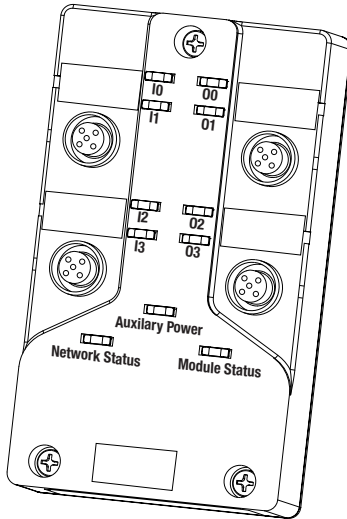




## Installation Instructions

# ArmorBlock MaXum 4 Input / 4 Output Module

(Cat. No. 1792D-4BVT4D)



30702-M

This ArmorBlock MaXum™ I/O module (Cat. No. 1792D-4BVT4D) is a stand-alone 24V dc I/O product which communicates via a DeviceNet network. The sealed housing of this module requires no enclosure.

This module has 4 inputs and 4 outputs accessed through Y splitter cables. Inputs are 24V dc automatically configured for PNP (sourcing) or NPN (sinking) devices. Four self-protected 24V dc outputs can provide up to 1.0 amp each. Diagnostic features included are short circuit, open wire and no load detection reported to the point level.

### Package Contents

Your package contains:

- 1 ArmorBlock MaXum Module
- Installation Instructions

(Please note: Cable bases are ordered and shipped separately.)

## European Union Directive Compliance

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

### EMC Directive

This product is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) and the following standards, in whole or in part, documented in a technical construction file:

- EN 50081-2 EMC - Generic Emission Standard, Part 2 - Industrial Environment
- EN 50082-2 EMC - Generic Immunity Standard, Part 2 - Industrial Environment

This product is intended for use in an industrial environment.

### Low Voltage Directive

This product is tested to meet Council Directive 73/23/EEC Low Voltage, by applying the safety requirements of EN 61131-2 Programmable Controllers, Part 2 - Equipment Requirements and Tests.

For specific information required by EN 61131-2, see the appropriate sections in this publication, as well as the following Allen-Bradley publications:

- Industrial Automation Wiring and Grounding Guidelines For Noise Immunity, publication 1770-4.1
- Automation Systems Catalog, publication B111

## Install Your ArmorBlock MaXum I/O Module

To install the module:

- Set the node address.
- Mount the module to the cable base.
- Connect the cord sets.
- Communicate with the module.

## Set the Node Address

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

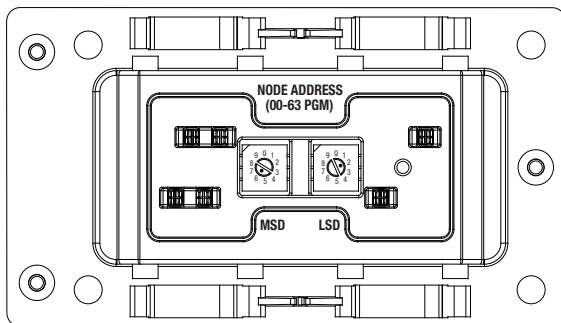
Set the node address using the rotary switches, DeviceNetManager™, or other software configuration tool. Setting the switches between **64** to **99** allows the software to have address control.

Each module is shipped set for node address **63**. The switches are located on the underside 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 black dot 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.



Bottom View of Module

Example: Node Address is set at 62, see small black dots.

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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.

## Install the Module

This module mounts to the following cable bases:

- 1792D-CBFM for KwikLink flat media installation
- 1792D-CB12 for 12mm drop cable installation
- 1792D-CB18P for round media DeviceNet and output power
- 1792D-CB18PT for 4 connector blocks needing round media DeviceNet and output power
- or other optional cable base assembly.

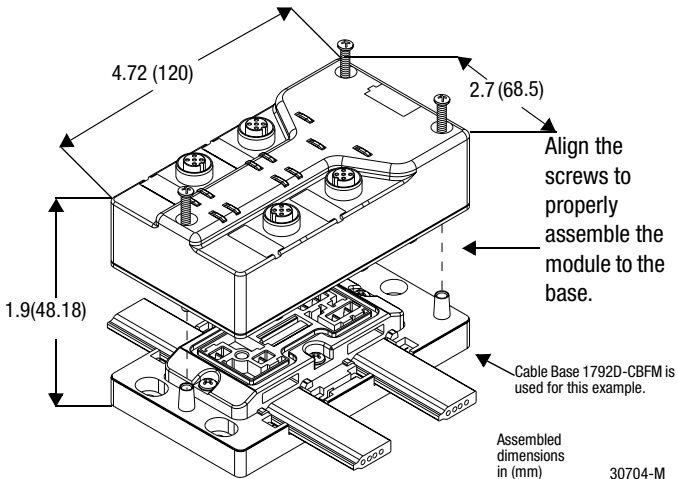
**Important:** The cable base should already be installed. See publication 1792D-5.9 to install the cable base.

To install the module:

**Important:** Proper alignment of the screws is necessary to complete the connections between the module contacts and the cable contacts.

1. Position the module over the mounted cable base. Align the three captive screws in the module with the accepting receptacles in the base.
2. Tighten the screws with a torque of 8 inch-pounds to secure the module to the base.

Note: Dimensions change according to the cable base and module combination used.

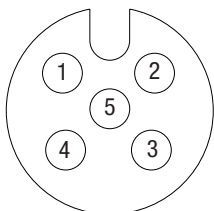


## Connect the Input / Output Cord Sets to the MaXum Module

This module uses 5 pin micro (12mm) style PCB mounted connectors.

Four micro caps cover the connectors on your module. Remove the caps and connect your cord sets to the appropriate ports. This product has two inputs or outputs per I/O connector. Use a “Y” splitter cable for access to all I/O connections. For more information on these cables, see the Product Data guide publication 1792-2.1.

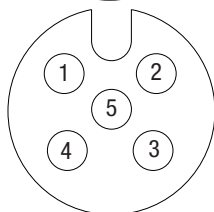
Use the micro caps to cover and seal unused ports. Pinout diagrams for the connectors are shown next.



### Input Micro-Connector

(View into Sockets)

- Pin 1 Sensor Source Voltage
- Pin 2 Input B
- Pin 3 Return Logic Ground<sup>1</sup>
- Pin 4 Input A
- Pin 5 Not Used



### Output Micro-Connector

(View into Sockets)

- Pin 1 Not Used
- Pin 2 Output B
- Pin 3 Auxiliary Power Ground
- Pin 4 Output A
- Pin 5 Not Used

<sup>1</sup> Logic Ground is approximately 0.4V above DeviceNet V-measured at the module.

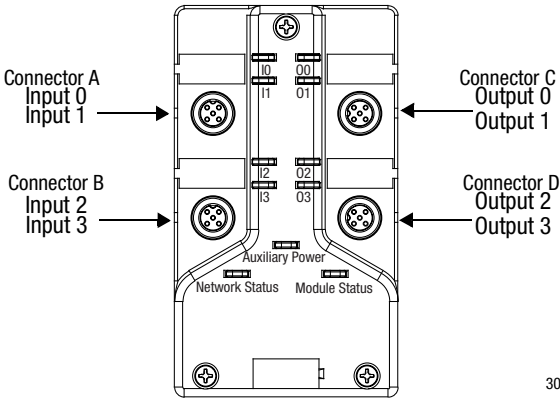
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### ATTENTION:

- Make sure all connectors and caps are securely tightened to properly seal the connections against leaks and maintain IP67 requirements
- For maximum noise immunity, input and output cable return wires must be properly terminated. When inputs and outputs are connected in loopback, return wires should be connected together.
- I/O cable length should be less than 30 meters.

I/O connectors for this module are shown below.



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## Output Power and DeviceNet Cables

Output power and DeviceNet cables are described in the installation publications for the cable base assembly of your choice. Refer to the following publications:

- 1792D-5.9 ArmorBlock MaXum Cable Base Installation Guide
- DN-6.7.2 DeviceNet Cable Planning and Installation Manual

## Communicate With Your ArmorBlock MaXum I/O Module

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

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

Type of I/O Connections	Consumes	Produces
Cyclic	1 Byte	2 Bytes
Polled	1 Byte	2 Bytes
Change of State	1 Byte	2 Bytes

**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.

**Polled** - a master initiates communication by sending its polled I/O message to the module. The 4 input / 4 output module consumes the message, updates outputs, and produces a response. The response has input data, input faults, output faults, and the status of the Auxiliary power.

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 output data to the I/O module.

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

Bit	07	06	05	04	03	02	01	00
<b>Produces 0</b>	OW-B	OW-A	ISC-B	ISC-A	I3	I2	I1	I0
<b>Produces 1</b>	RSVD	OPWR	RSVD	RSVD	OFLT3	OFLT2	OFLT1	OFLT0
<b>Consumes 0</b>	RSVD	RSVD	RSVD	RSVD	O3	O2	O1	O0

Where: OW = Off Wire      RSVD= Reserved    I = Input    O = Output    OPWR= Output Power (Auxiliary Power)  
 OFLT = Output fault    ISC=Input Short Circuit in Sensor Source Voltage

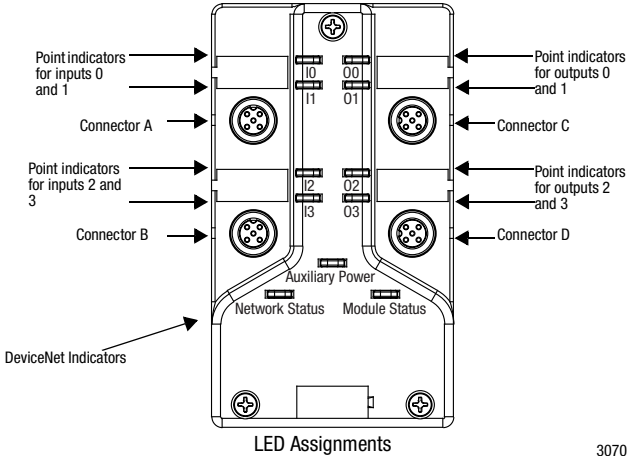
Byte	Bit	Description
<b>Produces 0</b>	00-03	Input status bits: When the bit is set (1), the input is on. Bit 00 corresponds to input 0, bit 01 corresponds to input 1, bit 02 corresponds to input 2, bit 03 corresponds to input 3.
	04	Input short circuit fault (ISC): ISC-A indicates a short circuit for connector A.
	05	Input short circuit fault (ISC): ISC-B indicates a short circuit for connector B.
	06	Input off wire fault (OW): OW-A indicates an off-wire fault for connector A.
	07	Input off wire fault (OW): OW-B Indicates an off-wire fault for connector B.
<b>Produces 1</b>	00-03	Output no load or overload fault (OFLT): - When the bit is set (1) an output fault has occurred. OFLT0 corresponds to output 0, OFLT1 corresponds to output 1, OFLT2 corresponds to output 2, OFLT3 corresponds to output 3.
	04-05	Reserved
	06	Output Power Fault (OPWR): When the bit is set (1) Auxiliary Power is not present.
	07	Reserved
<b>Consumes 0</b>	00-03	Output bits: When the bit is set (1), the output will be turned on. Bit 00 corresponds to output 0, bit 01 corresponds to output 1, bit 02 to output 2, bit 03 to output 3.
	04-07	Reserved

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 status indicator
- Module status indicator
- Auxiliary Power indicator
- Individual point status indicators for inputs 0, 1, 2, and 3 and outputs 0, 1, 2, and 3.



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<b>Module Status Indicator</b>	
<b>Indication</b>	<b>Status</b>
<b>None</b>	No Power
<b>Green</b> Blinking Solid	Needs Commissioning Operating Normal
<b>Red</b> Blinking Solid	Recoverable Fault Unrecoverable Fault

<b>Network Status Indicator</b>	
<b>Indication</b>	<b>Status</b>
<b>None</b>	Not On-line



<b>Green</b> Blinking Solid	On-line/No Connections On-line/Connected
<b>Red</b> Blink Solid	Connection Timed Out Failed Communication: A duplicate node address exists or module is at the wrong baud rate.

**Auxiliary Power**

Indication	Status
<b>None</b>	No Auxiliary Power
<b>Green</b> Solid	Auxiliary Power Present

**I/O Status Indicators**

Function	Module Status Indicator	Point Indicator <sup>1</sup>	Condition
Outputs	Green Green Module Status blink red Module Status blink red Module Status blink red Module Status blink red	None Yellow Orange Red Orange Red	Output not energized Output energized Output shorted-auto restart Output shorted-latching Output no load-auto restart Output no load-latching
Inputs	Green Green Module Status blink red  Module Status blink red	None Yellow Red  Blink red	No valid input Valid input Connector A or Connector B short circuited <sup>1</sup> Connector A or Connector B off-wire <sup>1</sup>

1. Only the first LED of each input connector will light as red when twin inputs are used.

For more information on indications see the Product Data publication 1792-2.1.

## Specifications

### 4 Input / 4 Output Module - Cat. No. 1792D-4BV4TD

Input Specifications	Max	Min
Inputs per block	4 - 3 wire or dry contact PNP or NPN devices or 2 - 4 wire PNP or NPN devices	
Sensor Source Current (per input)	50mA	-
Off-Wire Sense Current	0.5mA	-
Output Specifications	Max	Min
Outputs per block	4 sourcing outputs labeled 00, 01, 02, and 03	
Output Auxiliary Voltage	30V	10V
On-state Voltage Drop	1V	-
On-state Current	1A	-
Off-state Leakage	1.5mA	-
Module Current (all outputs)	4.0A	-
Surge Current - for 10ms, repeatable every 2s	2.4A	-
No Load Sense Current (On-state)	0.18A	-

### General Specifications

Indicators	Network Status - red/green Module Status - red/green Auxiliary Power - green Point LED - yellow/orange/red	
Communication Rate	<ul style="list-style-type: none"> <li>• 125Kbps @ 500 meters(1600 feet) for thick cable, flat media length 375 meters</li> <li>• 250Kbps @ 200 meters(600 feet) for thick cable, flat media length 150 meters</li> <li>• 500Kbps @ 100 meters (330 feet) for thick cable, flat media length 75 meters</li> </ul>	
DeviceNet Power	Voltage Current	25V dc max 150mA max (no sensors)
		11V dc min up to .8A (4 sensors @ 50mA per sensor)
Auxiliary Power	Voltage Current	30V dc max 4A max
		10V dc min 4A max
Dimensions (assembled to base) inches - (Millimeters)	1.9H x 2.7W x 4.72D (40.3)H x (68.5)W x (120)D	
Environmental Conditions	Operational Temperature -25 to 60 <sup>o</sup> (-13 to 140 <sup>o</sup> F) Storage Temperature -25 to 80 <sup>o</sup> C (-13 to 176 <sup>o</sup> F) Relative Humidity 5 to 95% Shock Operating 30g peak acceleration, 11 (+1) ms pulse width Non-operating 50g peak acceleration, 11(+1)ms pulse width Vibration Tested 10g @ 10-500Hz per IEC 68-2-6	

**4 Input / 4 Output Module - Cat. No. 1792D-4BV4TD**

<b>General Specifications Cont.</b>	<b>Max</b>	<b>Min</b>
Conductors	Publication DN-6.7.2	
Enclosure	Meets or exceeds IP67	
Agency Certification (when product is marked)	<ul style="list-style-type: none"> <li>• CSA certified</li> <li>• CSA Class 1, Division 2, Groups A, B, C, D certified</li> <li>• UL listed</li> <li>• CE marked for all applicable directives</li> </ul>	
Product Data (user information)	Publication 1792-2.1	

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 Software Composite Test Version 11.

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