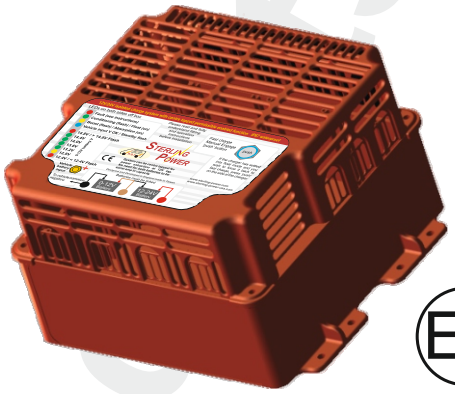
USERS MANUAL

STERLING POWER

Sterling Power
Alitech
BB1230 x2 (JSC1)
E13 10R-0513963
12V - 12V



Jump Start Charger Battery to Battery charger Module 1 (JSC1)

What is the JSC1?
- essentially 2x 12V-12V battery to battery chargers (w/ isolated outputs) working in conjunction.
- the charger's complement regen. braking / smart alternator - Euro 5 / Euro 6 engines.
- allows for charging of either a 12V service battery or a 24V (2x 12V in series) service battery.
- As the 2 x 12V batteries within the 24V bank are charged independently it enables better balancing within the 24V bank. E.g. If one of the 12V batteries is larger/smaller (in Ah) or older/newer it directs the charge to the 12V battery which requires the greater attention. This is ideal if you are using the 24V service bank to centre tap for large 12V loads (e.g. jump starting other vehicles | inverters etc.).
- The JSC1 can be forced into bulk mode to supplement large loads drawn from the service batteries, if needs be.

JSC1 kit - what comes in this box?
- The 12V - 12V/24V battery to battery charger
- 2m of pre-wired DC cables
- NO HEAVY DUTY CABLES SUPPLIED - length required shall be unique per individual.

Module 1 kit (JSC1MK) optional

JSC1MK - what comes with the kit?
- 3 x 100A (GANL100A) fuse.
- 3 x GANL fuse holder (GFH8).
- 12 x 8mm eye terminals for crimping/soldering to charge cables.
- **CONTACT STERLING FOR THIS KIT - OPTIONAL JSC1MK**

Fuse Holders and Fuses

3 x GFH8

12 x 8mm terminals

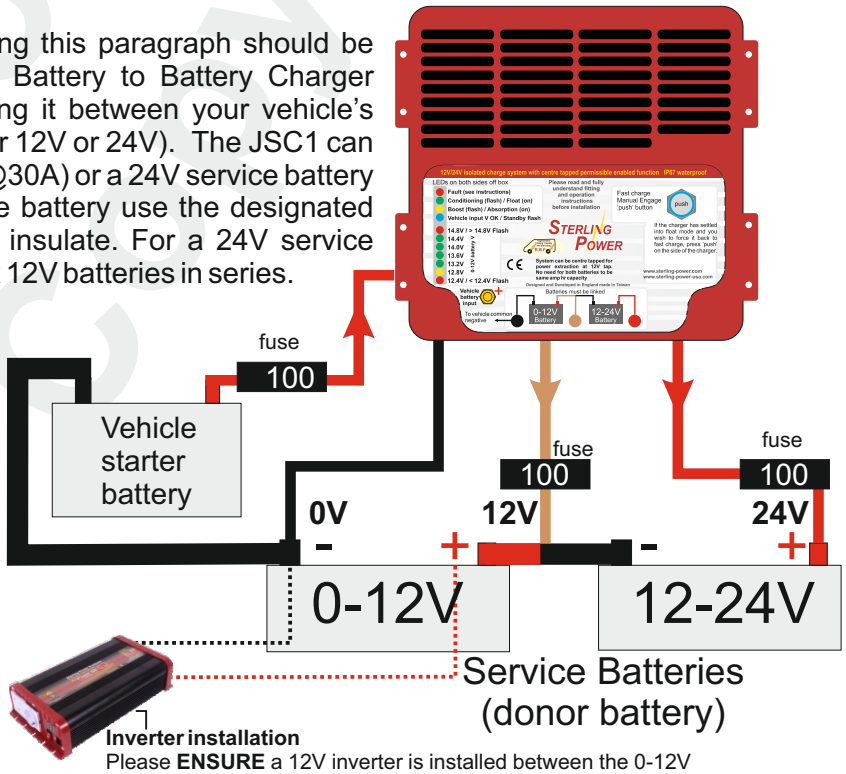
3 x 100A GANL fuse

MUST READ

For the vast majority of users (90%+) reading this paragraph should be sufficient for installation. The Jump Starter Battery to Battery Charger (JSC1) can be installed by simply connecting it between your vehicle's starter battery and the service batteries (either 12V or 24V). The JSC1 can be wired up to charge a 12V service battery (@30A) or a 24V service battery (@30A). If you wish to charge a 12V service battery use the designated brown wire. With the 24V (red wire) simply insulate. For a 24V service battery use both outputs and tap across the 2 x 12V batteries in series.

DO NOT stack both of the 12V outputs onto a 12V donor battery.

The JSC1 simply starts charging your service batteries when the input voltage exceeds 13.6V and switches off when the voltage drops below 13.3V for more than 120s. Going above 13.6V for 5 seconds shall reset this timer. The default charging profile is 14.4V abs. and 13.6V float - *for sealed lead acid batteries (x2 for 24V)*. There is a force to boost button on the side of the JSC1 which allows the charger to revert to bulk charging if your service battery bank has a high current demand.



Inverter installation
Please **ENSURE** a 12V inverter is installed between the 0-12V battery **NOT** the 12-24V battery. This goes for any 12V load.

WARNING:

DO NOT OPEN UNIT | HIGH INTERNAL VOLTAGE | PLEASE READ AND UNDERSTAND THE INSTRUCTIONS PRIOR TO INSTALLING OR OPERATING THIS PRODUCT | SHOULD ONLY BE INSTALLED BY A QUALIFIED PERSON

Contents Page

Legal and Safety

Using the Instruction Manual

This manual must be read throughout before installing this electronic device. Do not lose these instructions - keep them safe. The most up to date instructions can be found on the Sterling Power website. Please refer to the latest instruction manual before contacting Sterling. At Sterling, we endeavour to include all of the product information that we can think of into the manual.

Installation of the electronic device must be carried out by a qualified and trained personnel only. The personnel must be familiar with the locally accepted guidelines and safety measures.

Sterling Power's warranty statement

A comprehensive warranty statement is provide at the back of the instruction manual. A comprehensive warranty statement can also be found on sterling-power.com.

Copyright and plagiarism

Liability

Sterling Power can not accept liability for:
- consequential damage due to use of this device
- possible errors in the manuals and the results thereof

Device modification

Please do not modify the device unless you have been instructed to do so by Sterling Power, directly. Product modification shall be done at Sterling, when needed. Warranty shall be voided if personal attempts are made to modify the device, without Sterling's approval.

Use the battery to battery charger only:

- For DC to DC conversion.
- For DC current limiting.
- With fuses protecting the DC cables.
- In a well ventilated, dry, dust-free and condensation free environment.
- When instruction manual has been read through.

Safety Symbols

Example - WARNING. Never use the device in situations where there is danger of gas / dust EXPLOSION or potentially flammable products.

General maintenance and repair

The device must be switched off during maintenance. It must also be protected against unexpected switching off. Remove battery connections and ensure unit is off. If repair is required, only use original parts.

General safety and installation precautions

- Install device in well ventilated space. Do not expose device to: Rain, snow, spray, moisture, pollution, condensation. Do not cover or obstruct ventilation openings.
- Device connects to common negative. Common negative must be earthed.
- In case of fire use a fire extinguisher.
- Ensure reverse polarity and short circuiting is avoided - to prevent damage to battery.
- Protect DC wires with the appropriate sized fuse.
- Check cabling annually- fix where needed.
- Avoid contact with device with damp hands.
- Ensure the device is adequately and securely mounted to prevent the unit from displacement.
- Use a professional to install device.

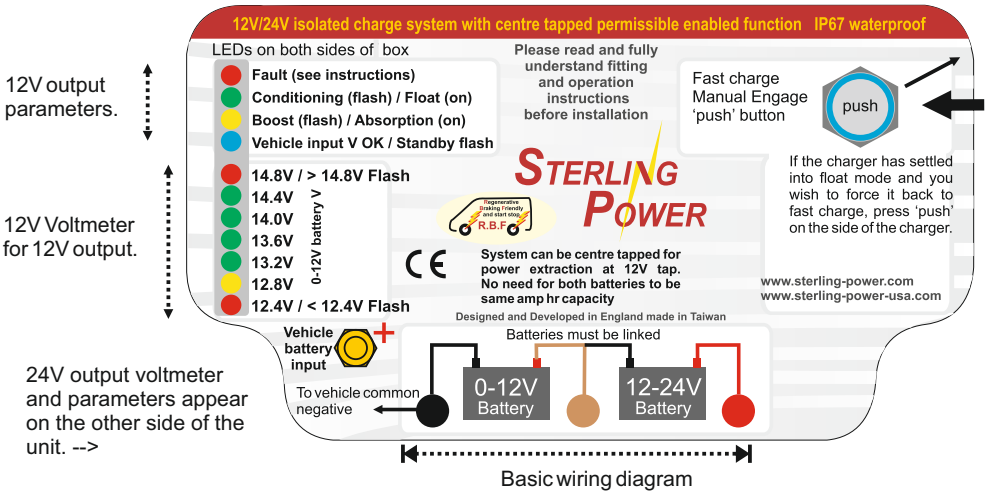
Battery safety

Excessive charge or discharge and high voltages can cause serious damage to batteries. Never exceed the recommended limits. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters the eye(s), immediately flood the eye(s) with running cold water for 20 minutes and seek medical attention.

Give extra care to not drop metal tools or jewellery on to the battery terminals as short circuiting can take place. Refrain from charging battery up to 4 hours prior of installation to avoid the formation of explosive gases.

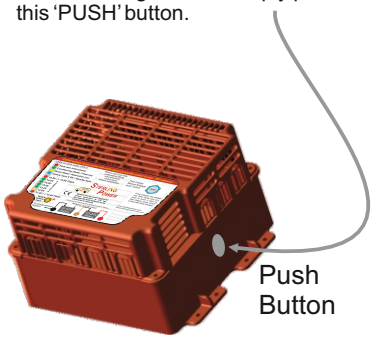
Never smoke / generate a spark around batteries.

Front Label

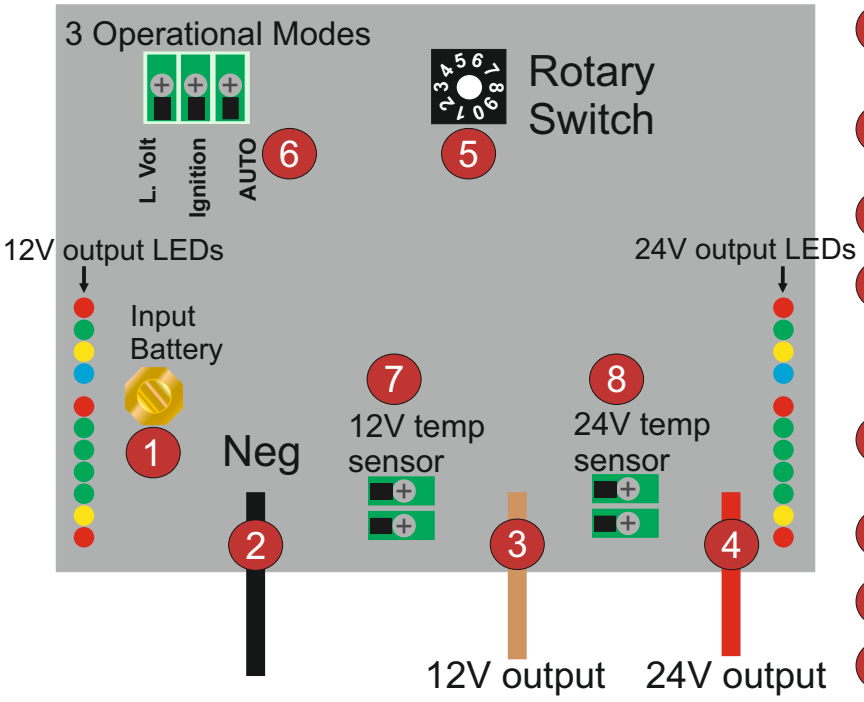


Push - this button is located on the side of the JSC1. Press it to manually engage the fast charge cycle.

If the charger has settled into float mode and you wish to force it back into fast charge mode, simply press this 'PUSH' button.



Under the Lid



1. Input battery terminal. This terminal should be connected to the starter battery of the vehicle.
2. Common negative terminal. Connect this black negative cable to the common negative.
3. 12V output for 12V charging at 30A.
4. 24V output for 24V charging at 30A. Must use in conjunction with the 12V output. Charge the 24V bank by centre tapping across the 2 x 12V batteries in series.
5. Rotary switch for battery chemistry selection (below).
6. 3 Operational modes selection (page4)
7. 12V temperature sensor.
8. 24V temperature sensor.

Battery Chemistry Type Selection - set before installing

Please set the rotary switch to the required number prior to installation. If you wish to change the switch position during JSC1 operation then the profile shall not change until the JSC1 has been turned off and on again (remove the negative and reconnect).

Rotary Switch

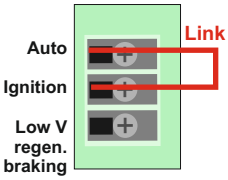
	Bulk / Abs.	Cond.	Float	Min | Abs. | Max	
#) Rotary Switch	Volts	Volts	Volts	Mins	Mins
1) Gel I	14.00	13.85	13.70	60	600
2) AGM I	14.10	13.75	13.40	60	480
3) Sealed (default)	14.40	14.15	13.60	120	480
4) Gel II	14.40	14.00	13.80	720	1440
5) AGM II	14.60	14.10	13.70	60	480
6) Open	14.80	14.00	13.30	60	480
7) Calcium	15.10	14.30	13.60	60	360
8) De-sulphation	15.50	--------	--------	240	240
9) *$LiFePO_4$	14.40	13.80	13.80	30	30

Lithium profile has reverse polarity protection disabled.

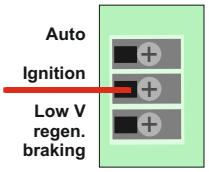
Remember it is the voltages which are more important than our battery types. After installation test the voltage from the unit is the desired voltage. **Ensure you remove at least 1 wire from the battery temperature sensor as the product voltage may be higher (if in cold climate) or lower (if in warm climate) than the preconceived voltage.** *The voltage requirements of the battery company will override our recommendations as it is them who are supporting the battery warranty.*

*****All voltages shall be 0.1V higher for the first 3 minutes of the charger's operation.***

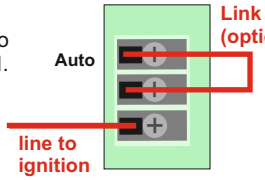
Operational Modes - set before operation.



How to connect?
Link the Auto and the Ignition terminals on the block together, as shown.



How to connect?
Connect ignition feed to the Ignition terminal. Can be any live feed.



How to connect?
Connect ignition feed to Low V regen braking. Link Auto to ignition connector.

1) Automatic activation (default setting). The most common mode, used in 99% of all installations including vehicles with Regen. braking system. This means that the unit is voltage sensitive (no ignition feed required). The moment the charger is installed onto an input and output battery it shall start charging for 120 seconds then turn off. Only when the input voltage goes to 13.2V-19.0V then the unit will simply start charging. If the voltage drops below 13.0V the unit shall turn off. With a caveat, read on.

However, if the input voltage has exceeded 13.2V for 5 seconds the regen. braking timer is prepped and shall become active if the input voltage drops down to 12.0V-13.3V. This timer is 240s (default - can be changed) and allows the charger to continue charging at these lower input voltages. If the voltage drops below 11.9V the charger goes to sleep irrespective of the timer. If the input voltage remains between 11.9V-13.0V for over 240s the charger also goes to sleep. To wake the charger, the input voltage needs to rise above 13.2V - this shall also reset the regen. braking timer.

2) Ignition feed w/ safe voltage activation
Mode 2 is identical to Mode 1. The only difference is that it requires a live signal on the ignition AND the aforementioned input voltages for it to remain charging. For example, if you have over 13.2V on the input terminal with no live feed then the Pro Batt Ultra shall be in standby. Only once you apply the ignition feed signal the Pro Batt shall start charging. The charger turns off when you turn off your ignition.
This mode is beneficial as it give you more control over when the charger operates. With a live ignition and low input voltage the charger shall still charge for 240 seconds, then turn off.

3) Pure ignition feed - WARNING flat batt.
If you just connect the ignition feed only to the bottom connector (remove the link) the BB shall operate when the ignition is live and turn off when the ignition is off. There is no timer, no trigger voltages - only a 10V (20V at 24V) low voltage trip.
With the link wire connected and the ignition feed connected the BB shall operate when the ignition is live. However, it shall also operate when there is no ignition under the conditions of mode 1 (above).

This mode is ideal for those who have Euro 6 engines that start up with the alternator off - here the starter battery's voltage does not exceed 13.3V, but you want the BB to charge.

Installation

Ensure the JSC1 is wired up as depicted below. Always use fuses. Connect the DC output cables first. Then the DC input cable, then the negative. The JSC1 shall light up provided it has battery voltage across the **Pos in** and **neg** terminal.

In default mode (1) or mode (2) the JSC1 shall simply turns off and goes to sleep after 60 seconds (no charging) if the input voltage has not risen above 13.6V. **WARNING,** If you have it set to mode (3) (Ignition feed, w/ Low voltage link) and the ignition is live then the charger shall charge until the input battery drops to **11.5V**. **VERY LOW**.

In default mode (1) or mode (2) the input voltage needs to rise to above 13.6V-19.0V in order for the JSC1 to start charging. Above 13.6V, for 5 seconds, the regenerative braking timer activates (120 seconds *default*).

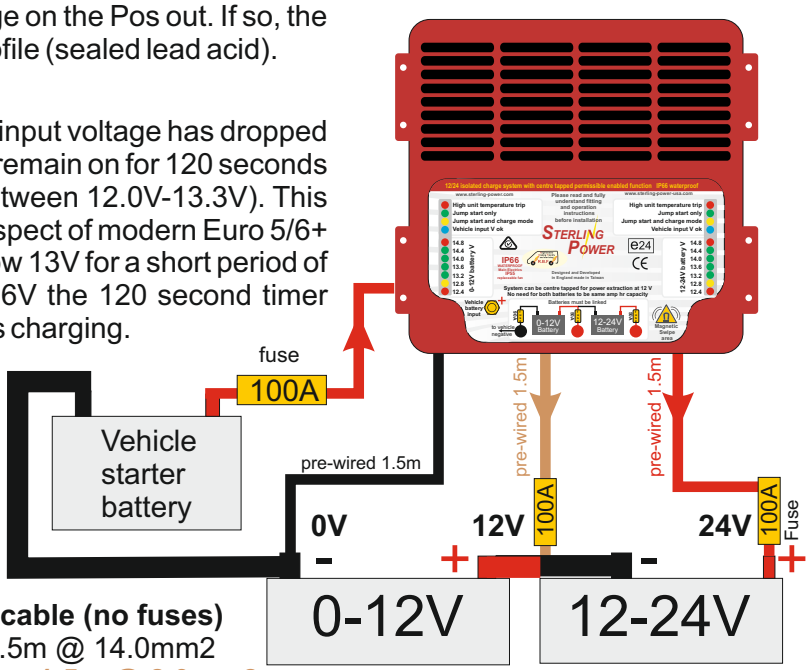
The JSC1 requires a battery voltage on the positive output terminal (Pos out) in order to start boost. Ensure that there is battery voltage on the Pos out. If so, the charger shall start charging at the default charging profile (sealed lead acid).

The JSC1 shall continue to operate normally until the input voltage has dropped below 13.3V. Between 13.3V and 12.0V the unit shall remain on for 120 seconds and then turn off (provided the input voltage stays between 12.0V-13.3V). This is required to complement the regenerative braking aspect of modern Euro 5/6+ engines - where the alternator's voltage can drop below 13V for a short period of time. When the alternator's voltage rises above 13.6V the 120 second timer ends (+ reactivates the timer) and the charger remains charging.

Cable size + Fuses

Recommended for cable runs extension of several metres. For longer runs, increase diameter. The negative is 14.0 mm2.

	Cable (mm2)	Fuse
12V Input	14.0	100A
12V Output	**8.0**	**100A**
12V / 24V Output	**8.0**	**100A**



Pre-wired cable (no fuses)
Negative 1.5m @ 14.0mm2
12V positive 1.5m @ 8.0mm2
12V / 24V positive 1.5m @ 8.0mm2

Advanced Installation - use with Jump Start

The diagram below is a follow on from the main installation diagram. Here we demonstrate how jump leads can be installed onto your service batteries.

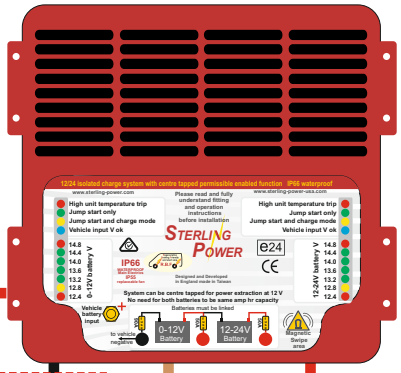
For 12V - take positive and negative leads from your 12V service battery. Put a 500A ANL fuse inline. We recommend splicing these cables and connecting them up via an Anderson socket (350A rated).

For 24V - take positive and negative leads from your 24V service battery. Put a 400A ANL fuse inline. We recommend splicing these cables and connecting them up via an Anderson socket (350A rated).

It is extremely important to fit the high amperage fuses (as depicted) to the positive cable. This shall protect against possible short circuiting or accidental 24V service to 12V recipient connections.

Inverter installation

Please **ENSURE** a 12V inverter is installed between the 0-12V battery NOT the 12-24V battery. This could prevent a fire. This goes for any 12V load, please use the 0-12V battery is used.



100A fuse

Vehicle starter battery

0V

12V

100A Fuse

24V

100A Fuse

0-12V Service Batteries

12-24V

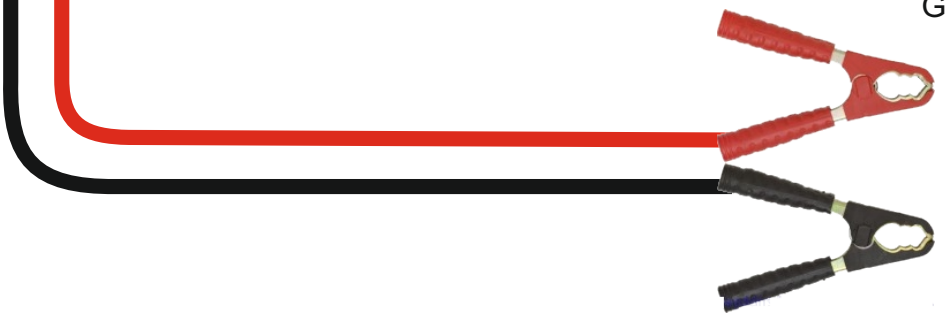
12V Output

Anderson type plug/socket 350A continuous

500A fuse on 12V line GFH8 fuse holder

24V output

400A fuse on 24V line GFH8 fuse holder



Jump Leads + Fuses

thicker cabling (larger cross sectional area) is always recommended. You shall experience voltage drop (energy loss) if the cables are too thin. Ensure cabling is high quality and insulated - do not use exposed jump leads.

12V fuse recommended 500A GANL
24V fuse recommended 400A GANL
Fuse holder is GFH8

	Cable (mm2)	Fuse
12V Output	35.0	500A
24V Output	20.0	400A

The recommendations are for the average truck system. These values could be lower or higher based on your demand.

Advanced Installation - use with Jump Start

Firstly, ensure the JSC1 is wired up as per page 5. Ensure negatives are common and the JSC1's negative is connected to the starter battery's negative - avoid connecting to chassis negative. Voltages between common negatives should be ~0V.

Secondly, to test the JSC1, remove (or turn off) any secondary charging source like AC to DC battery chargers or solar chargers going to the battery banks. Leave the primary charger connected (alternator) - ensure alternator is working. We also recommend turning off any loads (inverters etc.).

How to test if the JSC1 is charging:
With engine running (alternator charging), what is the voltage on the input terminal of the JSC1? What are the voltage on the output terminals of the JSC1? Measure these voltages at the JSC1's terminals, not at the batteries terminals.

Even though, by default, the JSC1 can work down at 12.0V on the input; it still requires over 13.6V+ to turn on and get going. If you are getting alternator voltage at the input terminal (~14V) and 14V+ on the output terminal the chances are your JSC1 is working fine. If little to no current is passing through the charger at these voltages then the batteries are either full or they are deceased. If the output voltage is between 13V-14V (but rising) then you could have a situation where the output batteries were very low in charge (or large in capacity) and the JSC1 shall be charging at maximum current. Provided the voltage continues rising the JSC1 is charging.

If your output voltage is less than 13V and your input voltage is healthy, it could be three things:
1) You have a large load on your output bank - turn load off.
2) The JSC1 is turned off - ensure connections are okay, check page 5.
3) The JSC1 is not working.

If your input voltage is less than 13V, it could be several things:

Automotive: Your alternator's voltage is at less than 13V (the alt. is in regenerative braking mode - sometimes expected on modern Euro 5/6+ engines) - take vehicle for drive and measure alternator's voltage and set up the BB to suit these needs. All vehicle manufactures have their own software / characteristics for regen. braking.

Automotive or Marine: If your alternator's voltage is ~14V then check continuity between the alternator's B+ terminal and the starter battery. If you are getting ~14V on starter battery then check continuity between starter battery and JSC1 input terminal.

Automotive or Marine: If your alternator's voltage is 0-13V (starter battery voltage) then alternator may have failed. Or, requires increase rpm of engine, possible belt slip.

Is your output voltage slightly higher or lower than expected - even with no loads / chargers on?
Check if you have the temperature sensor connected. If so, no problems leaving it there, it is simply voltage compensating for when the temperature at the sensor is lower or higher than the benchmark 20DegC (69F). If lower, then the voltage shall rise and vice versa. The further from 20DegC in either direction leads to proportional increase or decrease in the voltage.

Possible, voltage drop across long cabling / fuse holder / diode.

Fault red LED. **Fault (see instructions)**

The red fault light shall either be on the left column of LEDs (for 12V output) or on the right column LEDs (for 24V output).

Solid on - high voltage input. Check alternator's voltage. You may have a 12V JSC1 on a 24V system.
1 x flash means - low output voltage - output battery maybe beyond repair, or very large load.
2 x flash means - no output voltage, check you have a battery connected to the output, check continuity.
3 x flash means - high output battery temperature. Your batteries are either being charged too much, damaged or in a hot ambient temperature
4 x flash means - high output voltage. Check for alternative charging source onto the output battery.
5 x flash means - high heat sink (internal temp). Ambient temperature too high, ensure good ventilation. Fan may have failed.

Blue light **Vehicle input V OK / Standby flash**

The blue light shall either be on the left column of LEDs (for 12V output) or on the right column LEDs (for 24V output).

Flashing Blue light - Unit is in standby mode, this means you have the correct charging voltages on the input of the JSC1, however, you do not have a live ignition feed on the terminal.

Customer Service & Warranty

Your 100 % satisfaction is our goal. We realise that every customer and circumstance is unique. If you have a problem, question, or comment please do not hesitate to contact us. We welcome you to contact us even after the warranty and return time has passed.

Product Warranty:
Each product manufactured by Sterling Power comes with at least a 2 year limited factory warranty. Certain Products have a warranty period of time greater than 2 years. Each product is guaranteed against defects in material or workmanship from the date of purchase. At our discretion, we will repair or replace free of charge any defects in material or workmanship that fall within the warranty period of the Sterling Power product. The following conditions do apply:

- The original receipt or proof of purchase must be submitted to claim warranty. If proof cannot be located a warranty is calculated from the date of manufacture.
- Our warranty covers manufacture and material defects. Damages caused by abuse, neglect, accident, alterations and improper use are not covered under our warranty.
- Warranty is null and void if damage occurs due to negligent repairs.
- Customer is responsible for inbound shipping costs of the product to Sterling Power either in the USA or England.
- Sterling Power will ship the repaired or warranty replacement product back to the purchaser at their cost.

If your order was damaged in transit or arrives with an error, please contact us ASAP so we may take care of the matter promptly and at no expense to you. This only applies for shipping which was undertaken by our company and does not apply for shipping organised by yourself. Please do not throw out any shipping or packaging materials.

All returns for any reason will require a proof of purchase with the purchase date. The proof of purchase must be sent with the returned shipment. If you have no proof of purchase call the vendor who supplied you and acquire the appropriate documentation.

To make a claim under warranty, call our customer care line at (USA 1-(207)-226-3500, England 01905 771771). We will make the best effort to repair or replace the product, if found to be defective within the terms of the warranty. Sterling Power will ship the repaired or warranty replacement product back to the purchaser, if purchased from us.

Please review the documentation included with your purchase. Our warranty only covers orders purchased from Sterling Power. We cannot accept warranty claims from any other Sterling Power distributor. Purchase or other acceptance of the product shall be on the condition and agreement that Sterling Power USA LLC and Sterling Power LTD shall not be liable for incidental or consequential damages of any kind. Some states may not allow the exclusion or limitation of consequential damages, so, the above limitations may not apply to you. Additionally, Sterling Power USA and Sterling Power LTD neither assumes nor authorizes any person for any obligation or liability in connection with the sale of this product. This warranty is made in lieu of all other obligations or liabilities. This warranty provides you specific legal rights and you may also have other rights, which vary from state to state. This warranty is in lieu of all other, expressed or implied.

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