

JACE Niagara^{AX} Install & Startup Guide

Information and/or specifications published here are current as of the date of publication of this document. Tridium, Inc. reserves the right to change or modify specifications without prior notice. The latest product specifications can be found by contacting our corporate headquarters, Richmond, Virginia. Products or features contained herein are covered by one or more U.S. or foreign patents. This document may be copied by parties who are authorized to distribute Tridium products in connection with distribution of those products, subject to the contracts that authorize such distribution. It may not otherwise, in whole or in part, be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form without prior written consent from Tridium, Inc. Complete confidentiality, trademark, copyright and patent notifications can be found at: <http://www.tridium.com/galleries/SignUp/Confidentiality.pdf> © 2013 Tridium, Inc.

JACE, Niagara Framework, Niagara AX Framework and the Sedona Framework are trademarks of Tridium, Inc.

This document covers the initial NiagaraAX software installation and configuration for a QNX-based JACE controller, using either Workbench AX-3.8 or *update 1* of Workbench AX-3.7 (denoted as “AX-3.7u1”, that is builds 3.7.1nn, e.g. 3.7.106).

Applicable controllers include the latest models (JACE-3E, JACE-6E, JACE-603 and JACE-645), the JACE-6 and JACE-2 series (JACE-2/6), the JACE-7 series, the JACE-x02 Express (M2M JACE), as well as any earlier JACE-4/5 series. It assumes that you are an engineer, technician, or service person who is performing control system installation. All information in this document is also online in Niagara Workbench help, providing that the docJaceStartup module was installed.

Note: Terms “JACE-603” and “JACE-645” can apply to JACE-403 and JACE-545 controllers that have been outfitted with a “retrofit board”. If such a controller needs to run Niagara R2 instead of NiagaraAX, please refer to the Retrofit Board Niagara R2 Install & Startup Guide in place of this document.

For physical mounting and wiring details for any JACE controller, please refer to its specific hardware installation document. For example, see the *JACE-6 Mounting and Wiring Guide*.

This document does not cover station configuration or NiagaraAX components. For more information on these topics, please refer to NiagaraAX online help and the *User Guide*.

The following main sections are in this document:

- “JACE commissioning notes for AX-3.8 and AX-3.7u1” on page 1
- “Overview” on page 2
- “Preparation” on page 3
- “Connect to the JACE” on page 4
- “Run the Commissioning Wizard” on page 5
- “Platform services (station) config” on page 18
- “Optional platform administration” on page 30
- “Modem configuration” on page 33
- “Recovery tips” on page 33
- “Document Change Log” on page 38

JACE commissioning notes for AX-3.8 and AX-3.7u1



After using AX-3.7u1 or later Workbench to commission a JACE and install a station, by default the station is now accessible in Workbench (open in Fox connection) *only using AX-3.7u1 or later Workbench*. Any earlier “non update” AX Workbench (for example, build 3.7.44) will be *unable* to open the station.

While this could be overridden in the JACE station (in a new “Legacy Authentication” property of its FoxService), doing so would compromise security. For related details, see the section “Fox Service properties” in the NiagaraAX *Drivers Guide*.

Any other JACE commissioning operation affected by using either Niagara AX-3.8 or AX-3.7u1 is noted in this document. Otherwise, the term AX-3.7 is simply used instead.

Note that AX-3.8 and AX-3.7u1 (and similar 2013 “update releases” for AX-3.6u4 and AX-3.5u4) handle station passwords in a way that affects system upgrades, and (for update releases) ongoing station backup, copy, and restore functions. For more details, refer to the document *NiagaraAX 2013 Security Updates*.

AX-3.8 specific commissioning notes

When using AX-3.8 Workbench, note that default “Open Platform” and “Open Station” operations *initially* assume  **Platform SSL Connection** and  **Fox SSL Connection** types, respectively. This is intended to help *encourage* this SSL usage for all NiagaraAX platforms and stations—at least those that support this (all except “J9 JVM” QNX-based JACEs, i.e. any JACE-2/4/5 series). If you change either connection type, Workbench “remembers” this type to use on your next connection.

Note *any new* JACE controller ships with a minimum load of core software, and requires a “non-SSL” platform connection for *initial* commissioning. This also applies to any JACE controller in which you installed a “clean dist” file (“Cleaning” from the platform **Distribution File Installer** view).

If needed, change the connection “Type” from a Workbench “Open” dialog to a non-SSL connection type, at least until you have established regular connections and have configured and enabled SSL access. See the *NiagaraAX SSL Connectivity Guide* for complete details on the related tasks and concepts.

Platform credentials notes for AX-3.8

Note whenever you are using the AX-3.8 **Commissioning Wizard**, platform credentials are always handled as expected. If you are commissioning a JACE for AX-3.8 from any earlier release, e.g. AX-3.7u1, AX-3.6, and so on (or from a “clean dist’ed” unit in which you have already changed platform credentials), your non-default platform credentials are *retained*, or else set to whatever you specify in the AX-3.8 Commissioning Wizard’s “Platform daemon authentication” step.

However, due to AX-3.8 security improvements in JACE platform credentials, there may be confusion later regaining platform access after restoring a backup .dist file made from a JACE running AX-3.8. Why? Because platform credentials are no longer stored in AX-3.8 station backup .dist files.

- If the JACE was already running AX-3.8 before the backup .dist file install, its platform credentials will remain *unchanged*.
- However, if the JACE was running any earlier release (including a “clean dist’ed” unit in which you have already changed platform credentials), any *current* platform credentials are *reset to factory defaults*. In this case, after the backup .dist file install, you need to reopen a platform connection using factory default credentials, and then “**Update Authentication**” from the **Platform Administration** view.

Overview

As shipped from the [factory](#), a QNX-based JACE controller contains, at most, only a minimum core Niagara software load and a Tridium certificate, but *not* all items needed to run a station. Some JACE models ship with only the bare minimum of software to run the Niagara platform daemon (niagarad). In all cases, the JACE does *not contain* the complete Niagara runtime environment, Java VM, and collection of software modules and other items needed to run a station—including a usable license.

Starting in AX-3.7, you can also configure any properly licensed QNX-based “Hotspot JACE” (most except for a JACE-2 or JACE-4/5) for secure, encrypted (SSL or TLS) platform access, as well as SSL access for station (Fox) client connections or station browser (WebService) connections. Details are outside the scope of this document. See the *NiagaraAX SSL Connectivity Guide* for complete details.

Using NiagaraAX Workbench, you must connect to any new JACE and *commission it* to install the necessary Niagara core software, selected modules, license(s), and do other platform configuration. Some important related tasks include setting the JACE’s:

- IP network address, and related IP networking parameters
- Platform daemon credentials (for platform login)
- Time and date (or simply sync with your PC’s time)

This document provides step-by-step instructions for these and other tasks. As described ahead, the most straightforward way is to use the platform [Commissioning Wizard](#).

Note: *The Commissioning Wizard is the only way to install the needed NiagaraAX core software in a JACE. It is no longer possible to “inadvertently install” core software from the Software Manager, Station Copier, or Distribution File Installer (in some cases with pre-AX-3.5 releases, this caused reconnection issues).*

Note that most steps in the Commissioning Wizard remain available as separate platform views. For example, there is a Software Manager, License Manager, and many others. Using these views individually may be useful after commissioning a JACE. See the “Niagara platform” section in the Platform Guide.

However, always use the Commissioning Wizard to commission a new JACE for NiagaraAX, as well as to upgrade any JACE from one NiagaraAX point release to another—and make sure a license file is available!

Factory-shipped state

- [IP address](#)
- [HTTP port for platform access](#)
- [Platform daemon credentials](#)

IP address

When shipped, a new JACE controller is pre-configured with an IP address (IPv4) in the range:

- JACE-3E, JACE-6E, JACE-2/6 series: $192.168.1.12n$ (*primary* “LAN1” port; the “LAN2” port is disabled). This also applies to the JACE-x02 Express (M2M JACE) or a JACE-603 or JACE-645.
- JACE-7 series: $192.168.1.12n$ (*primary* “LAN1” port; the “LAN2” port is disabled).
- JACE-4/5 series: $192.168.1.14n$ (only a single LAN port available on these JACEs)
where the last numeral (n) in the IP address matches the last numeral in the JACE’s *serial number*.

In all cases, the default subnet mask is: $255.255.255.0$

You change these IPv4 network settings during your startup commissioning of the JACE.

HTTP port for platform access

When shipped, the JACE’s platform daemon is configured to listen on HTTP port 3011. Often, this is left at default. However, if a *different* port is needed for a platform connection (perhaps for firewall reasons), you can change this during the commissioning of the JACE.

Platform daemon credentials

Any JACE controller is shipped with default platform daemon (administrator) credentials, for example:

Username: tridium Password: niagara

Initially, you use these default credentials to open (login) a platform connection to the JACE. Like the factory-assigned IP address, default credentials are intended to be *temporary*. During your startup commissioning, you should change these credentials to be something unique, and *guard them closely*.



Caution

*When commissioning a new JACE, you should always change platform credentials from defaults! Note that the **Commissioning Wizard** includes a step for this (“Platform daemon authentication”), which you should not omit. A JACE installed with default platform credentials is extremely susceptible to unauthorized intrusion!*

Note that any AX-3.8 JACE operating with factory default platform credentials shows *warnings* in several views when platform connected with AX-3.8 Workbench. For details, see “Improvements to AX-3.8 digest authentication” in the latest *Platform Guide*.

Preparation

Two areas of preparation are required before proceeding:

- [Provide power and connectivity](#)
- [Niagara and PC Requirements](#)

Provide power and connectivity

In most cases, you perform the initial Niagara software installation and startup of a JACE (as described in this document) *in your office*, before physically mounting it in place at a job site. Please refer to the “Wiring Details” section of the appropriate JACE-xxx *Mounting and Wiring Instructions* document for details on making (temporary) power wiring and Ethernet wiring connections.

The remainder of this document assumes that you have the JACE nearby, and are able to power it on and off as needed. After you complete the commissioning process described in this document, you can mount and wire the JACE controller at the job site, making permanent mounting and wiring connections.

Niagara and PC Requirements

These instructions assume that you have a PC running a licensed copy of Niagara Workbench AX-3.7u1 or later, installed with the “installation tool” option. That option copies distribution files needed for commissioning various models of JACE controllers. This PC is referred to as “your PC.”

Note: *Your PC must meet minimum hardware/operating system requirements for a Workbench workstation. This includes a working Ethernet adapter with TCP/IP support (browser capable). An Ethernet TCP/IP connection to the JACE is required to install Niagara software and establish other parameters.*

For this initial Ethernet connection, you can use either:

- An Ethernet patch cable connected directly between your PC and the JACE (if your PC Ethernet port is not “auto-sensing”, you will need an Ethernet *crossover* cable), or
- A normal LAN connection, meaning that both your PC and the JACE are physically connected to the same Ethernet hub or switch.

To prepare for new JACE commissioning

To prepare for new JACE commissioning, do the following steps:

- Step 1 If not already installed, install the Niagara AX-3.7u1 or later software on your PC, including its permanent license.
- Step 2 Typically, the license file for the JACE already resides on the licensing server, where (if you have Internet connectivity) it is *automatically retrieved* during the licensing step of the Commissioning Wizard.
- Note:** *If you were emailed a license archive (.lar file) or .license file for the JACE, and you wish to use it instead of the online license server (for some reason, for example your Workbench PC will not have Internet connectivity when you are commissioning the JACE), make the file available to Workbench first, as follows:*
- Copy the file to your !licenses/inbox folder, then restart Workbench. For more details, refer to the section “Local license inbox” in the *Platform Guide*.
- Step 3 Attach one end of a standard category-5 Ethernet unshielded twisted pair (UTP) patch cable to the RJ-45 Ethernet connector for LAN1 on the JACE.
- Step 4 Attach the other end of the patch cable to a network port or directly to an Ethernet hub.
- Step 5 Power up the JACE.
- Step 6 Record you PC’s current IP settings, then re-assign your PC’s IP address for its Ethernet NIC (network interface card). If necessary, refer to Windows online Help for details on configuring TCP/IP settings.

Note: *As an alternative to re-assigning your PC’s IP address, you can do one of the following:*

- Obtain a USB-to-Ethernet network adapter (*second* network interface card, or NIC), and use it with an Ethernet crossover cable to commission JACEs. In this case, configure this second NIC to use the settings in the *remainder of this step*. This method offers an advantage over the serial shell method below, as you do not need to reboot a JACE in a special mode, i.e. change its serial shell jumper.
- Use a serial shell mode connection to the JACE to re-assign its factory IP address settings. After making this change and rebooting the JACE, you can continue commissioning using Workbench. This requires proper serial cabling and a special power-up mode for the JACE. For more details, see “[System shell](#)” on page 34.

For this initial connection to a factory-shipped JACE, configure your PC’s NIC to use an IP address in the same subnet as the JACE, as well as a matching subnet mask.

Set the IP address in the range: 192.168.1.1 to 192.168.1.254
with a subnet mask of: 255.255.255.0

Note: *Do not assign your PC the identical IP address as the JACE’s factory-assigned IP address.*

- Step 7 From your PC, start Workbench. The Nav tree should be visible in the side bar area (left pane).
If not, from the menu bar, select **Window > Side Bars > Nav**.

Connect to the JACE

Once the JACE has powered up, connect to it with Workbench using “Open Platform.” A platform connection to any JACE is required for *most host-level operations*. This includes installing NiagaraAX core software and modules, establishing network and TCP/IP settings, and performing various other platform tasks.


After you open a platform connection, you can run the Commissioning Wizard.


- [Open a platform connection](#)
- [Run the Commissioning Wizard](#)

Open a platform connection

To open a platform connection to a JACE

To open a platform connection from Workbench to a new JACE, do the following:

- Step 1 From the menu bar, select **File > Open > Open Platform**.
The **Open Platform** dialog box appears.
- Step 2 Complete the fields in the **Open Platform** dialog box as follows:
- Type — Select  **Platform Connection**, if not already selected.

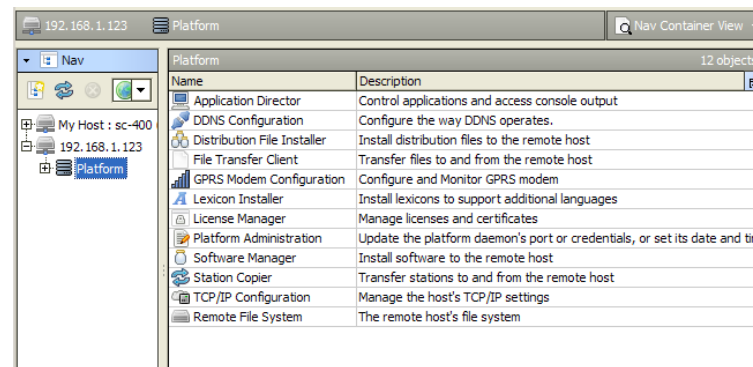
Note: AX-3.8 Workbench may default to  **Platform SSL Connection**. If so, for any new JACE change type to a regular (non-SSL) platform connection.

- Host — Leave at default **IP**, and type in the default **IP address** of the new JACE.
- Port — Leave at default 3011.
- Credentials (see “[Platform daemon credentials](#)” on page 3), which may be:
 - Username — Type in default username, for example: tridium
 - Password — Type in default password, for example: niagara

Step 3 Click the **OK** button to accept all settings.

The Platform opens in the tree, and its Nav Container View displays in the view pane ([Figure 1](#)).

Figure 1 Connected JACE platform



Caution

When commissioning a new JACE, you should always change platform credentials from defaults! Note that the **Commissioning Wizard** includes a step for this (“Platform daemon authentication”), which you should not omit. A JACE installed with default platform credentials is extremely susceptible to unauthorized access! If using AX-3.8, be sure to see “[Platform credentials notes for AX-3.8](#)” on page 2.

Note that any AX-3.8 JACE operating with factory default platform credentials shows warnings in several views when platform connected with AX-3.8 Workbench. For related details, see “Improvements to AX-3.8 digest authentication” in the latest Platform Guide.

Note: After you commission a JACE and it reboots, in future platform sessions you will need to login using any new (changed) parameters, such as IP address, Port, Credentials. If you changed your PC's IP address in order to connect to the JACE's factory-assigned IP address, you will first need to reconfigure your PC to the appropriate TCP/IP settings (to communicate to the now-commissioned JACE).

Run the Commissioning Wizard

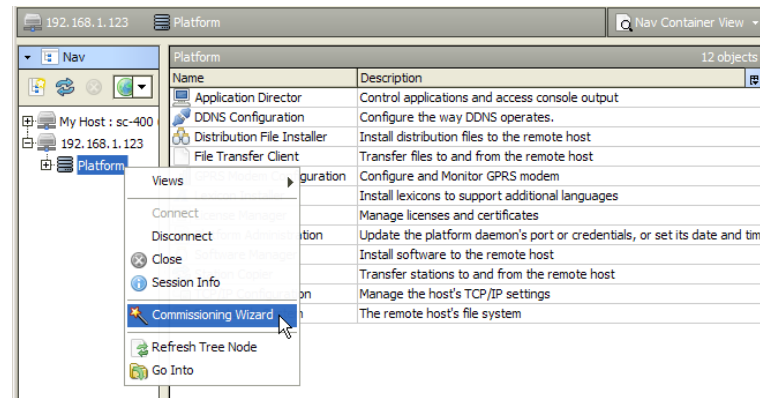
The following sections describe using the Commissioning Wizard for a new JACE:

- [About the Commissioning Wizard](#)
- [Start the Commissioning Wizard](#)
 - [Set module content filter level](#)
 - [Install/upgrade core software](#)
 - [Station installation](#)
 - [Select modules](#)
 - [TCP/IP configuration](#)
 - [Platform daemon authentication](#)
 - [Install lexicons](#)
 - [Install license](#)
 - [Review and finish wizard](#)

About the Commissioning Wizard

As shown in [Figure 2](#), the Commissioning Wizard is a right-click option on any connected platform in the Nav tree. You can also launch the wizard from the [Platform Administration](#) view.

Figure 2 Commissioning Wizard as right-click platform option



Use this wizard when installing a *new* NiagaraAX JACE, as it provides a “checklist” method to perform essential (and often “one time”) platform tasks. Also use this wizard whenever you *upgrade* the core NiagaraAX software in a JACE, at some future time. See “Upgrading a JACE” in the *Platform Guide*.

Note: Starting in Workbench AX-3.7, changes were made in the platform Commissioning Wizard. For a summary of these changes, see the next section “Important Commissioning Wizard notes”. Also see “AX-3.8 specific commissioning notes” on page 2.

Important Commissioning Wizard notes

- If you were familiar with the Commissioning Wizard in Workbench AX-3.6 and AX-3.5, note this change starting in AX-3.7:
 - The lexicon install step, formerly *last*, is now reordered to occur before the install/upgrade modules step. Note that starting in AX-3.7 “standard” lexicons are distributed as *modules* instead of folders of lexicon text files (lexicon sets). You can still use the “lexicon install” step to install any lexicon sets you have on your Workbench PC, if applicable. In the step after, you can *also* select and install any lexicon *modules*, along with the various software modules. For related details, see the section “Lexicon Installer” in the *Platform Guide*, and for further information the *NiagaraAX Lexicon Guide*.
- If you were familiar with the Commissioning Wizard in Workbench AX-3.4 and earlier, note these additional changes:
 - Other steps were reordered. For example, the license step “Request or install software licenses” is now *first*. This helps prevent the scenario of installing core software above the supported version in the JACE’s license, where as a result the station cannot start. Now, the wizard cannot complete (and start execution) unless the license in the JACE is at the required version.
 - The wizard no longer performs core software (dist file) installation first, separately, where after the JACE reboots and remaining steps execute in a second sequence, ending in another reboot. Now, all wizard steps execute in a single sequence, meaning that the JACE reboots only *once*.
- Throughout the wizard’s dialogs, use the buttons **Back** and **Next**, as needed, to retrace (or skip) steps. Also, the **Cancel** button exits the wizard after your confirmation—no operations are performed as a result.
- Before committing to the final sequence of steps, the wizard provides a summary for you to review.

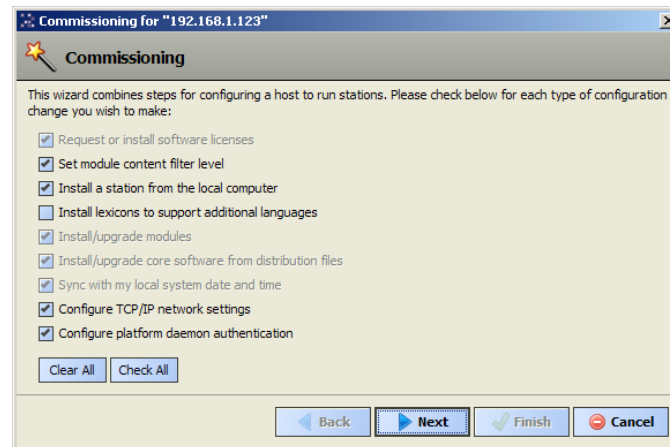
Start the Commissioning Wizard

To start the Commissioning Wizard

From Workbench with the JACE platform open, to start the Commissioning Wizard do the following:

- Step 1 In the Nav tree, right-click on Platform and select **Commissioning Wizard**.
The dialog box **Commissioning for “<IP address>”** appears (Figure 3).

Figure 3 Commissioning Wizard (default selections shown for new JACE)



By default, all steps are preselected except lexicon installation (for language support). Steps are executed in the order listed in the wizard.

Step 2 As needed, click to include or omit steps. For a new JACE, you typically *accept all default selections*. Commissioning steps include:

- Request or install software licenses — Preselected for any new JACE.
- Set module content filter level — Recommended.
Note: It is important not to omit this step, especially for any JACE running the Webservice.
- Install a station from the local computer — Recommended.
- Install lexicons to support additional languages — Recommended only if you are using lexicon sets (files) instead of lexicon modules, typically for non-English language support.
- Install/upgrade modules — (always preselected, whenever wizard is run). To select the software modules, and optionally any lexicon modules for a AX-3.7 or later JACE.
- Install/upgrade core software from distribution files — Preselected for any new JACE.
- Sync with my local system date and time — Preselected in most cases (new JACE for example).
- Configure TCP/IP network settings — Recommended.
- Configure platform daemon authentication method — *Do not skip this for any new JACE!*

Step 3 Click the **Next** button to continue. With wizard selection defaults, this is [Install license](#).

Install license

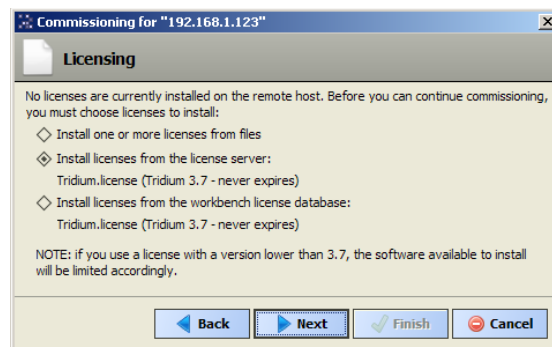
To automatically install or update licenses

At the License step ([Figure 4](#)), you install one or more license files in a new JACE. You typically select the option to get and install licenses from the licensing server.

Note: *At least one license file specific to any JACE is stored on the licensing server. Providing you have Internet connectivity, this is the recommended method to install or update a license. See [“About the Licensing Server”](#) on page 9 for more details.*

A minimum of one license file is always needed. Typically, other license files are not needed unless you are using third-party module(s). In this case, you can also install those license files during this same commissioning step, either automatically, or by selecting to install from files.

Figure 4 License dialog (select method)



- Step 1 Select “Get and Install the licenses for the host from the license server.”
- Step 2 Workbench silently searches the licensing server, locates the license(s), and the wizard advances to the next step. See “[Install Certificate](#)” on page 9.

Note: If the “license server” option shown above does not appear, Workbench has not detected Internet connectivity, and so cannot contact the licensing server. In this case, you can either:

- If you already have a license for this JACE in your “local license database,” select the *last* option shown in [Figure 4](#), to install from your “workbench license database.” (This option will be missing if your local license database does not include a license for this JACE.) Workbench locates the license, and the wizard advances to the next step. See “[Install Certificate](#)” on page 9.
- If you have the JACE license file(s), use the next procedure “[To install or update licenses from files](#)”. If necessary, you can also install license(s) later, either from your local license database or from license files.

To install or update licenses from files

- Step 1 At the License step, select “Install one or more licenses from files”.
- Step 2 Click the **Next** button.
The “Choose license files to install” step appears ([Figure 5](#)).
- Step 3 Click the **Add** button.
A “Select File” dialog appears ([Figure 6](#)). By default, the contents of your `licenses` subfolder is listed (showing your Workbench license). If you previously pointed Workbench to another location, license files in that location are listed instead.
- If you see the license you need, click it to *highlight* it. If other licenses are also needed, you can select multiples by holding down the Ctrl key while you click.
 - If a license is not listed, navigate to its location using the left-pane folder tree controls, and click the license to *highlight* it.
- Note:** The licensing tool prevents selection of a wrong license (different *hostid*) to install in the JACE.
- Step 4 Click the **OK** button.
The “Choose license files to install” dialog appears ([Figure 7](#)) with the selected license(s).
- Step 5 If necessary, click the **Add** button again ([step 3](#)) to add additional license files.
- Step 6 When all needed licenses are listed in the “Choose license files” dialog, click the **Next** button to go to the last (review) dialog in the Commissioning Wizard.

Figure 5 License dialog (choose files)

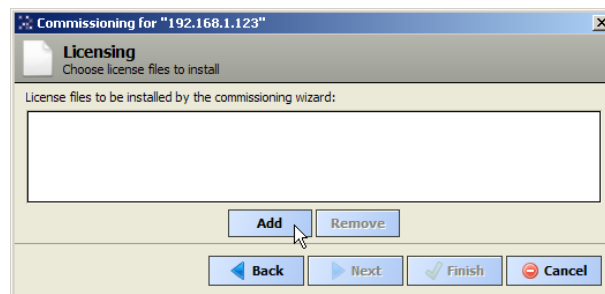


Figure 6 Select Files dialog from Add in Licensing

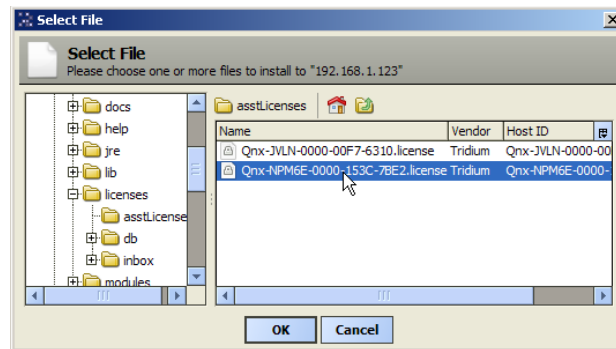
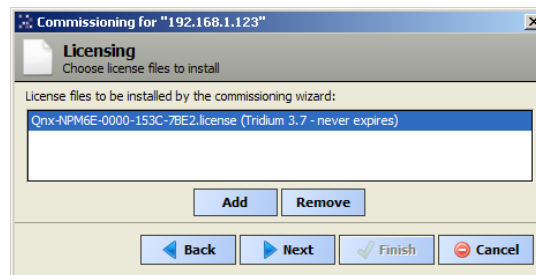


Figure 7 License dialog with file selected



About the Licensing Server

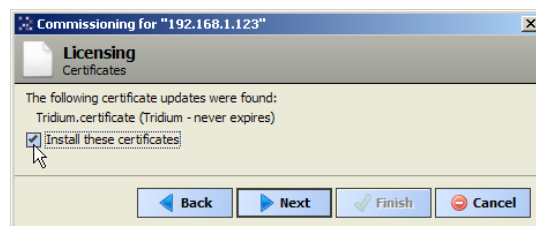
For license files validated against the Tridium certificate, installation can be automated from Workbench. All such purchased licenses (including JACE, Supervisor, or Workstation-only) are stored and available to Workbench through the licensing server.

Providing that your PC *currently has Internet connectivity* while running a platform connection to any Niagara host, Workbench provides an install option (get and install the licenses for the host from the license server). When selected, Workbench silently searches the Tridium web portal for a license with a matching *Host ID* of the target platform. When found, it selects the license(s) and advances to the next wizard step. For more details, refer to the section “About the licensing server” in the *Platform Guide*.

Install Certificate

During the license install step, the wizard checks to see if a Tridium certificate is installed. This certificate is *required by any* NiagaraAX host, to verify the license file. Additional certificates may also be required.

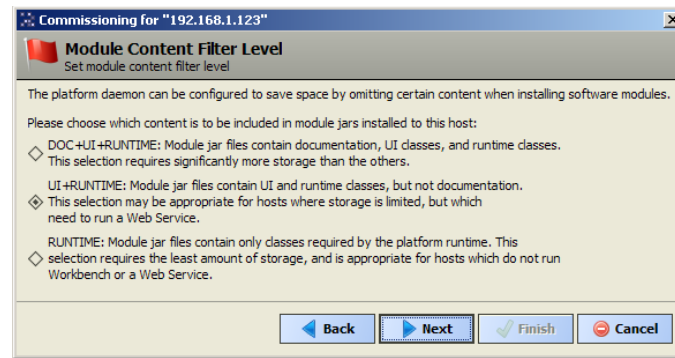
Figure 8 License certificate dialog with file selected



Select to install the certificate(s) and click **Next** to advance the “Set module content filter level” step.

Set module content filter level

Module content filter level affects how much storage space is used when installing Niagara modules. Usually, the default (preselected) level is appropriate for the opened JACE platform.

Figure 9 Module Content Filter Level

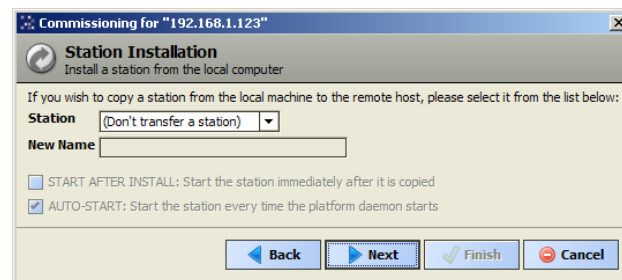
To specify the module content filter level

At the Module Content Filter Level step (Figure 9), do the following:

- Step 1 Click the desired level of content in Niagara modules to be installed in this JACE.
Module content level is *one* of the following:
- DOC+UI+RUNTIME — Typically not appropriate for any QNX-based JACE.
 - UI+RUNTIME — Required if the JACE is to run the Web Service.
 - RUNTIME — Typically best for any QNX-based platform *not* running the Web Service.
- Step 2 Click the **Next** button for the next step, which is [Station installation](#).

Station installation

If you have a specific station database ready to install in the JACE, you can specify it at this step in the wizard. Or, simply accept the default “(Don’t transfer a station)” and click **Next**. (You can create a station later using the New Station Wizard, and install it using the platform’s **Station Copier**.)

Figure 10 Station Installation dialog (default)

To specify a station database to install

At the Station Installation step (Figure 10), do the following:

- Step 1 Click the Station drop-down control and click the name of a station database on your PC.
Listed are station subfolders under your PC’s local Niagara stations folder.
- Step 2 If you select a station, the following additional selections are available (Figure 11):
- New Name — Either leave at same station name as local copy, or type in a new station name.
 - START AFTER INSTALL — Pre-selected as cleared. However, the station starts after the commissioning completes.
 - AUTO-START — If enabled (the default), the station starts every time the JACE is rebooted.
- Step 3 Click the **Next** button to continue.

A dialog asks which station files to copy (Figure 12), where you can select *one* of the following:

- Copy files from selected directories — Allows you to specify which subfolders under that local station that are copied. It produces a “tree” selection dialog (Figure 13) upon **Next** button.
 - If you choose this, click folder controls to expand and contract as needed.
 - Selected folders appear with an “X” and unselected folders show an empty folder box.
- Copy every file in the station directory and its subdirectory — The default, most typically used.
- Copy only the “config.bog” station database file — Copies only the station configuration (components), and not any supporting folders/files like px files, html files, and so forth.

- Step 4 Click the **Next** button for the next step, [Install lexicons](#) (or if skipping that step, [Select modules](#)).

Figure 11 Station Installation dialog (station selected)

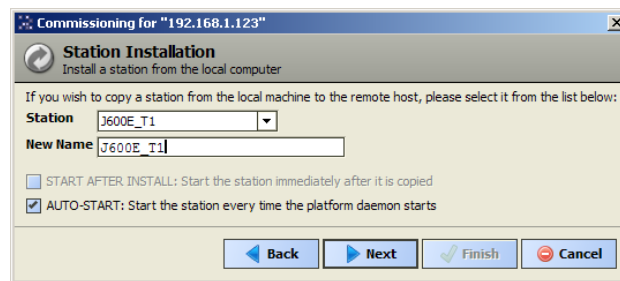


Figure 12 Station Installation dialog (copy options)

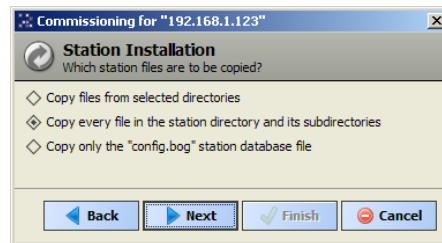
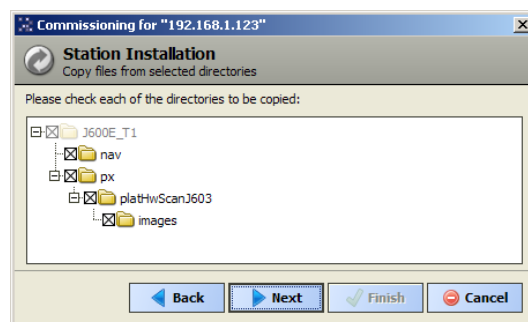
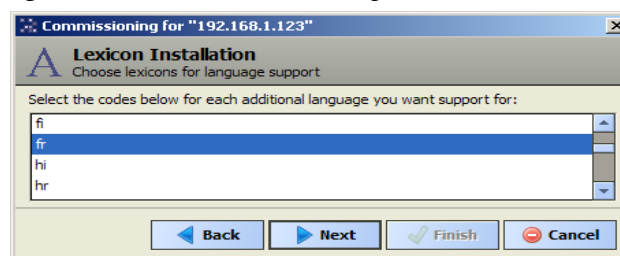


Figure 13 Station Installation dialog (select subfolders)



Install lexicons

Figure 14 Lexicon Installation dialog



To install lexicons

At the Lexicon Installation step (Figure 14), you can install one or more text-based lexicon file sets in a new JACE. Lexicons provide support for *non-English languages* in the JACE. Lexicons are identified by java locale *codes*, such as “fr” (French) or “de” (German).

Note: In some domestic (U.S.) installations, an English lexicon (“en”) is added and configured to globally “customize” items such as property descriptions in Workbench.

In order to select lexicons (file sets), they must be under a !lexicons subdirectory of your NiagaraAX Workbench home folder. Note that starting in AX-3.7, the Workbench installation no longer includes such lexicon file sets (along with your selection of them)—instead “standard” lexicons are now distributed as jar’ed software *modules*, which you select and install in the *next* step.

However, if you copied such lexicons from a previous NiagaraAX Workbench release, they will be available to install in this step. Typically you customize (edit) them using the Lexicon Editor in Workbench. Afterwards, you install them in JACEs, so that *each* JACE has the proper changes.

To install such lexicon file sets, do the following:

- Step 1 Click a language code to select (highlight) it.
If multiple lexicons are needed, hold down the Ctrl key while you click.
- Step 2 When needed lexicons are selected, click the **Next** button for the next step, [Select modules](#).

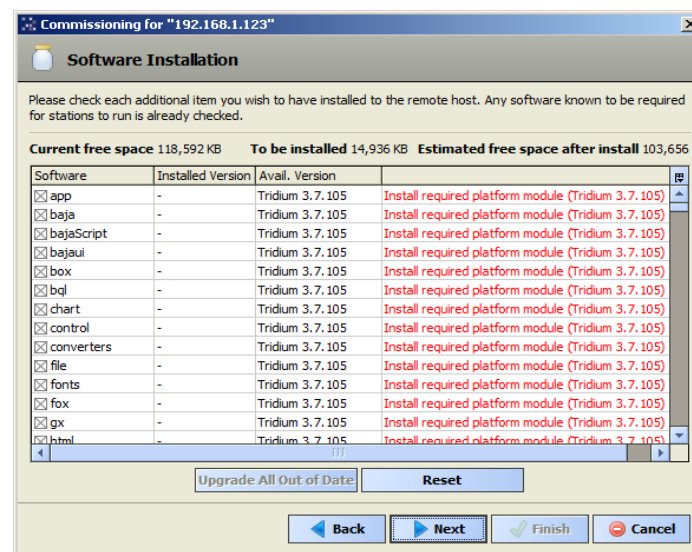
Select modules

At the select modules step, a popup “Rebuilding software list” dialog briefly appears as the dependencies of the JACE are compared against the available software modules in your Workbench PC’s “software database.” During commissioning, you add to the software modules that are preselected for installation. Often, you do not make any changes, as the wizard preselects all necessary “core” modules, plus any additional modules needed by the station you previously selected (see “[Station installation](#)” on page 10).

However, if you did not previously select a station to install, you may wish to select modules to support a station you have in mind. Or, you may need to install a *lexicon* module (new starting in AX-3.7), or you may know that the JACE will need a module in the future (say for a driver), and you wish to install it now.

In general, do not select modules if you are not sure they are needed. You can manage software modules anytime later, using the **Software Manager**. Also, if you install a station later, the **Station Copier** will automatically prompt for confirmation to install any additional modules deemed necessary.

Figure 15 Module installation dialog (default)



Note: For cases described below, install the following additional module(s) to enable options.

- If a “Hotspot” JACE controller (JACE-3E, JACE-6E, JACE-6, JACE-7, or JACE-602 Express) that is licensed for SSL (feature “crypto”), select the following module:
 - platCrypto

Note: In the original AX-3.7 release, you also selected the `cryptoCore` and `daemonCrypto` modules for SSL. However, starting in AX-3.7u1 (build 3.7.105 or higher), those two modules are no longer available for selection in the **Software Manager**. Instead, the correct versions of those two modules are in a core dist file for the JACE, and are automatically installed in another location.

Also, note that the `crypto` module is not used in AX-3.7 or later SSL for any “Hotspot” host—you do not need to install it. The `crypto` module is needed only for a “J9 JACE” (JACE-2/4/5 series) with SSL.

- If a JACE controller equipped with the “SRAM option card” (for battery-less operation), select the `platDataRecovery` module for installation. (Note if a JACE-3E or any NPM6E-based controller, such as a JACE-6E, JACE-603, or JACE-645, this is unnecessary—the `platDataRecovery` module is automatically included in the core “config” distribution file for those platforms).
- If a JACE-700 series controller equipped with the “WiFi option” (for wireless 802.11b/g operation), select the `platWifi` module for installation.
- Starting in AX-3.7, standard” lexicon modules appear listed using a module name convention of:

niagaraLexiconLc

where *Lc* is a two-character language code, such as *Fr* for French or *Es* for Spanish. It is also possible to make *custom* lexicon modules using Workbench Lexicon Tools (which can use different naming).

To select modules

At the Software Installation step (Figure 15), do the following:

- Step 1 Review the list of available modules (This list is long and requires you to use the scroll bar). Each selected module has an “X” in its selection box.

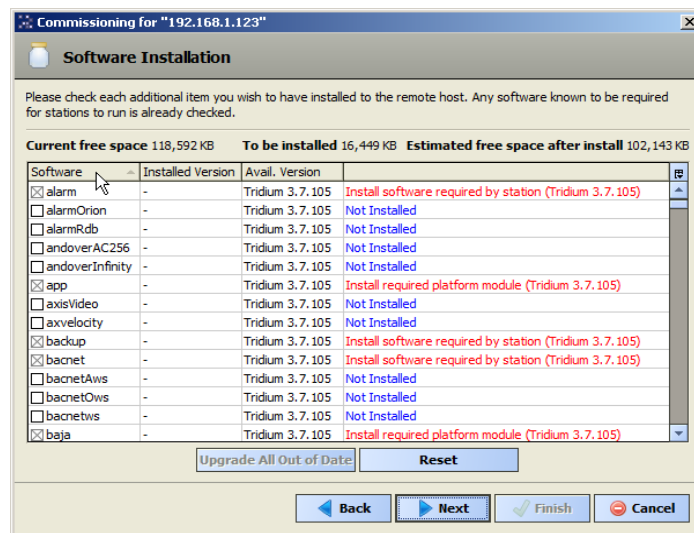
Note the following:

- Modules preselected from “core” need or station database reasons each have a *red text* descriptor, which may read as:
 - Install required platform module “Tridium *buildNumber*”
 - Install module required by station “Tridium *buildNumber*”
 By default, these modules are at the top of the list. You cannot deselect these modules.
- You can select *additional* modules to install by clicking selection boxes. The description for each is in *blue text*, and displays as either:
 - Not Installed (if not selected)
 - Install “Tridium *buildNumber*” (if selected)
- To resort the list alphabetically, click the **Module** header in the table. To return to the default sort order, click the table’s (blank) description header.
- To reset the selection of modules to the original collection, click the **Reset** button.

Figure 16 shows the dialog after modules have been selected and the list resorted alphabetically.

- Step 2 Click the **Next** button to go to the next step, “Install/upgrade core software”.

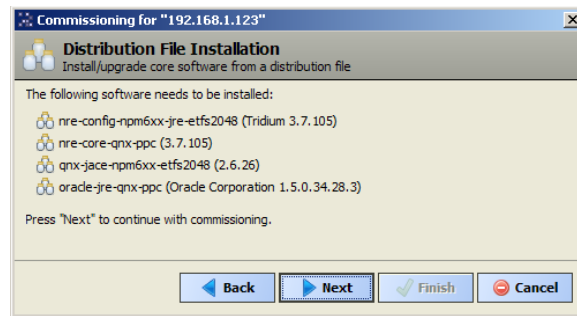
Figure 16 Module installation dialog (after resort, selecting modules)



Install/upgrade core software

At the install/upgrade core software step, the dependencies of the JACE platform are compared against the distribution (dist) files available in your Workbench PC’s “software database.” The wizard determines what dist file(s) need to be selected for installation, and then informs you in a dialog (Figure 17).

Figure 17 Distribution File Installation (beginning)



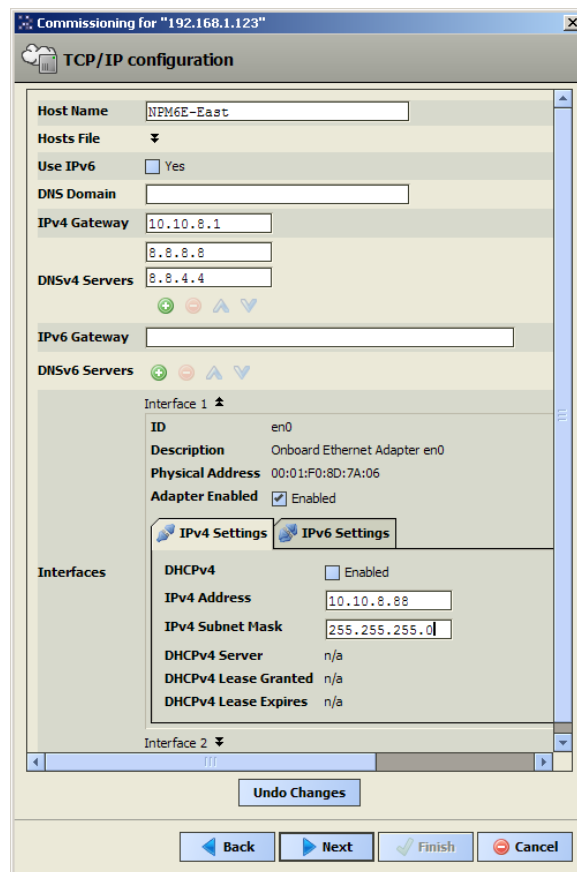
To select the distribution files

To select the distribution files for installation, do the following:

- Step 1 Click **Next** to select the distribution files.
The next commissioning step appears. Using wizard defaults, this is [TCP/IP configuration](#).

TCP/IP configuration

Figure 18 TCP/IP Configuration dialog



Note: IPv6 support is available for some QNX-based JACEs. These same JACEs use the Sun Hotspot JVM (Java Virtual Machine) instead of the IBM J9 JVM still used in the JACE-2 (NPM2) or older JACE-4/5 series.

This document focuses on IPv4 configuration. For details on IPv6 changes starting in AX-3.6, refer to the Platform Guide section on **TCP/IP Configuration**, including the section “TCP/IP changes in AX-3.6”.

Note: Also, it is possible for one JACE model (JACE-700) to be equipped with a “WiFi option”, which adds a third interface (**Interface 3**) for TCP/IP configuration. For related details, refer to the NiagaraAX JACE WiFi option - Engineering Notes document.

To configure TCP/IP settings

At the TCP/IP Configuration step (Figure 18), do the following:

- Step 1 Review the **Interface 1** settings on the **IPv4 Settings** tab, which include the temporary factory-shipped **IP address**.
- Step 2 Assign the JACE a unique IPv4 address for the network you are installing it on. No other device on this network should use this same IP address. Include the appropriate subnet mask used by the network. Alternatively, if the network supports DHCP, you can enable it (click DHCP Enabled). In this case, the IP Address and Subnet Mask fields become read only.

Note: *In general (for stability), static IP addressing is recommended over DHCP. Do not enable DHCP unless you are certain that the network has DHCP servers! Otherwise, the JACE may become unreachable over the network.*

- Step 3 Review, and if needed adjust other TCP/IP settings, which (in usual order of importance) include:
- IPv4 Gateway — The IP address for the device that forwards packets to other networks or subnets.
 - DNS Domain Name — Enter the name of network domain, or if not applicable, leave blank.
 - DNSv4 Servers — Click the ➕ add button for a field to enter the IPv4 address of one or more DNS servers.
 - Hostname — Default may be “localhost,” or enter another name you want to use for this host.
Note: *In some installations, changing hostname may result in unintended impacts on the network, depending on how the DHCP or DNS servers are configured. If in doubt, leave hostname at default.*
 - Hosts File — Click control to expand edit field. Format is a standard TCP/IP hosts file, where each line associates a particular IP address with a known host name. Each entry should be on an individual line. The IP address should be placed in the first column, followed by the corresponding host name. The IP address and the host name should be separated by at least one space.
 1. To add a line, click at the end of the last line and press **Enter**.
 2. Type in the required data on the new line.
 3. To return to see all TCP/IP settings, click the control to contract the edit field when done.
- Step 4 Click the **Next** button to go to the next step.

Note: *If commissioning a JACE controller with two Ethernet ports, please note that an “Interface 2” is available, for configuring the LAN2 (secondary) Ethernet port. By default, this port is disabled, that is without a “default” address. Intended usage is for:*

- Isolating a “driver’s” Ethernet traffic from the primary (LAN1) interface, OR
- In some cases, LAN2 may be set up with a standard, fixed, IP address that is used only by a company’s service technician, when on site. This allows access to the JACE without disconnecting it from the customer’s network, or without connecting the technician’s service PC to the customer’s network (which might go against local IT security policies).

In any case, note that only one LAN port can be set as DHCP. If enabling LAN2, you typically specify another (network) static IP address and the appropriate subnet mask.

Note: *Also note the following:*

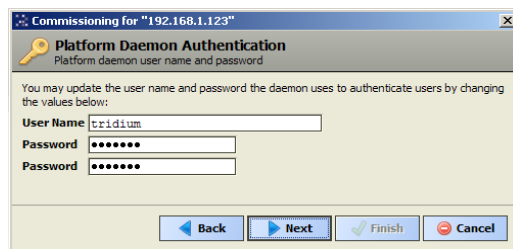
- If enabling both LAN ports, note that the LAN1 IP address and LAN2 IP address must be on different subnets, otherwise the ports will not function correctly.
For example, with a typical “Class C” subnet mask of 255.255.255.0, setting Interface 1=192.168.1.99 and Interface 2=192.168.1.188 is an *invalid* configuration, as both addresses are on the same subnet.
- A JACE *does not* provide IP routing or bridging operation between different Interfaces (LAN ports, GPRS, dialup).
- All of this also applies to the “third interface” provided by the “WiFi option” if installed in a JACE (at the time of this document, available for a JACE-700 only). However, it is likely the WiFi interface will be used as the *primary* interface in most cases (no LAN cabling available to the JACE).

Note: *The **Undo Changes** button resets all settings (all Interfaces) back to the original pre-step values.*

Platform daemon authentication

At the platform daemon authentication step (Figure 19), you specify platform login credentials (user name and password) for this JACE. See “Platform daemon credentials” on page 3 for default values.

Figure 19 Platform Daemon Authentication dialog



Note: Figure 19 reflects “factory default” platform credentials—which you should always change. See the [Caution](#) below for details, and if using AX-3.8, see “Platform credentials notes for AX-3.8” on page 2.

To specify the platform daemon authentication



Caution Be sure to change default platform credentials (user name=tridium, password=niagara). Consider the platform daemon as the highest-level access to the JACE.

Furthermore, make careful note of your entries. If you lose or forget these credentials, you may be unable to complete the commissioning and startup of this JACE. In this case, you can restore platform credentials to factory defaults, providing you can serially connect to the JACE (make serial shell connection)—pressing a key at the prompted time during JACE boot up. See “About JACE serial shell mode” on page 34.

To specify the platform daemon authentication, do the following:

Note: User name and password entries are case sensitive.

- Step 1 In the **User Name** field, type in the desired user name for platform login.
User Name can be a maximum of 14 alphanumeric characters (a - z, A - Z, 0 - 9), where the first character must be alphabetic, and following characters either alphanumeric or underscore (_).
- Step 2 In the **Password** fields, type in the desired password (it must *match* in both password fields).
Password can be any desired length and mix of characters. Entry characters display only in asterisks (*).

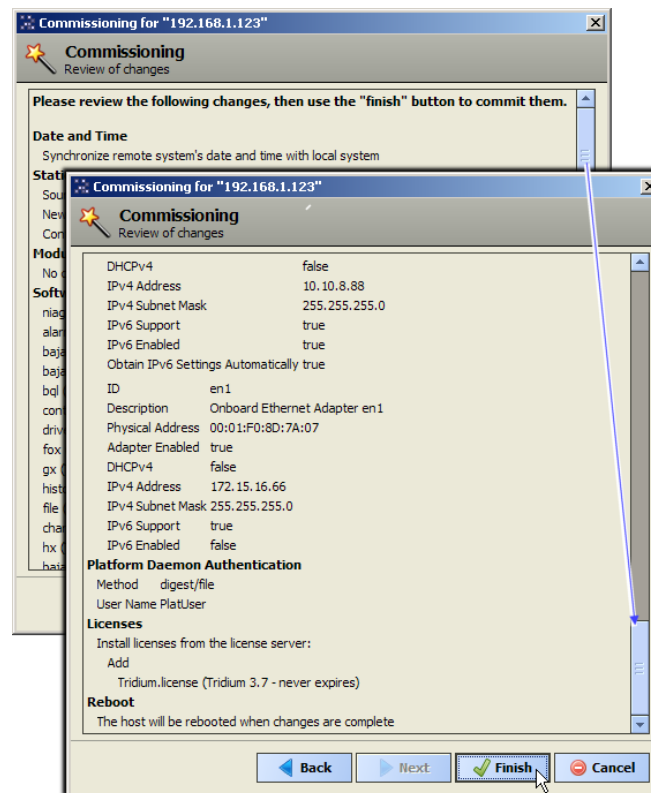
Note: A “strong password” is highly recommended. Some basic guidelines on strong passwords:

- Use both upper and lower case.
- Include numeric digits.
- Include special characters.
- Don’t use dictionary words.
- Don’t use company name.
- Don’t make the same as the user name.
- Don’t use common numbers like telephone, address, birthday, and so on.

- Step 3 Click the **Next** button for the next step. Unless installing lexicons, this is typically [Review and finish wizard](#).

Review and finish wizard

Figure 20 Review Commissioning Wizard dialog



To review and finish the Commissioning Wizard


After the final selected step in the Commissioning Wizard, a “Review of changes” dialog appears, as shown in [Figure 20](#). It lists a summary of all the actions to be performed by the wizard.

Before proceeding:

- Step 1 Read through the summary of changes, using the scroll bar to see those steps near the end.
 - If no change is needed, click the **Finish** button to initiate the rest of the Commissioning Wizard.
 - If any change is needed, click the **Back** button until the step dialog appears, then make the change. Then, click the **Next** button until this review dialog appears again.
- Step 2 While the wizard is working, progress updates are posted in a “Completing Commissioning” dialog. When completed, the wizard reboots the JACE, and a “Close” button is available ([Figure 21](#)).



Caution Do not remove power to the JACE controller immediately following any commissioning reboot. Extra run time may be needed, especially if there are IO-16 or IO-34 modules attached, for up to 4 minutes. This precaution allows any “automatic firmware upgrade” of the IO modules to succeed, without interruption. Note this IO firmware upgrade occurs before the platform daemon starts in the JACE controller. Therefore, it is safe to interrupt power anytime after you can successfully re-open a platform connection to the JACE. Alternatively, you can monitor the serial shell of the JACE following the reboot, to monitor messages that indicate the status of the firmware download to each of the attached NDIO modules.

- Step 3 Click the **Close** button to exit the wizard.
When the JACE reboots, your platform connection to it drops. Notice that in the Nav tree, the platform instance for that JACE is now dimmed .
- Step 4 Assuming that you changed the JACE’s IP address in commissioning, right-click and *close that platform instance* ([Figure 22](#)), as this would make that connection instance invalid.
If you did not change its IP address, after a minute or so you should be able to double-click the platform instance again to reconnect.

- Note:** Going forward, you must access the JACE by its new (assigned) IP address. Note that your Workbench keeps a history of TCP/IP changes made. See “[IP changes history](#)” on page 33. Also, remember to login using its new assigned platform credentials, see “[Platform daemon authentication](#)” on page 16.
- Note:** If you changed your PC's IP address in order to commission the JACE, you usually need to reconfigure your PC's TCP/IP settings back to appropriate settings (now) to communicate with it. Otherwise, you will be unable to connect to it for other commissioning.

Figure 21 Commissioning Wizard complete dialog

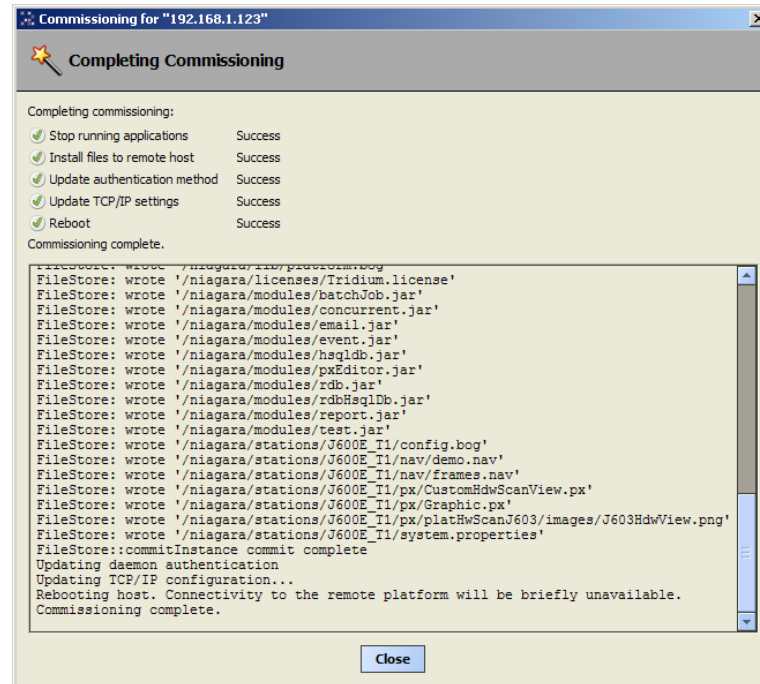
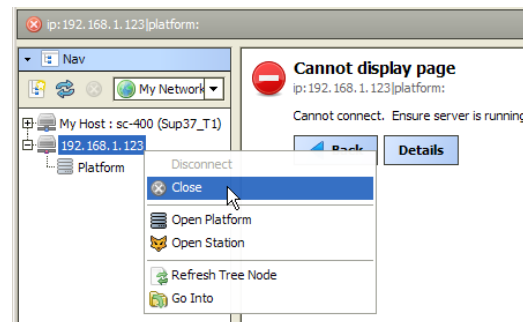


Figure 22 Closing now-invalid platform instance (if IP address changed in commissioning)



Platform services (station) config

A few platform configuration items in a JACE are not directly accessible in a Workbench platform connection to that controller—that is, via the Commissioning Wizard or any of the platform views. Instead, you must have a *station* installed on the JACE (*any station*), and that station *running*.

Then using Workbench, you open a station (Fox) connection to that station, and configure these platform-related items by accessing *services* under the station's **PlatformServices** container.

The following sections explain further:

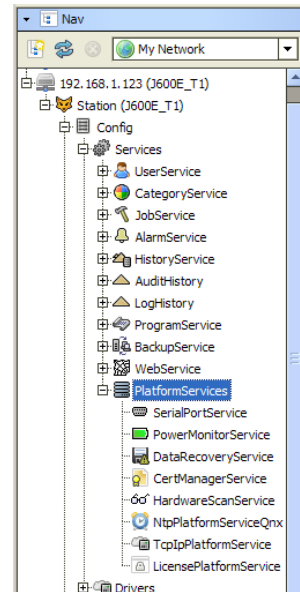
- [About Platform Services](#)
 - “[PlatformServices items of interest for JACE commissioning](#)” on page 19
- “[JACE power monitoring configuration](#)” on page 20
 - “[To configure power monitoring for a JACE with backup battery \(but no SRAM\)](#)” on page 20
 - “[To configure power monitoring for a JACE with SRAM and backup battery](#)” on page 21
 - “[To configure power monitoring for a JACE-700](#)” on page 22

- “Configure JACE-x02 Express (M2M JACE) for dual battery monitoring” on page 24
- “PlatformServices properties” on page 27
- “Controller-specific PlatformServices properties” on page 28
- “JACE SRAM support enabling/disabling” on page 29
- “JACE serial port configuration” on page 29

About Platform Services

Under its Services container, every NiagaraAX station has a PlatformServices container (Figure 23).

Figure 23 JACE station's PlatformServices



PlatformServices is *different from all other components* in a station in the following ways:

- It acts as the station interface to specifics about the host platform (whether JACE or a PC).
- It is built *dynamically* at station *runtime*—you do not see PlatformServices in an offline station.
- Any changes you make to PlatformServices or its child services are *not stored in the station database*. Instead, changes are stored in other files on the host platform, such as its `platform.bog` file.

Note: *With one exception, do not attempt to edit `platform.bog` directly; always use PlatformServices' views! At the time of this document, the single exception is to enable station monitoring of an external sealed lead-acid battery connected to a JACE-x02 Express platform (aka "M2M JACE").*

For details, see “Configure JACE-x02 Express (M2M JACE) for dual battery monitoring” on page 24.

Included under PlatformServices are a `TcpIpService` and `LicenseService`, providing station (Fox) access to dialogs used in platform views, for instance the TCP/IP Configuration dialog as shown in Figure 18 on page 14. These services support installations where *all* configuration must be possible using only a browser connection (and not Workbench connected to the JACE's platform daemon).

PlatformServices items of interest for JACE commissioning

For any QNX-based JACE, the following child platform services in the station's PlatformServices are of chief importance when commissioning a new controller.

- `PowerMonitoringService` — Holds properties for configuration and status of the JACE's battery monitoring and primary power monitoring, and power-fail shutdown. For details, see “JACE power monitoring configuration” on page 20.
(In the special case of a JACE with an SRAM option card, running an *early* AX-3.6 build (prior to 3.6.44), this service is automatically *removed*. This controller is always assumed to be “battery-less”. However, an SRAM-equipped controller running build 3.6.44 or later is configurable for simultaneous support of a backup battery (if installed) *and* SRAM. Or, the JACE may be re-configured to support only one or the other.)
- `DataRecoveryService` — For operation/monitoring of the ongoing SRAM backups for an SRAM-equipped JACE. Starting in build 3.6.44, it includes a “Service Enabled” *configuration* property, such that you can disable it (viable only if the controller has a backup battery installed). For details, see “JACE SRAM support enabling/disabling” on page 29.
- `SerialPortService` — Holds properties for the status of serial ports. Typically, this platform

service is important only if an older (JACE-403 or JACE-545) series platform, to access “Port Config” properties. In this case configuration may be needed because one or more ports may be “dual-duty”, that is either RS-232 or RS-485.

Also, you may wish to review the parent container’s [PlatformServices properties](#) and adjust, if needed.

- For any SRAM-equipped JACE running build 3.6.44 or later that is installed “battery-less” (without any backup battery), you *must* adjust its “Battery Present” property from (the default) true to false. See [“To review/adjust PlatformServices properties for the JACE”](#) on page 27.
- PlatformServices in a JACE-700 (JACE-7 series) station include properties for an onboard “tamper switch” CI. See [“Controller-specific PlatformServices properties”](#) on page 28.

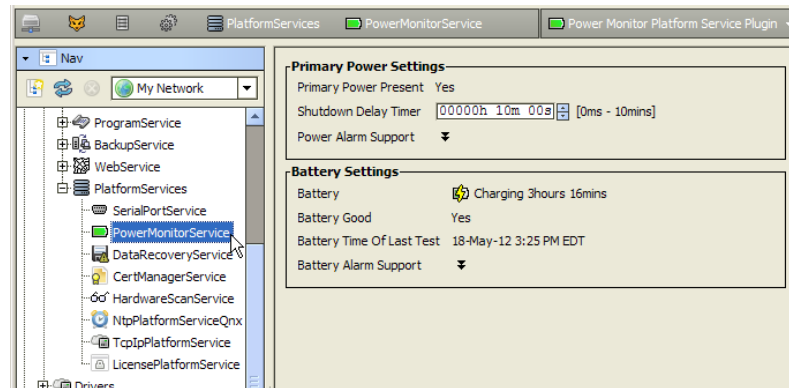
JACE power monitoring configuration

A JACE’s “power monitoring” options may require adjustment from default settings. These parameters define the JACE’s backup-battery monitoring and AC power-fail shutdown routines.

Note: *If an NPM6E-based JACE with “onboard SRAM” (JACE-3E, JACE-6E, JACE-603, or JACE-645), or another JACE with an installed “SRAM option card” that is running build 3.6.44 or later, you now have several backup options that involve the **PowerMonitorService** under its station’s **PlatformServices**. Note the initial AX-3.6 support for an SRAM option card-equipped JACE automatically removed the station’s **PowerMonitorService**, replacing it with the **DataRecoveryService** for SRAM support. This changed starting in build 3.6.44, where the station’s **PowerMonitorService** is always retained. For details on the **DataRecoveryService**, refer to the JACE Data Recovery Service (SRAM support) - Engineering Notes document.*

To review and configure a JACE’s power monitoring options, expand the station’s **PlatformServices** and double-click on the **PowerMonitorService**. See [Figure 24](#).

Figure 24 PowerMonitorService default view in a JACE-6E station





- If commissioning a JACE-2/6 or JACE-4/5 series controller *without* installed SRAM (or, a JACE-x02 Express (M2M JACE) installed *without* an optional, external 12V sealed lead-acid battery), see the procedure [“To configure power monitoring for a JACE with backup battery \(but no SRAM\)”](#).
- If commissioning any JACE equipped with SRAM *and* a backup battery, running build 3.6.44 or later, see [“To configure power monitoring for a JACE with SRAM and backup battery”](#).
Note: *For any SRAM-equipped JACE controller that is installed “battery-less”, there is no power monitoring. Instead, see [“To review/adjust PlatformServices properties for the JACE”](#) on page 27.*
- If commissioning a JACE-700 (JACE-7 series) controller, a special PowerMonitorService applies, with several configuration options. Some of these relate to onboard contact inputs (CIs) intended to monitor normally-closed alarm contacts on an external UPS. This JACE also supports (charges and monitors) an optional, external 12V sealed lead-acid battery. See [“To configure power monitoring for a JACE-700”](#) on page 22, and also tamper switch CI details for a [“JACE-700”](#) on page 28.
- If commissioning a JACE-x02 Express (M2M JACE) that is installed *with* an optional, external 12V sealed lead-acid battery, a different “dual battery” PowerMonitorService can be used. Two special procedures are required. See [“Configure JACE-x02 Express \(M2M JACE\) for dual battery monitoring”](#) on page 24.

To configure power monitoring for a JACE with backup battery (but no SRAM)

With a station in the JACE running, and that station opened in Workbench, do the following:

- Step 1 In the Nav tree, click to expand the station’s Services, PlatformServices, containers to reveal all contained services.

- Step 2 Double-click `PowerMonitorService`.
Its Power Monitor Platform Service Plugin displays in the view pane, as shown in [Figure 24](#) on page 20.
- Step 3 As needed, change configuration properties stored in the JACE platform, which include:
- **Shutdown Delay Timer**
Defines the period that the JACE waits between detecting loss of AC power and performing a *graceful shutdown* (backs up database and powers board off). Depending on JACE model, using either a nickel metal hydride (NiMH) battery or sealed lead-acid (Sla) battery, this varies.
 - For JACE-2/6 models (NiMH), the default value is 30 seconds, the valid range is 0 to 60 seconds (1 minute), maximum.
Note: The maximum value was formerly 30 seconds—the same as the default. Starting in builds 3.5.30 and 3.6.25, the maximum limit increased to 1 minute. Unless specifically needed longer, the default 30 seconds can be better in the case of multiple power outages that occur in quick succession. In that case, the NiMH battery may not become fully recharged, introducing a greater risk of the controller to be unable to complete a graceful shutdown upon loss of power.
 - For JACE-4/5 models (Sla), the default period is 1 minute, range is 0 to 15 minutes.
Generally, for “Sla battery” models, the default value is recommended, as longer periods means more time running on battery power. Otherwise, in some scenarios with multiple lengthy power failures (in succession) the battery may become completely discharged.
 - **Power Alarm Support**
 Expand to access properties that define how “primary power alarms” are handled in the station, including alarm class to use and other “alarm source info” type parameters.
 - **Battery Alarm Support**
 Expand to access properties that define how “battery alarms” are handled in the station, including alarm class to use and other “alarm source info” type parameters.
- Note:* Several settings reflect read-only status properties:
- **Primary Power Present** — Boolean, Yes (true) if AC power is currently supplied to JACE.
 - **Battery** — container that shows two values concatenated on a single line:
 - **State** — (with icon) enumerated descriptor, typically “Idle” if fully charged, else “Charging”, “Discharging”, or “Unknown”.
 - If “Charging”, the estimated charge time left until fully charged (Charge Time Left).
 - **Battery Good** — Boolean, Yes (true) if last JACE backup battery test was good.
 - **Battery Time of Last Test** - provides a timestamp (in AbsTime format) of the last battery test performed by the JACE.
- Step 4 Click **Save** to write the configuration to host platform.

To configure power monitoring for a JACE with SRAM and backup battery

This applies to any SRAM-equipped JACE controller that *also has a backup battery installed*. Controller types are JACE-3E, JACE-6E, any other NPM6E-based type (JACE-603, JACE-645), or any other JACE model with “SRAM option card”. The controller must be licensed with the “dataRecovery” feature.

If the controller is installed “battery-less”, do not use this procedure. Go instead to [“To review/adjust PlatformServices properties for the JACE”](#) on page 27.

With a station running in the JACE and opened in Workbench, do the following:

- Step 1 In the Nav tree, click to expand the station’s `Services`, `PlatformServices`, containers to reveal all contained services.
- Step 2 Double-click `PowerMonitorService`.
Its Power Monitor Platform Service Plugin displays in the view pane, as shown in [Figure 24](#) on page 20.
- Step 3 As needed, change configuration properties stored in the JACE platform, which include:
- **Shutdown Delay**
Defines the period that the JACE waits between detecting loss of AC power and performing a *graceful shutdown* (backs up database and powers board off). Depending on JACE model, using either a nickel metal hydride (NiMH) battery or sealed lead-acid (Sla) battery, this varies.
 - For models with a NiMH backup battery (JACE-3E, JACE-6E, or JACE-2,-6,-7 with an SRAM option card), the default value is 10 minutes, the valid range is:
 - 0 to 10 minutes, maximum— Providing the **DataRecoveryService** is enabled, *else:*
 - 0 to 60 seconds (1 minute maximum) — If the **DataRecoveryService** is disabled or absent.
 If the controller’s **DataRecoveryService** (for SRAM support) is enabled and operating, and the NiMH battery is known to be good, the default (and maximum) Shutdown Delay value

of 10 minutes is typically reasonable. This provides extra time for continuous operation during a power outage of up to 10 minutes.

Note the NiMH battery charge is monitored during this delay period, and if necessary, the shutdown is initiated *before* this timer expires. Further, even if the battery had insufficient charge to complete a “graceful shutdown”, the DataRecoveryService would successfully restore the runtime station data from SRAM upon controller bootup (when power is restored).

- For JACE models with a sealed lead-acid (SLA) battery, such as a JACE-603 or JACE-645, the default period is 10 minutes, with a range from 0 to 15 minutes maximum.

Again, providing the SLA battery is known good and the station’s **DataRecoveryService** is enabled and running, the default (maximum) shutdown delay of 15 minutes is typically reasonable, for reasons noted above.

In either case, the “Battery Present” property in the station’s PlatformServices container must be set to true (the default). See [“To review/adjust PlatformServices properties for the JACE”](#) on page 27. Furthermore, if at some point you disable the station’s DataRecoveryService, (either set its “Service Enabled” property to false, or else uninstall its platDataRecovery module), it is recommended that you first set the Shutdown Delay no higher than the default 30 seconds (NiMH) or 1 minute (SLA). See [“JACE SRAM support enabling/disabling”](#) on page 29.

- Battery Alarm Support
 - ✚ Expand to access properties that define how “battery alarms” are handled in the station, including alarm class to use and other “alarm source info” type parameters.
- Power Alarm Support
 - ✚ Expand to access properties that define how “primary power alarms” are handled in the station, including alarm class to use and other “alarm source info” type parameters.

Note: Several settings reflect read-only status properties:

- Primary Power Present — Boolean, Yes (true) if AC power is currently supplied to JACE.
- Battery — container that shows two values concatenated on a single line:
 - State — (with icon) enumerated descriptor, typically “Idle” if fully charged, else “Charging”, “Discharging”, or “Unknown”.
 - If “Charging”, the estimated charge time left until fully charged (Charge Time Left).
- Battery Good — Boolean, Yes (true) if last JACE backup battery test was good.
- Battery Time of Last Test - provides a timestamp (in AbsTime format) of the last battery test performed by the JACE.

Step 4 Click **Save** to write the configuration to host platform.

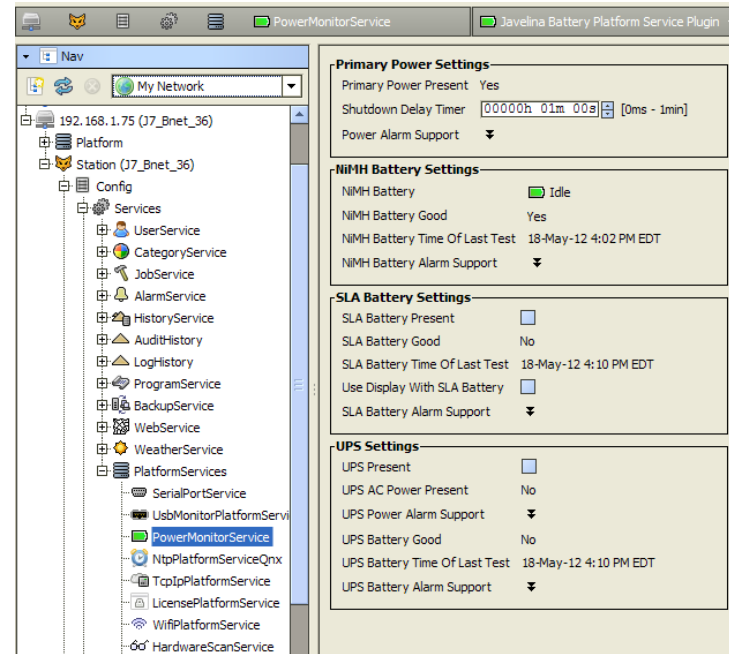
To configure power monitoring for a JACE-700

Note: Setup of the onboard “tamper switch” contact input (CI “TMP”) is at a different location. See [“Controller-specific PlatformServices properties”](#) on page 28.

With a station in the JACE-7 series controller running, and that station opened in Workbench, do the following:



- Step 1 In the Nav tree, click to expand the station’s Services, PlatformServices, containers to reveal all contained services.
- Step 2 Double-click PowerMonitorService for its Javelina Battery Platform Service Plugin ([Figure 25](#)).

Figure 25 Javelina Battery Platform Service Plugin view for JACE-700



Step 3 As needed, change configuration properties stored in the JACE-700 platform, which include:

- **Primary Power Settings**
 - **Shutdown Delay Timer**
Defines the period that the JACE-7 waits between detecting loss of AC power and performing a graceful shutdown (backs up database and powers board off).
Note: At shutdown, 12V battery power wired to any external I/O modules is also turned off.
Depending on whether a sealed lead-acid (SLA) battery is connected to the JACE, and also that battery's capacity (as well as the loading factor of any attached remote I/O modules), the maximum recommended time can vary. Longer periods means more time running on battery power.
 - If no external SLA battery is present, a value from 30 seconds to 1 minute (default) is recommended.
 - If an external SLA battery is present, a time of one fourth or less than the “total possible” battery run time is conservative. Otherwise, in a scenario with multiple lengthy power failures (in succession) the SLA battery may become completely discharged.
 - **Power Alarm Support**
Expand to access properties that define how “primaryPower” alarms are handled in the station, including alarm class and other “alarm source info” type parameters.
- **NiMH Battery Settings**
 - **Nimh Battery Alarm Support**
Expand to access properties that define how “nimhBattery” alarms are handled in the station, including alarm class and other “alarm source info” type parameters. Such alarms apply to the onboard NiMH battery pack in the controller, which is always periodically tested.
- **SLA Battery Settings**
 - **SLa Battery Present**
Boolean (checkbox) to specify if an external SLA battery is connected. If set to true (checked), the JACE-7 supplies trickle charge voltage, and also periodically tests this battery. Default value is false for no SLA battery (checkbox cleared).
 - **SLa Battery Alarm Support**
Expand to access properties that define how “slaBattery alarms” are handled in the station, including alarm class and other “alarm source info” type parameters. Such alarms apply to the external 12V sealed lead-acid battery connected to (and trickle charged by) the controller, if “SLa Battery Present” is true (checked).

- **UPS Settings**
 - **Ups Present**
Boolean (checkbox) to specify if one or two normally-closed (N.C.) alarm contacts are wired to onboard contact inputs (CIs) labeled “PWR” and “BAT” on the JACE-7. Default value is false (checkbox cleared) for no monitoring.
 - **Ups Power Alarm Support**
 Expand to access properties that define how “upsPower” alarms are handled in the station (based upon “open” at controller’s onboard CI “PWR” (UPS PWR)), including alarm class and other “alarm source info” type parameters.
 - **Ups Battery Alarm Support**
 Expand to access properties that define how “upsBattery” alarms are handled in the station (based upon an “open” at the controller’s onboard CI “BAT” (UPS BATT)), including alarm class and other “alarm source info” type parameters.

Note: Several settings reflect read-only status properties, as follows:

- Primary Power Present — Boolean, Yes (true) if 15Vdc power is currently supplied to the JACE.
- NiMH Battery — container for NiMH battery values concatenated on a single line:
 - State — (with icon) enumerated descriptor, typically “Idle” if fully charged, else “Charging”, “Discharging”, or “Unknown”.
 - If “Charging”, the estimated charge time left until fully charged (Charge Time Left).
- NiMH Battery Good — Boolean, Yes (true) if last JACE NiMH battery test was good.
- NiMH Battery Time of Last Test - provides a timestamp (in AbsTime format) of the last NiMH battery test performed by the JACE.
- SLA Battery Good — Boolean, Yes (true) if last JACE test of the external SLA battery was good.
- SLA Battery Time of Last Test - provides a timestamp (in AbsTime format) of the last NiMH battery test performed by the JACE.
- UPS AC Power Present — Boolean, Yes (true) if the JACE-7 controller’s onboard CI “PWR” (UPS PWR) is closed.
- UPS Battery Good — Boolean, Yes (true) if the JACE-7 controller’s onboard CI “BAT” (UPS BATT) is closed.
- UPS Battery Time of Last Test - provides a timestamp (in AbsTime format) of the last poll of all on-board contact inputs on the JACE-7 controller.

Step 4 Click **Save** to write the configuration to the JACE-7 controller.

Configure JACE-x02 Express (M2M JACE) for dual battery monitoring





Note: The following procedures apply only if you are commissioning a JACE-x02 Express that is installed with an optional external 12V sealed lead-acid battery. If the JACE-x02 Express only has the onboard NiMH battery pack, see the procedure [“To configure power monitoring for a JACE with backup battery \(but no SRAM\)”](#) on page 20.

This configuration requires two procedures, summarized as follows:

1. Enable the platform for dual battery monitoring. Do this by making a platform connection to the JACE, where you use the **File Transfer Client** to copy its existing `platform.bog` file to your local Workbench PC, where you can edit it. Then you copy the edited `platform.bog` file back to the JACE-x02 Express. Note that *two* JACE reboots are necessary. This process replaces the default “single battery” PowerMonitorService with a “dual battery” PowerMonitorService.
See [“Enable dual battery \(NiMH and SLA\) monitoring for a JACE-x02 Express”](#).
2. Following the second JACE reboot, you can open the station and set configuration properties as needed for both batteries in the station’s PowerMonitorService.
See [“To configure power monitoring for the JACE-x02 Express with dual battery support”](#).

Enable dual battery (NiMH and SLA) monitoring for a JACE-x02 Express

To enable dual battery monitoring:

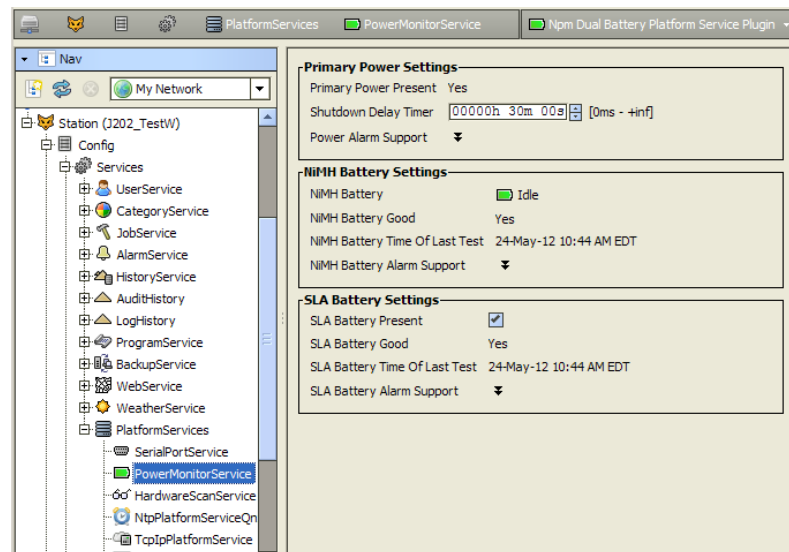
- Step 1 In Workbench, open a platform connection to the JACE-x02 Express (M2M JACE). Use the platform credentials you specified when commissioning the JACE.
In the Nav tree, click to expand the **Platform** node to reveal the different platform views (tools).
- Step 2 Double-click the **File Transfer Client**.
This two-sided view lists local PC folders/files (on left side) and remote JACE folders/files (on right side).
- Step 3 In the view’s *right side* for the platform  files, double-click the  `lib` folder to see the list of files inside.
- Step 4 Click to select the  `platform.bog` file, and click the left arrow  button to transfer to local PC.

- The file is transferred to your PC, ending with a confirmation “Transfer complete” popup (click **OK**).
- Step 5 Note where the copied `platform.bog` file is on your PC (by default, in your ! Niagara release root).
- Step 6 Open the file using your preferred text editor, and search for the text string:
- ```
platpwr:PowerMonitorPlatformServiceQnx
```
- Step 7 *Replace* the text string above with:
- ```
platpwr:NpmDualBatteryPlatformService
```
- Step 8 *Save* the edited `platform.bog` file and close your text editor.
- Step 9 In the Nav tree, double-click the **Application Director** platform tool for the JACE.
The Application Director view appears, with checkboxes and buttons on the right side.
- Step 10 In the Application Director, *uncheck* (clear) **Auto-Start**, then click the **Reboot** button.
Answer **Yes** to the confirmation dialog to reboot the system.

If a station is running, a dialog appears during shutdown, then a “Rebooting” dialog appears.
Click **OK** to proceed (a “Cannot display page” may appear when the JACE reboots).
- Step 11 After a minute, double-click on the Platform node again to reopen a platform connection.
Double-click the **File Transfer Client**
- Step 12 In the *left side* of the **File Transfer Client**, select the edited `platform.bog` file.
Click the right arrow button to transfer it back to the `lib` folder of the JACE platform.
A “Replace File” confirmation popup appears asking if you wish to replace existing `platform.bog` file.
- Step 13 Click **Yes**.
The file is transferred to the JACE, ending with a confirmation “Transfer complete” popup (click **OK**).
- Step 14 Access the **Application Director** platform tool for the JACE again.
- Step 15 In the Application Director, *re-check* (set) **Auto-Start**, then click the **Reboot** button.
Answer **Yes** to the confirmation dialog to reboot the system.

A “Rebooting” dialog appears. Click **OK** to proceed.
- After a couple of minutes, you should be able to open the restarted station and continue configuration of its PowerMonitorService. See [“To configure power monitoring for the JACE-x02 Express with dual battery support”](#).

Figure 26 Property sheet of “Npm Dual” PowerMonitorService in JACE-x02 Express



To configure power monitoring for the JACE-x02 Express with dual battery support

With a station in the JACE running, and that station opened in Workbench, do the following:

- Step 1 In the Nav tree, click to expand the station's **Services**, **PlatformServices**, containers to reveal all contained services.
- Step 2 Double-click **PowerMonitorService** to see its NPM Dual Battery Platform Service Plugin view in the view pane, as shown in [Figure 26](#).

Step 3 As needed, change configuration properties stored in the JACE platform, which include:

- **Primary Power Settings**
 - **Shutdown Delay Timer**
Defines the period that the JACE-x02 Express waits between detecting loss of AC power and performing a graceful shutdown (backs up database and powers board off).
Note: At shutdown, 12V battery power wired to any external I/O modules is also turned off.
Depending on whether a sealed lead-acid (SLA) battery is connected to the JACE, and also that battery's capacity (as well as the loading factor of any attached remote I/O modules), the maximum recommended time varies. Longer periods means more time running on battery power.
 - If no external SLA battery is present, a value from 30 seconds to 1 minute (default) is recommended.
 - If an external SLA battery is present, a time of one fourth or less than the "total possible" battery run time is conservative. Otherwise, in a scenario with multiple lengthy power failures (in succession) the SLA battery may become completely discharged.
 - **Power Alarm Support**
 - ✚ Expand to access properties that define how "primaryPower" alarms are handled in the station, including alarm class and other "alarm source info" type parameters.
- **NIMH Battery Settings**
 - **Nimh Battery Alarm Support**
 - ✚ Expand to access properties that define how "nimhBattery" alarms are handled in the station, including alarm class and other "alarm source info" type parameters. Such alarms apply to the onboard NiMH battery pack in the controller, which is always periodically tested.
- **SLA Battery Settings**
 - **Sla Battery Present**
Boolean (checkbox) to specify if an external SLA battery is connected. If set to true (checked), the JACE-7 supplies trickle charge voltage, and also periodically tests this battery. Default value is false for no SLA battery (checkbox cleared).
 - **Sla Battery Alarm Support**
 - ✚ Expand to access properties that define how "slaBattery alarms" are handled in the station, including alarm class and other "alarm source info" type parameters. Such alarms apply to the external 12V sealed lead-acid battery connected to (and trickle charged by) the controller, if "Sla Battery Present" is true (checked).

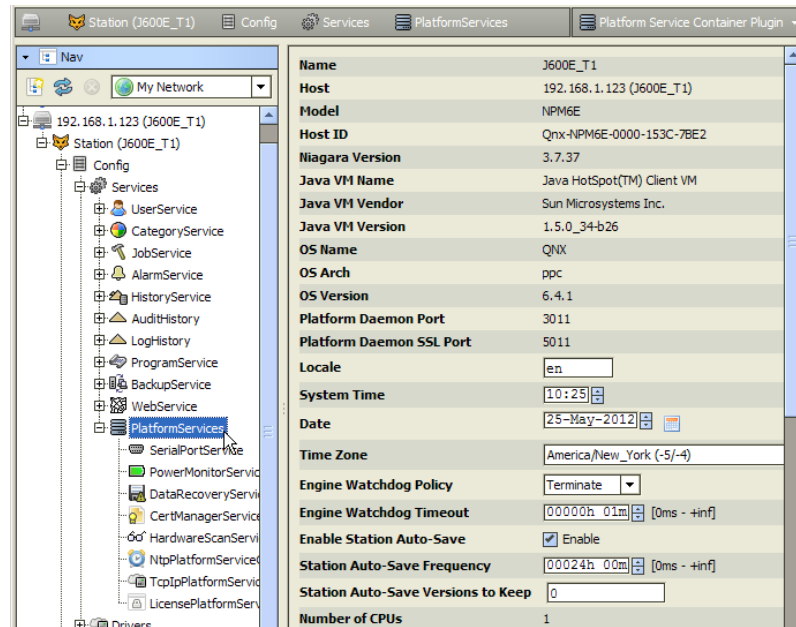
Note: Several settings reflect read-only status properties, as follows:

- Primary Power Present — Boolean, Yes (true) if 15Vdc power is currently supplied to the JACE.
- NiMH Battery — container for NiMH battery values concatenated on a single line:
 - State — (with icon) enumerated descriptor, typically "Idle" if fully charged, else "Charging", "Discharging", or "Unknown".
 - If "Charging", the estimated charge time left until fully charged (Charge Time Left).
- NiMH Battery Good — Boolean, Yes (true) if last JACE NiMH battery test was good.
- NiMH Battery Time of Last Test - provides a timestamp (in AbsTime format) of the last NiMH battery test performed by the JACE.
- SLA Battery Good — Boolean, Yes (true) if last JACE test of the external SLA battery was good.
- SLA Battery Time of Last Test - provides a timestamp (in AbsTime format) of the last NiMH battery test performed by the JACE.

Step 4 Click **Save** to write the configuration to host platform.

PlatformServices properties

Figure 27 PlatformServices property sheet in JACE



To review/adjust PlatformServices properties for the JACE

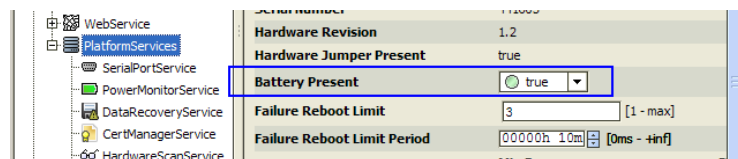
With a station in the JACE running, and that station opened in Workbench, do the following:

Step 1 In the Nav tree, double-click **Services** and then **PlatformServices**.

Its “Platform Service Container Plugin” displays in the view pane, as shown in Figure 27.

Some properties are read-only status types, similar to many seen in the [Platform Administration view](#). Other configuration properties are available. A group of 3 config properties allow adjustment of the time, date, and time zone settings for the host JACE (alternately accessible using a platform connection to the JACE). Access to these properties is useful if the installation requires all setup access using a browser only.

Step 2 Scroll down to the “Battery Present” property.



By default, the Battery Present property is **true**. This is the proper setting for any JACE controller, *unless*:

- It is SRAM-equipped, and has *no backup battery installed* (NiMH and/or external 12V), and;
- It has the **DataRecoveryService** running and enabled (license includes a dataRecovery feature).

In this case only, set the “Battery Present” value to **false** and click **Save**. After the next reboot (required), this prevents “battery bad” nuisance alarms from re-occurring.

Step 3 As needed, review other platform service configuration properties, which include the following:

Note: *It is strongly recommended that you leave the following properties at default values, unless otherwise directed by Systems Engineering.*

- **Locale** — Determines locale-specific behavior such as date and time formatting, and also which lexicons are used. A string entered must use the form: language [“_” country [“_” variant]] For example U.S. English is “en_US” and traditional Spanish would be “es_ES_Traditional”. See Oracle documentation at <http://docs.oracle.com/javase/1.4.2/docs/api/java/util/Locale.html> for related details.
- **Engine Watchdog Policy** — Defines response taken by the platform daemon if it detects a station engine watchdog timeout. With the watchdog, the station periodically reports to the platform daemon its updated engine cycle count. The watchdog purpose is to detect and deal with a “hung” or “stalled” station, and is automatically enabled when the station starts.
Watchdog policy selections include:

- **Log Only** — Generates stack dump and logs an error message in the system log.
- **Terminate** — (Default) Kills the VM process. If “restart on failure” is enabled for the station (typical), the station is restarted.
- **Reboot** — Automatically reboots the host JACE platform. If “auto-start” is enabled for the station, the station is restarted after the system reboots.
- **Engine Watchdog Timeout** — Default is 1 minute, and range is from 0 ms to infinity. If the station’s engine cycle count stops changing and/or the station does not report a cycle count to the platform daemon within this defined period, the platform daemon causes the VM to generate a stack dump for diagnostic purposes, then takes the action defined by the Engine Watchdog Policy.
- **Engine Station Auto-Save** — Either Enable (default) or Disable. Allows for “auto save” of running station to “config_backup_<YYMMDD>_<HHMM>.bog” file at the frequency defined in next property. Auto-saved backup files are kept under that station’s folder.
- **Station Auto-Save Frequency** — Default is every 24 hours for any embedded JACE, range is from 1 to many hours.
- **Station Auto-Save Versions to Keep** — Default is 0. Oldest of kept backups is replaced upon next manual save or auto-save backup, once the specified limit is reached. Significant flash space is saved by keeping this 0 or perhaps 1.
- **RAM Disk Size** — In MB, where default is 16 for a JACE-4/5 series, 8 for a JACE-2 series, 32 for a JACE-3E or JACE-6 or JACE-6E series, or 48 for a JACE-7 series. Specifies size of RAM disk used to store history and alarm files.

For further details on these and other PlatformServices properties, refer to the “PlatformServiceContainer parameters” section in the *Platform Guide*.

Step 4 Click **Save** to write any configuration change to the host JACE platform.

Controller-specific PlatformServices properties

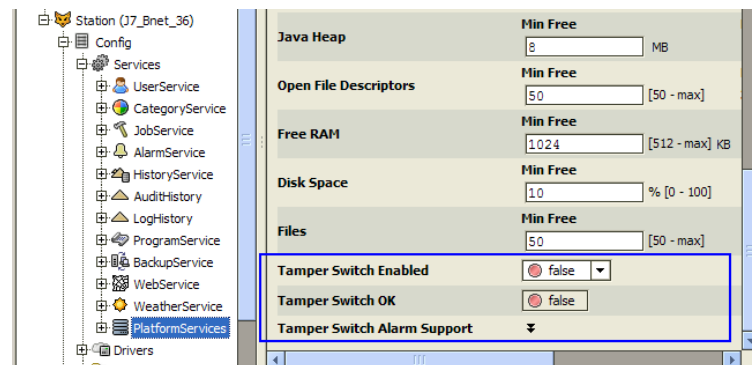
As newer JACE platforms are introduced, hardware-specific properties may be appended to the collection of a station’s [PlatformServices properties](#). Examples are given below.

JACE-700

A JACE-700 (JACE-7 series) controller includes properties for an onboard contact input (CI) intended for use with a nearby normally-closed (N.C.) “tamper switch”.

To see the three properties associated with this CI, double-click the station’s **PlatformServices**, for the Platform Service Container Plugin view, and scroll down to the bottom. See [Figure 28](#).

Figure 28 Tamper switch properties (for JACE-7 controller) at bottom of PlatformServices properties



The three properties related to this tamper switch CI are as follows:

- **Tamper Switch Enabled**
Default is `false`. If set to `true`, the onboard CI labeled “TMP” is polled once a second for a normally-closed (shorted) input. An open results in a “tamperSwitch” alarm from the default source “SystemService”.
- **Tamper Switch OK**
Read-only boolean that reflects tamper switch status as good (`true`) or bad (`false`). If the tamper switch is enabled, status is `true` while the “TMP” CI reads a closure (short), else `false` if the CI is open, which generates an alarm.
- **Tamper Switch Alarm Support**
Expand to access properties to define how “tamperSwitch” alarms are handled in the station, including alarm class and other “alarm source info” parameters. Applies if “Tamper Switch Enabled” is `true`.

JACE SRAM support enabling/disabling

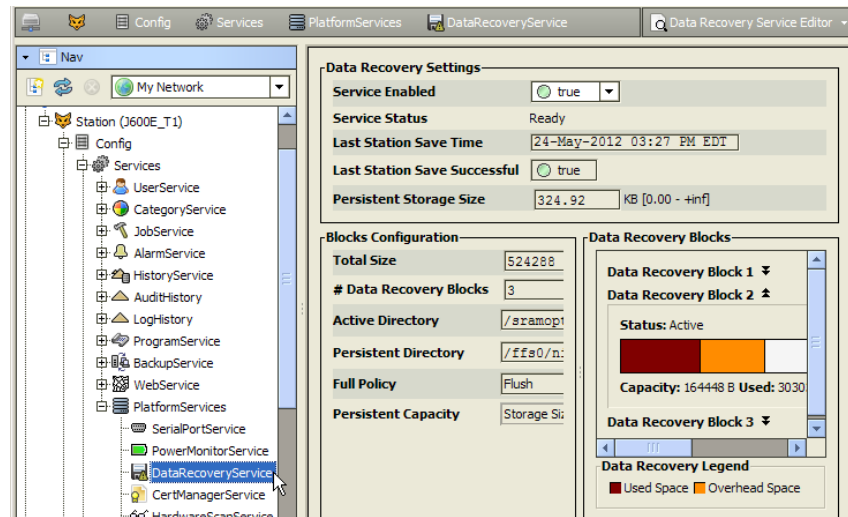
SRAM support is provided by the DataRecoveryService, a platform service that applies only to SRAM-equipped JACE controllers. In the initial AX-3.6 release, concurrent with the introduction of the “SRAM option card”, this platform service had no configuration properties—it is a “monitor only” service. Starting in build 3.6.44 and later, this service added a single configuration property: “Service Enabled”.

Note: *The main use case for this property is for a JACE-3E or NPM6E-based controller (JACE-6E, JACE-603, or JACE-645) with an installed backup battery, where you do not want it to use SRAM. This property setting is retained in any future controller upgrades. For more details, including scenarios where this configuration may be best, refer to the Engineering Notes II document JACE Data Recovery Service (SRAM support).*

To enable/disable SRAM support in the DataRecoveryService

With a station in the JACE running, and that station opened in Workbench, do the following:

- Step 1 In the Nav tree, click to expand the station's Services, then PlatformServices container to reveal all contained services.
- Step 2 Double-click DataRecoveryService. The **Data Recovery Service Editor** displays.



- Step 3 By default, the Service Enabled property is true. This is appropriate whenever the controller has no backup battery installed—for example, a JACE-3E or JACE-6E as factory shipped “battery-less”.

If the controller *has a backup battery* installed, you can optionally set this to false, providing:

- The “Battery Present” property in the station's PlatformServices container is set to true. See [“To review/adjust PlatformServices properties for the JACE”](#) on page 27.
- The backup battery is known good. If disabling SRAM support, is recommended that you set the PowerMonitorService's “Shutdown Delay” time no higher than the default 1 minute. See [“To configure power monitoring for a JACE with SRAM and backup battery”](#) on page 21.

Note: *If you set “Service Enable” to false, the DataRecoveryService no longer records runtime database changes to SRAM. The controller depends entirely on its backup battery to preserve station data upon a power loss!*

- Step 4 Click **Save** to write the configuration to host platform.
- You are prompted to reboot now to apply the changes. Click **Yes** to reboot with the change in the DataRecoveryService (disabled or enabled) made effective.

JACE serial port configuration

Note: *Serial port configuration applies only to older JACE-403 and JACE-545 platforms, particularly if equipped with an onboard dialup modem module. More recent JACE platforms have pre-determined serial port configuration, including the “retrofit board” JACE-603 and JACE-603 controllers.*

Dialup modem support was dropped starting in AX-3.7, such that port configuration for a unit running AX-3.7 should not include a choice with “_modem”. An onboard modem module should be removed.

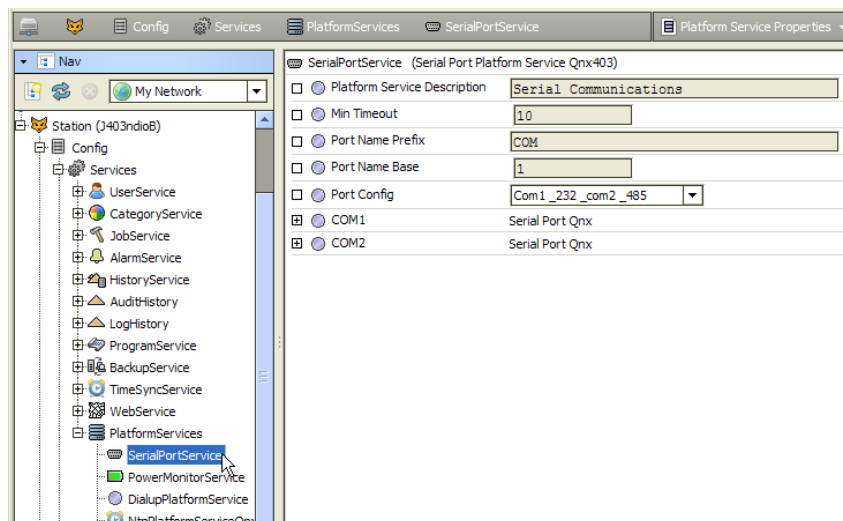
To configure serial port usage of the JACE

With a station in the JACE running, and that station opened in Workbench, do the following:

- Step 1 In the Nav tree, click to expand the station's Services, then PlatformServices container to reveal all contained services.

- Step 2 Double-click **SerialPortService**.
Its property sheet displays in the view pane, as shown in [Figure 29](#) on page 30.
- Step 3 By the **Port Config** property, click the drop-down control to select from a list of available choices. This list will vary depending on the particular JACE model being commissioned.
For example, if a JACE-403 the following choices are available:
- Com1_232_Com2_485 — Default configuration for a JACE-403 (only valid choice in AX-3.7 or later)
 - Com1_232_Com2_modem — if JACE-403 is equipped with onboard dialup modem.
 - Com1_485_Com2_modem — if JACE-403 is equipped with onboard dialup modem.
- Note:** Do not select either of the “_modem” options for a JACE running AX-3.7 or later.
- Step 4 Click **Save** to write the configuration to host platform.

Figure 29 Property sheet of **SerialPortService** in JACE-403 station



Optional platform administration

The [Commissioning Wizard](#) performs most, but sometimes not all, needed configuration for a new JACE platform. There are several items you should review (and possibly change) in a follow-up platform connection to each JACE, using the [Platform Administration view](#).

About JACE platform administration

As shown in [Figure 30](#), the Platform Administration view is one of several views for any platform, listed under the platform in the Nav tree and in the platform's Nav Container View.

Figure 30 Platform Administration is one of several platform views

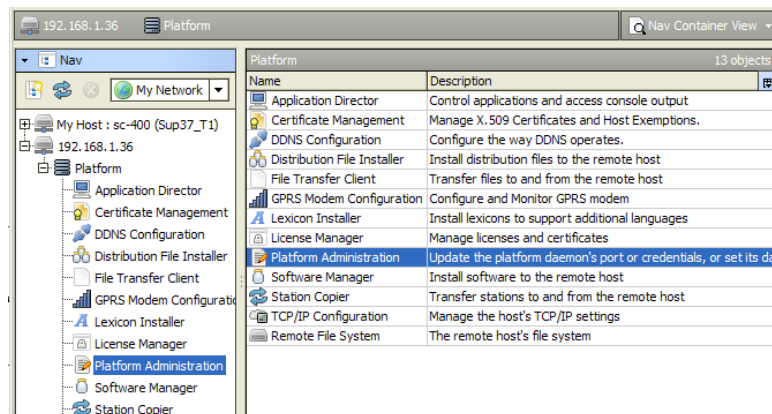
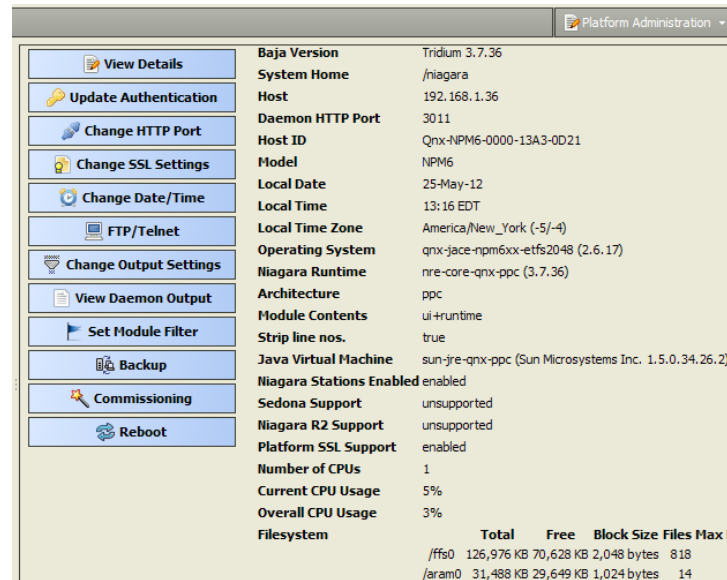


Figure 31 Platform Administrator view for JACE



Included in this view (Figure 31) are commands and related dialogs in which you can:

- Set the date and time in the JACE.
Typically, this is automatically handled by the Commissioning Wizard.
- Change the HTTP port used by the JACE for the Niagara platform daemon (platform server).
The default port is 3011.
- Enable or disable either or both FTP and Telnet access to the JACE.
By default, both FTP and Telnet are *disabled*, and use TCP ports 21 and 23, respectively.



Caution *FTP and Telnet pose security risks. We strongly recommend you keep each one disabled, unless otherwise directed by Systems Engineering. Upon completion of any use, they should be disabled once again.*

- View a simple text summary of the JACE's current software configuration, including its model number, OS level, JVM version, installed modules, lexicons, licenses, certificates, and so on.
- Use debug-level tools to change logging levels and view platform daemon output.
- Perform other platform tasks available using the Commissioning Wizard, such as changing platform authentication (platform's username and password), and so on.

For more details, see the "Platform Administration" section in the *Platform Guide*.

Administer the JACE platform

To perform platform administration

With your Workbench PC re-configured with its working IP address, and the JACE already commissioned using the [Commissioning Wizard](#):

- Step 1 Open a platform connection to the JACE. Use the platform credentials you specified when commissioning the JACE.
- Step 2 In the JACE platform's Nav Container View, double-click Platform Administration. The Platform Administration view appears (Figure 31).
- Step 3 As needed, click the following buttons to review or make changes:
 - **View Details** — For a platform summary that you can copy to the Windows clipboard.
 - **Update Authentication** — For a platform daemon authentication dialog to change platform login (username and password, as previously included as step in the commissioning wizard).
Note: If using AX-3.8, see "[Platform credentials notes for AX-3.8](#)" on page 2.
 - **Change HTTP Port** — For a dialog to change the HTTP port for the JACE's platform daemon from port 3011 to some other port. See "[Change HTTP Port](#)" on page 32.
 - **Change SSL Settings** — (Available only if the AX-3.7 or later JACE is licensed for SSL and has the necessary modules installed) For a dialog to specify platform SSL settings, including port to use, certificate to authenticate by, and secure protocol to use. Details are beyond the scope of this docu-

ment. For an overview, see “Change SSL Settings” in the Platform Guide. For complete information, refer to the *NiagaraAX SSL Connectivity Guide*.

- **Change Date / Time** — For a dialog to change the JACE’s current date, time, and time zone (as previously included as step in commissioning wizard).
- **FTP / Telnet** — For a dialog to enable/disable both FTP and Telnet access to the JACE, or change the default port number used by each one. See “Change FTP / Telnet” on page 32.
- **Change Output Settings** — Provides a dialog to change the log level of different processes that can appear in the platform daemon output
- **View Daemon Output** — Provides a window in which you can observe debug messages from platform daemon processes in real time. Also includes ability to pause or load.
- **Set Module Filter** — Provides a dialog to change the module content level of the JACE (as previously included as step in commissioning wizard).
- **Backup** — Make a complete backup of all configuration on the connected host platform, including all station files, plus other Niagara configuration (typically unnecessary for any JACE just started up).
- **Commissioning** — Another way to re-launch the [Commissioning Wizard](#), as previously used in the initial commissioning of the JACE.
- **Reboot** — Provides a method to reboot the JACE platform, which restarts all software including the OS and JVM, then the platform daemon, then if so configured in the Application Director (Station Director), the installed station. If you click this, a confirmation dialog appears. If you reboot, your platform connection is lost, and it is typically a minute or more until you can re-connect to this JACE. Note that a reboot is necessary if you have *manually* stopped (“Halted”) the station in any QNX-based JACE from the Application Director (Station Director), as the **Start** button will remain unavailable.

Change HTTP Port

This step is optional, and the default port 3011 is typically used in many Niagara installations. However, for reasons of additional security or perhaps firewall issues, you may need to change the HTTP port used by the JACE’s platform daemon.

To change HTTP port

From the Platform Administrator view ([Figure 31](#)):

- Step 1 Click the **Change HTTP Port** button.
A dialog appears showing the current HTTP port number highlighted.
- Step 2 Type in the new HTTP port number.
- Step 3 Click **Ok**.
Your current platform connection is dropped, and the JACE platform appears ghosted in the Nav tree, showing the new HTTP port number (:n) in parenthesis by the platform icon.
- Step 4 Double-click the ghosted JACE platform to get the platform login (Authentication) dialog, and enter the commissioned platform username and password. Click **OK**.
- Step 5 From the platform’s container view, double-click Platform Administrator to return to its view.

Note: *Before closing the host (removing it from Nav tree), carefully note the new (non-default) port number you entered. You must always specify that port number whenever reopening the JACE’s platform.*

Change FTP / Telnet

The default disabling of FTP (file transfer protocol) and Telnet access to the JACE prevents unauthorized access by either method. Generally, it is recommended that you *keep both disabled*.



Caution *Do not enable FTP and Telnet unless requested by Tridium Systems Engineering to facilitate debugging. Enabling FTP or Telnet on a JACE that is exposed to the public Internet introduces a big security risk.*

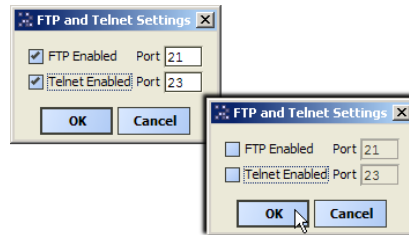
To verify or change FTP / Telnet access

From the Platform Administrator view ([Figure 31](#)):

- Step 1 Click the **FTP / Telnet** button.
A dialog shows an enabled checkbox by FTP and Telnet, with TCP/IP port numbers used ([Figure 32](#)).
- Step 2 If not already disabled, click each enabled checkbox to clear.
- Step 3 Click **Ok**.
FTP and Telnet access to the JACE are now disabled.

Note: Even with FTP disabled, you can transfer files between Workbench and the JACE using the platform's **File Transfer Client** view. See the Platform Guide section "File Transfer Client" for more details.

Figure 32 JACE FTP and Telnet setup dialog



Modem configuration

Starting in AX-3.7, dialup modem support ended (no longer any "Dialup Configuration" platform view). However if the JACE is equipped with a GPRS modem, you use the JACE platform's **GPRS Modem Configuration** view to configure its settings. Details are beyond the scope of this document. See the "GPRS Modem Configuration" section in the *Platform Guide*, and for further details the Engineering Notes document *GPRS Modem Option*.

Recovery tips

During JACE commissioning, it is possible to run into problems. For instance, you may mis-type an IP address when entering it, and as a result be unable to regain access. In this scenario, there are a couple of things you should know about:

- [IP changes history](#) (a Workbench feature)
- [System shell](#) (a feature of any QNX-based JACE)

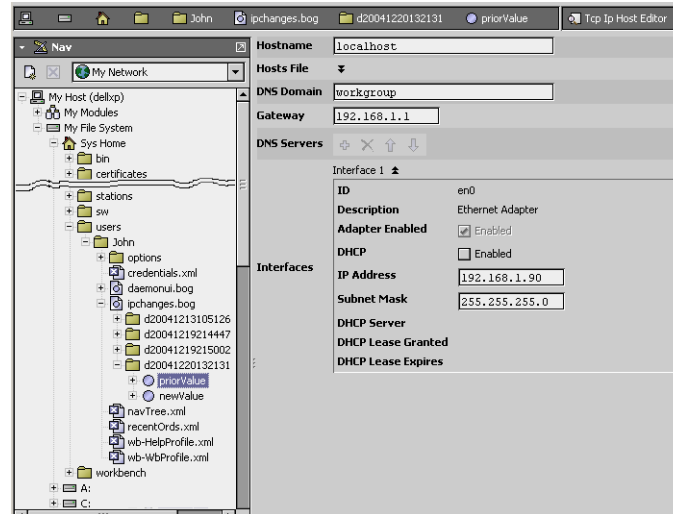
IP changes history

Your Workbench PC records "before and after" TCP/IP settings made from Niagara platform connections in an `ipchanges.bog` file. If necessary, you can review changes from Workbench using the following procedure.

To review TCP/IP changes made from your Workbench PC

From your PC with Workbench started, do the following:

- Step 1 In the Nav tree, expand "My Host" and then "My File System."
 - Step 2 Expand "Sys Home" and then "users."
 - Step 3 Expand your user folder, then expand "`ipchanges.bog`."
Child folders are "date-named" using the following convention:
`d<yyyymmddhhmmss>` for example, "`d20091013141522`" for 2009 Oct 13 2:15pm
 - Step 4 Expand any folder of interest. Underneath each folder are two objects:
 - `priorValue` — TCP/IP settings that existed before this change.
 - `newValue` — TCP/IP settings that existed *after* this change.
 - Step 5 Double-click a `priorValue` or `newValue` to see settings in the "Tcp Ip Host Editor" (see [Figure 33](#)).
- Note:** If you have a platform connection open (to any host), you can also review the history of IP changes made from your Workbench's TCP/IP Configuration view. Click the **"Audit"** button at the bottom of the view. This shows your `ipChanges.bog` folder and all child change entries. Expand a change folder to see a decoded "modTime" value, for example, "13-Oct-2009 02:15 PM" (vs "`d20091013141522`"). Double-click a "`priorValue`" or "`newValue`" in the view to see the settings in the "Tcp Ip Host Editor."

Figure 33 Accessing ipchanges.bog in Workbench

System shell

Any QNX-based JACE has a “system shell,” providing low-level access to a few basic platform settings. Using a special JACE power-up mode, you can access this system shell using a *serial connection* to the JACE’s onboard RS-232 port. Note that system shell is also available via Telnet (providing that Telnet is enabled in the JACE).

Typical usage is for troubleshooting. However, in the case of IP address mis-configuration, you can use the *serial system shell* in order to regain access to the unit.

Note: *Also, depending on your preference, as an alternative to reconfiguring your PC’s IP address in Windows (to initially connect to a new JACE), you may wish to use the serial system shell to set the JACE’s IP address. If done as the first step, afterwards you could connect normally (Ethernet/IP) and perform all other Niagara software installation/platform configuration using Workbench and the [Commissioning Wizard](#). This method would save you from having to re-configure your PC’s IP address settings in Windows: first to connect to the JACE as shipped from the [factory](#), and then back again to its original settings.*

The following sections provide more details:

- [About JACE serial shell mode](#)
- [Items needed for serial system shell](#)
- [Using serial system shell](#)
- [About the JACE system shell menu](#)

About JACE serial shell mode

Any JACE circuit board has a small 4-pin jumper connector, commonly called the mode jumper. To put the JACE in serial shell mode, you put a 2-pin jumper on certain connector pins, and cycle power to the unit. Upon system boot, this makes the system shell available at the JACE’s primary RS-232 (COM1) port, at a pre-defined serial rate: typically 115200, 8, N, 1 (or else if a JACE-403 or JACE-545: 57600, 8, N, 1).

Using a serial terminal program such as PuTTY or HyperTerminal, you can then login using platform credentials and access the system shell menu. After changing platform IP address parameters, a reboot command from the menu is necessary, and you remove (or reposition) the mode jumper. The JACE reboots using the changed IP address parameters, and its COM1 port operates as normally configured.

Note: *If using COM1 for any other application, be sure to move the 2-pin jumper from the “Serial Shell” position to the “Normal” position before rebooting from the serial system shell.*

Items needed for serial system shell

Apart from physical access to the JACE, you need the following items:

- A working RS-232 port on your PC.
Usually this is a DB-9 connector with a specific Windows ComN assignment (say Com1 or Com2). However, newer notebook PCs may require a USB-to-RS-232 adapter, installed with a Windows driver.
- Terminal emulation software, such as PuTTY (free open source application) or Microsoft HyperTerminal (standard in Windows XP).
- A serial cable to connect between your PC’s serial ComN port to the JACE’s RS-232 port, plus any adapter, if necessary.

- A JACE-3E, JACE-6E, or JACE-2,-6,-7's RS-232 port uses a DB-9 connector. Use a standard DB-9 to DB-9 "null modem" cable.
- For JACE controllers with RS-232 ports that use RJ-45 connectors, such as a JACE-x02 Express (M2M JACE), JACE-603, JACE-645, or any JACE-4/5 series, the following parts, listed by Tridium part number, apply:
 - 10148 — Adapter, RJ-45 to DB-9, null modem type
 - 10181 — Silver satin RJ-45 patch cable, 10 ft. (connects adapter to RJ-45 type RS-232 port)Patch cables are also available in lengths 4 ft. (10180) and 25 ft. (10182)

Note: If sourcing your own RJ-45 to DB-9 adapter, refer to the Mounting and Wiring Guide for the appropriate JACE controller for the pinouts used on the RS-232 port.

- A 2-pin jumper block for the JACE's "Serial Shell" jumper pins—in most cases this should already be installed on the "Normal" position pins.

Using serial system shell

The following procedure provides steps to use serial system shell.



Caution

In serial shell mode, normal COM1 port usage is overridden! Note that some models, such as a JACE-403, have configurable serial ports, where the RS-485 port may be configured as COM1. In this case, note that the RS-485 port will not function during serial shell mode.

To connect to the JACE serial system shell

To connect to the JACE's system shell using a serial connection, do the following:

- Step 1 Connect the necessary serial cable and adapter between the JACE's RS-232 port and the RS-232 COM port you are using on your PC. See ["Items needed for serial system shell"](#) on page 34.
- Step 2 On your PC, start your terminal emulation software. For Hyperterminal, from the Windows Start menu, this is typically **Programs > Accessories > Communications > HyperTerminal**.
- Step 3 In the **"Connection Description"** dialog, type a name for this session.
For example: Jace serial shell
Click **OK**.
- Step 4 In the **"Connect to"** dialog, use the **"Connect using"** drop-down list to select the COM port you are using on your PC, for example COM1. Click **OK**.
- Step 5 In the **Conn Properties** dialog, choose the following settings:
 - Bits per second: 115200 for a JACE-3E, JACE-6E, JACE-2,-6,-7, or JACE-x02 Express, JACE-603, JACE-645. (For a JACE-4/5 series, select 57600).
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: HardwareClick **OK**. The HyperTerminal session is now set up.
- Step 6 On the JACE controller, locate the 4-pin "Serial Shell" connector and put a 2-pin jumper on the appropriate pins. See the label on the JACE to locate the mode or "serial shell" connector pins.
- Step 7 With your HyperTerminal session active, remove power from the JACE, let it cycle down, then reapply power.
After a few seconds, text should appear in your terminal emulation software window similar to:
Press any key to stop auto-boot...
- Step 8 Do not press any key, wait for the login prompt.
Note: If you did press a key to stop auto-boot, select option 1 (Boot from on-board nand flash).
- Step 9 At the login prompt, enter the platform user name, and at the password prompt, the platform password. See ["Platform daemon credentials"](#) on page 3 for factory-default values.
The system shell menu appears. See ["About the JACE system shell menu"](#) on page 36.
- Step 10 When finished making platform changes from the serial system shell, do the following:
 - Move the 2-pin jumper block from the "Serial Shell" position back to the "Normal" position, or remove it from the "Mode" connector of a JACE-4/5 controller.
 - From the system shell menu, select the **Reboot** option.
Type "y" at the "Are you sure you want to reboot [y/n]" prompt, and press Enter.
Shutdown-related text appears in the HyperTerminal window, and then the connection is dropped.

- Step 11 Press the **Disconnect** button on the HyperTerminal tool bar.
- Step 12 Exit from the HyperTerminal application, selecting to **Save** if you wish to reuse this setup again.

About the JACE system shell menu

The system shell of a JACE provides simple, menu-driven, text-prompt access to basic Niagara platform settings, including IP network settings, platform credentials, system time, and enabling/disabling FTP and Telnet. Also, you can use it to perform a TCP/IP “ping” from the JACE to another host.

Changes issued in the system shell become immediately effective, except for IP address settings ([Update Network Settings](#)). You must reboot the JACE in order for any changed network settings to become effective.

Note: *If Telnet is enabled in a JACE, you can also access the JACE’s system shell using a Telnet session. Platform login is still required (just as with a JACE powered up in serial shell mode).*



Caution *Be careful when changing items from the system shell, in particular platform account (login credentials) and network settings. If you change platform login credentials and then lose or forget them, you can restore the “factory default” platform login credentials—however, you will need to make a serial shell connection, reboot the JACE, and then be careful to press a key at the appropriate time during JACE boot up.*

[Figure 34](#) shows an example main JACE system shell menu.

Figure 34 JACE system shell menu (serial shell or Telnet access)

```
NPM6E System Shell
-----
hostid: Qnx-NPM6E-0000-153C-7BE2
serial number: 441603
build version: 2.6.18
build date: built on 2012-05-10 15:00:34
system time: Fri May 25 16:20:52 DST 2012
niagara daemon port: 3011
en0:  inet 192.168.1.123 netmask 0xffffffff broadcast 192.168.1.255
      inet6 fe80::201:f0ff:fe8d:7a06%en0 prefixlen 64 scopeid 0x2
en1:  <disabled>
-----
1. Update System Time
2. Update Network Settings
3. Ping Host
4. Enable/Disable Ftp
5. Enable/Disable Telnet
6. Update Platform Account
7. Reboot

L. Logout

Enter choice:
```

To select a menu option, type the associated number (1 to 7) or “L” for logout, then press Enter. For example, you may choose [Update Network Settings](#) to recover IP access, or to set the IP settings of a new JACE.

Update Network Settings

Use this menu option to access most of the same IP networking options as available in the Commissioning Wizard step (“[TCP/IP configuration](#)” on page 14). When selected, you are prompted for each setting sequentially, starting with hostname ([Figure 35](#)).

Note: *If a JACE with an installed “WiFi option” (at the time of this document, applies only to a JACE-700 controller), note that TCP/IP settings for the WiFi card are not configurable from system shell. Instead, a platform connection to the JACE is needed for the TCP/IP Configuration view, or the equivalent TcpIpPlatformService plugin view in its station’s PlatformServices.*

For related details, refer to the NiagaraAX JACE WiFi option - Engineering Notes document.

Figure 35 Update Network Settings example in JACE system shell

```
JACE Network Configuration Utility

Enter new value, '.' to clear the field or '<cr>' to keep existing value

Hostname <NPM6E-357714> : NPM6E-EAST
Domain <> : myDomain.net
Primary DNS Server <> : 8.8.8.8
Secondary DNS Server <> : 8.8.4.4
Route <192.168.1.1> :
Primary IPv6 DNS Server <> :
Secondary IPv6 DNS Server <> :
IPv6 Route <> :

NET1 Ethernet interface
  IP address (clear to use DHCP) <> : 192.168.1.44
  Subnet mask <255.255.255.0> :
  Enable IPv6 addressing on this adapter? (Y/n) :
  IPv6 address (clear to use stateless autoconfiguration) <> :

Enable NET2 interface? (Y/n) : Y
  IP address (clear to use DHCP) <> : 172.15.16.66
  Subnet mask <255.255.255.0> :
  Enable IPv6 addressing on this adapter? (Y/n) :
  IPv6 address (clear to use stateless autoconfiguration) <> :

Confirm new configuration
Hostname      : NPM6E-EAST
Domain       : myDomain.net
Default Gateway : 192.168.1.1
Primary DNS   : 8.8.8.8
Secondary DNS : 8.8.4.4
Default IPv6 Gateway :
Primary IPv6 DNS :
Secondary IPv6 DNS :

NET1 settings:
IP Address      : 192.168.1.44
Subnet Mask     : 255.255.255.0
IPv6 Addressing assigned via Autoconfiguration

NET2 settings:
IP Address      : 172.15.16.66
Subnet Mask     : 255.255.255.0
IPv6 Addressing assigned via Autoconfiguration

Save these settings? (Y/n) :
```

Note: After you save the network settings, they do not become active until you perform a reboot of the JACE controller. You can do this when you return to the main system shell menu, by selecting menu option 7 (see [Figure 34](#) on page 36).

Document Change Log

Updates (changes/additions) to this JACE Niagara^{AX} *Install and Startup Guide* document are listed below.

- Revised: November 6, 2013
Edited for the initial NiagaraAX 3.8 release (denoted as “AX-3.8” in this document). A beginning section was edited and retitled “[JACE commissioning notes for AX-3.8 and AX-3.7u1](#)” on page 1, with new subsections “[AX-3.8 specific commissioning notes](#)” and “[Platform credentials notes for AX-3.8](#)”. Related to changes in AX-3.8, other document sections had new or expanded notes, including the following sections: “[Connect to the JACE](#)” on page 4, “[Start the Commissioning Wizard](#)” on page 6, and “[Platform daemon authentication](#)” on page 16.
- Revised: May 31, 2013
Edited for the security-oriented AX-3.7 “Update 1” release (AX-3.7u1, or build 3.7.105 or later), concurrent with (and required by) the newest JACE-3E series platform. The JACE-3E controller has on-board SRAM like NPM6E-based controllers (JACE-6E, JACE-603, JACE-645), and platform commissioning for all these Hotspot JVM controllers is comparable.
Document changes include a new beginning section “JACE commissioning notes for update 1 release” on page 1-1. Another change for AX-3.7u1 and later is in the module selection for a Hotspot JVM controller being configured for SSL—modules `cryptoCore` and `daemonCrypto` are no longer selected, only `platCrypto`. See “[Select modules](#)” on page 12, including [Note](#): on page 12.
Note if upgrading a previously SSL-configured AX-3.7 Hotspot JACE to AX-3.7u1 or later, the **Commissioning Wizard** automatically takes care of these module location differences, by updating all modules in their proper locations, then removing the older `cryptoCore` and `daemonCrypto` modules from controller’s `!modules` folder.
Various other minor changes are in other sections—mostly as new or reworded “Cautions” or “Notes” relating to best security practices.
- Revised: May 30, 2012
Reworked entire document to reflect NiagaraAX-3.7 changes to Workbench platform tools, including the platform Commissioning Wizard. Therefore, this is now a “versioned” document that applies to NiagaraAX Workbench starting in AX-3.7. Most screen captures were updated from the previous document, and various minor changes were made that are too numerous to mention.
The basic focus of this document remains unchanged—to describe the commissioning of a new JACE using the platform Commissioning Wizard. See the “[Important Commissioning Wizard notes](#)” on page 6 for a summary of some noticeable wizard changes, starting in AX-3.7. Included are the reordering (and lesser importance) of the “Install Lexicons” step, and some additional module information noted in the “Select modules” step. See “[Install lexicons](#)” on page 11 and “[Select modules](#)” on page 12 for related details.
Starting in AX-3.7, a station’s PowerMonitorService (platform service) has an improved default view (plugin), which is described and shown in various sections under the section “[JACE power monitoring configuration](#)” on page 20. With more SRAM-equipped JACE controllers becoming available, this configuration may have increased importance, along with the configuration described in the section “[JACE SRAM support enabling/disabling](#)” on page 29.