



Workhorse Waves Array

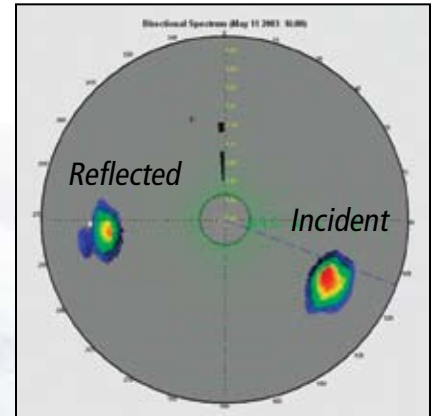
DIRECTIONAL WAVE MEASUREMENT
OPTION FOR WORKHORSE ADCPs

Collect High-quality Waves and Current Data with your Workhorse ADCP

Teledyne RDI's Workhorse **Waves Array** is an innovative, cost-effective upgrade that allows you to take your Teledyne RDI ADCP to the next level. Via a simple upgrade, you can capture not only the industry's most field-proven and dependable Broadband current profiling data, but highly accurate multi-directional wave measurements as well.

Teledyne RDI's Workhorse ADCP has long been viewed as the industry's most versatile ADCP. With a single instrument you can collect precision ADCP data from the seafloor, the surface, or even a moving vessel. And now, for the fraction of the cost of a stand-alone waves measurement tool, you can add highly robust multi-directional waves measurement capability to your instrument's repertoire.

Why limit yourself to a single measurement, or settle for inferior measurements, when Teledyne RDI's Waves Array allows you to have it all—at a price that meets your budget.



- **More than a basic wave gauge.** *Waves Array not only measures the complete frequency/direction wave spectrum, it provides you with the most reliable and field proven ADCP data available.*
- **Better than a directional buoy.** *This ADCP distinguishes waves from multiple directions with high resolution. Ocean floor deployment reduces the risk of loss or damage.*
- **More powerful than a single-purpose instrument.** *Waves Array allows your existing ADCP to measure multi-directional wave spectra, current velocity profiles, and water level—all at the same time.*
- **Waves data when and where you need it.** *Store you data in our stand-alone configuration, or transmit it directly to the surface utilizing our optional NEMO Waved Data Processing Module.*
- **Available as an option to your new ADCP, or as an upgrade to your existing Workhorse or Horizontal ADCP.**



**TELEDYNE
RD INSTRUMENTS**

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MEASURING WATER IN MOTION AND MOTION IN WATER

Workhorse Waves Array

DIRECTIONAL WAVE MEASUREMENT OPTION FOR WORKHORSE ADCPs



Technical Specifications

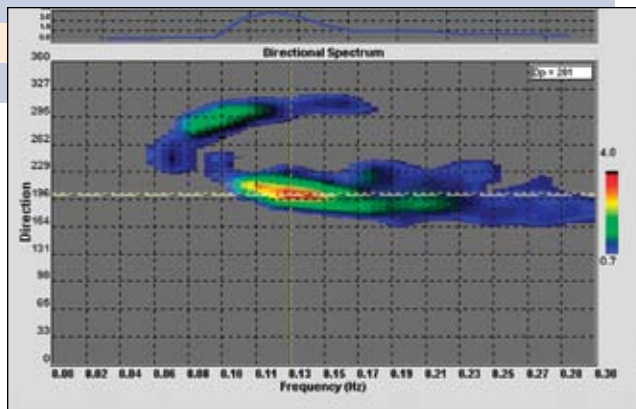
Measurement Technique						
Derivation of directional distribution	Array processing					
Location of sensors	Remotely measured near surface					
Number of independent sensors	12					
Array aperture	~0.7 x depth					
Acoustic sensor signal processing	Broadband					
Simultaneous sampling of wave burst + standard current profile	Yes					
Calculated Wave Parameters						
Primary data source	Near-surface velocity sensors					
Redundant data sources	Pressure sensor and "surface track" derived parameters for data QA					
Height	H_s	$H_{1/10}$	H_{mean}			
Period	T_p	T_{mean}				
Direction	D_p					
Custom	H_{sea}	H_{swell}	T_{sea}	T_{swell}	D_{sea}	D_{swell}

Minimum Wave Period Measured				
Deployment	Surface Track	Non-Directional	Directional	
Depth (m)	High-Freq. Cutoff ¹ (sec)	High-Freq. Cutoff (sec)	High-Freq. Cutoff (sec)	
5	1.0	1.7	1.8	
20	1.0	2.2	3.5	
80	1.0	4.4	7.0	

Recommended Deployment Depths	
ADCP Frequency	Depth (m) ²
1200	2.5–14
600	5–45
300	10–80

¹Acoustic surface track is only reliable in non-"whitcapping" conditions

²Assumes bottom-mounted ADCP, near-surface deployment on top of a current meter mooring is possible.



Frequency/Direction spectrum. The ADCP is showing multiple waves at similar frequencies that arrive from different directions.

Raw Sensor Data

All sensors are sampled at a 2Hz rate default. Sample rates of 4Hz are possible with a specialized setup with a 1200kHz.

Velocity:

1200 kHz accuracy $\pm 0.3\%$ $\pm 0.3\text{cm/s}$
 600 kHz accuracy $\pm 0.3\%$ $\pm 0.3\text{cm/s}$
 300 kHz accuracy $\pm 0.5\%$ $\pm 0.5\text{cm/s}$

Precision:

See Workhorse ADCP brochure

Surface track range:

Accuracy 1.0% of full scale
 Precision ADCP bin size/3.5

Pressure:

Accuracy 0.25% of full scale
 Precision 1/40,000 of full scale

Compass:

Accuracy $\pm 2^\circ$
 Precision $\pm 0.5^\circ$

* $\pm 1.0^\circ$ is commonly achieved after field calibration

Installation

Cable power/communications: provides unlimited duration for real-time data.

Battery power: for remote locations, power for 90 days or more available. Optional external pack available.

Software

Planning software: self-contained or real-time deployment set up with waves, current profiles, or both

Monitoring software: data acquisition and processing.

Viewing software: zoom, animate, average. Export to bmp, png, or text files.

Available Options

New ADCPs can be ordered with the Waves Array option, or you can upgrade your existing ADCP to include this capability. See the Workhorse NEMO datasheet for real-time waves processing capability.