

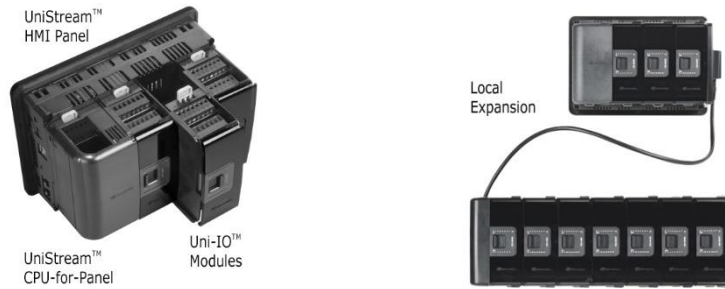
Uni-I/O™ is a family of Input/Output modules that are compatible with the UniStream™ control platform.

This guide provides basic installation information for the UIS-04PTN and UIS-04PTKN module. Technical specifications may be downloaded from the Unitronics website.

The UniStream™ platform comprises CPU controllers, HMI panels, and local I/O modules that snap together to form an all-in-one Programmable Logic Controller (PLC).

Install Uni-I/O™ modules:

- Onto the back of any UniStream™ HMI Panel comprising a CPU-for-Panel.
- Onto a DIN-rail, using a Local Expansion Kit.



The maximum number of Uni-I/O™ modules that can be connected to a single CPU controller is limited. For details, please refer to the specification sheets of the UniStream™ CPU or any of the relevant Local Expansion Kits.

## Before You Begin

Before installing the device, the installer must:

- Read and understand this document.
  - Verify the Kit Contents.

### Installation option requirements

If you are installing a Uni-I/O™ module onto:

- A UniStream™ HMI Panel; the Panel must comprise a CPU-for-Panel, installed according to the CPU-for-Panel installation guide.
- A DIN-rail; you must use a Local Expansion Kit, available by separate order, to integrate the Uni-I/O™ modules on the DIN-rail into a UniStream™ control system.

## Alert Symbols and General Restrictions

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

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

- 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.
- This product should be installed only by qualified personnel.

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- 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.
  - Do not connect/disconnect the device when power is on.
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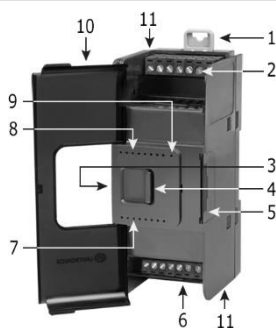
## Environmental Considerations

- ⚠️ ▪ Ventilation: 10mm (0.4") of space is required between the device top/bottom edges and the enclosure's walls.
- 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 and limitations 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.
- Install at maximum distance from high-voltage cables and power equipment.

## Kit Contents

- 1 Uni-I/O™ module
- 2 I/O terminal blocks (black)

## Uni-I/O™ Diagram



1	DIN-rail clips	Provide physical support for CPU and modules. There are two clips: one at the top (shown), one at the bottom (not shown).
2	Inputs 0-1	Input connection points
3	I/O Bus - Left	Left-side Connector
4	Bus Connector Lock	Slide the Bus Connector Lock to the left, to electrically connect the Uni-I/O™ module to the CPU or adjacent module.
5	I/O Bus - Right	Right-Side Connector, shipped covered. Leave covered when not in use.
	Bus Connector Cover	
6	Inputs 2-3	Input connection points
7	Input LEDs (2-3)	Red LEDs
8	Input LEDs (0-1)	Red LEDs
9	Status LED	Tricolor LED, Green/Red/Orange

**NOTE** ▪ Refer to the module's specification sheet for LED indications.

10	Module door	Shipped covered with protective tape to prevent the door from being scratched. Remove tape during installation.
11	Screw holes	Enable panel-mounting; hole diameter: 4mm (0.15").

## About the I/O Bus Connectors

The I/O Bus connectors provide the physical and electrical connection points between modules. The connector is shipped covered by a protective cover, protecting the connector from debris, damage, and ESD.

The I/O Bus - Left (#3 in diagram) can be connected to either a CPU-for-Panel, a Uni-COM™ module, to another Uni-I/O™ module or to the End Unit of a Local Expansion Kit.

The I/O Bus - Right (#5 in diagram) can be connected to another I/O module, or to the Base Unit of the Local Expansion Kit.

**Caution** ■ If the I/O module is located last in the configuration, and nothing is to be connected to it, do not remove its Bus Connector Cover.

## Installation

- ⚠ ■ Turn off system power before connecting or disconnecting any modules or devices.
- Use proper precautions to prevent Electro-Static Discharge (ESD).

### Installing a Uni-I/O™ Module onto a UniStream™ HMI Panel

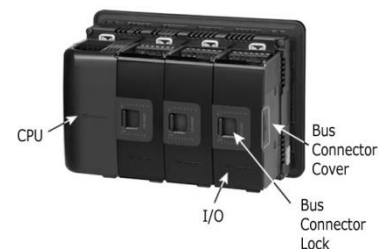
**NOTE** The DIN-rail type structure on the back of the panel provides the physical support for the Uni-I/O™ module.

1. Check the unit to which you will connect the Uni-I/O™ module to verify that its Bus Connector is not covered.  
If the Uni-I/O™ module is to be the last one in the configuration, do not remove the cover of its I/O Bus Connector - Right.

2. Open the door of the Uni-I/O™ module and hold it as shown in the accompanying figure.
3. Use the upper and lower guide-tunnels (tongue & groove) to slide the Uni-I/O™ module into place.
4. Verify that the DIN-rail clips located at the top and bottom of the Uni-I/O™ module have snapped onto the DIN-rail.



5. Slide the Bus Connector Lock all the way to the left as shown in the accompanying figure.
6. If there is already a module located to its right, complete the connection by sliding the Bus Connector lock of the adjacent unit to the left.
7. If the module is the last in the configuration, leave the I/O bus connector covered.



## Removing a Module

1. Turn off the system power.
2. Disconnect the I/O terminals (#2, 6 in the diagram).
3. Disconnect the Uni-I/O™ module from the adjacent units: slide its Bus Connector Lock to the right. If there is a unit located on its right, slide the lock of this module to the right as well.
4. On the Uni-I/O™ module, pull the top DIN-rail clip up and the bottom clip down.
5. Open the door of the Uni-I/O™ and hold it with two fingers as shown in the figure on page 3; then pull it carefully from its place.

## Installing Uni-I/O™ modules onto a DIN-rail

To mount modules onto a DIN-rail, follow steps 1-7 in Installing a Uni-I/O™ Module onto a UniStream™ HMI Panel on page 3.

In order to connect the modules to a UniStream™ controller, you must use a Local Expansion Kit.

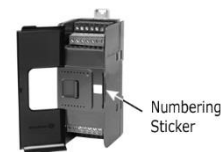
These kits are available with and without power supplies, and with cables of varying lengths. For complete information, please refer to the installation guide of the relevant Local Expansion Kit.

## Numbering Modules

You can number modules for reference purposes. A set of 20 stickers is provided with every CPU-for-Panel; use these stickers to number the modules.



- The set contains numbered and blank stickers as shown in the figure to the left.
- Place them on the modules as shown in the figure to the right.



## UL Compliance



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

The following models: UIA-0006, UID-0808R, UID-W1616R,UIS-WCB1 are UL listed for Hazardous Locations.

The following models: UIA-0006, UIA-0402N,UIA-0402NL, UIA-0800N, UID-0016R, UID-0016RL, UID-0016T, UID-0808R, UID-0808RL, UID-0808T, UID-0808THS, UID-0808THSL, UID-0808TL, UID-1600, UID-1600L, UID-W1616R, UID-W1616T, UIS-04PTKN, UIS-04PTN, UIS-08TC, UIS-WCB1, UIS-WCB2 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.
- 

### **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.

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- 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.
-

## Wiring

- ⚠️ ▪ This equipment is designed to operate only at 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 point.
  - Do not touch live wires.
- 
- ⚠️ ▪ All wiring activities should be performed while power is OFF.
  - 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, use a maximum torque of 0.5 N·m (5 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; use 26-12 AWG wire ( $0.13 \text{ mm}^2 - 3.31 \text{ mm}^2$ ).

1. Strip the wire to a length of  $7 \pm 0.5 \text{ mm}$  (0.250–0.300 inches).
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.

## Uni-I/O™ Connection Points

All wiring diagrams and instructions in this document refer to the Uni-I/O™ connection points.

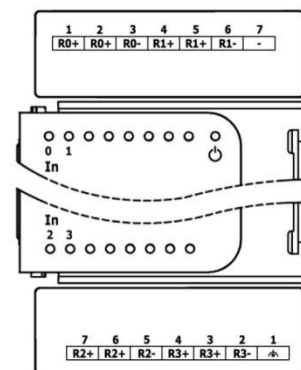
These points are arranged in two groups of 2 points as shown in the figure to the right.

### Top group

Input connection points (0-1)

### Bottom group

Input connection points (2-3)



## Wiring Guidelines

In order to ensure that the device will operate properly and to avoid electromagnetic interference:

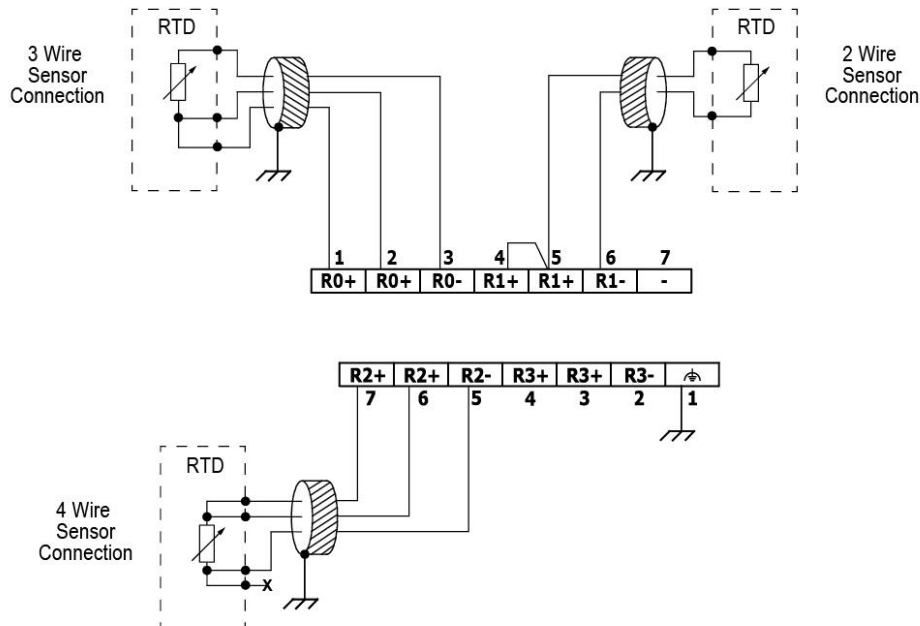
- Use a metal cabinet. Make sure the cabinet and its doors are properly earthed.
  - Use wires that are properly sized for the load.
- Use shielded cables for wiring RTD signals; do not use the cable shield as a signal common (CM) / return path.
  - Individually connect each functional ground point (⏏) to the earth of the system (preferably to the metal cabinet chassis).  
Use the shortest and thickest wires possible: less than 1m (3.3') in length, minimum thickness 14 AWG (2 mm<sup>2</sup>).
- Earthing the cables' shield:
  - Connect the cable shield to the earth of the system - preferably to the metal cabinet chassis. Note that the shield must be connected only at one end of the cable; typically, earthing the shield at the Uni-I/O™ end performs better.
  - Keep shield connections as short as possible.
  - Ensure shield continuity when extending shielded cables.

<b>NOTE</b>	For detailed information, refer to the document System Wiring Guidelines, located in the Technical Library in the Unitronics' website.
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## Wiring the RTD Inputs

**NOT** ▪ The inputs are not isolated.

- E**
- When connecting 3- or 4-wire RTDs, make sure to use conductors of the same type, width, and length for all RTD wires, otherwise module accuracy will degrade.
  - When connecting 4-wire RTDs, use 3-wire cable and leave the unused wire unconnected with minimal length.



# UniStream® Uni-I/O™ Modules

**Technical Specifications**
**UIS-04PTN, UIS-04PTKN**

This guide provides specifications for Unitronics' Uni-I/O™ modules UIS-04PTN and UIS-04PTKN. Those modules comprise:

- 4 RTD inputs

Uni-I/O modules are compatible with UniStream® family of Programmable Logic Controllers. They may be either snapped onto the back of a UniStream® HMI Panel next to a CPU-for-Panel to create an all-in-one HMI + PLC controller, or installed on a standard DIN Rail using a Local Expansion Adapter.

Installation Guides are available in the Unitronics Technical Library at [www.unitronicsplc.com](http://www.unitronicsplc.com)

<b>RTD Inputs</b>			
Number of inputs	4		
UIS-04PTN input range <sup>(1)</sup>	<b>Input Type</b>	<b>Nominal Values</b>	<b>Over/Under-range Values *</b>
	PT100 0.00385 0.00392 0.00391	-200°C ≤ T ≤ 850°C (-328°F ≤ T ≤ 1,562°F)	Under-range: -220°C ≤ T < -200°C (-364°F ≤ T < -328°F)  Over-range: 850°C < T ≤ 860°C (1,562°F < T ≤ 1,580°F)
	NI100 0.00618	-100°C ≤ T ≤ 260°C (-148°F ≤ T ≤ 500°F)	Under-range: -150°C ≤ T < -100°C (-238°F ≤ T < -148°F)  Over-range: 260°C < T ≤ 270°C (500°F < T ≤ 518°F)
	NI100 0.00617	-60°C ≤ T ≤ 180°C (-76°F ≤ T ≤ 356°F)	Under-range: -104°C ≤ T < -60°C (-155.2°F ≤ T < -76°F)  Over-range: 180°C < T ≤ 210°C (356°F < T ≤ 410°F)
	NI120 0.00672	-80°C ≤ T ≤ 260°C (-112°F ≤ T ≤ 500°F)	Under-range: -130°C ≤ T < -80°C (-202°F ≤ T < -112°F)  Over-range: 260°C < T ≤ 270°C (500°F < T ≤ 518°F)
	Resistance	0Ω ≤ R ≤ 390Ω	390Ω < R ≤ 395.85Ω
* <b>Overflow or Underflow</b> <sup>(11)</sup> is declared when an input value exceeds the Over-range or Under-range boundaries respectively.			



UIS-04PTKN input range (1)	<b>Input Type</b>	<b>Nominal Values</b>	<b>Over/Under-range Values *</b>	
	PT1000 0.00385 0.00392	-200°C ≤ T ≤ 850°C (-328°F ≤ T ≤ 1,562°F)	Under-range: -220°C ≤ T < -200°C (-364°F ≤ T < -328°F) Over-range: 850°C < T ≤ 860°C (1,562°F < T ≤ 1,580°F)	
	NI1000 0.00618	-100°C ≤ T ≤ 260°C (-148°F ≤ T ≤ 500°F)	Under-range: -150°C ≤ T < -100°C (-238°F ≤ T < -148°F) Over-range: 260°C < T ≤ 270°C (500°F < T ≤ 518°F)	
	NI1000 LG	-50°C ≤ T ≤ 190°C (-58°F ≤ T ≤ 374°F)	Under-range: -60°C ≤ T < -50°C (-76°F ≤ T < -58°F) Over-range: 190°C < T ≤ 200°C (374°F < T ≤ 392°F)	
	Resistance	0Ω ≤ R ≤ 3,900Ω	3900Ω < R ≤ 3,958.5Ω	
<b>* Overflow or Underflow</b> (1) is declared when an input value exceeds the Over-range or Under-range boundaries respectively.				
Sensor Type	4, 3 and 2 wire (2)			
Absolute maximum rating	±50V at any pin relative to power-supply 0V			
Maximum excitation current	UIS-04PTN: 5.2mA UIS-04PTKN: 0.52mA			
Isolation	None			
Conversion method	Delta-sigma			
Resolution	RTD – 0.1°C (0.1°F) (3) Resistance – 14 bits			
Accuracy 25°C / -20°C to 55°C (77°F / -4°F to 131°F)	UIS-04PTN : RTD – ±0.5°C / ±1.0°C (±0.9°F / ±1.8°F) Resistance – ±0.05% / ±0.1% of full scale  UIS-04PTKN : RTD – ±1.0°C / ±1.5°C (±1.8°F / ±2.7°F) Resistance – ±0.1% / ±0.15% of full scale			
Noise rejection	50Hz, 60Hz			
Step response (4) (0 to 100% of final value)	<b>Smoothing (filter)</b>	<b>Noise Rejection Frequency</b>		
		<b>60Hz</b>	<b>50Hz</b>	
	None	465ms	535ms	
	Weak	930ms	1,070ms	
	Medium	1,860ms	2,140ms	
Strong	3,720ms	4,280ms		
Update time (4)	<b>Noise Rejection Frequency</b>	<b>Update Time</b>		
	60Hz	465ms		
	50Hz	535ms		

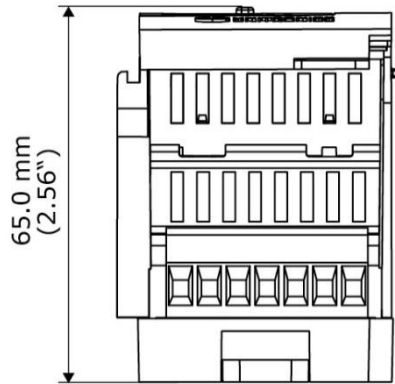
Cable	Shielded, see installation guide for details
Diagnostics <sup>(11)</sup> <sup>(5)</sup>	Input Overflow or Underflow, sensor connection fault <sup>(6)</sup> <sup>(7)</sup>

IO/COM Bus	
Bus current consumption	90mA maximum

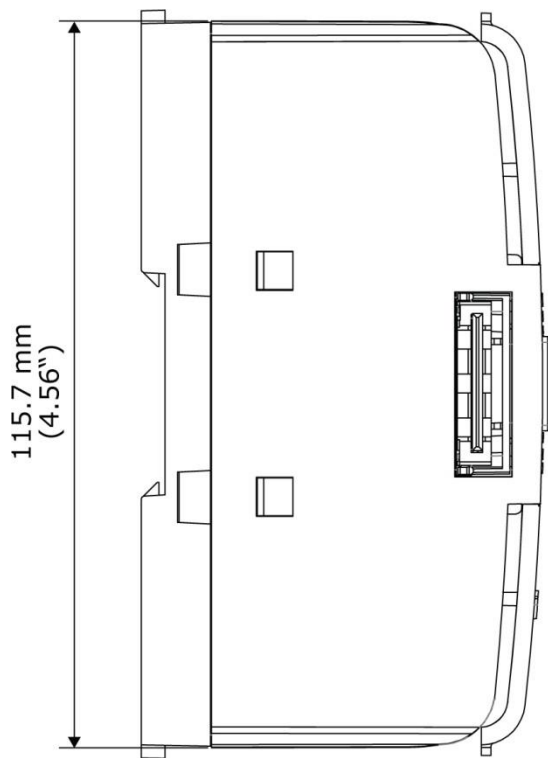
LED Indications			
Input LEDs	Red	On: Input value is in Overflow, Underflow, or a connection fault occurs	
Status LED	A triple color LED. Indications are as follows:		
	Color	LED State	Status
	Green	On	Operating Normally
		Slow Blink	Boot
		Rapid Blink	OS Initialization
	Green/Red	Slow Blink	Configuration Mismatch
	Red	Slow Blink	No IO Exchange
		Rapid Blink	Communication Error
	Orange	Rapid Blink	OS Upgrade
Slow Blink		Firmware Error, Contact Support	

Environmental	
Protection	IP20, NEMA1
Operating temperature	-20°C to 55°C (-4°F to 131°F)
Storage temperature	-30°C to 70°C (-22°F to 158°F)
Relative Humidity (RH)	5% to 95% (non-condensing)
Operating altitude	2,000 m (6,562 ft)
Shock	IEC 60068-2-27, 15G, 11ms duration
Vibration	IEC 60068-2-6, 5Hz to 8.4Hz, 3.5mm constant amplitude, 8.4Hz to 150Hz, 1G acceleration

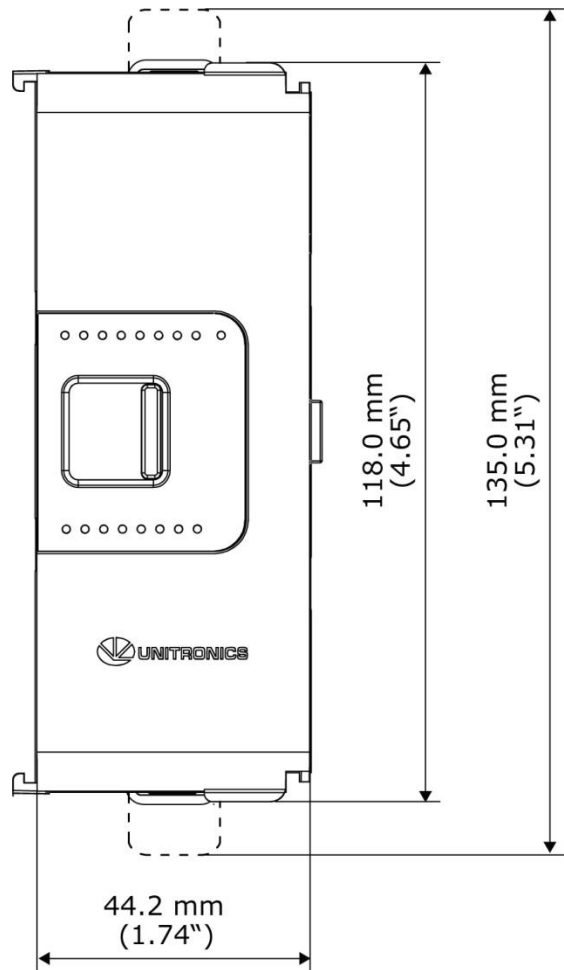
Dimensions	
Weight	100 g (0.220 lb)
Size	Refer to the images below



Bottom View



Side View



Front View

**Notes:**

1. The UIS-04PTN and UIS-04PTKN measures values that are slightly higher or lower than the nominal input range (i.e. Input Over/Under-range respectively).  
Note that when input Overflow, Underflow or a connection fault occurs, it is indicated in the corresponding I/O Status tag (refer to the UniLogic help for details) as well as by the respective input LED (see LED Indications), while the input value is registered as follows:

<b>Fault Type</b>	<b>Registered Value in the Input Tag</b>
Overflow	32,767
Underflow	-32,767
Connection fault	-32,768

2. The UIS-04PTN and UIS-04PTKN inherently supports 3-wire sensors.  
4-wire sensors may be connected by utilizing 3 of the sensor wires; in-order to achieve the specified performance, all sensor wires shall be of identical type and length just as with a 3-wire sensor connection.  
2-wire sensors may also be connected; performance in this case will degrade because of the wires' resistance.  
Refer to the UIS-04PTN and UIS-04PTKN installation guide for detailed installation instructions.
3. For temperature measurement, the value is represented in 0.1° units. For example, a temperature of 12.3° is represented as 123 at the Value tag.
4. Step response and update time are independent of the number of inputs that are used.
5. See LED Indications Table above for description of the relevant indications. Note that the diagnostics results are also indicated in the I/O tags and can be observed through the UniApps™ or the online state of the UniLogic™.
6. Sensor connection fault check is active by default for both temperature and resistance measurements.
7. Sensor connection fault check may interfere with some test equipment like resistance/RTD simulators and thus may induce reading errors or cause malfunction of the test equipment and/or the UIS-04PTN and UIS-04PTKN.  
In order to interoperate correctly with such equipment, you may set the Disable Fault Detection I/O tag. This will disable connection fault check for all inputs.  
Note that when this tag is set, the UIS-04PTN and UIS-04PTKN will not check, or report, connection faults; thus, the reading in such case is unpredictable.

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