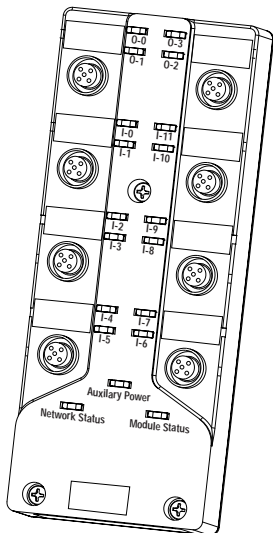




# ArmorBlock MaXum 12 Input/ 4 Output Module

(Cat. No. 1792D-12BVT4D)



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This ArmorBlock MaXum™ I/O module (Cat. No. 1792D-12BVT4D) 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 model has 12 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 2.0 amp each. Diagnostic features included are short circuit, open wire and no load detection reported to the connector level for inputs, to point level for outputs.

## **Check 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.

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## 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 B113

## Install Your ArmorBlock MaXum I/O Module

To install the module you must:

- Set the node address.
- Mount the module to the cable base.
- Connect the input/output cord sets to the MaXum module.
- Communicate with your ArmorBlock MaXum I/O module.

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

### Set the Node Address

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

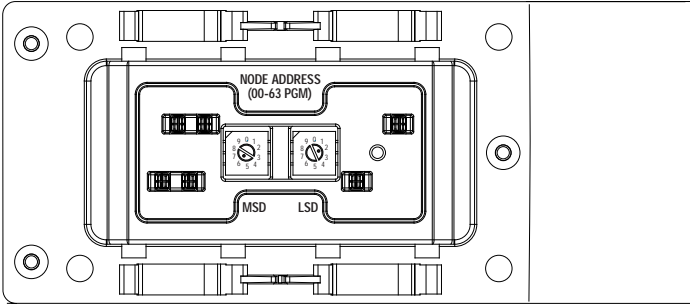
Set the node address using the rotary switches, RSNetWorx for DeviceNet™, or other software configuration tool. Setting the switches between **64** to **99** allows the software to have address control.

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

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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.

## Mount the Module to the Cable Base

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
  - or other optional cable base assembly
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### **IMPORTANT**

The cable base should already be installed. See publication 1792D-5.9 (CB18P) or 1792D-5.36 (CBFM, CB12) to install the cable base.

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To install the module:

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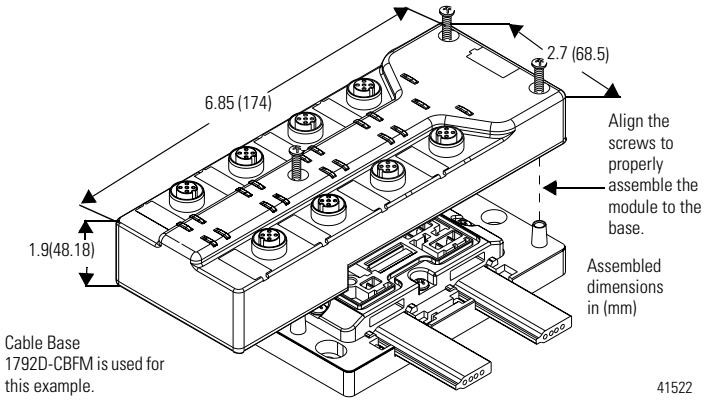
### **IMPORTANT**

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

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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.

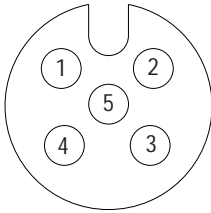


## Connect the Input / Output Cord Sets to the MaXum Module

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

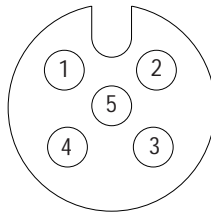
Eight micro caps cover the connectors on your module. Remove the caps and connect your cord sets to the appropriate ports. This product has two inputs or outputs per I/O connector. Use a “Y” splitter cable for access to all I/O connections. For more information on these cables, see the Product Data publication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

- 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 Socket)

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

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

Molded I/O cables with LEDs embedded in the connector are incompatible with MaXum universal sink/source inputs. Please refer to publication 889-5.0 for Rockwell Automation cables and cord sets offerings.

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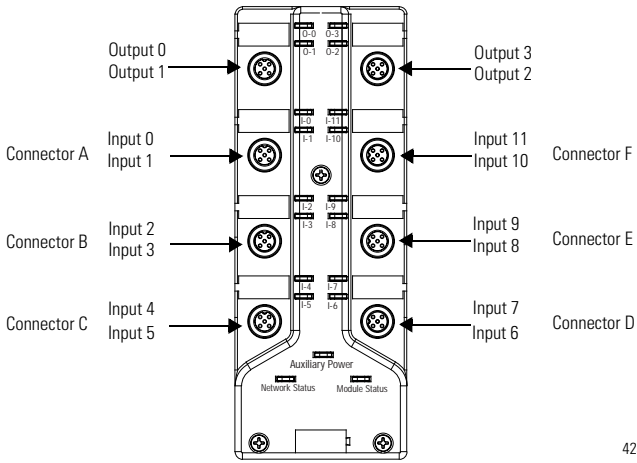
**ATTENTION**



- 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.



## 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 poll, 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	4 Bytes
Polled	1 Byte	4 Bytes
Change of State	1 Byte	4 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 device** - a master initiates communication by sending its polled I/O message to the module. The 12 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 device** - 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 block.

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

Bit	07	06	05	04	03	02	01	00
Produces 0	I7	I6	I5	I4	I3	I2	I1	I0
Produces 1	ISC-D	ISC-C	ISC-B	ISC-A	I11	I10	I9	I8
Produces 2	OW-F	OW-E	OW-D	OW-C	OW-B	OW-A	ISC-F	ISC-E
Produces 3	RSVD	OPWR	RSVD	RSVD	OFLT3	OFLT2	OFLT1	OFLT0
Consumes 0	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>	00-07	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, bit 04 corresponds to input 4, bit 05 corresponds to input 5, bit 06 corresponds to input 6, bit 07 corresponds to input 7.
	00-03  04-07	Input Status bits: When the bit is set (1), the input is on. Bit 08 corresponds to input 8, bit 09 corresponds to input 9, bit 010 corresponds to input 10, bit 011 corresponds to input 11.  Input short circuit fault (ISC): (ISC-A indicates a short circuit fault for connector A. Input short circuit fault ((ISC): (ISC-B indicates a short circuit fault for connector B. Input short circuit fault ((ISC): (ISC-C indicates a short circuit fault for connector C. Input short circuit fault ((ISC): (ISC-D indicates a short circuit fault for connector D.
<b>Produces 2</b>	00-01 ISC  02-07 Offwire	Input short circuit fault (ISC): (ISC-E indicates a short circuit fault for connector E. Input short circuit fault ((ISC): (ISC-F indicates a short circuit fault for connector F. Input off wire fault (OW): OW-A indicates an off-wire fault for connector A. Input off wire fault (OW): OW-B indicates an off-wire fault for connector B. Input off wire fault (OW): OW-C indicates an off-wire fault for connector C. Input off wire fault (OW): OW-D indicates an off-wire fault for connector D. Input off wire fault (OW): OW-E indicates an off-wire fault for connector E. Input off wire fault (OW): OW-F indicates an off-wire fault for connector F.

Byte	Bit	Description
<b>Produces 3</b>	00-03 OFLT0-3	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 Output Power Fault (OPWR): When the bit is set (1) Auxiliary Power is not present. RSVD = Reserved
	06	
	07, 04, 05	
<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 00, bit 01 corresponds to output 01, bit 02 to output 02, bit 03 to output 03. RSVD = Reserved
	04-07	

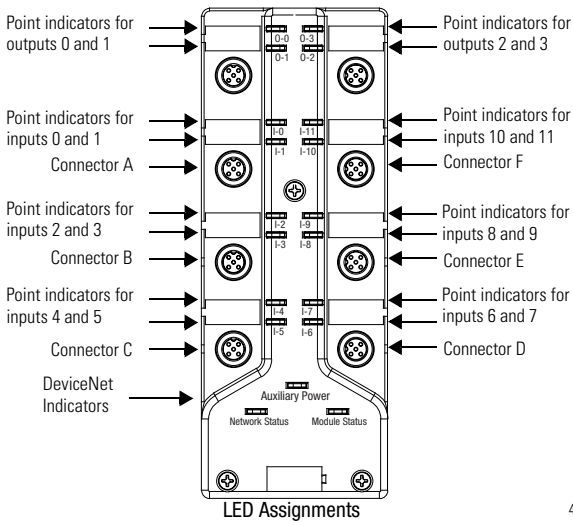
The DeviceNet Network uses advanced network technology, producer/consumer communication, to increase network functionality and throughput. Visit our web site at <http://www.ab.com/networks> for producer/consumer technology information and updates.

## Troubleshoot with the Indicators

This module has the following indicators:

- Network status indicator
- Module status indicator
- Auxiliary Power indicator

Individual I/O status indicators for inputs 0 through 11 and outputs 0 through 3.



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The table below describes the module status indicator.

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

The table below describes network status and auxiliary power indicators.

Network Status Indicator NS	
Indication	Status
None	Not On-line
<b>Green</b> Blinking Solid	On-line/No Connections On-line/Connected
<b>Red</b> Solid Blinking	Failed Communication: A duplicate node address exists or module is at the wrong baud rate. Indicates one or more I/O connections have timed out.

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

**I/O Status Indicators**

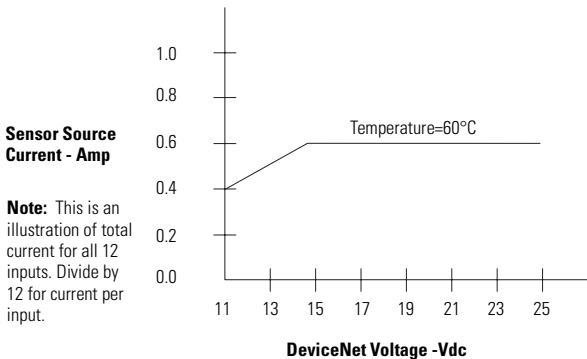
<b>Function</b>	<b>Module Status Indicator</b>	<b>Point Indicator<sup>1</sup></b>	<b>Condition</b>
Outputs	Green Green Module Status blink red Module Status blink red Module Status blink red Module Status blink red	None Yellow Orange Red Orange Red	Output not energized Output energized Output shorted-auto 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 Short on input connector <sup>1</sup> Off wire on input connector <sup>1</sup>

<sup>1</sup>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

<b>12 Input / 4 Output Module - Cat. No. 1792D-12BVT4D</b>		
<b>Input Specifications</b>	<b>Max</b>	<b>Min</b>
Inputs per block	12 - 3 wire or dry contact PNP or NPN devices or 6 - 4 wire PNP or NPN devices	
Sensor Source Current (per input)	See the graph below.	
Off-Wire Sense Current	0.5mA	-
<b>Output Specifications</b>	<b>Max</b>	<b>Min</b>
Outputs per block	4 sourcing outputs labeled 00 through 03	
Off Peak Blocking Voltage	30V	10V
On-state Voltage Drop	1V	-
On-state Current	2.0A	-
Off-state Leakage	1.5mA	-
Module Current (all outputs)	4.0A	-
Surge Current - for 10ms, repeatable every 2s	4.0A	-
No Load Sense Current (On-state)	0.18A	-
<b>General Specifications</b>		
Indicators	Network Status - red/green Module Status - red/green Auxiliary Power - green Point LED - yellow/orange/red	
Communication Rate	125Kbps @ 500 meters(1600 feet) for thick cable, flat media length 375 meters (1230 feet) 250Kbps @ 200 meters(600 feet) for thick cable, flat media length 150 meters (492 feet) 500Kbps @ 100 meters (330 feet) for thick cable, flat media length 75 meters (246 feet)	



## 12 Input / 4 Output Module - Cat. No. 1792D-12BVT4D

### General Specifications

DeviceNet Power Voltage Current	25V dc max 175mA max (no sensors)	11V dc min up to 1.6A (12 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 6.85D (48.18)H x (68.5)W x (174)D (millimeters)	
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	-25 to 60 <sup>o</sup> (-13 to 140 <sup>o</sup> F) -25 to 80 <sup>o</sup> C (-13 to 176 <sup>o</sup> F) 5 to 95% 30g peak acceleration, 11 (+1) ms pulse width 50g peak acceleration, 11(+1)ms pulse width Tested 10g @ 10-500Hz per IEC 68-2-6	
Conductors	Publication DN-6.7.2	
Enclosure	Meets or exceeds IP67	
Agency Certification (when product is marked)	CSA certified CSA Class 1, Division 2, Groups A, B, C, D certified UL listed CE marked for all applicable directives	
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. 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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