WaterLinked

Compact 3D real-time imaging – Sonar 3D-15

Redefine your perception of the underwater environment thanks to the Water Linked advanced acoustic imaging sonar.

The Sonar 3D-15 is at the forefront of underwater exploration, delivering a clear, three-dimensional acoustic image that penetrates even the murkiest of waters. This technology creates the ability for intuitive navigation, greatly enhancing the user's capability to maneuver around obstacles and pinpoint targets.

Shallow water, often characterized by low visibility and high turbidity, typically renders optical cameras ineffective. While traditional 2D sonars offer some improvement, they fall short in providing a comprehensive understanding of the surrounding environment.

The 3D shaded view simplifies navigation, and the digitized point cloud data is ideal for detailed inspections and creating intricate models of both targets and the underwater terrain. This enables autonomous systems to execute complex decision-making processes.

The Sonar 3D-15 sets itself apart with its compact and efficient design, boasting a 300 meter operational depth and less than 0.4 kilogram in-water weight. Its small size makes it suitable for an extensive variety of ROVs, from the smallest to those of larger size, and empowering them with the ability to discern targets in challenging conditions.

Aligning with the Water Linked commitment for ease of use, the sonar's Graphical User Interface (GUI) is designed for accessibility through a web-based browser. This user-centric design eliminates the complexity of software installation, simplifying the integration process.

A detailed Application Programming Interface (API) allows users to merge the sonar image with third-party software.

Key features

- 3D imaging sonar
- 15m acoustic range
- 90 degree horizontal field of view
- 300m depth rating
- Ethernet communication
- Web GUI and API

Acoustic | performance

Mode	Navigation	Inspection
Transducer frequency	1.2 MHz	2.4 MHz
Horizontal field of view	90° (±45°)	40° (±20°)
Vertical field of view	40° (±20°)	40° (±20°)
Maximum range	15 meters	4 meters
Minimum range	20 cm	20 cm
Range resolution	4 mm	1.5 mm
Beam separation	0.35° (horizontal) / 0.6° (vertical)	0.16° (horizontal) / 0.6° (vertical)
Angular resolution	0.6° (horizontal) / 2.4° (vertical)	0.4° (horizontal) / 1.1° (vertical)
Update rate	5 Hz	20 Hz

Electrical | interface

Input voltage	10-30 Vdc
Power (operational)	20 W (maximum 60W surge)
Power (standby)	3 W
Physical interface	3-m cable with interface module, 6 wires, (Power / Ethernet)
Indicator	Status LED (Power)
Communication	Ethernet (10/100/1000 Base-T)
Maximum bandwidth	10 Mbit/s
Protocols	Water Linked API
GUI view	3D (first-person), 2D (plan)

Mechanical

Dimensions (W x H xD)	12 x 8 x 4 cm
Weight in air	0.66 kg
Weight in water	0.39 kg
Depth rating	300 meters
Material	Stainless Steel 316, Polyurethane
Operating temperature	-5 to 55 °C

Approvals

CE

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WaterLinked

The world's smallest DVL – DVL A50

The Water Linked A50 is the world's smallest Doppler Velocity Log (DVL). By utilising the latest technology Water Linked has been able to reduce the size and cost of the DVL, while delivering a level of performance previously not possible in a product so small.

Thanks to the size and weight of the A50, the smallest ROVs and AUVs can now benefit from increased navigation and control. This allows these small vehicles operating in water depths down to 600m to perform tasks that would have previously required a larger and more expensive vehicle.

Although a clear benefit for small vehicles, larger vehicles requiring high accuracy navigation features also benefit from the size, weight, and cost benefits of fitting this high accuracy DVL.

While typically integrated fully to the ROV or AUV for enhanced control, the integrated Attitude and Heading Reference System (AHRS) within the A50 allows the DVL to be used for dead reckoning positioning. This feature allows the A50 to generate an accurate track plot of the vehicles movements without the need to fully integrate with the vehicle control system.

Key features

- 5cm – 50m altitude range
- 300m or 600m depth rated
- Ethernet and Serial interface
- Embedded computer for standalone operation
- AHRS for increased accuracy
- Extremely small size enabling easy mounting and integration
- Web GUI with comprehensive diagnostic features

Acoustic | performance

Transducer frequency	1 MHz
Transducer setup	4-beam convex Janus array
Transducer beam angle	22.5 degrees
Ping rate	4 - 15 Hz (adaptive to altitude)
Sensor assist	Integrated AHRS
Min altitude	5 cm
Max altitude	50 meters (>35 m is dependent on seabed conditions, salinity levels etc.)
Max velocity	3.75 m/s
Velocity resolution	0.1 mm/s
Long term accuracy	±1.01 % (Standard version), ±0.1 % (Performance version)

Electrical | interface

Input voltage	10 - 30 Vdc
Average power	4 W
Peak power	35 W
Physical interface	3m cable with interface module, 8 wires, (Power / Ethernet / Serial)
Indicator	Status LED (Power, Lock)
Communication	Ethernet & Serial (UART 115200 baud)
Protocols	Water Linked API and PD6

Mechanical

Diameter	66 mm
Height	25 mm
Weight in air	0.17 kg
Weight in water	0.105 kg
Depth rating	300m or 600m
Material	PEEK (housing), Stainless Steel 316 (back plate)
Operating temperature	-5 to 55 °C

Approvals

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WaterLinked

Miniature long range DVL – DVL A125

The Water Linked A125 is the world's smallest long range Doppler Velocity Log (DVL). By utilising the latest technology Water Linked has been able to reduce the size and cost of the DVL, while delivering a level of performance previously not possible in a product so small.

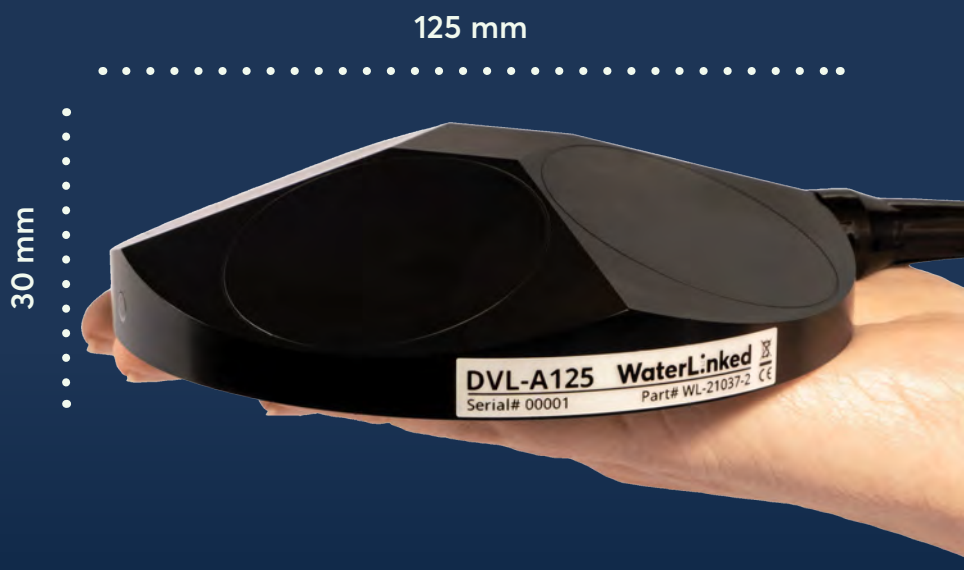
Capable of maintaining bottom lock at speeds of up to 9 meters per second, and with an altitude range of 125m, the A125 is the perfect DVL for ROVs, USVs and AUVs. The ability to also operate at an altitude as low as 5cm means the DVL will work at extremely short range as well as long range.

The size and weight of the A125 allows this DVL to be used on the smallest of vehicles, while having a depth rating of 3000m means this high performance DVL can also be used on vehicles that operate at these extreme depths.

Although a DVL is typically integrated fully to the vehicle for enhanced control, the integrated Attitude and Heading Reference System (AHRS) within the A125 allows the DVL to be used for dead reckoning positioning. This feature allows the A125 to generate an accurate track plot of the vehicles movements without the need to fully integrate with the vehicle control system.

Key features

- 5cm – 125m altitude range
- 600m or 3000m depth rated
- Ethernet and Serial interface
- Embedded computer for standalone operation
- AHRS for increased accuracy
- Extremely small size enabling easy mounting and integration
- Web GUI with comprehensive diagnostic features



Acoustic | performance

Transducer frequency	420 kHz
Transducer setup	4-beam convex Janus array
Transducer beam angle	22.5 degrees
Ping rate	2 - 15 Hz (adaptive to altitude)
Sensor assist	Integrated AHRS
Min altitude	5 cm
Max altitude	125 meters (>110 m is dependent on seabed conditions, salinity levels etc.)
Max velocity	9 m/s
Velocity resolution	0.1 mm/s
Long term accuracy	±1.01 % (Standard version), ±0.1 % (Performance version)

Electrical | interface

Input voltage	10 - 30 Vdc
Average power	4 W
Peak power	35 W
Physical interface	3m cable with interface module, 8 wires, (Power / Ethernet / Serial)
Indicator	Status LED (Power, Lock)
Communication	Ethernet & Serial (UART 115200 baud)
Protocols	Water Linked API and PD6

Mechanical

Diameter	125 mm
Height	30 mm
Weight in air	0.75 kg
Weight in water	0.50 kg
Depth rating	600m or 3,000m
Material	PEEK (housing), Stainless Steel 316 (back plate)
Operating temperature	-5 to 55 °C

Approvals

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WaterLinked

Miniature underwater communication – Modem M16

The Water Linked M16 modem is a miniature 16 bits per package underwater acoustic modem which has been designed for use in the most challenging of environments, where a reliable connection is of utmost importance.

Utilising the latest technology, developed for Aquaculture, Water Linked has produced a modem which provides a robust half duplex communication link with an acoustic range of 1,000m.

With a rapid boot-up time, the M16 modem is ideal for use with subsea vehicles or instrumentation that has limited available power.

When transmitting and receiving data, the M16 modem continues to offer the benefits of a low power solution requiring less than 2 watt seconds during transmission.

With 12 channels to choose from, operating around a 58.5 kHz centre frequency, multiple modems can be operated at the same time in the same area without interference.

Maintaining a small physical size and being lightweight was critical when designing the M16 modem for OEM integration, allowing the M16 modem to be integrated with little impact on the design of the overall system.

A transparent UART interface allows for simple low power connection to sensors, while an extended cable variation of the M16 modem is available with RS422 communication.

Key features

- Robust bi-directional communication
- 1,000m acoustic range
- Low power requirement
- Rapid boot-up time
- 600m depth rated
- 16 bits per package
- <250 mW Rx power
- Serial interface

35.5 mm
OEM housing

47.5 mm
Flange housing

47 mm
Standard/Extended

Acoustic | performance

Carrier frequency	58.5 kHz
Frequency bandwidth	7812 Hz
Transmitter source	160dB re 1µPa at 1m
Directivity	Omnidirectional
Acoustic range	1,000m
Bits per package	16
Package duration	1.6 seconds
Communication type	Half duplex

Electrical | interface

Type	OEM	Flange	Standard	Extended cable
Input voltage	3.0 - 4.2 Vdc	3.0 - 4.2 Vdc	3.0 - 4.2 Vdc	10 - 30 Vdc
Power (Tx)	<1.1 W	<1.1 W	<1.1 W	<2.0 W
Power (Rx)	<250 mW	<250 mW	<250 mW	<400 mW
Cable length	0.3m	0.3m	2m	15m
Communication	Serial UART (2.5-3.3V CMOS, 2.5-5V TTL)	Serial UART (2.5-3.3V CMOS, 2.5-5V TTL)	Serial UART (2.5-3.3V CMOS, 2.5-5V TTL)	RS422
Onboard data buffer	16 bits (while transmitting)			

Mechanical

Dimensions (excludes cabling)	Ø3.0 x 3.6 cm	4.1 x 4.1 x 4.8 cm	Ø3.0 x 4.7 cm	Ø3.0 x 4.7 cm
Weight in air (excludes cabling)	27 g	62 g	40 g	40 g
Weight in water (excludes cabling)	12 g	32 g	14 g	14 g
Cable jacket diameter	N/A	N/A	Ø6.0 +/- 0.2 mm	Ø6.0 +/- 0.2 mm
Depth rating	600 meters			
Material	POM (housing), PEEK (transducer)			
Operating temperature	-10 to 70 °C			

Approvals

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Robust positioning system – Underwater GPS G2

Underwater GPS G2 is our latest Short BaseLine (SBL) system providing reliable accurate and robust acoustic positioning of a single Locator.

The G2 Topside is connected to the G2 Antenna which must be mounted in the water with direct line of sight to the Locator. A Wi-Fi signal emitted by the internal Web server of the G2 Topside allows the user to track the Locator using the Water Linked Web-based GUI. Users can also develop their own user interface using the Water Linked easy to use HTTP based API.

With the benefit of an integrated GPS and Inertial Measurement Unit (IMU), the GPS G2 provides absolute GPS position of the Locator, removing the need to integrate additional third-party sensors for accurate navigation.

While only one Locator can be tracked the Locator can be set to one of 7 channels, allowing multiple GPS G2 systems to be used in the same area without interference.

Locators are available in one of 3 configurations to support the user's requirements. The Locator must be synchronised with the Topside, which is achieved either through a GPS lock or through direct connection with the Topside, typically through the ROV tether.

Key features

- Reliable positioning in the most challenging environments (shallow water, inside tanks/ pools, around installations etc.)
- Omnidirectional 360 degrees operation
- Locator operates reliability even when close to the surface
- 100m and 300m range versions available
- Small size enabling easy mounting
- On-board user-friendly web-based GUI with comprehensive diagnostic features
- Water Linked API supplied to allow for custom integration

G2 Topside

U1 Locator

G2 Antenna

Locator Type*	Power Source	Depth Source	Time Synchronization	Signal Range
U1	Integrated Battery	Integrated	GPS lock	300m
A1	G2 Topside	User supplied	G2 Topside (Direct connection/Tether)	300m
D1	G2 Topside	Integrated	G2 Topside (Direct connection)	100m

*U1 Locator is supplied as standard and is limited to 200m operating depth

Acoustic | performance

System range	100 meter and 300 meter options
Ping rate	2 Hz
Accuracy	Horizontal range: <0.2%, Horizontal angle: <1 deg, Vertical range (depth): <1%
Long term drift	Locator A1/D1: None, Locator U1: ~1m/6hr
Frequency	31.25 – 250 kHz (200 kHz typical)
Directivity	Omnidirectional
Operating principle	Time of flight, Triangulation

Electrical | interface

Input voltage	10 - 30 Vdc
Power drain	3 W
Power-on surge	28 W
Communication	Wi-Fi (802.11ac/a/b/g/n), Ethernet (100 Mbps), NMEA 0183
User Interface	Web based GUI
Protocols	Water Linked API

Mechanical

System Weight (typical)	6 kg
Receiver dimension	30 x 21 x 10 cm
Antenna dimension	54 x 12.5 x 14.5 cm (folded), 151 x 98 x 53.5 cm (expanded)
Locator U1 dimension	13.3 x 3.2Ø cm
Depth rating	300 meters (U1 limited to 200 meters)
Operating temperature	-10 to 60 °C

Approvals

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