VERTIV™

NetSure™ -48 VDC to -58 VDC Output Converter Upgrade Kit

Installation Manual

Kit Specification Number: 60028017
For Use in Spec. Nos. 582127000100, 582127000101, 582127000102, 582127000103, 582127000203 Power Systems

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit https://www.vertiv.com/en-us/support/ for additional assistance.

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Admonishments Used in this Document

DANGER! Warns of a hazard the reader **will** be exposed to that will **likely** result in death or serious injury if not avoided. (ANSI, OSHA)

WARNING! Warns of a potential hazard the reader **may** be exposed to that **could** result in death or serious injury if not avoided. This admonition is not used for situations that pose a risk only to equipment, software, data, or service. (ANSI)

CAUTION! Warns of a potential hazard the reader **may** be exposed to that **could** result in minor or moderate injury if not avoided. (ANSI, OSHA) This admonition is not used for situations that pose a risk only to equipment, data, or service, even if such use appears to be permitted in some of the applicable standards. (OSHA)

ALERT! Alerts the reader to an action that **must be avoided** in order to protect equipment, software, data, or service. (ISO)

ALERT! Alerts the reader to an action that **must be performed** in order to prevent equipment damage, software corruption, data loss, or service interruption. (ISO)

FIRE SAFETY! Informs the reader of fire safety information, reminders, precautions, or policies, or of the locations of fire-fighting and fire-safety equipment. (ISO)

SAFETY! Informs the reader of general safety information, reminders, precautions, or policies not related to a particular source of hazard or to fire safety. (ISO, ANSI, OSHA)

Important Safety Instructions

Safety Admonishments Definitions

Definitions of the safety admonishments used in this document are listed under "Admonishments Used in this Document" on page iv.

Safety and Regulatory Statements

Refer to Section 4154 (provided with your customer documentation) for Safety and Regulatory Statements.

Déclarations de Sécurité et de Réglementation

Reportez-vous à la Section 4154 (fourni avec les documents de votre client) pour les déclarations de sécurité et de réglementation.

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1 Vertiv™ NetSure™ -48 VDC to -58 VDC Converter Upgrade Kit Installation Instructions

1.1 Kit Description

These instructions provide a step-by-step procedure to field install this kit into Vertiv™ NetSure™ 7100 Power Systems (Spec. Nos. 582127000100, 582127000101, 582127000102, 582127000103, 582127000203). Installation of this kit in other equipment should not be attempted.

This kit provides components to change converter module mounting positions for Spec. No. 1C48241500 (-48 VDC to +24 VDC) converter modules to mounting positions for Spec. No. 1C48582000P3 (-48 VDC to -58 VDC) converter modules. It also provides components to change the breaker positions in the distribution cabinet from +24 VDC to -58 VDC. A backout procedure is also provided.

1.2 Restrictions

You MUST have an NCU Controller in your system to use the Spec. No. 1C48582000P3 (-48 VDC to -58 VDC) converter modules.

1.3 Kit Contents

Table 1.1 lists the items furnished as a part of this kit. Before installing the kit, check the items furnished against those listed to ensure that there are no shortages.

Table 1.1 Kit Contents

P/N	Description	Qty.
60028735	Use Only -58 VDC Converters Caution Label	9
10019532	Critical Load Distribution Position Label (4-Position)	5
10019557	Critical Load Distribution Position Label (6-Position)	1
534800	Plug Button	5
60027373	Rectifier/-58 VDC Converter Module Mounting Positions Label	1
60027892	Field Retrofitted for Use with -58 VDC Converters Nameplate Label	1
245126200	Quick Connect Terminal	1
60027756	Fuse Alarm Jumper Harness	1
237650200	Cable Tie	6
552423	Hook-and-Loop Fastener (factory attached to storage pouch)	2
150661	USB Memory Device with Storage Pouch (contains new NCU configuration, NCU Clean-up package, and customer documentation)	1

1.4 Tools and Material Required

Table 1.2 lists the items required to install this kit.

Table 1.2 Tools and Material Required

Description
7/16" Socket
Small Flat-Blade Screwdriver
#2 Phillips Screwdriver
Torque Wrench
Spec. No. 1C48582000P3 (-48 VDC to -58 VDC) Converter Modules (as required)

1.5 Installation Procedure

THESE INSTRUCTIONS SHOULD BE READ THROUGH COMPLETELY BEFORE INSTALLING THE KIT.

The following is a step-by-step procedure to install the kit. The procedure has been written for ease of use and to minimize the possibility of contact with potentially hazardous energy. This procedure should be performed in the sequence given, and each step should be completely read and fully understood before performing that step. Observe all "Important Safety Instructions" starting on page v and also those presented in the following procedure. As each step of the procedure is completed, the box adjacent to the respective step should be checked. This will minimize the possibility of inadvertently skipping any steps. If the step is not required to be performed for your site, also check the box to indicate that it was read.
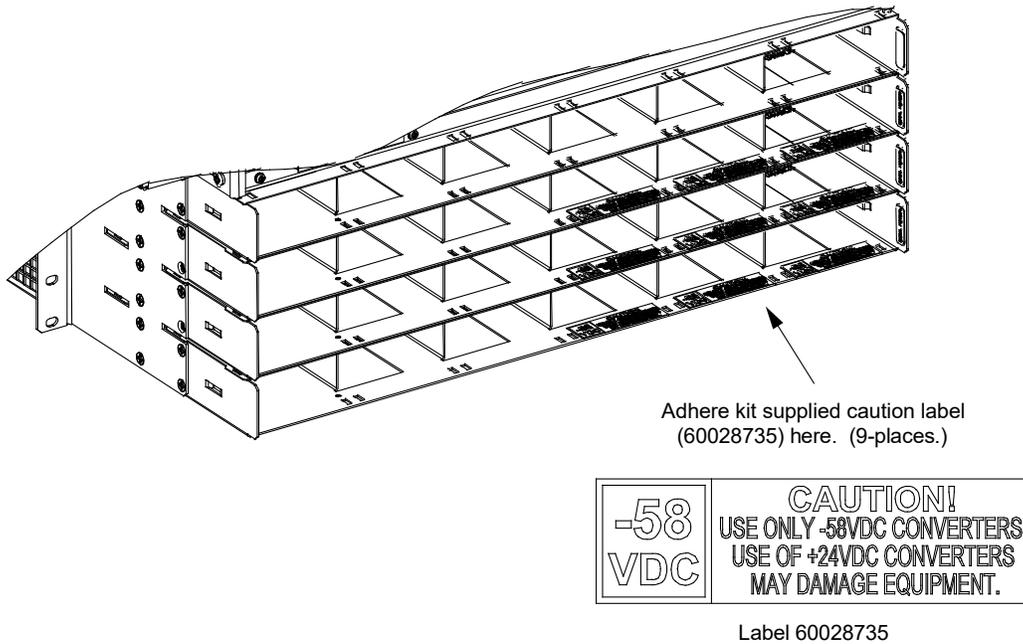
Procedure

⚠️ **DANGER!** This procedure is performed on a LIVE system. Observe the "Important Safety Instructions" starting on page v and those listed in the power system manual.

[ ] 1.   Performing this procedure may activate external alarms. Do one of the following. If possible, disable these alarms. If these alarms cannot be easily disabled, notify the appropriate personnel to disregard any future alarms associated with this system while the procedure is being performed.

[ ] 2.   If your system has an ACU+ controller, replace it with an NCU controller (P/N 1M830DNA562919).

[ ] 3.   If your system ORIGINALLY had an NCU controller, refer to "Backing Up the NCU Configuration" on page 16 and backup the controller configuration.

[ ] 4.   Open the distribution cabinet door. Ensure that there are no loads/cables connected to the +24V circuit breaker positions. Upon completion of this upgrade, the system will no longer support +24V loads. If there are loads tied to the +24V positions, these will need to be removed and connected to a separate +24V system.

[ ] 5.   Remove all existing +24 VDC output converter modules from the module mounting shelves.

[ ] 6.   Clear the converter Communication and/or Lost alarms via the controller, if applicable. Via the controller front panel main screen, navigate to the Settings Icon in the upper left of the main screen and press the ENT key. Enter your username and password. Use the arrow keys to scroll to the Alarm Settings Menu and press the ENT key. Use the arrow keys to scroll to the ClrAllConvCommF and press the ENT key. Use the arrow keys to scroll to the ClrConvCommFail and press the ENT key. Use the arrow keys to scroll to the Clear Conv Lost and press the ENT key.

[ ] 7.   Adhere kit supplied "Use Only -58 VDC Converters" caution label (60028735) to each of the nine (9) module mounting slots shown in Figure 1.1. Orient the labels between the two (2) rectangular slots used for the converter module locking tabs. Align front edge of label to front edge of shelf. **Do Not** cover the converter module locking tab slots.

Figure 1.1 Adhere 60028735 Labels

Adhere kit supplied caution label
(60028735) here. (9-places.)

| -58 VDC | CAUTION!
USE ONLY -58VDC CONVERTERS.
USE OF +24VDC CONVERTERS
MAY DAMAGE EQUIPMENT. |

Label 60028735

[ ] 8.   Open the distribution cabinet front door.

[ ] 9.   Remove the shield from the top distribution panel by loosening the screws securing it and lifting the shield up and out (see Figure 1.2).

Figure 1.2 Remove Shield

Shield
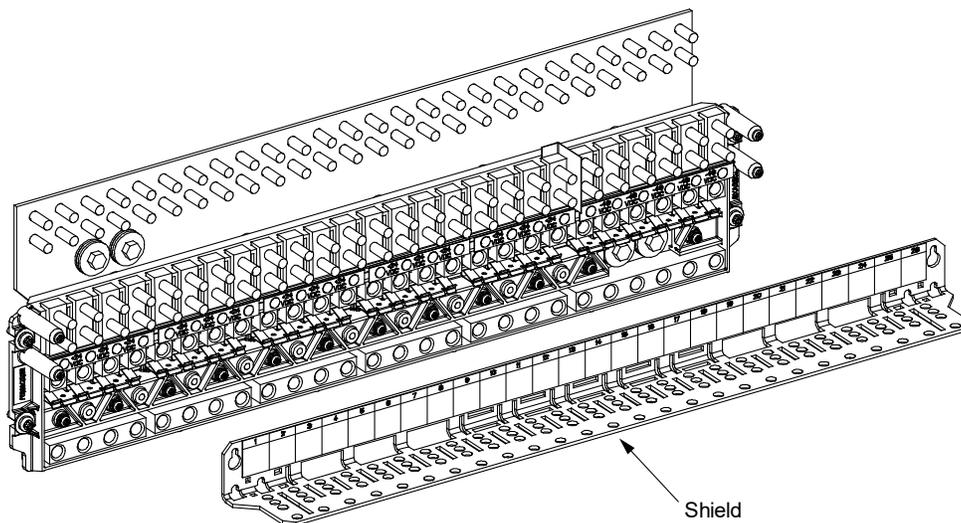
[ ] 10.   Remove the plug buttons securing the +24 VDC distribution position labels located on the top distribution panel. Save the plug buttons after removing them as they will be needed in later steps. Remove the labels. See Figure 1.3. Save these +24 VDC distribution position labels in case the system needs to be converted back for use with +24 VDC output converters.

[ ] 11.   Install kit supplied "Critical" load distribution position labels (10019532) in the places the +24 VDC labels were removed from. Orient so the -58V side is visible. Secure the labels with the plug buttons previously removed. See Figure 1.3.

[ ] 12.   Remove the plug buttons securing the -48 VDC distribution position label located on the top distribution panel. Save the plug buttons after removing them as they will be needed in later steps. Remove the label. See Figure 1.3. Save this -48 VDC distribution position label in case the system needs to be converted back for use with +24 VDC output converters.

[ ] 13.   Install kit supplied "Critical" load distribution position label (10019557) in the place the -48 VDC label was removed. Orient so the -48V side is visible. Secure the label with the plug buttons previously removed. See Figure 1.3.

Figure 1.3 Install 10019532 and 10019557 Labels

Remove +24 VDC distribution position labels and replace with critical load distribution position labels (10019532). (5-places.)

Label 10019532

Remove -48 VDC distribution position label and replace with critical load distribution position label (10019557). (1-place.)

Label 10019557
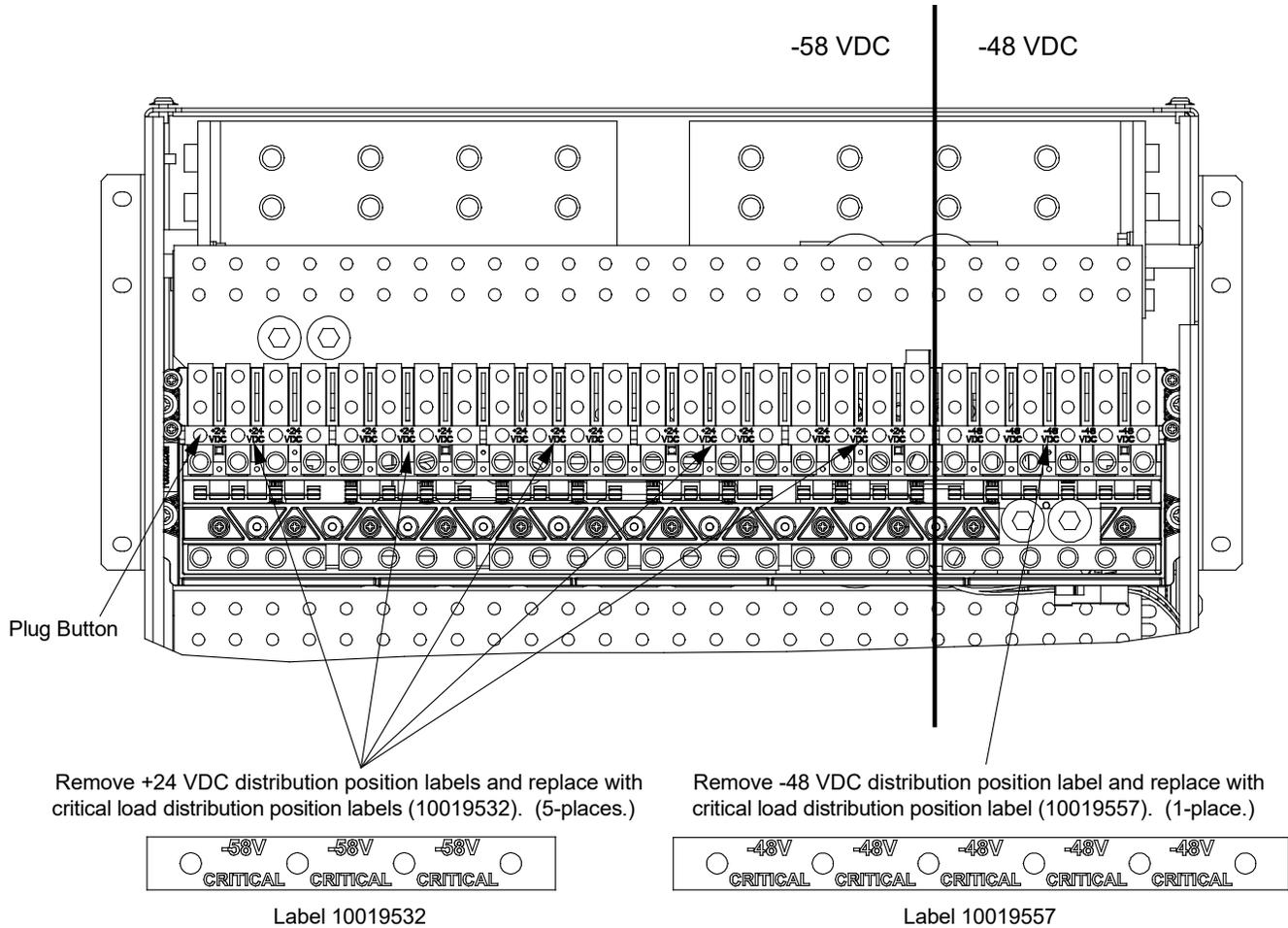
[ ] 14.   Replace the top distribution panel shield.

[ ] 15.   Adhere kit supplied module position label (60027373) over the existing module position label. See Figure 1.4.

Figure 1.4 Adhere 60027373 Label

Adhere kit supplied module
position label (60027373) here.
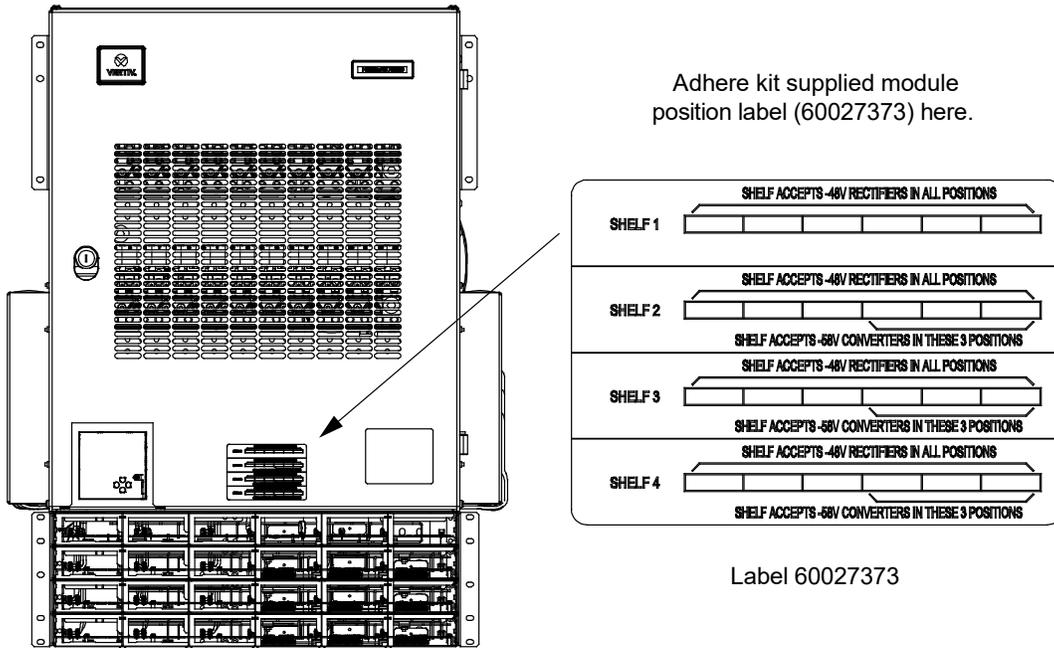
Label 60027373

[ ] 16.   Adhere kit supplied nameplate label (60027892) above the existing nameplate label. See Figure 1.5.

Figure 1.5 Adhere 60027892 Label

Adhere kit supplied nameplate
label (60027892) here.

Label 60027892
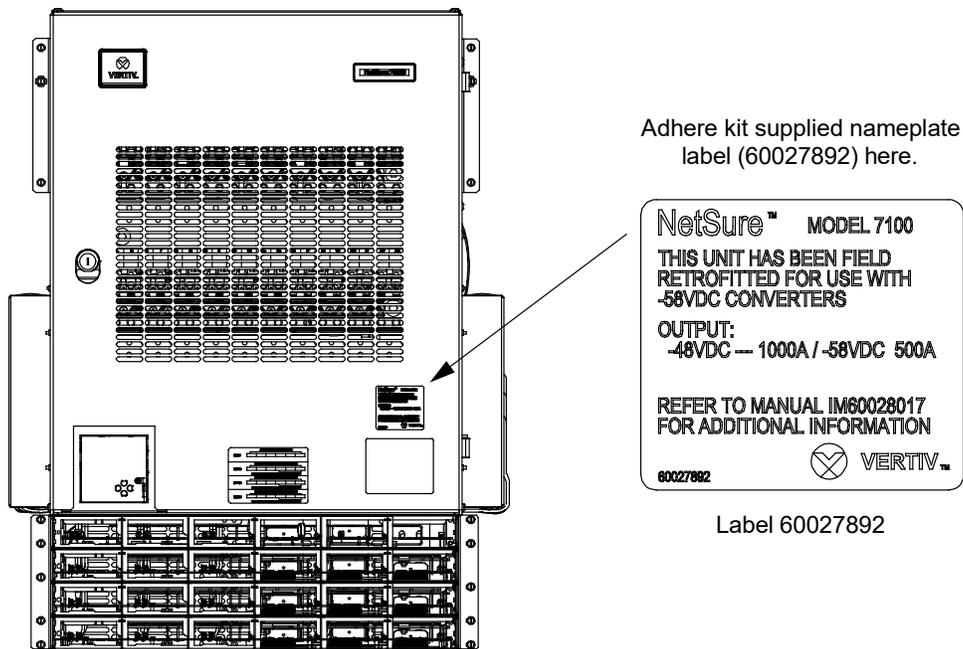
[ ] 17.   Install kit supplied quick connect terminal (245126200) to return busbar on ANY distribution panel. Figure 1.6 shows the quick connect terminal attached to the lower distribution panel for reference. Install using the existing 1/4-20 bolt and hardware. Re-torque the 1/4-20 bolt to 84 in-lbs.

Figure 1.6 Installing Quick Connect Terminal

Install quick connect terminal using existing bolt and hardware to return busbar on ANY distribution panel.
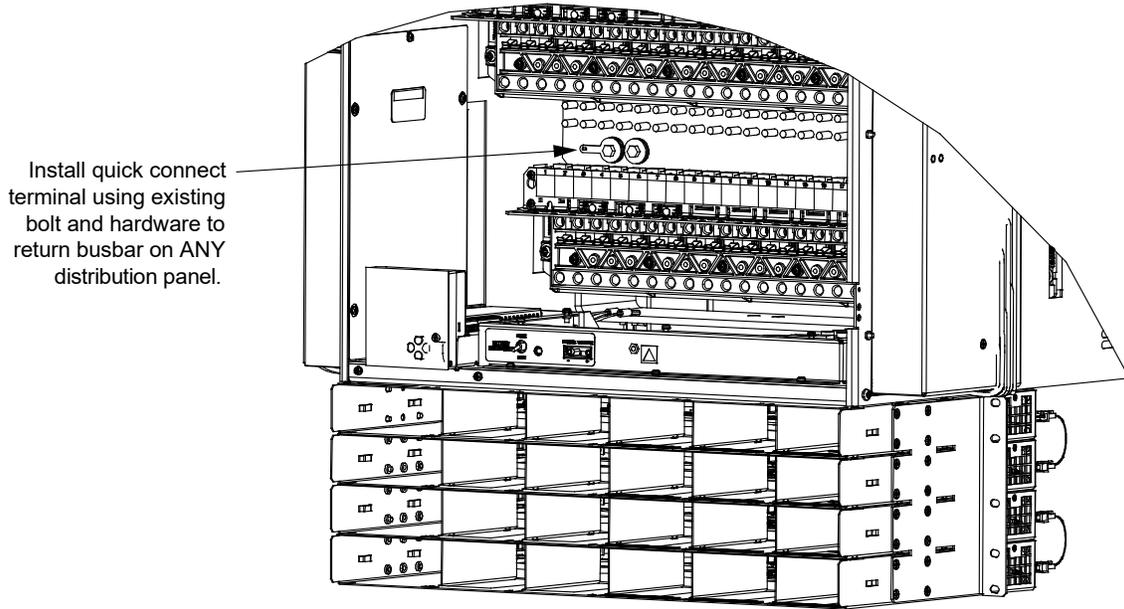
[ ] 18.   Remove the shield from the control shelf located at the bottom of the distribution cabinet. See Figure 1.7.

[ ] 19.   Disconnect the existing system wire harness from J4 on the system interface board. See Figure 1.7.

Figure 1.7 Disconnecting Existing System Wire Harness

Remove Shield

System Interface Board

System Interface Board

J4
(System Interconnects)

Disconnect the existing system wire harness from J4 on the system interface board.
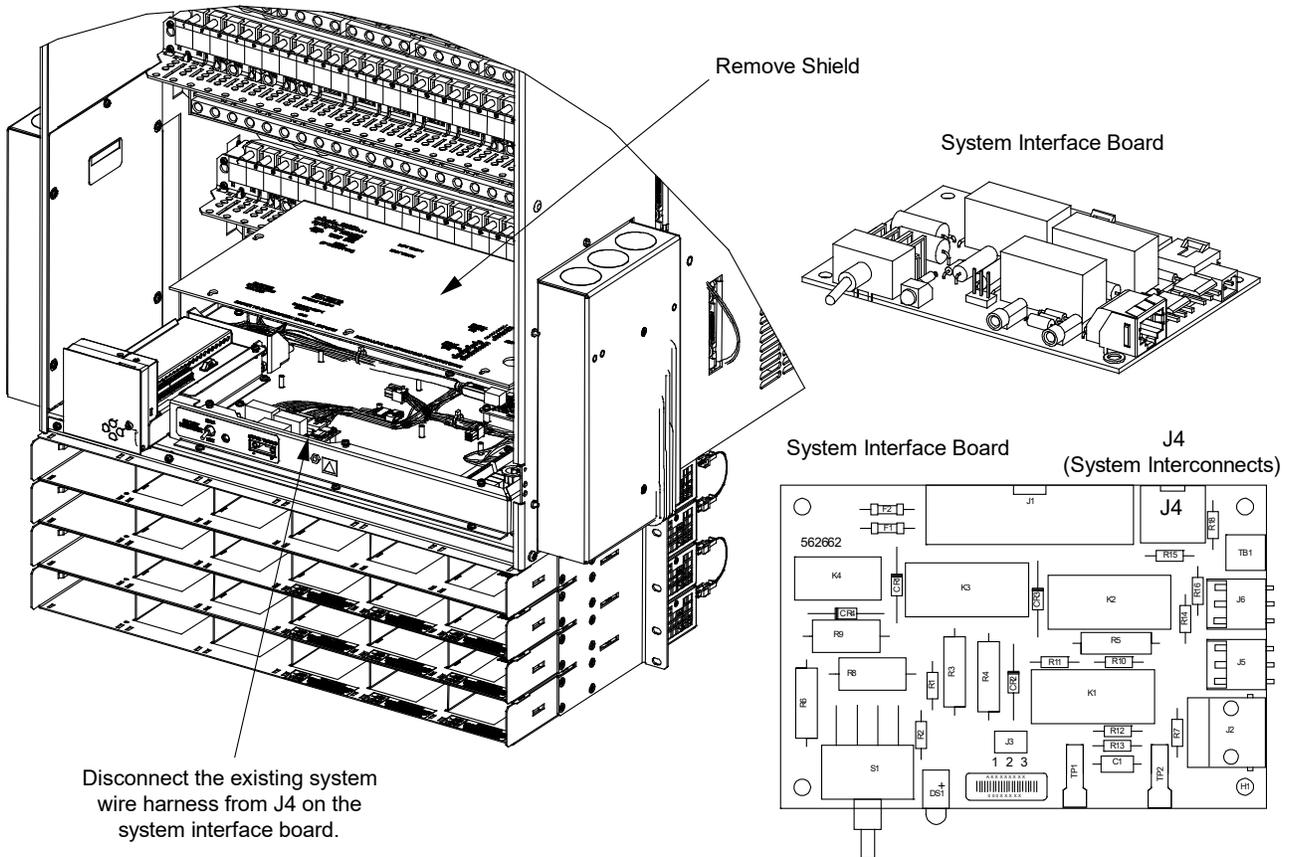
[ ] 20.   Install kit supplied fuse alarm jumper harness (60027756). See Figure 1.8 and Figure 1.9.

a)   Connect the fuse alarm jumper harness RED (R) wire to the IB2-1 controller interface board terminal J4-5 (DI6-). See Figure 1.8.

b)   Connect the fuse alarm jumper harness BLACK (BK) wire to the IB2-1 controller interface board terminal J4-6 (DI6+). See Figure 1.8.

c)   Connect the fuse alarm jumper harness to the quick connect terminal previously installed on ANY distribution panel return busbar. Figure 1.9 shows the quick connect terminal on lower panel for reference.

d)   Route the fuse alarm jumper harness from the quick connect terminal block down to the system interface board. See Figure 1.9.

e)   Plug the mating connector of the fuse alarm jumper harness into J4 on the system interface board. See Figure 1.9.

f)   Plug the remaining connector on the fuse alarm jumper harness into the mating connector of the existing system wire harness (previously disconnected from J4 on system interface board in a previous step). See Figure 1.9.

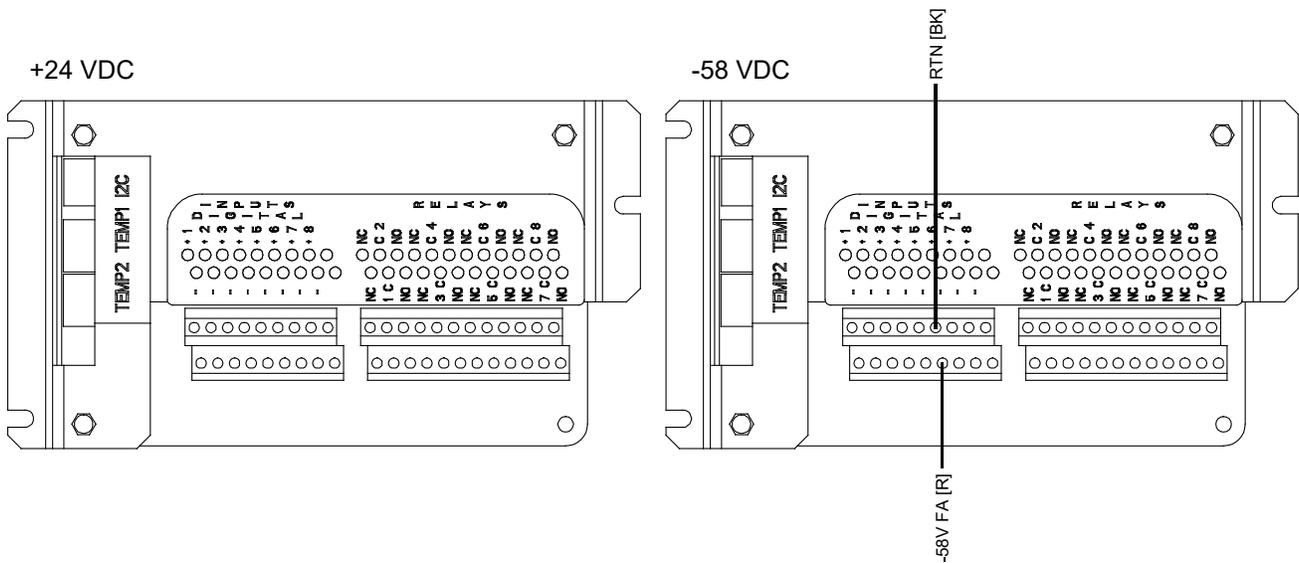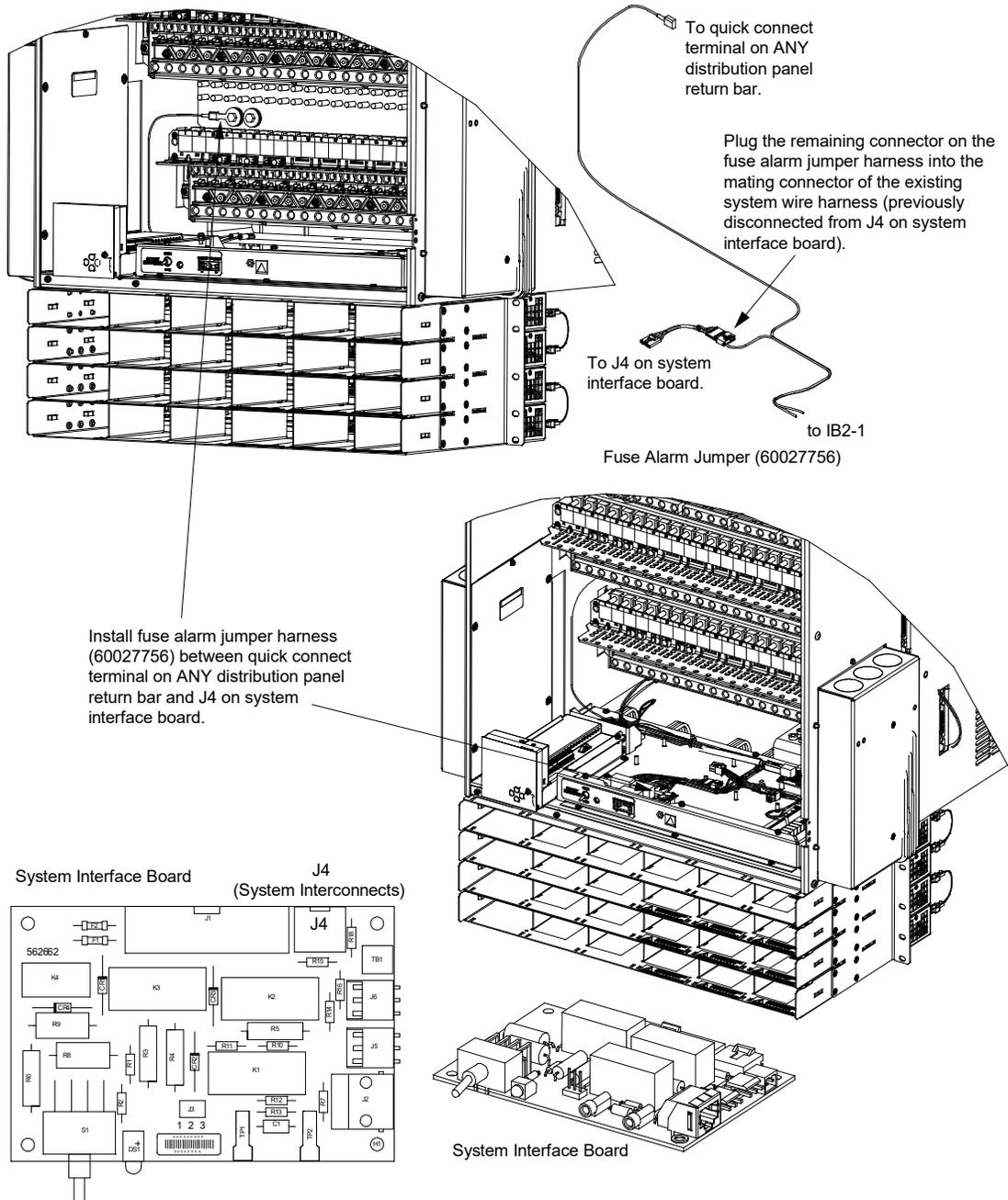**Figure 1.8 IB2-1 Controller Interface Board**

Figure 1.9 Installing Fuse Alarm Jumper Harness

To quick connect terminal on ANY distribution panel return bar.

Plug the remaining connector on the fuse alarm jumper harness into the mating connector of the existing system wire harness (previously disconnected from J4 on system interface board).

To J4 on system interface board.

to IB2-1

Fuse Alarm Jumper (60027756)

Install fuse alarm jumper harness (60027756) between quick connect terminal on ANY distribution panel return bar and J4 on system interface board.

System Interface Board

J4 (System Interconnects)

562662

System Interface Board

[ ] 21.   Re-install the shield to the control shelf located at the bottom of the distribution cabinet.

[ ] 22.   Dress and secure the fuse alarm jumper harness with the kit supplied cable ties (237650200).

[ ] 23.   Update the controller configuration file as follows.

🔍 **NOTE!** *When using the Web interface to update an NCU containing firmware that is revision level 1.2.51B or less to version 1.2.60B or greater, the NCU requires its flash memory to be refreshed. The Clean-up Tool package frees enough flash so that the controller can be updated to 1.2.60B or greater while maintaining the Web user interface.*

Starting with version 1.2.60B and later, software is loaded using a different strategy, so this clean-up process is not needed once a controller is updated to 1.2.60B. See the main page (Figure 1.10) to determine software version.

a)   Copy the Application "All" package file and the Clean-up Tool package (ncu_cleanup_V1.1.tar or later) located on the kit-supplied USB drive to your computer. The name of the Application "All" package file ends in either .tar or .tar.gz. The name of the Clean-up Tool package ends in .tar.

b)   Log in to the Web user interface page.

c)   Click "Advanced Settings." See Figure 1.10.

Figure 1.10 Advanced Settings

d) Go to the SW Maintenance tab. Click on "Stop Controller." See Figure 1.11.

Figure 1.11 Stop Controller
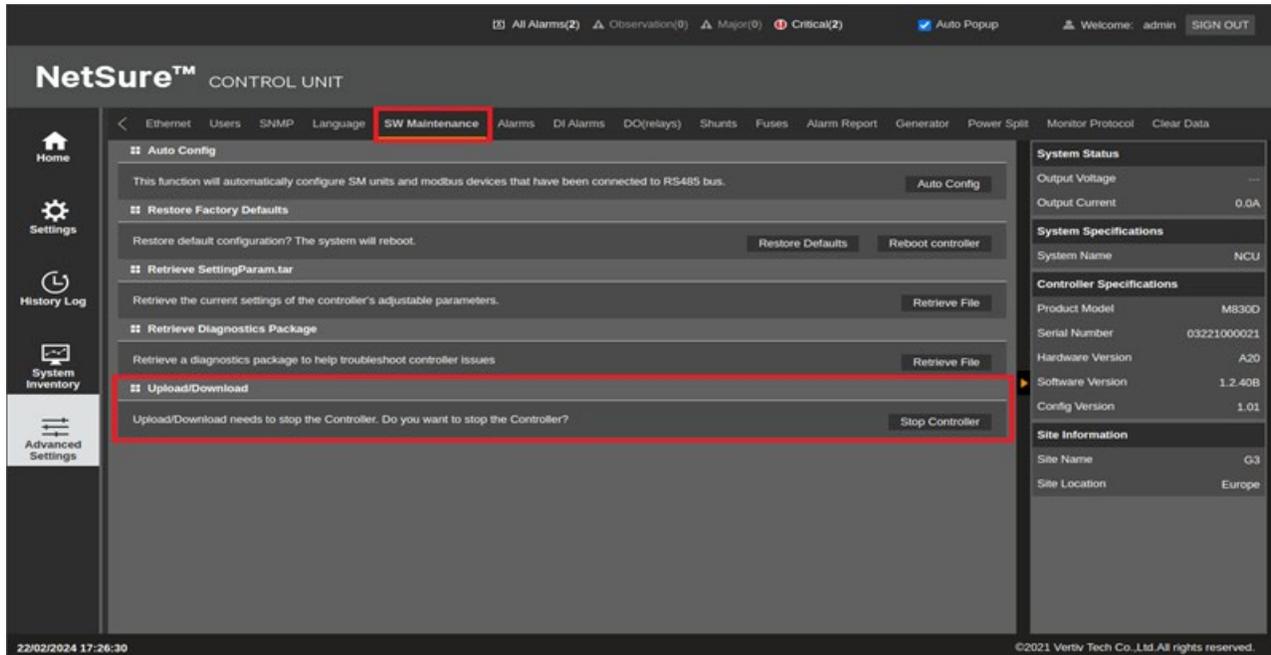
e) After the following window opens, click "OK." See Figure 1.12.

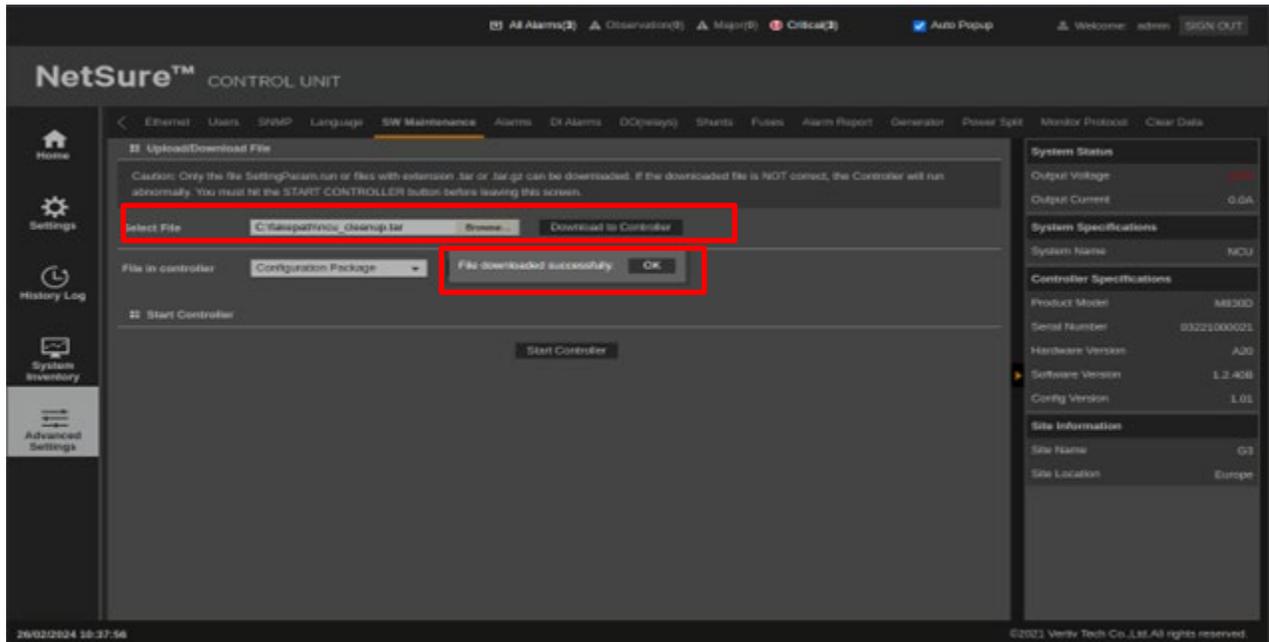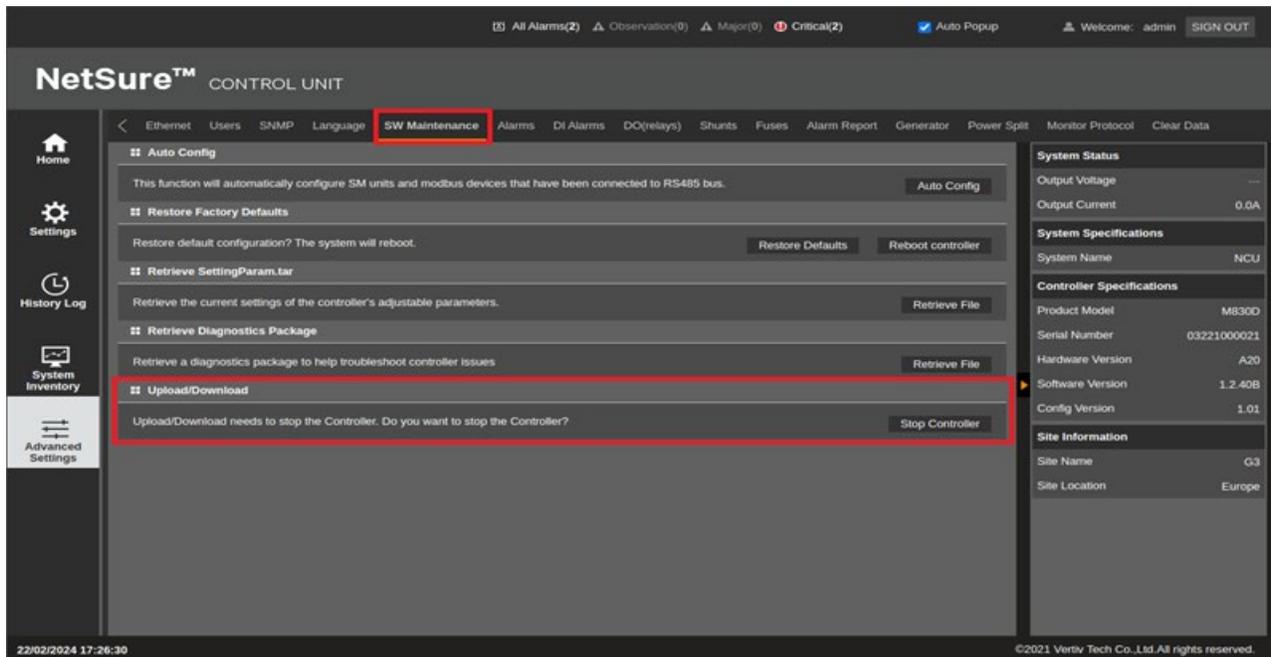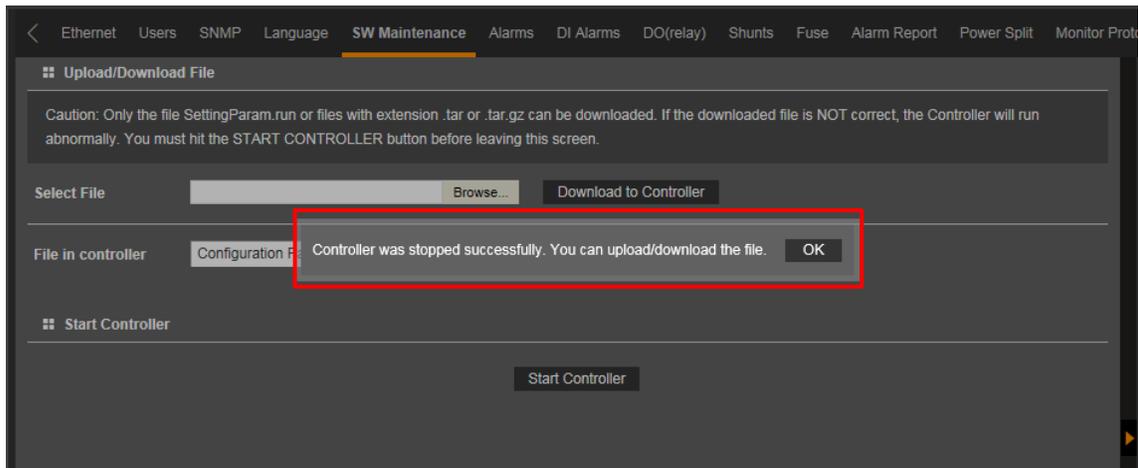**Figure 1.12 Upload/Download- Controller Stopped**
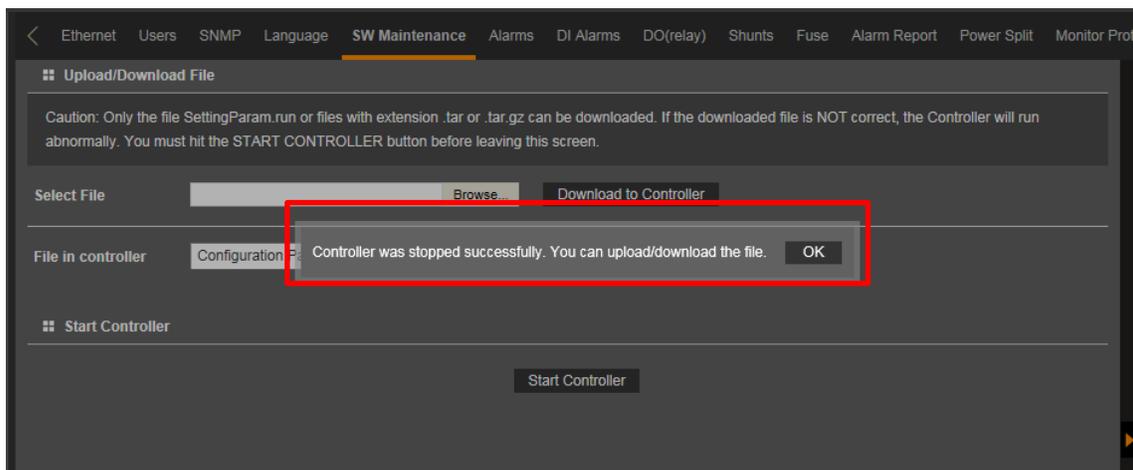
ALERT! Never navigate away from this Web page without first clicking on "Start Controller" after loading the appropriate file(s). If you do, you will not have Web access. A manual system reset is required to restore Web access.

NOTE! *If the original software version is 1.2.60B or higher, go to step k.*

f) After the following window appears (Figure 1.13), browse and select the Clean-up Tool package (ncu_cleanup_V1.1.tar or later) you copied earlier to your computer. Click "Download to Controller." This process may take several minutes. The following screen displays, indicating a successful upload. Click "OK" and then click "Start Controller" to reboot the NCU. This process could take several minutes.

Figure 1.13 Download Clean-Up Tool Package and Start Controller

g) Log in to the Web user interface page.

h) Click "Advanced Settings." See Figure 1.14.

Figure 1.14 Advanced Settings

i)   Go to the SW Maintenance tab. Click on "Stop Controller." See Figure 1.15.

Figure 1.15 Stop Controller

j)   After the following window opens, click "OK." See Figure 1.16.

Figure 1.16 Upload/Download – Controller Stopped

ALERT! Never navigate away from this Web page without first clicking on "Start Controller" after loading the appropriate files. If you do, you will not have Web access. A manual system reset is required to restore Web access.

k)   After the following window appears (Figure 1.17), browse and navigate to the folder where the file to download is located. Select the application "All" package you copied earlier to your computer. Click "Download to Controller." This process may take several minutes. The following screen displays, indicating a successful upload. Click "OK" and then click "Start Controller" to reboot the NCU with the downloaded file installed. This process could take several minutes.

**Figure 1.17 Download Firmware Package and Start Controller**
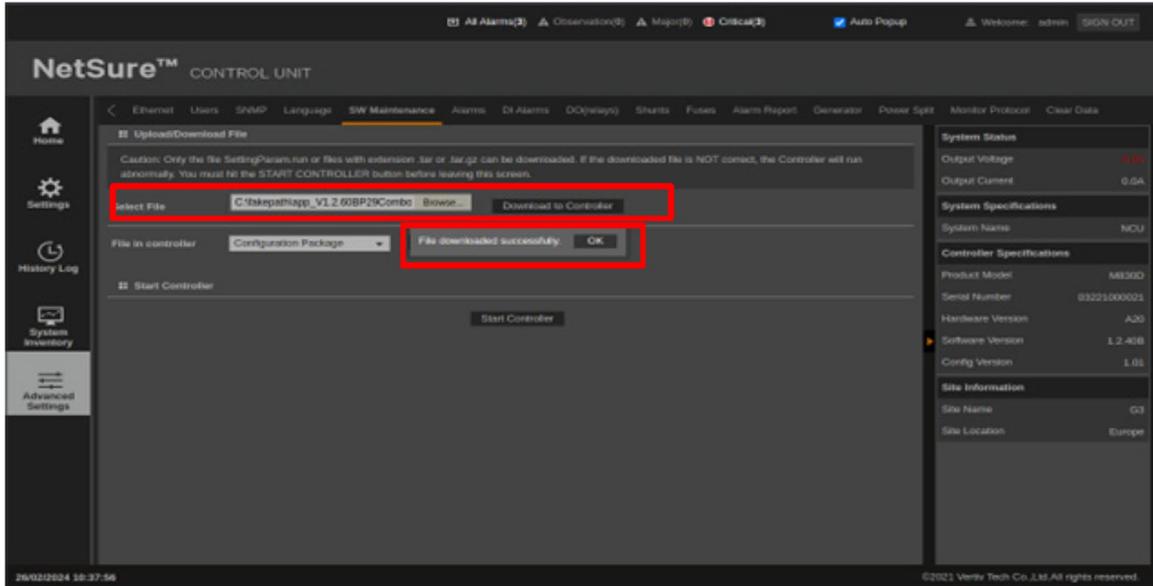
> 🔍 **NOTE!** *If a V1.260B or greater package file is downloaded in the previous steps to a revision 1.2.51B or less revision controller before using the Clean-up tool, one of the following error messages will display:*

Figure 1.18 Error Message 1: "Failed to download file or wrong package type."
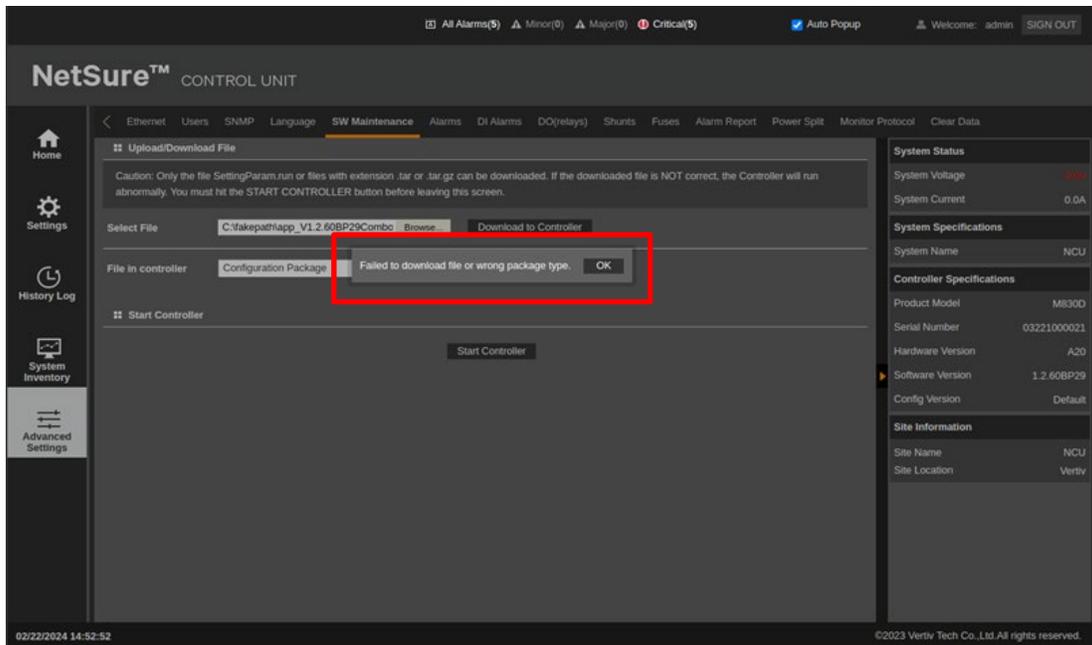
OR

Figure 1.19 Error Message 2: "Failed to download file."
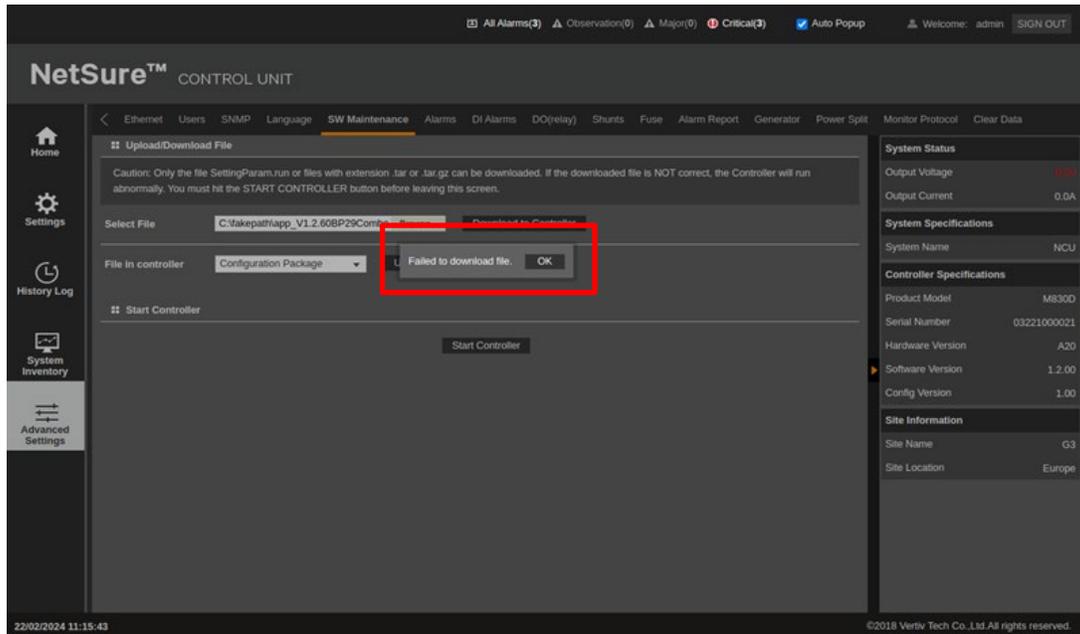
[ ] 24.   If your system ORIGINALLY had an NCU controller, refer to "Reloading a Backed-Up NCU Configuration" on page 19 and restore the backed-up controller configuration file saved in step [ ] 3.

[ ] 25.   Close the distribution cabinet front door.

[ ] 26.   Install separately ordered converter modules 1C48582000P3 in the far right mounting positions shown in Figure 1.1 and Figure 1.4, as required.

[ ] 27.   Click on the converter icon in the NCU WEB interface power system status block diagram. This brings up the converter group status page. Check the converter output voltage and the status of each converter installed to verify all converters installed are active.

[ ] 28.   Enable the external alarms or notify appropriate personnel that this procedure is finished.

[ ] 29.   Ensure that there are no local or remote alarms active on the system.

[ ] 30.   If your system ORIGINALLY had an ACU+ controller, refer to "Backing Up the NCU Configuration" on page 16 and backup the controller configuration. Save this configuration file in case the NCU configuration ever needs to be reloaded.

[ ] 31.   Save these instructions in case a backout procedure needs to be performed at a later date.

Backout Procedure

If the power system needs to revert back to -48V/+24V operation, perform the following procedure.

[ ] 1.   Performing this procedure may activate external alarms. Do one of the following. If possible, disable these alarms. If these alarms cannot be easily disabled, notify the appropriate personnel to disregard any future alarms associated with this system while the procedure is being performed.

[ ] 2.   Remove all existing -58 VDC output converter modules from the module mounting shelves.

[ ] 3.   Remove the "Use Only -58 VDC Converters" caution labels (60028735).

[ ] 4.   Open the distribution cabinet front door.

[ ] 5.   Remove the shield from the top distribution panel.

[ ] 6.   Remove the plug buttons securing the -58 VDC distribution position labels located on the top distribution panel. Save the plug buttons after removing them as they will be needed in later steps. Remove the labels.

[ ] 7.   Install the saved "+24 VDC" distribution position labels in the places the -58 VDC labels were removed from. Secure the labels with the plug buttons previously removed.

[ ] 8.   Replace the shield to the top distribution panel.

[ ] 9.   Remove the kit supplied module position label (60027373).

[ ] 10.   Remove the kit supplied nameplate label (60027892).

[ ] 11.   Remove the shield from the control shelf located at the bottom of the distribution cabinet.

[ ] 12.   Remove, insulate, and tie-back the fuse alarm jumper harness BLACK (BK) wire from the IB2-1 controller interface board terminal J4-6 (DI6+).

[ ] 13.   Remove, insulate, and tie-back the fuse alarm jumper harness RED (R) wire from the IB2-1 controller interface board terminal J4-5 (DI6-).

[ ] 14.   Remove and insulate the connector plugged in J4 of the system interface board.

[ ] 15.   Separate and insulate the connector on the fuse alarm jumper harness from the system wire harness. Connect the system wire harness connector to J4 on the system interface board.

[ ] 16.   Remove, insulate, and tie-back the fuse alarm jumper harness from the quick connect terminal installed on the bottom distribution panel return busbar.

[ ] 17.   Re-install the shield to the control shelf located at the bottom of the distribution cabinet.

[ ] 18.   Close the distribution cabinet front door.

[ ] 19.   Install converter modules 1C48241500 in the far-right converter module mounting positions, as required.

[ ] 20.   Enable the external alarms or notify appropriate personnel that this procedure is finished.

[ ] 21.   Ensure that there are no local or remote alarms active on the system.

1.6 Backing Up the NCU Configuration

1.6.1 NCU Version 1.1.80, or Later

General

To back up the NCU configuration, simply save the file named "SettingParam.tar".

Saving the "SettingParam.tar" File

**Local Menu Navigation:**

None.

Web Menu Navigation:

Advance Settings Menu / SW Maintenance Tab.

Procedure

1. Click on the "Retrieve File" button to save the file named "SettingParam.tar" to your computer. Select where you want the file to be copied to on your computer.

   To aid in file management, you may change the name of the "SettingParam.tar" file to differentiate it from other "SettingParam.tar" files saved. The new name can use alpha and numeric characters preceding the original "SettingParam.tar" name (the end of the new file name **must** always be "SettingParam.tar"; for example, an acceptable filename would be "seville4SettingParam.tar").

Figure 1.20 Retrieve "SettingParam.tar" File
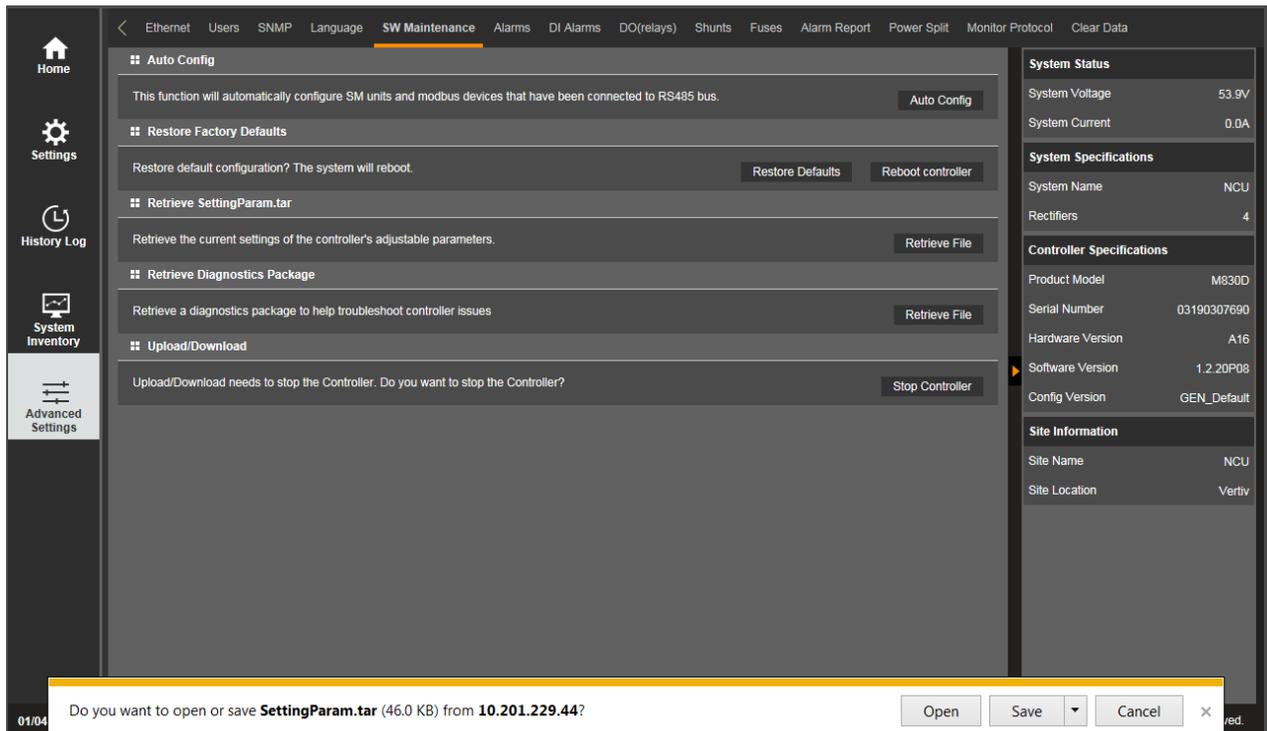
1.6.2   NCU Version 1.1.70, or Earlier

General

There are two steps in backing up the system's NCU configuration:

- Save the NCU configuration package. This package includes the base configuration and any changes made to alarm severity levels, relay assignments, signal names and site information.

- Save a file named "SettingParam.run". This file contains changes made to alarm setpoints and other settings such as float/ equalize voltage, etc. A file named "SettingParam.run" is automatically created/appended by the controller whenever a User (or the factory at the time of shipment) makes changes to parameter settings via the local display or Web Interface. This file can be saved to your computer so you can restore any custom settings you may have made.

Saving the Configuration Package

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / SW Maintenance Tab.

Procedure

You can upload (from the controller to your computer) a configuration package.

1. To upload a file, you need to shut down the controller first. When you select the SW Maintenance Tab, click on the "Stop Controller" button.
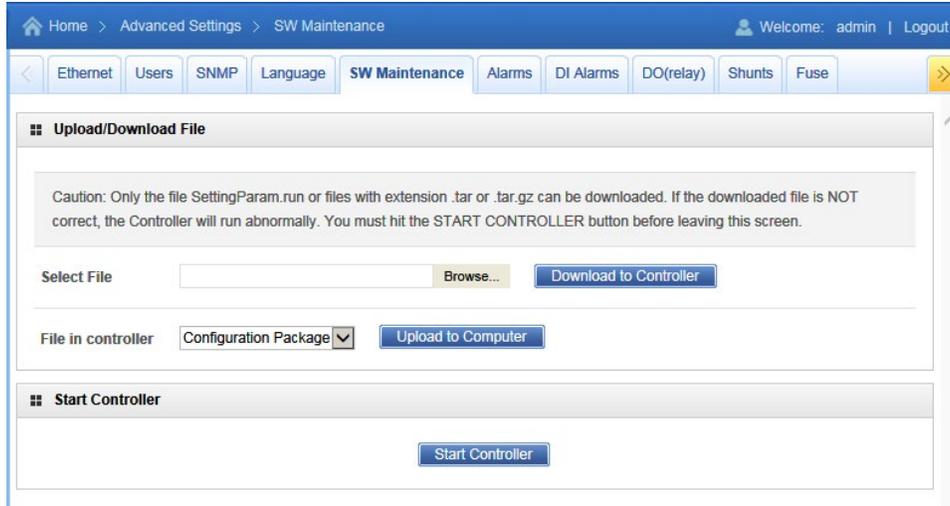
Figure 1.21 Upload - Stop Controller

2. The following window opens.

Figure 1.22 Upload - Controller Stopped
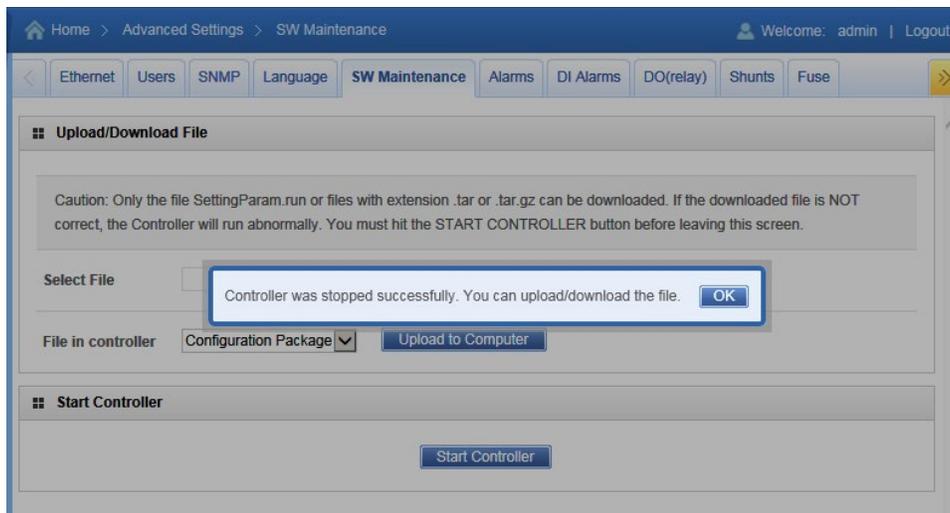
3. Click "OK".

4. The following window opens.

Figure 1.23 Upload File

ALERT! Never navigate from this Web page without first clicking on "Start Controller". If you do, you will not have Web access. A manual system reset is required to restore Web access.

5. To **upload** a file to your computer, select "Configuration Package" from the "File in Controller" drop-down list box, and click on the "Upload to Computer" button to save the file to your computer. Select where you want the file to be copied to on your computer. Click "Start Controller" to restart the Controller.

Saving the SettingParam.Run File

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / SW Maintenance Tab.

Procedure

1. Click on the "Retrieve File" button to save the file named "SettingParam.run" to your computer. Select where you want the file to be copied to on your computer.

To aid in file management, you may change the name of the "SettingParam.run" file to differentiate it from other "SettingParam.run" files saved. The new name can use alpha and numeric characters preceding the original "SettingParam.run" name (the end of the new file name **must** always be "SettingParam.run"; for example, an acceptable filename would be "seville4SettingParam.run").

Figure 1.24 Retrieve SettingParam.run

1.7   Reloading a Backed-Up NCU Configuration

1.7.1   NCU Version 1.1.80, or Later

General

To reload the NCU configuration, simply download a saved "SettingParam.tar" file into the NCU.

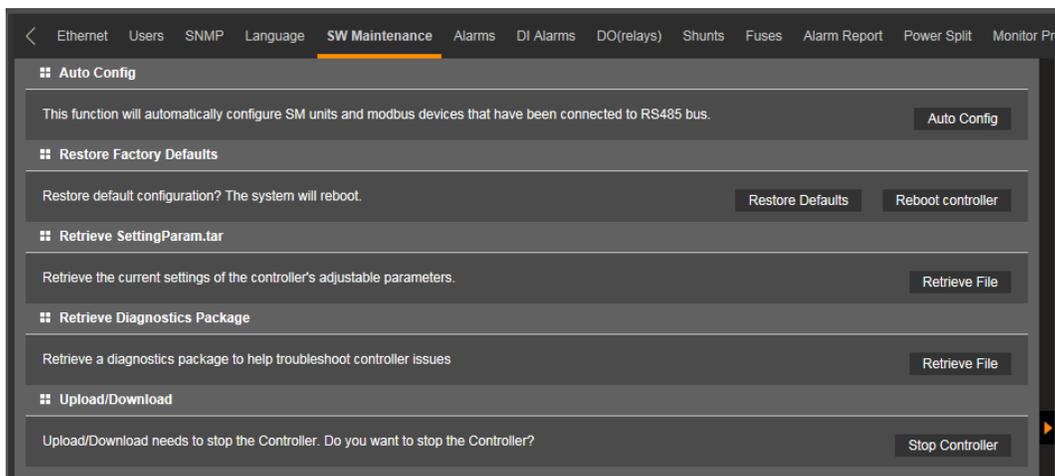**Reloading the "SettingParam.tar" File**

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / SW Maintenance Tab.

Procedure

1. To download a file, you need to shut down the controller first. When you select the SW Maintenance Tab, click on the "Stop Controller" button.

Figure 1.25 Download - Stop Controller

2. The following window opens.

Figure 1.26 Download - Controller Stopped
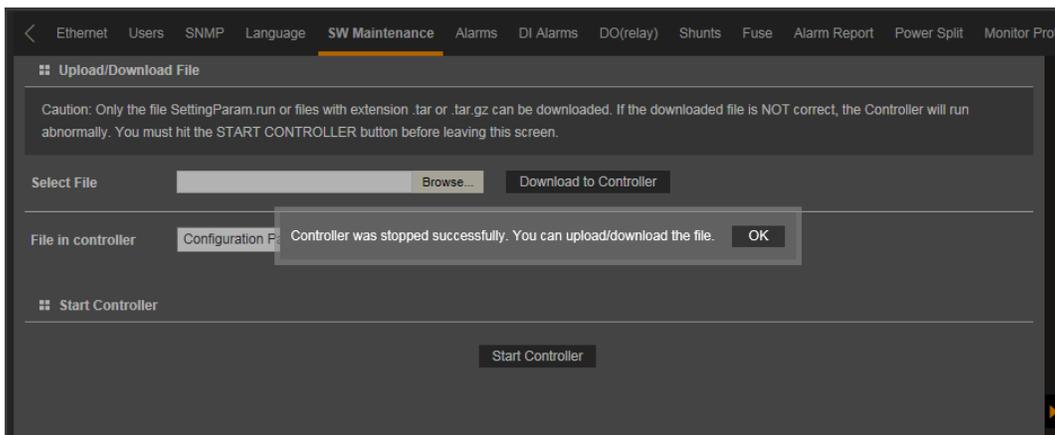
3.   Click "OK".

4.   The following window opens.

Figure 1.27 Download File
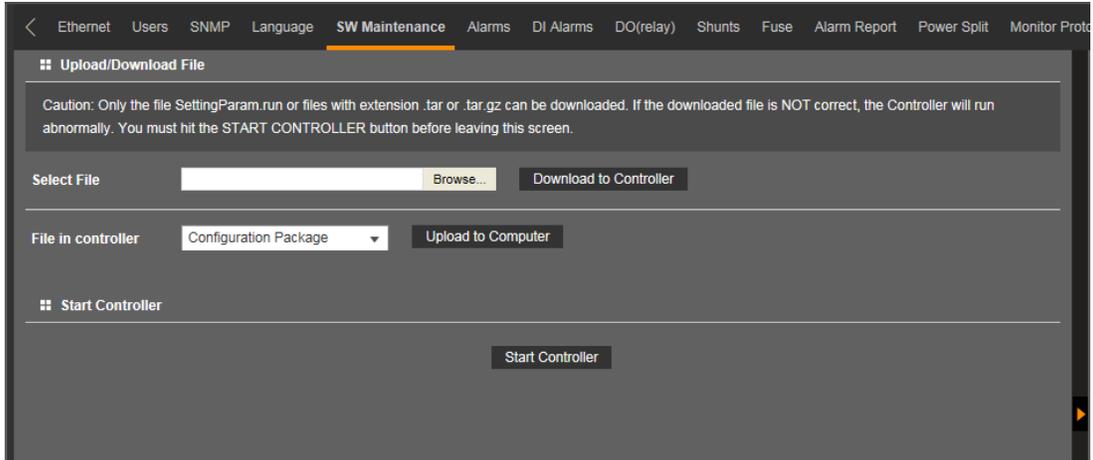
ALERT! Never navigate from this Web page without first clicking on "Start Controller". If you do, you will not have Web access. A manual system reset is required to restore Web access.

5.   To **download** (from your computer into the controller) a "SettingParam.tar" file; click the "Browse…" button and navigate to the folder where the file to download is located. Select the file to be downloaded and then click the "Download to Controller" button. Click "Start Controller" to restart the controller with the downloaded file installed.

1.7.2   NCU Version 1.1.70, or Earlier

General

There are two steps in reloading a backed-up NCU configuration:

- One step to reload the saved NCU configuration package.

- One step to reload the saved "SettingParam.run" file.

Reloading the Configuration Package

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / SW Maintenance Tab.

Procedure

You can download (from your computer into the controller) a configuration package (filename has a tar or tar.gz extension).

1.   To download a file, you need to shut down the controller first. When you select the SW Maintenance Tab, click on the "Stop Controller" button.

Figure 1.28 Download - Stop Controller

2. The following window opens.

Figure 1.29 Download - Controller Stopped
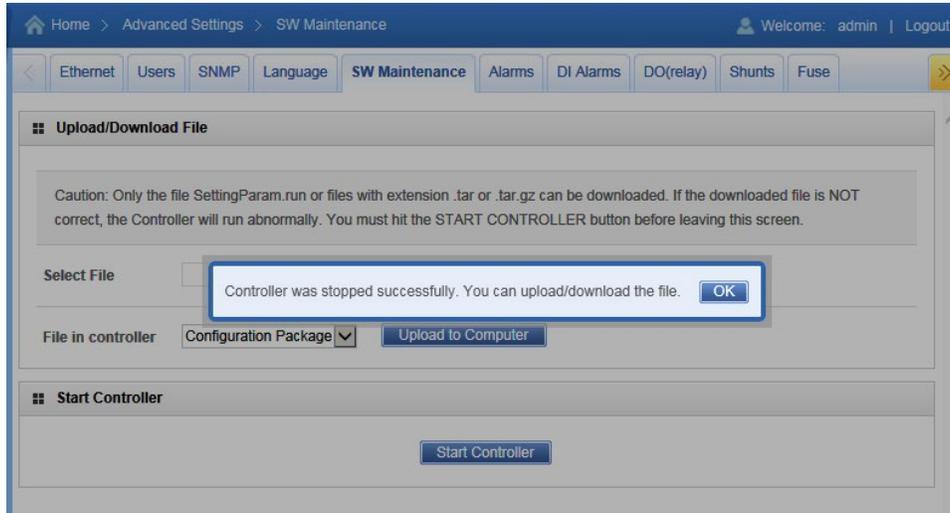
3. Click "OK".

4. The following window opens.

Figure 1.30 Download File
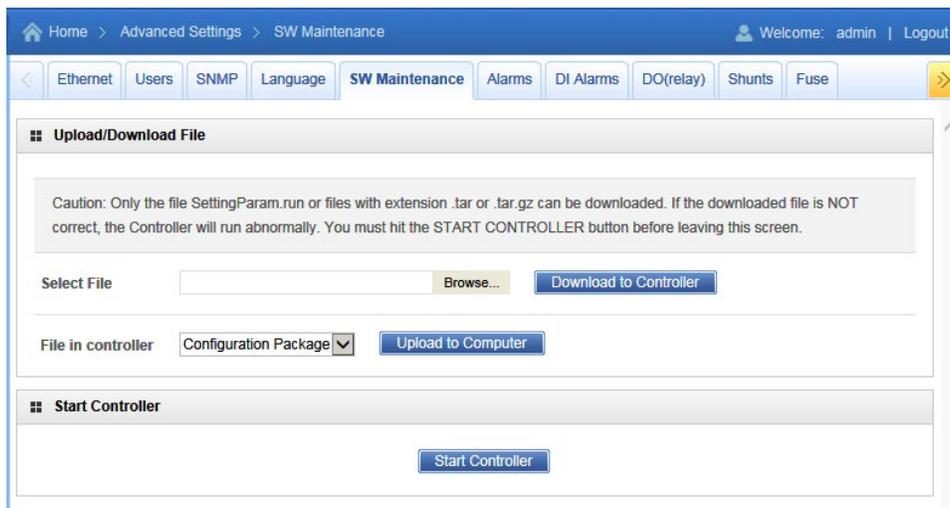
ALERT! Never navigate from this Web page without first clicking on "Start Controller". If you do, you will not have Web access. A manual system reset is required to restore Web access.

5. To **download** (from your computer into the controller) a configuration package; click the "Browse…" button and navigate to the folder where the file to download is located. Select the file to be downloaded and then click the "Download to Controller" button. Click "Start Controller" to restart the controller with the downloaded file installed.

Reloading the SettingParam.Run File

Local Menu Navigation:

None.

Web Menu Navigation:

Advance Settings Menu / SW Maintenance Tab.

Procedure

You can download (from your computer into the controller) a "SettingParam.run file".

1. To download a file, you need to shut down the controller first. When you select the SW Maintenance Tab, click on the "Stop Controller" button.

Figure 1.31 Download - Stop Controller

2. The following window opens.

Figure 1.32 Download - Controller Stopped
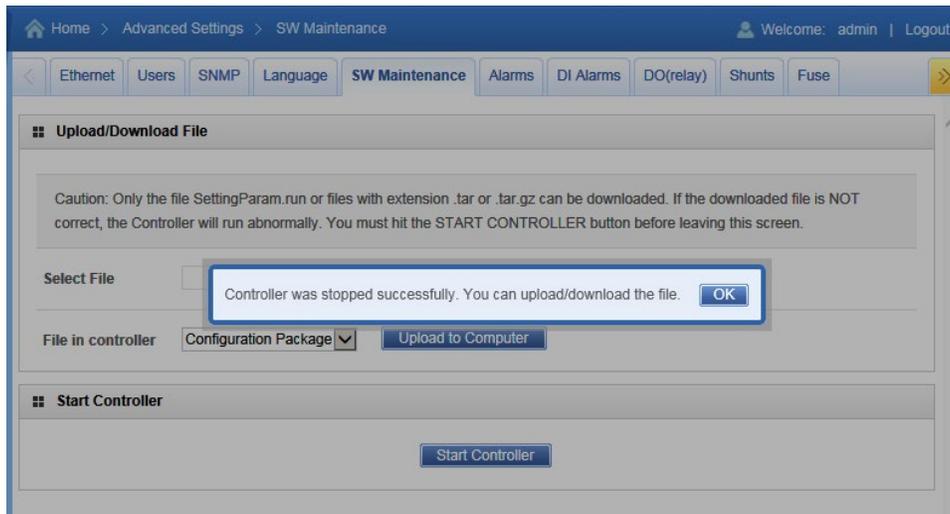
3. Click "OK".

4. The following window opens.

Figure 1.33 Download File

⛔ **ALERT!** Never navigate from this Web page without first clicking on "Start Controller". If you do, you will not have Web access. A manual system reset is required to restore Web access.

5. To **download** (from your computer into the controller) a "SettingParam.run" file; click the "Browse…" button and navigate to the folder where the file to download is located. Select the file to be downloaded and then click the "Download to Controller" button. Click "Start Controller" to restart the controller with the downloaded file installed.

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