Acoustic Subsea Monitoring





Overview

Scanmatic now offers exceptionally small, low cost and low powered sensor transmitters with acoustic communication. While primarily developed for the purpose of providing health information and id-tracking of fish, these units have a wide ranging potential for offering integrity monitoring of subsea infrastructure. In many cases these units can offer the same situational awareness and early warning functionality as traditionally bulky and costly transponders.

The 10 cm transmitters measures tilt, depth or movement. They are attached to mooring lines, subsea buoyancy elements or other objects of interest by use of customized solutions, ranging from cable ties, diver fasteners or ROV clamps.

The acoustically transmitted sensor information is received by a 25 cm long cabled receiver which for permanent installations typically interfaces with a top side control system for relevant presentation and alarm handling. For temporary operations, the receiver could for example communicate with a laptop computer, or distribute the information directly to web based solutions.

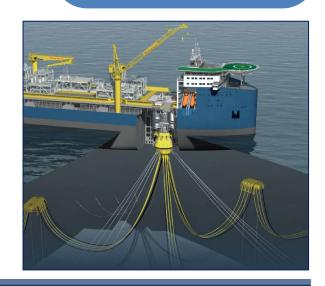
The technology is well proven in the aquaculture market, with more than 18 000 units deployed in Norway since 2006.

Applications

- Mooring Line Integrity Monitoring
 - o Early warning of mooring line failure
 - Increased situational awareness
- Riser monitoring
- Depth monitoring of subsea buoyancy
- Permanent monitoring solutions
- Retrofit integration
- Temorary operations, e.g. rig moving, equipment deployment

Features:

- Tilt/Inclinometer
- Movement/Accelerometer
- Depth/Pressure
- Wireless acoustic communication
- > 500 m range
- Up to 10 years battery life
- Low cost
- Small footprint
- Easy deployment and retrofit
- Data acquisition and system integration
- "Internet of Things under Water"





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Specifications

| Specifications | |
|---------------------------|---|
| Acoustic receiver: | |
| Dimensions | 230 mm length, 75 mm diameter, 1140 g in air, 260 g in water |
| Material | Delrin |
| Operational depth | 0 - 500 m (pressure tested to 1000 m) |
| Signal processing | True and parallell multichannel reception in the 60 – 80 kHz band Advanced digital signal processing to reduce noise influence Signal intensity and background noise logging Range estimate to transmitter based on signal intensity |
| Battery operating life | Stand alone logger: 8 – 9 months Real time version: Optional 4 months backup battery which enables buffering of data in the eventuality of power outage. When power is restored, receiver automatically transmits stored values. |
| Input voltage | Real time version: 6 – 30 VDC |
| Data storage capability | 1 500 000 detections |
| Communication interfaces | Realtime version: RS485Stand alone version: Bluetooth and USB |
| Other | Integrated temperature sensor Three-color LED diode for status indication Intuitiv PC software for import, .csv export, filtering and graph view Straight forward integration to top side control systems with alarm handling Customisable cabling, connector and fastening solutions |



| Acoustic transmitter: | |
|------------------------------|---|
| Dimensions | 105 mm length, 16 mm diameter, 18 g in air, 7 g in water |
| Material | Delrin, Titanium pressure transmitter |
| Power output | 156 dB re 1μPa@1m |
| Transmit range | 0.5 – 1 km, depending on local conditions |
| Transmit frequency | 60 – 80 kHz (configurable) |
| Battery life | Up to 10 years with 2 - 3 min transmitting interval (configurable) |
| Operational depth | 0 – 300 m |
| Depth resolution | 1 cm |
| Depth accuracy | Maximum error +- 50 cm |
| Inclinometer measuring range | 0 – 180 degrees |
| Inclinometer resolution | 1 degree |
| Inclinometer accuracy | +- 1 degree |
| Movement – sensor | 3 - axis MEMS accelerometer |
| Other | Activated with magnetic key Possibility of "alarm mode" where unit only transmits if depth and/or inclinometer values exceeds pre-configured range for increased battery lifetime. Alive-signal e.g. once every 24 hours |





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