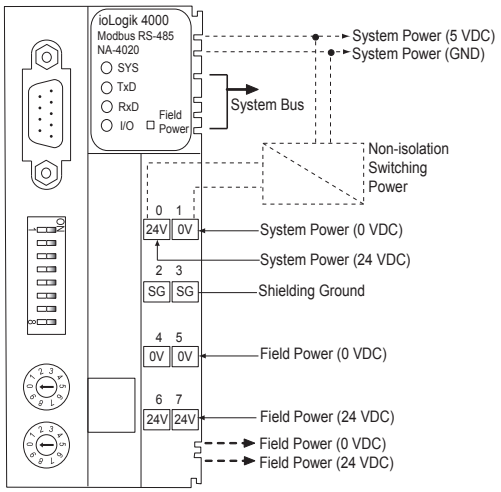
NA-4020/4021

RS-485 or RS-232 network adaptors



Specifications

Serial Communication Parameters

Parity: None, Even, Odd

Data Bits: 7, 8

Stop Bits: 1, 2

Baudrate: 1200 to 115200 bps

Signals:

- NA-4020: Data+, Data-, Gnd, DIR
- NA-4021: TxD, RxD, Gnd

Software Features

Protocols: Modbus/RTU, Modbus/ASCII

Modbus Address: 00 to 99 (set by rotary switches)

Utility: ioAdmin

Programming Library: MXIO DLL library for Windows; Supports Visual Basic, Visual C++, Borland C++ Builder

Number of I/O Modules Supported: Max. of 32

Power Requirements

Power Input: 11 to 28.8 VDC, 24 VDC typical

Power Consumption: 70 mA typical @ 24 VDC

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

Field Power

Rated Voltage: 11 to 28.8 VDC, 24 VDC typical

Current in Field Power Contact: Max. 10 A

Isolation

System Power to I/O Driver: Optical isolation

Physical Characteristics

Dimensions: 45 x 99 x 70 mm (1.77 x 3.9 x 2.76 in)

Weight: 150 g

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

Safety: UL508

EMC: CE IEC 61000-6-2, IEC 61000-6-4

Vibration: IEC-68-2-6 (2 g's during operation)

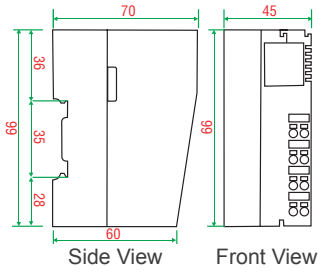
Warranty

Warranty Period: 2 years

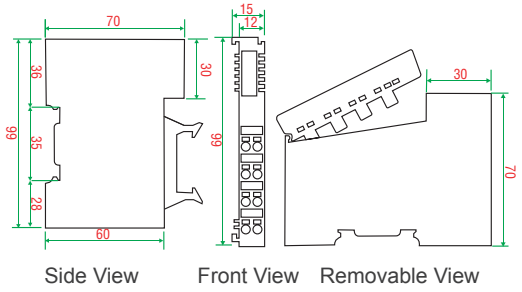
Details: See www.moxa.com/warranty

Dimensions (unit = mm)

I/O Network Adaptor



I/O Module



Ordering Information

Step 1: Select a network adaptor module

NA-4000 series

Step 2: Select I/O modules

M-1000/2000/3000/4000/6000 series

Step 3: Select power modules (optional)

M-7000 series

Available Models

NA-4020: RS-485 network adaptor (Modbus)

NA-4021: RS-232 network adaptor (Modbus)

Note: The NA-4020/4021 RS-485/232 network adaptors can be expanded by adding up to 32 I/O modules. See pages 5-33 to 5-41 to select the M- series modules for your application.

Modular Remote I/O Selection Guide

I/O Modules

		DC-Digital Inputs				AC-Digital Inputs	
Specs	Model	M-1800	M-1801	M-1600	M-1601	M-1450	M-1451
	Channels	8	8	16	16	4	4
	Sink/Source	Sink	Source	Sink	Source	---	---
	Connector	RTB	RTB	20-pin	20-pin	RTB	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	110 VAC	220 VAC
	Isolation	Optical isolation					

		Digital Outputs				
Specs	Model	M-2800	M-2801	M-2600	M-2601	M-2450
	Channels	8	8	16	16	4
	Sink/Source	Sink	Source	Sink	Source	Relay
	Connector	RTB	RTB	20-pin	20-pin	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
	Current	0.5 A	0.5 A	0.3 A	0.3A	0.5 A
	Isolation	Optical isolation				

		Analog Inputs			
Specs	Model	M-3802	M-3810	M-6200	M-6201
	Channels	8	8	2	2
	Current	4 to 20 mA	---	---	---
	Voltage	---	0 to 10V	---	---
	Connector	RTB	RTB	RTB	RTB
	Resolution	12-bit	12-bit	---	---
	Isolation	Optical isolation			
	Sensor Input	---	---	RTD(ohm)	Thermo-couple (mV)

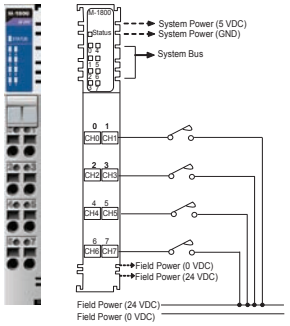
		Analog Outputs	
Specs	Model	M-4402	M-4410
	Channels	4	4
	Current	4 to 20 mA	---
	Voltage	---	0 to 10 V
	Connector	RTB	RTB
	Resolution	12-bit	12-bit
	Isolation	Optical isolation	

Power Modules

Power Modules					
Specs	Model	M-7001	M-7002	M-7804	M-7805
	Channels	0	0	8	8
	Voltage	24 VDC	DC: 5, 24, 48 VDC AC: 110/220 VAC	0 VDC	24 VDC
	Purpose	System Power	Field Power	Field Power	Field Power

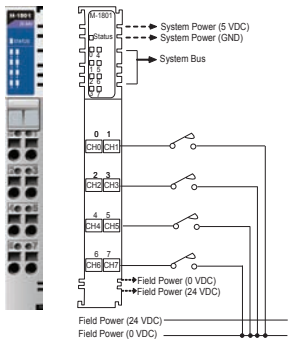
Digital Input Modules

8-channel 24 VDC digital input modules



M-1800: 8 digital inputs, sink, 24 VDC

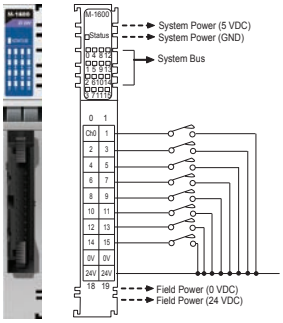
Inputs per Module: 8 channels, sink type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ. 1.5 ms
Common Type: External common
Power Consumption: Max. 35 mA @ 5 VDC



M-1801: 8 digital inputs, source, 24 VDC

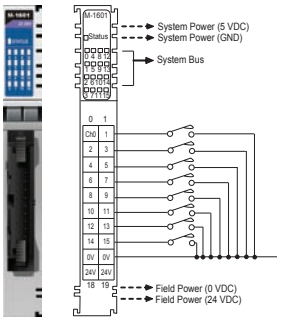
Inputs per Module: 8 channels, source type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ 1.5 ms
Common Type: External common
Power Consumption: Max. 35 mA @ 5 VDC

16-channel 24 VDC digital input modules



M-1600: 16 digital inputs, sink, 24 VDC

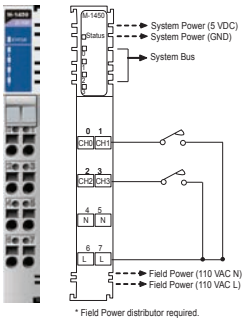
Inputs per Module: 16 channels, sink type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ. 1.5 ms
Common Type: 16 channels for 2 COMs
Power Consumption: Max. 40 mA @ 5 VDC



M-1601: 16 digital inputs, source, 24 VDC

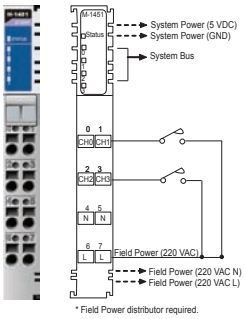
Inputs per Module: 16 channels, source type
On-state Voltage: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
Min. Off-state Voltage: Max. 5 VDC
On-state Current: Max. 6 mA/point @ 28.8 VDC
Input Impedance: Typ. 5.1K ohms
Filtering Time: Typ. 1.5 ms
Common Type: 16 channels for 2 COMs
Power Consumption: Max. 40 mA @ 5 VDC

4-channel AC digital input modules



M-1450: 4 digital inputs, 110 VAC

Inputs per Module: 4 channels
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. 11K ohms
Common Type: 4 channels for 2 COMs (single common)
Power Consumption: Max. 35 mA @ 5 VDC



M-1451: 4 digital inputs, 220 VAC

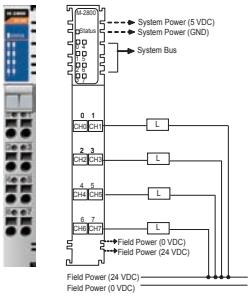
Inputs per Module: 4 channels
On-state Voltage: 240 VAC nominal, min. 170 VAC to max. 264 VAC
Min. Off-state Voltage: Max. 45 VAC
On-state Current: Max. 12 mA/point @ 264 VAC
Input Impedance: Typ. 22K ohms
Common Type: 4 channels for 2 COMs (single common)
Power Consumption: Max. 35 mA @ 5 VDC

Ordering Information

		DC-Digital Input Modules				AC-Digital Input Modules	
Specs	Model	M-1800	M-1801	M-1600	M-1601	M-1450	M-1451
	Channels	8	8	16	16	4	4
	Sink/Source	Sink	Source	Sink	Source	---	---
	Connector	RTB	RTB	20-pin	20-pin	RTB	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	110 VAC	220 VAC
	Isolation	Optical Isolation					

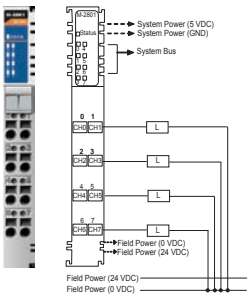
Digital Output Modules

8-channel 24 VDC digital output modules



M-2800: 8 digital outputs, sink, 24 VDC, 0.5 A

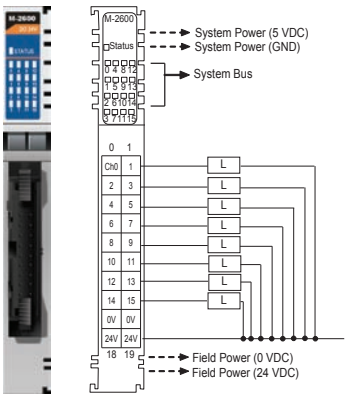
Outputs per Module: 8 channels, sink type
Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
On-state Voltage Drop: Max. 0.3 VDC @ 25°C
On-state Current: Min. 1 mA per channel
Off Leakage Current: Max. 50 μA
Output Current Rating: Max. 0.5 A per channel
Common Type: 8 channels per external common (single common)
Power Consumption: Max. 60 mA @ 5 VDC



M-2801: 8 digital outputs, source, 24 VDC, 0.5 A

Outputs per Module: 8 channels, source type
Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
On-state Voltage Drop: Max. 0.3 VDC @ 25°C
On-state Current: Min. 1 mA per channel
Off Leakage Current: Max. 50 μA
Output Current Rating: Max. 0.5 A per channel
Common Type: 8 channels per external common (single common)
Power Consumption: Max. 60 mA @ 5 VDC

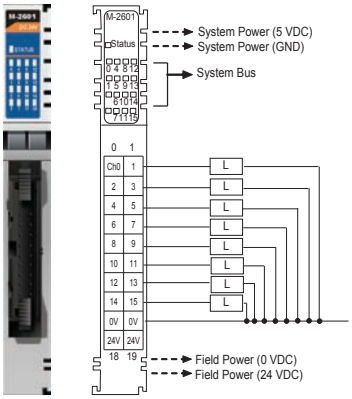
16-channel digital output modules



M-2600: 16 digital outputs, sink, 24 VDC, 0.3 A

Outputs per Module: 16 channels, sink type
Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC
On-state Voltage Drop: Max. 0.3 VDC @ 25°C
On-state Current: Min. 1 mA per channel
Off Leakage Current: Max. 50 μA
Output Current Rating:
- Max. 0.3 A per channel
- Max. 4 A per common

Common Type: 16 channels for 2 COMs (single common)
Power Consumption: Max. 80 mA @ 5 VDC



M-2601: 16 digital outputs, source, 24 VDC, 0.3 A

Outputs per Module: 16 channels, source type

Output Voltage Range: 24 VDC nominal, min. 11 VDC to max. 28.8 VDC

On-state Voltage Drop: Max. 0.3 VDC @ 25°C

On-state Current: Min. 1 mA per channel

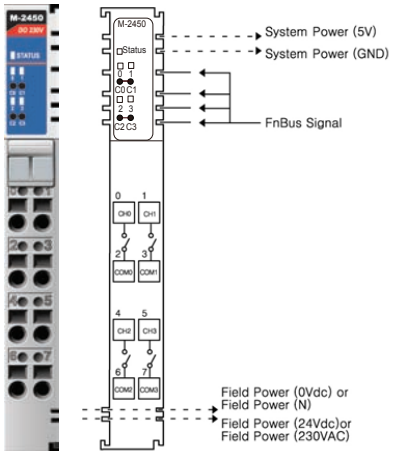
Off Leakage Current: Max. 50 μA

Output Current Rating:
- Max. 0.3 A per channel
- Max. 4 A per common

Common Type: 16 channels for 2 COMs (single common)

Power Consumption: Max. 80 mA @ 5 VDC

4-channel relay output modules



M-2450: 4 relay outputs, 24-VDC/230-VAC, 2 A

Outputs per Module: 4 channels, relay

Relay Type:
- Form A, Normally Open (N.O.)
- Single Pole, Single Throw (SPST)

Output Voltage Range: Load dependent
- 5 to 28.8 VDC @ 2 A resistive
- 48 VDC @ 0.8 A resistive
- 110 VDC @ 0.3 A resistive
- 250 VAC @ 2 A resistive

Output Current Rating: At rated power
- 2 A @ 5 to 28.8 VDC
- 0.8 A @ 48 VDC
- 0.5 A @ 110 VDC
- 2 A @ 250 VAC

Min. Load: 100 μA, 100 m VDC per point

Max. On-state Voltage Drop: 0.5 V @ 2 A, resistive load, 24 VDC

Off-state Leakage Current: Max. 1.5 mA

Common Type: 1 channel for 1 COM

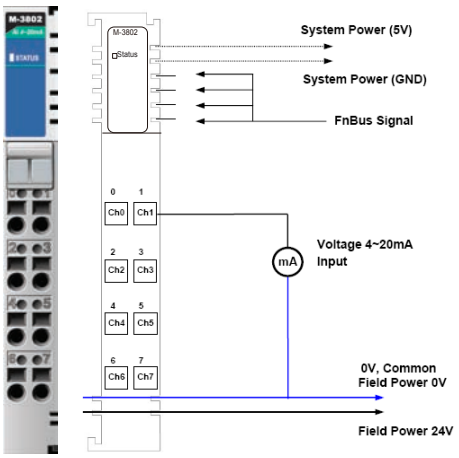
Power Consumption: Max. 65 mA @ 5 VDC

Ordering Information

Digital Output Modules						
Specs	Model	M-2800	M-2801	M-2600	M-2601	M-2450
	Channels	8	8	16	16	4
	Sink/Source	Sink	Source	Sink	Source	Relay
	Connector	RTB	RTB	20-pin	20-pin	RTB
	Voltage	24 VDC	24 VDC	24 VDC	24 VDC	230 VAC/ 24 VDC
	Current	0.5A	0.5A	0.3A	0.3A	2.0A
	Isolation	Optical isolation				
	Diagnostics	---	---	---	---	---

Analog Input Modules

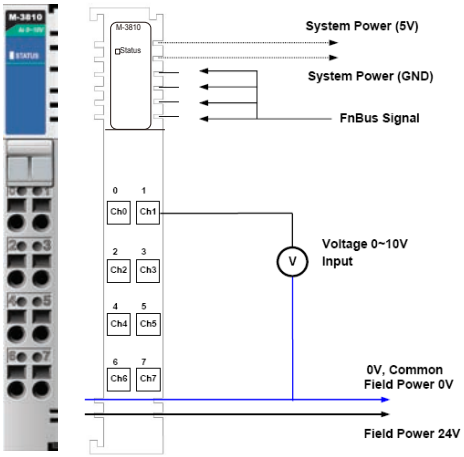
8-channel analog input modules, 12-bit resolution



M-3802: 8 analog inputs, 4 to 20 mA, 12 bits

Resolution in Ranges: 12 bits, 3.91 μA/bit
Input Current Range: 0 to 20 mA
Data Format: 16-bit integer (2's complement)
Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Input Impedance: 120 ohms
Conversion Time: 4 ms for all channels
Power Consumption: Max. 150 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14



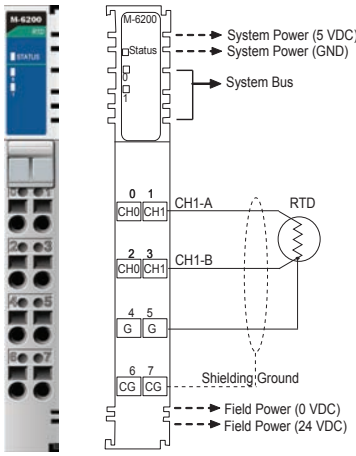
M-3810: 8 analog inputs, 0 to 10 V, 12 bits

Resolution in Ranges: 12 bits, 2.44 mV/bit
Input Current Range: 0 to 10 VDC
Data Format: 16-bit integer (2's complement)
Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Input Impedance: 500K ohms
Conversion Time: 4 ms for all channels
Power Consumption: Max. 150 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14

Temperature Input Modules

2-channel temperature input modules, RTD or thermocouple input



M-6200: 2 analog inputs, RTD: PT100, JPT100

Sensor Types:
- PT50, PT100, PT200, PT500, PT1000 (resistance 100 milli-ohms/bit)
- JPT100, JPT200, JPT500, JPT1000 (resistance 10 milli-ohms/bit)
- NI100, NI200, NI500, NI1000, NI120, CU10 (resistance 20 milli-ohms/bit)

Resolution: 0.1°C/10 milli-ohms

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

Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Input Impedance: 500K ohms

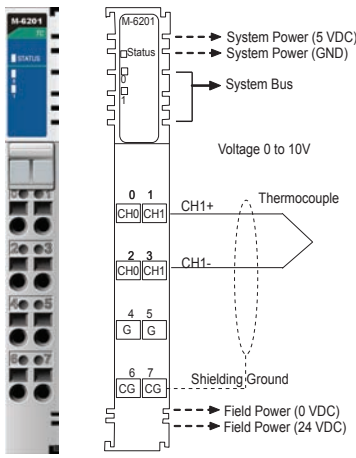
Conversion Time: 200 ms for all channels

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

Power Consumption: Max. 80 mA @ 5 VDC

Isolation: I/O to logic (photocoupler isolation)

Wiring: I/O cable max. AWG14



M-6201: 2 analog inputs, thermocouple

Sensor Types:
Type J/K/T/E/R/S/B/N/L/U/C/D
(mV input 10 µV/bit, 2 µV/bit)

Resolution: 0.1°C/10 µV

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

Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Input Impedance: 500K ohms

Conversion Time: 200 ms for all channels

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

Power Consumption: Max. 80 mA @ 5 VDC

Isolation: I/O to logic (photocoupler isolation)

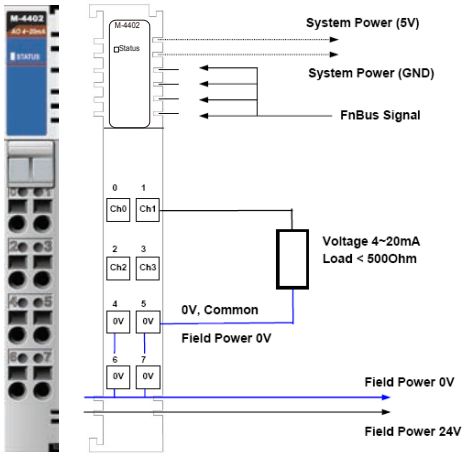
Wiring: I/O cable max. AWG14

Ordering Information

Analog Input Modules					
Specs	Model	M-3802	M-3810	M-6200	M-6201
	Channels	8	8	2	2
	Current	4 to 20 mA	---	---	---
	Voltage	–	0 to 10V	---	---
	Connector	RTB	RTB	RTB	RTB
	Resolution	12-bit	12-bit	---	---
	Isolation	Optical isolation			
	Sensor Input	---	---	RTD (ohm)	Thermo-couple (mV)

Analog Output Modules

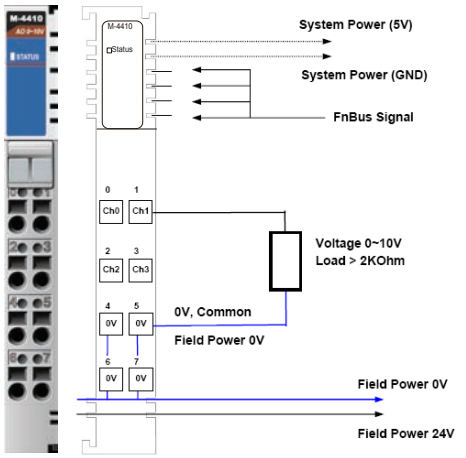
4-channel analog output modules, 12-bit resolution



M-4402: 4 analog outputs, 4 to 20 mA, 12 bits

Resolution in Ranges: 12 bits, 3.91 μA/bit
Output Current Range: 4 to 20 mA
Data Format: 16-bit integer (2's complement)
Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Output Impedance: Max. 500 ohms
Conversion Time: 2 ms for all channels
Power Consumption: Max. 65 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14



M-4410: 4 analog outputs, 0 to 10 V, 12 bits

Resolution in Ranges: 12 bits, 2.44 mV/bit
Output Current Range: 0 to 10 VDC
Data Format: 16-bit integer (2's complement)
Accuracy:
- ±0.1%, FSR @ 25°C
- ±0.3%, FSR @ 0°C, 60°C

Output Impedance: Max. 5K ohms
Conversion Time: 2 ms for all channels
Power Consumption: Max. 200 mA @ 5 VDC
Isolation: I/O to logic (photocoupler isolation)
Wiring: I/O cable max. AWG14

Ordering Information

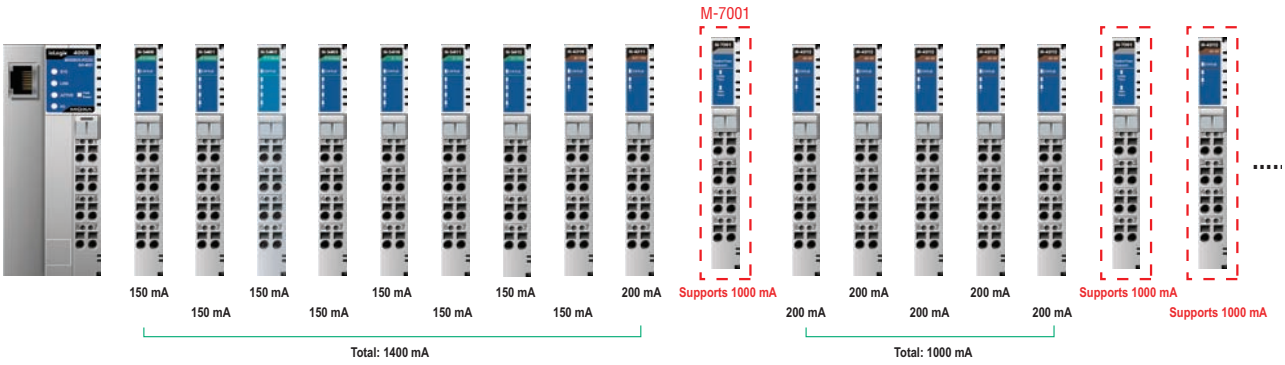
Analog Output Modules			
Specs	Model	M-4402	M-4410
	Channels	4	4
	Current	4 to 20 mA	---
	Voltage	---	0 to 10V
	Connector	RTB	RTB
	Resolution	12-bit	12-bit
	Isolation	Optical Isolation	

Power Modules

When to Use a Power Module

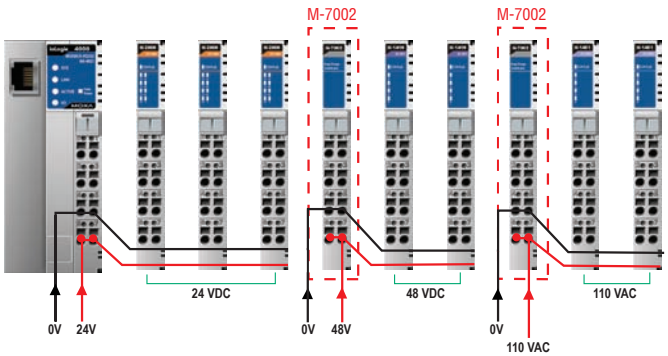
System Power Distributor

The system power expansion module is designed to provide extra power for connected I/O expansion modules. Each NA-4000 series network adaptor can provide 1.5 A @ 5 VDC. If you need more power for your installed I/O expansion modules, you will need to use an M-7001 module. However, note that the M-7001 can only provide 1.5 A @ 5 VDC.



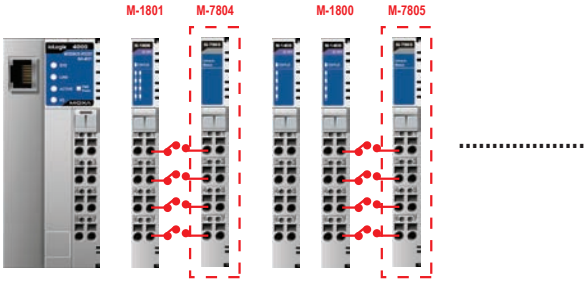
Field Power Distributor

The field power distributor is designed to isolate different field voltages. For example, before you connect a 48 VDC or 110 VAC DI/O module to a 24 VDC DI/O module, you will need an M-7002 field power distributor.



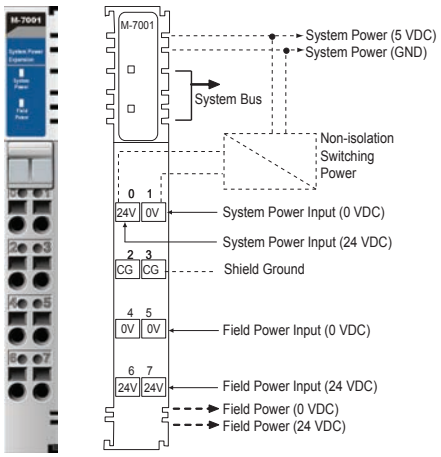
Potential Power Distributor

There are three types of potential distributor modules that provide extra wiring points, such as shielding ground, 0 V field power, and 24 V field power. For example, the 8-channel digital input (sink type) module by itself does not have a 24 V wiring point. In this case, you can add an M-7805 for easier wiring.



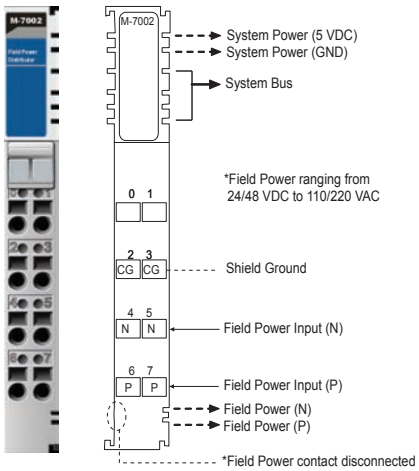
Power Modules

M-7001: System power module



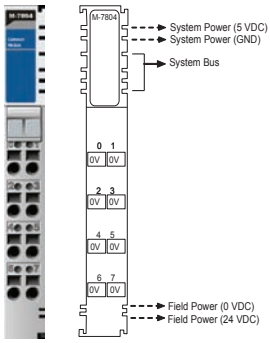
- **System Input Voltage:** 24 VDC, 11 to 28.8 VDC
- **Field Power Input Voltage:** 24 VDC (±20%)
- **Current for I/O Modules:** 1.5 A @ 5 VDC (Max.)
- **System Bus Output Voltage:** 5 VDC (Max.)
- **Field Power Contacts Current:** 10 A (Max.)

M-7002: Field power module



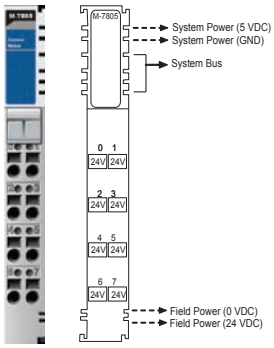
- **Field Power Input Voltage:**
  DC: 5 VDC, 24 VDC, 48 VDC
  AC: 110 VAC, 220 VAC
- **Current for Field Power Contacts:** 10 A (Max.)

M-7804: 0 VDC



Channels: 8
Mode: 0 VDC

M-7805: 24 VDC



Channels: 8
Mode: 24 VDC

Ordering Information

Power Modules					
Specs	Model	M-7001	M-7002	M-7804	M-7805
	Channels	0	0	8	8
	Voltage	24 VDC	DC: 5, 24, 48 VDC AC: 110/220 VAC	0 VDC	24 VDC
	Purpose	System Power	Field Power	Field Power	Field Power

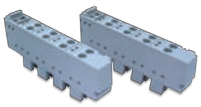
Modular I/O Accessories

TB 1600 DIN-Rail mounting screw terminal module with 20-pin connector

- 20 pins, one-to-one assignment
- Connector pitch: 3.81 mm
- DIN-Rail mounting type
- Dimensions: 77.5 x 67.5 x 51 mm (3.05 x 2.66 x 2.01 in)
- RoHS compliant

20-to-20-pin flat cable

- Connects between the TB 1600 and ioLogik 4000 series
- Length: 500 mm
- Number of Pins: 20



M-8001-PK Removable terminal block

- Terminal block for the ioLogik 4000 series
- Packaging: 9 pcs in one box

M-8003-PK Marker with 0 to 9 numbering

M-8004-PK Blank marker

- Marker for the ioLogik 4000 series
- Packaging: 100 pcs in one box

Ordering Information

- **TB 1600:** DIN-Rail mounting screw terminal module with 20-pin connector
- **20-to-20-pin flate cable:** 20-pin to 20-pin flat cable, 500 mm
- **M-8001-PK:** Removable terminal block, 9 pcs per pack
- **M-8003-PK:** Marker with 0 to 9 numbering, white color, 100 pcs
- **M-8004-PK:** Blank marker, 100 pcs