How-to Guide: Connecting a DSC Radio to a GPS - Simplified!

Why you do it

Your GPS or chart plotter will be able to calculate your position, and modern units all have wires through which this information can be sent to another device that needs it, like a DSC radio. The radio needs it so it can broadcast your position if you have to make a distress call. The data can flow the other way too. The radio will receive DSC calls, and the chart plotter may have the facility to log these calls and keep a record of them.

How it's done

Different manufacturers have different technologies, and you may choose items of navigation equipment supplied by different manufacturers. Luckily these manufacturers have agreed to use a standard way of sending data between their equipment, using a protocol or "language" referred to as NMEA. The most common version of that language in current use is NMEA 0813. If you want to read up more on this, there is a good explanation on Wikipedia. It is actually very simple to connect these wires if you understand the basic principles behind it. This section is an explanation of the principles - armed with this knowledge, the installation manuals for your equipment (often written by geeks) may be easier to understand. **You will need to refer to the User Manuals for the exact wiring for your equipment.**

The basics

Firstly, my apologies to all electronics experts: this is a simplified explanation of how NMEA devices are connected. Always consult your manuals before getting the wire cutters out, this explanation is not an instruction and may not be exactly the way your own units are wired.

Each item of navigation equipment will have **one or more** imaginary tubes or "ports", through which data goes in and/or out of the unit. Each port has a pair of wires, you only see the wires because the ports are hidden in the electronics. On some units you can set the function of a port (data in, data out or both) in a system menu. You may also have an option to set different communication protocols and speeds. More of that later. Now you are ready to look at a picture.

The images are kindly provided by Standard Horizon and Garmin
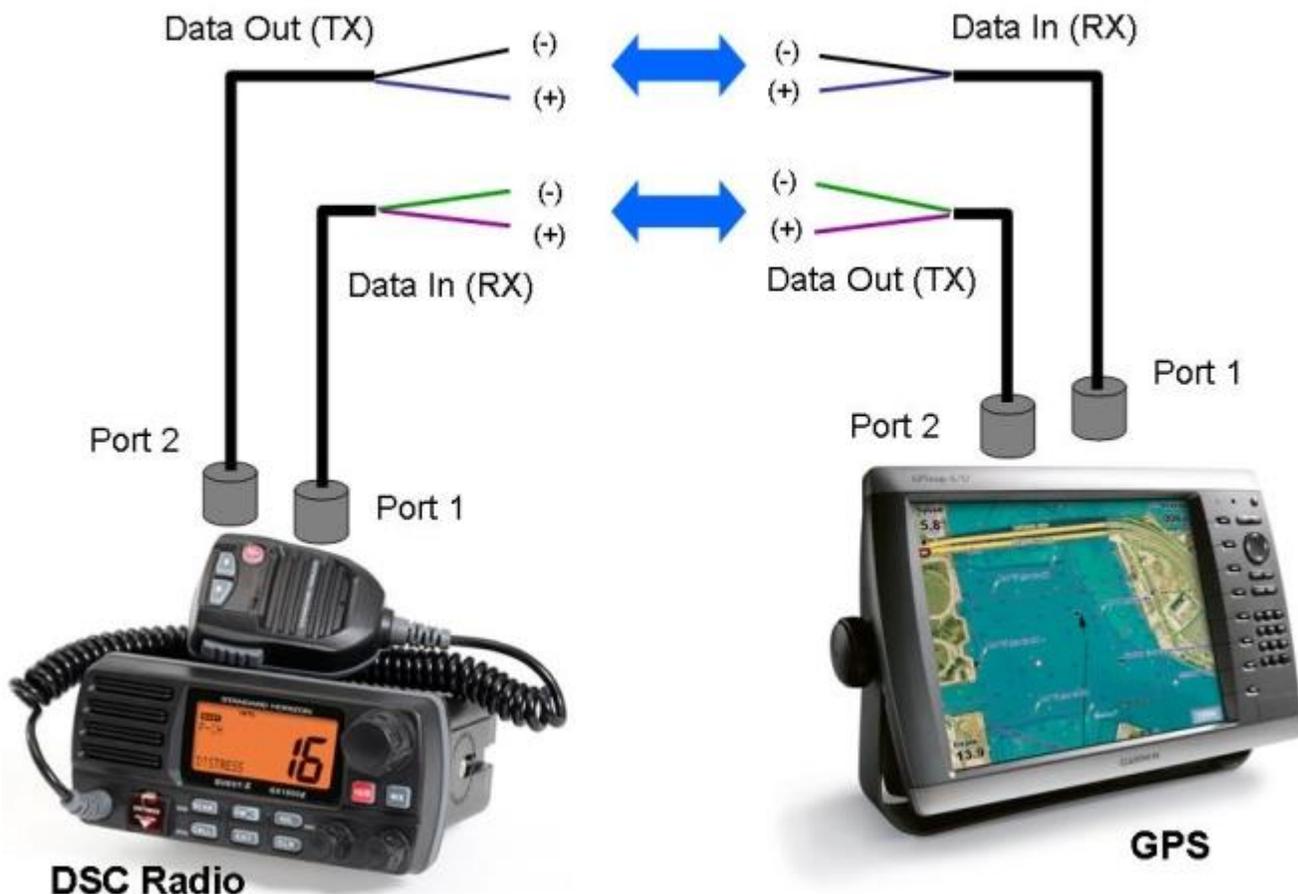
Your manual will have the color codes for the wires, these are just examples. If you want to send position data from a GPS/chart plotter to your DSC radio, you will need to do the following. Look at the picture above, and it will suddenly appear very obvious. That data has to go OUT of the GPS and IN to the DSC radio. (Port 2 on the GPS connected to Port 1 on the radio above in case you had not spotted it). Some units, e.g. Standard Horizon radios, only have one port, which has to handle both IN and OUT. Next, you need to connect the relevant TX(-) to RX(-) and TX(+) to RX(+) wires. These are only data wires so they are tiny. You can use solder and shrink tube over, small terminal blocks, or even lash it up with twisted wires and sticky tape - all will work. I recommend the last method to test it out then the first method for the best connection.

Once you have done the wiring, you need to go into the system or set-up menus in each device to make sure the data is going in the right direction (if there is an option), using the correct protocol (e.g. NMEA 0813) and at the right speed or baud. Standard or 4800 is almost certainly what you want. If you are connecting an AIS unit to a chart plotter it will be high speed or 38400.

One small complication to all that - power cables. Many devices mingle power wires with data wires, and often with simple connections there is a short cut where a (-) wire, sometimes called Data Ground, is connected to the power (-) wire or Power Ground. This is fine if that is what the manual says, and if so make sure both devices are doing the same thing with their Data Ground wires or they won't meet up.

Just in case you thought wires were wires, not always. Some cables are made up of a plastic sheath over a wire braid which surrounds a bunch of wires for physical or electronic protection. This screen braid can be one of the wires, usually the Data Ground. Your manual will say if this applies to your cable.

One final point: don't worry too much if your unit is supplied with a cable and a special connector on the other end from the unit. These are supplied in case you are going to connect to another unit that has a corresponding socket. If so, fine and dandy. If not, and if your manual says its OK, cut it off (making absolutely sure you are cutting off the right one) and splay out the wires so you can connect them as above.

Armed with this understanding, you will now be able to make perfect sense of your chart plotter manual that has wire tables and diagrams for one-way connection, two-way connection, sending data with a single wire connection and receiving data with a single wire connection.

You will also need to go online to: http://www.boatus.com/MMSI/ and obtain an **MMSI** number.
You will then need to program that number into your radio.

Tutorial on DSC

http://www.boatus.com/foundation/dsc/player.html