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Unitronics UIA-0800N Uni-Input-Output Modules User Guide

Contents

UNITRONICS®

Unitronics UIA-0800N Uni-Input-Output Modules

Product Information

The Uni-I/OTM Modules are a part of the UniStreamTM product line offered by Unitronics. They are designed to provide physical and electrical connection points between modules in a system. The UIA-0800NH module is a specific model that comes with various features and components.

Installation Requirements

- Read and understand the user guide before installing the device.
- Verify the kit contents to ensure all necessary components are present.

Alert Symbols and General Restrictions
When using the Uni-I/OTM modules, it is important to pay attention to the following symbols:

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

Please note that all examples and diagrams provided in the user guide are for instructional purposes only and do not guarantee operation. Unitronics does not accept responsibility for the actual use of the product based on these examples. It is important to dispose of the product according to local and national standards and regulations. Furthermore, installation should only be performed by qualified personnel, and appropriate safety guidelines must be followed to avoid injury or property damage. The device should not be used with parameters that exceed permissible levels, and
connection/disconnection should only be done when the power is off.

Environmental Considerations
When installing the Uni-I/OTM modules, the following environmental considerations should be taken into account:

- A minimum of 10mm (0.4″) of space is required between the device top/bottom edges and the enclosure's

  walls for proper ventilation.
- Do not install the modules in areas with excessive or conductive dust, corrosive or flammable gas, moisture or
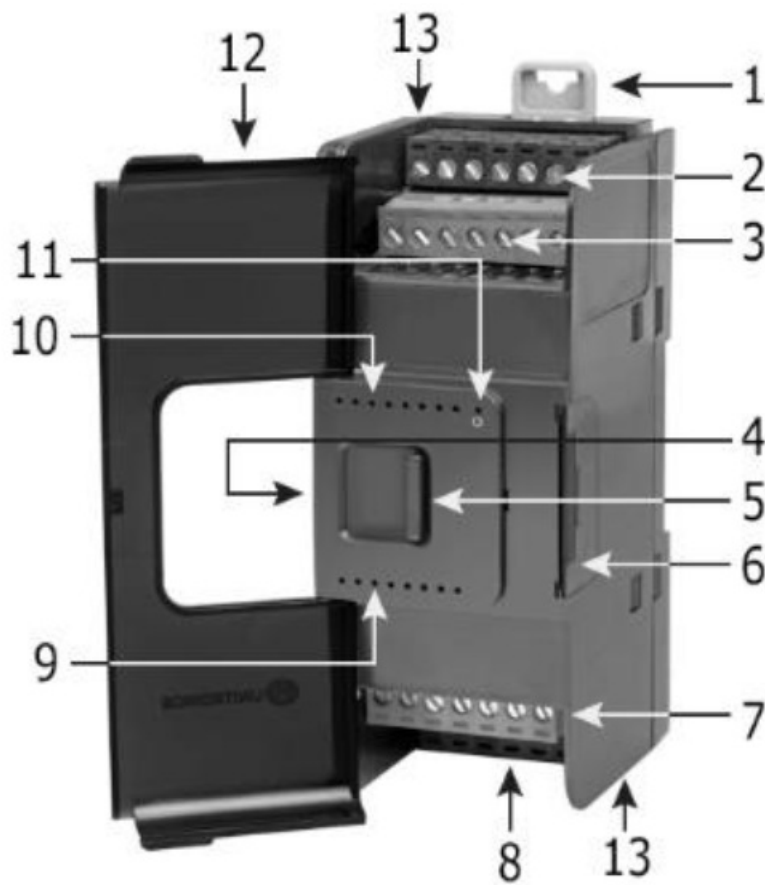
rain, excessive heat, regular impact shocks, or excessive vibration, as specified in the product's technical specification sheet.

- Avoid placing the modules in water or allowing water to leak onto them. Take precautions to prevent debris from falling inside the unit during installation. Install the modules at a safe distance from high-voltage cables and power equipment.

Kit Contents

- 1 UIA-0800NH module
- 4 I/O terminal blocks (2 black and 2 gray)
- DIN-rail clips (top and bottom)

UIA-0800NH 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	Inputs 2-3	
4	– Left	Left-side Connector
5	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.
6	I/O Bus – Right	Right-Side Connector, shipped covered. Leave covered when not in use.
6	Bus Connector Cover	
7	Inputs 6-7	Input connection points
8	Inputs 4-5	
9	Input LEDs (4-7)	Red LEDs
10	Input LEDs (0-3)	Red LEDs
11	Status LED	Tricolor LED, Green/Red/Orange
Note: Refer to the module's specification sheet for LED indication.		
12	Module door	Shipped covered with protective tape to prevent the door from being scratched. Remove tape during installation.
13	Screw holes	Enable panel-mounting; hole diameter: 4mm (0.15").

1. DIN-rail clips: Provide physical support for CPU and modules.
2. Inputs 0-1: Input connection points.
3. Inputs 2-3: Input connection points.
4. I/O Bus – Left: Left-side connector.
5. Bus Connector Lock: Slide to the left to electrically connect the Uni-I/OTM module to the CPU or adjacent module.
6. I/O Bus – Right: Right-side connector, shipped covered.
7. Bus Connector Cover: Protects the right-side connector when not in use.
8. Inputs 6-7: Input connection points.
9. Inputs 4-5: Input connection points.
10. Input LEDs (4-7): Red LEDs indicating input status.
11. Input LEDs (0-3): Red LEDs indicating input status.
12. Status LED: Tricolor LED (Green/Red/Orange) for status indication. Refer to the module's specification sheet for LED indications.
13. Module door: Shipped covered with protective tape to prevent scratching. Remove tape during installation.
14. Screw holes: Enable panel-mounting with a hole diameter of 4mm (0.15″).

About the I/O Bus Connectors
The I/O Bus connectors serve as the physical and electrical connection points between modules. They are shipped with protective covers to prevent debris, damage, and electrostatic discharge (ESD). The I/O Bus – Left connector can be connected to a CPU-for-Panel, a Uni-COMTM module, another Uni-I/OTM module, or the End
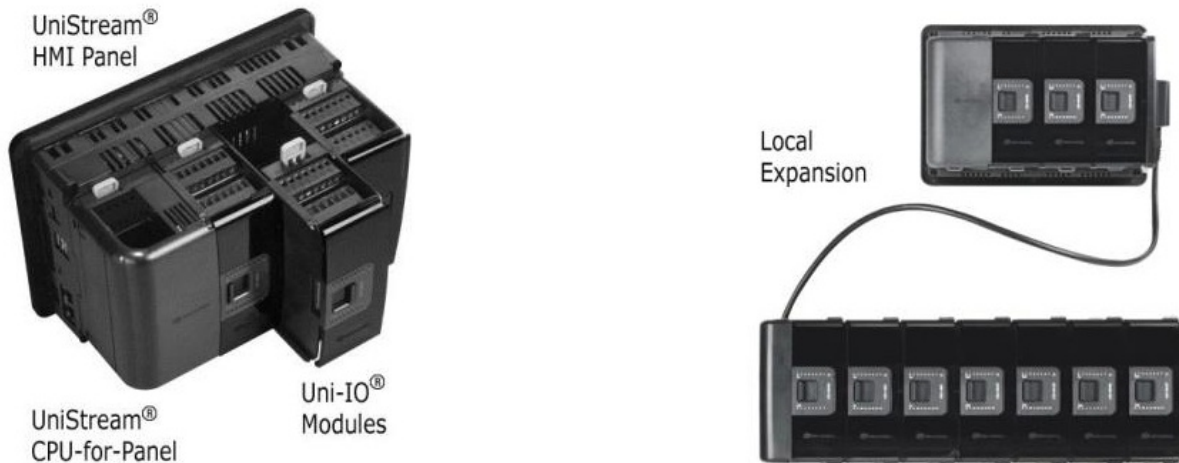
Unit of a Local Expansion Kit.

Overview

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 UIA-0800NH 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.
- 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.
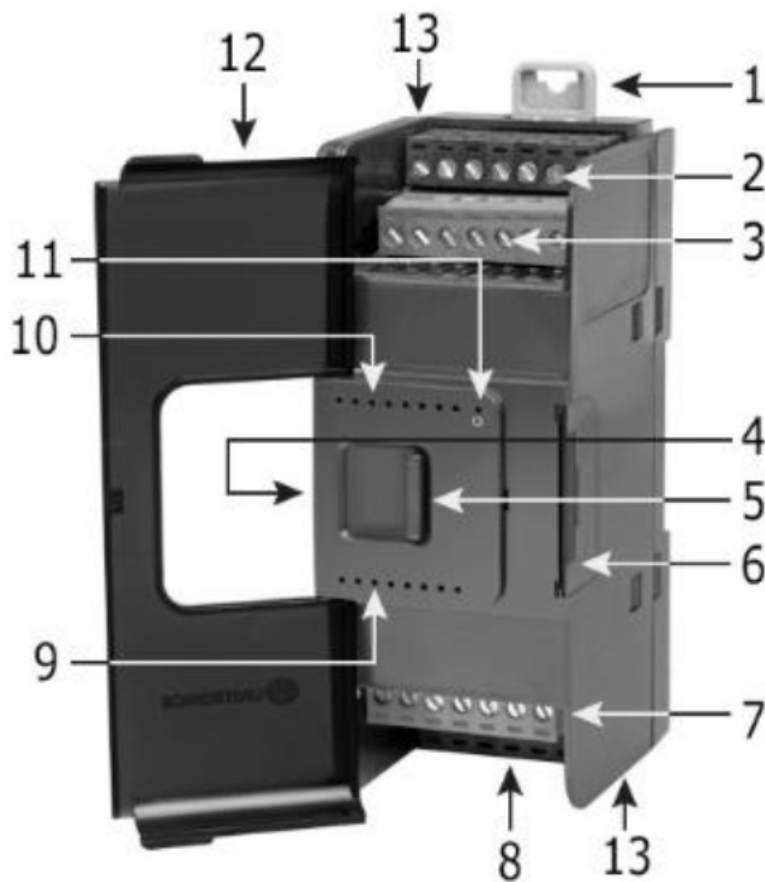- Do not connect/disconnect the device when power is on.

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 UIA-0800NH module
- 4 I/O terminal blocks (2 black and 2 gray)

UIA-0800NH 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	Inputs 2-3	
4	I/O Bus – Left	Left-side Connector
5	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.
6	I/O Bus – Right	Right-Side Connector, shipped covered. Leave covered when not in use.
	Bus Connector Cover	
7	Inputs 6-7	Input connection points
8	Inputs 4-5	
9	Input LEDs (4-7)	Red LEDs
10	Input LEDs (0-3)	Red LEDs
11	Status LED	Tricolor LED, Green/Red/Orange
Note: Refer to the module's specification sheet for LED indication.		
12	Module door	Shipped covered with protective tape to prevent the door from being scratched. Remove tape during installation.
13	Screw holes	Enable panel-mounting; hole diameter: 4mm (0.15").

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

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 (#4 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 (#6 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.

Uni-IO grip for placement/removal

Guide Tunnel

Guide Tunnel

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.
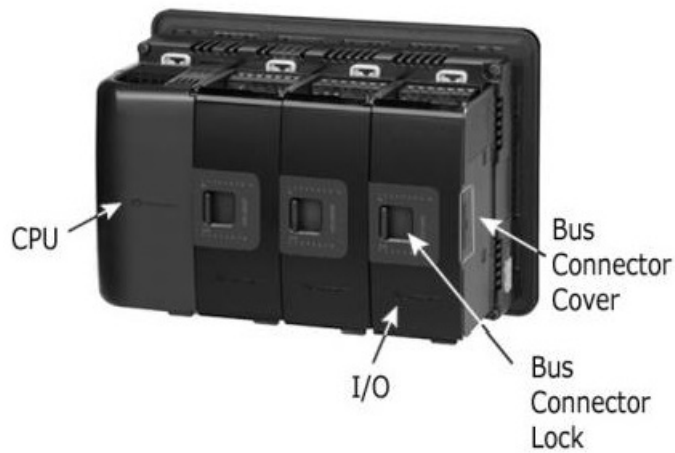
Removing a Module

- Turn off the system power.
- Disconnect the I/O terminals (#2,3,7,8 in the diagram).
- 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.
- On the Uni-I/O™ module, pull the top DIN-rail clip up and the bottom clip down.
- 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.
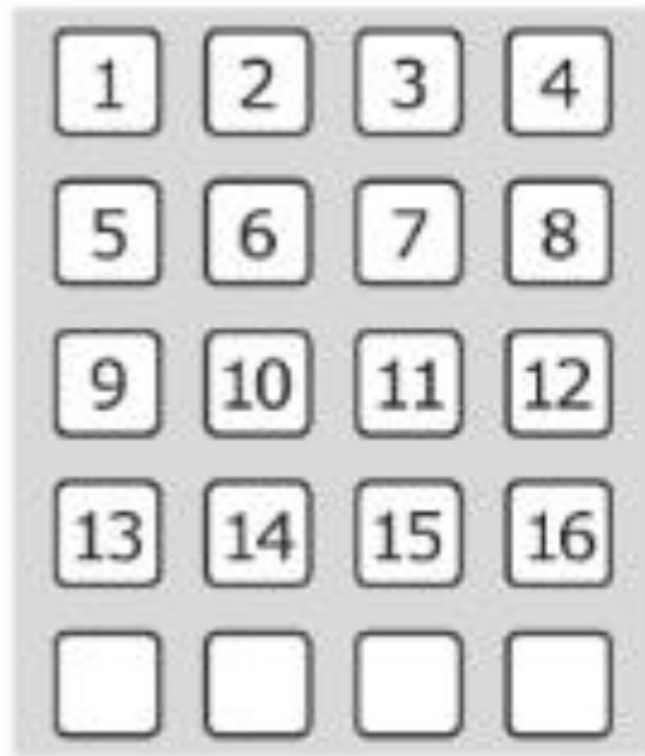
- The set contains numbered and blank stickers as shown in the figure to the left.
- Place them on the modules as shown in the figure to the right.

Numbering Sticker

UL Compliance

The following section is relevant to Unitronics' products that are listed with the UL.
The following models: UIA-0006, UIA-0800N, 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.

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 mm2 –3.31 mm2).

1. Strip the wire to a length of 7±0.5mm (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.
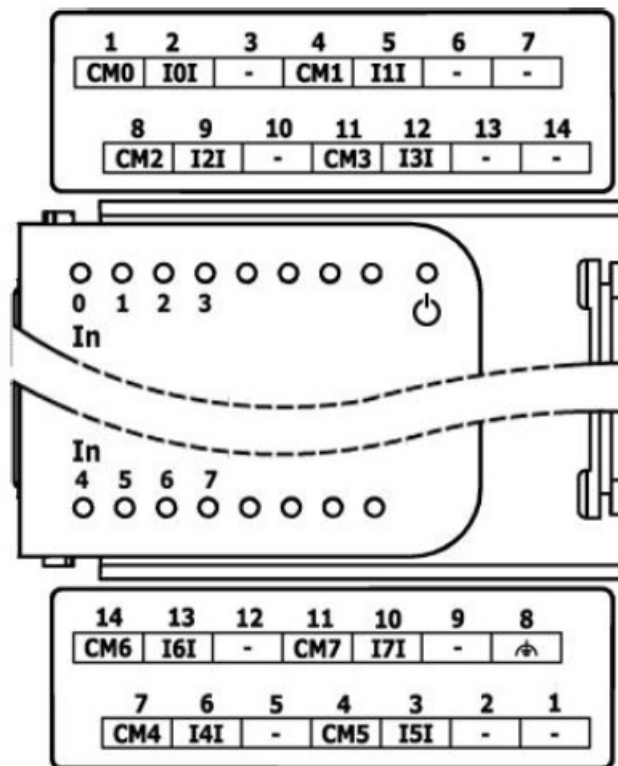

UIA-0800NH Connection Points
All wiring diagrams and instructions in this document refer to the UIA-0800NH connection points.
These points are arranged in four groups of 7 points as shown in the figure to the right.

Two top groups
Input connection points (0,1,2,3)

Two bottom groups
Input connection points (4,5,6,7)

1	2	3	4	5	6	7
CM0	I0I	-	CM1	I1I	-	-

8	9	10	11	12	13	14
CM2	I2I	-	CM3	I3I	-	-

○ ○ ○ ○ ○ ○ ○ ○ ○
0 1 2 3 ⏻
In

In
4 5 6 7
○ ○ ○ ○ ○ ○ ○ ○

14	13	12	11	10	9	8
CM6	I6I	-	CM7	I7I	-	⏚

7	6	5	4	3	2	1
CM4	I4I	-	CM5	I5I	-	-

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 twisted pair cables for wiring Analog I/O signals; do not use the cable shield as a signal common (CM) / return path.
    - Route each I/O signal with its own dedicated common wire. Connect common wires at their respective common (CM) points at the I/O module.

Individually connect each 0V point and each common (CM) point in the system to the power supply 0V terminal, unless otherwise specified.

- 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 mm2).

- Connect the power supply 0V to the earth of the system.
- 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 UIA-0800NH end performs better.
  - Keep shield connections as short as possible.
  - Ensure shield continuity when extending shielded cables.

NOTE: For detailed information, refer to the document System Wiring Guidelines, located in the Technical Library in the Unitronics' website.
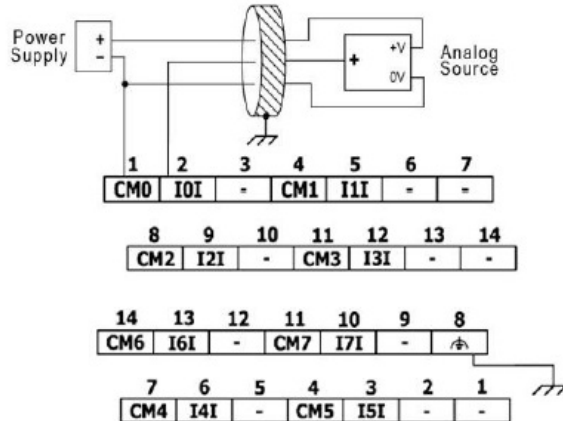
Wiring the Analog Inputs

- **NOT:** The inputs are not isolated.
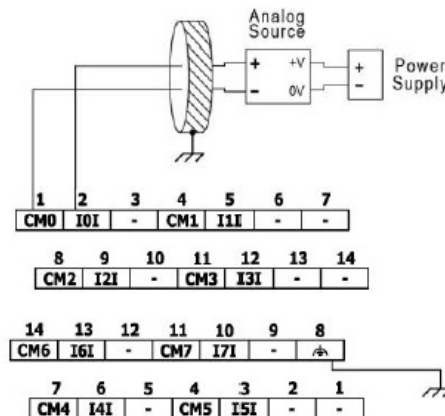- **E:** Each input has its own common point (CM0 for I0, etc.).

2-wire
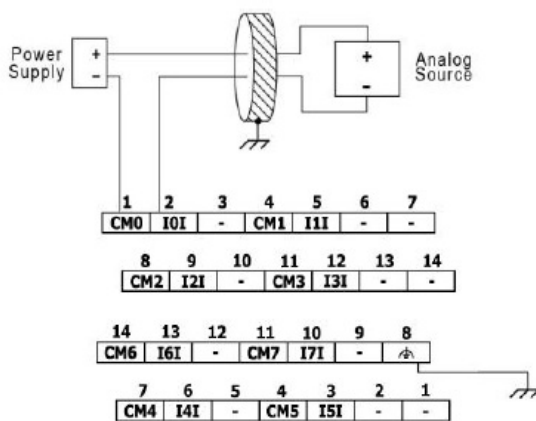
3-wire

4-wire

UniStream® Uni-I/O™ Module

Technical Specifications UIA-0800NH

This guide provides specifications for Unitronics' Uni-I/O™ module UIA-0800NH. This module comprises:

- 8 analog inputs, 12 bit, supports HART protocol

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**

Analog Inputs				
Number of inputs	8			
	Input Type	Nominal Values	Over-range Values	Overflow Values

Input range	0 ÷ 20mA	0 ≤ Iin ≤ 20mA	20 < Iin ≤ 20.3mA	Iin > 20.3mA
Absolute maximum rating	±30mA (Current)			
Isolation	None			
Conversion method	Successive approximation			
Resolution	12 bits			
Accuracy (25°C / -20°C to 55°C)	±0.5% / ±0.7% of full scale (Current)			
Input impedance	251Ω (Current)			
Noise rejection	10Hz, 50Hz, 60Hz, 200Hz			

Step response (0 to 100% of final value)	Smoothing	Noise Rejection Frequency			
		200Hz	60Hz	50Hz	10Hz
	None	48ms	67ms	70ms	150ms
	Weak	63ms	117ms	130ms	450ms
	Medium	83ms	184ms	210ms	850ms
	Strong	123ms	317ms	370ms	1650ms

Update time	Noise Rejection Frequency	Update Time
	200Hz	2.5ms
	60Hz	8.33ms
	50Hz	10ms
	10Hz	50ms

Operational signal range (signal + common mode)	Current mode – IxI: -1V ÷ 5.4V; CMx: -1V ÷ 0.4V (x=0,1,2 or 3)
Common mode rejection	30dB @ 10Hz, 50Hz, 60Hz or 200Hz noise rejection mode
Normal mode rejection	60dB @ 10Hz, 50Hz or 60Hz noise rejection mode 45dB @ 200Hz noise rejection mode
Cable	Shielded twisted pair
Diagnostics	Analog input overflow
IO/COM Bus	
Bus current consumption	85mA maximum

LED Indications			
Input LEDs	Red	On: Input value is in Overflow	
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	On	Supply voltage is low or missing
		Slow blink	No IO exchange
		Rapid blink	Communication error
	Orange	Rapid Blink	OS Upgrade

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	0.13 Kg (0.286 lb)
Size	Refer to the images below

Top View

Side View

Front View
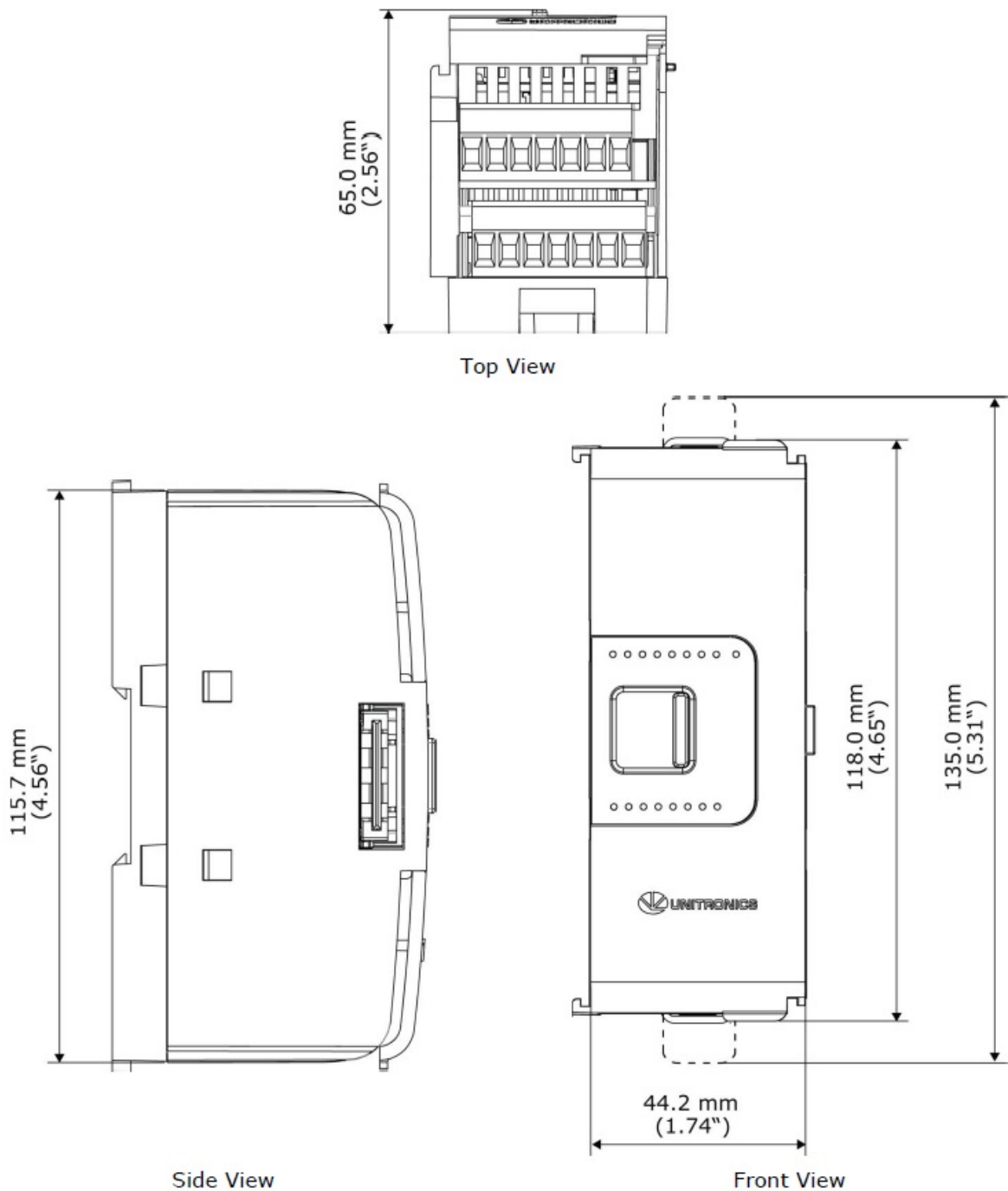
Notes:

1. The 4-20mA input option is implemented using 0-20mA input range.
2. The UIA-0800NH measures values that are up to 1.5% higher than the nominal input range (i.e. Input Over-range). Note that when the input overflow occurs, it is indicated in the corresponding system tag while the input value is registered as the maximum permissible value. The Over-range values can reach up to 20.3mA, and any input current higher than that will still register as 20.3mA while the Overflow system tag is turned on.
3. Step response and update time are independent of the number of channels that are used.
4. See LED Indications Table above for description of the relevant indications. Note that the diagnostics results are also indicated in the system tags and can be observed through the UniApps™ or the online state of the UniLogic™.

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Documents / Resources

[Unitronics UIA-0800N Uni-Input-Output Modules](#) [pdf] User Guide
UIA-0800N Uni-Input-Output Modules, UIA-0800N, Uni-Input-Output Modules, Input-Output Modules, Output Modules, Modules

References

- [Unitronics- Programmable Logic Controller + Built-in HMI](#)
- [Unitronics- Programmable Logic Controller + Built-in HMI](#)