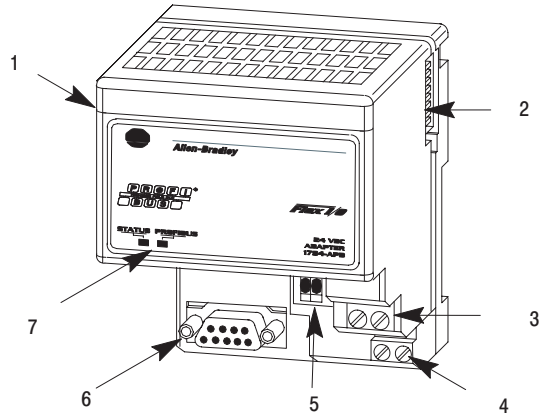




# Installation Instructions

## FLEX I/O PROFIBUS Adapter Module (Cat. No. 1794-APB Series B)



	Description
1	FLEX I/O PROFIBUS Adapter 1794-APB
2	Flexbus Connector
3	24V common connections
4	+24V dc connections
5	Node Address Switches
6	PROFIBUS Connector
7	Status Indicators

### Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of these products must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards. In no event will Allen–Bradley be responsible or liable for indirect or consequential damage resulting from the use or application of these products.

Any illustrations, charts, sample programs, and layout examples shown in this publication are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen–Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication. Allen–Bradley publication SGI–1.1, Safety Guidelines for Application, Installation, and Maintenance of Solid–State Control (available from your local Allen–Bradley office), describes some important differences between solid–state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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Throughout this publication, notes may be used to make you aware of safety considerations. The following annotations and their accompanying statements help you to identify a potential hazard, avoid a potential hazard, and recognize the consequences of a potential hazard.

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**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.

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**ATTENTION**



Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.

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**IMPORTANT**

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

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**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 enclosures. 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.

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**ATTENTION**

FLEX I/O is grounded through the DIN rail to chassis ground. Use zinc plated, yellow chromated steel DIN rail to assure proper grounding. Using other DIN rail materials (e.g. aluminum, plastic, etc.) which can corrode, oxidize or are poor conductors can result in improper or intermittent platform 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:

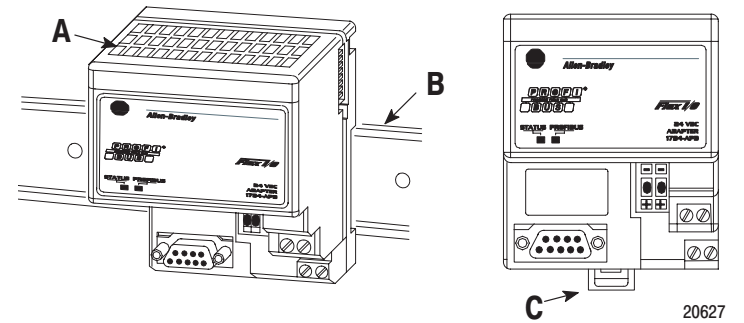
- Touch a grounded object to discharge potential static.
- Wear an approved grounding wriststrap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static-safe workstation.
- When not in use, keep modules in appropriate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

**WARNING**

Remove field-side power before removing or inserting this module. This module is designed so you can **remove and insert it under backplane power**. When you remove or insert a module with field-side power applied, an electrical arc may occur. An electrical arc can cause personal injury or property damage by:

- sending an erroneous signal to your system's field devices causing unintended machine motion
- causing an explosion in a hazardous environment

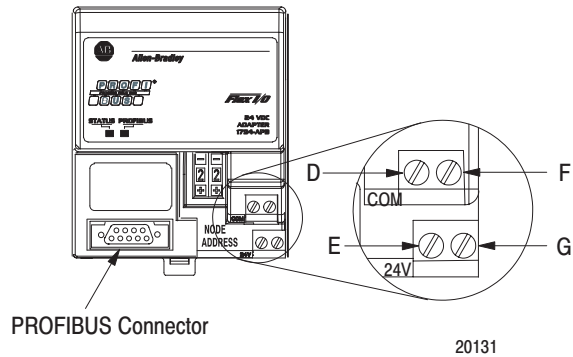
Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance.

**Mounting on the DIN Rail**

1. Position the PROFIBUS adapter module (A) on a 35 x 7.5mm DIN rail (B) (A-B pt. no. 199-DR1; 46277-3; EN 50022) at a slight angle.
2. Hook the lip on the rear of the adapter onto the top of the DIN rail, and rotate the adapter module onto the rail.
3. 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.
4. 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.
5. Connect the adapter wiring as shown under “Wiring” later in this document.

**NOTE:** For Panel/Wall mounting, refer to publication 1794-5.13, “Panel Mounting Kit, Cat. No. 1794-NM1.”

Wiring



**WARNING**



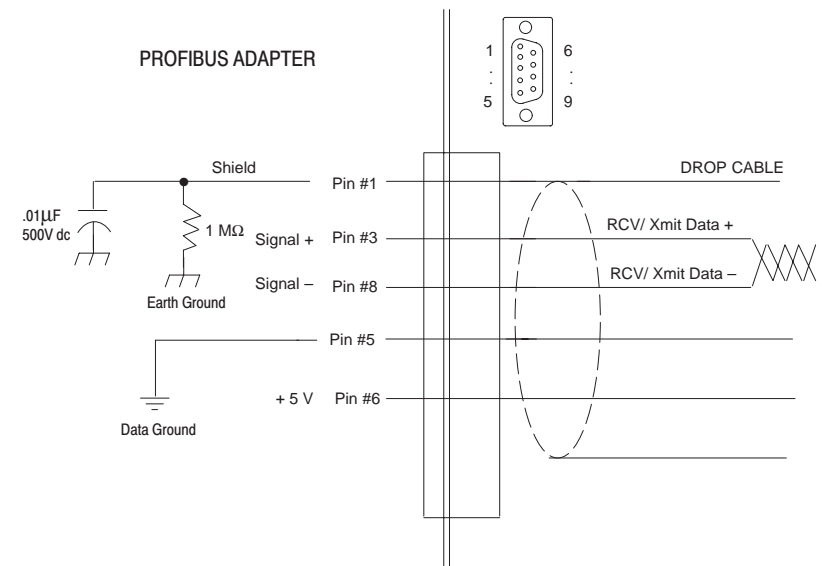
When you connect or disconnect the PROFIBUS cable while power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

Connect the PROFIBUS drop cable to the 9-pin D-shell connector according to the following pin assignments:

Pin #	RS-485 Reference	Signal	Description
1		Shield	Shield, RC to earth ground
2		RP	not used
3	B/B'	RXD/TXD-P	Receive/transmit data - P
4		CTNR-P	not used
5	C/C'	DGND	Data ground
6		VP	Voltage plus (+5V)
7		RP	not used
8	A/A'	RXD/TXD-N	Receive/transmit data - N
9		CTNR-N	not used
Metal Shell			Earth Ground

## 8 FLEX I/O PROFIBUS Adapter Module

1. Connect the cable shield to Pin #1. The shield is connected to earth ground.
2. Connect the data signal pins on both ends (Signal + Pin #3 and Signal – Pin#8).
3. Insert the wired connector into the mating connector on the PROFIBUS adapter.

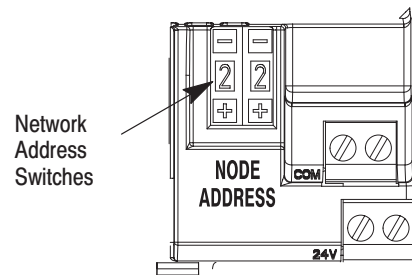


4. Connect +24V dc input to the left side of the lower connector **E**.
5. Connect 24V common to the left side of the upper connector **D**.
6. Connections **G** and **F** are used to pass 24V dc power (G) and 24V common (F) to the next module in the series (if required).



## Set the Node Address

Set the node address using the 2-position pen-push switches. Use a ball-point pen to press either the + or – buttons to change the number. Valid settings range from 00 to 99.

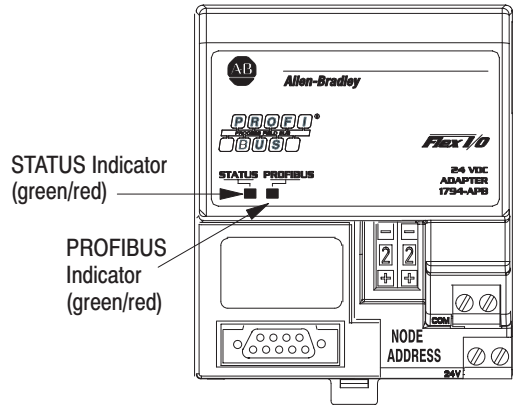


**Note:** The adapter automatically sets the baud rate at power-up.

## GSD File Requirements

Current functionality of PROFIBUS adapters requires GSD files. These files are easy to install and are available online at:  
[www.ab.com/networks/gsd/](http://www.ab.com/networks/gsd/).

**Indicators**



STATUS Indicator	
Indication	Status
OFF	No power
Solid Green	Normal operation
Flashing Red/OFF	Recoverable fault <ul style="list-style-type: none"> <li>- FLEX I/O module defective</li> <li>- Incorrect FLEX I/O module installed</li> <li>- Node address changed since power up</li> </ul>
Solid Red	Unrecoverable fault

PROFIBUS Indicator	
Indication	Status
OFF	No power or no communication
Solid Green	Data is being transmitted and recieved
Flashing Red/OFF	Recoverable fault <ul style="list-style-type: none"> <li>- Invalid Send Parameter data</li> <li>- Invalid Check Configuration data</li> </ul>
Solid Red	Unrecoverable fault <ul style="list-style-type: none"> <li>- Unable to communicate</li> </ul>

## Safety Approvals

### The following information applies when operating this equipment in hazardous locations:

Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, and 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.

#### WARNING



#### EXPLOSION HAZARD –

- 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.

### Informations sur l'utilisation de cet équipement en environnements dangereux:

Les produits marqués CL I, DIV 2, GP A, B, C, D ne conviennent que 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.

#### AVERTISSEMENT



#### RISQUE D'EXPLOSION –

- 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 1, Division 2.
- S'assurer que l'environnement est classé non dangereux avant de changer les piles.

<b>Specifications - PROFIBUS Adapter Module, 1794-APB Series B</b>	
I/O Capacity	8 modules
Input Voltage Rating	24V dc nominal
Input Voltage Range	19.2V to 31.2V dc (includes 5% ac ripple)
Communication Rate	All rates up to 12.0Mbit/s
Indicators	STATUS - red/grn PROFIBUS - red/grn
Flexbus Output Current	640mA maximum @ 5V dc
Isolation Voltage	100% tested at 850V dc for 1s between user power and flexbus
Power Consumption	400mA maximum from external 24V dc supply
Power Dissipation	7.68W maximum @ 19.2V dc
Thermal Dissipation	26 BTU/hr @ 19.2V dc
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) 32 to 131°F (0 to 55°C)
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 185°F (-40 to 85°C)
Relative Humidity	IEC 60068-2-30 (Test Db, Unpackaged, Nonoperating Damp Heat) 5 to 95%, noncondensing
Shock Operating Nonoperating	IEC 60068-2-27 (Test Ea, Unpackaged Shock) 30g 50g
Vibration	IEC 60068-2-6 (Test Fc, Operating) 5g @ 10-500Hz

**Specifications continued on next page**

**Specifications - PROFIBUS Adapter Module, 1794-APB Series B**

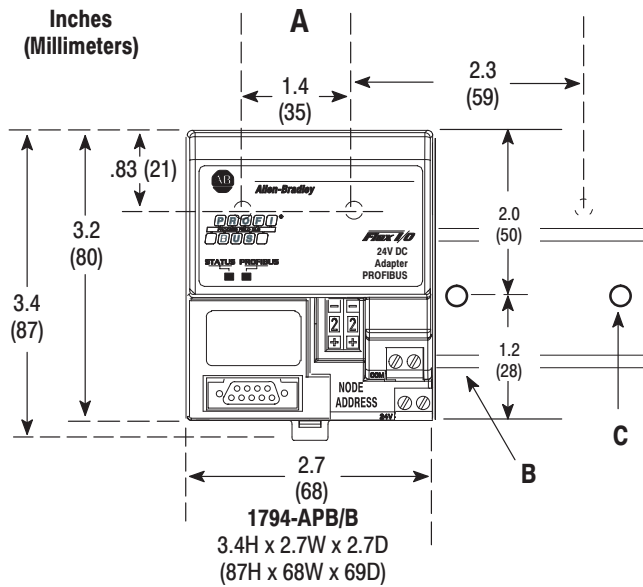
ESD Immunity	IEC 61000-4-2 4kV contact discharges 8kV air discharges
Radiated RF Immunity	IEC 61000-4-3 10V/m with 1kHz sine-wave 80% AM from 30MHz to 2000MHz
EFT/B Immunity	IEC 61000-4-4 ±4kV @ 2.5kHz on power ports ±2kV @ 5kHz on communications ports
Surge Transient Immunity	IEC 61000-4-5 ±1kV line-line (DM) and ±2kV line-earth (CM) on signal ports
Conducted RF Immunity	IEC 61000-4-6 10V rms with 1kHz sine wave 80% AM from 150kHz to 80MHz
Emissions	CISPR 11 Group 1, Class A (with appropriate enclosure)
Enclosure Type Rating	None (open-style)
PROFIBUS Connector	9-pin D-shell
PROFIBUS Drop Cable	Standard drop cable
Power Conductors Wire Size	12 gauge (4mm <sup>2</sup> ) maximum stranded or solid copper wire rated @ 75°C or greater
Category	3/64 inch (1.2mm) insulation max. 2 <sup>1</sup>
GSD File	The GSD file is available online at <a href="http://www.ab.com/networks/gsd">www.ab.com/networks/gsd</a>

**Specifications continued on next page.**

<b>Specifications - PROFIBUS Adapter Module, 1794-APB Series B</b>		
Agency Certification (when product is marked)	UL	UL Listed Industrial Control Equipment
	UL	UL Listed for Class I, Division 2 Group A, B, C and D Hazardous Locations
	CSA	CSA Certified Process Control Equipment for Class I, Division 2 Group A, B, C, D Hazardous Locations
	CE <sup>2</sup>	European Union 89/336/EEC EMC Directive, compliant with: EN 50081-2, Industrial Emissions EN 50082-2, Industrial Immunity EN 61326, Meas./Control/Lab., Industrial Requirements EN 61000-6-2, Industrial Immunity
	C-Tick <sup>2</sup>	Australian Radiocommunications Act, compliant with: AS/NZS 2064, Industrial Emissions
User Manual	Publication 1794-UM059	

<sup>1</sup> Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines."  
<sup>2</sup> See the Product Certification link at [www.ab.com](http://www.ab.com) for Declarations of Conformity, Certificates and other certification details

**Mounting Dimensions**



- A** = Mounting hole dimensions for optional mounting kit
- B** = DIN rail
- C** = Secure DIN rail approximately every 200mm



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