AML-3

The AML-3 series of instruments is a highly configurable family of multiparameter sondes designed for a wide range of data collection applications. The '3' designation refers to the number of sensors that may be simultaneously installed on the instrument's endcap. One additional sensor may be connected externally, allowing up to 4 sensors in total.

Typical Configurations include:

- Sound Velocity Profiling (SVP)
- Sound Velocity and Turbidity Profiling (SVP Tu)
- Conductivity Temperature & Depth (CTD)
- Sound Velocity / Conductivity Temperature & Depth (SVCTD)

The AML-3 comes in the AML-3 LGR and the AML-3 RT. While nearly identical in size and form factor, the two configurations differ in a few key features which specialize them for their respective applications:

- The LGR designation (ie. AML-3 LGR) are self-powered via a rechargeable internal battery and have a mechanical on/off switch adjacent to their shackle. These instruments are most commonly used for multiparameter profiling applications and internally log sensor measurements and transfer data post-deployment.
- The RT designation (ie. AML-3 RT) stream data while in-situ (though they have the ability to internally record data as well). Power and communication to these instruments is facilitated via a waterproof connector located adjacent to the shackle.

WiFi GPS Rechargable USB 500 m Depth Rating 6,000 m Depth Rating

Max. Depth	500m	6000m
Number of Ports	3 (Option for up to 5)	3 (Option for up to 5)
Biofouling Protection	Street Lamp UV	N/A
Communication	WiFi, USB-C, RS232	USB-C, RS-232
Input Voltage	8-30 VDC	8-30 VDC
Pressure Housing	Acetal	Titanium
Protective Cage	Stainless Steel (Optional: CuNi)	Stainless Steel (Optional: CuNi)
Dimensions	332 x 76 mm	400 x 100 mm
Weight in Air	1.36 kg	2.4 kg
Weight in Water	0.69 kg	1.3 kg
Software	Sailfish	Sailfish

Key Benefits:

- **Three X2 series Interchangeable Ports:** Ability to custom configure a single instrument for multiple applications
- **Magnetic On/Off Switch:** Configure Now, Power & Deploy Later
- **Integrated WiFi & GPS (500m):** Transfer data wirelessly
- **USB Connectivity:** Recharge battery and connect via USB
- **Integrated UV Biofouling (Optional):** Maintain consistent data quality & Decrease maintenance intervals
- **Sailfish Software:** Download, process, and export profiles automatically

rev210220

AML-6

The AML-6 series of instruments is a highly configurable family of multiparameter sondes designed for a wide range of data collection applications. The '6' designation refers to the number of X2 series sensors that may be simultaneously installed on the instrument's endcap. Additional sensors may be connected externally, allowing up to 8 sensors in total.

The AML-6 comes in the AML-6 LGR and the AML-6 RT. While nearly identical in size and form factor, the two configurations differ in a few key features which specialize them for their respective applications:

- The LGR designation (ie. AML-6 LGR) are self-powered via a rechargeable internal battery and have a mechanical on/off switch adjacent to their shackle. These instruments are most commonly used for multiparameter profiling applications and internally log sensor measurements and transfer data post-deployment.
- The RT designation (ie. AML-6 RT) stream data while in-situ (though they have the ability to internally record data as well). Power and communication to these instruments is facilitated via a waterproof connector located adjacent to the shackle. These instruments rely on external power for operation and the application of this power turns the instrument on in lieu of a mechanical switch These instruments are commonly used in moored applications, buoys, underwater observatories, and ROVs.

WiFi	GPS	Rechargable	USB	Depth Rating	Depth Rating
				500 m	6,000 m

Max. Depth	500m	6000m
Number of Ports	6 (Option for up to 8)	6 (Option for up to 8)
Biofouling Protection	Street Lamp UV	N/A
Communication	WiFi, USB-C, RS232	USB-C, RS-232
Input Voltage	8-30 VDC	8-30 VDC
Pressure Housing	Acetal	Steel Reinforced Acetal
Protective Cage	Stainless Steel (Optional: CuNi)	Stainless Steel (Optional: CuNi)
Dimensions	600 x 100 mm	600 x 100 mm
Weight in Air	4.0 kg	4.9 kg
Weight in Water	2.1 kg	2.8 kg
Software	Sailfish	Sailfish

Key Benefits:

- **Six X2 series Interchangeable Ports:** Ability to custom configure a single instrument for multiple applications
- **Magnetic On/Off Switch:** Configure Now, Power & Deploy Later
- **Integrated WiFi & GPS:** Transfer data wirelessly
- **USB Connectivity:** Recharge battery and connect via USB
- **Integrated UV Biofouling (Optional):** Maintain consistent data quality & Decrease maintenance intervals
- **Sailfish Software:** Download, process, and export profiles automatically

rev200902

Conductivity

Sound Velocity

Pressure

Turbidity

And More.....

X2change™ is the industry's leading family of field-swappable sensor heads. Each sensor head contains its own embedded calibration and can be moved from instrument to instrument without impacting accuracy. Changing sensors is easy: simply unscrew one sensor head and replace it with another.

Key Benefits:

- *Zero Down Time* - With X2 series sensors, recalibrated sensors are sent to the instrument instead of sending the instrument to the recalibration centre.

- *Reduce Logistical Costs* - With X2 series small sensor heads are shipped instead of heavy instruments.

- *Increased Flexibility* - Field-swappable sensor heads enable any organization - big or small - to become a virtual recalibration centre by stocking spare calibrated sensor heads.

- *One Instrument, Multiple Applications* - the ability to change sensor type on any instrument to suit specific application requirements. This means instrument duplicates (identical instruments dedicated to different pressure ranges, seperate instrument for Turbidity, pH, Chlorophyll, etc) become a thing of the past.

- *Improved absolute pressure accuracy -* You may choose the best full scale pressure range to suit your deployment depth.

X2change™ sensor heads are used exclusively with X2•Series / Orange Line instrumentation. Total flexibility of instrument model, sensor type, and sensor range ensures that the right instrument is always available. Please refer to the X2•Series brochure for a list of instruments, applications, and specifications.

Sound Velocity / CTD / Multiparameter / Biofouling Control / Deployment Systems

	Max Depth (m)	Range	Precision (+/-)	Accuracy (+/-)	Resolution	Response Time	Notes
Conductivity & Temperature	6000 [1]	C: 0-90 mS/cm [2] T: -5 - 45 °C	C: 0.003 mS/cm T: 0.003 °C TMP: 0.003 °C	C: 0.01 mS/cm [6] or 0.003mS/cm [6] T: 0.005 °C or 0.002 °C	C: 0.001 mS/cm T: 0.001 °C	C: 25 ms T: 100 ms	Combined Conductivity & Temperature
Sound Velocity	6000 [1]	1375-1625 m/s	0.006 m/s	0.025 m/s	0.001 m/s	20 ms	
Sound Velocity & Temperature	6000 [1]	SV: 1375-1625 m/s	0.006 m/s T: 0.003 °C	SV: 0.025 m/s T: 0.005 °C	SV: 0.001 m/s T: 0.001 °C	SV: 20 ms T: 550 ms	Combined Sound Velocity & Temperature
Pressure Sensor	100 - 6,000	0-100 dBar to 0 to 6,000 dBar	0.03% FS	0.05% FS	0.02% FS	10 ms	Piezo-Resistive
Turbidity Powered by Turner	200	0-1500 NTU [4]	0.5% reading or 0.1 NTU [5]	2% reading or 0.2 NTU [5]	0.01 NTU	<0.7 s	
	600	0-3000 NTU [4]	0.04% NTU [5] or 0.1 NTU [5]	Linearity 0.99 R [2]	0.01 NTU	<0.7 s	Wiper-equipped
Chlorophyll Powerd by Turner	600	0-500 µg/L	± 0.05% FS	Linearity 0.99 R [2]		200 ms	A & B Red Excitation A & B Blue Excitation High CDOM
Dissolved Oxygen Powerd by JFE Rinko FT	2000	0 to 425 µmol L^{-1} (1)		±2% of measured value or ±2.0 µmol L^{-1} (calibration range: 3 to 30 °C)	0.01 µmol L^{-1}	< 1 s	
	6000						
pH Powered by Idronaut	1500	0 to 14	± 0.05% FS	± 0.1			KCl Reference: Ideal for fast response profiling applications NaCl Reference: Idealfor fast response in situ applications
	6000						
Phycoerythrin (BGA)		0 to 750 ppb					
CDOM/FDOM		0-1250 ppb					
Flourescein		0-500 ppb					
Rhodamine		0-1000 ppb					
Crude Oils	600	>10000 ppb	± 0.05% FS	Linearity 0.99 R [2]		200 ms	X2 Series optical sensors are powered by Turner
Refined Fuels		>100 ppm					
Tryptophan		0-5000 ppb					
Optical Brighteners		0-5000 ppb					

Additional Sensors in both X2Change and Cabled Configurations are available upon request.
All specifications subject to change without notice.

[1] Survivable to 11000 m. Inquire for specifications.
[2] Will over-range to 100 mS/cm. Inquire for specifications.
[3] Will over-range to 60 °C. Inquire for specifications.
[4] Digital auto-ranging
[5] Whichever is greater
[6] Stability is +/-0.003 mS/cm/month when combined with UV UVUV•Xchange™

rev210220

Product Details

**SOUND
SPEED**

**DIALOGUE
X2 SOFTWARE**

miniSVS -
Sound Velocity Sensor

Valeport's unique digital time of flight technology gives unmatched performance figures, with signal noise an order of magnitude better than any other sensor. The miniSVS is available in a selection of configurations and with optional pressure or temperature sensors. There are a number of size options to suit many applications.

The miniSVS is titanium housed as standard and 6000m rated, its rugged design allows it to withstand the toughest conditions.

Sound Velocity Measurement

Each sound velocity measurement is made using a single pulse of sound traveling over a known distance, so is independent of the inherent calculation errors present in all CTDs. Our unique digital signal processing technique virtually eliminates signal noise, and gives almost instantaneous response; the digital measurement is also entirely linear, giving predictable performance under all conditions.

Range	1375 - 1900m/s
Resolution	0.001m
Accuracy	Dependent on sensor size
100mm	Random noise (point to point) ±0.002m/s Max systematic calibration error ±0.013m/s Max systematic clock error ±0.002m/s **Total max theoretical error** **±0.017m/s**
50mm	Total max theoretical error ±0.019m/s
25mm	Total max theoretical error ±0.020m/s

Acoustic Frequency: 2.5MHz

Sample Rate: Selectable, dependent on configuration

Rate	SV	SV+P	SV+T
Single Sample	•	•	•
1Hz	•	•	•
2Hz	•	•	•
4Hz	•	•	•
8Hz	•	•	•
16Hz	•	•	•
32Hz	•	•	•
60Hz	•		

Optional Sensors

The miniSVS may be optionally supplied with either a pressure or temperature sensor. Data is sampled at the rates shown above.

Sensor	Pressure	Temperature
Type	Strain Gauge	PRT
Range	2, 5, 10, 50, 100, 300or 600 Bar	-5°C - +35°C
Resolution	0.001°C range	0.001°C
Accuracy	±0.05% range	±0.01°C

Data Output

The miniSVS has RS232 & RS485 output, selected by command code. RS232 data may be taken directly into a PC over cables up to 200m long, whereas RS485 is suitable for longer cables (up to 1000m) and allows for multiple addressed units on a single cable.

Baud Rate	2400 - 115200 (NB. Low baud rates may limit data rate)
Protocol	8 data bits, 1 stop bit, No parity, No flow control

Electrical

Voltage	9 - 28V DC
Power	0.25W (SV only) 0.35W (SV + Pressure)
Connector	SubConn MCBH6F (alternatives on request)

Data Format

Examples of data formats are:
<space>{sound_velocity}<CR><LF>
<space>{pressure}<space>{sound_velocity}<CR><LF>
<space>{temperature}<space>{sound_velocity}<CR><LF>

SV	Choose from: mm/s (1510123) m/s to 3 decimal places (1510.123) m/s to 2 decimal places (1510.12)
Pressure	If fitted, pressure is always output in dBar with 5 digits, with a decimal point, including leading zeros if necessary. Position of the point is dependent on sensor range, e.g.
	50dBar 47.123
	100dBar 047.12
	1000dBar 0047.1
Temperature	If fitted, temperature is output as a 5 digit number with 3 decimal places and leading zeros, signed if negative, e.g.
	21.456 02.298 -03.174

Physical

Please refer to factory for detailed dimensions if required.

Depth Rating	6000m (Titanium)
Weight	1kg (housed type)
Housing & Bulkhead	Titanium
Transducer Window	Polycarbonate
Sensor Legs	Carbon Composite
Reflector Plate	Titanium

Ordering

All systems supplied with operating manual and carry case.
OEM units come with a test lead, housed units with a 0.5m pigtail.

Configuration	100mm	50mm	25mm
Titanium Housing	0652004	0652005	0652006
Bulkhead OEM	0652001	0652002	0652003
Remote OEM	0652007	0652008	0652009
Titanium + Pressure	0652004-P-XX	0652005-P-XX	0652006-P-XX
Titanium + Temperature	0652004-T	0652005-T	0652006-T
Note	XX Where P = 2, 5, 10, 50, 100, 300 and 600 Bar.		

VALEPORT

miniCTD Profiler

The miniCTD has been developed to provide a cost effective tool for the collection of CTD profiles, without compromising the quality of the data. Ideally suited to ROV, coastal, or small boat applications, the miniCTD will appeal to survey companies and academia alike, being both simple to use and easy to handle.

Product Details

CTD

SOUND SPEED

DATALOG X2 SOFTWARE

Sensors

The miniCTD is fitted with Valeport's unique digital, high stability conductivity sensor, a PRT temperature sensor, and strain gauge pressure transducer. In addition to the measured parameters listed, Salinity and Density values are also calculated by the software.

Conductivity

Range	0 - 80 mS/cm
Resolution	0.001mS/cm
Accuracy	±0.01mS/cm

Temperature

Range	-5°C - +35°C
Resolution	0.001°C
Accuracy	±0.01°C

Pressure

Range	5, 10, 20, 30, 50, 100, 200, 300 or 600 Bar
Resolution	0.001% range
Accuracy	±0.05% range

Data Acquisition

Features a selection of pre-programmed sampling regimes, covering many standard applications. Data may be sampled from 1 to 8Hz, making it suitable for rapid profiling or for continuous measurement at a fixed point

Sampling Modes

Continuous	Regular output from all sensors at 1, 2, 4 or 8Hz
Profile	Logs data as the device falls (or rises) by a defined amount through the water column

Communications

Operates autonomously, with setup and data extraction performed by direct communications with PC. Also operates in real time, with a choice of communication protocols fitted as standard and selected by pin choice on the output connector:

RS232	Up to 200m cable, direct to serial port
RS485	Up to 1000m cable
Baud Rate	38400 - 460800
Protocol	8 data bits, 1 stop bit, No parity, No flow control

Memory

Fitted with a solid-state, non-volatile Flash memory, storing over 10 million lines of data (equivalent to 10,000 profiles to 500m at 1m profile resolution).

Electrical

Internal	1x C cell, 1.5V alkaline or 3.6V lithium
External	9 – 28V DC
Power	<250mW
Battery Life	~30 hrs (alkaline) | ~90 hrs (lithium)
Connector	SubConn MCBH10F

Physical

Materials	Titanium housing (as ordered), Polyurethane and ceramic sensor components Stainless steel (316) deployment cage
Depth Rating	6000m (Titanium) Note: Maximum deployment depth may be limited by transducer range
Instrument Size	Main Housing 48mmØ Sensor Body 54mmØ Length 370mm (including connector)
Deployment Cage	110mmØ x 450mm long
Weight	1.8kg (Titanium)
Shipping	51 x 42 x 27cm, 10kg

Software

Supplied with DataLog X2 PC software, for instrument setup, data extraction and display. DataLog Express is licence free.
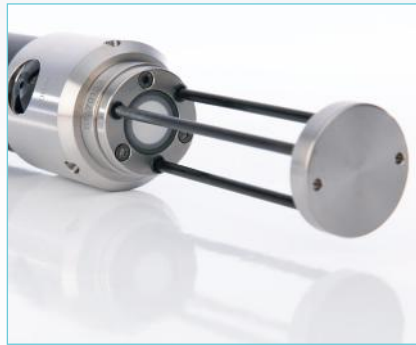
Ordering

0660004-XX	miniCTD Profiler in Titanium Supplied with: · Deployment frame · Switch plug · 3m comms lead · DataLog x2 software · Manual and transit case
Note:	XX denotes pressure transducer range Select from 5, 10, 20, 50, 100, 200, 300 or 600 Bar

VALEPORT

Product Details

SOUND SPEED

DATALOG X2 SOFTWARE

miniSVP
Sound Velocity Profiler

The miniSVP has been developed to provide a cost effective tool for the collection of Sound Velocity Profiles without compromising the quality of the data. Ideally suited to hydrographic survey operations, from coastal to deep water, the miniSVP will appeal to survey companies and academia alike, being simple to use and easy to handle.

Bluetooth

VALEPORT

Sensors

Fitted with Valeport's digital time of flight sound velocity sensor, a PRT temperature sensor, and piezo-resistive pressure transducer.

Sound Velocity

Range	1375 - 1900m/s
Resolution	0.001m/s
Accuracy	±0.02m/s

Temperature

Range	-5°C - +35°C
Resolution	0.001°C
Accuracy	±0.01°C

Pressure

Range	5, 10, 30, 50, 100, 300 or 600 Bar
Resolution	0.001% range
Accuracy	±0.05% range

Data Acquisition

Features a selection of pre-programmed sampling regimes, covering many standard applications. Data may be sampled from 1 to 16Hz, making it suitable for rapid profiling or for continuous measurement at a fixed point.

Sampling Modes

Continuous	Regular output from all sensors at 1, 2, 4, 8 or 16Hz
Profile	Logs data as the device falls (or rises) by a defined amount through the water column.

Communications

Will operate autonomously, with setup and data extraction performed by direct communications with PC. Operates in real time, with a choice of communication protocols fitted as standard and selected by pin choice on the output connector.

RS232	Up to 200m cable, direct to serial port
RS485	Up to 1000m cable
Baud Rate	38400, 57600 or 115200
Protocol	8 data bits, 1 stop bit, No parity, No flow control
Bluetooth	Bluetooth logger and communication set available for cable free data recovery. Bluetooth module is limited to a depth rating of 500m.

Memory

Fitted with a solid state non-volatile Flash memory, capable of storing over 10 million lines of data (equivalent to 10,000 profiles to 500m, at 1m profile resolution).

Electrical

Internal	1 x C cell, 1.5V alkaline or 3.6V lithium
External	9 – 28V DC
Power	<250mW
Battery Life	approximately 30 hours operation (alkaline) approximately 90 hours operation (lithium)
Connector	SubConn MCBH10F

Physical

Materials	Acetal or Titanium housing (as ordered) Polycarbonate & Composite sensor components. Stainless steel (316) deployment cage
Depth Rating	500m (Acetal) 6000m (Titanium)
Note:	Maximum deployment depth may be limited by pressure transducer range
Instrument Size	Main Housing: 48mmØ Sensor Body: 54mmØ Length: 435mm (including connector)
Deployment Cage	110mmØ x 450mm long
Weight	0.8kg (Acetal) | 1.6kg (Titanium)
Shipping	51 x 42 x 27cm | 10kg

Software

The system is supplied with DataLog X2 software, for instrument setup, data extraction and display. DataLog X2 is licence free.

Ordering

0660001-XX	miniSVP Sound Velocity Profiler in Acetal Supplied with: • Deployment cage • Switch plug • 3m comms lead • DataLog X2 software • Manual and transit case
0660001BT-XX	miniSVP Sound Velocity Profiler in Acetal Supplied with: • Deployment cage • Switch plug • Bluetooth logger/communication set • DataLog X2 software • Manual and transit case
Note:	**XX** denotes pressure transducer range Select from 5, 10, 30 or 50bar
0660002-XX	miniSVP Sound Velocity Profiler in Titanium Supplied with: • Deployment cage • Switch plug • 3m comms lead • DataLog X2 software • Manual and transit case
Note:	**XX** denotes pressure transducer range. Select from 5, 10, 30, 50, 100, 300 or 600 Bar

VALEPORT

SWiFT CTD

CTD Profiler

Designed from the outset with the intention of a seamless workflow, the SWiFT CTD profiler provides survey-grade sensor technology coupled with the convenience of Bluetooth connectivity and rechargeable batteries. An integral GPS module, to geo-locate each profile, completes the package. Data can be easily and quickly downloaded and reviewed wirelessly, via Bluetooth, using the Ocean software available for iOS, Android and PC device and instantly shared, in industry standard data formats through email and cloud services. A USB Cable and Bluetooth adapter are provided.

In addition to the directly measured Conductivity, Temperature and Depth measurements, Salinity, Density and Sound Velocity is calculated using the UNESCO international standard algorithm and Chen and Millero equation.

With an operational battery life of up to 5 days and the convenience of charging via USB, SWiFT CTD is intended for offshore, coastal, harbour and inland environmental and hydrographic survey use to 500m and offers the highest quality CTD profiles in a compact, robust and portable package.

Optionally, there is a deployment cage available to bolt onto the instrument to help get the SWiFT CTD to depth in fast-flowing currents.

Product Details

MULTI-PARAMETER CTD

SOUND SPEED

OCEAN SOFTWARE

Bluetooth · USB · Rechargeable Battery · GPS

Sensor Specifications

The SWiFT CTD is fitted with Valeport's conductivity sensor, temperature compensated piezo-resistive pressure transducer and a new fast response thermistor temperature sensor.

Conductivity

Range	0-80 mS/cm
Resolution	0.001 mS/cm
Accuracy	±0.01 mS/cm

Temperature

Range	-5°C – +35°C
Resolution	0.001°C
Accuracy	±0.01°C

Pressure

Range	50 Bar
Resolution	0.001% FS
Accuracy	±0.01% FS

Calculated Parameters and Accuracy

Calculations based on the UNESCO international standard algorithm and Chen and Millero equation

Sound Velocity	~0.25 m/s
Salinity	±0.01 PSU
Density	±0.01 kg/m³

Physical

Materials	Housing - Titanium | Sensor Guard - Acetal | Temperature Sensor - Titanium | Pressure Sensor - Titanium | Conductivity Sensor - Polyurethane coated titanium with ceramic core
Depth Rating	500m
Dimensions	ø78mm x Length 350mm
Weight	2.7kg (in air) / 1.65kg (in water)

Communications (set up and data offload)

USB Serial
Bluetooth v4 - low energy

Electrical

Battery	Internal rechargeable Li-ion battery pack
Battery life	5 days continuous operation
Charging	USB Typically, 1 hour fast charge will give 12 hours operation

Software

iOS and Android Valeport Ocean App for Bluetooth compatible mobile devices – instrument set up, data offload, display and translation to common data formats. Valeport's Ocean PC software, with both USB cable and Bluetooth connectivity, for instrument setup, data extraction, display and translation to common data formats.

Instrument and data time is synchronised to GPS, UTC.

Ordering

0660049-50	SWiFT CTD Profiler Titanium housing rated to 500m
Supplied with	PC Bluetooth adapter USB interface and charging cable 1.5 A charger Valeport Ocean software Operating manual System transit case

Battery indicator — Bluetooth comms — GPS Status — Operational status

VALEPORT