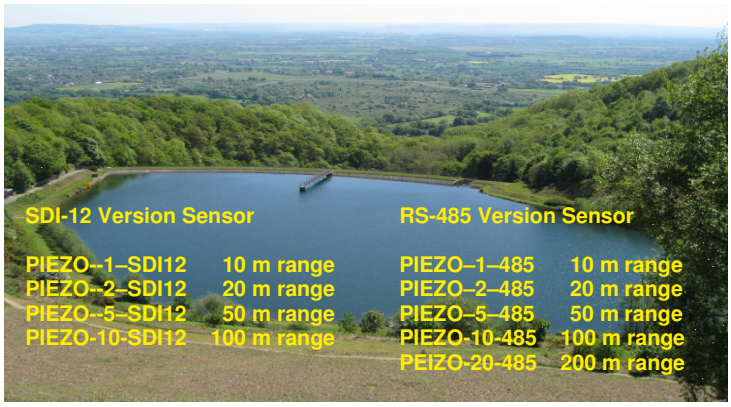
PIEZO-RM ™ Digital Level Sensor

SDI-12/RS485 & Modbus over 485 Network

FEATURES:

- **Custom level ranges up to 200m / 600ft H_2O**
- **Unsurpassed accuracy of ±0.05% total error band**
- **SDI-12 / RS485 / Modbus digital communication**
- **Local gravity, salinity corrections**
- **316 SS / marine bronze construction**
- **Engineering results - digital data transfer**
- **Gas discharge lightning protection as standard**
- **Option for user-installed cables**
- **IP68 sealed device. Glass-sealed network connection**
- **Compatible with any third party SDI-12 logger, RS485 & Modbus Interfaces**



APPLICATIONS:

- **Level monitoring**
- **Surface water monitoring**
- **Downhole**
- **Groundwater monitoring**
- **Well monitoring**
- **Tank level**
- **De-watering**
- **Reservoirs**
- **Oceanographic research**

The PIEZO-RM submersible hydrostatic transducer represents the leading edge of level sensing technology available today. The device uses a highly stable ceramic-based sealed silicon-isolated sensor for the pressure measurements.

The PIEZO-RM series of sensors features the SDI-12 / RS485 digital interface for communications. The SDI-12 interface is an industry standard network for digital communications with data recorders and other intelligent sensors, especially in the environmental field monitoring applications. The transducer meets the demanding requirements of the UK Environment Agency Office for accuracy specification for stage monitoring.

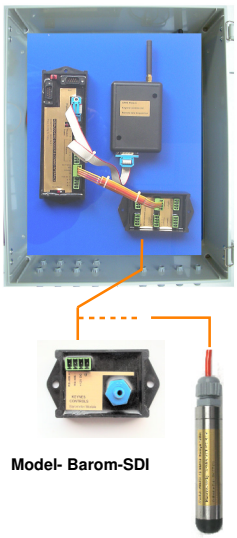
The PIEZO-RM sensors are intended for applications requiring long term deployment. All of the sensors use advanced power management and can be connected directly to a data logger for long term automatic reporting applications, or to a laptop for immediate short term measurements.

A range of media converters are available to connect the PIEZO-RM sensors to a laptop across a digital network. The USB-SDI12-Pro range of media converter also powers the sensors from the PC in order to simplify the sensor installation.

To provide the optimum in measurement accuracy and reliability the PIEZO-RM does not use vented signal cabling and is a complete hermetically-sealed device. This removes any chance of failure due to accidental cable breaks; barometric errors due to cable elongation; the ingress of moisture due to condensation from high humidity levels and damage to the electronics.

Remote Data Access - Mobile Phone Network

The data from the PIEZO-RM range of sensors can be accessed from remote sites automatically by using the EZ-LOG data loggers and Web page interface. Data is sent out across the mobile phone GPRS network and stored into a database.

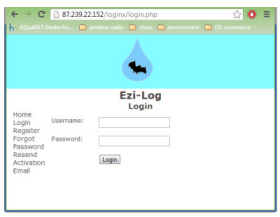


Model- Barom-SDI

The EZ-LOG Web interface enables the User to control the remote download times and to set the E-mail alarm system directly onto the secure database.

The logger systems can be expanded to include additional environmental sensors such as for water level and flow along with weather station components.

All the data access and E-mail alarms are set from the EZ-Log Web page interface.



EZ-LOG Web Interface

Q-LOG Data Display & Recording Software

The PIEZO-RM sensors are fully integrated to the free Q-LOG data acquisition & display software.

Additional details can be found at:

http://www.aquabat.net/QLOGFree/qlogv2.html

Supplied by: Keynes Controls Ltd
Pakenham House
Risely
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Web: http:/www.aquabat.net for all the technical data sheets

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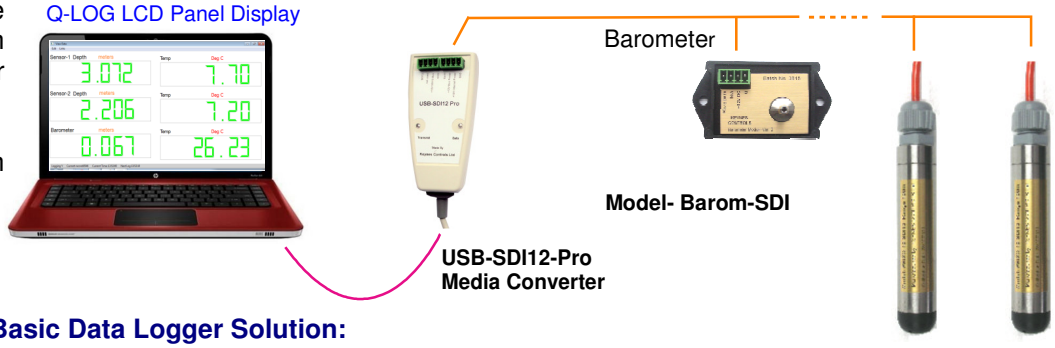
ISO 9000 Certified

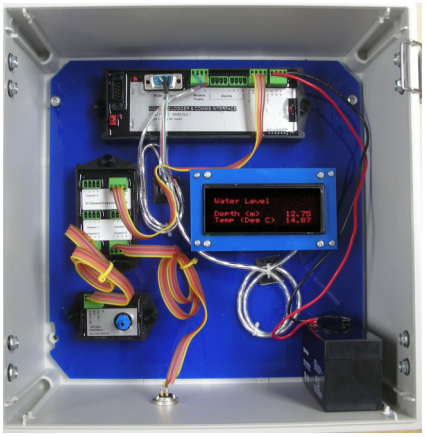
Last Updated: Nov 2011

Laptop / PC Water Level Recording System

The image opposite shows a simple PC-based water level recording system using the PIEZO-RM and barometer module.

The sensors are powered directly from the USB port of the PC.





Basic Data Logger Solution:

The image opposite demonstrates the basic data logger configuration for using the AquaLOG sensor and optional barometer module for atmospheric corrections.

A simple 3-wire SDI-12 network is used to pass data digitally between the sensors and the data logger. Water level values can be shown on the display unit or passed onto a web- based application for remote access.

SDI-12 data transmission is used to communicate pressure values to the logger. The analogue conversion is carried out inside the sensor and so there there are no errors in the measurements due to cable losses and calibration errors in a separate data acquisition system.

Third Party Data Loggers:

The PIEZO-RM range of sensors will operate with any third party logger supporting SDI-12 digital communications.

SPECIFICATIONS

Specifications can change without notice

Total Error - includes the combined errors due to non-linearity, hysteresis, non-repeatability, and thermal effects over the compensated temperature range

Description	
Physical parameters	Length: 100 mm Diameter: 22 mm Weight: 600 g without cable
Communications	
SDI-12	Version 1.3 SDI-12 protocol - Enhanced spec on request
RS-485	Optional on request
Ranges	1, 2, 5, 10 bar (10, 20, 50 100 m) Intermediate ranges on request Absolute gauge
Proof pressure	1.5 x F.S (F.S = Full scale range)
Burst pressure	2.0 x F.S
Materials	316 stainless steel (standard) Marine bronze - Titanium upon request
Protection rating	IP 68
Level	
Measurement accuracy	± 0.05 % F.S. typical
Temperature	
Measurement accuracy	± 0.5 deg C typical
Resolution	
1 Bar (10m)	0.015mm
2 Bar (20m)	0.030mm
5 Bar (50m)	0.075mm
10 Bar (100m)	0.15mm
Engineering units	mm H_20, cm H_20, m H_20, inch H_20, ft H_20, PSI, bar
Temperature	degC or degF
User-assigned level correction factors	Local gravity Density
Operating temperature	-20 to 60 deg C polyurethane cable/ 0 to 50 deg C ETFE cable
Calibrated range	5 to 30 deg C (standard) - other ranges by request.
Excitation	10 - 18V DC
Current	8 mA average during acquisition < 1 mA quiescent state
Sampling Period	1 ms to 10 secs: user-defined 100 ms standard preset measurement period
Warranty Information:	

High Pressure Seals:

Long-term stability of the compression seals used on the PIEZO-RM range of sensors are also very stable over long periods of time.

Since plastic is an inorganic material, it is not affected by long-term exposure to elevated temperatures, or to the chemical components of the liquids under investigation. In other words, it does not lose the mechanical properties which can affect the seal, as do organic materials such as moulded epoxies; potting compounds, and all engineering grade thermoplastics and thermosets. This is critical in applications where pressure integrity over a long life (over 10 years) is an advantage.

The electronics inside the PIEZO-RM sensors are inside a dry chamber safe from the ingress of any moisture including that caused by changes of humidity along vented cables.

In-built Statistics:

The following parameters are available directly from the sensor:

Maximum Pressure, Minimum Pressure
Maximum Temperature, Minimum Temperature

Local calibration : Salinity, gravity adjustments

SDI-12 Version Sensor

PIEZO–1–SDI12	**10 m range**
PIEZO–2–SDI12	**20 m range**
PIEZO–5–SDI12	**50 m range**
PIEZO–10-SDI12	**100 m range**

Mobus Version Sensors

PIEZO–1–485M	**10 m range**
PIEZO–2–485M	**20 m range**
PIEZO–5–485M	**50 m range**
PIEZO–10-485M	**100 m range**

RS-485 Version Sensor

PIEZO--1–485	**10 m range**
PIEZO--2–485	**20 m range**
PIEZO--5–485	**50 m range**
PIEZO-10-485	**100 m range**
PEIZO-20-485	**200 m range**