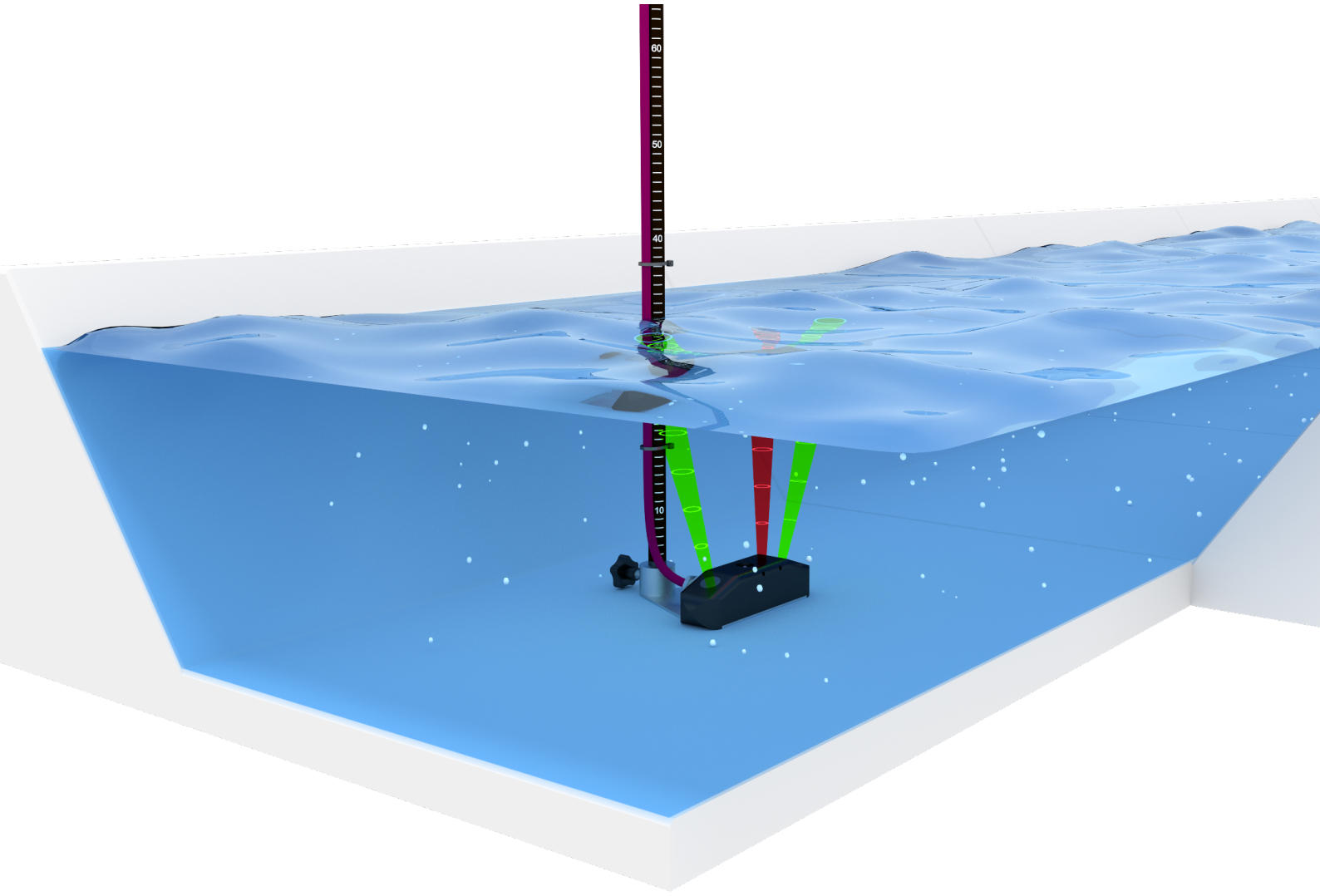
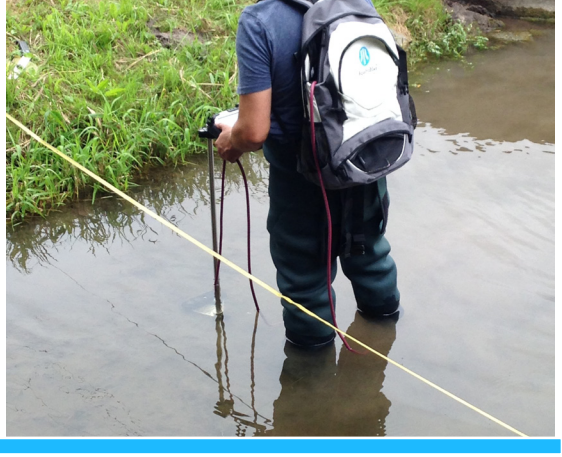
HydroVision

Portable Flow Profiler for Open Channels

AquaProfiler® M-Pro

Get the entire velocity profile in one single shot!
Be ready with your entire measurement when the others are still measuring their first vertical!
Up to 5 times faster than standard single point velocity meters.

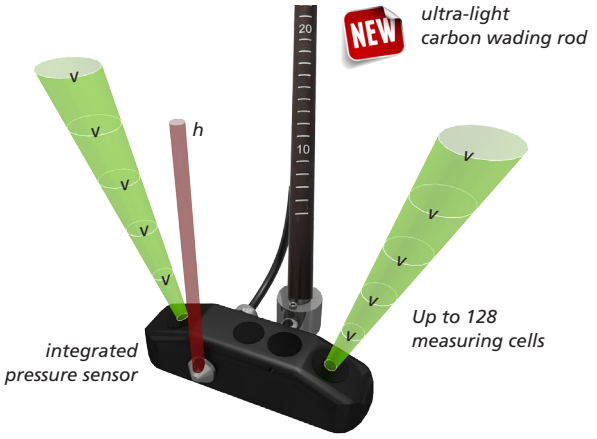




AquaProfiler® M-Pro

With **AquaProfiler™ M-Pro** we take mobile discharge measurements to a next level. The system makes monitoring flow in natural streams, concrete lined channels and partially filled pipes very easy.

It is able to measure flow in harsh environments and in difficult (i.e. less than ideal hydraulic) conditions very accurately. This lightweight and compact system uses HydroVision's proven Acoustic Profiling Technology, in a single transducer assembly, to measure the flow, velocity and water level.
The system is designed to measure both, the vector and the magnitude (using twin velocity beams) of individual velocity cells (up to 128) to account for velocity variations within the flow and obtain the flow profile.
A hydrostatic pressure sensor is used to measure water level and combined with the velocity profile, calculates flow very accurately.



Flow Determination

The velocity data from the two profiles are entered into an algorithm to determine a mathematical description of the flow velocities throughout the cross-sectional of the flow. The result determines flow velocities at all points throughout the flow.

These results are integrated over the cross-sectional to determine the flow. The key benefit to this approach is that the system will operate accurately under different hydraulic conditions. This eliminates the need of site-specific calibrations.

Profiling Technology

An ultrasonic transducer transmits two short pulses of ultrasound, which travel along the measurement axis and then switches over to receiver mode. When the ultrasonic pulses hit a small particle or air bubble in the medium, part of the ultrasonic energy scatters on the particle and echoes back. The echoes reach the transducer after a certain time. If the scattering particle is moving with a non-zero velocity into the acoustic axis of the transducer, a time delay between the two echoed signals takes place, and the measured time delay is analyzed by correlation technique for the velocity of the particle or air bubble. The AquaProfiler™ measures the position and velocity of the particle, and hence establishes the fluid flow component in the given space point.

The basic feature of the **Acoustic Flow Profiler** is the ability to establish the velocity in many separate space points along the measurement axis and develop the flow profile. Each acoustic beam measures velocity at multiple points within the water column. The measured velocity data within each cell are very precise. This distribution of accurate velocity measurements is then used to determine the flow pattern over the entire cross-section of flow.
Since the flow pattern and measured velocity distribution are dependent on each other, the AquaProfiler™'s advanced flow algorithms automatically adapt to changing hydraulic conditions within the channel. This removes the need for in-situ calibration and ensures accurate flow rate measurement over a host of different measurement environments and hydraulic conditions.

The AquaProfiler™ M-Pro is ideal for temporary flow monitoring studies/surveys:

» River discharge measurements

» Open Channel flow measurements

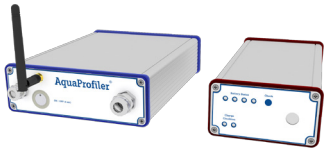
» Current measurements in large pipes

» Rapid multi-point current surveys

» Current monitoring in water treatment plants

» Hydro Power Plants studies

Technical Information



Transmitter
and battery pack

The measured data are directly received by the transmitter which amplifies and digitizes the signals with its internal processor on the spot. For further evaluation the signals can be transmitted wireless via WLAN to your computer. With a fully charged battery an on-site operation of up to eight hours is provided. For comfortable charging the battery pack on the way, there is a car charger available for the system.

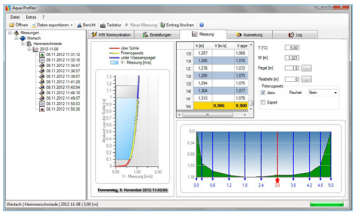
SENSOR
acoustic technology

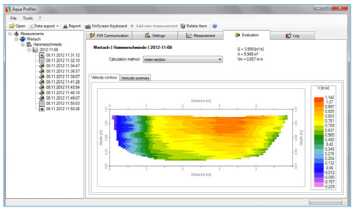
The discharge is computed graphically by summing the products of the velocity and corresponding area for a series of observations in a cross section.

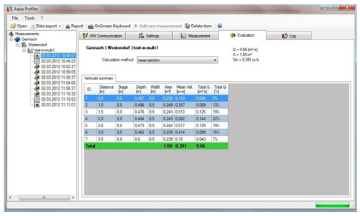
A hydrostatic pressure cell as well as a temperature sensor guarantee a high measurement accuracy for an insertion depth within a range of 0.02 to 3 m and for a water temperature up to 40°C.

Accessories
waterproof backpack
carbon wading rod

In order to transport the measuring devices to the field safe and sound, a **waterproof** backpack is included in the scope of delivery. Both transmitter, battery pack and charger (weight approx. 2.7 kg) can be easily carried on your back during measurement. There is still enough room for your tablet PC and other things. As an addition, you may decide to go with our new **ultra-light** graduated wading rod made of carbon.







Software
AquaProfiler™

The user-friendly **software AquaProfiler™** is used to easily communicate with the system and initiate operations like executing and controlling measurements.

The measurement protocol includes a summary of various settings, parameters and results so each application in the field can be customized individually.

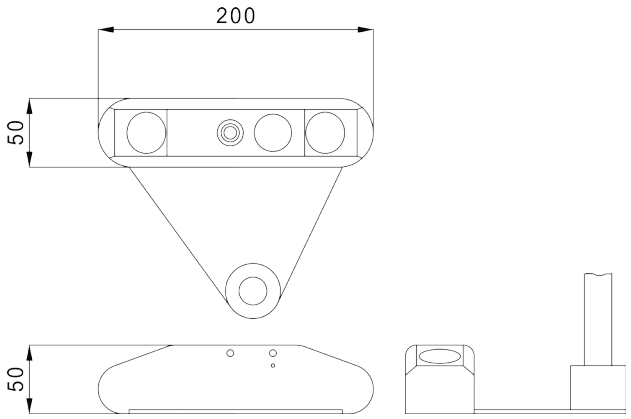
In addition, it will list the measuring results in simple, clearly arranged tables and even display the velocity distribution in the cross-section in an easy to read graphic chart. The measured velocity profile can be instantly visualised, so the results can be directly checked for plausibility.

It is also possible to calculate the discharge selectively according to the **mean-section** or **mid-section** method as well as export the desired data in different file formats for further evaluation and use.

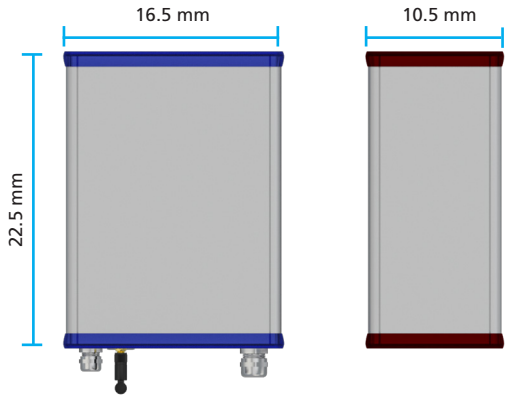
AquaProfiler™ can be installed on any laptop suitable for outdoor use or the rugged field-proof tablet PC with the following Microsoft operating systems: XP and higher. It can be downloaded from the internet or installed from the included CD-ROM.

Technical Data

AquaProfiler™ M Pro sensor



Transmitter & battery



AquaProfiler™ M-Pro

Sensor:	2 x velocity 1 x water level 1 x temperature
Frequency:	2 MHz
Range:	± 5 m/s for velocity 0 - 4 m for water level (hydrostatic) 0°- 40°C for temperature
Max. profiling range:	0 - 3 m
Blanking distance:	0.02 m
Minimum cell size:	0.01 m
Accuracy:	± 1% of measured value (for value v) ± 0.1% for value h (hydrostatic)
Cable:	5 m from sensor to backpack optional: 10 m
Power Supply:	6000 mAh rechargeable battery pack + 24hrs lifetime (sensor&transmitter)
Weight:	1.7 kg (sensor incl. 5m cable) 1.2 kg (transmitter) 1.0 kg (battery pack) 0.5 kg (charger)
Accessories:	waterproof backpack ultra-light wading rod (optional) top-set part for wading rod (optional) car charger pole mount for rugged tablet PC

Polemount

rugged field tablet PC

Technical Specifications	
Processor:	Quad-core Intel Celeron
Memory:	4GB DDR3
Display:	WXGA 1,366 x 768 sunlight readable
Connection:	WiFi, Bluetooth, GPS, optional WWAN GSM/GPRS, HSPA+, LTE
Interfaces:	1 x USB 2.0, 1 x USB 3.0, RS-232, RJ45
Operating System:	Windows 8.1 Pro, Windows 7 downgrade available

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