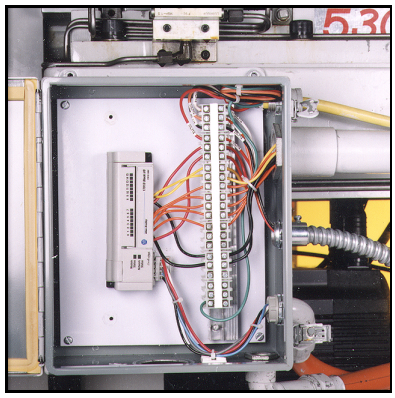
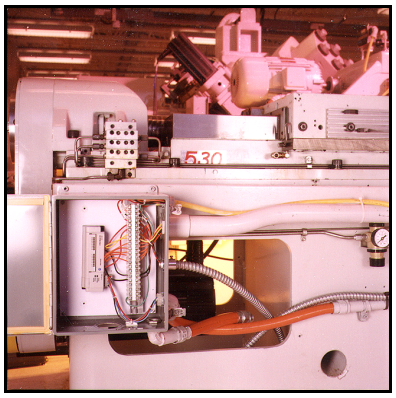
Allen-Bradley

Technical Data

CompactBlock I/O for DeviceNet

1791D





The 1791D CompactBlock I/O modules contain I/O circuits, a built-in power supply, and a built-in DeviceNet™ I/O adapter. CompactBlock I/O modules are ideal for applications restricted by space limitations and applications requiring highly distributed I/O blocks close to sensors and actuators.

The following CompactBlock I/O modules are available:

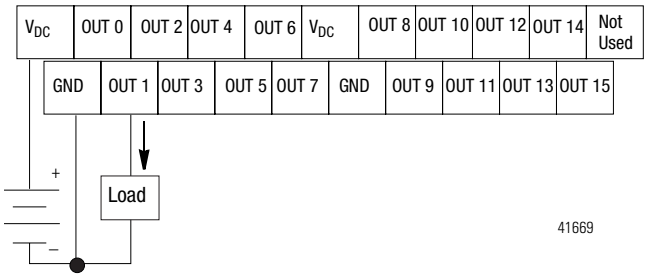
CompactBlock I/O

- 4 sinking input base module (1791D-4B0)
- 4 sinking input/ 4 sourcing output base module (1791D-4B4P)
- 8 sinking input/ 8 sourcing output base module (1791D-8B8P)
- 8 sourcing input/ 8 sinking output base module (1791D-8V8P)
- 16 sinking input base module (1791D-16B0)
- 16 sinking input expansion module (1791D-16B0X)
- 16 sourcing input base module (1791D-16V0)
- 16 sourcing input expansion module (1791D-16V0X)
- 8 sourcing output base module (1791D-0B8P)
- 16 sourcing output base module (1791D-0B16P)
- 16 sourcing output expansion module (1791D-0B16PX)
- 16 sinking output base module (1791D-0V16P)
- 16 sinking output expansion module (1791D-0V16PX)

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.

Wiring Connections

Output Wiring Diagram for 1791D-OB16P



Specifications

Sourcing Outputs	
Outputs per Block	2 groups of 8
On-state Voltage Range	10 - 30V dc
On-state Voltage Drop	0.5V dc @ rated current
On-state Current	0.5A maximum
Off-state Leakage	1.0mA maximum
Module Current (all outputs)	4.0A maximum
Surge Current - for 10ms, repeatable every 2 s	1.0A maximum

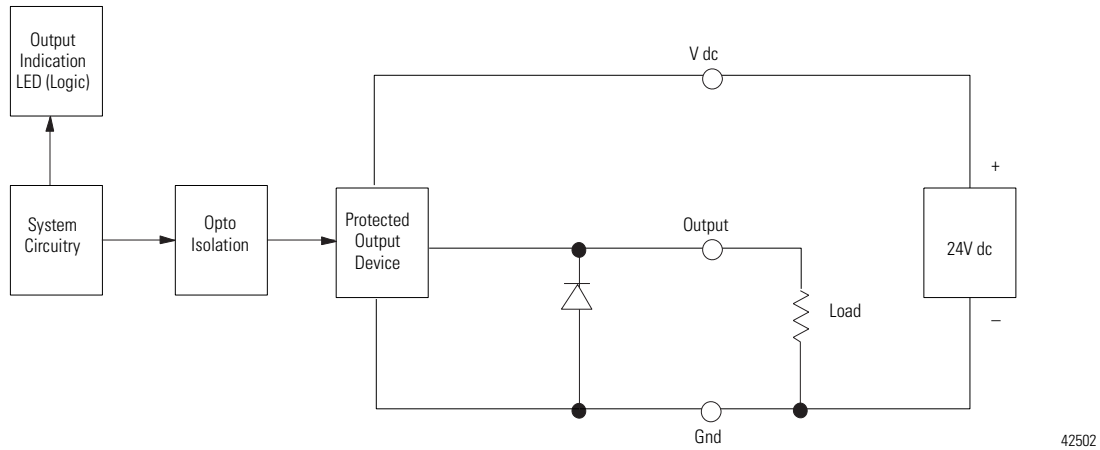
General Specifications	
Indicators	Mod/Net status - red/green Logic status - green I/O status - yellow
Communication Rate Thick Cable Flat Media 	 125Kbps @ 500m (1600ft) 250Kbps @ 200m (600ft) 500Kbps @ 100m (330ft) 125Kbps @ 420m (1230ft) 250Kbps @ 200m (490ft) 500Kbps @ 75m (245ft)
Isolation I/O to DeviceNet I/O group-to-group I/O group-to-logic	 500V ac 500V ac 500V ac
DeviceNet Power Voltage Current	 11V - 25 V dc 200mA maximum (with expansion)
Auxiliary Power Voltage Current	 10 - 30V dc 4A maximum
Base Module Dimensions	150mm X 48mm X 38mm 5.91 in X 1.9 in X 1.5 in
Environmental Conditions Operating Temperature Non-Operating Temperature Relative Humidity Operating Shock Non-operating Shock Vibration	 0 to 60°C (32 to 140°F) -40 to 85°C (-40 to 185°F) 5-95% non-condensing 30g 50g tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	 14 gauge ($2mm^2$) stranded maximum 3/64 inch insulation maximum 2[1, 2]
Product Certifications	UL, UL Hazardous Class I, Div 2, Groups A, B, C, D. C-UL, C-UL Hazardous Class I, Div 2, Groups A, B, C, D. CE marked for all applicable directives
Enclosure	IEC IP20

[1] Use this conductor category information for planning conductor routing as described in the system level installation manual.

[2] Refer to, Programmable Controller Wiring and Grounding Guidelines, publication 1770-4.1.

16 Sourcing Output Expansion Module 1791D-0B16PX

Simplified Schematic



The CompactBlock expansion module I/O is exchanged with the master through a poll, change-of-state, or cyclic connection.

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

Change-of-state - productions occur when an input changes. If no input change occurs within the expected packet rate, a heartbeat production occurs. This heartbeat production tells the scanner module that the CompactBlock 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.

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.

This modules consumes 1 byte for every 8 outputs. When it is connected to a base module, an additional byte will be returned indicating the health of the expansion module.

The following table contains connection sizes for this module:

Module(s)	I/O Points	Produce (input bytes)	Consume (output bytes)
1791D-0B16PX with base input module	16 input/16 output	3	2
1791D-0B16PX with base output module	32 output	1	4
1791D-0B16PX with combination base module	8 input/ 24 output	2	3

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

Bit	07	06	05	04	03	02	01	00
Consumes 0	O7	O6	O5	O4	O3	O2	O1	O0
Consumes 1	O15	O14	O13	O12	O11	O10	O9	O8

Word	Bit	Description
Consumes 0	00-07	Output bits - when the bit is set (1), the output will be turned on. Bit 00 corresponds to output O0, bit 01 corresponds to output 01, bit 02 to output 02, bit 03 to output 03, etc.
Consumes 1	08-15	Output bits - when the bit is set (1), the output will be turned on. Bit 00 corresponds to output O8, bit 01 corresponds to output O9, bit 02 to output O10, bit 03 to output O11, etc.

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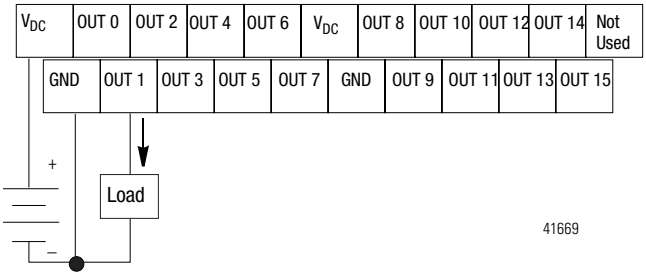
Wiring Connections

Output Wiring Diagram for 1791D-OB16PX Expansion Module



Specifications

Sourcing Outputs	
Outputs per Block	2 groups of 8
On-state Voltage Range	10 - 30V dc
On-state Voltage Drop	0.5V dc @ rated current
On-state Current	0.5A maximum
Off-state Leakage	1.0mA maximum
Module Current (all outputs)	4.0A maximum
Surge Current - for 10ms, repeatable every 2 s	1.0A maximum

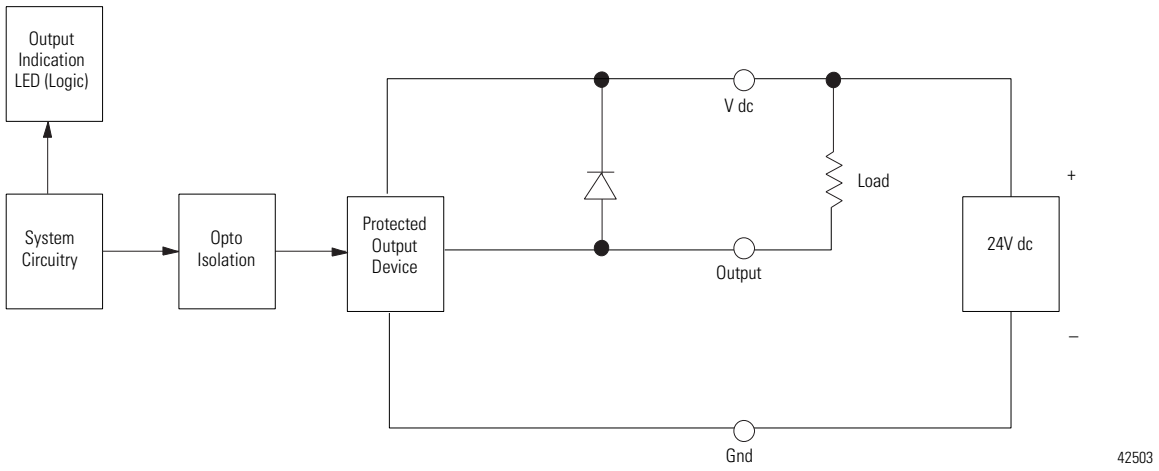
General Specifications	
Indicators	Mod/Net status - red/green Logic status - green I/O status - yellow
Communication Rate Thick Cable Flat Media 	 125Kbps @ 500m (1600ft) 250Kbps @ 200m (600ft) 500Kbps @ 100m (330ft) 125Kbps @ 420m (1230ft) 250Kbps @ 200m (490ft) 500Kbps @ 75m (245ft)
Isolation I/O to DeviceNet I/O group-to-group I/O group-to-logic	 500V ac 500V ac 500V ac
Expansion Power Voltage Current	 5V dc 100mA
Auxiliary Power Voltage Current	 10 - 30V dc 4A maximum
Expansion Module Dimensions	113mm X 48mm X 38mm 4.4in X 1.9in X 1.5in
Environmental Conditions Operating Temperature Non-Operating Temperature Relative Humidity Operating Shock Non-operating Shock Vibration	 0 to 60°C (32 to 140°F) -40 to 85°C (-40 to 185°F) 5-95% non-condensing 30g 50g tested 5g @ 10-500Hz per IEC 68-2-6
Conductors Wire Size Category	 14 gauge ($2mm^2$) stranded maximum 3/64 inch insulation maximum 2[1, 2]
Product Certifications	UL, UL Hazardous Class I, Div 2, Groups A, B, C, D. C-UL, C-UL Hazardous Class I, Div 2, Groups A, B, C, D. CE marked for all applicable directives
Enclosure	IEC IP20

[1] Use this conductor category information for planning conductor routing as described in the system level installation manual.

[2] Refer to, Programmable Controller Wiring and Grounding Guidelines, publication 1770-4.1.

16 Sourcing Output Base Module 1791D-0V16P

Simplified Schematic



The CompactBlock base module I/O is exchanged with the master through a poll, change-of-state, or cyclic connection.

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

Change-of-state - productions occur when an input changes. If no input change occurs within the expected packet rate, a heartbeat production occurs. This heartbeat production tells the scanner module that the CompactBlock 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.

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.

The module consumes 1 byte for every 8 outputs. When an expansion module is connected, an additional byte will be returned indicating the health of the expansion module.

The following table contains connection sizes for this module:

Module(s)	I/O Points	Produce (input bytes)	Consume (output bytes)
1791D-0V16P	16 output	0	2
1791D-0V16P with expansion output	32 output	1	4
1791D-0V16P with expansion input	16 output/ 16 input	3	2

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

Bit	07	06	05	04	03	02	01	00
Consumes 0	O7	O6	O5	O4	O3	O2	O1	O0
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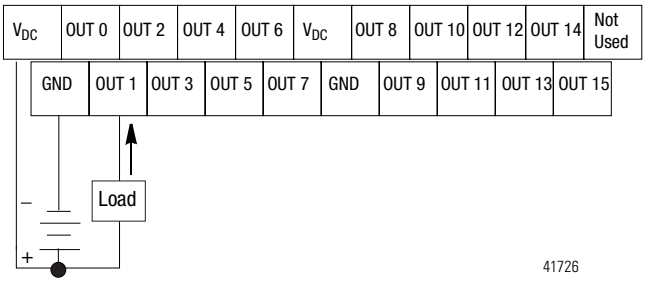
Wiring Connections

Output Wiring Diagram for 1791D-OV16P



Specifications

Sourcing Outputs	
Outputs per Block	2 groups of 8
On-state Voltage Range	10 - 30V dc
On-state Voltage Drop	0.5V dc @ rated current
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Module Current (all outputs)	4.0A maximum
Surge Current - for 10ms repeatable every 2 s	1.0A maximum

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Isolation I/O to DeviceNet I/O group-to-group I/O group-to-logic	 500V ac 500V ac 500V ac
DeviceNet Power Voltage Current	 11V - 25 V dc 200mA maximum (with expansion)
Auxiliary Power Voltage Current	 10 - 30V dc 4A maximum
Base Module Dimensions	150mm X 48mm X 38mm 5.91in X 1.9in X 1.5in
Environmental Conditions Operating Temperature Non-Operating Temperature Relative Humidity Operating Shock Non-operating Shock Vibration	 0 to 60°C (32 to 140°F) -40 to 85°C (-40 to 185°F) 5-95% non-condensing 30 g 50g tested 5g @ 10-500Hz per IEC 68-2-6
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