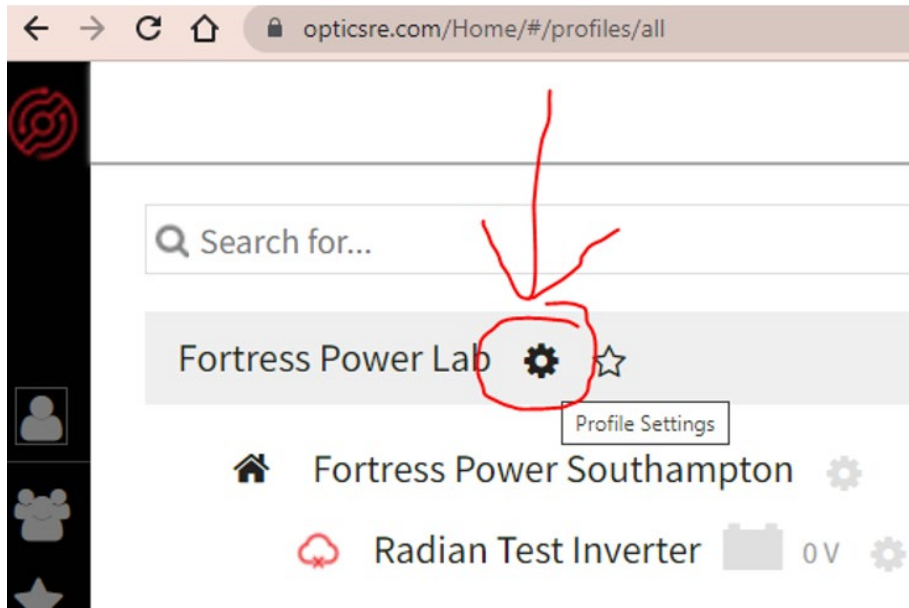# Share Your OpticsRE online monitoring with Fortress Power

Sharing OpticsRE with Fortress Power
Log into OpticsRE and Click on "My Profiles" in the side menu.

1. **Click on the Gear icon next to the site name.**

2. **Add "techsupport@fortresspower.com as an Admin profile.**
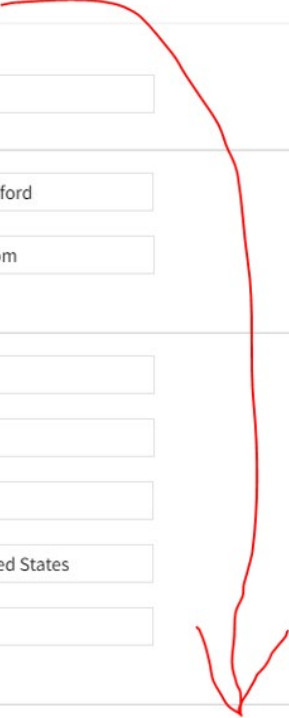
Fortress Power Lab

Profile Name	Fortress Power Lab	

Primary Contact	Bob	Bradford
	techsupport@fortresspower.com	

Mailing Address	505 Keystone Rd	
	Street address #2	
	Southampton	PA
	18966	United States
	+	18604990622

People with Access   ● Add a Person

Fortress Power	☑ Profile Admin

SAVE SETTINGS

Unpack batteries and check voltage

1. Unpack the batteries and turn each battery on by itself.
2. Note the voltage of each battery and serial number. The serial numbers are useful during warranty submittal.
3. The batteries must be within +/-0.5V of each other before commissioning. Groups of 4 batteries or more may require a narrower voltage range to commission properly.
4. Turn off the batteries and install them in parallel.

Notes
If the battery voltages are significantly different, one technique is to finish battery installation and only turn on the lowest voltage battery using the pushbutton. Charge the battery, and when the charging voltage is ~0.2V above the resting

voltage of the next lowest battery, turn it on too. Proceed until all batteries are turned on and at the same voltage level. If the batteries are below 51V, keep charging amperages below 10A per battery.

If the batteries are slightly more than +/-0.5V from each other, turning on the highest voltage batteries only will reduce their voltages, and turning on the lowest voltage batteries only will lower the highest voltage. Likewise, turning on the lowest voltage batteries as a group will raise the lowest voltage. Then, all the batteries can be turned on within a 0.5/V difference.

Use of the Fortress firmware update tool can help speed up commissioning times. Fortress installers should request a firmware update tool by filling out a support ticket at https://support.fortresspower.com

Radian / FXR / VFXR Inverter Settings

Inverter	80% DoD, 6000 cycles
Absorb Voltage and Time	54.4 Vdc/ 2.0hr
Float Voltage and Time	54.2 Vdc / 0.0 hr *only float with w/inverter if charge controllers unavailable
Re-float Voltage	52.4 Vdc *Increase by 1V if charge controllers unavailable
Re-Bulk Voltage	51.2 Vdc *Increase by 1V if charge controllers unavailable
AC Input Mode	Grid Tied (default, adjust as needed)
AC Charger Limit in AC	LFP10:15 Aac per battery eFlex:15Aac per battery eVault: 30Aac per battery
Low Battery Cut-Out Voltage	50V *user adjustable
LBCO Delay	130 seconds *user adjustable
Low Battery Cut-in Voltage	51.2 *user adjustable
High Battery Cut-Out Voltage	56.4V
HBCO Delay	10 seconds

High Battery Cut-in Voltage	55.2V
SellRE (Offset) Voltage Max	51.6V for "zero-outflow", 53.6V for selling at "100% full"
Temp Sensors	Do not use temperature sensors / reduce any temperature coefficients to as close to zero as allowed

*divide voltage by 2 for 24V FXR settings

Skybox Settings

The settings below should be programmed into the unit under the Custom choice.

Inverter	
Maximum SOC	100%
Minimum SOC	20%
Absorb Charge	Timed
Absorb Voltage	55.2 Vdc
Absorb Time	02:00 hr
Float Charge	Disabled
Float Voltage	Can be left at default
Float Time	Can be left at default
Re-float Voltage	54.4 Vdc
Re-bulk Voltage	52.5 Vdc
Equalize Voltage	54.4 Vdc
Minimum Equalize Time	00:00
Max Charge Current (Adc)	LFP-5 & LFP-10: 50Adc eVault: 100Adc eFlex: 60Adc
Max Discharge Current (Adc)	LFP-5 & LFP-10: 90Adc eVault: 125Adc eFlex: 60Adc
Grid Charge Limit (kW)	Site specific
Low Battery Cutout	50 Vdc
LBCO Delay	130 seconds
Low Battery Restart	51.2 Vdc
High Battery Cutout	56.0 Vdc

HBCO Delay	10 seconds
High Battery Cut-in	55.5 Vdc
Battery Series	Custom
Battery Model Number	Custom
Battery Description	Fortress Power
Battery Total Amp-Hours	eFlex: 105Ah LFPP-10: 200Ah eVault: 360 Ah
Charge Efficiency Factor	96%
Absorb End Amps	1Adc

FM60/80/100 Charge Controller Settings

Charge Controller	
Absorb Voltage and Time	55.2, 2 hours
Float Voltage	54.4
Rebulk Voltage	52.5
DC Current Limit	LFP-10: 80A per battery ÷ # of controllers eVault: 170A per battery ÷ # of controllers eFlex: 55A per battery ÷ # of controllers
Absorb End Amps	1A

FlexNET DC Settings

FLEXnet DC (FN-DC)	If FLEXNET DC display voltage is not within 0.1V of inverter terminal voltage, calibrate Outback equipment
Battery Amp hour	eFlex :105Ah per battery LFP-10: 200Ah per battery eVault: 360Ah per battery
Charged Voltage	54.0V
Charged Time	15 minutes
Charged Return Amps	1A
Battery Charge	96%

Relay Invert Logic	No *User adjustable
Relay Voltage	High = 53.8 ; Low = 51.2 *User adjustable
Relay Delay	High = 1, Low = 0 *User adjustable
MATE3/MATE3s	
FLEXnet DC Advanced	Low SOC Warning = 20% *User adjustable
FLEXnet DC Advanced	Critical SOC Warning = 10%*User adjustable

Calibrating Outback Systems

Calibrating the battery literally means charging the battery 100% full and confirming the battery resting voltage is above 54V. This can be done onsite or remotely.
Calibration is not a regular task. Good times to calibration are:

- System commissioning
- occasionally when batteries are kept 80-100% full
- deep discharge recovery
- extended periods of overcast / low production days
- anytime when the % state-of-charge says 100% but battery voltage is below 54V

Conforming calibration is easiest to do online but can be done onsite.

1) Go to OpticsRE.
2) Reduce all system loads and charging to a bare minimum, including charge controllers.
3) Determine the battery voltage on the inverter terminals.
4) Calibrate the charge controllers to match the inverter terminals.
5) Determine if the FlexNET DC also needs calibration and follow this link for further instructions:
https://www.outbackpower.com/downloads/documents/appnotes/fndc_field_cal_app_note.pdf

Onsite:

C-7. Calibrate

This menu allows adjustment of the voltmeter. Calibration can improve system performance. Multiple controllers can achieve voltage targets at the same time.

One or more uncalibrated controllers may stop charging because they read the batteries as fully charged. On the FLEXmax 60 or 80 display, this is shown as a mode called "EX-ABSORB." (See the FLEXmax literature for more information.)

- **Battery Voltage** — Calibrates the DC voltage measurement made at the controller's battery terminals.

```
                    Calibrate
                                    Port 6
  Battery Voltage    28.8 VDC  0.0
```

To calibrate the charge controller:

1. Place an accurate DC voltmeter at the battery terminals (not the charge controller terminals).

2. Operate the controller while delivering normal PV current, then adjust the **Battery Voltage** setting until the inverter's battery voltage matches the reading on the DC voltmeter.

IMPORTANT:
Calibration does not change the actual voltage of the charge controller, only the reading of that voltage.

I-13. Calibrate

This menu allows adjustment of the inverter's internal voltmeters. Calibration can improve system performance. Multiple inverters can achieve voltage targets at the same time.

This image shows the readings taken by the inverter in Vac and Vdc. To the right of each value is the calibration setting which adjusts the reading.

```
            Calibrate          Port 1
Input Voltage    115 VAC   ▣
Output Voltage   115 VAC   -3
Battery Voltage  28.5 VDC  0.0
```

The settable range will vary with inverter model. See the inverter literature for specific ranges.

- **Input Voltage** — Calibrates the AC voltage measurement made at the inverter's AC input (from an incoming AC source).

NOTE: Radian-class inverters have two **Input Voltage** settings due to the dual inputs.

- **Output Voltage** — Calibrates the AC voltage measurement made at the inverter's AC output (from the inverter's own power, or from an incoming AC source).

- **Battery Voltage** — Calibrates the DC voltage measurement made at the inverter's DC terminals.

To calibrate the battery voltage reading:

1. Place an accurate DC voltmeter at the battery terminals (not the inverter terminals).

2. Operate the inverter at about half power, then adjust the **Battery Voltage** setting until the inverter's battery voltage matches the reading on the DC voltmeter.

The AC readings are calibrated similarly at the AC terminals.

IMPORTANT:

Calibration does not change the actual output of the inverter, only the reading of that output.