

Step 1 - Select:

- I/O modules

Selecting ArmorBlock I/O Modules

ArmorBlock MaXum I/O



ArmorBlock MaXum input modules are universal sinking/sourcing, while the output modules are sourcing (except the 1792D-OVT16E, which is a 16 sinking output module).

General ArmorBlock MaXum I/O Specifications

Enclosure Type Rating	IP67
Mounting Type	On-Machine
Operating Temperature	-25...60 °C (-13...140 °F)
Storage Temperature	-25...80 °C (-13...176 °F)
Relative Humidity	5...100%
Shock, Operating	30 g peak acceleration, 11(±1) ms pulse width
Shock, Non-Operating	50 g peak acceleration, 11(±1) ms pulse width
Vibration	Tested 10 g @ 10...500 Hz per IEC 68-2-6
Certifications	CSA, CE, C-Tick, DeviceNet*

*When product is marked. See the Product Certification link at www.ab.com for declarations of Conformity, Certificates, and other certification details.

ArmorBlock MaXum Digital I/O

- Each ArmorBlock MaXum I/O Block requires a cable base.
- Electronically protected outputs.
- M12 Quick-Disconnect terminations.
- Signal delay is selectable per input for <1ms (default), 2 ms, 4 ms, 8 ms, or 16 ms.
- The input circuit power source (11...25V dc) is the same as the I/O block power source, which comes through the DeviceNet connection.

Digital Input Blocks

Cat. No.	Number of Inputs	Voltage, On-State Input, Nom.	Voltage, On-State Input, Range	Current, Off-State Input, Max.	Number of Connectors	Diagnostics	DeviceNet Current (mA)
1792D-16BVT0D	16 Sink/Source	24V dc	10V dc...25V dc	1.5 mA	8	Connector-level	700 mA*
1792D-16BVT0CD				1.5 mA		Point-level	650 mA*
1792D-8BVT0D	8 Sink/Source	24V dc	10V dc...25V dc	1.5 mA	4	Connector-level	470 mA†
1792D-8BV0D				1.5 mA	8	Point-level	470 mA†
1792D-4BV0D	4 Sink/Source	24V dc	10V dc...25V dc	1.5 mA	4	Point-level	220 mA‡
1792D-2BV0D	2 Sink/Source	24V dc	10V dc...25V dc	1.5 mA	2	Point-level	130 mA§

*DeviceNet Current specified with 16 sensors drawing 25 mA @ 24V dc.

†DeviceNet Current specified with 8 sensors drawing 25 mA @ 24V dc.

‡DeviceNet Current specified with 4 sensors drawing 25 mA @ 24V dc.

§DeviceNet Current specified with 2 sensors drawing 25 mA @ 24V dc.

Digital Output Blocks

Cat. No.	Number of Outputs	Voltage, On-State Output, Nom.	Voltage, On-State Output, Range	Current, On-State Output, Max.	Number of Connectors	Diagnostics	DeviceNet Current (mA)
1792D-0B4D	4 Source	24V dc	10V dc...30V dc	2.0 A	4	Point-level	80 mA
1792D-0B8D	8 Source	24V dc	10V dc...30Vdc	1.0 A	8	Point-level	80 mA
1792D-0VT16E	16 Sink	24V dc	10V dc...30Vdc	0.3 A	8	None	150 mA

Digital Combination Blocks

Cat. No.	Inputs			Outputs			Number of Connectors	Diagnostics	DeviceNet Current (mA)
	Number of Inputs	Operating Voltage	Current, Off-State Input, Max.	Number of Outputs	Operating Voltage	Current, On-State Output, Max.			
1792D-12BVT4D	12 Sink/Source	10V dc...25V dc	1.5 mA	4 Source	10V dc...30V dc	0.5 A	8	Connector-level	570 mA*
1792D-8BVT8D	8 Sink/Source	10V dc...25V dc	1.5 mA	8 Source	10V dc...30V dc	0.5 A	8	Connector-level	470 mA†
1792D-8BVT8CD	8 Sink/Source	10V dc...25V dc	1.5 mA	8 Source	10V dc...30V dc	0.5 A	8	Point-level	470 mA†
1792D-4BVT4D	4 Sink/Source	10V dc...25V dc	1.5 mA	4 Source	10V dc...30V dc	1.0 A	4	Connector-level	220 mA‡
1792D-4BV4D	4 Sink/Source	10V dc...25V dc	1.5 mA	4 Source	10V dc...30V dc	1.0 A	8	Point-level	220 mA‡
1792D-2BVA2D	2 Sink/Source	10V dc...25V dc	1.5 mA	2 Source	10V dc...30V dc	1.0 A	4	Point-level	130 mA§
1792D-8BIO8E	8 Sink	10V dc...25V dc	1.5 mA	8 Source	10V dc...30V dc	0.3 A	8	None	470 mA†

*DeviceNet Current specified with 12 sensors drawing 25 mA @ 24V dc.

†DeviceNet Current specified with 8 sensors drawing 25 mA @ 24V dc.

‡DeviceNet Current specified with 4 sensors drawing 25 mA @ 24V dc.

§DeviceNet Current specified with 2 sensors drawing 25 mA @ 24V dc.

ArmorBlock MaXum Cable Bases

Each ArmorBlock MaXum I/O block, except for the 1792D-88HC high current block, requires a separate cable base.

Cat. No.	Description
1792D-CB12	ArmorBlock MaXum I/O Cable Base with 12 mm round media connectors. Accepts standard drop cables from round or flat media taps.
1792D-CB12JP	ArmorBlock MaXum I/O Cable Base with 12 mm round media connectors and jumpered DeviceNet power
1792D-CBFM	ArmorBlock MaXum I/O Cable Base for KwikLink flat media
1792D-CB18	ArmorBlock MaXum I/O Cable Base with 18 mm round or flat media connectors and passthrough for DeviceNet
1792D-CB18JP	ArmorBlock MaXum I/O Cable Base with 18 mm round media connectors and jumpered DeviceNet power
1792D-CB18P	ArmorBlock MaXum I/O Cable Base with 18 mm round or flat media connectors, DeviceNet passthrough, and auxiliary power input connection
1792D-CB18PT	ArmorBlock MaXum I/O Cable Base with 18 mm round or flat media connectors, DeviceNet passthrough, and auxiliary power input and output connections*
1792D-CB23	ArmorBlock MaXum I/O Cable Base with 17 Pin M23 Connectors
1792D-KPLT	KEMPF Interface Plate

*Compatible only with MaXum blocks with a maximum of 4 I/O connectors.

Step 2 - Select:

- *power supplies*

ArmorBlock I/O Requirements

ArmorBlock MaXum I/O Requirements

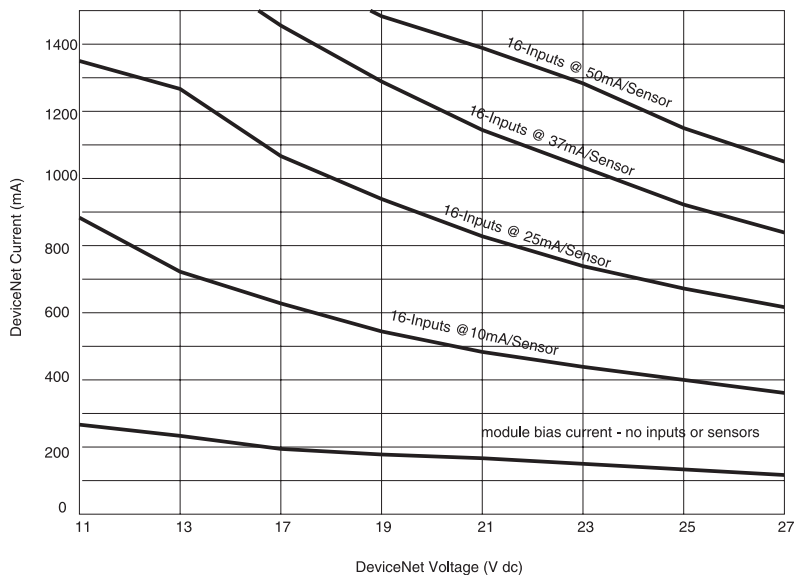
DeviceNet Power Supply Requirements

The 1732 ArmorBlock I/O only draws 100 mA from DeviceNet power. Inputs and outputs are both powered from auxiliary power. See page 13.

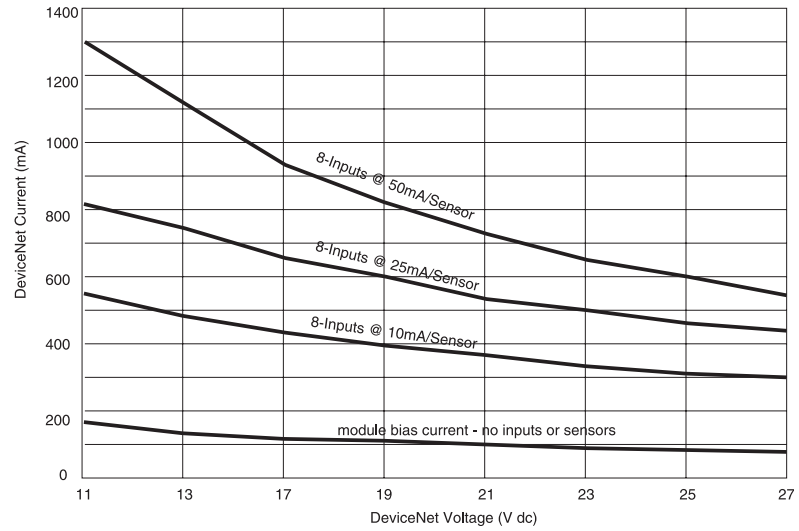
The DeviceNet network supplies power to the 1792D ArmorBlock system as well as to sensors. Outputs are powered by an external 24V dc source which is independent of the network.

Remember when planning your network that adding more sensors and blocks will draw a greater current from the DeviceNet network. Make sure that the added sensors and blocks do not draw more current than your power budget allows. The following charts describe the current draw created by installing MaXum modules.

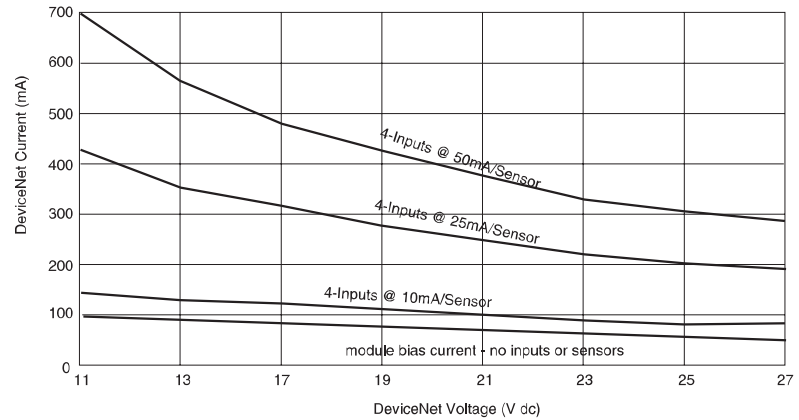
16 Input MaXum Power Requirements for DeviceNet



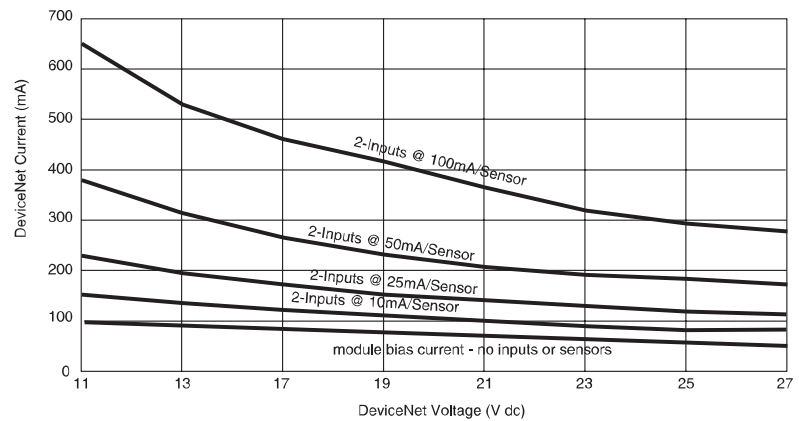
8 Input MaXum Power Requirements for DeviceNet



4 Input MaXum Power Requirements for DeviceNet



2 Input MaXum Power Requirements for DeviceNet



ArmorBlock MaXum Using DeviceNet Power for Outputs

In some applications where low-power actuators are used, DeviceNet power can be used to power those outputs. The 1792D-CB18JP and -CB12JP MaXum bases provide this capability.

- The 1792D-CB18JP takes power from the thick DeviceNet trunk and applies it to any outputs that exist on the block.
- The 1792D-CB12JP takes power from a DeviceNet drop cable (flat or round media) and applies it to the outputs.

When using these bases for power, be sure that a problem with an output device will not lead to a network failure.

1732 ArmorBlock I/O Auxiliary Power

In 1732 ArmorBlock I/O, inputs and outputs are powered solely from the auxiliary power connector. DeviceNet power is used only for the electronics of the block itself and consumes only 100 mA from network power.

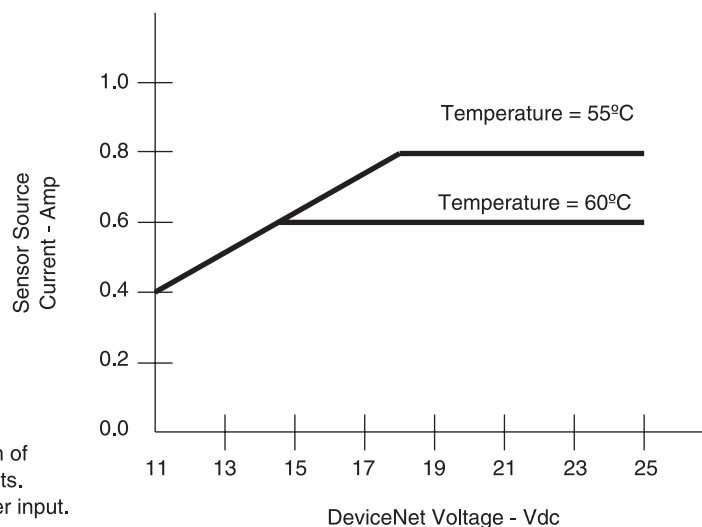
Due to the M12 pin size, 24V dc is brought in on pins 1 and 2 while ground is on pins 3 and 4. This permits 4 A to be brought into the block.

Both inputs and outputs are powered from this same connector. In the self-configuring versions, if you turn off the outputs for E-Stop you will also turn off the power to the inputs. If you need to control power to the outputs in the self-configuring versions, only use the output-only blocks.

ArmorBlock MaXum I/O Sensor Source Current

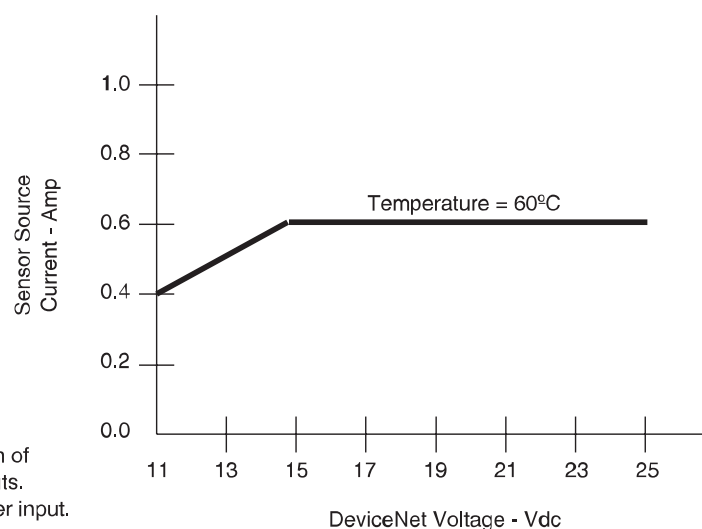
The following charts give the available current to power sensors for two ArmorBlock MaXum modules: the 1792D-16BVT0D module and the 1792D-12BVT4D module. These charts indicate the current available to power sensors based on the DeviceNet operating voltage and the ambient operating temperature. All other MaXum modules provide 50 mA per input or 100 mA per connector for all combinations of DeviceNet voltage and ambient temperature.

Variable Sensor Current for the 1792D-16BVT0D Module



Note: This is an illustration of total current for all 16 inputs. Divide by 16 for current per input.

Variable Sensor Current for the 1792D-12BVT4D Module



Note: This is an illustration of total current for all 12 inputs. Divide by 12 for current per input.

Step 4 - Select:

- *software*

ArmorBlock Family Module Communication

Selecting Software

The ArmorBlock family I/O modules act as a slave in a master/slave environment. Their I/O data is exchanged with the master through a poll, cyclic, or change-of-state connection. Selection of poll, cyclic, or change-of-state I/O is done in the DeviceNet scanner module's configuration.

When configured as a polled device, a master initiates communication by sending its polled I/O message to an ArmorBlock family module.

With change-of-state, the master no longer has to request data from the slave, it is sent automatically when data changes. In addition, an adjustable "heartbeat" is produced periodically by an ArmorBlock family I/O module to let the consuming device know that the module connection is alive and ready to communicate.

When an ArmorBlock family I/O module is configured for change-of-state, the master only sends output data when the user's control program wants to update the module's outputs. The ArmorBlock family module's input and fault status is only sent to the master when an input, state of the sensor source voltage, or output fault status changes.

A cyclic device allows configuration of the block as an I/O client. The block will produce and consume its data cyclically at the rate configured.

Input Filtering

Input filtering limits the effect of voltage transients caused by contact bounce and/or electrical noise. If not filtered, voltage transients could produce false data.

In the MaXum, to configure an input filter, an input signal delay is set to turn off-to-on or on-to-off for nominal amounts of time (0, 2, 4, 8, or 16 ms). When an input transitions from off-to-on, it must remain on for the specified amount of time before the module considers it.

In the ArmorBlock, there is a continuous range of 0...16000 ms.

The mode and filter time is set through RSNetWorx for DeviceNet or a similar configuration tool. Selectable filter time is provided on all ArmorBlock input modules.

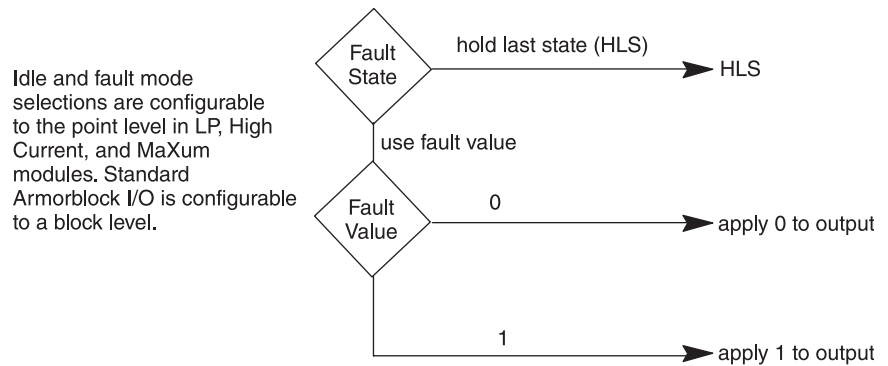
AutoBaud Detect

The ArmorBlock I/O modules have an autobaud detect feature. These modules automatically sense the baud rate of the network they are connected to and adjust the module's communication rate accordingly. You can disable the autobaud feature through your configuration software.

Idle and Fault Mode Selection

When the PLC controller or SLC controller is in program mode, the DeviceNet scanner puts the ArmorBlock module in an idle state. If the DeviceNet scanner drops off the network, the module goes to a fault state.

In both idle and fault state, the module resets its outputs by default. RSNetWorx for DeviceNet or a similar configuration tool can change the default and set the module to the last received outputs.



The ArmorBlock modules let you select how the blocks will respond to either a Network Communication Fault or placing the controller in program mode. To have the module respond in the desired manner, you must configure the Fault States parameter in the EDS file of the ArmorBlock module to Hold Last State. If you elect not to enable Hold Last State, the module will defer to the Fault Value Selection parameter.

The Fault Value Selection parameter is where you select either 0 or 1 as the Communication Fault value. The default value is 0.

DeviceLogix Functionality

The Series B ArmorBlock MaXum modules now have DeviceLogix - a local logic capability that provides users with the ability to control outputs and manage status information locally, within the device. DeviceLogix is configured through a function-block editor that is accessed through RSNetWorx for DeviceNet. This editor allows that user to create local logic using Boolean logic (AND, OR, etc.), as well as a variety of timers and counters. User support for the editor can be found in the DeviceLogix online manual or DeviceLogix User's Manual, publication ACIG-UM001.

Products that support DeviceLogix have some device-specific capabilities and capacities, which are outlined in the table below.

Note that 1732 ArmorBlock I/O does not support DeviceLogix.

Capability/Capacity	ArmorBlock MaXum (Series B)
Function blocks supported	Boolean Latches Timers Counters
Maximum number of function blocks included in a configuration	48
Function block processing time	1 ms/24 blocks 2 ms/48 blocks
Network input bits	32
Network output bits	8
Available fault bits	Input short circuit Input off-wire Output wire
Available status bits	Explicit message connection Polled connection Change-of-state/cyclic connection exists Network fault Minor module fault Auxiliary power status
Logic status indication (none, solid green, flashing green)	Logic disabled Logic enabled Local forces are applied and local logic is enabled