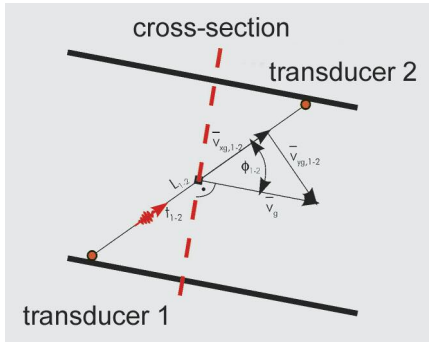


Adaption of the system to local characteristics by different methods of adjusting the ultrasonic transducers
Mode of operation: transit-time method



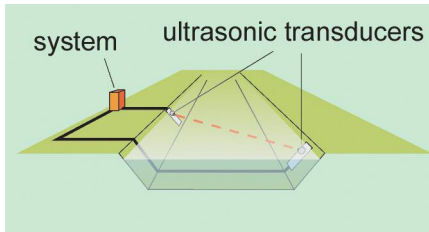
Transit-time method

Transit-time method

The Quantum Flowmeter is connected via signal cables to a pair of transducers mounted diagonally to the flow direction. A pulse of sound travelling diagonally across the flow in a downstream direction will be faster than a pulse travelling in an upstream direction. The difference between both travel times is directly related to the mean flow velocity and therefore directly related to the discharge of a known cross-section.

Single path system

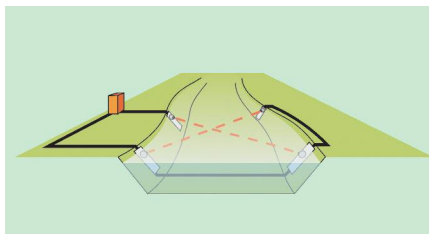
If the flow direction is parallel to the banks, the least complex configuration can be used: a single path system consisting of two acoustic transducers adjusted diagonally to the flow.



Single path system

Cross path system

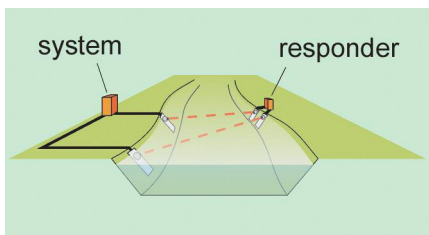
If the flow direction is not parallel to the banks, the first path can be "crossed" with a second path. A cross path system is recommended when the river is curved or the geometry of the cross-section changes significantly.



Cross path system

Responder system

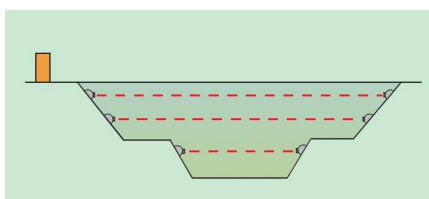
If the installation of an underwater cable to connect the transducers is impossible or undesirable, both the transmitter and the receiver are installed on the same river bank. On the opposite river bank, a responder is installed, which receives the ultrasonic signal, amplifies it and sends it back.



Responder system

Multiple level system

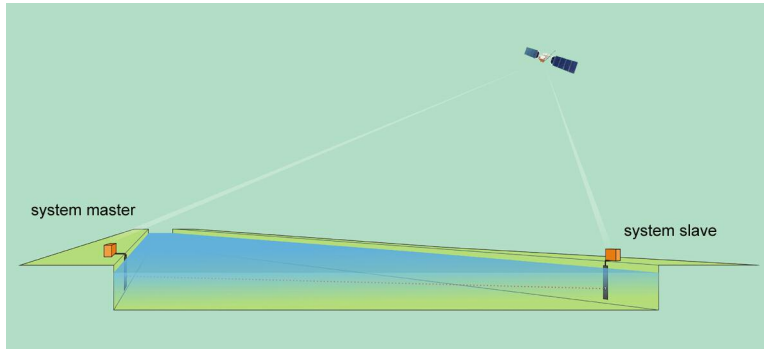
If the water level is prone to extreme fluctuations, the accuracy of any of the above configurations can be improved with the installation of multiple levels. In multiple level measurements, the vertical velocity distribution found in the cross-section can be measured directly.



Multiple level system

All system configurations can be realized as wireless systems (page 2).

System configurations

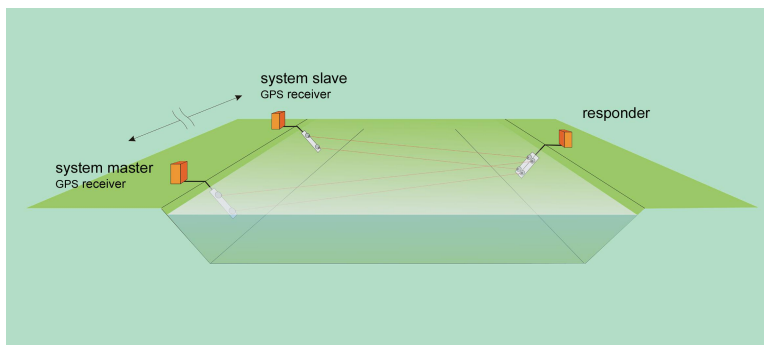


Wireless system
img: single path system

Wireless system

Wireless Systems - when crossing a cable through the water is not an option

On either side autonomous systems are installed such that their line of sight is diagonal to the flow of water. Both systems communicate with each other by means of directional radio. Additionally the systems are equipped with GPS receivers. The satellite data from these receivers provide a high-precision standard frequency and accurate timing pulse which is necessary to ensure both systems run absolutely synchronous. If other power sources are unavailable you can run a wireless system using solar panels or using a hybrid concept with fuel cells and solar panels. One master system can control multiple slaves, making multiple-level, cross path and responder system setups possible. The example on the left side is showing a wireless system installed with a responder system configuration. Here you can see the next advantage of a wireless system. It also substitutes long cables running on land.



Wireless system
img: 2 level responder system