xylem
Environmental Solutions

FlowTracker2 ADV®

VERSATILE WADING DISCHARGE & LAB ACOUSTIC DOPPLER VELOCIMETER

SonTek
a xylem brand

FlowTracker2 Advantage

For decades, the **Acoustic Doppler Velocimeter (ADV®)** has been the preferred instrument for precisely-defined sampling of water velocity across a wide range of environments.

FlowTracker2 uses SonTek's tried-and-true ADV technology, vetted by experts across the globe in hydraulics labs and wide-ranging field environments. Improved and perfected for FlowTracker2, the acoustic-based ADV sensor offers unparalleled accuracy, particularly in low flow and in the shallowest water of any wading device. 2-D data in the horizontal plane (2D/3D option available) allows the most comprehensive QC and understanding about flow conditions. User calibration is never required, and 24/7 tech support from SonTek and our worldwide team is only a call away.

But the real power becomes clear from the moment you start to collect data. Each step of the way FT2 guides you along the measurement process with visual prompts and **SmartQC** audio alerts just in case something important needs your attention. The FT2 also comes with time-saving, fool-proof features that came straight from suggestions of field users like you:

- Battery life icon on the screen at all times. Pre-load the spare cartridge and replace, even mid-measurement, with no data loss.
- Set up and save templates—no need to re-enter data every time you visit a site.
- Embedded GPS for georeferencing with automatic or manual fixes.
- Probes and handhelds are interchangeable—flexibility within agency teams and when sending equipment for service.
- Improved ADV acoustics: faster pinging, lower noise and better standard error.
- Optional integrated pressure sensor provides accurate depth measurement employing SonTek's robust, patented technique.
- Bluetooth or direct USB interface with PC.
- Audio prompts.
- Lab ADV with real time applications.

SmartQC

SmartQC is our exclusive promise your SonTek system is performing at optimum standards and that your data is precise, reliable and defensible.

Discharge and Velocity Data Collection

The **FlowTracker2 ADV** is the time-tested instrument for precise and accurate velocity measurements in the field. The FlowTracker2 is the industry preferred instrument for collecting accurate wading discharge measurements using time tested mid-section and mean-section methods. Intuitive menus and helpful prompts walk through every step of the measurement process, allowing even the most inexperienced user to collect data like a long-time pro. Pair the FT2 instrumentation with the optional top-setting wading rod kit for a system that is ready for the field right out of the box.

With rugged construction for any climate and multiple display options for both day and night, FT2 goes whenever and wherever you need it to go:

- Natural Streams
- Irrigation Canals
- Mining Channels
- Water Treatment
- Weirs/Flumes
- Storm Water
- Open Channel
- Lakes

Features You Can Count On

It doesn't matter if you are new to acoustic Doppler technology, or a seasoned pro. FT2 provides unparalleled benefits you will only find with SonTek instrumentation. Here are a few more features that set the FT2 apart:

+ Multi-language instrument and software for English, German, French, Portuguese, Spanish, Russian, Chinese, Japanese, Korean, and many more. Add additional languages using the built-in translator utility
+ Bracket adaptors for top-setting or universal 20mm wading rods
+ Tactile, rugged keypad and IP67 waterproof rating
+ SonTek's 2-year warranty and 24/7 tech support
+ Accurate and reliable under-ice measurements
+ Weighted gauge height calculations

The FlowTracker2 is used in a dye study of "Beelzebub's Bathtub" (Tennessee, USA) as part of an underground spring water flow analysis. Courtesy, Brian Ham, Karst Springs Initiative.

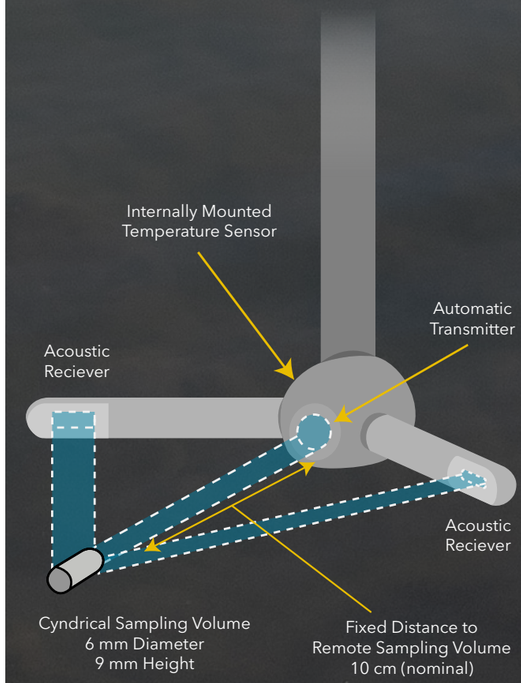
Handheld Software

There is a lot to get excited about when using the FT2 handheld. Intuitive workflow and rich graphics make for a modernized, interactive experience. Now you can:

+ View beam check or QC plots directly to know immediately if you have signal or beam blockage problems
+ Rely on FT2 to automatically conform to proper methods based on depth
+ See an image of top-set wading rod
+ View a running discharge summary
+ Get real-time plots of velocity and other parameters
+ View an on-screen tilt sensor
+ Enter comments and gauge heights with any station
+ Edit data

Example of FlowTracker2 discharge software and reports

The ADV Method



The FlowTracker2 probe uses an acoustic transmitter to send a short pulse of sound concentrated in a narrow beam out from the transmitter. With acoustic receivers that are sensitive to this narrow beam and focused on a common volume approximately 10 cm from the acoustic transmitter, the FlowTracker2 measures velocity in a small and discreet sample volume. This allows for FlowTracker2 to provide velocity measurements that are unparalleled in their precision and accuracy. Add the optional pressure sensor and the FT2 provides accurate depth measurements that will give you the best discharge measurement possible.

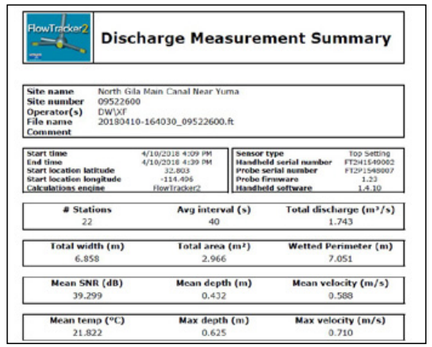
Desktop Software

Data Analysis

Comprehensive tables and time series graphs allow you to visualize and QC data during analysis. Change SmartQC criteria and edit data–yet rest assured the original file will always remain untouched. FT2's opensource JSON file format is ready to be read into any organization's database, and is supported with direct import to Hydstra and WISKI.

Example of desktop PC software

Easily view, analyze, and edit your data within the FlowTracker2 Desktop Software.



Discharge Measurement Summary

Site name	North Gila Main Canal Near Yuma
Site number	09522600
Operator(s)	DW\XF
File name	20180410-164030_09522600.ft
Comment	

Start time	4/10/2018 4:09 PM	Sensor type	Top Setting
End time	4/10/2018 4:39 PM	Handheld serial number	FT2H1549002
Start location latitude	32.803	Probe serial number	FT2P1549007
Start location longitude	-114.406	Probe firmware	1.23
Calculations engine	FlowTracker2	Handheld software	1.4.10

# Stations	Avg interval (s)	Total discharge (m³/s)
22	40	1.743

Total width (m)	Total area (m²)	Wetted Perimeter (m)
6.858	2.966	7.051

Mean SNR (dB)	Mean depth (m)	Mean velocity (m/s)
39.299	0.432	0.588

Mean temp (°C)	Max depth (m)	Max velocity (m/s)
21.822	0.625	0.710

Discharge Measurement Summary allows you to export your measurement data into one convenient PDF file.

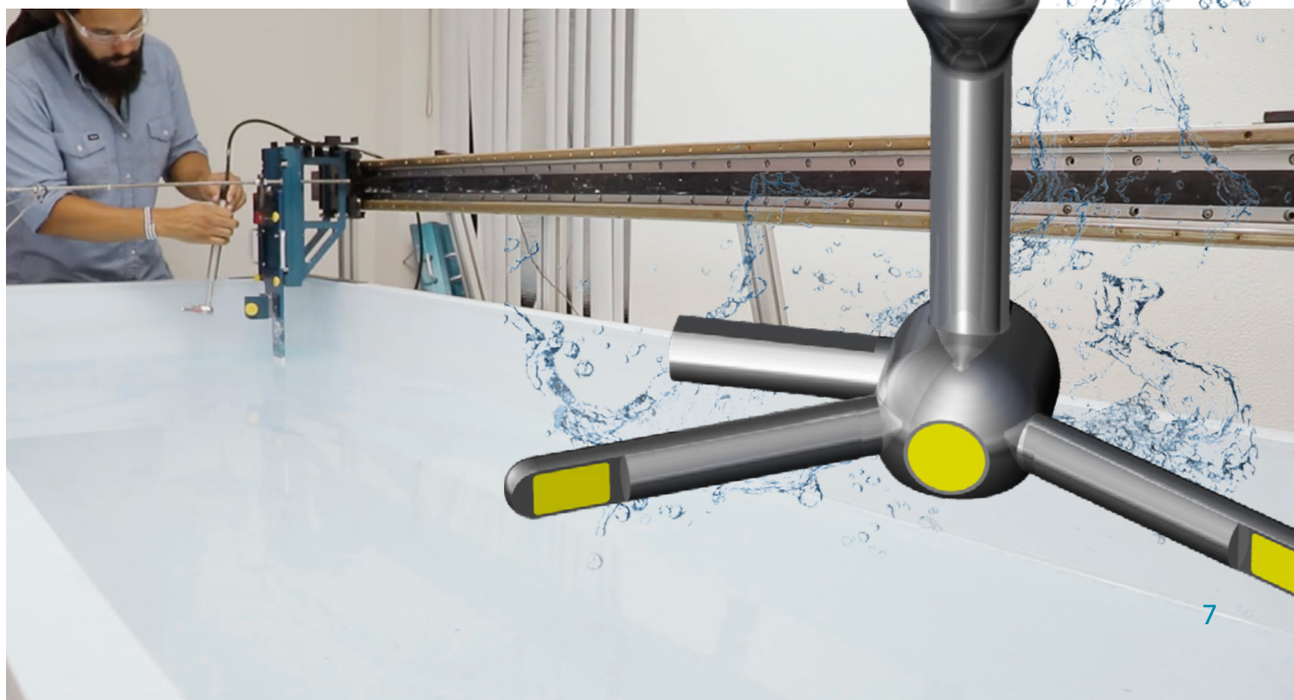
For The Laboratory

Recommended Use

The FlowTracker2 Lab ADV utilizes SonTek's continuing innovation in ADV platforms to offer a laboratory version of the world's best-selling ADV, the FlowTracker2. For the first time, the ADV's acoustic probe and processing electronics are housed in one small, lightweight, easily manoeuvrable unit, and the acoustic head has an optional, integrated pressure (depth) sensor. Depth data are even corrected for dynamic pressure (Bernoulli) and altitude effects using SonTek's patented method.

Flowtracker2 Lab ADV is recommended for use in:

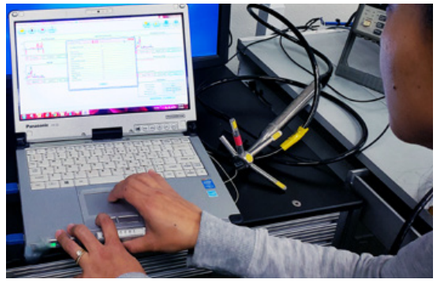
- Civil engineering, environmental, and hydraulic projects
- Aquaculture and aquarium operations
- Surface and bottom boundary studies
- Tanks, flumes, and physical models
- Very shallow water environments
- Turbulence
- Settling rates
- Fish screens

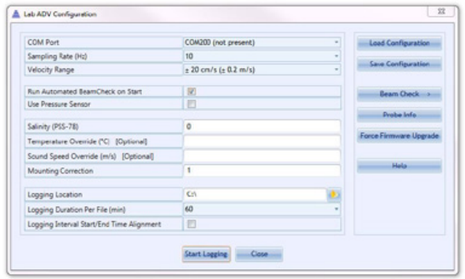


FlowTracker2

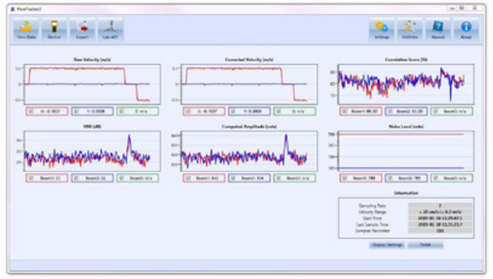
Lab Software

The **FlowTracker2 Lab Kit** comes with its own version of the powerful and user friendly FlowTracker2 desktop software. Setup of the probe and PC software is simple and mistake-proof. Just connect the cables between the probe and your laboratory PC or laptop, check a few settings, and press the “Start Logging” button. Data are output directly to a *.CSV file that is immediately ready for processing, analysis, and import to your project database or other programs.

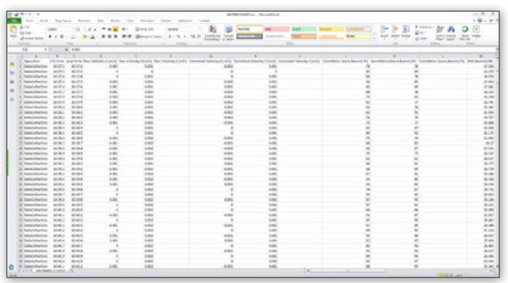




The Lab ADV configuration screen



Export data in a variety of formats

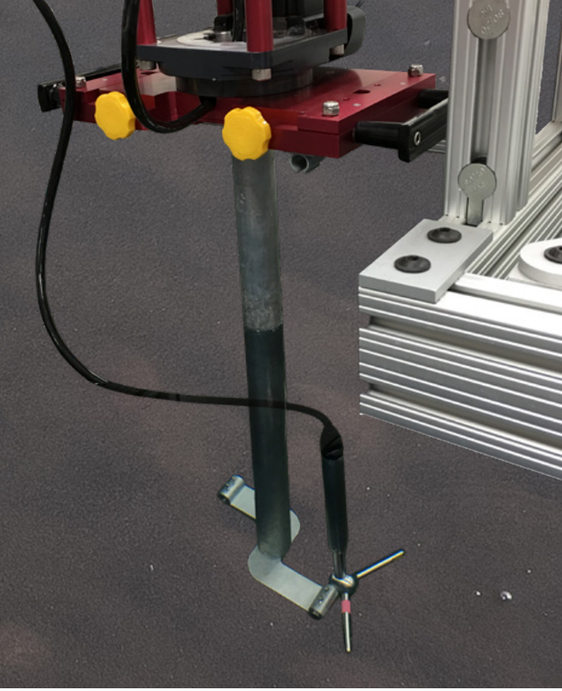


Output directly to a *.CSV file

FlowTracker2

Lab ADV

The FlowTracker2 lab kit includes cables to connect your probe to your power supply and PC. The simple system can be set up and ready to collect velocity data within minutes. For even more versatility, add a FlowTracker2 Handheld to your lab package to collect velocity data even when the PC is out of reach.



Output Variables Available

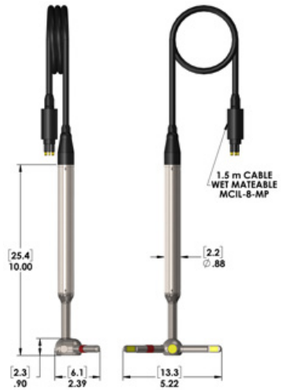
- Velocity X, Y, and Z[1]
- Temperature
- Raw pressure[2]
- Depth[2]
- Accelerometer X, Y, and Z
- Sound speed
- Corrected pressure[2]
- Power voltage
- Pressure sensor calibration interval

[1] *Z (vertical) velocity available with optional 2D/3D probe configuration*
[2] *Pressure and depth available with optional probe configuration*

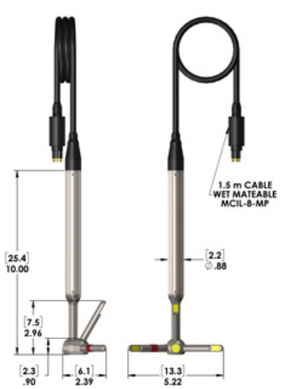
- Per beam (2 or 3 parameters, depending on probe configuration):
  - Correlation score
  - Signal amplitude
  - Signal-to-Noise Ratio (SNR)
  - Noise level

FlowTracker2 Specifications

2D Probe



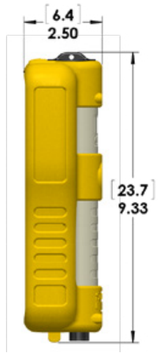
2D/3D Probe

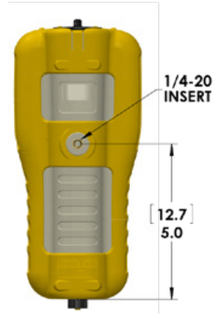


The SonTek deluxe wading rod, featuring a sturdy grip and bubble level.

Part I: Probe	
Velocity Range	**XZ:** ±0.001 to 4.0 m/s (0.003 to 13 ft/s), **Y:** ±0.001 to 1.0 m/s (0.003 to 3.25 ft/s)
Velocity Resolution	0.0001 m/s (0.0003 ft/s)
X & Y Velocity Accuracy	±1% of measured velocity, ±0.25 cm/s
Z Velocity Accuracy	±3% of measured velocity
Acoustic Frequency	10.0 MHz
Sampling Volume Location	10 cm (3.93 in) from the center transducer
Sampling Volume Size	0.25 cc
Minimum Depth	0.02 m (0.79 in)
Depth Measurement Range	0 to 10 m (0 to 32.81 ft)
Depth Measurement Resolution	0.001 m (0.003 ft)
Temperature Sensor	Resolution: ±0.01° C, Accuracy: ±0.1° C
Tilt Sensor	Resolution: (7) significant digits, Accuracy: ±1.0°
Communication Protocol	RS–232
Operating/Storage Temperature	–20° C to 50° C (–4° F to 122° F)
Optional Extension Cables	1.5, 3.5, or 8.5 m
Sampling Rate	1*, 2, 5*, or 10* Hz
Physical Specifications	
Probe Head Dimensions	**2D:** (L)13.3 cm (5.22 in); (W) 6.1 cm (2.39 in); (H) 2.3 cm (0.90 in), **2D/3D:** (L)13.3 cm (5.22 in); (W) 6.1 cm (2.39 in); (H) 7.5 cm (2.96 in)
Standard Cable Length	1.5 m (4.92 ft)
Weight in Air	**2D:** 0.90 kg (1.98 lbs)
Weight in Water	**2D:** 0.30 kg (0.66 lbs)
Depth Sensor Accuracy	
+/– 0.1% of FS (temperature compensated over full operating range)	
+/– 0.05% Static (steady-state at 25° C)	
Additionally compensated for real-time water velocity, temperature, salinity, and altitude.	

**Lab Probe Only*





Part II: Handheld	
Bluetooth	Class 2, Range = 10 m (33 ft) nominal
USB	Micro USB, IP-67
Storage Temperature	–30° to 70° C (–22° F to 158° F)[3]
Physical Specifications	
Waterproof Rating	Field: IP–67 (1m submersible); Lab: IP–68 (30 m, 42 PSI)
Handheld Dimensions	(L)10.4 cm (4.1 in); (W) 6.4 cm (2.5 in); (H) 23.7cm (9.3 in)
Weight in Air	0.75 kg (1.65 lbs)
Weight in Water	–0.25 kg (–0.55 lbs)
Power	
Input Battery Voltage	8–12 VDC
Battery Life	12 hours continuous use, typical settings[1]
Power Supply	Field: 8x AA Batteries; Lab: 8–12 VDC
Power Consumption	1 W (Average)
Probe Interface	
Battery Power to Probe	8–12 VDC
Data Transfer	RS–232
Data Storage	16 GB. Up to 10k discharge measurements. Up to 10 million velocity samples
GPS	
H. Position Accuracy	Up to 2.5 m (8.2 ft) nominal[2]
Frequency	L1 (1.575 MHz), SBAS compensation (WAAS, EGNOS, MSAS, GAGAN)
LCD	
Resolution	320 x 240 TFT Transmissive
Operating Temperature	
Alkaline Batteries: –20° to 45° C (–4° F to 113° F)	
NiMH: –20° to 50° C (–4° F to 122° F)	

[1] *Defined as power on with screen on at 100% brightness, ADV sensor pinging 50% of the time, GPS off, and no sleep periods. Actual battery life will vary depending on FlowTracker2 settings, manner of use and brand of battery.*
[2] *Ideal conditions and settings. GPS data are intended for approximate georeferencing and site ID.*
[3] *Remove batteries from FlowTracker2 handheld if storage temperatures exceeds operating temperature of Alkaline and NiMH batteries as stipulated above.*

Xylem |'zīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xylem.com

Sound Principles.
Good Advice.

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Environmental Solutions

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