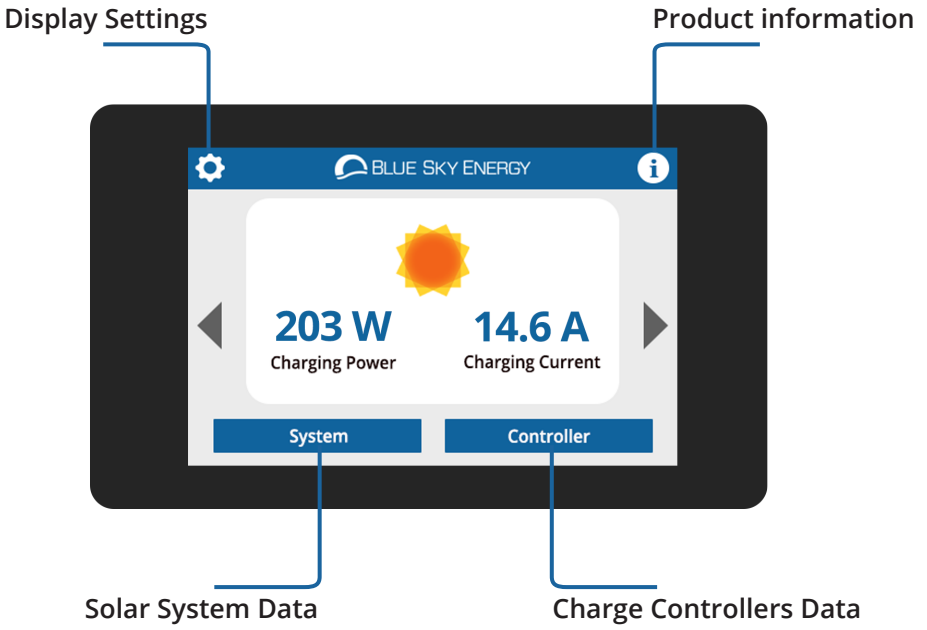
ProTouch Manual

Remote Display | Revision 1.0 2022

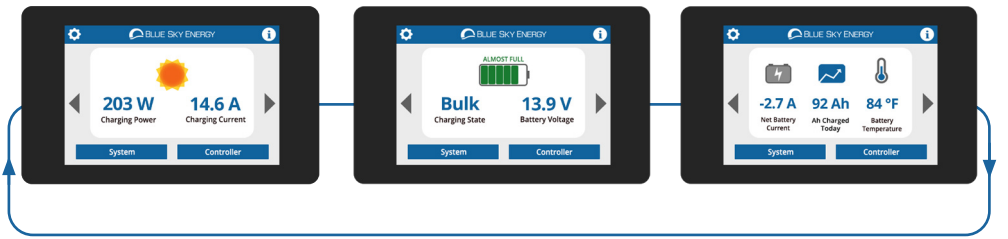
Product Description:

The **ProTouch** (PT) is a 3.5" flush-mounting touchscreen display compatible with any Blue Sky Energy charge controller with IPN network capability. It provides a user-friendly graphic interface for monitoring your solar system as well as five preset charge profiles for your charge controller.

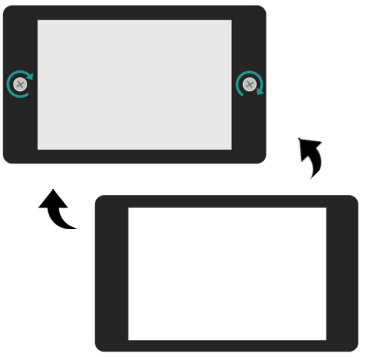


Home Dashboard

These three page provides a quick look at the most important data as the solar power input, charging current output, battery state, battery net current, etc.



Flush Mounting Instructions:



1. Make a 2.38” x 4.40” (60.5 mm x 112 mm) hole on your mounting surface.

2. Position the PT in the hole and affix it with the two screws (included). Remove the plastic layer protection on the display.

3. Apply the front cover on the PT.

Installation:

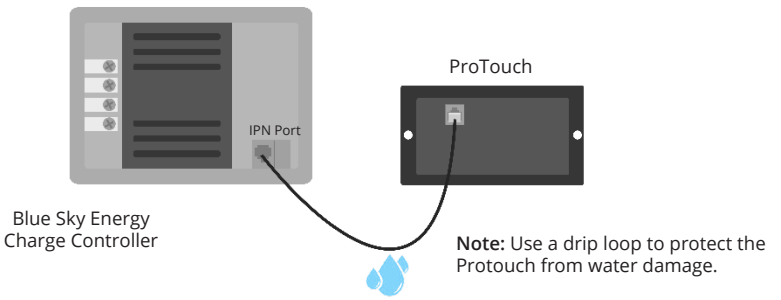
- Plug the PT to the Blue Sky charge controller via RJ-11 cable (included) as shown in the wiring diagrams below. If there are multiple controllers installed in a system, the PT can be plugged into any of the IPN Networked BSE charge controllers. Refer to the charge controller’s manual for location of the IPN port.

NOTE: The PT is powered by the RJ-11 cables, please make sure the charge controller is connected to the battery and the battery voltage is > 9.0 V.

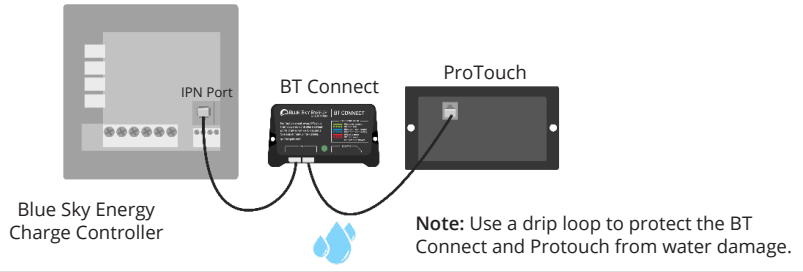
CAUTION: Do not connect the PT and the IPN ProRemote in the same IPN network.

- For a longer distance between charge controller and ProTouch, replace the 25’ RJ-11 cable with a longer RJ-11 telephone cable with “reversed” pinout.

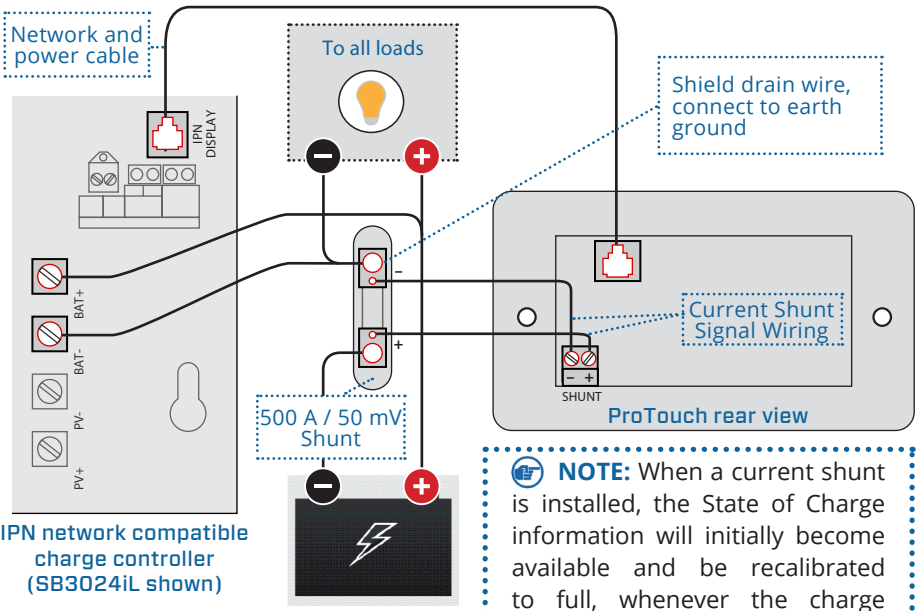
ProTouch and Charge Controller



ProTouch, BT Connect and Charge Controller



- Connect the ProTouch to the current shunt as shown below for full battery monitoring.



NOTE: When a current shunt is installed, the State of Charge information will initially become available and be recalibrated to full, whenever the charge controller transitions from Absorption to Float Mode.

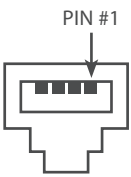
CURRENT SHUNT SIGNAL WIRING

The shunt itself is not a polarized device. Once installed in series with battery negative it produces the +/– signal polarity shown in the Wiring Diagram when the battery is being charged. The +/– shunt signal connections must connect to the corresponding +/– ProTouch-S shunt terminal block locations for proper current polarity reading on the screen. The shunt produces very sensitive microvolt level signals and signal wires must be (stranded/braided) twisted pairs. Lengths less than 35 feet (10.7 m) can be unshielded twisted pairs if routed away from power or noise generating conductors. Shielded twisted pair cable is preferred for lengths greater than 35 feet (10.7 m) or where electrical noise is expected. Terminate shield drain wire to earth ground at one end only.

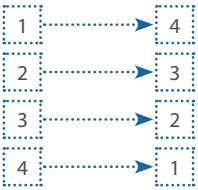
NOTE: Standard 4-pin telephone cables swap pin numbers end-to-end. If cables are custom terminated or cable couplers are used, be certain pin swap is maintained. Do not plug into anything other than a IPN-compatible communications port. Total maximum cable length should be limited to approximately 500 feet (152.4 m).

Network / Power Cable Schematic and Maximum Cable Length for 0.50 V Drop

RJ-11 plug - viewed from open end where cable is inserted



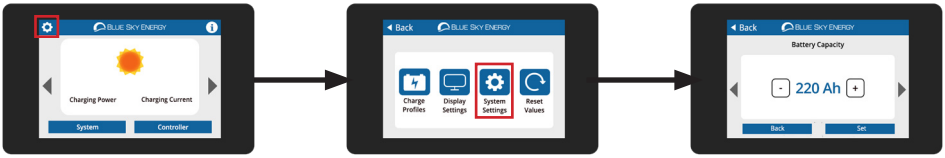
Standard 4-pin telephone cable pin swap



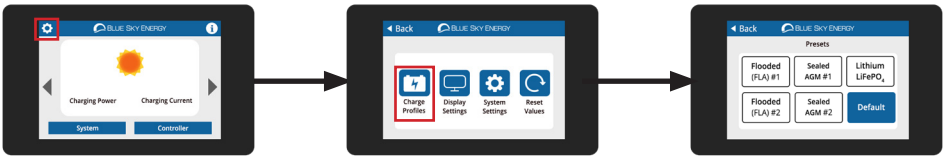
Wire Gauge (AWG)	Max. Recommended Cable Length (Feet / Meters)
30	45 / 13.7
28	73 / 22.2
26	117 / 35.7

Quick Start Settings:

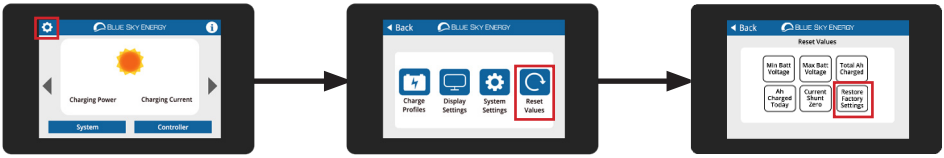
1. For accurate battery monitoring, set the nominal battery capacity (Ah, rated @ 20 HR).



2. As default, the BSE charge controllers are programmed for a Lead-Acid battery, click the highlighted icon "Default" to display current charge parameters.



3. To reset the charge controller to the factory setting, follow the following procedure and click on the values to reset.

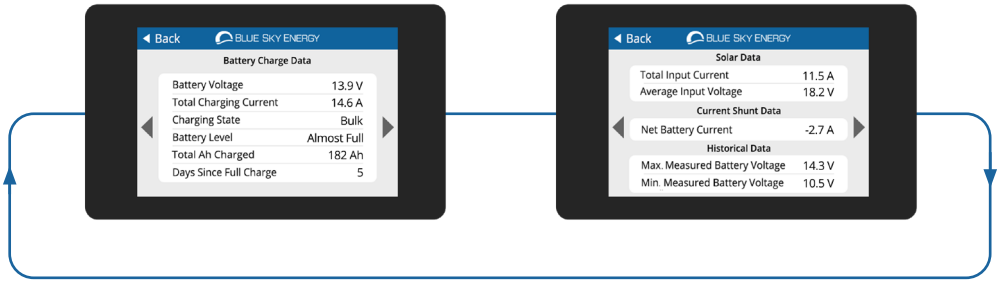


View Flow Chart Graphic Interface:

System and Controller Data

Home ····➤ System ····➤ Battery Charge Data

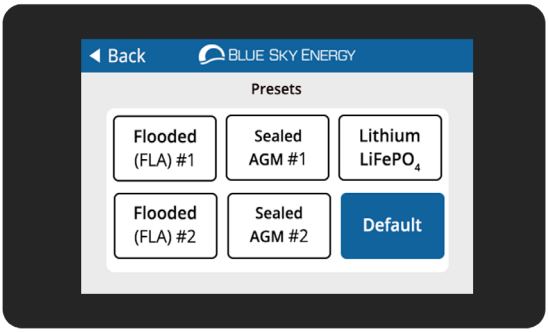
By clicking "System" from the home screens, is possible to monitor the battery charge and solar data real-time. These two screens provide all the data and battery voltage historical data.

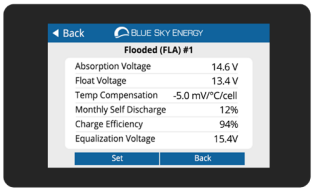


Preset Charge Profiles

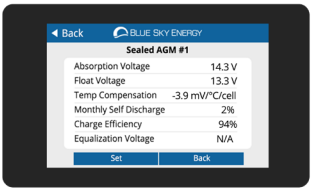
Home ····➤ Display Settings ····➤ Charge Profiles

The ProTouch allows you to configure the solar charge controllers with one of the five (5) preset charge profiles, avoiding potential mistakes and making the programming procedure fast and easy. Check the specification of the battery manufacturer and select the battery type; Sealed, Flooded, or Lithium. The BSE charge controllers are programmed at the factory with a Default charge profile for lead acid batteries.

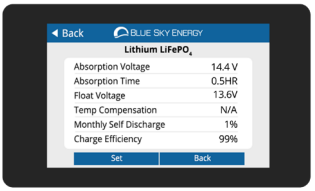




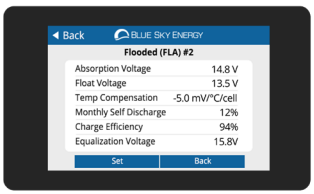
Flooded #1



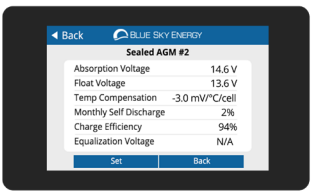
Sealed #1



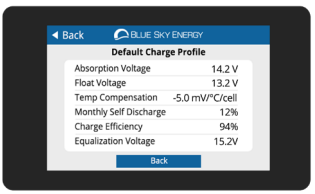
$LiFePO_4$



Flooded #2



Sealed #2



Default

NOTE: When programming the Blue Sky Energy charge controller with a different charge profile (Lead-Acid or Lithum), please consult the manual of the battery manufacturer and select the appropriate charge profile.

NOTE: When an external current shunt is installed and setup to charge Lead Aacid batteries, the charge controller will base its transition from Absorption to Float Mode on the NET current reaching the battery or the Absorption Time, whichever is satisfied first. The Float Transition Current is 1.5A/100Ah for Default and FLA#1 & FLA#2, is set to 0.5A/100Ah for AGM #1, and 1.7A/100Ah for AGM #2.

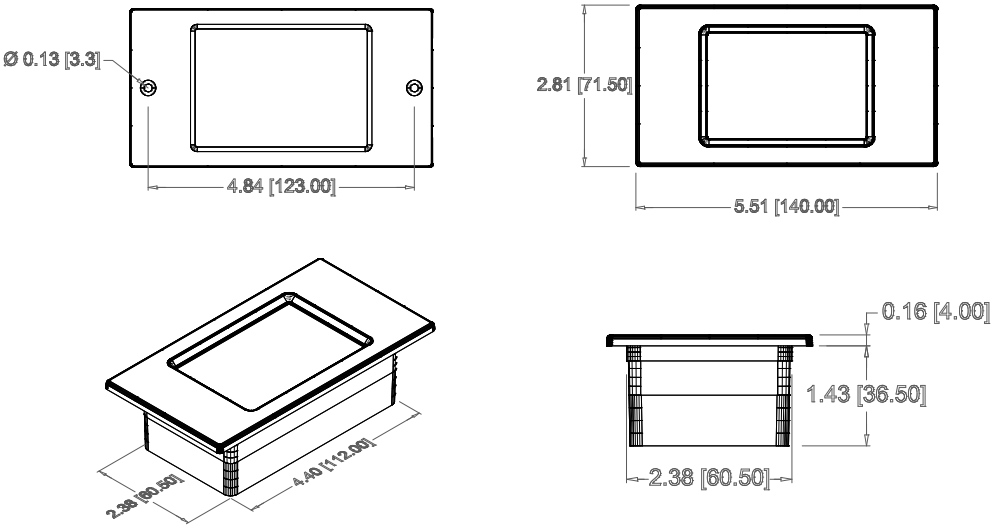
Troubleshooting Guide:

Symptom	Probable Cause	Items to Examine or Correct
Display blank	No power	Charge controller not properly powered.
		Network cable faulty, not plugged in or standard 4-pin telephone swap (end-to-end) cable not utilized.
Display turns on, but battery voltage shows an incorrect number	ProTouch not communicating with charge controller	Network cable faulty.
		Charge controller may have locked up, re-boot by momentarily removing battery and PV power from charge controller.
		One charge controller is not set to Master, more than one charge controller is set to Master, or more than one follower is assigned to same address.
		Controller-to-controller network cable not wired A-to-A, B-to-B, or wires are open or short.
Only Master (IPN Address 0) shown in Controller screen	Charge controller not communicating with ProTouch	Controller-to-controller network cable not wired A-to-A, B-to-B, or wires are open or short.
		More than one charge controller is set to be Master or more one charge controller set to same follower address.
		Follower controller does not have 9.0 V minimum battery voltage for operation
Days since Full Charge not accurate	The Day counter increments once each 24 hours since the controller was last in Float Mode	Normal Operation. Day counter updates when Float Mode is achieved.
Battery Level is not available	External Current Shunt not connected	An External current shunt needs to be connected to the ProTouch Display in order to observe this Data.
	Controller has not transitioned to Float mode since installed	The controller needs to transition from Absorption to Float mode in order for the State of Charge information to be shown initially.
Battery Level indicator is incorrect (Cont'd...)	Incorrect programming	Battery Capacity (25 °C @ 20 hr. rate) should be programmed in the System Settings menu
		Type of Battery should be selected in the Charge Profile Screen
	Controller has not transitioned to Float mode since installed	Battery Capacity recalibrated to full when controller transitions from Absorption to Float Mode
	Current shunt observations inaccurate	see "Battery current seems inaccurate" troubleshooting
	Battery not fully charged for an extended period	Since battery charge / discharge behavior is not ideal, error in the State of Charge builds as the battery cycles without becoming full.
		Try to fully charge the battery often.
	Charge controller is not what normally fully charges the battery	To get the best accuracy, the charge controller should be what normally or at least regularly brings the battery back to full charge.

Symptom	Probable Cause	Items to Examine or Correct
(Cont'd) Battery Level indicator is incorrect	Temperature sensor faulty	Many factors are temperature compensated. Confirm proper temperature sensor operation as described in the charge controller manual.
Battery current seems inaccurate	Some charging sources or loads do not go through shunt	Confirm that no other current carrying conductors other than the shunt cable is connected to battery negative.
		All loads and charge sources should be routed through the external current shunt.
	Shunt wiring incorrect or faulty.	Shunt wired in series with battery positive, should be negative
		One or both shunt signal wires open or short.
		Standed/braided twisted pair wire should be utilized. Solid core twisted pair wire can fracture due to continual movement.
	Shunt signal wires picking up electrical noise	Confirm signal wires are (strainded) twisted pairs.
		Consider using shielded twisted pair cable for signal wires.
		Relocate signal wires away from power or noise generating wiring
	Excessive voltage drop in network cable to ProTouch Display or in system power wiring	Utilize the correct twisted pair wire guage for the instalation distance for a maximum 0.50V drop as referenced in the manual.
	Net battery current not reading 0.0 A with zero amps flowing	Perform Reset Current Shunt Zero function as demonstrated in the "Resetting IPN ProRemote Display Current Shunt Zero Offset" video in our Learning Center (https://sunforgellc.com/learning-center/)
	Incorrect current shunt utilized	Use only a 50mV/500A rated shunt
Net battery current polarity reversed	Signal wires on shunt reversed	Swap signal wire positions on shunt.
Net Battery Current & Ah Charged today showing "--"	External Current Shunt not connected	An External current shunt needs to be connected to the ProTouch Display in order to observe this Data.
Battery Temperature showing "--"	Battery temperature sensor not attached	A battery temperature sensor need to be attached to the charge controller. Use only BSE battery temperature sensor p/n 930-0022-20.
ProTouch Display continually illuminated	Energy Saving mode disabled	Change Energy Saving mode to "ON" in the Display Settings Menu
Auxiliary/Load output voltage not displaying correctly.	No Auxillary battery attached	If the charge controller is configured for the 2A Auxillary battery maintainer (factory default) and no Auxillary battery is attached, the Load Output Voltage will reflect the main (house) battery's voltage

Dimensional Drawing:

inch [mm]



Specifications:

Display:	Touchscreen TFT 3.5”
Resolution:	480 x 320 pixel
Power Consumption:	Max. 1.5 W (100% backlite ON), Default 1.0 W (50% backlite ON)
Stand-by Consumption:	0.45 W
Battery Ammeter:	Accuracy +/- 0.5% FS
Current Shunt:	2-Position Terminal Connector (ProTouch-S)
Operating Temperature Range:	-20 °C, +70 °C
Environmental Protection:	IP20
Communication and Cabling:	IPN Communication via 25' (7.6 m) RJ-11 (4-pin telephone cable provided)
Weight:	5.30 Oz (150.2 g)
Dimensions:	2.81” x 5.51” x 1.59” (71.5 mm x 140 mm x 40.5 mm)
Certifications:	CE, FCC, RoHS
Warranty:	5 years

5 year limited warranty

Visit https://sunforgellc.com/product/protouch/ for more information and terms of the warranty.