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SOLVE.<sup>SM</sup>

# PRODUCT PROFILE

**COMPACTBLOCK I/O**

## BENEFITS

**Save Space:** A small form factor allows you to mount into shallow cabinets, operator workstations and wireways, saving space.

**Lower Costs:** The small size reduces your need for large cabinets and extensive wiring. Removable terminal blocks and single bus cabling reduce wiring and maintenance costs.

**Flexibility:** A wide variety of base and expansion combinations allow you to eliminate unnecessary I/O points.

**Easy to Install and Use:** Modular EDS or GSD files, rotary switches, and autobaud rate detection provide easy commissioning.

**Application Diversity:** Digital base and expansion modules accommodate up to 32 points of I/O per node, and analog expansion module offer configurable input and output channels, allowing you to mount CompactBlock in a broad range of applications.

**Decreased Downtime:** Removable terminal blocks on all modules are easy to maintain and minimize your downtime.

**Network Connectivity:** DeviceNet™, Remote I/O and PROFIBUS® DP.

**Local Control:** DeviceLogix Smart Technology enables local control in the block for faster sense-to-actuation times.

## COMPACTBLOCK I/O IN-CABINET BLOCK I/O PLATFORM



CompactBlock I/O provides you with an easy-to-use, compact, and cost-effective distributed I/O solution. Handling 24 VDC and analog application on three networks, it can be distributed throughout your plant for applications such as material handling, conveyors, packaging, or where space is limited.

CompactBlock I/O provides higher performance and more benefits than other block I/O products:

- IEC/NEMA Type 3+ inputs offers the widest range of compatible sensors.
- 10-30 VDC device power accommodates a broad range of applications.
- Digital base modules are available with 4 to 16 points per block with a built-in network adaptor. Digital expansion modules are 16 points.
- Analog expansion module provides 4 inputs and 2 outputs for either 0-20mA, 4-20mA or 0-10 VDC with each channel configurable by wiring.
- Address switches and autobaud ease network commissioning.
- Hardware Watchdog function secures state of I/O modules in case of a failure.
- Output short-circuit protection protects outputs in case of accidental miswiring.
- Removable terminal blocks on all modules save maintenance costs.



Compact Block I/O offers the leading, lowest cost, device-level communication network – DeviceNet – to translate simple messages from the controller to the plant floor, giving you better diagnostic capabilities:

- Single bus cable for reduced wiring costs
- Retention screws prevent cable disconnection from challenging environments
- Cyclic or change-of-state operation increases network bandwidth by sending I/O messages only when necessary

- ODVA conformance ensures DeviceNet compatibility and reliability
- Includes DeviceLogix™ Smart Component Technology enabling localized, simple control functions for faster sense-to-actuation times
- Compact Block I/O is also available on Remote I/O & PROFIBUS DP
- RIO block configuration is accomplished via DIP switches, no software is needed
- Configure using provided GSD files and any PROFIBUS DP configuration package
- All base blocks are compatible with all expansion modules (except for 1791D-4B0 which is not expandable)

DeviceNet Bases	
1791D-0B16P	DNet, 24 VDC CompactBlock I/O, 16 out source, base
1791D-0B8P	DNet, 24 VDC CompactBlock I/O, 8 out source, base
1791D-0V16P	DNet, 24 VDC CompactBlock I/O, 16 out sink, base
1791D-16B0	DNet, 24 VDC CompactBlock I/O, 16 in sink, base
1791D-16V0	DNet, 24 VDC CompactBlock I/O, 16 in source, base
1791D-4B0	DNet, 24 VDC CompactBlock I/O, 4 in sink (not expandable)
1791D-4B4P	DNet, 24 VDC CompactBlock I/O, 4 in sink/4 out source, base
1791D-8B8P	DNet, 24 VDC CompactBlock I/O, 8 in sink/8 out source, base
1791D-8V8P	DNet, 24 VDC CompactBlock I/O, 8 in source/8 out sink, base
Remote I/O Bases	
1791R-0B16P	RIO, 24 VDC CompactBlock I/O, 16 out source, base
1791R-16B0	RIO, 24 VDC CompactBlock I/O, 16 in sinking, base
1791R-4B4P	RIO, 24 VDC CompactBlock I/O, 4 in sink/4 out source, base
1791R-8B8P	RIO, 24 VDC CompactBlock I/O, 8 in sink/8 out source, base
1791R-8V8P	RIO, 24 VDC CompactBlock I/O, 8 in source/8 out sink, base
PROFIBUS Bases	
1791P-0B16P	PROFIBUS, 24 VDC CompactBlock I/O, 16 out sourcing, base
1791P-16B0	PROFIBUS, 24 VDC CompactBlock I/O, 16 in sinking, base
1791P-4B4P	PROFIBUS, 24 VDC CompactBlock I/O, 4 in sink/4 out source, base
1791P-8B8P	PROFIBUS, 24 VDC CompactBlock I/O, 8 in sink/8 out source, base
1791P-8V8P	PROFIBUS, 24 VDC CompactBlock I/O, 8 in source/8 out sink, base
Universal Expansion Blocks*	
1791D-0B16PX	24 VDC CompactBlock I/O Expansion, 16 out source
1791D-0V16PX	24 VDC CompactBlock I/O Expansion, 16 out sink
1791D-16BOX	24 VDC CompactBlock I/O Expansion, 16 in sink
1791D-16VOX	24 VDC CompactBlock I/O Expansion, 16 in source
1791D-N4CV2X	Analog CompactBlock I/O Expansion, 4 inputs, 2 outputs
Optional Components	
1791D-15CMCBL	24 VDC Block I/O longer ribbon cable, 15 cm
1791D-30CMBL	24 VDC Block I/O long cable, 30 cm
1791D-4CMCBL	24 VDC Block I/O replacement ribbon cable, 4 cm
1791D-RTBN21	Block I/O replacement terminal block, 21-pin NEMA
1791R-RIOSCON	RIO 6-position connector, lock screws
*Universal expansion blocks function with DeviceNet, RIO & PROFIBUS Bases – 1 expansion per base block.	
Technical Publications	
I/O Products System Overview: CIG-SO001D-EN-P	
CompactBlock I/O Technical Data: 1791D-TD001D-EN-P (DeviceNet), 1791P-TD001A-EN-P (PROFIBUS), 1791R-TD001A-EN-P (Remote I/O)	
Dimensions (H x D x W)	
Base Block	150 mm X 50 mm X 38 mm (5.9 in X 1.97 in X 1.5 in)
Expansion Block	115 mm X 50 mm X 38 mm (4.53 in X 1.97 in X 1.5 in)

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[www.rockwellautomation.com](http://www.rockwellautomation.com)

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Environmental Specifications	
Operating Temperature	0 to 60°C (32 to 140°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Relative Humidity	5 - 95% non-condensing
Shock Operating	30 g
Non-operating	50 g
Vibration	Tested 5 g @ 10-500 Hz per IEC 66-2-6
Mounting	DIN rail or screw
Wire Size (Terminal Block)	14 gauge (2mm2) stranded max, 3/64 in insulation max
General Specifications	
Isolation Voltage	
I/O to network+A16	500 VAC/60 s
I/O group-to-group	500 VAC/60 s
I/O group-to-logic	500 VAC/60 s
Inputs	Type 3 (1&2)
Output On-state Current	0.5 A
Product Certifications	UL, UL Hazardous Class I Div 2, Groups A,B,C,D (where product is marked) C-UL, C-UL Hazardous Class I Div 2, Groups A,B,C,D CE marked for all applicable directives
Enclosure	IEC IP20
Wiring Category	2 <sup>1,2</sup>
DeviceNet Specifications	
Indicators	1 red/green module/network status 1 green Logic status 1 yellow I/O status per point
Network Protocol	I/O slave messaging
Modes Supported	Poll, cyclic and change-of-state commands
Communication Rate	125 Kbps, 250 Kbps, 500 Kbps; autobaud rate selection
Remote I/O Specifications	
Indicators	1 red/green module status 1 red/green communication status 1 yellow I/O status per point
Communication Rate	57.6 Kbps @ 3048 m (10,000 ft) 115.2 Kbps @ 1524 m (5,000 ft) 230.4 Kbps @ 762 m (2,500 ft)
PROFIBUS Specifications	
Indicators	1 red/green module status 1 red/green network status 1 yellow I/O status per point
Network Protocol	PROFIBUS DP (EN50170), Slave with Class 1 or 2 master
Modes Supported	Freeze, sync, and fail safe
Communication Rate	Current standards of PROFIBUS DP
Technical Publications	
I/O Module Brochure ACIG-BR002b-EN-P	
CompactBlock I/O Technical Data: 1791D-TD001D-EN-P; 1790P-TD001B-EN-P; 1791R-TD001B-EN-P	
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."	