Expansion of the RBRcervello for Multi-Instrument Capability in Real-time

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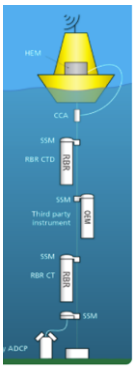
Since 1973, RBR has been designing and manufacturing oceanographic instruments in its Ottawa, Canada headquarters. From the ocean abyss to the polar ice cap, and on every continent, RBR sensors track water parameters: temperature, depth, salinity, dissolved gases, pH, and many others.

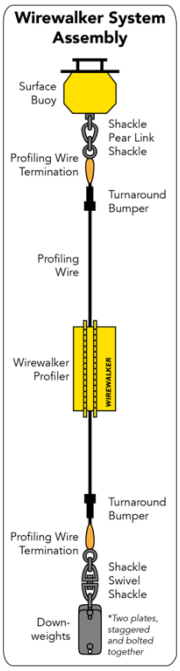
This spotlight article details the evolution of the RBR Mooring Line Modem (MLM) and RBRcervello to allow multi-instrument moorings to report their data in real-time.



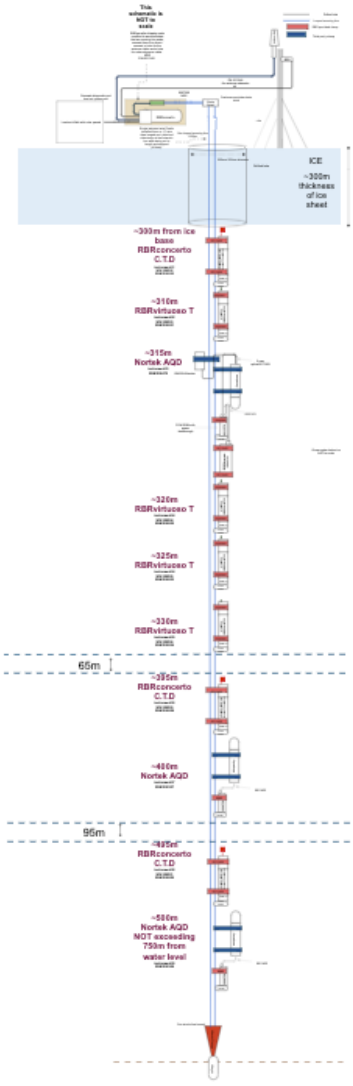
RBR's inductive modem communication system, the MLM-1000, was developed to provide fast communication with deployed instruments over several thousand metres of jacketed wire. It uses an inductive signal to bring data to the surface via the mooring line at speeds up to 4800 baud, where the seawater acts as the return to complete the circuit.

Instruments are connected to a sub-surface modem (SSM), either directly integrated or via a cable, and the jacketed cable feeds through the coupler for data transmission. This allows flexibility in where the instruments are mounted. A head end modem is used at the surface to provide control and connect to the user's data logger / telemetry system.

The DMO Wirewalker is a vertically profiling platform, powered by ocean waves, that uses the RBR mooring line modem as the profiling wire to bring data from instruments in the profiling body to the surface buoy.



To expand the Wirewalker's capability, RBR then developed the RBRcervello as the "brain" of the system. In addition to controlling the mooring line communications, the RBRcervello also provides data storage and data telemetry (via GSM and Iridium). This allowed the data from the RBR instrumentation in the profiling body to be brought to the surface and be telemetered to the world in real-time. Reconfiguring of the on-board instrumentation via the telemetry is also possible.



In the most recent evolution of the RBRcervello, RBR has worked extensively with two international organisations to develop the RBRcervello's capabilities to allow it to communicate with multiple instruments on a single mooring line and not just the one in a profiling body. This has been specifically valuable for a current project in Antarctica requiring under ice, multi-instrument, multi-year, real-time measurements. The collaboration in this project has included customised transit cases that are then used at site as permanent enclosures, buried in the snow, for insulation.

The systems that have been delivered to date host multiple RBR instruments as well as Nortek Aquadopp's (see right), acquiring data to a depth of ~750m.

Although this collaboration focused specifically on a design evolution with the upper ~300m frozen in the ice and measuring below the ice, this system can equally work from a surface buoy or vessel, reporting in real-time from all sensors, expanding the possibilities for moored, or drifting, ocean column monitoring.