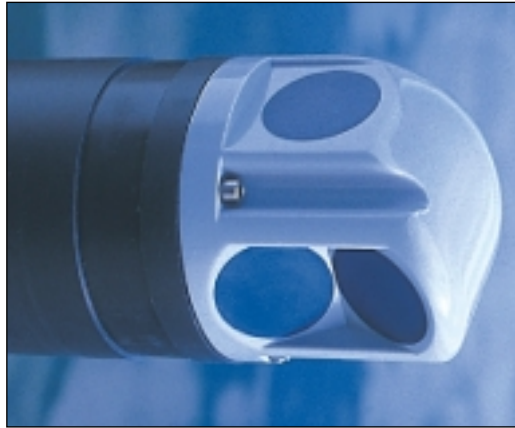


Nortek EasyQ™

River Velocity and Stage Monitor



The EasyQ combines accurate Doppler velocity measurements with stage to give you unprecedented functionality in a compact flow monitor. The acoustic system mounts at mid-depth on a river or channel sidewall and it has four acoustic beams, each being configured and processed independently. You can deploy it underwater – out of sight – where it can record data to the internal logger, you can connect it to your SDI-12 data logger, or you can connect it your computer for online data collection. Either way, you will have the most modern and most feature-rich flow monitor available.

Velocity

The velocity measurements in the EasyQ is a heritage from oceanographic research, where Doppler velocity profiling is the recognized standard for ocean current measurements. Two horizontal beams look sideways into the flow and measure the 2D water velocity in three adjacent measurement cells. The position of the cells can be adjusted depending on the width of the river and the ideal location for the measurement cells. The velocity measurements can be integrated over an adjustable time interval, ranging from one second to one hour.

Stage

A vertical acoustic beam on top of the EasyQ measures the stage acoustically with high stability and 3-mm accuracy. The measurement is insensitive to atmospheric pressure changes and does not require vented tubes. The built-in high-resolution pressure sensor is recorded as an independent variable but is also used in combination with the acoustic stage measurements to separate the surface echoes from those generated by debris floating in the water. This combination gives you stable, accurate and reliable water level measurements.

Echo Sounder

The EasyQ has a unique "Diagnostic mode" where it records the strength of the acoustic echo in 50 cells over 10 m for each of the 4 beams. The echo sounder data shows variations in the bottom depth (scouring), variations in plant growth on the channel walls, and can detect items blocking one or more of the acoustic beams.

Software

The EasyQ comes with free Windows PC software that offers a simple and standardized method for setting up the sensor. Different views and menus guide you through the process from configuration to data collection to data conversion. The software displays numerical and graphical EasyQ data online.

The EasyQ software has stage and range test modes that are invaluable while installing the sensor. The range check displays the acoustic conditions and verifies the soundness of the measurement scheme suggested by the user. The stage check facilitates quick and easy adjustment of pitch and roll angles, and allows the user to check the quality of the surface detection before leaving the installation site.

Key Features

- ✓ Accurate velocity measurements at three points across the river
- ✓ Acoustic stage measurements
- ✓ Diagnostics mode detects changing bottom conditions
- ✓ No moving parts that can be blocked or damaged.
- ✓ No vented pressure sensor tubes that can get clogged
- ✓ Simple and inexpensive installation
- ✓ SDI-12 interface to a wide variety of standard data loggers
- ✓ Powerful software for easy configuration

Flood water monitoring

The Nortek EasyQ is ideal for capturing storm data because it can be mounted out of the water in the dry season while still operating perfectly once the water rises. This means that the EasyQ is a great tool in dry areas, where the water flows only intermittently and it is difficult for field personnel to reach the site in time. The EasyQ can also be used during dangerous flood situations to establish the rating curve for high flow rates.

EasyV

The EasyV is a simplified version of the EasyQ with two acoustic beams. It measures the water velocity in 1 or optionally 3 cells but it does not measure stage and it does not have a pressure sensor. Both the EasyV and the EasyQ are SDI-12 compatible.



Velocity Measurements

Range	± 10 m/s
Accuracy	1 % of measured value ± 0.5 cm/s
Minimum integrating time	1 s
Number of cells	3
First cell starting position	0.3-10 m
Cell size	0.4-2 m
Amplitude Resolution	0.45 dB
Dynamic range	90 dB

Stage

Range	0.15-10 m
Accuracy	3 mm (unstratified water)
Resolution	1 mm
Integrating time	1-120 s
Data quality parameter	User selectable quality threshold.

Echo sounder (diagnostic mode)

Number of beams	4
Number of cells	50
Cell size	0.2 m

Transducer

Frequency	2.0 MHz
Beam width	1.7°

Standard sensors

Temperature	Thermistor embedded in head
Range	-4°C to 40°C
Accuracy	0.1°C
Tilt	Liquid level
Accuracy	0.2° @ 0° tilt; 0.5° @ 10° tilt
Pressure	Piezoresistive sensor
Range	0-10 m
Accuracy	0.025% of full scale
Resolution	1 mm

Serial Data Communication

I/O	RS232, RS422, SDI-12
Baud rate	9600 standard, 300-115,200 (user setting)
User control	Handled via EasyQ software

Software

Operating system	WIN 95/98, NT 4.0, WIN2000
Functions	Deployment planning, range and stage check, data retrieval, ASCII conversion, online data collection and graphical display
Modem	Software allows connection over transparent GSM or Radio modem (option)

SDI-12 mode

Compatible with SDI-12 protocol 1.1. Velocity and stage data accessible with SDI-12 commands. Diagnostic mode or recorder backup not implemented in SDI-12.

Internal Recording

Capacity	2 MB, expandable to 21 or 78 MB
Data record (bytes)	Velocity: 30+6x Ncells Stage: 34 Echosounder: 234
Modes	- Self-contained recording with internal batteries. - Backup during online data collection.

Power

DC Input	9-16VDC
Typical mean power	50 mW
Transmit power	0.3-20 W, adjustable over 4 levels

Batteries (optional)

Type/capacity	18 AA Alkaline cells/50Wh
New battery voltage	13.5VDC
Duration	40 days at 50 mW

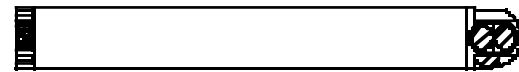
Materials

Standard model	Delrin and polyurethane plastics
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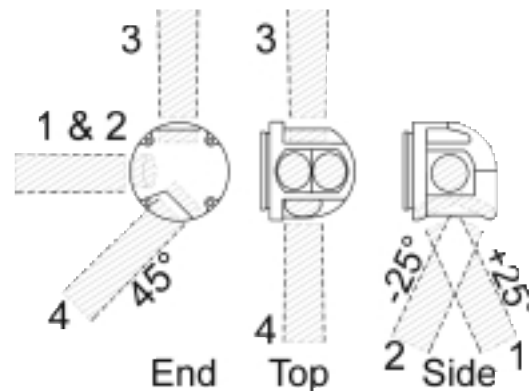
Dimensions

Weight in air	1.7 kg
Weight in water	0.7 kg buoyant
Length	590 mm
Diameter	75 mm

Easy Q side view



EasyQ standard beam geometry and location of pressure sensor



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