

Balmar SG200 Battery Monitor Install

One of the items I had on my list when attending the Annapolis Boat show was the Balmar SG200. I've long wanted a Smart Gauge to augment my Blue Sea 422 VSM because of all the good things I've read online. So when I heard Balmar had a new improved model – it went on my short list. I discussed the plans for the SG200 with the friendly Balmar folks – and it sounded like they are thinking similar to where I want to take the boat – namely a SignalK friendly environment with lots of data available to the network. It should be noted that Balmar has **NOT** decided to release the API or a SignalK interface – but rather leaning that direction (they knew what I was talking about which is a big change from other vendors). So I pre-ordered right then and there.

The box with the SG200 showed up right as I was wrapping up a major install of forced air Diesel Furnace, so I couldn't jump on the install right away. I did read the online install manual and started thinking on where to put the components. One disappointment is the Bluetooth adapter was not included with the shipment. The email stated it would be coming "soon", after using Kickstarter my definition of "soon" has been recalibrated to 2yrs to never (hope Balmar helps move that needle back)

The photo below shows the beginning layout of some of my nav-station devices. I decided to move the USB/Line-In receptacle from the Fusion MS205, from its current location next to the fuel gauge, down to a line of 12V receptacles and USB charge ports. The display for the SG200 would then occupy the space next to the fuel gauge.



Using a 2 1/16 hole saw (Note: this is too small – more later) to drill the hole to mount the SG200 presents a problem – there is already a hole there where the pilot drill for the hole saw should go. The solution is to prestart the hole to give the outside of the hole saw something to ride on. I drilled a scrap piece of Iroko to size and used double stick tape to mount it where I needed the hole, this “pre-starts” the hole and you get a perfect new hole. Balmar specifies a 53mm hole saw but thought the 2 1/16 was

close enough, so I used a small router with a Dremel bit to open the hole up probably a 1/32" more, perfect.



Here you can see I'm getting ready to pull the wires from the battery compartment to the panel. First I push the end without the connector from the battery compartment to an area directly below the gauge (one bulkhead aft). Then I need to get the wire from floor level to behind the panel. I really like the 6' fiberglass pull rod for this task. It is easy to push thru the mass of wires behind this panel down to where I can tape the loose end onto the rod and pull it out the upper hole.

Installing the connector was fairly easy, be sure and refer to the color code in the manual. Pushing the pins home took a bit more force than I thought was necessary, so be sure they are flush with the opposite side of the connector. If you get confused about the orientation of the connector and what wire goes where – the pin numbers 1-4 are embossed on the connector if you look close. This will eliminate any doubt on where the wires go.



Installing the display in the panel is straight forward. Click in the connector and push the display into the hole you drilled earlier. As you can see from the first picture, I have quite a reach to get to where the display is mounted; even with the Fusion Radio removed I still had to reach from the breaker panel 14' to the display. You want to make sure you don't drop either the draw bar or the nut/lock washer while doing this. I was lucky and didn't lose them to the void. Now I have lots of tools on Mahalo – but none of my combination wrenches fit the little nut that holds on the draw bar. I have 7mm, 8mm, 10mm; the first two were too small and the last too big, with a similar story on the SAE side. I guess Goldilocks wasn't on the boat. A small plastic 4 wing know would be perfect for this, application. When you're in the panel at arm's reach you don't want to be turning wrenches.



The job so far took about 90 minutes including cleanup. Much of that was due to relocating the Fusion Radio receptacle (wires were tangled behind the panel and it took a while to extricate them).

Now I know you're saying the manual has you put in the smart shunt first. I hadn't calculated the position or length of ground needed to connect up the shunt. Plus I'm going to have to kill power to the boat and pull a battery out of the box to get working room, its cold and the diesel heater is required, so a job for later.

I made a quick stop at Harbor Marine to fabricate a 24" Yellow #1AWG cable. Harbor Marine has bulk cable, ends and a big crimper mounted on the wall so you can easily make custom cables. Then back to the boat for heat shrinking to seal the cables.

I needed to pull one battery and the battery box to give access to the side of the compartment where I planned to move the existing shunt down 6" and install the smart shunt in the freed up space. First problem is whomever installed the shunt didn't remove the battery box so the screw holding it in was angled and very stripped. I had to drill out the screw and remove the stub with vice grips.

I grumble every time I deal with heavy wire like this – but remember it not the 750MCM cable I installed in a glass plant, that required pipe benders to make a bend.

Everything went very smooth after that. I used 2 each #8 x ¾ stainless screws to fasten both the shunt and the smart shunt to the bulkhead. You might notice on the battery side of the smart shunt I have two wires attached to the nut. For my house bank I have 4 GC2 FLA batteries, two in the location shown and two under the nav seat.



One note: the Bolt for the "Cable" side of the smart shunt was loose and I had to make sure it didn't fall out when screwing the shunt to the wall. The "Battery" side was firmly in place. It would be nice if they both were captive.

One ground is for each set. After reinstalling the removed battery and box, I turned my attention to powering up the unit.

The smart shunt and display need 12V to function. Balmar provides a slick weather tight fuse holder and large ring terminal to connect right up to the battery positive lead. I like to keep my fuses in one place to make trouble shooting easier; so I have a 6 position ATC fuse panel for my always on devices like the SG200. I'm already powering two bilge pumps and with Balmar providing a 10A fuse, I thought it might overload the 30A panel. After due consideration, I decided to not use my panel and go to the positive buss bar instead. The fuse inserted and the SG200 came to life. I took some time to get use to the User Interface (hold till flashing to select). Then I configured the unit for the type and capacity of my batteries.

While at Harbor Marine I purchased 10' of 2/20 wire to run from my Circuit Breaker panel to the Smart Shunt. This wire will be connected to the already fused voltage sense wires from my start and windlass batteries. Wish I had the wire when pulling the SG200 Network wire - poor planning on my part

I don't currently plan on adding smart shunts to the other two battery boxes, and while I have digital readout of the voltage of all banks – eventually the voltage will be part of the data I collect with signalK so having available on Bluetooth is good.

This part of the tasks took about an hour, so 2 ½ hours total. I'm lucky that my wire pull is very easy at under 8' and only one bulkhead to traverse. I was unlucky in having to relocate items on both the panel and battery box to find room to install the SG200.



Observations/Comments –

- While it's interesting how you can setup a system with either one button or a single reed switch/magnet, it does make for an awkward User Interface. The one button on the SG200 is a big step up over the magnet on the MC614 I have controlling the alternator but still not the easiest. I didn't want to poke around in the menu too much for fear of setting something incorrect. I look forward to the Bluetooth Interface to the settings.
- Keep in mind some people (like me) won't have good access to the back of the display; it would be much easier to secure using four wing plastic nuts.
- While a lot of people like chrome – it doesn't fit in with the aesthetics of all installations, consider offering black rings (or removable paintable rings).
- Either both bolts on the smart shunt should be captive or neither of them captive – I wonder what the design reason was for only one to be captive.
- Time will tell on how well the unit will perform, but I have every expectation it will be positive.
- 57mm may be a European standard for gauges – but making the display a few thousands smaller so it could fit in a 2 1/16 hole would be more SAE friendly.
- I like the SG200 display the firmware revision on power up.
- Is it necessary to display the CRC on the startup screen if the firmware is “validated” which I assume means the CRC was good?? How many people know what a CRC is – move this to a “Test Screen”
- If you set capacity before setting battery type – it gets erased
- After setting battery type and capacity a blue progress bar goes across the screen twice with the back/exit prompts still on the screen and no idea what your waiting for.
- No EEPROM saved settings – all settings erased after power removed from the unit.
- I didn't see it in the manual – and I didn't play enough with the config – but it would be nice to name/rename the banks – ie Bank-1 to House, Bank-2 to Start, Bank-3 to Windlass. And have them referred by that name in the menu's

- The bank-2/bank-3 voltage wires are a bit short when crimping with the smart shunt mounted. I had to shorten that line twice as the other crimp failed (wire pull out while in at an awkward angle) and I need to cut it off.
- It would be helpful to have physical dimensions listed in the manual or online for preplanning and space allocation.

Note 1) The bank-1/bank-2 voltage lines are connected and run but not yet connected to the source at the panel.

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