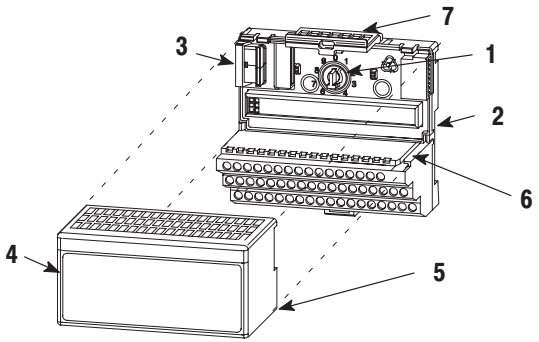
Installation Instructions

24V dc FLEX I/O 32 Protected Source Output Module

(Cat. No. 1794-OB32P)



ATTENTION

This module must be used with a 1794–TB32 or –TB32S terminal base unit. When used in a remote I/O system, the adapter must be a 1794–ASB Series E or later. When used in a ControlNet system, you must structure this module as a rack connection in order to access both write words.

Module Installation

This module mounts on a 1794 terminal base unit.

1. Rotate keyswitch (1) on terminal base unit (2) clockwise to position 2 as required for this type of module.
2. Make certain the flexbus connector (3) is pushed all the way to the left to connect with the neighboring terminal base/adapter. **You cannot install the module unless the connector is fully extended.**
3. Make sure that the pins on the bottom of the module are straight so they will align properly with the connector in the terminal base unit.

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WARNING

If you remove or insert the module while the backplane 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.

4. Position the module (4) with its alignment bar (5) aligned with the groove (6) on the terminal base.
5. Press firmly and evenly to seat the module in the terminal base unit. The module is seated when the latching mechanism (7) is locked into the module.

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.

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.

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.

ATTENTION

Identifies information about practices or circumstances that can 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

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.

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.

ATTENTION

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

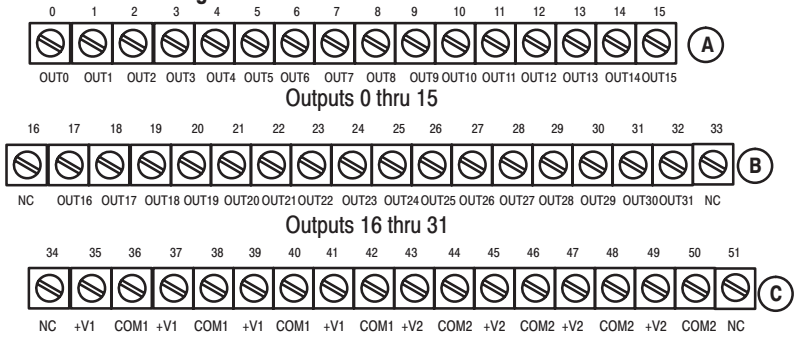
Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance.

Wiring to a 1794–TB32 or –TB32S Terminal Base Unit

1. Connect individual output wiring (OUT0 to OUT15) to numbered terminals on the **0–15** row **(A)** as indicated in the table below.
2. Connect the associated power to the +V1 terminal (35, 37, 39 or 41) on the 34–51 row **(C)** as indicated in the table below.
3. Connect the associated common (–V1) for OUT0 to OUT15 to COM1 (terminal 36, 38, 40 or 42) on the 34–51 row **(C)**.

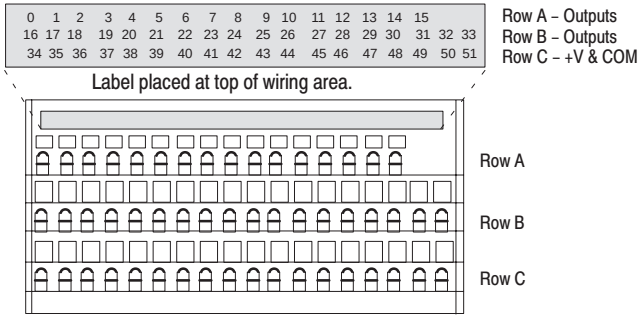
4. Connect individual output wiring for outputs OUT16 thru OUT32 to numbered terminals 17 thru 32 on the **16–33** row **(B)** as indicated in the table below. (**Note:** Do not connect to terminals 16 and 33.)
5. Connect the associated power to the +V2 terminal (43, 45, 47 or 49) on the **34–51** row **(C)** as indicated in the table below.
6. Connect the associated common (–V2) to terminal COM2 (terminal 44, 46, 48 or 50) on the 34–51 row **(C)**.
7. If continuing output wiring power to the next terminal base unit, connect a jumper from terminal 49 (+V2) on this base unit to the power terminal on the next terminal base unit (refer to the installation instructions for the next type of terminal base unit).
8. If continuing output wiring return to the next terminal base unit, connect a jumper from terminal 50 (COM2) on this base unit to the next terminal base unit (refer to the installation instructions for the next type of terminal base unit).

Wiring Connections for Terminal Base 1794-TB32



+V1 = Voltage applied to outputs OUT0 thru OUT15
+V2 = Voltage applied to outputs OUT16 thru OUT31
COM1 = Common for outputs OUT0 thru OUT15
COM2 = Common for outputs OUT16 thru OUT31
NC = No connection

Wiring Connections for Terminal Base 1794-TB32S



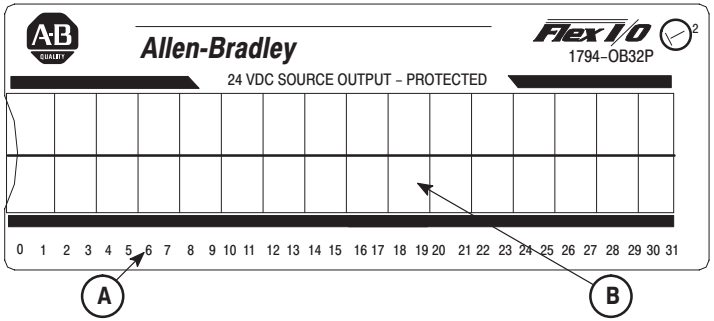
+V1 = Voltage applied to outputs OUT0 thru OUT15
+V2 = Voltage applied to outputs OUT16 thru OUT31
COM1 = Common for outputs OUT0 thru OUT15
COM2 = Common for outputs OUT16 thru OUT31
NC = No connection

ATTENTION

Total current draw through the terminal base unit is limited to 10A. Separate power connections to the terminal base unit may be necessary.

Output	Output Terminal	Common Terminal	Output	Output Terminal	Common Terminal
Output 0	A–0	Connect Common to terminals 36, 38, 40 and 42	Output 16	B–17	Connect Common to terminals 44, 46, 48 and 50
Output 1	A–1		Output 17	B–18	
Output 2	A–2		Output 18	B–19	
Output 3	A–3		Output 19	B–20	
Output 4	A–4		Output 20	B–21	
Output 5	A–5		Output 21	B–22	
Output 6	A–6		Output 22	B–23	
Output 7	A–7		Output 23	B–24	
Output 8	A–8		Output 24	B–25	
Output 9	A–9		Output 25	B–26	
Output 10	A–10		Output 26	B–27	
Output 11	A–11		Output 27	B–28	
Output 12	A–12		Output 28	B–29	
Output 13	A–13		Output 29	B–30	
Output 14	A–14		Output 30	B–31	
Output 15	A–15		Output 31	B–32	
COM 1 dc Return	Common terminals 36, 38, 40 and 42		COM 2 dc Return	Common terminals 44, 46, 48 and 50	
+V1 dc Power	Power Terminals 35, 37, 39 and 41		+V2 dc Power	Power Terminals 43, 45, 47 and 49	

Indicators



A = Status Indicators – show status of individual outputs.

B = Insertable label for writing individual output designations.

Image Table Memory Map

Bit⇒ Word⇓	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Read	Not used															
Write	O15	O14	O13	O12	O11	O10	O9	O8	O7	O6	O5	O4	O3	O2	O1	O0
Write	O 31	O 30	O 29	O 28	O 27	O 26	O 25	O 24	O 23	O 22	O 21	O 20	O 19	O 18	O 17	O 16

Where: O = Output value

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 systéme, le code de température le plus défavorable (code de température le plus faible) peut eatre utilisé pour déterminer le code de température global du systéme. Les combinaisons d'equipements dans le systéme 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.

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Specifications – 24V dc Protected Output Module Cat. No. 1794-OB32P	
Number of Outputs	32 output channels – isolated in 2 groups
Module Location	Cat. No. 1794-TB32, -TB32S Terminal Base Unit
ON-state Voltage Range	10V dc minimum 24V dc nominal; 31.2V dc maximum
OFF-state Voltage	31.2V dc maximum
ON-state Current	1.0mA minimum per channel 500mA maximum per channel 14A maximum per module (6A total for channels 0–15; 8A total for channels 16–31)
Surge Current	2A for 50ms, repeatable every 2 seconds
OFF-state Leakage	0.5mA maximum
ON-state Voltage Drop	0.5V dc maximum
Isolation Voltage (minimum)	Output to backplane – 1250V ac (rms) isolation 100% tested at 2121V dc for 1s between user and system No isolation between individual channels
Output Signal Delay Off to On On to Off	 0.5ms maximum 1.0ms maximum
Flexbus Current (maximum)	80mA
Power Dissipation	5.3W maximum @ 31.2V
Thermal Dissipation	18.1 BTU/hr @ 31.2V dc
Indicators (field side indication, logic driven)	32 yellow status indicators
Fuse recommendations	Outputs are electronically protected
Keyswitch Position	2
Specifications continued on next page.	

Specifications – 24V dc Protected Output Module Cat. No. 1794-OB32P

General Specifications

External dc Power		
	Supply Voltage	24V dc nominal
	Voltage Range	19.2 to 31.2V dc (includes 5% ac ripple)
	Supply Current	49mA @ 24V dc (38 to 65mA)
Dimensions	Inches	1.8H x 3.7W x 2.1D
	(Millimeters)	(45.7 x 94.0 x 53.3)
Environmental Conditions		
Operational Temperature		0 to 55°C (32 to 131°F)
Storage Temperature		–40 to 85°C (–40 to 185°F)
Relative Humidity		5 to 95% noncondensing
Shock	Operating	30g peak acceleration, 11(±1)ms pulse width
	Non-operating	50g peak acceleration, 11(±1)ms pulse width
Vibration		Tested 5g @ 10–500Hz per IEC 68-2-6
Conductors	Wire Size	12 gauge (4mm^2) stranded maximum copper wire rated @ 75°C or greater 3/64 inch (1.2mm) insulation maximum
	Category	2[1]
Terminal Screw Torque		7 Pound-Inches (0.6Nm)
Agency Certification		• C-UL certified • C-UL Class I, Division 2 Groups A, B, C, D certified • UL listed • UL Class I, Division 2 Groups A, B, C, D certified • CE marked for all applicable directives • C–Tick marked for all applicable acts

[1] You use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidellines."

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