



# *JNIOR Series 4*

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A Network I/O Resource  
Utilizing the JAVA™ Platform

## JNIOR Series 4 with 4 Relay Output Expansion Module Version 5.0

NOTE: JNIOR JANOS 1.7 or greater required

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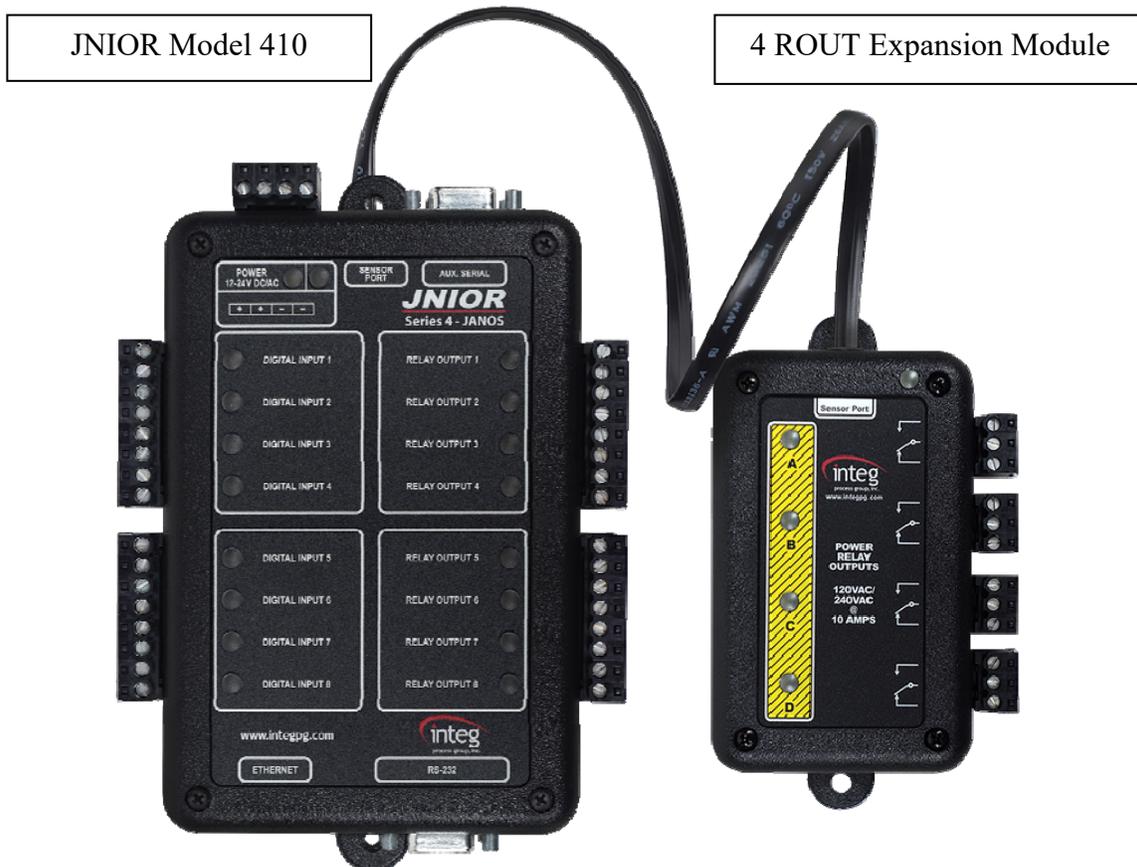
# 1 Overview

The JNIOR 4 Relay Output Expansion Module (4ROUT) provides an easy way to add more relays to the JNIOR. The 4ROUT adds four relays that can handle low or high-voltages (up to 240 VAC at 10 amps per relay) that integrate automatically with the JNIOR Series 4 – Models 410, 412, 414.

The expansion module is connected to the JNIOR via the supplied cable that is plugged in to the Sensor Port on each device. A JNIOR can have a total of 16 relay outputs so the JNIOR 410 can have two 4ROUTs, the JNIOR 412 one 4ROUT and the JNIOR 414 two 4ROUTs. The expansion modules are daisy-chained together.

The module can be connected to the JNIOR with power OFF or ON, but the JNIOR should still be rebooted after adding a module in case any application will use the module addressing. The 4ROUT expansion module will be automatically integrated into the various JNIOR communication methods (Web page, JNIOR Protocol and Modbus) for use by the various JNIOR applications.

Please see Section 3 of this manual for the wiring details.



## 2 Viewing, Managing, Configuring and Controlling

### 2.1 Viewing

The 4ROUT Expansion Module is 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 Expansion Modules are viewed and controlled on the External page.

#### Dynamic Configuration Pages (DCP) for the JNIOR Series 4

**jr618080146** 410 (S/N 618080146) JANOS v1.7.1  
[logout 'jnior'](#)

**Input/Output** Configuration Console Folders Registry Syslog Peers About

**Internal**  
**External**

click on External to view expansion modules

<b>1 - Digital Input 1</b>	OFF	<b>1 - Relay Output 1</b>	OFF	Toggle
0.00 Hours	0 Counts	0.00 Hours		
<b>2 - Digital Input 2</b>	OFF	<b>2 - Relay Output 2</b>	OFF	Toggle
0.00 Hours	0 Counts	0.00 Hours		
<b>3 - Digital Input 3</b>	OFF	<b>3 - Relay Output 3</b>	OFF	Toggle
0.00 Hours	0 Counts	0.00 Hours		
<b>4 - Digital Input 4</b>	OFF	<b>4 - Relay Output 4</b>	OFF	Toggle
0.00 Hours	0 Counts	0.00 Hours		
<b>5 - Digital Input 5</b>	OFF	<b>5 - Relay Output 5</b>	OFF	Toggle
0.00 Hours	0 Counts	0.00 Hours		
<b>6 - Digital Input 6</b>	OFF	<b>6 - Relay Output 6</b>	OFF	Toggle
0.00 Hours	0 Counts	0.00 Hours		
<b>7 - Digital Input 7</b>	OFF	<b>7 - Relay Output 7</b>	OFF	Toggle
0.00 Hours	0 Counts	0.00 Hours		
<b>8 - Digital Input 8</b>	OFF	<b>8 - Relay Output 8</b>	OFF	Toggle
0.00 Hours	0 Counts	0.00 Hours		

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Wed, 23 Jan 2019 12:55:44 EST Dynamic Configuration Pages (DCP) v2.2

The 4ROUT will be displayed as shown below. The picture above and below are for a JNIOR 410 with 8 digital inputs and 8 relay outputs standard. The 4ROUT is automatically numbered relays 9 – 12 for the first 4ROUT expansion module in a 410. For a 412, it is numbered relays 13 -16 and for a 414 it is numbered relays 5 – 8.

**jr618080146** 410 (S/N 618080146) JANOS v1.7.1  
logout 'jnior'

Input/Output Configuration Console Folders Registry Syslog Peers About

Internal External

Digital 4ROUT <span style="float: right;">F9110500000001FB</span>			
9-Relay Output A	OFF	Toggle	11-Relay Output C
10-Relay Output B	OFF	Toggle	12-Relay Output D

**4ROUT connected to a JNIOR 410**

Wed, 23 Jan 2019 12:55:57 EST Dynamic Configuration Pages (DCP) v2.2

**jr618080146** 410 (S/N 618080146) JANOS v1.7.1  
logout 'jnior'

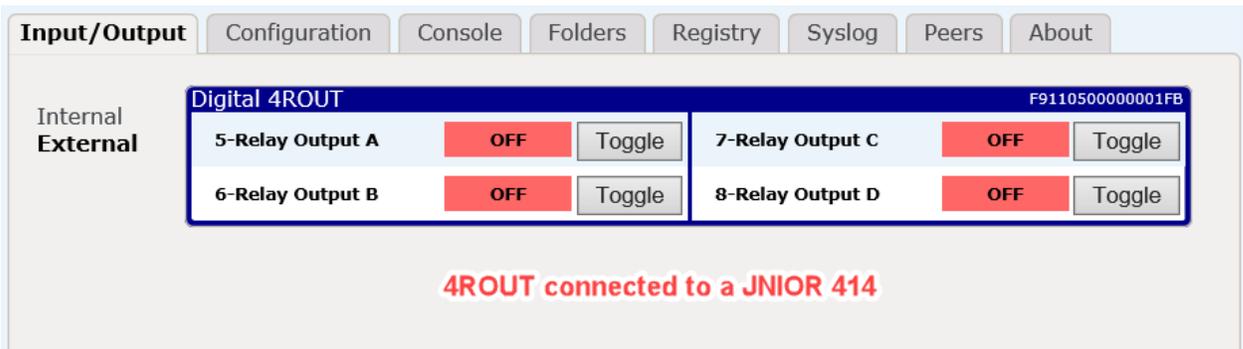
Input/Output Configuration Console Folders Registry Syslog Peers About

Internal External

Digital 4ROUT <span style="float: right;">F9110500000001FB</span>			
9-Relay Output A	OFF	Toggle	11-Relay Output C
10-Relay Output B	OFF	Toggle	12-Relay Output D

Digital 4ROUT <span style="float: right;">ED111090708120FB</span>			
13-Relay Output A	OFF	Toggle	15-Relay Output C
14-Relay Output B	OFF	Toggle	16-Relay Output D

**Two 4ROUT connected to a JNIOR 410**



## 2.2 Relay Number Management

Each expansion module for the JNIOR has a unique serial number that ends in two characters that identify the 'type' of module. All relay expansion modules end in FB.

The first 4ROUT module has \_1 appended to its serial number. The second 4ROUT has \_2 appended to its serial number. This is how the JNIOR operating system knows to apply relay numbers 9 – 12 to the first module and relays 13 – 16 to the second module.

The screenshot shows the 'Configuration' tab selected in the top navigation bar. On the left sidebar, 'Modules' is highlighted. The main content area is titled 'Sensor Port - External Modules' and contains a table with the following data:

Module	Serial No.	ID	Status	Assignment
▶ Digital 4ROUT	0500000001	F9110500000001FB	connected	ROUT 9-12
▶ Digital 4ROUT	1090708120	ED111090708120FB	connected	ROUT 13-16

Below the table, there is a link 'rescan' and a note: 'Click Assignment column to change relay group'. Red arrows point from the 'ID' and 'Assignment' columns to explanatory text: 'Unique ID ending in FB' and 'Matches label on side of 4ROUT' (pointing to the ID), and 'relay numbers assigned' (pointing to the Assignment).

Alternatively, you can go to the Console tab (or a Telnet or Command Line session) and use the **extern** command to display the modules connected to the JN10R.

The screenshot shows the 'Console' tab selected. The 'End Session' button is highlighted. The terminal output is as follows:

```

Welcome to the JN10R Model 410 (S/N 618080146) running JANOS v1.7.1
Copyright (c) 2012-2018 INTEG Process Group, Inc., Gibsonia PA USA.
Local time: Wed Jan 23 14:19:29 EST 2019 Process ID: 10
System up time: 3 Hours 20:17.880

jr618080146 login: jnior
jr618080146 password: *****

jr618080146 /> extern
TypeFB_1 = F9110500000001FB present
TypeFB_2 = ED111090708120FB present

jr618080146 /> |
    
```

Red arrows and text provide context: 'type extern' points to the command; 'unique ID' points to the ID values in the output; 'and the two modules will be listed' points to the two lines of output; and '1 is relays 9-12' and '\_2 is relays 13-16' point to the subscripts in the output.

## 2.3 Relay Module Replacement

Should you ever have to replace a module, since each expansion module for the JNIOA has a unique serial number, the JNIOA will actually remember the order number it assigned to that module. For example, \_1 will always be relays 9 – 12 for the original unique ID number for that module, \_2 will always be relays 13 – 16 for its unique ID number. This is done so that if you have two modules and the first module fails, you want the second module to always remain the second module and use relay numbers 13 – 16.

Below is a series of screen pictures that show you what the modules look like on the Configuration tab – Modules web page in the JNIOA main web page. The screen pictures show one module missing and how to replace it with a new module.

**NOTE: If you only have one expansion module, you would just click on the ‘rescan’ link to remove the old one and THEN plug in the new one so it is assigned as the first module (\_1) and relay numbers 9 – 12.**

**NOTE: If you have two modules and want to renumber them as to which relays they use, unplug both modules, click on rescan and then plug in one module at a time starting with the one you want used for relays 9-12 and then plug in the second module.**

The screenshot shows the 'Configuration' tab selected in the JNIOA web interface. The 'Modules' section is active, displaying a table titled 'Sensor Port - External Modules'. The table has five columns: Module, Serial No., ID, Status, and Assignment. The first row, representing a missing module, is highlighted in light grey. A red arrow points to the 'not found' status of this module. A red text annotation below the table reads 'missing module is shown in light grey'. The 'rescan' link is visible at the bottom right of the table area.

Module	Serial No.	ID	Status	Assignment
▶ Digital 4ROUT	0500000001	F9110500000001FB	not found	ROUT 9-12
▶ Digital 4ROUT	1090708120	ED111090708120FB	connected	ROUT 13-16

Click Assignment column to change relay group [rescan](#)

Sensor Port - External Modules

Module	Serial No.	ID	Status	Assignment
▶ Digital 4ROUT	1090708120	ED111090708120FB	connected	ROUT 13-16

Click Assignment column to change relay group [rescan](#)

**NOTE: that the remaining module remains identified as relays 13-16**

**'clicking' on rescan will cause JNIOR OS to remove non-existent modules**

Sensor Port - External Modules

Module	Serial No.	ID	Status	Assignment
▶ Digital 4ROUT	1110826227	2C111110826227FB	connected	ROUT 9-12
▶ Digital 4ROUT	1090708120	ED111090708120FB	connected	ROUT 13-16

Click Assignment column to change relay group [rescan](#)

**the replacement module will become relays 9 - 12 when connected to the JNIOR**

Alternatively, you could do all the above functions through the Console tab in the JNIOR web page or a Telnet/command line session using the **extern** and **extern -r** commands as shown below.

The screenshot shows the JNIOR Console interface with the 'Console' tab selected. The terminal output shows the following sequence of commands and results:

```

jr618080146 login: jnior
jr618080146 password: *****

jr618080146 /> extern
  TypeFB_1 = F9110500000001FB present
  TypeFB_2 = ED111090708120FB present

jr618080146 /> extern
  TypeFB_1 = F9110500000001FB not present ← Module 1 missing
  TypeFB_2 = ED111090708120FB present

jr618080146 /> extern -r
  TypeFB_2 = ED111090708120FB present ← extern -r
  command removes old module

jr618080146 /> extern
  TypeFB_2 = ED111090708120FB present
  TypeFB_1 = 2C111110826227FB present ← new module with a
  new unique ID
  becomes module_1

jr618080146 /> |
  
```

Annotations in red text with arrows point to the 'not present' status of the first module after the 'extern' command, the 'extern -r' command, and the new 'TypeFB\_1' module after the second 'extern' command.

## 2.4 Configuring

The 4 Relay Output Expansion Module is configured via the main JNIOR web page. Go to the Configuration tab and the Modules page as shown below.

Each change takes effect immediately.

**Configuration** Console Folders Registry Syslog Peers About

Sensor Port - External Modules **'click' on triangle to expand configuration for each module**

Module	Serial No.	ID	Status	Assignment
▲ Digital 4ROUT	0500000001	F911050000001FB	connected	ROUT 9-12

Click Assignment column to change relay group rescan

**Digital 4ROUT - Configuration (ID F911050000001FB)**

Name	Description	Relay
Relay A	Relay Output A	<input checked="" type="checkbox"/>
	On Text	ON
	Off Text	OFF
Relay B	Relay Output B	<input checked="" type="checkbox"/>
	On Text	ON
	Off Text	OFF
Relay C	Relay Output C	<input checked="" type="checkbox"/>
	On Text	ON
	Off Text	OFF
Relay D	Relay Output D	<input checked="" type="checkbox"/>
	On Text	ON
	Off Text	OFF

**Edit descriptions that are displayed on External web page**

**check boxes are used to add (checked) or remove relay (uncheck) from External web page**

**Modules**

Mouseover and use F1 for context sensitive help.

## 2.5 Controlling

The relay outputs can be controlled from the JNIOR web page on the External page. You can change the output status from OFF to ON or ON to OFF by clicking on the Toggle button.

If you want to **pulse** an “expansion” relay output for a preset duration, you would need to do it via another device or application controlling the JNIOR.

The screenshot shows the JNIOR web interface for the Digital 4ROUT module. The interface has a navigation menu at the top with the following tabs: Input/Output (selected), Configuration, Console, Folders, Registry, Syslog, Peers, and About. Below the navigation menu, there are two radio buttons for 'Internal' and 'External', with 'External' selected. The main content area displays the 'Digital 4ROUT' module with the ID 'F911050000001FB'. It contains four relay output controls:

Relay Output	Status	Action
9-Relay Output A	OFF	Toggle
10-Relay Output B	OFF	Toggle
11-Relay Output C	OFF	Toggle
12-Relay Output D	OFF	Toggle

The integ logo is located in the bottom left corner of the interface.

### 3 Specifications and Wiring

The 4 Relay Output Expansion Module (EXP-200-005) specifications are as follows:

#### General

- No power required – draws power from the JNIO
- Dimensions: 4.25 x 2.63 x 1.27 in (108 x 67 x 32 mm)
- Weight: 4 ounces (115 grams)

#### Relay Outputs

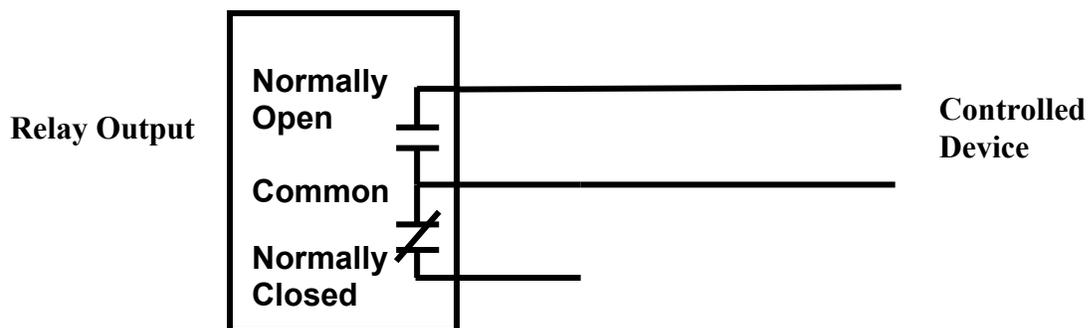
- Quantity: 4
- Type: SPST, Form C – 1 Normally Open Contact, 1 Normally Closed Contact
- Range: up to 240 volts AC
- Contact Ratings: 10 Amps
- Pulse Resolution: 1 millisecond pulse increments

#### 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 JNIO. A wiring diagram for the connector cable follows in this manual.

#### Wiring

Care should be used when wiring signals to the 4 Relay Output Expansion Module. Industry standard power and grounding methods should be followed.



## Sensor Port Cable

The JNIOR Expansion Modules come with a standard length cable. However, 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:**

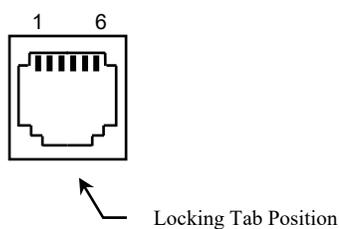
An RJ12 connector is the same size as an RJ11 connector except all 6 pins have copper pads to connect all 6 wires to the port.

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.

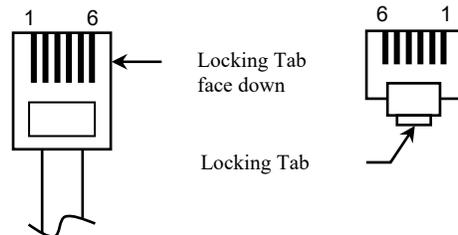
Sensor Port Pin-Outs – Use a 6 conductor wire and connect each colored wire to the same pin number on each connector.

<u>Pin</u>	<u>Description</u>
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

## 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 on our website.

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