Chapter 1

Introducing Block I/O

Chapter Objectives

In this chapter you will learn what block I/O is, its features, and how it functions.

General Description

Block I/O consists of small, self-contained remote I/O devices complete with power supply, programmable controller interface, input/output connections and signal conditioning circuitry.

The 1791-IOBX 24V dc module has 64 sink input channels, and 64 source output channels.

The 1791-IOVX 24V dc module has 64 source input channels, and 64 sink output channels.

Complete specifications for these modules are contained in Appendix A.

The blocks are compatible with PLC-2®, PLC-3®, and PLC-5® family programmable controllers, and the SLC® 500 modular controllers. When used with PLC-2 family programmable controllers, a sub-scanner module is used to communicate with the blocks. When used with PLC-3 and PLC-5 family programmable controllers, they can be connected directly to the controller or to a scanner module. When used with SLC 500 controllers, a 1747-SN remote I/O scanner is used to communicate with the blocks.

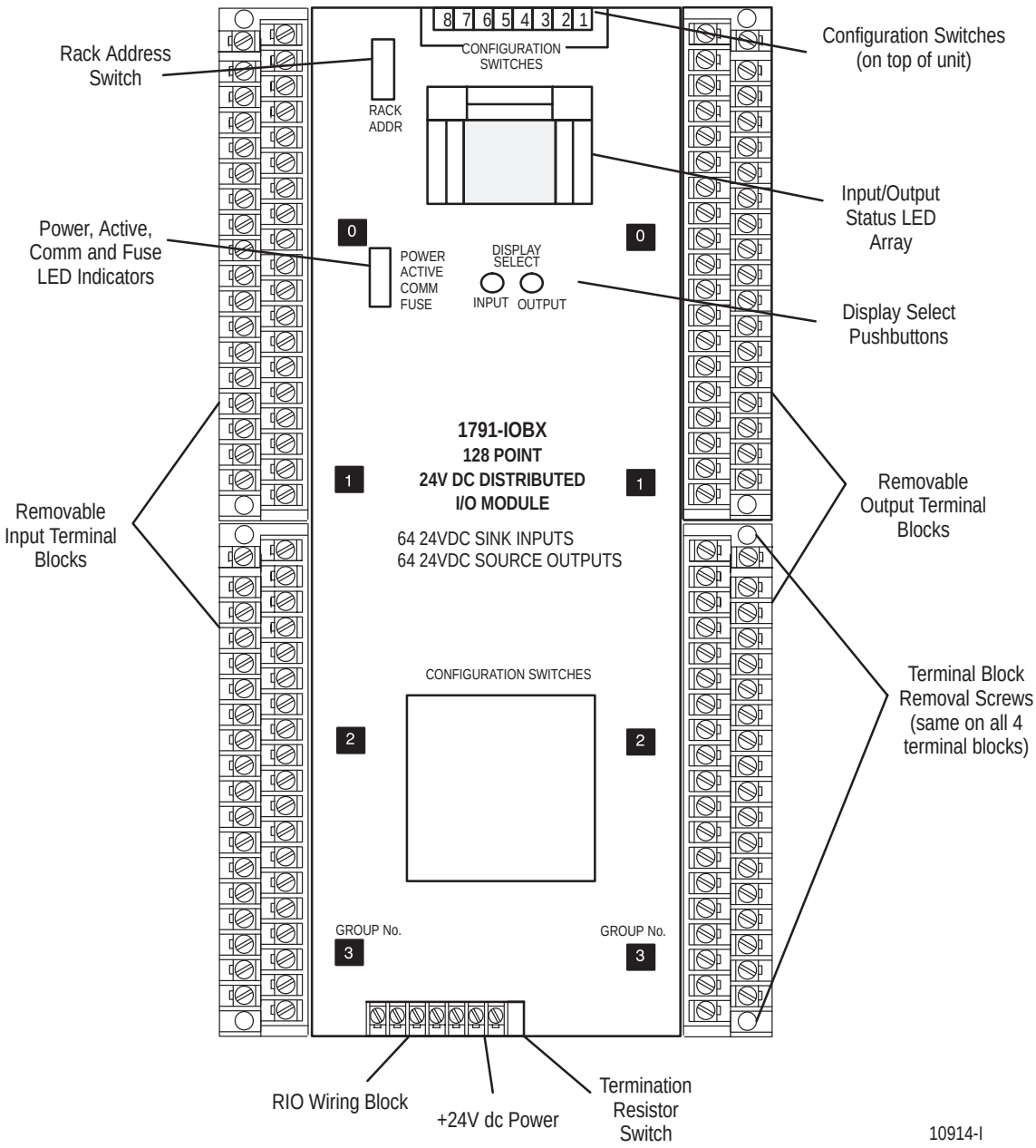
ATTENTION: When using PLC-3 programmable controllers, you must use a 1775-S5 or -SR5 scanner module. **Do not use** 1775-SR, -S4A or -S4B scanner modules.

Note: The 1791-IOBX and -IOVX block modules are not compatible with the 1747-DSN scanner module.

Connections are made to removable terminal blocks mounted on the sides of the block.

Physical features of the block I/O are shown in Figure 1.1.

Figure 1.1
Major Features of the 1791-IOBX and -IOVX Block I/O Modules (-IOBX shown)



Wiring Terminals - The remote I/O field wiring is made to 4 separate removable 37-pin terminal blocks mounted on the sides of the module. Terminal assignments are shown in chapter 3.

A separate nonremovable terminal block is provided for connection of the remote I/O link and external 24V dc power supply.

Switch Assemblies - Two DIP switches are provided for setting the I/O configuration and rack address.

The **configuration switch** lets you select baud rate, last state, processor restart lockout, last rack and I/O group.

The **rack address switch** lets you select the system rack address for the block.

A third switch is provided for selection of the termination resistor.

Status Indicators - Indicators are provided for power, active, communication and fuse blown indications. An LED array provides input/output status.

Status Indicators - Bi-color LED indicators provide power, active, communication and fuse blown indications. An LED array provides input/output status.

Indicator	Indication	
Power (green/wht)	On (green)	Customer voltage is present
	Off (wht)	No customer voltage (less than 2V)
Active (green/red)	On (green)	CPU operating correctly
	Off (red)	CPU not running
Comm (green/wht)	On (green)	Communication correctly established
	Off (wht)	Communication not established
Fuse (red/wht)	On (red)	One of the 4 output fuses is open
	Off (wht)	All fuses are intact

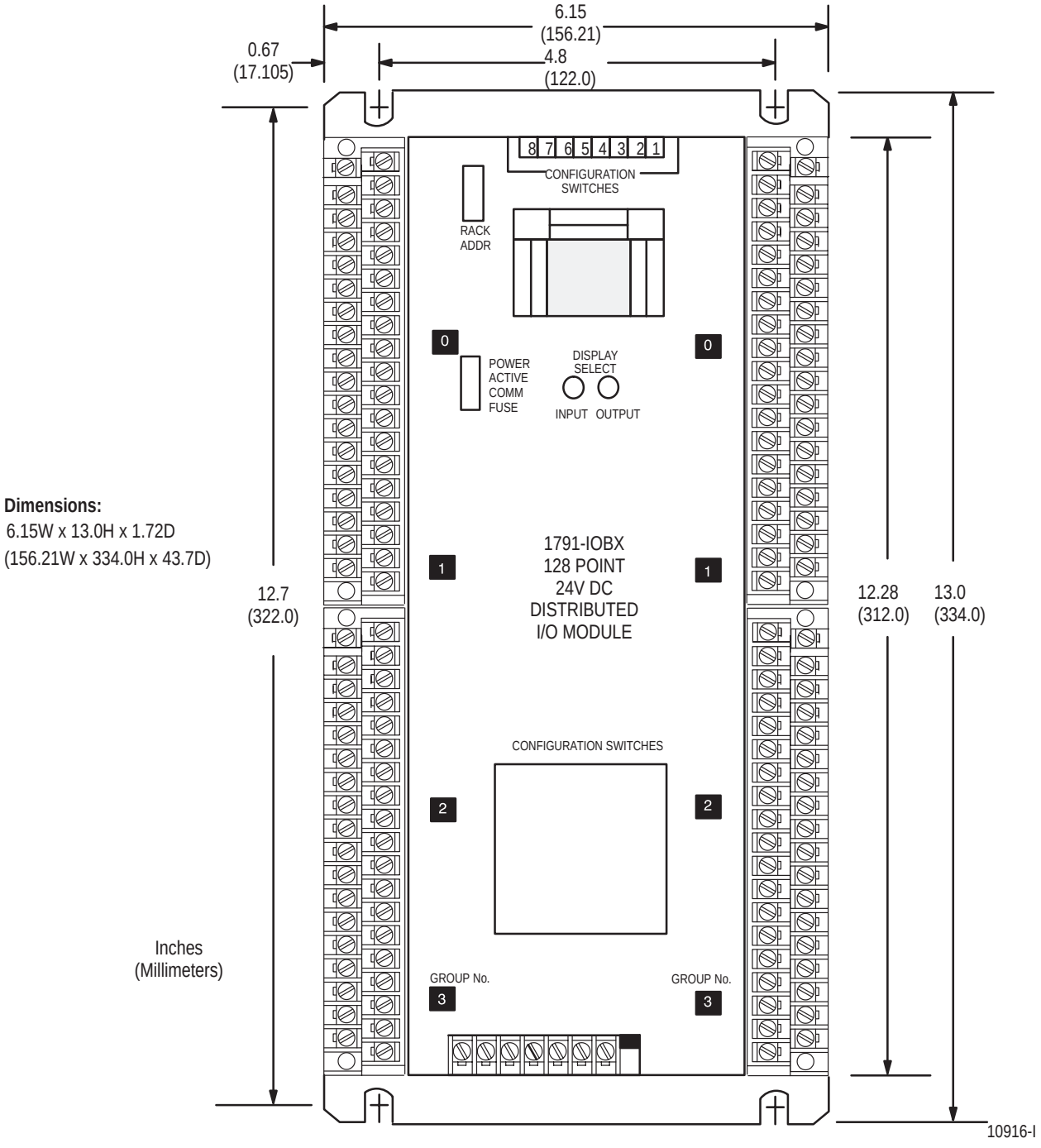
The I/O status array is an 8 by 8 array of 64 LEDs capable of displaying the status of 32 inputs and 32 outputs at any one time. Pushbuttons are provided to toggle the display between the lower 32 bits and the upper 32 bits.

How the Block I/O Fits in a PLC System

Block I/O is a complete I/O interface that includes the functionality of the I/O rack, adapter, power supply, and I/O modules in a single unit. Simply connect sensors and actuators to the module and use the remote I/O cable to connect the block I/O to your programmable controller (Figure 1.6).

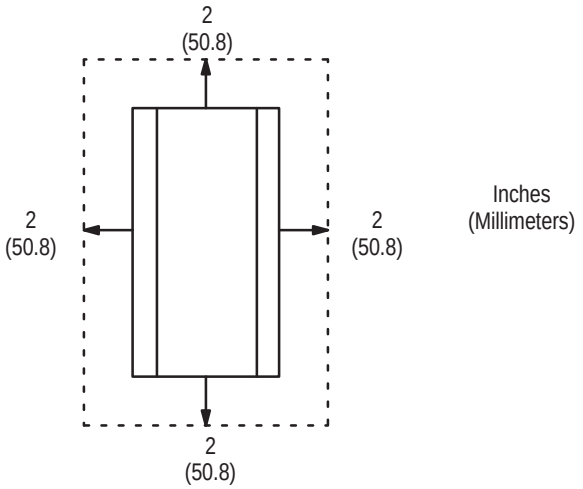
The 1791-IOBX block uses sinking inputs and sourcing outputs.

Figure 2.1
Mounting Dimensions for the Block I/O Module (Cat. No. 1791-IOBX and -IOVX)



The operating temperature in the air gap between block I/O modules must not exceed 60ºC (140ºF). The dimensions of the air gap required are shown in Figure 2.2.

Figure 2.2
Clearance Required for Block I/O Modules



Connecting Wiring

Connections to the block I/O module are made to the removable terminal blocks on each side of the module. Input connections are on the left side, and output connections are on the right side. The input terminal blocks are keyed differently than the output blocks to prevent incorrect insertion.

ATTENTION: Both input terminal blocks are keyed alike. If removed for wiring, or module replacement, make certain that the terminal blocks are placed in their proper position when reinstalling.

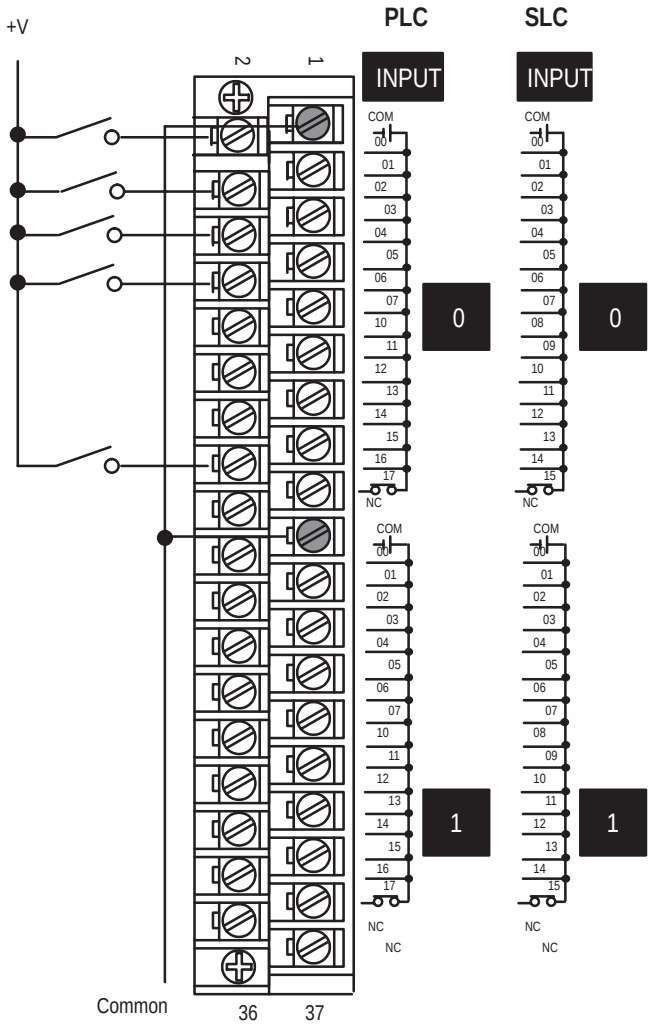
Wiring connections for the 1791-IOBX and -IOVX are shown in Tables 2.A through 2.H.

Catalog Number 1794-IOBX		Catalog Number 1794-IOVX	
Input Terminal Wiring		**Input Terminal Wiring**	
Groups 0 and 1 (TRM1)	Table 2.A, page 2-4	Groups 0 and 1 (TRM1)	Table 2.E, page 2-8
Groups 2 and 3 (TRM2)	Table 2.B, page 2-5	Groups 2 and 3 (TRM2)	Table 2.F, page 2-9
Output Terminal Wiring		**Output Terminal Wiring**	
Groups 0 and 1 (TRM3)	Table 2.C, page 2-6	Groups 0 and 1 (TRM3)	Table 2.G, page 2-10
Groups 2 and 3 (TRM4)	Table 2.D, page 2-7	Groups 2 and 3 (TRM4)	Table 2.H, page 2-11

Remote I/O link wiring connections are shown in Figure 2.3.

Table 2.A
1791-IOBX Input Terminal Wiring for Groups 0 and 1 (TRM1) for PLC Family Controllers and SLC Processors

Terminal Number	Input Assignment Group 0		Terminal Number	Input Assignment Group 1	
	PLC	SLC		PLC	SLC
1	Common A	Common A	19	Common B	Common B
2	Input 00	Input 00	20	Input 00	Input 00
3	Input 01	Input 01	21	Input 01	Input 01
4	Input 02	Input 02	22	Input 02	Input 02
5	Input 03	Input 03	23	Input 03	Input 03
6	Input 04	Input 04	24	Input 04	Input 04
7	Input 05	Input 05	25	Input 05	Input 05
8	Input 06	Input 06	26	Input 06	Input 06
9	Input 07	Input 07	27	Input 07	Input 07
10	Input 10	Input 08	28	Input 10	Input 08
11	Input 11	Input 09	29	Input 11	Input 09
12	Input 12	Input 10	30	Input 12	Input 10
13	Input 13	Input 11	31	Input 13	Input 11
14	Input 14	Input 12	32	Input 14	Input 12
15	Input 15	Input 13	33	Input 15	Input 13
16	Input 16	Input 14	34	Input 16	Input 14
17	Input 17	Input 15	35	Input 17	Input 15
18	N.C.	N.C.	36	N.C.	N.C.
			37	N.C.	N.C.



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