



## 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.

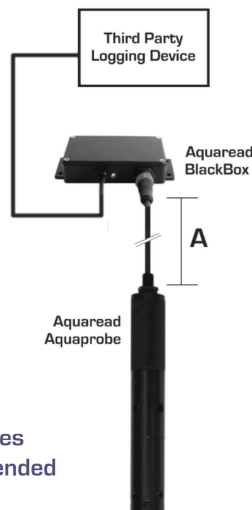
### Sensors

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.

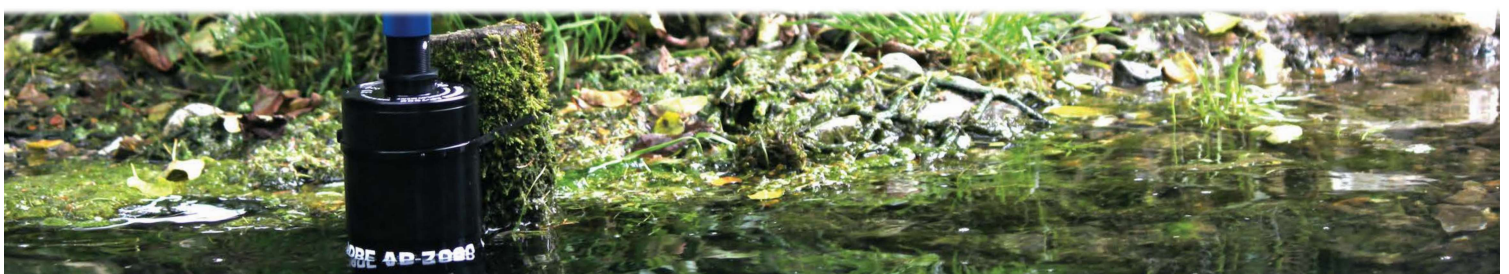


### Features

- 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



# Aquaprobe Specifications



Standard Parameters	Parameter	Range	0 – 500.0% / 0 – 50.00 mg/L	
		Dissolved Oxygen	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 ct		
	Resolution	0.1 ct		
	Accuracy	± 1.0 ct		
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	± 0.5 °C		

\* Readings calculated from EC and temperature electrode values

ISE	Parameter	Range	0 – 9,000mg/L (ppm)	
		Ammonium	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 <sup>†</sup>	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	Parameter	Range	0 – 3000 NTU	
		Turbidity	Resolution	2 Auto-range scales: 0.0 - 99.9 NTU, 100 - 3000 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.