



# Directional Waverider GPS

Datawell - Oceanographic Instruments

## Measuring waves with GPS

The DWR-G wave buoy measures waves with help of the Global Positioning System (GPS) only. It features a patented algorithm and custom-made GPS receiver. With a single stand-alone GPS receiver it can measure directional waves, up to 100 s periods, without any calibration ever, and even in the middle of the ocean.

Already with its introduction in 2002 the new GPS measurement principle was tested against the standard in the field of wave measurement: the Datawell Directional Waverider (MkII). For a copy of these publications please visit our website or contact Sales. By now the GPS buoy is well-established and has taken its own place in the oceanographic market.

### 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 flashlight** 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.
  - A **water temperature sensor** in the mooring eye providing sea surface temperature. (0.7m and 0.9m version only)
  - Standard integrated **datalogger** 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.

### Optionals:

- **HF link:** 25.5 MHz - 35.5 MHz
- **Iridium:** global, two-way satellite link
- **Iridium SBD:** global, two-way satellite link
- **Argos:** global, one-way satellite link.
- **GSM:** near shore data link via SMS or Internet
- **Power switch:** on/off
- **Hull painting:** yellow (no anti-fouling)



0.7 m (Hull painting is optional, not standard)



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## Specifications

<b>Wave motion sensor</b>	Sensor	single GPS (not differential)	
	Precision	1-2 cm	free floating, all directions ( $1\sigma$ )
		1-2 cm + 0.5 %	moored, vertical ( $1\sigma$ )
		–	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	
	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		
<b>Wave data</b>	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	
<b>Spectral data</b>	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°	
<b>Standard features</b>	Datalogger	Compact Flash Module 1Gb	
	LED Flashlight	4 high intensity LEDs, colour yellow (590 nm), pattern 5 flashes every 20 s standard length 35 cm	
	GPS position	every 30 min, precision 5 m	
	Water temperature	range –5 °C - +46 °C, resolution 0.05 °C, accuracy 0.2 °C	
<b>Options</b>	HF transmitter Flashlight antenna 195 cm	frequency range 25.5 MHz - 35.5 MHz (35.5 - 45.0 MHz on request) transmission range 50 Km	
	Argos/Iridium	satellite communication	
	GSM	mobile communication	
	Power switch	data files are closed and secured	
	Hull painting	Brantho Korruux "3 in 1" paint system (no anti-fouling)	
<b>General</b>	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 1 year, 2 sections of 15 batteries 0.9 m diam. operational life 2 years, 5 sections of 13 batteries type Datacell RC25G (250 Wh green)	
	Receiver	RX-C, RX-D (recommended) or Warec (older Warecs may need modification)	
	Compatibility	DWR-G hatchcovers are compatible with MkII buoys	