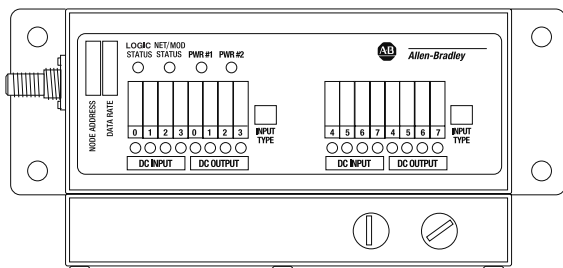




Installation Instructions

High Current 8 Input/8 Output ArmorBlock I/O Module Series B

(Cat. No. 1792D-88HC)



The High Current ArmorBlock™ I/O module (Cat. No. 1792D-88HC) is a stand-alone 24V dc I/O product which communicates via a DeviceNet™ network. The semi-sealed housing requires no enclosure.

This module has 8 inputs and 8 outputs. Inputs are 24V dc PNP (sourcing) or NPN (sinking) devices. Outputs are self-protected 24V dc and are for sourcing only. Diagnostic features included are output short circuit and open wire detection reported to the point level.

Check Your Package Contents

Your package contains:

- 1 High Current Module
- Installation Instructions

IMPORTANT

Mating connectors and/or cable assembly must be ordered separately.

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of these products must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards. In no event will Allen-Bradley be responsible or liable for indirect or consequential damage resulting from the use or application of these products.

Any illustrations, charts, sample programs, and layout examples shown in this publication are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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Throughout this publication, notes may be used to make you aware of safety considerations. The following annotations and their accompanying statements help you to identify a potential hazard, avoid a potential hazard, and recognize the consequences of a potential hazard:

ATTENTION



Identifies information about practices or circumstances that can 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**Environment and Enclosure**

This equipment is intended for use in a Pollution Degree 2 industrial environment, 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.

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.

Install Your High Current I/O Module

To install the module you must:

- Set the node address
- Mount the module
- Connect the cable assembly to the module
- Connect the DeviceNet cable to the module
- Communicate with your ArmorBlock I/O module

More detailed information about each of these steps is in the following procedures.

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:

ATTENTION



- 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.
-

Set the Node Address

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

Set the node address using the rotary switches, RSNetWorx for DeviceNet™, DeviceNetManager™, or another software configuration tool. Setting the switches between **64** and **99** lets the software have address control.

Each module is shipped with the node address set to **63** in the module's memory. The rotary switches are set for position **99** at shipment. The switches are located on the bottom of the module.

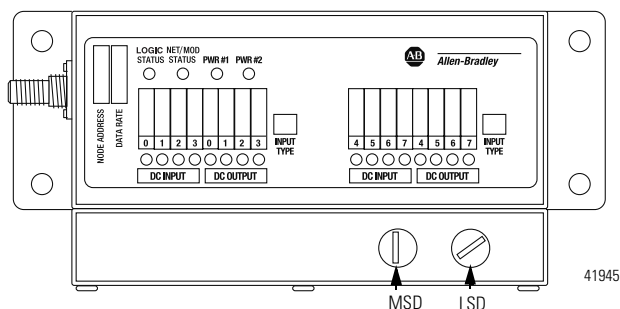
The two switches are:

- MSD (most significant digit)
- LSD (least significant digit)

To reset the node address, use a small blade screwdriver to rotate the switches. Line up the small arrow on the switch with the number setting you wish to use.

The rotary switches are read at module power up only. Settings between 64 and 99 cause the module to use the last valid node address stored internally. Example: The last setting was 40. If a change is made to 68, and then you power up, the address will default to 40. Use the mini caps to cover and seal node address switch ports.

Refer to the illustration of the rotary switches below.

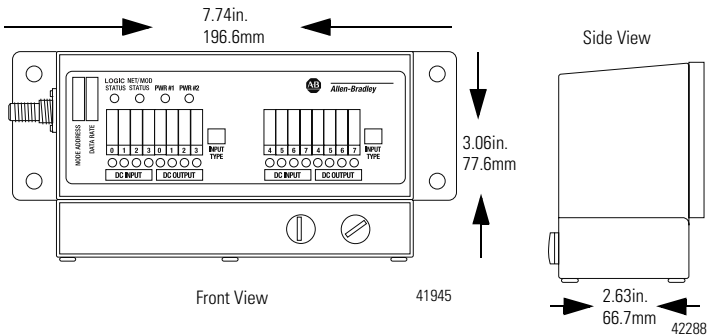


The module is equipped with AutoBaud detect. AutoBaud lets the module read the settings already in use on your DeviceNet network and automatically adjusts to follow those settings. The module is shipped with AutoBaud enabled.

Mount the Module

1. Place the module against the panel where you want it mounted.
2. Drill holes in the panel that are aligned with the moving holes on the module.

- Place screws through each of the 4 mounting holes and tighten the screws until the module is firmly in place.



Connect the Cable Assembly to the Module

Inputs, outputs, and power can either be wired directly to a mating connector, or through a cable assembly.

Connection Using a Connector Assembly

Use the Allen-Bradley user-fabricated connector assembly, catalog number 1792D-88HCCON, with a hand crimp tool and follow the instructions to crimp connector contacts onto field wires. (Purchase the hand crimp tool from Positronic Industries, Inc., part number 9501 and 9502-1). See the connector pinouts on the next page.

ATTENTION

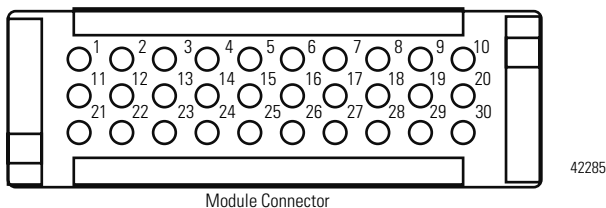


For maximum noise immunity, input cable return wires must be properly terminated. When inputs are connected in loopback, return wires should be connected together.

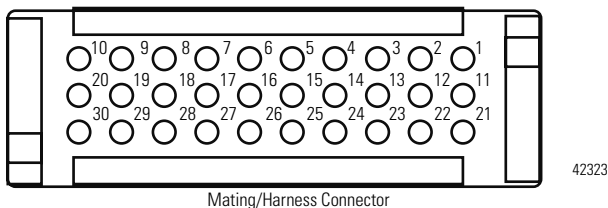
Connection Using a Prefabricated Harness Assembly

1. Connect the harness assembly, 1792D-88HCCBL, to field wiring.
2. Connect the harness connector to the module.

The 1792D-88HC module connector pinout is shown below (looking into the module connector).



The mating connector pinout is shown below (looking into the mating connector).

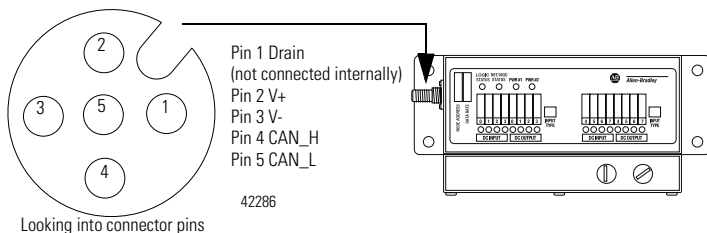


The following table lists the signal for each pin number.

Pin Number	Signal
1	PWR1+
2	IN_0 (GRP 1)
3	IN_1 (GRP 1)
4	IN_2 (GRP 1)
5	IN_3 (GRP 1)
6	IN_0 (GRP 2)
7	IN_1 (GRP 2)
8	IN_2 (GRP 2)
9	IN_3 (GRP 2)
10	PWR2+
11	PWR1+
12	PWR1-
13	PWR1-
14	PWR1-
15	PWR1-
16	PWR2-
17	PWR2-
18	PWR2-
19	PWR2-
20	PWR2+
21	PWR1+
22	OUT_0 (GRP 1)
23	OUT_1 (GRP 1)
24	OUT_2 (GRP 1)
25	OUT_3 (GRP 1)
26	OUT_0 (GRP 2)
27	OUT_1 (GRP 2)
28	OUT_2 (GRP 2)
29	OUT_3 (GRP 2)
30	PWR2+

Connect the DeviceNet Cable to the Module

Connect the DeviceNet wiring to the 5-pin micro-connector on the module. The micro-connector pinout is shown below.



IMPORTANT

If the devices (sensors) connected to the input connections require Class 2 power to operate, the DeviceNet connections of this equipment must be powered by a Class 2 source.

Communicate with Your ArmorBlock I/O Module

This High Current module's I/O is exchanged with the master through a polled, cyclic, or change-of-state connection.

The module produces and consumes I/O data as follows:

Type of I/O Connections	Consumes	Produces
Polled	1 Byte	3 Bytes
Cyclic	1 Byte	3 Bytes
Change-of-State	1 Byte	3 Bytes

Polled - master initiates communication by sending its polled I/O message to the module. The module consumes the message, updates any outputs, and produces a response. If inputs are present, the response contains the input data.

Cyclic - allows configuration of the block as an I/O client. The block will produce and consume its I/O cyclically at the rate configured.

Change-of-State - productions occur when an input changes or a fault condition occurs. If no input or fault condition change occurs within the expected packet rate, a heartbeat production occurs. This heartbeat production tells the scanner module that the I/O module is alive and ready to communicate. Consumption occurs when data changes and the master produces new input data to the I/O block.

Refer to the table below for the word/bit definitions.

Bit	07	06	05	04	03	02	01	00
Produces 0	OL7	OL6	OL5	OL4	OL3	OL2	OL1	OL0
Produces 1	NL7	NL6	NL5	NL4	NL3	NL2	NL1	NL0
Produces 2	I7	I6	I5	I4	I3	I2	I1	I0
Consumes 0	O7	O6	O5	O4	O3	O2	O1	O0

Where: OL=Output Overload NL=Output No Load I=Input O = Output

Refer to the table below for byte/bit descriptions.

Byte	Bit	Description
Produces 0	00-07	Output overload status
Produces 1	00-07	Output no load status
Produces 2	00-07	Input point status
Consumes 0	00-07	Output bits: When the bit is set (1), the output will be turned on. Bit 00=output 00, bit 01=output 01, bit 02=output 02, bit 03=output 03, bit 04=output 04, bit 05=output 05, bit 06=output 06, bit 07=output 07.

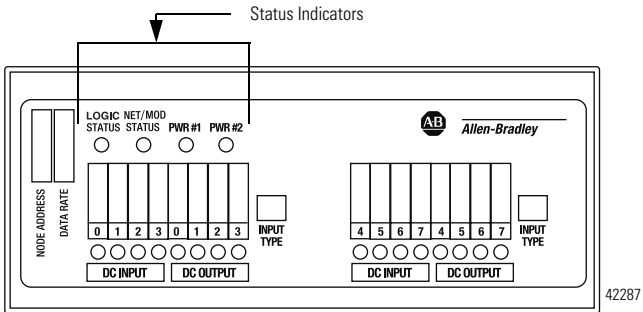
The DeviceNet Network uses advanced network technology, producer/consumer communication, to increase network functionality and throughput. Visit our web site at <http://www.ab.com/networks> for producer/consumer technology information and updates.

Troubleshoot with the Indicators

This module has the following indicators:

- Network/Module status indicator
- Logic status indicators
- Individual point status indicators

The following illustration shows status indicators.



The following table describes the network and module status indicator.

Net/Mod Status Indicator	
Indication	Status
Off	No power or auto bauding
Flashing Green/Off	On line but not connected
Solid Green	On line, link OK, connected
Flashing Red	Recoverable fault-expansion module fault or module configuration error
	I/O connection fault-one or more I/O connections in the timed-out state
Solid Red	Unrecoverable fault
	Communication failure-duplicate node address present or incorrect baud rate
Green to Red to Off	At powerup only - LED test

The following table describes the logic status indicator.

Logic Status Indicators	
State	Status
Off	Logic is disabled
Solid Green	Logic is enabled
Flashing Green	Local forces are applied and local logic is enabled

The following table describes the I/O status indicator.

I/O Status Indicators			
Function	LED Color	Condition	Module Illumination
Auxiliary Power Group #1	Yellow	No auxiliary power Auxiliary power present	None Yellow
Auxiliary Power Group #2	Yellow	No auxiliary power Auxiliary power present	None Yellow
Outputs	Green/red	Output not energized Output energized Output shorted and latched off Output No-load in OFF state	None Green Red, MS blink red Blinking Red, MS blink Red
Inputs	Yellow	No valid input Valid input	None Yellow

For more information on indications, see the Technical Data, publication 1792-TD001.

Specifications

8 Input / 8 Output Module - Cat. No. 1792D-88HC

Input Specifications		Max.	Min.
Inputs per block		8, Configurable as sinking or sourcing in two groups of 4 sourcing type is default	
Off-State Voltage		4	0
On-State Voltage		30	8
Off-State Current		-	1.2mA
On-State Current		11mA (@30V dc)	2mA (@10V dc)
Output Specifications		Max.	Min.
Outputs per block		8 sourcing type in two groups of 4	
Off Peak Blocking Voltage		-	30V
On-State Voltage Drop	5Amp	1V	-
	10 Amp	1V	-
On-State Current	5 Amp	5A	-
	10 Amp	10A	-
Off-State Leakage	5 Amp	250uA	-
	10 Amp	250uA	-
Module Current (all outputs)		40A	-
Surge Current - for 10mS repeatable every 2 sec.	5 Amp	10A	-
	10 Amp	20A	-
General Specifications		Max.	Min.
DeviceNet Power:	Voltage	25V dc	11V dc
	Current	75mA	125mA
Auxiliary Power	Voltage	30V dc	8V dc (inputs) 10V dc (outputs)
Group 1 and Group 2	Current	40A	40A
Indicators		Net/Mod Status -red/green Auxiliary Power -yellow Logic Status -green Input Point LED -yellow Output Point LED -red/green	
Communication Rate		<ul style="list-style-type: none"> 125Kbps @ 500 meters (1600 feet) for thick cable, flat media length 375 meters 250Kbps @ 200 meters (600 feet) for thick cable, flat media length 150 meters 500Kbps @ 100 meters (300 feet) for thick cable, flat media length 75 meters 	
Dimensions (assembled to base) inches - (millimeters)		2.63H x 7.74W x 3.06D (66.7H x 196.6W x 77.60D)	

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General Specifications

Operational 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), IEC 60068-2-14 (Test Na, Un-packaged Non-operating Thermal Shock): -40 to 85°C (-40 to 185°F)
Wiring Category DeviceNet Conductors Category	Use 14-22 AWG wire with insulation Temperature rating of 75°C min. See Publication DN-6.7.2 2 ^{1, 2}
Relative Humidity	IEC 60068-2-30 (Test Db, Un-packaged Non-operating Damp Heat): 5 to 95% non-condensing
Shock Operating	IEC60068-2-27: Test Ea (Unpackaged shock, ES#002) Operating 30g Non-operating 50g
Vibration	IEC60068-2-6 (Test Fc, Operating): 10g @ 10-500Hz
Emissions	CISPR 11: Group 1, Class A
ESD Immunity	IEC 61000-4-2: 4kV contact discharges 8kV air discharges
Enclosure Type Rating	Meets IP52
Radiated RF Immunity	IEC 61000-4-3: 10V/m with 1kHz sine-wave 80%AM from 30MHz to 1000MHz 10V/m with 200Hz 50% Pulse 100%AM at 900Mhz
EFT/B Immunity	IEC 61000-4-4: ±2kV at 5kHz on signal ports
Surge Transient Immunity	±1kV line-line(DM) and ±2kV line-earth(CM) on signal 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

General Specifications

Agency Certification (when product is marked)	c-UR-us UL Recognized Component Industrial Control Equipment, certified for US and Canada CE ³ European Union 89/336/EEC EMC Directive, compliant with: EN 50081-2; Industrial Emissions EN 50082-2; Industrial Immunity EN 61326; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity C-Tick ³ Australian Radiocommunications Act, compliant with: AS/NZS 2064; Industrial Emissions ODVA ODVA conformance tested to ODVA DeviceNet specifications
Technical Data (user information)	Publication 1792-TD001

1. You use this conductor category information for planning conductor routing as described in the system level installation manual.
2. See publication 1770-4.1, "Programmable Controller Wiring and Grounding Guidelines."
3. See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

This product has been tested at an Open DeviceNet Vendor Association, Inc. (ODVA) authorized independent test laboratory and found to comply with ODVA Conformance Test. Please contact the ODVA website (<http://www.odva.org>) for listing of products tested by ODVA independent test labs for further details.

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