



How To Set Up Fortress Power Lithium Batteries Using Schneider Equipment

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How To Set Up Fortress Power Lithium Batteries Using Schneider Equipment

Introduction

This integration guide will help set up the charge/discharge parameters of Fortress Power batteries as they relate to Schneider inverters, as well as the setup of closed-loop communication between the Fortress batteries and Schneider inverters. Please note that only the Schneider XW Pro and Gateway support running the batteries in closed loop communication mode, and that the inverters will still need to be programmed in the open loop settings before setting up closed loop communication.

For any additional help, please contact techsupport@fortresspower.com

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Open Loop Settings for Fortress Batteries with Schneider Inverters

Charger Setting > Custom Setting		
	80% DoD, 6000 cycles	90% DoD, 3000 cycles
Battery Type	Custom	
Charge Cycle	2StgNoFloat	
Bulk Voltage	54.4 V	54.6 V
Max Bulk Current	eFlex:55A per battery eVault:100A per battery eVault MAX 150 per battery LFP-10: 70A per battery	eFlex: 60A per battery eVault:150A per battery eVault MAX: 180A per battery LFP-10: 80A per battery
Max Discharge Current	eFlex: 60A per battery eVault: 160A per battery eVault MAX: LFP-10: 100A per battery	
Battery Capacity	eFlex: 105AH per battery eVault: 360AH per battery eVault MAX: 360AH per battery LFP-10: 200AH per battery	
Max Charge Rate Percentage (%)	eFlex:60A per battery eVault:100A per battery eVault MAX 150 per battery LFP-10: 70A per battery Divided by Total Inverter DC Amperage	eFlex: 60A per battery eVault:150A per battery eVault MAX: 180A per battery LFP-10: 80A per battery Divided by Total Inverter DC Amperage
Default Battery Temperature	Warm	
Recharge Volts	51.3	
Grid Support Volts**	53	
Absorb Volts	54.4	
Absorb Time	1 Hour	
Charge Block Start	Default	
Charge Block Stop	Default	
Advanced Settings > Inverter Settings		
Low Battery Cut Out Voltage	48V (50V if allowed)	
LBCO Hysteresis	2.0V	
LBCO Delay	5 Sec	
High Battery Cut Out Voltage	61V (58V if allowed)	
Search Watts	Default	
Search Delay	Default	

****The Parameter Setting for Grid-tie Sell Mode:**

In a DC coupled system, **Grid Support or Enhanced Grid Support** mode supplies PV power to the loads and sells surplus power to the grid. This mode of operation keeps the batteries as



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completely charged as possible. The **Enhanced Grid Support** **only works with lead acid batteries, please disable it when you use Fortress batteries.**

Grid Support Mode is used for the systems with DC Sources not communication over Xanbus.

Advanced Setting > Inverter Settings	
Charger	Enabled
Enhanced Grid Support	N/A
Grid Support	54V (site specific)
Recharge Volts	51.3 V
Sell Mode	Enabled
Max Sell Amps**	PV array size ÷ 240V ÷ total inverter output kW
Advanced Setting > Charger Setting	
Recharge Volts	51.3 V

** For example, if the system has a 10 KW PV array and 2 of XW+ 5848 inverters, the Max Sell Amps per inverter will be $10,000W/240V/2 = 21A$

Grid Support Voltage Note: The grid support voltage will “sell back” the battery to the grid side of the battery inverter when voltage meets the programmed threshold. This is a user specific setting – some users will want to use more battery capacity for selling back, and others will want a full battery before selling back. Selling back at 54V will keep the battery mostly full. Users on reliable power grids wanting to sell back for evening peak utility rates may prefer to lower grid support to allow the battery to more deeply discharge at night (suggestion:52.5V).

Recharge Voltage Note: A battery voltage near 51.4V indicates an approximate 20% state of charge. As such, the inverter is programmed to recharge the battery from an AC power source (grid or generator) when the battery reaches a 20% SoC. This voltage setting can be increased to allow for more reserve capacity in the battery.

AC-coupled note: AC coupling an appropriately sized solar array on the backup side of the Schneider inverter will automatically charge the batteries. AC-coupling on the grid or supply side of the Schneider inverter will charge the batteries only when the battery bank reaches the inverter recharge voltage.



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Open Loop Settings with Schneider Charge Controllers

Parameter Setting for Fortress Batteries with Schneider XW+ MPPT 60/80

Advanced Setting > Charger Setting		
Battery Type	Custom	
Custom Setting		
	80% DoD, 6000 cycles	90% DoD, 3000 cycles
Charge Mode	3 Stage	
Eqlz Support	Disabled	
Bulk Voltage	54.4 V	54.6 V
Absorb Voltage	54.4 V	54.6 V
Absorb Time	60 minutes	
Float Voltage	54.4 V	
Battery Temperature Compensation	0mV/C	
Battery Capacity	eFlex: 105AH per battery eVault: 360AH per battery eVault MAX: 360AH per battery LFP-10: 200AH per battery	
Max Charge Rate Percentage*	eFlex:55A per battery eVault:100A per battery eVault MAX: 150A per battery LFP-10: 70A per battery Divide by total CC amp output	eFlex: 60A per battery eVault:150A per battery eVault MAX: 180A per battery LFP-10: 80A per battery Divide by total CC amp output
Charge Cycle	Warm	
Recharge Volts	53 V	
Absorb Time	1 Hour	
Default Battery Temperature	Warm	
Battery Voltage (Auto-detected)	48V	

Note: The charge controllers can be set to a 3 stage charging cycle, but the inverter should be kept in a 2 stage charging cycle. Doing so, as well as setting the charge controller recharge voltage to be greater than that of the inverter recharge voltage, will prioritize charge controller charging over the inverter charging. Inverter charging is a grid/generator charge which has a lower priority than solar charge controller charging.

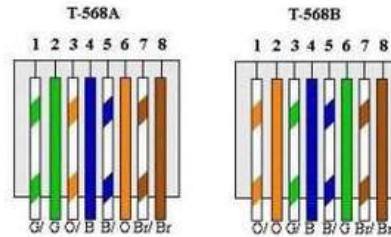
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Closed-Loop Setup between Fortress Batteries and Schneider Conext Gateway/ Insight Facility

All Fortress Power batteries work in open-loop communication mode—that is, with voltage detection. Closed loop *does not exempt the installer from programming the inverter manually. Open loop settings should be programmed before setting up closed loop communication. The inverter will revert to open loop settings if closed loop communication drops.*

1. Connect communication cables and canbus terminator between the batteries
 - a. **eFlex-specific instructions:**
 - i. RX/TX ports are universal
 - ii. The “master” battery is the one powered up first – so after plugging in the communication cables, turn the battery which will communicate to the Schneider inverter on first. After the light show completes, push button the next eFlex battery on, proceeding down the chain to the last eFlex with the Canbus terminator. and install a Canbus communicator at the end of a CAT6 cable into the eFlex and then into the RJ46 pinout converter (Exhibit A).
 - b. **eVault-specific instructions:**
 - i. Use the TX port on the master inverter to connect to the RX port of the slave inverter.
 - ii. The inverter communication will therefore be plugged into the RX port of the master inverter.
 - c. **eVault MAX specific instructions:**
 - i. set the battery protocol to 1 on the touchscreen
 - ii. plug the RJ45 cable into the battery RS485 port.
 - iii. If three or more batteries are connected in parallel, turn on the 120Ω on the first and last battery. Leave the rest off.
2. Modify the communication cable between the master battery and the inverter
 - a. **eFlex-specific instructions:**
 - i. Cut off one end of the ethernet cable and connect wire 7 (brown-white/RJ485A) to **port 18** and pin 8 (brown/RJ485B) to **port 20** on the Conext Gateway/ Insight Facility (Exhibit B).
 - b. **eVault-&eVault MAX specific instructions:**
 - i. Identify if the RJ45 cable is the A or B format. Typically, the cables are B format. Whichever format, the eVault uses wire 3+5 for RJ485A/B communication.

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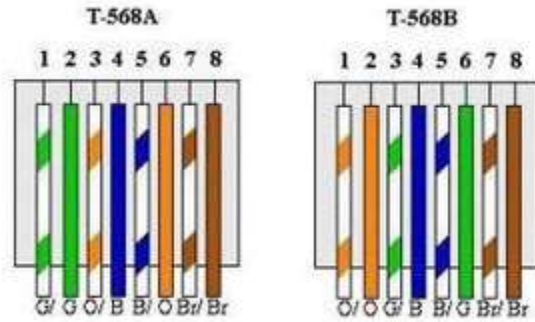
- ii. Cut off one end of the ethernet cable and connect wire 3 (typically green-white) to port 18 and wire 5 (typically blue-white) to port 20 on the Conext Gateway/ Insight Facility (Exhibit A).
3. Power on the batteries and Schneider as usual and connect to the Conext Insight.
4. Navigate to Setup -> **Device Detection** and run detection for **RS-485-1 with range 1 to 2**. The battery BMS will then appear in the device list, as the Schneider Battery Monitor (Exhibit C).
5. Navigate to the Devices -> **Inverter\Charger** -> Configuration -> **Advanced Charger settings** should be set to **lithium-ion battery** with an **charge cycle set to external BMS**. **Grid Support** settings should be set to **state of charge control**. **Battery Management System** settings should be set to **Fault on Loss of BMS Status** and **loss of State of Charge information**. (Exhibit D)
6. Navigate to the Schneider Devices -> **BMS Menu** -> Battery Bank 1 -> Apply
 Make sure the BMS is associated with Battery Bank 1 by **clicking "Apply"** (Exhibit E)

Closed-Loop Setup between Fortress Batteries and Schneider Insight Home

1. Repeat steps 1-2 from "Closed-Loop Setup between Fortress Batteries and Schneider Conext Gateway/ Insight Facility".
2. Modify the communication cable between the master battery and the inverter.
 - a. **eFlex-specific instructions:**
 - i. Cut off one end of the ethernet cable and connect wire 7 (brown white/RJ485A) to **port 9** and pin 8 (brown/RJ485B) to **port 11** on the Insight Home (Exhibit B).
 - b. **eVault-& eVault MAX specific instructions:**

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- i. Identify if the RJ45 cable is the A or B format. Typically, the cables are B format. Whichever format, the eVault uses wire 3+5 for RJ485A/B communication.

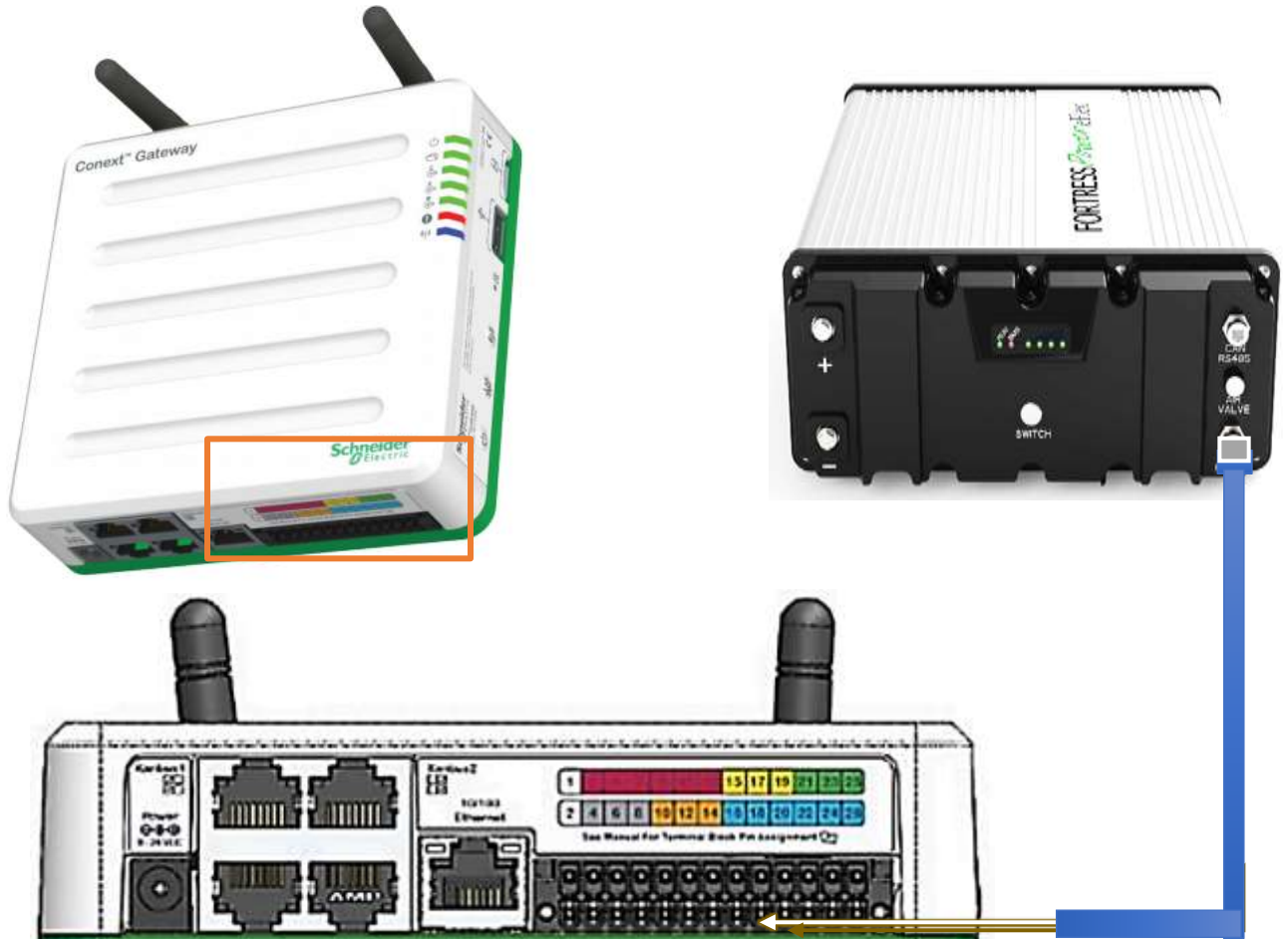


- ii. Cut off one end of the ethernet cable and connect wire 3 (typically green-white) to port 9 and wire 5 (typically blue-white) to port 11 on the Insight Home (Exhibit B).
3. Repeat steps 3-6 from “Closed-Loop Setup between Fortress Batteries and Schneider Conext Gateway/ Insight Facility”.

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Closed Loop Communication Set-Up using Schneider Gateway

Appendix
Exhibit A

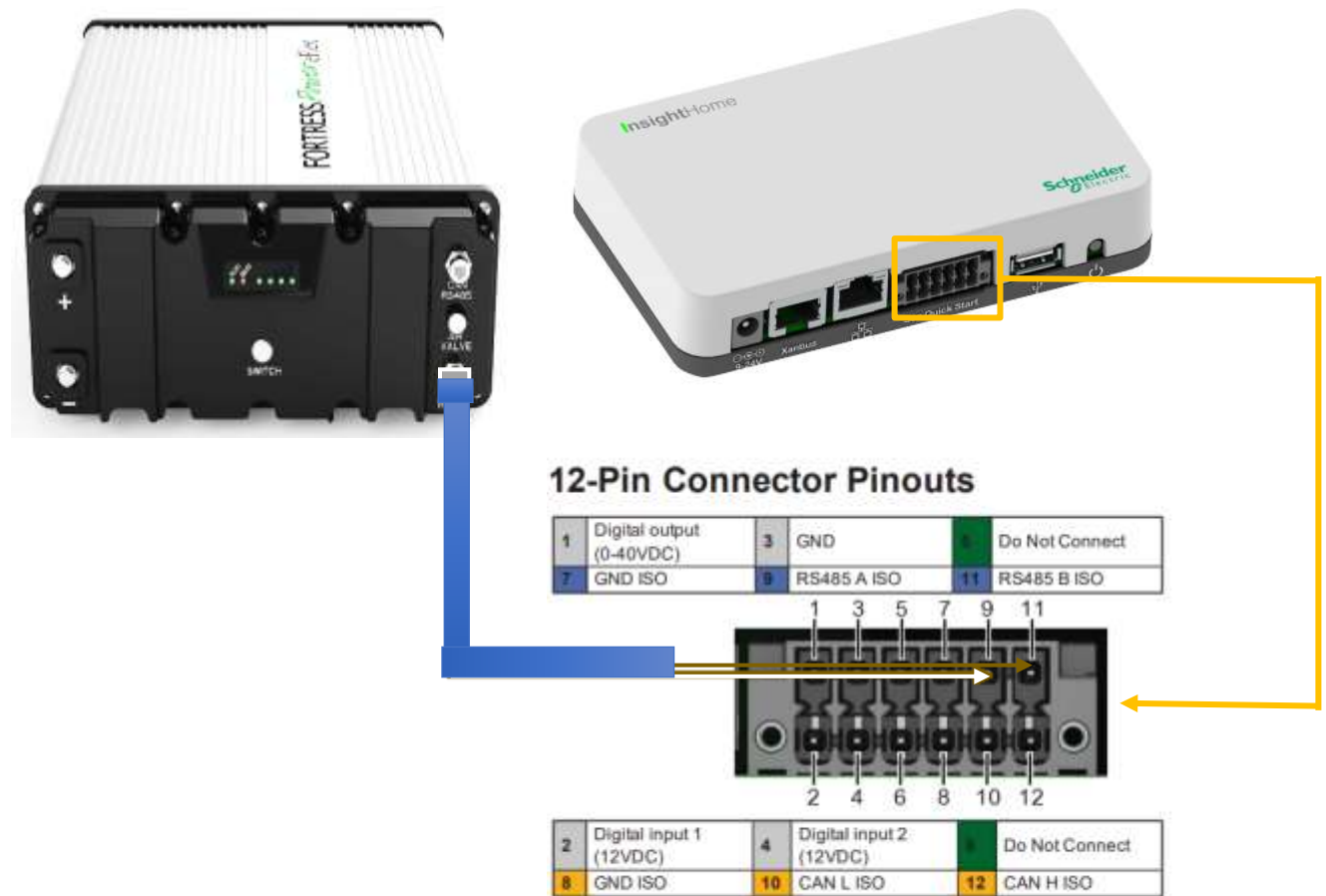


From Battery	<u>eFlex</u>	<u>eVault</u>
Gateway Port 18	brown-white, wire 7	typ. green-white, wire 3
Gateway Port 20	brown RJ45, wire 8	typ. blue-white, wire 5

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Schneider Closed Loop Communication Set-Up using Insight Home

Exhibit B



From Battery	eFlex	eVault
Gateway Port 9	brown-white, wire 7	green-white, wire 3
Gateway Port 11	brown, wire 8	blue-white, wire 5

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Exhibit C

InsightLocal Version: v1.09 | Build number: 418 | Conext Gateway

2020/11/17 16:59 | Admin | [Disclaimer](#) | [Logout](#)

Life Is On



Dashboard Devices Events Setup About

- Configuration
- Network
- Manage Passwords
- Device Detection**
- Smart Energy Manager

Detect devices ▼

Port	Range
RS-485-1	<input type="text" value="1"/> to <input type="text" value="2"/>
RS-485-2	<input type="text"/> to <input type="text"/>

InsightLocal Version: v1.09 | Build number: 418 | Conext Gateway

2020/11/17 17:04 | Admin | [Disclaimer](#) | [Logout](#)

Life Is On



Dashboard Devices Events Setup About

- Device Overview**
- Inverters/Chargers
- Charge Controllers
- Other Devices

4 devices Display: System Operating State:

<div style="border: 1px solid #ccc; padding: 5px;"> <p>XW6848-21 0 Online</p> <p>Operating Mode: Operating</p> <p>Inverter Status: Grid Support</p> <p>Charge Status: AC Good</p> <p>Inverter Mode: Split Phase Master</p> <p>AC Load Power: 5534 W</p> <p>AC Load Voltage: 259.1 V</p> <p>AC Load Frequency: 59.98 Hz</p> <p>AC1 Input Power (W): 2499 W</p> <p>AC1 Voltage: 251.18 V</p> <p>AC1 Frequency: 59.98 Hz</p> <p>AC2 Power: 0 W</p> <p>AC2 Voltage: 0 V</p> <p>AC2 Frequency: 0 Hz</p> <p>DC Power: -3272 W</p> </div>	<div style="border: 1px solid #ccc; padding: 5px;"> <p>XW MPPT80 0 Online</p> <p>Operating Mode: Standby</p> <p>Charge Status: Stand alone</p> <p>Charge Mode: Stand alone</p> <p>DC Input Association: Solar Array 1</p> <p>IP/Power: 0 W</p> <p>IP Voltage: 0 V</p> <p>Battery Association: House Battery</p> <p>DC Output Power: 0 W</p> <p>DC Output Voltage: 0 V</p> </div>	<div style="border: 1px solid #ccc; padding: 5px;"> <p>SEMB_BMS 1.4 Online</p> <p>Voltage: 53 V</p> <p>Temperature: 16.58 °C</p> <p>State of Charge: 99 %</p> <p>State of Health: 100 %</p> <p>Device Number: 0</p> <p>Device Name: BMS</p> <p>Device Association:</p> </div>
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How To Set Up Fortress Power Lithium Batteries Using Schneider Equipment

Exhibit D

InsightLocal | Version: v1.00 | Build number: 418 | Connect Gateway

Dashboard | **Devices** | Events | Setup | About

Inverter/Charger: KW604210 | Charge Selection

Status | Performance | Events | Configuration | Diagnostics | Firmware | Grid Codes

Device Overview | **Inverter/Charger** | Charge Controller | Other Devices

Controls

Inverter Settings

Charger Settings

AC Settings

Grid Support

Generator Support

Auxiliary Relay

Multi-unit Configuration

Associations

Advanced Features

Advanced Device Settings

Battery Management System Settings

Device Instance

Modbus Settings

Refresh | Back | Advanced

Charger Settings

Battery Type: Li-Ion

Battery Bank Capacity: 210 Ah

Maximum Charge Rate: 100 %

Charge Cycle: External BMS

Recharge Voltage: 51.5 V

Note: 105 Amp hours per EFLEX

Charge controller recharge voltage should be set higher.

Reset

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Grid Support

Grid Support	<input checked="" type="checkbox"/>	Enabled	
Grid Support Voltage	<input type="range" value="53"/>	53V	12:00 AM
Maximum Sell Scale Percentage	<input type="range" value="100"/>	100	
Maximum Sell Amps	<input type="range" value="10"/>	10 A	
SoC Grid Forming Limit	<input type="range" value="80"/>	80 %	
EPC Enable	<input type="checkbox"/>	Disabled	
State of Charge Control	<input checked="" type="checkbox"/>	Enabled	

Grid support voltage setting is user specific based on sell back amount vs. reserve capacity

Note: XW Pro only - Make sure State of Charge Control is Enabled

Battery Management System settings

Fault on loss of BMS status information: <input checked="" type="checkbox"/> Enabled	Discharge Overcurrent Offset: <input type="range" value="82.9"/> 82.9 A
BMS Status Lost Fault Trip time: <input type="range" value="200"/> 200 s	Discharge Overcurrent Trip Time: <input type="range" value="2"/> 2 s
Charge Voltage Limit (BMS status lost): <input type="range" value="55"/> 55 V	DC Undervoltage Offset: <input type="range" value="3"/> 3 V
Discharge Voltage Limit (BMS status lost): <input type="range" value="51.4"/> 51.4 V	DC Undervoltage Trip Time: <input type="range" value="10"/> 10 s
Charge Current Limit (BMS status lost): <input type="range" value="55"/> 55 Amp Per Eflex	DC Overvoltage Offset: <input type="range" value="1"/> 1 V
Discharge Current Limit (BMS status lost): <input type="range" value="60"/> 60 Amp Per Eflex	DC Overvoltage Trip Time: <input type="range" value="5"/> 5 s
Charge Overcurrent Offset: <input type="range" value="10"/> 10 A	Fault on loss of State of Charge information: <input checked="" type="checkbox"/> Enabled
Charge Overcurrent Trip Time: <input type="range" value="600"/> 600 s	

XW Pro only: Enable Fault on loss of BMS Status / State of Charge

Exhibit E

Dashboard
Devices
Events
Setup
About

- Device Overview
- Inverter/Chargers
- Charge Controllers
- Other Devices

Other: BMS 0
Change Selection

Status
Configuration

Basic
Advanced

BMS_DEV
▼

Device Association
House Battery Bank 1

Note: Be sure to click apply"

Apply
Reset