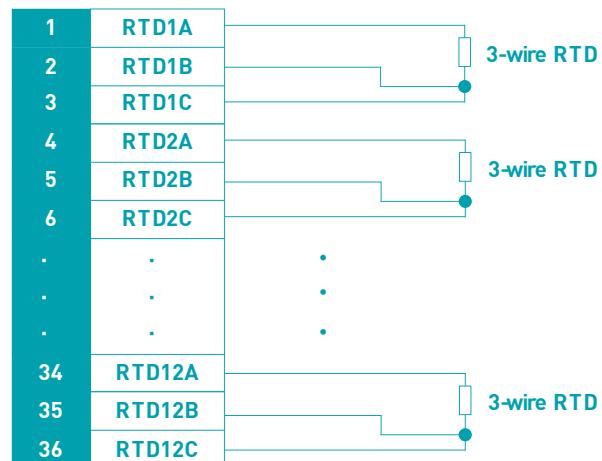
The different types provide a variety of available temperature ranges that may be read. The inputs may be wired in 3-wire mode and individually configured.



Module front wiring and rotary address switch access allow for simple configuration and installation. A total of 14 LEDs are used to indicate individual channel status as well as power and module status.

This module is available in Rack Based (-923) Configuration.

Wiring Diagram



Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12
RTD1A	RTD1B	RTD1C	RTD2A	RTD2B	RTD2C	RTD3A	RTD3B	RTD3C	RTD4A	RTD4B	RTD4C
13	14	15	16	17	18	19	20	21	22	23	24
RTD5A	RTD5B	RTD5C	RTD6A	RTD6B	RTD6C	RTD7A	RTD7B	RTD7C	RTD8A	RTD8B	RTD8C
10	10	10	10	10	10	10	10	10	10	10	10
RTD9A	RTD9B	RTD9C	RTD10A	RTD10B	RTD10C	RTD11A	RTD11B	RTD11C	RTD12A	RTD12B	RTD12C

Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Analog Out

8 Channel Analog Output – 4~20mA Isolated
MX603 – 0408 – 61X

Performance Specifications

Number of Channels	8
Nominal Signal Range (span)	4 to 20 mA
Load Resistance	750 Ω (max)
Accuracy (@ 25°C)	±0.02 mA @ 25 °C
Temperature Stability	±0.006% of span / °C
Resolution	12 bits

Maximum Power Consumption

Rack Based	< 1.1 W
Standalone Serial	< 2.2 W
Standalone Ethernet	< 2.5 W

Isolation

Channel to System	2000 Vrms
Channel to Channel	1500 Vrms

Configurable Parameters

Pre-defined Output State	User defined
Drive on Fail-safe	User defined
Channel Status	Active / inactive

8 INDIVIDUALLY ISOLATED OUTPUT CHANNELS

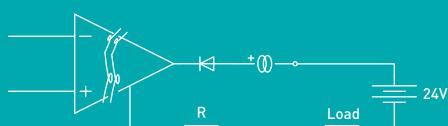
INVERSE WIRING PROTECTION

OPEN-CIRCUIT FIELD WIRING DETECTION

HOT SWAPPABLE

REDUNDANT CAPABILITY

Equivalent Circuit



The MOX 603 Analog Output Modules provide the capability of generating variable output signals for controlling devices such as variable frequency drives, positioning valves, speed controllers and other devices. Each output will convert levels set by the Host Controller into variable signals for use in the field. Front panel LEDs indicate the module power and operational status as well as the signal status of each individual channel.



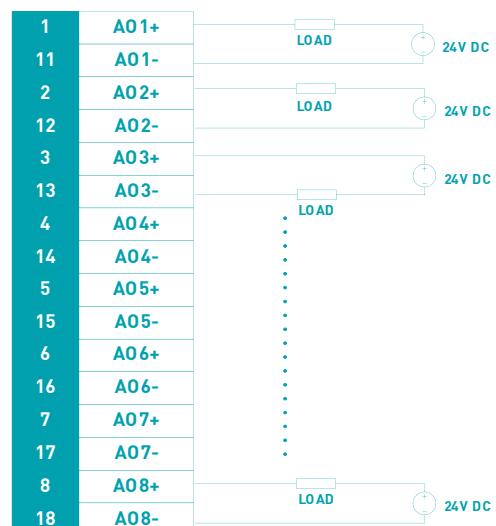
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10
A01+	A02+	A03+	A04+	A05+	A06+	A07+	A08+	N/A	N/A
11	12	13	14	15	16	17	18	19	20
A01-	A02-	A03-	A04-	A05-	A06-	A07-	A08-	N/A	N/A

The MX603-0408-61x is an 8 channel, 4~20mA Analog Output Module. It contains 8 individually isolated output channels, each of which will drive output devices through the variation of the analog signal.

The module is available in Standalone Serial (-615), Standalone Ethernet (-616) and Rack Based (-613) Configurations.

Wiring Diagram



Safety Keying

Module Top	1	0	0	1
Base Top	0	1	1	0
Module Bottom	1	1	1	0
Base Bottom	0	0	0	1

Analog Out

8 Channel Analog Output – 4~20mA Isolated
MX603 – 0408 – 123

Performance Specifications

Number of Channels	8
Nominal Signal Range (span)	4 to 20 mA
Load Resistance	0 to 750Ω
Accuracy	±20µA @ 25°C
Temperature stability (-20°C to +70°C)	±0.006% of span / °C
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Maximum Power Consumption

Module power dissipation	< 1.0W
24VDC Field Power	< 10.0 W

Isolation

Channel to System	1000 Vrms
Channel to Channel	1000 Vrms

Configurable Parameters

Activate channel	Activate, deactivate
Predefined value	User defined
Drive on failsafe value	User defined

Environmental Conditions

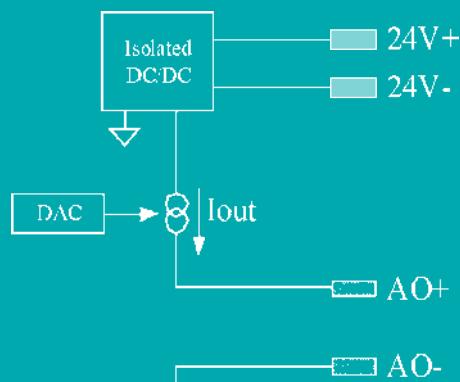
Operating Temperature	-20 to 70°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

8 INDIVIDUALLY ISOLATED ANALOG OUTPUTS

OPEN CIRCUIT DETECTION

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit



The MOX 603 Analog Output Modules provide the capability of generating variable output signals for controlling such devices as variable frequency drives, positioning valves, speed controllers and other devices. Each output will convert levels set by the Host Controller into variable signals for use in the field. Front panel LEDs indicate the module power and operational status as well as the signal status of each individual channel.

The MX603-0408-123 is an 8 Channel, Isolated Analog Output device. It contains 8 individually isolated output channels. Each of these channels can drive output devices through the variation of the analog signal.



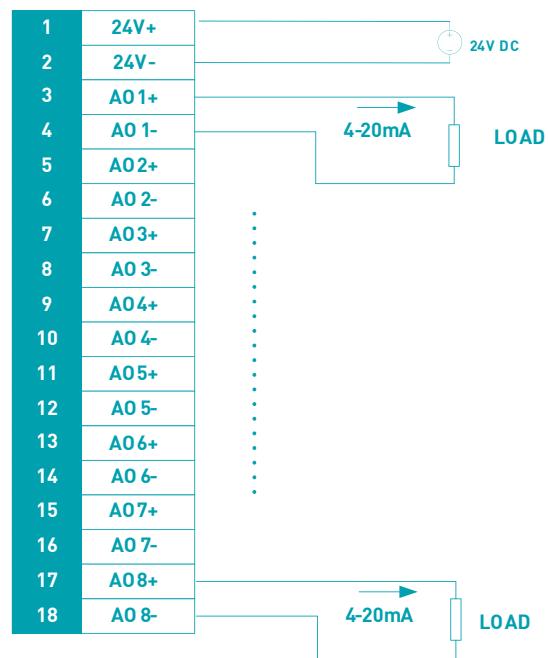
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
24V+	24V-	A01+	A01-	A02+	A02-	A03+	A03-	A04-	A04+	A05+	A05-	A06+	A06-	A07+	A07-	A08+	A08-

The MX603-0408-123 8 Channel Analog Output device is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. User configurable parameters include the ability to activate or deactivate any channel, to set a power-up predefined value for each channel and to set a failsafe value for each channel.

This module is available in Rack Based (-123) Configuration.

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Analog Out

8 Channel Analog Output – 4~20mA Isolated
MX603-5408-123

Performance Specifications

Number of channels	8
Nominal signal range (span)	4 to 20mA
Load resistance(@ 20mA)	0 to 750Ω
Resolution of DAC Chip	12 Bits
Accuracy	±20µA @ 25°C
Temperature stability (-20°C to +55°C)	± 0.006% of span per °C
Visual Indicators	1 x LED per Channel plus Power and Status LEDs

Explosive Atmosphere Specifications

IECEx Certification	Ex nA II T4 Gc -20°C ≤ Ta ≤ +55°C IEC 60079-0 : 2007-10 (edition 5) IEC 60079-15 : 2005-03 (edition 3)
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Maximum Power Consumption

Module power dissipation	<1.0W
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Isolation

Channel to system	1000Vrms
Channel to channel	1000Vrms

Configurable Parameters

Activate channel	Activate, deactivate
Predefined value	User definable
Drive on failsafe value	User definable

Environmental Conditions

Operating Temperature	-20 to 55°C
Storage Temperature	-40 to 85°C
Relative Humidity	5 to 95% non-condensing

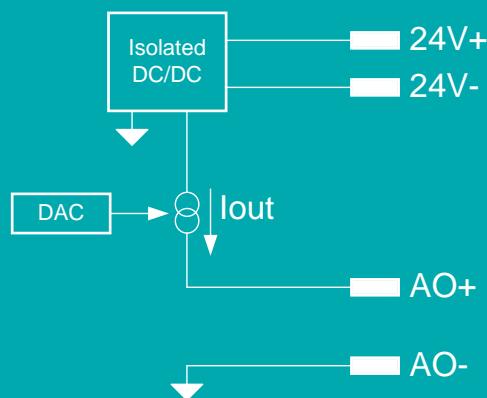
8 INDIVIDUALLY ISOLATED ANALOG OUTPUTS

IECEx CERTIFIED FOR EXPLOSIVE ATMOSPHERES

OPEN CIRCUIT DETECTION

FRONT WIRING FOR EASE OF CONNECTION

Equivalent Circuit



The MOX 603 Analog Output Modules provide the capability of generating variable output signals for controlling such devices as variable frequency drives, positioning valves, speed controllers and other devices. Each output will convert levels set by the Host Controller into variable signals for use in the field. Front panel LEDs indicate the module power and operational status as well as the signal status of each individual channel.

The MX603-5408-123 is an 8 Channel, Isolated Analog Output device. It contains 8 individually isolated output channels. Each of these channels can drive output devices through the variation of the analog signal. It is IECEx certified for explosive atmospheres.



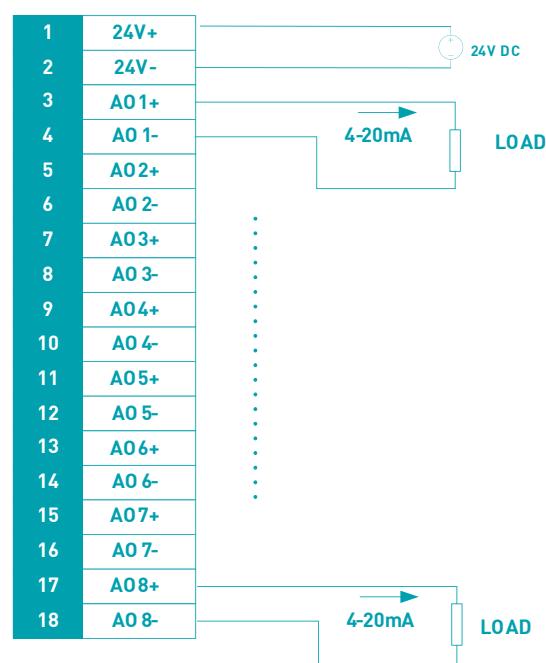
Terminal Connector Assignments

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
24V+	24V-	A01+	A01-	A02+	A02-	A03+	A03-	A04+	A04-	A05+	A05-	A06+	A06-	A07+	A07-	A08+	A08-

The MX603-5408-123 8 Channel Analog Output device is a front wired module so that cabling access is from the front of the module as is access to the rotary switch for module addressing. User configurable parameters include the ability to activate or deactivate any channel, to set a power-up predefined value for each channel and to set a failsafe value for each channel.

This module is available in Rack Based (-123) Configuration.

Wiring Diagram



Safety Keying

Module Top	1	1	0	1
Base Top	0	0	1	0
Module Bottom	1	0	1	0
Base Bottom	0	1	0	1

Ordering

Standalone Serial I/O	Main Feature	Part Number
Digital Input Modules	8 Channel 24Vdc Individually Isolated	MX603-0108-115
	16 Channel 24Vdc Module Powered Input	MX603-0116-135
	4 Channel 24Vdc Counter Input	MX603-0104-125
Digital Output Modules	8 Channel 240Vac / 30Vdc Relay Output	MX603-0208-315
	16 Channel 24Vdc Module Powered Output (Basic)	MX603-0216-125
	16 Channel 24Vdc Module Powered Output (Read Back)	MX603-0216-135
Analog Input Modules	8 Channel 4-20mA Individually Isolated	MX603-0308-615
	8 Channel 4-20mA Module Powered Input	MX603-0308-635
	8 Channel 4-20mA Input	MX603-0308-645
	8 Channel 1-5V Input	MX603-0308-425
	8 Channel Thermocouple and mV Input	MX603-0508-815
	4 Channel RTD and Ω Input	MX603-0604-915
Analog Output Modules	8 Channel 4-20mA Individually Isolated	MX603-0408-615
Base Unit		
IO Base - Terminal Connectors	Designed for Individual Standalone Operation 2x RS485, 1x RS232	MX603-2016-01
IO Base - Terminal to Bus Connectors	Designed as First Base when Connecting Multiple Bases, 2x RS485	MX603-2015-01
IO Base - Bus Connectors	Designed for Connecting in Multiple Base Configuration, 2x RS485	MX603-2018-01
IO Base - Bus to Terminal Connectors	Designed as Last Base Extension for Multiple Base, 2x RS485	MX603-2017-01
Standalone Ethernet I/O	Main Feature	Part Number
Digital Input Modules	8 Channel 24Vdc Individually Isolated	MX603-0108-116
	16 Channel 24Vdc Module Powered Input	MX603-0116-136
	4 Channel Counter Module	MX603-0104-126
Digital Output Modules	8 Channel 240Vac / 30Vdc Relay Output	MX603-0208-316
	16 Channel 24Vdc Module Powered Output (Basic)	MX603-0216-126
	16 Channel 24Vdc Module Powered Output (Read Back)	MX603-0216-136

Analog Input Modules	8 Channel 4-20mA Individually Isolated	MX603-0308-616
	8 Channel 4-20mA Module Powered Input	MX603-0308-636
	8 Channel 4-20mA Input	MX603-0308-646
	8 Channel 1-5V Input	MX603-0308-426
	8 Channel Thermocouple and mV Input	MX603-0508-816
	4 Channel RTD and Ω Input	MX603-0604-916
Analog Output Modules	8 Channel 4-20mA Individually Isolated	MX603-0408-616
Base Unit		
IO Base - Terminal Connectors	For Individual Standalone Operation, 2x RS485, 1x RS232, 1x 10BaseT	MX603-2016-02
IO Base - Terminal to Bus Connectors	First Base when Connecting Multiple Bases, 2x RS485, 1x 10BaseT	MX603-2015-02
IO Base - Bus Connectors	For Connecting in Multiple Base Configuration, 2x RS485, 1x 10BaseT	MX603-2018-02
IO Base - Bus to Terminal Connectors	For Individual Standalone Operation, 2x RS485, 1x RS232, 1x 10BaseT	MX603-2017-02
Rack Based I/O (Bottom Wiring)	Main Feature	Part Number
Digital Input Modules	8 Channel 24Vdc Individually Isolated (RDN)	MX603-0108-113
	16 Channel 24Vdc Module Powered Input (RDN)	MX603-0116-133
	4 Channel Counter Module	MX603-0104-123
	8 Channel SOE - High Speed <1ms Input Module	MX603-0108-143
Digital Output Modules	8 Channel 240Vac / 30Vdc Relay Output (RDN)	MX603-0208-313
	16 Channel 24Vdc Module Powered Output (Back)(RDN)	MX603-0216-123
	16 Channel 24Vdc Module Powered Output (Read Back)(RDN)	MX603-0216-133
Analog Input Modules	8 Channel 4-20mA Individually Isolated (RDN)	MX603-0308-613
	8 Channel 4-20mA Module Powered Isolated (RDN)	MX603-0308-633
	8 Channel 4-20mA Input (RDN)	MX603-0308-643
	8 Channel 1-5V Input (RDN)	MX603-0308-423

Ordering

	8 Channel Thermocouple and mV Input (can use two as a redundant pair with two MX603-2008-01 bases)	MX603-0508-813
	4 Channel RTD and Ω Input (RDN)	MX603-0604-913
Analog Output Modules	8 Channel 4-20mA Individually Isolated (RDN)	MX603-0408-613
Base Unit		
IO Base - 1-Slot Standard Module	IO Base Unit for Single Module for use in Rack Configuration	MX603-2022-01
IO Base - 1-Slot for TC Module	IO Base Unit for Thermocouple with Internal Cold Junction Compensation	MX603-2008-01
IO Base - 2-Slot for Redundancy	IO Base Unit for Two Modules as a Redundant Pair (RDN modules above)	MX603-2023-01
Rack Based I/O (Front Wiring)	Main Feature	Part Number
Digital Input Modules	16 Channel 24Vdc Module Powered Input (4 Isolated groups of 4 channels)	MX603-0116-273
	32 Channel 24Vdc Module Powered Input	MX603-0132-133
	32 Channel Digital Input	MX603-0132-233
	8 Channel Counter Module	MX603-0108-173
	16 Channel 115Vac Input Module	MX603-0116-253
	16 Channel 230Vac Input Module	MX603-0116-263
Digital Output Modules	12 Channel 240Vac / 30Vdc Relay Output	MX603-0212-113
	32 Channel 24Vdc Module Powered Output (Basic)	MX603-0232-123
Analog Input Modules	12 Channel 4-20mA Input	MX603-0312-113
	12 Channel 1-5V Input	MX603-0312-123
	12 Channel 4-20mA Input Group Isolated	MX603-0312-133
	12 Channel Thermocouple and mV Input	MX603-0512-823
	12 Channel RTD and Ω Input (Three Wire Only)	MX603-0612-923
Analog Output Modules	8 Channel 4-20mA Individually Isolated Module Powered	MX603-0408-123
Base Unit		
IO Base - 1-Slot for Front Wiring Module	IO Base Unit for Single Front Wiring Module for use in Rack Configuration	MX603-2020-01

MOX 603 Power Supply for Rack I/O	Main Feature	Part Number
MOX 603 PSU Module 24VDC	Power Supply Required for Rack Based I/O	MX603-4001
Base Unit		
PSU Base-Rack	Bottom side terminal inputs; right side bus connectors	MX603-4101
MOX 603 Comms Processor for Rack I/O	Main Feature	Part Number
CP Module Serial RS232	1x Serial RS232, 1x Serial RS485	MX603-3005
CP Module Serial RS485	2x Serial RS485	MX603-3007
CPE Module Ethernet	10Base-T Ethernet; 1xRJ45	MX603-3010
CPE Module Combo Fiber/Ethernet	Fiber and 10Base-T Ethernet; 1x SC Pair, 1xRJ45	MX603-3012
CP Ethernet to Serial Gateway	10Base-T Ethernet and MoxBUS;1xRJ45, 1XSMA	MX603-3014
CPP Module PROFIBUS DP Slave	Dual PROFIBUS DP Slave; 2xPROFIBUS DP Port	MX603-3020
Base Unit		
CP/CPE Base	For Serial CP Modules and all CPE Modules	MX603-3105
CPP Base-PROFIBUS	For CPP PROFIBUS DP Slave	MX603-2020-01
MOX 603 IONITY Rack Based I/O (Front Wiring) Hazardous Environment Modules	Main Feature	Part Number
Digital Input Modules	8 Ch Counter Front Wiring	MX603-5108-173
	16 Ch DI Dry Contract Front Wiring	MX603-5116-273
	32 Ch DI Dry Contract Front Wiring	MX603-5132-133
	12 Ch DI SOE Front Wiring	MX603-5112-143
Digital Output Modules	32 Ch DO 24VDC Module Powered Front Wiring	MX603-5232-123
Analog Input Modules	12 Ch AI 4-20mA Front Wiring	MX603-5312-113
	12 Ch AI 1-5VDC Front Wiring	MX603-5312-123
	12 Ch AI 4-20mA Front Wiring	MX603-5312-133
	12 Ch TC Front Wiring	MX603-5512-823
	12 Ch RTD Front Wiring	MX603-5612-923
Analog Output Modules	8 Ch AO Front Wiring	MX603-5408-123

Ordering

Base Unit		
I/O Base – 1-Slot for Front Wiring IONITY Module	I/O Base Unit for Single IONITY Front Wiring Module for use in Rack Configuration	MX603-7020-01
MOX 603 IONITY Power Supply for Rack I/O	Main Feature	Part Number
MOX 603 PSU Module 24VDC	Power Supply Required for IONITY Rack Based I/O	MX603-9001
Base Unit		
I/O Base – 1-Slot for Front Wiring IONITY Module	I/O Base Unit for Single IONITY Front Wiring Module for use in Rack Configuration	MX603-9101
MOX 603 IONITY Comms Processor	Main Feature	Part Number
CPE Module Ethernet	10Base-T Ethernet; 1 x RJ45	MX603-8105
Base Unit		
CPE Base	For all IONITY CPE Modules	MX603-8010
MOX 603 Other Modules	Main Feature	Part Number
MOX 603 Blank Module	Module for Filling an Empty MOX 603 Slot, requires MX603-2022-01 base	MX603-1901-111
Cables and Connectors	Main Feature	Part Number
Ethernet 1m STP Patch Lead	1m Cat 5 E STP patch cable with RJ45 Connectors	MX603-00-13020
Ethernet 3m STP Patch Lead	3m Cat 5 E STP patch cable with RJ45 Connectors	MX603-00-13021
Ethernet 5m STP Patch Lead	5m Cat 5 E STP patch cable with RJ45 Connectors	MX603-00-13022
Optical Cable Kir 1m	2 x 1m Optical Link Cables with SC Connectors	MX603-00-13050
Optical Cable Kir 5m	2 x 5m Optical Link Cables with SC Connectors	MX603-00-13051
PROFIBUS Angled Connector up to 12Mbps	Integrated Termination Resistor, Spring Cage Connector	MX603-00-16506

NOTES:

For pricing, please contact MOX Group or your distributor. Delivery time is ex stock or 12 weeks if out of stock.
For urgent delivery, please contact MOX Group or your distributor.



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