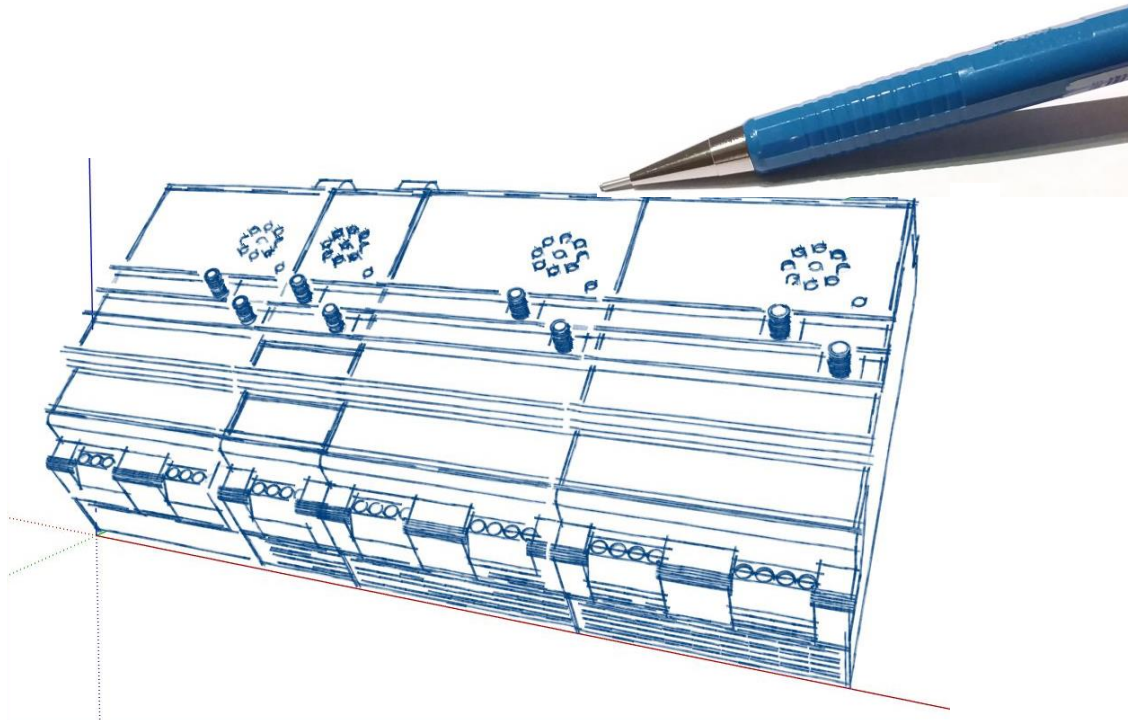


AUTONNIC

presents the

AptiVolt® Battery Management System

- Designed for your boat



Aptivolt installation

cs 23oct18

Aptivolt applications 04.docx

We have a problem

We understand that you might be a bit sceptical of yet another system for charging batteries. After all, we've all been doing it for over 100 years. But yet, in boats, there still seems to be a problem. Aren't batteries on boats the same as everywhere else? Well, actually, no for two reasons: number one is that you've several of them – we guess at least two. And number two, you've several ways that charging power is meant to get to them – mains, engine alternator and maybe solar too. And then there's wind. And your batteries may be of different types. And then also you'd probably prefer your engine battery gets topped up first so as to be ready for when you need a sure start. And only then would you want the power going to the boat battery and only after that the fridge or bow-thruster battery.

Mind you, we don't help make it easy. We came up with the right answer to all these things but then we've gone and made it worse by making it all modular. Well we figured that we could either do that or else we'd make one box which did a typical thing by making a guess at what you'd need. Bound to get one that wrong! Life afloat is a pretty individual world. So its Modular

Still what we can do is help you out by telling you what we would have put in the typical box and then help you some more by showing you how to go about adapting it for what you actually need for your own private boat.

So here goes:

The Basic Idea of AptiVolt

Remember what Autonnic's AptiVolt range of things is all about:

several different sources of power are connected in a special way so all the batteries can use it.

We gather all the power and then make it available to separate battery managers each of which will regulate the charging so as to make sure its own battery is exactly correctly charged and each of which is already set to which is more important. You decide which battery is to be preferred to the others. (We've given you three level to choose from).

So, if we were to make typical boat system we would expect it to take three sources of power – the existing mains charger you've got already, the alternator on your engine and one or a whole bunch of solar panels. And you've got two batteries, one for the whole boat and one for the engine.

Meet the Sources

We've been really helpful with the VAS45 - but it didn't start that way. The whole AptiVolt project was set up by trying to make an *Alternator Booster – without touching the Alternator*. We gave it a number of shots and finally got it

figured how you can get lots of current out of an alternator whose output voltage may be lower than the battery it's charging.

Then we went on and figured out the whole system. We now call the booster we made, the VAS45, a Source manager – we put an S in the number to help everyone remember. And the VAS45 is great because not only is it one of the 20A series A modules but it can also manage two separate inputs. This means that for your mains charger and for your alternator you only need one module. You would probably only use only one at a time, but it will be quite happy whatever you do.

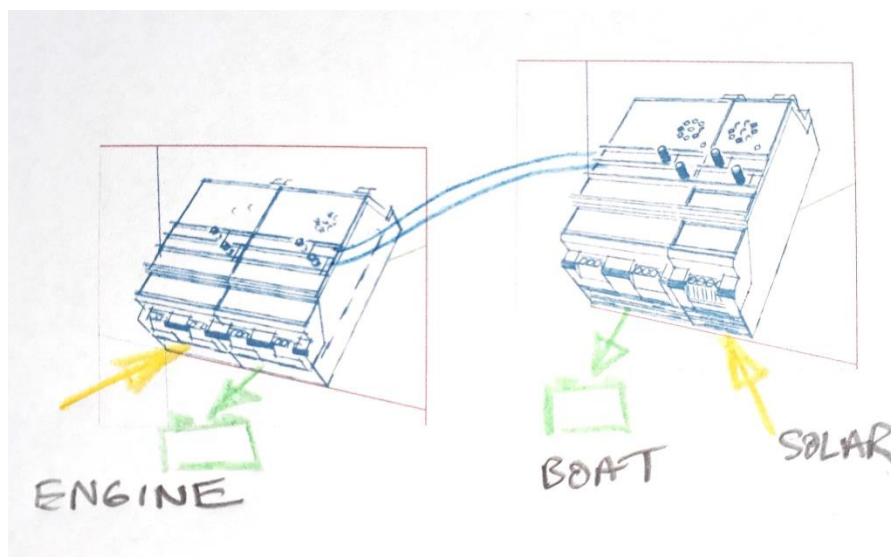
And then there is our VAS10. *Having just made an alternator booster why not a solar panel booster?* Instead of just connecting a panel to a battery we run the panel at MPP (Max Power Point) so a 100W panel delivers 100W. There's no way it'll do that by just connecting it to a battery; if you do that you can waste maybe 40% of the power. And just like the VAS45 it is one of our A series so it'll do up to 20A and it's got an S so it manages a Source – in this case it is just for solar panels at the MPP so around 340W on a good bright day.

And now for the batteries

So, between these two the inputs are covered. And they are joined together to feed any battery that needs it. We've even put in bus-bars so you can link them in a block just like in the picture.

Some would call these links a microgrid and maybe others would call it a power bus. Here at Autonnic we call it AptiRail®.

The rest is easy – just wire up a Battery Manager for each and every battery you've got. The VAR20 is really neat – it even has a temperature probe if you want to get the absolute best out of your system. One for each battery, naturally. And you set each one to the type of battery you've got connected to it. And the you set the Priority you want it charged at. You can put them all in a block, like the picture right at the end or else split them up. We've drawn you a picture of that so you can see for yourself.



Modular

So, when we went around the local village marina we thought this was it. A couple of Source Managers and a couple of Battery Regulators each either putting current into AptiRail or else taking current out of it.

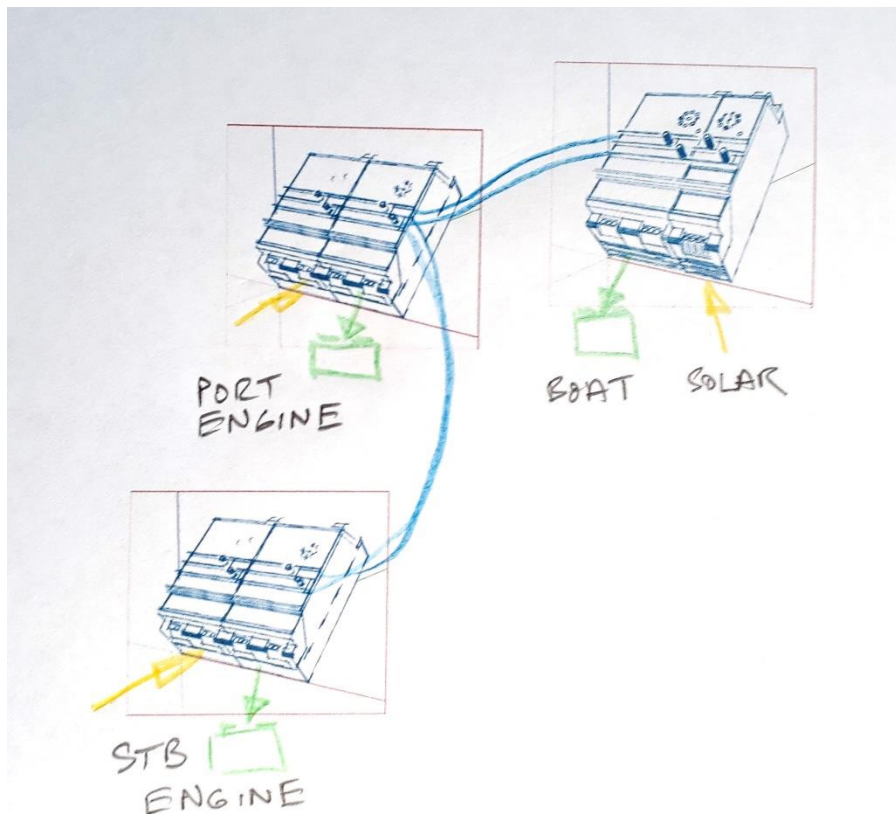
In, if available, and out, if needed.

But then we met Pete. He's got a catamaran with two engines. Then we met Andy who's got a fridge battery as well as a bow-thruster battery. So we decided to keep it modular and let you decide what collection suits your boat. Just find out which sources need managing and which batteries need regulating, get the modules in and join them all up – right up to the 1000W limit of AptiRail.

Andy would add two more VAR20s – but would he put them altogether in one big block? Probably not for a couple of reasons.

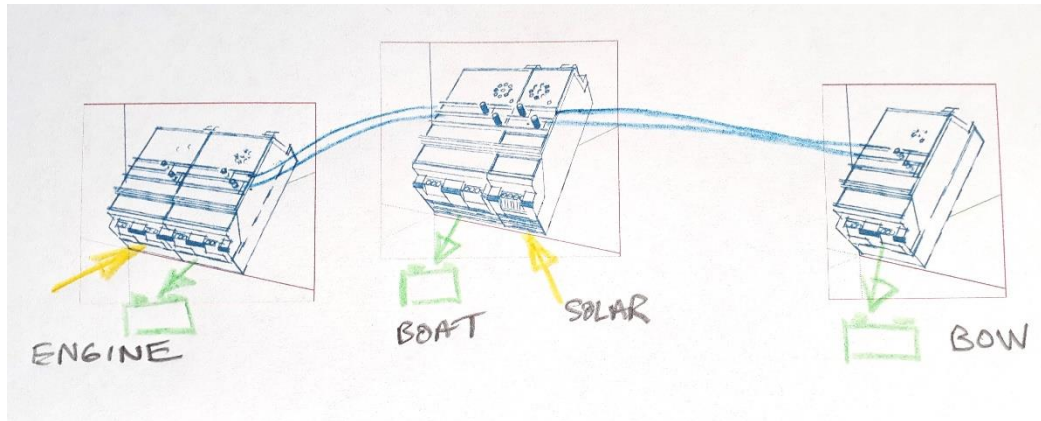
- 1 Its best to keep the leads short between a Regulator and its battery.
- 2 Its best to keep short leads from the alternator to its VAS45
- 3 If you need to run a longer wire use the AptiRail

Here's how Pete's might be arranged:



When we say keep short leads to a VAS45 maybe keep it outside the engine box so its not in a hot place. So it and the VAR20 for the engine battery just naturally go together.

Andy's bow-thruster battery is best looked after if you put its own VAR20 just next to it right up there in the bows – here's a sketch of Andy's arrangement:



So you've read all this and you've looked at the data-sheet we send out with each module and done what you need to do:

- they're all wired up just right
- in all the right places.
- you've set the priority levels.
- and you've set the type of battery each VAR20 has to look after.

Now what? What happens next?

Absolutely nothing.

Forget it. Go to sleep. Go to the pub. Go home and come back next weekend. Or just leave it for the winter.

And while you do nothing, here is what it will be doing for you:

When you're plugged in at the marina the mains power from your battery charger (or some other 12-15V power supply) is keeping the batteries topped up. When the sun comes out the mains power is not used as much because the sun always has priority. Or maybe the marina supply got tripped out. And if you just unplug and go away for months on end the sun will come out from time to time and each and every battery will be kept just right.

Or just go out and sail.

When you do go out and start up the engine and unplug from the marina, the first thing is that your engine battery will get fully charged because you set that one to top priority. Well, in Pete's case that's not one but two because both his engine batteries will get charged first. But then has two alternators. And then when the engine battery's full whatever is left goes to the boat battery. (OK Pete, we know, you've probably also got two of those – one in each hull). And when it's full there will be some left for Andy's fridge. And his bow thruster. So you still don't need to do anything. It does it all for you – if there is power available it will go the right place just like the power grid to your house. But in this case you've used APTiVOLT modules to make your own boat its very own grid.

One last thing

You thought we'd forgotten the dinghy. Well we didn't. A modular system can generally be set to cover most things, even that. You probably want to charge your dinghy battery from the boat battery so the way we would do that would be have a separate subsystem. Just two modules connected together – just a VAS45 and VAR20. From a 20A MCB you can connect the VAS45 to the boat battery and then leave the dinghy battery plugged into the VAR20. We don't care that the dinghy battery might have a higher voltage than the boat battery – the Autonnic AptiVolt system is about power management.

So it's all taken care of.

The end

