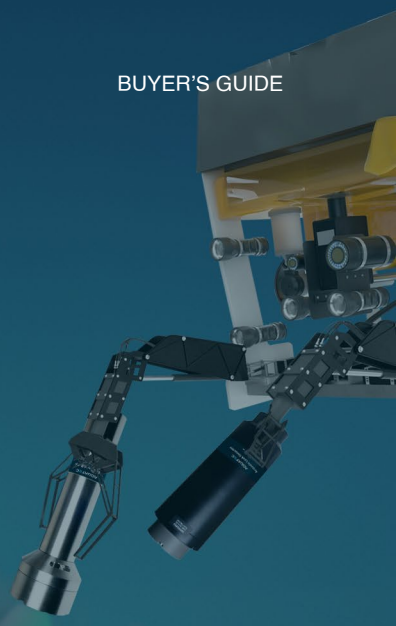
AQUATEC

BUYER'S GUIDE

LEAK*log*®

LEAK DETECTION SYSTEM



SOME APPLICATIONS

- Pipeline integrity monitoring
- Pre-commissioning and decommissioning
- Inspection, maintenance and repair
- Subsea asset protection
- Subsea production optimisation
- Deep-water operations support
- Research and development

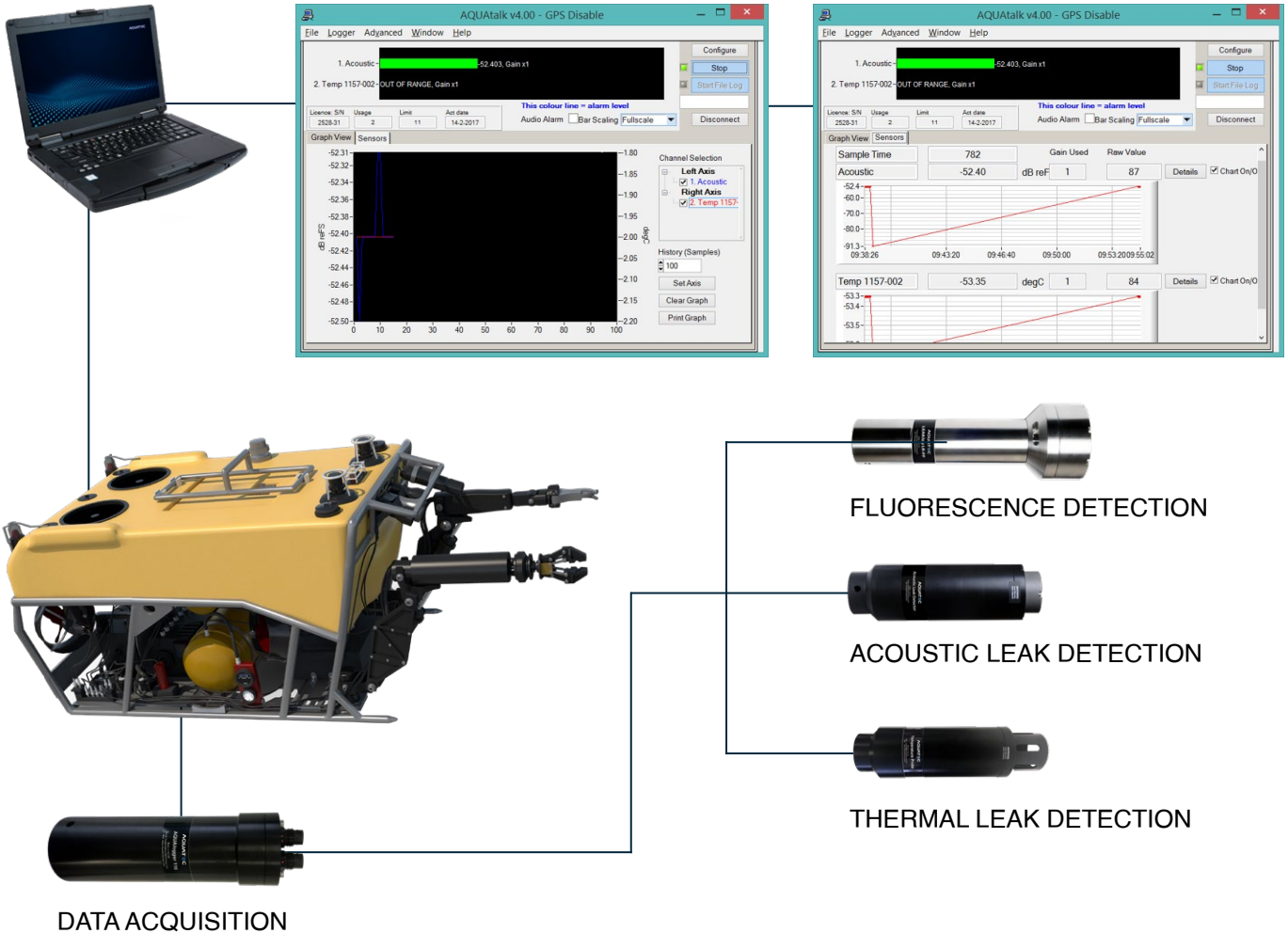

AQUATEC
AQUA*logger*® 110
AQUATEC
LEAK*log* LR-FR
WARNING!
Leak Warranty
Void If Opened
AQUATEC
Acoustic Leak Detector
WARNING
Leak Warranty
Void If Opened
AQUATEC
Temperature Probe

Aquatec's Dual-Channel Leak Detection System

The LEAK*log*® system by Aquatec stands out as a cutting-edge solution for subsea leak detection, combining advanced technology with flexible operation. Its core innovation lies in the dual-channel capability, allowing the simultaneous integration of different sensor types, such as those for fluorescent dye tracking, acoustic signal analysis, and thermal differential identification. This versatility enables operators to customise detection strategies based on specific mission requirements, providing a comprehensive approach to monitoring.

Each sensor is linked to a high-performance processor board enclosed in a durable, pressure-resistant casing, typically mounted on a Remotely Operated Vehicle (ROV). The processor ensures real-time data collection and transmission through RS232 and RS485 outputs, while also supplying continuous power to the sensors.

The accompanying AQUA*talk*™ software enhances this functionality by presenting data in dual-channel colour time series plots, offering a clear visualisation of potential leaks in real time. Operators can set custom alarm levels, triggering immediate notifications of anomalies for rapid response. Overall, LEAK*log*®'s adaptability and reliability make it a valuable tool for effectively protecting subsea infrastructure, embodying Aquatec's commitment to innovation in underwater monitoring.



ROV-BASED

DATA ACQUISITION UNIT

AQUA*logger*® 110

The AQUA*logger*® 110, central to Aquatec's LEAK*log*® system, offers dual-channel precision for real-time leak monitoring. It streamlines subsea leak detection with versatile ROV/computer connectivity, independent sensor controls, and compatibility with diverse sensors. Packaged in robust housing, it requires only an external 24V power supply, ensuring efficient and accurate data transmission to surface PCs via AQUA*talk*™ software.

KEY FEATURES

- Dual-mode: absolute and gradient temperature
- High sensitivity to millidegree changes
- Depth rating to 3,000 m
- Real-time data via AQUA*talk*™ software
- ROV deployment compatibility

APPLICATIONS

- Leak detection in subsea pipelines
- Monitoring thermal plumes in oceanography
- Temperature gradient analysis for engineering studies

SPECIFICATIONS

Depth Rating	3,000 m
Communications	RS232 and RS485
Supply Voltage	-+24 Vdc
Dimensions	76 mm (2.99 in) diameter × 268 mm (10.55 in) length
Weight	1.9 Kg (4.18 lbs)
Material	Anodised aluminium

OPTIMISED CONNECTIVITY AND PRECISION

Efficient Interface and Power Supply:
The AQUA*logger*® 110 simplifies connectivity, interfacing directly with ROVs and surface computers to ensure a streamlined operation. Powered by a +24 Vdc input, with a tolerance for 19-36V to accommodate typical ROV power supplies, it supports both RS485 communication for long cables and non-multiplexed ROVs, and RS232 for shorter cables or when integrated with an ROV multiplexer. This versatility ensures compatibility across a wide range of operational scenarios.

Dual-Channel Flexibility:
Equipped with two independent analogue acquisition channels (0 – 5 Vdc), the AQUA*logger*® can connect to a variety of sensors, allowing simultaneous monitoring of two different data streams. Each channel is complemented by sensor power (12 Vdc) and dual Sensor Gain or Mode controls, providing the operator with precise control over sensor sensitivity and data acquisition parameters.

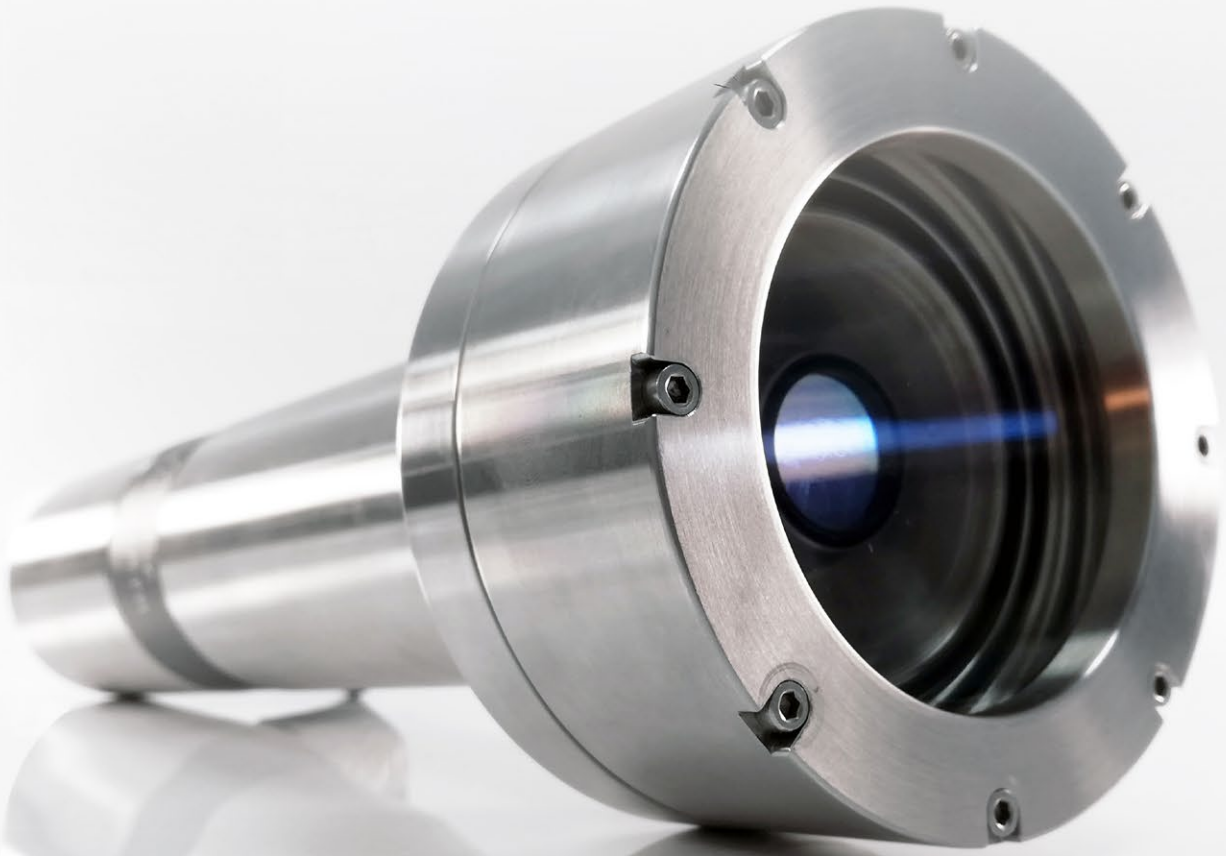
Streamlined Design and Operation:
Housed in a robust single enclosure, the AQUA*logger*® features an 8-way connector for power and communications and two 6-way connectors for seamless connection to fluorometer cables or other sensors. Designed for real-time monitoring, each channel is equipped with independent gain control, enabling adjustment across four gain modes for optimal sensor performance.

ROV-BASED

LONG RANGE FLUOROMETER

LEAK*log*® LR

Aquatec's LEAK*log*® LR Fluorometer is a cornerstone in the Leak Detection System. This instrument embodies sensitivity in fluorescence leak detection, utilising a spectrum of models to detect various dyes including Rhodamine, Fluorescein, and Ultraviolet markers. Its rugged design, capable of operating at depths up to 3,500 m and detecting leaks up to 10 m range, integrates seamlessly into ROV-based inspections. Ideal for subsea pipeline monitoring, the LEAK*log*® LR ensures peace of mind in the most challenging environments.



KEY FEATURES

- Multiple models for diverse dye detection (Rhodamine, Fluorescein, and UV)
- Effective in turbid conditions with a detection range of up to 10 m
- Seamless integration with ROVs for operational flexibility
- Real-time analysis and alerting via AQUA*talk*™ software
- Engineered for depths up to 3,500 m ensuring robust deep-sea performance

APPLICATIONS

- Subsea pipeline leak detection during pre-commissioning checks
- Inspection and maintenance of offshore oil and gas infrastructure
- Research applications in marine biology and underwater ecology

SPECIFICATIONS

Depth Rating	3,500 m
Detection Range	Up to 10 m (depending on visibility, dye type and concentration)
Miminum Detection Level	0.001 ppm
Sensitivity	Can detect as low as 1 ppb when immersed in plume
Supply Voltage	12 - 31 Vdc, 150 mA avg, 500mA pk
Output	0-5 V
Dimensions	100 mm (3.94 in) max diameter × 296 mm (11.65 in) length
Weight	~5 kg (~11.02 lbs)
Material	Stainless Steel 316L

FLUORESCENCE LEAK DETECTION

The LEAK*log* ® LR can detect a wide range of substances, including UV, Rhodamine, and Fluorescein dyes and is particularly effective in scenarios involving dye use, offering a clear advantage in turbid waters, confined spaces, or areas challenging for ROV navigation. Its integration with thermal or acoustic sensors enables a holistic approach to leak detection.

Wavelengths	Fluorometer Models		
	LEAK*log*® LR-FR (Rhodamine)	LEAK*log*® LR-FF (Fluorescein)	LEAK*log*® LR-UV (Ultraviolet)
Excitation	543 nm ±14	472 nm ±18	370 nm ±5
Reception	586 nm ±13	534.5 nm ±24	450 nm ±40

Some Detectable Dyes and Fluids	Fluorometer Models		
	LEAK*log*® LR-FR (Rhodamine)	LEAK*log*® LR-FF (Fluorescein)	LEAK*log*® LR-UV (Ultraviolet)
Anthracene Derivatives			•
Aquasweep HDW1000 FluorBlue			•
Castrol Brayco Micronic SV3			•
Castrol Transaqua HT		•	
Castrol Transaqua HT2			•
Champion Hydrosure Fluorodye UC	•		
Champion Hydrosure O-3670 RD		•	
Chromophoric Dissolved Organic Matter (CDOM)			•
Clariant Preservan 2140		•	
Clariant Tros Seadye		•	
Dipyrromethene Boron Difluoride (BODIPY)	•		
Eosin Y		•	
Fluorescein		•	
Houghton Chemical Fluids	•		
Lissamine Green B		•	
MacDermid OCEANIC EFC 25		•	
MacDermid OCEANIC HW 443 R	•		
MacDermid OCEANIC HW 443		•	
MacDermid OCEANIC HW 460 R	•		
MacDermid OCEANIC HW 510	•		
MacDermid OCEANIC HW 510 P		•	
MacDermid OCEANIC HW 525	•		
MacDermid OCEANIC HW 525 P		•	
MacDermid OCEANIC HW 540 E	•		
MacDermid OCEANIC HW 540 P		•	
MacDermid OCEANIC HW 720 R	•		
MacDermid OCEANIC HW 740 R	•		
MacDermid OCEANIC Red LTF	•		
MacDermid OCEANIC Yellow LTF		•	
MacDermid PELAGIC 100 (H)	•		
MacDermid PELAGIC 100			•
Naphthalimide			•
Optical Brighteners			•
Pyrenetetrasulfonic Acid Tetrasodium Salt (PTSA)			•
Quinine Sulphate			•
Rhodamine B	•		
Rhodamine WT	•		
Roemex RX-5255	•		
Roemex RX-9022	•		
Roemex RX-9025		•	
Roemex RX-9025A		•	
Roemex RX-9026E			•
Roemex RX-9026EC			•
Roemex RX-9034A	•		
Schlumberger Tracer Dyes	•		
Schlumberger D247	•		
Sulphorhodamine B	•		
Uranine		•	

ROV-BASED

PASSIVE ACOUSTIC LEAK DETECTOR

LEAK*log*® PA1

Enhancing subsea pipeline integrity through advanced acoustic sensing, Aquatec's LEAK*log*® PA1 Passive Acoustic Leak Detector excels in pinpointing high-pressure gas and liquid leaks. Optimised for deep-sea operations up to 2,000 m, this instrument harnesses ultrasonic technology to detect the distinct acoustic signatures of leaks in the 30-150 kHz frequency range.

With remarkable precision, the LEAK*log*® PA1's highly sensitive directional hydrophone and sophisticated noise filtration capabilities isolate leak sounds from ambient underwater disturbances. Seamlessly integrating with ROVs and Aquatec's AQUA*talk*™ software, it delivers real-time acoustic data to operators, enabling rapid leak localisation. An invaluable addition to multi-sensor leak detection strategies, the LEAK*log*® PA1 ensures comprehensive pipeline monitoring where conventional methods fall short.

KEY FEATURES

- Advanced ultrasonic acoustic sensing tuned to detect leak signatures in the 30-150 kHz range
- Highly directional hydrophone for precise leak localisation
- Sophisticated noise filtration to isolate leak sounds from ambient underwater noise
- Selectable gain options and auto-gain for optimised sensitivity in varying conditions
- Real-time data Integration with AQUA*talk*™ software for immediate leak analysis

APPLICATIONS

- Deep-sea pipeline integrity monitoring for the Oil & Gas industry
- Rapid localisation and mitigation of high-pressure gas and liquid leaks
- Complementary technology for multi-sensor leak detection strategies
- Preventive maintenance and routine subsea inspection surveys
- Remote subsea acoustic monitoring for various underwater operations including valve monitoring

SPECIFICATIONS

Depth Rating	2,000 m
Frequency Response	From 30kHz to 150kHz
Gain Options	40dB, 52dB, 60dB and 72dB
Supply Voltage	12 Vdc
Output	0-5 V
Dimensions	80 mm (3.15 in) diameter × 261 mm (10.28 in) length
Weight	1.4 kg (3.08 lbs)
Material	Acetal and ABS

ACOUSTIC LEAK DETECTION

The LEAK*log*® PA1 offers unparalleled acoustic precision. This method utilises a directional hydrophone that 'listens' for high-frequency sounds produced by pressurised fluids escaping through small orifices. By using precision filtering, the LEAK*log*® PA1 discerns the distinct ultrasonic frequencies of a leak amidst the sea of underwater sounds, including those from ROVs and surface vessels.

The advanced acoustic detection capability of the PA1, powered by noise filters, zeroes in on leaks across a spectrum of pipeline and equipment failures – from risers and flanges to complex sub-sea control systems. Designed for versatility, the hydrophone can be deployed via ROV, AUV, or towed vehicles, providing flexibility and rapid pinpointing of leak locations. Embracing the latest in data handling, the PA1 ensures that leak detection remains accurate and efficient even amid the bustling activity of marine operations.

ROV-BASED

TEMPERATURE PROBE

LEAK*log*® T1

Engineered for the demanding conditions of subsea operations, Aquatec's LEAK*log*® T1 Temperature Probe delivers rapid detection of thermal plumes from leaks with sensitivity to millidegree changes. It provides absolute temperature measurements and ultra-sensitive temperature gradient data, crucial for monitoring pipeline integrity in the Oil & Gas industry. Its design facilitates easy integration with ROVs for real-time, dependable monitoring.

KEY FEATURES

- Dual-mode: absolute and gradient temperature
- High sensitivity to millidegree changes
- Depth rating to 2,000 m
- Real-time data via AQUA*talk*® software
- ROV deployment compatibility

APPLICATIONS

- Leak detection in subsea pipelines
- Monitoring thermal plumes in oceanography
- Temperature gradient analysis for engineering studies

SPECIFICATIONS

Depth Rating	2,000 m
Temperature Range	-2°C to 50°C
Accuracy	±1°C
Temperature Gradient Mode	Detects rapid temperature changes with precision to the millidegree level
Supply Voltage	12-30 VDC
Output	0-5 V
Dimensions	80 mm (3.15 in) diameter × 292 mm (11.50 in) length
Weight	1.35 Kg (2.97 lbs)
Material	Acetal

PRECISION THERMAL LEAK DETECTION

Choosing the LEAK*log*® T1 for leak detection means relying on precise thermal differentials, which are crucial in scenarios where the leaking substance has a distinct temperature from the surrounding environment, such as in hot product-carrying infrastructure.

The LEAK*log*® T1 is engineered to exploit the principle of convection, detecting the subtle rise of warmer fluids, often indicating a leak. Temperature detection with the T1 is not affected by the visibility or noise of the surrounding waters.

It employs a high-precision thermistor that monitors temperature changes or the rate of change, making it exceptionally practical for identifying even the most minor leaks. This method is particularly powerful when the leaking fluid is warmer and rises due to its lower density, offering an efficient and direct approach to safeguarding the integrity of subsea installations.

Aquatec House, Stroudley Road,Basingstoke RG24 8FW, UK | www.aquatecgroup.com | inquiry@aquatecgroup.com | +44 (0) 1256 416010