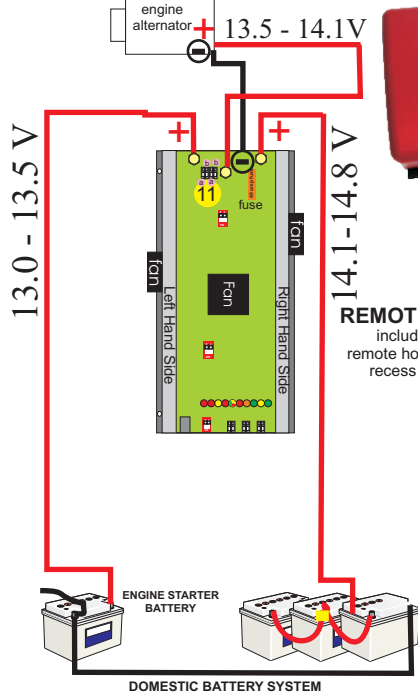


# Alternator to Battery chargers

## System wiring, single or twin alt (minimum requirement)



Not just a new product but a whole new concept  
All the performance of an advanced alternator regulator without all the fitting



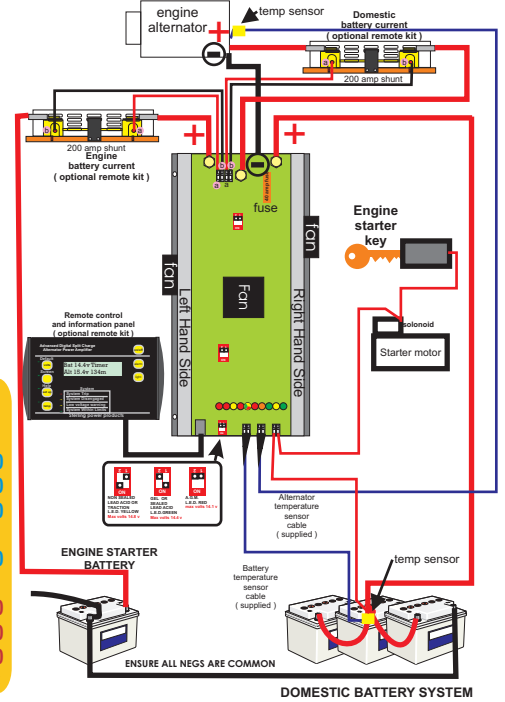
**80 & 130A**  
**REMOTE CONTROL (OPTION)**  
including 10 metres cable Unique remote housing can be surface mounted, recess mounted or flush mounted



**160-210A**  
Remote control and information panel (ABRC)  
Advanced Digital Split Charge Alternator Power Regulator  
Bat 14.4v Timer  
Alt 15.4v 134m

| DC voltage   | Max Alt amps | Size L x W x D | Weight | Part nos |
|--|--------------|----------------|--------|----------|
| 12   | 80           | 250 x 180 x 70 | 2.5    | AB1280   |
| 12   | 130          | 250 x 180 x 70 | 2.5    | AB12130  |
| 12   | 300          | 370 x 288 x 70 | 5.0    | AB12300  |
| 12   | 400          | 370 x 288 x 70 | 5.1    | AB12400  |
| 24   | 80           | 250 x 180 x 70 | 2.5    | AB2480   |
| 24   | 200          | 370 x 288 x 70 | 5.2    | AB24200  |
| Remote for above products in Blue (no shunts) ABNRC  |              |                |        |          |
| 12   | 160          | 250 x 280 x 70 | 3.5    | AB12160  |
| 12   | 210          | 250 x 280 x 70 | 3.5    | AB12210  |
| 24   | 100          | 250 x 280 x 70 | 3.5    | AB24100  |
| Remote for above product inc 2 x 200 amp shunts ABRC |              |                |        |          |

## Full system wiring single or twin alt (including optional remote kit if used)



Charge your batteries over 5 times faster, input 50% extra power plus de-sulphate the batteries and make them last longer.

Can be used with 2 alternators

Available in 80 / 130 / 160 / 210A models

This is a 100% unique product, not available anywhere else in the world, and totally designed and conceived by Sterling in order to overcome all problems experienced now and anticipated in the future with standard advanced alternator regulators. This following explanation is to help understand what it does and where it should be used and should not in any way be taken to demean any of the other charging products we manufacture.

The Digital Advanced Alternator Regulator offers the best low cost technical solution to maximise the performance of your alternator ensuring *adaptive charging*. There are, however, applications and markets that require a different approach to increasing the alternator performance; without all the work and expertise required to install a regulator.

### Issues with advanced alternator regulators are:

The main problems with all standard advanced regulators are:

- 1) **Relatively difficult to install.** This prevents semi skilled personnel from fitting .
- 2) **Requires the removal of the existing alternator to work on it.** This is not always easy to achieve and can add many hours of awkward work to an otherwise simple installation.
- 3) **Requires extra cables to be run on the boat or vehicle.** Again this can appear a simple thing, until a few hours work is required to pass a cable through a bulkhead .
- 4) **Warranty on new engines:** some engine/vehicle dealers raise warranty issues if a new alternator is modified to fit an advanced regulator, with this product, the alt is not tampered with.
- 5) **E.C.U. problems** Many new engines have E.C.U.'s (electronic control systems) on their engine management systems, any attempt to fit an Advanced Regulator will result in alarms going off (mostly in vehicles, motor homes and the latest marine engines ). This new system ensures the main vehicle/boat voltage remains within the E.C.U.'s programmed parameters and allows the extra battery bank to be charged at the higher voltages needed to achieve fast charging.
- 6) **Total Package** 95% of installations using an advanced alternator regulator also have some sort of split charger system. This product already has this split charge system built in to it.

### How do we do this.

Well, in theory, it is very simple. With an advanced regulator which connects to the alternator's regulator, we override the standard alternator regulator and we push the alternator's voltage up to increase the voltage at the batteries. This results in a massive charge improvement at the batteries. With the alternator to battery charger we do the reverse. We put a load on the alternator to pull the alternator voltage down. This fools the alternator into thinking that there is a major drain on the system and as such the standard regulator works at full current. However, the voltage is pulled down to a totally useless voltage for charging batteries. So, the new system takes in this high current, but low voltage, and amplifies the voltage to charge the auxiliary battery bank at a much higher voltage than the base system voltage. In order to achieve the fast battery charging, the software control program and settings for this product are the same as for our digital battery chargers and our digital advanced alternator regulator.

### When would I use an alternator to battery charger over an advanced alternator regulator?

- 1) If you are a boat builder or vehicle builder and labour costs are a critical issue, then this unit wins hands down. It requires only one extra wire (a negative) to the unit, the other power cables will already be standard. The only wires required for this unit are the alternator in and domestic + engine battery out.
- 2) If you are worried about the time and effort that it takes to fit an advanced regulator, then this unit will win. If you already have a split charger diode installed then the fitting for this unit will be about 15 minutes.
- 3) If you have a voltage sensitive base platform ( i.e. a car or van with an E.C.U. with high voltage alarms ) then this is a must.
- 4) If you have warranty issues with a new engine, then this unit simply does not touch the alternator, as a result there is no warranty conflict.
- 5) If you are worried about finding a competent electrician abroad, or concerned about the fitting costs of an advanced regulator, then this is the solution.

This new product incorporates a split charge system to charge 2 battery banks. However, on the domestic battery bank channel only, there is a unique voltage amplifier. This ensures the alternator works at its maximum output (it could also be used on a single output battery charger or other current limited power source) and increases the voltage of the domestic line (with software digital control) up to 14.1V (for AGM) 14.4V (for GEL) and 14.8V for open lead acid/traction. The same advanced program is used in the very successful Digital Advanced Regulator. Both products 'fail safe', allowing the original regulator(s) to operate.

### What other uses for this product?

This product could be used on any other product which has a current limit on it. For example, if you have an old fashioned constant voltage transformer based battery charger (or a constant current with low preset voltage controls and poor timer performance) which does not work very well, then simply attach this to the output of the old battery charger, and you will have the latest digital controlled 4 step charger, with all the programs, remote control and split output of the latest chargers on the market. Plus, at least a performance increase of about 500% (charger must not exceed the current rating of the device purchased).

### Extra Features built into the system for use if required:

- 1) **Battery temperature sensing.**
- 2) **Alternator temperature sensing.** This disengages the unit in the event of the alternator temperature getting too high, it then re-engages the unit when the alternator cools down.
- 3) **Battery sensor.** the system battery sensor is built into the unit and is connected to the battery out terminal. An extension cable can, however, be fitted to sense the voltage at the battery thus improving the performance slightly in the event of long cable runs.
- 4) **Ignition start.** Some alternators require a voltage on the alternator to start up. A split diode will prevent such an alternator from working. However, there is a built in device to overcome this problem in the event of such an alternator type being used.
- 5) **The remote control.** This offers full set-up information, plus voltages and temperatures of all the relevant places, as per the digital alternator regulator.
- 6) **Current measurement.** This unit, as standard, does not measure current. However, if the optional remote control is purchased it can measure the current to the domestic system ( on both remote models ). The remote on the 160-210 amp models can also measure the alternator and starter battery currents it comes complete with 2x pre-wired shunts that enable 2 currents to be monitored and the third current to be derived from the first two using the embedded software. The end package is a very simple and easy to instal with all the performance and safety features of the most expensive Advanced Alternator Regulator, but with an extremely simple and convenient installation method.

## What do I expect to see from this unit and why?

The illustration below shows results from bench tests representing a typical split charge system with an engine battery of 100Ah (standard lead acid) and a domestic battery of 3 x 100Ah (standard lead acid). The engine battery was discharged to 11V (about 10 engine starts) and the domestic bank to about 11V (will no longer run an inverter and is about 60% empty). The alternator used was a Bosch 90A with a standard 13.9V (variable) regulator. The unit battery type is programmed to open lead acid. There are 2 graphs, one is the current delivered into the batteries, and the other is various voltages measured on the system.

### System voltage graph:

The key points to pick up on here are:

The yellow trace (alternator voltage into the unit) clearly shows the system doing its job. It is designed to pull this voltage down a little to enable the standard alternator regulator to produce its full current- you can clearly see that the standard alternator voltage is at position 4 on the voltage curve, however, the input voltage has been pulled down to position 5, the effect on the alternator output current is full output at position 8-9, this is where you can clearly see the standard alternator current without the advanced charging system taper down fast from 80-30A over the same time (from position 2-3). The advanced charging equates to about 70A

improvement over the standard non-assisted alternator.

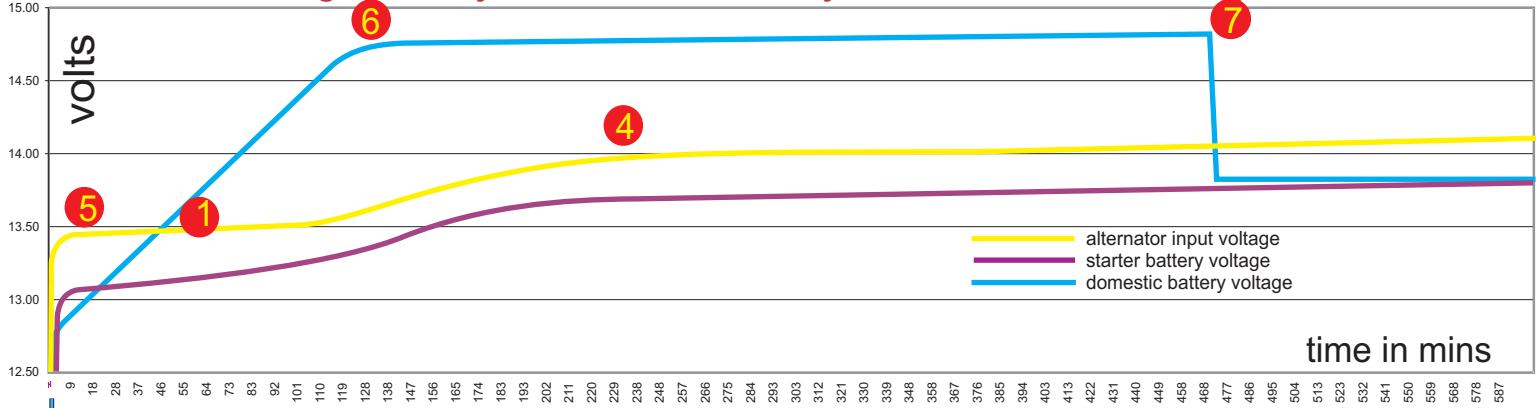
Position 1: This is the most interesting stage where the magic is at work, the point where the domestic battery voltage exceeds the alternator input voltage, this is what the advanced charging process is all about.

**The current graph:** The domestic current graph clearly shows the constant current charge between points 8-9, at position 9 the current starts to taper off until it reaches position 10. The accuracy of the software can be seen when the voltage drops from the high voltage charge to the constant voltage charge (float), the current only dropped 5A, (at position 10) showing without doubt that the software program was spot on, the batteries could not accept any more charge and were clearly full. The high charge voltage is maintained between voltage positions 6-7 at 14.8V.

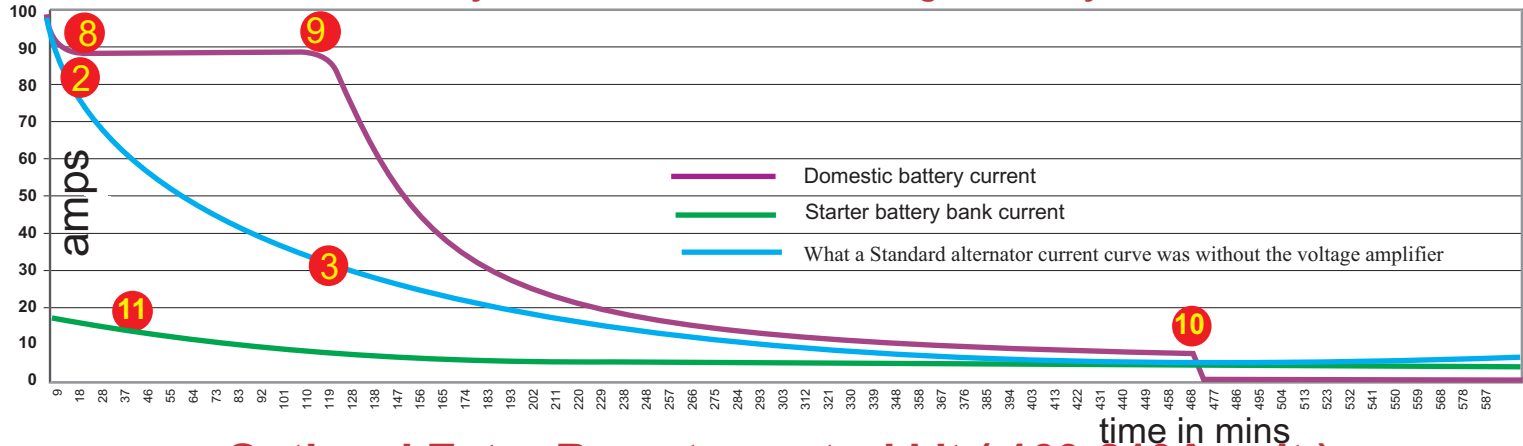
### Engine priority

Position 11 shows that through the whole process the engine battery continues to charge and is not deprived of its charging voltage, the engine battery performance is the most important, as, at the end of the day it must be able to restart the engine.

## Engine battery bank, domestic battery bank, and alternator voltage curves

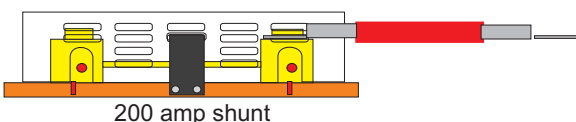
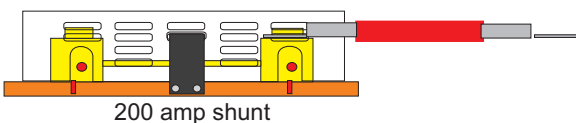
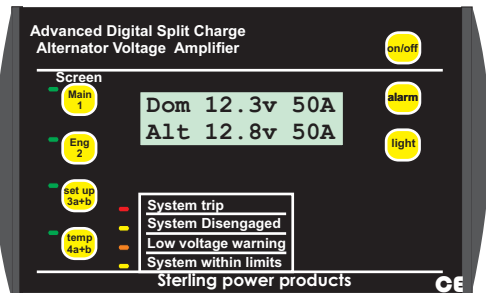


## Domestic battery bank current curve, with engine battery bank current curve



## Optional Extra Remote control kit ( 160-210A unit )

Included parts: the remote panel, 10 metres of pre-wired link cable and 2 x 200A pre-wired shunts. The 2 x shunts enable 2 x real currents to be measured and 1 x current calculated in the software the 3 x currents to be measured, accuracy +5%



### Screen 1:

Push the button marked Main 1, this is the main screen and the best one to leave the unit on. It shows the domestic battery voltage and current, also the alternator output current

### Screen 2:

Push button marked Eng 2. It shows the engine battery voltage and current. This screen also shows the elapsed time.

### Screen 3a:

Push button marked Setup 3a+b: There are 2 screens on this button. Push once for screen a, then again for screen b. Screen a shows the system setup, this refers to the domestic battery only

### Screen 3b:

Push button marked Setup 3a+b: There are 2 screens on this button. Screen b shows the effective boost being delivered at this time and ranges from 0% ( during the rest periods and on float ) to 100 % when system on full power

### Screen 4a:

Push button marked Temp 4a+b: There are 2 screens on this button. Push once for screen a, then again for screen b. Screen a shows the alternator temp and the domestic battery temp. If the temperature sensors are not fitted it will default to 20 deg C

### Screen 4b:

Push button marked Temp 4a+b: There are 2 screens on this button. Push once for screen a, then again for screen b. Screen b shows the box heat sink temperatures, LHS stands for left hand side, guess what RHS stands for.

Dom 12.3v 50A  
Alt 12.8v 50A

Start 12.7 4A  
Timer: 134 m

System set: 12v  
Bat Type : Wet

Alt Controller  
Power 13% Bost

Alt Temp + 20C  
Bat Temp + 20C

Case LHS + 17C  
Case RHS + 23C