

HydroSurveyor System

Frequently Asked Questions Guide

Basic description of product offering

The HydroSurveyor is a system designed to collect bathymetric, water column velocity profile, and acoustic bottom tracking data as part of a hydrographic survey. The two key components of the system are the HydroSurveyor Acoustic Doppler Profiler (ADP®) platform, and the powerful, yet user-friendly, data collection software (also called “HydroSurveyor”).

With the HydroSurveyor ADP platform, SonTek is able to offer an exclusive 5-beam depth sounding device, with built-in navigation, full water column velocity profiling, full compensation for speed of sound correction (with the CastAway-CTD), and integrated positioning solution.

The HydroSurveyor software package offers a central recording and processing platform that allows users to develop bathymetric maps with modest accuracy, using properly gridded data points—a function that is fully embedded in the software and automated.

In addition, because the HydroSurveyor offers two distinct navigation solutions (GPS and Bottom-Track), the system also offers users a solution for locations with restricted or intermittent GPS coverage, such as under bridges.

What does the hardware consist of?

The hardware is the same electroacoustic package as used in the RiverSurveyor M9. Similarly, the various PCM (power-communications modules) and DGPS/RTK GPS options are also the same.

I already have a RiverSurveyor M9, can I use HydroSurveyor?

Yes, your hardware is ready to go with no upgrades needed. However, you will need to download the latest firmware from the SonTek website and then call SonTek or your local representative with your system serial number and payment to get the access code.

What is new about the existing M9 firmware?

A new firmware version (3.0) is available for the M9 that supports both RiverSurveyor and HydroSurveyor. Just like with Stationary method for RiverSurveyor, a serial number specific access code is required to unlock HydroSurveyor. There is a fee for this access code - please contact SonTek or your local representative for pricing and more information.

There are nine beams on the HydroSurveyor, how are they used for depth measurement?

The vertical acoustic beam, operating at 500 kHz, provides direct measurements below the instrument in the same manner as a single beam echosounder. The four velocity beams, operating at 1000 kHz, each measure an additional depth and are projected at a 25 degree angle from the vertical axis. When the water depth gets shallow (approximately less than 5 m), the four 3000 kHz beams measure the bottom depth in place of the 1000 kHz beams.

This means you will always have 5 independent beams measuring the bottom arranged along a swath of approximately 50 degrees. Note that all velocity beams measure both water and boat velocity.

What is the bottom coverage (foot print) for each individual beam?

The beam width of the 500 kHz vertical beam is about 8 degrees and it can provide up to 80 m of range depending on bottom type. The velocity beams (projected at a 25 degree angle from vertical) have individual beam widths of about 3 degrees. The actual footprint will depend on the rotation of the M9 in relation to its course, but think of it like 5 individual echosounders all working at the same time.

Can I correct the sounding data for sound velocity changes?

Absolutely! The easiest way to do this is with the CastAway-CTD from SonTek. The HydroSurveyor software can automatically retrieve the cast data from the CastAway-CTD via Bluetooth. HydroSurveyor even features a sophisticated algorithm that interpolates cast data.

Can I process the data with HydroSurveyor?

The HydroSurveyor software is primarily a data collection platform. You can review the data both as its being collected and afterward; however, there are no data editing functions

Can I export the data with HydroSurveyor

Yes, the data is easily exported for use with programs such as MATLAB, Caris, or Hypack via ASCII export. MATLAB has native export.

What are the differences between using the HydroSurveyor and a basic single beam echosounder?

The HydroSurveyor is an “all in one” survey solution. The transducers, echosounder, processing electronics, and compass/tilt sensor are all in one integrated hardware unit with integrated firmware and PC software. Similarly, SonTek can also provide a CastAway-CTD and several power, telemetry, DGPS, and RTK GPS options. HydroSurveyor also gives water column velocity and SOG (speed over ground).

I have a RiverSurveyor S5, can I use HydroSurveyor?

No, at the present time, HydroSurveyor only supports the M9.

Can I use RiverSurveyor concurrently with HydroSurveyor?

No, you have to use the M9 as either a RiverSurveyor or a HydroSurveyor, not both at the same time. Once the code is activated the RiverSurveyor Live and HydroSurveyor software packages will automatically configure the system for either discharge measurement or survey operation as soon as the software is launched.

Is there a charge for HydroSurveyor software?

There is no charge for the PC software, it is freely downloadable from the SonTek website. However, it will only work with an M9 that has been activated (see above)

Can HydroSurveyor compute discharge?

No, HydroSurveyor system firmware and ping sequences have been optimized for bathymetric surveying. The system will concurrently measure current profiles, but the quality of the velocity data will be related to boat speed and water conditions.

I would like to buy a HydroSurveyor, but am not sure I need RiverSurveyor, is this possible?

Yes, you may purchase a system with HydroSurveyor firmware activated only. In this instance the RiverSurveyor feature (for discharge measurement) is deactivated. However, if you would like to activate the RiverSurveyor feature at a future date, this is possible by purchasing the access code from SonTek.

What are the GPS options for the HydroSurveyor?

SonTek offers our own integrated DGPS and RTK GPS systems complete with telemetry options. Contact your representative for details and pricing.

I have my own GPS equipment; can I use it with the HydroSurveyor?

This is possible by feeding the GPS strings directly into HydroSurveyor via the dedicated GPS connector included on the power/communications cable supplied with the instrument. Alternatively, you can connect your GPS equipment directly into a secondary serial port on the host computer. Please see the technical documentation or contact SonTek if you have questions about the compatibility of your GPS system.

I have a precise GPS compass/heading sensor, can I use that with HydroSurveyor?

Yes. GPS compasses and/or heading sensors can be connected directly to the host computer. Please see the technical documentation or contact SonTek for the requirements for this integration.

I want to deploy my HydroSurveyor in an autonomous mode (e.g. on the bottom of the river or harbor) - is this possible?

At the present time, the firmware and hardware to conduct a self-contained deployment are not available.

How do I mount the systems?

The HydroSurveyor may be easily mounted over the side of any boat. SonTek provides a simple mounting bracket that facilitates this or there are also attachment points on the HydroSurveyor so that customers may mount them with their own custom mounts.

How does the HydroSurveyor use bottom-tracking and GPS together?

The system references all water velocity data to bottom-tracking only and it references all boat position data to GPS only. Position data is used to calculate the boat's track and speed over ground. If GPS is lost (e.g. when going under a bridge), the system will automatically switch to using bottom-tracking for position as well, until GPS is recovered.

I don't have a GPS and don't want to purchase one; can I still use a HydroSurveyor?

No. Given the geo-referenced nature of the data and software, the system requires valid GPS data to operate.