FLEX I/O Remote I/O Adapter Module

1794-ASBLT Series D

WARNING

Use the 1794-ASBLT Series D adapter when communicating with Classic PLC-5/15 or PLC-5/25 via Remote I/O. The 1794-ASBLT Series D adapter is a replacement for the 1794-ASB Series D adapter **only** when communicating with PLC-5/15 or PLC5/25.

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. *Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls* (Publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.literature.rockwellautomation.com) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual we use notes to make you aware of safety considerations.

WARNING — Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

IMPORTANT — Identifies information that is critical for successful application and understanding of the product.

ATTENTION — Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you:

- identify a hazard
- avoid a hazard
- recognize the consequence

SHOCK HAZARD — Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that dangerous voltage may be present.

BURN HAZARD — Labels may be located on or inside the equipment (e.g., drive or motor) to alert people that surfaces may be dangerous temperatures.

ATTENTION

Environment and Enclosure

This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as "open type" equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

See NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure. Also, see the appropriate sections in this publication, as well as the Allen-Bradley publication 1770-4.1 ("Industrial Automation Wiring and Grounding Guidelines"), for additional installation requirements pertaining to this equipment.

WARNING

When you insert or remove the module while backplane power is on, or connect or disconnect the serial cable with power applied to this module or the serial device on the other end of the cable, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

WARNING

If you connect or disconnect wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

ATTENTION

FLEX I/O is grounded through the DIN rail to chassis ground. Use zinc plated yellow-chromate steel DIN rail to assure proper grounding. The use of other DIN rail materials (e.g. aluminum, plastic, etc.) that can corrode, oxidize, or are poor conductors, can result in improper or intermittent grounding.

ATTENTION

Preventing Electrostatic Discharge

This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static-safe workstation.

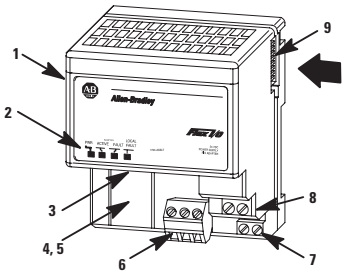
North American Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations:	Informations sur l'utilisation de cet équipement en environnements dangereux :
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local Authority Having Jurisdiction at the time of installation.	Les produits marqués "CL I, DIV 2, GP A, B, C, D" ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.

WARNING	EXPLOSION HAZARD	AVERTISSEMENT	RISQUE D'EXPLOSION
	• Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous. • Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product. • Substitution of components may impair suitability for Class I, Division 2. • If this product contains batteries, they must only be changed in an area known to be nonhazardous.		• Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit. • La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe I, Division 2. • S'assurer que l'environnement est classé non dangereux avant de changer les piles.

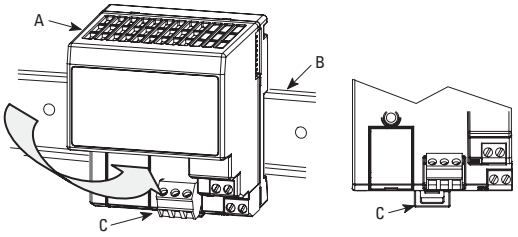
Remote I/O Adapter, Cat. No. 1794-ASBLT Series D

These adapters are shipped configured for standard addressing mode. In Standard Addressing Mode, the 1794-ASBLT series D adapter can be used as a replacement for 1794-ASB series A and B remote I/O adapters.



Component Identification	
1	Remote I/O Adapter Module
2	Indicators
3	Communication reset button (PRL)
4	Access door to switches S1 and S2
5	Switches S1 and S2 (behind door)
6	Remote I/O cable connector
7	+V dc connections
8	-V common connections
9	Flexbus connector

Install Your Adapter Module



ATTENTION During mounting of all devices, be sure that all debris (such as metal chips or wire strands) is kept from falling into the module. Debris that falls into the module could cause damage on power up.

Mount on a DIN Rail Before Installing the Terminal Base Units

1. Hook the lip on the rear of the adapter onto the top of the DIN rail, and rotate the adapter module onto the rail.
2. Press the adapter module down onto the DIN rail until flush. Locking tab C will snap into position and lock the adapter module to the DIN rail.
3. If the adapter module does not lock in place, use a screwdriver or similar device to move the locking tab down while pressing the adapter module flush onto the DIN rail, and release the locking tab to lock the adapter module in place. If necessary, push up on the locking tab to lock.
4. Connect the adapter wiring as shown under "Wiring" later in this document.

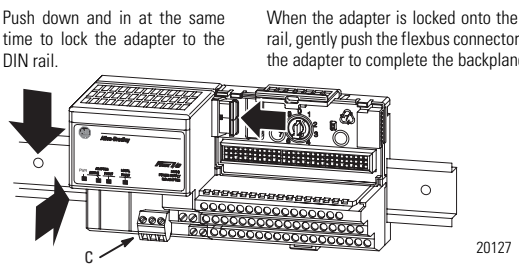
Mount (or Replace) the Adapter on an Existing System

1. Remove the RIO plug-in connector from the front of the adapter.
2. Disconnect any wiring jumpered to the adjacent terminal base.

WARNING If you connect or disconnect wiring while the field-side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

3. Open the module latching mechanism and remove the module from the base unit to which the adapter will be attached.
4. Push the flexbus connector toward the right side of the terminal base to unplug the backplane connection. (When fully retracted, you will see a raised dot on the connector.)
5. Release the adapter locking tab and remove the adapter module.
6. Before installing the new adapter, notice the notch on the right rear of the adapter. This notch accepts the hook on the terminal base unit. The notch is open at the bottom. The hook and adjacent connection point keep the terminal base and the adapter tight together, reducing the possibility of a break in communication over the backplane.

7. Complete the adapter mounting as shown below.



8. If the adapter module does not lock in place, use a screwdriver or similar device to move the locking tab down while pressing the adapter module flush onto the DIN rail, and release the locking tab to lock the adapter module in place. If necessary, push up on the locking tab to lock.
9. Reinstall the module in the adjacent terminal base unit.

Connect Wiring

WARNING

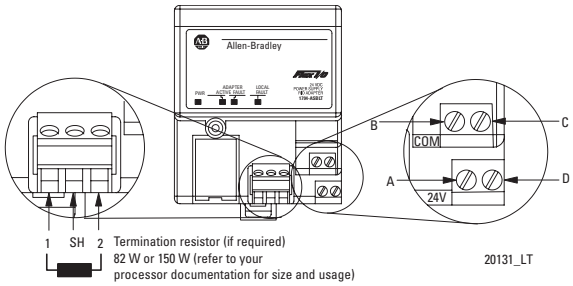
If you connect or disconnect the communications cable with power applied to this module or any device on the network, an electrical arc can occur. This could cause an explosion in hazardous location installations.

1. Connect the remote I/O cable to the removable remote I/O connector.

Connect	To terminal
Blue Wire - RIO	1
Shield Wire - RIO	SH
Clear Wire - RIO	2

ATTENTION

If this is the last adapter, you must terminate the remote I/O link here. Use a terminating resistor connected across terminals 1 and 2. Refer to your processor manual for information on the size of the resistor.

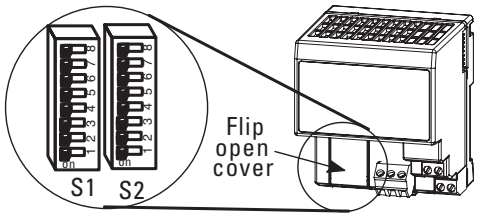


2. Connect +V dc power to the left side of the lower connector, terminal **A**.
3. Connect -V common to the left side of the upper connector, terminal **B**.
4. Connections C and D are used to pass +V dc power (D) and -V common (C) to the next module in the series (if required).

ATTENTION

To reduce susceptibility to noise, power analog modules and digital modules from separate power supplies. Do not exceed a total length of 32.8 ft (10m) for dc power cabling.

Set the Addressing Mode Switches



ATTENTION

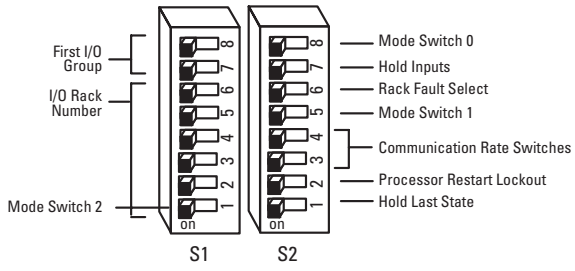
Some switches on this adapter differ from the switches on previous versions. Make certain that you identify each switch before setting.

1. Lift the hinged switch cover on the front of the adapter to expose the switches.
2. Set the switches as shown below.
3. Cycle power to the adapter after setting the switches.

8 and 16-point Mode Switch Settings

When using this addressing mode	And	Mode Switch 2 S1-1	Mode Switch 1 S2-5	Mode Switch 0 S2-8
Standard (as shipped	8 and/or 16-point modules	See note 1	ON	ON
Compact	8-point modules	OFF	ON	OFF
	16-point modules	ON	ON	OFF
Complementary	See complementary table below.			
Primary Chassis	8-point modules	OFF	OFF	ON
Complementary Chassis		ON	OFF	ON
Complementary	See complementary table below.			
Primary Chassis	16-point modules	OFF	OFF	OFF
Complementary Chassis		ON	OFF	OFF

1 In Standard mode, this switch retains its function as switch position 1 of rack addressing. In standard mode, the module is functionally interchangeable with 1794-ASB series A or B adapters.
2 In compact mode, 32-point modules appear as 8 or 16-point modules.
3 When programming block transfers, address analog modules as module 0 if switch S1-1 is on; module 1 if switch S1-1 is off.



First I/O Group			I/O Rack Number
S1-8	S1-7	I/O Group	S1-6 thru S1-1
ON	ON	0 (1st)	Refer to addressing mode tables.
OFF	ON	2 (2nd)	
ON	OFF	4 (3rd)	
OFF	OFF	6 (4th)	

S2-8	Mode Switch 0
Refer to mode selection switches, above.	

S2-7	Hold Inputs	S2-6	Rack Fault Select
ON	Hold inputs	ON	Disabled (default)
OFF	Reset inputs	OFF	Enabled

S2-5	Mode Switch 1
Refer to mode selection switches, above.	

Communication Rate			Processor Restart Lockout		Hold Last State	
S2-4	S2-3	Bits/s	S2-2		S2-1	
ON	ON	57.6 k	ON	Restart	ON	Reset Outputs
OFF	ON	115.2 k[1]	OFF	Locked out	OFF	Hold Last State
ON	OFF	230.4 k[1]				
OFF	OFF	230.4 k[1]				

[1] PLC5/15 and PLC5/25 can only support 57.6 kbps.

I/O Rack Number Switch Settings

Rack Number		S1 Switch Position					
PLC5/15	PLC-5/25	6	5	4	3	2	1
Not Valid	Rack 0	ON	ON	ON	ON	ON	ON
Rack 0	Rack 1	OFF	ON	ON	ON	ON	ON
Rack 1	Rack 2	ON	OFF	ON	ON	ON	ON
Rack 2	Rack 3	ON	ON	OFF	ON	ON	ON
Rack 3	Rack 4	ON	ON	ON	OFF	ON	ON
	Rack 5	OFF	ON	OFF	ON	ON	ON
	Rack 6	ON	OFF	OFF	ON	ON	ON
	Rack 7	OFF	OFF	OFF	ON	ON	ON

Complementary I/O Rack Number Switch Settings for PLC-5 Processors

Refer to your processor documentation for all other processors.

Primary Rack

Rack Number	Rack Number	S1 Switch Position					
PLC-5/15	PLC-5/25	6	5	4	3	2	1
Not Valid	Not Valid	ON	ON	ON	ON	ON	OFF
Rack 1	Rack 1	OFF	ON	ON	ON	ON	OFF
Rack 2	Rack 2	ON	OFF	ON	ON	ON	OFF
Rack 3	Rack 3	OFF	OFF	ON	ON	ON	OFF
	Rack 4	ON	ON	OFF	ON	ON	OFF
	Rack 5	OFF	ON	OFF	ON	ON	OFF
	Rack 6	ON	OFF	OFF	ON	ON	OFF
	Rack 7	OFF	OFF	OFF	ON	ON	OFF

Complementary Rack

Rack Number	Rack Number	S1 Switch Position					
PLC-5/15	PLC-5/25	6	5	4	3	2	1
Not Valid	Not Valid	ON	ON	ON	OFF	ON	ON
Rack 1	Rack 1	OFF	ON	ON	OFF	ON	ON
Rack 2	Rack 2	ON	OFF	ON	OFF	ON	ON
Rack 3	Rack 3	OFF	OFF	ON	OFF	ON	ON
	Rack 4	ON	ON	OFF	OFF	ON	ON
	Rack 5	OFF	ON	OFF	OFF	ON	ON
	Rack 6	ON	OFF	OFF	OFF	ON	ON
	Rack 7	OFF	OFF	OFF	OFF	ON	ON

Refer to your processor documentation for all other processors.

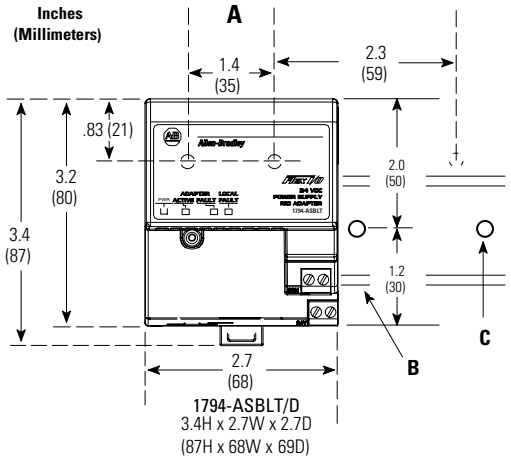
Specifications

Specifications - Remote I/O Adapter, Cat. No. 1794-ASBLT/D	
I/O Capacity	8 modules
Power Supply	Power supply must be capable of providing a turn-on inrush surge current of 23 A (at 24V dc) for 2 ms for each adapter connected to the power supply.
Input Voltage Rating	24V dc nominal 19.2V to 31.2 V dc (includes 5% ac ripple)
Communication Rate	57.6 kbps 115.2 kbps 230 kbps **NOTE:** PLC5/15 and PLC5/25 can only support 57.6 kbps
Indicators	Power - green Adapter Active - green Adapter Fault - red Local Fault - red
Flexbus Output Current	640 mA maximum
Isolation Voltage	50V continuous Tested at 850V dc for 1 s between user power and flexbus
Current Draw	330 mA at 24V dc; 450 mA maximum
Power Dissipation	4.6 W maximum @ 31.2V dc
Thermal Dissipation	Maximum 1.7 BTU/hr @ 31.2V dc

General Specifications	
Dimensions	3.4H x 2.7W x 2.7D inches 87H x 69W x 69D mm
Environmental Conditions	
Operating Temperature	IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock): 0 to 55 °C (32 to 131 °F)
Storage Temperature	IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock): –40 to 85 °C (–40 to 185 °F)
Relative Humidity	IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat): 5 to 95% non-condensing
Vibration	IEC60068-2-6 (Test Fc, Operating): 5g @ 10-500 Hz
Shock	IEC60068-2-27 (Test Ea, Unpackaged shock): Operating 30g Non-operating 50g
Emissions	CISPR 11: Group 1, Class A (with appropriate enclosure)
ESD Immunity	IEC 61000-4-2: 4 kV contact discharges 8 kV air discharges
Radiated RF Immunity	IEC 61000-4-3: 10V/m with 1kHz sine-wave 80%AM from 30MHz to 2000MHz 10V/m with 200Hz 50% Pulse 100%AM at 900Mhz 10V/m with 200Hz 50% Pulse 100%AM at 1890Mhz
EFT/B Immunity	IEC 61000-4-4: ±2 kV at 5 kHz on power ports ±2 kV at 5 kHz on communications ports
Surge Transient Immunity	IEC 61000-4-5: ±2 kV line-earth(CM) on communications ports
Conducted RF Immunity	IEC 61000-4-6: 10Vrms with 1 kHz sine-wave 80%AM from 150 kHz to 80 MHz
Enclosure Type Rating	None (open-style)
Conductors Wire Size	Communications: 12 AWG (2.5mm2) …22 AWG (0.34mm2) solid or stranded copper wire rated at 75°C or greater, 3/64 inch (1.2mm) insulation maximum. Power: 12 AWG (2.5mm2) …22 AWG (0.34mm2) solid or stranded copper wire rated at 75°C or greater, 3/64 inch (1.2mm) insulation maximum."
Category[1]	2 on communication ports 3 on power ports
Terminal Screw Torque	7 pound-inches (0.8 Nm)
Remote I/O Cable	Belden 9463 as specified in publication ICCG-2.2
Remote I/O connector Plug	Part Number 942029-03
Certifications (when product is marked)[2]	**cULus** UL Listed Industrial Control Equipment, certified for US and Canada **cULus** UL Listed for Class I, Division 2, Groups A, B, C and D Hazardous locations, certified for US and Canada **CSA** CSA certified Process Control Equipment **CSA** CSA certified Process Control Equipment for Class I, Division 2, Groups A, B, C and D Hazardous locations **CE** European Union 89/336/EEC EMC Directive, compliant with: EN 61000-6-4; Industrial Emissions EN 50082-2; Industrial Immunity EN 61326; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity **C-Tick** Australian Radiocommunications Act compliant with AS/NZS CISPR 11, Industrial Emissions

1 You use this category information for planning conductor routing as described in Allen-Bradley publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines.
2 For the latest up-to-date information, see the Product Certification link at www.ab.com for Declarations of Conformity, Certificates and other certification details.

Mounting Dimensions



A = Mounting hole dimensions for optional wall/panel mounting kit
B = DIN rail
C = Secure DIN rail approximately every 200mm

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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