# ArmorPoint ControlNet Adapter, Series A

Catalog Number 1738-ACNR

The ArmorPoint ControlNet adapter 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.) ControlNet connectors are two redundant TNC style network connectors and one mini style power connector. The ArmorPoint ControlNet adapter is shown below.
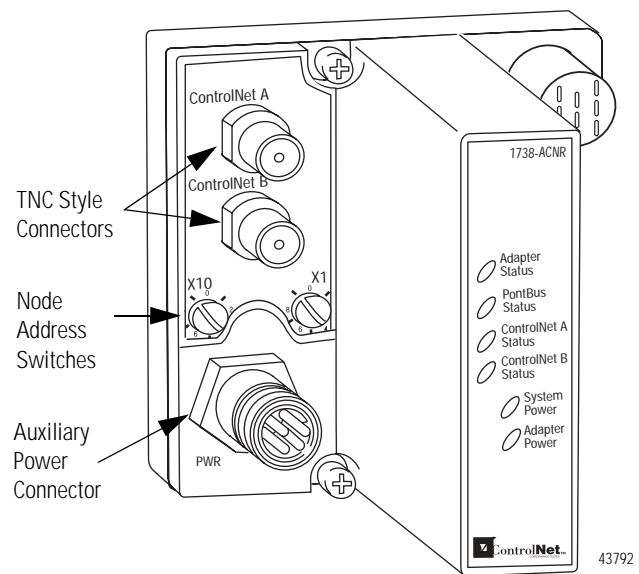
Important User Information

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://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 • recognize the consequence

SHOCK HAZARD ⚡	Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that dangerous voltage may be present.

BURN HAZARD ♨	Labels may be located on or inside the equipment (e.g., drive or motor) 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.

Before You Begin

To effectively use your adapter, note the following considerations.

Understand Messaging

Class 3 (Explicit Message) requests through the adapter to a specific I/O module may not always receive a response from the I/O module. In the case where the I/O module does not reply to the request, the adapter responds with an error code indicating a time-out.

Establish I/O Connections

When you power up a ArmorPoint I/O system and establish I/O connections, the outputs transition to the Idle state, applying Idle state data before going to RUN mode. This occurs even when the controller making the connection is already in RUN mode.

Configure Autobaud

The adapter cannot reconfigure an I/O module that you previously configured to operate at a fixed baud rate. When you reuse a ArmorPoint I/O module from another ArmorPoint I/O system, configure the module to autobaud before using it with the adapter.

For More Information

Refer to the ArmorPoint I/O ControlNet Adapter Release Notes, publication 1738-RN001, online at URL http://literature.rockwellautomation.com.

Mount the Adapter and I/O Base

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

A mounting illustration for the ArmorPoint adapter with I/O bases is shown below.
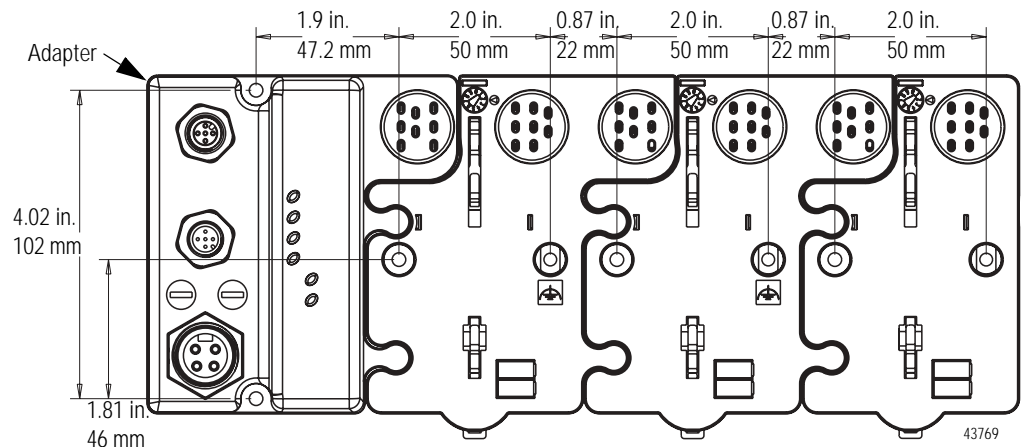
Install the mounting base as follows:

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.
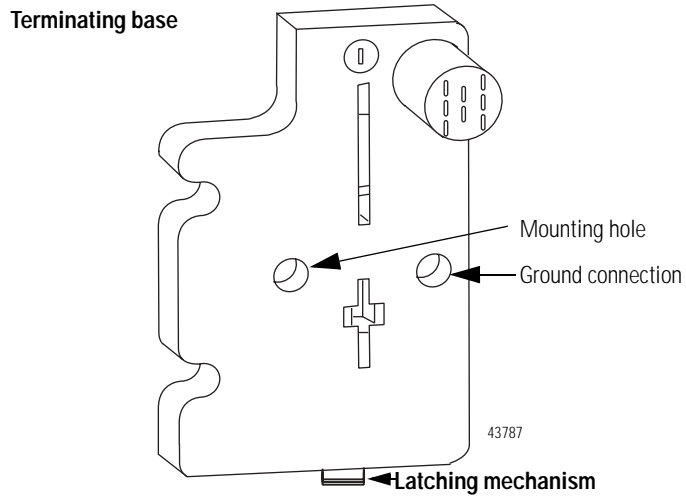
Set the Node Address

To set the node address, adjust the 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. The two switches are most significant digit (MSD) and least significant digit (LSD). The switches can be set from 01 through 99. The module reads the switches at power-up.

This example shows the node address set at 63.
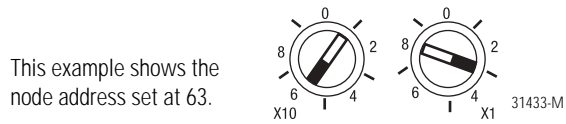
The rotary switches are read periodically. If the switches have been changed since the last time they were read and they no longer match the on line address, a minor fault will occur, which is indicated by a flashing red Adapter Status LED.

Wire the ControlNet Adapter

Following are wiring instructions for the ArmorPoint ControlNet adapter.

TNC Cables

- Connect TNC cables to Channel A or B for single media.
- Connect TNC cables to Channel A and B for redundant media.

1738-ACNR Auxiliary Power
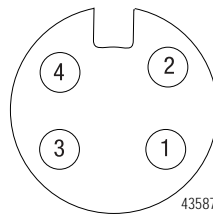
Male In Connector
(view into connector)
Pin 1 -   User Power +
Pin 2 -   Adapter Power +
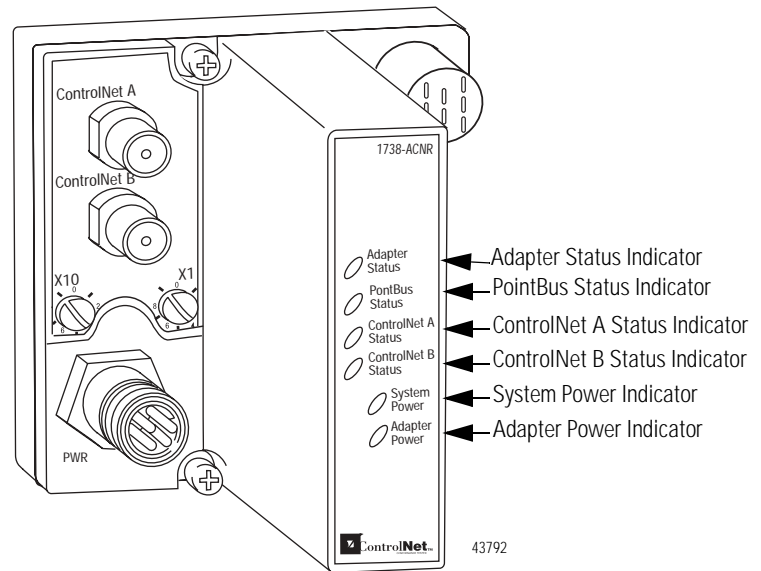Pin 3 -   Adapter Power -
Pin 4 -   User Power -

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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

Adapter Status Indicator
PointBus Status Indicator
ControlNet A Status Indicator
ControlNet B Status Indicator
System Power Indicator
Adapter Power Indicator

Indication	Indication	Probable Cause
Adapter Status	Off	No power applied to device.
	Alternating Red/Green	LED powerup test (module self-test).
	Flashing Red	Recoverable fault has occurred: - Firmware (NVS) update - MAC ID changed - CPU load exceeded.
	Solid Red	Unrecoverable fault has occurred: - self test failure (checksum failure at powerup, ramtest failure) at powerup - firmware fatal error.
	Flashing Green	Waiting for connection or ControlNet cable break.
	Solid Green	Module is operating correctly (normal mode).

Indication	Indication	Probable Cause
PointBus Status	Off	Device is not powered - check module status indicator.
	Alternating Red/Green	LED powerup test.
	Flashing Red	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 - the adapter has failed its dup_MAC_ID check.
	Flashing Green	Adapter is on line with no connections established: - adapter chassis size has not been configured - controller in program/Idle mode - ControlNet cable break.
	Green	Adapter is on line with connections established (normal operation, in run mode).
ControlNet A/B Status (Viewed together)	Both Steady Off	Reset, no power or entire network interface deactivated.
	Alternating Red/Green	Self test mode.
	Alternating Red/Off	Bad/invalid node configuration (such as dup_MAC_ID).
	Both Steady Red	Failed link interface.
ControlNet A/B Status (Viewed individually)	Steady Off	Channel disabled or channel not supported.
	Flashing Red/Green	Invalid link configuration.
	Flashing Red/Off	Severe link error - link fault or no MAC frames received.
	Flashing Green/Off	Temporary channel error or listen-only.
	Steady Green	Normal operation - MAC frames are being received without detected error.
System Power	Off	Not active - Field power is off or dc-dc converter problem.
	Green	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 ControlNet adapter.

ArmorPoint Control Adapter - 1738-ACNR	
Expansion I/O Capacity	- Maximum of 63 modules - Maximum of 5 Rack Optimized connections (for digital modules only) - Maximum of 25 Direct connections 1738-ACNR backplane current output = 1.0A maximum. See the list below for backplane current consumption for each ArmorPoint I/O catalog number and the current consumption for each of the ArmorPoint modules connected to the 1738-ACNR. Verify that it is below 1.0A. - Backplane current can be extended beyond 1.0A with a 1738-EP24DC Backplane Extension Power Supply. The 1738-EP24DC can supply up to an additional 1.3A of backplane current. - Multiple 1738-EP24DC modules can be used to reach the maximum of 63 modules. **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
ControlNet Communication Rate	5Mbits/s (fixed value)

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 10-28.8V dc range
Inrush Current	6A maximum for 10ms
Field Side Power Requirements, Maximum	24V dc (+20% = 28.8V dc) @ 425 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 2 green/red ControlNet status 1 green/red PointBus status 1 green System Power (PointBus 5V power) 1 green Adapter Power (24V from field supply)
Power Consumption, Maximum	10.2W @ 28.8V dc
Power Dissipation, Maximum	5.0W @ 28.8V dc
Thermal Dissipation, Maximum	16.9 BTU/hr. @ 28.8V dc
PointBus Output Current, Maximum	1A @ 5V dc $\pm$5% (4.75-5.25)
Input Overvoltage Protection	Reserve polarity protected
Isolation Voltage (continuous-voltage withstand rating)	50V rms Tested at 1250V ac 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 ±3kV at 5kHz on signal 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 shielded ports
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:[2]
(when product is marked)
	c-UL-us UL Listed Industrial Control Equipment,
	              certified for US and Canada
	
	CE 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 Australian Radiocommunications Act, compliant with:
	              AS/NZS CISPR 11; Industrial Emissions
	CI ControlNet Int'l conformance tested to ControlNet
	              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 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 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 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:

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.