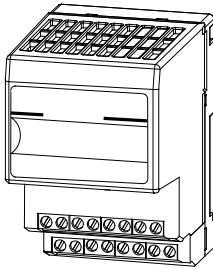




Installation Instructions

FLEX Integra 2 Input/1 Output Analog Module

(Cat. No. 1793-IE2X0E1 and -IE2X0E1S)

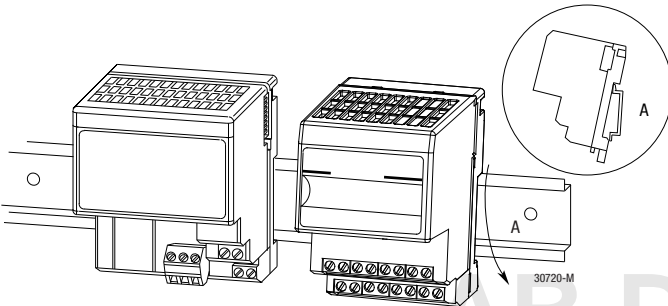


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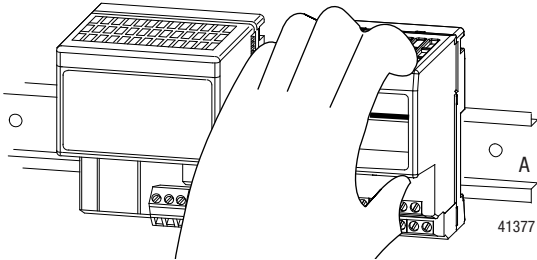
Module Installation

This module mounts on a DIN rail. It connects to an adapter or another FLEX I/O or Integra module. Note: If using this module with FLEX I/O modules, do not mount between FLEX I/O modules. Mount Integra modules to the right of the FLEX I/O modules. To mount this module:

1. Remove the cover plug (if used) in the male connector of the unit to which you are connecting this module.
2. Position the module on the 35 x 7.5mm DIN rail A (A-B pt. no. 199-DR1).
3. Rotate the module onto the DIN rail with the top of the rail hooked under the lip on the rear of the module.

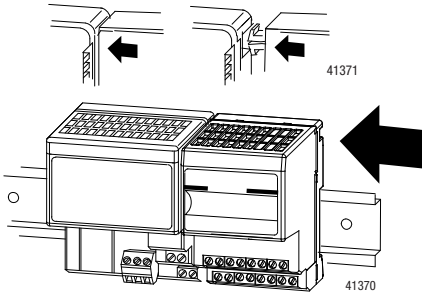


4. Press down to lock the module on the DIN rail.

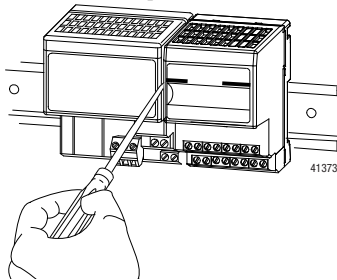


If the module does not lock in place, use a screwdriver of similar device to move the locking tab down, press the module flush with the DIN rail and release the locking tab to lock the module in place.

5. Firmly push the module into the adjacent module/terminal base until the units lock together.



6. Repeat the above steps to install the next Integra module.
7. To remove an Integra module, you must work from the right side and remove one module at a time. To disengage a module from its neighbor, place a common flat-bladed screwdriver between the 2 modules and turn 1/4 turn to separate the modules.



8. Then slide the module away from its left neighbor, and release the locking lever to remove the module from the DIN rail.



ATTENTION: Do not remove this module under power. Removing this module under power will break the electrical backplane (flexbus) connections. This 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
- breaking communication to modules beyond this module

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.

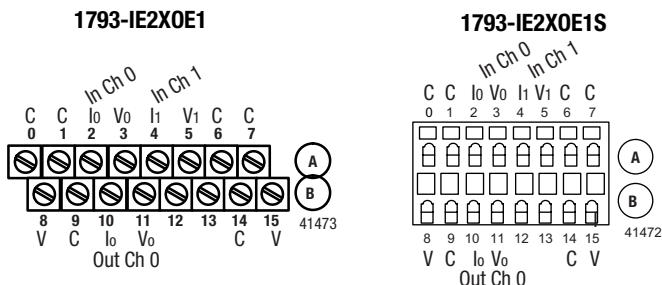
For specific information required by EN 61131-2, see the appropriate sections in this publication, as well as the following Allen-Bradley publications:

- 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

This module is available with 2 styles of connectors; screw-cage and spring clamp. Refer to the wiring figure below.



Where: C = common; V = +24V dc power; I_{0,1} = current in;
V_{0,1} = voltage in; I_o = current out; V_o = voltage out

1. Connect individual analog input channel signal wiring to terminals on row **A**. Use terminals 2 (channel 0) and 4 (channel 1) for current and terminals 3 and 5 for voltage. Use **Belden 8761 cable for signal wiring**.



ATTENTION: Connect only 1 current or 1 voltage signal per channel. Do not connect both current and voltage on 1 channel.

2. Connect the associated channel common to common terminals 1 and 6 according to the wiring table on the next page.
3. Connect individual analog output channel signal wiring to terminals 10 or 11 on row **B**. (Use terminal 10 for current, or terminal 11 for voltage - not both.)
4. Connect the associated channel common to common terminal 9 according to the wiring table on the next page.
5. Connect +24V dc to terminal 8 on row **B**
6. Connect 24V dc common to terminal 0 on row **A**.
7. If daisy-chaining +24V dc from this module to the next FLEX Integra module, connect a jumper from terminal 15 to terminal 8 on the next FLEX Integra module.
8. If daisy-chaining 24V dc common from this module to the next FLEX Integra module, connect a jumper from terminal 7 on this module to terminal 0 on the next Integra module.



ATTENTION: Total current draw through the module's (+) voltage terminals is limited to 10A. Separate power connections to the module may be required.

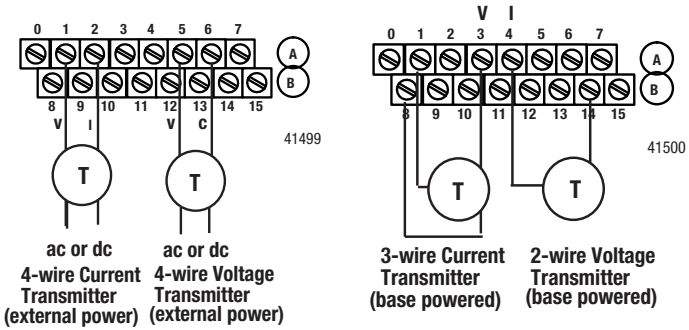
Wiring Connections

| Channel | Signal Type | Label Markings | Signal | Return |
|---------------|--|----------------|--------|--------|
| Input | | | | |
| 0 | Current | I | 2 | 1 |
| | Voltage | V | 3 | |
| 1 | Current | I | 4 | 6 |
| | Voltage | V | 5 | |
| Output | | | | |
| 0 | Current | I | 10 | 9 |
| | Voltage | V | 11 | |
| +24V dc | Terminals 8 and 15 are internally connected to +V. | | | |
| 24V dc common | Terminals 0, 1, 6, 7, 9, 14 are internally connected together in the module. | | | |

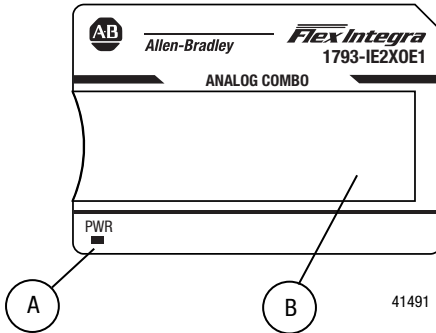


ATTENTION: Use a 100Ω, 25W or greater, resistor when connecting to a low-impedance device, i.e., panel meter. Failure to do so can result in damage to output circuitry..

Examples of Sensor Wiring



Indicators



A = Power indicator - indicates power applied to module

B = Insertable label for writing individual output designations

Input Map

| Bit/ Word | 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
|--------------|----------|----------------------------------|----|----|----|----|----|----|----|----|----|----|---------------|----|----|----|
| Read | | | | | | | | | | | | | | | | |
| 0 | S | Analog Input Value for Channel 0 | | | | | | | | | | | | | | |
| 1 | S | Analog Input Value for Channel 1 | | | | | | | | | | | | | | |
| 2-3 | Reserved | | | | | | | | | | | | | | | |
| 4 | PU | Reserved | | | | | | | | | | W0 | Re-ser ved | U1 | U0 | |

Where: S = Sign bit
 PU = Power up bit
 U = Underrange bit
 W = Diagnostic bit for current output wire broken or load resistance high.
 (Not used on voltage outputs)

Output Map

| Bit/ Word | 15 | 14 | 13 | 12 | 11 | 10 | 09 | 08 | 07 | 06 | 05 | 04 | 03 | 02 | 01 | 00 |
|--------------|---------------------|---------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Write | | | | | | | | | | | | | | | | |
| 0 | S | Analog Data for Channel 0 | | | | | | | | | | | | | | |
| 1 | Reserved | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | M0 |
| 3 | 0 | 0 | 0 | C4 | 0 | 0 | C1 | C0 | 0 | 0 | 0 | F4 | 0 | 0 | F1 | F0 |
| 4-5 | Not used - Set to 0 | | | | | | | | | | | | | | | |
| 6 | S | Safe State value for output Channel 0 | | | | | | | | | | | | | | |
| 7 | Reserved | | | | | | | | | | | | | | | |

Where: M = Multiplex bits
 C = Configure Select bit
 S = Sign bit (in 2's complement)
 F = Full range bit

Output Map

| Channel No. | In Ch. 0 | | In Ch. 1 | | Out Ch. 0 | |
|------------------|----------|----|----------|----|-----------|----|
| | F0 | C0 | F1 | C1 | F4 | C4 |
| Dec.Bit | 00 | 08 | 01 | 09 | 04 | 12 |
| Write | | | | | | |
| 0-10V dc/20mA | 1 | 0 | 1 | 0 | 1 | 0 |
| 4-20mA | 0 | 1 | 0 | 1 | 0 | 1 |
| -10 to +10V dc | 1 | 1 | 1 | 1 | 1 | 1 |
| Off ¹ | 0 | 0 | 0 | 0 | 0 | 0 |

Where: F = Full Range bit

C = Configure Select bit

1 When configured to Off, individual input channels will return 0000H

Specifications - 2 Input/1 Output Analog Module, Cat. No. 1793-IE2X0E1 and -IE2X0E1S

| | |
|---|--|
| Module Type | 2 analog inputs, 1 analog output 1793-IE2X0E1 - 16 screw-cage terminals 1793-IE2X0E1S - 16 spring-clamp terminals |
| Module Location | DIN rail mounting |
| Number of Channels | 3 - 2 in, 1 out - nonisolated |
| Input | |
| Resolution Voltage Current | 12-bits - unipolar; 11-bit plus sign - bipolar 2.56mV/cnt unipolar; 5.13mV/cnt bipolar 5.13μA/cnt |
| Data Type | left justified 16-bit 2's complement |
| Conversion Type | Successive approximation |
| Conversion Rate | 256μs all channels |
| Input Current Terminal | 4-20mA (user configurable) 0-20mA (user configurable) |
| Input Voltage Terminal | ±10V (user configurable) 0-10V (user configurable) |
| Normal Mode Rejection Ratio Voltage Terminal Current Terminal | -3db @ 17Hz; -20db/decade -10db @ 50Hz; -11.4db @ 60Hz -3db @ 17Hz; -20db/decade -15.3db @ 50Hz; -16.8db @ 60Hz |
| Step Response to 63% Voltage Terminal Current Terminal | 9.4ms 18.2ms |




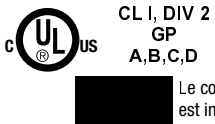
**Specifications - 2 Input/1 Output Analog Module,
Cat. No. 1793-IE2X0E1 and -IE2X0E1S**

| | |
|----------------------|--|
| Impedance | |
| Voltage Terminal | 9.4ms100K Ω ; 200K Ω @ dc |
| Current Terminal | 238 Ω |
| Absolute Accuracy | |
| Voltage Terminal | 0.20% FS @ 25 $^{\circ}$ C |
| Current Terminal | 0.20% FS @ 25 $^{\circ}$ C |
| Accuracy Drift | |
| Voltage Terminal | 0.00428% FS per $^{\circ}$ C |
| Current Terminal | 0.00407% FS per $^{\circ}$ C |
| Maximum Overload | Single channel, continuous |
| Voltage Terminal | 30V |
| Current Terminal | 32mA |
| Output | |
| Resolution | 12-bits plus sign |
| Voltage | 2.56mV/cnt |
| Current | 5.13 μ A/cnt |
| Data Type | left justified 16-bit 2's complement |
| Conversion Type | Pulse width modulation |
| Conversion Rate | 1.024ms all channels |
| Current Terminal | 4-20mA (user configurable) 0-20mA (user configurable) |
| Voltage Terminal | \pm 10V (user configurable) 0-10V (user configurable) 3A maximum |
| Step Response to 63% | |
| Voltage Terminal | 24ms |
| Current Terminal | 24ms |
| Impedance | |
| Voltage Terminal | 15-750 Ω resistive |
| Current Terminal | 15-750 Ω resistive |
| Absolute Accuracy | |
| Voltage Terminal | 0.133% FS @ 25 $^{\circ}$ C |
| Current Terminal | 0.425% FS @ 25 $^{\circ}$ C |
| Accuracy Drift | |
| Voltage Terminal | 0.0045% FS per $^{\circ}$ C |
| Current Terminal | 0.0069% FS per $^{\circ}$ C |
| Isolation Voltage | Channel to system - 850V dc for 1s Channel to channel - None |

**Specifications - 2 Input/1 Output Analog Module,
Cat. No. 1793-IE2X0E1 and -IE2X0E1S**
General

| | |
|--|--|
| Flexbus Current | 20mA maximum |
| Power Dissipation | 2.5W @ 31.2V dc |
| Thermal Dissipation | 8.5 BTU/hr @ 31.2V dc |
| Indicators | 1 green power indicators |
| External dc Power Voltage Current | 19.2-31.2V dc (5% ac ripple) 100mA maximum |
| Dimensions in (mm) | 2.72H x 3.15D x 2.17W (69H x 80D x 55W) |
| 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 | Tested to 30g peak acceleration, 11(+1)ms pulse width |
| Nonoperating | Tested to 50g peak acceleration, 11(+1)ms pulse width |
| Vibration | Tested 5g @ 10-500Hz per IEC68-2-6 |
| Conductors Wire Size | 12 gauge (4mm ²) stranded wire |
| Category | 3/64 in (1.2mm) maximum insulation 2 |
| Screw Terminal Torque | 7-9 lb-in |
| Agency Certification (when product is marked) | <ul style="list-style-type: none"> • CUL Listed • CUL Class I, Division 2 Groups A, B, C and D certified • UL listed • CE marked for all applicable directives |
| User Manual | <ul style="list-style-type: none"> • Publication 1793-6.5.1 |

¹ Use this category information for planning conductor routing as described in publication 1770-4.1, "Wiring and Grounding Guidelines for Noise Immunity."

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|--|---|
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| <p>Example of the CUL certification product label:</p>  | <p>Exemple d'étiquette de certification d'un produit par la CUL :</p>  |
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| <p>Temperature code rating:</p>  <p>Look for temperature code rating here.</p> | <p>Code de température :</p>  <p>Le code de température est indiqué ici.</p> |
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|---|---|
| <p>ATTENTION: 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 this equipment by 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. • Batteries must only be changed in an area known to be non-hazardous. | <p>AVERTISSEMENT : Risque d'explosion</p> <ul style="list-style-type: none"> • La substitution de composants peut rendre ce matériel inadapté à une utilisation en environnement de Classe I, Division 2. • Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de remplacer des composants. • 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 fournis par l'utilisateur pour se brancher aux circuits externes de cet appareil à l'aide de vis, loquets coulissants, connecteurs filetés ou autres, de sorte que les connexions résistent à une force de séparation de 15 Newtons (1,5 kg - 3,4 lb.) appliquée pendant au moins une minute. • S'assurer que l'environnement est classé non dangereux avant de changer les piles. |
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