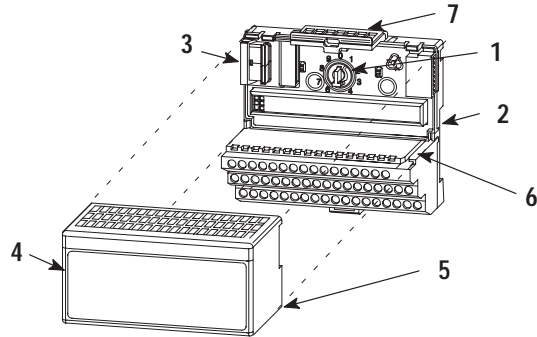




Installation Instructions

24V dc FLEX I/O 10 Input/6 Output Module (Cat. No. 1794-IB10XOB6)



English

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/adaptor. **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.
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.



ATTENTION: This module does not support complementary I/O. It uses both the input and output image tables since it is a combination input and output module.



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.

European Union Directive Compliance

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

This product is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) and the following standards, in whole or in part, documented in a technical construction file:

- EN 50081-2 EMC – Generic Emission Standard, Part 2 – Industrial Environment
- EN 50082-2 EMC – Generic Immunity Standard, Part 2 – Industrial Environment

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is tested to meet Council Directive 73/23/EEC Low Voltage, by applying the safety requirements of EN 61131-2 Programmable Controllers, Part 2 – Equipment Requirements and Tests.

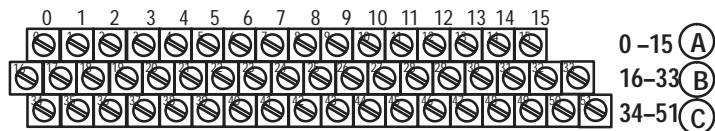
For specific information required by EN 61131-2, see the appropriate sections in this publication, as well as the following Allen-Bradley publications:

- Industrial Automation Wiring and Grounding Guidelines For Noise Immunity, publication 1770-4.1
- Automation Systems Catalog, publication B111

This equipment is classified as open equipment and must be mounted in an enclosure during operation to provide safety protection.

Wiring to a 1794-TB3 or -TB3S Terminal Base Unit

1. Connect individual input and output wiring to numbered terminals on the **0–15** row (**A**) as indicated in the table below.
2. Connect the associated input power to the corresponding terminal on the **34–51** row (**C**) for each as indicated in the table below. (Power terminals 34 thru 51 are internally connected together.)
3. Connect +24V dc power to terminal 34 on the **34–51** row (**C**).
4. If continuing power to the next terminal base unit, connect a jumper from terminal 51 (+24V dc) on this base unit to terminal 34 on the next base unit.
5. Connect the associated input or output return to the corresponding terminal on the **16–33** row (**B**) for each as indicated in the table below. (Returns are internally connected together.)
6. Connect 24V dc return to terminal 16 on the **16–33** row (**B**).
7. If continuing 24V return to the next terminal base unit, connect a jumper from terminal 33 (return) on this base unit to terminal 16 on the next base unit.



1794-TB3 or 1794-TB3S



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

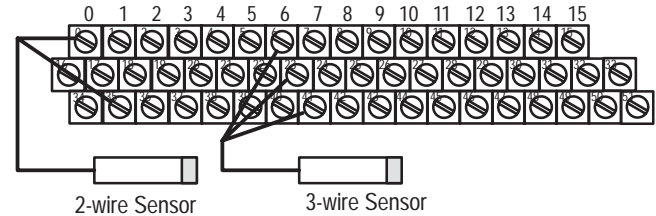
4 24V dc FLEX I/O 10 Input/6 Output Module

Channel	Signal Type ¹	1794-TB3		
		Signal	Return ³	Supply ²
Input				
0	Sink Input	A-0	B-17	C-35
1	Sink Input	A-1	B-18	C-36
2	Sink Input	A-2	B-19	C-37
3	Sink Input	A-3	B-20	C-38
4	Sink Input	A-4	B-21	C-39
5	Sink Input	A-5	B-22	C-40
6	Sink Input	A-6	B-23	C-41
7	Sink Input	A-7	B-24	C-42
8	Sink Input	A-8	B-25	C-43
9	Sink Input	A-9	B-26	C-44

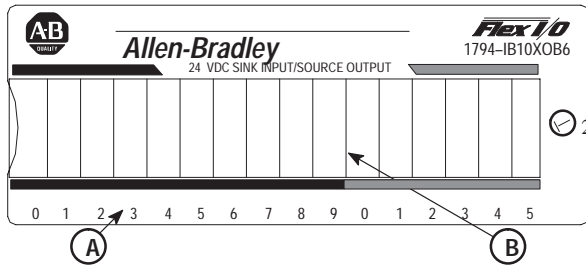
Output				
0	Source Output	A-10	B-27	
1	Source Output	A-11	B-28	
2	Source Output	A-12	B-29	
3	Source Output	A-13	B-30	
4	Source Output	A-14	B-31	
5	Source Output	A-15	B-32	
24V dc Return		B-16 thru 33		
+24V dc power		C-34 thru 51		

¹ Two-wire input devices use signal and supply terminals, 3-wire input devices use signal, return and supply terminals.
² +24V dc power internally connected to terminals 34 thru 51.
³ +24V Return internally connected to terminals 16 thru 33.

Example of 2-wire and 3-wire sensor



Indicators



- A = Status Indicators – show status of individual inputs or outputs.
- B = Insertable label for writing individual input or output designations.

Image Table Memory Map

Word	Image Table	Dec. Bits (Octal Bits)	Description	Format
0 (read only)	Not used by 1794-AS B	00-15 (00-17)	Module Status Word	
1 (read only)	Input	00-09 (00-11)	Status of Input 0-9	0-9
		10-15 (12-17)	Not used	
2 (write only)	Output	00-05	Status of Output 0-5	0-5
		06-15 (06-17)	Not used	
3 (write only)	Not used by 1794-AS B	00-07	Not used	
		08-10 (10-12)	Input filter time	3 bit
		11-15 (13-17)	Not used	

Configuration

Dec.	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Word 1 (Read)	Not used						19	18	17	16	15	14	13	12	11	10
Word 2 (Write)	Not used										0 5	0 4	0 3	0 2	0 1	0 0
Word 3 (Write)	Not used						FT 08–10			Not used						



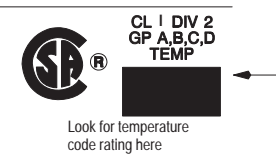
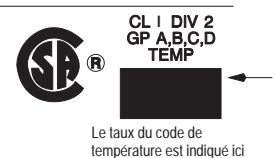
Where I = Input Channel
 O = Output Channel
 FT = Input Filter Time



Setting the Input Filter Time (not available when used with the 1794-ASB)

You can select the input filter time (FT) for the input channels (channels 00 through 09). Select the input filter time by setting the corresponding bits in the configuration word (word 3) for the module.

For example, to set a filter time of 8ms for a dc input module at address rack 1, module group 0, set bits 08, 09 and 10 in configuration word 3 as shown below.

Bits			Description	Filter Time
10	09	08	Filter Time for Inputs 00–09	Off to On/On to Off
0	0	0	Filter Time 0 (default)	0.25ms
0	0	1	Filter Time 1	0.5ms
0	1	0	Filter Time 2	1ms
0	1	1	Filter Time 3	2ms
1	0	0	Filter Time 4	4ms
1	0	1	Filter Time 5	8ms
1	1	0	Filter Time 6	16ms
1	1	1	Filter Time 7	32ms

CSA Hazardous Location Approval	Approbation d'utilisation dans des emplacements dangereux par la CSA
<p>CSA® certifies products for general use as well as for use in hazardous locations. Actual CSA certification is indicated by the product label as shown below, and not by statements in any user documentation.</p>	<p>La CSA® certifie les produits d'utilisation générale aussi bien que ceux qui s'utilisent dans des emplacements dangereux. La certification CSA en vigueur est indiquée par l'étiquette du produit et non par des affirmations dans la documentation à l'usage des utilisateurs.</p>
<p>Example of the CSA certification product label</p> 	<p>Exemple d'étiquette de certification d'un produit par la CSA</p> 
<p>To comply with CSA certification for use in hazardous locations, the following information becomes a part of the product literature for CSA-certified Allen-Bradley industrial control products.</p> <ul style="list-style-type: none"> • This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D, or non-hazardous locations only. • The products having the appropriate CSA markings (that is, Class I Division 2, Groups A, B, C, D), are certified for use in other equipment where the suitability of combination (that is, application or use) is determined by the CSA or the local inspection office having jurisdiction. 	<p>Pour satisfaire à la certification de la CSA dans des endroits dangereux, les informations suivantes font partie intégrante de la documentation des produits industriels de contrôle Allen-Bradley certifiés par la CSA.</p> <ul style="list-style-type: none"> • Cet équipement convient à l'utilisation dans des emplacements de Classe I, Division 2, Groupes A, B, C, D, ou ne convient qu'à l'utilisation dans des endroits non dangereux. • Les produits portant le marquage approprié de la CSA (c'est à dire, Classe I, Division 2, Groupes A, B, C, D) sont certifiés à l'utilisation pour d'autres équipements où la convenance de combinaison (application ou utilisation) est déterminée par la CSA ou le bureau local d'inspection qualifié.
<p>Important: Due to the modular nature of a PLC® control system, the product with the highest temperature rating determines the overall temperature code rating of a PLC control system in a Class I, Division 2 location. The temperature code rating is marked on the product label as shown.</p>	<p>Important: Par suite de la nature modulaire du système de contrôle PLC®, le produit ayant le taux le plus élevé de température détermine le taux d'ensemble du code de température du système de contrôle d'un PLC dans un emplacement de Classe I, Division 2. Le taux du code de température est indiqué sur l'étiquette du produit.</p>
<p>Temperature code rating</p>  <p>Look for temperature code rating here</p>	<p>Taux du code de température</p>  <p>Le taux du code de température est indiqué ici</p>
<p>The following warnings apply to products having CSA certification for use in hazardous locations.</p>	<p>Les avertissements suivants s'appliquent aux produits ayant la certification CSA pour leur utilisation dans des emplacements dangereux.</p>

CSA Hazardous Location Approval	Approbation d'utilisation dans des emplacements dangereux par la CSA
 <p>WARNING: Explosion hazard —</p> <ul style="list-style-type: none"> • Substitution of components may impair suitability for Class I, Division 2. • Do not replace components unless power has been switched off or the area is known to be non-hazardous. • Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous. • Do not disconnect connectors unless power has been switched off or the area is known to be non-hazardous. Secure any user-supplied connectors that mate to external circuits on an Allen-Bradley product using screws, sliding latches, threaded connectors, or other means such that any connection can withstand a 15 Newton (3.4 lb.) separating force applied for a minimum of one minute. 	 <p>AVERTISSEMENT: Risque d'explosion —</p> <ul style="list-style-type: none"> • La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de Classe I, Division 2. • Couper le courant ou s'assurer que l'emplacement est désigné non dangereux avant de remplacer les composants. • Avant de débrancher l'équipement, couper le courant ou s'assurer que l'emplacement est désigné non dangereux. • Avant de débrancher les connecteurs, couper le courant ou s'assurer que l'emplacement est reconnu non dangereux. Attacher tous connecteurs fournis par l'utilisateur et reliés aux circuits externes d'un appareil Allen-Bradley à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens permettant aux connexions de résister à une force de séparation de 15 newtons (3,4 lb. - 1,5 kg) appliquée pendant au moins une minute.
<p>Le sigle CSA est la marque déposée de l'Association des Standards pour le Canada. PLC est une marque déposée de Allen-Bradley Company, Inc. CSA logo is a registered trademark of the Canadian Standards Association PLC is a registered trademark of Allen-Bradley Company, Inc.</p>	

Specifications – 24V dc Input/Output Module Cat. No. 1794-IB10XOB6

Number of Inputs	10 non-isolated, sinking
Number of Outputs	6 non-isolated, sourcing
Module Location	Cat. No. 1794-TB3 or -TB3S Terminal Base Unit
Input	
Number of Inputs	10 (1 group of 10), non-isolated, sinking
ON-state Voltage	10V dc minimum; 24V dc nominal; 31.2V dc maximum
ON-state Current	2.0mA minimum; 8.0mA nominal at 24V dc; 11.0mA maximum
OFF-state Voltage	5.0V dc maximum
OFF-state Current	1.5mA minimum
Input Impedance	4.8K ohms maximum
Input Filter Time ¹	0.25ms, 0.5ms, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms
Off to On	0.25ms, 0.5ms, 1ms, 2ms, 4ms, 8ms, 16ms, 32ms
On to Off	0.25ms default– Selectable using configuration word 3. (Not selectable when used with the 1794-ASB Adapter.)
Indicators (field side indication, customer device driven)	10 yellow status indicators
Output	
Number of Outputs	6 (1 group of 6), non-isolated, sourcing
ON-state Voltage Range	10V dc minimum; 24V dc nominal; 31.2V dc maximum
Output Current Rating	2A per output, 10A per module maximum
OFF-state Voltage	31.2V dc maximum
ON-state Current	1.0mA minimum per channel; 2.0A maximum per channel; 10A maximum per module
Surge Current	4A for 50ms, repeatable every 2 seconds
OFF-state Leakage	0.5mA maximum
ON-state Voltage Drop	1V dc @ 2A, 0.5V dc @ 1A maximum
Specifications continued on next page	

Specifications – 24V dc Input/Output Module Cat. No. 1794-IB10XOB6

Output Signal Delay ² Off to On On to Off	0.5ms maximum 1.0ms maximum
Indicators (field side indication, logic driven)	6 yellow status indicators
General Specifications	
Keyswitch Position	2
Flexbus Current (maximum)	35mA
Power Dissipation	6.0W maximum @ 31.2V
Thermal Dissipation	20.3 BTU/hr @ 31.2V dc
Isolation Voltage (minimum)	1250V ac (rms) isolation 100% tested at 2121V dc for 1s between user and system No isolation between individual channels
External dc Power Supply Voltage Voltage Range Output Supply Current	24V dc nominal 19.2 to 31.2V dc (includes 5% ac ripple) 15mA @ 19.2V dc; 19mA @ 24V dc 24mA @ 30V dc; 25mA @ 31.2V dc
Dimensions Inches (Millimeters)	1.8H x 3.7W x 2.1D (45.7 x 94.0 x 53.3)
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Non-operating Vibration	0 to 55°C (32 to 131°F) –40 to 85°C (–40 to 185°F) 5 to 95% noncondensing 30 g peak acceleration, 11(±1)ms pulse width 50 g peak acceleration, 11(±1)ms pulse width Tested 5 g @ 10–500Hz per IEC 68-2-6
Conductors Wire Size Category	12 gauge (4mm ²) stranded maximum 3/64 inch (1.2mm) insulation maximum 2 ³
Agency Certification (when product or packaging is marked)	<ul style="list-style-type: none"> • CSA certified • CSA Class I, Division 2, Groups A, B, C, D certified • UL listed • CE marked for all applicable directives • C–Tick marked for all applicable acts

¹ Input off-to-on filter time is the time from a valid input signal to recognition by the module. Input on-to-off filter is time from the input signal dropping below the valid level to recognition by the module.

² Output off-to-on or on-to-off delay is the time from the module issuing an output on or off until the output actually turns on or off.

³ You use this conductor category information for planning conductor routing as described in publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines for Noise Immunity.



With major offices worldwide.

World Headquarters,
Allen-Bradley,
1201 South Second Street,
Milwaukee, WI 53204 USA,
Tel: (1) 414 382-2000 Fax: (1) 414 382-4444