Technical Document

JACE-8000 Backup and Restore Guide

February 19, 2019

niagara⁴

JACE-8000 Backup and Restore Guide

Tridium, Inc.
3951 Westerre Parkway, Suite 350
Richmond, Virginia 23233
U.S.A.

Confidentiality

The information contained in this document is confidential information of Tridium, Inc., a Delaware corporation ("Tridium"). Such information and the software described herein, is furnished under a license agreement and may be used only in accordance with that agreement.

The information contained in this document is provided solely for use by Tridium employees, licensees, and system owners; and, except as permitted under the below copyright notice, is not to be released to, or reproduced for, anyone else.

While every effort has been made to assure the accuracy of this document, Tridium is not responsible for damages of any kind, including without limitation consequential damages, arising from the application of the information contained herein. Information and specifications published here are current as of the date of this publication and are subject to change without notice. The latest product specifications can be found by contacting our corporate headquarters, Richmond, Virginia.

Trademark notice

BACnet and ASHRAE are registered trademarks of American Society of Heating, Refrigerating and Air-Conditioning Engineers. Microsoft, Excel, Internet Explorer, Windows, Windows Vista, Windows Server, and SQL Server are registered trademarks of Microsoft Corporation. Oracle and Java are registered trademarks of Oracle and/or its affiliates. Mozilla and Firefox are trademarks of the Mozilla Foundation. Echelon, LON, Lon-Mark, LonTalk, and LonWorks are registered trademarks of Echelon Corporation. Tridium, JACE, Niagara Framework, NiagaraAX Framework, and Sedona Framework are registered trademarks, and Workbench, WorkPlaceAX, and AXSupervisor, are trademarks of Tridium Inc. All other product names and services mentioned in this publication that are known to be trademarks, registered trademarks, or service marks are the property of their respective owners.

Copyright and patent notice

Contents

Preface

About this Guide

This topic contains important information about the purpose, content, context, and intended audience for this document.

Product Documentation

This document is part of the Niagara technical documentation library. Released versions of Niagara software include a complete collection of technical information that is provided in both online help and PDF format. The information in this document is written primarily for Systems Integrators. In order to make the most of the information in this book, readers should have some training or previous experience with Niagara 4 or NiagaraAX software, as well as experience working with JACE network controllers.

Document Content

This document includes topics that describe how to create USB backups and restore them to your JACE-8000 controller. Also included are instructions for recovering factory defaults, and safely shutting down a controller.

Document change log

Updates and changes to the document are listed in this topic.

February 19, 2019

Regarding changes in the backup/restore functionality for Niagara 4.7U1, added a note in the following topics: "USB Backup and restore feature", "Restoring from a USB backup" and "Recovering factory defaults".

January 23, 2018

Added the procedure, "Resetting platform credentials". Also, changed the title of another procedure to, "Recovering factory defaults".

March 27, 2018

Revised procedure, "Resetting platform credentials".

December 12, 2016

Minor branding correction in two topics, "Restoring from a USB backup," and "Restore Options."

October 11, 2016

Revised wording of the caution included in the following topics: "USB Backup and Restore feature", "Create a USB Backup", "Restoring from a USB Backup", and "Platform and station backup options".

September 14, 2016

Minor changes to step 2 of the procedure, "Restoring factory defaults", to clarify functionality.

August 19, 2016

- In the topic, "Restoring from a USB Backup", revised content in steps 5–11.
- Added a caution to the following topics regarding connecting large-capacity USB drives (>128GB): "USB Backup and Restore feature", "Create a USB Backup", "Restoring from a USB Backup", and "Platform and station backup options".
- Removed the Caution regarding Sandisk Cruiser USB flash drives causing the unit to fail from the USB Backup and Restore feature topic.

July 19, 2016

Added a note about supported file systems for USB backup to the topics: "USB backup and restore", Creating a USB backup", and "Platform and station backup options".

May 6, 2016

Modified note after the first paragraph in chapter 1, included the other features not supported when running AX.

April 13, 2016

- Edited wording in About this guide to include "shutdown".
- Added a note, after the first paragraph in chapter 1, stating that USB Backup/Restore and USB port functionality is not supported for any JACE-8000 running AX.
- In the topic, "Creating a USB Backup," added a similarly worded note above the first step in the procedure.
- In the topic, "Restoring from a USB Backup," added the same note (as that used in the "Creating…" topic) above the first step in the procedure.
- In the topic, "Recovering factory defaults," added a note after the image callouts table, stating that for any JACE-8000 running AX, USB Backup/Restore and USB port functionality is not supported. And, that while holding the Backup button during power up/boot up still initiates a factory recovery image, it restores the controller to its factory ship state which is N4.1, etc.
- Added the topic, "Shutting down the controller."
- Added the topic, "Shutdown operations" under the Reference Information.

December 2, 2015

- In the USB Backup and Restore feature topic, added a caution about USB drives causing the unit to fail.
- In the Create a USB Backup topic, added a caution about USB drives causing the unit to fail.

November 20, 2015

The USB backup restore procedure was updated to reflect a change in the restore options.

October 26, 2015

Changes throughout to reflect Niagara 4.1 updates.

August 18, 2015

Initial release publication.

Related documentation

Additional related information is available in the following document(s).

- *JACE-8000 Mounting and Wiring Guide*
- *JACE-8000 Install and Startup Guide*
- *Niagara Platform Guide*

Chapter 1   USB backup and restore

Topics covered in this chapter

♦ Creating a USB backup
♦ Restoring from a USB backup
♦ Restoring factory defaults
♦ Resetting platform credentials
♦ Shutting down the controller

The JACE-8000 allows you to back up the entire platform and station to a USB flash drive without requiring the backup functions of Workbench. Called a clone backup, the file created by a USB backup contains a complete image of the platform and station, including system modules and the QNX OS.

NOTE: Starting in Niagara 4.2, the JACE-8000 can be converted (downgraded) to run AX-3.8U1–with some feature limitations. For example, for any JACE-8000 running AX the USB Backup/Restore functionality is not supported. When running AX the USB port on the device is not monitored. Other unsupported features are IEEE 802.1X wired authentication and WiFi functionality.

The BackupService, which comes standard with Workbench, backs up station files to a local Supervisor or browser PC. A backup made by the BackupService includes only pointers to required core software modules. To restore from a backup made using Workbench, not only do you need Workbench, but also its software database with matching versions of all required core .dist files, OS .dist files, and software modules. Afterwards, use the **Distribution File** Installer to restore the backup.

The JACE-8000 provides the ability to:

• Initiate a backup manually by inserting a USB flash drive into the USB port and pressing the backup and restore button on the unit itself.

  NOTE: USB backup supports only FAT32 and FAT32X file systems. NTFS is not supported.

  CAUTION: Only flash drives (USB sticks ≤128GB) are recommended for backup/restore operations. USB bus powered external hard drives often have higher power requirements and so may not function as expected, possibly resulting in permanent damage to the drive or to the JACE-8000. Plugging in an external hard drive may cause the controller to become unresponsive, requiring a reboot.

• Restore a USB backup image using a USB flash drive, USB-to-microUSB cable connection and a terminal emulator program.

• Recover the factory default image. This feature does not require a USB flash drive, special cable or terminal emulator. The system pulls the factory image from non-volatile, read-only memory.

  NOTE: In Niagara 4.7U1 and later, the presence of a USB device inserted in the USB backup/restore port prevents you from accidentally launching the factory defaults recovery process while attempting to restore a backup. If a USB device, of any type, is inserted in the backup/restore port, then recovery is skipped. Consequently, when factory defaults recovery is desired, no USB device can be inserted in the USB port.

• In Niagara 4.4 and later, the Secure Platform Account Recovery feature provides customers with a secure method of regaining access to their JACE-8000 without losing station data and configuration.

Creating a USB backup

You may create a clone backup while a station is running or stopped. When the controller is powered on, the software continuously monitors the USB port. Putting a USB flash drive in the port triggers backup/restore mode.

Prerequisites:

- USB backups are enabled on the controller:
  Platform Administration→Advanced Options→USB Backup Enabled property is selected

 **NOTE:** USB backup supports only FAT32 and FAT32X file systems. NTFS is not supported.

- You need a USB flash drive with enough memory to contain the complete platform and station image along with the operating system and all software modules.

  CAUTION: Only flash drives (USB sticks ≤128GB) are recommended for backup/restore operations. USB bus powered external hard drives often have higher power requirements and so may not function as expected, possibly resulting in permanent damage to the drive or to the JACE-8000. Plugging in an external hard drive may cause the controller to become unresponsive, requiring a reboot.

Step 1   Confirm that the controller's power is on.

Step 2   Insert a USB flash drive into the USB port.

The backup and restore LED turns on.
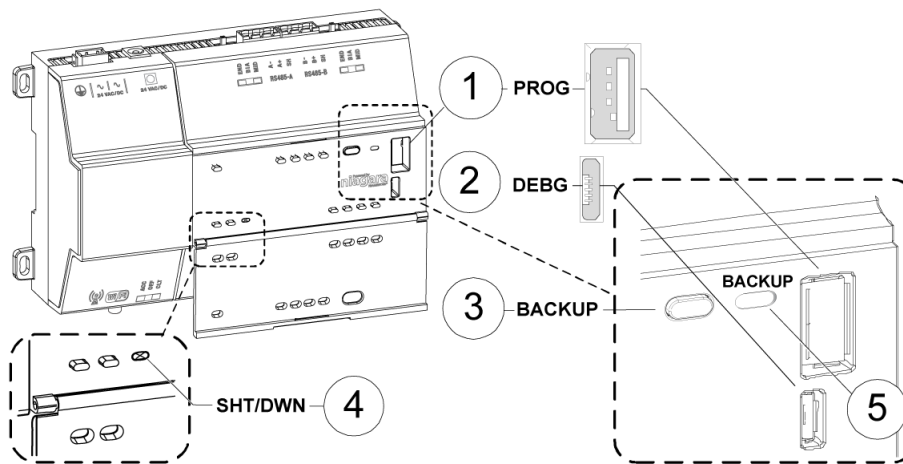
1	USB port
2	Micro-A USB debug port
3	Backup and restore button
4	Shutdown (initiates an orderly shutdown)
5	Backup and restore LED

Step 3   Hold the backup and restore button until the LED flashes at medium speed (100mS on and 100mS off), then release the button.

The system begins the backup. While backing up, the LED flashes slowly (one second on, one second off).

When the backup completes, the system prepares the USB flash drive to be removed safely.

NOTE: If the backup is unable to complete successfully, the LED flashes rapidly (200ms on, 200ms off, 200ms on, 3s off), indicating an error. In this case, simply unplug the USB thumb drive, wait for the LED to turn off, then insert the thumb drive and try the backup procedure again.

If problems persist, possible causes could be:

- Insufficient disk space on the thumb drive
- Write protect enabled on the thumb driver

Step 4   When the backup and restore LED turns off, remove the USB flash drive and store it in a safe place.

The backup image includes the contents of the boot partition, /home/Niagara, /opt/Niagara, etc. The name of the resulting image file follows this convention: `hostid` (unique host ID of the JACE-8000), underscore (_) `timestamp`, For example:

- Qnx-TITAN-D01C-CA36–CB10–4E3B_20170912230355

- Qnx-TITAN-D01C-CA36–CB10–4E3B_20171015212346

Restoring from a USB backup

Restoring from a USB backup returns the controller to the state it was in when the system made the backup. You may restore to a controller other than the one on which the backup was made, provided that the target controller is the same model. The restore procedure does not require access to Workbench.

Prerequisites:

- The USB flash drive on which the backup is stored.

  CAUTION: Only flash drives (USB sticks ≤128GB) are recommended for backup/restore operations. USB bus powered external hard drives often have higher power requirements and so may not function as expected, possibly resulting in permanent damage to the drive or to the JACE-8000. Plugging in an external hard drive may cause the controller to become unresponsive, requiring a reboot.

- A USB-to-micro USB cable (same cable as that used to connect a smart phone to a computer). The Debug port on a controller is a standard Micro-A type USB port for debugging serial communications.

- A terminal emulator (system shell program), such as PuTTY.

  You use this program to access the controller's system shell menu, which lists the restore options.

- The system passphrase of the system to which you are restoring the backup.

- The system passphrase used to create the backup. If you are restoring the image to a different controller (another of the same model), or if the system passphrase for the controller on which the backup was made changed since you made the backup, the passphrase required to decode the backup will be different from the current system passphrase.

NOTE: For any JACE-8000 converted to run AX, USB Backup/Restore functionality is not supported. Also, the USB port on the device is not monitored for insertion/removal of devices.

Step 1   Set up the terminal emulator program running on your PC with the following settings:

- baud rate: 115200

- data bits: 8

- parity: N

- stop bits: 1

  For details on using a serial connection to this port, see "Secure storage and the SD card", "Preparing for new JACE commissioning" and System shell" topics in the *JACE-8000 Install and Startup Guide*.

Step 2   Ensure that the controller's power is off.

Step 3   Connect the USB-to-microUSB cable from the computer to the controller's microUSB port (Debug port).

Step 4   Insert the USB flash drive that contains the backup into the USB port.

Step 5   Press and hold down the backup and restore button throughout the boot-up process (approximately 5 seconds) until the button press is detected and this confirmation banner displays:

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
  Backup/Restore button press detected.  Release button
  now to proceed.
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Step 6   Release the backup and restore button once the banner displays.

On detecting the button release, the system begins a 10-second countdown, which displays as shown here:

```
Press any key to restore from USB backup.
If no key pressed, factory recovery will begin in 10 seconds

Recovery begins in 9 seconds
Recovery begins in 8 seconds
Recovery begins in....
```

Step 7   Press any key during the 10-second countdown to restore from a USB backup (and to prevent the system from entering factory recovery mode).

CAUTION: If no key press is detected during this 10-second countdown, then the factory recovery process begins at the moment the countdown finishes.

NOTE: In Niagara 4.7U1 and later, the presence of a USB device inserted in the USB backup/restore port prevents you from accidentally launching the factory defaults recovery process while attempting to restore a backup. If a USB device, of any type, is inserted in the backup/restore port, then recovery is skipped. Consequently, when factory defaults recovery is desired, no USB device can be inserted in the USB port.

The system enters the USB restore mode and the following banner displays:

```
*******************************************************
   Restore from a USB Backup
*******************************************************

Existing Niagara and platform installation will be completely removed!
This includes
   licenses
   TCP/IP and WiFi configuration
   platform credentials

If restoring a backup from another unit, you will need to
install a new license.

TCP/IP configuration and platform credentials will be set to values
in the backup.

Niagara daemon and station will be killed if they are currently running

Enter the system passphrase for this system to proceed, or return to exit
and reboot
```

Step 8   At the passphrase prompt, enter the current system passphrase for the controller.

One of the following happens:

- If the entered passphrase does not match the system passphrase for this controller, after prompting a second time and no match, the backup and restore LED flashes rapidly (200mS on, 200mS off) and it prompts you to reset the system.

- If the entered passphrase and the passphrase stored on the controller match, the system waits while the USB drive mounts, this can take a few minutes. The following message appears:

```
Waiting for USB drive to mount.  Press any key to quit and reboot.
```

Once USB drive is detected, the following message and options display:

```
USB drive detected
This platform is Qnx-TITAN-61BA-B6DB-88FE-4A31
Please make your selection below
1) Abort Recovery/Restore mode
2) Show backups for other host IDs
3) Qnx-TITAN-61BA-B6DB-88FE-4A31_20151119154109
```

Step 9   Type the number for a listed backup file name (for example: 3) or other option and press **Enter**.

NOTE: The backup file name is the name of the backup file stored on the USB flash drive:

`(hostid (unique host ID of the controller), underscore (_) timestamp)`

The system prompts you to enter the passphrase for the backup file.

Step 10   At the prompt asking if the backup file's passphrase is the same as the system passphrase for the controller, type `Y` (yes) or `N` (no).

- If `Yes`, then the system passphrase entered in the earlier step is used to decode the backup.

- If `No`, you must enter the passphrase for the backup file to decode the backup.

Step 11   If you entered `N` in the previous step, at the prompt enter the passphrase for the backup file, and confirm it.

The restore begins.

CAUTION: Once a restore begins, do not interrupt the process by removing the USB flash drive, disconnecting the power, or pressing the backup and restore button again. If you do not allow the restore to complete, the controller could be left in a non-functional state.

When the restore successfully completes, the backup and restore LED turns off and the system displays a message indicating that the restore is complete and that the controller requires a reset.

Step 12   Turn the controller's power off and back on again.

Restoring factory defaults

The process of recovering factory defaults returns the controller to the state it was in when it shipped from the factory. This procedure describes the steps to recover factory defaults when using a terminal emulator program to access the controller's system shell menu.

Prerequisites:

- A USB-to-micro USB cable (same cable as that used to connect a smart phone to a computer) connecting the controller to your PC. The Debug port on a controller is a standard Micro-A type USB port for debugging serial communicaStions. For more details, refer to the *JACE-8000 Install and Startup Guide*.

- A terminal emulator (system shell program), such as PuTTY, installed on your PC.

CAUTION: Recovering factory defaults removes all platform and station data in the controller. Be sure to backup data prior to performing this procedure.

Following are a couple of scenarios for which you might choose to recover factory defaults:

- While commissioning a brand new JACE, you make an error entering the default platform daemon credentials or passphrase. The result is that you cannot commission the controller. In this scenario, your only option is to recover the factory defaults.

- When decommissioning the JACE, a best practice to follow is recovering the factory defaults in order to wipe all of the platform and station data in the controller.

The figure with numbered call-outs, shown here, indicates the position of USB ports and switches behind the access door.
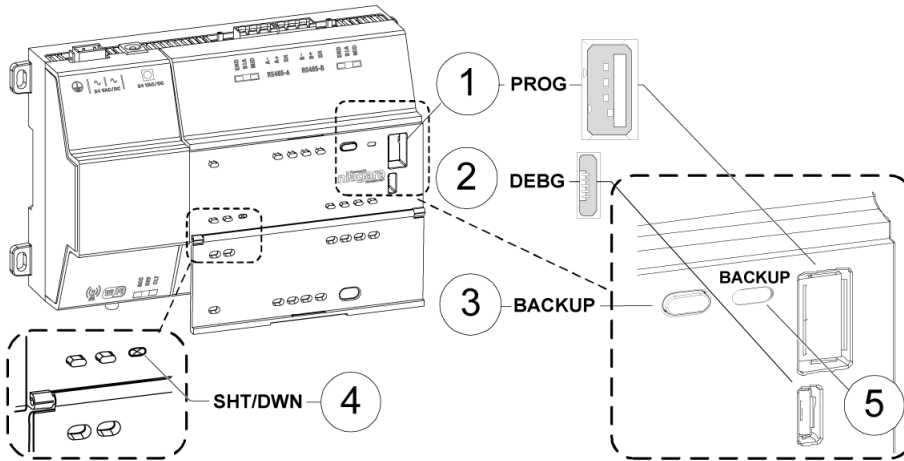
1	PROG	USB 2.0 for use with USB Flash (thumb) drive
2	DEBUG	Micro-A USB for serial debug communications
3	BACKUP	Pushbutton switch to start a USB backup, or if held in during power up/boot up, initiates a factory recovery image
4	SHT/DWN	Recessed pushbutton switch for initiating a controlled shutdown
5	BACKUP	LED to indicate USB media present, or a backup, restore, or factory recovery image in progress

NOTE: In Niagara 4.7U1 and later, the presence of a USB device inserted in the USB backup/restore port prevents you from accidentally launching the factory defaults recovery process while attempting to restore a backup. If a USB device, of any type, is inserted in the backup/restore port, then recovery is skipped. Consequently, when factory defaults recovery is desired, no USB device can be inserted in the USB port.

NOTE: For any JACE-8000 that is converted to run NiagaraAX, the USB Backup/Restore function is not supported and USB Connector 1 (for thumb drive) is disabled. USB Connector 2 for serial shell connections is still enabled in theJACE-8000 running NiagaraAX. And although holding down the Backup button during power up/boot up still functions to initiate a factory recovery image, it restores the controller to its factory ship state which is N4.1 or later. You must repeat the conversion procedure to get it to AX-3.8U1.

- The DEBUG port is a standard Micro-A type USB port for serial debug communications to the controller.

   NOTE: Login requires administrator level platform credentials.

- The SHT/DWN pushbutton initiates a "controlled shutdown" of the controller, ensuring that all station data is preserved.

Step 1   Ensure that the controller's power is off.

Step 2   Press and hold down the backup and restore button as you power up the controller, and continue holding down the button throughout the boot-up process until the button press is detected and the following confirmation banner displays:

```
*******************************************************
  Backup/Restore button press detected.  Release button
  now to proceed.
*******************************************************
```

NOTE: During this step of the procedure, the Backup LED flashes at medium speed (100 mS on, 100 mS off). Also, be aware that holding the button down too long results in the following message (which does not indicate a hardware fault). If this message appears it is best to start the procedure over, beginning with step 1:

```
"WARNING - CHECK BACKUP BUTTON - POSSIBLE SHORT!"
```

Step 3   Release the backup and restore button once the banner displays.

On detecting the button release, the system begins a 10-second countdown, which displays as shown here:

```
Press any key to restore from USB backup.
If no key pressed, factory recovery will begin in 10 seconds

Recovery begins in 9 seconds
Recovery begins in 8 seconds
Recovery begins in....
```

NOTE: Pressing any key during this 10-second countdown prevents the system from entering factory recovery mode. Instead, the system switches modes to restore from a USB backup.

When no key press is detected during the 10-second countdown, the factory recovery process begins at the moment the countdown finishes. Upon entering recovery mode, the boot process overwrites the controller with a default factory image. During this process the Backup LED blinks at slow speed (one second on, then one second off).

CAUTION: Once in recovery mode (BACKUP LED is flashing in slow blink), do not interrupt this process. Allow the recovery to complete or the controller could be left in an inoperable state.

Step 4   When the Backup LED stops flashing, turn the controller's power off and back on again to reboot.

NOTE: After recovering factory defaults the initial controller reboot process takes longer than usual.

On completion, the controller is restored to a factory default state.

Resetting platform credentials

Occasionally a situation will arise where you have a functional JACE-8000 controller but no valid credentials or system passphrase. This could be due to a change in building ownership or control contractors. In Niagara 4.4 and later, the Platform Account Recovery feature provides you with a secure method of regaining access to the JACE-8000 without losing station data and configuration.

Prerequisites:

• A USB-to-micro USB cable (same cable as that used to connect a smart phone to a computer) connects the controller to your PC.
• A terminal emulator (system shell) program, such as PuTTY, is installed on your PC.
• During the procedure, you will be prompted to provide the hostid and "proof of ownership" for this controller.

Resetting platform credentials is accomplished via a multi-stage process that involves using serial shell software plus contacting your Support channel, and interacting with Tridium in order to initiate a secure method of validating that you (the serial shell user) are authorized to reset the platform credentials and system passphrase.

NOTE: The controller must be powered off to initiate this procedure. Additionally, you must be able to communicate with Tridium via phone or email. Also, this process could conceivably take several hours to complete, depending on your access to cell phone or internet service.

Step 1   Power off the controller.

Step 2   Using the serial shell program on your PC, open a serial connection to the controller.

Step 3   Power up the controller and during the boot sequence, press **ESC** to enter the recovery mode which presents alternate boot options.

Step 4   While viewing the **Alternate Boot Options** menu in the serial shell window, enter **8** to select the option to "Reset Platform Credentials", and when prompted to confirm that you intend to reset platform credentials and system passphrase, enter **Y** to continue.

The **Platform Access Recovery** screen displays the controller's hostId, and OS version, as well as a randomly generated token and additional instructions, as shown.

```
*****************************************
**** Platform Access Recovery ****
*****************************************

Token generation in progress...

host id : Qnx-TITAN-B423-8B47-3D06-73E6

Token : 836E-8D70-BBBF-EEE

OS Version: 4.4.62.1 built on 2017-05-16 21:25:25

Contact technical support and provide them with the hostId and token
```

Step 5   Contact your appropriate Support channel and request credential/system passphrase reset for the hostid shown on-screen.

Step 6   When prompted, provide the support representative with the required "proof of ownership" for the controller.

Once proof of ownership is established the support representative will notify Tridium.

Step 7   When prompted In the **Platform Access Recovery** screen, enter the customer name. For example, `Joe NewBuildingOwner`.

Step 8   Contact Tridium (either via phone or email) and provide the generated token, the hostid and the customer name entered in the previous step.

The Tridium representative validates your customer identity via Niagara Licensing, and generates a "Signature" for the token/hostid/customer name that includes a **Reset Authorization Key**. This Signature is sent to you either by phone or email.

CAUTION: The **Reset Authorization Key** is valid only for 24-hours from the time it is generated. If you do not enter the key in the **Platform Access Recovery** screen within the 24-hour period, you must start over with step 1 of this procedure to obtain another Key.

Step 9   Once you have received the Signature, in the **Platform Access Recovery** screen indicate your preference for entering the **Reset Authorization Key** in the serial shell window, enter one of the following:

- Enter**1** for Single Line (best when the Key is copied from email), and at the "Enter Key" prompt paste the Reset Authorization Key. After checking the key enter **v** to verify it (or if necessary, enter 1 to edit the key and then **v** to verify it.)

```
Enter choice: 1

Enter Key: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa

Please check the key & edit it if necessary

1) Edit key: aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
v) Verify key
Enter choice: v
```

- Enter**2** for Multiple Line (best when receiving the Key over voice), and at the "Enter line x" prompts enter the string of characters as instructed. After checking your entries enter **v** to verify the key.

```
Enter choice: 2

Enter line 1: xxxxxxxxx
 Enter line 2: xxxxxxxxx
 Enter line 3: xxxxxxxxx
 Enter line 4: xxxxxxxxx

Please check the entries & edit them if necessary


1) Edit line 1: xxxxxxxxx
2) Edit line 2: xxxxxxxxx
3) Edit line 3: xxxxxxxxx
4) Edit line 4: xxxxxxxxx
v) Verify key
Enter choice:v
```

The controller uses the previously installed `tridium` certificate to verify that this Signature was generated by private key for the given token/hostid/customer name values. Afterwards, the system software generates the factory default username/password credentials and default system passphrase.

The serial shell window displays the following text and reboots after the specified amount of time:

```
Verification Passed

System user credentials are reset
Shutdown in 10 seconds
```

Step 10   Make a serial or platform connection to the controller. On detecting default credentials, the system prompts you to change the default credentials and default system passphrase before completing the platform connection.

On completion, you can login and access the station data and configuration as you normally would.

Shutting down the controller

The shutdown procedure allows you to safely shutdown the controller.

Step 1   Press and hold the **Shutdown** button until the **Backup** LED begins to flash.

NOTE: In QNX 4.3, the heartbeat LED also turns off, and all Ethernet, USB, and console connectivity is lost.

Step 2   Once the **Backup** LED begins to flash, release the **Shutdown** button.

Step 3   Once the **Backup** LED turns on (solid) and begins to blink, wait until the **Backup** LED turns off.

Step 4   Remove power to the controller.

NOTE: If you have a terminal connected to the controller, the following message displays when the shutdown process is complete and it is safe to remove power:

```
iomonitor: shutdown complete, safe to remove power
```

Chapter 2   Reference information

Topics covered in this chapter

♦ Platform and station backup options
♦ Restore options
♦ Shutdown operations

The following sections provide additional backup, restore, and shutdown reference information.

Platform and station backup options

Several options are available for backing up platform and station data.

NOTE: USB backup supports only FAT32 and FAT32X file systems. NTFS is not supported.

CAUTION: Only flash drives (USB sticks ≤128GB) are recommended for backup/restore operations. USB bus powered external hard drives often have higher power requirements and so may not function as expected, possibly resulting in permanent damage to the drive or to the JACE-8000. Plugging in an external hard drive may cause the controller to become unresponsive, requiring a reboot.

In Niagara, the term "backup" describes different operations. Refer to the following table for information about each backup type.

Backup type	Contents	Size	Tool	Notes	Platforms supported
Station copier	Station .bog file, histories, and alarms	<1 to 50 MB	Workbench	Supports cross-model installation of station backup	All (NiagaraAX and Niagara 4)
Backup `.dist`	Station `.bog` file, histories, alarms, references to modules, JVM and OS version, and platform configuration	<1 to 50 MB	Workbench	Requires a clean dist (distribution) to downgrade	All (NiagaraAX and Niagara 4)
Clone backup	Station bog, histories, alarms, copies of modules, JVM, OS image, platform configuration	50+ MB	Browser, USB port, debug port access	Completely self-contained. May only be restored to the same model of controller.	JACE-8000 (Niagara 4 only)

Restore options

The restore options are displayed when restoring a controller (platform and station) that was backed up to a USB flash drive.

The restore options display when you connect to the controller using a USB-to-microUSB cable and run a terminal emulator.

```
This Platform's ID is hostid
Please make your selection below
1) Abort Recovery/Restore mode
2) Show backups for other host IDs
3) backup file name
```

Where: `backup file name` is the name of the backup file on the USB flash drive:

```
(hostid (unique host ID of the controller), underscore (_) timestamp)
```

Menu item	Description
1) Abort Recovery/Restore mode	Allows you to abandon the process of recovering or restoring a USB backup.
2) Factory Recovery **ALL DATA WILL BE LOST!!**	Recovers the controller to its factory default state.
3) Show backups for other host IDs	Displays all backups on the UPS flash drive.
4–n) `hostid_timestamp`	Displays the USB backup file name, where: `n` is the option number. `hostid` is the host name. `timestamp` identifies the date and time when the backup was made.

Shutdown operations

The information below describes how the shutdown operation works.

To initiate a shutdown press and hold the **Shutdown** button on the enclosure. When the controller detects that the **Shutdown** button is being pressed, it enters the shutdown mode. This is indicated by the Backup LED flashing the alert mode pattern (On 100-mS, Off 100-mS).

To verify the **Shutdown** button is functioning and not in a failed state, the controller must detect the button release before proceeding. Once the button is released, the controller puts the software in a safe state. During this process, the Backup LED toggles with the work pattern (On 1-Second, Off 1-Second). Once the software has successfully completed its process, it notifies the controller that it is safe to shutdown. The controller turns off the Backup LED indicating it is safe to remove power.

In the event that the software is unable to put the system into a safe state, the software notifies the controller that it could not complete the request. The controller then indicates this by toggling the Backup LED with the error pattern (On 200-mS, Off 200-mS, On 200 mS, Off 3-Seconds).