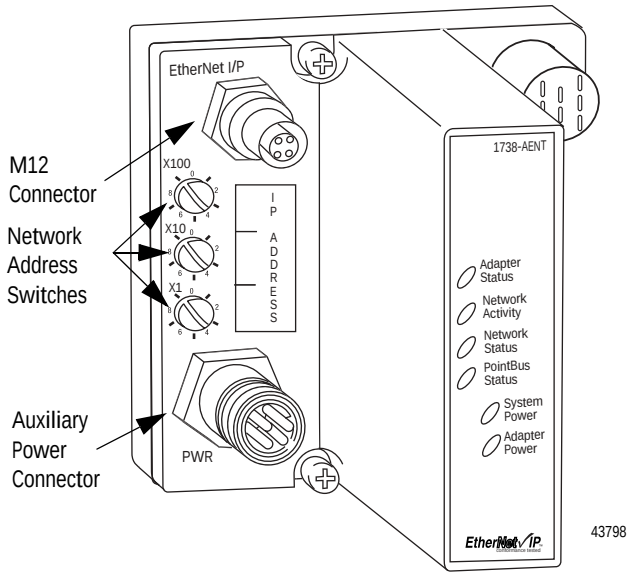
ArmorPoint EtherNet/IP Adapter, Series A

(Cat. No. 1738-AENT)

The ArmorPoint™ EtherNet/IP adapter (Cat. no. 1738) ships with the adapter and a terminating base to be used with the last I/O module on the backplane. The sealed IP67 housing of the adapter requires no enclosure. (Note that environmental requirements other than IP67 may require an additional appropriate housing.) The EtherNet/IP connector is a sealed D-coded M12 (micro) style. The ArmorPoint EtherNet/IP adapter is shown below.



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.ab.com/manuals/gi) 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 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 • recognize the consequence
SHOCK HAZARD 	Labels may be located on or inside the equipment to alert people that dangerous voltage may be present.
BURN HAZARD 	Labels may be located on or inside the equipment to alert people that surfaces may be dangerous temperatures.

ATTENTION

Environment and Enclosure

This equipment is intended for use in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters 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.

NOTE: See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure. Also, see the appropriate sections in this publication, as well as the Allen-Bradley publication 1770-4.1 ("Industrial Automation Wiring and Grounding Guidelines"), for additional installation requirements pertaining to this equipment.

ATTENTION

Preventing Electrostatic Discharge

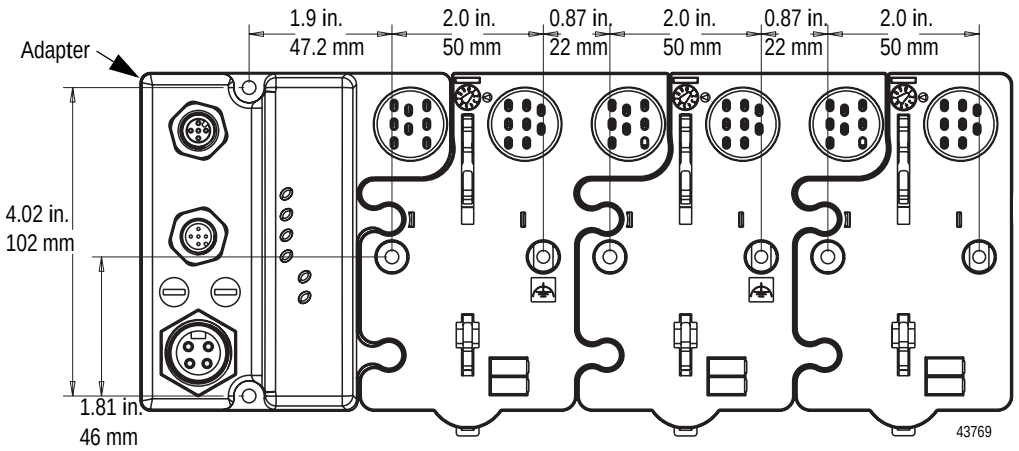
This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- 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, store the equipment in appropriate static-safe packaging.

Mount the Adapter and I/O Base

To mount the ArmorPoint adapter on a wall or panel, use the screw holes provided in the ArmorPoint adapter.

A mounting illustration for the ArmorPoint adapter with I/O bases is shown below.



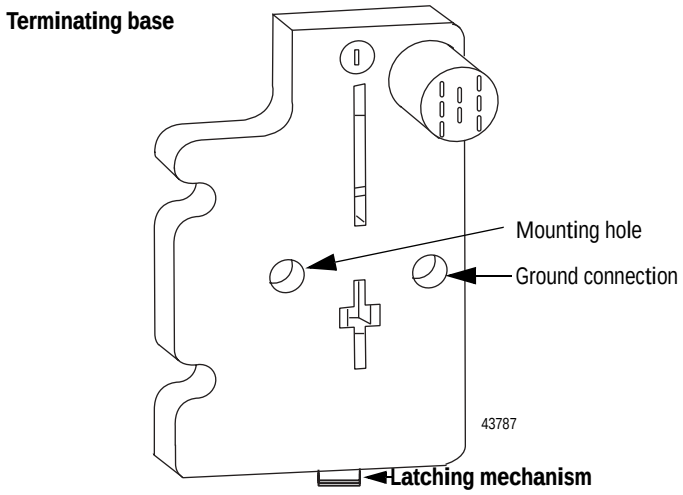
Install the mounting base as follows:

1. Lay out the required points as shown above in the drilling dimension drawing.
2. Drill the necessary holes for #8 (M4) machine or self-tapping screws.

3. Mount the adapter using #8 (M4) screws.

4. Ground the system using the ground lug connection in the I/O base. (The ground lug connection is also a mounting hole.)

5. Mount the terminating base that was shipped with the adapter as the last base in the backplane instead of the base that was shipped with the I/O module.



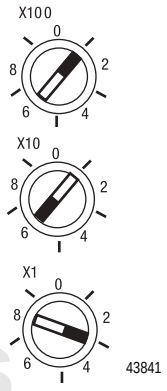
Set the Network Address

To set the network address, you can:

- adjust the switches on the front of the module
- use a Dynamic Host Configuration Protocol (DHCP) server, such as Rockwell Automation BootP/DHCP
- retrieve the IP address from nonvolatile memory

The adapter reads the switches first to determine if the switches are set to a valid number. You set the node address by adjusting the 3 switches on the front of the module (refer to the illustration on page 1). Use a small blade screwdriver to rotate the switches. Line up the small notch on the switch with the number setting you wish to use. Valid settings range from 001 through 254.

This example shows the network address set at 163.



When the switches are set to a valid number, the adapter's IP address will be 192.168.1.xxx (where xxx represents the number set on the switches). The adapter's subnet mask will be 255.255.255.0 and the gateway address will be set to 0.0.0.0. When the adapter is reading the network address set on the switches, the adapter will not have a host name assigned to it or use any Domain Name System.

If the switches are set to an invalid number (i.e., 000 or a value greater than 254), the adapter checks to see if DHCP is enabled. If DHCP is enabled, the adapter asks for an address from a DHCP server. The DHCP server will also assign other Transport Control Protocol (TCP) parameters.

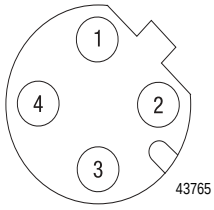
If DHCP is not enabled, the adapter will use the IP address (along with other TCP configurable parameters) stored in nonvolatile memory.

Refer to publication 1738-UM004, ArmorPoint I/O EtherNet/IP Adapter User Manual, for more information.

Wire the EtherNet/IP Adapter

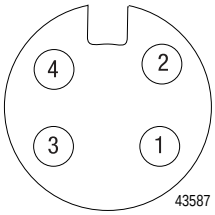
Following are wiring instructions for the ArmorPoint EtherNet/IP adapter.

1738-AENT Network Connector



Female In Connector
(view into connector)
Pin 1 - Tx +
Pin 2 - Rx +
Pin 3 - Tx -
Pin 4 - Rx -

1738-AENT Auxiliary Power

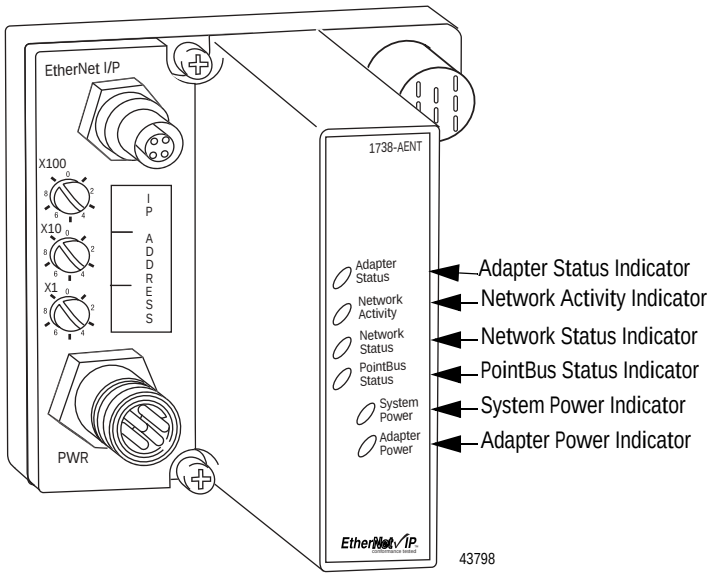


Male In Connector
(view into connector)
Pin 1 - User Power +
Pin 2 - Adapter Power +
Pin 3 - Adapter Power -
Pin 4 - User Power -

ATTENTION

Make sure all connectors and caps are securely tightened to properly seal the connections against leaks and maintain IP67 requirements.

Troubleshoot with the Indicators



Indication	Indication	Probable Cause
Adapter Status	Off	No power applied to the device.
	Flashing Red/Green	LED power up test (module self test).
	Green	Device is operating normally.
	Flashing Red	Recoverable fault has occurred: - Firmware (NVS) update - Network IP address changed - CPU load exceeded.
	Solid Red	Unrecoverable fault has occurred: - self test failure (checksum failure at power up, ramtest) failure at powerup - firmware fatal error.
Network Activity	Off	No link established.
	Flashing Green/Off	Transmit or receive activity.
	Green	Link established.
Network Status	Off	Device is not initialized. The module does not have an IP address.
	Flashing Green	No CIP connections. Device has an IP address, but no CIP connections are established.
	Green	CIP connections. Device on line, has an IP address, and CIP connections are established.
	Flashing Red	One or more Ethernet® connections has timed out.
	Red	No link. The module is not physically connected to a powered Ehternet device.
	Flashing Red/Green	The module is performing a self test (only occurs during power up test).

Indication	Indication	Probable Cause
PointBus Status	Off	Device not powered - check module status indicator.
	Flashing Red/Green	Recoverable fault has occurred: - at power up, the number of expected modules does not equal the number of modules present - a module is missing - node fault (I/O connection timeout).
	Red	Unrecoverable fault has occurred: - the adapter is bus off - controller in program/idle mode - Ehternet cable open.
	Green	Adapter online with connections established (normal operation, run mode).
System Power	Off	Not active - field power is off or dc-dc converter problem.
	Green	System power on - dc-dc converter active (5V).
Adapter Power	Off	Not active - field power is off.
	Green	Power on - 24V present.

Specifications

Following are specifications for the 1738 ArmorPoint EtherNet/IP adapter.

ArmorPoint EtherNet/IP Adapter - 1738-AENT	
Expansion I/O Capacity	• Maximum of 63 modules • Maximum of 5 Rack Optimized connections (for digital modules only) • Maximum of 25 Direct connections • 1738-AENT backplane current output = 1.0A maximum. The actual number of modules can vary. Add up the current requirements of the modules you want to use to make sure they do not exceed the amperage limit of 1.0A for the 1738-AENT. • Backplane current can be extended beyond 1.0A with a 1738-EP24DC Backplane Extension Power Supply. Add multiple 1738-EP24DC modules to reach the 63 module maximum.
Ethernet Communication Rate	10/100Mbits/s, half or full-duplex

Cat. No.	**PointBus Current Requirements**
1738-IB2M12	75mA
1738-IB4xxx	75mA
1738-IB8xxx	75mA
1738-IV4xxx	75mA
1738-OB2EM12	75mA
1738-OB2EPM12	75mA
1738-OB4Exxx	75mA
1738-OB8Exxx	75mA
1738-OV4EM12	75mA
1738-OW4xxx	90mA
1738-IE2CM12	75mA
1738-OE2CM12	75mA
1738-IE2VM12	75mA
1738-OE2VM12	75mA
1738-IA2xxx	75mA
1738-OA2xxx	75mA
1738-IJM23	160mA
1738-SSIM23	110mA
1738-IR2M12	220mA
1738-IT2IM12	175mA
1738-VHSC24M23	180mA
1738-232ASCM12	75mA
1738-485ASCM12	75mA

Power Supply Specifications	
Power Supply	**Note:** In order to comply with CE Low Voltage Directives (LVD), you must use either a NEC Class 2, a Safety Extra Low Voltage (SELV) or a Protected Extra Low Voltage (PELV) power supply to power this adapter. A SELV supply cannot exceed 30V rms, 42.4V peak or 60V dc under normal conditions and under single fault conditions. A PELV supply has the same rating and is connected to protected earth.
Input Voltage Rating	24V dc nominal 10-28.8V dc range
Inrush Current	6A maximum for 10ms
Field Side Power Requirements, Maximum	24V dc (+20% = 28.8V dc) @ 400 mA
Interruption	Output voltage will stay within specifications when input drops out for 10ms at 10V with maximum load
General Specifications	
LED Indicators	1 green/red Adapter status 1 green Network activity 1 green/red Network status 1 green/red PointBus status 1 green System Power (PointBus 5V power) 1 green Adapter Power (24V from field supply)
Power Consumption, Maximum	8.1W @ 28.8V dc
Power Dissipation, Maximum	2.8W @ 28.8V dc
Thermal Dissipation, Maximum	9.5 BTU/hr. @ 28.8V dc
PointBus Output Current, Maximum	1A @ 5V dc ±5% (4.75 - 5.25)
Input Overvoltage Protection	Reverse polarity protected
Isolation Voltage (continuous-voltage withstand rating)	50V rms Tested to withstand 1250V ac rms for 60s
Field Power Bus Nominal Voltage Supply Voltage Supply Current	 24V dc 10-28.8V dc range 10A maximum
Dimensions Inches (Millimeters)	4.41H x 2.83W x 2.56D (112H x 72W x 65D)
Operating Temperature	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 to 60°C (-4 to 140°F)
Storage Temperature	IEC 60068-2-1 (Test Ab, Un-packaged Non-operating Cold), IEC 60068-2-2 (Test Bb, Un-packaged Non-operating Dry Heat), -40 to 85°C (-40 to 185°F)
Relative Humidity	IEC 60068-2-30 (Test Db, Un-packaged Non-operating Damp Heat): 5-95% non-condensing
Shock	IEC60068-2-27 (Test Ea, Unpackaged Shock): Operating 30g Non-operating 50g
Vibration	IEC60068-2-6 (Test Fc, Operating): 5g @ 10-500Hz
ESD Immunity	IEC 61000-4-2: 6kV contact discharges 8kV air discharges

General Specifications (continued)		
Radiated RF Immunity	IEC 61000-4-3: 10V/m with 1kHz sine-wave 80%AM from 30MHz to 2000MHz 10V/m with 200Hz 50% Pulse 100%AM at 900Mhz 10V/m with 200Hz 50% Pulse 100%AM at 1890Mhz	
EFT/B Immunity	IEC 61000-4-4: ±4kV at 5kHz on power ports ±2kV at 5kHz on communication ports	
Surge Transient Immunity	IEC 61000-4-5: ±1kV line-line(DM) and ±2kV line-earth(CM) on power ports ±2kV line-earth(CM) on unshielded communications port (tested as balanced circuits)	
Conducted RF Immunity	IEC 61000-4-6: 10Vrms with 1kHz sine-wave 80%AM from 150kHz to 80MHz	
Emissions	CSPR 11: Group 1, Class A	
Enclosure Type Rating	Meets IP65/66/67 (when marked)	
Mounting Base Screw Torque	#8 screw, 7.5 in. lbs. in Aluminum, 16 in. lbs. in Steel	
Wiring Category[1]	1 - on power ports 1 - on communications ports	
Weight Imperial (Metric)	0.80 lb. (0.36 kg)	
Certifications: (when product is marked)	c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada
	CE[2]	European Union 89/336/EEC EMC Directive, compliant with: EN 61000-6-4; Industrial Emissions EN 50082-2; Industrial Immunity EN 61326; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity
	C-Tick[2]	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
	EtherNet/IP	ODVA conformance tested to EhterNet/IP specifications

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

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

Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the web to assist you in using our 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 with a hardware module 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 module up and running:

United States	1.440.646.3223 Monday – Friday, 8am – 5pm EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

New Product Satisfaction Return

Rockwell tests all of our 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:

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 return procedure.

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Publication 1738-IN017A-EN-E - June 2004 PN 957824-43