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I/O Expansion Modules and Adapters Installation Guide

EX-D16A3-RO8	IO-DI8-RO4	IO-D16A3-RO16	IO-AI4-AO2
EX-D16A3-TO16	IO-DI8-RO8	IO-D16A3-TO16	IO-DI8ACH
EX-A2X	IO-DI8-TO8	IO-DI16	IO-AI8
EX-RC1	IO-RO8	IO-AO6X	IO-LC1
IO-PT400	IO-RO16	IO-ATC8	IO-LC3
IO-PT4K	IO-TO16	IO-AI1X-AO3X	

General Description

The products listed above may be used with compatible Unitronics PLCs.



Detailed Installation Guides containing the I/O wiring diagrams for these models, technical specifications, and additional documentation are located in the Technical Library in the Unitronics website:

<https://unitronicsplc.com/support-technical-library/>



Alert Symbols and General Restrictions

When any of the following symbols appear, read the associated information carefully.



Symbol	Meaning	Description
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	Danger	The identified danger causes physical and property damage.
	Warning	The identified danger could cause physical and property damage.
<i>Caution</i>	Caution	Use caution.

- Before using this product, the user must read and understand this document.
- All examples and diagrams are intended to aid understanding, and do not guarantee operation. Unitronics accepts no responsibility for actual use of this product based on these examples.
- Please dispose of this product according to local and national standards and regulations.
- Only qualified service personnel should open this device or carry out repairs.

	▪ Failure to comply with appropriate safety guidelines can cause severe injury or property damage.
	▪ Do not attempt to use this device with parameters that exceed permissible levels. ▪ To avoid damaging the system, do not connect/disconnect the device when power is on.

Environmental Considerations

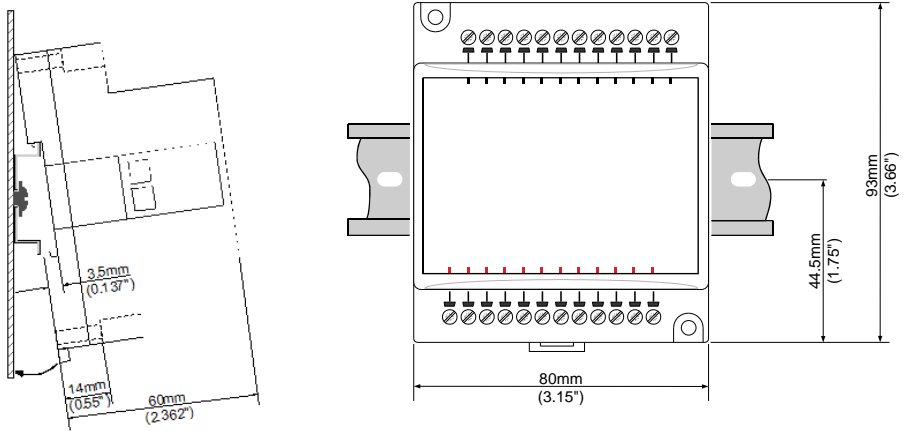
	▪ Do not install in areas with: excessive or conductive dust, corrosive or flammable gas, moisture or rain, excessive heat, regular impact shocks or excessive vibration, in accordance with the standards given in the product's technical specification sheet. ▪ Do not place in water or let water leak onto the unit. ▪ Do not allow debris to fall inside the unit during installation.
	▪ Ventilation: 10mm space required between controller's top/bottom edges & enclosure walls. ▪ Install at maximum distance from high-voltage cables and power equipment.

Mounting

Note that figures are for illustrative purposes only.

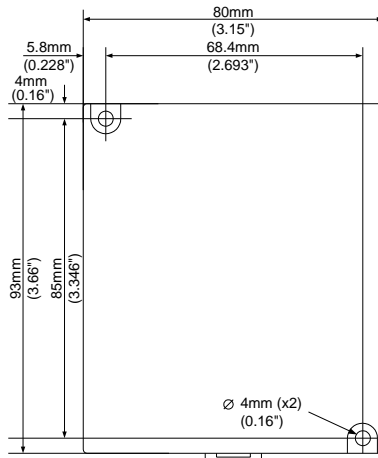
DIN-rail mounting - I/O Expansion Modules

Snap the device onto the DIN rail as shown below; the module will be squarely situated on the DIN rail.



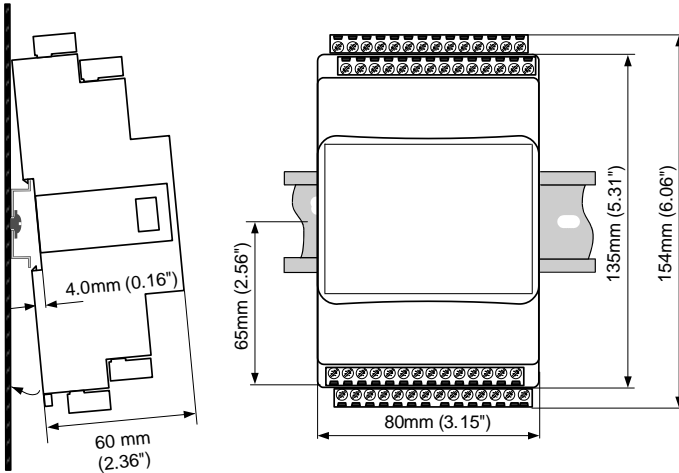
Screw-Mounting

The figure below is drawn to scale. It may be used as a guide for screw-mounting the module. Mounting screw type: either M3 or NC6-32.



DIN-rail mounting -XL I/O Expansion Modules

To mount the module on a 35mm DIN-rail, snap it squarely onto the DIN-rail, as shown below.



- Install the module in an upright position.
- To ensure good ventilation, leave at least 50mm between the device and all other objects above or below it.
- Install at a maximum distance from high-voltage cables and power equipment.

Wiring



- Do not touch live wires.



- This equipment is designed to operate only in SELV/PELV/Class 2/Limited Power environments.
- All power supplies in the system must include double insulation. Power supply outputs must be rated as SELV/PELV/Class 2/Limited Power.
- Do not connect either the 'Neutral' or 'Line' signal of the 110/220VAC to device's 0V pin.
- All wiring activities should be performed while power is OFF.
- Use over-current protection, such as a fuse or circuit breaker, to avoid excessive currents into the power supply connection point.
- Unused points should not be connected (unless otherwise specified). Ignoring this directive may damage the device.
- Double-check all wiring before turning on the power supply.

Caution

- To avoid damaging the wire, do not exceed a maximum torque of:
 - Controllers offering a terminal block with pitch of 5mm: 0.5 N·m (5 kgf·cm).
 - Controllers offering a terminal block with pitch of 3.81mm f 0.2 N·m (2 kgf·cm).
- Do not use tin, solder, or any substance on stripped wire that might cause the wire strand to break.
- Install at maximum distance from high-voltage cables and power equipment.

Wiring Procedure

Use crimp terminals for wiring;

- Controllers offering a terminal block with pitch of 5mm: 26-12 AWG wire (0.13 mm² –3.31 mm²).
 - Controllers offering a terminal block with pitch of 3.81mm: 26-16 AWG wire (0.13 mm² – 1.31 mm²).
1. Strip the wire to a length of 7±0.5mm (0.270–0.300“).
 2. Unscrew the terminal to its widest position before inserting a wire.
 3. Insert the wire completely into the terminal to ensure a proper connection.
 4. Tighten enough to keep the wire from pulling free.

Wiring Guidelines

- Use separate wiring ducts for each of the following groups:
 - Group 1: Low voltage I/O and supply lines, communication lines.
 - Group 2: High voltage Lines, Low voltage noisy lines like motor driver outputs.
 Separate these groups by at least 10cm (4“). If this is not possible, cross the ducts at a 90° angle.
- For proper system operation, all 0V points in the system should be connected to the system 0V supply rail.
- Product-specific documentation must be fully read and understood before performing any wiring.

Allow for voltage drop and noise interference with input lines used over an extended distance.
Use wire that is properly sized for the load.

Earthing the product

To maximize system performance, avoid electromagnetic interference as follows:

- Use a metal cabinet.
- Connect the 0V and functional ground points (if exist) directly to the earth ground of the system.
- Use the shortest, less than 1m (3.3 ft.) and thickest, 2.08mm² (14AWG) min, wires possible.

UL Compliance

The following section is relevant to Unitronics' products that are listed with the UL.

The following models: IO-AI4-AO2, IO-AO6X, IO-ATC8, IO-DI16, IO-DI16-L, IO-DI8-RO4, IO-DI8-RO4-L, IO-DI8-TO8, IO-DI8-TO8-L, IO-RO16, IO-RO16-L, IO-RO8, IO-RO8L, IO-TO16, EX-A2X are UL listed for Hazardous Locations.

The following models: EX-D16A3-RO8, EX-D16A3-RO8L, EX-D16A3-TO16, EX-D16A3-TO16L, IO-AI1X-AO3X, IO-AI4-AO2, IO-AI4-AO2-B, IO-AI8, IO-AI8Y, IO-AO6X, IO-ATC8, IO-D16A3-RO16, IO-D16A3-RO16L, IO-D16A3-TO16, IO-D16A3-TO16L, IO-DI16, IO-DI16-L, IO-DI8-RO4, IO-DI8-RO4-L, IO-DI8-RO8, IO-DI8-RO8-L, IO-DI8-TO8, IO-DI8-TO8-L, IO-DI8ACH, IO-LC1, IO-LC3, IO-PT4, IO-PT400, IO-PT4K, IO-RO16, IO-RO16-L, IO-RO8, IO-RO8L, IO-TO16, EX-A2X, EX-RC1 are UL listed for Ordinary Location.

UL Ratings, Programmable Controllers for Use in Hazardous Locations,

Class I, Division 2, Groups A, B, C and D

These Release Notes relate to all Unitronics products that bear the UL symbols used to mark products that have been approved for use in hazardous locations, Class I, Division 2, Groups A, B, C and D.

Caution



- This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D, or Non-hazardous locations only.
 - Input and output wiring must be in accordance with Class I, Division 2 wiring methods and in accordance with the authority having jurisdiction.
 - **WARNING—Explosion Hazard—**substitution of components may impair suitability for Class I, Division 2.
 - **WARNING – EXPLOSION HAZARD –** Do not connect or disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
 - **WARNING –** Exposure to some chemicals may degrade the sealing properties of material used in Relays.
 - This equipment must be installed using wiring methods as required for Class I, Division 2 as per the NEC and/or CEC.
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Relay Output Resistance Ratings

The products listed below contain relay outputs:

Input/Output expansion modules, Models: IO-DI8-RO4, IO-DI8-RO4-L, IO-RO8, IO-RO8L

- When these specific products are used in hazardous locations, they are rated at 3A res, when these specific products are used in non-hazardous environmental conditions, they are rated at 5A res, as given in the product's specifications.

Certification UL des automates programmables, pour une utilisation en environnement à risques, Class I, Division 2, Groups A, B, C et D.

Cette note fait référence à tous les produits Unitronics portant le symbole UL - produits qui ont été certifiés pour une utilisation dans des endroits dangereux, Classe I, Division 2, Groupes A, B, C et D.

Attention



- Cet équipement est adapté pour une utilisation en Classe I, Division 2, Groupes A, B, C et D, ou dans Non-dangereux endroits seulement.
 - Le câblage des entrées/sorties doit être en accord avec les méthodes de câblage selon la Classe I, Division 2 et en accord avec l'autorité compétente.
 - **AVERTISSEMENT: Risque d'Explosion –** Le remplacement de certains composants rend caduque la certification du produit selon la Classe I, Division 2.
 - **AVERTISSEMENT - DANGER D'EXPLOSION -** Ne connecter pas ou ne débranche pas l'équipement sans avoir préalablement coupé l'alimentation électrique ou la zone est reconnue pour être non dangereuse.
 - **AVERTISSEMENT -** L'exposition à certains produits chimiques peut dégrader les propriétés des matériaux utilisés pour l'étanchéité dans les relais.
 - Cet équipement doit être installé utilisant des méthodes de câblage suivant la norme Class I, Division 2 NEC et /ou CEC.
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Certification de la résistance des sorties relais

Les produits énumérés ci-dessous contiennent des sorties relais:

- Modules d'Extensions d'E/S, modèles: IO-DI8-RO4, IO-DI8-RO4-L, IO-RO8, IO-RO8L.
 - Lorsque ces produits spécifiques sont utilisés dans des endroits dangereux, ils supportent un courant de 3A charge résistive, lorsque ces produits spécifiques sont utilisés dans un environnement non dangereux, ils sont évalués à 5A res, comme indiqué dans les spécifications du produit Plages de températures.
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