

Upgrade CXC to CXC HP: AMPS Systems

Technical Guide: 0380880-F0

Effective: 08/2018

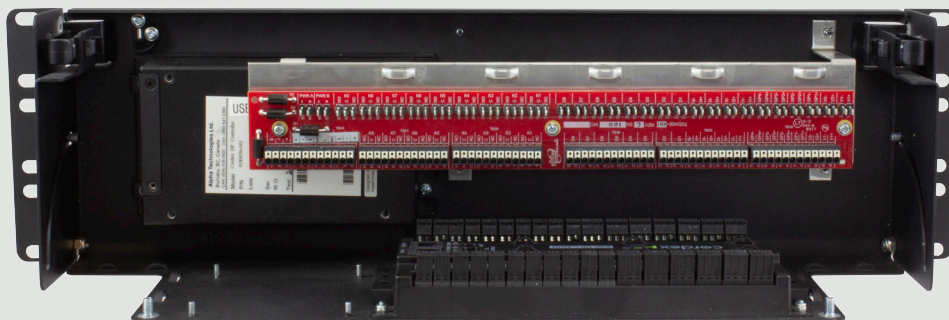


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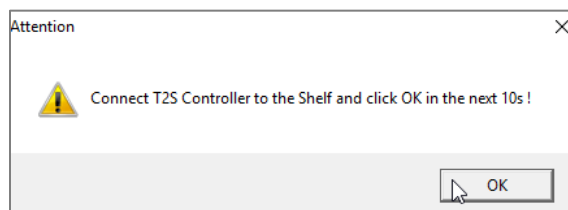
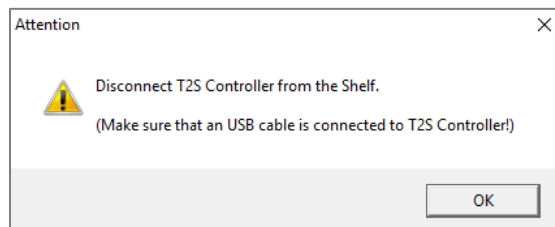
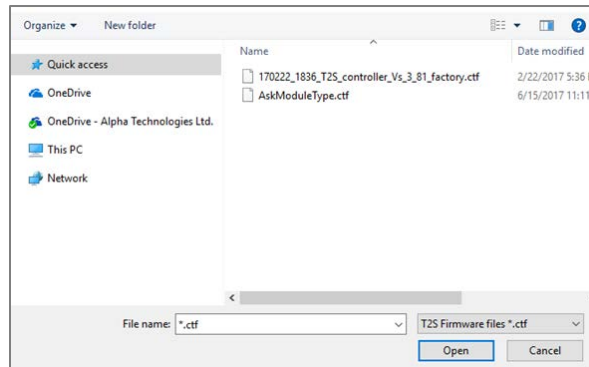
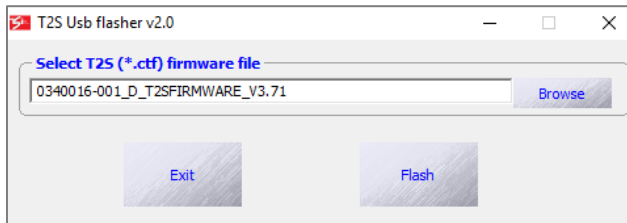
1 Introduction

This procedure describes how to upgrade the CXCR to a CXC HP on an AMPS system. The AMPS controller can only be changed without dropping the loads if an External Bypass is installed. Commissioning shall be done by Alpha approved technicians.

1.1 T2S Software Set Up

Using the installed and working T2S upgrade software, on a working computer, upgrade the T2S firmware to 3.81 or greater.

1. Connect the USB cable from the computer to the T2S then follow the screen shots below.



```

C:\Users\LES~1\FRO\Desktop\Desktop\Training\COURSE~2\PRESEN~1\AMPS\MATERI~1\3.81\3.81>C:\PROGRA~2\ALPHAT~2\T2SUSB~1\dunl
d_cl --if 170222_1836_T2S_controller_Vs_3_81_factory.ctf --v

Download : 045 %

```

```

C:\Users\LES~1\FRO\Desktop\Desktop\Training\COURSE~2\PRESEN~1\AMPS\MATERI~1\3.81\3.81>C:\PROGRA~2\ALPHAT~2\T2SUSB~1\dunl
d_cl --if 170222_1836_T2S_controller_Vs_3_81_factory.ctf --v

Download : 100 %
T2S download log file created on Tue Jul 24 14:42:31 2018

T2S auto detection gave COM 4
File Information :
-----
File module type      : 00000000
File software revision : 3.81
File build time       : Wed Feb 22 09:36:45 2017

Device Information :
-----
Device module type    : 00000000

Download was successful
Download time : 37 seconds

C:\Users\LES~1\FRO\Desktop\Desktop\Training\COURSE~2\PRESEN~1\AMPS\MATERI~1\3.81\3.81>pause
Press any key to continue . . .

```

- From the web interface go to the Modules menu to confirm the T2S firmware is 3.81 or higher.

Dashboard Power Flow Controller System **Modules** Alarms Logs Shelf Layout

Home Modules

All Modules

Assign All Modules

Target Power Modules to Control Load

Identity	Model	Firmware	System	Bus	Node	Comm. Status	Alerts	Actions
LADIO97800227	L-ADIO	1.02	Controller	CAN2	6	Normal	0	Levels Refresh ADC
CXRC 48V 650W 240VAC-N3012050111	CXRC 48V 650W 240VAC	1.04	Unassigned Modules	CAN1	5	Normal	0	Levels
CXRC 48V 650W/NS01855-9306	CXRC 48V 650W	1.03	Unassigned Modules	CAN1	6	Normal	0	Levels
CXRF 48V 1.8kW/NS32052-0409	CXRF 48V 1.8kW	1.07	Unassigned Modules	CAN2	5	Normal	0	Levels
T2S Inverter Controller/2110	T2S Inverter Controller	3.81	Test System (AMPS HP2 Inverter System/548)	CAN2	3	Normal	0	Refresh T2S

1.2 Collecting CXCR Parameters

1. Upgrade T2S then wait for alarms to clear.
2. After upgrading the T2S collect the digital inputs, alarms, relays and custom formula configurations from the CXCR.
3. Click the drop-down menu to select an alarm category.

The screenshot shows the 'Configure Alarms' page with the 'Voltage Alarms' dropdown menu selected. The page displays a table of alarm configurations with columns for Alarm Name, Activation Value, Enable, Priority, Relay Mapping, Alarm Cut Off, Email, SNMP, and Severity.

Alarm Name	Activation Value	Enable	Priority	Relay Mapping	Alarm Cut Off	Email	SNMP	Severity
AC Mains High	270.0	<input checked="" type="checkbox"/>	Minor	Relay 6 (K6)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
AC Mains Low	180.0	<input checked="" type="checkbox"/>	Minor	Relay 6 (K6)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
High Voltage 1	55.50	<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
High Voltage 2	56.50	<input checked="" type="checkbox"/>	Major	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Low Voltage 1	48.00	<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Low Voltage 2	46.50	<input checked="" type="checkbox"/>	Major	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Midpoint Monitor 1	0.50	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Midpoint Monitor 2	0.50	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Midpoint Monitor 3	0.50	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Midpoint Monitor 4	0.50	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Midpoint Monitor 5	0.50	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0

4. Make note of the CXC Parameters.

The screenshot shows the 'Configure Alarms' page with the 'Digital Alarms' dropdown menu selected. The page displays a table of alarm configurations with columns for Alarm Name, Activation Value, Enable, Priority, Relay Mapping, Alarm Cut Off, Email, SNMP, and Severity.

Alarm Name	Activation Value	Enable	Priority	Relay Mapping	Alarm Cut Off	Email	SNMP	Severity
Bypass Mode On	[Digital Input 1]	<input checked="" type="checkbox"/>	Major	Relay 7 (K7)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Inverter Output Breaker Off	[Digital Input 2]	<input checked="" type="checkbox"/>	Major	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
UVSS	[Digital Input 3]	<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Inverter Input Breaker Off	[Digital Input 4]	<input checked="" type="checkbox"/>	Major	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Digital 5	[Digital Input 5]	<input checked="" type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Digital 6	[Digital Input 6]	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Digital 7	[Digital Input 7]	<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Digital 8	[Digital Input 8]	<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0

The screenshot shows the 'Configure Alarms' page with the 'Voltage Alarms' dropdown menu selected. The page displays a table of alarm configurations with columns for Alarm Name, Activation Value, Enable, Priority, Relay Mapping, Alarm Cut Off, Email, SNMP, and Severity.

Alarm Name	Activation Value	Enable	Priority	Relay Mapping	Alarm Cut Off	Email	SNMP	Severity
AC Mains High	270.0	<input checked="" type="checkbox"/>	Minor	Relay 6 (K6)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
AC Mains Low	180.0	<input checked="" type="checkbox"/>	Minor	Relay 6 (K6)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
High Voltage 1	55.50	<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
High Voltage 2	56.50	<input checked="" type="checkbox"/>	Major	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Low Voltage 1	48.00	<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Low Voltage 2	46.50	<input checked="" type="checkbox"/>	Major	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Midpoint Monitor 1	0.50	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Midpoint Monitor 2	0.50	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Midpoint Monitor 3	0.50	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Midpoint Monitor 4	0.50	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Midpoint Monitor 5	0.50	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0

Normal Alarm Cut Off Submit Changes Discard Changes Battery Voltage 53.98V
Load Current ---
AC Output Power 170W

System | Controller | Converters | **Inverters** | Rectifiers | Batteries | Alarms | Signals | Controls | Communications | Hardware | Logs and Files | Supervisor
View Live Status View Group Status Group Mapping Set Inputs Set Output General Settings Manage Config File Retrieve History File Auto DC Priority

Inverters > Set Output

AC Output Groups		
	Value	Unit
1: Number of Modules	1	
1: Amount of Redundancy	0	
1: Phase Shift	0	*
1: Nominal Output Voltage	120.0	V
2: Number of Modules	1	
2: Amount of Redundancy	0	
2: Phase Shift	240	*
2: Nominal Output Voltage	120.0	V

Submit Cancel

Normal Alarm Cut Off Submit Changes Discard Changes Battery Voltage 53.98V
Load Current ---
AC Output Power 157W

System | Controller | Converters | **Inverters** | Rectifiers | Batteries | Alarms | Signals | Controls | Communications | Hardware | Logs and Files | Supervisor
View Live Status View Group Status Group Mapping Set Inputs Set Output **General Settings** Manage Config File Retrieve History File Auto DC Priority

Inverters > General Settings

General Settings		
	Value	Unit
Input Source: AC:0 DC:100	0	%
AC Input Mode: Normal:0 Safe:1	0	
Nominal Inverter Frequency	60.00	Hz
Short Circuit Voltage Threshold	80	V
Short Circuit Hold Time	60.0	s
Maximum Current	150	%
Maximum Power	150	%
Maximum Overload Duration	15	s
Synchronization Tracking Speed	1	

Submit Cancel

Normal Alarm Cut Off Submit Changes Discard Changes Battery Voltage 53.98V
Load Current ---
AC Output Power 161W

System | Controller | Converters | **Inverters** | Rectifiers | Batteries | Alarms | Signals | Controls | Communications | Hardware | Logs and Files | Supervisor
View Live Status View Group Status Group Mapping Set Inputs Set Output General Settings **Manage Config File** Retrieve History File Auto DC Priority

Inverters > Manage Config File

Manage Config File	
Save Inverter Configuration File	Save the present inverter configuration file to local disc.
Browse...	Sends the configuration file from local disc to the inverter system.
Upload Inverter Configuration File	

Normal Alarm Cut Off Submit Changes Discard Changes Battery Voltage 53.98V
Load Current ---
AC Output Power 172W

System | Controller | Converters | **Inverters** | Rectifiers | Batteries | Alarms | Signals | Controls | Communications | Hardware | Logs and Files | Supervisor
View Live Status View Group Status Group Mapping Set Inputs Set Output General Settings Manage Config File **Retrieve History File** Auto DC Priority

Inverters > Retrieve History File

Retrieve Alarm History File	
Save Inverter History File	Save the inverter alarm history file to local disc.
<small>This option is not available with versions of the T2S firmware older than 2.51</small>	

Normal Alarm Cut Off Submit Changes Discard Changes Battery Voltage 53.98V Load Current --- AC Output Power 158W

System | Controller | Converters | Inverters | Rectifiers | Batteries | Alarms | Signals | Controls | Communications | Hardware | Logs and Files | Supervisor

Batteries > Configure Batteries

Battery Properties

Capacity Rating: 1550.0 AH at 20hr Rate

Capacity Calibration: 100 %

Open Circuit Voltage: 51.96 V

Peukert Number: 1.242

Temp Comp Slope: 3.50 mV/C/Cell

Number of Cells: 24 per String

Battery State of Charge Estimation

Enable SOC Estimation During Discharge

Load Model For Runtime Estimation

Constant Power

Constant Current

Resistive Load

Charge Current Control

Enable Primary CCC

Charge Rate Amps: 310.0 A

Charge Rate C/X: 5.0 X

Enable Secondary CCC

Charge Rate Amps: 0.0 A

Charge Rate C/X: 0.0 X

Secondary CCC Trigger: AC Output (W)

Battery Test

BT Termination Voltage: 44.50 V

Rectifier BT Voltage: 44.00 V

Rectifier BT Timeout: 8.0 Hrs

Enable Periodic Auto BT

Interval: 180 Days

Language Logout Normal Alarm Cut Off Submit Changes Discard Changes Battery Voltage 53.98V Load Current --- AC Output Power 167W

System | Controller | Converters | Inverters | Rectifiers | Batteries | Alarms | Signals | Controls | Communications | Hardware | Logs and Files | Supervisor

Batteries > Configure Batteries

Reset Battery Estimation

Auto Equalize

Equalize Normal Duration: 8 Hrs

Enable Periodic Auto EQ

Interval: 30 Days

Enable Charge Auto EQ

Activation Threshold: 53.00 V

Arming Threshold: 48.00 V

Terminate on Current Threshold

Enable BCT EQ

EQ Duration After Threshold: 1 Hrs

Current Threshold: 5.0 A

Remote BT: Custom 6

Temperature Compensation

Enable TC in EQ mode

Enable TC in FL mode

Upper Temperature Breakpoint

Voltage: 52.50 V

Temperature: 50.0 °C

Lower Temperature Breakpoint

Voltage: 55.50 V

Temperature: 0.0 °C

Boost Mode

Enable Manual Boost

Boost Mode Voltage: 2.30 V/Cell (55.2 V)

Boost Mode Timeout: 4.0 Hrs

Boost Mode Inhibit: Custom 7

Select a custom alarm. When this alarm is active it will inhibit boost mode.

Normal Alarm Cut Off Submit Changes Discard Changes Battery Voltage 53.98V Load Current --- AC Output Power 164W

System | Controller | Converters | Inverters | Rectifiers | Batteries | Alarms | Signals | Controls | Communications | Hardware | Logs and Files | Supervisor

Batteries > Configure Alarms

Alarm Configuration Custom Alarms Please wait...

Alarm Name	Activation Value	Enable	Priority	Relay Mapping	Alarm Cut Off	Email	SNMP	Severity
Custom 1	[V1]<22	<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 2	[I1]>640	<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 3	[I2]>640	<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 4	[I3]>640	<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 5	[I4]>640	<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 6	[ADIO01.CHAND4]	<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 7		<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 8		<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 9		<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Low AC Output Power	[AC Output VA] < 20	<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
DC Mode	[DC Input Current] > 10	<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 12		<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 13		<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 14		<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Custom 15		<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0

Language Logout

Normal Alarm Cut Off Submit Changes Discard Changes

Battery Voltage 63.98V
Load Current ---
AC Output Power 175W

System | Controller | Converters | Inverters | Rectifiers | Batteries | Alarms | Signals | Controls | Communications | Hardware | Logs and Files | Supervisor
View Live Status Configure Alarms Global Alarm Configuration

Alarms > Configure Alarms

Alarm Configuration Miscellaneous Alarms Please wait...

Alarm Name	Activation Value	Enable	Priority	Relay Mapping	Alarm Cut Off	Email	SNMP	Severity
Real Time Clock Error		<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Invalid Device Firmware		<input checked="" type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Ground Fault Detected	5 mA	<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Improper Controller Shutdown		<input type="checkbox"/>	Minor	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
Invalid Battery Voltage		<input type="checkbox"/>	Message	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
System Major		<input checked="" type="checkbox"/>	Major	Relay 5 (K5)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0
System Minor		<input checked="" type="checkbox"/>	Minor	Relay 4 (K4)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0

Normal Alarm Cut Off Submit Changes Discard Changes

Battery Voltage 63.98V
Load Current ---
AC Output Power 170W

System | Controller | Converters | Inverters | Rectifiers | Batteries | Alarms | Signals | Controls | Communications | Hardware | Logs and Files | Supervisor
View Live Status Configure System Select Voltage Mode Upgrade Firmware Set ADIO Module Number User Inventory System Inventory

System > Configure System

Contact Information

Site Name CXC Supervisory

City Burnaby

Region/State/Prov. B.C.

Country Canada

Contact Name Alpha Technical Support

Phone Number 604-436-5900

Site Number 123456789

System Information

System Number 026-069-31

System Serial Number 417214

System Voltage 48V

Language Logout

Normal Alarm Cut Off Submit Changes Discard Changes

Battery Voltage 63.98V
Load Current ---
AC Output Power 171W

System | Controller | Converters | Inverters | Rectifiers | Batteries | Alarms | Signals | Controls | Communications | Hardware | Logs and Files | Supervisor
View Live Status Configure System Select Voltage Mode Upgrade Firmware Set ADIO Module Number User Inventory System Inventory

System > Upgrade Firmware

Firmware Source

From Acquired Devices

Serial Number	Device Name	Version
N322052/0409	CXRF 48-1.8kW	1.07
2110	Inverter Ctrl	3.81

From PC

Browse...

Submit

Firmware Destination

Select All Unselect All

Serial Number	Device Name	Version
<input type="checkbox"/> N322052/0409	CXRF 48-1.8kW	1.07
<input type="checkbox"/> 2110	Inverter Ctrl	3.81

Firmware Name Version

No Device Firmware Loaded

Perform Upgrade

Language Logout

Normal Alarm Cut Off Submit Changes Discard Changes

Battery Voltage 63.98V
Load Current ---
AC Output Power 168W

System | Controller | Converters | Inverters | Rectifiers | Batteries | Alarms | Signals | Controls | Communications | Hardware | Logs and Files | Supervisor
View Live Status Configure Communication Parameters Event Notification Destination SNMP Configuration

Communications > View Live Status

Port Status

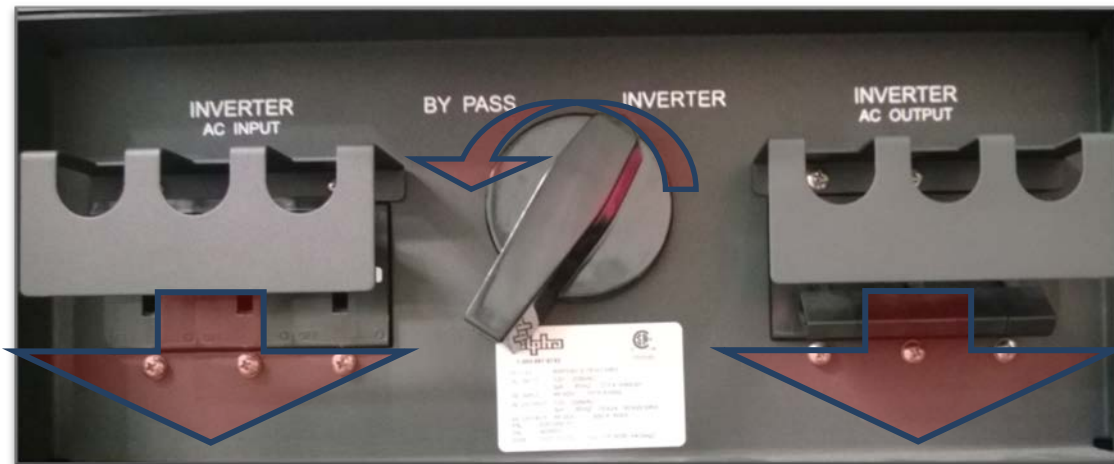
CAN	Active
RS485	Inactive
Craft Port	Inactive
Ethernet Port	Active

IP Information

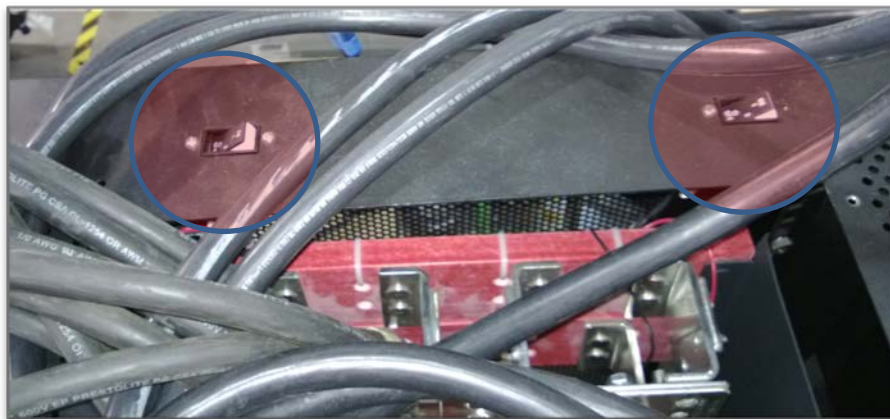
IP Address	10.1.12.156
Subnet Mask	255.255.255.0
Gateway	10.10.10.1
Ethernet/Mac Address	0090EAC1DCB9

2 Lock Out the UPS

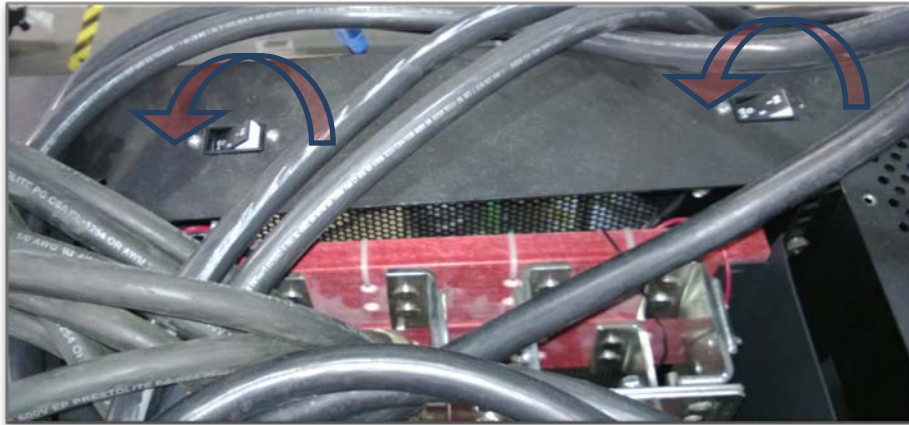
1. Verify that all inverter module AC input/output indicators are green.
2. Switch the system to bypass using the internal bypass switch if installed.
3. If there is an external MBS switch it to bypass. **Note: If the external MBS switch is not installed the load will need to be taken off line for a retrofit.**
4. Ensure the system is in **Bypass Mode**, and that the AC input and output breakers are off, and that the internal rectifier breaker is off (hybrid systems only).
5. Go to the main panel and turn off the AMPS80 main input breaker, and the AMPS internal rectifier breaker.
6. Remove all power connected to the AMPS system. This may mean turning off the main input breaker of the main panel, and the internal rectifier breaker.
7. Turn off all AMPS battery breakers or disconnects.



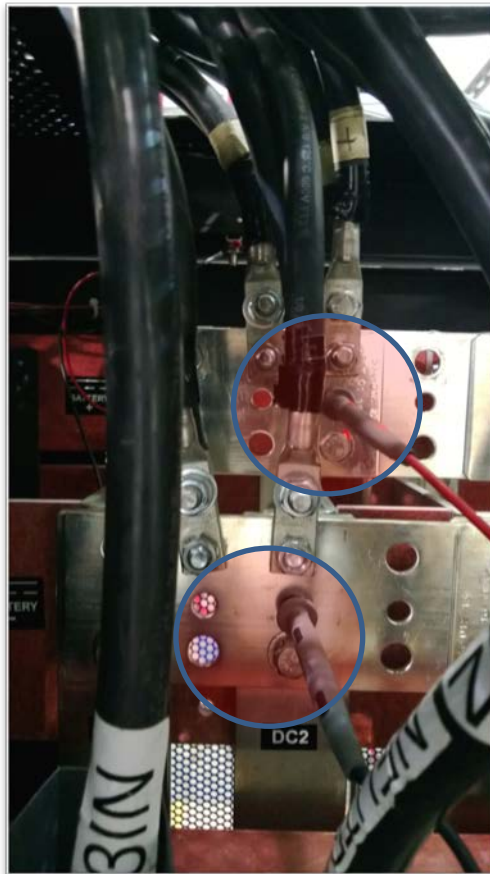
8. Locate DC CB6 and CB7 on the top back of the AMPS system.



9. Turn off both circuit breakers.



10. Using a voltmeter verify that there are no AC or DC voltages present.

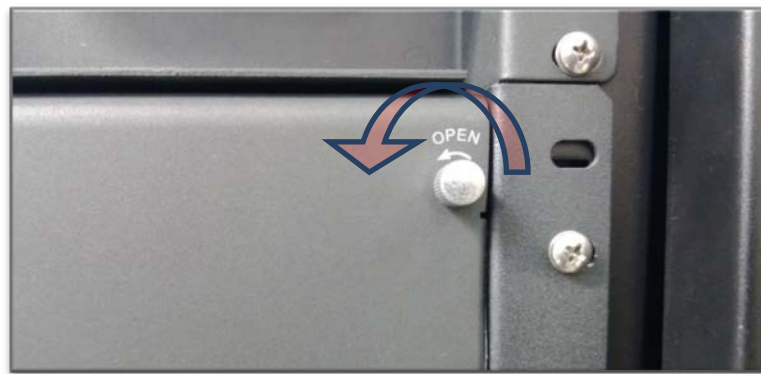


3 Hardware Setup

1. Locate the CXCR and remove the safety screw near the top of the unit.



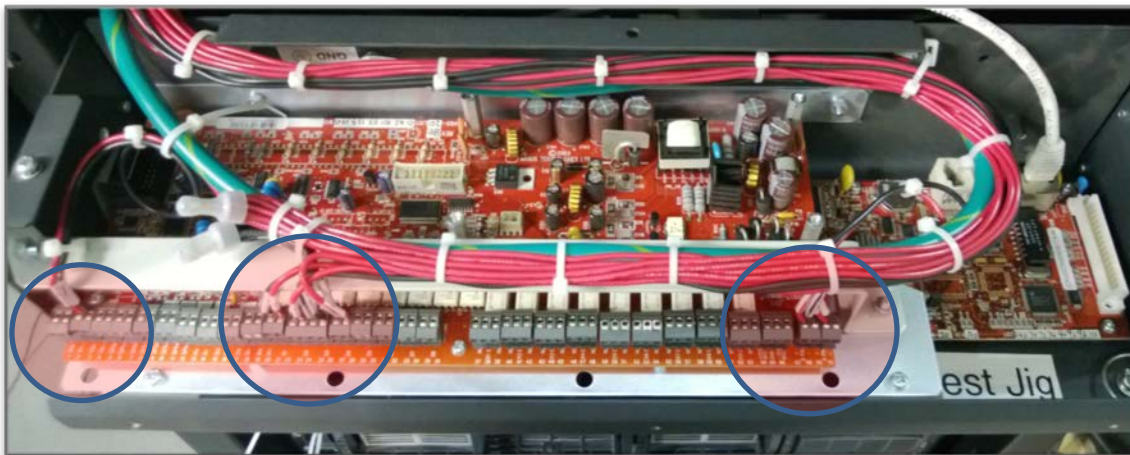
2. Unlock the CXCR and pull CXCR down.



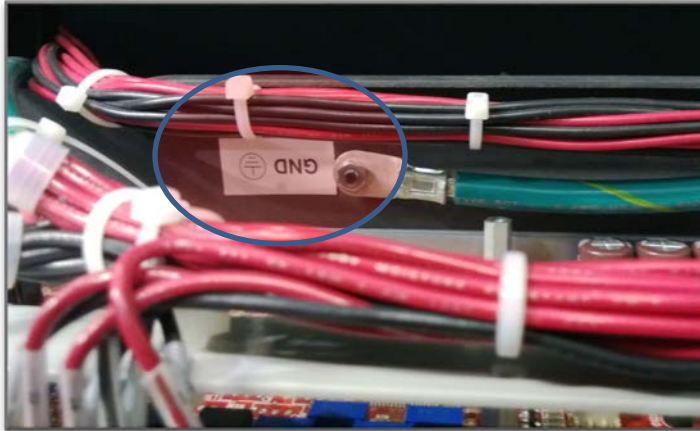
3. Remove the CXCR back panel.



4. Use the labels provided and label all the wires connected to the ADIO.



5. Disconnect the ground bond wire.



6. Remove the system CAN bus cable.



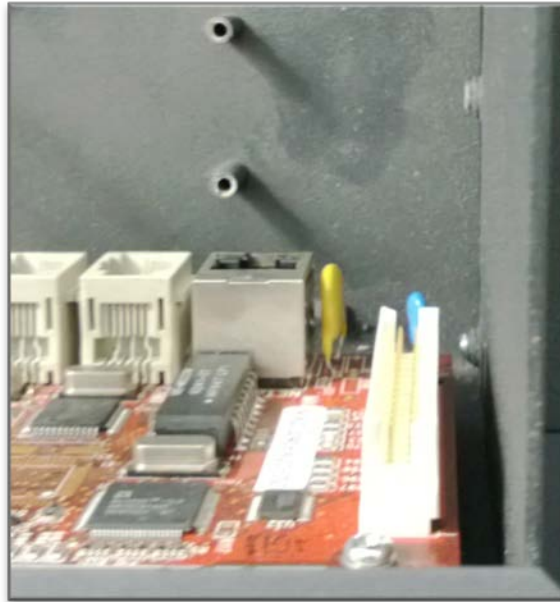
7. Remove the system Ethernet cable.



8. Remove the remaining ADIO wires.



9. Remove the CXCR once all the wires have been released.





10. Install the new CXC HP 3RU panel.

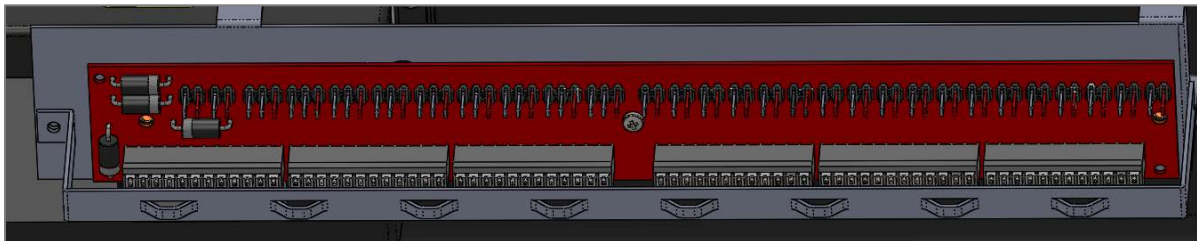


11. Unlock the CXC HP by pushing the two side tabs at the same time and pull CXC HP down.

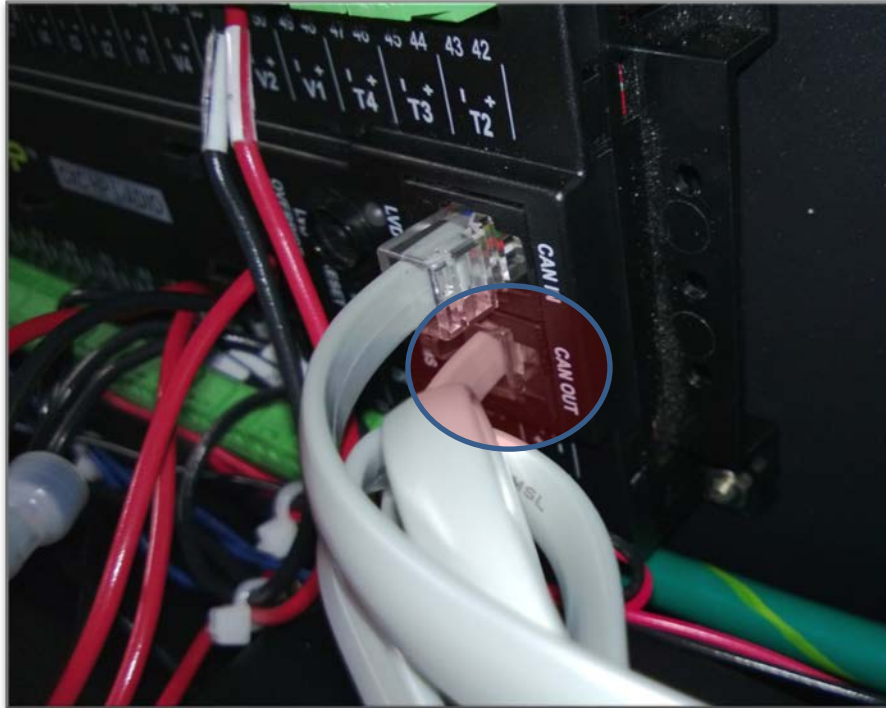


12. Connect the ground bond wire.

13. Connect the labeled ADIO wires onto the adaptor PCB.



14. Connect the system CAN cable to the CAN out port of the L-ADIO.



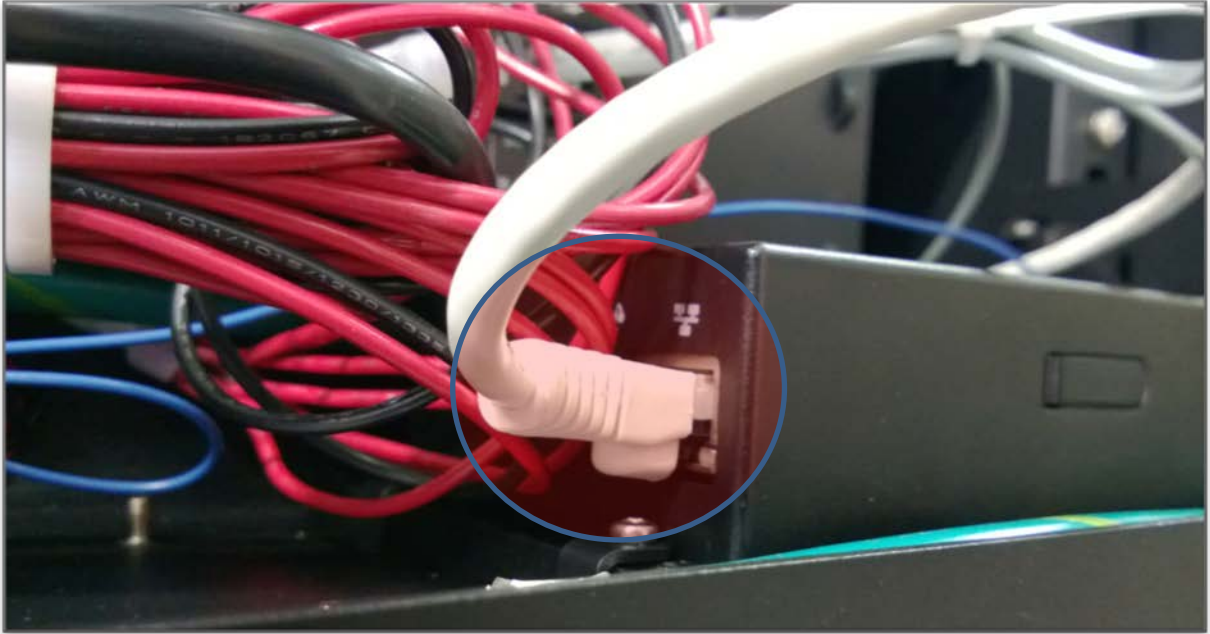
(L-ADIO)



(Bottom Shelf)

(Only on hybrid systems)

15. Connect the Ethernet cable.



16. Turn on the battery breakers or disconnects.

17. Locate DC CB6 and CB7 on the top back of the AMPS system. Turn them on.

18. Turn on the AC mains breaker for the AMPS system found in the Breaker panel.

19. Turn on the inverter AC input breaker.

20. Follow the software set up in the next section.

4 CXC HP Software Set Up

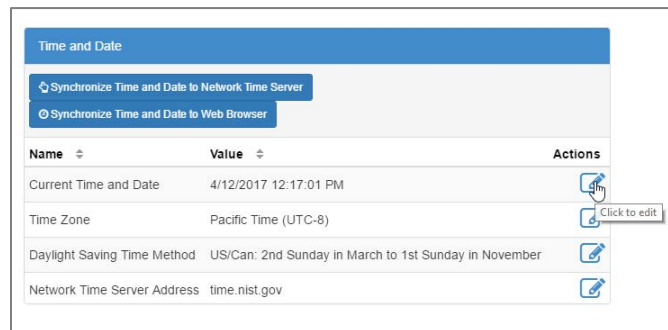
4.1 Setting the Date and Time

There are three options to change the date and time:

- Manually with the date/time picker
- Using the local browser/computer
- Using simple network time protocol (SNTP)

To set the date and time:

1. Go to **Controller > Configure controller > Time and Date**.
2. From the drop-down **Time Zone** menu, select your time zone, and then click **Save**.
3. If setting the time manually, click the edit icon beside the **Current Time and Date**. Use the date/time picker to change the date and time.
4. If setting the time and date with the local browser click **Synchronize Time and Date to Web Browser**. This reads the time from the browser and sends it to the controller.



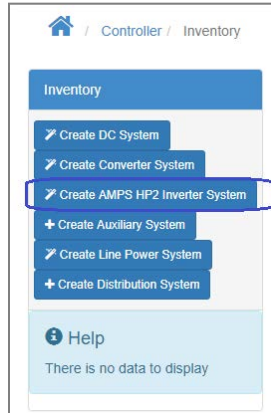
5. If setting the time and date using SNTP, first enter a valid SNTP server address, and then click **Synchronize Time and Date to Network Time Server**. If you do not want to use the SNTP server, clear the **Network Time Server Address** field.

4.2 Creating an AMPS HP2 Inverter System

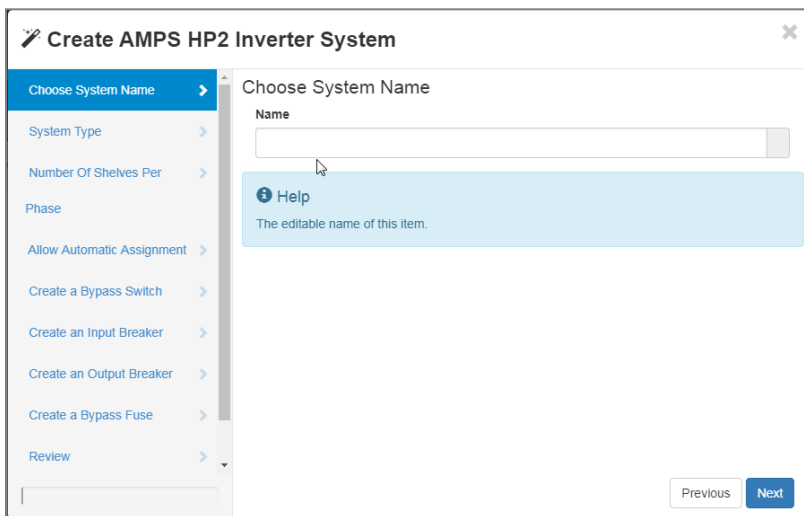
The following conditions are required before you begin:

- CXC HP controller with software v4.10 or later.
- Logged into a CXC HP controller via the web interface.
- A T2S controller plugged into an inverter shelf with an inverter powered on.
- Active T2S controller shelf connected to CXC HP controller via CAN.
- An ADIO module connected to the CXC HP via CAN for breaker/fuse configuration.

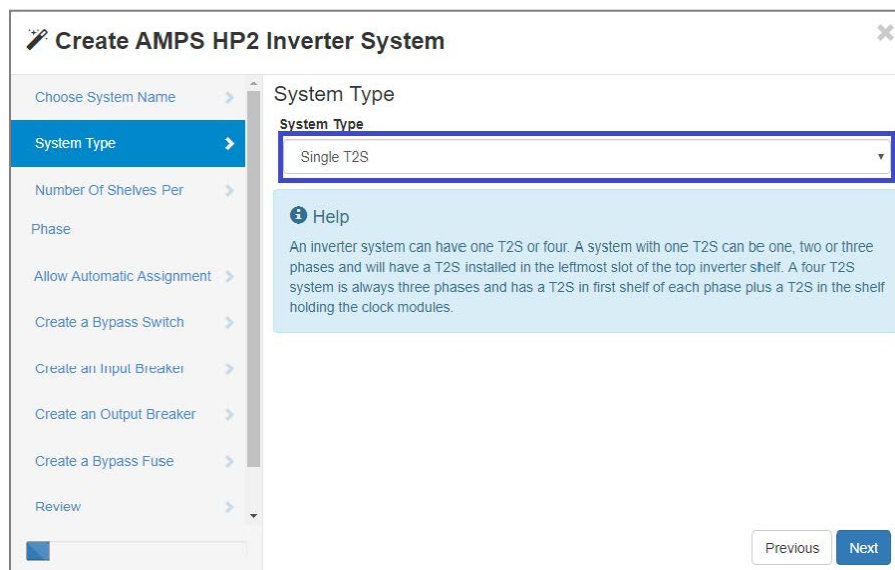
1. Go to Controller > Inventory and click Create AMPS HP2 Inverter System.



2. The Create Amps HP2 Inverter System wizard displays.



3. Enter a system name and click **Next**.
4. From the **System Type** window pane, select **Single T2S** from the drop-down menu and click **Next**.



- From the **Number of Shelves Per Phase** window enter the number of shelves allotted per phase and click **Next**.
- From the Allow Automatic Assignment window, set the T2S Assignment Rule to Automatic, and click Next.

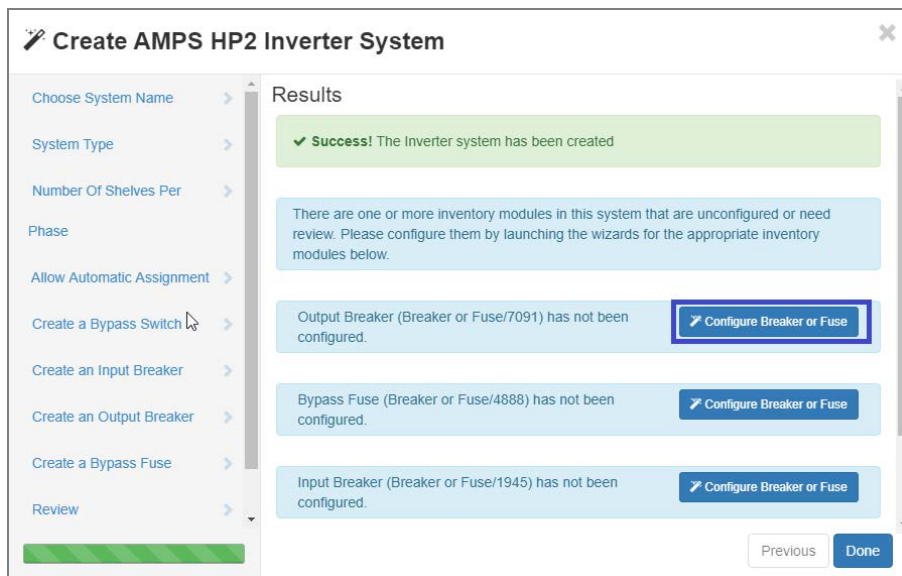
The screenshot shows the 'Create AMPS HP2 Inverter System' wizard at the 'Allow Automatic Assignment' step. The left sidebar contains a list of steps: 'Choose System Name', 'System Type', 'Number Of Shelves Per', 'Phase', 'Allow Automatic Assignment' (highlighted), 'Create a Bypass Switch', 'Create an Input Breaker', 'Create an Output Breaker', 'Create a Bypass Fuse', and 'Review'. The main content area is titled 'Allow Automatic Assignment' and features a 'T2S Assignment Rule' dropdown menu set to 'Automatic'. Below this is a 'Help' box with the text: 'The assignment rule can be either manual or automatic. When configured as manual, it is necessary to manually add unassigned modules to the system. When configured as automatic, modules are automatically added to the system.' At the bottom right, there are 'Previous' and 'Next' buttons.

- For the following windows, click next: Create a Bypass Switch, Create an Input Breaker, Create an Output Breaker, Create a Bypass Fuse.
- From the **Review** window, verify that the settings entered are correct. If not, use the **Previous** button to go back, make adjustments, and then click **Next**.

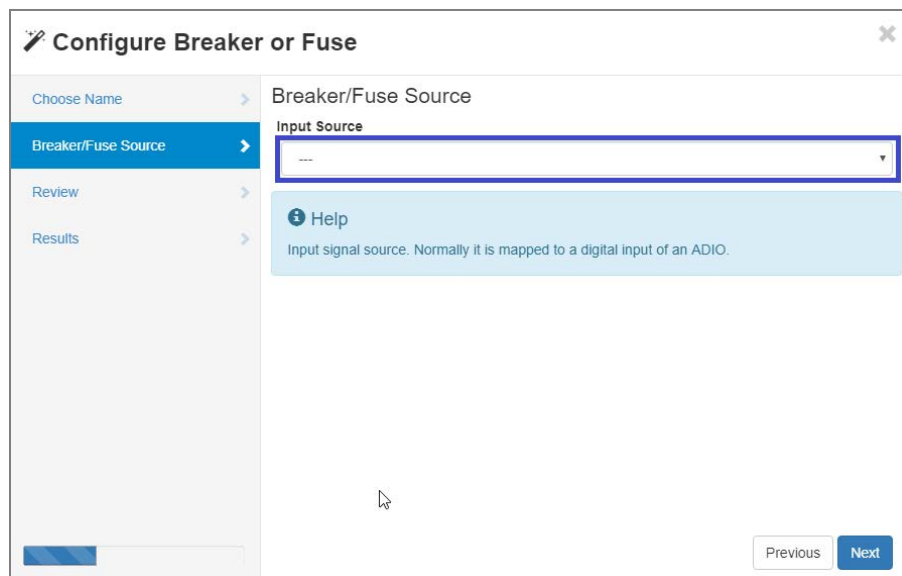
The screenshot shows the 'Create AMPS HP2 Inverter System' wizard at the 'Review' step. The left sidebar highlights the 'Review' step. The main content area is titled 'Review' and displays a summary of the configuration: 'Name' (230VAC/60HZ Inverter System), 'System Type' (Single T2S), 'Number Of Shelves Per Phase' (1), 'T2S Assignment Rule' (Automatic), and 'Create a Bypass Switch' (Yes). At the bottom right, there are 'Previous' and 'Next' buttons.

- From the **Results** window, click the **Configure Breaker** or **Fuse** button for the **Output Breaker**. A **Configure Breaker** or **Fuse** wizard will display.

Note: If you selected **Done** and the wizard closed, got to **System > AMPSP2 > Inventory > Breakers, Fuses and Bypass Switches** then click the more details icon. Open the configure breaker or fuse wizard and then continue to Step 10.

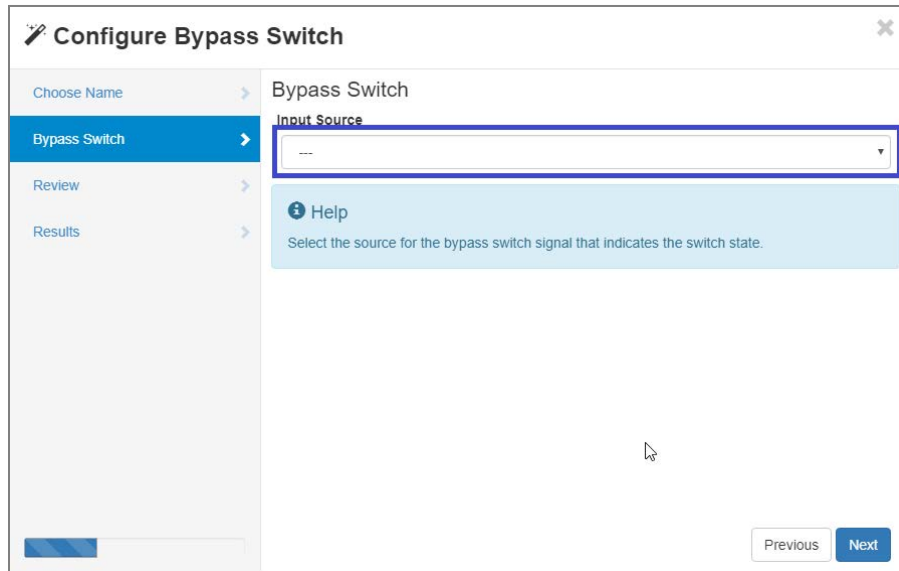


10. In the **Choose Name** window, verify the name (**Output Breaker**) for the AMPS HP2 System and click **Next**.
11. From the **Breaker/Fuse Source** window, click the drop-down menu for the **Input Source** and select the **ADIO** input that the **Output Breaker** is physically wired into, click **Next**.

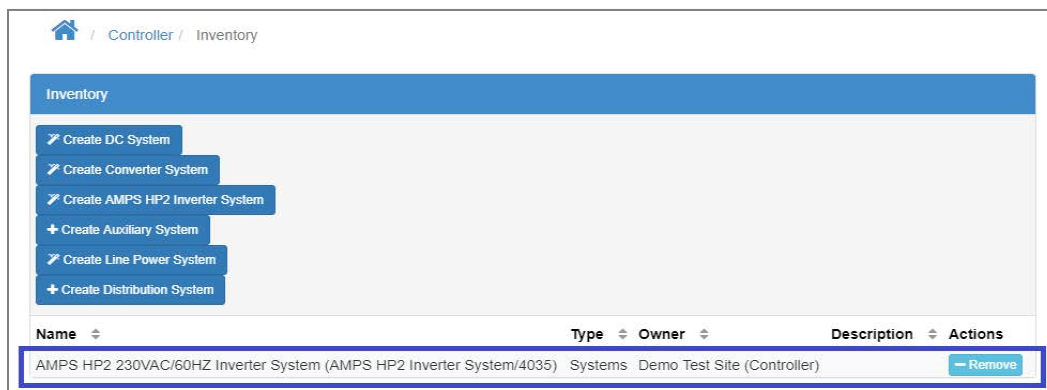


12. From the **Review** window, verify that the settings entered are correct. If not, use the **Previous** button to go back and adjust then click the **Next**.
 13. Repeat Steps 9-12 for the **Bypass Fuse** configuration and **Input Breaker** configuration.
- Note: Bypass fuse, step 10, rename the TVSS.

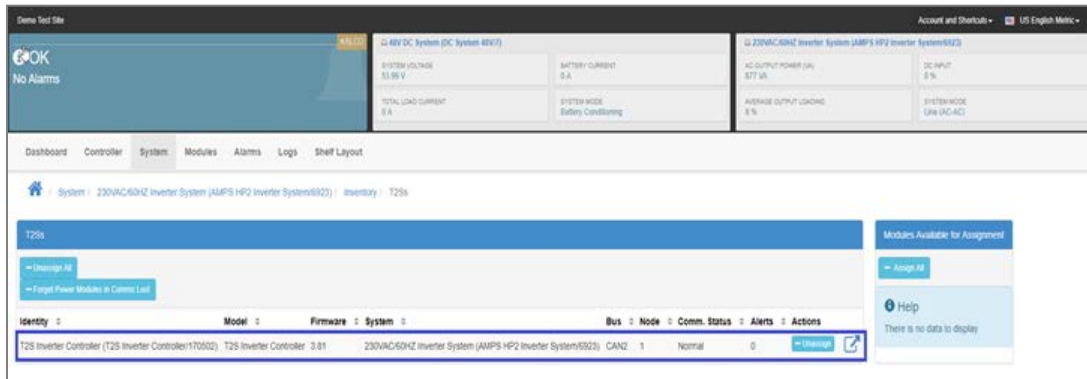
14. Click the Configure Bypass Switch on the Results window in either the Configure Breaker or Fuse wizard.
15. Verify the name (**Bypass Switch**) of the AMPS HP2 System. Click **Next**.
16. From the **Bypass Switch** window, click the drop-down menu for the **Input Source** and select the **ADIO** input that the **Bypass Switch** is physically wired into. Click **Next**.



17. From the **Review** window, verify that the settings entered are correct if not use the **Previous** button to go back and adjust them, then click **Next**.
18. From the Results window, click Done. The web interface displays the new AMPS HP2 system as an inventory item.



- Go to **System > Inverter System > Inventory > T2Ss**. Confirm a **T2S Inverter Controller** has been assigned to the newly created inverter system.



- Inverter system has been successfully created on CXC HP controller. The next step is commissioning the inverter system.

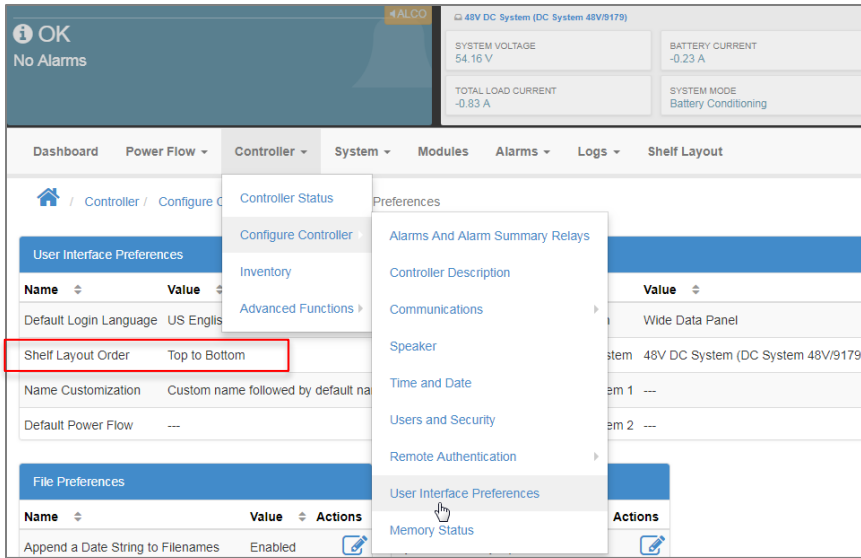
4.3 Configuring the ADIO and Alarms Manually

Configure the Digital Inputs, Relays, Alarms and Custom Actions manually as recorded from the CXCR in section 1.2, Collecting CXCR Parameters.

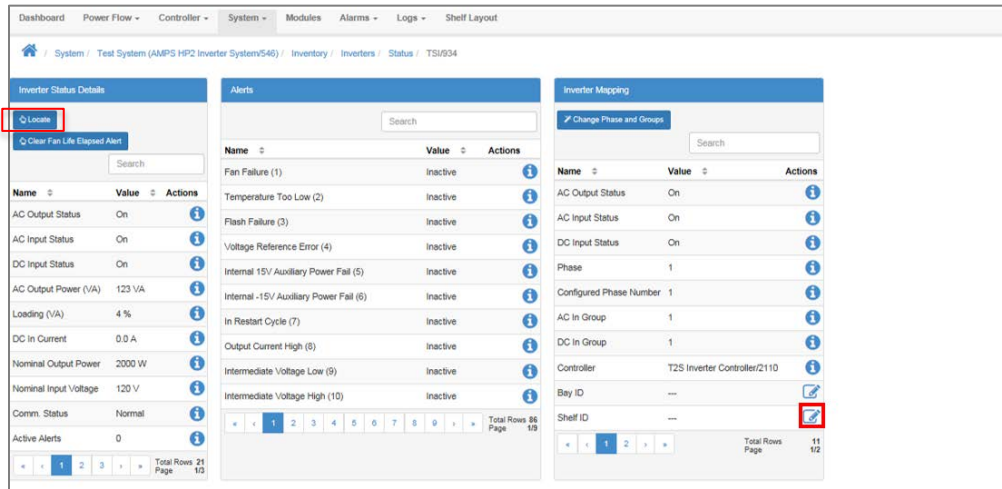
4.4 Configuring the Shelf Layout

After inverter system setup, the **Bay ID**, **Slot ID** and **Shelf ID** need to be configured. This is done manually as shown in the following images.

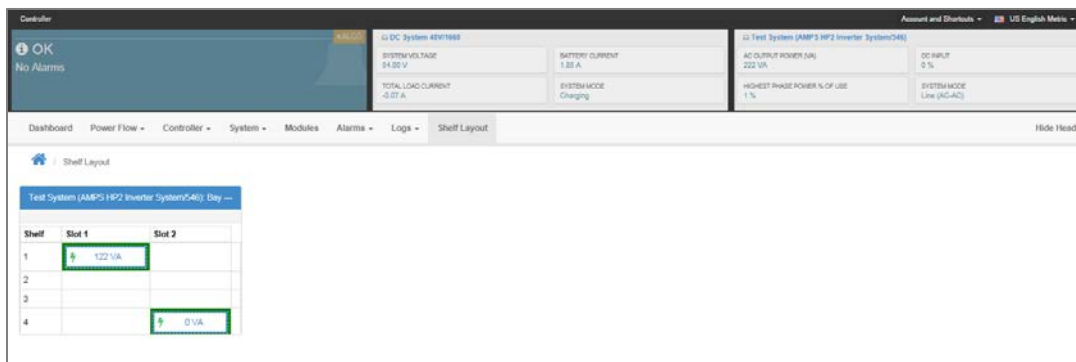
1. Go to **Controller > Configure Controllers > User Interface Preferences** to verify the shelf layout order. For example, if the shelf is on top, then top to bottom.



2. From the web menu, select an inverter and use the **Locate** function to identify physical location of the module.



3. From the **Shelf Layout** menu, verify the shelf is laid out correctly.



4. Verify the number of shelves and phases.

The screenshot shows the 'Configure System' page for a 'Test System (AMPS HP2 Inverter System(54))'. The 'System Properties' section is expanded to 'Configure Inverter Redundancy', showing the following values:

- System Type: Single T2S
- T2S Assignment Rule: Automatic
- Commissioning Method (Advanced): Wizard/Automatic
- Number Of DC Input Groups (Feeds): 1
- Number Of Phases: 2
- Number Of Shelves Per Phase: 2
- Alarm Limit For Inverter Redundancy Phase 1: 0
- Alarm Limit For Inverter Redundancy Phase 2: 0
- Alarm Limit For Inverter Redundancy Phase 3: 0

The 'Alarms' section displays a table of system alerts:

Name	Alarm Processing	Limit	Priority	Relay	Actions
T2S Comms Lost	Enabled		Critical	—	[Icon]
Inverter Comms Lost	Enabled		Major	—	[Icon]
Inverter Fan Failure	Enabled		Minor	—	[Icon]
Inverter Internal Error	Enabled		Major	—	[Icon]
Inverter Restarts	Enabled		Warning	—	[Icon]
Inverter Overload	Enabled		Minor	—	[Icon]
Inverter Configuration Error	Enabled		Minor	—	[Icon]
Inverter Output Voltage Change in Progress	Enabled		Warning	—	[Icon]
Inverter Not Ready	Enabled		Warning	—	[Icon]
Inverter Temperature Derating	Enabled		Minor	—	[Icon]

The screenshot shows the 'Shelf Layout' page for the 'Test System (AMPS HP2 Inverter System(54))'. The layout is as follows:

Shelf	Slot 1	Slot 2	Slot 3	Slot 4
1	117 VA	0 VA		
2				
3				
4		0 VA		0 VA

4.5 Remove Bypass and Apply the Load

1. Turn on UPS output breaker
2. Switch external bypass to UPS
3. Switch AMPS internal bypass to inverter

4.6 Configuring CXC HP Parameters

- Configure the alarms and parameters taken from the CXCR in section 1.2, Collecting CXCR Parameters.

5 Appendix

CAUTION: Alpha authorized commissioning is mandatory for warranty coverage and shall be conducted by Alpha trained personnel. A complete commissioning report shall be submitted for Alpha's records.

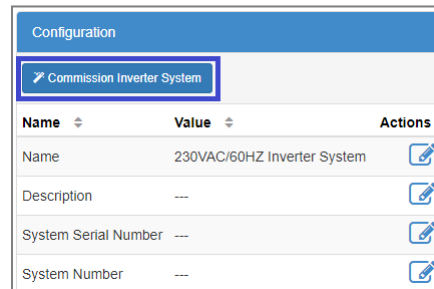
NOTE: This process requires removing ALL inverter modules. The AMPS system will not output AC power.

5.1 AMPS HP2 Commissioning

The following conditions are required before you begin:

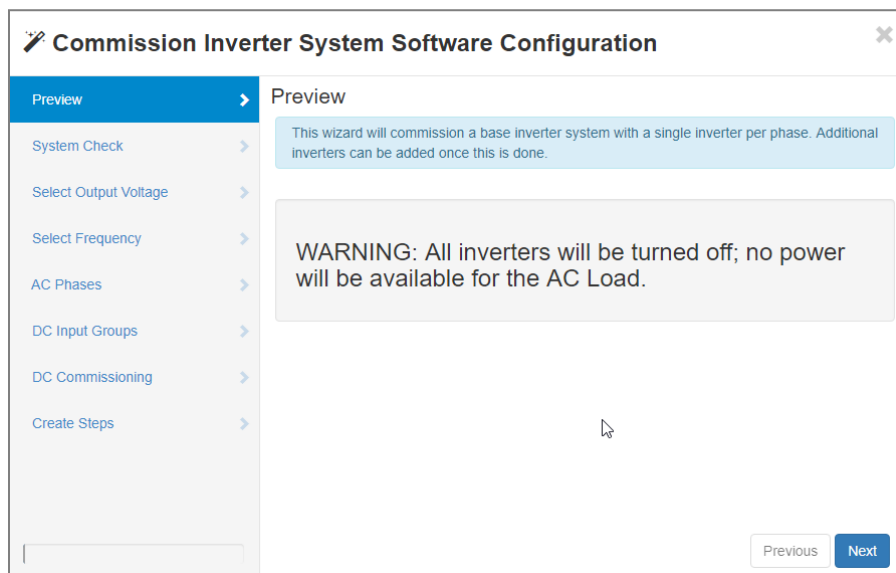
- The CXC HP controller must be connected via the web
- There must be an inverter system on CXC HP controller using software v4.10 or later.
 - If not, see 4.1 Creating and AMPS HP System.
- The AC input to inverter shelves are connected in the correct order (Phase A, Phase B, Phase C).
- A single T2S is assigned to the inverter system being commissioned.
 - To check go to: **System > Inverter System > Inventory > T2Ss**

1. Go to System > Inverter System > Configure System and click Commission Inverter System.



Configuration		
Commission Inverter System		
Name	Value	Actions
Name	230VAC/60HZ Inverter System	
Description	---	
System Serial Number	---	
System Number	---	

2. A Commission Inverter System Software Configuration wizard displays.



Commission Inverter System Software Configuration

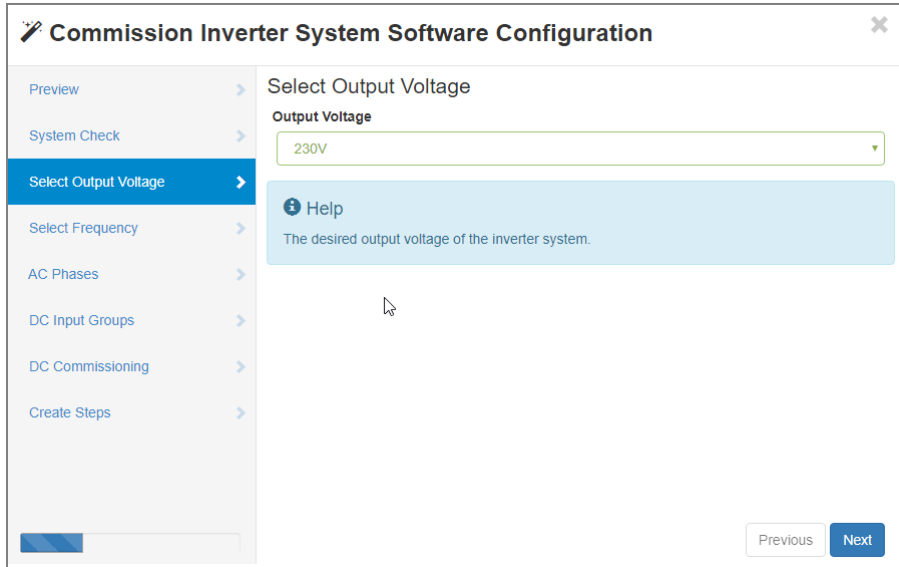
Preview

This wizard will commission a base inverter system with a single inverter per phase. Additional inverters can be added once this is done.

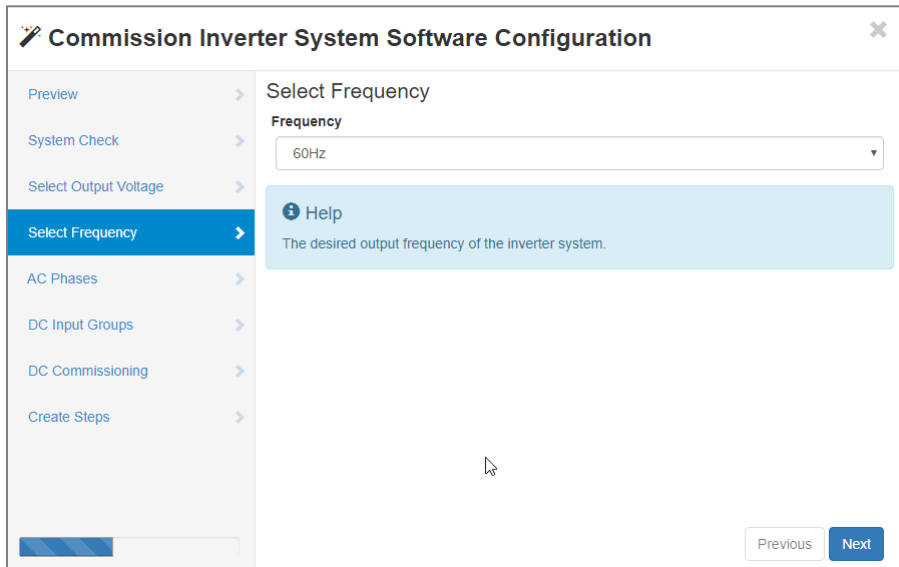
WARNING: All inverters will be turned off; no power will be available for the AC Load.

Previous Next

3. Click **Next** in the **Preview** window.
4. Click **Next** in the **System Check** window pane. Important, this step assumes that a T2S has been assigned, and system is in a normal operating state.
5. From the **Select Output Voltage** window, use the drop-down menu to select the output voltage of the inverter system being commissioned and click **Next** (in North America 120V).



6. From the **Select Frequency** window, use the drop-down menu to select the output operating frequency of the inverter system being commissioned and click **Next**.



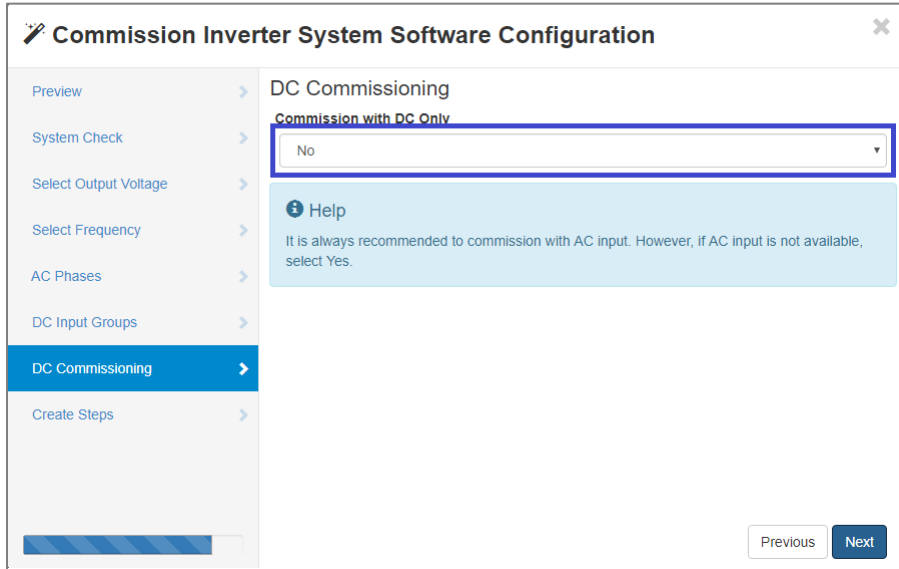
- From the **AC Phases** window, enter the number of phases that the inverter system is wired for and click **Next**.

The screenshot shows a software configuration window titled "Commission Inverter System Software Configuration". On the left is a navigation menu with options: Preview, System Check, Select Output Voltage, Select Frequency, AC Phases (highlighted), DC Input Groups, DC Commissioning, and Create Steps. The main area is titled "AC Phases" and contains a "Number Of Phases" input field with the value "3". Below this is a help box with an information icon and the text "Help" and "Enter the number of phases." At the bottom right, there are "Previous" and "Next" buttons, with "Next" being the active button.

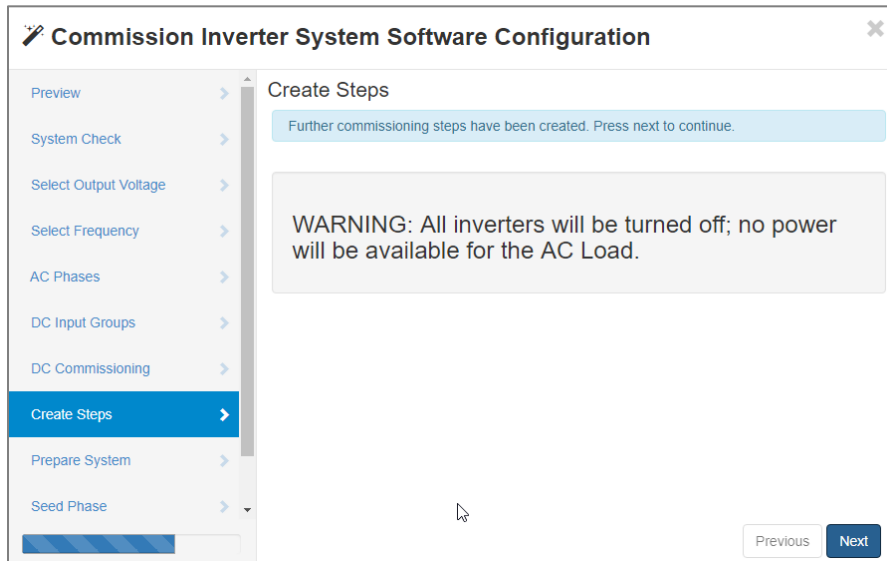
- From the **DC Input Groups** window, select the number of independent DC input groups, click **Next**.

The screenshot shows the same software configuration window, but now on the "DC Input Groups" step. The navigation menu has "DC Input Groups" highlighted. The main area is titled "DC Input Groups" and contains a "Number Of DC Input Groups" dropdown menu with the value "1". Below this is a help box with an information icon and the text "Help" and "Enter the number of independent DC input groups (feeds)". At the bottom right, there are "Previous" and "Next" buttons, with "Next" being the active button.

9. In the **DC Commissioning** window, select **No** from the drop-down menu. Click **Next**.

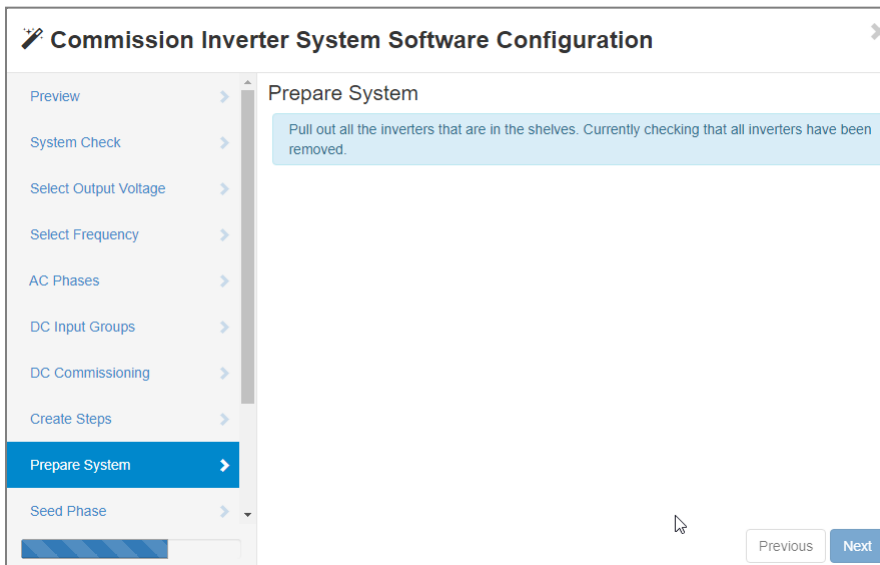


IMPORTANT: Check the validity all selected options before moving forward because the **Previous** button will not allow any changes after this point in the configuration.

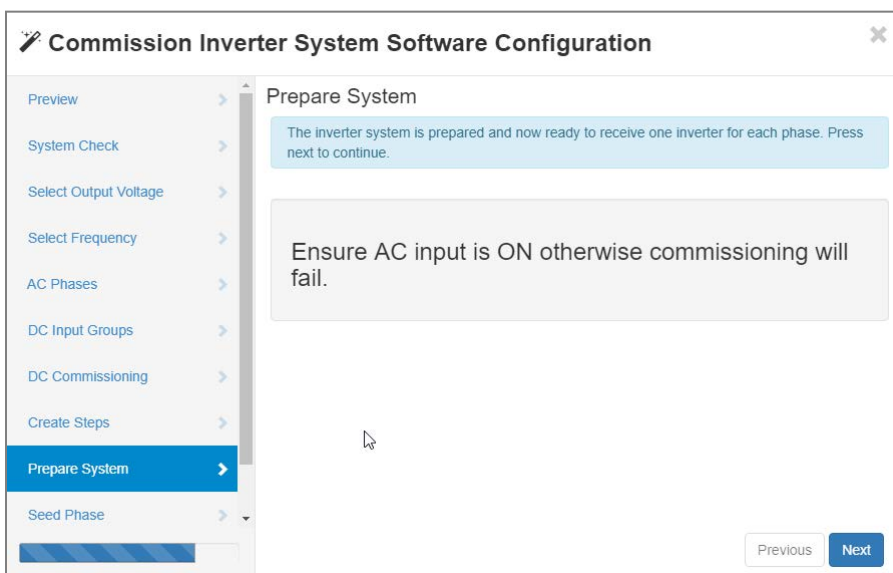


10. In the Create Steps window, click **Next**.

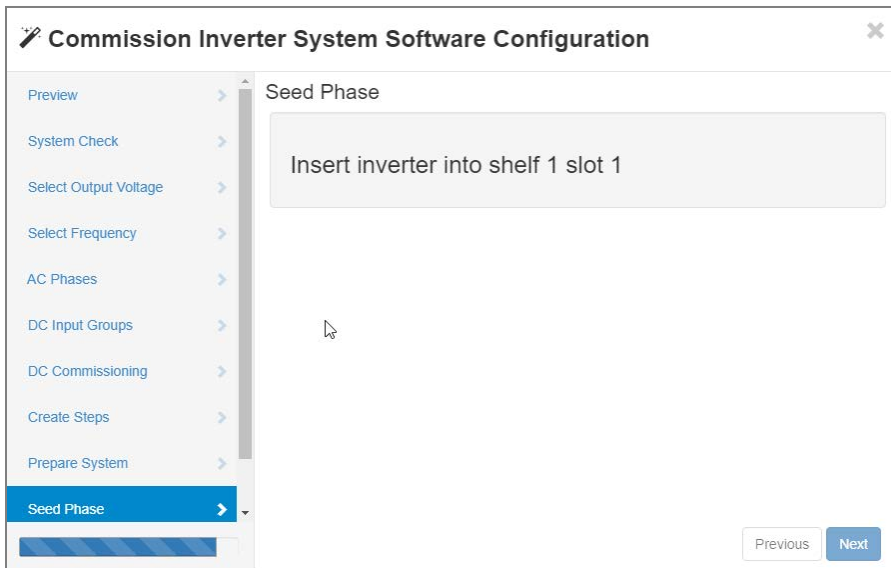
11. Physically remove all the inverters that are seated into any inverter shelves.



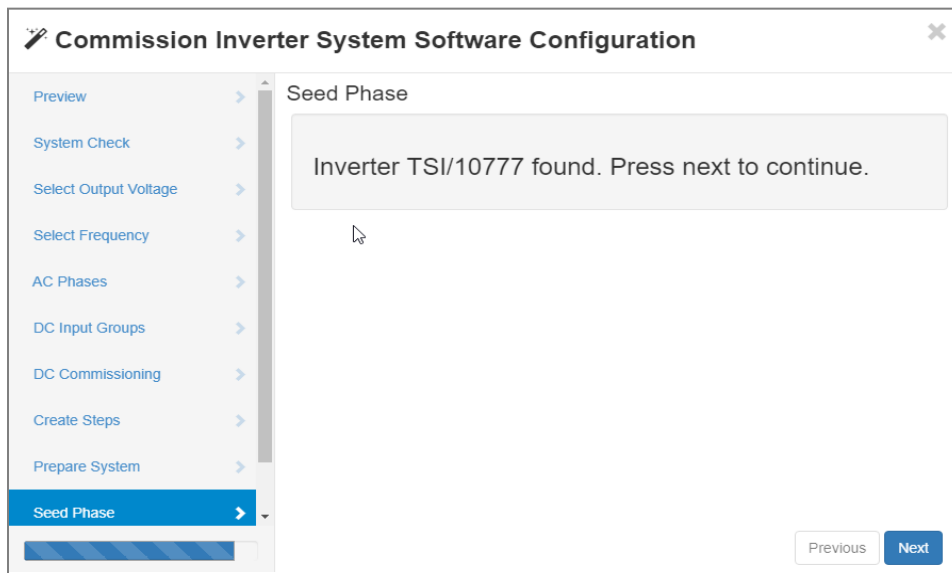
12. After all inverters are removed the wizard will progress. Make sure that the AC input into the inverter shelves that are being commissioned is active. Click Next.



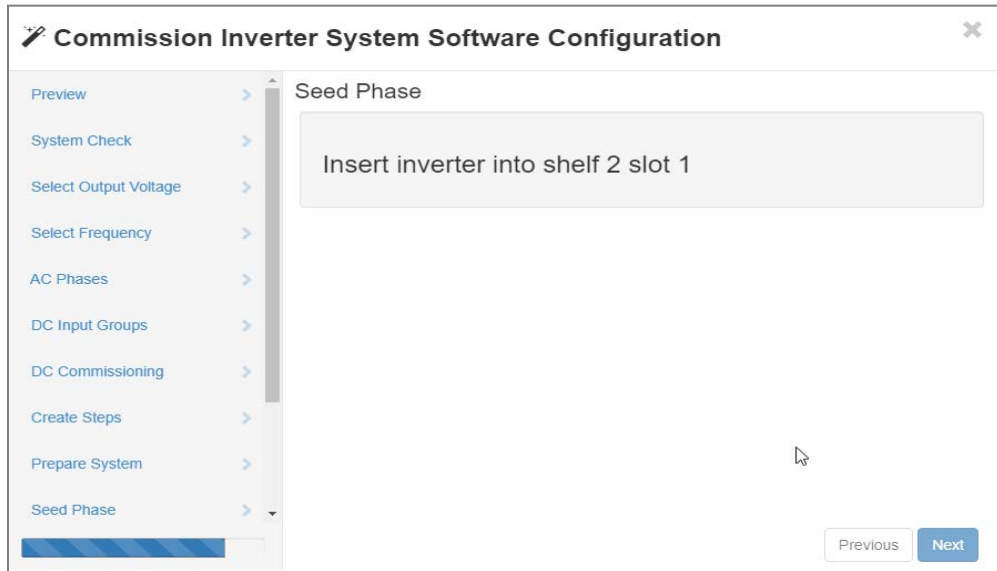
13. Insert the first phase seed inverter into the slot specified by the wizard. Wait approximately 1-2 minutes for it to find the inverter that has been seated.



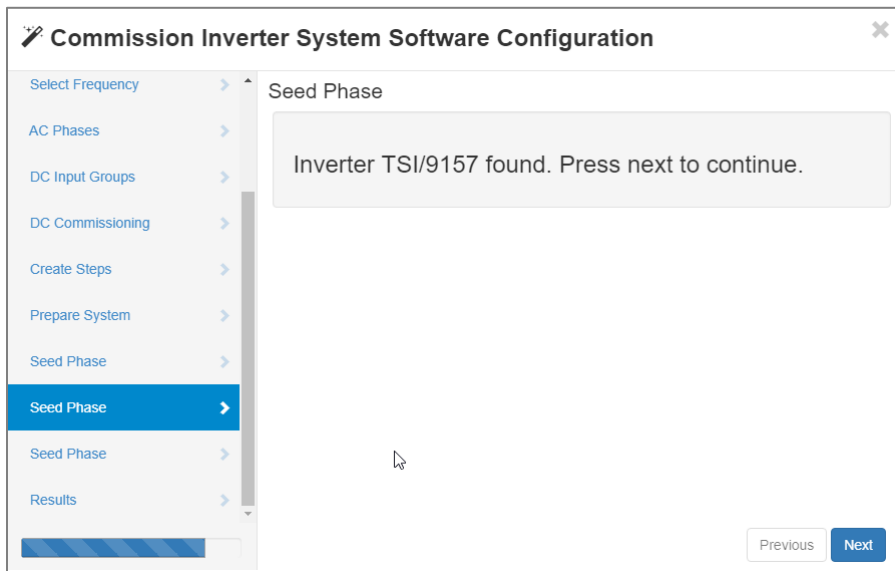
14. Once the seed inverter for the first phase has been discovered, click Next to proceed to the next seed, phase (2).



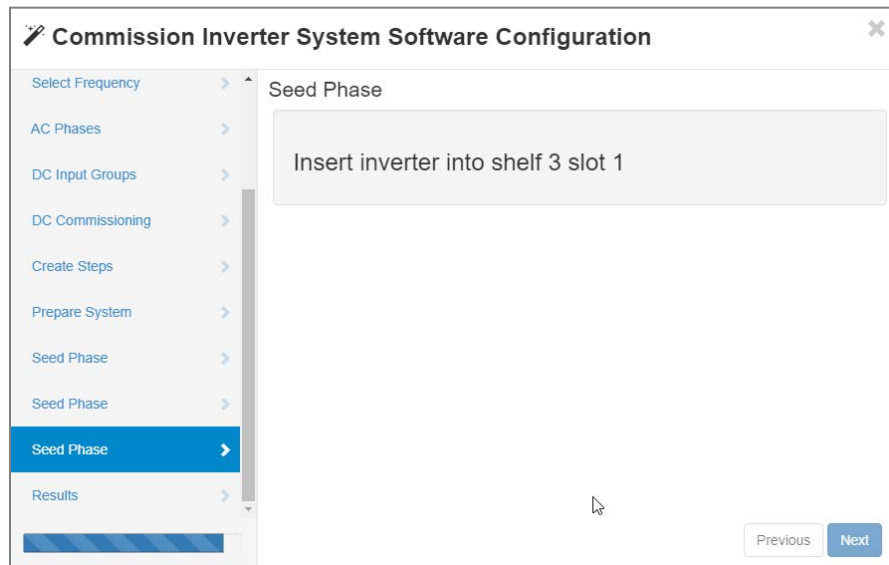
15. Insert the second phase seed inverter into the shelf and slot specified by the wizard. Wait approximately 30 seconds for it to find the inverter that has been seated.



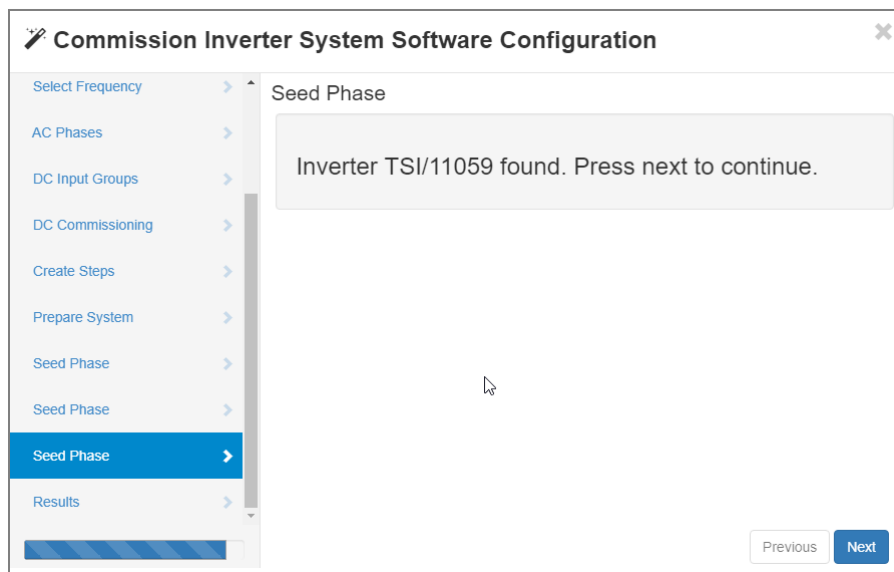
16. Once the seed inverter for the first phase has been discovered, click Next to proceed to the final seed phase (3).



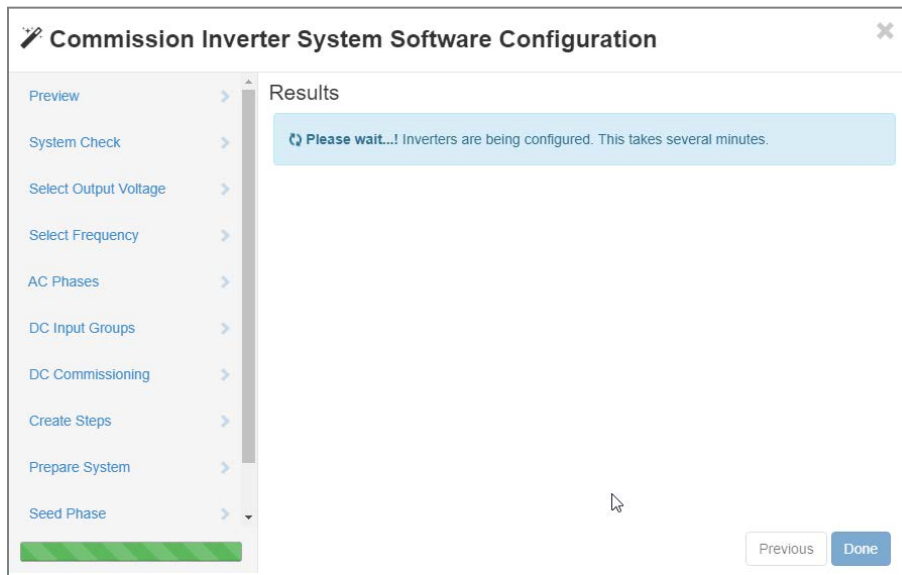
17. Insert the third phase seed inverter into the shelf and slot specified by the wizard. Wait for approximately 30 seconds for it to find the inverter that has been seated.



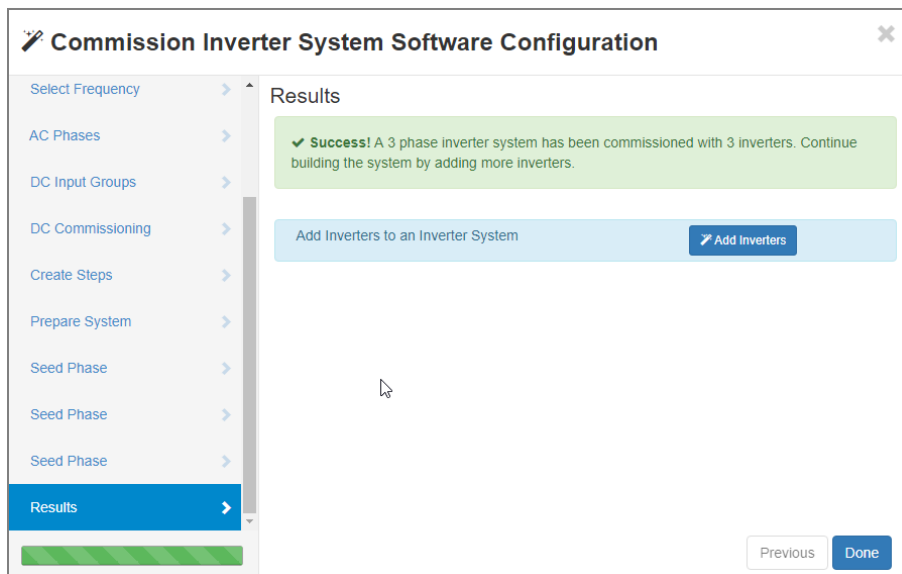
18. Once the seed inverter for the third phase has been discovered, click **Next**.



19. The **Results** window displays a **Please Wait...!** message for approximately 2-4 minutes, and then displays a **Success!** message on completion.



20. Click **Done** to complete commissioning



21. Go to System > Inverter System > Phase and Group Data to see commissioned phases.

Name	Voltage (V)	Current (A)	Power (VA)	Frequency (Hz)	Loading Ratio (%)	# Inverters On	Actions
Phase 1	233.3 V	1.2 A	282 VA	60.0 Hz	11 %	1	[Icon]
Phase 2	235.0 V	1.2 A	289 VA	60.0 Hz	11 %	1	[Icon]
Phase 3	233.1 V	1.1 A	277 VA	60.0 Hz	11 %	1	[Icon]

Name	Voltage (V)	Current (A)	Power (VA)	Frequency (Hz)	# Inverters On	Actions
AC Group 1	227.0 V	0.1 A	22 VA	60.0 Hz	1	[Icon]
AC Group 2	227.4 V	0.1 A	27 VA	60.0 Hz	1	[Icon]
AC Group 3	226.9 V	0.1 A	29 VA	60.0 Hz	1	[Icon]

Name	Voltage (V)	Current (A)	Power (W)	# Inverters On	Actions
DC Group 1	54.1 V	0.0 A	0 W	3	[Icon]

22. A shelf layout of the commissioned system can be viewed on the **Shelf Layout** page.

Shelf	Slot 1	Voltage	Power
1	1	279 VA	289 VA
2	2	289 VA	289 VA
3	3	272 VA	277 VA

Serial	Model	Shelf ID	Slot ID	Output Current	Alerts	Actions
5	CXRP 48V 2.4kV HP	---	---	1.2 A	0	[Icon]
318100240	CXRP 48V 2.4kV HP	---	---	0.4 A	0	[Icon]

23. The Inverter system has been successfully commissioned. The next step, is to add more inverters into the system.

5.2 Add or Remove Inverters

The following conditions are required before you begin:

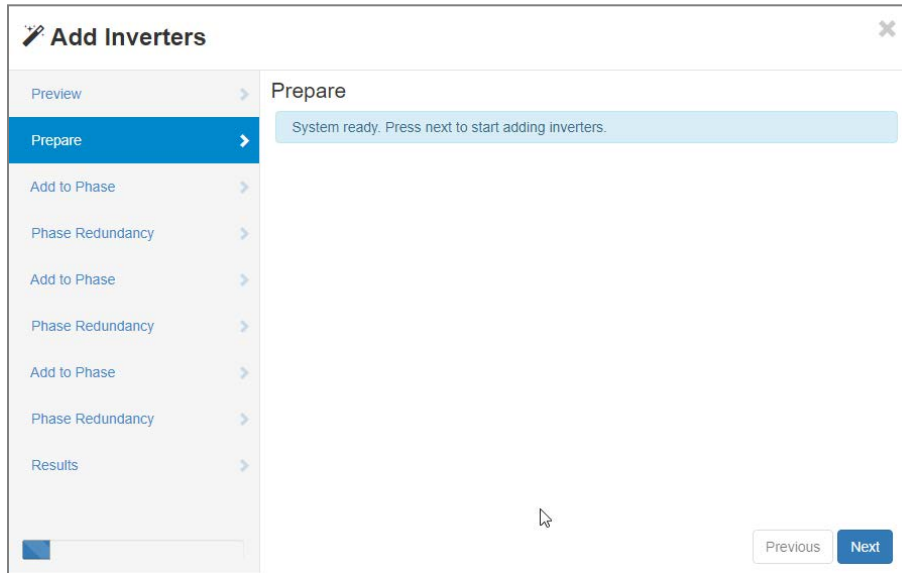
- Logged into a CXC HP controller via the web
- Inverter system created on CXC HP software v4.10 or greater
- Inverter system commissioned on CXC HP software v4.10 or greater

CXC HP has no alarms active

Note: The add inverters wizard can be used to change the number of redundant modules, even if not adding new inverters.

5.2.1 To Add Inverters:

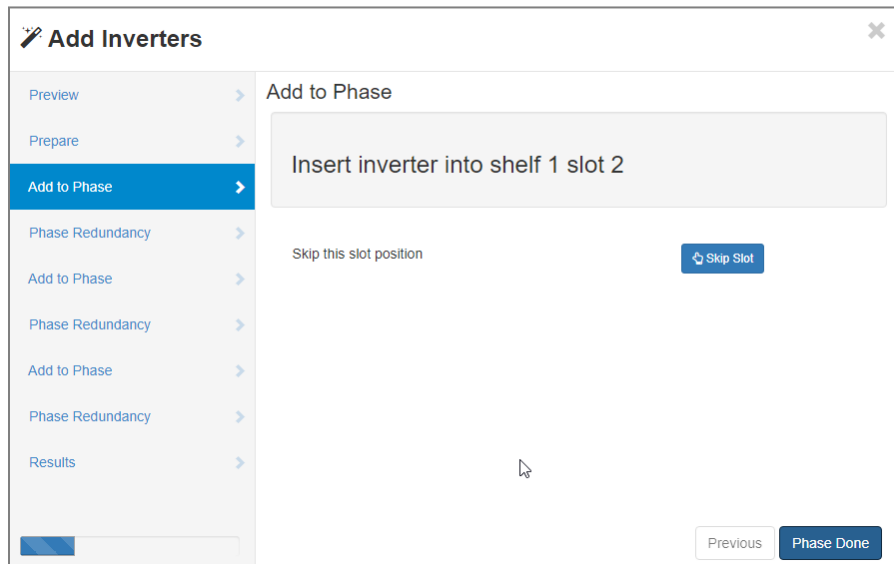
1. Go to System > Inverter System > Inventory > Inverters > Status.
2. Click Add Inverters in the Status table to open the Add Inverters Wizard.
3. Click **Next** in the **Preview** window.
4. Click **Next** in the **Prepare** window.



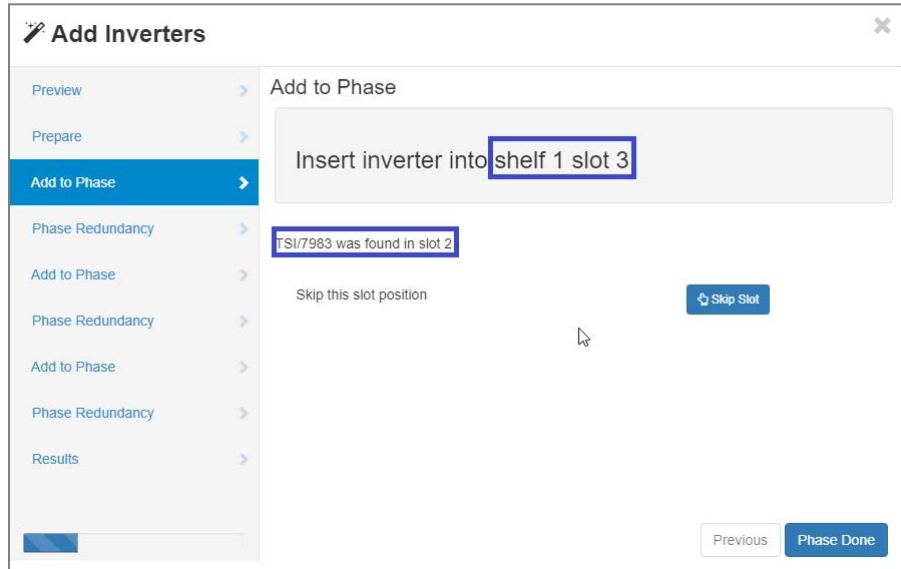
5. Confirm the correct shelf and slot window in the **Add to Phase** window that the new inverter will be added.

Note: This will depend on the physical layout of the shelf and where the inverter resides. Skip slots using the Skip Slot button if there will be no inverter in the slot specified.

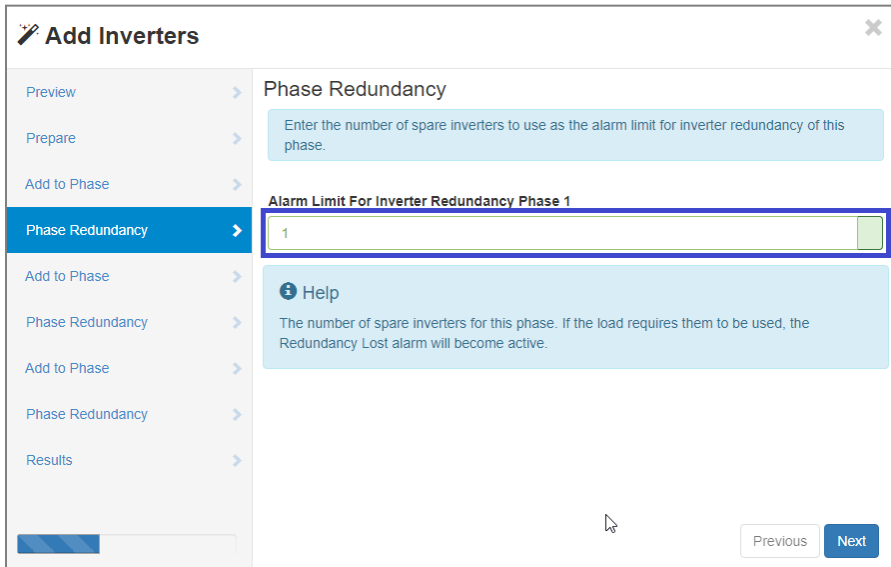
6. Insert the inverter into the indicated shelf and slot number in the **Add to Phase** window.



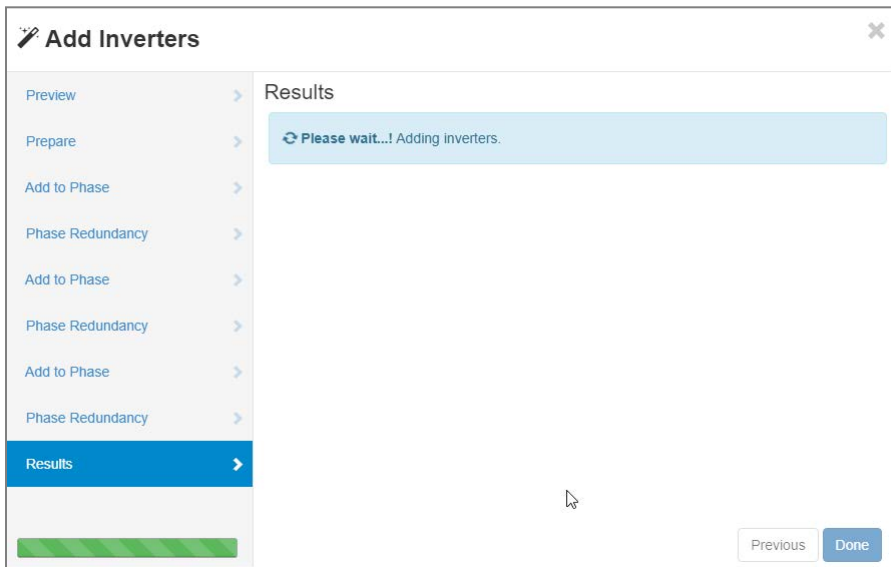
7. After inserting the inverter into the shelf, the **Add to Phase** window will display “TSI/xxxx was found in slot y”. This verifies that an inverter was found and added to the system at the specified shelf and slot.
8. The window pane will automatically move to the next available slot after the last inserted inverter has been found.



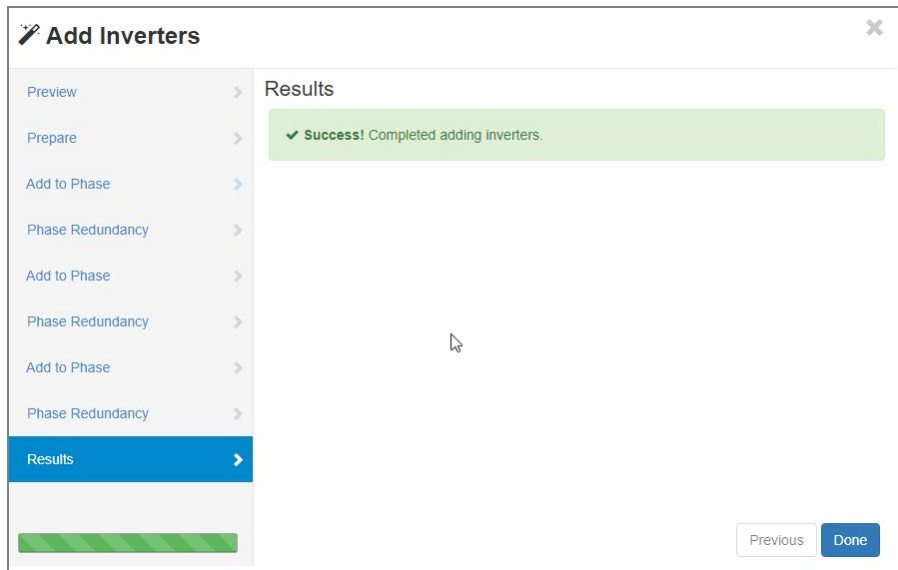
- Once all the inverters for the specified phase have been added, click the **Phase Done** button to the **Phase Redundancy** window.
- Enter the number of redundant inverters on Phase 1.



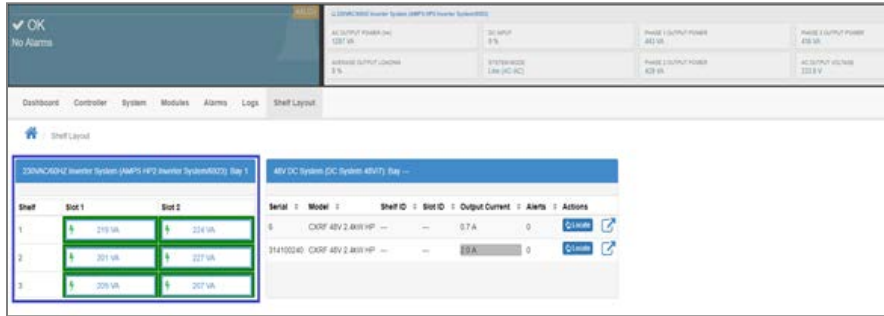
- Repeat the Add to Phase for Phase 2 and 3 (if required).
- Wait approximately 30 seconds for the controller to add inverters into the system.



- Click **Done** to exit the wizard.



14. Newly added inverters display in **System > Inverter System > Inventory > Inverters > Status** table and the inverter **Shelf Layout** will be updated.



15. Go to **System > Inverter System > Configure System > System Properties** table, to verify that the number of redundant modules in the system are correct.

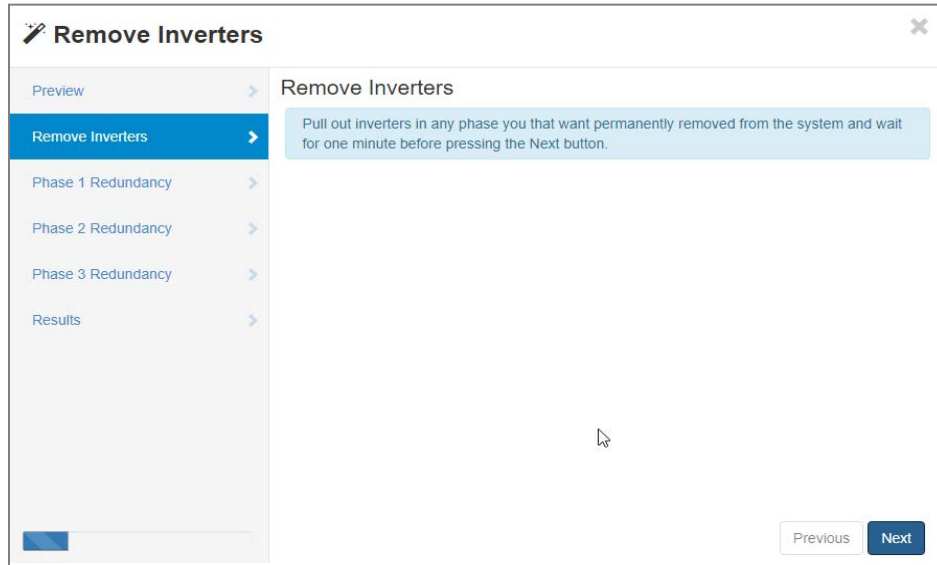
To adjust the alarm limit for inverter redundancy on each phase. Step through the add inverters wizard (section 4.1) and click the **Phase Done** button at each Add to Phase window pane without adding new inverters. Numerically enter the correct number of redundant modules for each phase when presented with the option.

Name	Value	Actions
System Type	Single T2S	
T2S Assignment Rule	Automatic	
Commissioning Method (Advanced)	Wizard/Automatic	
Number Of DC Input Groups (Feeds)	1	
Number Of Phases	3	
Number Of Shelves Per Phase	1	
Alarm Limit For Inverter Redundancy Phase 1	1	
Alarm Limit For Inverter Redundancy Phase 2	1	
Alarm Limit For Inverter Redundancy Phase 3	1	

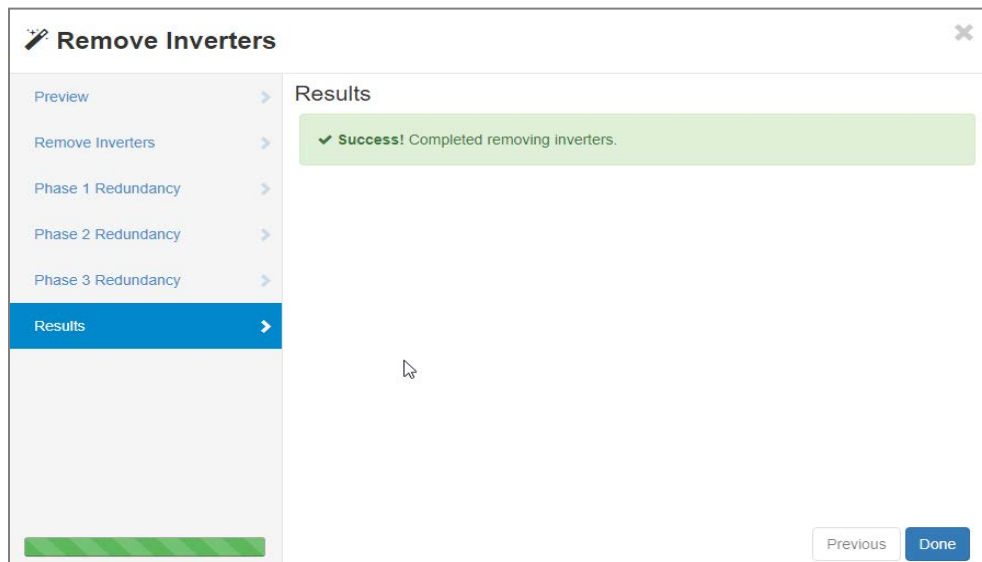
Note: If an incorrect number of redundant modules is set then some system alarms may or may not trigger, therefore having the correct number of modules set is crucial.

5.2.2 To Remove Inverters

1. Go to System > Inverter System > Inventory > Inverters > Status.
2. Click the **Remove Inverters** to activate the wizard.
3. Click **Next** in the preview window pane.
4. From the **Remove Inverters** window, physically remove the inverters that are no longer needed in the system. Wait 60 seconds and then click **Next** to proceed.

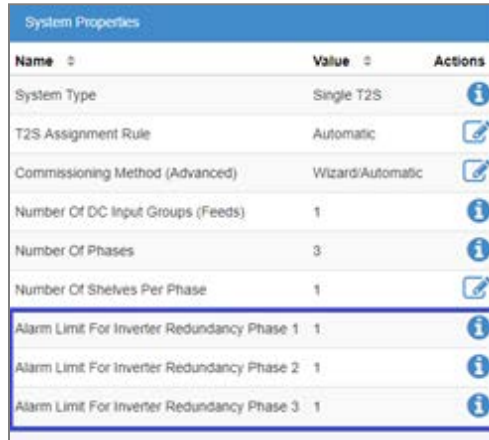


5. Set the new redundancy values for the number of redundant inverters in the system and then click **Next**.
6. Wait for 1-3 minutes so that the inverters can be permanently removed from the system, then click **Done** to close the wizard.



7. Go to **System > Inverter System > Configure System > System Properties** table, to verify the number of redundant modules in the system are correct.

To adjust the alarm limit for inverter redundancy on each phase. Step through the remove inverters wizard procedure and do not remove any inverters at the **Remove Inverters** window, click the **Next** button to the **Phase 1 Redundancy** window pane. Numerically enter the correct number of redundant modules for each phase when presented with the option.



Name	Value	Actions
System Type	Single T2S	
T2S Assignment Rule	Automatic	
Commissioning Method (Advanced)	Wizard/Automatic	
Number Of DC Input Groups (Feeds)	1	
Number Of Phases	3	
Number Of Shelves Per Phase	1	
Alarm Limit For Inverter Redundancy Phase 1	1	
Alarm Limit For Inverter Redundancy Phase 2	1	
Alarm Limit For Inverter Redundancy Phase 3	1	

IMPORTANT: If an incorrect number of redundant modules is set then some system alarms may or may not trigger, therefore having the correct number of modules set is crucial.

5.3 AMPS HP2 T2S Replacement

The following conditions are required before you begin:

- Logged into a CXC HP controller via the web interface
- A communication lost T2S controller (module)
- A newly inserted T2S controller (module)

1. Go to **Modules** and view the **All Modules** table.

Identity	Model	Firmware	System	Bus	Node	Comm. Status	Alerts	Actions
L-ADIO 1 (L-ADIO/T000091/0813)	L-ADIO	1.03	Demo Test Site (Controller)	CAN1	1	Normal	---	Locate Replace ADIO
314100240	CXRF 48V 2.4kW HP	2.05	48V DC System (DC System 48V/7)	CAN1	2	Normal	0	Locate
T000006	CXRF 48V 2.4kW HP	2.05	48V DC System (DC System 48V/7)	CAN1	3	Normal	0	Locate
T2S Inverter Controller (T2S Inverter Controller/170502)	T2S Inverter Controller	3.81	230VAC/60HZ Inverter System (AMPS HP2 Inverter System/8923)	CAN2	1	Normal	0	Replace T2S

2. View the Communication Lost T2S controller that needs to be replaced.

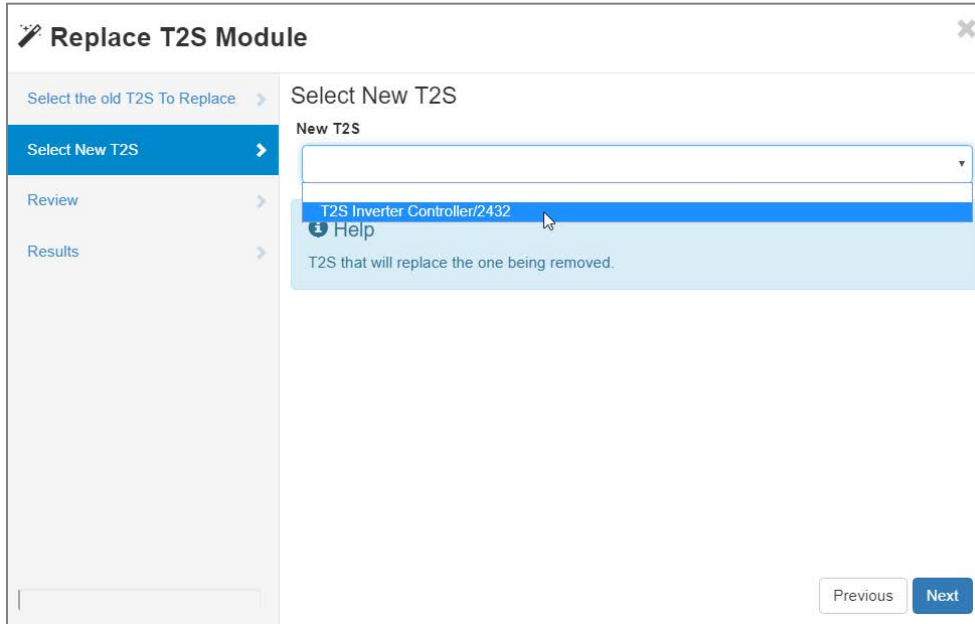
Identity	Model	Firmware	System	Bus	Node	Comm. Status	Alerts	Actions
L-ADIO 1 (L-ADIO/T000091/0813)	L-ADIO	1.03	Demo Test Site (Controller)	CAN1	1	Normal	---	Locate Replace ADIO
314100240	CXRF 48V 2.4kW HP	2.05	48V DC System (DC System 48V/7)	CAN1	2	Normal	0	Locate
T000006	CXRF 48V 2.4kW HP	2.05	48V DC System (DC System 48V/7)	CAN1	3	Normal	0	Locate
T2S Inverter Controller (T2S Inverter Controller/170502)	T2S Inverter Controller	---	230VAC/60HZ Inverter System (AMPS HP2 Inverter System/8923)	CAN2	---	Communication Lost	0	Forget Replace T2S

3. Insert a new T2S controller that will use the old T2S controller's configuration.
4. Wait a few minutes for the T2S controller to be acquired on the CXC HP CAN bus.
5. For reference, write down the serial number of the Communication Lost T2S controller and the new T2S controller.
6. Click the **Replace T2S** button to open the **Replace T2S** wizard.

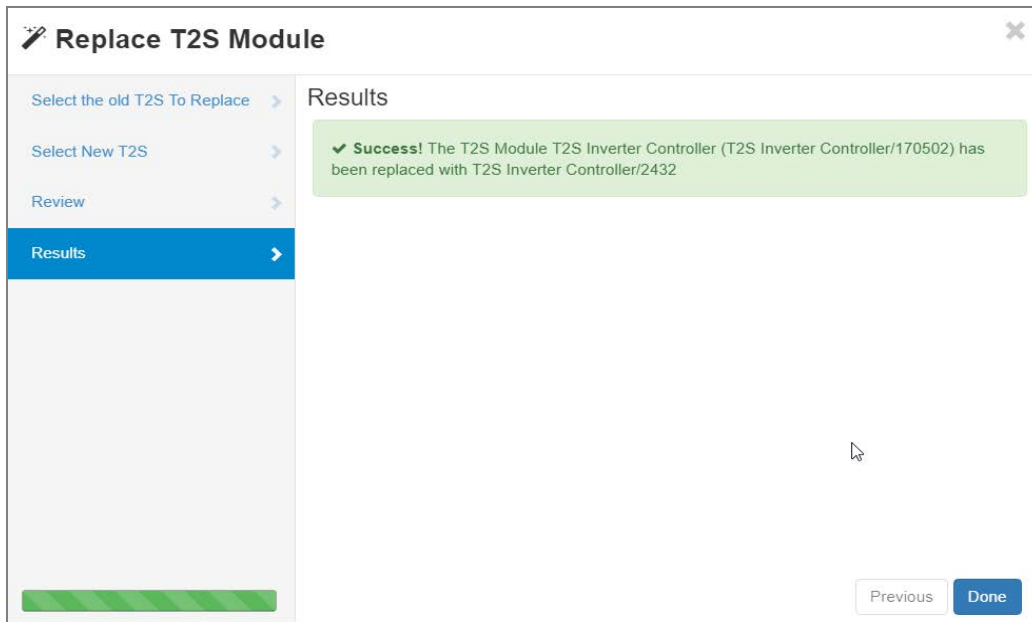
Note: The T2S controller that is being replaced is the Communication Lost T2S controller in the Comm. Status column. The settings of the old controller will transfer to the new controller.

Identity	Model	Firmware	System	Bus	Node	Comm. Status	Alerts	Actions
L-ADIO 1 (L-ADIO/T000091/0813)	L-ADIO	1.03	Demo Test Site (Controller)	CAN1	1	Normal	---	Locate Replace ADIO
314100240	CXRF 48V 2.4kW HP	2.05	48V DC System (DC System 48V/7)	CAN1	2	Normal	0	Locate
T000006	CXRF 48V 2.4kW HP	2.05	48V DC System (DC System 48V/7)	CAN1	3	Normal	0	Locate
T2S Inverter Controller (T2S Inverter Controller/170502)	T2S Inverter Controller	---	230VAC/60HZ Inverter System (AMPS HP2 Inverter System/8923)	CAN2	1	Communication Lost	0	Forget Replace T2S
T2S Inverter Controller/2432	T2S Inverter Controller	---	Unassigned Modules	CAN2	2	---	---	Replace T2S

7. In the **Select New T2S** window, select the new T2S controller and click **Next**.



8. Review the changes between old and new T2S controllers. Compare the serial numbers to ensure that the it changed from the old controller to the new controller.
9. Click **Next**. A **Success** window displays.



10. Click the **Done** to close the wizard and return to the **Modules** page.

Alpha Technologies Ltd.

7700 Riverfront Gate
Burnaby, BC V5J 5M4
Canada
Tel: +1 604 436 5900
Fax: +1 604 436 1233
Toll Free: +1 800 667 8743
www.alpha.ca

Alpha Energy

1628 W Williams Drive
Phoenix, AZ 85027
United States
Tel: +1 623 251 3000
Fax: +1 623 249 7833
www.alphaenergy.us

Alphatec Ltd.

339 St. Andrews St.
Suite 101 Andrea Chambers
P.O. Box 56468
3307 Limassol, Cyprus
Tel: +357 25 375 675
Fax: +357 25 359 595
www.alpha.com

Alpha Innovations S.A.

1, Avenue Alexander Fleming
B-1348 Ottignies, Louvain-la-Neuve
Belgium
Tel: +32 10 438 510
Fax: +32 10 438 213
www.alphainnovations.eu

Alpha Technologies Turkey Enerji Ltd Sti

Altaycesme Mah. Sarigul Sok. No: 33 Umut Kent
Sitesi A Blok D:5
Maltepe, Istanbul
Turkey
Tel: +90 216 370 23 28
Fax: +90 216 370 23 68
www.alpha.com.tr

Alpha Technologies Inc.

3767 Alpha Way
Bellingham, WA 98226
United States
Tel: +1 360 647 2360
Fax: +1 360 671 4936
www.alpha.com

Alpha Technologies GmbH.

Hansastrasse 8
91126
Schwabach, Germany
Tel: +49 9122 79889 0
Fax: +49 9122 79889 21
www.alphatechnologies.com

Alpha Technologies Pty Ltd.

Level 7
91 Phillip Street
Parramatta NSW 2150
Australia
Tel: +61 2 8599 6960
www.alpha.com

OutBack Power

17825 59th Ave. NE, Suite B
Arlington, WA 98223
United States
Tel: +1 360 435 6030
Fax: +1 360 435 6019
www.outbackpower.com

Alpha Mexico Network Power S.A. de C.V.

Montecito #38 (World Trade Center)
Piso 37, Oficina 33
Col. Nápoles, CDMX, C.P. 03810, México
www.alphapower.mx

Alpha Industrial Power Inc.

1075 Satellite Blvd NW.
Suite 400
Suwanee, GA 30024
Tel: +1 678 475 3995
Fax: +1 678 584 9259
www.alpha.com

Alpha Technologies Europe Ltd.

Twyford House, Thorley
Bishop's Stortford
Hertfordshire, CM22 7PA
United Kingdom
Tel: +44 1279 501110
Fax: +44 1279 659870
www.alphatechnologies.com

Alpha Innovations Brasil

Address: Rua Alvares Cabral,
Nº 338 – Diadema - SP
09981-030
Brazil
Tel: +55 11 2476 0150
www.alphainnovations.com.br

Alpha Tec Trading Co. Ltd.

Suite 1903, Tower 1,
China Hong Kong City,
33 Canton Road,
Kowloon, Hong Kong
Tel: +852 2736 8663
Fax: +852 2199 7988
www.alpha.com

NavSemi Technologies Pvt Ltd.

Vikas Plaza, Plot No. 38/1A (4),
Electronic City Phase 2, Hosur Road,
Bengaluru – 560100, Karnataka, India.
Tel: +91 80 4123 0299
www.navsemi.com

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