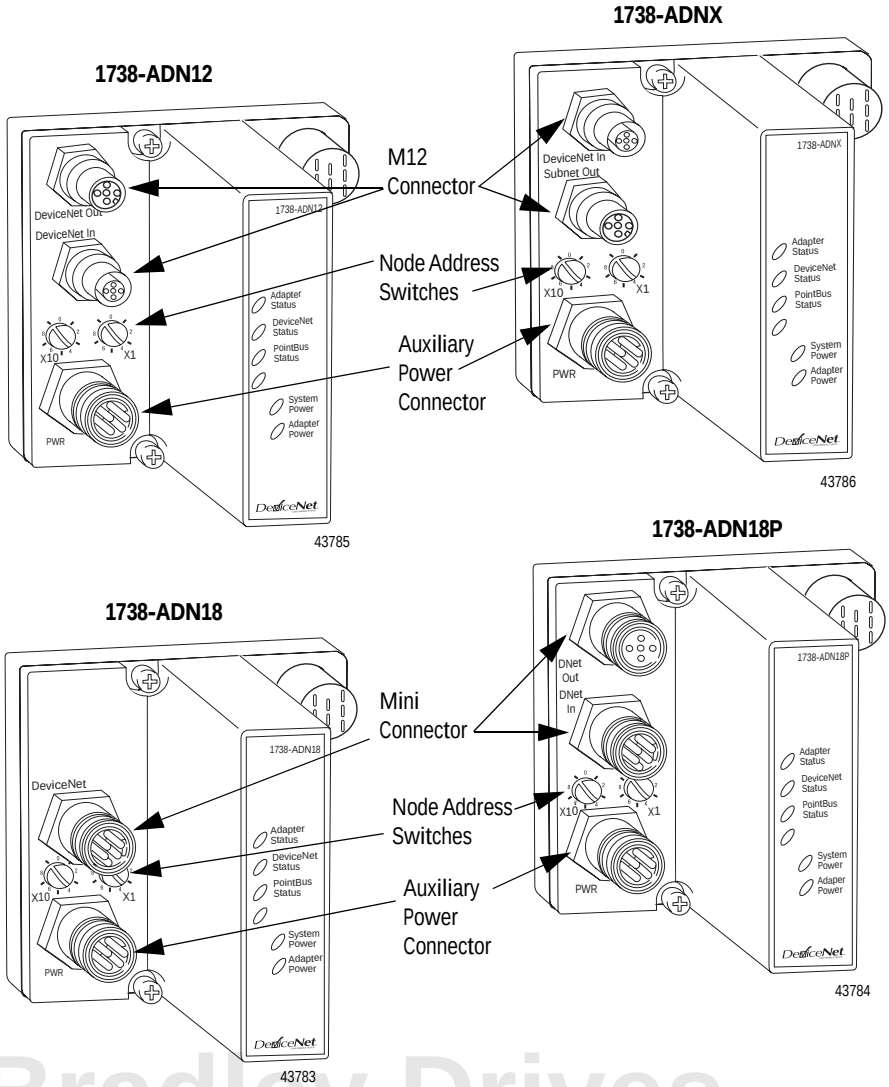
Installation Instructions

ArmorPoint DeviceNet Adapters, Series A

(Cat. No. 1738-ADN12, -ADN18, -ADN18P, -ADNX)

The ArmorPoint™ family of DeviceNet™ adapters (Cat. no. 1738) ship with the adapter and a terminating base to be used with the last I/O module on the backplane. The sealed IP67 housing of these adapters requires no enclosure. (Note that environmental requirements other than IP67 may require an additional appropriate housing.) DeviceNet connectors are sealed M12 (micro) or M18 (mini) styles. The DeviceNet adapters are shown below.



Publication 1738-IN014A-EN-E - June 2004

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

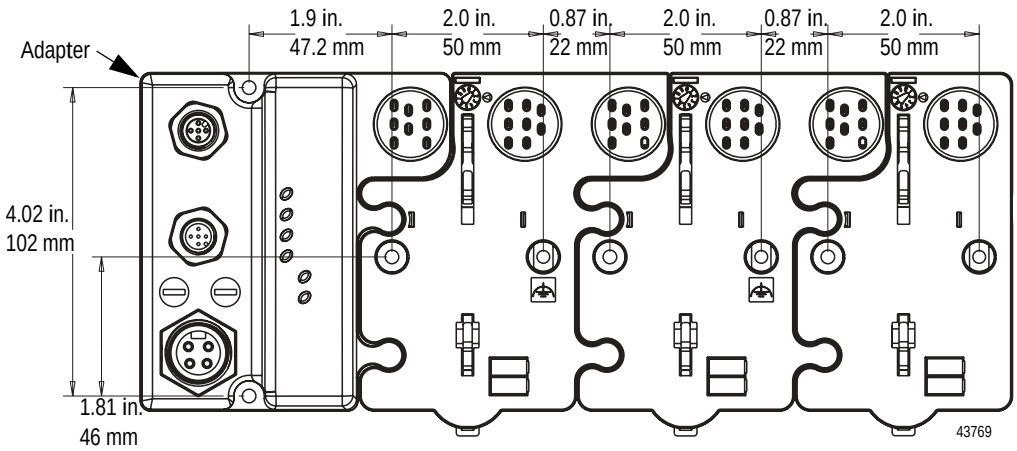
This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- 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 adapter.

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



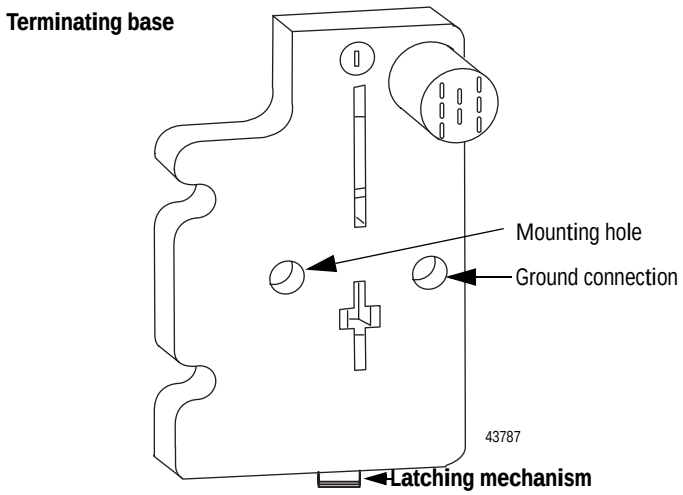
Install the mounting base as follows:

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 and I/O bases 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

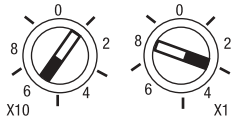
Valid node addresses are **00** through **63**.

Set the node address using either the rotary switches, RSNetWorx for DeviceNet™, DeviceNetManager™, or another software configuration tool. Setting the switches at any number from **64** through **99** lets the software have address control.

Each module is shipped with the switches set for node address **63**. Remove the caps on the front of the module to access the switches (refer to the illustrations on page 1). The two switches are:

- X10 (most significant digit) - left side of module
- X1 (least significant digit) - right side of module

This example shows the node address set at 63.



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To reset the node address, 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 and then cycle power.

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. Settings of 64 through 99 cause the module to use the last valid node address stored internally. Example: The last setting internally was 40. If a change is made to 68, and then you power up, the address will default to 40.

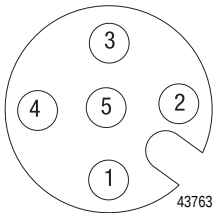
The module is equipped with AutoBaud detect. AutoBaud lets the module read the settings already in use on your DeviceNet network and automatically adjusts to follow those settings.

Wire the DeviceNet Adapters

Following are wiring instructions for the ArmorPoint DeviceNet adapters.

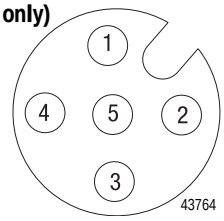
1738-ADN12 and 1738-ADNX

Male In Connector



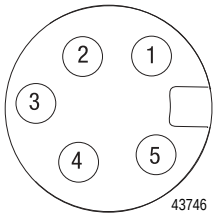
Female Out Connector (1738-ADN12)
(Subnet out - 1738-ADNX only)

(view into connector)
Pin 1 - Drain
Pin 2 - +V
Pin 3 - -V
Pin 4 - CAN_High
Pin 5 - CAN_Low



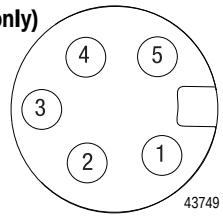
1738-ADN18 and 1738-ADN18P

Male In Connector

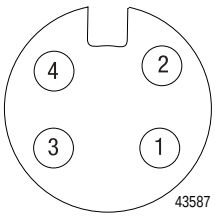


Female Out Connector
(1738-ADN18P only)

(view into connector)
Pin 1 - Drain
Pin 2 - +V
Pin 3 - -V
Pin 4 - CAN_High
Pin 5 - CAN_Low



1738 ArmorPoint DeviceNet Auxiliary Power



Male In Connector

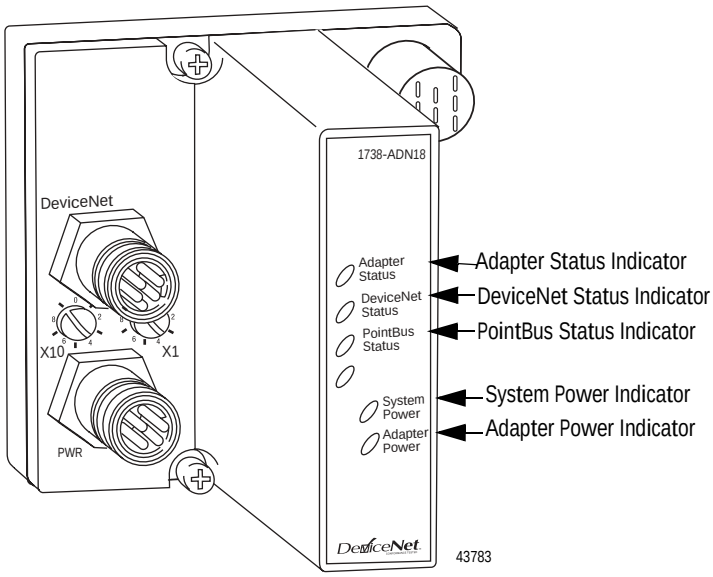
(view into connector)
Pin 1 - User Power +
Pin 2 - Adapter Power +
Adapter/Subnet + (1738-ADNX only)
Pin 3 - Adapter Power -
Adapter/Subnet - (1738-ADNX only)
Pin 4 - User Power -

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

1738-ADN18



Indication	Indication	Probable Cause
Adapter Status	Off	No power applied to device.
	Green	Device is operating normally.
	Flashing Red	Recoverable fault.
	Red	Unrecoverable fault - may require device replacement.
	Flashing Red/Green	Device is in self-test.
DeviceNet Status	Off	Device is not on line: - Device attempting to AutoBaud - 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. (Possible duplicate MAC ID or baud rate mismatch).

Indication	Indication	Probable Cause
PointBus 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. (Possible duplicate MAC ID or baud rate mismatch).
	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 Identify Communication Faulted Request - long protocol message.
PointBus Status (1738-ADNX only)	Off	No power applied to device. Device not online Device has not completed dup_MAC_ID test.
	Green	Subnet online and has connections in the established state.
	Flashing Red	Recoverable fault: - No scanlist configured - Problem with module in scanlist (missing, mismatch, etc.).
	Red	Unrecoverable fault may require device replacement (Possible duplicate MAC ID or baud rate mismatch.)
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 DeviceNet adapters.

ArmorPoint DeviceNet Adapters - 1738-ADN12, -ADN18, -ADN18P, and -ADNX

Expansion I/O Capacity	• DeviceNet adapter 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 ArmorPoint DeviceNet adapter. 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

DeviceNet Communication Rate	125K bit/s (500m maximum) 250K bit/s (250m maximum) 500K bit/s (100m maximum)
DeviceNet Cable	Allen-Bradley part number 1485C-P1-Cxxx Refer to publication DN-2.5 for more information

DeviceNet Power 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
DeviceNet Input Voltage Range	11-25V dc DeviceNet specification
Input Overvoltage Protection	Reverse polarity protected
DeviceNet Power Requirements	24V dc (+4% = 25V dc) @ 30 mA maximum
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
Input Overvoltage Protection	Reverse polarity protected
Inrush Current	6A maximum for 10ms
PointBus Output Current	1A maximum @ 5V dc ±5% (4.75-5.25
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/red DeviceNet 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
Isolation Voltage (continuous-voltage withstand rating)	50V rms Tested at 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 (68 to 140°F)

General Specifications	
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
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: (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 ODVA ODVA conformance tested to DeviceNet 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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