DWR-G unit

Datawell - Oceanographic Instruments

Turn your navigation or meteo-buoy into a directional wave buoy with this GPS-based wave motion sensor package.

Shipping lanes and harbour entrances are usually marked by numerous navigation buoys. Especially at these locations seafarers are interested in the wave conditions. Furthermore, networks of marine and meteorological monitoring buoys cover the oceans for weather forecasting and climate change studies. Such networks offer a good opportunity to collect ocean wave data as well. These are just two examples for application of the Datawell DWR-G unit: a directional wave motion sensor package based on GPS.

The DWR-G unit builds on the Datawell principle of measuring waves with a single Global Positioning System (GPS) receiver. No differential GPS receiver is required. The same principle is also exploited in the DWR-G directional Waverider buoys. It offers 3-dimensional motion with centimetre-precision up to wave periods of 100 seconds.

All data are output through one RS232 port. The DWR-G unit outputs the well-known HXV format of the Waverider buoys which provides raw displacement, full spectra and buoy position. A single cable carrying power and signal lines enters the unit. The unit has a base plate with 4 holes for mounting. Since GPS refers directly to the WGS84 reference frame no special alignment is required.

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Specifications

Wave motion sensor	Sensor	single GPS (not differential)
	Precision	1-2 cm, all directions (1σ) buoy mooring and pitch-roll may affect wave measurement precision
	Periods	1.6 s - 100 s
	Calibration	not required ever
	Exclusion	GPS signals do not penetrate through water, occasional data gaps may occur
	Exclusion	not resistant to SA (Selective Availability, may be switched on by US Department of Defence for strategic reasons)
	Exclusion	measurements fail at position changes > 100 m in < 100 s, e.g. when used free floating or towed at constant velocities > 1 m/s
Wave data	Data	north, west, vertical
	Resolution	1 cm (north 2 cm, LSB “north” is GPS data gap indicator)
	Range	–20 m - +20 m
	Rate	1.28 Hz
	Reference	WGS84
Spectral data	Frequency resolution	0.005 Hz below 0.10 Hz and 0.010 Hz above
	Frequency range	0.025 Hz - 0.58 Hz
	Direction resolution	1.5°
	Direction range	0° - 360°
GPS position	GPS position	every 30 min, precision 5 m
Interface	Port	RS232
	Format	HXV
General	Outer Dimensions	height 0.16 m (incl. GPS ant.) base plate 0.20 m × 0.20 m
	Weight	approx.. 5 Kg
	Housing material	stainless steel AISI316
	Power	10 - 30 V, 1.0 W