JNIOR Series 4

A Network I/O Resource
Utilizing the JAVA™ Platform

Analog Expansion Modules (4-20 mA, +/-10 VDC, Control Panel, 4 Relay Output, Temp Sensor, Temp/Humidity Sensor, 3 Channel LED Dimmer)

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1 Overview

The JNIOR Analog Expansion Modules provide an easy way to add multiple analog signals for integration with the JNIOR. There are currently seven types of Analog Expansion Modules or Sensors available:

1. **4 – 20 mA** (4 analog inputs, 2 analog outputs)
2. **+/- 10 VDC** (4 analog inputs, 2 analog outputs)
3. **Control Panel** (12 analog outputs)
4. **3 Channel LED Dimmer** (3 outputs)
5. **4 Relay Output** (4 outputs)
6. **Temperature Sensor** (1 digital temperature sensor)
7. **Humidity and Temperature Sensor** (1 digital temperature and humidity sensor)

The modules are connected to the JNIOR via the supplied cable that is connected to the Sensor Port on each device. The temperature sensor plugs directly into any Sensor Port. Up to two expansion modules per JNIOR can be daisy-chained together. The modules should be connected to the JNIOR while the power is off so that on boot-up, the JNIOR can properly recognize and address each module. The analog expansion modules are automatically integrated into the various JNIOR communication methods.

All of these analog modules work the same way concerning their interaction with the JNIOR. The main difference is in the wiring of the devices. Please see Section 3 of this manual for the various wiring details.

4 – 20 mA Module

+/- 10 VDC Module

3 Channel LED Dimmer

Control Panel

4 Relay Output

Temperature Sensor

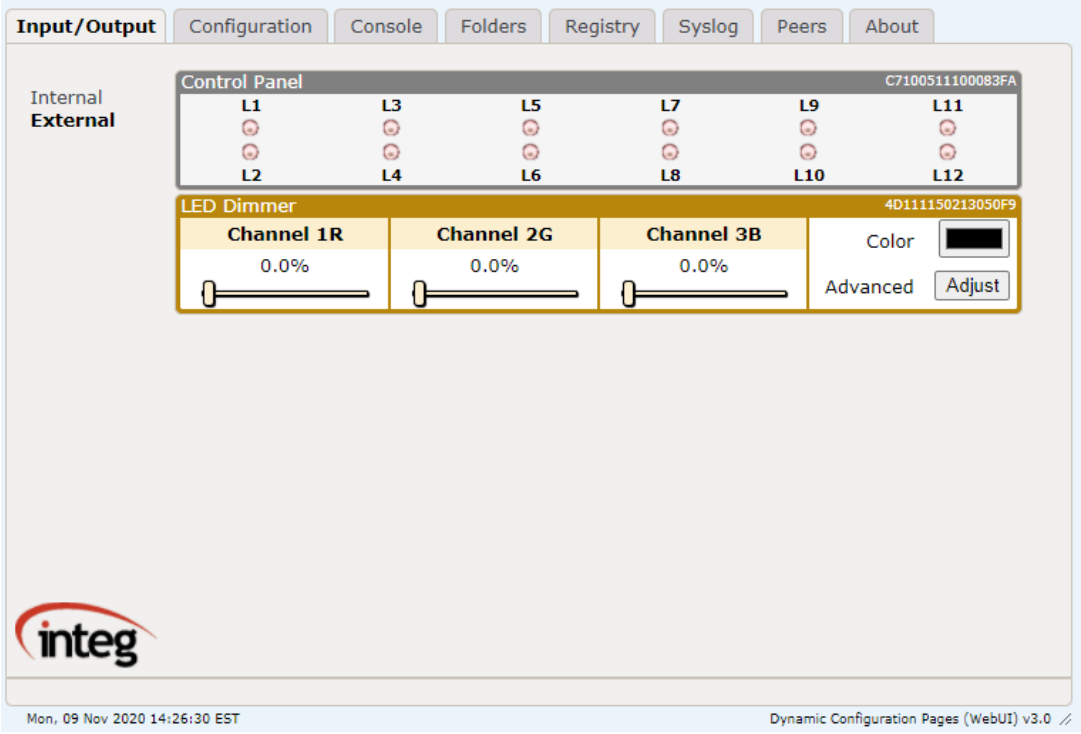
Humidity and Temperature Sensor

2 Configuring and Controlling

2.1 Viewing

Analog Expansion Modules

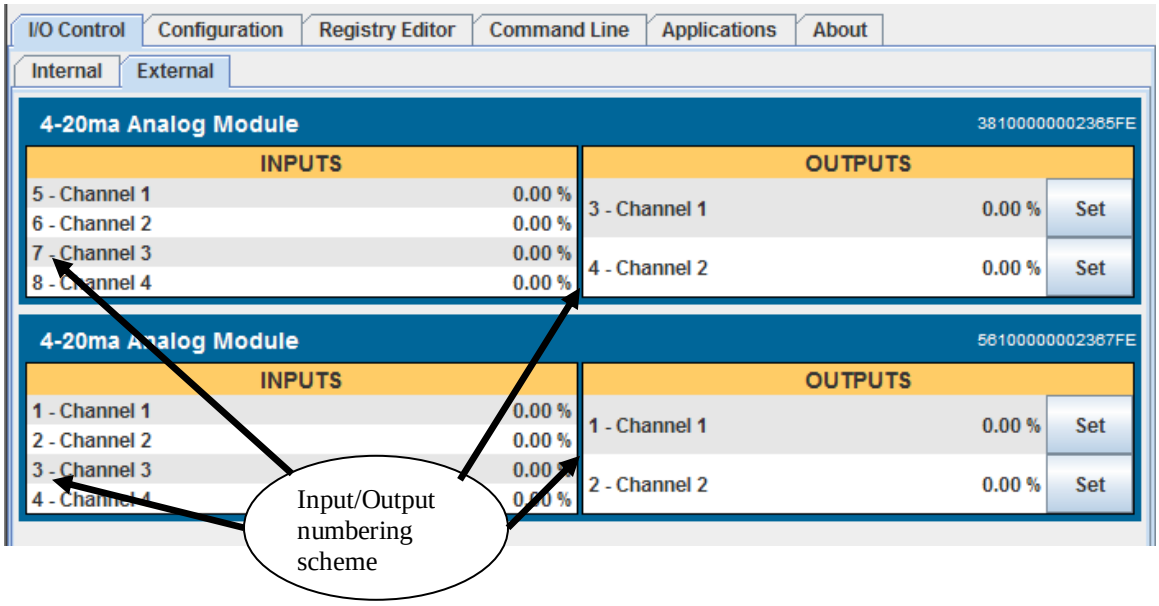
The Analog Expansion Modules are viewed via the main JNIOR web page. The JNIOR web page allows the user to monitor, control and configure the JNIOR internal and external I/O. The Analog Expansion Modules are viewed, controlled and configured under the I/O Control/External devices tab.



The first time you click on the External tab, the web page will poll the JNIOR for a list of all external devices available. If new external devices are added while the External devices tab is being displayed, the exapansion module will populate onto the page.

The above screen shot shows the web page display for the 4-20 mA Analog Expansion Module. It is comprised of four analog inputs and two analog outputs. In the upper right hand corner is a long alphanumeric number. This unique number is how the JNIOR identifies each individual module. It may be important for you to know this number for use with your external application and/or for some of the standard INTEG applications (like logging via Task Manager). It is also important to know this address if you want to find the registry entries for each device or access the external devices via the JNIOR OPC Server or JNIOR Protocol (see the JNIOR Protocol documentation) for a custom application. The unique ID number is also located on a label attached to the side of each module.

If the Analog Expansion Modules are connected to the JNIOR during boot-up (reboot or first power on), the JNIOR will assign an I/O "number" to each input and output on the modules. For the first analog module, it will use inputs 1 through 4 and outputs 1 and 2, and for the second analog module of the same type, it will use inputs 5 through 8 and outputs 3 and 4. Below is a screen shot with two 4 – 20 mA Analog Expansion Modules.



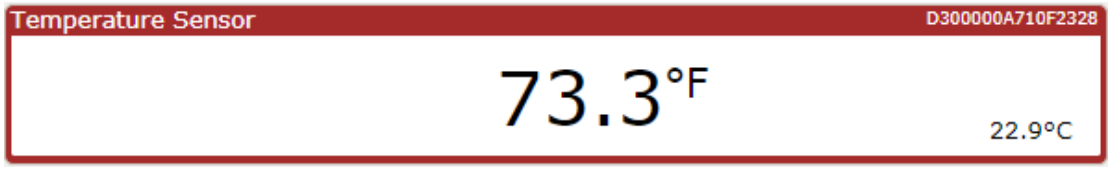
NOTE: If you unplug one of the expansion modules from the JNIOR, the JNIOR will retain the numbering sequence for the other module whether that is 1 – 4 or 5 – 8. This allows you to replace one of the modules without having to modify your application use of the channel numbers.

Temperature Sensors

The Temperature Sensors are also viewed via the main JNIOR web page under the Modules Section of the Configuration tab. The Temperature Sensor value can be viewed as Degrees Celsius or Fahrenheit by having the Fahrenheit box "unchecked" (shows Celsius) or "checked" (shows Fahrenheit).

Celsius View

Fahrenheit View

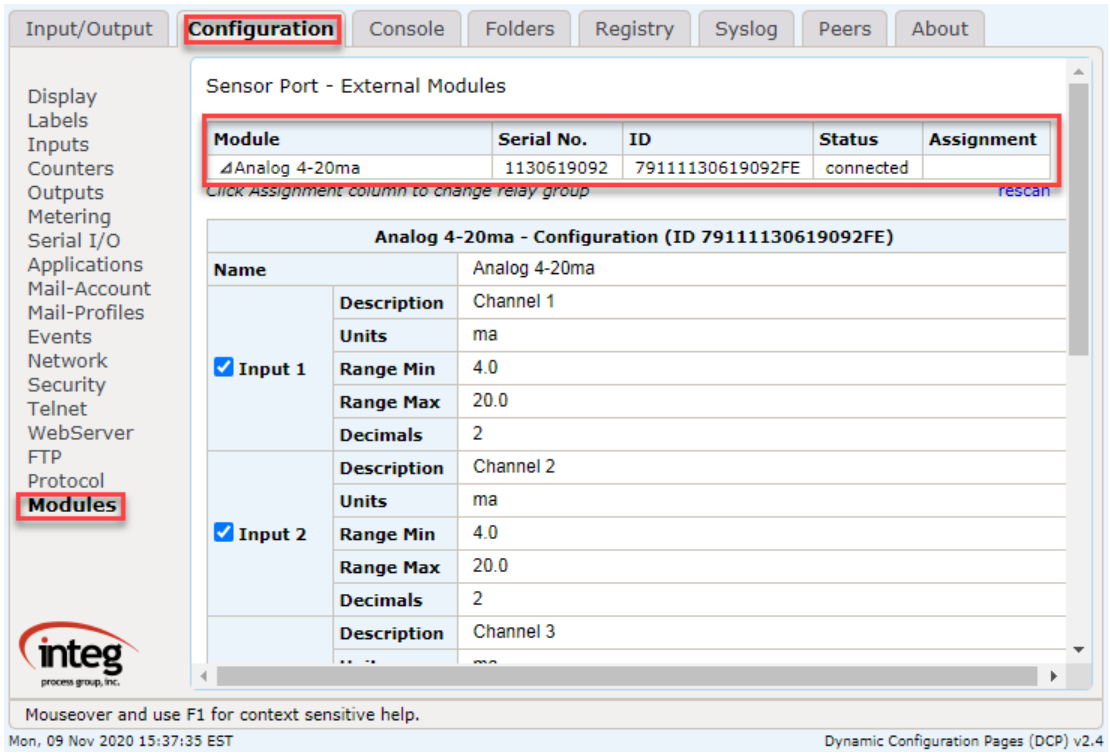


2.2 Configuring

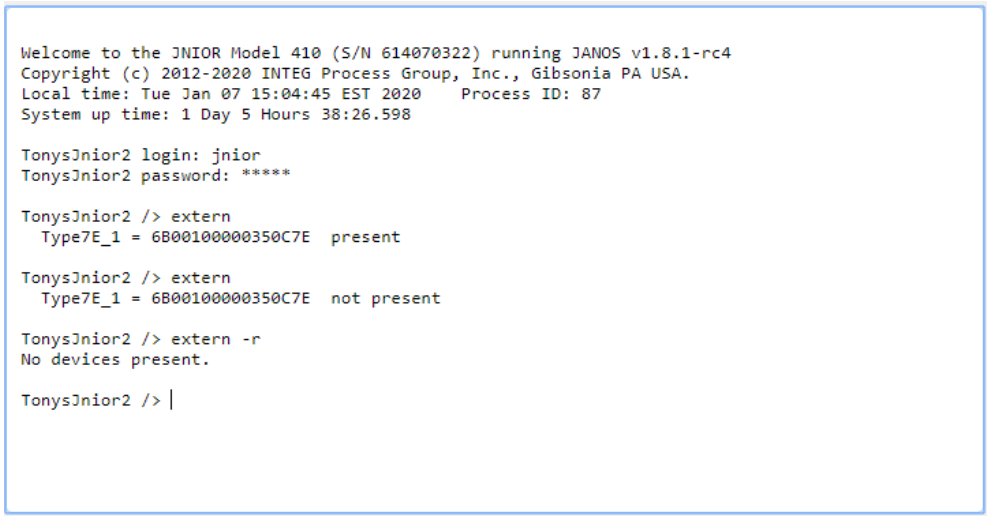
Analog Expansion Modules

The Analog Expansion Modules are configured via the Modules Section of the Configuration Tab.

The overall descriptions and values for the exapansion modules can be configured here by clicking the drop down next to the expansion modules name.

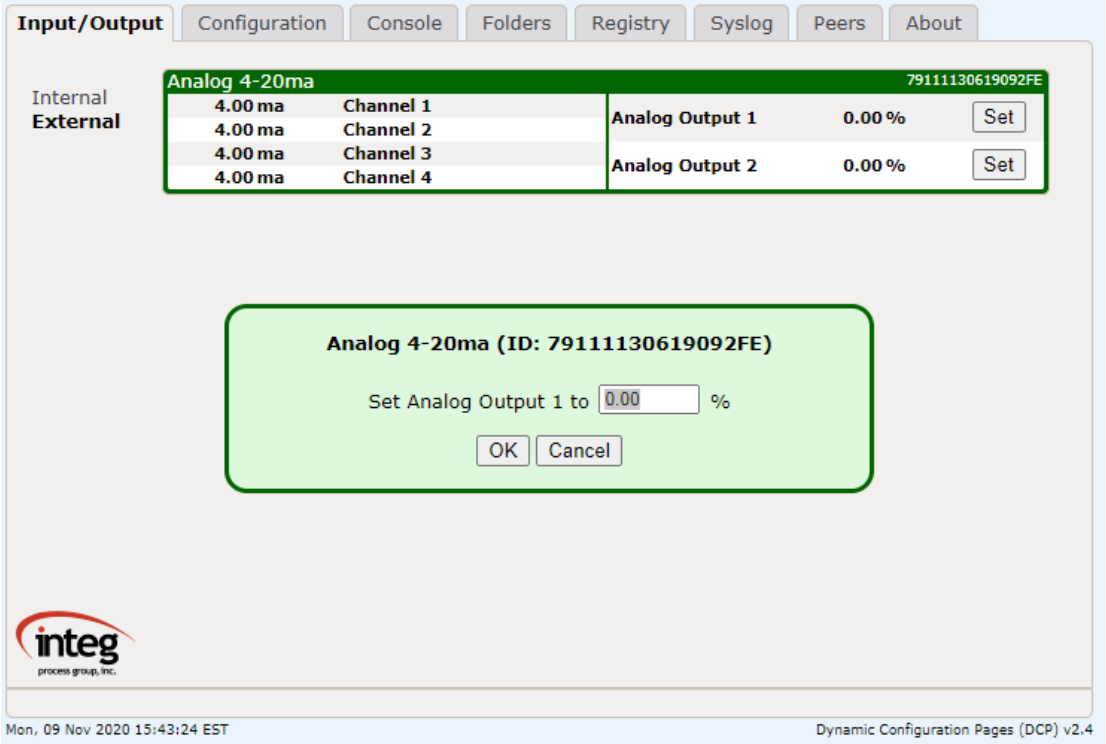


There is also a rescan button under the Assignment column to re-check the order modules are connected to the JNIOR. Another way to check the currently assigned moudles is to go to the Console Tab and type extern. This shows the current list of modules that are or were connected to the JNIOR. Typing extenr -r will remove any currently not connected modules to the JNIOR from the list.



2.3 Controlling

Values for the analog output signals can be controlled from the JNIOR web page. The number to the left of the Set button is the current output value in percentage terms (i.e. percent of milliamps between 4 and 20 or percent of voltage between 0 and +10). You can change the output value by clicking on the Set button and then entering a new value in the pop-up box and pressing the OK button or by pressing the enter key. The number that displays in bold may be slightly different than the value you just typed in due to scaling of a digital value.



If a value is entered outside of the current scale, then the value for the output will be set to either 0 or 100 depending if you went under or over the scale.

3 Specifications and Wiring

Please see the appropriate data sheet for each Analog Expansion Module for each module's specifications. Some general information is as follows:

General

- No power required – draws power from the JNIOR
- Dimensions: 4 x 2 x 1.2 in (102 x 51 x 31 mm)
- Weight: 4 ounces (115 grams)

Analog Inputs

- Quantity: 4
- Range: -10 to + 10 volts DC or 4 – 20 mA
- A/D resolution: 16 bits (12 bits effective)
- Full Scale Accuracy: better than 1% full-scale

Analog Outputs

- Quantity: 2
- Range: 0 – 10 volts DC or 4 – 20 mA
- D/A resolution: 8 bits
- Full Scale Accuracy: better than 1% full-scale

Sensor Port

- Up to 2 expansion modules can be daisy-chained
- Each module comes with a cable for connecting to the Sensor Port. However, the Expansion Modules can be located up to 50 ft. from the JNIOR. A wiring diagram for the connector cable follows in this manual.

Temperature Sensor

- Either standard temperature sensor or rugged temperature sensor
- Stainless steel probe
- Standard sensor temperature range is – 20 ˚C to 75 ˚C
- Rugged sensor temperature range is – 55 ˚C to 125 ˚C

Wiring

Care should be used when wiring analog signals to the Analog Expansion Module. Industry standard power and grounding methods should be followed.

Connection diagrams are provided for each module in the following pages.

Sensor Port Cable

The Expansion Modules can be located up to 50 feet from the JNIOR. In these instances, the user must make a custom cable to connect the expansion module with the JNIOR. The pin out for the cable that connects the Sensor Port on the JNIOR with the Expansion Module is the same on both ends. The connector is a standard RJ-12 connector on both ends.

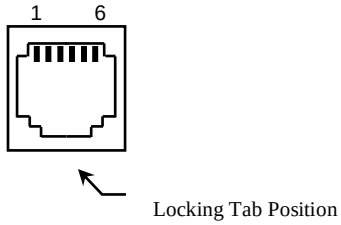
> ***Note:***
>
> *An RJ12 connector is the same size as an RJ11 connector except all 6 pins have copper pads to connect all 6 wires to the port.*
>
> *Please make sure that you orient the pins properly for each side of the cable.* ***The cable will be twisted (or the one RJ12 connector will be upside down from the other) so that when you hold both ends of the cable side by side, the pin numbers will match.*** *Please contact INTEG Process Group with any questions.*

Sensor Port Pin-Outs – Use a 6 conductor wire and connect each colored wire to the same pin number on each connector.

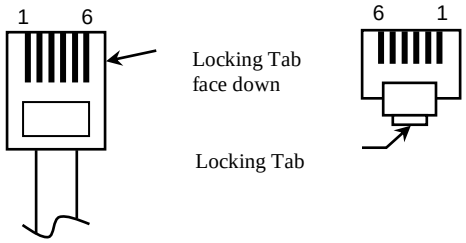
Pin	Description

1 Voltage (5V Vcc)
2 GND
3 1-WIO (1-Wire Data)
4 GND (1-Wire Return)
5 NC (No Connection internally to the Expansion Module)
6 Unregulated DC

Reference the following diagrams to determine the proper pin numbers of the connectors:



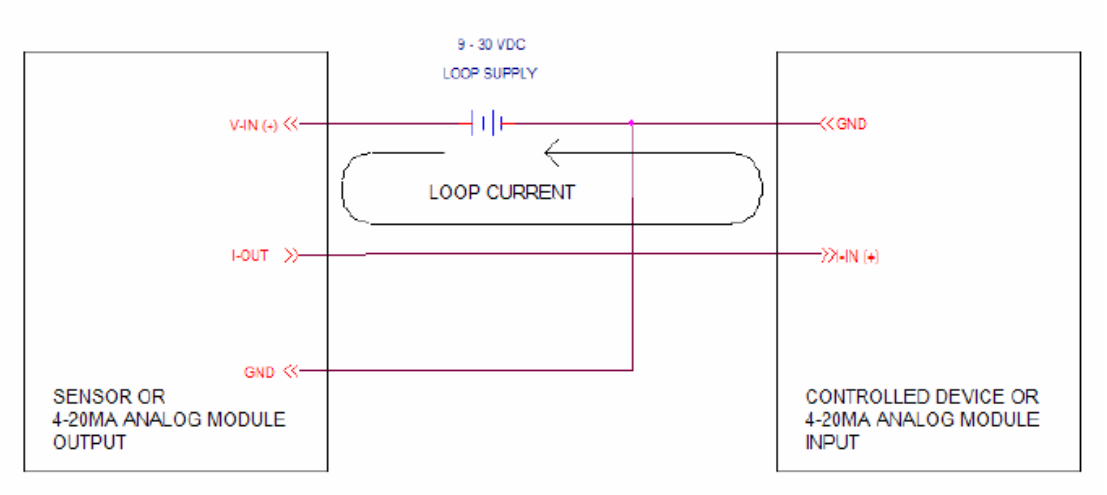
RJ12 Modular



RJ12 Modular

JNIOR 4 – 20 mA Expansion Module

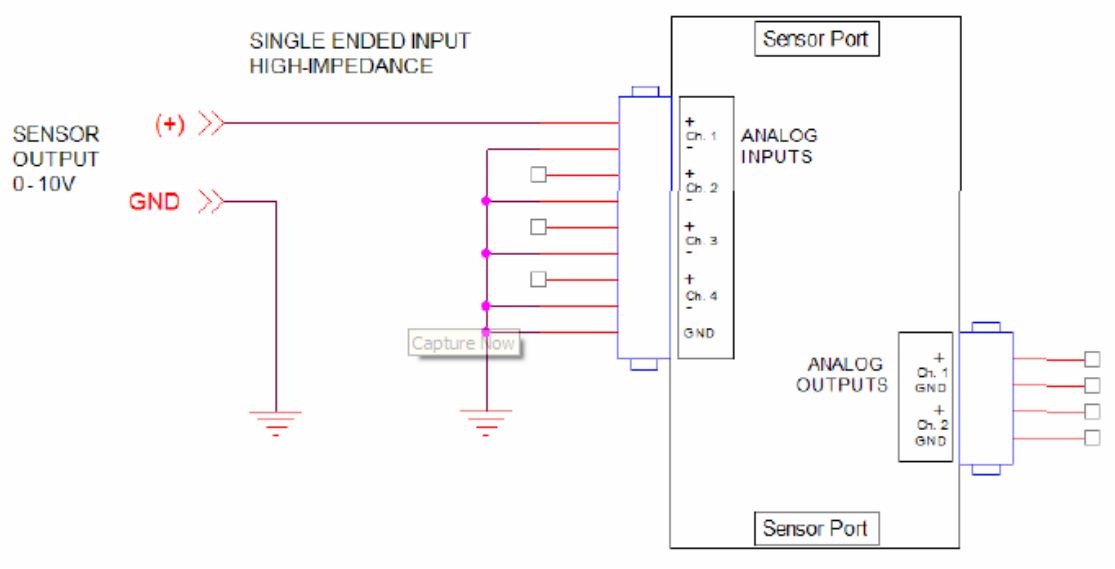
Wiring Diagram



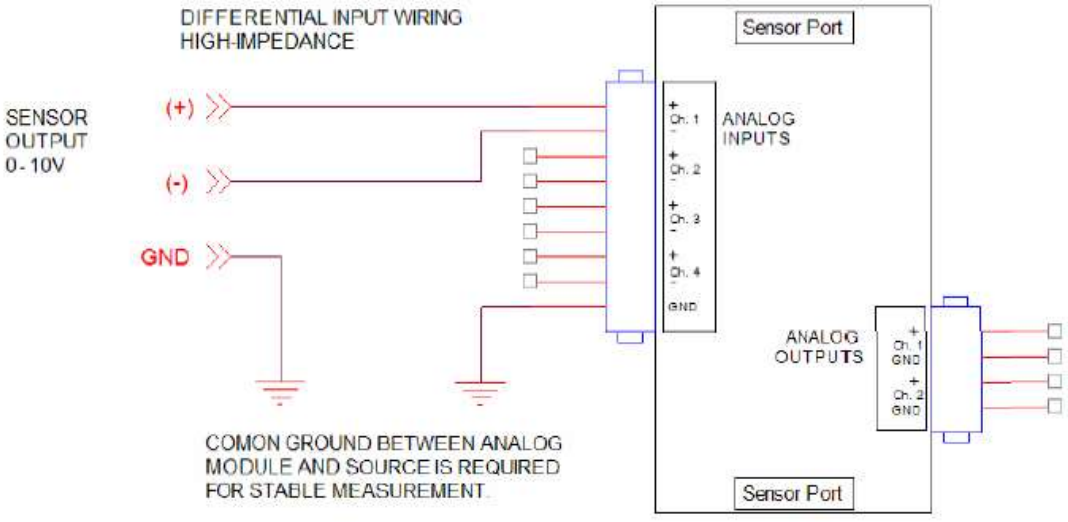
JNIOR +/- 10 VDC Expansion Module

Wiring Diagram

Single ended wiring (each 0-10V input referenced directly to GND)



Differential input wiring (measured voltage difference)



BOTH THE POSITIVE (+) AND NEGATIVE (-) INPUTS MUST REMAIN WITHIN +/- 12 VOLTS RELATIVE TO GND.

Summary

Thank you for purchasing the **JNIOR**. Hopefully this manual made the getting-to-know process of your new **JNIOR** very quick and easy. The **JNIOR** has many more wonderful tools and features available, and are explained in detail in the supplied documents.

Notice — Every effort was made to make this manual as accurate and useful as practical at the time of the writing of this manual. However, all information is subject to change.

Please do not hesitate to contact our **JNIOR** team at **INTEG Process Group, Inc**. We can be reached via phone, fax or e-mail as follows:

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