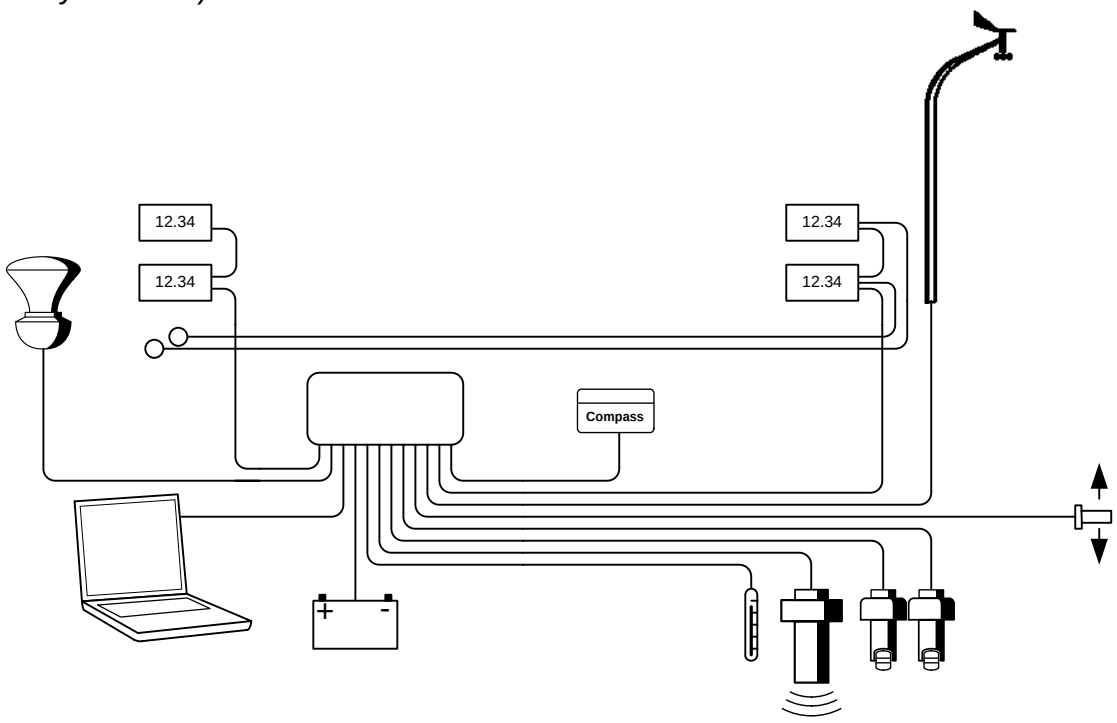
OCKAM
INSTRUMENTS,INC.

Realization of the Integrated Instrument

The Centralized Approach

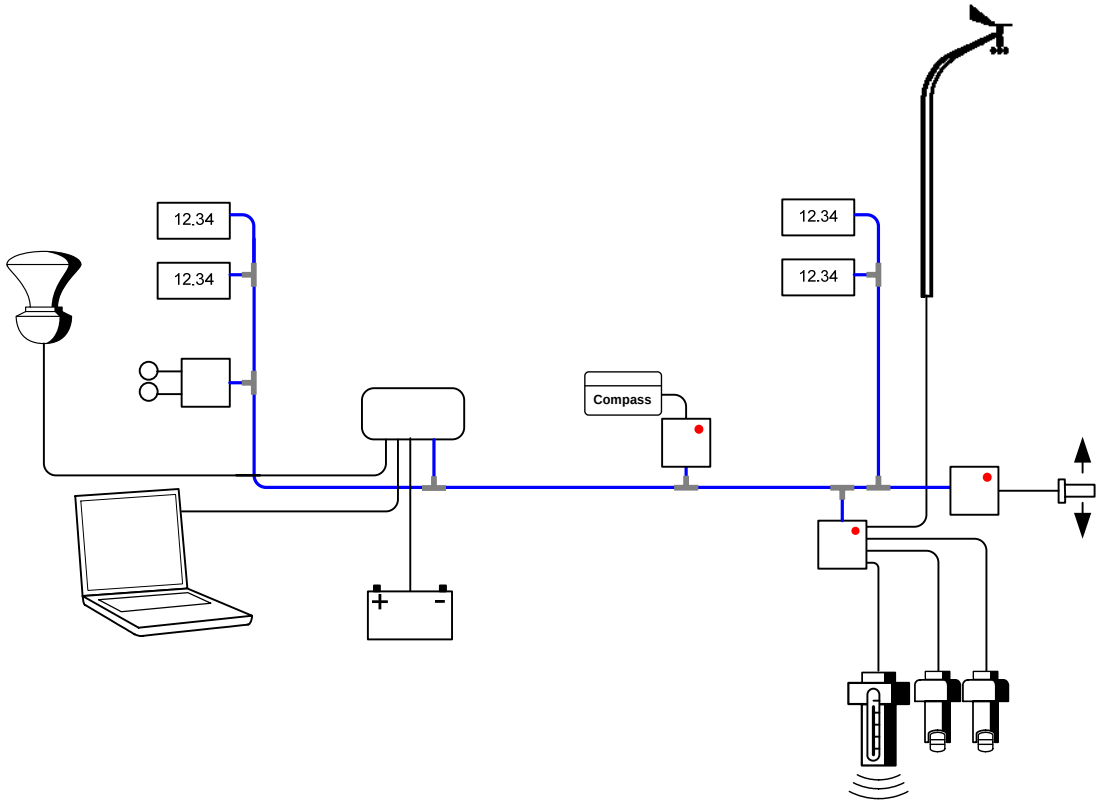
One philosophy for integrated instruments is a centralized design where everything connects to the processor except the displays, which can be bussed (daisy-chained).



The system shown above is not particularly large (boatspeed, wind, compass, GPS, loadcell, depth/temp and a laptop). But as the system gets bigger, problems start cropping up.

- There is a maximum number of connections and mix of input types (analog, serial, pulse, etc.) that can be accommodated by the processor, which is set at design time. Once you have reached either limit, you're done, even if you haven't used up all the plugs.
- The wiring is difficult to maintain and a challenge to troubleshoot. You have to dismantle the processor in order to change or test the cables, and when there are a lot of them, just touching something can cause new problems.
- The weight of the sensor and control button cable home-runs mounts up.

The Distributed Approach
Another philosophy is to put everything on the bus, with small interfaces serving as connections for sensors, and connected at a convenient point.



This is the same system but designed with distributed architecture.

- The number and type of processor inputs are no longer limited. Each sensor is mated to a small interface nearby, and there is plenty of room on the processor for the few cables that make sense there. The processor box can be smaller and lighter. The input requirements for the sensors are now independent of the design of the processor.

- Wiring is easy to maintain and troubleshoot. If you have a problem with heading, you know where to go, and there are only two wires to look at, with plenty of room to do so.

- You save weight by eliminating sensor and control button cable home-runs.