

THE RiverSonde®



Non-Contact River Monitoring System



The **RiverSonde®** is an **affordable, non-contact** monitoring system providing continuous surface velocity measurements for streams, channels, and rivers. Data output from this system can be used in conjunction with other data sets or as model input for calculation of discharge. It is also ideal for monitoring river movement during flood events and in disaster planning.

This system is designed for operation at river's edge, in populated or remote locations. Robust hardware and software allow automated operation and data processing, even under extreme weather and/or vessel traffic conditions when other in-situ devices routinely fail.

Development began at CODAR Ocean Sensors in 1999 with funding from the US Geological Survey (USGS), whose aim was to see a non-contact alternative to present stream gauging methods. The RiverSonde is now commercially available.

System Highlights:

Convenient: Nothing in the water: a truly non-contact sensor. All hardware is located on land close to river's edge.

Reliable: All system hardware and software are developed by our own staff specifically for continuous, long-term field operations, and consistent data outputs.

Remote Access: Data retrieval, system monitoring, parameter modifications and even factory support are all conducted through remote system access. (communication link required)

Low Power: RiverSondes low power consumption allow for working off-the-grid with alternative energy sources.

Cross-Platform Data Format: All data products are stored as ASCII files for convenient data transfer to various computer platforms.

Single Station Operation: River velocities, which may be applied to estimations of river discharge, are obtained with a single RiverSonde station.



Entire RiverSonde system shown here

Optimal River Conditions for Operation

River Width: min. 10 meters, max. 250-300 meters if antenna is near ground level. Observation range may be extended if antenna is elevated (see Alternate Antenna Equipment Positioning).

Current Speed: min. 2.5 cm/sec – 3.5 m/sec

Surface Roughness: min. 2-3 cm

Water Depth: min. 10 cm

Optimal Antenna Equipment Positioning (with respect to river)

Within 20 meters of water edge (along horizontal)

Min. 3 meters above water (along vertical), no greater than 15 m

Unobstructed View towards river > ±45°

Alternate Antenna Equipment Positioning

Place antenna at higher elevation for extended range. In one operation, a 42 m high antenna placement yielded measurements to 1200 m.

RiverSonde Equipment Specifications

The RiverSonde consists of antenna mounted onto single post, a transceiver and processor unit.

Output Radiated Power: 1 watt

Operating Frequency Range: Select a band between 420-450 MHz that radio frequency license can be obtained for.

Bandwidth: up to 30 MHz (10 MHz => 15 meter range resolution, 30 MHz => 5 meter range resolution).

Power Requirements: either 120 VAC or 220 VAC, 50-60 Hz; approximately 100 watts for RiverSonde. 400 watts required if using optional weatherproof box with cooling system. Additional power may be required onsite for any peripheral equipment.

Communication link to system processor required for automated data retrieval, remote system monitoring and support. Internet Protocol preferred.

Output Data Product Specifications

Cross-Channel Velocity Profile. Mean Channel Velocity Estimates & other Estimates

Cross-Channel Resolution: 1/20th river width

Velocity Resolution: 2.5 cm/sec (corresponds to a 16-second FFTs)

Velocity Accuracy: 5% (of max. velocity bin)

Data Output Sample Times: 5 min.

Data Output Product File Size: ~250 kB

† RiverSonde General Specifications are subject to change. Consult company for latest information.

About CODAR

CODAR Ocean Sensors personnel are the inventors and original developers of HF and VHF radar technology for ocean monitoring applications, some having been in this field for nearly 50 years. CODAR staff continue to make advancements in radar physics theory as well as product engineering refinements, and apply them to ensure the SeaSonde as the most reliable HF radar system in the world. The RiverSonde takes advantage of many key SeaSonde features.



1914 Plymouth Street,
Mountain View, CA 94043 USA

Phone: +1 (408) 773-8240

Fax: +1 (408) 773-0514

E-mail: info@codar.com
www.codar.com

