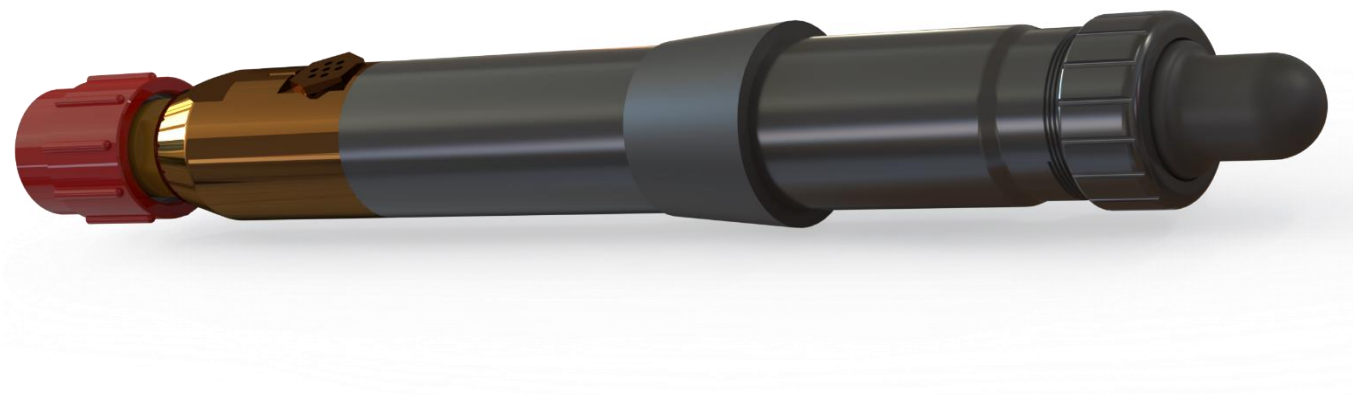
Hydraq QQ1000
Digital Hydrophone



Applications

- Vessel acoustic signatures for maritime and defence sectors
- Port and Harbour Authority shipping noise/security monitoring
- Quiet Ocean Initiative data capture

The Seiche Hydraq QQ1000, developed in conjunction with QinetiQ, is a unique instrumented hydrophone combining acoustic and auxiliary sensors for cutting edge metrology. It is suitable for seabed, rising cable or suspended cable deployments.

This Ethernet hydrophone meets the challenges of accurately measuring radiated noise and environmental noise in the marine environment over a wide bandwidth. By integrating auxiliary sensors with the primary acoustic sensor, the Hydraq QQ1000 provides a comprehensive solution which ensures that sensor orientation, pressure and hydrophone vibration are continuously monitored.

The acoustic sensor is a 12.7 mm ceramic ball, chosen to extend the below-resonance measurement bandwidth compared with similar low-noise hydrophones. Hydraq QQ1000 incorporates a very low noise switched gain hydrophone amplifier with self-noise levels below Knudsen Sea State 0.

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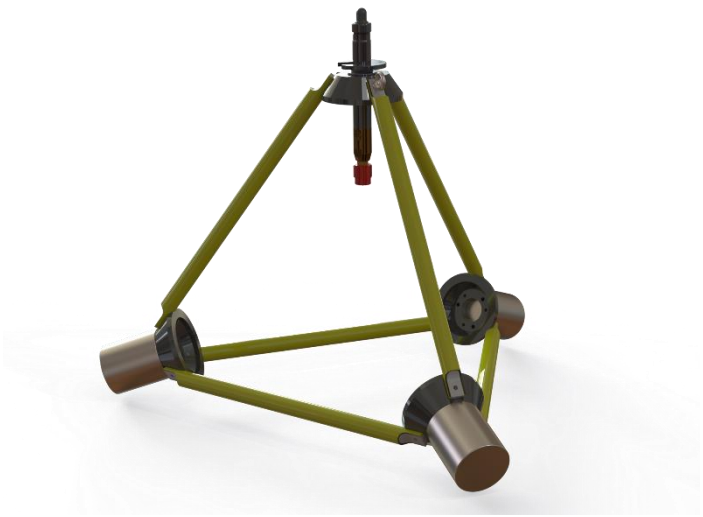

Employing a sensitive three-axis accelerometer, Hydraq QQ1000 can measure both orientation with respect to vertical, and hydrophone vibration (the latter typically caused by proximity to propulsion systems or Scholte waves at the water/seabed boundary). Vibration, typically a low frequency effect, can contaminate acoustic measurement and should be measured and accounted for.

Uncertainty in sensor orientation principally affects high frequency measurements and can occur in rising-cable deployments that are influenced by tidal flow, or hydrophone misalignment during seabed deployment. To resolve the problem of orientation, a three-axis magnetometer augments the accelerometer, enabling computation of attitude and bearing.

Hydraq QQ1000 also provides an accurate pressure sensor for direct measurement of hydrophone depth. The pressure sensor has sufficient resolution for measurement of hydrostatic pressure variation in proximity to underway ships, having an estimated equivalent resolution of 1 mm water depth when using the 3 Bar sensor.

The Hydraq QQ1000 acoustic monitoring solution is suitable for wide-ranging noise measurement and environmental use, including compliance with expanding environmental legislation, recording marine mammals, generic noise pollution, or individual vessel sound signatures at sea.

Specifications

Acoustic
Nominal sensitivity -207 dB re 1V/µPa
Resolution 24 bits
Pre-amp fixed gain 18 dB
Adjustable gain 0 – 48 dB, 12 dB steps
Total system gain 18 – 66 dB, 12 dB steps
Bandwidth 5 – 115 000 Hz, adjustable on request
Sampling rate 250 000 Hz, adjustable on request
Communication
10/100 Ethernet
Magnetometer
Resolution 40 nT
16 bit data (18 bit Sensor)
RMS Noise 40 nT
Output data rate 100 Hz
Pressure
Range 3/10/30 Bar, range on request
Accuracy ±0.15 % FS
Estimated resolution equivalent to 1 mm water depth with 3 Bar sensor option
Temperature
Operational range -10° C to 80° C
Accuracy ±2° C
Accelerometer
Range ±2.5 g
Three-axis
Resolution 16 bit
Bandwidth 440 Hz

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