RBR Data Controller

Instrumentation Platform

The DBC-2 aggregates data from a range of sources, and provides storage and telemetry options for these data. Weather, current and water quality parameters from multiple sensors may be included.

Power management & telemetry options are also incorporated to enable real time transmission of data directly to the user's desktop. As a back up, the data stored in flash memory may be retrieved from the DBC-2 when the unit is taken off line for service.

The entry level DBC-2 is housed in an IP65 enclosure size 90x145x225mm with LEMO environmental series K connectors.

The mating LEMO connectors are designed to enter the external housing of a data buoy superstructure through water tight glands to provide a simple field installation of all cabling, thus avoiding any custom work on the part of the user. The DBC-2 hardware may contain a combination of serial data and analogue cards to connect to external sensors. The entry level enclosure supports up to 12 channels, but larger enclosures housing higher numbers of interface cards are available. Serial cards are controlled by the RBR metatable software (see data sheet on the reverse) and analogue cards may be selected from a range of standard interfaces.

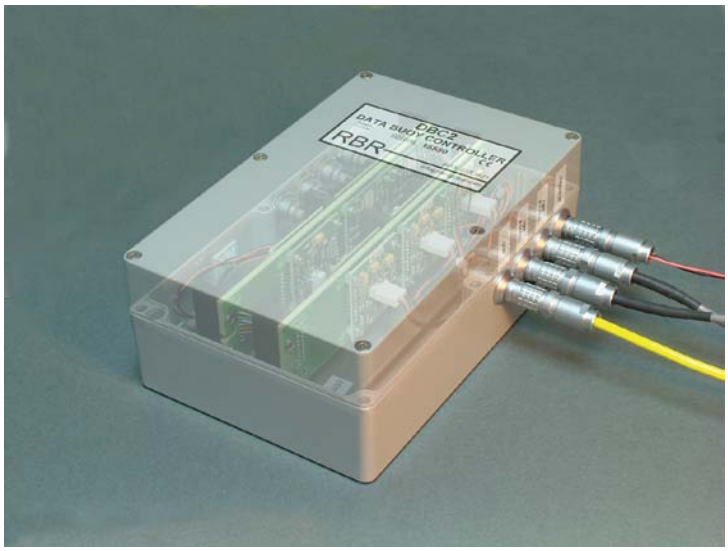
Features:

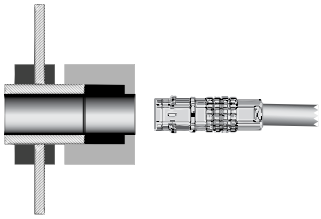
- Central controller integrates all sensors
- Easy interface to RBR sensors
- Accommodates wide range of 3rd party sensors
- Simple data access
- Rugged water resistant packaging

A power budget for the DBC-2 will be supplied by RBR for each configuration.

Typical Sensors

- All RBR Loggers, including CTD and thermistor chains
- Wind speed & direction
- Thermistor Chains
- Barometric Pressure
- Fluorometer
- Compass
- Turbidity
- Optical Water Quality
- GPS





The LEMO connectors enter the external housing of a data buoy through water tight glands, providing simple field installation of all cabling and avoiding any custom work by the user.

Specifications

Input cards include:	• Serial RS232/RS485 with RBR metatable software for control • Analogue input cards for low impedance input with auto ranging on selected optical sensors • High impedance electrochemical sensors • Pressure • Temperature - single and multiple thermistor inputs
Sample period:	From a few seconds up to an hour or more, depending on sensors installed.
Operating Temperature:	Range: -40°C to +50°C
Humidity:	Range: 5% to 95% non-condensing
Clock Accuracy:	GPS accuracy (when so equipped), RTC is ~1min/year otherwise
Telemetry Options:	GSM/GPRS, CDMA, Iridium or RF

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Metatables

How to configure the DBC-2 to manage serial devices

Any device that gives an ASCII text output will require that a driver is written for it. The usual approach is for the supplier to do this, and only brave users may take on the job. RBR has provided a fast and elegant approach to this task in the serial interface cards used in the DBC-2 and any user can easily write, modify and test the driver. Examples of such serial devices include integrated weather sensors, GPS units, compass, tilt modules, RBR CTD, ADCP and other instruments.

The RBR approach is to use a metatable of basic commands. Just five basic commands are all that is required:

<WAKE>	To awaken the sensor
<CONFIG>	To select a configuration
<SAMPLE>	To poll the sensor
<SEND_DATA>	To accept data from a stream
<SLEEP>	Puts the sensor to low power mode

In XML parlance, the items between the <> brackets are "tags". Each string is bounded by a pair of tags, as is shown in the examples below. Other auxiliary tags that are used for setup include:

<COMPORT>	Define the comport
<TERM>	Define the termination of messages to the sensor
<ACK>	Define the termination of messages from the sensor

Each serial sensor is controlled by its own "metatable" of commands. These are text strings conforming to XML which may be simply edited and rapidly entered. The responses from each sensor are stored or transmitted as ASCII strings for later interpretation.

A Metatable is written as a simple text file by the user and it can be easily downloaded into the generic serial cards in the DBC-2 and tested before deployment. Here is an example:

Part of the Metatable for a Vaisala-WXT510 Weather Station

<WXT510>	The name of the sensor
<COMPORT>19200,"N",8,1</COMPORT>	19200 baud rate, no parity, 8 data bits, 1 stop bit
<TERM>"<cr><lf>"</TERM>	Every message sent to this sensor must end with a carriage-return, line-feed sequence
<ACK>"<cr><lf>"</ACK>	This sensor always terminates its output with a carriage-return, line-feed sequence
<WAKE>"0","0",10,2</WAKE>	Send "0" to wake up the sensor; expect a string with "0" included; expect the response within 10*10 mseconds; try twice
<CONFIG> "0XU,M=P", "0XU,M=P", 50,1, "0WU,R=&01001000", "&01001000", 50,1, "0WU,I=2,A=20,U=M,D=0,N=W,F=4", ….etc etc….</CONFIG>	Sensor setup details will vary according to the parameters desired. Long strings of setup details may be specified for this sensor, defining each measurement of the weather station. Details are found in the users manual for the WXT510
<SAMPLE>"0R0","0R0", 200, 1</SAMPLE>	Send "0R0" to request a sample; expect a string with "0R0" included; expect the response within 2000 mseconds (200*10); try just once
<SEND_DATA>null</SEND_DATA>	Not used – See next example.
<SLEEP>null</SLEEP>	Not used – the WXT510 never sleeps
</WXT510>	End of sensor metatable

The WXT510 is polled for data. Other sensors may send a steady stream of data, in which case the tag <SEND_DATA> is used to control the transmission. For example, to extract the GPGLL sentence from a GPS data stream, the following commands may be used:

<SAMPLE> "", "$GPGLL", 150,1,</SAMPLE>	Wait for the $SPGLL string within 150*10 msec, try once
<SEND_DATA> "$PGRMO,,2*hh<cr><lf>", "$PGRMO,,2", 50, 1,</SEND_DATA>	Inhibits further output

Full details of this approach may be found on www.rbr-global.com

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