Installation Instructions

A-B **Allen-Bradley**

Micro800 8-Point and 16-Point AC/DC Relay Output Modules

Catalog Numbers 2085-OW8, 2085-OW16

http://www.rockwellautomation.com/literature/

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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://www.rockwellautomation.com/literature/) 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.

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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.
⚠	**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.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Environment and Enclosure

⚠ **ATTENTION:** This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC 60664-1), at altitudes up to 2000 m (6562 ft) without derating. This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR 11. Without appropriate precautions, there may be difficulties with electromagnetic compatibility in residential and other environments due to conducted and radiated disturbances.

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 enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA or be approved for the application if nonmetallic. 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.

In addition to this publication, see the following:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1, for additional installation requirements.
- NEMA Standard 250 and IEC 60529, as applicable, for explanations of the degrees of protection provided by enclosures.

Preventing Electrostatic Discharge

⚠ **ATTENTION:** 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 wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the equipment in appropriate static-safe packaging when not in use.

North American Hazardous Location Approval

The following modules are North American Hazardous Location approved:
2085-OW8, 2085-OW16

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.	⚠ **WARNING:** 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.

⚠ **WARNING:** When you connect or disconnect the Removable Terminal Block (RTB) with field side power applied, 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: When used in a Class I, Division 2, hazardous location, this equipment must be mounted in a suitable enclosure with proper wiring method that complies with the governing electrical codes.

WARNING: If you connect or disconnect wiring while the field-side 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 insert or remove the module while backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed before proceeding.

WARNING: Exposure to some chemicals may degrade the sealing properties of materials used in the following devices: Relay K100 through K107, Epoxy for 2085-OW8; Relay K100 through K115, Epoxy for 2085-OW16. It is recommended that the User periodically inspect these devices for any degradation of properties and replace the module if degradation is found.

Additional Resources

Resource	Description
Micro830 and Micro850 Programmable Controller User Manual, publication 2080-UM002	A detailed description of how to install and use a Micro850 Programmable Controller.
Micro 800 Bus Terminator Installation Instructions, publication 2085-IN002	Information on installing the bus terminator module.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	More information on proper wiring and grounding techniques.

If you would like a manual, you can:

- download a free electronic version from the Internet: http://www.rockwellautomation.com/literature/.
- purchase a printed manual by contacting your local Allen-Bradley distributor or Rockwell Automation representative

Overview

The Micro800™ expansion I/O is a modular I/O that complements and extends the capabilities of Micro850™ controllers. These expansion I/O modules interface with Micro850 controllers using an I/O expansion port.
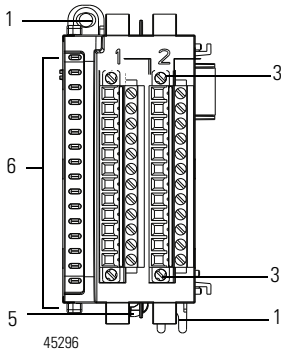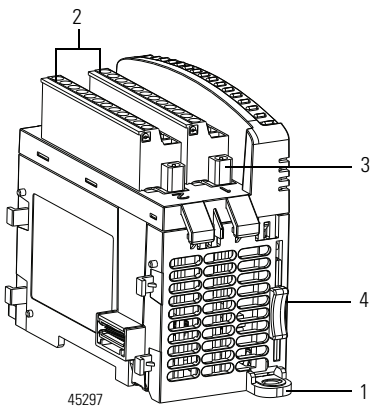
I/O Module Overview

2085-OW8 shown

45307

Front view

45308
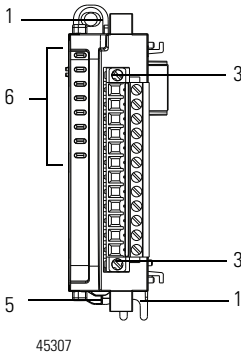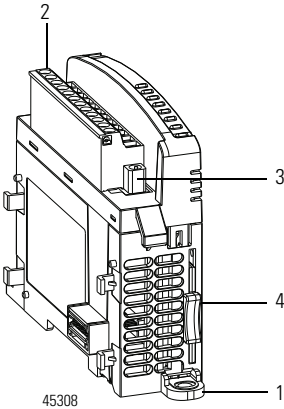
Right top view

2085-OW16 shown

45296

Front view

45297

Right top view

Module Description

	Description			Description
1	Mounting screw hole / mounting foot		4	Module interconnect latch
2	Removable Terminal Block (RTB)		5	DIN rail mounting latch
3	RTB hold down screws		6	I/O status LED

This equipment is sensitive to electrostatic discharge (ESD).
Follow ESD prevention guidelines when handling this equipment.

WARNING: Do not unscrew the RTB hold down screws and remove the RTB while power is on. This could cause an explosion in hazardous location installations. Be sure that power is removed before proceeding.
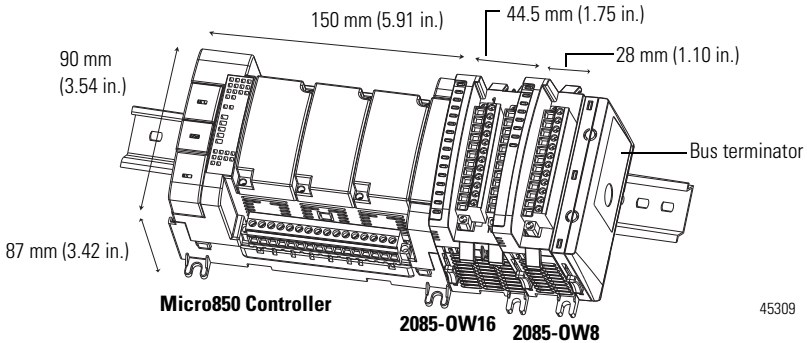
Mount the Module

For more information on proper grounding guidelines, see the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Module Spacing

Maintain spacing from objects such as enclosure walls, wireways and adjacent equipment. Allow 50.8 mm (2 in.) of space on all sides for adequate ventilation, as shown.

Mounting Dimensions and DIN Rail Mounting

150 mm (5.91 in.)
44.5 mm (1.75 in.)
28 mm (1.10 in.)
90 mm (3.54 in.)
87 mm (3.42 in.)
Bus terminator
Micro850 Controller
2085-OW16
2085-OW8
45309

Mounting dimensions do not include mounting feet or DIN rail latches.

Use Surge Suppressors

Because of the potentially high current surges that occur when switching inductive load devices, such as motor starters and solenoids, we recommend the use of some type of surge suppression to protect and extend the operating life of the controllers output contacts.

Switching inductive loads without surge suppression can significantly reduce the life expectancy of relay contacts. By adding a suppression device directly across the coil of an inductive device, you prolong the life of the output or relay contacts. You also reduce the effects of voltage transients and electrical noise from radiating into adjacent systems.

Refer to the Micro830 and Micro850 Programmable Controllers User Manual, publication 2080-UM002, for suitable surge suppression methods and recommended surge suppressors.

DIN Rail Mounting

The module can be mounted using the following DIN rails: 35 x 7.5 mm x 1 mm (EN 50 022 - 35 x 7.5).

> **TIP**   For environments with greater vibration and shock concerns, use the panel mounting method, instead of DIN rail mounting.

> ⚠ **ATTENTION:** This product is grounded through the DIN rail to chassis ground. Use zinc plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail materials (for example, aluminum or plastic) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding. Secure DIN rail to mounting surface approximately every 200 mm (7.8 in.) and use end-anchors appropriately.

Before mounting the module on a DIN rail, use a flat-blade screwdriver in the DIN rail latch and pry it downwards until it is in the unlatched position.

1. Hook the top of the DIN rail mounting area of the module onto the DIN rail, and then press the bottom until the module snaps onto the DIN rail.

2. Push the DIN rail latch back into the latched position.
   Use DIN rail end anchors (Allen-Bradley part number 1492-EAJ35 or 1492-EAHJ35) for vibration or shock environments.

To remove your module from the DIN rail, pry the DIN rail latch downwards until it is in the unlatched position.

Panel Mounting

The preferred mounting method is to use two M4 (#8) per module. Hole spacing tolerance: ±0.4 mm (0.016 in.). For mounting dimensions, refer to Micro830 and Micro850 Programmable Controller User Manual, publication 2080-UM002.

Follow these steps to install your module using mounting screws.

1. Place the module next to the controller against the panel where you are mounting it. Make sure the controller and module are spaced properly.

2. Mark drilling holes through the mounting screw holes and mounting feet then remove the module.

3. Drill the holes at the markings, then replace the module and mount it.
   Leave the protective debris strip in place until you are finished wiring the module and any other devices.

System Assembly

The Micro800 expansion I/O module is attached to the controller or another I/O module by means of interconnecting latches and hooks, as well as the bus connector. The Micro850 controller and expansion I/O modules must terminate with a 2085-ECR Bus Terminator module.

Be sure to lock the module interconnect latches and tighten the RTB hold down screws before applying power to the module.

For installation of the 2085-ECR module, refer to Micro800 Bus Terminator Module Installation Instructions, publication 2085-IN002.

> ⚠ **ATTENTION:** Failure to connect a bus terminator module to the last expansion I/O module will result in a controller hard fault.

Field Wiring Connections

In solid-state control systems, grounding and wire routing helps limit the effects of noise due to electromagnetic interference (EMI).
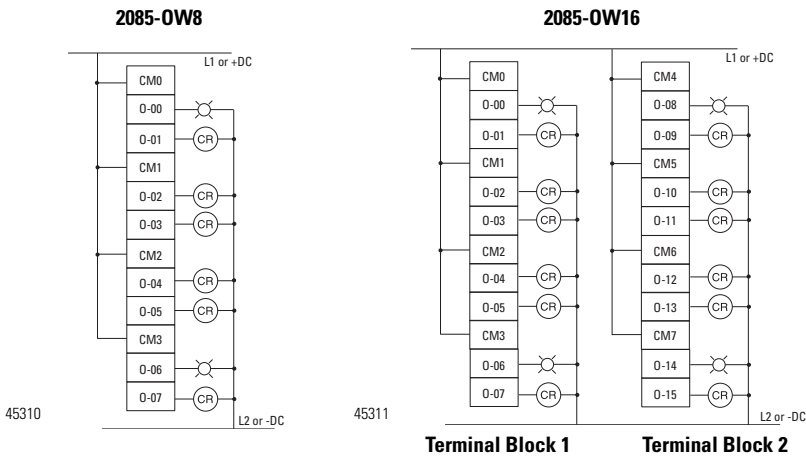
⚠ **ATTENTION:** Do not wire more than 2 conductors on any single terminal.

Wire the Outputs

Included with your 2085-OW8 module is a single 12-pin Removable Terminal Blocks (RTB). Included with your 2085-OW16 module are two 12-pin RTB. Basic wiring of your module is shown below.

Basic Wiring to the Module

2085-OW8

2085-OW16

Terminal Block 1   Terminal Block 2

Specifications

General Specifications

Attribute	2085-OW8	2085-OW16
Number of Outputs	8	16
Dimensions HxWxD	28 x 90 x 87 mm (1.10 x 3.54 x 3.42 in.)	44.5 x 90 x 87 mm (1.75 x 3.54 x 3.42 in.)
Shipping weight, approx.	140 g (4.93 oz)	220 g (7.76 oz)
Wire size	0.25… 2.5 mm^2 (22…14 AWG) solid or stranded copper wire rated at 75 °C (167 °F), or greater, 1.2 mm (3/64 in.) insulation max	

General Specifications

Attribute	2085-OW8			2085-OW16	
Insulation strip length	10 mm (0.39 in.)				
Wiring category[1]	2 – on signal ports				
Wire type	Copper				
Terminal screw torque. max	0.5…0.6 Nm (4.4…5.3 lb-in.)[2]				
Bus current draw, max	5V DC, 120 mA 24V DC, 50 mA			5V DC, 160 mA 24V DC, 100 mA	
Load current, max	(refer to Relay contact, (0.35 power factor) below)				
Power dissipation, total	2.72 W			5.14 W	

Relay contact, (0.35 power factor)	Maximum Volts	Amperes		Amperes Continuous	Volt-Amperes	
		Make	Break		Make	Break
	120V AC	15 A	1.5 A	2.0 A	1800 VA	180 VA
	240V AC	7.5 A	0.75 A			
	24V DC	1.0 A		1.0 A	28 VA	
	125V DC	0.22 A				

Attribute	Value				
Minimum load, per point	10 mA per point				
Off-state leakage, max	1.5 mA				
Status indicators	8 yellow indicators			16 yellow indicators	
Isolation voltage	240V (continuous), Reinforced Insulation Type, channel to system Type tested at 3250V DC for 60s				
Pilot duty rating	C300, R150				
Enclosure type rating	None (open-style)				
North American temp code	T4				

[1]   Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

[2]   RTB hold down screws should be tightened by hand. They should not be tightened using a power tool.

Environmental Specifications

Attribute	Value
Temperature, operating	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): -20…65 °C (-4…149 °F)
Temperature, surrounding air, max	65 °C (149 °F)
Temperature, non-operating	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): -40…85 °C (-40…185 °F)

Environmental Specifications

Attribute	Value
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5…95% non-condensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 2 g @ 10…500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g
Shock, non-operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 25 g DIN rail mount 35 g Panel mount
Emissions	CISPR 11 Group 1, Class A
ESD immunity	IEC 61000-4-2: 6 kV contact discharges 8 kV air discharges
Radiated RF immunity	IEC 61000-4-3: 10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 10V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity	IEC 61000-4-4: ±2 kV at 5 kHz on signal ports
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line(DM) and ±2 kV line-earth(CM) on signal ports
Conducted RF immunity	IEC 61000-4-6: 10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications

Certification (when product is marked)[1]	Value
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.

CE	European Union 2004/108/EC EMC Directive, compliant with:
	  EN 61326-1; Meas./Control/Lab., Industrial Requirements
	  EN 61000-6-2; Industrial Immunity
	  EN 61000-6-4; Industrial Emissions
	  EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
	European Union 2006/95/EC LVD, compliant with:
	  EN 61131-2; Programmable Controllers (Clause 11)

C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

[1]   See the Product Certification link at http://www.rockwellautomation.com/products/certification/ for Declaration of Conformity, Certificates, and other certification details.

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.

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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://www.rockwellautomation.com/literature/.

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