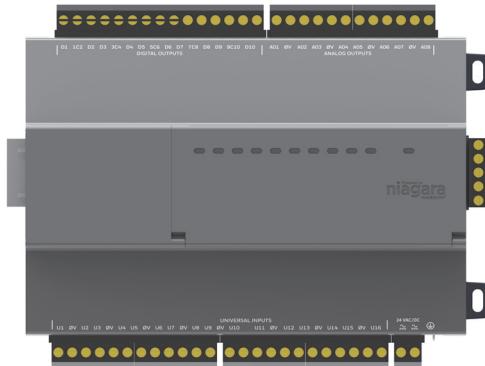


# Remote IO-R-34 Module

## 14022

## Mounting and Wiring Guide

This document covers the mounting and wiring of the IO-R-34 module for expanding a JACE-8000® or JACE-9000® controller. It assumes that you are an engineer, technician, or service person who is performing control system design or installation. Please read through this entire document before beginning the installation procedures.



## Product Description

The IO-R-34 expands a controller<sup>1</sup> with 34 I/O points that can be remotely located, including:

- 16 Universal Inputs (UIs) compatible with 0-10Vdc, 0-20mA, dry contacts, pulsing dry contacts, 0-100K ohm resistive, or Type 3 thermistor temperature sensors.
- 10 Digital Outputs (DOs) with Form-A relay contacts for on/off control of loads up to 24Vac/dc, at 0.5A max.
- 8 Analog Outputs (AOs) for 0-10Vdc analog control of loads at 2.5K ohm minimum, or 4mA drain maximum.

The IO module uses DIN rail mounting and has two end-mounted 5-pin connectors that support direct-chaining (in-line attachment) to IO-R-16 modules.

Communications to the controller uses RS-485 multidrop on 3 wires of an end-mounted 5-pin connector. The other two wires are for OUTPUT power (15 Vdc) used to power IO-R-16 modules. The IO-R-34 can provide power to up to 4 attached IO-R-16 modules (if used). A two position connector is provided for primary power input to the module. The RS-485 bus is wired back to Com 1 or Com 2 of the controller.

## Related Documentation

For more information on mounting, wiring and configuring a system, refer to the *JACE-8000 Mounting & Wiring Guide*, *JACE-9000 Mounting & Wiring Guide*, *Remote IO-R-16 Mounting and Wiring Guide*, and the *NRIO Driver Guide*.

## System Planning

System planning requires consideration of options regarding power, RS-485 communications, mounting and wiring. The following sections describe communications and power variables to consider before mounting and wiring your hardware.

## Number of Supported Expansion Modules

The controller supports a maximum of 8 IO-R-34 modules or a maximum of 16 IO-R-16 modules on a single RS-485 bus. So, the IO-R-34 counts as two IO-R-16 modules. For example, the controller could support 2 IO-R-34 modules and 12 IO-R-16 modules. [Table 1](#) shows possible options for combinations of IO-R-16 and IO-R-34 modules. If you are using T-IO-16-485 modules, they count the same as an IO-R-16.

1. JACE-8000 with NiagaraAX-3.8U3 or Niagara 4.3 and later and an available RS-485 port.  
JACE-9000 with Niagara 4.13 or later and an available RS-485 port. See “System Planning” on page 1 for more details.

## Power Supply Options and Considerations

The IO-R-34 is a 24Vac or dc-powered device compatible with controller input power requirements. Use a dedicated transformer to supply 21.6 to 26.4Vac/dc power to the module. Only the JACE and IO-R-34 modules should be powered from the same transformer. Wire the input voltage to the module's 2-pin 24Vac/dc power connector, located on the lower right corner of the unit.

Table 1 shows possible combinations. For example, Option 2 includes a total of 14 IO-R-16s and one IO-R-34. Four of the IO-R-16s are powered by the IO-R-34. The remaining 10 IO-R-16s must be powered by an external source.

**Table 1 IO Module Combinations and IO-R-16 Power Options**

Combinations	Module	Number of Devices	Powered by IO-R-34(s)	Powered by External Supply
<b>Option 1</b>	IO-R-16	16	0	16
	IO-R-34	0		
<b>Option 2</b>	IO-R-16	14	4	10
	IO-R-34	1		
<b>Option 3</b>	IO-R-16	12	8	4
	IO-R-34	2		
<b>Option 4</b>	IO-R-16	10	10	0
	IO-R-34	3		
<b>Option 5</b>	IO-R-16	8	8	0
	IO-R-34	4		
<b>Option 6</b>	IO-R-16	6	6	0
	IO-R-34	5		
<b>Option 7</b>	IO-R-16	4	4	0
	IO-R-34	6		
<b>Option 8</b>	IO-R-16	2	2	0
	IO-R-34	7		
<b>Option 9</b>	IO-R-16	0	0	0
	IO-R-34	8		

Both IO-R-16 and IO-R-34 should have a UPS power backup if continuous operation during power failures is a requirement. These modules do not support the battery powered configurations provided on some legacy hardware. The 5 pin power/comm connectors do not include a battery pin, preventing connection to (and possible damage from) legacy controllers.



**Note** When cabling power to modules located some distance from the controller, you should allow for voltage drops introduced by cabling distances.

## Operation without power backup

If an IO-R-34 module is powered locally and a momentary AC power loss occurs, note that a number of *undesirable things can result*, including:

- Load cycling from module relays dropping out, including several seconds lag to first re-establish communications with the JACE (Nrio driver) before relays can pull in again, as needed.
- Totalized “counts” zeroed out.
- History (logging) entries for associated IO points as “down,” as well as Nrio “device down” alarms.

Further, loss of power without backup makes an IO firmware upgrade a risky operation. Such an upgrade is initiated from the “Nrio Device Manager” view (in a station connection to the JACE). If this upgrade process is interrupted by a IO-R-34 power cycle, the module may be rendered inoperable—and will likely need to be replaced. Therefore, consider providing UPS backup power.

**Configure default settings for comm loss scenarios**—You can use Niagara Workbench to configure default AO and DO values to be set in case of a power outage or other communications-loss situations. The feature is configurable for timing and function. You can choose to use it on Powerup, CommLoss, both or neither. See the *Niagara Nrio Driver Guide* for details.

## Preparation

Unpack the IO-R-34 and inspect the contents of the packages for damaged or missing components. If damaged, notify the appropriate carrier at once and return any damaged components for immediate repair or replacement. See “[Returning a Defective Unit](#)” on page 18.

## Included in this Package

Included in this package you should find the following items:

- IO-R-34 module with quick-disconnect female connectors.
- *Remote IO-R-34 Module Mounting and Wiring Guide*, Part Number 32327280-001.
- Hardware bag containing the following items:
  - One (1) grounding wire, with quick-disconnect 0.187" female connector.
  - Sixteen (16) 499-ohm resistors, used for 4–20mA input

## Material and Tools Required

The following supplies and tools are required for installation:

- A suitable power source, as *one* of the following:
  - UL listed, Class 2, 24Vac transformer, rated a minimum of 21.6 to 26.4Vac and 28VA. Note that a *dedicated* transformer is required. Only a JACE-8000, JACE-9000, and the IO-R-34 may be powered from the same transformer.
  - 22 to 26.4Vdc power supply capable of supplying at least 916mA (22 Watts). This is sufficient to power a fully loaded IO-R-34 (4 IO-R-16 modules plus the IO-R-34).
- DIN rail, type NS35/7.5 (35mm x 7.5mm) and low-profile DIN rail end-clips (stop clips), recommended for mounting with the controller. The DIN rail should be sufficient length to accommodate both the controller and any other modules. See [Figure 1](#) on page 7.
- Suitable screws and screwdriver for mounting DIN rail, or if DIN rail not used, for mounting bases of the controller and the module. A small flat-bladed screwdriver is needed for wiring terminals.

## Precautions

This document uses the following warning and caution conventions:



### Caution

Cautions remind the reader to be careful. They alert readers to situations where there is a chance that the reader might perform an action that cannot be undone, might receive unexpected results, or might lose data. Cautions contain an explanation of why the action is potentially problematic.

**Warning**

Warnings alert the reader to proceed with extreme care. They alert readers to situations where there is a chance that the reader might do something that can result in personal injury or equipment damage. Warnings contain an explanation of why the action is potentially dangerous.

## Safety Precautions

The following items are warnings of a general nature relating to the installation and start-up of the controller. Be sure to heed these warnings to prevent personal injury or equipment damage.

**Warning**

- A 24Vac or 24Vdc circuit powers the IO-R-34 and controller. Disconnect power before installation or servicing to prevent electrical shock or equipment damage.
- Make all connections in accordance with national and local electrical codes. Use copper conductors only.
- To reduce the risk of fire or electrical shock, install in a controlled environment relatively free of contaminants.
- Controllers and I/O modules are only intended for use as monitoring and control devices. To prevent data loss or equipment damage, do not use them for any other purposes.

## Static Discharge Precautions

These items are cautionary notes to help prevent equipment damage or loss of data caused by static discharge.

**Caution**

- Static charges produce voltages high enough to damage electronic components. The microprocessors and associated circuitry within an IO-R-34 are sensitive to static discharge. Follow these precautions when installing, servicing, or operating the system:
  - Work in a static-free area.
  - Discharge any static electricity you may have accumulated. Discharge static electricity by touching a known, securely grounded object.
  - Do not handle the printed circuit board (PCB) without proper protection against static discharge. Use a wrist strap when handling PCBs, with the wrist strap clamp secured to earth ground.

## Module Connection Precautions

**Caution**

Do not connect more than the maximum number of IO-R-34 modules to the RS-485 port of the parent JACE controller—note that *8 is the maximum number supported in software*. However, less IO-R-34 modules may be supported. See “Number of Supported Expansion Modules,” page 1.

**Caution**

Connect S terminal wiring as shown in [Figure 6](#) or communication errors may result. S terminal serves as reference ground between isolated RS-485 ports on a JACE, and IO-R-16 or IO-R-34 module.

## WEEE (Waste of Electrical and Electronic Equipment)



### Recycling of Electronic Products: (International Installations)

In 2006 the European Union adopted regulations (WEEE) for the collection and recycling of all waste electrical and electronic equipment. It is no longer allowable to simply throw away such equipment. Instead, these products must enter the recycling process.

To properly dispose of this product, please return it to your local authority collection point. If such a facility is not available, please send it to one of these offices:

**Tridium Europe Ltd****1, The Grainstore****Brooks Green Road****Coolham, West Sussex****RH138GR United Kingdom****Tridium Asia Pacific Pte Ltd****17 Changi Business Park Central 1****Honeywell Building****Singapore 486073****Tridium Inc.****2256 Dabney Road, Suite C****Richmond, VA 23230**

# Installation and Start-up Outline



**Note** If installing the controller and IO-R-34s at the same time, please refer to the appropriate controller installation document.

The major steps to installing and starting the IO-R-34, are outlined as follows:

1. Physically mount the module with the controller. See “Physical Mounting.” If directly attaching to other modules, ensure that the 5-position end connector(s) are properly seated into the end connector(s) of the other units. Note the previous “Module Connection Precautions” on page 4.
2. Make wiring connections for grounding, 24Vac power, and I/O wiring. See “Wiring Details,” page 8.
3. Apply power and perform an initial checkout. See “Power up and Initial Checkout” on page 16.

## Physical Mounting

The following applies to mounting an IO-R-34 module with a JACE-8000 or JACE-9000 controller:



**Note** Horizontal mounting is strongly recommended to achieve maximum heat dissipation and meet the operating temperature upper limit. Any other mounting orientation reduces this upper limit.

- Mounting on a 35mm wide DIN rail is recommended. The IO-R-34 unit base has a molded DIN rail slot and locking clip, which simplifies mounting with other modules. Mounting on a DIN rail ensures accurate alignment of connectors between all modules.
- If DIN rail mounting is not practical, you can use screws in mounting tabs on the IO-R-34.

### Procedure 1 To mount IO-R-34 on existing installed DIN rail.

**Step 1** Pull or pry down the plastic locking clip until it snaps into the open (down) position.

**Step 2** Position the IO-R-34 module on the rail, tilting to hook the top DIN rail tab over the upper edge of the DIN rail (Figure 1). Rotate the module flush against the DIN rail and then press the locking clip upward to release it and secure the module to the rail.

**Step 3** Slide the IO-R-34 module along the DIN rail to its intended location. If connecting to an IO-R-16 module, seat the 5-position plug into that module’s connector socket.

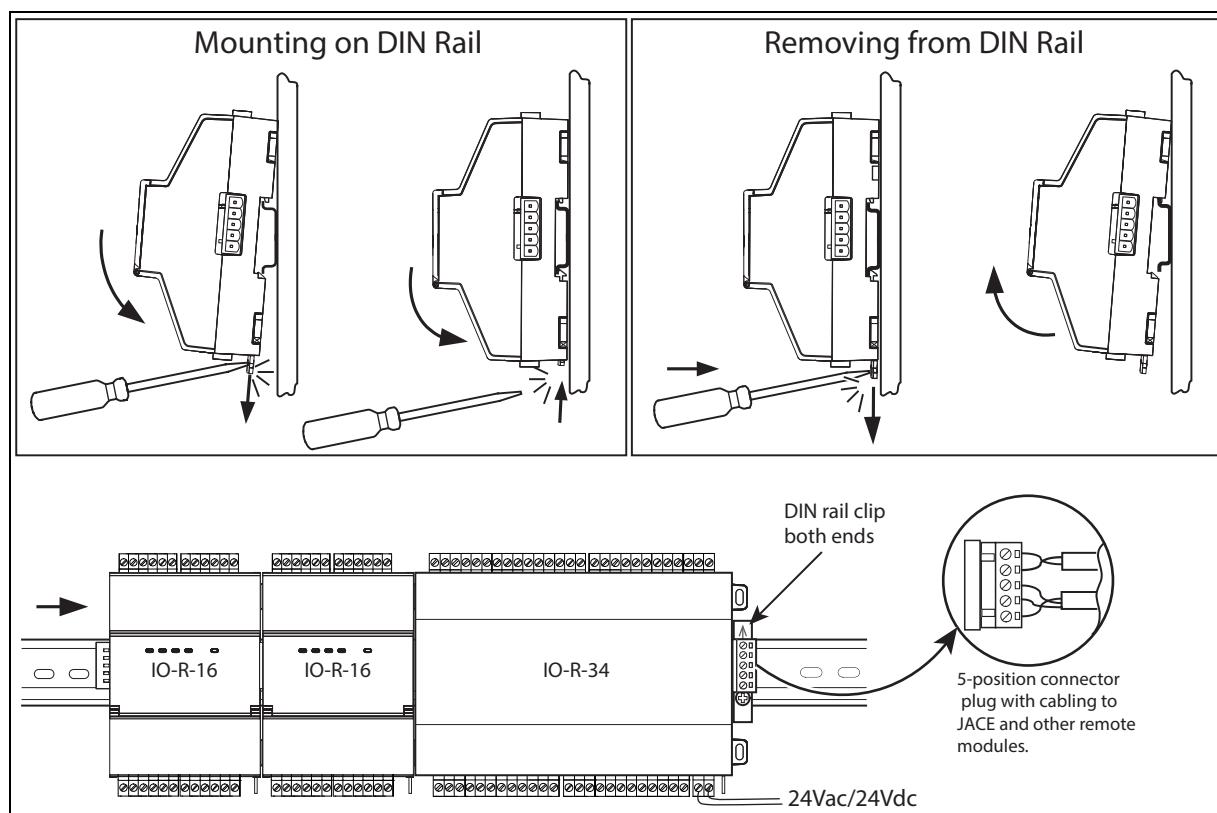
**Step 4** Carefully install DIN rail end clips to secure the assembly. Make sure that the DIN rail stops do not press against the end connectors on the IO-R-34 or other modules.



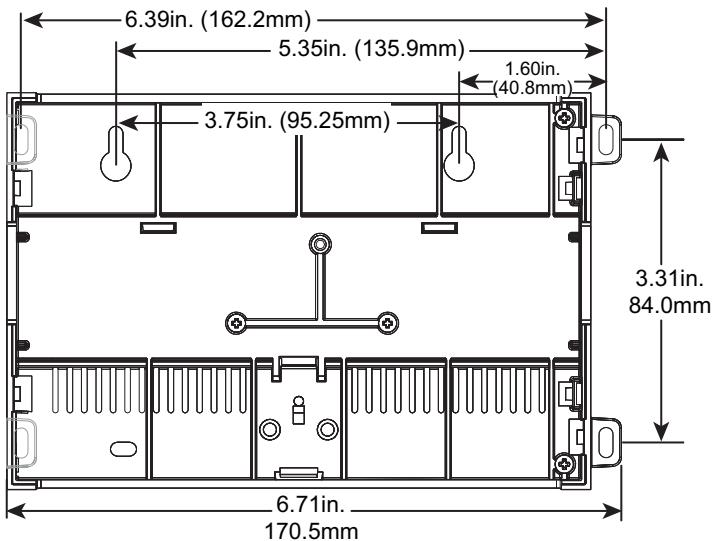
**Caution**

- Do not mount hardware on **both** a DIN Rail and with tab mounts to another surface. This causes physical stress on equipment and prevents good connections between controller and modules.
- Do not mount DIN rail stops so that they press against module end connectors. If possible, use low-profile rail stops to eliminate possibility of contact and damage to the connectors.

**Step 5** Repeat this for all items, until all are mounted on the DIN rail(s), firmly connected to each other, and secured with DIN rail end clips.

**Figure 1 IO-R-34 module mounting details.**

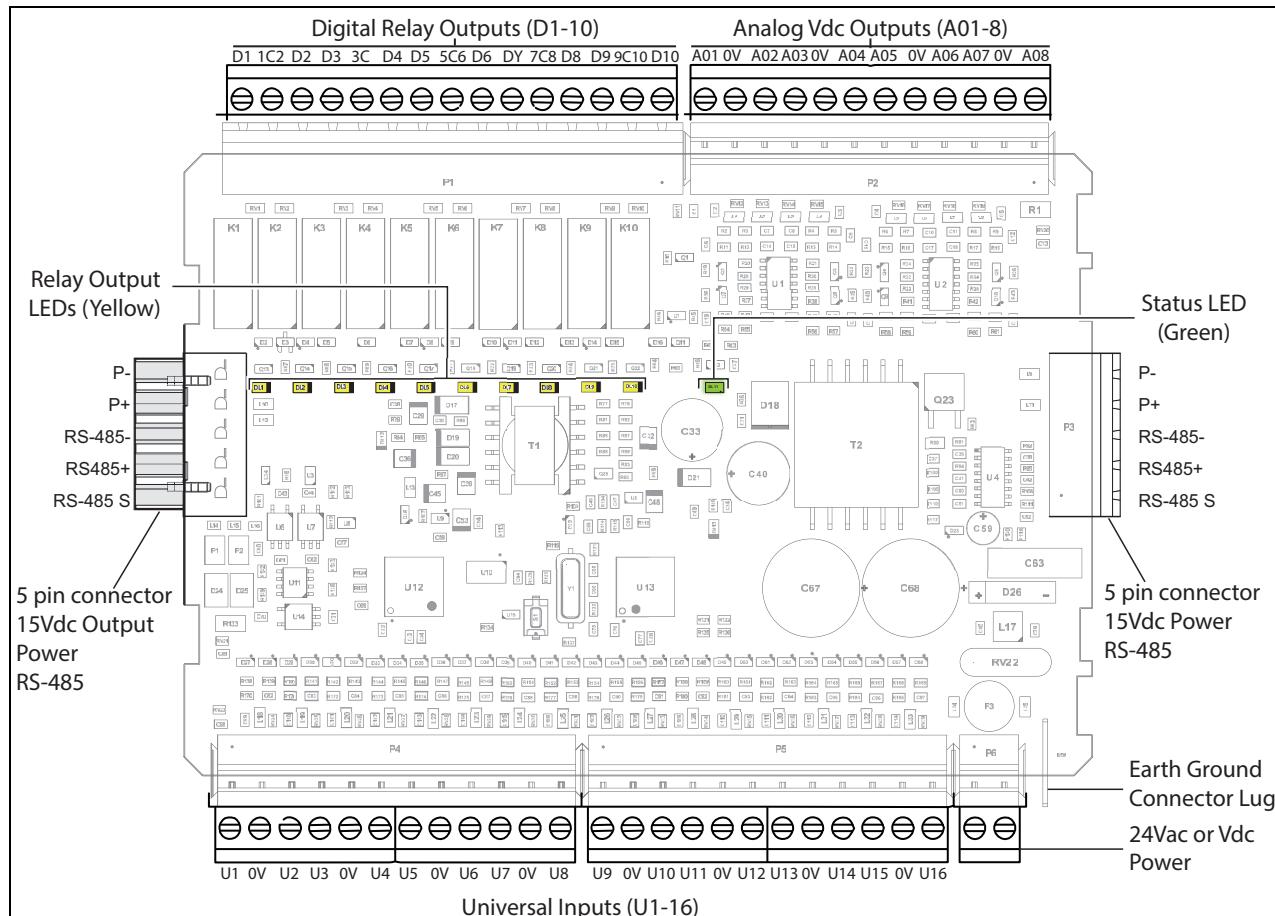
**Note** To remove an IO-R-34 module from a DIN rail, remove DIN rail end clips and (if applicable) slide it away from other modules. Move the plastic locking tab down to open position then lift unit outwards.

**Figure 2 Tab Mounting Dimensions.**

## IO-R-34 Board Layout and Terminal Locations

The IO-R-34 provides 16 universal [inputs](#) compatible with 0–10Vdc, 0–20mA, dry contacts, pulsing dry contacts, 0–100K ohm resistive, or Type 3 thermistor temperature sensors, and 18 [outputs](#): 10 relay (24Vac/dc, 0.5A max.) outputs and 8 analog outputs (0–10 Vdc). Wiring terminal positions are shown in [Figure 3](#), along with LED locations.

**Figure 3** IO-R-34 Wiring Terminal Locations.



## Wiring Details

See [Figure 3](#) above to locate connectors and other components on the IO-R-34 module.

Make connections to the IO-R-34 in the following order.

1. Connect the earth grounding wire (with spade connector) from the earth ground lug on the IO-R-34 to a nearby earth grounding point. See “[Grounding](#)” for details.
2. Wire the supply power to the IO-R-34, but *do not energize the power source* until all other wiring is completed. See “[Power Wiring](#)” for details.
3. Connect RS-485 wiring between the IO-R-34 and the controller, and (if applicable) to other modules (for example: IO-R-16, IO-R-34, or IO-16-485) in a continuous multidrop fashion. See sections “[RS-485 Communications](#)” on page 10, “[Inputs](#)” on page 11, and “[Outputs](#)” on page 14.



**Caution** Connect S terminal wiring as shown in [Figure 6](#) or communication errors may result. S terminal serves as reference ground between isolated RS-485 ports on the controller and IO-R-16 and IO-R-34 modules.

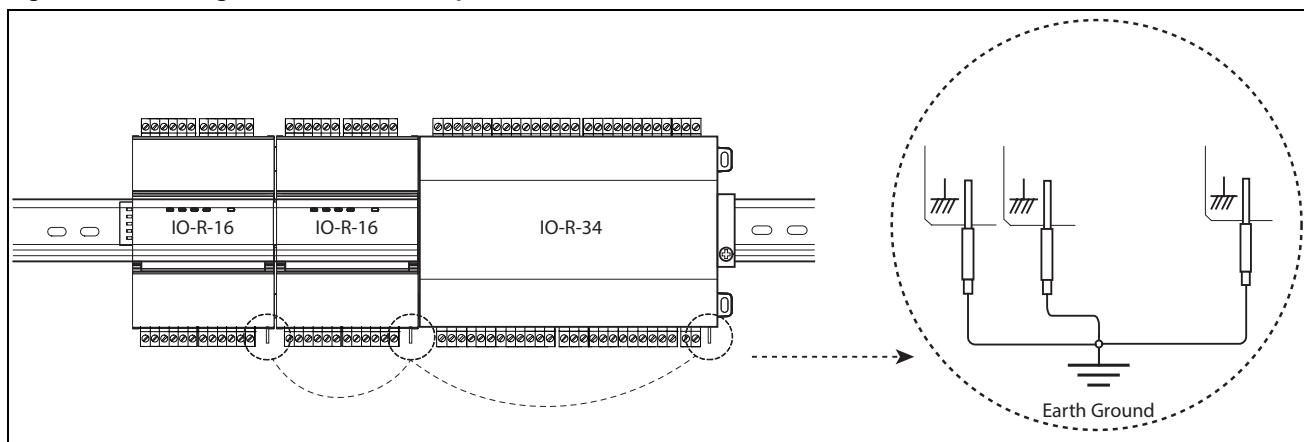
4. Apply power to the unit. See “[Power up and Initial Checkout](#),” page 16.

## Grounding

An earth ground spade lug (0.187") is provided on the base of the IO-R-34 for connection to earth ground. For maximum protection from electrostatic discharge or other forms of EMI, connect **each** earth ground using a #16 AWG or larger wire. Keep these wires as short as possible.

See [Figure 4](#) for the location of the earth grounding wire for the IO-R-34.

**Figure 4** Earth ground connection required to the IO-R-34 module as well as IO-R-16 modules, if used.



## Power Wiring

The IO-R-34 can be powered by wiring to a **dedicated** Class 2, 24V transformer, or to a 24Vdc power source. The IO-R-34 can share transformer power with the controller.



**Note** If powering from a 24V transformer, do not also power equipment (other than a JACE-8000/JACE-9000) with the same transformer. Otherwise, conducted noise problems may result. Also, do *not* ground either side of the transformer’s 24V secondary.

As shown in [Figure 5](#), the IO-R-34 2-position power connector is located at the lower corner of the unit. Unplug the connector from the module and install wire connections to the connector as shown.

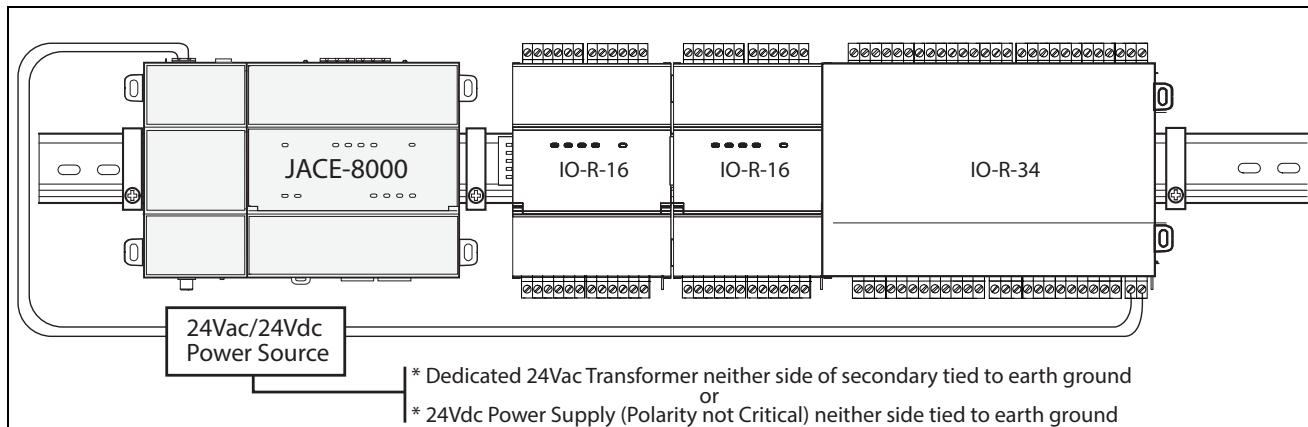


**Note** Do not apply 24V power (reinsert connector plug into the IO-R-34) until all other wiring is completed, including IO-R-34 [inputs](#) and [outputs](#). See “[Power up and Initial Checkout](#),” page 16.

**Caution**

Do not connect two or more IO-R-34 modules together. Connecting IO-R-34 modules directly to each other may allow for hardware configurations that lead to equipment damage.

**Figure 5** IO-34 Power Wiring to 24vac/dc Power Source, shared with JACE-8000 (or JACE-9000).



## RS-485 Communications

RS-485 communications from the controller to each IO module (or assembly of modules) requires a continuous “daisy-chain” wiring topology using a shielded, twisted-pair cable. Wire between the IO-R-16 assemblies using the 5-position end connectors. At the controller, wire to either of its 3-position RS-485 connectors.

Use shielded 18-22AWG wiring (refer to the TIA/EIA-485 standard). Wire in a continuous multidrop fashion, meaning “plus to plus,” “minus to minus”, and “shield to shield.” Connect the shield wire (reference ground) to earth ground at one end only, such as at the JACE. See [Figure 6](#).

## Bias Settings

Each RS485 port on the controller has an adjacent 3-position biasing switch, with these settings:

- **BIA** - (Default, middle) RS485 biasing and termination: 2.7K Ohm bias resistors with no termination resistor
- **END** - RS485 biasing and a termination: 562 Ohm bias resistors and 150 Ohm termination resistor
- **MID** - RS485 biasing or termination: 47.5K bias resistors with no termination resistor

Often, adding RS-485 biasing can improve communications by eliminating indeterminate idle states.

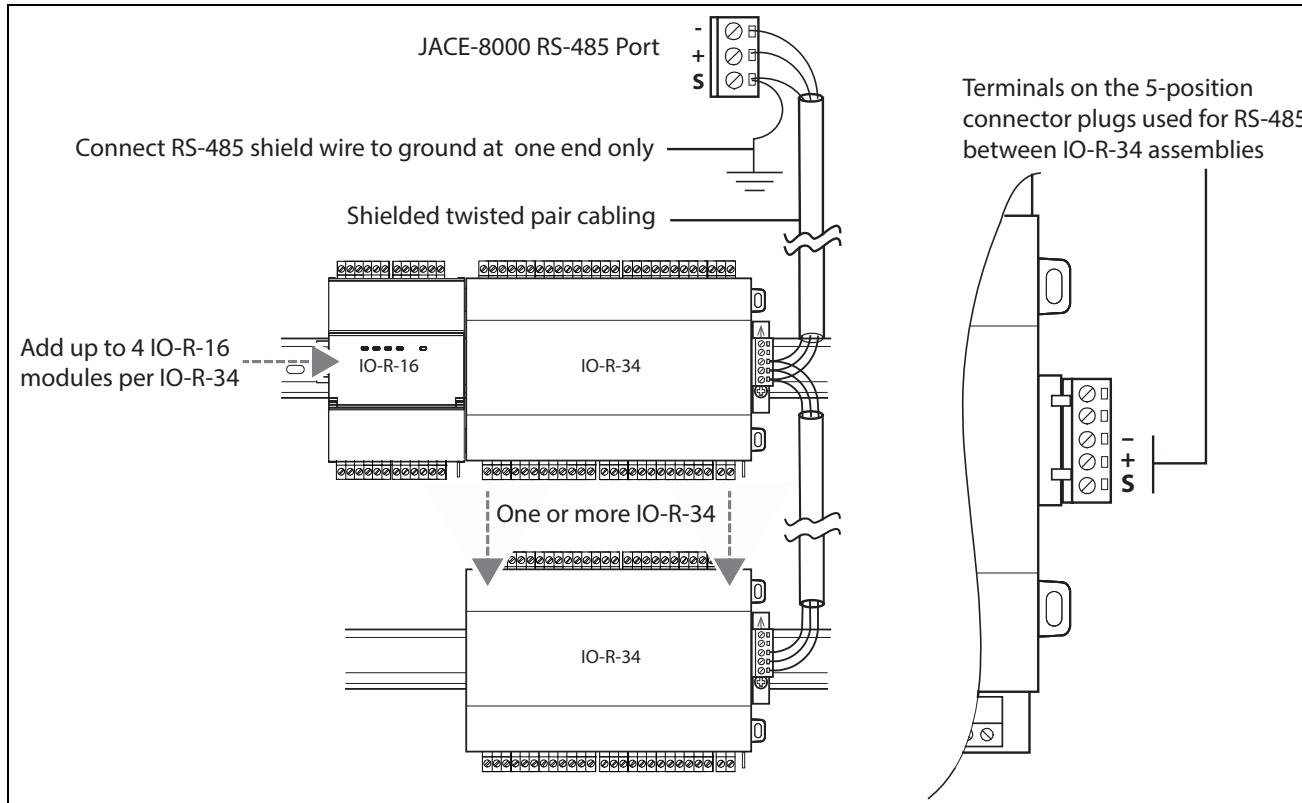
- **BIA** - (Default, middle) Often best if the RS485 trunk needs biasing, but when the controller is not installed at the end of the trunk.
- **END** - Often best if the controller is installed at the end of an RS485 trunk of devices that is not already biased.
- **MID** - Often best if the controller is put in the middle of an already-biased RS485 trunk.

If desired, you can change the position of an RS485 port's bias switch while the controller is running.



**Caution** Connect S terminal wiring as shown in [Figure 6](#) or communication errors may result. S terminal serves as reference ground between isolated RS-485 ports on the controller and IO-R-16 and IO-R-34 modules.

**Figure 6** RS-485 wiring from the JACE to one or more IO-R-34 modules uses a “daisy-chain” connection.



## Inputs

Each of the 16 universal inputs (UI) can support any one of the following:

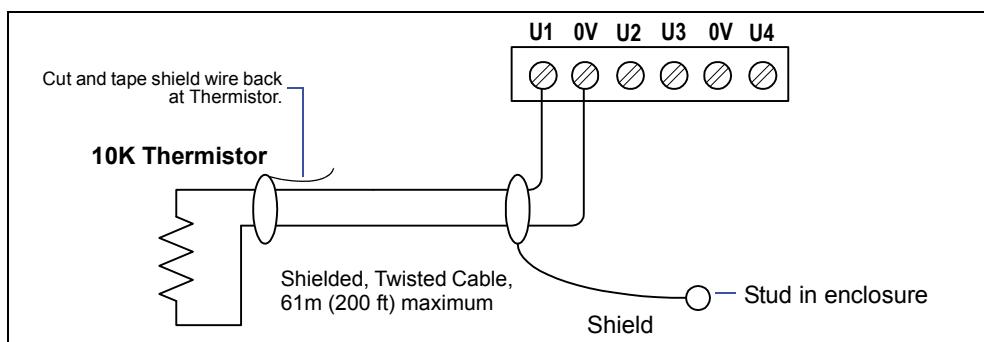
- Type-3 10K ohm Thermistor (also see [Caution](#) on page 12)
- Resistive 0-100K ohms
- 0–10 Vdc
- 4–20 mA
- Binary Input

## Thermistor

The inputs support 10K Thermistor temperature sensors. Input accuracy is in the range of  $\pm 1\%$  of span. By default, conversion is for a standard Type 3 thermistor sensor, with a sensor range of  $-10^{\circ}$  to  $135^{\circ}\text{F}$  ( $-23.3^{\circ}$  to  $57.2^{\circ}\text{C}$ ). Using a conversion type of “Tabular Thermistor,” you can specify a different thermistor response curve, by importing a thermistor curve .xml file. The *kitIo* module contains an xml folder with thermistor curves for a various thermistor temperature sensors. You can also edit and export (for reuse) *customized* thermistor curve xml files. See the *NRIO Driver Guide* for details.

[Figure 7](#) shows the wiring diagram.

## Inputs

**Figure 7 Thermistor wiring.****Resistive 0-100K ohms**

The inputs can read a resistive signal within a range from 0 to 100,000 ohms. Wiring is the same as shown for a Thermistor temperature sensor ([Figure 7](#)).

Resistive signals require a **ResistiveInputPoint**.

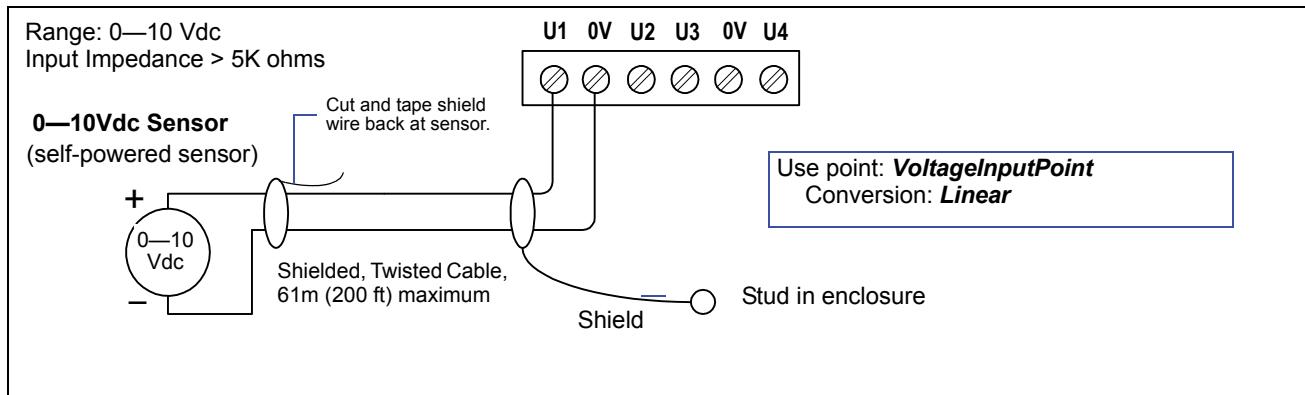
**Caution**

UI inputs provide optimum resistive-to-temperature resolution in the 10K ohm range. For a sensor with a range far from 10K ohms (such as a **100-ohm** or **1000-ohm sensor**), resolution is **so poor as to be unusable!** To successfully use such a sensor, install a *transmitter* that produces a Vdc or mA signal, and then wire the transmitter to the UI according to the [0-10 Vdc](#) or [4-20 mA](#) instructions.

**0-10 Vdc**

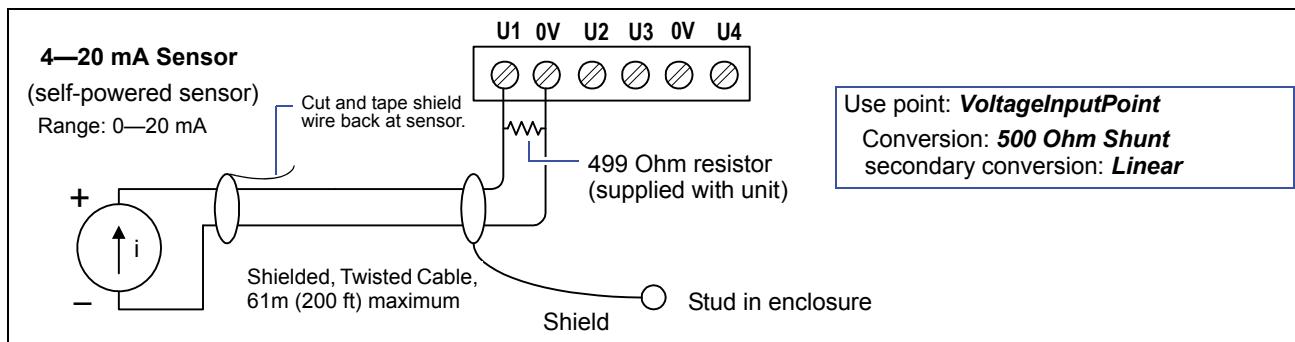
The inputs support self-powered 0–10 Vdc sensors. Input impedance is greater than 5K ohms. 0–10 volt accuracy is  $\pm 2\%$  of span, without user calibration. [Figure 8](#) shows the wiring diagram.

0–10 Vdc sensors require a **VoltageInputPoint**.

**Figure 8 0–10 Vdc wiring.****4-20 mA**

The inputs support self-powered 4–20 mA sensors. Input accuracy is  $\pm 2\%$  of span, without user calibration. [Figure 9](#) shows the wiring diagram, which requires a 499 ohm resistor wired across the input terminals.

4–20 mA sensors also require the **VoltageInputPoint**.

**Figure 9** 4 to 20 mA wiring.**Caution**

When using an externally powered 4–20 mA sensor, be sure to **de-energize its power supply** before making or changing any wiring connections to the IO-R-34 module. This is in addition to removing power from the IO-R-34 module.

It is important to not apply external power to the UI inputs without the 499 ohm resistor in place. Otherwise, even a momentary application of power (say, 24Vdc) to the UI terminals without the resistor may damage circuitry on the IO-R-34. Only *after* completing all input wiring should you restore power to such external power supplies.

## Binary Input

The universal inputs support both pulse contacts and normal dry (equipment status) contacts.

- Pulse contacts may have a change-of-state (COS) frequency of up to 20 Hz with a 50% duty cycle.  
**Note:** Minimum dwell time must be > 25ms.  
(Contacts must remain open at least 25ms and be closed at least 25ms.)
- Standard dry contacts must have a 1 Hz. (or less) COS frequency, with minimum dwell time > 500ms.  
(Contacts must remain open at least 500ms and be closed at least 500ms.)

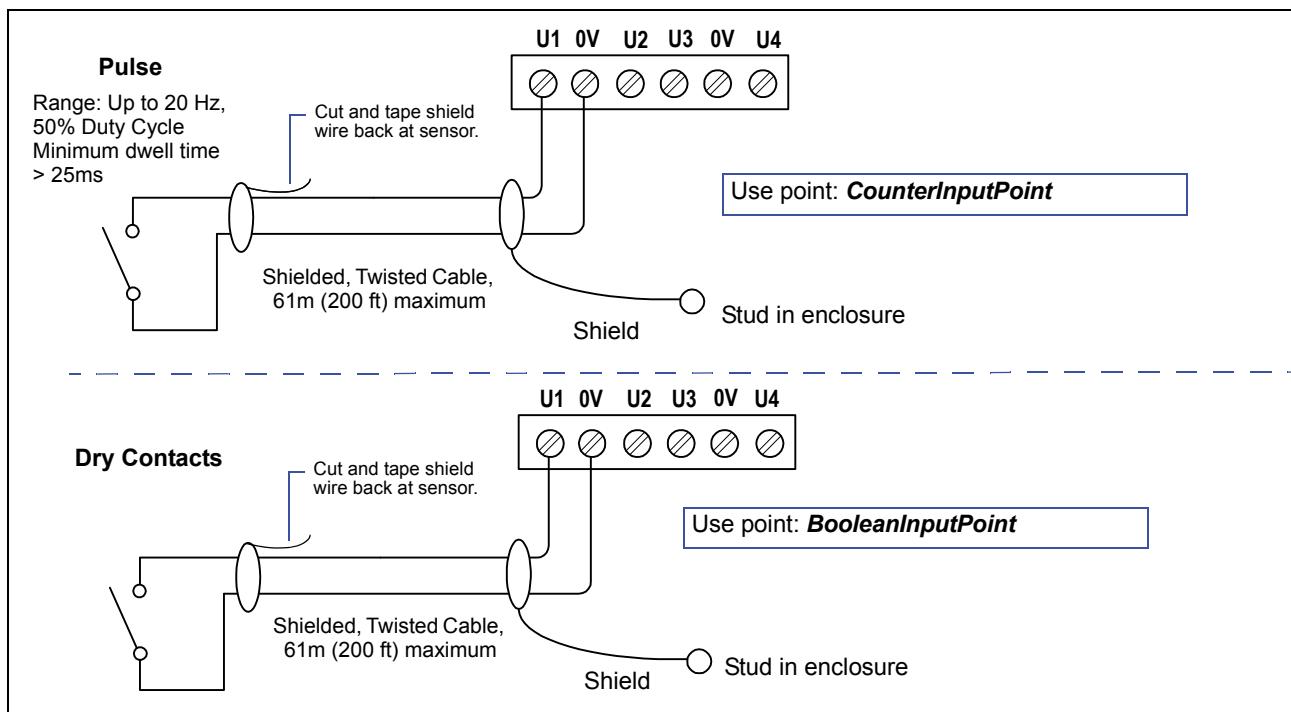
Both types of dry contacts support 3.3 Vdc open circuits or 330  $\mu$ A short-circuit current.

Figure 10 shows the wiring diagram.

For a pulse contact, use the **CounterInputPoint** in the station database.

For other dry contacts, use the **BooleanInputPoint**.

## Outputs

**Figure 10** Binary input wiring.

## Outputs

The IO-R-34 has ten (10) digital [relay outputs](#) and eight (8) 0–10 volt [analog outputs](#).

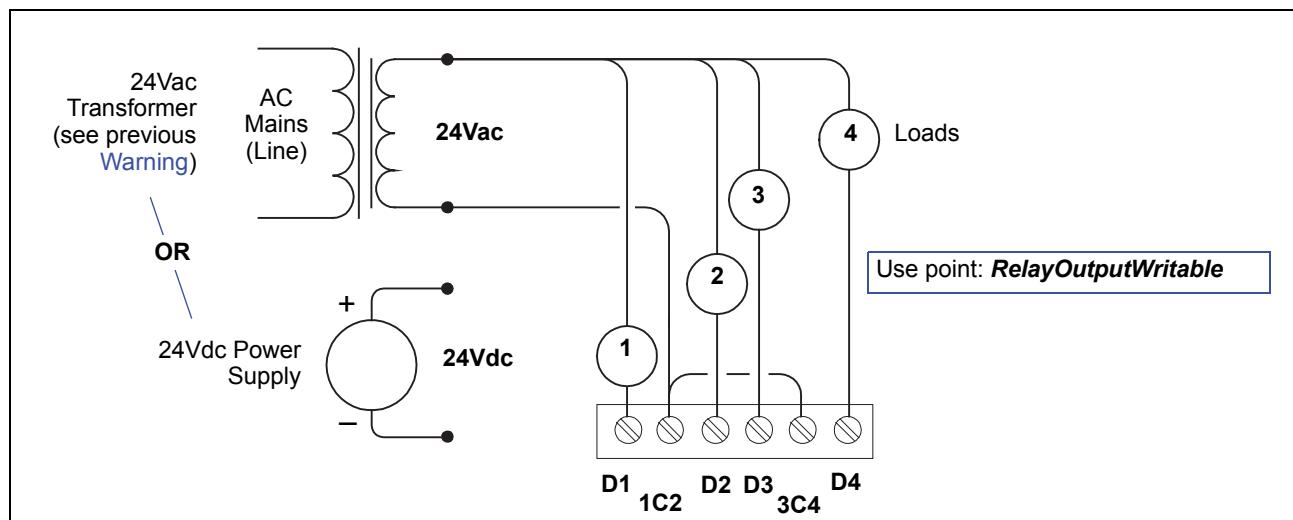
### Relay Outputs

Each relay output is rated at 24 Vac or Vdc at 0.5A. Relay outputs have MOV (metal oxide varistor) suppressors to support inductive-type loads such as heavy-duty relay coils.

**Warning**

Relays are not rated for AC mains (line level) powered loads (instead, 24V maximum). Never use a controller's power transformer to power I/O loads. Using the controller's transformer introduces potentially damaging switching transients into the unit.

Use a [RelayOutputWritable](#) in the station for each output. [Figure 11](#) shows an example wiring diagram.

**Figure 11** Relay output wiring diagram.

Note that 15-position DO connector plug has 5 common terminals "C" (1–2, 3–4, 5–6, 7–8, 9–10), which are isolated from each other. This can be useful when powering loads from different 24Vac sources.

A yellow LED status indicator for each relay (D1—D10) is located on the board (Figure 3 on page 8), and also visible through the cover. Under normal operation, each digital status LED indicates activity as follows:

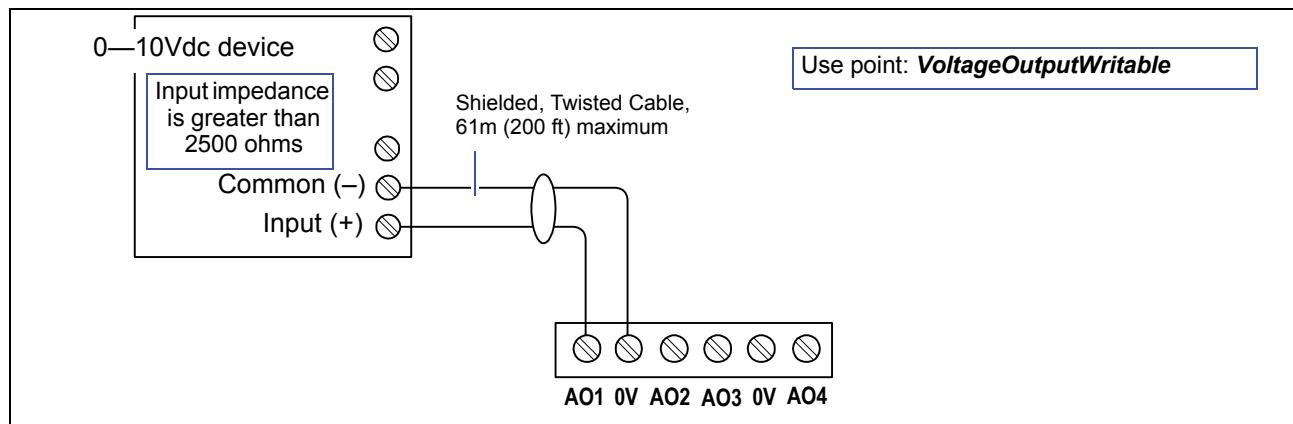
- **Off**—relay open / no current flows.
- **On**—relay closed / load current flows.

Therefore, an **On** status indicates that the load is powered.

## Analog Outputs

Analog outputs (AO) are referenced by the terminals labeled  $AOn$  and 0V (ground). Each AO can supply a maximum of 4 mA over the entire 0 to 10Vdc range. The minimum input impedance of a device controlled by an AO must be greater than 2500 ohms. Typical wiring for an AO is shown in Figure 12.

For each AO, use a **VoltageOutputWritable** in the station database.

**Figure 12** Analog output wiring diagram.

## NrioModule (Software) Representation

In the Niagara station interface to the JACE and IO-R-34 module, the module's I/O is modeled in the station's **NrioNetwork** (copied from the *nrio* palette), under a child **Nrio34Module** "device level" component. This Nrio34Module has a default name of "io34\_n".



**Note** After a remote I/O module is discovered and added to the station under this NrioNetwork (each one as an Nrio34Module), the serial status LEDs for the JACE's RS-485 port continually flash, reflecting polling activity. At this time, the "STATUS" LED on that IO-R-34 module lights solid green.

Blinking of a remote I/O module's status LED indicates that the unit is NOT Online.

Each input or output used requires a special Niagara Remote Input/Output (Nrio) point to be added in the station database. These components act as the station interface to the physical I/O points. The Nrio points you need for each input or output type are noted in previous wiring sections in **boldface**. For Nrio software details, see the *Nrio Driver Guide*.

## Power up and Initial Checkout

**Step 1** Apply power to the IO-R-34.

The IO-R-34 module's board status LED ([Figure 3](#) on page 8) will initially be blinking.

**Step 2** Using Workbench, open a station connection to the controller. If not already present, add an **NrioNetwork** component to the station's Drivers Container.

**Step 3** Configure the NrioNetwork's "Port Name" property to match the controller's RS-485 port COM assignment (for example, **COM2**), and set its "Trunk" property to a unique number Nrio-wide (i.e., **2**).

**Step 4** From the NrioNetwork's **Nrio Device Manager** view, perform a **Discover**.

Each discovered remote I/O module will be listed in the top "Discovered" pane in the view, with each IO-R-34 appearing as an "Io34" device type.



**Note** To associate a discovered device to a specific IO-R-34, issue a right-click "Wink Device" action—this cycles a relay output on that IO-R-34 several times, which you can hear or see if nearby. This action is available both *before* and after a discovered device is added to the station.

**Step 5** Add each discovered IO-R-34 to the station, renaming to reflect its actual location (see Note above). Each IO module is represented by an Nrio34Module component.

**Step 6** Verify that each IO-R-34 module's board status LED is now lit solid green.



**Note** If an Nrio34Module is selected in the Nrio Device Manager view, and the **Upgrade Firmware** button is active, it is recommended that you upgrade its firmware. After selecting this, **do not interrupt power to the IO-R-34 and JACE, or the communications between them**, until the firmware upgrade job finishes. Typically, this takes less than 2 minutes, with job completion signaled in the Workbench view.

**Step 7** You can now discover, add, and configure IO points under each Nrio34Module's Points device extension. For more details about Nrio components, refer to the *NRIO Driver Guide*, also available in Workbench online Help (doc Nrio).

# Replacement Parts

Servicing the IO-R-34 may call for replacement parts. There are two categories of parts:

- Standard Replacement Parts
- New Replacement Units

## Standard Replacement Parts

Standard replacement parts are listed in [Table 2](#) and can be ordered from stock without restriction. Standard replacement parts cannot be returned for credit and should be disposed of in an appropriate manner.

**Table 2** [Parts Listing for IO-R-34](#)

Part Number	Item	Description
32327282-001	Replacement Unit	IO-R-34 option module, model #14022
10600	Connector plug	15 position screw terminal, 180 deg.
10599	Connector plug	12 position screw terminal, 180 deg.
10598	Connector plug	2 position screw terminal, 180 deg.
32330828	Connector plug	5 position screw terminal, 180 deg.
32327803	Accessory Kit, IO-R-34	<ul style="list-style-type: none"> <li>– One (1) grounding wire, with quick-disconnect 0.187" female connector.</li> <li>– Sixteen (16) 499-ohm resistors, +/-1%, 0.6W.</li> </ul>

## New Replacement Units

To replace a faulty unit, order and install a *new* IO-R-34 accessory module. If the faulty IO-R-34 is *still in warranty*, you can receive credit by returning it. Be sure to contact the vendor for a return material authorization (RMA) number before shipping an item for return credit. See “[Returning a Defective Unit](#),” page 18, for details.



**Note** Before ordering a new IO-R-34, it is strongly recommended that you contact your normal technical support resource to eliminate the possibility of a software issue or mis-configuration problem.

## Replacing an IO-R-34



**Caution** Before handling circuit boards, discharge any accumulated static by touching the nearby earth grounding point. For details, see the “[Static Discharge Precautions](#)” section on page 4.

To replace the IO-R-34 module in the field, proceed as follows:

**Procedure 2** [Replacing an IO-R-34 accessory module.](#)

**Step 1** Using the appropriate Niagara software tool, back up the JACE’s configuration to your PC.

**Step 2** Remove power to the IO-R-34. The unit should power down automatically.



**Note** If any I/O points have voltage, turn the devices off or disconnect power to them.

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Returning a Defective Unit

- Step 3** Note positions of all I/O wiring going to the IO-R-34. If necessary, label connectors to avoid mis-connection later (after module is replaced). The software that runs on the controller expects the terminal positions to be the same in the replacement IO-R-34, in order to collect data from or to control the attached devices.
- Step 4** Unplug all connectors from the IO-R-34, including all I/O connectors, power, and earth ground wire.
- Step 5** Remove any screws or DIN rail clips securing the module, removing it from its mounting. See [Figure 1](#) on page 7 for details on removal from (and mounting onto) DIN rail.
- Step 6** Mount the replacement IO-R-34 as it was previously, using the same DIN rail location and/or screws.
- Step 7** Reconnect the earth ground wire to the module's grounding lug.
- Step 8** Reconnect all I/O connectors to the IO-R-34.
- Step 9** If any of your I/O points have voltage, turn the devices back on, or reconnect power to them.
- Step 10** Restore power to the IO-R-34, *allowing at least 4 minutes before possibility of power interruption*. For related details, see "[Power up and Initial Checkout](#)", including the [Warning](#) on page 14.
- Step 11** For more details, see the *Nrio Driver Guide*, the *JACE-8000 Install and Startup Guide* or *JACE-9000 Install and Startup Guide*.
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## Returning a Defective Unit

**Note**

If the defective unit is under warranty, please follow return instructions provided in this section. If the unit is *out of warranty*, please discard it, observing all national and local recycling regulations. See "WEEE Waste of Electrical and Electronic Equipment", page 5.

- Do not return an out-of-warranty IO-R-34.

Prior to returning the unit, contact your vendor to obtain a return materials authorization (RMA) number and other instructions.

Please provide:

- Product model
- Nature of the defect
- PO number to secure the RMA

## Compliance

For a complete listing of Agency and Regulatory compliance, download the Agency Listings and Approvals for Tridium Hardware Products document in the “Knowledge” section of the Niagara Community:

<https://www.niagara-community.com>



中国电子电气产品中有害物质的名称及含量  
**China EEP Hazardous Substance Information**

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