



Directional Waverider GPS

Datawell - Oceanographic Instruments

Measuring waves with GPS

With the DWR-G wave buoy Datawell introduces a revolutionary concept of measuring waves with a *single* GPS (Global Positioning System) receiver. Without the need of a *differential* GPS reference station, the DWR-G can measure waves even in the middle of the ocean. It features a patented algorithm and custom-made GPS receiver that will challenge existing, conventional wave buoys based on inertial sensors such as accelerometers and magnetic compass (see specs).

To convince potential users of this unorthodox method the new DWR-G buoy has been tested against the standard in the field of wave measurement: the Datawell Directional Waverider (MkII). For more information refer to the December 2003 issue of Sea Technology, visit our website or contact Sales.

The highlights:

- **Measuring wave height and wave direction.**
- **Wave periods up to 100 s.**
- **HF link up to 50 km** over sea. By powering up the transmitter and using a directional receiving antenna the HF range can be stretched.
- **LED flash light** mounted at the top of the antenna increasing the buoy's visibility to passing ships.
- The **GPS receiver** for the wave measurement also serves for buoy positioning, thus facilitating buoy retrieval.
- Standard integrated **data logger** based on the latest flash card technology.
- **High capacity primary cells** operating under all wave conditions and weather circumstances for up to one-and-a-half years without replacement.
- An accurate onboard **energy meter** monitors the actual energy consumption of the buoy, and reports a reliable estimate of the remaining operating life.
- Available in **0.9 m, 0.7 m and even 0.4 m diameter hulls**. See also our separate DWR-G 0.4 m diameter brochure.



0.7 m

The DWR-G comes standard with Datawell's HF link for ranges up to 50 Km over sea. For larger ranges the HF link can be combined or replaced with Iridium, Argos or Orbcomm satellite communication. A GSM link is also available making the standard receiver redundant.

Optionals:

- A **water temperature sensor** in the mooring eye providing sea surface temperature
- **Iridium:** sending data via satellite over the Internet
- **Argos:** satellite link
- **Orbcomm:** satellite link (two-way)
- **GSM:** data through SMS or Internet
- **Hybrid Power System:** solar energy combined with primary cells for extending operational life up to 100%
- **Hull painting:** yellow (no anti-fouling)



Directional Waverider GPS

Datawell - Oceanographic Instruments

Specifications

Wave motion sensor	Sensor	single GPS (not differential)	
	Precision	1-2 cm	free floating, all directions (1 σ)
		1-2 cm + 0.5 %	moored, vertical (1 σ)
		–	moored, horizontal, depends on current and wave frequency (excluding GPS antenna pitch and roll motion)
	Periods	1.6 s - 100 s	
	Calibration	not required ever	
	Exclusion	GPS signals do not penetrate through water, occasional data gaps may occur	
Wave data	Exclusion	not resistant to SA (Selective Availability, may be switched on by US Department of Defence for strategic reasons)	
	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 - 0.60 Hz	
	Direction resolution	1.5°	
	Direction range	0° - 360°	
Standard features	HF transmitter	frequency range 27 MHz - 40 MHz, transmission range 50 Km	
	Data logger	type 1 Compact Flash Module 128Mb (other sizes available)	
	Flash light antenna	4 high intensity LEDs, colour yellow (590 nm), pattern 5 flashes every 20 s standard length 195 cm	
	GPS position	every 30 min, precision 10 m	
Options	Iridium/Argos/Orbcomm	satellite communication	
	GSM	mobile communication	
	Water temperature	range –5 °C - +46 °C, resolution 0.05 °C, accuracy 0.2 °C	
	Hybrid power system	solar panel combined with Boostcaps	
	Hull painting	Brantho KorruX "3 in 1" paint system (no anti-fouling)	
General	Hull diameter	0.7 m or 0.9 m (excluding fender)	
	Material	stainless steel (AISI316) or CuniFer 10	
	Weight	approx. 95 Kg (0.9m 225 Kg)	
	Batteries	0.7 m diam. operational life 7 months, 2 sections of 15 batteries 0.9 m diam. operational life 17 months, 5 sections of 13 batteries type Datacell RC17G (170 Wh green)	
	Receiver	RX-C, RX-D (recommended) or Warec (older Warecs may need modification)	
	Compatibility	DWR-G hatchcovers are compatible with MkII buoys	