

## Argonaut-SW Expanded Description



Designed with state-of-the-art surface mount electronics and proven Doppler technology, SonTek's Argonaut series of acoustic current meters offers unsurpassed accuracy in velocity measurements. Argonauts are available in several configurations for a wide range of applications.

First, a little bit of history about why an instrument such as our Argonaut-SW (Shallow Water) was needed by the water resources community.

In a number of small, low head-loss channels (usually irrigation, though there are many others), hydrometrists have tried several methods to obtain continuous or near-continuous flow measurements. This includes the use of flumes and weirs often being installed in applications where discharge is very low.

While trapezoidal flumes allow for better measurements throughout a range of flows without introducing large head losses, they are difficult and costly to build.

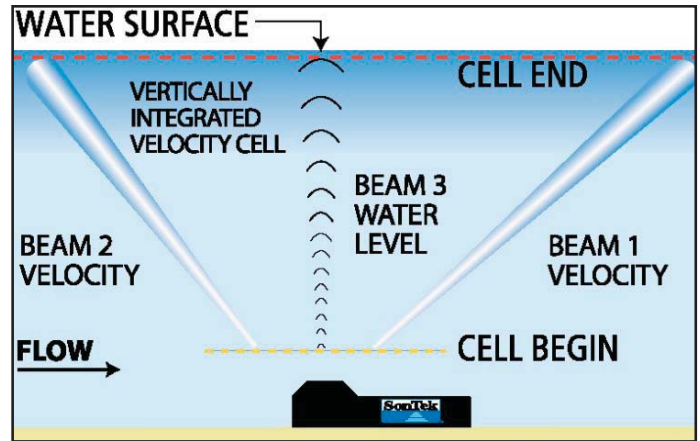
Weirs have often been of the thin plate variety. The thin-plated weirs can create large areas of backwater and have the ever present threat of lost accuracy (and further backwater effects) by becoming clogged with debris.

This difficulties of flumes and weirs seems to point well to the use of a side-mounted Doppler velocity sensor (such as our Argonaut-SL), where there is no need to be concerned



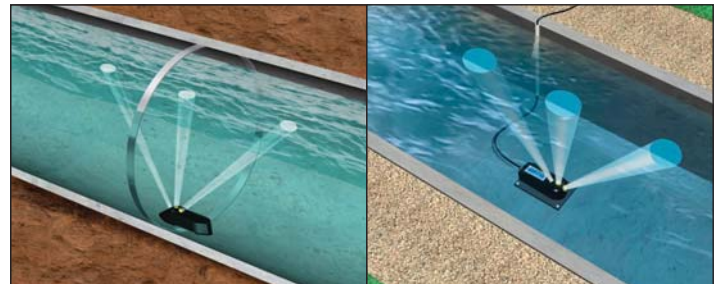
with head-loss or backwater effects. However, the difficulty of maintaining water depth, or mounting a relatively large sensor in a small channel played a major part in the development of the Argonaut-SW velocity sensor. The SW is a bottom-mounted system intended for complex index velocity sites (those with large stage variation or stratified flow), and for sites where purely theoretical discharge calculations are desired.

The Argonaut-SW has three acoustic beams. When properly bottom-mounted (usually in a channel), one of these beams points straight up, and the other two point up/down stream at a 45-degree angle. The upward-looking beam measures water level. The two slanted beams measure the water velocity in two dimensions via the Doppler method. This level and velocity information is then used (together with with the geometry of the



channel) to compute flow, mean velocity, and area.

A key technical innovation in the Argonaut-SW, which separates it from other Doppler sensors, is that velocity measurements are made all the way to the water's surface without any of the contamination normally associated with side-lobe interference. This enables the SW to take full advantage of the vertically-integrated velocity in its internal flow calculations.



Left: The Argonaut-SW in an industrial pipe. Right: The Argonaut-SW in an irrigation canal.

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SonTek/YSI, founded in 1992 and advancing environmental science in over 100 countries, manufactures affordable, reliable acoustic Doppler instrumentation for water velocity measurement in oceans, rivers, lakes, harbors, estuaries, and laboratories. Headquarters are located in San Diego, California.