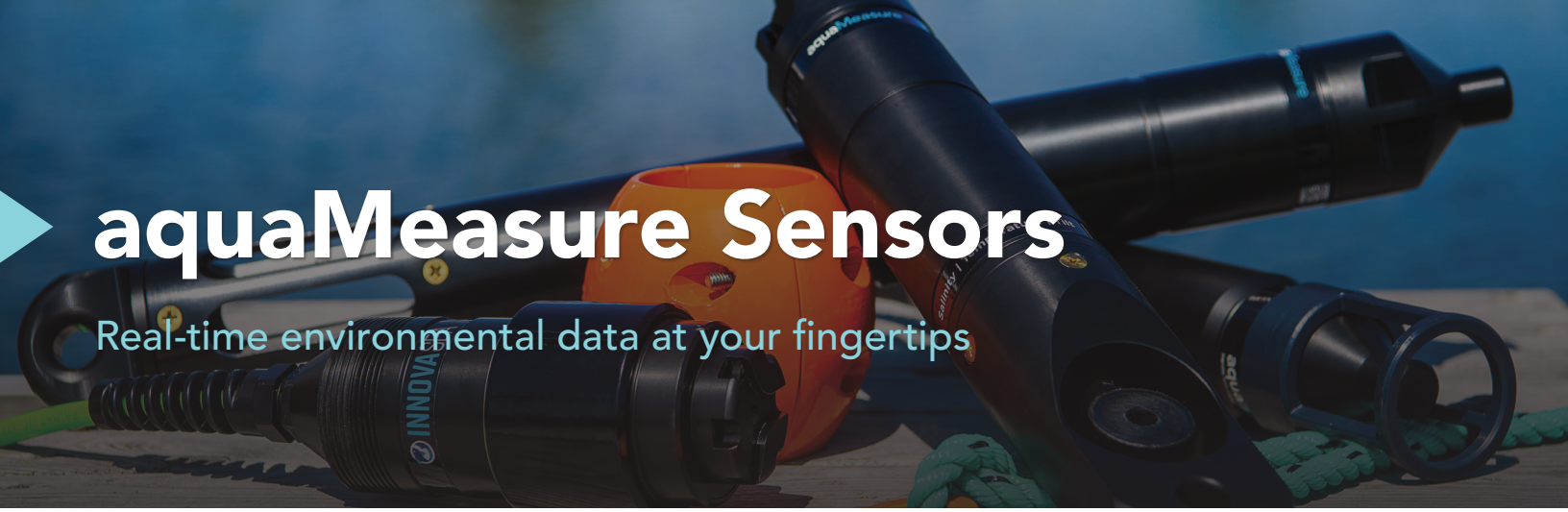

aquaMeasure Sensors

Real-time environmental data at your fingertips

aquaMeasure is a suite of compact, submersible, environmental sensors with underwater, and in-air wireless communications. aquaMeasure was designed with a focus on what matters most — your data.
By combining underwater communications with cloud-synched technology, aquaMeasure delivers a unique, intuitive user experience, enabling massive amounts of data to be gathered from underwater environments and sent seamlessly to the cloud. All aquaMeasure sensors measure temperature and tilt along with a range of different sensor configurations, including dissolved oxygen with optional depth sensor (DOTD), salinity (SAL), blue-green algae (BGA — freshwater and marine), turbidity (TURB), chlorophyll (CHL), and chromophoric/fluorescent dissolved organic matter (CDOM/FDOM). Sensors are easy to install, built for the roughest of open ocean conditions, and are factory calibrated and field ready. Users can now perform single- and two-point calibrations on the DOTD sensors.

Key Features

- Underwater wireless communications
- Easy to deploy
- Cloud-sync technology
- Mobile configuration
- Bluetooth connectivity

INNOVASEA

aquaMeasure DOT(D)

Wireless Sensor/Data Logger

Dissolved oxygen DO measurements are crucial in optimizing the feeding and health of farmed fish. Low dissolved oxygen levels can significantly affect fish behavior, cause stress to fish and even lead to mortality. Every farm faces its own set of challenges and the wireless nature of the sensors allow for flexible deployment configurations to better understand each farms unique environment. DO levels can be affected by numerous variables: biomass, net fouling, water temperature, and harmful algae blooms (HABs). DO levels vary throughout the day, so real time DO measurements allow farmers to make informed decisions and optimize fish growth.

PRODUCT SPECIFICATIONS

The aquaMeasure DOT(D) is a compact, wireless underwater sensor that measures dissolved oxygen, temperature, and tilt in real time.

Dissolved Oxygen:
Optical based measurement
Operational range: 0-150%
Resolution (logged data): 0.1%
Resolution (transmitted data): 0.55-1%
Accuracy: ±5% between 0-120% and 5-25 °C

Temperature:
Operational range: -5-35 °C (water must not freeze)
Resolution (logged data): 0.01 °C
Resolution (transmitted data): 0.1 °C
Accuracy: ±0.2 °C

Tilt:
3D accelerometer: 0-180°
Resolution (logged data): 0.1°
Resolution (transmitted data): 1°

Depth (optional sensor):
Operational range: 0-100 m ±1.5 m
Resolution (logged data): 0.1 m
Resolution (transmitted data): 0.5 m

Battery Life: 6-12 months

Configuration/Offload:
Via aquaMeasure app (iOS/Android)

Real-time Mode:
Yes (underwater communications)

Logger Mode: Yes (internal storage)

Memory: 64 Mb flash drive (stores over 1 million records)

Operating Depth Range: Up to 100 m

Sensor Dimensions: 50 mm x 274 mm

Weight Collar Dimensions: 70 mm x 80 mm

Weight (Air/Water): 526 g/154 g

Weight Collar (Air/Water): 907 g/816 g

INNOVASEA

aquaMeasure SAL

Wireless Sensor/Data Logger

Salinity is an important measure of water quality, as many species of fish tolerate different ranges of salinity. Although large changes in salinity are uncommon, fluctuations often occur in fjords and coastal areas due to local hydrodynamics, tidal cycles and freshwater inputs from rivers and precipitaion. Salinity can be measured in real time to capture upwelling events and to understand water column stratification. Salinity can also be used to convert DO saturation measurements into concentration (mg/L).

PRODUCT SPECIFICATIONS

The aquaMeasure SAL is a compact, wireless underwater sensor that measures salinity, temperature and tilt in real time.

Salinity:
Conductivity-based measurement
Operational range: 0-75 PSU
Resolution (logged data): 0.1 PSU
Resolution (transmitted data): 0.5 PSU
Accuracy: ±1.0 PSU

Temperature:
Operational range: -5-35 °C
(water must not freeze)
Resolution (logged data): 0.01 °C
Resolution (transmitted data): 0.1 °C
Accuracy: ±0.2 °C

Tilt Sensor:
3D accelerometer: 0-180°
Resolution (logged data): 0.1°
Resolution (transmitted data): 1°

Battery Life:
6-12 months

Configuration/Offload:
Via aquaMeasure app (iOS/Android)

Real-time Mode:
Yes (underwater communications)

Logger Mode:
Yes (internal storage)

Strorage:
64 MB flash drive (stores over 1 million records)

Depth:
Up to 100 m

Sensor Dimensions:
64 mm x 386 mm

Weight Collar Dimensions:
99 mm x 106 mm

Weight (Air/Water):
820 g/300 g

Weight Collar (Air/Water):
2360 g/2170 g

INNOVASEA

aquaMeasure BGA (Freshwater)

Wireless Sensor/Data Logger

Blue-green algae is a type of phytoplankton also known as cyanobacteria that grows in both freshwater and marine ecosystems. In aquaculture environments, signs of blue-green algae are not always visible, and blooms can have devastating effects on farm biomass. Negative impacts can include low dissolved oxygen and the production of toxins, which can lead to gill health issues and mortality. In areas known for harmful algae blooms and high levels of blue-green algae, real time monitoring can alert you to changing concentrations that can help farmers take action to protect their stocks.

PRODUCT SPECIFICATIONS

The aquaMeasure BGA is a compact, wireless underwater sensor that measures blue-green algae, temperature, and tilt in realtime. The freshwater sensor targets phycocyanin, the pigment found in freshwater species.

BG Algae Freshwater (Phycocyanin):
Optical fluorescence measurement
Operational range: 0–4500 ppb
Resolution (logged data): 1.0 ppb
Resolution (transmitted data): 30.0 ppb

Temperature:
Operational range: -2-35 °C
(water must not freeze)
Resolution (logged data): 0.01 °C
Resolution (transmitted data): 0.1 °C
Accuracy: ±0.2 °C

Tilt:
3D Accelerometer: 0-180°
Resolution (logged data): 0.1°
Resolution (transmitted data): 1°

Battery Life:
4-6 months

Configuration/Offload:
Via aquaMeasure app (iOS/Android)

Real-time Mode:
Yes (underwater communications)

Logger Mode:
Yes (internal storage)

Strorage:
64 MB flash drive (stores over 1 million records)

Operating Depth Range:
Up to 100 m

Sensor Dimensions:
64 mm x 574 mm

Weight Collar Dimensions:
99 mm x 106 mm

Weight (Air/Water):
1300 g/265 g

Weight Collar (Air/Water):
2360 g/2170 g

INNOVASEA

aquaMeasure BGA (Marine)

Wireless Sensor/Data Logger

Blue-green algae is a type of phytoplankton also known as cyanobacteria that grows in both freshwater and marine ecosystems. In aquaculture environments, signs of blue-green algae are not always visible, and blooms can have devastating effects on farm biomass. Negative impacts can include low dissolved oxygen and the production of toxins, which can lead to gill health issues and mortality. In areas known for harmful algae blooms and high levels of blue-green algae, real time monitoring can alert you to changing concentrations that can help farmers take action to protect their stocks.

PRODUCT SPECIFICATIONS

The aquaMeasure BGA is a compact, wireless underwater sensor that measures blue-green algae, temperature, and tilt in real time. The marine sensor targets phycoerythrin, the pigment found in marine species.

BG Algae Marine (Phycoerythrin):
Optical fluorescence measurement
Operational range: 0-700 ppb
Resolution (logged data): 0.1 ppb
Resolution (transmitted data): 5.0 ppb

Temperature:
Operational range: -2-35 °C
(water must not freeze)
Resolution (logged data): 0.01 °C
Resolution (transmitted data): 0.1 °C
Accuracy: ±0.2 °C

Tilt:
3D accelerometer: 0-180°
Resolution (logged data): 0.1°
Resolution (transmitted data): 1°

Battery Life:
4-6 months

Configuration/Offload:
Via aquaMeasure app (iOS/Android)

Real-time Mode:
Yes (underwater communications)

Logger Mode:
Yes (internal storage)

Strorage:
64 MB flash drive (stores over 1 million records)

Operating Depth Range:
Up to 100 m

Sensor Dimensions:
64 mm x 574 mm

Weight Collar Dimensions:
99 mm x 106 mm

Weight (Air/Water):
1300 g/265 g

Weight Collar (Air/Water):
2360 g/2170 g

INNOVASEA

aquaMeasure TURB

Wireless Sensor/Data Logger

Turbidity is a measurement of water clarity and estimates the concentration of suspended particles in the water column. Turbidity is an important measure of water quality and increased levels of turbidity can cause gill health issues and affect fish feeding, behavior, and welfare. Sudden changes in turbidity can also be an indication of runoff from nearby river sources after significant precipitation events. Real time monitoring of turbidity helps ensure that nothing goes unnoticed and can provide evidence of environmental changes that occur overnight or when there are no staff on site.

PRODUCT SPECIFICATIONS

The aquaMeasure TURB is a compact, wireless underwater sensor that measures turbidity, temperature, and tilt in real time.

Turbidity:
Optical back-scatter based measurement
Operational range: 0-200 NTU
Resolution (logged data): 0.01 NTU
Resolution (transmitted data): 2.0 NTU

Temperature:
Operational range: -2-35 °C
(water must not freeze)
Resolution (logged data): 0.01 °C
Resolution (transmitted data): 0.1 °C
Accuracy: ±0.2 °C

Tilt:
3D accelerometer: 0-180°
Resolution (logged data): 0.1°
Resolution (transmitted data): 1°

Battery Life:
4-6 months

Configuration/Offload:
Via aquaMeasure app (iOS/Android)

Real-time Mode:
Yes (underwater communications)

Logger Mode:
Yes (internal storage)

Strorage:
64 MB flash drive (stores over 1 million records)

Operating Depth Range:
Up to 100 m

Sensor Dimensions:
64 mm x 574 mm

Weight Collar Dimensions:
99 mm x 106 mm

Weight (Air/Water):
1300 g/265 g

Weight Collar (Air/Water):
2360 g/2170 g

INNOVASEA

aquaMeasure CHL

Wireless Sensor/Data Logger

Chlorophyll can be used as a proxy to estimate concentrations of phytoplankton. Phytoplankton can cause many different issues on farms including low dissolved oxygen, gill health issues and toxic species produce toxins that have a wide variety of effects including mortality. High levels of phytoplankton can be an indicator of an upcoming crash in dissolved oxygen levels. Using this sensor in conjunction with other environmental monitoring equipment can provide an early warning for farmers to turn on mitigation systems and limit feeding to protect fish from harmful environmental conditions.

PRODUCT SPECIFICATIONS

The aquaMeasure CHL is a compact, wireless underwater sensor that measures chlorophyll-α temperature, and tilt in real-time.

Chlorophyll-α (Blue):
Optical fluorescence measurement
Operational range: 0–100 µg/L
Resolution (logged data): 0.01 µg/L
Resolution (transmitted data): 1.0 µg/L

Chlorophyll-α (Red):
Optical fluorescence measurement
Operational range: 0– 500 µg/L
Resolution (logged data): 0.1 µg/L
Resolution (transmitted data): 5.0 µg/L

Temperature:
Operational range: -2-35 °C
(water must not freeze)
Resolution (logged data): 0.01 °C
Resolution (transmitted data): 0.1 °C
Accuracy: ±0.2 °C

Tilt:
3D accelerometer: 0-180°
Resolution (logged data): 0.1°
Resolution (transmitted data): 1°

Battery Life:
4-6 months

Configuration/Offload:
Via aquaMeasure app (iOS/Android)

Real-time Mode:
Yes (underwater communications)

Logger Mode:
Yes (internal storage)

Strorage:
64 MB flash drive (stores over
1 million records)

Operating Depth Range:
Up to 100 m

Sensor Dimensions: 64 mm x 574 mm

Weight Collar Dimensions:
99 mm x 106 mm

Weight (Air/Water): 1300 g/265 g

Weight Collar (Air/Water):
2360 g/2170 g

INNOVASEA

aquaMeasure CDOM/FDOM

Wireless Sensor/Data Logger

Fluorescent or chromophoric dissolved organic matter (FDOM/CDOM) are naturally occurring organic matter that contributes to turbid conditions in coastal waters. CDOM will fluoresce when it absorbs light of a certain wavelength which is what allows it to be measured with optical sensors. CDOM/FDOM sensors are used to measure dissolved organic material (DOM) in both freshwater and marine ecosystems. Aquaculture sites close to human-produced effluent from sources such as logging, agriculture, discharge, and wetland drainage can be subject to varying levels of CDOM/ FDOM, making it crucial to measure in real time.

PRODUCT SPECIFICATIONS

The aquaMeasure CDOM/FDOM is a compact, wireless underwater sensor that measures CDOM/FDOM, temperature, and tilt in real time.

CDOM/FDOM:
Optical fluorescence measurement
Operational range: 0-500 ppb
Resolution (logged data): 0.1 ppb
Resolution (transmitted data): 5.0 ppb

Temperature:
Operational range: -2-35 °C
(water must not freeze)
Resolution (logged data): 0.01 °C
Resolution (transmitted data): 0.1 °C
Accuracy: ±0.2 °C

Tilt:
3D accelerometer: 0-180°
Resolution (logged data): 0.1°
Resolution (transmitted data): 1°

Battery Life:
4-6 months

Configuration/Offload:
Via aquaMeasure app (iOS/Android)

Real-time Mode:
Yes (underwater communications)

Logger Mode:
Yes (internal storage)

Strorage:
64 MB flash drive (stores over
1 million records)

Operating Depth Range:
Up to 100 m

Sensor Dimensions: 64 mm x 574mm

Weight Collar Dimensions:
99 mm x 106mm

Weight (Air/Water): 1300 g/265 g

Weight Collar (Air/Water):
2360 g/2170 g

Ready to Get Started?

Learn more at www.innovasea.com

INNOVASEA

aquaHub

Delivering your data seamlessly and securely to the cloud.

The aquaHub is the core of the real time environmental monitoring system deployed on the farm and it can be easily mounted to existing pen infrastructure or feed barges. Utilizing a digital receiver, communications modem, and state of the art electronics, the aquaHub can support up to 100 aquaMeasure sensors within a 500 m radius. The aquaHub was built to work in remote environments, so it supports many telemetry protocols for cloud communications including cellular, Wi-Fi and iridium. It is contained in a rugged, waterproof housing, that stands up to the rough, open ocean conditions. The hub also supports third-party sensors like weather stations, via its auxiliary sensor port and features internal memory for backup purposes.

Key Features

- Underwater Communications
- Easy to Mount
- Remote Telemetry
- Mobile Configuration
- Bluetooth Connectivity

INNOVASEA

aquaHub

Centralized Hub/Cloud Communications

Pair With

For a complete solution, we recommend pairing with:

- Airmar 200 WX Weather Station
- aquaDopp Current Profiler
- Solartech SPM-20 Solar Panel

PRODUCT SPECIFICATIONS

Dimensions:
254 mm x 203 mm x 152 mm

Power:
DC: 15-25 V
AC Converter: 110–230 V (50-60 Hz)
Solar Panel (Optional)
Internal 5 Ah Nanophosphate®
LiFePO4 battery

Power Consumption:
14 mA x 12 V

Communications:
WLAN: Dual bane IEEE 802.11 a/b/g/n (Wi-Fi)
Cellular module: (GSM/GPRS/EDGE/WCDMA)
Optional Satellite module (Iridium)
Bluetooth Dual-mode Bluetooth v4.0

GPS:
GPS/GLONASS Receiver

Auxiliary Sensors:
1 auxiliary sensor port (RS-485 Port/RS-232)
4 Modbus ports (optional)

Sensors:
Box temperature & tilt
Water temperature, receiver tilt

Hydrophone:
Optional Multi-channel digital hydrophone

Environmental:
NEMA-4X, IP66

Operating Temperature Range:
Surface unit: -20-70 °C
Hydrophone: -5-50 °C (water must not freeze)

Ready to Get Started?

Learn more at www.innovasea.com

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