



BlackBox Data Converter

The Blackbox is a data converter that allows any model of Aquaread water quality probe to be interfaced directly to a third party data logger or telemetry device. With the choice of SDI-12 or Modbus (RS485) digital interfaces, the blackbox offers a versatile and cost effective data conversion solution.

Build

The Blackbox is constructed from thick, hard-anodised aluminium and features a flanged base for mounting. An Aquaprobe cable connector is present along side a wire for connection to your chosen logger and power supply.

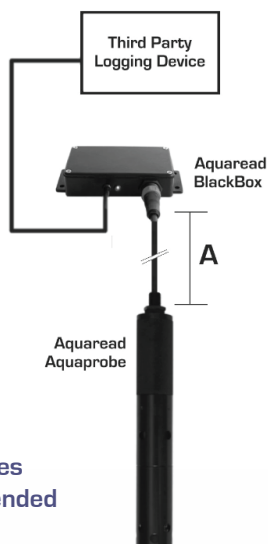
Sensors

The BlackBox features an internal pressure sensor to detect changes in atmospheric pressure. All data output by the BlackBox is therefore fully compensated ready to be handled/displayed by the chosen third party hardware.

Deployment

The blackbox comes with a 30cm wire with exposed ends to allow you to connect to your logging device. The Blackbox will therefore be located next to your logging device. Various cable lengths are available for use with your chosen probe, standard lengths available are 3, 10, 20 and 30m.

Power can either be taken from the device you are connecting to or from an external power supply at the correct voltage. Larger probes such as the AP-7000 are recommended to be used on external power.



Features

- Compatible with all Aquaprobes, AP-LITE and Aquaplus.
- Internal barometric pressure sensor for compensation.
- SDI-12 output (selectable by how its wired).
- Modbus RS485 output (selectable by how its wired).
- Low current consumption.
- Wide operating voltage range.
- Rugged aluminium construction.
- LED status light.
- IP67 rated.
- Suitable for long term unattended deployment.

BlackBox Mechanical Specification

Input Voltage	10V – 14V DC
Input Current (awake)	~ 40mA (AP-Lite / AquaPlus / AP-700 - AP-2000) ~ 100mA (AP-5000 or AP-7000 attached) ~ 500mA (AP-7000 during self cleaning cycle)
Input Current (asleep)	< 100µA (includes current drawn by attached Probe)
Protection Class	IP67
Dimensions	140mm x 65mm x 30mm
Weight	400g
Connections	Probe socket on flying lead & 1M screened power/data cable
Fixing	Aluminium flange with four 5mm mounting holes
Digital Interface	User selectable between SDI-12 & Modbus (RS485)
Update rate	All data is refreshed every 2 seconds



Standard Parameters	Dissolved Oxygen	Range	0 – 500.0% / 0 – 50.00 mg/L
		Resolution	0.1% / 0.01mg/L
		Accuracy	0 - 200%: ± 1% of reading, 200% - 500%: ± 10%
	Depth AP-2000/ AP-5000	Range	± 0 – 60.00 m (60m max displayed depth, max probe immersion 100m)
		Resolution	1cm
		Accuracy	± 0.5% FS
	Depth AP-7000	Range	± 0 – 99.99 m
		Resolution	1cm
		Accuracy	± 0.2% FS
	Conductivity (EC)	Range	0 – 200 mS/cm (0 - 200,000 µS/cm)
Resolution		3 Auto-range scales: 0 – 9999 µS/cm, 10.00 – 99.99 mS/cm, 100.0 – 200.0mS/cm	
Accuracy		± 1% of reading	
TDS*	Range	0 – 100,000 mg/L (ppm)	
	Resolution	2 Auto-range scales: 0 – 9999mg/L, 10.00 – 100.00g/L	
	Accuracy	± 1% of reading	
Resistivity*	Range	5 Ω • cm – 1 MΩ • cm	
	Resolution	2 Auto-range scales: 5 – 9999 Ω • cm, 10.0 – 1000.0 KΩ • cm	
	Accuracy	± 1% of reading	
Salinity*	Range	0 – 70 PSU / 0 – 70.00 ppt (g/Kg)	
	Resolution	0.01 PSU / 0.01 ppt	
	Accuracy	± 1% of reading	
Seawater Specific Gravity*	Range	0 – 50 σt	
	Resolution	0.1 σt	
	Accuracy	± 1.0 σt	
pH	Range	0 – 14 pH / ± 625mV	
	Resolution	0.01 pH / ± 0.1mV	
	Accuracy	± 0.1 pH / ± 5mV	
ORP	Range	± 2000mV	
	Resolution	0.1mV	
	Accuracy	± 5mV	
Temperature (non freezing)	Range	-5°C – +50°C (23°F – 122°F)	
	Resolution	0.01°C / 0.1°F	
	Accuracy	± 0.1 °C	

* Readings calculated from EC and temperature electrode values

ISE	Ammonium	Range	0 – 9,000mg/L (ppm)
		Resolution	2 Auto-range scales: 0.00 - 99.99 mg/L, 100.0 – 8,999.9 mg/L
		Accuracy	± 10% of reading or 2ppm (whichever is greater)
	Ammonia†	Range	0 – 9,000mg/L (ppm)
		Resolution	2 Auto-range scales: 0.00 - 99.99 mg/L, 100.0 – 8,999.9 mg/L
		Accuracy	± 10% of reading or 2ppm (whichever is greater)
	Chloride	Range	0 – 20,000mg/L (ppm)
		Resolution	2 Auto-range scales: 0.00 - 99.99 mg/L, 100.0 – 19,999.9 mg/L
		Accuracy	± 10% of reading or 2ppm (whichever is greater)
	Fluoride	Range	0 – 1,000mg/L (ppm)
Resolution		2 Auto-range scales: 0.00 - 99.99 mg/L, 100.0 – 999.9 mg/L	
Accuracy		± 10% of reading or 2ppm (whichever is greater)	
Nitrate	Range	0 – 30,000mg/L (ppm)	
	Resolution	2 Auto-range scales: 0.00 - 99.99 mg/L, 100.0 – 29,999.9 mg/L	
	Accuracy	± 10% of reading or 2ppm (whichever is greater)	
Calcium	Range	0 – 2,000mg/L (ppm)	
	Resolution	2 Auto-range scales: 0.00 - 99.99 mg/L, 100.0 – 1,999.9 mg/L	
	Accuracy	± 10% of reading or 2ppm (whichever is greater)	

† Ammonium electrode required. Readings calculated from ammonium, pH and temperature values.

Optical	Turbidity	Range	0 – 4000 NTU
		Resolution	2 Auto-range scales: 0.0 - 99.9 NTU, 100 - 4000 NTU
		Accuracy	± 5% of auto-ranged scale
	Chlorophyll	Range	0 – 500.0 µg/L (ppb)
		Resolution	2 Auto-range scales: 0.00 - 99.99 µg/L, 100.0 - 500.0 µg/L
		Repeatability	± 5% of reading
	Phycocyanin (freshwater BGA)	Range	0 – 300,000 cells/mL
		Resolution	1 cell/mL
		Repeatability	± 10% of reading
	Phycerythrin (marine BGA)	Range	200,000 cells/mL
Resolution		1 cell/mL	
Repeatability		± 10% of reading	
Rhodamine WT Dye	Range	0 – 500 µg/L (ppb)	
	Resolution	2 Auto-range scales: 0.00 - 99.99 µg/L, 100.0 - 500.0 µg/L	
	Accuracy	± 5% of reading	
Fluorescein Dye	Range	0 – 500 µg/L (ppb)	
	Resolution	2 Auto-range scales: 0.00 - 99.99 µg/L, 100.0 - 500.0 µg/L	
	Accuracy	± 5% of reading	
Refined Oil	Range	0 – 10,000 µg/L (ppb) (Naphthalene)	
	Resolution	0.1 µg/L	
	Repeatability	± 10% of reading	
CDOM / FDOM	Range	0 – 20,000 µg/L (ppb) (Quinine Sulphate)	
	Resolution	2 Auto-range scales: 0.0 - 9,999.9 µg/L, 10,000 – 20,000 µg/L	
	Repeatability	± 10% of reading	

The accuracy figures quoted throughout this document represent the equipment's capability at the calibration points at 25°C. These figures do not take into account errors introduced by variations in the accuracy of calibration solutions and errors beyond the control of the manufacturer that may be introduced by environmental conditions in the field. Accuracy in the field is also dependent upon full calibration and minimal time between calibration and use.