



# JACE-NXS

## MOUNTING & WIRING GUIDE

This document covers the mounting and wiring of the Vykon® JACE-NXS series controller. It assumes that you are an engineer, technician, or service person who is performing control system installation. Instructions in this document apply to the following products:



Models	Description
JACE-NXS-R2	JACE-NXS controller with 40GB hard drive storage, Niagara Release 2 software, and a LOGO!Power universal input power supply module. Both JACE-NXS and power supply module are DIN-mountable.
J-NXS-AX-HD	JACE-NXS controller with 40GB hard drive storage, NiagaraAX software, and a LOGO!Power universal input power supply module. Both JACE-NXS and power supply module are DIN-mountable.
J-NXS-AX-FL	JACE-NXS controller with 1GB CompactFlash storage, NiagaraAX software, LOGO!Power universal input power supply, both modules DIN-mountable. Includes the following <i>additional</i> option (2 modules): NXS-UPS <sup>1</sup> : SITOP DC-USV-Modul 15: 24Vdc UPS module, DIN-mountable, plus: SITOP Power Battery 24V/1.2Ah module for UPS, DIN-mountable.

1. Standard on J-NXS-AX-FL model. You can also use an NXS-UPS option for any hard-drive based JACE-NXS model.



**Note** Complete details for mounting and wiring the companion LOGO!™ Power and SITOP® modules listed above (power supply, NXS-UPS and battery) are furnished in separate documents, shipped with each module. They are covered in this document only as applied to using them with the JACE-NXS.

Not covered in this document is the Niagara<sup>AX</sup> or Niagara® R2 software installation and configuration required for a fully functioning unit. This includes setting host IP address and password, as well as other parameters. Refer to the appropriate JACE-NXS “Startup Guide” for this information.

These are the main topic sections in this document:

- [Product Description](#), page 2
- [Preparation](#), page 4
- [Precautions](#), page 4
- [Mounting](#), page 6
- [Wiring Details](#), page 11
- [Status LEDs](#), page 18
- [Power Up and Initial Checkout](#), page 18

Also included are several appendixes, as follows:

- [Maintenance](#), page 19
- [Replacement Parts](#), page 25
- [Certifications](#), page 28

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## Product Description

The Vykon JACE-NXS (**J**ava **a**pplication **c**ontrol **e**ngine) is an ultra-compact, 24Vdc-powered, industrial PC platform, designed for DIN rail mounting. It provides integral control, supervision, and network management solutions for wide variety of networked field devices. The fanless design of the JACE-NXS incorporates an Intel® 650 Mhz Celeron® processor and 512MB of system RAM. The OS is Microsoft® Windows® XP Embedded, using either 1GB CompactFlash or a 40GB hard drive for storage (depending on model).

The JACE-NXS uses DIN-mountable modules for power and UPS backup—refer to [Table 1](#) for a summary and description of onboard communications ports.

**Table 1 JACE-NXS features and options**

Model	Description	Ports / Notes
JACE-NXS	Any model JACE-NXS, DIN-mountable, with 512MB RAM, and Windows XP Embedded OS pre-installed. Includes brackets for alternate panel mounting. For 24Vdc operation only, using supplied power supply, described below.  LOGO!Power 24V/4A universal input power supply module: 100–240Vac, 47–63 Hz input, 24Vdc output, 90W power supply module, DIN-mountable	2 - 10/100 MB Ethernet, RJ-45 1 - RS-232 Serial, DB-9 male 1 - RS-485 Serial, 3-pos. plug 1 - FTT-10A LON, 2-position plug 4 - USB (2.0)
NXS-UPS option (standard with J-NXS-AX-FL)	Includes SITOP DC-USV-Modul 15: 24Vdc output UPS (uninterruptable power supply) module, DIN-mountable, with communications to JACE-NXS for power monitoring. Includes/requires battery module, below. Connects to a USB port on the JACE-NXS.	Recommended in all cases, and included/required if a CompactFlash-based J-NXS-AX-FL. Includes two separate SITOP modules, described at left.
	Includes SITOP Power Battery 24V/1.2Ah module, DIN-mountable, use with SITOP DC-USV-Modul 15.	

Although the normal operating mode for a JACE-NXS is “headless,” an onboard DVI/VGA port supports connection to a CRT or LCD monitor (providing it has a DVI interface). A local console also requires connection of a USB-type keyboard and mouse to the JACE-NXS USB ports.

## Windows Notes

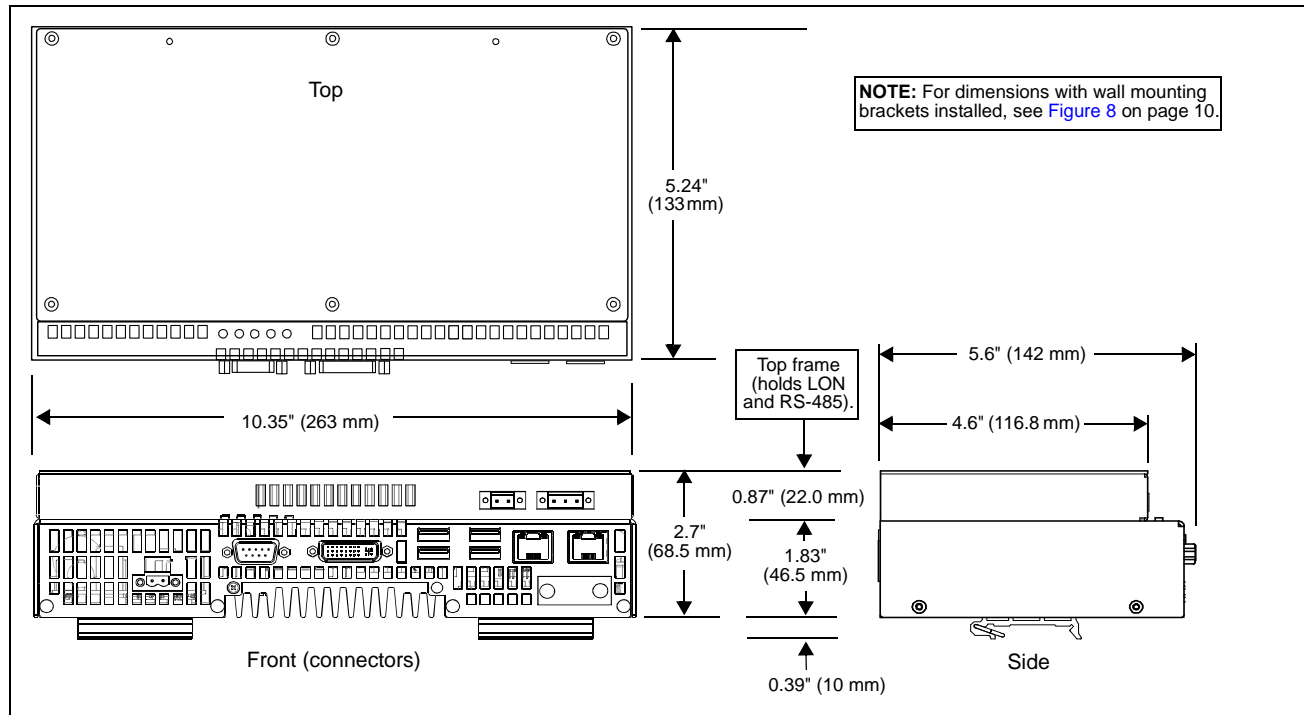
Regardless of JACE-NXS model, Windows “XP Embedded” is pre-installed on CompactFlash (J-NXS-AX-FL) or a hard drive (J-NXS-AX-HD, JACE-NXS-R2). No Windows CD is included. However, a “Certificate of Authenticity” sticker is attached near the model number label.

Windows XP Embedded supports a “local desktop environment,” meaning the attachment of a keyboard, mouse, and monitor. However, typical Windows access is done using a Microsoft “Remote Desktop” client connection to the unit, as all models of JACE-NXS are factory-configured to support this. For related details, see [“Local Console,”](#) page 10.

## Dimensions

Figure 1 shows dimensions of the JACE-NXS ready for DIN-mounting.

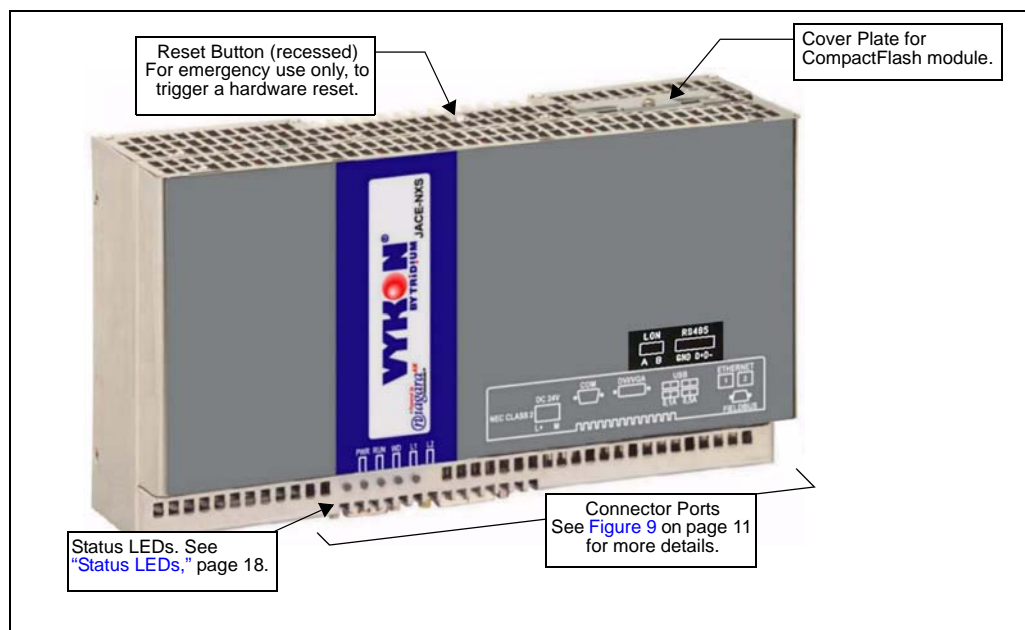
**Figure 1** Dimensions of the JACE-NXS.



## JACE-NXS Layout

Figure 2 shows the location of important features of the JACE-NXS, as oriented in its typical mounting position.

**Figure 2** Layout of JACE-NXS features.



## Preparation

Unpack the JACE-NXS and inspect the contents of the package 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 Module”](#) on page 27.

### Included in this Package

Included in this package you should find the following items:

- a JACE-NXS
- a **packing slip**, which lists the factory settings for IP address, machine name, and host login.
- This *JACE-NXS Mounting & Wiring Guide* document, Part Number 10729 Rev 2, *Updated: November 9, 2010*
- a hardware bag including the following:
  - One USB cable strain-relief bracket, with Torx T20 mounting screw.
  - Two panel/wall mounting brackets, with Torx T20 mounting screws.
  - One 2-position screw terminal plug, with locking screws, for 24Vdc power.
  - One 3-position screw terminal plug, for RS-485 port.
  - One 2-position screw terminal plug, for LON FTT-10.

### Material and Tools Required

The following supplies and tools are required for installation:

- a LOGO!Power 24V/4A DC power supply, DIN-mountable (included in separate package)
- if a J-NXS-AX-FL model (optional for other models), an NXS-UPS option consisting of two modules:
  - UPS module: SITOP DC-USV-Modul 15
  - Battery module: SITOP Power Battery 24V/1.2Ah
- Inline **fuse holder** (Bussmann # HRF or # HMF or equivalent) **and compatible 4A**, 32V, fast-acting **fuse** (Bussmann type # SFE-4 or equivalent).
- Suitable enclosure for housing the JACE-NXS and other modules, as applicable.
- 35mm DIN rail(s) for mounting the JACE-NXS and other modules, as the recommended method.
- Suitable tools and supplies for mounting enclosures, JACE-NXS and other modules, and for making all wiring terminations.



#### Note

The following *non-standard* tools may be needed: **Torx T20 screwdriver**, for mounting USB strain-relief bracket, and panel/wall mounting brackets (optional). **Other Torx drivers (T8, T10)** may be needed later if performing maintenance, and covers must be removed.

## 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.

Precautions are grouped into the following three categories:

- [Safety Precautions](#)
- [Static Discharge Precautions](#)
- [General Precautions](#)

## Safety Precautions

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

**Warning**

- **A 120Vac or 240Vac circuit powers the 24Vdc module (Power Supply) powering the JACE-NXS. 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.**
- **This device is only intended for use as a monitoring and control device. To prevent data loss or equipment damage, do not use it for any other purpose.**

## Static Discharge Precautions

Static charges produce voltages high enough to damage electronic components. The microprocessors and associated circuitry within a JACE-NXS controller are sensitive to static discharge. The following items are cautionary notes that will help prevent equipment damage or loss of data caused by static discharge.

**Caution**

- **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 printed circuit boards (PCBs) without proper protection against static discharge. Use a wrist strap when handling PCBs. The wrist strap clamp must be secured to earth ground.**

## General Precautions

**Caution**

Do not install any expansion options (memory, PC/104 modules) apart from those already in the device, or this will void the warranty for the JACE-NXS. Note that the JACE-NXS already contains the maximum amount of allowable system RAM, at 512 MB.

## Mounting



- Notes**
- This product is intended for indoor use only. The unit should not be exposed to ambient conditions outside of the range of:
    - Humidity: 5 to 80% at 25°C (77°F), non-condensing
    - Temperature: 0°C (32°F) to 50°C (122°F) if CompactFlash (base) model, or 5°C (41°F) to 40°C (104°F) if hard drive option.
  - Mechanical ambient conditions are as follows:
    - Vibration, in operation:
      - Flash-based model: 10 to 58 Hz: 0.075 mm, 58 to 500 Hz: 9.8 m/s<sup>2</sup>;
      - with hard drive option and DIN mounting: none permitted;
      - with hard drive option and wall mounting: 10 to 58 Hz: 0.035mm; 58 to 200 Hz: 4.9 m/s<sup>2</sup>
    - Resistance to shock, in operation:
      - Flash-based model: 150 m/s<sup>2</sup>, 11 ms;
      - with hard drive option: 50 m/s<sup>2</sup>, 30 ms
  - A minimum clearance of 3.94" (100mm) is required around all four sides of the JACE-NXS, between any other devices and/or sides of the enclosure. See [“Space Requirements,”](#) page 7.
  - Mounting orientation is strongly recommended to be horizontal only, with connectors at bottom, to maximize heat dissipation.

The following sections provide more details:

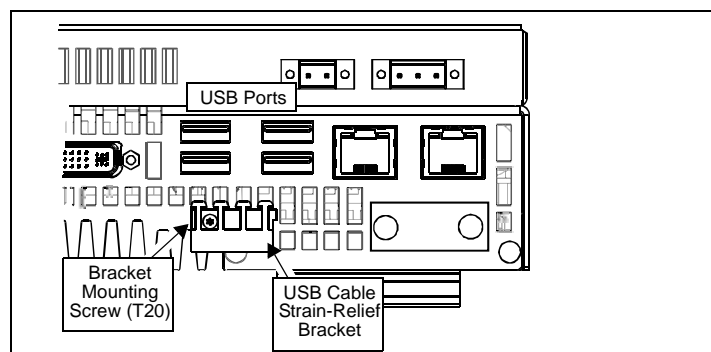
- [USB Strain-Relief](#)
- [Space Requirements](#)
- [DIN Rail Mounting](#)
- [Wall Mounting](#)

### USB Strain-Relief

A strain-relief bracket is included in the JACE-NXS hardware bag, for use with USB cables. Once mounted to the unit, you can secure USB cables to the bracket using cable tie-wraps (not supplied). Securing cables to the bracket helps prevent accidental detachment from the USB ports.

Use one of the provided pan-head screws (Torx T20 head) to mount the bracket below the ports. See [Figure 3](#).

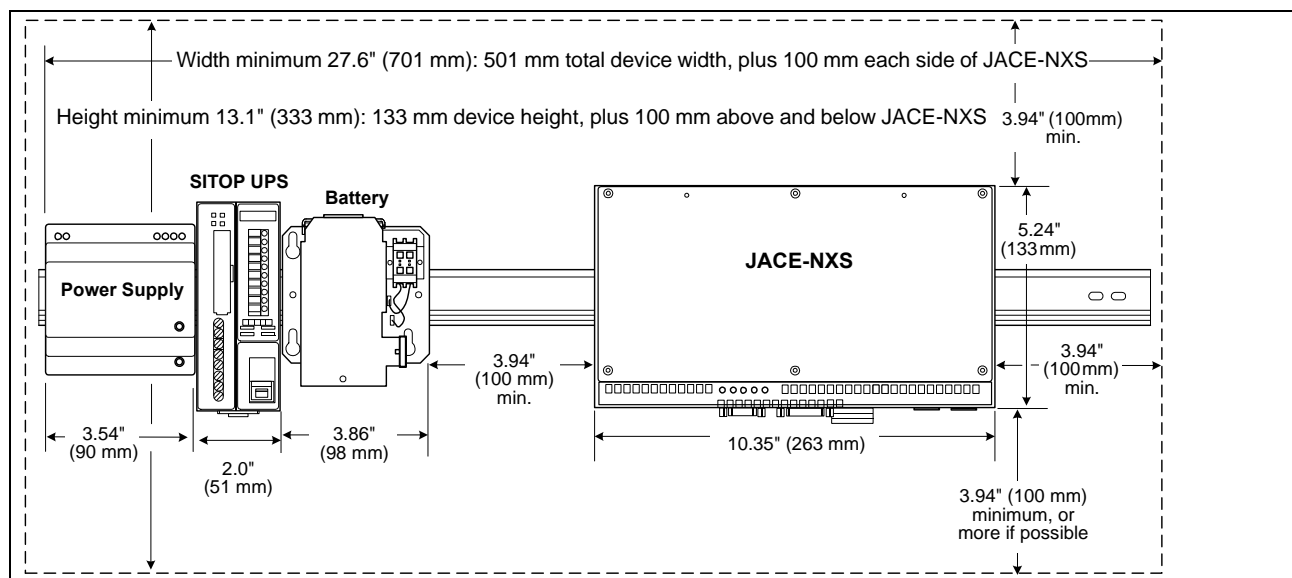
**Figure 3** USB cable strain-relief bracket.



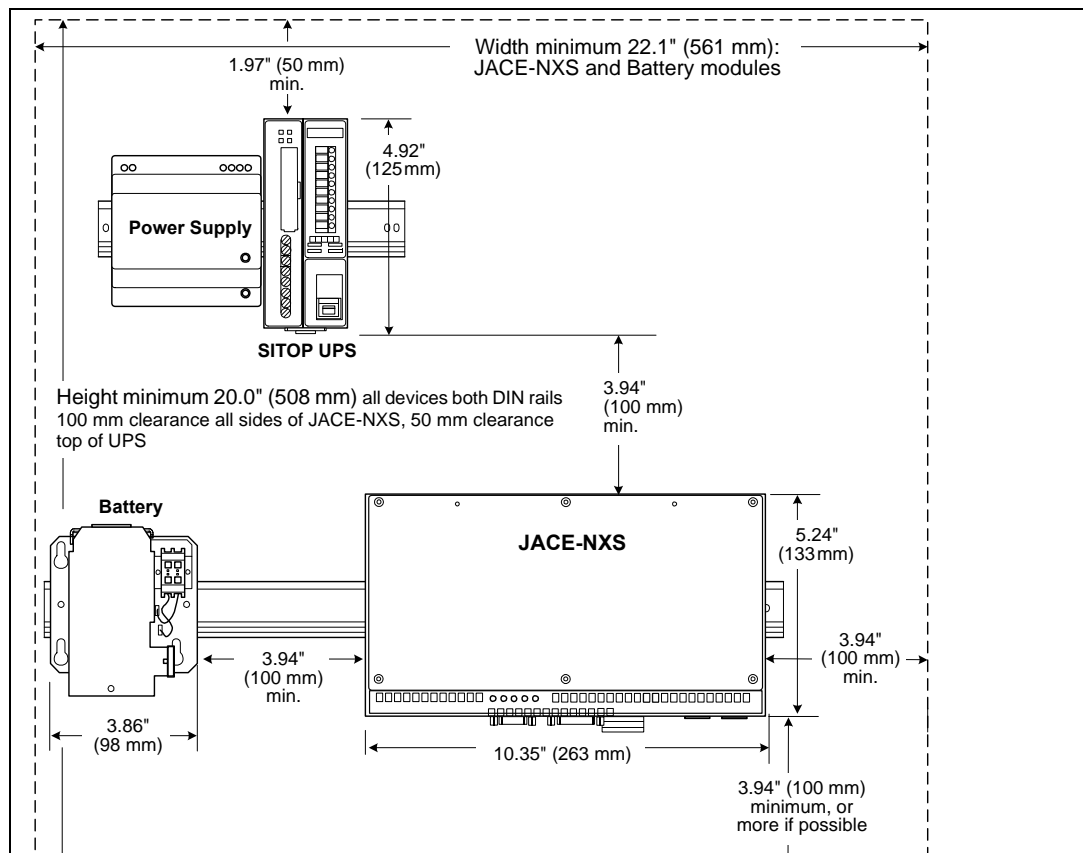
## Space Requirements

A typical installation includes the power supply module, and NXS-UPS (UPS module and battery module). Depending on the enclosure space available, mount the JACE-NXS and other modules on either a single DIN rail, as shown in [Figure 4](#), or on two DIN rails, as shown in [Figure 5](#) (preferred) or in [Figure 6](#).

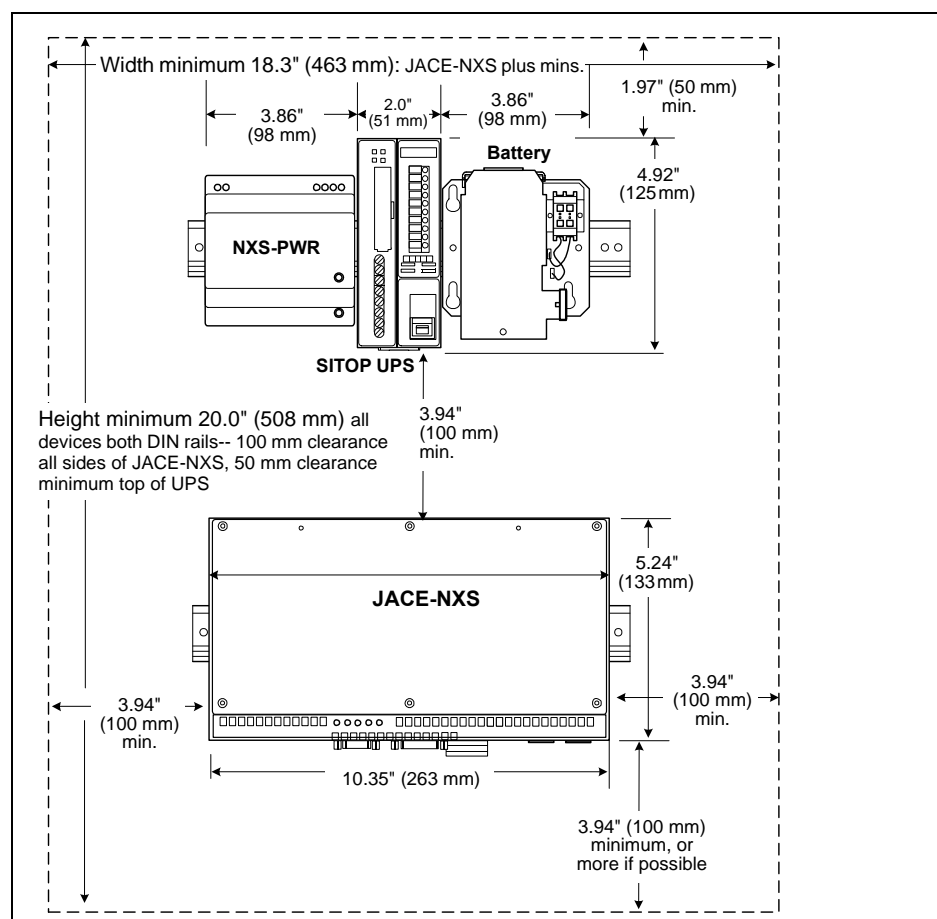
**Figure 4 Single DIN-rail mounting of all devices.**



**Figure 5 Two DIN-rail mounting method A (preferred), JACE-NXS and Battery located below other modules.**



**Figure 6 Two DIN-rail mounting method B (alternate), all modules located above JACE-NXS.**

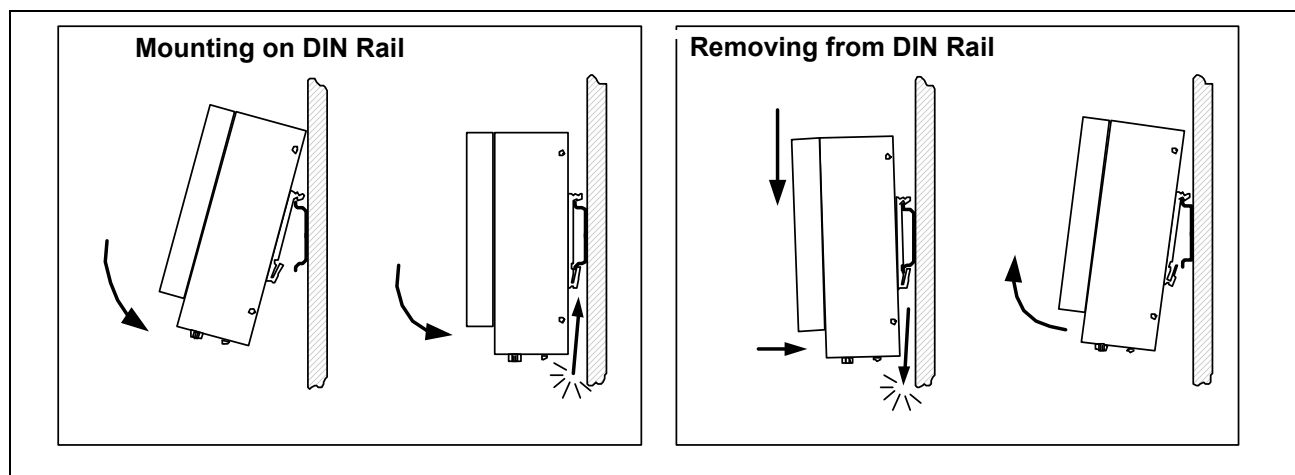


## DIN Rail Mounting

**Procedure 1**      **To mount on DIN rail.**

- |               |   |
|---------------|---|
| <b>Step 1</b> | Position the JACE-NXS on the DIN rail, tilting to hook clamps over the top edge of the rail ( <a href="#">Figure 7</a> ).   |
| <b>Step 2</b> | Swing the device down fully onto the DIN rail, until both clamps completely latch.  |
| <b>Step 3</b> | Mount other modules (Power Supply, NXS-UPS, Battery) onto DIN rail in the same fashion—see the installation document shipped with each module for complete details. |
| <b>Step 4</b> | If needed, secure devices with DIN rail end-clips provided by the DIN rail vendor.  |



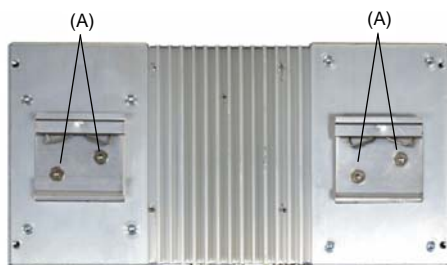
**Figure 7** JACE-NXS mounting details.

## Wall Mounting

To mount the JACE-NXS on a wall, remove the factory-installed DIN-rail mounting clamps from the back of the device, and install the mounting brackets with the Torx T20 (M4 x 6mm) screws provided in the hardware bag. [Procedure 2](#) provides step-by-step instructions for installing the brackets.

### Procedure 2 To replace DIN-mount clamps with wall mount brackets.

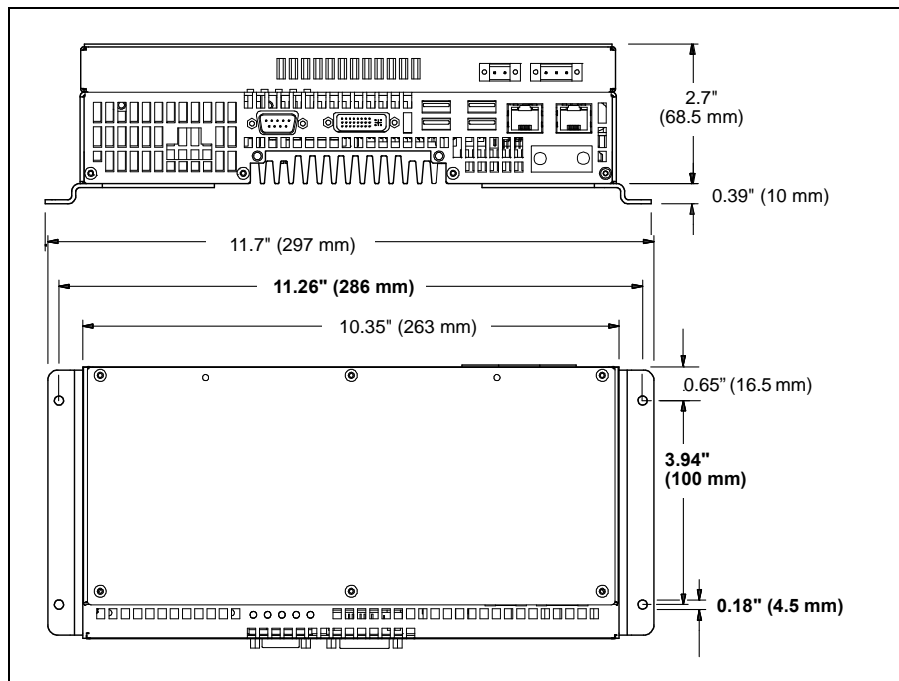
**Step 1** At the back of the unit, remove the four screws (A) securing the two DIN brackets, as shown below.



**Step 2** Install the wall mount brackets using the supplied pan-head screws into the mounting holes, using four screws in each bracket, as shown below.



**Step 3** See [Figure 8](#) for dimensions with wall mount brackets installed.

**Figure 8 JACE-NXS dimensions with wall mounting brackets.**

When mounting, ensure that a *minimum* of 3.94" (100 mm) clearance is maintained on all sides of the JACE-NXS from other devices and/or enclosure walls. See ["Space Requirements,"](#) page 7 for more details.

## Local Console

Typically, for initial software installation and commissioning, you access the JACE-NXS *remotely*, using NiagaraAX or Niagara R2 software (Workbench platform connection or Admin Tool, respectively). In the case of applying Windows updates or making Windows security setting changes, you connect remotely using the Microsoft "Remote Desktop" software. See the appropriate JACE-NXS *"Install & Startup Guide"* for further details.

However, in some cases you may need a "local console" attached to the JACE-NXS, that is a keyboard, mouse, and monitor. One example is after [replacing the backup battery](#), to re-enter the BIOS setup data that was lost. Note that access of the BIOS setup of a JACE-NXS is not possible over a network connection.

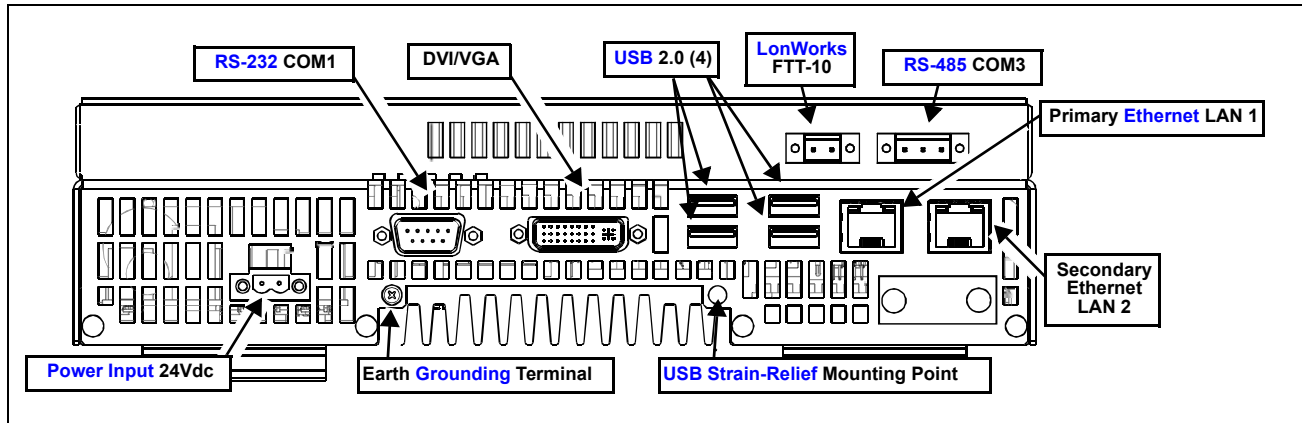
Please note the following about using a local console with the JACE-NXS:

- A USB type keyboard and mouse is required (no PS/2 type connectors).
- A DVI-capable display is needed, or a DVI-to-VGA adapter and a VGA monitor combination that has been tested to work with the JACE-NXS.
- After attaching these items to the JACE-NXS, you must reboot the unit for local console operation.

## Wiring Details

All wiring is made to the front of the JACE-NXS—when mounted, this is the *bottom* of the unit. See [Figure 9](#) for a layout of connectors. Allow suitable slack for removing unit from DIN rail with wiring still connected.

**Figure 9** JACE-NXS Connectors.



Make connections to the JACE-NXS in the following order:

1. Connect an earth grounding wire to a nearby earth grounding point, and to the earth ground screw (Phillips head) on the JACE-NXS. See the “[Grounding](#)” section on page 12 for details.
2. Connect a standard USB A–B type cable between the NXS-UPS (if used) and one of the USB ports on the JACE-NXS. Note that the UPS module must specifically be configured. See “[USB to NXS-UPS](#),” page 13.
3. Prepare the 24Vdc power source. The LOGO!Power 24V/4A module is typically used for 24Vdc power. In most cases, two additional modules are used for UPS backup operation during AC power outages: the SITOP DC-USV-Modul 15 (UPS) and SITOP battery module. See the “[Power Input](#)” section on page 14.
4. Connect the Ethernet cable. The JACE-NXS provides two (2) auto-sensing 10BASE-T or 100BASE-TX (RJ-45) connectors. **Use the left RJ-45 connector** as the primary port—see [Figure 9](#). Make this connection to your LAN (local area network).
5. Other connectors include an RS-232 serial port (DB-9 connector, COM1) and an RS-485 serial port (3-position, COM3). Both ports can be used to support serially-connected integrations. In addition, the LON port supports connection to a LonWorks 78-Kbaud free topology (FTT-10) network, using the two-pin connector plug. Wiring is polarity insensitive.

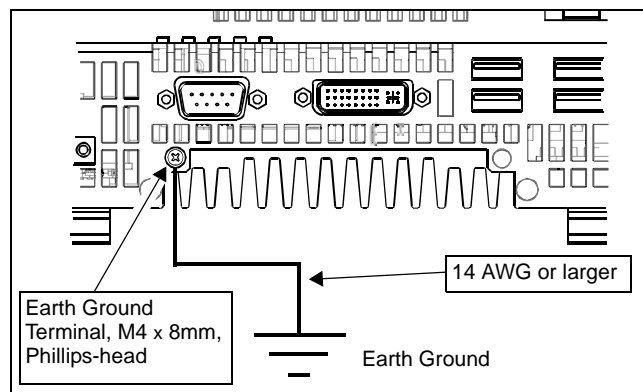
Further wiring details are provided in these subsections:

- [Grounding](#), page 12
- [USB](#), page 12
- [Power Input](#), page 14
- [Ethernet](#), page 16
- [RS-232](#), page 17
- [RS-485](#), page 17
- [LonWorks](#), page 17

## Grounding

Connect a wire from a nearby earth ground to the protective earth terminal (Phillips-head screw, M4 x 8mm) on the JACE-NXS (see [Figure 10](#)). Minimum wire gauge (cross section) is 14 AWG (2.5mm<sup>2</sup>).

**Figure 10** Connect earth ground using grounding wire to grounding lug.



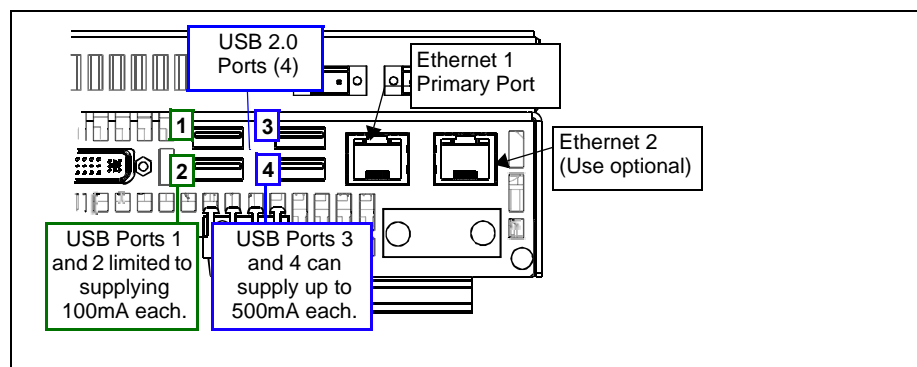
Keep this grounding wire as short as possible.

## USB

Four USB 2.0 ports are available, and are labeled “1”, “2”, “3,” and “4”—see [Figure 11](#).

- Ports 1 and 2 are “low current” ports, capable of supplying up to 100 mA (0.1A).
- Ports 3 and 4 are “high current” ports, capable of supplying up to 500 mA (0.5A).

**Figure 11** USB, Ethernet, and RS-485 ports.



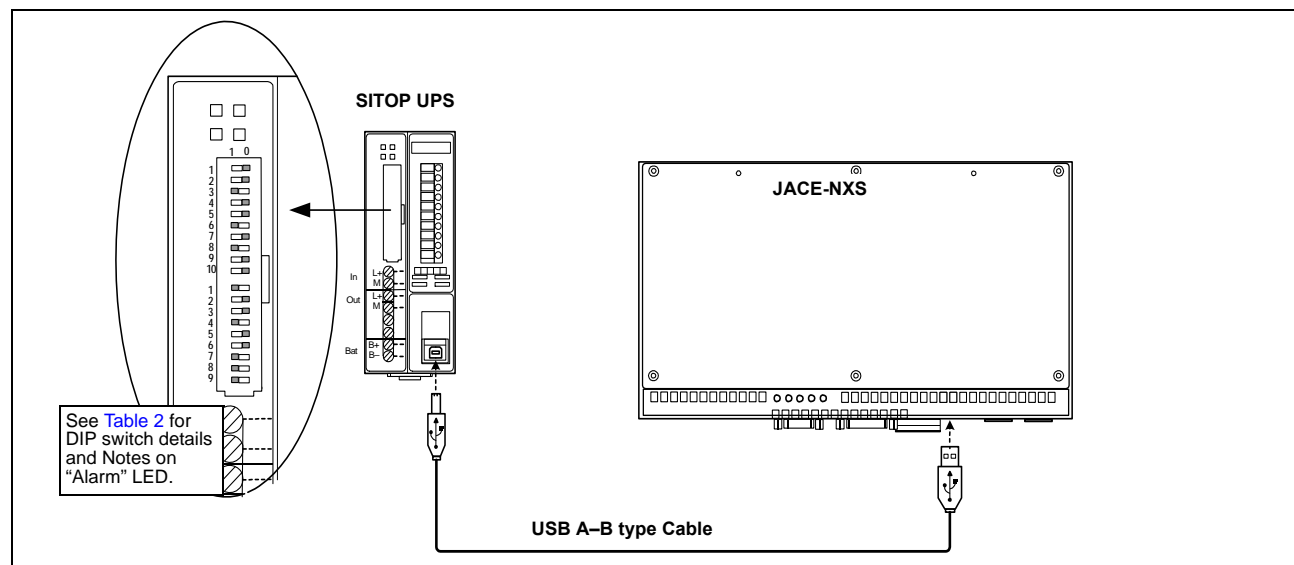
The typical application for a USB port is for communications to a NXS-UPS. See the “[USB to NXS-UPS](#)” section on page 13.

USB ports can also be used with a USB-type PC keyboard and PC mouse, if a local console is needed. Note that the JACE-NXS must be rebooted after attaching a PC keyboard for it to be operational.

## USB to NXS-UPS

If installed with the NXS-UPS modules, connect a USB “A–B type” cable between the SITOP UPS and one of the USB ports on the JACE-NXS (any one). In addition, you must set the DIP switches on the NXS-UPS to specific positions, for operation with Niagara software. See [Figure 12](#) and [Table 2](#).

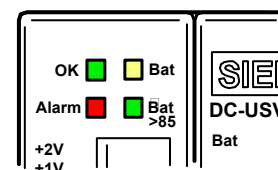
**Figure 12** USB to NXS-UPS connections.



**Table 2** DIP switch settings on SITOP UPS for use with JACE-NXS, notes on UPS “Alarm” LED.

NXS-UPS DIP Switch		Default/Recommended Setting
Switch	Pos. (0=Off)	
1	0	Sets cut-in threshold to 22.5 volts. If the input voltage drops below this value, the UPS module switches into buffer mode, supplied solely by the battery.
2	0	
3	1 (On)	
4	0	Sets end-of-charge voltage to 27.0 volts. This is the recommended voltage using the associated battery module around a 25°C (77°F) operating temperature.
5	0	
6	1 (On)	
7	0	
8	1 (On)	Sets charging current to 0.7A. Charging of the battery module continues until end-of-charge voltage is reached.
9	0	
10	0	Set to deactivate after buffering time reached.
1	1 (On)	
2	0	
3	0	
4	1 (On)	
5	0	
6	0	
7	1 (On)	
8	1 (On)	
9	1 (On)	
		Sets buffering time to 95 seconds.
		Set to 5 second disconnect at end of buffering time.
		Battery in ON state (as an alternative, jumper terminals X2.9–X2.10). This provides a way to disconnect the battery.

### Notes on UPS Alarm LED and SITOP battery module



If the red Alarm LED flashes in a 2 second cycle, this typically indicates that batteries in the battery module need replacement.

There are two (2) batteries, both 12V, 1.2Ah, sealed lead acid types with 0.187" faston tabs, such as

- Yuasa NP 1.2-12
  - Rocket ES 1.2-12
- models, or equivalent.

For more details, see the printed installation documents that were shipped with the SITOP UPS module and power battery module.

## Power Input

Review the “[Safety Precautions](#),” page 5. Typically, power wiring involves all modules listed in [Table 3](#).

**Table 3** Power, UPS and battery modules for JACE-NXS.

Module	Description	Notes
Power Supply	LOGO!Power 100–240Vac input, 24Vdc output, 90W power supply module, DIN-mountable.	Mount and wire according to shipped installation document. Also see “ <a href="#">Power Wiring Between Modules</a> ,” page 14.
NXS-UPS	SITOP DC-USV-Modul 15, 24Vdc output UPS (uninterruptable power supply) module, DIN-mountable, with communications to JACE-NXS for power monitoring.	Mount and wire according to shipped installation document. Also see “ <a href="#">USB to NXS-UPS</a> ,” page 13, and “ <a href="#">Power Wiring Between Modules</a> ,” page 14.
	SITOP Power Battery 24V/1.2Ah battery pack module, DIN-mountable, for use with UPS.	Mount and wire according to shipped installation document. Also see “ <a href="#">Power Wiring Between Modules</a> ,” page 14.

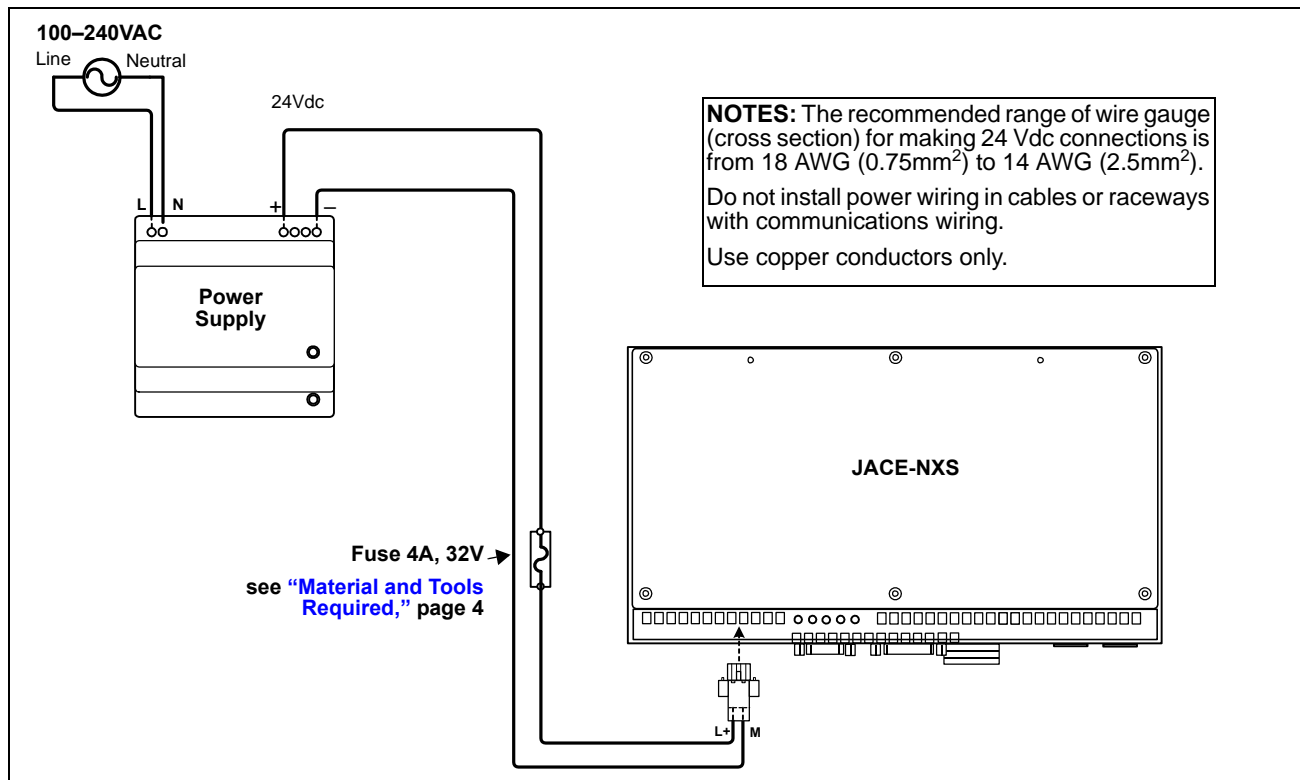
See the following sections for more details:

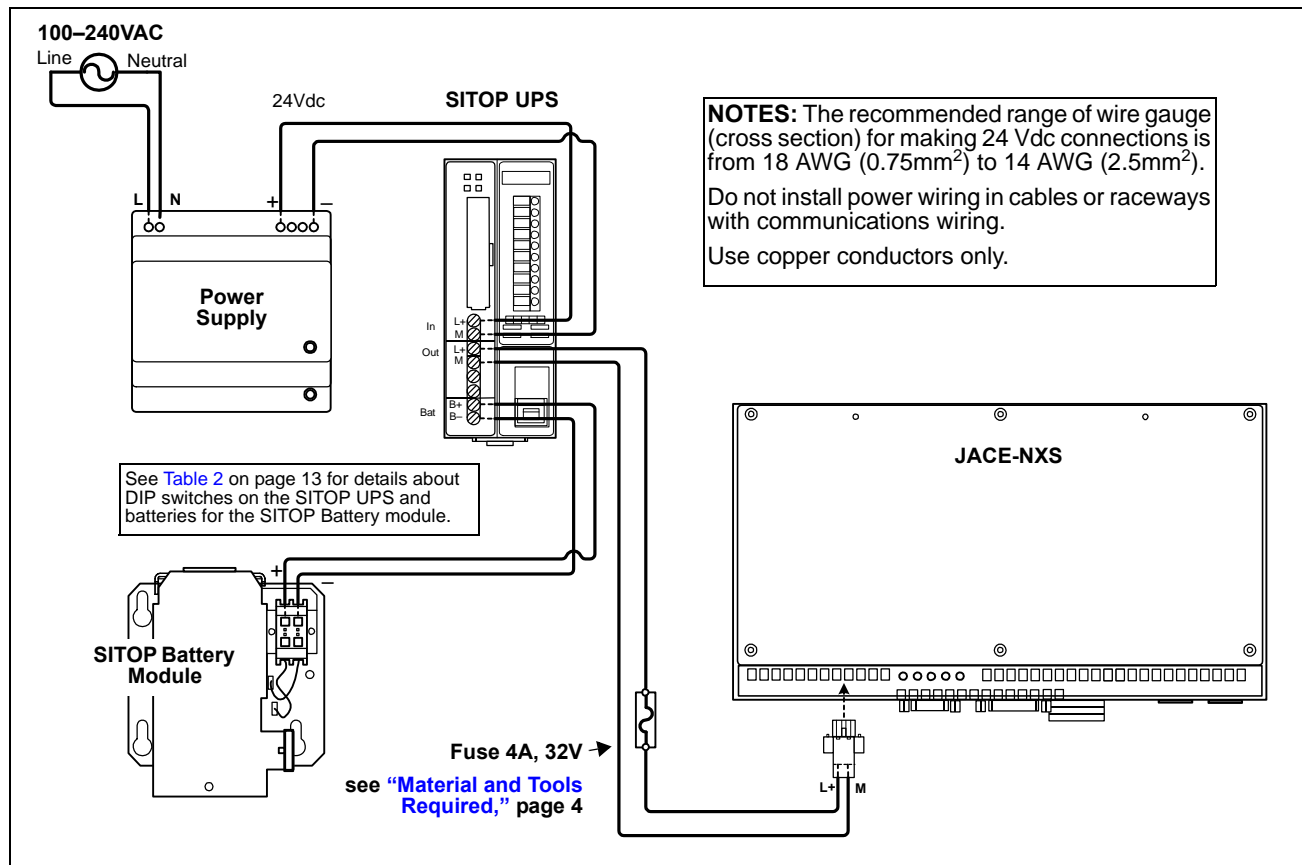
- [Power Wiring Between Modules](#)
- [Connecting the 24 Vdc Supply](#)

## Power Wiring Between Modules

- [Figure 13](#) shows typical power wiring connections for JACE-NXS *without* the NXS-UPS option.
- [Figure 14](#) shows power wiring connections for the JACE-NXS *with* NXS-UPS option (J-NXS-AX-FL).

**Figure 13** Power-related connections for JACE-NXS without NXS-UPS option.



**Figure 14** Power-related connections between modules for JACE-NXS with NXS-UPS option.

## Connecting the 24 Vdc Supply



### Caution

Before powering the JACE-NXS, note the following:

- Use only the special connector plug supplied with the unit to connect supply voltage.
- The device should only be connected to a 24Vdc power supply that satisfies the requirements of safe extra low voltage (SELV).
- When the device is operated on a wall, in an open rack, or other similar locations, an NEC Class 2 current source must be used for UL requirements (in accordance with UL 60950-1). In all other cases, in accordance with IEC / EN / DIN EN 60950-1, it is necessary to use either a power source of limited performance (LPS - Low Power Source), or use a line-side fuse or line-side power switch. Power needs to be limited to less than 8 A. The recommended fuse rating is 4 A.
- For operation in closed cabinets or fireproofing cabinets (including the operation of a cabinet in accordance with UL508), there are no requirements for current limiting of supply voltage.



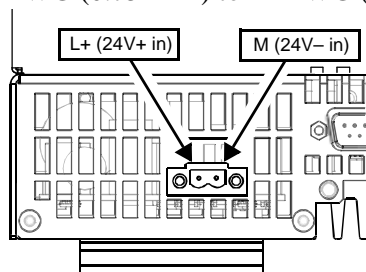
### Note

If the JACE-NXS uses a CompactFlash card, make sure that the card is properly seated before powering the unit. See Figure 2 on page 3 for location of the CompactFlash card cover.

Procedure 3 provides instructions for connecting the 24 Vdc power supply.

**Procedure 3 To connect 24 Vdc power to the JACE-NXS.**

- Step 1** Switch off the power source for the 24 Vdc supply.
- Step 2** Wire the 24 Vdc source (typically from the NXS-UPS “Out” terminals) to the 2-position connector plug included with the JACE-NXS. The power input connector is shown below.
- The recommended range of wire gauge (cross section) for making 24 Vdc connections is from 18 AWG (0.75mm<sup>2</sup>) to 14 AWG (2.5mm<sup>2</sup>).



**NOTES:** Install an inline, **4A, 32V** fast-acting **fuse** on the “L+” wiring to the JACE-NXS. See [Figure 13](#) and [Figure 14](#).

Do not install power wiring in cables or raceways with communications wiring.

Use copper conductors only.

- Step 3** Insert the power connector plug into the JACE-NXS.
- Step 4** When finished making other wiring connections, restore the power source to the 24 Vdc supply.

## Ethernet

Two, female RJ-45, 10/100-Mbit Ethernet ports are provided on the JACE-NXS, numbered “1” and “2.” The 1 (left) port is the primary Ethernet port. See [Figure 11](#) on page 12.



**Note** Typically, you *only use the left* (primary port), unless you have a specific application for isolating a driver’s network traffic to a separate IP address (and LAN) using the right port. The packing slip accompanying the JACE-NXS will provide the “factory-shipped” IP settings for both Ethernet ports. Refer to the *appropriate* NiagaraAX or Niagara R2 “startup guide” for details on changing IP address.

Use a standard Category 5 Ethernet patch cable for connecting to a hub or Ethernet switch on the LAN. The maximum end-to-end distance from the controller to the hub is 328 feet (100m).



**Note** The JACE-NXS is *not* a “hub” that can forward Ethernet packets between attached segments.

Each Ethernet port has two LEDs:

- Link (Green): Remains lit whenever an Ethernet link is established.
- Activity (Yellow): Lit with blinking to indicate activity on the LAN.

Also see “[Status LEDs](#),” page 18.



## RS-232

A standard RS-232 serial port uses a DB-9 male connector, and is labeled “COM” (see [Figure 9](#) on page 11). It operates as COM1 in software. A standard “null-modem” cable can be used to communicate to another DTE device, or a “straight-through” cable can be used to communicate to a DCE device, such as a modem.



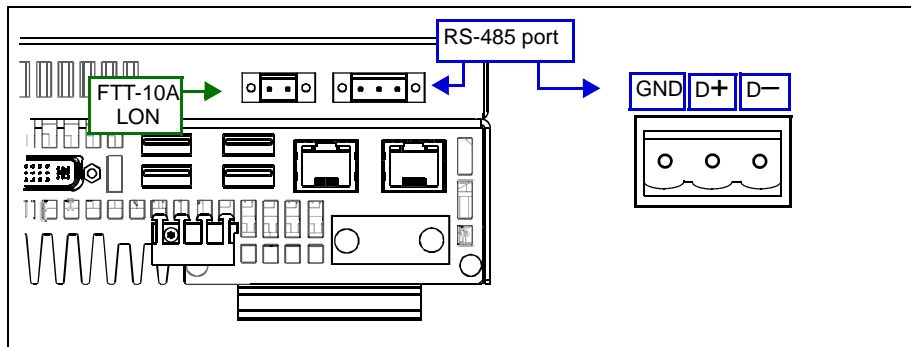
### Note

Use only shielded cable for any RS-232 connection, such as available with a standard (pre-fabricated) straight-through or null-modem cable. If fabricating a cable, connect the shield (drain) wire to the DB-9S (socket) connector shell at the JACE end only—do not connect the drain wire at the other end.

## RS-485

An RS-485, optically isolated port uses a 3-position, screw terminal connector and always operates as COM3<sup>1</sup>. Wire to this connector with shielded 18-22AWG wiring (refer to the TIA/EIA-485 standard). As shown in [Figure 15](#), the RS-485 screw terminals (from left-to-right) are shield (GND), Data plus (+), and Data minus (–).

**Figure 15** RS-485 port (COM3) pinouts



## LonWorks

A single, two-pin, male LonWorks FTT-10A connector port and wiring plug is available (see [Figure 15](#)). This connection supports twisted pair, unshielded, polarity-insensitive, peer-to-peer communications at 78 Kbps.

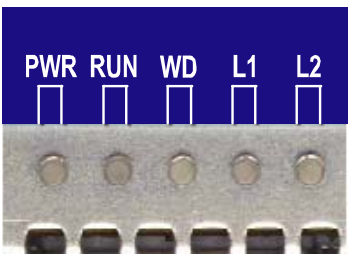
Refer to the *LonWorks FTT-10A Free Topology Transceiver User's Guide* (078-0156-01F) for technical guidelines associated with free topology restrictions, and the *Junction Box and Wiring Guidelines for Twisted Pair LonWorks Networks* (005-0023-01) for more detailed information on wiring specifications. These documents are available on Echelon's web site ([www.echelon.com](http://www.echelon.com)).

1. Revisions of this document prior to August 29, 2007 incorrectly stated COM2 for the RS-485 port.

## Status LEDs

The JACE-NXS has five LEDs located above the DB-9 COM1 port, as described in [Table 4](#) below.

**Table 4** Status LEDs.

Status LEDs	Label	Meaning	LED	Description
	PWR	Power Supply	Off	Isolated from supply voltage.
			Yellow	Supply voltage available.
	RUN	Operation	Off	No access to PCI bus.
			Green	Access to PCI bus, onboard, and ISA peripherals.
	WD	Watchdog status display	Off	Watchdog disabled (normal configuration).
			Green	Watchdog enabled, monitoring time not expired.
			Red	Watchdog enabled, monitoring time expired.
	L1	LED 1	Yellow	Not currently used (normally Off).
	L2	LED 2	Yellow	Not currently used (normally Off).

During typical operation, only two of the LEDs above are illuminated: PWR (yellow) and RUN (green).

## Power Up and Initial Checkout

Once you have installed the JACE-NXS and completed all wiring, power on the unit. See “[Connecting the 24 Vdc Supply](#),” page 15. Verify that the PWR and RUN [Status LEDs](#) light and remain lit.



- Notes**
- Windows takes up to 1-1/2 minutes to load on the JACE-NXS.
  - Once the operating system has been successfully loaded, you can commission the JACE over the network using the appropriate Niagara host platform tool. This is the recommended method to access any JACE controller. For example, see the *JACE-NXS NiagaraAX Install and Startup Guide*.
  - A JACE-NXS can also be accessed over a LAN using a networked Windows PC and a Remote Desktop Connection (Windows Terminal Services).

## Related Documentation

For more information on configuring and using the JACE-NXS controller, consult the following documents:

- JACE-NXS with Niagara<sup>AX</sup>
  - *JACE-NXS NiagaraAX Install and Startup Guide*
  - *NiagaraAX Platform User Guide*
  - *NiagaraAX User Guide*
- JACE-NXS with Niagara R2
  - *JACE-NXS Niagara R2 Install and Startup Guide*
  - *Using the Niagara Admin Tool*
  - *Niagara Standard Programming Reference*

# Maintenance

Tools needed when opening and working in the JACE-NXS include the following:

- Front cover and top cover plates: **Torx T8** driver
- Protective earth terminal: Phillips-head driver



**Note** Remove power from the JACE-NXS before beginning any maintenance.

As needed, use the following procedures to perform maintenance tasks on the JACE-NXS controller:

- [Open the device \(front panel\)](#), page 19
- [Replacing the backup battery](#), page 20
- [BIOS Setup](#), page 21



**Note** For units installed with the NXS-UPS and Battery modules, maintenance may require replacement of the two (2) sealed lead acid batteries in the Battery module. See the section “[USB to NXS-UPS](#),” page 13, including [Table 2](#) notes about the UPS “Alarm” LED and replacement battery models.

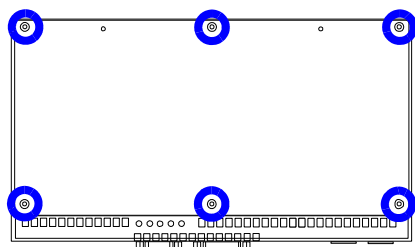
## Open the device (front panel)



**Caution** The JACE-NXS contains electronic components that are vulnerable to static discharge. Therefore, take precautionary measures before opening the device. See “[Static Discharge Precautions](#),” page 5.

### Procedure 4 To open the JACE-NXS front panel

**Step 1** Remove the six Torx T8 screws, setting them aside.



**Step 2** Remove the front panel.



**Note** To close the device, simply realign the front panel on the frame, and refasten the six Torx T8 screws.

## Replacing the backup battery

The JACE-NXS is equipped with a 3.0Vdc Lithium backup battery (part number 10737). The battery provides back-up power to buffered SRAM, the real-time clock, and the CMOS data area that stores BIOS setup.



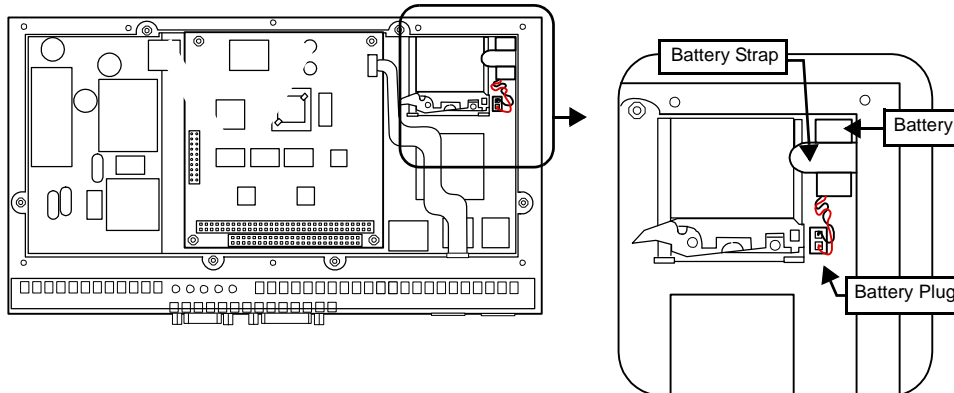
- Notes**
- The life span of the backup battery is approximately 3–5 years, depending on the operating conditions.
  - After physically replacing the backup battery, you must re-enter certain [BIOS Setup](#) information. A [local console](#) (at minimum, a USB keyboard and DVI-capable display) must be connected to the JACE-NXS in order to do this. For more details, see “[BIOS Setup](#),” page 21



- Caution**
- Risk of damage!  
The lithium battery may only be replaced with an identical battery or with a type recommended by the manufacturer (order part 10737, see “[Standard Replacement Parts](#),” page 25).
  - Depleted batteries must be disposed of in accordance to local regulations.

### Procedure 5 To replace the backup battery

- Step 1** Run BIOS setup on the JACE-NXS, recording the current settings. Power the unit off when done.
- Step 2** [Open the device \(front panel\).](#)
- Step 3** Pull out the battery plug (see below).



- Step 4** Carefully bend up the battery strap, and remove the battery.
- Step 5** Insert the new battery in the same location, and secure it by bending down the battery strap.
- Step 6** Insert the new battery plug into the battery socket—note that the connector is keyed to prevent incorrect polarity.
- Step 7** Close and refasten the front panel.
- Step 8** Attach a local console to the JACE-NXS (USB keyboard, DVI-capable display).
- Step 9** Restore power, and allow to boot into BIOS setup. Re-enter BIOS settings to those recorded earlier, or refer to the standard BIOS settings in the appendix of this document.

## BIOS Setup

The BIOS Setup program is in ROM of the JACE-NXS. When run, it stores the BIOS configuration for the JACE-NXS in on-board, battery-backed SRAM. This is part of the factory preparation for a JACE-NXS. Generally, you should not change anything in the BIOS setup of a JACE-NXS. However, after [replacing the backup battery](#), you may need to re-enter several settings from defaults.



**Note** If you do make changes in BIOS setup, record them for re-entry after a future battery replacement.

### Procedure 6 To run BIOS Setup on a JACE-NXS.

- Step 1** Attach a [local console](#) to the JACE-NXS.
- Step 2** Reset the device (warm or cold restart).
- Step 3** With the default settings in effect, you should see a screen similar to below:

```
Phoenix BIOS 4.0 Release 6.0 A5E000xxxxx-ES0x
Copyright 1985-2004 Phoenix Technologies Ltd. All Rights Reserved
SIMATIC Tridium PC 420 xx.xx.xx

CPU = Intel® Celeron CPU 650 MHz
```

Within a few seconds, after completing the POST, a message similar to below appears:

```
639K System RAM Passed
503MB Extended RAM Passed
256KB Cache SRAM Passed
System BIOS Shadowed
Video BIOS Shadowed

Press <F2> to enter SETUP or <ESC> to display the boot menu
```

- Step 4** Press the **F2** key to enter BIOS Setup.
- Step 5** BIOS Setup provides these selectable categories:
  - **Main** System functions are set here.
  - **Advanced** Extended system functions are set here.
  - **Security** Security functions are set here, for example, a password.
  - **Power** Power-saving functions are set here.
  - **Boot** Boot priority is set here.
  - **Version** Provides technical data about versions of BIOS, boards, firmware, and hardware.
  - **Exit** Used to save and terminate BIOS Setup.
- Step 6** Use the keyboard cursor keys [←] left and [→] right to move between menu categories, and the keyboard cursor keys [↑] up and [↓] down to move between fields. Other “Item Specific Help” is displayed in the right side of any BIOS Setup display.
- Step 7** If restoring from BIOS defaults (say, after replacing the backup battery), enter the necessary non-default settings, either as were previously recorded, or using [Table 5](#) in the next section, “JACE-NXS BIOS Settings.”

- Step 8** From the Exit menu, select either “Exit Saving Changes” (press **F10**) if you made changes, or “Exit Discarding Changes” if you were just reviewing BIOS configuration. The JACE-NXS reboots.
- Step 9** Disconnect the USB keyboard, DVI-capable display, and (if connected) USB mouse.

## JACE-NXS BIOS Settings

Table 5 provides a list of BIOS settings for a JACE-NXS—including those that require settings from “default” values. Default values can become effective if the backup battery goes bad, or whenever the battery is replaced.



**Tip** Print out the table below and keep the pages in a safe place, for future reference.

**Table 5 JACE-NXS required BIOS settings**

Menu	SubMenu	System Parameters	Defaults	JACE-NXS / Notes
Main	—	System Time	hh:mm:ss	You can also set time and date from a NiagaraAX or Niagara connection.
		System Date	MM/DD/YYYY	
		Primary Master	40008 MB	<b>1024 MB</b> (if CompactFlash model), or <i>nnnn</i> MB reflects hard drive size (where Type = Auto)
		Primary Slave	None	Default (None)
		Secondary Master	512 MB	None
		Memory Cache	Write Back	Default (Write Back)
	Boot options	Quick Boot Mode	Enabled	Defaults
		SETUP prompt	Enabled	
		POST errors	All, but not keyboard	
		Summary screen	Disabled	
	Keyboard Features	Num Lock	Auto	Defaults
		Keyboard auto-repeat rate	30/sec	
		Keyboard auto-repeat delay	½ sec	
	Hardware Options	Eth 1 Address	0800068F9DB5	Defaults
		Eth 1 Remote Boot	Disabled	
		Eth 2 Enable	Enabled	
		Eth 2 Address	0800068F9E69	
		Eth 2 Remote Boot	Disabled	
		PCI – MPI/DP	Enabled	
		Boot Display	Auto	
	—	System Memory	640 KB	(Read Only)
		Extended Memory	515072 KB	

**Table 5 JACE-NXS required BIOS settings (continued)**

Menu	SubMenu	System Parameters	Defaults	JACE-NXS / Notes
Advanced	—	Installed O/S	Other	Default
		Reset Configuration Data	No	Default
		Local Bus IDE adapter	Both	Defaults
		Legacy USB support	Enabled	
		Frame Buffer Size	8 MB	
		Memory gap at 15 MByte	Disabled	
		SafeCard functions	Enabled	
		SRAM length and base address	Disabled	
Advanced (continued) PCI Configuration	PCI Device, Slot #1	Option Rom Scan	Enabled	Defaults
		Enable Master	Enabled	
		Latency Timer	0040h	
	PCI Device, Slot #2	Option Rom Scan	Enabled	
		Enable Master	Enabled	
		Latency Timer	0040h	
	PCI Device, Slot #3	Option Rom Scan	Enabled	
		Enable Master	Enabled	
		Latency Timer	0040h	
	PCI Device, Slot #4	Option Rom Scan	Enabled	
		Enable Master	Enabled	
		Latency Timer	0040h	
	PCI/PNP ISA IRQ Resource Exclusion	IRQ 3	Available	Reserved
		IRQ 4	Available	
		IRQ 5	Available	
		IRQ 7	Available	
		IRQ 9	Available	
		IRQ 10	Reserved	
		IRQ 11	Reserved	Defaults
	—	PCI IRQ line 1	Auto Select	
		PCI IRQ line 2	Auto Select	
		PCI IRQ line 3	Auto Select	
		PCI IRQ line 4	Auto Select	
Advanced (continued)	I/O Device Configuration	Internal COM1	Enabled	
		Base I/O address	3F8	
		Interrupt	IRQ 4	
		Internal COM2	Disabled	
		Base I/O address	2F8	
		Interrupt	IRQ 3	

**Table 5** JACE-NXS required BIOS settings (continued)

Menu	SubMenu	System Parameters	Defaults	JACE-NXS / Notes
Security	—	Supervisor Password Is	Disabled	Defaults
		User Password Is	Disabled	
		Set Supervisor Password	Enter	
		Set User Password	Enter	
		Password on boot	Disabled	
		Fixed disk boot sector	Normal	
		Virus check reminder	Disabled	
		System backup reminder	Disabled	
Power	—	Power Savings	Disabled	Defaults
		Hard Disk Timeout	Disabled	
Boot	—	Removable Devices		—
		Hard Drive	+	
		CD-ROM Drive		
Version	—	SIMATIC		(Read Only, may vary slightly from values shown in your JACE-NXS)
		BIOS Version	L08.01.02.2	
		BIOS Number	A5E00292235-ES005	
		Board Revision	V01	
		CPU Type	Celeron (R)	
		CPU Speed	650 MHz	
		CPU ID	06B4	
		Code Revision	0002	



# Replacement Parts

Servicing the JACE-NXS may call for replacement parts. There are three categories of parts:

- [Non-replaceable Parts](#)
- [Standard Replacement Parts](#)
- [Field Replacement Units](#)

Also see the section [“Returning a Defective Module,”](#) page 27.

## Non-replaceable Parts

Other than the parts listed in the replacement parts sections, there are no serviceable components on a JACE-NXS.

## Fuses

There are no replaceable fuses inside a JACE-NXS.

An *external*, inline, 4A 32V fuse should be installed in the “L+” wiring to the power input connector, as shown in [Figure 13](#) on page 14, and in [Figure 14](#) on page 15. See the [“Material and Tools Required”](#) section on page 4.

## Standard Replacement Parts

Standard replacement parts are listed in [Table 6](#) 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.



**Note** Only the originally-supplied CompactFlash card can be used, which is an industrial (high-temperature) rated unit with Windows XP Embedded OS pre-installed, along with core files needed for NiagaraAX. Additionally, CompactFlash cards are not interchangeable between different JACE-NXS units, due to NiagaraAX licensing mechanisms. Use of any other CompactFlash card will void the product warranty.

**Table 6** Standard replacement parts.

Part Number	Description
10737	3V Lithium backup battery assembly, with cable and plug.
10740	Power input connector plug, 2 position
10027	RS-485 connector plug, 3 position (replacement plug is black)
10319	LON connector plug, 2 position
10741	Mounting bracket pair for wall mount.

## Field Replacement Units

To replace faulty equipment, order from the field replacement units (FRUs) listed in [Table 7](#). FRUs listed in [Table 7](#) consist of a JACE-NXS with CompactFlash card (if so equipped), but without mounting brackets.

FRU parts can be ordered from stock, but the removed JACE-NXS must be returned to the factory for credit.



- Notes**
- Before ordering an FRU, it is strongly recommended that you contact your normal technical support resource to eliminate the possibility of a software issue or mis-configuration problem.
  - Be sure to contact Tridium for a return authorization (RA) number (see [“Returning a Defective Module,”](#) page 27) before shipping an item for return credit or repair. To allow proper licensing of the replacement unit, please have information ready about the existing unit, including its serial number, model number, and project licensed to, when placing the order.

**Table 7** Field replaceable parts for JACE-NXS.

Part Number	Description
R-JACE-NXS	FRU, JACE-NXS

To replace an FRU in the field, proceed as follows:



- Caution** Be sure to discharge any accumulated static by touching the metal surface of the JACE before handling connections. See the [“Static Discharge Precautions”](#) section on page 5 for more details.

**Procedure 7** Replacing an FRU.

- Step 1** Using the appropriate NiagaraAX or Niagara software tool, back up the device to your PC, if possible.
- Step 2** Turn the JACE-NXS off and unplug the power cable.
- Step 3** Making sure to first properly label all cables, unplug any Ethernet, LON, serial, and modem cables.
- Step 4** Remove the unit from its DIN mount or mounting by wall brackets.
- Step 5** Remount the replacement unit, reattaching it to its DIN mount or wall brackets.
- Step 6** Reconnect any Ethernet, LON, serial, and modem cables.
- Step 7** Plug the power cable in, turn the JACE-NXS on, and verify normal operation.
- Step 8** Using the appropriate NiagaraAX or Niagara software tool, restore the station database.
- Step 9** Using the Niagara software tool, install the new license file and start the station.

## Returning a Defective Module

For proper credit on the returned unit, ship the defective module to Tridium within 30 days.

Prior to returning the unit, contact one of the following Tridium offices to obtain a return authorization (RA) number and other instructions. Please provide:

- Product model
- Serial number
- Project currently licensed to
- Nature of the defect

### United States

**Phone:** 804-254-7086, ext. 11

**Email for RMA:**

[rma@tridium.com](mailto:rma@tridium.com)

**Return to:**

Tridium, Inc.  
2256 Dabney Road, Suite C  
Richmond, VA 23230  
Attn: Return Department RA# \_\_\_\_\_

### Europe

+44 (0) 1403 740290

**Fax:** +44 (0) 1403 741804

**Return to:**

Tridium Europe Ltd  
1, The Grainstore  
Brooks Green Road  
Coolham, West Sussex  
RH13 8GR United Kingdom  
Attn: Return Department RA# \_\_\_\_\_

**Email for technical support:**

[supportuk@tridium.com](mailto:supportuk@tridium.com)

**Email for product orders:**

[ordersuk@tridium.com](mailto:ordersuk@tridium.com)

### Asia/Pacific

**Phone:** +65 6887 5154

**Fax:** +65 6887 5342

**Address:**

Tridium Asia Pacific Pte Ltd  
17 Changi Business Park Central 1  
Honeywell Building  
Singapore 486073  
Attn: Return Department RA# \_\_\_\_\_

**Email for technical support:**

[hclim@tridium.com](mailto:hclim@tridium.com)

Attn: Mr Lim Hoon Chat, Engineering Mgr.

**Sales:** (Australia/Asia Pacific): **Phone:** +61 4 1264 4234

**Email:** [mhodder@tridium.com](mailto:mhodder@tridium.com)

# Certifications

## Federal Communications Commission (FCC)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received including interference that may cause undesired operation.

The equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference, in which case, the user will be required to correct the interference at his own expense.

## Canadian Department of Communications (DOC)



### Note

This digital apparatus does not exceed the Class B limits for radio noise emissions from a digital apparatus as set forth in the radio interference regulations of the Canadian Department of Communications, and complies with Canadian ICES-003.

## Underwriters Laboratories Inc. (UL)

This device is listed for UL 916, and is also C-UL listed to Canadian Standards Association (CSA) C22.2 No. 205-M1983 “Signal Equipment”.

## Declaration of Conformity (EU, CE)

This device fulfills the requirements for the EC directive “89/336/EEC Electromagnetic Compatibility,” and the following field of application applies according to its CE label:

Area of Application	Requirements	
	Emitted interference	Noise Immunity
Industry	EN 61000-6-4: 2001	EN 61000-6-2: 2001
Residential Environment	EN 61000-6-3: 2001	EN 61000-6-1: 2001

Requirements regarding noise immunity to EN 61000-6-2:2001 are met when you connect a peripheral suitable for an industrial environment. Peripheral devices are only to be connected via shielded cables.