

## How and where is an ADCP used?



### Offshore Energy Applications:

#### 1. Oil & Gas

Long range current profiles and wave measurement in support of deepwater oil and gas exploration, drilling and production. Real-time current measurement for decision making during drilling, riser deployment & recovery and ROV operations. Full water column current profiles to detect VIM phenomenon and help model VIV.

#### Seismic, Cable and Pipe Laying Vessel Operations

Real-time current profiles for streamer cable feathering angle prediction and correction, pipe lay and cable lay operations to calculate accurate touchdown position, ROV operations.

#### 2. Renewable Energy—Tidal/Wave/Offshore Wind

Current and wave measurement for site selection, design and performance monitoring, and environmental impact studies.

### Coastal Applications:

#### 3. Biological Oceanographic

Wave and current measurements for oceanographic/meteorological data collection, display/analysis to quantify the biological/ecological condition of coasts and estuaries.

#### Environmental Management

Oceanographic and meteorological data collection, display/analysis to properly manage coastal development and quantify the environmental effects of development and conduct environmental impact studies.

#### 4. Fisheries/Aquaculture

Current and wave data for site assessment and short or long-term environmental monitoring.

#### 5. Navigation Safety

Current and wave measurements for oceanographic/meteorological data collection, display/analysis to increase the safety of vessel navigation within or approaching a terrestrial port.

#### 6. Coastal and Ocean Engineering

Current and wave measurements for oceanographic/meteorological data collection, display/analysis to properly design coastal structures and public works projects, provide long-term monitoring, and assess impact to the littoral environment.

#### Academic Coastal Oceanography

Current and wave measurements for research areas including near-shore circulation, tidal currents, meso/micro scale turbulence, waves and wave current interaction.

### Oceanographic Applications:

#### 7. Integrated Ocean Observation Systems (IOOS) and Ocean Observatory Initiatives (OOI)

Real-time current and wave data support the integrated long-term monitoring, predicting and modeling of ocean environments with time scales ranging from minutes to decades.

#### 8. Deep and Mid-Water Depth Moorings

Moored ADCPs for oceanographic research based on the measurement of seasonal, annual, and decadal variability of ocean currents.

#### 9. Oceanographic Research Vessels

Large-scale, detailed measurements of ocean currents and motility of entrained biomass populations using vessel-mounted ADCPs.

#### 10. Autonomous Underwater Vehicles (AUVs) and Gliders

ADCPs installed onboard AUVs and gliders collect current profile data over an extended range and duration for academic, commercial, and military applications.

# Pick your Perfect Profiler...a simple 3-step process.

**Step 1:** Select the product(s) best suited to your **Application**

**Step 2:** Narrow your product selection by reviewing the **Product Specifications**

**Step 3:** Further narrow your selection by choosing a **Method of Deployment**



**Sentinel V**

Versatile, next-generation self-contained ADCP.



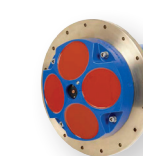
**Workhorse Monitor**

Direct read for real-time data collection.



**Workhorse Sentinel**

Versatile self-contained ADCP for mooring, bottom-mount, or moving boat applications.



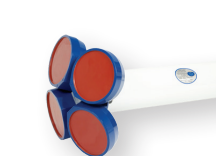
**Workhorse Mariner**

Vessel-mounted ADCP for coastal applications.



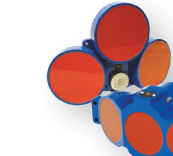
**Workhorse Quartermaster**

Highly flexible extended-range ADCP for "Continental Shelf" applications.



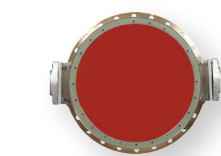
**Workhorse Long Ranger**

Rugged and reliable ADCP for extended range applications.



**Workhorse Horizontal**

ADCP that "looks out" horizontally from its mounting structure to measure near-surface water currents and multi-directional waves.



**Ocean Observer**

Our longest-range ADCP for deployments from offshore platforms. High-resolution or long-range settings.



**Ocean Surveyor**

Advanced long-range vessel-mounted ADCP for deep water current-profiling applications.

### Application

Oil and Gas	•		•		•	•	•	•	
Seismic, Cable and Pipe Laying Vessel Ops		•		•	•				•
Renewable Energy	•	•	•	•			•		•
Biological/Oceanographic	•	•	•	•	•				
Environmental Management	•	•	•	•					
Fisheries/Aquaculture	•	•	•						
Navigation Safety	•	•	•				•		
Coastal and Ocean Engineering	•		•	•					
Observatories		•	•		•	•			
Deep and Midwater Moorings	•		•		•	•			
Research Vessels				•					•
Academic Coastal Oceanography	•	•	•	•	•	•			•

### Product Specifications

Measurement Range	0.7m–159m	0.6m–150m	0.6m–150m	0.6m–150m	10m–300m	20m–600m	6m–200m	50m–1000m+	10m–1000m+
Sampling Rate—Typical (Minimum)	1–60 min. (4Hz)	1–15 min. (4Hz)	1–60 min. (4Hz)	1–15 min. (4Hz)	1–60 min. (0.6Hz)	15–60 min. (0.3Hz)	1–15 min. (1Hz)	5–20 min. (0.3–1Hz)	5–20 min. (0.3–1Hz)
Profile Resolution—Typical (Minimum)	1/2/4m (30/60/100cm)	1/2/4m (5/10/20cm)	1/2/4m (5/10/20cm)	1/2/4m (5/10/20cm)	8m (40cm)	16m (80cm)	2/4/8m (20/50/100cm)	8/16/24m (2/4/8m)	8/16/24m (2/4/8m)
Typical / Peak Deployment Duration	30–90 days / > 1 year	Real Time / > 5 years	30–90 days / > 1 year	Real Time / > 5 years	90–180 days / > 1 year	90–180 days / > 1 year	Real Time / > 5 years	Real Time / > 5 years	Real Time / > 5 years
Operational Depth Rating	200m/6000m	200/500/1000/6000m	200/500/1000/6000m	Up to 50m	1500m/3000m/6000m	1500m/3000m	200m	100m	Up to 50m
Standard Sensors / # of Beams	HPR/Temp/Press / 4 or 5 bms	HPR/Temp / 4 bms	HPR/Temp / 4 bms	HPR/Temp / 4 bms	HPR/Temp/Press / 4 bms	HPR/Temp/Press / 4 bms	HPR/Temp/Press / 3 bms	HPR/Temp / 4 bms	Temp / 4 bms
Available Upgrades	Waves/BT/P2P	Press/Waves/BT/P2P	Press/Waves/BT/P2P	Press/Waves/BT/P2P	BT		Waves		
Data Quality and Confidence Parameters	Error Velocity Screening, Fish Contamination Rejection, Correlation Threshold Screening, and Echo Intensity Threshold Screening								

### Method of Deployment

Moving Vessel		•	•	•	•				•
Mooring/Bottom Mount	•	•	•		•	•			
Marine Structure		•	•			•	•	•	

# What is an ADCP?

An Acoustic Doppler Current Profiler (ADCP) is a type of sonar that measures and records water current velocities over a range of depths. Teledyne RD Instruments actually designed and delivered the industry's first ADCP in 1982. The ADCP is now considered an essential tool for oceanography, estuary, river, and stream flow current measurement worldwide.



## How do they work?

An ADCP transmits sound bursts into the water column. Suspended particles carried by water currents produce echoes (from these sound bursts) which are "heard" by the ADCP. Echoes arriving later, from deeper in the water column, are assigned greater depths in the echo record. This allows the ADCP to form vertical profiles of current velocity. The ADCP senses in four different directions simultaneously. Particles within the current flow moving towards the instrument exhibit different frequencies from those moving away. This is the famous Doppler shift, which enables precise measurement of current speed and direction.

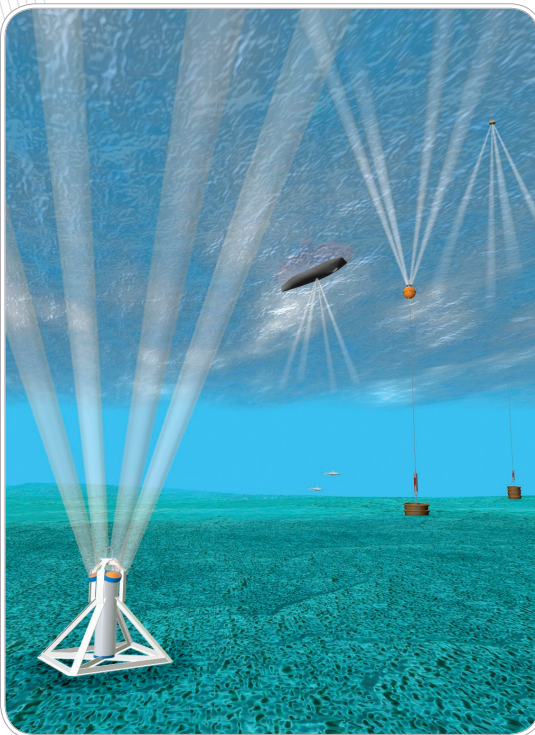
## What do they do?

When the ADCP is mounted in a moving vessel, the information obtained is used to measure water current speed, vessel speed and direction, and also distance above the sea bed. The ADCP also shows the distribution of suspended material. When the ADCP is mounted on the seabed to look upwards it measures current velocity and direction and—with a simple software add-on—the direction of waves. So with a Teledyne RDI ADCP you can:

- **Survey** the patterns of currents, suspended sediments, and zooplankton.
- **Simplify** difficult measurements—e.g. river discharge and biomass.
- **Receive** rapidly updated hi-res data in shallow water and observe short-lived events or small sized features.
- **Measure** vessel movement through water or over the bottom.
- **Determine** position and altitude of underwater vehicles such as AUVs and ROVs.
- **Collect** high-resolution time series of currents at many depths using a single instrument.

## What makes Teledyne RDI's ADCPs unique?

With well over 20,000 Doppler products delivered worldwide, Teledyne RDI's Workhorse ADCP products have become the de facto standard instrument used worldwide by scientists and field engineers to improve their understanding of water current circulation. Teledyne RDI's proven ADCP products provide:



Teledyne RDI ADCPs are versatile enough to be used in a wide range of marine applications.

- **Our Broadband processing** for significantly improved data quality, power efficiency, and error detection over competing narrowband systems.
- **Our patented 2-dimensional phased array transducer design** for significantly reduced size, weight, and deployment complexity.
- **Our unique 4-beam configuration** designed to ensure data redundancy for quality and reliability.
- **A highly flexible design**, which ensures that your base instrument is designed to meet your current needs and future needs as well.

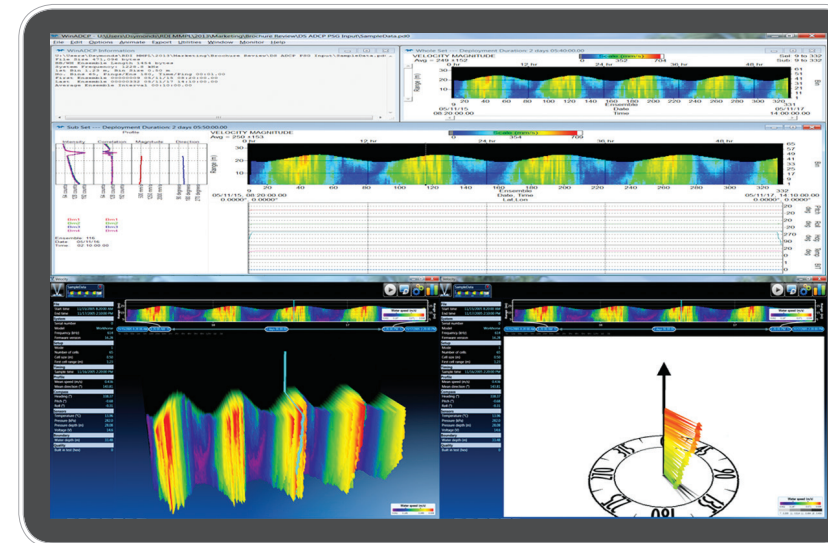
Teledyne RDI's ADCPs have become synonymous with high-quality data, ease of operation, and unsurpassed value. Each and every one of our products is backed by:

- **The best customer services team and philosophy in the industry.** We gauge our success by your success.
- **24/7 emergency service and support.** You'll never be left to sort out an issue alone.
- **Our worldwide offices** and leading industry representative network to ensure local support when and where you need it.
- **Free online training and product support** via our highly informative and dynamic Teledyne RDI University.
- **Our uncompromising commitment** to product quality and field dependability.

## How is my data displayed?

Teledyne RDI offers an array of software suites designed to quickly convert data into a variety of graphical display options, allowing you to quickly and easily view and assess the data you've collected. Our versatile software packages allow you to study the results of long-term self-contained deployments, or watch your real-time measurements as they unfold.

For those new to data collection, Teledyne RDI's software offers Wizards that quickly walk you through your system setup and data collection functions. For those with advanced or highly specific data requirements, Teledyne RDI offers the most comprehensive and powerful ADCP software in the industry. From rivers to deep-ocean projects, Teledyne RDI has a software solution to meet your project needs. Consult with our sales staff to see which option is right for you.



Teledyne RDI's Velocity post processing software package offers options and displays designed for novice to expert users.



**Teledyne RD Instruments, Inc.** specializes in the design and manufacture of underwater acoustic Doppler products and oceanographic sensors for a wide array of commercial, academic, and defense applications. The company currently employs over 200 multi-disciplined scientists, engineers, technicians, sales, and support personnel, and resides in an 80,000 square-foot ISO-9001:2000 facility that includes state-of-the-art engineering, laboratory, manufacturing, and test areas. The company is comprised of three distinct business units, each focused on acoustic Doppler technology:

**Marine Measurements:** Acoustic Doppler current profiling, wave measurement, CTD, and Carbon Sensor products for coastal and deepwater oceanographic environments.

**Navigation:** Precision acoustic Doppler navigation products for the marine environment.

**Water Resources:** Acoustic Doppler discharge and flow-measurement products for inland environments.

Since 1982, Teledyne RDI has led the industry by providing our customers with the highest quality, innovative Doppler technology backed by our unparalleled customer service and support.

## Our Commitment to you...

At Teledyne RD Instruments, we aspire to maintain leadership in our marketplace, enlisting customers as partners to work together in enduring relationships built on mutual trust and mutual benefit. From this foundation, we will continually evolve our products and services to meet our customers' needs.



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# Teledyne RD Instruments

Measuring Water in Motion and Motion in Water

## MARINE MEASUREMENTS Product Selection Guide

