



**ALLEN-BRADLEY**

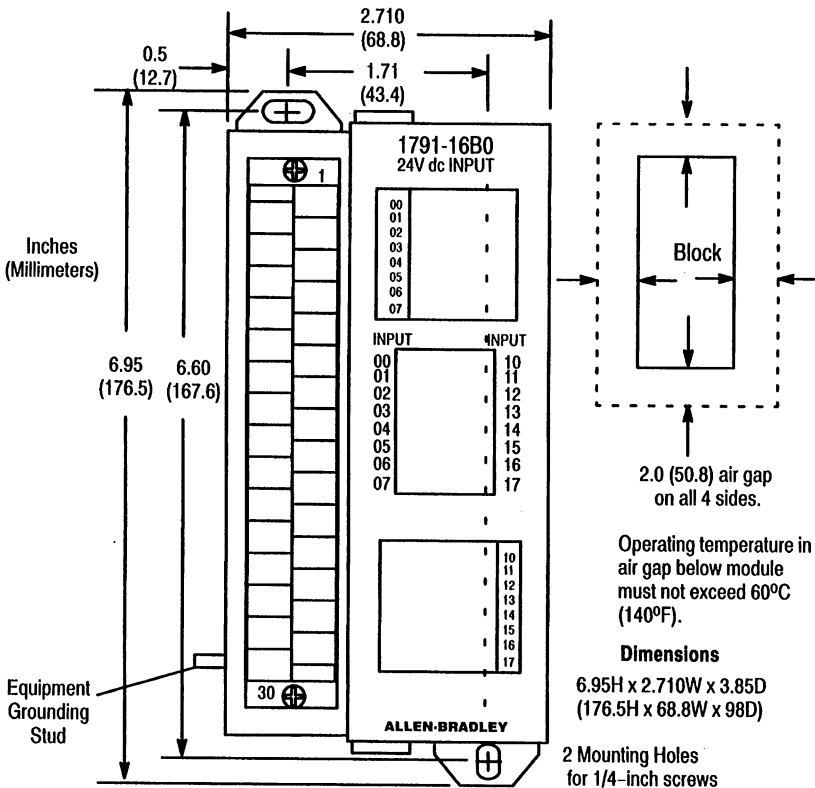
# 16 Input DC Block I/O Module

**Cat. No. 1791-16B0 Series B**

## Installation

Mount the block I/O module in a vertical (recommended) or horizontal position. Allow sufficient room around the block for cooling air flow through the block module. Refer to Figure 1.

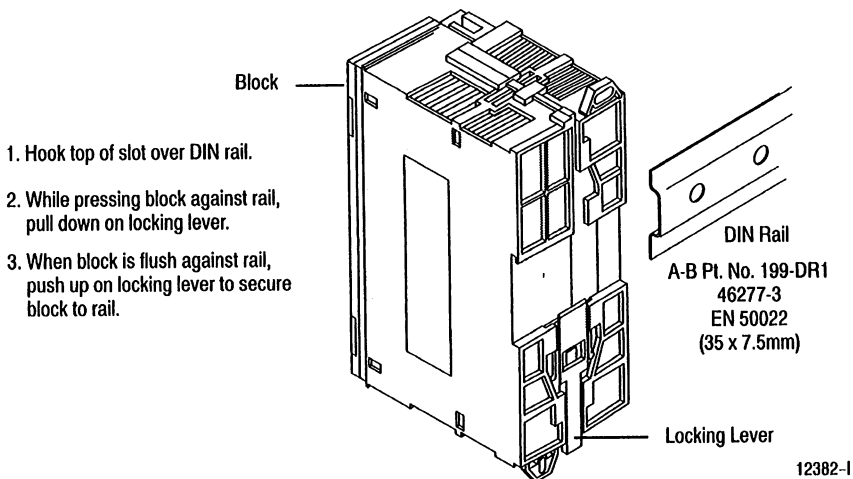
**Figure 1**  
**Mounting Dimensions for the Block I/O Module**  
**Cat. No. 1791-16B0 Series B (PLC version shown)**



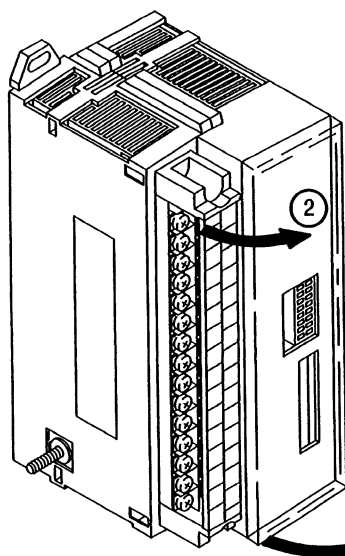
**CAUTION:** When tightening grounding stud nut, do not exceed 15 in-lbs.

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**Figure 2**  
**Mounting on a DIN Rail**



**Figure 3**  
**Inserting Labels**



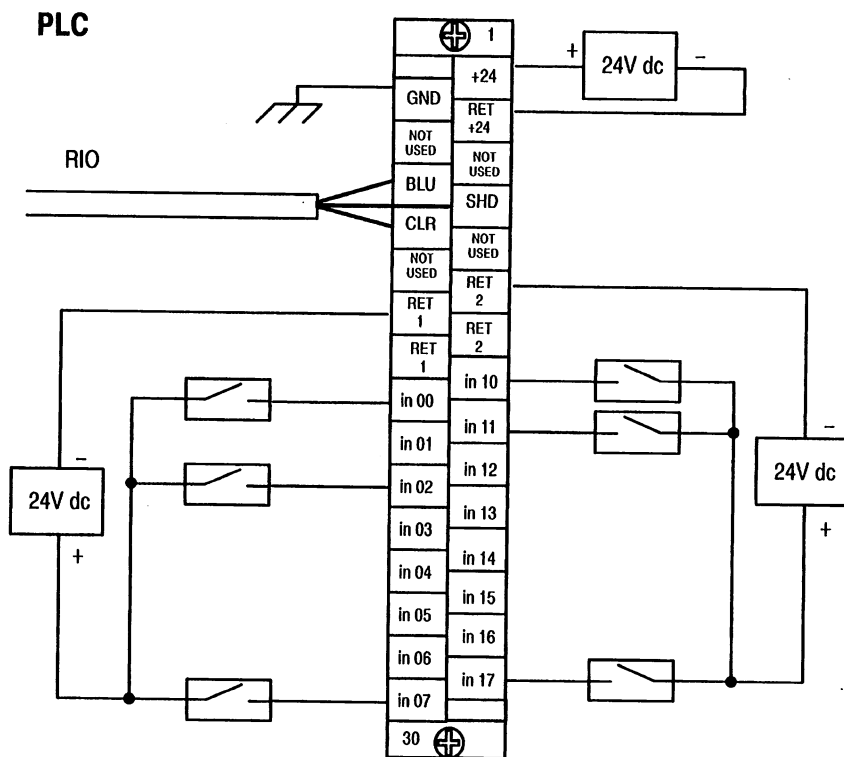
A set of labels is supplied with your module. Select the proper module designation labels (PLC or SLC) for the front door and terminal strip.

1. Remove die-cut labels from package. Select correct labels for your application. (PLC label is numbered 00-07 and 10-17. SLC label is numbered 00-07 and 08-15.)
2. Remove plastic cover on terminal strip by flexing in middle. Slip the terminal designation label into built-in holders in terminal strip cover. Flex cover slightly to install.
3. Open clear front door. Slip module designation label into slots that secure it to the door.

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Connect wiring as shown in Figure 4 or Figure 5.

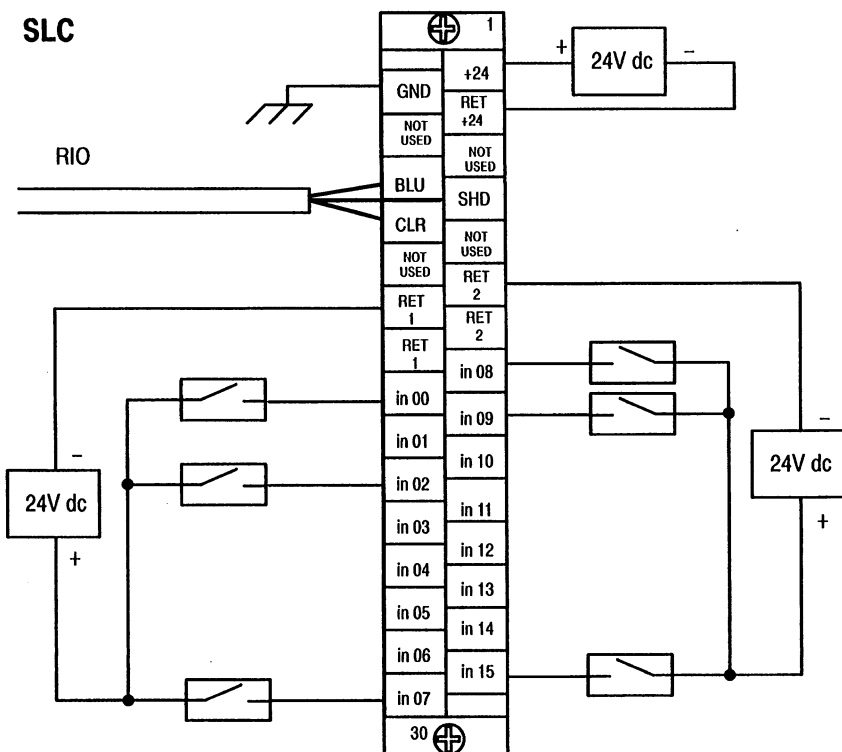
**Figure 4**  
**Wiring Connections for the Block I/O Module with PLC Family**  
**Programmable Controllers (refer to Table A)**



NOTE: RET 1 connections are internally connected together.  
 RET 2 connections are internally connected together.

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**Figure 5**  
**Wiring Connections for the Block I/O Module with SLC Family**  
**Controllers (refer to Table A)**



NOTE: RET 1 connections are internally connected together.  
RET 2 connections are internally connected together.

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The block I/O module has an equipment grounding stud on the lower left side of the module. Connect this grounding stud to your equipment ground. Torque the nut to 15 in-lbs maximum when connecting to your equipment ground.



**ATTENTION:** Do not overtighten the nut on the grounding stud when connecting the wire. Damage to the module could result.

Refer to “Programmable Controller Wiring and Grounding Guidelines” (1770-4.1) for further information.

**Table A**  
**Wiring Block Designations**

Connections	1791-16B0 Series B		
	Designation	Description	Terminal No.
Power Connections	+24	+24V dc Power	1
	RET +24	dc Return	3
	GND	Chassis ground	2 <sup>1</sup>
Remote I/O Connections	BLU	Blue wire – RIO	6
	CLR	Clear wire – RIO	8
	SHD	Shield – RIO	7
I/O Connections			
Input	in 00 thru in 07	Input 00 thru 07	16, 18, 20, 22, 24, 26, 28, 30
	RET 1	RET 1 Input Common	12, 14 <sup>2</sup>
Input	RET 2	RET 2 Input Common	11, 13 <sup>3</sup>
	PLC: in 10 thru in 17 SLC: in 08 thru in 15	PLC: Input 10 thru input 17 SLC: Input 08 thru input 15	15, 17, 19, 21, 23, 25, 27, 29
	Not Used	For internal test only; not for customer use.	4, 5, 9, 10

<sup>1</sup> Connect chassis ground to equipment grounding stud. These are not internally connected.

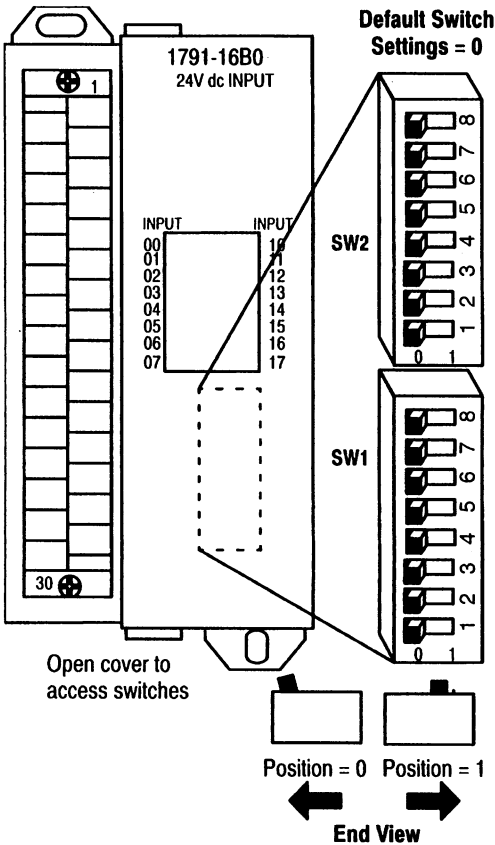
<sup>2</sup> Terminals 12 and 14 are internally connected.

<sup>3</sup> Terminals 11 and 13 are internally connected.

**Table B**  
**Acceptable Wiring Cables for Block I/O Connection**

Use	Cable Type
Remote I/O link or Distributed I/O link	Belden 9463
Input and output wiring	Up to 14AWG (2mm <sup>2</sup> ) stranded with 3/64 inch insulation

**Figure 6**  
**Switch Settings**



**ATTENTION:** Cycle power to the module after setting the switches.

**Only block I/O modules with all inputs or all outputs can use complementary I/O.**

**NOTE:** Set switch SW2-3 to 0 if this rack will have a unique address (not complemented). If this rack address is a duplicate of another I/O block or chassis, set the switch to 1 for primary or 0 for complementary. Refer to Table C for the complementary I/O rack address.

**Series A block I/O modules do not support complementary I/O. If using series A modules, set switch SW2-3 to 0.**

SW2-8
Not used

SW2-7	Filter Speed Select
0	Slow
1	Fast

Note: For inputs only

SW2-6	Last I/O Group
0	Not last rack
1	Last rack

SW2-5	Processor Restart/Lockout (PRL)
0	Processor Restart
1	Processor Lockout

SW2-4	Hold Last State
0	Reset Outputs
1	Hold Last State

SW2-3	Complementary I/O <sup>1</sup>
0	Non-Complemented System
0	Complementary Rack <sup>1</sup>
1	Primary Rack <sup>1</sup>

<sup>1</sup> See Note.

Communication Rate		
SW2-2	SW2-1	Bits/s
0	0	57.6 K
0	1	115.2 K
1	0	230.4 K
1	1	230.4 K

Starting Quarter		
SW1-2	SW1-1	Module Group
0	0	0 (1st)
0	1	2 (2nd)
1	0	4 (3rd)
1	1	6 (4th)

**Installation Instructions**  
Block I/O  
Cat. No. 1791-16B0 Series B

1747-SN Rack Number	1771-SN Rack Number	PLC-2 Rack Number	PLC-5 Rack Number	PLC-5/250 Rack Number	PLC-3 Rack Number	SW1 Switch Position					
						8	7	6	5	4	3
Rack 0	Rack 1	Rack 1	Not Valid	Rack 0	Rack 0	0	0	0	0	0	0
Rack 1	Rack 2	Rack 2	Rack 1	Rack 1	Rack 1	0	0	0	0	0	1
Rack 2	Rack 3	Rack 3	Rack 2	Rack 2	Rack 2	0	0	0	0	1	0
Rack 3	Rack 4	Rack 4	Rack 3	Rack 3	Rack 3	0	0	0	0	1	1
	Rack 5	Rack 5	Rack 4	Rack 4	Rack 4	0	0	0	1	0	0
	Rack 6	Rack 6	Rack 5	Rack 5	Rack 5	0	0	0	1	0	1
	Rack 7	Rack 7	Rack 6	Rack 6	Rack 6	0	0	0	1	1	0
			Rack 7	Rack 7	Rack 7	0	0	0	1	1	1
			Rack 10	Rack 10	Rack 10	0	0	1	0	0	0
			Rack 11	Rack 11	Rack 11	0	0	1	0	0	1
			Rack 12	Rack 12	Rack 12	0	0	1	0	1	0
			Rack 13	Rack 13	Rack 13	0	0	1	0	1	1
			Rack 14	Rack 14	Rack 14	0	0	1	1	0	0
			Rack 15	Rack 15	Rack 15	0	0	1	1	0	1
			Rack 16	Rack 16	Rack 16	0	0	1	1	1	0
			Rack 17	Rack 17	Rack 17	0	0	1	1	1	1
			Rack 20	Rack 20	Rack 20	0	1	0	0	0	0
			Rack 21	Rack 21	Rack 21	0	1	0	0	0	1
			Rack 22	Rack 22	Rack 22	0	1	0	0	1	0
			Rack 23	Rack 23	Rack 23	0	1	0	0	1	1
			Rack 24	Rack 24	Rack 24	0	1	0	1	0	0
			Rack 25	Rack 25	Rack 25	0	1	0	1	0	1
			Rack 26	Rack 26	Rack 26	0	1	0	1	1	0
			Rack 27	Rack 27	Rack 27	0	1	0	1	1	1
				Rack 30	Rack 30	0	1	1	0	0	0
				Rack 31	Rack 31	0	1	1	0	0	1
				Rack 32	Rack 32	0	1	1	0	1	0
				Rack 33	Rack 33	0	1	1	0	1	1
				Rack 34	Rack 34	0	1	1	1	0	0
				Rack 35	Rack 35	0	1	1	1	0	1
				Rack 36	Rack 36	0	1	1	1	1	0
				Rack 37	Rack 37	0	1	1	1	1	1
					Rack 40	1	0	0	0	0	0
					Rack 41	1	0	0	0	0	1
					Rack 42	1	0	0	0	1	0
					Rack 43	1	0	0	0	1	1
					Rack 44	1	0	0	1	0	0
					Rack 45	1	0	0	1	0	1
					Rack 46	1	0	0	1	1	0
					Rack 47	1	0	0	1	1	1
					Rack 50	1	0	1	0	0	0

**Installation Instructions**  
**Block I/O**  
**Cat. No. 1791-16B0 Series B**

1747-SN Rack Number	1771-SN Rack Number	PLC-2 Rack Number	PLC-5 Rack Number	PLC-5/250 Rack Number	PLC-3 Rack Number	SW1 Switch Position					
						8	7	6	5	4	3
					Rack 51	1	0	1	0	0	1
					Rack 52	1	0	1	0	1	0
					Rack 53	1	0	1	0	1	1
					Rack 54	1	0	1	1	0	0
					Rack 55	1	0	1	1	0	1
					Rack 56	1	0	1	1	1	0
					Rack 57	1	0	1	1	1	1
					Rack 60	1	1	0	0	0	0
					Rack 61	1	1	0	0	0	1
					Rack 62	1	1	0	0	1	0
					Rack 63	1	1	0	0	1	1
					Rack 64	1	1	0	1	0	0
					Rack 65	1	1	0	1	0	1
					Rack 66	1	1	0	1	1	0
					Rack 67	1	1	0	1	1	1
					Rack 70	1	1	1	0	0	0
					Rack 71	1	1	1	0	0	1
					Rack 72	1	1	1	0	1	0
					Rack 73	1	1	1	0	1	1
					Rack 74	1	1	1	1	0	0
					Rack 75	1	1	1	1	0	1
					Rack 76	1	1	1	1	1	0
					Not Valid	1	1	1	1	1	1

Rack address 77 is an illegal configuration.

PLC-5/11 processors can scan rack 03.

PLC-5/15 and PLC-5/20 processors can scan racks 01-03.

PLC-5/25 and PLC-5/30 processors can scan racks 01-07.

PLC-5/40 and PLC-5/40L processors can scan racks 01-17.

PLC-5/60 and PLC-5/60L processors can scan racks 01-27.

PLC-5/250 processors can scan racks 00-37.

**Table C**  
**PLC-2 and PLC-5 With Complementary I/O**

PLC-2 Rack Number	PLC-5 Rack Number	SW1 Switch Position					
		8	7	6	5	4	3
Rack 1	Not Valid	0	0	1	0	0	0
Rack 2	Rack 1	0	0	1	0	0	1
Rack 3	Rack 2	0	0	1	0	1	0
Rack 4	Rack 3	0	0	1	0	1	1
Rack 5	Rack 4	0	0	1	1	0	0
Rack 6	Rack 5	0	0	1	1	0	1
Rack 7	Rack 6	0	0	1	1	1	0
	Rack 7	0	0	1	1	1	1

When configured as complementary I/O:

PLC-2 can scan racks 01-07

PLC-5/11 can scan rack 03

PLC-5/20, PLC-5/30, PLC-5/40, PLC-5/60  
 can scan racks 01-07

**NOTE:** Remote rack numbers which can  
 have a complementary rack are rack  
 numbers 01 thru 07 only.



The SLC 500 controllers communicate with the block I/O using an I/O Scanner module (cat. no. 1747-SN series A). Refer to the user manual for the 1747-SN/A Scanner module for more information.

**Note:** This block I/O module is **not** compatible with the **1747-DSN** Distributed I/O Scanner module.

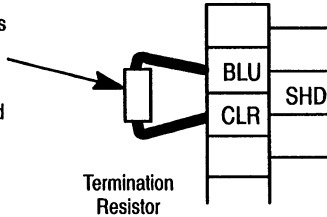
## Termination Resistor

A termination resistor must be installed on the last block in a series. Connect the resistor as shown in Figure 7.

### Figure 7 Installing the Termination Resistor

Connect termination resistor across terminals 6 (BLU) and 8 (CLR).

150 ohm – 57.6K and 115.2K baud  
82 ohm – 230.4K baud

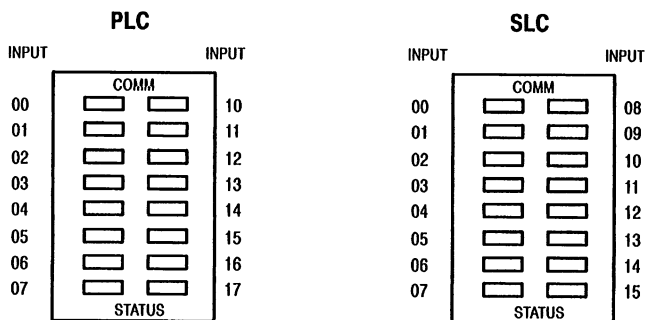


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**ATTENTION:** Devices that are operating at 230.4K baud must have 82 ohm terminators in place for proper operation.

## Indicators



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Indicator		Description
COMM	OFF	Communication not established
	ON	Communication established
	Flashing	Processor in Program mode
STATUS	OFF	Normal
	ON	Error (hardware or software), block power low
	Flashing	COMM FAIL - communication cable disconnected, 100ms between valid frames, no more than 255 valid frames between valid frames addressed to block, 20ms idle time exceeded.

COMM and STATUS will alternately flash when processor restart lockout is selected, a fault has occurred and the processor is communicating with the block.

## Fusing

The block I/O module is internally fused to protect the module. No external power fusing is required.

## 1791-16B0 Series B Specifications

### Input Specifications

Inputs per Block		16 – 2 groups of 8
On-state Voltage Range		10–30V dc
On-state Current	Maximum Minimum	11.0mA @ 30V 2.5mA @ 10V
Off-state Voltage	Maximum	5V dc
Off-state Current	Minimum	1.5mA
Input Impedance	Maximum	3.4K ohms
Input Signal Delay	Fast Slow	1.0ms on; 5.0ms off (maximum) 1.0ms on; 18.0ms off (maximum)

### General Specifications

External Power (internally protected - no external fuse required)	Voltage Current	19.2–30V dc 300mA
Dimensions	Inches Millimeters	6.95H X 2.7W X 3.85D 176.5H X 68.8W X 98D
Isolation	Power supply to RIO I/O Group-to-Group I/O Group-to-Logic	500V ac 500V ac 500V ac
Power Dissipation	Maximum	11.1 Watts
Thermal Dissipation	Maximum	38.0 BTU/hr
Environmental Conditions	Operational Temperature Storage Temperature Relative Humidity	0 to 60°C (32 to 140°F) –40 to 85°C (–40 to 185°F) 5 to 95% noncondensing
Conductors	Wire Size  Category	14 gauge (2mm <sup>2</sup> ) stranded maximum 3/64 inch insulation maximum 2 <sup>1</sup>

<sup>1</sup> You use this conductor category information for planning conductor routing as described in the system level installation manual.