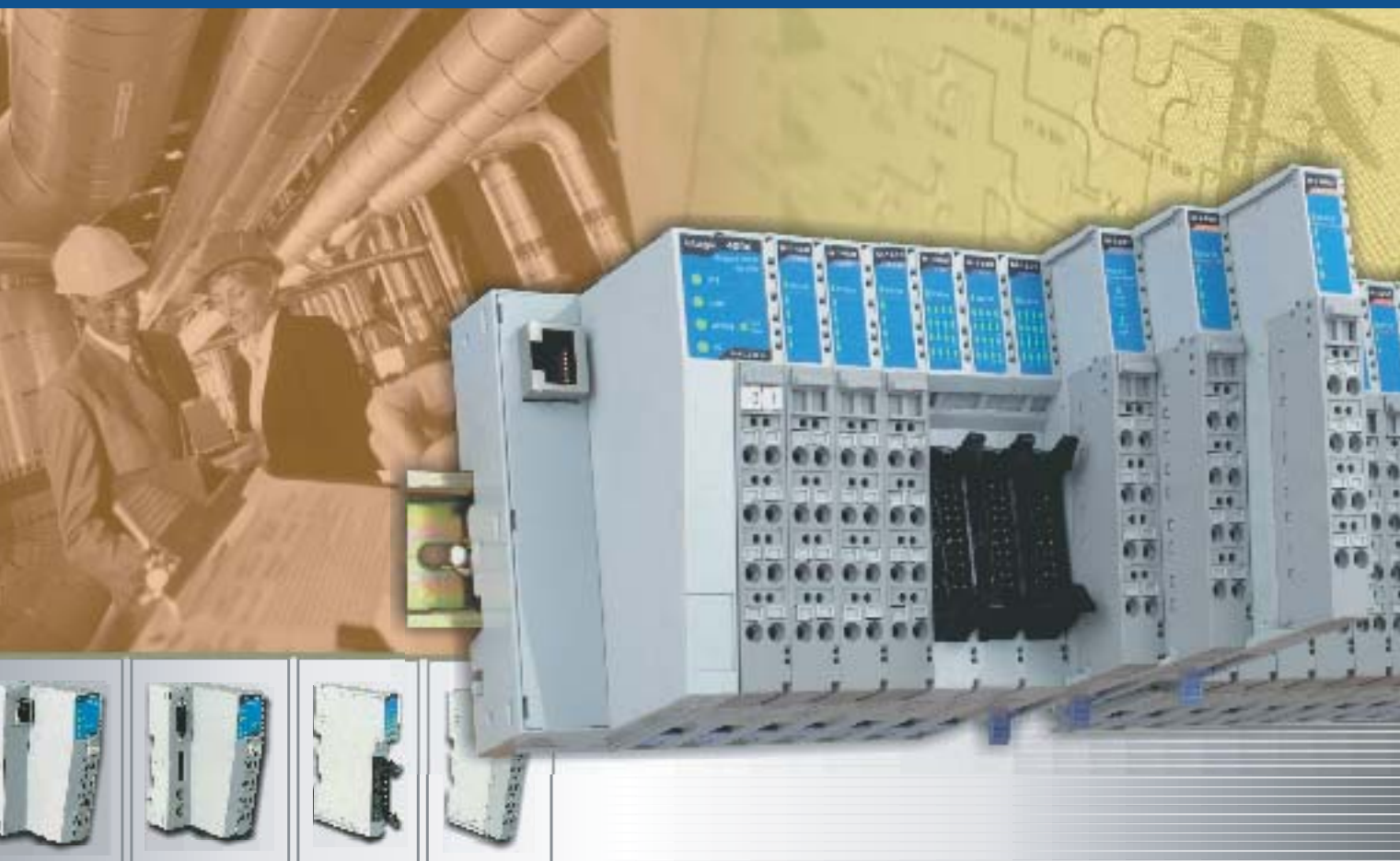


# ***Industrial Ethernet I/O Solutions for Data Acquisition and Control***



- Network I/O Solution for SCADA Systems
- IoLogik 4000 Network I/O Server
- MODBUS/TCP, MODBUS/RTU/ASCII
- Digital Input/Output Modules
- Analog Input/Output Modules
- Temperature Sensing Modules

V61

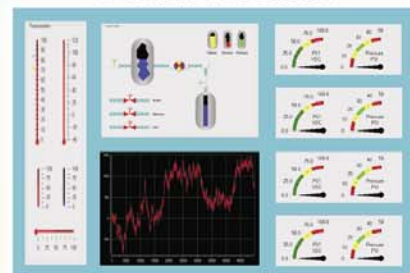
# Network I/O Solution for SCADA Systems

**MXIO Library for User Programs**

**SCADA Software**



MXEIO\_Init()  
AI\_Read()  
DO\_Write()  
AO\_Write()  
DI\_Read()



**Standard  
Modbus  
Protocol**

**AWK-1100**  
Wireless  
AP/Bridge/AP  
Client

**EDS-508**  
Ethernet  
Switches

*Ethernet and Wireless Ethernet*

**NPort IA 5000**  
Serial Device  
Server

**NPort W2004**  
Wireless  
Serial Device Server

**Linux  
WinCE**

**UC-7400**  
Embedded  
Controller

*10/100Mbps  
Ethernet*

*RS-485*

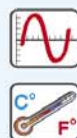
**ioLogik 4000  
Slice I/O  
Server**

**ioLogik 2000  
Stand-alone  
I/O Server**



**Digital I/O**

- ▶ Actuator
- ▶ Relay
- ▶ Alarm
- ▶ ON/OFF Device
- ▶ Open/Close



**Analog I/O**

- ▶ Temperature Sensor
- ▶ Transmitter
- ▶ Recorder
- ▶ Drive/Valve
- ▶ Humidity Sensor
- ▶ Pressure Sensor



# ***A trusted company that brings you Access to Success™***

Moxa is a world-class corporation that designs and produces products for Ethernet I/O Industrial Ethernet communications, Serial-to-Ethernet, and Video Networking. Our many products exhibit the highest quality and reliability, and are used in applications worldwide, including Industrial Automation, Telecommunications, Transportation, Building Automation, and more.

## **Vision**

*To be the leading brand of world-class device networking solutions for industrial automation.*

## **Core Competence**

- A leading brand in the worldwide Industrial Ethernet market
- Successful integration of hardware (ASIC, to board, to system design) with software (firmware, to driver, to API design)
- More than 18 years of experience dedicated to industrial serial technology
- In-house group of professional researchers with expertise in all facets of network technology.

## **Friendly & Professional Global Service**

- Worldwide service with customer support certification in the U.S., China, and Taiwan
- Convenient on-line service

## **Proven Quality**

Moxa's software is certified by Windows, Linux, Unix, FreeBSD, Solaris, and QNX. In addition,

- Moxa is the first manufacturer to receive Windows 2000 certification for its multiport communication boards.
- Moxa's I/O products have received UL508, UL, and CE certification.
- MOXA patented ADDC™ (Automatic Data Direction Control) makes RS-485 communication programming a snap.
- State of the art ASIC (Application Specific Integrated Circuit) techniques specially designed for multiport serial communications, greatly reduce the number of traditional ICs and dramatically lowers repair rate.

## **ISO 9001 Certified**

Moxa's commitment to quality is recognized internationally with our ISO 9001: 2000 certification by German auditors with no deficiencies.

## **Innovation and Awards**

Moxa has received prestigious industry awards, including the Control Engineering 2004 Editors' Choice Award, Taiwan Symbol of Excellence Research Award, and Innovation Award, affirming Moxa's position as an industry leader with a reputation for producing innovative, top quality communications products.



### **More than 18 years in Industrial Device Networking**

- Over 7.5 million devices connected to MOXA products, providing Access to Success™ for customers worldwide.
- Global acceptance by many long-term customers, including Agilent, Alcatel, Gateway 2000, HP, IBM, NCR, NTT, Siemens, Toshiba, and TSMC.
- Solid 2-year warranty for I/O products and lifetime service backed by experienced and friendly technical support personnel.
- Worldwide RMA service centers in the United States, China, and Taiwan.



SYMBOL OF EXCELLENCE  
WINNER

**Modbus-IDA**  
the architecture for distributed automation



# ioLogik 4000 Network I/O Server

## Ethernet I/O Solutions for Data Acquisition and Control

### Features

- Remotely acquire sensor data and control I/O points via Ethernet, RS-485
- Full range of Digital and Analog I/O modules
- Expandable up to 32 modules for a maximum of 512 DIO points or 128 analog channels
- Modular package for fast swap and maintenance
- Standard Modbus/TCP/RTU/ASCII, and compatible with most SCADA software
- Easy-to-use DLL library for easy user programming



### Overview

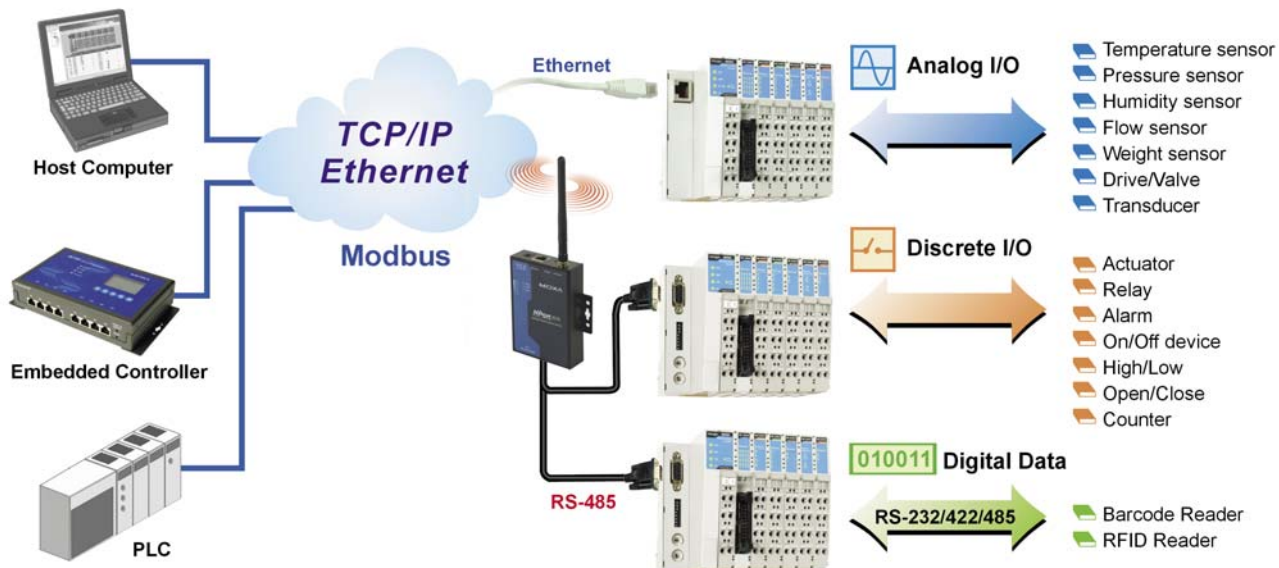
ioLogik 4000 is designed to read sensor data, on/off status, and to control the on/off status of devices via Ethernet or RS-485/232 remotely from a host computer or PLC controller.

Support for the standard Modbus protocol makes ioLogik 4000 compatible with most SCADA software, such as Intellution iFix, Wonderware, and Labview.

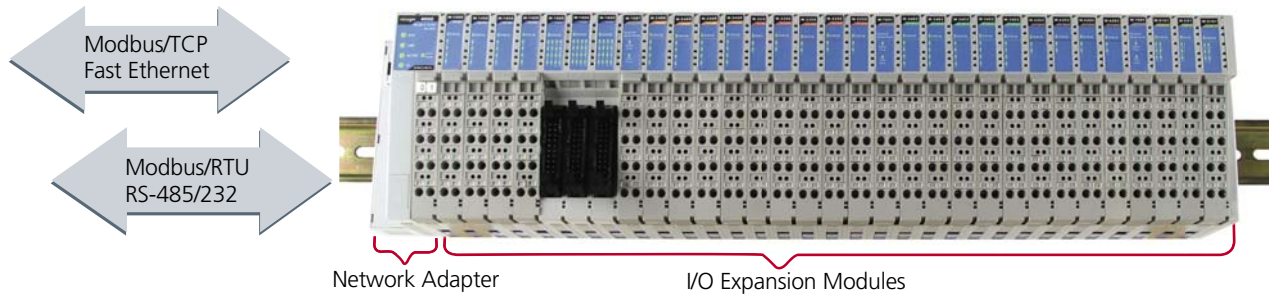
### Link the Real World and Digital World

ioLogik Ethernet I/O from Moxa connects a variety of sensors, and electrical, electronic, and mechanical devices—temperature, humidity, and light sensors, pressure transmitters and motors, serial devices, and more—to computers and applications over standard Ethernet networks and the Internet.

ioLogik also provides a traditional RS-485 Remote I/O server that works with existing applications, and with the help of an NPort Wireless Device Server, you may even connect sensors and devices via a Wireless LAN network.



## Slice Type I/O Modules for a Full Range of I/O Combinations

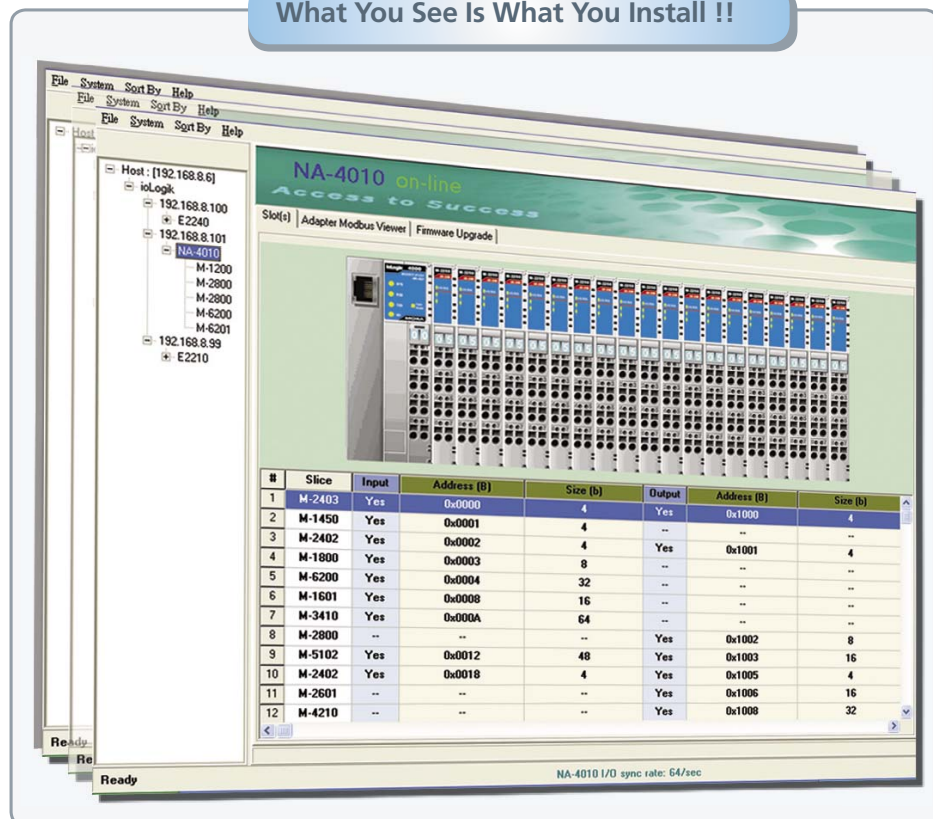


| Network Adapter | Digital Input |          | Digital Output |          | Analog Input |     | Analog Output |     |
|-----------------|---------------|----------|----------------|----------|--------------|-----|---------------|-----|
| Types           | Types         | Ch.      | Types          | Ch.      | Types        | Ch. | Types         | Ch. |
| Ethernet        | 24 VDC        | 4, 8, 16 | 24 VDC         | 4, 8, 16 | 0-20 mA      | 4   | 0-20 mA       | 2   |
| RS-485          | 48 VDC        | 4        | 24 VDC w/ Diag | 4        | 4-20 mA      | 4   | 4-20 mA       | 2   |
| RS-232          | 110 VAC       | 4        | 125 VAC        | 2        | 0-10V        | 4   | 0-10V         | 2   |
|                 | 230 VAC       | 4        | 230 VAC        | 2        | +/-10V       | 4   | +/-10V        | 2   |
|                 |               |          |                |          | 0-5V         | 4   | 0-5V          | 2   |
|                 |               |          |                |          | RTD          | 2   |               |     |
|                 |               |          |                |          | TC           | 2   |               |     |

## Easy to use Windows Software Utility

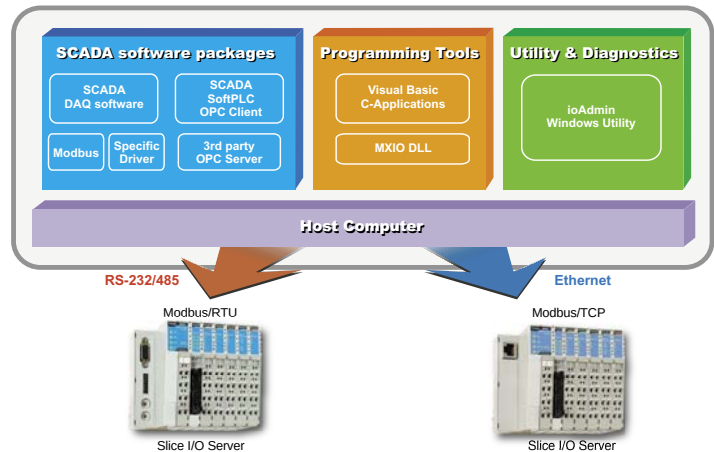
ioAdmin is designed to configure and monitor the slice I/O server remotely. It automatically detects the installed Ethernet I/O server and presents the installation sequence of the I/O expansion modules. ioAdmin also detects and generates a Modbus Address table, which can be printed or stored on a computer for SCADA software configuration.

What You See Is What You Install !!



## Versatile Software Support

ioLogik 4000 supports the standard Modbus protocol and is compatible with most SCADA software. In addition, Moxa provides an easy-to-use MXIO DLL library that helps programmers develop application software with Visual Basic or C language under a Windows platform.



## Fast Maintenance

ioLogik 4000 provides sprint type, removable terminal blocks (RTB) that allow you to preserve field wiring before replacing

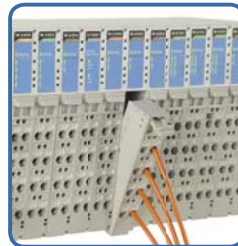
any I/O expansion modules. Each slice of I/O expansion module can be replaced directly in no time.



Slice Type I/O Modules



Removable Terminal Block



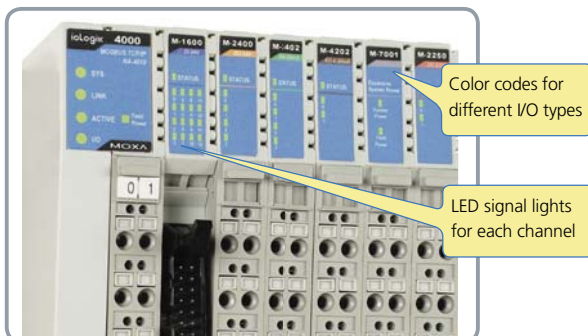
Spring Type Terminal Block



Module Coding Tag

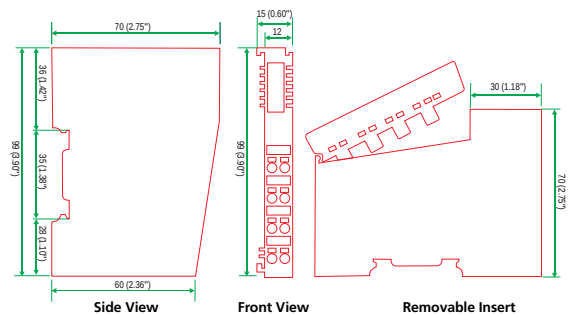
## Easy Maintenance

ioLogik 4000 provides LED signal lights for each I/O channel and clearly indicates if the I/O channel is active or has problems. Different types of module are categorized by different colors so that you may identify the type of module directly.

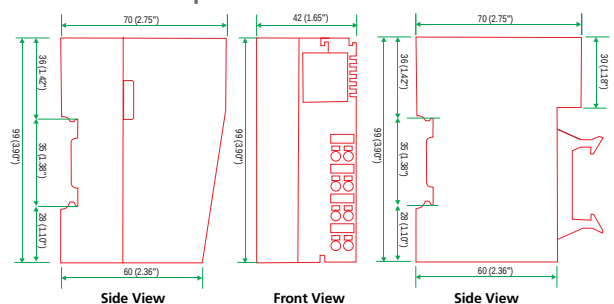


## Dimensions

### I/O Terminal Dimensions



### I/O Network Adaptor Dimensions



## Ordering information



| Model No. | Network Adapter                                          |
|-----------|----------------------------------------------------------|
| NA-4010   | Ethernet Network Adapter Modbus/TCP                      |
| NA-4020   | RS-485 Network Adapter Modbus/RTU                        |
| NA-4021   | RS-232 Network Adapter Modbus/RTU                        |
| Model No. | Digital Input                                            |
| M-1400    | 4DI, sink, 24 VDC, RTB                                   |
| M-1401    | 4DI, source, 24 VDC, RTB                                 |
| M-1410    | 4DI, sink, 48 VDC, RTB                                   |
| M-1411    | 4DI, source, 48 VDC, RTB                                 |
| M-1800    | 8DI, sink, 24 VDC, RTB                                   |
| M-1801    | 8DI, source, 24 VDC, RTB                                 |
| M-1600    | 16DI, sink, 24 VDC, RTB                                  |
| M-1601    | 16DI, source, 24 VDC, 20-pin                             |
| M-1450    | 4DI, 110 VAC, RTB                                        |
| M-1451    | DI, 220 VAC, RTB                                         |
| Model No. | Digital Output                                           |
| M-2400    | 4DO, sink, MOSFET, 24 VDC, 0.5A, RTB                     |
| M-2401    | 4DO, source, MOSFET, 24 VDC, 0.5A, RTB                   |
| M-2800    | 8DO, sink, MOSFET, 24 VDC, 0.5A, RTB                     |
| M-2801    | 8DO, source, MOSFET, 24 VDC, 0.5A, RTB                   |
| M-2600    | 16DO, sink, MOSFET, 24 VDC, 0.3A, 20-pin                 |
| M-2601    | 16DO, source, MOSFET, 24 VDC, 0.3A, 20-pin               |
| M-2402    | 4DO, sink, MOSFET, with diagnostics, 24 VDC, 0.5A, RTB   |
| M-2403    | 4DO, source, MOSFET, with diagnostics, 24 VDC, 0.5A, RTB |
| M-2404    | 4DO, sink, MOSFET, with diagnostics, 24 VDC, 2.0A, RTB   |
| M-2405    | 4DO, source, MOSFET, with diagnostics, 24 VDC, 2.0A, RTB |
| M-2250    | 2DO, Relay, 230 VAC, 24 VDC, 2.0A, RTB                   |
| M-2254    | 2DO, Triac, 12-125 VAC, 0.5A, RTB                        |

\* RTB: Removable Terminal Block

\* 20-pin: 20-pin header

| Model No.   | Analog Input                                          |
|-------------|-------------------------------------------------------|
| M-3400      | 4AI, Current, 0-20 mA, 12-bit, RTB                    |
| M-3402      | 4AI, Current, 4-20 mA, 12-bit, RTB                    |
| M-3410      | 4AI, Voltage, 0-10V, 12-bit, RTB                      |
| M-3412      | 4AI, Voltage, -10-10V, 12-bit, RTB                    |
| M-3414      | 4AI, Voltage, 0-5V, single-ended, 12-bit, RTB         |
| M-3401      | 4AI, Current, 0-20 mA, 14-bit, RTB                    |
| M-3403      | 4AI, Current, 4-20 mA, 14-bit, RTB                    |
| M-3411      | 4AI, Voltage, 0-10V, 14-bit, RTB                      |
| M-3413      | 4AI, Voltage, -10-10V, 14-bit, RTB                    |
| M-3415      | 4AI, Voltage, 0-5V, single-ended, 14-bit, RTB         |
| M-6200      | 2AI, RTD: PT100, JPT100 3000 hm, RTB                  |
| M-6201      | 2AI, Thermocouple: 30 mV (1 $\mu$ V/bit), RTB         |
| Model No.   | Analog Output                                         |
| M-4201      | 2AO, 0-20 mA, 12-bit, RTB                             |
| M-4202      | 2AO, 4-20 mA, 12-bit, RTB                             |
| M-4210      | 2AO, Voltage, 0-10V, 12-bit, RTB                      |
| M-4211      | 2AO, Voltage, -10-10V, 12-bit, RTB                    |
| M-4212      | 2AO, Voltage, 0-5V, 12-bit, RT                        |
| Model No.   | System Modules                                        |
| M-7001      | System expansion power supply, 1.0A (5 VDC)           |
| M-7002      | Field power distributor, 10A (24/48 VDC, 110/220 VAC) |
| M-7803      | Potential Distribution, 8ch, Shield signal            |
| M-7804      | Potential Distribution, 8ch, 0 VDC                    |
| M-7805      | Potential Distribution, 8ch, 24 VDC                   |
| M-7806      | Potential Distribution, 4ch/24 VDC, 4ch/0 VDC         |
| Accessories |                                                       |
| M-8001-PK   | Removable terminal block, 9 pcs per pack              |
| M-8003      | Marker with 0-9 numbering, white color, 100 pcs       |
| M-8004      | Blank marker, 100 pcs                                 |



M-8001-PK

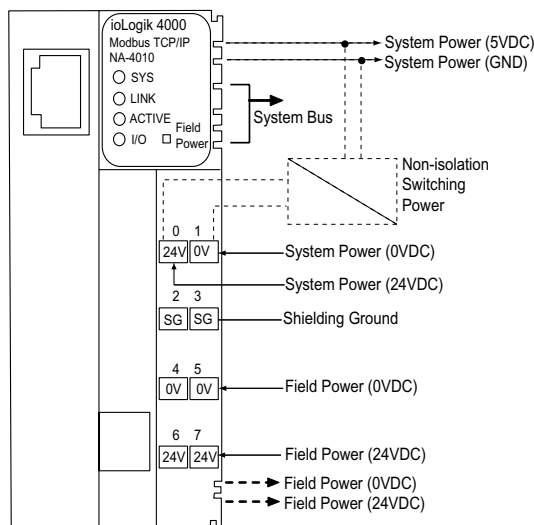


M-8003/8004



# Network Adapter Modules

## NA-4010 Ethernet Network Adapter



### Specifications

#### Network

**Ethernet:** 10/100 Mbps, RJ45

#### Software Features

**Protocols:** Modbus/TCP, HTTP, Bootp

**IP settings:** ARP, Bootp, static IP

**Utility:** ioAdmin

**Programming library:** MXIO DLL library for Windows supporting Visual Basic, Visual C++, Borland C++ Builder

**Max. I/O modules:** Up to 32 I/O expansion modules

#### System Power

**Power input:** 11-28.8 VDC, 24Vdc typical

**Power consumption:** 60 mA typical @ 24 VDC

**Current for I/O modules:** Max. 1.5A @ 5 VDC

#### Field power

**Rated voltage:** 11-28.8 VDC, 24 VDC typical

**Current in field power contact:** Max. 10A

#### Protection

**System power to I/O driver:** 2 k Vrms optical isolation

#### Environmental

**Operating Temperature:** -20 to 60°C, 5 to 90%RH

**Storage Temperature:** -45 to 85°C

**Vibration:** IEC-68-2-6, 2G in operation

#### Agency Approval

**EMC:** CE EN-55082, EN-55081

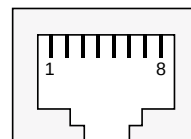
**Safety:** UL 508

#### Weight

**Net weight:** 150 g

### Pin Assignment

#### Ethernet Port

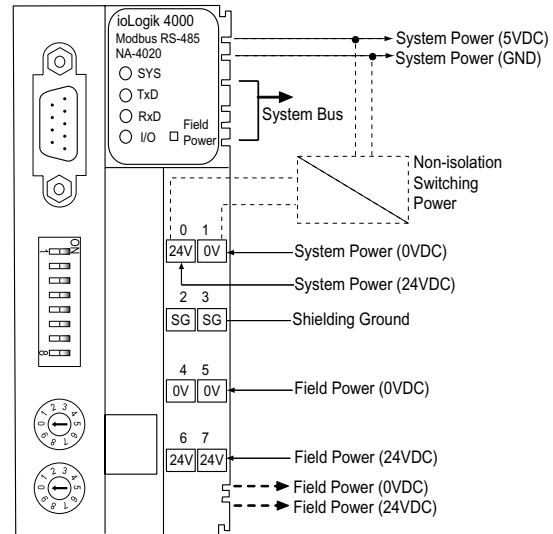


| PIN | Signals | PIN | Signals |
|-----|---------|-----|---------|
| 1   | TX-     | 5   | ---     |
| 2   | TX-     | 6   | Rx-     |
| 3   | RX+     | 7   | ---     |
| 4   | ---     | 8   | ---     |



# NA-4020 RS-485 Network Adapter

## NA-4021 RS-232 Network Adapter



### Specifications

#### Serial Communication

**Baud rate:** 1200 to 15200 bps

**Data bit:** 7, 8

**Parity bit:** None, Even, Odd

**Stop bit:** 1, 2

**Signal:** NA-4020: Data+, Data-, Gnd, DIR

NA-4021: TxD, RxD, Gnd

#### Software Features

**Protocols:** Modbus/RTU, Modbus/ASCII

**Modbus Address:** 00 – 99 by rotary switches

**Utility:** ioAdmin

**Programming library:** MXIO DLL library for Windows supporting Visual Basic, Visual C++, Borland C++ Builder

**Max. I/O modules:** Up to 32 I/O expansion modules

#### System Power

**Power input:** 11-28.8 VDC, 24 VDC typical

**Power consumption:** 70 mA typical @ 24 VDC

**Current for I/O modules:** Max. 1.5A @ 5 VDC

#### Field power

**Rated voltage:** 11-28.8 VDC, 24 VDC typical

**Current in field power contact:** Max. 10A

#### Protection

**System power to I/O driver:** 2 k Vrms optical isolation

#### Environmental

**Operating Temperature:** -20 to 60°C, 5 to 90%RH

**Storage Temperature:** -45 to 85°C

**Vibration:** IEC-68-2-6, 2G in operation

#### Agency Approval

**EMC:** CE EN-55082, EN-55081

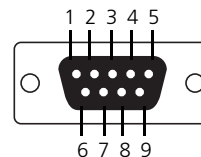
**Safety:** UL 508

#### Weight

**Net weight:** 150 g

### Pin Assignment

#### DB9 Female



#### NA-4020

| PIN | Signals            |
|-----|--------------------|
| 1   | ---                |
| 2   | ---                |
| 3   | Data+              |
| 4   | Direction (Output) |
| 5   | GND                |
| 6   | ---                |
| 7   | ---                |
| 8   | Data-              |

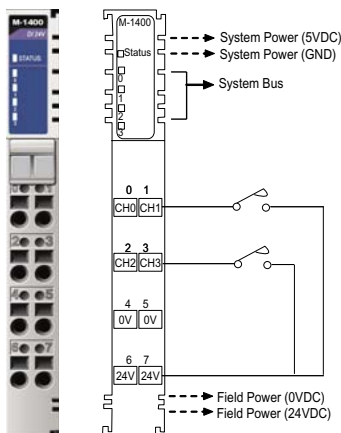
#### NA-4021

| PIN | Signals |
|-----|---------|
| 1   | ---     |
| 2   | TxD     |
| 3   | RxD     |
| 4   | ---     |
| 5   | GND     |
| 6   | ---     |
| 7   | ---     |
| 8   | ---     |



# Digital Input Modules

## 4/8-channel 24/48 VDC Digital Input Modules



### M-1400 4 Digital inputs, sink, 24 VDC

#### Input Specifications

**Inputs per module:** 4 points, sink type

**On-state voltage :** 24 VDC nominal, Min.11 VDC to Max. 28.8 VDC

**Min. Off-state voltage:** Max. 5 VDC

**On-state current:** Max. 6 mA / point @ 28.8 VDC

**Input impedance:** Typ. 5.1 Kohm

**Filtering time:** Typ. 1.5 ms

**Common type:** 4 points/2 COM

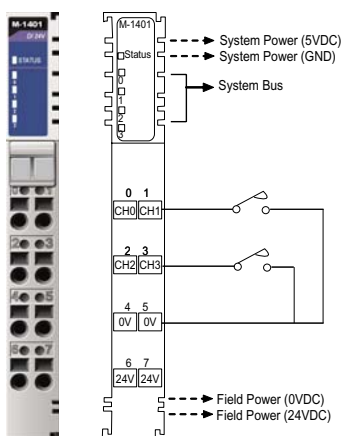
#### General Specifications

**Power dissipation:** Max. 35 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



### M-1401 4 Digital inputs, source, 24 VDC

#### Input Specifications

**Inputs per module:** 4 points, source type

**On-state voltage :** 24 VDC nominal, Min.11 VDC to Max. 28.8 VDC

**Min. Off-state voltage:** Max. 5 VDC

**On-state current:** Max. 6 mA / point @ 28.8 VDC

**Input impedance:** Typ. 5.1 Kohm

**Filtering time:** Typ. 1.5ms

**Common type:** 4 points/2 COM

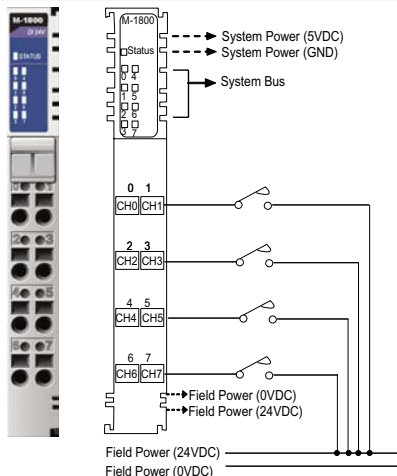
#### General Specifications

**Power dissipation:** Max. 35 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



### M-1800 8 Digital inputs, sink, 24 VDC

#### Input Specifications

**Inputs per module:** 8 points, sink type

**On-state voltage :** 24 VDC nominal, Min.11 VDC to Max. 28.8 VDC

**Min. Off-state voltage:** Max. 5 VDC

**On-state current:** Max. 6 mA / point @ 28.8 VDC

**Input impedance:** Typ. 5.1 Kohm

**Filtering time:** Typ. 1.5ms

**Common type:** External common

#### General Specifications

**Power dissipation:** Max. 35 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

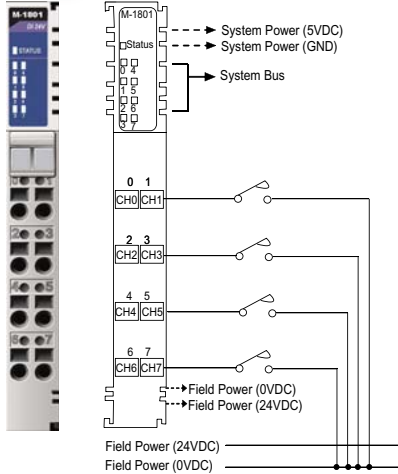
**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



# Digital Input Modules

## 4/8-channel 24/48 VDC Digital Input Modules



### M-1801 8 Digital inputs, source, 24 VDC

#### Input Specifications

**Inputs per module:** 8 points, source type

**On-state voltage :** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC

**Min. Off-state voltage:** Max. 5 VDC

**On-state current:** Max. 6 mA / point @ 28.8 VDC

**Input impedance:** Typ. 5.1 Kohm

**Filtering time:** Typ 1.5 ms

**Common type:** External common

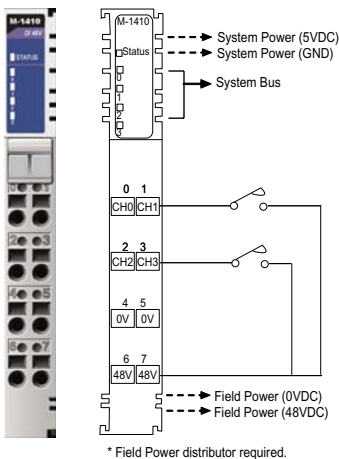
#### General Specifications

**Power dissipation:** Max. 35 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



\* Field Power distributor required.

### M-1410 4 Digital inputs, sink, 48 VDC

#### Input Specifications

**Inputs per module:** 4 points, sink type

**On-state voltage :** 48 VDC nominal, Min. 34 VDC to Max. 60 VDC

**Min. Off-state voltage:** Max. 10 VDC

**On-state current:** Max. 4 mA / point @ 48 VDC

**Input impedance:** Typ. 12 Kohm

**Common type:** 4 points/2 COM

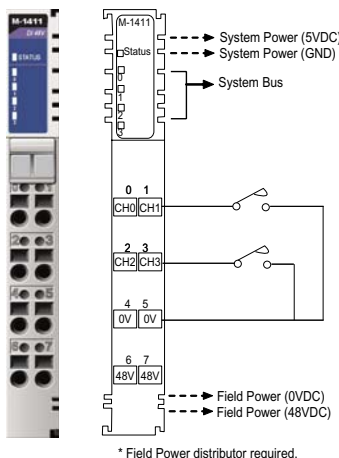
#### General Specifications

**Power dissipation:** Max. 35 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 48 VDC nominal

**Wiring:** I/O cable max. AWG14



\* Field Power distributor required.

### M-1411 4 Digital inputs, source, 48 VDC

#### Input Specifications

**Inputs per module:** 4 points, source type

**On-state voltage :** 48 VDC nominal, Min. 34 VDC to Max. 60 VDC

**Min. Off-state voltage:** Max. 10 VDC

**On-state current:** Max. 4 mA / point @ 48 VDC

**Input impedance:** Typ. 12 Kohm

**Common type:** 4 points/2 COM

#### General Specifications

**Power dissipation:** Max. 35 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 48 VDC nominal

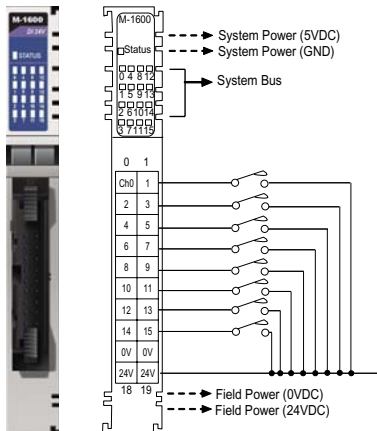
**Wiring:** I/O cable max. AWG14





# Digital Input Modules

## 16-channel 24 VDC Digital Input Modules



### M-1600 16 Digital inputs, sink, 24 VDC

#### Input Specifications

**Inputs per module:** 16 points, sink type

**On-state voltage:** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC

**Min. Off-state voltage:** Max. 5 VDC

**On-state current:** Max. 6 mA / point @ 28.8 VDC

**Input impedance:** Typ. 5.1 Kohm

**Filtering time:** Typ. 1.5 ms

**Common type:** 16 points/2 COM

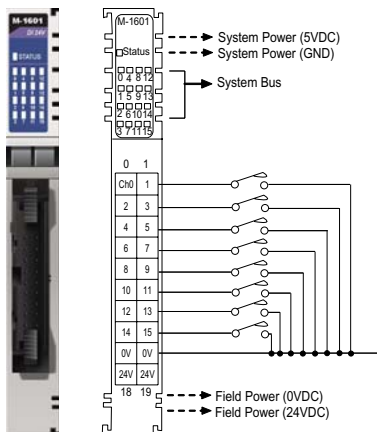
#### General Specifications

**Power dissipation:** Max. 40 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



### M-1601 16 Digital inputs, source, 24 VDC

#### Input Specifications

**Inputs per module:** 16 points, source type

**On-state voltage:** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC

**Min. Off-state voltage:** Max. 5 VDC

**On-state current:** Max. 6 mA / point @ 28.8 VDC

**Input impedance:** Typ. 5.1 Kohm

**Filtering time:** Typ. 1.5 ms

**Common type:** 16 points/2 COM

#### General Specifications

**Power dissipation:** Max. 40 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

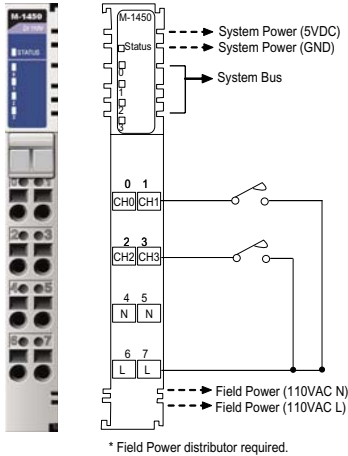
**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



# Digital Input Modules

## 4-channel 110V/240 VAC Digital Input Modules



### M-1450 4 Digital inputs, 110 VAC

#### Input Specifications

**Inputs per module:** 4 points

**On-state voltage:** 120 VAC nominal, Min. 85 VAC to Max. 132 VAC

**Min. Off-state voltage:** Max. 45 VAC

**On-state current:** Max. 8 mA / point @ 132 VAC

**Input impedance:** Typ. 11 Kohm

**Common type:** 4 points/2 COM (single common)

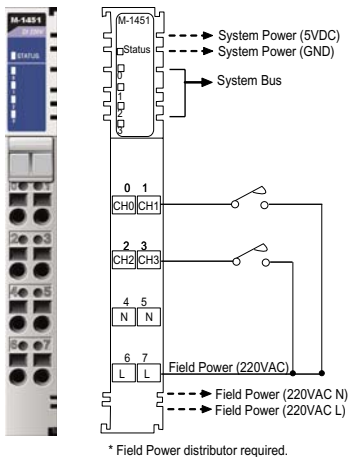
#### General Specifications

**Power dissipation:** Max. 35 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



### M-1451 4 Digital inputs, 240 VAC

#### Input Specifications

**Inputs per module:** 4 points

**On-state voltage:** 240 VAC nominal, Min.170 VAC to Max. 264 VAC

**Min. Off-state voltage:** Max. 45 VAC

**On-state current:** Max. 12 mA / point @ 264 VAC

**Input impedance:** Typ. 22 Kohm

**Common type:** 4 points/2 COM (single common)

#### General Specifications

**Power dissipation:** Max. 35 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

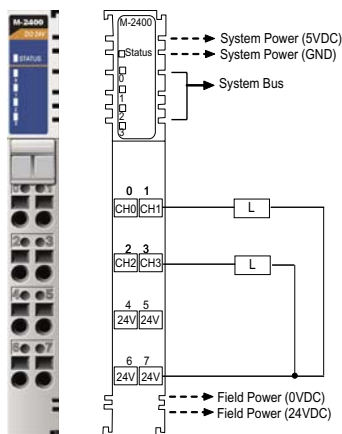
**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



# Digital Output Modules

## 4/8-channel 24 VDC Digital Output Modules



### M-2400 4 Digital outputs, sink, 24 VDC, 0.5A

#### Output Specifications

**Outputs per module:** 4 points, sink type

**On-state voltage :** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC

**Operating frequency:** DC to 50 KHz

**On-state voltage drop:** Max. 0.3 VDC@25°C

**On-state current:** Min. 1 mA per channel

**Off leakage current:** Max. 50  $\mu$ A

**Output current rating:** Max. 0.5A per channel

Max. 2A per common

**Protection:** Over temperature shutdown: Typ. 175°C

Over current limit: 6.5A per 1/2/4 channels

Short circuit protection: 6.5A per 4 channels

ESD protection for output pin: 16.5 KV

**Surge current:** 1A for 10 ms, repeatable every 3 seconds

**Common type:** 4 points /4 COM (single common)

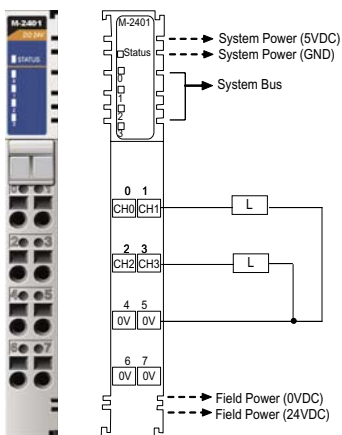
#### General Specifications

**Power dissipation:** Max. 45 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



### M-2401 4 Digital outputs, source, 24 VDC, 0.5A

#### Output Specifications

**Outputs per module:** 4 points, source type

**On-state voltage :** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC

**Operating frequency:** DC to 50 KHz

**On-state voltage drop:** Max. 0.3 VDC@25°C

**On-state current:** Min. 1 mA per channel

**Off leakage current:** Max. 50  $\mu$ A

**Output current rating:** Max. 0.5A per channel

Max. 2A per common

**Protection:** Over temperature shutdown: Typ. 175°C

Over current limit: 6.5A per 1/2/4 channels

Short circuit protection: 6.5A per 4 channels

ESD protection for output pin: 16.5 KV

**Surge current:** 1A for 10 ms, repeatable every 3 seconds

**Common type:** 4 points/4 COM (single common)

#### General Specifications

**Power dissipation:** Max. 45 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

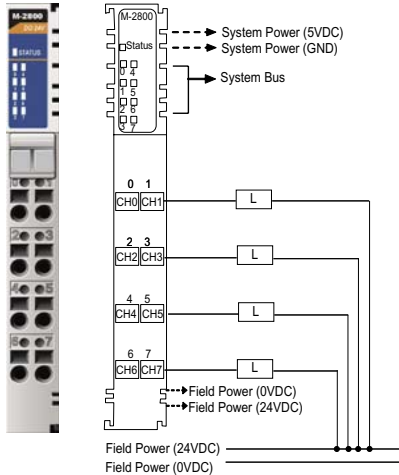
**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



# Digital Output Modules

## 4/8-channel 24 VDC Digital Output Modules



### M-2800 8 Digital outputs, sink, 24 VDC, 0.5A

#### Output Specifications

**Outputs per module:** 8 points, sink type  
**On-state voltage :** 24 VDC nominal, Min.11 VDC to Max.28.8 VDC  
**Operating frequency:** DC to 50 KHz  
**On-state voltage drop:** Max. 0.3 VDC@25°C  
**On-state current:** Min. 1 mA per channel  
**Off leakage current:** Max. 50  $\mu$ A  
**Output current rating:** Max. 0.5A per channel  
 Max. 4A per common

**Protection:** Over temperature shutdown: Typ. 175°C  
 Over current limit: 1.7A

ESD protection for output pin: 16.5 KV

**Surge current:** 1A for 10 ms, repeatable every 3 seconds

**Common type:** 8 points/External common (single common)

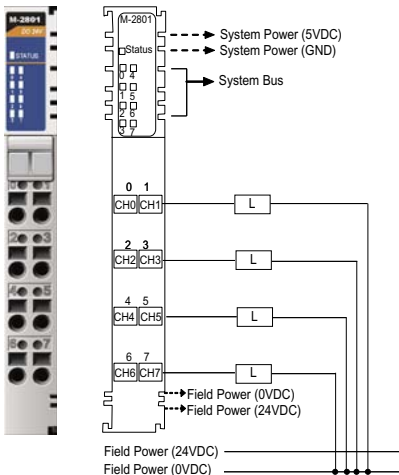
#### General Specifications

**Power dissipation:** Max. 60 mW @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



### M-2801 8 Digital outputs, source, 24 VDC, 0.5A

#### Output Specifications

**Outputs per module:** 8 points, source type  
**On-state voltage :** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC  
**Operating frequency:** DC to 50 KHz  
**On-state voltage drop:** Max. 0.3 VDC@25°C  
**On-state current:** Min. 1 mA per channel  
**Off leakage current:** Max. 50  $\mu$ A  
**Output current rating:** Max. 0.5A per channel  
 Max. 4A per common

**Protection:** Over temperature shutdown: Typ. 175°C  
 Over current limit: 1.7A

ESD protection for output pin: 16.5 KV

**Surge current:** 1A for 10 ms, repeatable every 3 seconds

**Common type:** 8 points/External common (single common)

#### General Specifications

**Power dissipation:** Max. 60 mW @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 24 VDC nominal

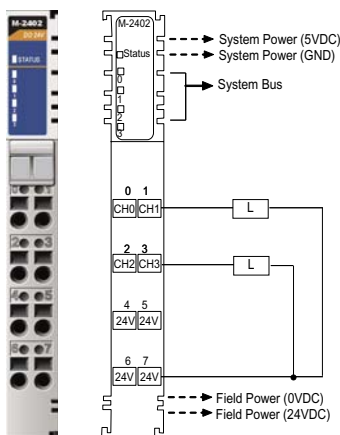
**Wiring:** I/O cable max. AWG14





# Digital Output Modules

## 4-channel Digital Output Modules with Self-Diagnostics



### **M-2402** 4 Digital outputs, self-diagnostics, sink, 24 VDC, 0.5A

#### Output Specifications

**Outputs per module:** 4 points, sink type

**On-state voltage :** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC

**Operating frequency:** DC to 50 KHz

**On-state voltage drop:** Max. 0.3 VDC @25°C

**On-state current:** Min. 1 mA per channel

**Off leakage current:** Max. 50  $\mu$ A

**Output current rating:** Max. 0.5A per channel

Max. 2A per common

**Protection:** Over temperature shutdown: Typ. 175°C

Over current limit: 6.5A per 1/2/4 channels

Short circuit protection: 6.5A per 4 channels

ESD protection for output pin: 16.5 KV

**Surge current:** 1A for 10 ms, repeatable every 3 seconds

**Common type:** 4 points/4 COM (single common)

**Self diagnostics:** Yes

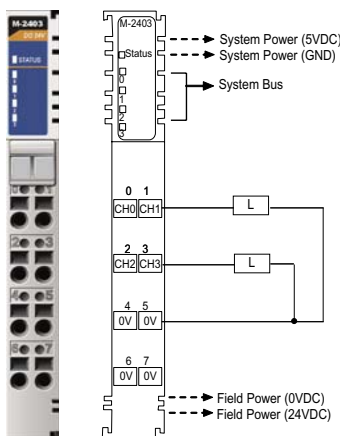
#### General Specifications

**Power dissipation:** Max. 45 mW @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



### **M-2403** 4 Digital outputs, self-diagnostics, source, 24 VDC, 0.5A

#### Output Specifications

**Outputs per module:** 4 points, source type

**On-state voltage :** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC

**Operating frequency:** DC to 50 KHz

**On-state voltage drop:** Max. 0.3 VDC @25°C

**On-state current:** Min. 1 mA per channel

**Off leakage current:** Max. 50  $\mu$ A

**Output current rating:** Max. 0.5A per channel

Max. 2A per common

**Protection:** Over temperature shutdown: Typ. 175°C

Over current limit: 6.5A per 1/2/4 channels

Short circuit protection: 6.5A per 4 channels

ESD protection for output pin: 16.5 KV

**Surge current:** 1A for 10 ms, repeatable every 3 seconds

**Common type:** 4 points /4 COM (single common)

**Self diagnostics:** Yes

#### General Specifications

**Power dissipation:** Max. 45 mW @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

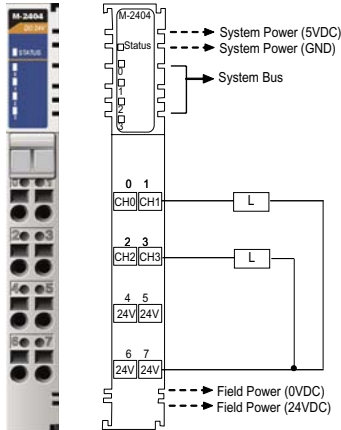
**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



# Digital Output Modules

## 4-channel Digital Output Modules with Self-Diagnostics



### M-2404 4 Digital Output, self-diagnostics, sink, 24 VDC, 2A

#### Output Specifications

**Outputs per module:** 4 points, sink type

**On-state voltage :** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC

**Operating frequency:** DC to 50 KHz

**On-state voltage drop:** Max. 0.3 VDC @25°C

**On-state current:** Min. 1 mA per channel

**Off leakage current:** Max. 50  $\mu$ A

**Output current rating:** Max. 2A per channel  
Max. 8A per common

**Protection:** Over temperature shutdown: Typ. 175°C

Over current limit: 6.5A

Short circuit protection: 6.5A per 4 channels

ESD protection for output pin: 16.5 KV

**Surge current:** 1A for 10 ms, repeatable every 3 seconds

**Common type:** 4 points/4 COM (single common)

**Self diagnostics:** Yes

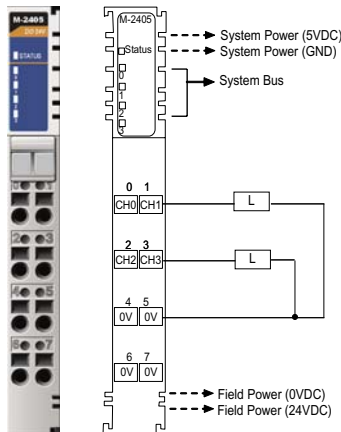
#### General Specifications

**Power dissipation:** Max. 45 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



### M-2405 4 Digital outputs, self-diagnostics, source, 24 VDC, 2A

#### Output Specifications

**Outputs per module:** 4 points, source type

**On-state voltage :** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC

**Operating frequency:** DC to 50 KHz

**On-state voltage drop:** Max. 0.3 VDC @25°C

**On-state current:** Min. 1 mA per channel

**Off leakage current:** Max. 50  $\mu$ A

**Output current rating:** Max. 2A per channel  
Max. 8A per common

**Protection:** Over temperature shutdown: Typ. 175°C

Over current limit: 6.5A

Short circuit protection: 6.5A per 4 channels

ESD protection for output pin: 16.5 KV

**Surge current:** 1A for 10 ms, repeatable every 3 seconds

**Common type:** 4 points/4 COM (single common)

**Self diagnostics:** Yes

#### General Specifications

**Power dissipation:** Max. 45 mA @ 5 VDC

**Isolation:** I/O to logic: 2 k Vrms optical isolation

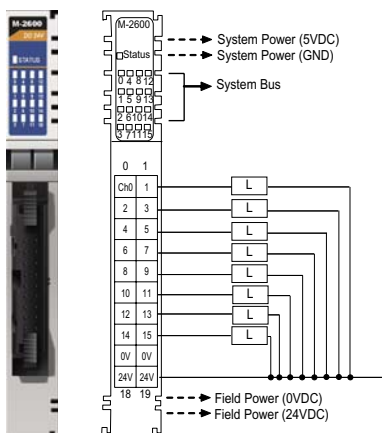
**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** I/O cable max. AWG14



# Digital Output Modules

## 16-channel Digital Output Modules



### **M-2600** 16 Digital outputs, sink, 24 VDC, 0.3A

#### Output Specifications

**Outputs per module:** 16 points, sink type

**On-state voltage :** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC

**Operating frequency:** DC to 50 KHz

**On-state voltage drop:** Max. 0.3 VDC@25°C

**On-state current:** Min. 1 mA per channel

**Off leakage current:** Max. 50  $\mu$ A

**Output current rating:** Max. 0.3A per channel  
Max. 4A per common

**Protection:** Over temperature shutdown: Typ. 175°C

Over current protection: one time electrical fuse  
(125 VDC/6.3A)

**Common type:** 16 points / 2 COM (single common)

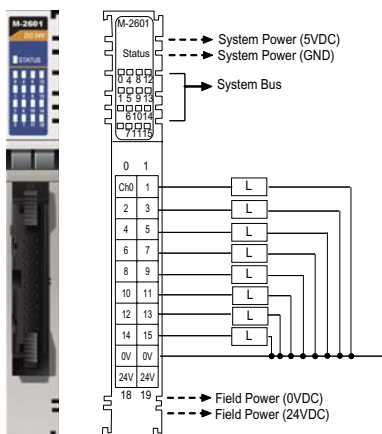
#### General Specifications

**Power dissipation:** Max. 80 mA @ 5 VDC

**Isolation:** I/O to logic: optical isolation, 500 VAC/min, terminal to FG

**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** Pin header, external relay board required



### **M-2601** 16 Digital outputs, source, 24 VDC, 0.3A

#### Output Specifications

**Outputs per module:** 16 points, source type

**On-state voltage :** 24 VDC nominal, Min. 11 VDC to Max. 28.8 VDC

**Operating frequency:** DC to 50 KHz

**On-state voltage drop:** Max. 0.3 VDC@25°C

**On-state current:** Min. 1 mA per channel

**Off leakage current:** Max. 50  $\mu$ A

**Output current rating:** Max. 0.3A per channel  
Max. 4A per common

**Protection:** Over temperature shutdown: Typ. 175°C

Over current protection: one time electrical fuse  
(125 VDC/6.3A)

**Common type:** 16 points / 2 COM (single common)

#### General Specifications

**Power dissipation:** Max. 80 mA @ 5 VDC

**Isolation:** I/O to logic: optical isolation, 500 VAC/min, terminal to FG

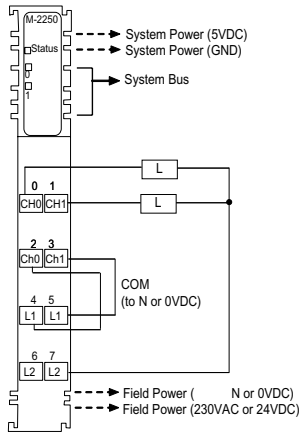
**Field power:** Supply voltage: 24 VDC nominal

**Wiring:** Pin header, external relay board required



# Digital Output Modules

## 2-channel Relay Output Module



\* Field Power distributor required when the field power is not 24VDC.

### M-2250 2 Digital outputs, relay , 24 VDC/ 230 VAC, 2A

#### Output Specifications

**Outputs per module:** 2 points, relay

**Relay type:** Form A, Normally Open (N.O.)

Single pole, single throw (SPST)

**Output voltage range:** Load dependent

5 to 28.8 VDC @ 2A resistive

48 VDC @ 0.8A resistive

110 VDC @ 0.3A resistive

250 VDC @ 2A resistive

**Output current rating:** at rated power

2A @ 5 to 28.8 VDC

0.8A @ 48 VDC

0.5A @ 110 VDC

2A @ 250 VAC

**Min. Load:** 100  $\mu$ A, 100 m VDC per point

**Max. on-state voltage drop:** 0.5V @ 2A, resistive load, 24 VDC

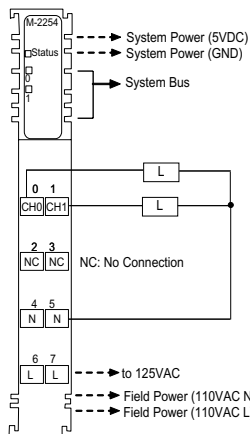
**Off-state leakage current:** Max. 1.5 mA

**Common type:** 1 point/1 COM

#### General Specifications

**Power dissipation:** Max. 65 mA @ 5 VDC

**Wiring:** I/O cable Max. AWG14



\* Field Power distributor required when the filed power is not 24VDC.

### M-2254 2 Digital outputs, Triac, 12-125 VAC, 0.5A

#### Output Specifications

**Outputs per module:** 2 points

**Switch type:** Zero crossing

**Rated load voltage:** 15 to 132 VAC

**Output current rating:** 0.05 to 0.5A

**Frequency range:** 47 to 63 Hz

**Surge current:** 40A (16 ms) /4A (30S)

**On-state voltage drop:** 1.3 Vrms (Max. load)

**Off-state leakage current:** Max. 1.5 mA

**Common type:** 2 points / 2 COM

#### General Specifications

**Power dissipation:** Max. 35 mA @ 5 VDC

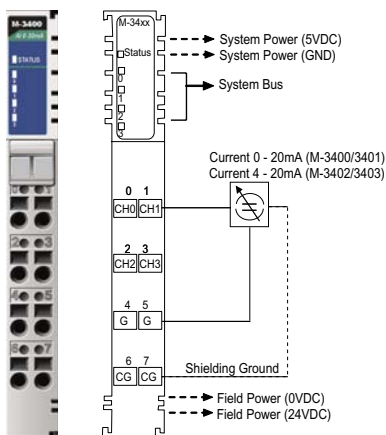
**Wiring:** I/O cable Max. AWG14





# Analog Input Modules

## General Resolution



### **M-3400** 4 Analog input, 0-20 mA, 12-bit

### **M-3402** 4 Analog input, 4-20 mA, 12-bit

#### Input Specifications

**Resolution in ranges:** 12 bits, 4.88  $\mu\text{A/bit}$  (M-3400)

12 bits, 3.91  $\mu\text{A/bit}$  (M-3402)

**Input current range:** 0 to 20 mA (M-3400)

4 to 20 mA (M-3402)

**Data format:** 16-bit integer (2's complement)

**Accuracy:** +/- 0.1%, FSR @ 25°C

+/- 0.3%, FSR @ 0°C, 60°C

**Input impedance:** 120 ohm

**Conversion time:** 4 msec. / all channels

#### General Specifications

**Power dissipation:** Max. 150 mA @ 5 VDC

**Isolation:** I/O to logic: 1k VDC galvanic isolation

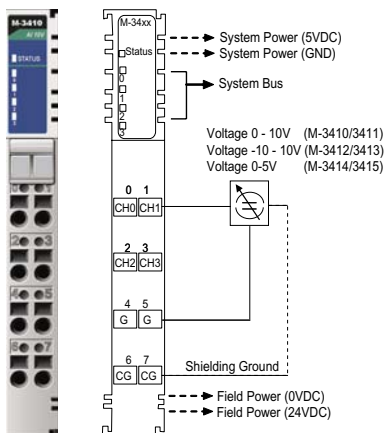
**Wiring:** I/O cable max. AWG14

#### Conversion Table (M-3400)

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Current    | 0 mA  | 5 mA  | 10 mA | 20 mA |
| Data (Hex) | H0000 | H03FF | H07FF | H0FFF |

#### Conversion Table (M-3402)

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Current    | 4 mA  | 5 mA  | 10 mA | 20 mA |
| Data (Hex) | H0000 | H00FF | H05FF | H0FFF |



### **M-3410** 4 Analog inputs, 0-10V, 12-bit

### **M-3412** 4 Analog inputs, -10-10V, 12-bit

### **M-3414** 4 Analog inputs, 0-5V, 12-bit

#### Input Specification

**Resolution in ranges:** 12 bits, 2.44 mV/bit (M-3410)

12 bits, 4.88 mV/bit (M-3412)

12 bits, 1.22 mV/bit (M-3414)

**Input current range:** 0 to 10 VDC (M-3410)

-10 to 10 VDC (M-3412)

0 to 5 VDC (M-3414)

**Data format:** 16-bit integer (2's complement)

**Accuracy:** +/- 0.1%, FSR @ 25°C

+/- 0.3%, FSR @ 0°C, 60°C

**Input impedance:** 500 Kohm

**Conversion time:** 4 msec. / all channels

#### General Specifications

**Power dissipation:** Max. 150 mA @ 5 VDC

**Isolation:** I/O to logic: 1k VDC galvanic isolation

**Wiring:** I/O cable max. AWG14

#### Conversion Table (M-3410)

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Voltage    | 0V    | 2V    | 5V    | 10V   |
| Data (Hex) | H0000 | H0333 | H07FF | H0FFF |

#### Conversion Table (M-3412)

|            |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|
| Voltage    | -10V  | -5V   | 0V    | 5V    | 10V   |
| Data (Hex) | HF800 | HFC00 | H0000 | H3FFF | H07FF |

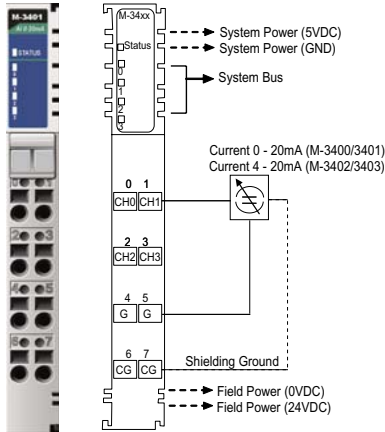
#### Conversion Table (M-3414)

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Voltage    | 0V    | 2V    | 4V    | 5V    |
| Data (Hex) | H0000 | H0666 | H0CCC | H0FFF |



# Analog Input Modules

## High Resolution



### **M-3401** 4 Analog inputs, 0-20 mA, 14-bit **M-3403** 4 Analog inputs, 4-20 mA, 14-bit

#### Input Specifications

**Resolution in ranges:** 14 bits, 1.22  $\mu$ A/bit (M-3401)

14 bits, 0.98  $\mu$ A/bit (M-3403)

**Input current range:** 0 to 20 mA (M-3401)

4-20 mA (M-3403)

**Data format:** 16-bit integer (2's complement)

**Accuracy:** +/- 0.1%, FSR @ 25°C

+/- 0.3%, FSR @ 0°C, 60°C

**Input impedance:** 120 ohm

**Conversion time:** 4 msec. / all channels

#### General Specifications

**Power dissipation:** Max. 150 mA @ 5 VDC

**Isolation:** I/O to logic: 1k VDC galvanic isolation

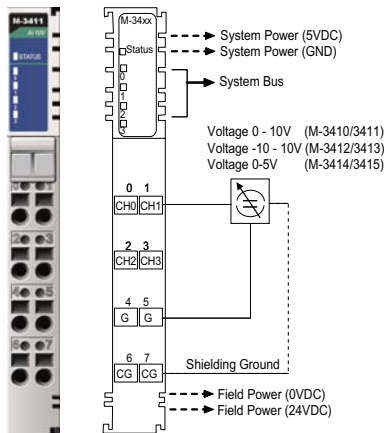
**Wiring:** I/O cable max. AWG14

#### Conversion Table (M-3401)

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Current    | 0 mA  | 5 mA  | 10 mA | 20 mA |
| Data (Hex) | H0000 | H0FFF | H1FFF | H3FFF |

#### Conversion Table (M-3403)

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Current    | 4 mA  | 5 mA  | 10 mA | 20 mA |
| Data (Hex) | H0000 | H03FF | H17FF | H3FFF |



### **M-3411** 4 Analog inputs, 0-10V, 14-bit **M-3413** 4 Analog inputs, -10-10V, 14-bit **M-3415** 4 Analog inputs, 0-5V, 14-bit

#### Input Specifications

**Resolution in ranges:** 14 bits, 0.61 mV/bit (M-3411)

14 bits, 1.22 mV/bit (M-3413)

14 bits, 0.31 mV/bit (M-3415)

**Input current range:** 0 to 10 VDC (M-3411)

-10 to 10 VDC (M-3413)

0 to 5 VDC (M-3415)

**Data format:** 16-bit integer (2's complement)

**Accuracy:** +/- 0.1%, FSR @ 25°C

+/- 0.3%, FSR @ 0°C, 60°C

**Input impedance:** 500 ohm

**Conversion time:** 4 msec. / all channels

#### General Specifications

**Power dissipation:** Max. 150 mA @ 5 VDC

**Isolation:** I/O to logic: 1k VDC galvanic isolation

**Wiring:** I/O cable max. AWG14

#### Conversion Table (M-3411)

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Voltage    | 0V    | 2V    | 5V    | 10V   |
| Data (Hex) | H0000 | H0CCC | H1FFF | H3FFF |

#### Conversion Table (M-3413)

|            |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|
| Voltage    | -10V  | -5V   | 0V    | 5V    | 10V   |
| Data (Hex) | HE000 | HF000 | H0000 | H0FFF | H1FFF |

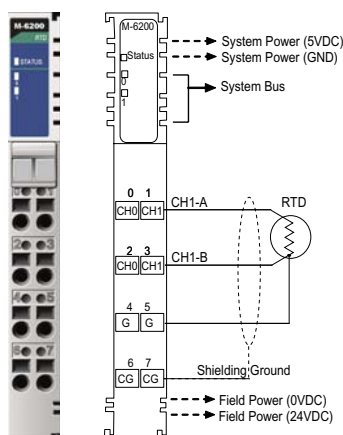
#### Conversion Table (M-3415)

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Voltage    | 0V    | 2V    | 4V    | 5V    |
| Data (Hex) | H0000 | H1999 | H3332 | H3FFF |



# Analog Input Modules

## Temperature sensing



### M-6200 2 Analog inputs, RTD: PT100, JPT100

#### Input Specifications

**Sensor types:** PT50, PT100, PT200, PT500, PT1000, JPT100, JPT200, JPT500, JPT1000, NI100, NI200, NI500, NI1000, NI120, CU10, Resistance 100 mohm/bit, Resistance 10 mohm/bit, Resistance 20 mohm/bit

**Data format:** 16-bit integer (2's complement)

**Resolution:** 0.1°C / 10 mohm

**Accuracy:** +/- 0.1%, FSR @ 25°C

+/- 0.3%, FSR @ 0°C, 60°C

**Input impedance:** 500 Kohm

**Conversion time:** 200 msec. / all channels

**Diagnostics:** Range over (if range over, data=Dx8000)

#### General Specifications

**Power dissipation:** Max. 80 mA @ 5VDC

**Isolation:** I/O to logic: 1k VDC galvanic isolation

**Wiring:** I/O cable max. AWG14

## Conversion Table

### Sensor PT100

| Temp.      | -200 °C | -100 °C | 0 °C  | 200°C | 400°C | 640°C |
|------------|---------|---------|-------|-------|-------|-------|
| Data (Hex) | HF830   | HFC18   | H0000 | H07D0 | H0FA0 | H1900 |

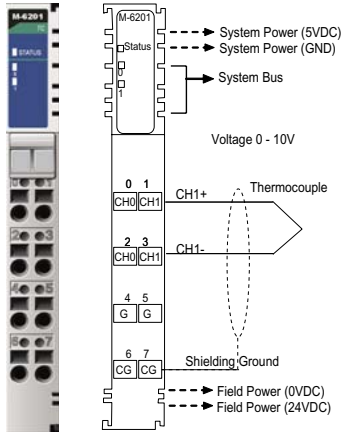
## Other Sensor Type Data

| Sensor Type         | Degree        | Count         | Resolution              |
|---------------------|---------------|---------------|-------------------------|
| Resistance 100 mOhm | 1 to 2000 Ohm | 10 to 20000   | 100 mOhm / 1 count      |
| Resistance 10 mOhm  | 1 to 327 Ohm  | 10 to 3270    | 10 mOhm / 1 count       |
| Resistance 20 mOhm  | 1 to 620 Ohm  | 10 to 6200    | 20 mOhm / 1 count       |
| PT50, 0.00385       | 200 to 850°C  | -2000 to 8500 | 0.1°C or 0.1°F/ 1 count |
| PT100, 0.00385      | -200 to 850°C | -2000 to 8500 | 0.1°C or 0.1°F/ 1 count |
| PT200, 0.00386      | -200 to 850°C | -2000 to 8500 | 0.1°C or 0.1°F/ 1 count |
| PT500, 0.00385      | -200 to 850°C | -2000 to 8500 | 0.1°C or 0.1°F/ 1 count |
| PT1000, 0.00385     | -200 to 350°C | -2000 to 3500 | 0.1°C or 0.1°F/ 1 count |
| JPT100, 0.003916    | -200 to 640°C | -2000 to 6400 | 0.1°C or 0.1°F/ 1 count |
| JPT200, 0.003916    | -200 to 640°C | -2000 to 6400 | 0.1°C or 0.1°F/ 1 count |
| JPT500, 0.003916    | -200 to 640°C | -2000 to 6400 | 0.1°C or 0.1°F/ 1 count |
| JPT1000, 0.003916   | -200 to 350°C | -2000 to 3500 | 0.1°C or 0.1°F/ 1 count |
| NI100, 0.00618      | -60 to 250°C  | -600 to 2500  | 0.1°C or 0.1°F/ 1 count |
| NI120, 0.00672      | -80 to 250°C  | -800 to 2500  | 0.1°C or 0.1°F/ 1 count |
| NI200, 0.00618      | -60 to 250°C  | -600 to 2500  | 0.1°C or 0.1°F/ 1 count |
| NI500, 0.00618      | -60 to 250°C  | -600 to 2500  | 0.1°C or 0.1°F/ 1 count |
| NI1000, 0.00618     | -60 to 180°C  | -600 to 2500  | 0.1°C or 0.1°F/ 1 count |
| CU10, 0.00427       | -200 to 260°C | -2000 to 2600 | 0.1°C or 0.1°F/ 1 count |



# Analog Input Modules

## Temperature sensing



### M-6201 2 Analog inputs, Thermocouple

#### Input Specifications

**Sensor types:** Type J/K/T/E/R/S/B/N/L/U/C/D  
mV input 10  $\mu$ V/bit, 2  $\mu$ V/bit

**Data format:** 16-bit integer (2's complement)

**Resolution:** 0.1°C / 10 mV

**Accuracy:** +/- 0.1%, FSR @ 25°C  
+/- 0.3%, FSR @ 0°C, 60°C

**Input impedance:** 500 Kohm

**Conversion time:** 200 msec. / all channels

**Diagnostics:** Range over (if range over, data=Dx8000)

#### General Specifications

**Power dissipation:** Max. 80 mA @ 5 VDC

**Isolation:** I/O to logic: 1k VDC galvanic isolation

**Wiring:** I/O cable max. AWG14

## Conversion Table

### Type B

| Temp.      | 0 °C  | 300°C | 900 °C | 1800°C |
|------------|-------|-------|--------|--------|
| Data (Hex) | H0000 | H0BB8 | H2328  | H4650  |

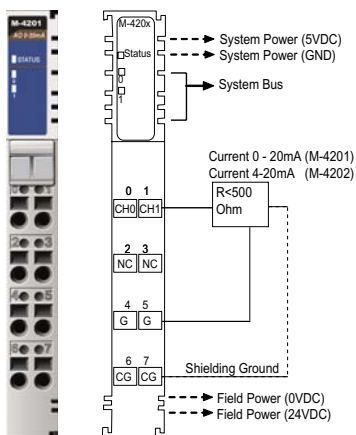
## Other Sensor Type Data

| Sensor Type            | Degree          | Count      | Resolution     |
|------------------------|-----------------|------------|----------------|
| K                      | -200 to 12000°C | -6 to 54mV | 0.1°C, °F/bit  |
| J                      | -40 to 11000°C  | -8 to 69mV | 0.1°C, °F/bit  |
| T                      | -200 to 350°C   | -6 to 20mV | 0.1°C, °F/bit  |
| B                      | 600 to 1700°C   | 0 to 13mV  | 0.1°C, °F/bit  |
| R                      | 0 to 1600°C     | 0 to 21mV  | 0.1°C, °F/bit  |
| S                      | 0 to 1600°C     | 0 to 18mV  | 0.1°C, °F/bit  |
| E                      | -200 to 800°C   | -9 to 76mV | 0.1°C, °F/bit  |
| N                      | -200-1250°C     | -4 to 47mV | 0.1°C, °F/bit  |
| L                      | -150-850°C      | -8 to 53mV | 0.1°C, °F/bit  |
| U                      | -150-550°C      | -5 to 34mV | 0.1°C, °F/bit  |
| C                      | 100-2200°C      | 0 to 37mV  | 0.1°C, °F/bit  |
| D                      | 100-2300°C      | 0 to 41mV  | 0.1°C, °F/bit  |
| Voltage 10 $\mu$ V/bit |                 |            | 10 $\mu$ V/bit |
| Voltage 1 $\mu$ V/bit  |                 |            | 1 $\mu$ V/bit  |
| Voltage 2 $\mu$ V/bit  |                 |            | 2 $\mu$ V/bit  |



# Analog Output Modules

## General Resolution



### M-4201 2 Analog outputs, 0-20 mA, 12-bit

### M-4202 2 Analog outputs, 4-20 mA, 12-bit

#### Output Specifications

Resolution in ranges: 12 bits, 4.88  $\mu$ A/bit (M-4201)

12 bits, 3.91  $\mu$ A/bit (M-4202)

Input current range: 0 to 20 mA (M-4201)

4 to 20 mA (M-4202)

Data format: 16-bit integer (2's complement)

Accuracy: +/- 0.1%, FSR @ 25°C

+/- 0.3%, FSR @ 0°C, 60°C

Input impedance: Max. 500 ohm

Conversion time: 2 msec. / all channels

#### General Specifications

Power dissipation: Max. 65 mA @ 5 VDC

Isolation: I/O to logic: 1k VDC galvanic isolation

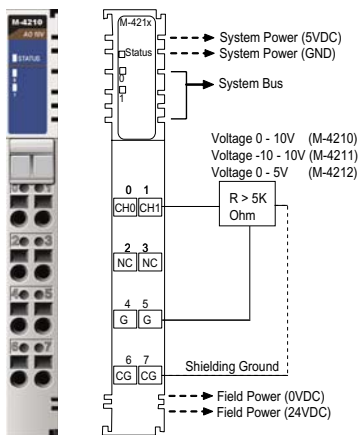
Wiring: I/O cable max. AWG14

#### Conversion Table (M-4201)

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Current    | 0 mA  | 5 mA  | 10 mA | 20 mA |
| Data (Hex) | H0000 | H03FF | H07FF | H0FFF |

#### Conversion Table (M-4202)

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Current    | 4 mA  | 5 mA  | 10 mA | 20 mA |
| Data (Hex) | H0000 | H00FF | H05FF | H0FFF |



### M-4210 4 Analog outputs, 0-10V, 12-bit

### M-4211 4 Analog outputs, -10-10V, 12-bit

### M-4212 4 Analog outputs, 0-5V, 12-bit

#### Input Specifications

Resolution in ranges: 12 bits, 2.44 mV/bit (M-4210)

12 bits, 4.88 mV/bit (M-4211)

12 bits, 1.22 mV/bit (M-4212)

Input current range: 0 to 10 VDC (M-4210)

-10 to 10 VDC (M-4211)

0 to 5 VDC (M-4212)

Data format: 16-bit integer (2's complement)

Accuracy: +/- 0.1%, FSR @ 25°C

+/- 0.3%, FSR @ 0°C, 60°C

Input impedance: Min. 5 Kohm

Conversion time: 2 msec. / all channel

#### General Specifications

Power dissipation: Max. 200 mA @ 5 VDC

Isolation: I/O to logic: 1k VDC galvanic isolation

Wiring: I/O cable max. AWG14

#### Conversion Table (M-4210)

|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Voltage    | 0V    | 2V    | 5V    | 10V   |
| Data (Hex) | H0000 | H0333 | H07FF | H0FFF |

#### Conversion Table (M-4211)

|            |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|
| Voltage    | -10V  | -5V   | 0V    | 5V    | 10V   |
| Data (Hex) | HF800 | HFC00 | H0000 | H3FFF | H07FF |

#### Conversion Table (M-4212)

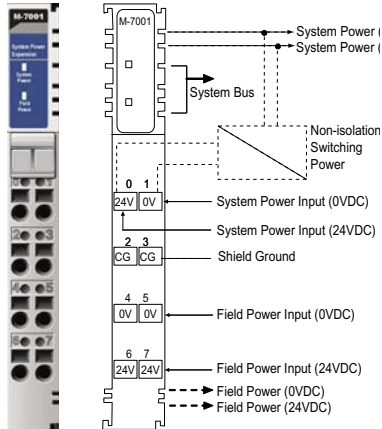
|            |       |       |       |       |
|------------|-------|-------|-------|-------|
| Voltage    | 0V    | 2V    | 4V    | 5V    |
| Data (Hex) | H0000 | H0666 | H0CCC | H0FFF |





# System Modules

## System Power Module



### M-7001 System power expansion, 1.0A/ 5 VDC

#### Input Specifications

**System input voltage range:** 11 VDC to 28.8 VDC

**System power input voltage:** Nominal 24 VDC

**Field power input voltage:** Nominal 24 VDC (+/-20%)

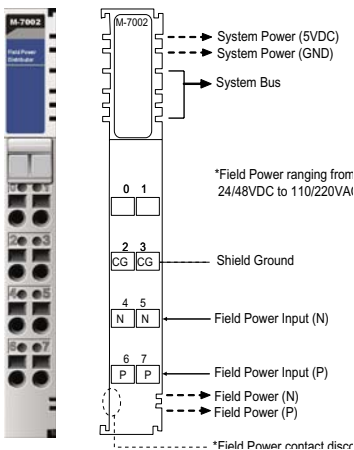
#### Output Specifications

**System bus output voltage:** Max. 5 VDC

**Field power contacts current:** Max. 10A

**Wiring:** I/O cable max. AWG14

The system power expansion module is designed to provide extra power for connected I/O expansion modules. When the overall I/O expansion module exceeds 1.5 Amp/ 5 VDC, you'll need to use an M-7001 module.



### M-7002 Field power distributor

#### Input Specifications

**Field power voltage:** 5 VDC, 24 VDC, 48 VDC, 110 VAC, 220 VAC

#### Output Specifications

**Field power contacts current:** Max. 10A

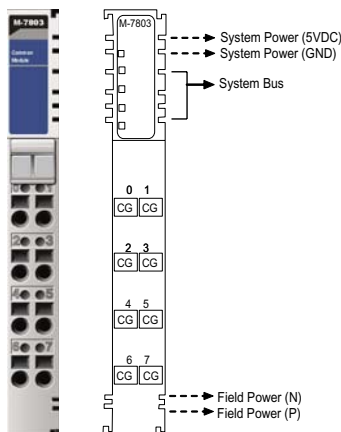
**Wiring:** I/O cable max. AWG14

The field power distributor is designed to isolate different field voltages. For example, before you connect a 48 VDC or 110 VAC DIO module to a 24 VDC DIO module, you'll need an M-7002 Field power distributor.



# System Modules

## System Power Module



### M-7803 Potential Distributor

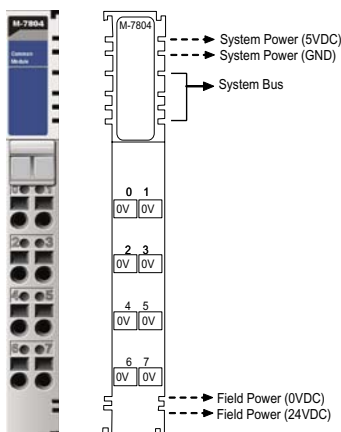
#### Input Specifications

Field power voltage: Shield signal

#### Output Specifications

Field power contacts current: Max. 10A

Wiring: I/O cable max. AWG14



### M-7804 Potential distributor, 8-ch, 0V VDC

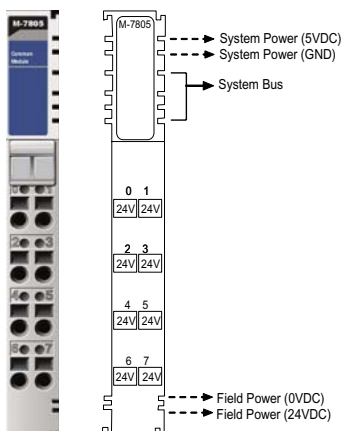
#### Input Specifications

Field power voltage: 0 VDC

#### Output Specifications

Field power contacts current: Max. 10A

Wiring: I/O cable max. AWG14



### M-7805 Potential distributor, 8-ch, 24 VDC

#### Input Specifications

Field power voltage: 24 VDC

#### Output Specifications

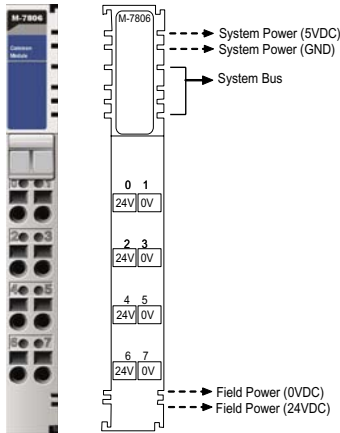
Field power contacts current: Max. 10A

Wiring: I/O cable max. AWG14



# System Modules

## System Power Module



### M-7806 Potential distributor, 8-ch, 24/0V VDC

#### Input Specifications

Field power voltage: 24 VDC/ 0 VDC

#### Output Specifications

Field power contacts current: Max. 10A

Wiring: I/O cable max. AWG14

## General Specifications

| Environmental Specifications |                                                                                                                                                                                 |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating Temperature        | -20 to 60°C (Discrete I/O)<br>0 to 60°C (Analog I/O)                                                                                                                            |
| Non-Operating Temperature    | -40 to 85°C                                                                                                                                                                     |
| Relative Humidity            | 5 to 90% Non-condensing                                                                                                                                                         |
| Operating Altitude           | 2,000 m                                                                                                                                                                         |
| Mounting                     | DIN-Rail                                                                                                                                                                        |
| General Specifications       |                                                                                                                                                                                 |
| Wiring I/O Cable             | I/O Cable Max. 2.0m <sup>2</sup> (AWG 14)                                                                                                                                       |
| Shock (Operating)            | 2g                                                                                                                                                                              |
| Shock (Non-Operating)        | 30g                                                                                                                                                                             |
| Protect. Class               | IP20                                                                                                                                                                            |
| Product Certifications       | UL508, CE                                                                                                                                                                       |
| Isolation                    | DC Module (Includes Analog Module): Terminal Block to F.G 500 VAC/1 min<br>AC Module: Terminal Block to F.G 1500 VAC/1 min<br>Relay Module: Terminal lock to F.G 2500 VAC/1 min |
| Gross Weight                 | Network Adapter: 180g<br>I/O Modules: 70g                                                                                                                                       |



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