POWERBOOST DC Converter System 1.5: Quick Start Guide





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List of Contents:

- Pre-Installation checklist
- Unbox
- Mount in rack
- Connect ground
- Input power- route, pre-check polarity, then connect.
- Output connections
- Data and alarm connections
- Startup

Note:

- This information applies to product referred to as "PowerBoost 1.5," identifiable by Orion controller software version B8.97B01 or later.
 - Also has firmware version label on circuit board at rear of chassis indicating FW 1.5.0.
- For information about product "PowerBoost 1.0," identifiable by Orion controller software version (circa) B8.30B32 and circuit board at rear indicating FW 1.0.2, see other documents 16089-01 and 15525-01.
- To identify the Orion controller's software via touch screen:
 - $_{\odot}$ Swipe right (or left) as needed to reach the main screen.
 - Touch the icon labeled **Controller** or **Device**.
 - $_{\odot}$ $\,$ Orion will reveal its installed software version, serial number, etc.
- Updated "PB 1.5" vs existing "PB 1.0":

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- The use model of PB 1.5 is slightly different; users who are familiar with existing PB 1.0 please read this document fully before working with PB 1.5.
- Input power connections (from DC plant) are the same.
- Output power connections (to lower OVP) are the same, now with greater flexibility.

Definitions

OMM Output Management Module: uppermost 1U of PowerBoost, has 16 output circuit breakers

Orion Controller: In PowerBoost upper shelf at left side; has touch screen, has Ethernet GUI

OVP - **Over Voltage Protection**: generally refers to the Raycap units upper and lower. Note: the Raycap OVP units also provide a telemetry function that communicates upper channel Voltages. This is used by PowerBoost to regulate Voltage at load.

PB: PowerBoost product

PB-COM: Circuit board at rear of PowerBoost upper shelf; interface between Raycap RS485 data and Orion controller. Has heartbeat LED and other indicators.

RRH - Remote Radio Head: i.e., the load, typically connected near upper OVP unit)

SYS-8: Short-hand reference to PB-19-SYS-8

SYS-16: Short-hand reference to PB-19-SYS-16

General overview

JMA PowerBoost is a rack-mounted voltage boost unit that maintains acceptable voltage at the RRH by sensing system characteristics and adjusting its output voltage accordingly. PowerBoost makes use of telemetry data from suitably equipped Raycap OVP units as a reference point for maintaining RRH Voltage. The PowerBoost unit is comprised of the following:

- Rack frame (19 inch 1U high), holds an Orion controller and up to 4 boost modules (2 channels per module), referred to as "boost rack."
- Rack frame (19 inch, 1U high), holds 16 individual circuit breakers for boost outputs, referred to as OMM output management module.

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Two variants of PowerBoost are available:

- PB-19-SYS-8 (total 2U high), consists of 1 OMM unit married with 1 boost rack (single Orion controller and 1 to 4 boost modules); supports up to 8 channels.
- PB-19-SYS-16 (total 3U high), consists of 1 OMM unit married with 2 boost racks (single Orion controller and 1 to 8 boost modules); supports up to 16 channels.

1. Pre-installation checklist

Space:

- □ System design performed; confirm equipment configuration.
- □ Documented wiring diagram with components and distances labeled.
- □ Rack space available for PowerBoost.
- DC plant has capacity and breaker space to feed PowerBoost inputs.
- □ Ground bus has sufficient location(s) available.
- □ Shelter/cabinet cooling system has capacity for added equipment.

Components:

- PowerBoost shelf and modules
- □ Circuit breakers and current lug adapters
- □ Compression lugs and heat shrink tubing
- Wire (typically Telcoflex II or Telcoflex IV, 6AWG for PowerBoost outputs. Input AWG per code and system design.)

Tools:

- □ Standard hand tools
- □ 7/16 deep socket and driver capable of calibrated torque to 65 lbf·in.
- □ Compression tool(s) for wire/lugs
- Label maker

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2. Confirm OVP equipment and operation

 Verify that Raycap OVP network configuration is appropriate for use with PowerBoost (per system design). Lower Raycap OVP unit must have output port labeled "VBOOST OUTPUT." See table below:

Raycap Model	No. of circuits	RS485 board required	Description
RxxDC-2260-RM-48	6	Yes	6 Circuit rack
RxxDC-3315-PF-48	6	Yes	6 Circuit tower or base
RxxDC-4520-RM-48	12	No	12 Circuit rack
RxxDC-4520-RM-482	12	No	12 Circuit rack with (2) CPRI interface modules
RxxDC-6627-PF-48	12	No	12 Circuit tower or base

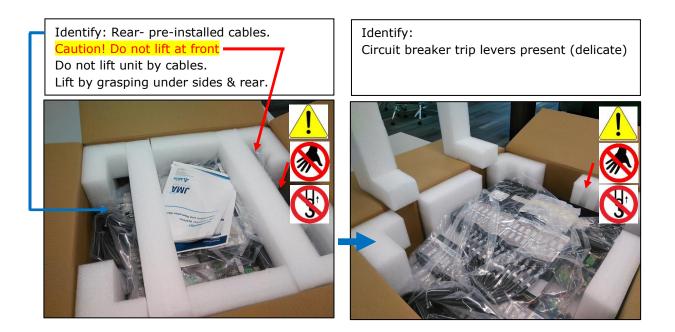
- Verify that Raycap OVP network telemetry is functioning correctly.
 (lower OVP is reading voltage at upper OVP, from correct channels)
- OVP: Conductors correct connection has been verified (no crossed channels or bridging/jumpering).
- Consult Raycap documents for troubleshooting OVP. See also general information later in this document.

Installation

3. Unbox, mount PowerBoost unit, connect ground

Caution! Wear a grounded ESD wrist strap when handling equipment or working with electrical connections.

3.1. Unbox.



3.2. Mount securely in rack.

Mounting hardware supplied in box under unit.

3.3. Attach ground cable 6AWG or larger

Compression lug for 6AWG ($1/4'' \times 5/8''$ spacing) and bolts provided in hardware kit. (See photos below)

• Arrows show recommended point for ground lug. Typically, one ground cable per PowerBoost unit is acceptable, provided that the factory-supplied mounting brackets are present and secure.

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• Ground wiring must be installed in accordance with all local and national electric codes and requirements.

Arrow shows recommended earth connection point on PB-19-SYS-16



Arrow shows recommended earth connection point on PB-19-SYS-8



3.4. How to insert and remove modules from boost rack

The following information explains how to insert and remove modules from the boost rack. The Orion controller comes pre-installed and is typically removed only for the purpose of resetting the controller.

Insertion:

Simply slide the Orion controller and/or boost module into the appropriate bay and push it fully in. The module will automatically latch in place. For the Orion controller, push on the left side (not on the touch screen).

Removal:

Orion controller: Locate the unlocking slide lever at the upper left corner. Hold the slide lever in the "up" position and pull on the protrusion at the bottom to remove the controller. The Orion controller is hot-swappable; loads will remain powered, but will not be regulated until a controller is installed.

Boost module: Locate the unlocking lever at the right side. Hold the lever in the "up" position and pull on it to remove the boost module. Use only boost modules specified for use in PowerBoost.



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During the installation process for a new rack, the Orion controller should be (remain) installed. **Important!** No boost modules should be present; they are installed at a later step.

4. Connect -48VDC input power from DC plant

4.1. Circuit breakers & conductors – DC Plant

• Input wiring and overcurrent protection must be installed in accordance with all local and national electric codes and requirements.

Install circuit breakers and associated current combiner plates in DC plant to feed each PowerBoost input. Circuit breaker size is determined during system design. Use manufacturer recommended torque values. See <u>Appendix A</u> and <u>Appendix B</u> for reference information on lugs and circuit breakers.

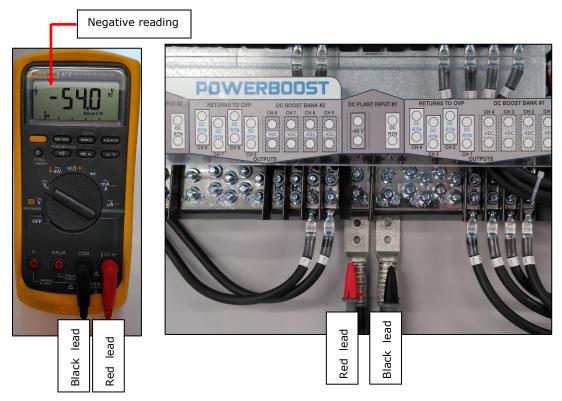
Note that PB-19-SYS-8 utilizes up to 2 power inputs, and PB-19-SYS-16 utilizes up to 4 power inputs; a separate circuit breaker is needed for each input. See <u>Appendix B</u> for reference information on circuit breakers.

4.2. Power input connections at PowerBoost rack

- Run conductors of appropriate AWG (per code and system design) to rear of the PowerBoost rack.
- Before connecting input power to PowerBoost rack, verify polarity of each power feed as follows: Feed circuit breakers in DC plant OFF.
- □ Caution! PowerBoost equipment will be damaged if energized with reversed polarity.
- See images below. Insert probes into DMM as shown (black probe = COM) At PowerBoost rack, at least 1 power lug not landed and insulated from connection. Black lead from DMM to the "return" (RTN) feed. Orient the input power cables securely so they can be energized independent of the boost rack, for purpose of measuring voltage polarity.

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- □ Turn circuit breaker ON. Verify that meter indicates negative polarity voltage reading equal to DC plant voltage. Turn circuit breaker OFF.
- □ If voltage reading is not negative, remedy the situation before connecting to PowerBoost inputs.



Images below show connection points for power feeds from DC plant to PowerBoost inputs. Torque value for all lugs on the PowerBoost unit is 65 lbf·in.

Photo below shows PB-19-SYS-8.

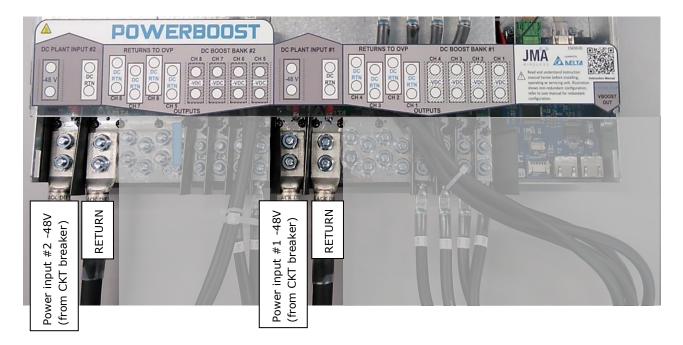
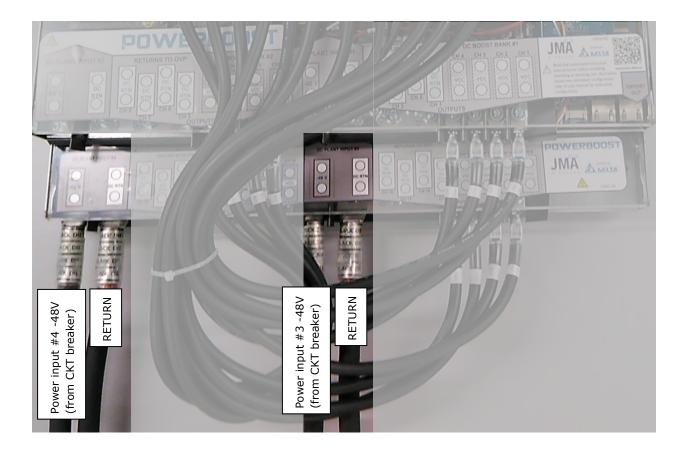




Photo below shows PB-19-SYS-16. Power inputs #1 and #2 are the same as shown in PB-19-SYS-8 above. PB-19-SYS-16 only: LOWER SHELF Power inputs #3 and #4.



4.3. Connect PowerBoost outputs to lower OVP

• Output wiring and overcurrent protection must be installed in accordance with all local and national electric codes and requirements.

Torque value for all lugs on the PowerBoost unit is 65 lbf·in. See labels on lug covers for further detail. See <u>Appendix C</u> for reference information connections to lower OVP rack.



Photo below shows PB-19-SYS-8

- -48V connection is made at upper "OMM" shelf.
- Return connection is made at lower "boost" shelf.

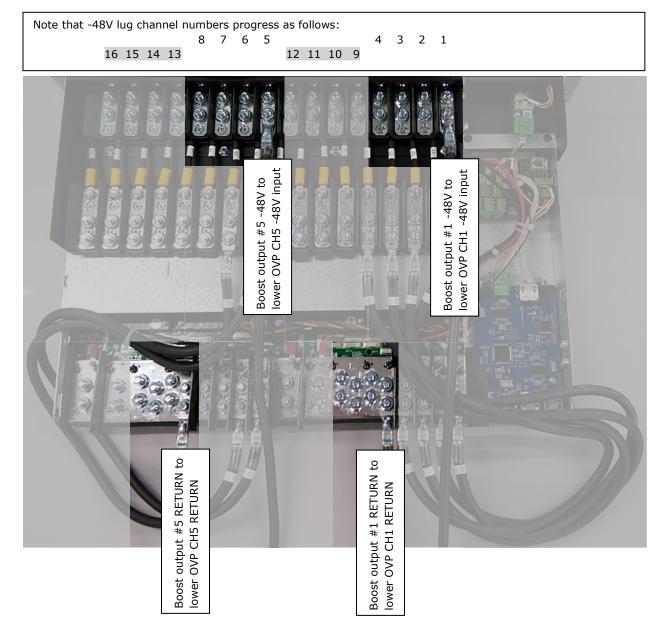


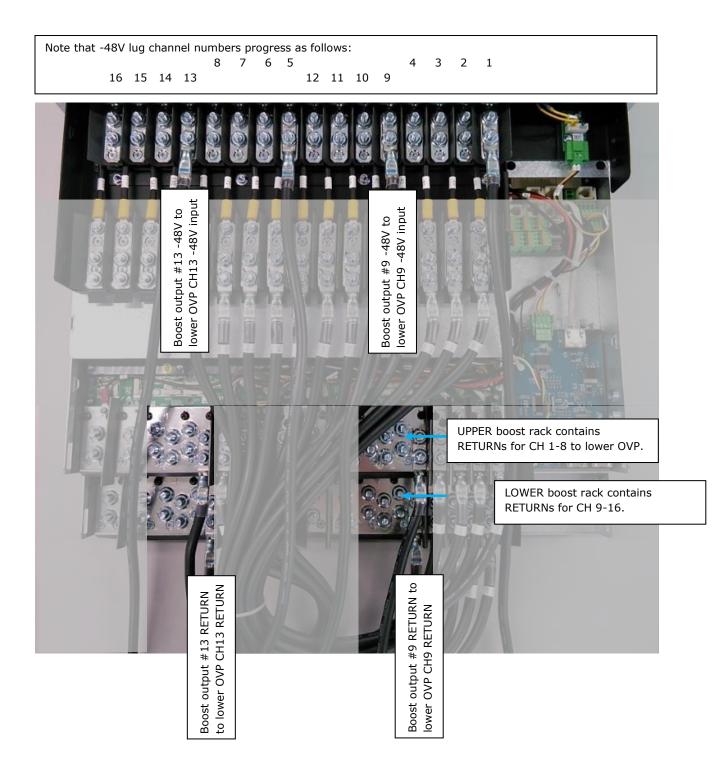


Photo below shows PB-19-SYS-16. For CH1-8, locations of -48V lugs and RETURN lugs are the same as PB-19-SYS-8 above. For CH9-16:

- -48V connections are made at upper "OMM" shelf at the locations illustrated below.
- Return connections are made in similar fashion as SYS-8, but connect to the lowest "boost" shelf.

Note: When connecting a SYS-16, tool access is often easier if the lower connections (CH9-16) are made first.







4.4. RS485 Data link and alarm connections

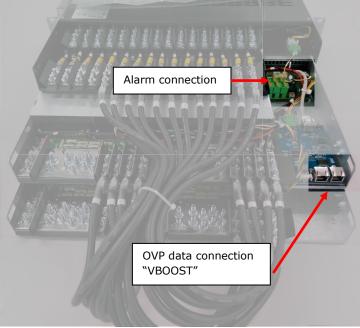
4.4.1. RS485 data

Alarm connections are made in the location shown. See further below for more information.

OVP data connection is made in the location shown. This is the PowerBoost "VBOOST IN" connection. The lower OVP "VBOOST OUT" connects here.

Note: If PowerBoost has 2 connectors (as shown in photo):

- Connection to either connector is acceptable.
- Only 1 cable connects tothis location; both connectors are never used at same time.

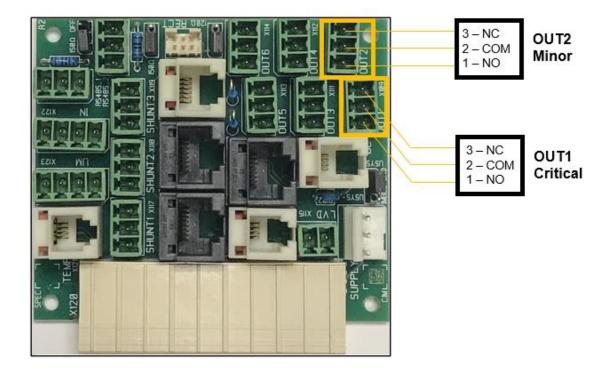




4.4.2. Alarm connections

For reference, summary information on alarm connections is shown below. (See <u>Appendix G</u> for further information and alarm mapping.)

Relay name	Pin out
Critical	OUT1.1 – Normally open OUT1.2 – Common OUT1.3 – Normally closed
Minor	OUT2.1 – Normally open OUT2.2 – Common OUT2.3 – Normally closed



Board is on rear of rack behind Orion controller (interface connectors are included with unit).

5. Startup:

5.1. New system startup

Note: In order to select the proper configuration file later in this segment, it is necessary to have knowledge (and preferably a diagram) of the system wiring connections. The diagram should show:

- PowerBoost
- OVP lower and upper
- cable spans and
- RRH units
- Which PowerBoost channels are connected to which OVP channels and RRH units.

Before applying power, ensure the following:

- The Orion controller is present and fully inserted.
- No boost modules are inserted
- Power input feeds from DC plant have been checked for correct polarity before connecting to the lug lands. (See <u>Section 4.2</u>: Power input connections)

Turn on only the circuit breaker feeding power input for channels 1-4

- Note: the Orion controller can draw power from either of the bulk input feeds (ch 1-4 or ch 5-8) and can withstand application of reverse polarity without damage, facilitating its use to verify correct polarity. Boost modules will be damaged if they are energized with reverse polarity.
- Verify that the Orion controller touch screen lights up. (Typically it lights up, then shows "ORION," then progresses to the default display screen). Allow up to 30 seconds.
- Orion touch screen that lights up is an indication that the input power is connected with the correct polarity.
- If the Orion touch screen remains dark when the input power is turned on, this is typically a sign that polarity is reversed. Troubleshoot before proceeding.
- Once the Orion controller has been confirmed to properly light up, turn OFF the circuit breaker for channels 1-4.

If the system has a second power input feed for channels 5-8, turn on the circuit breaker feeding those channels.

• Using same approach as in preceeding step, verify that the Orion controller lights up as expected. Troubleshoot before proceeding.

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If the system has 3rd and 4th power input feeds (i.e., PB-19-SYS-16 with 2nd boost shelf for channels 9-12 and 13-16): Note that the Orion controller does NOT draw power from these 2nd boost shelf inputs, so the Orion touch screen will remain dark when only those power feeds are energized. Correct polarity of the 3rd and 4th power feeds can be confirmed by ensuring that the polarity connections are the same as the feed supplying ch 1-4, which has been previously verified.

Final step in performing the polarity checks — finish with all circuit breakers OFF.

- All power feed breakers from DC plant to PowerBoost OFF
- All 16 circuit breakers on PowerBoost OMM OFF
- No boost bricks are inserted

Once polarity of the individual power feeds has been verified, proceed with actual power-up:

- Turn on all breakers in DC plant that feed the given PowerBoost rack.
- Allow 2-3 minutes for the Orion controller to boot.
- Proceed with configuration; see the following pages.

5.2. Orion controller access

General login information for reference:

- Orion touch screen default password is 0000 (four zeros)
- Orion GUI (Ethernet) default address from factory is set for static 192.168.100.100
- Default username: Admin; Password: orion

Note: The Orion controller GUI contains many menus/sub-menus. Only the parameters needed for the PowerBoost functions are covered here. Leave all other settings at their default values.

A note about configuration files: Think of the config. file in same general manner as a radio channel preset button. The config file is a convenience device that sets one or more (typically several) parameters within the Orion controller. Selecting and engaging a config. file saves time that would otherwise be spent navigating to and altering the various parameters.

Refer to <u>Appendix E</u> to identify the configuration file appropriate for the given application. Consult JMA tech support with any questions.

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5.2.1. Select a config file via touch screen

To select a config file via the Orion touch screen (without using a laptop / without logging into the Orion Ethernet GUI):

Think of swipes horizontally on the Orion touch screen as flipping through pages in a book; repeated swipes to the right return toward "front of the book"; in other words, toward the Orion main screen.

From the factory, default display page for the Orion controller is the "meter panel" page, which shows parameters for each channel. Scroll up and down to scroll through the channels. Rather than one long (vertical) string of all channels, the meter panel page is divided into segments of approximately 5 channels. To advance forward through the meter panel page segments, scroll down to the bottom of a given segment and choose "Next." To return through the segments, swipe right in a given segment.





To select a configuration file via the Orion touch screen: swipe right in order to reach the "Menu" screen. (show image main screen)

Screen order is: Main "Orion" page, "Menu" page, "Alarm" page, "Meter Panel" page.

Touch the icon **Controller**.



This reveals the Orion controller serial number and installed software version. Scroll down (swipe up) to reach the configurations section.

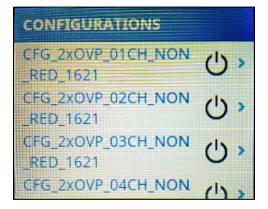
CON	ROLLER	
Softw	are B8.97B01	
S/N	220000000001000046	
P/N	TPS1020034A	
Auto	Backup inactive	



Touch **Configurations** to enter the configs menu.

CONFIGURATION	
Checksum	58080
Configurations	ڻ»
SETTINGS	
Change Password	

Touch on the desired configuration file (identified previously based on system design).

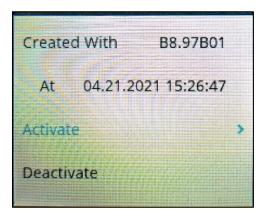




The example below illustrates selection of 2xOVP_01CH.

Note: The "CUSTOM" config file cannot be implemented via touch screen, but must be implemented via Orion Ethernet GUI access. See information later in this document.

For the given config file, scroll down slightly to expose the "Activate" menu. Select **Activate**.



If prompted for password, enter the default password 0000 and touch the **blue checkmark**.





Activate?

Orion will present a confirmation screen; touch the **blue checkmark** at bottom.

If using config file 20VP, 30VP, 40VP: those files are fully defined and no further action is necessary.

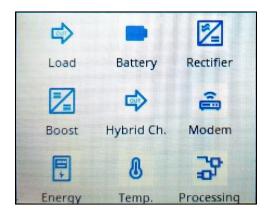
If selecting the config file CFG_06OVP... or CFG_12OVP..., an extra step is necessary to enable the desired channels (because these two config files ship by default with no channels enabled). Channel enable can be performed from the Orion touch screen as follows:

Swipe the Orion touch screen as needed to reach the "Menu" screen:





Once on the "Menu" screen, swipe up (scroll down) to reveal more icon tiles. Touch on the **Hybrid Ch.** tile.



This brings the "HYBRID CHANNEL" menu.

Note: Do not change other existing entries in this menu; focus is only on the individual channels for enabling.

Within the "HYBRID CHANNEL" menu, scroll down (swipe up) as appropriate and touch on the desired mapped channel (101, 102... etc.).

HYBRID CHANNE	L
Manual Control	
101	<u>ن</u> ک
102	心。
103	() >



This opens the channel menu.

101	
Status	disabled
Voltage	****
Current	****
Power	****

Once in the menu for the desired channel, scroll down (swipe up) to reach the line item for "Enable." Although the icon for "Enable" appears as a slider, it can be toggled on/off by simply touching.

Power	****
Energy	23 kWh
Def. Supply Volt.	56.00 V
Enable	6 13



If the Orion password hasn't already been entered for this session, a password prompt will appear.

Password is 0000 (four zeros).



Result is the channel enabled.

Power	****
Energy	23 kWh
Def. Supply Volt.	56.00 V
Enable	

Swipe left as appropriate, and repeat the process to enable other channels as needed. After enabling the desired channels, the config file must be synchronized.



Swipe (typically right or down) as appropriate to return to the "MENU" screen, and touch the **Controller** icon. Scroll down (swipe up) to reach the "Configurations" line. Touch the active configuration; status will indicate "not synchronized."

CONFIGURATIONS	
CFG_12OVP_16CH_NON _RED_1621	۸ ،
CFG_2xOVP_01CH_NON _RED_1621	Ċ,
CFG_2xOVP_02CH_NON _RED_1621	(¹) >
CFG_2XOVP_03CH_NON	(1)

CFG_120	VP_16	CH_NON_RED_1
Status	not s	synchronized
Created	With	B8.97B01
At 01.01.2010 19:47:29		
Activate		

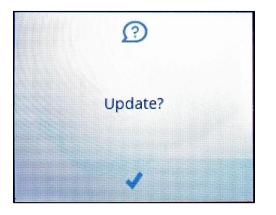
Scroll down to find and touch the line for **Update.**

At	01.01.2010 19:47:29	
Activat	e	
Deactiv	vate	>
Update	2	>

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Touch the **blue checkmark** to confirm.



Allow a few seconds for the change; config status will indicate "synchronized."

CFG_12OVP_1	CH_NON_RED_1
Status	synchronized
Created With	B8.97B01
At 01.02	.2010 00:11:50
Activate	

Once the configuration file is selected and implemented:

- With all OMM circuit breakers OFF, insert boost modules only for the channels that are enabled.
- It is recommended to turn on the OMM circuit breakers one at a time, and verify that the expected Raycap channel energizes.
- Confirm/troubleshoot as appropriate.
- Optional: once all channels are energized, one can proceed to <u>Appendix I</u> for closeout checklist.

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5.2.2. Select a config file via Ethernet GUI

To select a config file via the Orion GUI (uses laptop and login via Ethernet connection on front):

If accessing the Orion controller GUI via its front Ethernet port, refer to <u>Appendix D</u> for information to connect and log in.

Quick steps:

Configuration, System, Config Manager, Deactivate current config file, new file- Activate, OK, Update.

- Under Configuration, System, click Configuration Manager.
- Look through the list of configuration files; use arrow buttons at the bottom.
- In the Status column, the presently active configuration file will indicate "synchronized," and it will have a **Deactivate** button.
- In order to change the configuration file, first deactivate the presently active file, then select the new desired file in the list and click **Activate**.
- Next, an "are you sure?..." dialogue box will appear. Click **OK**.
- This will load the new configuration file, and Status will indicate "not synchronized."
- Click the Update button for the chosen configuration file. This will engage the file, and status will change to "synchronized."
 - If using config file 20VP, 30VP, 40VP: those files are fully defined and no further action is necessary.
 - $_{\odot}\,$ If using one of the last three config files (060VP, 120VP, or 16CH CUSTOM), an extra step is necessary. Please read the steps below.

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Below, find the Orion main screen after login. (Note: this image is displaying an "S Boost Skipped Message" alarm because the PowerBoost unit from which the screen was captured did not have connected Raycap telemetry at the time.)

🛕 ORION Configuration and Supe	× +			- 0	
(←) → C' ŵ	0 🔒 https://192.168.100.100/contr	roller/login		回合 IIA 回 @	Ξ
System Name: PB-19-SYS- Site: Date/Time: 01.01.2010		Admia 😻 read-write Logout			
Home	Home	ORION SW	88.97801 ID: 14.1 ?		
⊳ Status	Measurements				
≻ Alarm	ID Name 1 Vsys:	Value 54 V			
⊩ Log	2 CH1 BOTTOM V:				
⊩ Control	3 CH1 TOP V:	v			
► Configuration	4 CH1 E	A			
Documents	5 CH1 P:	•••• W			
	6 CH2 BOTTOM V:				
	7 CH2 TOP V: 8 CH2 I:	**** V			
		<< < 9 IIA >>>			
1					1
	Events				
	1D Name Statu 50 S Boost Converter Fault: fa	is Hour Meter Since Event Counter	Since		
	51 S Boost Skipped Message: (1 Im				
			Reload Values		

On the left side Menu, click **Configuration**.

🛕 ORION Configuration and Sup	× +		- σ ×
€ → ୯ ଜ	🛛 🔒 https://192.168.100.100/controller/login		··· 🗢 🏠 🐘 🗊 🛎
System Name: PB-19-SYS Site: Date/Time: 01.01.2010	read-write		L NELTA
Home	Home	ORION SW 88.97801 ID: 14.1 ?	
⊳ Status	Measurements		
≻ Alarm	10 Name Value 1 Vsys: 54 V		
⊩ Log	2 CH1 BOTTOM V:		
► Control	3 CH1 TOP V:		
* Configuration	4 CH1 :		
⊳ System	5 CH1 P: •••• W		
Measurements	6 CH2 BOTTOM V: **** V		
> Rectifier	7 CH2 TOP V:		
⊫ Boost	8 CH2 I: **** A		
Hybrid Channel	<< < Al 9 > >>		
⊳ Battery			
► Load	Events		
⊨ HW Setup		Event Counter Since	
► Signal Processing Engine	50 \$ Boost Converter Fault: false 15.6 h sax 51 \$ Boost Skipped Message: ① true 22.6 h sax	19 **** 10 ****	
» System Architecture			
System Parameter		Reload Values	
Documents			



Under "Configuration," click **System.**

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System Name: PB-19-SYS-c Site: Date/Time: 01.01.2010.0			udmin 😵 ead-write Logout				A BELTA	
Home	Home			ORION SW B	8.97801 ID: 14.1 ?			
▶ Status	Measurements							
► Alarm	ID Nama 1 Vsys:		Value 54 V					
⊩ Log	2 CH1 BOTTOM V:							
► Control	3 CH1 TOP V:							
* Configuration	4 CH1 I:		····· A					
⊤ System	5 CH1 P:		**** W					
Customer Settings	6 CH2 BOTTOM V:		•••• V					
User Management	7 CH2 TOP V: 8 CH2 I:		····· 4					
▷ Interface Setup	0 012 1	<< < All						
Time & Date		<< < All	8 2 22					
Remote Monitoring								
Setup View	Events							
File Manager	1D Name 50 S Boost Converter Fault:	Status Hour Meter Tals e 15	Since 6 h ****	Event Counter	Since			
Configuration Manager	51 S Boost Skipped Message:	() True 22	6 h ****	10				
Measurements								
⊳ Rectifier					Reload Values			
Boost Hybrid Channel								
► Battery								
⊳ Load								
⊨ HW Setup								
► Signal Processing Engine								
⊨ System Architecture								
System Parameter								
Documents								

Under "System," click **Configuration Manager.**

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System Name: PB-19-SYS-xo Site: Date/Time: 01.01.2010 0		Adm read Log	-write							LTA
Home	Configuration > System > Configuration I	Manager					ORION SW B8.976	301 ID:6.82 ?		
Status	Overview									
Alarm	Name CFG_2X0VP_01CH_NON_RED_1621	Status	(dependence)		Created With B8.97B01	Created At 04.21.2021 15:26:47	Save to PC	Delete		
Log	CFG_2X0VP_02CH_NON_RED_1621	inactive	deactivate	update update	B8.97B01	04.21.2021 15:30:17	Save to PC			
Control	CFG_2XOVP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:28:41	Save to PC			
Configuration	CFG_2X0VP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:29:41	Save to PC			
v System	CFG_3x0VP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:33:22	Save to PC			
Customer Settings	CFG_3x0VP_02CH_NON_RED_1621	inactive	octivate	update	B8.97B01	04.21.2021 15:34:32	Save to PC			
User Management	CFG_3x0VP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:36:05	Save to PC			
► Interface Setup	CFG_3x0VP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:37:12	Save to PC			
Time & Date	CFG_4x0VP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:25:04	Save to PC			
► Remote Monitoring	CFG_4x0VP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.22.2021 12:06:51	Save to PC			
-			<< <	All 15 >	>>					
Setup View						File Type:	V Load File	from PC		
File Manager										
Configuration Manager							Accept Changes	Reload Values		
Measurements										
▶ Rectifier										
⊳ Boost										
Hybrid Channel										
Battery										
⊨ Load										
⊨ HW Setup										
» Signal Processing Engine										
▶ System Architecture										
System Parameter										

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Deactivate the existing configuration file (if applicable). Select the desired configuration file and click **Activate.**

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System Name: PB-19-SYS-cc Site: Date/Time: 01.01.2010.0			Admin read-w Logou						A NELTZ	
Home	Configuration > System > Configuration II	lanager					ORION SW 88.978	01 ID:682 ?		
⊩ Status	Overview									
► Alarm	Nams	Status			Created With	Created At		Delete		
Log	CFG_2xOVP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:26.47	Save to PC			
Control	CFG_2xOVP_02CH_NON_RED_1621	inactivo	activate	update	B8.97B01	04.21.2021 15:30:17	Save to PC			
	CFG_2XOVP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01 B8.97B01	04.21.2021 15:28:41 04.21.2021 15:29:41	Save to PC			
Configuration	CFG_2xDVP_04CH_NON_RED_1521 CFG_3xDVP_01CH_NON_RED_1521	inactive	activate	update update	B8.97801	04.21.2021 15:29:41	Save to PC Save to PC			
▼ System	CFG_3x0VP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:34:32	Save to PC			
Customer Settings	CFG_3x0VP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:36:05	Save to PC			
User Management	CFG_3xOVP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:37:12	Save to PC			
► Interface Setup	CFG_4xOVP_01CH_NON_RED_1621	inactive	activate	uodate	B8.97B01	04.21.2021 15:25:04	Save to PC			
Time & Date	CFG_4xOVP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.22.2021 12.06.51	Save to PC			
▶ Remote Monitoring				All 1	5 > >>					
Setup View					Red Instand Instantion (
File Manager						File Type:	 Load File 	from PC		
Configuration Manager							Accept Changes	Reload Values		
Measurements										
▶ Rectifier										
⊳ Boost										
Hybrid Channel										
► Battery										
⊳ Load										
► HW Setup										
➢ Signal Processing Engine										
▷ System Architecture										
System Parameter										
Documents										

This will bring a confirmation dialogue box; click **OK**.

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ystem Name: PB-19-SYS- ite: ate/Time: 01.01.2010		Adm read Log	write							74
Home	Configuration > System > Configuration Manager						ORION SW 88.978	101 ID: 6.82 ?		
Status	Overview									
Alarm	Name	Status			Created With	Created At		Delete		
Log	CFG_2x0VP_01CH_NON_RED_1621 CFG_2x0VP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01 B8.97B01	04.21.2021 15:26:47 04.21.2021 15:30:17	Save to PC			
Control	CFG_2X0VP_02CH_NON_RED_1021		activate		B8.97B01	04.21.2021 15:28:41	Save to PC			
Configuration	CFG_2x0VP_04CH_NON_RED_1621		activate		B8.97801	04212021152941	Save to PC			
▼ System	CFG_3xOVP_01CH_NON_RED_1621		activate		B8.97B01	04.21.2021 15:33.22	Save to PC			
	CFG_3x0VP_02CH_NON_RED_1621		activate		B8.97B01	04.21.2021 15:34:32	Save to PC			
Customer Settings	CFG_3xOVP_03CH_NON_RED_1621		activate		88.97801	04 21 2021 15:36:05	Save to PC			
User Management	CFG_3xOVP_04CH_NON_RED_1621	inactive	activate		B8.97B01	04.21.2021 15:37:12	Save to PC			
► Interface Setup	CFG_4x0VP_01CH_NON_RED_1621	inactive	activate		88.97801	04.21.2021 15:25:04	Save to PC			
Time & Date	CFG_4x0VP_02CH_NON_RED_1621	inactive	activate	update	88.1					
⊨ Remote Monitoring	CFG_4x0VP_03CH_NON_RED_1621	inactive	activate		B8.1 Are y	ou sure you want to overv	vrite the active se	etup?		
Setup View	CFG_4x0VP_04CH_NON_RED_1621	inactive	activate		B8.1	OK Cance	1			
File Manager	CFG_060VP_16CH_NON_RED_1621	inactive	activate		88.1	Rectioned Institution				
Configuration	CFG_120VP_16CH_NON_RED_1621	inactive	activate	update	B8.97B01	01.01.2010 19:47:29	Save to PC			
Manager	CFG_120VP_16CH_NON_RED_1621_1	inactive	activate	update	B8.97B01	04.23.2021.09:11:42	Save to PC			
Measurements	CFG_0VP_16CH_NON_RED_CUSTOM_1621	inactive	activate		88.97801	04.24.2021 10:18:47	Save to PC			
▶ Rectifier				Last Selectio	xn > >>					
⊫ Boost						File Type:	Load File	from PC		
Hybrid Channel										
▶ Battery							Accept Changes	Reload Values		
▶ Load										
▶ HW Setup										
Signal Processing Engine										

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Allow a few seconds; Orion will activate the file, and the menu will appear as:

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System Name: PB-19-SYS- Site: Date/Time: 01.01.2010		Admin read-write Logout	0					A DELT	24
Home	Configuration > System > Configuration Manager						ORION SW 88.97801 ID: 6.82 ?		
Status	Overview								
Alarm	Name	Status			Created With	Created At	Delete		
Log	CFG_2xOVP_01CH_NON_RED_1621	synchronized	deactivate	update	B8.97B01	04.21.2021 15.26.47	Save to PC		
Control	CFG_2KOVP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01 B8.97B01	04.21.2021 15:30:17 04.21.2021 15:28:41	Save to PC		
	CFG_2x0VP_03CH_NON_RED_1621 CFG_2x0VP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:28:41	Save to PC		
Configuration	CFG_3x0VP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15.33.22	Save to PC		
∀ System	CFG_3X0VP_01CH_NON_RED_1021 CFG_3X0VP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:34:32	Save to PC		
Customer Settings	CFG_3xOVP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:36:05	Save to PC		
User Management	CFG_3xOVP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:37:12	Save to PC		
⊨ Interface Setup	CFG_4x0VP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:25:04	Save to PC		
Time & Date	CFG_4xOVP_02CH_NON_RED_1621	inactive	octivate	update	B8.97B01	04 22 2021 12:06:51	Sove to PC		
► Remote Monitoring	CFG_4x0VP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01	04 22 2021 13:55:23	Save to PC		
Setup View	CFG_4x0VP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.23.2021.09:19:18	Save to PC		
File Manager	CFG_060VP_16CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.22.2021 14:11:49	Save to PC		
Configuration	CFG_120VP_16CH_NON_RED_1621	inactive	activate	update	B8.97B01	01.01.2010 19:47:29	Save to PC		
Manager	CFG_120VP_16CH_NON_RED_1621_1	inactive	activate	update	B8.97B01	04.23.2021 09:11:42	Save to PC		
Measurements	CFG_OVP_16CH_NON_RED_CUSTOM_1621	inactive	activate	update	B8.97B01	04.24.2021 10:18:47	Save to PC		
▶ Rectifier			<< < La	st Selection	> >>				
⊫ Boost				at percentri					
Hybrid Channel						File Type:	Load File from PC		
► Battery							Accept Changes Reload Values		
► Load							Contraction of the second second		
► HW Setup									
 Signal Processing Engine 									
► System Architecture									

The first 12 config files (names CFG_2xOVP..., CFG_3xOVP..., CFG_4OVP...) are fully defined and no further action is necessary after following the steps above.

If using config file CFG_06VP... or CFG_12OVP..., go through the same steps as outlined above to select and activate the file.

These config files are shipped with all channels deactivated so the user can activate the desired channels. Channel activation is accomplished as follows:



The image below shows example status after selecting and activating the "06OVP..." file per the preceding steps.

ORION Configuration and Super >										- 0
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System Name: P8-19-SYS-0 Site: Date/Time: 01.01.2010.2		Admin read-v Logo	rite						ANELT	a
Home	Configuration > System > Configuration Manager						ORION SW 88.978	301 ID: 6.82 ?		
Status	Overview									
Alarm	Name	Status			Created With	Created At		Delete		
Log	CFG_2X0VP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:28:47	Save to PC			
Control	CFG_2X0VP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:30:17	Save to PC			
	CFG_2XOVP_03CH_NON_RED_1621	Inactive	activate	update	B8.97B01	04.21.2021 15:28:41	Save to PC			
Configuration	CFG_2x0VP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:29:41	Save to PC			
⊤ System	CFG_3x0VP_01CH_NON_RED_1621 CFG_3x0VP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01 B8.97B01	04.21.2021 15:33:22 04.21.2021 15:34:32	Save to PC Save to PC			
Customer Settings	CFG_3x0VP_03CH_NON_RED_1621	inactive	activate	update	88.97801 88.97801	04.21.2021 15:36:05	Save to PC Save to PC			
User Management	CFG_3x0VP_04CH_NON_RED_1621	inactive	activate	update	88.97801	04.21.2021 15:37:12	Save to PC			
⊨ Interface Setup	CFG_4x0VP_01CH_NON_RED_1621	inactive	activate	update	88.97801	04.21.2021 15:25:04	Save to PC			
Time & Date	CFG_4x0VP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04 22 2021 12:06:51	Save to PC			
▶ Remote Monitoring	CFG 4x0VP 03CH NON RED 1621	inactive	activate	update	B8.97B01	04.22.2021 13:55:23	Save to PC			
Setup View	CFG_4x0VP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.23.2021 09:19:18	Save to PC			
File Manager	CFG_060VP_16CH_NON_RED_1621	synchronized	deactivate	update	B8.97B01	04.22.2021 14:11.49	Save to PC			
Configuration Manager	CFG_120VP_16CH_NON_RED_1621	inactive	activate	update	B8.97B01	01.01.2010 19:47:29	Save to PC			
Measurements	CFG_OVP_16CH_NON_RED_CUSTOM_1621	inactive	activate	update	B8.97B01	04.24.2021 10:18:47	Save to PC			
▶ Rectifier			<< < La:	st Selection	> >>					
⊩ Boost						File Type:	 Load File 	from DC		
Hybrid Channel						the type.	Cood File	india PC		
► Battery							Accept Changes	Reload Values		
> Load										
► HW Setup										
 Signal Processing Engine 										
» System Architecture										
System Parameter										
Documents										



After activating the file CFG_06OVP... or CFG_12CHOVP, navigate menu path: **Configuration, System, Hybrid channel**. See image below. The purpose of navigating to this menu is to enable the desired channels.

Note: Do not change other existing entries in this menu; focus is only on the "Enable" column.

See the "Enable" column, and note that none of the checkboxes are checked.

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System Name: PB-19-SYS-a Site: Date/Time: 01.01.2010 2				Admin read-wr Logout					A NELTA	
Home	Config	guration > Hybrid Chan	inel				ORION S	N 88.97801 ID: 24.5 ?		
▶ Status	Hyb	rid Channels								
⊨ Alarm		tanual Control								
⊨ Log	ID	Name	Detault Supply Voltage (V)	Enable	Cable Length (ft)	Wire AWS	Parallel Pairs	Max. Vottage [V]		
▶ Control	1	101	56.00		100	6	1	68.00		
* Configuration	2	102	56.00		100	6	1	68.00		
⊤ System	3	103	56.00		100	6	1	68.00		
Customer Settings	5	104	56.00		100	6	1	68.00		
User Management	6	106	56.00		100	6	1	68.00		
► Interface Setup	7	201	56.00		100	6	1	68.00		
Time & Date	8	202	56.00		100	6	1	68.00		
⊨ Remote Monitoring	9	203	56.00		100	6	1	68.00		
Setup View	10	204	56.00		100	6	1	68.00		
File Manager			<<	< All	16 > >>					
Configuration Manager	_									
Measurements							Accept Cr	anges Reload Values		
▶ Rectifier										
Boost										
Hybrid Channel										
⊨ Battery										
► Load										
► HW Setup										
▶ Signal Processing Engine										
⊨ System Architecture										
System Parameter										
Documents										



Place checks in the checkboxes for the channels desired to activate. See example image below: channels 1, 2, 4, 5, 7, 8 have been selected.

(Note: it is not necessary to use all channels in sequence. In this example, channels 3, 6, 9, 10 have not been enabled, as if the system design has left those channels and OVP positions unloaded for future build-out).

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System Name: PB-19-SYS-00 Site: Date/Time: 01.01.2010.2				Admin read-w Logou					A NELTA	
Home	Confi	guration > Hybrid Char	nnel				ORION S	V 88.97801 10:24.5 ?		
► Status	Hyb	rid Channels			_	_				
⊳ Alarm		Ianual Control								
⊢ Log	ID.	Name	Default Supply Voltage [V]	Enable	Cable Length (ft)	Wire AWG	Perollel Pairs	Max. Voltage [V]		
▶ Control	1	101	56.00		100	6	1	68.00		
▼ Configuration	2	102	56.00		100	6	1	68.00		
Y System	3	103	56.00		100	6	1	68.00		
Customer Settings	4	104	56.00		100	6	1	68.00		
User Management	5	105	56.00		100	6	1	68.00		
► Interface Setup	6	106	56.00		100	6	1	68.00		
Time & Date	8	201	56.00		100	6	1	68.00		
► Remote Monitoring	9	202	56.00		100	6	1	68.00		
Setup View	10	204	56.00		100	6	1	68.00		
File Manager			<<	< All	16 > >>					
Configuration Manager										
Measurements							Accept Ch	anges Reload Values		
► Rectifier										
▶ Boost										
Hybrid Channel										
► Battery										
⊳ Load										
► HW Setup										
► Signal Processing Engine										
► System Architecture										
System Parameter										
Documents										



After selecting the "Enable" boxes for the desired channels, click **Accept Changes** at the bottom.

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System Name: PB-19-SYS-a Site: Date/Time: 01.01.2010 (e:			nin 🔯 I-write gout							
Home	Configuration	> Hybrid Channel				ORION SV	V 88.97801 ID: 24.5 ?				
Status	Hybrid Ch	annels									
Alarm	Manual (ontrol									
Log	ID Name	Default Suppl	Voltage (V) Ena	ole Cable Length (tt)	Wire AWG	Parallel Pairs	Max. Voltage (V)				
Control	1 101	56.00		100	6	1	68.00				
Configuration	2 102	56.00		100	6	1	68.00				
* System	3 103	56.00		100	6	1	68.00				
Customer Settings	4 104	56.00		100	6	1	68.00				
User Management	5 105	56.00		100	6	1	68.00				
	6 106	56.00		100	6	1	68.00				
► Interface Setup	7 201	56.00		100	6	1	68.00				
Time & Date	8 202 9 203	56.00		100	6	1	68.00				
Remote Monitoring	9 203 10 204	56.00		100	6	1	68.00				
Setup View	10 204	30.00			0		00.00				
File Manager			<< <	All 16 > >>							
Configuration Manager						Accept Ch	anges Reload Values				
Measurements						Acception	siges Reliau values				
⊨ Rectifier											
⊩ Boost											
Hybrid Channel											
▶ Battery											
▶ Load											
▶ HW Setup											
▶ Signal Processing Engine											
▹ System Architecture											
System Parameter											



Important: after clicking **Accept Changes**, it is necessary to return to the menu **Configuration**, **System**, **Configuration Manager** to synchronize the config file.

Note that making the channel "Enable" changes in previous steps has resulted in config file status changing to "not synchronized."

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System Name: PB-19-SYS-to Site: Date/Time: 01.01.2010.2		Admin read-write Logout	0							та
Home	Configuration > System > Configuration Manager						ORION SW 88.978	01 ID: 6.82 ?		
▶ Status	Overview									
► Alarm	Nama	Status			Created With	Created At		Delete		
⊳ Log	CFG_2xOVP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:26:47	Save to PC			
	CFG_2xOVP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:30:17	Save to PC			
► Control	CFG_2xOVP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:28:41	Save to PC			
* Configuration	CFG_2xOVP_04CH_NON_RED_1621	inactive	activate	update	88.97801	04.21.2021 15:29:41	Save to PC			
⊤ System	CFG_3xOVP_01CH_NON_RED_1621	inactive	octivate	update	B8.97B01	04.21.2021 15:33:22	Save to PC			
Customer Settings	CFG_3xOVP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:34:32	Save to PC			
User Management	CFG_3xOVP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:36:05	Save to PC			
► Interface Setup	CFG_3xOVP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:37:12	Save to PC			
Time & Date	CFG_4xOVP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15.25.04	Save to PC			
► Remote Monitoring	CFG_4xOVP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.22.2021 12:06:51	Save to PC			
	CFG_4xOVP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01	04 22 2021 13 55 23	Save to PC			
Setup View	CFG_4xOVP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.23.2021 09:19:18	Save to PC			
File Manager	CFG_060VP_16CH_NON_RED_1621	O not synchronized	deactivate	update	B8.97B01	04.22.2021 14:11:49	Save to PC			
Configuration Manager	CFG_120VP_16CH_NON_RED_1621	inactive	activate	update	B8.97B01	01.01.2010 19:47:29	Save to PC			
Measurements	CFG_OVP_16CH_NON_RED_CUSTOM_1621	inactive	activate	update	B8.97B01	04.24.2021 10:18:47	Save to PC			
⊳ Rectifier			<< < Last Se	election >	>>					
⊳ Boost						File Type:	 Load File I 	from PC		
Hybrid Channel										
► Battery							Accept Changes	Reload Values		
► Load										
⊨ HW Setup										
➢ Signal Processing Engine										
⊳ System Architecture										
System Parameter										
Documents										



Click the **Update** button associated with the config file. Allow a few seconds for Orion to process the update. See image below; the config file is now synchronized.

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System Name: PB-19-SYS-o Site: Date/Time: 01.01.2010.2		Admir read - Logo	vrite							TA
Home	Configuration > System > Configuration Manager						ORION SW 88.978	01 ID:6.82 ?		
Status	Overview									
Alarm	Name	Status			Created With	Created At		Delete		
Log	CFG_2x0VP_01CH_NON_RED_1621	inactive	activate	update	88.97801	04.21.2021 15:26:47	Save to PC			
Control	CFG_2x0VP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:30:17	Save to PC			
	CFG_2x0VP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:28:41	Save to PC			
Configuration	CFG_2x0VP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15.29.41	Save to PC			
▼ System	CFG_3x0VP_01CH_NON_RED_1021	inactive	activate	update	B8.97B01	04.21.2021 15:33.22	Save to PC			
Customer Settings	CFG_3x0VP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15.34.32	Save to PC			
User Management	CFG_3x0VP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:36:05 04.21.2021 15:37:12	Save to PC			
⊫ Interface Setup	CFG_3x0VP_04CH_NON_RED_1621 CFG_4x0VP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01 B8.97B01	04.21.2021 15:37:12	Save to PC			
Time & Date	CFG_4X0VP_01CH_NON_RED_1621 CFG_4X0VP_02CH_NON_RED_1621	inactive	activate	update update	B8.97801 B8.97801	04 22 2021 15:25:04	Save to PC Save to PC			
» Remote Monitoring	CFG_4X0VP_02CH_NON_RED_1621 CFG_4X0VP_03CH_NON_RED_1621	inactive	activate	update	B8.97801 B8.97801	04.22.2021 12:05:51	Save to PC Save to PC			
Setup View	CFG_4x0VP_04CH_NON_RED_1621	inactive	activate	update	B8.97B01	04 23 2021 09:19:18	Save to PC			
File Manager	CFG_060VP_16CH_NON_RED_1621	synchronized	deactivate	update	B8.97801	01.01.2010 21:09:58	Save to PC			
Configuration Manager	CFG_060VP_16CH_NON_RED_1621_1	inactive	activate	update	B8.97B01	04.22.2021 14:11.49	Save to PC			
Measurements	CFG_120VP_16CH_NON_RED_1621	inactive	activate	update	B8.97B01	01.01.2010 19:47:29	Save to PC			
» Rectifier	CFG_OVP_18CH_NON_RED_CUSTOM_1821	inactive	activate	update	B8.97B01	04.24.2021 10.18.47	Save to PC			
⊨ Recener ⊨ Boost			<< < La:		> >>					
Hybrid Channel						File Type:	Tend mind	leave DC		
						rite Type.	 Load File f 	ion PC		
▶ Battery							Accept Changes	Reload Values		
> Load										
► HW Setup										
 Signal Processing Engine 										
» System Architecture										
System Parameter										

If using config file CFG_OVP_16CH CUSTOM...

The channels must be mapped, then enabled, then synchronize the file.

Note: engaging the "CUSTOM" file cannot be done via the Orion touch screen; access must be made via the Orion Ethernet GUI in order to perform the channel mapping entries.



First, select and activate the CUSTOM config file...

(**Configuration, System, Configuration Manager**: "Display all 15" config files as necessary.)

Deactivate an existing config file if necessary.

CFG_2x0VP_01CH_NON_RED_ CFG_2x0VP_02CH_NON_RED_										lin 🗉 🤇
Status Overview New Alarm Cr.2, solve_stolut_Nov_RED_ Control Configuration Cr.2, solve_stolut_Nov_RED_ Configuration Cr.2, solve_stolut_Nov_RED_ Cr.2, solv			Admin read-wr Logoul						A	LTA
Alam Inve Inve Inve Control Configuration * System Configuration * System Configuration * System Configuration * System Configuration * System Configuration * Configuration Distribution * System Configuration * System Configuration * System Configuration * System Configuration * Configuration * System Configuration * Remain Manager * R	uration Manager	ger					ORION SW B8 9780	01 10:6.82 ?		
Alarm Alarm Constrol Control Control Control Configuration										
Leg Cr0_2x0VP_02CH_NON_RED_ Cr0_2x0VP_		Status			Created With	Created At		Delete		
Control Conjunction (Conjunction) Control Configuration Configuration Continuer Settings Control Settings Control Settings Particular Settings Partic		inactive	activate	update	B8.97B01 B8.97B01	04.21.2021 15:26:47	Save to PC			
Configuration Could Count of C		inactive inactive	activate activate	update update	88.97801	04.21.2021 15:30:17	Save to PC Save to PC			
System Conclusion Settings Oraclassing Conclusion (RED) Oraclassing Conclusion (RE		inactive	activate	update	88.97801	04 21 2021 15 29 41	Save to PC			
Customer Satings Customer Satings User Management > Interface Satup Time & Custo > Remote Noninking Setup View File Manager Mescurimers > Rectifier > Rescut Mennel Hydrd Channel > Battery > Load		nactive	activate	update	88.97801	04 21 2021 15:33:22	Save to PC			
User Management i Interface Satup Time & Daw Remosil Meniosing Satup View File Manager Conguence Conguence Conguence Remosil Meniosing Satup View File Manager Conguence Conguence Conguence Recotilier Beost Hybrid Cannel Bettery Load		inactive	activate	update	88.97801	04.21.2021 15:34:32	Save to PC			
Interface Setup Time & Date Time & Date I mean & Date I mean & Date Setup View Setup View Setup View File Manager Compusion Manager Measuremeets I Resciller Boost Hybrid Channel I Battery I Load	_1621 in a	inactive	activate	update	88.97801	04.21.2021 15:36:05	Save to PC			
Time & Cales P Remarks Unclusions Sates View F Re Manager Configuration Manager Measurements > Rectifier > Boost + Spectifier > Battery > Load	.1621 in a	inactive	activate	update	B8.97B01	04.21.2021 15:37:12	Save to PC			
Remain Unitation Setup View File Manager Configuration Manager Rescriber Module Modul	_1621 in a	nactive	activate	update	B8.97B01	04.21.2021 15:25:04	Save to PC			
Setup View File Maragor Confluction Manager Measurements P Rectifier P Rectifier P Rotol Channel B Battery P Load	_1621 in a	inactive	activate	update	B8.97B01	04.22.2021 12:06:51	Save to PC			
File Manager Conduction Manager Messarsements > Recettler > Roost Hybrid Channel > Batary > Load			<<	< All 1	5 > >>					
Configuration Manager Messarements > Rectlist Uppont Channel > Dattery > Load						File Type:	 Load File f 	from PC		
If a surrements > Rectifier > Root Hybrid Channel > Statery > Load										
» Rectifier ⇒ Boost Hydrd Channel > Bodtery > Load							Accept Changes	Reload Values		
» Boost Hybrid Channel ≫ Battery ≫ Load										
Hybrid Channel > Battery > Load										
>> Battery > Load										
> Load										
> HW Setup										
▶ Signal Processing Engine										
» System Architecture										
System Parameter										



Image below shows the full config file list after clicking **All 15** button.

▲ ORION Configuration and Supe >	< +	/login							🖂 🕁	lin 🗉 📽
System Name: PB-19-SYS-xu Site: Date/Time: 01.01.2010 2			Admin Sead-write Logout						۵	SELTA
Home	Configuration > System > Configuration Manager						ORION SW B8.978	801 ID: 6.82 ?		
⊳ Status	Overview									
► Alarm	Nama	Status			Created With	Created At		Delete		
⊳ Log	CFG_2X0VP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15.26.47	Save to PC			
Control	CFG_2x0VP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:30.17	Save to PC			
	CFG_2x0VP_03CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:28:41	Save to PC			
Configuration	CFG_2X0VP_04CH_NON_RED_1621	inactive	activate	update	88.97801 88.97801	04.21.2021 15:29:41 04.21.2021 15:33:22	Save to PC			
⊤ System	CFG_3x0VP_01CH_NON_RED_1621 CFG_3x0VP_02CH_NON_RED_1621	inactive inactive	activate	update update	B8.97801 B8.97801	04.21.2021 15:33:22	Save to PC Save to PC			
Customer Settings	CFG_3x0VP_03CH_NON_RED_1021	inactive	activate	update	B8.97B01	04.21.2021 15.36.05	Save to PC			
User Management	CFG_3xOVP_04CH_NON_RED_1021	inactive	activate	update	B8.97B01	04.21.2021 15:37:12	Save to PC			
► Interface Setup	CFG_4x0VP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15.25.04	Save to PC			
Time & Date	CFG_4x0VP_02CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.22.2021 12:06:51	Save to PC			
▶ Remote Monitoring	CFG_4x0VP_03CH_NON_RED_1621	inactive	activate	update	B8.97801	04.22.2021 13:55:23	Save to PC			
Setup View	CFG_4x0VP_04CH_NON_RED_1621	inactive	octivate	update	B8.97B01	04.23.2021.09:19:18	Save to PC			
File Manager	CFG_060VP_16CH_NON_RED_1621	inactive	activate	update	B8.97B01	01.01.2010 21:09:58	Save to PC			
Configuration Manager	CFG_120VP_16CH_NON_RED_1621	inactive	activate	update	B8.97B01	01.01.2010 19:47:29	Save to PC			
Measurements	CFG_OVP_16CH_NON_RED_CUSTOM_1621	inactive	activate	update	B8.97B01	04.24.2021 10:18:47	Save to PC			
► Rectifier			<c 2<="" td=""><td>Last Selectio</td><td>in > >></td><td></td><td></td><td></td><td></td><td></td></c>	Last Selectio	in > >>					
⊳ Boost						File Terror	- Charles	6		
Hybrid Channel						File Type:	V Load File	from PC		
							Accept Changes	Reload Values		
▶ Battery							monumer and the states of			
⊳ Load										
⊨ HW Setup										
▶ Signal Processing Engine										
⊨ System Architecture										
System Parameter										
Documents										

Select and activate the bottom file in the list CFG_OVP_16CH_NON_RED_CUSTOM.... Click **OK** to engage the file.

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System Name: PB-19-SYS-10 Site: Date/Time: 01.01.2010.2		1	ldmin 🔯 ead-write Logout						A	LTA
Home	Configuration > System > Configuration Manager						ORION SW 88.978	01 ID: 6.82 ?		
Status	Overview									
Alarm	Name	Status			Created With	Created At		Defete		
Log	CFG_2X0VP_01CH_NON_RED_1621	inactive	activate		B8.97891	04.21.2021 15.26.47	Save to PC			
	CFG_2X0VP_02CH_NON_RED_1621	isactive	activate	update	88.97801	04.21.2021 15 30 17	Save to PC			
Control	CFG_2X0VP_03CH_NON_RED_1621		activate	update	88.97801	04.21.2021 15:28:41	Save to PC			
Configuration	CFG_2X0VP_04CH_NON_RED_1621		activate	update	88.97801	04.21.2021 15:29:41	Save to PC			
▼ System	CFG_3x0VP_01CH_NON_RED_1621	inactive	activate	update	B8.97B01	04.21.2021 15:33:22	Save to PC			
Customer Settings	CFG_3x0VP_02CH_NON_RED_1621	inactive	activate		88.97801	04.21.2021 15:34:32	Save to PC			
User Management	CFG_3xOVP_03CH_NON_RED_1021	inactive	activate		B8.97B01	04.21.2021 15.36.05	Save to PC			
⊫ Interface Setup	CFG_3x0VP_04CH_NON_RED_1621	inactive	activate		B8.97B01	04,21,2021 15:37:12	Save to PC			
Time & Date	CFG_4X0VP_01CH_NON_RED_1621		activate		B8.97B01	04 21 2021 15 25 04	Save to PC			
► Remote Monitoring	CFG_4xOVP_02CH_NON_RED_1621		activate	update	88.97801	04.22.2021 12:06:51	Save to PC			
Setup View	CFG_4X0VP_03CH_NON_RED_1621 CFG_4X0VP_04CH_NON_RED_1621		activate	update	B8 97801 B8 97801	Are you sure you want to	supporte the est	fire asker0		
File Manager	CFG_060VP_16CH_NON_RED_1621		activate		B8.97801			uve setup?		
Configuration Manager	CFG_120VP_16CH_NON_RED_1621		activate		B8.97B01	ОК	Cancel			
Measurements	CFG_OVP_18CH_NON_RED_CUSTOM_1821		activate		B8.97B01	04.24 2021 10 18:47	Save to PC	0		
			-				Save to PC			
▶ Rectifier				Last Selectio	n > >>					
Boost						File Type:	 Load File I 	from PC		
Hybrid Channel										
⊨ Battery							Accept Changes	Keload Values		
► Load										
► HW Setup										
► Signal Processing Engine										
» System Architecture										
System Parameter										
Documents										

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After activating the "CUSTOM" config file, navigate menu path: **Configuration, System, Hybrid channel**. See image below. The purpose of navigating to this menu is to do 2 things:

- Enter the desired channel mapping numbers in the "Name" column.
- Enable the desired channels.
- Enabled channels must have a valid OVP channel reference in their "Name" entry (ie. 101, 102, etc.). Enabling a channel that doesn't have a valid "Name" mapping entry will result in error message.

Note: Do not change other existing entries in this menu; focus is only on the "Name" and "Enable" columns.

ORION Configuration and Super 2	+									
⊖ → ଫ ଢ	1	🖸 🔒 https://192	2.168.100.100/controller/login							··· 🖂 🕁
System Name: PB-19-SYS-x Site: Date/Time: 01.01.2010.2				Admin read-wr						
Home	Config	uration > Hybrid Ch	annel				ORION S1	V 88.97801 ID: 24.5 ?		
Status	Hyb	rid Channels								
► Alarm	- M	anual Control								
⊳ Log	æ	Name	Default Supply Voltage [V]	Enable	Cable Length (ft)	Wire AWS	Parallel Pairs	Max. Voltage (V)		
Control	1	1	56.00		100	6	1	68.00		
Configuration	2	2	56.00		100	6	1	68.00		
v System	3	3	56.00		100	6	1	68.00		
Customer Settings	4	4	56.00		100	6	1	68.00		
	5	5	56.00		100	6	1	68.00		
User Management	6	6	56.00		100	6	1	68.00		
⊫ Interface Setup	7	7	56.00		100	6	1	68.00		
Time & Date	8	8	56.00		100	6	1	68.00		
▶ Remote Monitoring	9	9	56.00		100	6	1	68.00		
Setup View	10	10	56.00		100	6	1	68.00		
File Manager	11	11	56.00		100	6	1	68.00		
Configuration Manager	12	12	56.00		100	6	1	68.00		
Measurements	13	13	56.00		100	6	1	68.00		
⊫ Rectifier	14	14	56.00		100	6	1	68.00		
⊳ Boost	15	15	56.00		100	6	1	68.00		
Hybrid Channel	16	16	56.00		100	6	1	68.00		
► Battery			<< <	Last Se	lection > >>					
	_									
⊳ Load							Accept Ch	anges Reload Values		
► HW Setup ► Signal Processing										
Engine > System Architecture										
System Parameter										
Documents										



The example below shows the CUSTOM file configured such that:

- PB CH1 is mapped to OVP 101 (ie. first OVP set, CH1).
- PB CH2 is mapped to OVP 102 (ie. first OVP set, CH2).
- PB CH3 is mapped to OVP 203 (ie. second OVP set, CH3) (ie. skipped OVP ch 1&2).
- PB CH4 is mapped to OVP 204 (ie. second OVP set, CH4).
- PB CH7 is mapped to OVP 301 (ie. third OVP set, CH1) (ie. skipped PB ch 5&6).
- PB CH8 is mapped to OVP 302 (ie. third OVP set, CH2).

ORION Configuration and Supe >	+							
-)→ ଫ ŵ	🛛 🔒 https://192.	.168.100.100/controller/login						··· 🖂 🕁
System Name: PB-19-SYS-xx Site: Date/Time: 01.01.2010.2			Admin read-wr Logout					
Home	Configuration > Hybrid Cha	annel				ORION SV	V 88.97801 ID: 24.5 ?	
⊢ Status	Hybrid Channels							
Alarm	Manual Control							
Log	ID Name	Default Supply Voltage [V]	Enable	Cable Length [ft]	Wite AWG	Parallel Pairs	Max: Voltage [V]	
Control	1 101	56.00		100	6	1	68.00	
Configuration	2 102	56.00		100	6	1	68.00	
v System	3 203	56.00		100	6	1	68.00	
Customer Settings	4 204	56.00		100	6	1	68.00	
User Management	5 5	56.00		100	6	1	68.00	
	6 6	56.00		100	6	1	68.00	
▶ Interface Setup	7 301	56.00		100	6	1	68.00	
Time & Date	8 302	56.00		100	6	1	68.00	
▶ Remote Monitoring	9 9	56.00		100	6	1	68.00	
Setup View	10 10	56.00		100	6	1	68.00	
File Manager	11 11 12 12	56.00		100	6	1	68.00	
Configuration Manager	12 12	56.00		100	6	1	68.00	
Measurements	14 14	56.00		100	6	1	68.00	
» Rectifier	15 15	56.00		100	6	1	68.00	
⊫ Boost	16 16	56.00		100	6	1	68.00	
Hybrid Channel	Local Contraction			lection > >>			Lawrence of the second se	
► Battery			Last Se	section 1050 085				
► Load						Accept Ch	inges Reload Values	
► HW Setup						- and a complete com		
► Signal Processing Engine								
» System Architecture								
System Parameter								
Documents								



When finished making the "Name" and "Enable" entries, click **Accept Changes** at the bottom.

ORION Configuration and Super X	+								-
)→ C' @	🖸 🔏 http	os://192.168.100.100/controller/login						···· 🖂 🕁	III/
			Admin						
System Name: PB-19-SYS-xx Site:			read-wr					A DELTA	
Date/Time: 01.01.2010 2	:00		Logout					ALL BELIA	
Home	Configuration > Hy	brid Channel				ORION ST	W 88.97801 10: 24.5 7		
Status	Hybrid Chann	els							
Alarm	Manual Contr								
Log	ID Name	Default Supply Voltage [V]	Enable	Cable Length [1]	Wine AWG	Perallol Poirs	Max. Voltage [V]		
Control	1 101	56.00		100	6	1	68.00		
Configuration	2 102	56.00		100	6	1	68.00		
	3 203	56.00		100	6	1	68.00		
∀ System	4 204	56.00		100	6	1	68.00		
Customer Settings	5 5	56.00		100	6	1	68.00		
User Management	6 6	56.00		100	6	1	68.00		
► Interface Setup	7 301	56.00		100	6	1	68.00		
Time & Date	8 302	56.00		100	6	1	68.00		
► Remote Monitoring	9 9	56.00		100	6	1	68.00		
Setup View	10 10	56.00		100	6	1	68.00		
File Manager	11 11	56.00		100	6	1	68.00		
Configuration Manager	12 12	56.00		100	6	1	68.00		
Measurements	13 13	56.00		100	6	1	68.00		
► Rectifier	14 14	56.00		100	6	1	68.00		
	15 15	56.00		100	6	1	68.00		
⊫ Boost	16 16	56.00		100	6	1	68.00		
Hybrid Channel		<< <	Last Se	lection >>>					
⊨ Battery	<u>.</u>								
⊳ Load						Accept Ch	anges Reload Values		
⊩ HW Setup									
⊫ Signal Processing Engine									
▶ System Architecture									
System Parameter									
Documents									

Important! After clicking **Accept changes**, the config file must be synchronized. Use the same procedure described on <u>page 39</u> for the CFG_060VP and CFG_120VP files.

(Return to the menu **Configuration, System, Configuration Manager**, and click the **Update** button to synchronize the config file.)

Once the configuration file is selected and implemented:

- With all OMM circuit breakers OFF, insert boost modules only for the channels that are enabled.
- It is recommended to turn OMM circuit breakers on one at a time, and verify that the expected Raycap channel energizes.
- Confirm/troubleshoot as appropriate.
- Optional: once all channels are energized, one can proceed to <u>Appendix I</u> for closeout checklist.

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Appendix A: Suggested lugs

Note: all input and output lug locations on the PowerBoost chassis, including ground bonding locations on the side, utilize 1/4'' stud x 5/8'' spacing.

The following crimp lug part numbers are provided for reference.

Wire size (AWG)	Recommended Burndy part number	Recommended Panduit part number
#8	YAZ8C2TC14FX	LCCX8-14A-L
#6	YAZV6C2TC14FX	LCCX6-14A-L
#4	YAZV4C2TC14FX	LCCX4-14A-L
#2	YAZV2C2TC14FX	LCCX2-14A-E
#1	YAZV1C2TC14FX	LCCX1-14A-X
1/0	YAZV252TC14FX	LCCX1/0-14A-X
2/0	YAZV262TC14FX	LCCX2/0-14A-X
4/0	YAZV282NT14FX	PennUnion BBLU4/0D2TC14 w/o inspection window via elecdirect.com



Appendix B: Circuit breakers for reference

Summary of circuit breakers and lug adapter kits for DC plant manufacturers Delta, GE, and Vertiv/Emerson.

	Delta	GE	Vertiv/ Emerson	
Circuit breaker 75A 1 pole	830692008	N/A	101609	
Circuit breaker 80A 1 pole	830692108	407998251	121995	
Circuit breaker 150A 2 pole	830734408	408185346	516839	
Circuit breaker 200A 2 pole	830746508	408544076 (See Note 1)	121832	
Circuit breaker 200A 3 pole	xx	408564941	xx	
Circuit breaker 225A 3 pole	N/A	408573975	144886	7
Circuit breaker 250A 3 pole	830730008	408535752	121836	
Note: 2-pole and 3-pole breakers require	ug adapters. Info belo	w:	1	
Lug adapter kit 2 pole (conn posts 3/8 x 1.0)	3799235700-S	850021775	534449	
Lug adapter kit 2 pole (conn posts 1/4 x 5/8)		CC848756916		
Lug adapter kit 3 pole (conn posts 3/8 x 1.0)	3799236400-S	850021955	514714	
Lug adapter kit 3 pole offset (conn posts 3/8 x 1.0)		CC848756924		

# of CH	Typ. Breaker (A) *
1	75 or 80
2	150
3	200 or 225
4	250
* For reference standards/requi	only. Consult local system design rements.

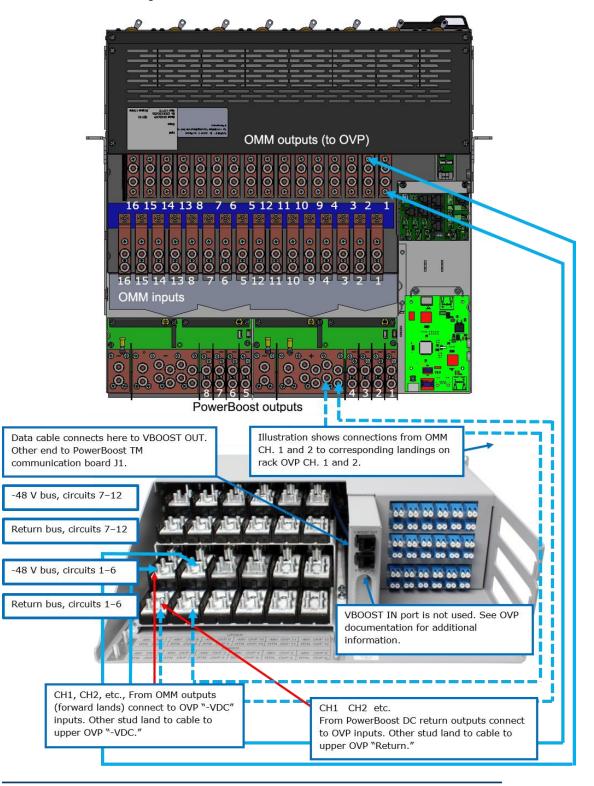
Note 1: For GE/ABB plant:

- 100A/pole buss to use 2-pole 200A breaker, and requires no spacing (modern 600A & 900A plants).
- 70A/pole buss requires a space between the next breaker when using a 2 pole; pre 2015.

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Appendix C: Connections from PowerBoost output to rack mount "near" OVP input

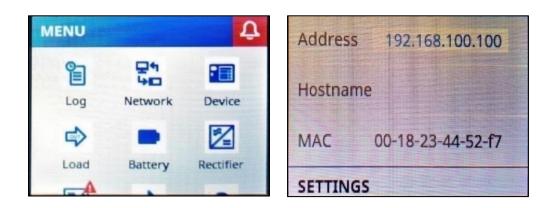


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Appendix D: Orion GUI login

• Swipe through the menu options on the Orion controller screen and find the network option. Identify and remember the IP address on the controller.



- Connect the Ethernet cable to the Orion controller and the other end of the cable to your laptop/PC.
- Go to **Control Panel** on your laptop → **Network Sharing center** → **Local Area connection**.





• Go to Properties → Internet Protocol Version 4 (TCP/IPv4).

Local Area Connection Status	Local Area Connection Properties
General	Networking Sharing
Connection IPv4 Connectivity: No network access IPv6 Connectivity: No network access Media State: Enabled Duration: 05:31:17 Speed: 1.0 Gbps Details	Connect using: Intel(R) Ethernet Connection (2) I219-LM Configure This connection uses the following items: Client for Microsoft Networks Client for Microsoft Networks Client for Microsoft Networks File and Printer Sharing for Microsoft Networks
Activity	✓ Internet Protocol Version 4 (TCP/IPv4) ✓ ▲ Link-Layer Topology Discovery Mapper I/O Driver ✓ ▲ Link-Layer Topology Discovery Responder Install Uninstall
Packets: 357 0	Description Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
Close	OK Cancel

• Change the properties to match the IP address identified in the first bullet and click **OK**.

Internet Protocol Version 4 (TCP/IPv4	4) Properties
General	
You can get IP settings assigned autor supports this capability. Otherwise, yo administrator for the appropriate IP se	u need to ask your network
Obtain an IP address automatica	lly
Ouse the following IP address:	
IP address:	192.168.100.102
Subnet mask:	255.255.255.0
Default gateway:	192.168.100.1
Obtain DNS server address autor	natically
• Use the following DNS server add	dresses
Preferred DNS server:	
Alternate DNS server:	· · ·
Validate settings upon exit	Advanced
	OK Cancel

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Note: You will only need to perform the above steps when you are connecting the first time or if you change the IP address settings to different properties.

Logging into the Orion:

- Open the webpage on your laptop/PC and type in the address https://192.168.100.100
- On entering the IP address on the webpage, it will direct you to a login page. Log in with the following credentials:

Username: Admin

Password: orion

Username: Password:	
	Login



Appendix E: OVP Configurations and channel mapping

General overview of Raycap OVP telemetry connections for reference

This information is provided for general reference only; consult Raycap information for setup and troubleshooting. In the event of conflicting information, information from Raycap company or documentation should take precedence.

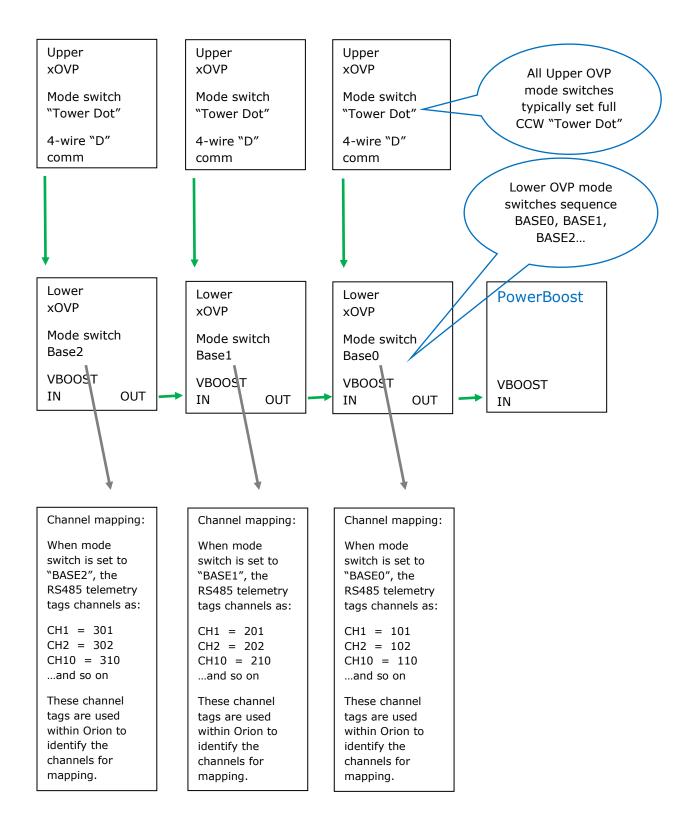
See diagram below. (Diagram shows only the RS485 "OVP telemetry" wiring, not the radio power cables.)

- OVP units are generally organized in pairs containing 1 upper and 1 lower OVP.
- Each OVP unit has a rotary mode switch selector that must be set correctly.
- Upper OVP units typically have their mode switches set same = "Tower Dot" (fully CCW).
- Each upper OVP unit has data wires that connect to its corresponding lower OVP unit. (Typically 4 wires connected at green & orange terminal blocks "TOWER COMM" ports.)
- Lower OVP units have their mode switch set to BASEx (where "x" is a number 0,1,2...)
 - If using just 1 pair of upper and lower OVPs, the lower OVP mode switch is set to BASE0.
 - VBOOST OUT from the lower OVP connects to VBOOST IN at PowerBoost.
 - If using 2 or more OVP pairs, the lower OVP mode switches are set in sequence BASE0, BASE1, BASE2, etc.
 - Lower OVP BASE0 VBOOST OUT connects to PowerBoost VBOOST IN.
 - Lower OVP BASE0 VBOOST IN comes from BASE1 VBOOST OUT.
 - Lower OVP BASE1 VBOOST IN comes from BASE2 VBOOST OUT and so on.
 - Note that only one OVP base unit connects to PowerBoost "VBOOST IN."
- Important! The power wiring conductors must connect to SAME channel number at upper and lower OVP. (Not shown in diagram)
- Diagram below shows general OVP configuration for introduction.

Note: Other configurations are supported; contact JMA technical support (888-201-6073) with any questions.

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Explanation of channel mapping:

There exists PowerBoost channels 1-8 (for PB-19-SYS-8), or channels 1-16 (for PB-19-SYS-16).

Within the PowerBoost Orion GUI, OVP channels are tagged to the PowerBoost channels as described below.

As described in the diagram above, Raycap OVP channels are identified by the mode select switch on the lower OVP unit(s):

- For a single lower OVP unit, mode select is set to BASE0.
 - In that setting, the OVP channels are identified as 101 (OVP CH1), 102 (OVP CH2) etc. up through 106 or 112.
- When two lower OVP units are daisy-chained together, the first lower OVP unit mode select is set to BASE0, and the second lower OVP unit is set to BASE1.
 - In that setting, channels of the BASE0 OVP are identified as 101, 102, etc.
 - Channels of the BASE1 OVP are identified as 201, 202, etc.

The approach remains same for daisy-chaining more lower OVP together.

The third lower OVP mode select is set to BASE2, and its channels would be identified as 301, 302, etc.

A fourth lower OVP in daisy-chain would have its mode select set to BASE3, and its channels would be identified as 401, 402, etc.

These numbers 101, 102... 201, 202... are used by PowerBoost to map the given OVP channels to the PowerBoost channels 1-8 (SYS-8) or 1-16 (SYS-16).

A note about configuration files: Think of the config file in same general manner as a radio channel preset button. The config file is a convenience device that sets one or more (typically several) parameters within the Orion controller. Selecting and engaging a config file saves time that would otherwise be spent navigating to and altering the various parameters.

PowerBoost includes a set of pre-made configuration files which address the following:

- A group of config files which directly address the most common anticipated system designs. (Simply select the diagram that matches the system, and engage that config file.)
- A pair of config files which facilitate sequential channel use in 2 common variations. (Daisy-chained pair consisting of 60VP + 120VP, or 120VP + 60VP – simply select the appropriate config file, then enable the desired channels)
- A config file that allows the user to easily map channels as desired. (Select the "CUSTOM" config file, enter the desired channel mapping for each of the 8 or 16 PowerBoost channels, then enable the desired channels.)

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Image below shows the list of configuration files as seen in the Orion graphical user interface.

Overview
Name
CFG_2xOVP_01CH_NON_RED_1621
CFG_2xOVP_02CH_NON_RED_1621
CFG_2xOVP_03CH_NON_RED_1621
CFG_2xOVP_04CH_NON_RED_1621
CFG_3xOVP_01CH_NON_RED_1621
CFG_3xOVP_02CH_NON_RED_1621
CFG_3xOVP_03CH_NON_RED_1621
CFG_3xOVP_04CH_NON_RED_1621
CFG_4xOVP_01CH_NON_RED_1621
CFG_4xOVP_02CH_NON_RED_1621
CFG_4xOVP_03CH_NON_RED_1621
CFG_4xOVP_04CH_NON_RED_1621
CFG_06OVP_16CH_NON_RED_1621
CFG_12OVP_16CH_NON_RED_1621
CFG_OVP_16CH_NON_RED_CUSTOM_1621

Next, for each configuration file, a basic diagram and notes are provided:

CFG_2xOVP_01CH_NON_RED_1621

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	2 sep	arate	e OV	Ps.	Any	con	nbin	atio	n of I	5 or 1	1201	P. E	ach C	OVP h	nas C	h1 a	ctive	2.																																	
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		RRH#1													RRH #2																																				
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CFG_2xOVP_02CH_NON_RED_1621

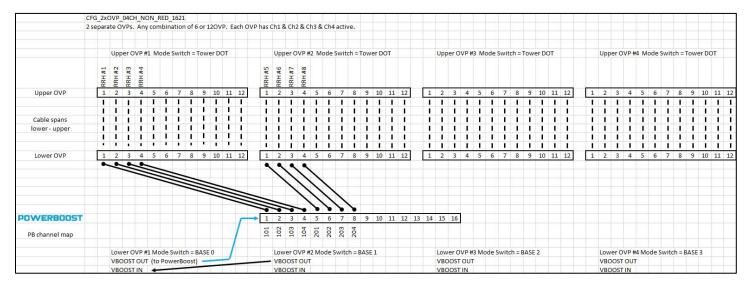
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$CFG_2xOVP_03CH_NON_RED_1621$

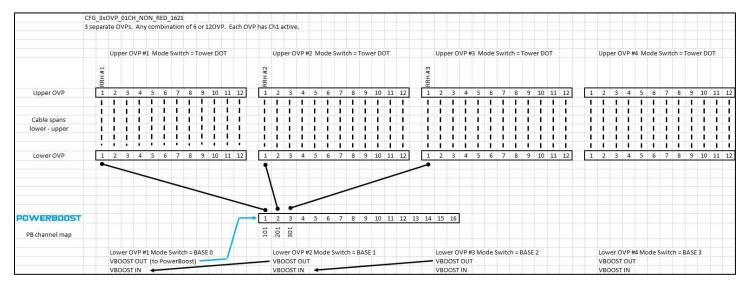
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CFG_2xOVP_04CH_NON_RED_1621

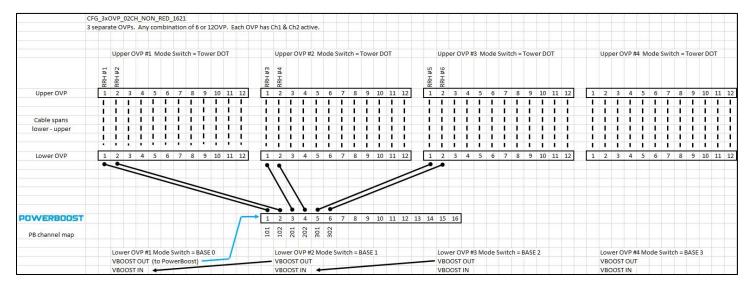


CFG_3xOVP_01CH_NON_RED_1621

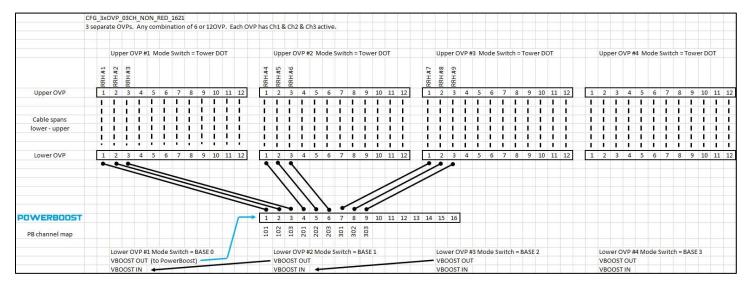




CFG_3xOVP_02CH_NON_RED_1621

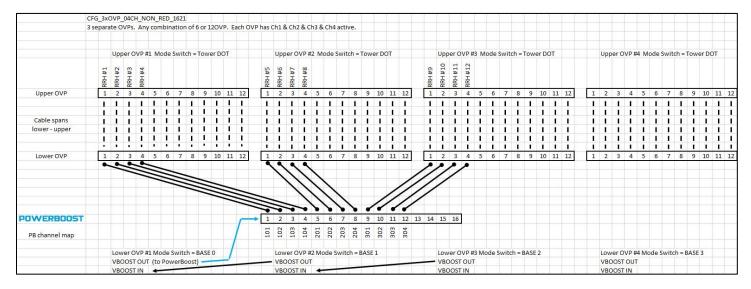


CFG_3xOVP_03CH_NON_RED_1621





CFG_3xOVP_04CH_NON_RED_1621

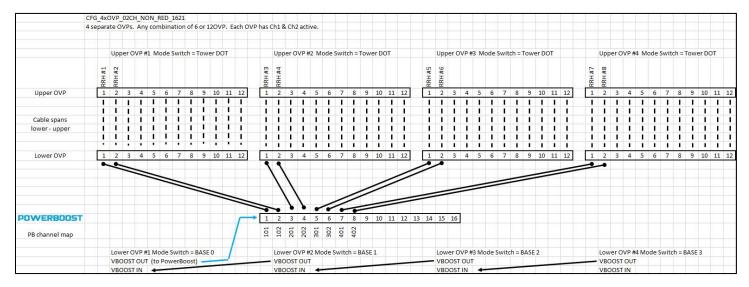


CFG_4xOVP_01CH_NON_RED_1621

	CFG_4xC																																															
4	1 separa	te O'	VPs.	Any	com	nbina	ation	of 6	or 12	20VP	Eac	h OVP	has	Ch1 a	octive	2.																																
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	RRH#1												RRH #2													RRH#3												RRH#4										
Upper OVP	1	2	3	4	5	6	7	8	9	10	11 1	12		2	3	4	5	6	7	8	9	10	11	12			2	3	4	5	6 7	8	9	10	11	12			2	3	4	5	6	7 8	9	10) 11	1 1
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PB channel map											1		101	201	301	401																																
		Low	er O	VP #	1 Mc	de S	witc	h = B	ASE	0	1			Low	/er O	VP #	2 Mc	de S	Swite	h = E	BASE	1				1	lowe	r OV	P #3	Mod	e Swi	tch =	BAS	E 2					owe	rOV	P #4	Mod	e Sw	itch =	BAS	E 3		
								oost)			,				DOST												VBOC									1			BOC									
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CFG_4xOVP_02CH_NON_RED_1621

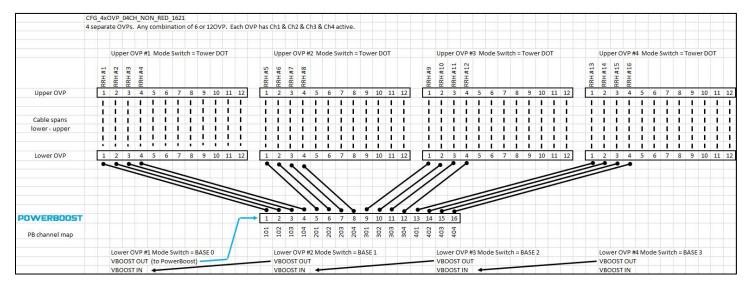


$\mathsf{CFG_4xOVP_03CH_NON_RED_1621}$

	CFG_4																																																
	4 sepa	rate	OVE	s. A	ny ci	ombi	inati	ion o	f 6 or	120	VP. E	ach C	OVP h	as C	h1&	Ch2	& Ch	13 ac	tive.																														
		U	pper	OVF	9#1	Mod	e Sv	vitch	= To	wer D	от				Uppe	er OV	/P #2	Mo	de Si	wite	:h = 1	owe	er DC	т			ι	Ipper	OVP	9 #3 I	Mode	e Swi	tch =	Tow	/er D	от			L	Jpper	OVE	P #4	Mod	le Sv	vitch	= Tov	ver D	оот	
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CFG_4xOVP_04CH_NON_RED_1621



CFG_060VP_16CH_NON_RED_1621

This configuration file maps the channels as shown, but by default none of the channels are enabled.

After activating this configuration file, an extra step is required to enable the desired channels then synchronize the file. See sync instructions, pq 39.

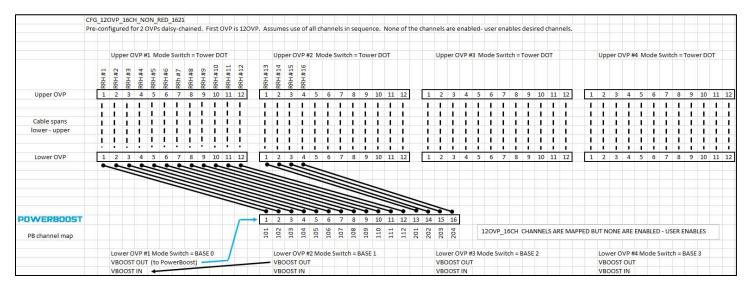
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CFG_12OVP_16CH_NON_RED_1621

This configuration file maps the channels as shown, but by default none of the channels are enabled.

After activating this configuration file, an extra step is required to enable the desired channels then synchronize the file. See sync instructions, pg 39.





CFG_OVP_16CH_NON_RED_CUSTOM_1621

This configuration file is constructed with place-holders for the channel map numbers, and none of the channels are enabled. After activating this configuration file, the desired channel mapping entries are made, then an extra step is required to enable the desired channels then synchronize the file. See sync instructions, pg_{39} .

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Appendix F: Converter status LEDs

LED	LED behavior	Description
OK COM LD STA	OK LED is solid green	 The converter is operating normally Action N/A
OK COM STA	OK LED is solid red	 The converter is not operating due to input being out of the operating range (under-voltage or overvoltage) The converter is not operating due to overtemperature protection (OTP) The converter is not operating due to a fan failure The converter is not operating due to a DC overvoltage protection (OVP) The converter is not operating due to improper installation Action View converter status on controller Reseat converter Test status of converter by inserting converter into different slot Replace converter
OK COM STA	OK LED is off	 The converter is not working due to a loss of input power The converter is not working due to a converter failure Action View converter status on controller Reseat converter Test status of converter by inserting converter into different slot Replace converter
OK COM LD STA	COM LED is solid green	 The converter is communicating with the controller (if applicable) Action N/A

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LED	LED behavior	Description
OK COM STA	COM LED is off	 The converter is not communicating with the controller (if applicable) Action View converter status on controller Reseat converter Test status of converter by inserting converter into different slot Replace converter
OK COM STA	LD LED is solid yellow	 The converter is operating at less than 5 percent load Action N/A
OK COM STA	LD LED is blinking yellow	 The converter is operating in current limit mode The DC output of the converter is short circuited Action View converter status on controller Reseat converter Test status of converter by inserting converter into different slot Replace converter
OK COM STA	STA LED is solid red	 The converter is shut down permanently (latched protection) due to an over-temperature or a DC over-voltage condition Action Reseat converter Replace converter



Appendix G: Alarm information

The Orion controller provides output alarm relays (see table below), local LCD display, and web access to alarm statuses. Alarms can be found on the controller display at **Main Menu > Alarm > Alarm List**.

- From the home screen, press the Enter button to enter the Main Menu.
- Highlight the **Alarm** menu and press **Enter**.
- Highlight the **Alarm List** menu and press **Enter**.

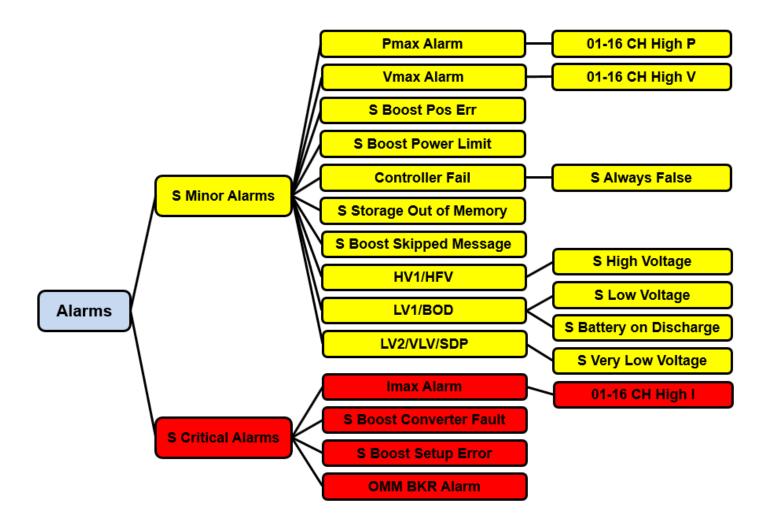
Alarm name	Critical	Minor	Alarm Description
Relay output:	O/P#1	O/P#2	
HV1/HFV		x	sys high voltage
LV1/BOD		x	sys low voltage or sys battery on discharge
LV2/VLV/SDP		x	sys very low voltage
S BOOST CONVERTOR FAULT	×		Event indicating that at least one of the configured boost converters is not running
S BOOST SETUP ERROR	x		The controller is not able to send a correct configuration to the convertor
OMM BKR Alarm	x		Results when a 50A breaker is tripped
CONTROLLER FAIL		x	This is the result of a failed controller
STORAGE OUT OF MEMORY		x	This is the result of not clearing device history
S BOOST SKIPPED MESSAGE		x	Event received by the JMA Modbus protocol. Indicated that there is an issue with the radio head communication.
Imax ALARM	x		Over current threshold alarm above 33A
Pmax ALARM		x	Overpower threshold alarm above 2200W
Vmax ALARM		x	Over voltage threshold alarm above 70V
S BOOST POS ERR		x	A positioning error occurred
S BOOST POWER LIMIT		x	Event indicating that at least one of the configured boost convertors is in power limit
S HIGH VOLTAGE			sys output voltage above 55.50 +/- 0.5
S LOW VOLTAGE			sys output voltage below 53 +/- 0.5

PowerBoost alarm matrix:

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Alarm name	Critical	Minor	Alarm Description
S BATTERY ON DISCHARGE			Sys battery on discharge below 53 +/- 0.5
S VERY LOW VOLTAGE			sys output voltage below 46 +/- 0.5





Alarm details:

Converter fail

Converter fail alarms are due to the failure of one or more converters.

- 1. Identify the failed converter(s). See the Converter status LEDs table (Appendix F) for information on the converter LED status indicators.
- 2. Remove and reinsert the converter per the instructions in <u>Section 3.4.</u>
- 3. If the converter continues to shut down, replace the faulty converter.

LV1/BOD

PB input low voltage (below 53 +/- 0.5) /system battery on discharge alarm (PB input voltage below 53 +/- 0.5). (ie. the DC plant Voltage is low) Increase in voltage clears the alarm.

LV2/VLV/SDP

PB input very low voltage alarm (below 46V + -0.5). (ie. the DC plant Voltage is low) Increase in voltage clears the alarm.

HV1/HFV/HVSD

This alarm is the result of an input voltage being above the high voltage set point (55.50 +/- 0.5). Check the DC plant voltage.

"SBoost" Convertor Fault error

Event indicating that at least one of the configured boost converters is not running.

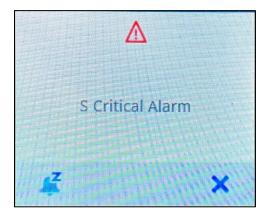
This error message can result in rare situations where operational channels are taken out of service and one or more boost modules are removed. To reset this, follow the steps below.



In the example below, the configuration file for 2xOVP_01CH is active. Associated brick is currently loaded.

CONFIGURATIONS	
CFG_2xOVP_01CH_NON _RED_1621	<, <>
CFG_2xOVP_02CH_NON _RED_1621	<u>ر</u>) ،
CFG_2xOVP_03CH_NON _RED_1621	с ,
CFG_2xOVP_04CH_NON	(小)

On withdrawal of brick 1, the S Critical Alarm \rightarrow S Boost Convertor Fault alarm appears.



S CRITICAL ALAR	M
Status	active
INSPECTION	
S Boost Converte	r Fault 🚺

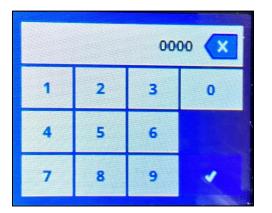
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Touch **Boost** and view the status of the brick. The Orion system indicates it has lost an operating brick.

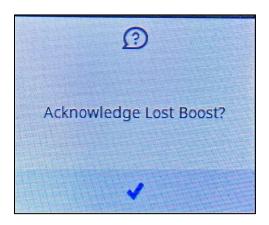


To reset this alarm: Click on the **Lost** option. It will ask you to enter the password (0000) for acknowledging the error.

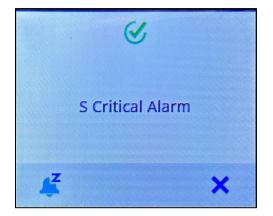




Once you enter the password "0000," click on the check mark. An acknowledgement window will pop up.



Click on the check mark and wait till the alarm clears.



S Boost Setup Err

The controller is not able to send a correct configuration to the convertor. This alarm is triggered if you plug in a boost convertor that does not match the profile. Plug in the correct boost convertor (PB-PSU-162) to clear the alarm.

OMM BKR Alarm

When any of the Output management module 50A breakers trips, system will generate this alarm. Reset the breaker that was tripped to clear the alarm. There might be subsequent channel errors to investigate which channel triggered the alarm.

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Imax Alarm

This alarm is raised when there is a current draw above 33A per channel. When operating under parallel or redundant mode, the alarm is raised when the current draw is above 66A per boost brick. Reduce the current to clear the alarm.

Pmax Alarm

This alarm is raised when there is power output over 2200W per channel. When operating under parallel or redundant mode, the alarm is raised when the power output is above 4400W per boost brick. Reduce the power load to clear the alarm.

Vmax Alarm

This alarm is raised when the output voltage is above 70V per module. Reduce the voltage to clear the alarm.

S Boost Pos Error

A positioning error occurred. If the configuration file uses less number of channels and an additional module is plugged in without updating the configuration, the system will flag this alarm. To reset the alarm, select the correct configuration file and reset the Orion controller by withdrawing it for a few seconds, then re-insterting.

S Boost Power Limit

Event indicating that at least one of the configured boost convertors is in power limit.

Orion controller fail (failure message or blank screen)

This is the result of a failed controller.

- 1. Remove the controller according to the steps in <u>Section 3.4</u>.
- 2. Reinsert the controller.
- 3. If the controller is still faulty, replace the controller.

Storage out of memory

Currently the device logs 10000 events per file up to 90 different files. If the device history is not cleared, the system will generate this alarm.

S Boost Skipped Message

- Indicates that there is an issue with the Raycap OVP telemetry (RS485) data reaching (or not reaching) the PB "VBOOST IN" port.
- PB-COM LED steady red indicates a fault or error in the message from the Raycap OVP or a bad connection to communication board.

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- It also indicates that the telemetry between Raycap top and bottom is missing or damaged.
 - Check the RS485 cable on Raycap and to the PB-COM
 - \circ Check telemetry wiring connection between Raycap base and the top
 - Reset PB-COM or power cycle the Orion controller
 - Check system installation for RS485 signals
- PB-COM LED green flashing at approximate one second interval indicates that it is receiving valid data from Raycap OVP telemetry.



Appendix H: Ordering guide

Part number	Details
PB-19-KIT6	POWERBOOST 6RRH KIT WOMM (2U) COMES W/ JUMPERS INSTALLED, BOOST MODULES INCL.
PB-19-KIT8	POWERBOOST 8RRH KIT WOMM (2U) COMES W/ JUMPERS INSTALLED, BOOST MODULES INCL.
PB-19-KIT9	POWERBOOST 9-10RRH KIT WOMM (3U) COMES W/ JUMPERS INSTALLED, BOOST MODULES INCL.
PB-19-KIT12	POWERBOOST 12RRH KIT WOMM (3U) COMES W/ JUMPERS INSTALLED, BOOST MODULES INCL.
PB-19-SYS-8	19IN 2RU DC BOOST SYSTEM 8CH WOMM JUMPERS, BOOST MODULES ORDERED SEPARATELY
PB-19-SYS-16	19IN 3RU DC BOOST SYSTEM 16CH WOMM JUMPERS, BOOST MODULES ORDERED SEPARATELY
PB-PSU-162	CPC1700B-24 DC Boost Module
PB-PASS	FRU, CPC1700B-24 Bypass Module
PB-PSU-COV	Slot Blank Cover, PSU
PB-OMM-CBL-KIT-2	OMM JUMPER CABLE KIT, CONTAINS 2 CABLES 26IN EA

Appendix I: Commissioning and closeout checklist

Definitions:

PB: PowerBoost

OVP: Raycap OVP equipment

OMM: PowerBoost Output Management Module, i.e., circuit breakers on PB unit

PowerBoost installation/commissioning

- Note: Commissioning of PowerBoost system assumes that the Raycap OVP system to which PowerBoost will be connected has previously been installed and verified for correct wiring connections and correct data communication upper to lower (i.e., the display on lower OVP correctly reports the upper OVP channel voltages).
- □ Prior to energizing PB, complete the next three steps:
 - System wiring must be complete.
 - Based on system design information (OVP configuration), identify the associated PB configuration file that will be selected during setup.
 - Verify correct polarity of all power feeds from the DC plant to the PB rack. Note that PB-19-SYS-8 contains two (2) input power feeds, and PB-19-SYS-16 contains four (4) input power feeds. Correct polarity of all power feeds must be verified before energizing. See pp. 9-12.
- □ Energize the system.
- □ Select and implement the PB config file for the given system configuration.
- With at least one PB channel energized, after at least 1 minute of operation, observe the PB-COM circuit board and verify the presence of an orange LED flashing at approximately 1 second intervals. This indicates the receipt of communication from the lower OVP to PB.
- For all PB channels used in the given system, sequentially energize channels at the PB OMM, adding 1 more channel at a time, and verify that the expected channel indicates voltage at the upper OVP (as read on the lower OVP display). Allow at least 30 seconds for a recently energized channel to indicate voltage on the OVP.
- Check for the absence of system alarms after PB has been operating for at least 3 minutes beyond the most recent change.

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Option 1: Using Orion GUI

- After the installation is complete and verified, log into Orion GUI (refer to <u>Appendix D</u>: Orion GUI Login).
- Go to Alarm → Status

Home	Alarm > Status	ORION SW B8.	97B01 ID:1.1
▶ Status	Alarm Events		
▼ Alarm	S Minor Alarm:	Status	
Status	S Critical Alarm:	etive OK	Inspect Inspect
Setup			
Maintenance			Reload Values
Log			
Control			
Configuration			
Documents			

• The status "OK" on all the alarm events is a clear indication that there are no system alarms.

Option 2: Using Orion GUI (High Level Screen Capture)

- After the installation is complete and verified, log into the Orion GUI (refer to Appendix A: Orion GUI Login).
- Go to **Home**; the status in the highlighted screen capture that there are no alarms is an indication that there are no system alarms.
- Note: the screen shot below is showing an active alarm for illustrative purposes.

Home	Status > Sy	stem Overview			ORION SV	W B8.97B01 ID: 22.2
▶ Status	System	5	Active Alarms		Temperat	tures
▶ Alarm	Vsys:	54.11 V	S Minor Alarm:	() active	Tbatt:	**** °F
▶ Log	Psys:	**** W				
▶ Control	Irect:	0.0 A				
▶ Configuration						
Documents						Reload Value

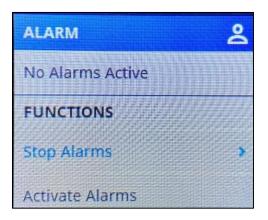


Option 3: Using Orion touchscreen

• The clear screen with no alarm symbol is an indication that there are no system alarms.



(or) Swipe right twice on the Orion touchscreen:





• Below is a screenshot of the Orion touchscreen with active alarms. Refer to the alarms section if there are any active alarms.



Capture the inventory report

Log into the PB GUI and record the following:

- After the installation is complete and verified, log into Orion GUI (refer to <u>Appendix A</u>: Orion GUI Login).
- Go to **Status** → **Modules**.

Home	Status > Modules	ORION SW B8.9	7801 ID: 19.1 ?
▼ Status	Overview		
System Overview	Part Number:	TPS1020034A	
Modules	Serial Number:	22000000001000046	
Meter Panel	Inventory Report:	** ** ** ** ** **	Create
Load			Reload Values
▶ Battery			
Rectifier			
Boost			
Hybrid Channel			
▶ Alarm			
► Log			
► Control			
► Configuration			
Documents			



• Click on **Create**. You will see a pop-up window. Click **OK**. Do not log off or disconnect until the process is finished.

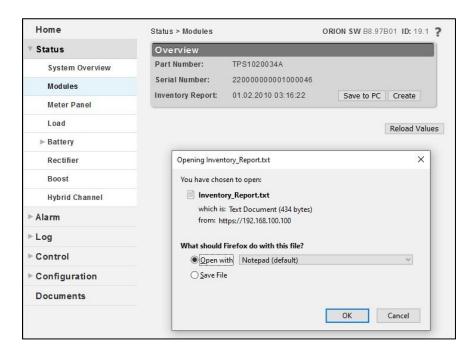
Creating an Inventory Report may last some minutes. Are you sure you want to create one?
OK Cancel

• Once the process is complete, you will see that an inventory report is generated and gives an option to save it to your PC. Click on **Save to PC** to download the file to your PC.

Home	Status > Modules	ORION SW 88.97801 ID: 19.1 ?		
▼ Status	Overview			
Status System Overview Modules Meter Panel Load b Battery Rectifier Boost Hybrid Channel Alarm	Overview Part Number: Serial Number: Inventory Report:	TPS1020034A 22000000001000046 01.02.2010 03:16:22	Save to PC	Create Reload Values
▶ Log				
▶ Control				
▶ Configuration				
Documents				



• An inventory report is generated/downloaded, as shown in the screenshot below.



Capture the alarm history report

- After the installation process is complete and verified, log into the Orion GUI (refer to <u>Appendix A</u>: Orion GUI Login).
- Go to Log → Status

Home	Log > <mark>Stat</mark> us	ORION SW 88.97801 ID: 5.			
▶ Status	Overview				
▶ Alarm	Storage Me	Storage Memory Usage:		1 %	
▼ Log	Default:	State running	Log Type continuous	Files	Setup
<mark>Statu</mark> s	Access:	running	continuous	Files	Setup
Setup					
► Control					Reload V
▶ Configuration					
Documents					

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- Click on **Files**.
- Click on **Save to PC**; do not log off or disconnect until the process is finished.

Home	Log > Status > <mark>F</mark> ile Manager			ORION SW 88.97801 ID: 5.5 ?		
▶ Status	Overview					
▶ Alarm	File Name	00000 <mark>1.csv</mark>	View	Save to PC	Delete	
▼ Log			Lucional L			
Status	Description	escription				
Setup	Description:	Default Log	3			
► Control	bescription.				.d	
Configuration						
Documents			Accept Change	es Back	Reload Values	

• Once the process is complete, you will see that an event/alarm spreadsheet is generated/downloaded to your PC. An alarm report is generated at the bottom of the page in the screenshot below.

Home	Log > Status > File Manager ORION SW 88.97801 ID: 5.5 ?					
▶ Status	Overview					
▶ Alarm	File Name Delete LOG Default 000001.csv View Save to PC					
▼ Log						
Status	Description					
Setup	Default Log Description:					
► Control	Jescipton.					
Configuration						
Documents	Accept Changes Back Reload Values					
	You have chosen to open: LOG_Default_000001.csv which is: Microsoft Excel Comma Separated Values File (12.6 KB) from: https://192.168.100.100 What should Firefox do with this file?					
	Open with Excel (default)					
	○ Save File OK Cancel					

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Capture the system map worksheet

PB CH #	RRU #	RRU Sector	Notes info	PB input breaker #	OVP base ID #	OVP base port #
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						

PowerBoost closeout

- Verify that the system map table is completely and correctly captured (see installation/commissioning section).
- □ Verify that the system inventory report is captured and accurate.
- □ Verify that the system alarm history report is captured.

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