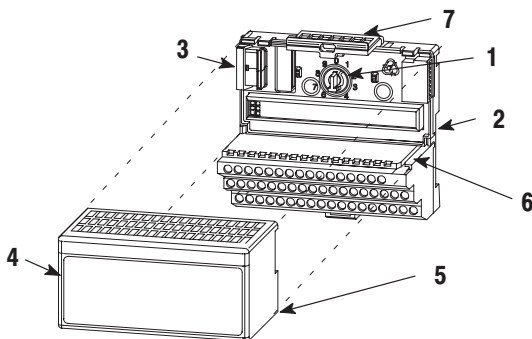




Installation Instructions

English

120V ac FLEX I/O 16 Input Module (Cat. No. 1794-IA16)



Module Installation

This module mounts on a 1794 terminal base unit.

1. Rotate keyswitch (1) on terminal base unit (2) clockwise to position 8 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.
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: To use this module in a complementary I/O system, refer to your Remote I/O Adapter module documentation.



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.

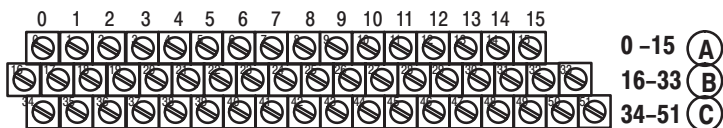
For specific information required by EN 61131-2, see the appropriate sections in this publication, as well as the following Allen-Bradley publications:

- 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

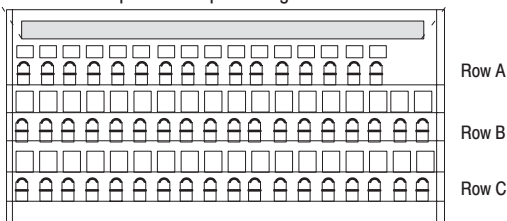
1. Connect individual wiring to numbered terminals on the **0–15** row (A) as indicated in the table below.
2. Connect the associated input wiring to the associated terminal on the **34–51** row (C) for each input as indicated in the table below.
3. Connect 120V ac L1 to terminal 34 on the **34–51** row (C).
4. Connect 120V ac common L2 to terminal 16 on the **16–33** row (B).
5. If continuing power to the next terminal base unit, connect a jumper from terminal 51 (120V ac L1) on this base unit to terminal 34 on the next base unit.
6. If continuing common to the next terminal base unit, connect a jumper from terminal 33 (120V ac common L2) on this base unit to terminal 16 on the next base unit.



1794-TB3

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Row A		
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	Row B
34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	Row C

Label placed at top of wiring area.



1794-TB3S

Channel	1794-TB3, 1794-TB3S				
	Input Terminals	120V ac Supply	Channel	Input Terminals	120V ac Supply
0	A-0	C-35	8	A-8	C-43
1	A-1	C-36	9	A-9	C-44
2	A-2	C-37	10	A-10	C-45
3	A-3	C-38	11	A-11	C-46
4	A-4	C-39	12	A-12	C-47
5	A-5	C-40	13	A-13	C-48
6	A-6	C-41	14	A-14	C-49
7	A-7	C-42	15	A-15	C-50

A = Input terminals

B = B-16 thru B-33 are internally connected together. Connect 120V ac common L2 to B-16.

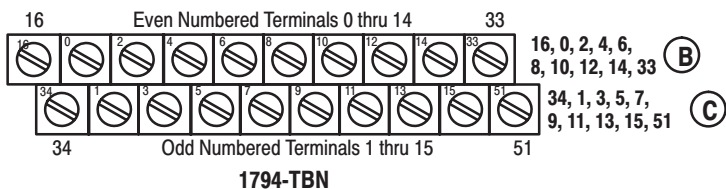
C = Power terminals (C34 thru 51) are internally connected together. Connect 120V ac L1 to C-34.



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

Wiring to a 1794-TBN Terminal Base Unit

1. Connect individual input wiring to the even numbered terminals on row (B) and the odd numbered terminals on row (C) as indicated in the table below.
2. Connect 120V ac (L1) to terminal 34 on row (C).
3. Connect 120V ac common (L2) to terminal 16 on row (B).
4. If continuing power to the next terminal base unit, connect a jumper from terminal 51 (120V ac L1) on this base unit to terminal 34 on the next base unit.
5. If continuing common to the next terminal base unit, connect a jumper from terminal 33 (120V ac common L2) on this base unit to terminal 16 on the next base unit.



1794-TBN			
Channel	Input Terminals	Channel	Input Terminals
0	B-0	1	C-1
2	B-2	3	C-3
4	B-4	5	C-5
6	B-6	7	C-7
8	B-8	9	C-9
10	B-10	11	C-11
12	B-12	13	C-13
14	B-14	15	C-15

B = Even numbered input terminals 0 thru 14, ac common terminals 16 and 33

C = Power terminals C-34 and C-51, and odd numbered input terminals 1 thru 15

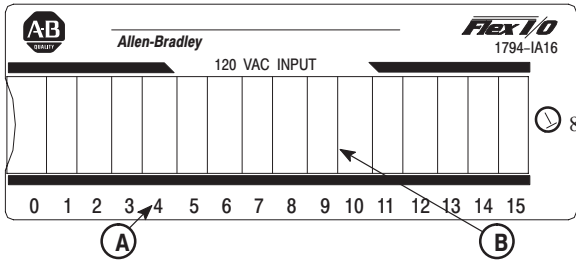
C-34 and C-51 = 120V ac L1 power terminals

B-16 and B-33 = 120V ac common L2



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

Indicators



- A** = Status Indicators – yellow – show status of individual inputs.
- B** = Insertable label for writing individual input designations.

Image Table Memory Map

Image Table	Dec. Bits (Oct. Bits)	Description	Format
Input	00-15	Status of input data	0-15
Output	00-02	Delay time for Inputs 0-11	
	03-05	Delay time for Inputs 12-15	
	06-15 (6-17)	Not used	

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
read	I15	I14	I13	I12	I11	I10	I9	I8	I7	I6	I5	I4	I3	I2	I1	I0
write	Not used - set to 0										D	D	D	D	D	D

Where: I = Input number
 D = Delay time bit - see below

Increasing the Input Delay Time

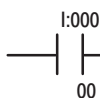
You can increase the input delay time (DT) for channels 00 through 11 and/or channels 12 through 15. Select the input delay time by setting the corresponding bits in the **output** image table (complementary word) for the module.

For example, to increase the off-to-on delay time for inputs 0 through 11 to 10ms for an ac input module at address rack 1, module group 0, set bits 02, 01, and 00 as shown below.

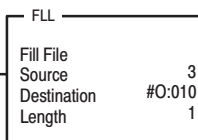
	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00	Dec. (Octal) = 3 Octal or 3 Decimal
	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00	
O:010											0	0	0	0	1	1	

DT = 12-15 DT = 00-11

Write Delay Time on system startup.



Write DT to complement of input module.



Delay Times

Bits			Description	Maximum Delay Time	
02	01	00		Off to On	On to Off
05	04	03	Delay Time for Inputs 12-15		
0	0	0	Delay Time 0 (default)	7.5ms	26.5ms
0	0	1	Delay Time 1	8ms	27ms
0	1	0	Delay Time 2	9ms	28ms
0	1	1	Delay Time 3	10ms	29ms
1	0	0	Delay Time 4	12ms	31ms
1	0	1	Delay Time 5	16ms	35ms
1	1	0	Delay Time 6	24.5ms	44ms
1	1	1	Delay Time 7	42ms	60.5ms

CSA Hazardous Location Approval

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.

Example of the CSA certification product label

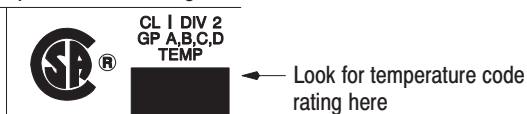


To comply with CSA certification for use in hazardous locations, the following information becomes a part of the product literature for CSA-certified Allen-Bradley industrial control products.

- 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.
-

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.

Temperature code rating



The following warnings apply to products having CSA certification for use in hazardous locations.

CSA Hazardous Location Approval



ATTENTION: Explosion hazard —

- 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.

Approbation d'utilisation dans des emplacements dangereux par la CSA

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.

Exemple d'étiquette de certification d'un produit par la CSA



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.

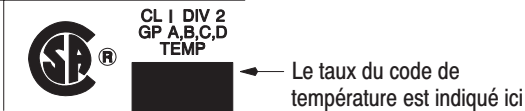
- Cet équipement convient à l'utilisation dans des emplacements de Classe I, Division 2, Groupes A, B, C, D, ou ne convient qu'à l'utilisation dans des endroits non dangereux.
- Les produits portant le marquage approprié de la CSA (c'est à dire, Classe I, Division 2, Groupes A, B, C, D) sont certifiés 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.

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.

CSA Hazardous Location Approval

Approbation d'utilisation dans des emplacements dangereux par la CSA

Taux du code de température



Les avertissements suivants s'appliquent aux produits ayant la certification CSA pour leur utilisation dans des emplacements dangereux.



AVERTISSEMENT: Risque d'explosion —

- 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.

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.

Specifications - 120V ac Input Module Cat. No. 1794-IA16

Number of Inputs	16 non-isolated						
Module Location	Cat. No. 1794-TB3, -TB3S, or -TBN Terminal Base						
Minimum ON-state Voltage	74V ac, 47Hz						
ON-state Current	<table border="0"> <tr> <td>Minimum</td> <td>5.49mA @ 74V ac, 47Hz</td> </tr> <tr> <td>Normal</td> <td>12.06mA @ 120V ac, 60Hz</td> </tr> <tr> <td>Maximum</td> <td>14.81mA @ 132V ac, 63Hz</td> </tr> </table>	Minimum	5.49mA @ 74V ac, 47Hz	Normal	12.06mA @ 120V ac, 60Hz	Maximum	14.81mA @ 132V ac, 63Hz
Minimum	5.49mA @ 74V ac, 47Hz						
Normal	12.06mA @ 120V ac, 60Hz						
Maximum	14.81mA @ 132V ac, 63Hz						
Maximum OFF-state Voltage	20V ac						
Minimum OFF-state Current	2.87mA						
Nominal Input Impedance	10K ohms						
Nominal Input Current	12mA @ 120V ac, 60Hz						
Isolation							
Channel to channel	None required						
Customer power to input channels	None						
User to system	100% tested at 2150V dc for 1s						
Input DelayTime (maximum)							
Off to On (time from a valid input signal to recognition by block)	7.5ms, 8ms, 9ms, 10ms, 12ms, 16ms, 24.5ms, 42ms						
On to Off (time from input dropping below valid level to recognition by block)	26.5ms, 27ms, 28ms, 29ms, 31ms, 35ms, 44ms, 60.5ms						
	Delay time selectable thru output image table Default is 7.5ms off to on/26.5ms on to off						
Flexbus Current (maximum)	20mA @ 5V dc						
Power Dissipation	Maximum 6.4W @ 132V ac						
Thermal Dissipation	Maximum 21.8 BTU/hr @ 132V ac						
Indicators (field side indication, customer device driven)	16 yellow status indicators						
Keyswitch Position	8						

Specifications continued on next page.

Specifications - 120V ac Input Module Cat. No. 1794-IA16**General Specifications**

External ac Power Supply Voltage Voltage Range		120V ac nominal 74 to 132V ac, 47-63Hz
Dimensions	Inches (Millimeters)	1.8H x 3.7W x 2.1D (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	30 g peak acceleration, 11(±1)ms pulse width
	Non-operating	50 g peak acceleration, 11(±1)ms pulse width
Vibration		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 1 ¹
Agency Certification (when product 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

¹ You use this conductor category information for planning conductor routing as described in publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines."



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