

Installation Instructions

ArmorPoint 4-Channel 24V dc Analog Output Modules, Series A

Catalog Number 1738-OE4CM12

Topic	Page
Important User Information	2
Environment and Enclosure	3
Prevent Electrostatic Discharge	3
About the Module	4
Mount the I/O Base	5
Install the Module	6
Remove the Module From the Mounting Base	7
Wire the Module	8
Communicate With Your Module	8
Interpret the Status Indicators	10
Specifications	12

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.

Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell Automation, Inc., is prohibited.

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.

Environment and Enclosure

ATTENTION

This equipment is intended for use in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters (6562 ft) without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as enclosed equipment. It should not require additional system enclosure when used in locations consistent with the enclosure type ratings stated in the Specifications section of this publication. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings, beyond what this product provides, that are required to comply with certain product safety certifications.

In addition to this publication, see:

- Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication 1770-4.1, for additional installation requirements.
- NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure

Prevent 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.
-

4 ArmorPoint 4-Channel 24V dc Analog Output Modules, Series A

ATTENTION



Make sure all connectors and caps are securely tightened to properly seal the connections against leaks and maintain IP enclosure type requirements.

ATTENTION

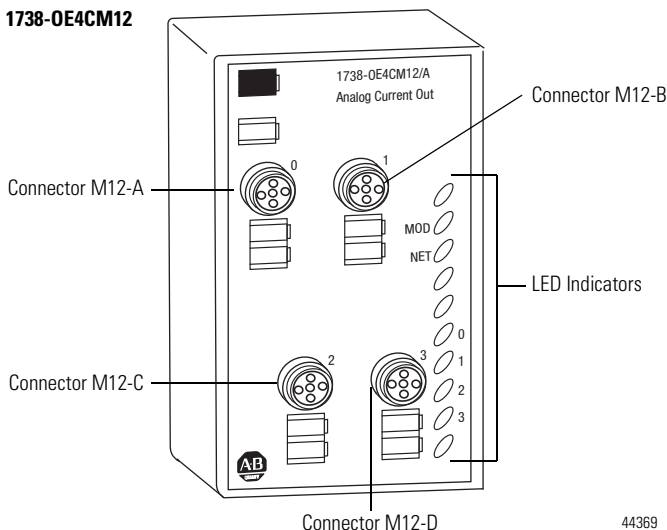


To comply with the CE Low Voltage Directive (LVD), all connected I/O must be powered from a source compliant with the following:
Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV).

About the Module

The ArmorPoint I/O family (Cat. no. 1738) consists of modular I/O modules. The sealed IP67 housing of these modules requires no enclosure. (Note that environmental requirements other than IP67 may require an additional appropriate housing.) I/O connectors are sealed M12 style. The mounting base ships with the module. The 1738-OE4CM12 module is shown below.

1738-OE4CM12



44369

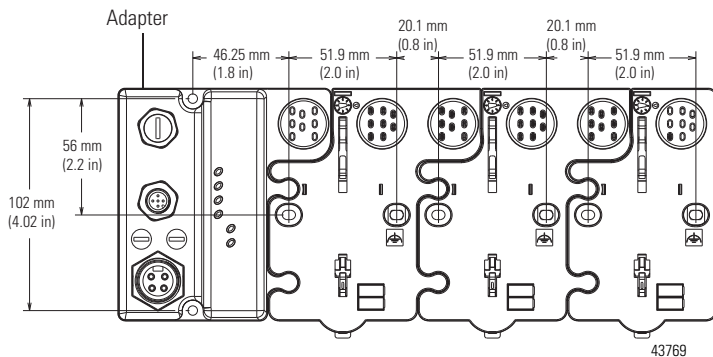
Mount the I/O Base

To mount the ArmorPoint I/O base on a wall or panel, use the screw holes provided in the ArmorPoint base .

IMPORTANT

The ArmorPoint I/O module must be mounted on a grounded metal mounting plate or other conductive surface.

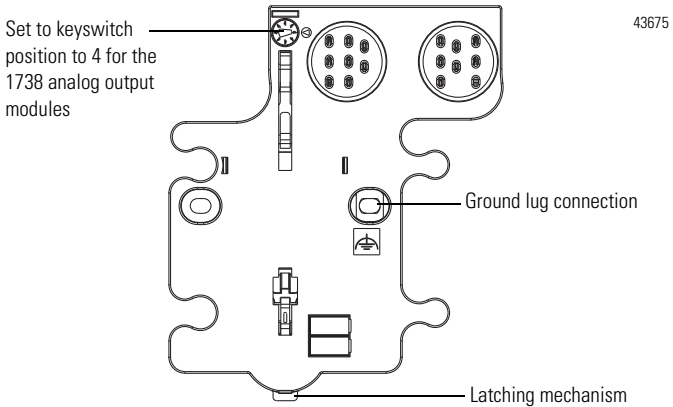
Mounting illustration for the ArmorPoint adapter with I/O bases



Follow the instructions to install the mounting base.

1. Lay out the required points as shown above in the drilling dimension drawing.
2. Drill the necessary holes for M4 (#8) machine or self-tapping screws.
3. Mount the base using M4 (#8) screws.
4. Ground the system using the ground lug connection. (The ground lug connection is also a mounting hole.)

Mounting base

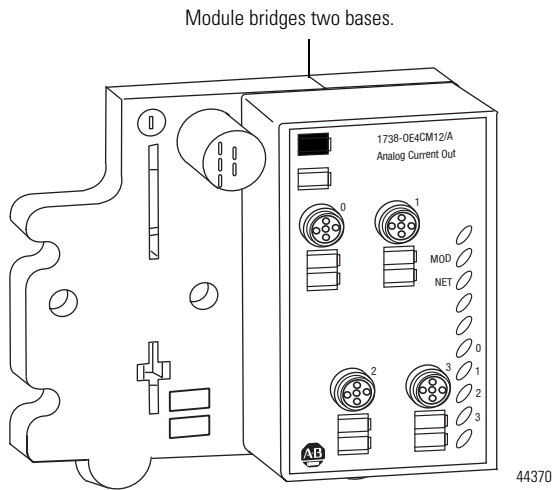


Install the Module

Follow the instructions to install the analog output module.

1. Using a bladed screwdriver, rotate the keyswitch on the mounting base clockwise until the number 4 aligns with the notch in the base.
2. Position the module vertically above the mounting base.

The module bridges two bases.



3. Push the module down until it engages the latching mechanism.

You will hear a clicking sound when the module is properly engaged.

The locking mechanism locks the module to the base.

Remove the Module From the Mounting Base

Follow the instructions to remove the module from the mounting base.

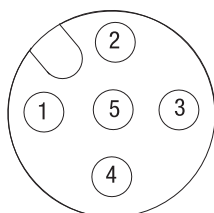
1. Put a flat blade screwdriver into the slot of the orange latching mechanism.
2. Push the screwdriver toward the I/O module to disengage the latch.

The module lifts up off the base.

3. Pull the module off of the base.

Wire the Module

1738-OE4CM12



(view into connector)

- Pin 1 - Output
- Pin 2 - 24V dc
- Pin 3 - Common
- Pin 4 - Common
- Pin 5 - No Connect

IMPORTANT

Analog modules have earth grounded metal rings. This should be considered when choosing shielded cables and grounding techniques.

ATTENTION



Make sure all connectors and caps are securely tightened to properly seal the connections against leaks and maintain IP enclosure type requirements.

Communicate With Your Module

I/O messages are sent to (consumed) and received from (produced) the ArmorPoint I/O modules. These messages are mapped into the processor's memory. These ArmorPoint I/O analog output modules produce 4 bytes of input data (scanner Rx - fault status). They consume 8 bytes of output data (scanner Tx).

Default Data Map for the Module

1738-OE4CM12

Message size: 4 Bytes

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Produces (Scanner Rx)	High Byte - Channel 1 Status								Low Byte - Channel 0 Status							
	Not used				H C A	L C A	C C M	C M F	Not used				H C A	L C A	C M M	C M F
	High Byte - Channel 3 Status								Low Byte - Channel 2 Status							
	Not used				H C A	L C A	C C M	C M F	Not used				H C A	L C A	C M M	C M F

Where:

CF = Channel Fault Status; 0 = no error, 1 = fault

CM = Calibration Mode; 0 = normal, 1 = calibration mode

LCA = Low Clamp Alarm; 0 = no error, 1 = fault

HCA = High Clamp Alarm; 0 = no error, 1 = fault

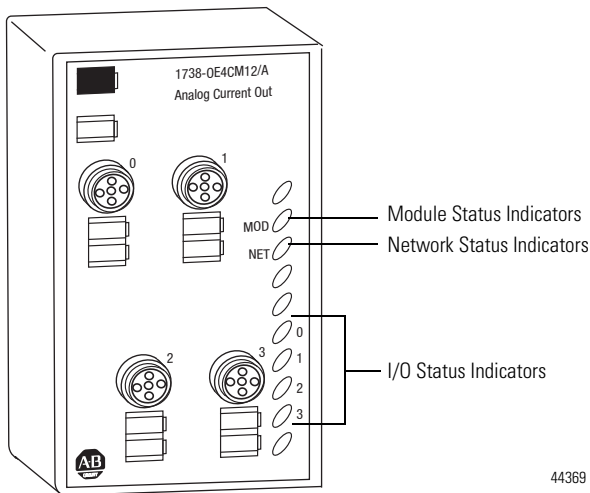
1738-OE4CM12

Message size: 8 Bytes

	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Consumes (Scanner Tx)	Output Channel 0 High Byte								Output Channel 0 Low Byte							
	Output Channel 1 High Byte								Output Channel 1 Low Byte							
	Output Channel 2 High Byte								Output Channel 2 Low Byte							
	Output Channel 3 High Byte								Output Channel 3 Low Byte							

Interpret the Status Indicators

1738-OE4CM12



Status Indicators

Indicator	State	Description
Module Status	Off	No power applied to device.
	Green	Device operating normally.
	Flashing green	Device needs commissioning due to missing, incomplete, or incorrect configuration.
	Flashing red	Recoverable fault.
	Red	Unrecoverable fault - may require device replacement.
	Flashing red/green	Device is in self-test.

Status Indicators (Continued)

Indicator	State	Description
Network Status	Off	Device is not on line: - Device has not completed dup_MAC-id test. - Device not powered - check module status indicator.
	Flashing green	Device is on line but has no connections in the established state.
	Green	Device is on line and has connections in the established state.
	Flashing red	One or more I/O connections in timed-out state.
	Red	Critical link failure - failed communication device. Device detected error that prevents it from communicating on the network.
	Flashing red/green	Communication faulted device - the device has detected a network access error and is in communication faulted state. Device has received and accepted an Identity Communication Faulted Request - long protocol message.
I/O Status	Off	Module in CAL mode.
	Solid green	Device operating normally.
	Flashing green	Channel being calibrated.
	Flashing red	Open wire or no power.
	Solid red	Unused.

Specifications

General

Attribute	Value
Outputs per module	4 single ended, nonisolated
Output current	0 mA output until communication established 0...21 mA user configurable
Resolution	16 bits 0.32 μ A/cnt
Absolute accuracy, min ⁽¹⁾	0.4% (0.1% if calibrated)
Accuracy drift w/temp.	< 50 ppm/ $^{\circ}$ C
Resistive load on mA output	0...750 Ω
Conversion type	Digital to analog converter
Conversion rate	1 μ s
Data format	Signed integer
Calibration	Factory calibrated
Step response to 63% of FS	40 μ s
Indicators	1 green/red module status indicator, logic side 1 green/red network status indicator, logic side 4 green/red output status indicators, logic side
Keyswitch position	4
PointBus current	75 mA @ 5V dc
Power dissipation, max, at 28.8V dc	750 Ω load on each output - 1.86 W 0 Ω load on each output - 2.15 W
Power requirements	Backplane 75 mA @ 5V dc, Customer supply 10...28.8V dc

General (Continued)

Attribute	Value
Special functionality	Open wire detect, integer scaling Calibration possible for better accuracy Programmable Low, Low Low, High, and High High range alarms
Thermal dissipation, max, at 28.8V dc	750 Ω load on each output - 6.34 BTU/hr 0 Ω load on each output - 7.33 BTU/hr
Isolation voltage	50V (continuous), Reinforced Insulation Type, field-side to system Type tested at 1250V AC for 60 s, field-side to system No isolation between individual channels
External dc power supply voltage	24V dc nominal
External dc power voltage range	10...28.8V dc (includes 5% ac ripple)
External dc power supply current	115 mA @ 24V dc (including outputs @ 20 mA)
Dimensions (HxWxD), approx.	71.6 x 33.1 x 111.6 mm (2.82 x 1.30 x 4.39 in.)
Enclosure type rating	Meets IP65/66/67/69K (when marked)
Mounting base screw torque	M4 (#8) screw 0.85 Nm (7.5 lb-in) in Aluminum 1.81 Nm (16 lb-in) in Steel
Wiring category ⁽²⁾	2 - on signal ports
Weight, approx.	290 g (10.2 oz)

⁽¹⁾ Includes offset, gain, non-linearity and repeatability error terms.

⁽²⁾ Use this Conductor Category information for planning conductor routing. Refer to Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

14 ArmorPoint 4-Channel 24V dc Analog Output Modules, Series A

Environmental

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...60 °C (-4...140 °F)
Temperature, nonoperating	IEC 60068-2-1 (Test Ab, Unpackaged Non-operating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Non-operating Dry Heat): -40...85 °C (-40...185 °F)
Relative humidity	IEC 60068-2-30 (Test Db, Unpackaged Damp Heat): 5...95% non-condensing
Vibration	IEC 60068-2-6 (Test Fc, Operating): 5g @ 10...500 Hz
Shock, operating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 30g
Shock, nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock): 50g
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 3V/m with 1 kHz sine-wave 80%AM from 2000...2700 MHz

Environmental (Continued)

Attribute	Value
EFT/B immunity	IEC 61000-4-4: ±3 kV at 5 kHz on signal ports
Surge transient immunity	IEC 61000-4-5: ±1 kV line-line (DM) on signal ports ±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
CE	European Union 2004/108/EC EMC Directive, compliant with: EN 61326; 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)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR11; Industrial Emissions

⁽¹⁾ See the Product Certification link at <http://www.ab.com> for Declarations 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://support.rockwellautomation.com>, 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://support.rockwellautomation.com>.

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	1.440.646.3434 Monday – Friday, 8 a.m. – 5 p.m. EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

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 (see phone number above to obtain one) to your distributor in order to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

Allen-Bradley, Rockwell Automation, TechConnect, and ArmorPoint are trademarks of Rockwell Automation, Inc. Trademarks not belonging to Rockwell Automation are property of their respective companies.

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Publication 1738-IN025C-EN-P - March 2010

Supersedes Publication 1738-IN025B-EN-P - February 2010 Copyright © 2010 Rockwell Automation, Inc. All rights reserved. Printed in Singapore.