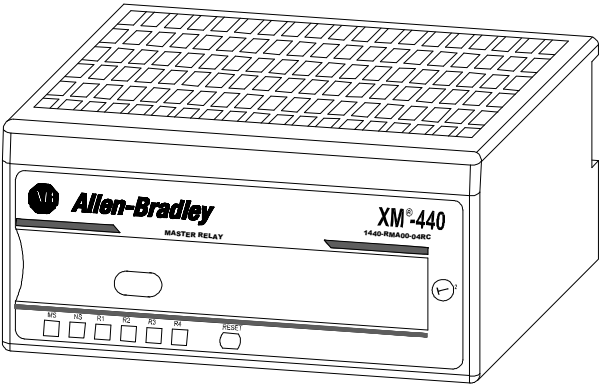
Installation Instructions

Allen-Bradley

XM-440 Master Relay Module

Catalog Number 1440-RMA00-04RC



Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://literature.rockwellautomation.com) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

WARNING 	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
ATTENTION 	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard and recognize the consequences.
SHOCK HAZARD 	Labels may be on or inside the equipment (for example, drive or motor) to alert people that dangerous voltage may be present.
BURN HAZARD 	Labels may be on or inside the equipment (for example, drive or motor) to alert people that surfaces may reach dangerous temperatures.

ATTENTION

Environment and Enclosure

This equipment is supplied as “open type” equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present, and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.
See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosures.

ATTENTION

Preventing Electrostatic Discharge

This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wrist strap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static-safe workstation.
- When not in use, keep modules in appropriate static-safe packaging.

ATTENTION

This module is designed so you can **remove and insert it under power**. However, when you remove or insert the module with power applied, I/O attached to the module can change states due to its input/output signal changing conditions. Take special care when using this feature.

WARNING

When you insert or remove the module while power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

WARNING

If you connect or disconnect the serial cable with power applied to the module or the serial device on the other end of the cable, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

IMPORTANT

Install the overlay slide label to protect serial connector and electronics when the serial port is not in use.

Safety Approvals

The following information applies when operating this equipment in hazardous locations.	**Informations sur l'utilisation de cet équipement en environnements dangereux.**
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.

WARNING

EXPLOSION HAZARD -

- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
- Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Substitution of components may impair suitability for Class I, Division 2.
- If this product contains batteries, they must only be changed in an area known to be nonhazardous.

AVERTISSEMENT

RISQUE D'EXPLOSION –

- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement.
- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit.
- La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2.
- S'assurer que l'environnement est classé non dangereux avant de changer les piles.

IMPORTANT Wiring to or from this device, which enters or leaves the system enclosure, must utilize wiring methods suitable for Class I, Division 2 Hazardous Locations, as appropriate for the installation in accordance with the product drawings as indicated in the following table.

Model	Catalog Number	Haz Location Drawings*	
		w/o Barriers	w/ Barriers
XM-120	1440-VST0201RA	48178-HAZ	48179-HAZ
XM-121	1440-VLF0201RA		
XM-122	1440-VSE0201RA		
XM-123	1440-VAD0201RA		
XM-160	1440-VDRS0600RH	51263-HAZ	51264-HAZ
XM-161	1440-VDRS0606RH		
XM-162	1440-VDRP0600RH		
XM-220	1440-SPD0201RB	48640-HAZ	48641-HAZ
XM-320	1440-TPS0201RB	48238-HAZ	48239-HAZ
XM-360	1440-TPR0600RE	48295-HAZ	48299-HAZ
XM-361	1440-TUN0600RE		
XM-362	1440-TTC0600RE		
XM-440	1440-RMA0004RC	48240-HAZ	N/A
XM-441	1440-REX0004RD	48241-HAZ	N/A
XM-442	1440-REX0304RG	48642-HAZ	N/A

* Drawings are available on the included CD

European Zone 2 Certification

If appropriately marked, this equipment is intended for use in potentially explosive atmospheres as defined by European Union Directive 94/9/CE.

Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 60079-0:2009, EN 60079-15:2010, and EN 60079-11:2007.

IMPORTANT

Observe the following additional Zone 2 certification requirements:

- This equipment is not resistant to sunlight or other sources of UV radiation.
- The secondary of a current transformer shall not be open–circuited.
- The marking "ALCR" is to be considered "as applicable" to individual products.
- Equipment of lesser Enclosure Type Rating must be installed in an enclosure providing at least IP54 protection when applied in Class I, Zone 2 environments.
- This equipment must be powered by energy limited associated equipment as defined in EN 60079 when applied in Class I, LCIE 04 ATEX 6084 X Zone 2 environments.
- Provision shall be made external to the equipment to provide the transient protection device to be set at a level not exceeding 140% of the peak rated voltage when applied in Class I, Zone 2 environments.

Mounting the Module

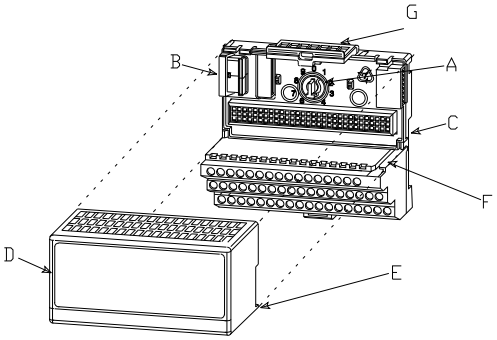
The XM-440 mounts on a XM-942 terminal base unit, Cat. No. 1440-TB-C. We recommend that you mount the module after you have connected the wiring on the terminal base unit. Refer to the *XM-942 Master Relay Terminal Base Installation Instructions* or the Module User Guide for wiring information.

ATTENTION

The XM-440 is compatible only with the XM-942 terminal base unit. The keyswitch on the terminal base unit should be at position 2 for the XM-440 module.

Do not attempt to install XM-440 modules on other terminal base units. Do not change the position of the keyswitch after wiring the XM-942 terminal base unit.

1. Make certain the keyswitch (A) on the terminal base unit (C) is at position 2 as required for the XM-440.



2. Make certain the side connector (B) is pushed all the way to the left. **You cannot install the module unless the connector is fully extended**.

3. Make sure that the pins on the bottom of the module are straight so they will align properly with the connector in the terminal base unit.

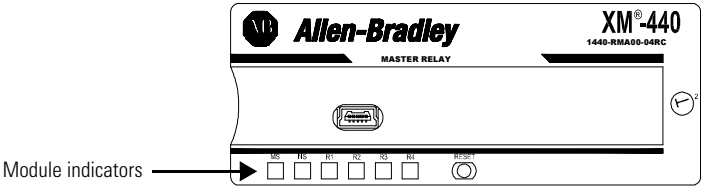
4. Position the module (D) with its alignment bar (E) aligned with the groove (F) on the terminal base.

5. Press firmly and evenly to seat the module in the terminal base unit. The module is seated when the latching mechanism (G) is locked into the module.

6. Repeat the above steps to install the next module in its terminal base.

Module Indicators

The XM-440 has six LED indicators, which are located on top of the module.



Module Status (MS) Indicator

Color	State	Description
No color	Off	No power applied to the module.
Green	Flashing Red	Module performing power-up self-test.
	Flashing	Module operating in Program Mode[1].
	Solid	Module operating in Run Mode[2].
Red	Flashing	• Application firmware is invalid or not loaded. Download firmware to the module. • Firmware download is currently in progress.
	Solid	An unrecoverable fault has occurred. The module may need to be repaired or replaced.

1 Program Mode - Typically this occurs when the module configuration settings are being updated with the Configuration Tool. In Program Mode, the module does not perform its normal functions. The alarm monitoring is stopped and the relay outputs are deactivated unless they are latched.

2 Run Mode - In Run Mode, the module collects alarm status from the XM measurement modules and controls the relay outputs.

Network Status (NS) Indicator

Color	State	Description
No color	Off	Module is not online. • Module is autobauding. • No power applied to the module; look at Module Status LED.
Green	Flashing	Module is online (DeviceNet) but no connections are currently established.
	Solid	Module is online with connections currently established.
Red	Flashing	One or more I/O connections are in the timed-out-state.
	Solid	Failed communications (duplicate MAC ID or bus-off).

Relay Indicators (4)

Color	State	Description
Red	Off	On-board relay in not activated.
	Solid	On-board relay is activated.

Self-Test

The XM-440 performs a self-test at power-up. The self-test includes an LED test and a device test. During the LED test, the indicators will be turned on independently and in sequence for approximately 0.25 seconds.

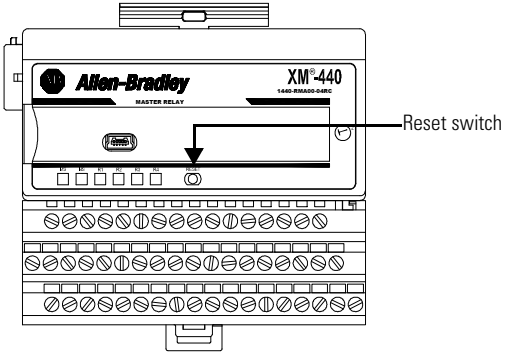
The device test occurs after the LED test. The Module Status (MS) indicator is used to indicate the status of the device self-test.

MS Indicator State	Description
Flashing Red and Green	Device self-test is in progress.
Solid Green or Flashing Green	Device self-test completed successfully, and the firmware is valid and running.

MS Indicator State	Description
Flashing Red	Device self-test completed, the hardware is OK, but the firmware is invalid. Or, the firmware download is in progress.
Solid Red	Unrecoverable fault, hardware failure, or Boot Loader program may be corrupted.

Using the Reset Switch

The XM-440 module has an external reset switch located on top of the module. The Reset switch can be used to reset all latched relays, including the relays in the Relay Expansion module when it is attached to the XM-440.



IMPORTANT The Reset switch resets the relays only if the input is no longer in alarm or the condition that caused the alarm is no longer present.

Installing the XM Serial Configuration Utility Software

The XM Documentation and Configuration Utility CD is packaged with the XM module. It contains the XM Serial Configuration Utility software, a set of User's Guides, Hazardous Location Installation drawings, and Electronic Data Sheet (EDS) files that are used by network configuration tools such as

RSNetWorx for DeviceNet. The User's Guides are in portable document format (PDF), and must be viewed using Adobe Acrobat Reader software.

To install the XM Serial Configuration Utility software, follow these steps:

1. Insert the XM Serial Configuration Utility CD-ROM into the CD-ROM drive.

If autorun is:	Then:
enabled	The Setup program starts automatically and the XM Serial Configuration Utility opening screen appears. Proceed to step 2.
disabled	Perform the following steps: A. Click **Start**, and then click **Run**. The **Run** dialog box appears. B. In the open field, type `x:\autorun`, where x is the letter of the drive containing the XM Documentation and Configuration Utility CD-ROM. C. Click **OK**. The XM Serial Configuration Utility opening screen appears.

2. Follow the instructions that appear on the screen to install the XM Serial Configuration Utility.

3. When you are finished installing the software, remove the XM Documentation and Configuration Utility CD-ROM from the CD-ROM drive. Store it in a safe place.

Agency Certification (when product marked)

UL	UL Listed for Ordinary Locations
UL	UL Listed for Class I, Division 2 Group A, B, C, and D Hazardous Locations
CSA	CSA Certified Process Control Equipment
CSA	CSA Certified Process Control Equipment for Class I, Division 2 Group A, B, C, and D Hazardous Locations
EX[3]	European Union 94/9/EEC ATEX Directive, compliant with EN 60079; Potentially Explosive Atmospheres, Protection “n,” and Protection by intrinsic safety "i"
CE[3]	European Union 89/336/EEC EMC Directive
C-Tick[3]	Australian Radiocommunications Act, compliant with:
	AS/NZS 2064, Industrial Emissions

3 See the Product Certification link at www.rockwellautomation.com for Declarations of Conformity, Certificates and other certification details.

Specifications

The following table lists the technical specifications for the XM-440 module.

Product Feature	Specification
Communications	
DeviceNet	Standard DeviceNet protocol for all functions *NOTE: The XM-440 uses only the DeviceNet protocol, not power. Module power is provided independently.* Available Electronic Data Sheet (EDS) file provides support for most DeviceNet compliant systems Baud rate 125 kb, 250 kb, 500 kb
Side Connector	All XM measurement and relay modules include side connectors that allow interconnecting adjacent modules, thereby simplifying the external wiring requirements. The interconnect provides power, DeviceNet communication, and the circuits necessary to support expansion modules, such as the XM-441 Expansion Relay module.
Serial	RS-232 via mini-connector or terminal base unit Baud rate fixed at 19200. *NOTE: Local configuration via Serial Configuration Utility.*
Indicators	
6 LEDs	Module Status - red/green Network Status -red/green Relay 1 Status - red Relay 2 Status -red Relay 3 Status - red Relay 4 Status - red

Product Feature	Specification
Relays	
Number	Four relays, two sets of contacts each - DPDT (2 Form C) Four or eight additional relays when connected to one or two XM-441 Expansion Relay modules
Contacts	250V AC, 50/60 Hz, 3 A Resistive
Failsafe	Normally energized (failsafe), or Normally de-energized (non-fail-safe)
Latching	Latching, or Non-latching
Time Delay	0 to 25.5 seconds, adjustable in 100msec increments
Voting Logic	Per relay, defined as "A out of B" where "B" is up to 16 alarms and/or relays from any XM measurement module(s) on the bus and "A" is from 1 to "B"
Reset	Local reset switch on top of module Remote reset switch wired to terminal base Digital reset command via serial or DeviceNet interface
Power	
Module	24V DC
Consumption	200mA maximum
Heat Production	3.4 Watts (11.6 BTU/hr) maximum

Product Feature	**Specification**
Environmental	
Operating Temperature	-20 to +65°C (-4 to +149°F)
Storage Temperature	-40 to +85°C (-40 to +185°F)
Relative Humidity	95% non-condensing
Conformal Coating	All printed circuit boards are conformally coated in accordance with IPC-A-610C.
Physical	
Dimensions	Height: 3.8 in (97 mm) Width: 3.7 in (94 mm) Depth: 3.7 in (94 mm)
Terminal Screw Torque	7 pound-inches (0.6 Nm)

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support/, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/support/.

Installation Assistance

If you experience a problem within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/support/americas/phone_en.html, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://literature.rockwellautomation.com.

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