WaveSystem

A monitoring system for vessels and installations providing draught, directional wave and surface current data

Our WaveSystems are designed to provide accurate wave, current and draught data for weather critical marine operations. The system also provides real time positive or negative draught, depending on whether the hull is partly below or above the water line.

The system provides data both during transit and when stationary, utilizing the higher accuracy data provided by the RangeFinder or WaveFinder when possible, typically below 4 knots. These sensors also provide measured Hmax calculated from the time series.

As Miros sensors are completely dry, with no parts submerged into water, they benefit from much more efficient and simpler installation and maintenance procedures compared to wave buoys.

Key Features:

- Real-time sea state and draught monitoring
- Directional wave and surface current data
- Data export to third party systems
- No parts submerged in water
- Low maintenance costs.

Essential For:

- Weather critical marine operations
- Lifting operations
- Wind turbine installation and overhaul
- Cable and pipelay campaigns
- Diving support operations
- ROV launch and recovery
- Jacking operations

The Wave System combines measurements from two different sensor systems, the X-band radar based Wavex, and the downward looking RangeFinder or WaveFinder.

The Waves provides directional wave and surface current data. It will interface variety of X-band radars, including a set of IP radars, without interfering with, or affecting the navigation system. Wavex® requires at least 1-3 m/s wind. Heavy precipitation will affect data capture rate.

For fixed installation, the downward looking SM-140 Range Finder is used for calculating non-directional wave data from both the time series and the point-spectrum. This includes measured and estimated significant and maximum wave heights.

For floating installation, the SM-140 WaveFinder is used, calculating the same parameters but compensated for the vessel heave. These sensors operators independently of wind and rain conditions.

The system GUI includes user displays for wave, current and draught information. User defined layouts and visual alarms are available.

PR/014/DB/002 WaveSystem 100/200 Rev.03 (2019-09-19)

SPECIFICATIONS

Wave data Transit:

	Range	Resolution	Std Dev.
Height	0 – 5 m	0.1 m	0.5 m [1]
	5 – 10 m	0.1 m	10 % [1]
	10 – 15 m	0.1 m	20 % [1]
	15 -	0.1 m	
Period:	3.2 – 5.0 s [3]	0.1 s	0.5 s [2]
	5.0 – 13.0 s [3]	0.1 s	10 % [1]
	13.0 - 25.3 s [3]	0.1 s	20 % [2]
Direction:	1 - 360°	1°	20° [1], 2° [2]

Surface current data transit and stationary:

	Range	Resolution	Std. dev
Speed	0 – 5 m/s	0.01 m/s	0.05 m/s [4]
Direction	0 - 360°	1°	10° [4]

Non-directional Wave and Draught data stationary:

	Range	Resolution	Accuracy[5]
Height			
WS 100	< 92 m[6]	0.1 m	1 cm
WS 200	< 40 m[6]	0.1 m	Greater of 5 cm or 5%[7]
Period [8, y]	2 - 64 s	0.1 s	0.1 s
AirGap	3 -47 m [6]	0.01 m	< 5 cm
Draught	±20 m	0,01 m	< 5 cm

Interfaces:

Output Interfaces:

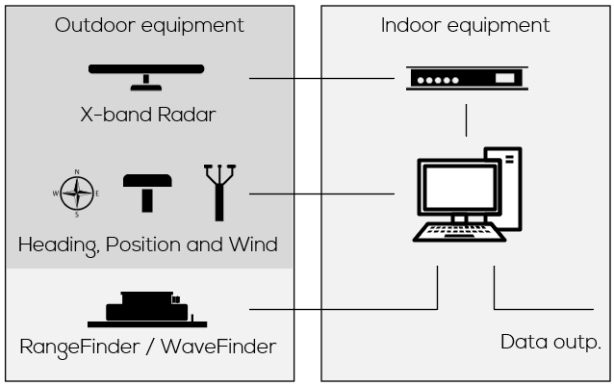
Other sensor data:	Proprietary NMEA-0183
	Proprietary file formats via FTP

Input Interfaces:

Heading[5]:	NMEA - HDT
Position[5]:	NMEA - GGA/GLL
Draught[6]:	NMEA – XDR, or Modbus
Wind:	NMEA – MWV
AIS	NMEA – IAIVDM
Date/Time:	NMEA – ZDA or NTP

X-Band radar interface:

Ant. Beam Width:	2° or less (4 feet or more)
Ant. Rot. Speed	15 - 48 RPM
Ant. Mount. Height:	15 - 100 m above sea level [8]
Pulse Mode:	Short pulse (50 - 80 ns)
Pulse Rep. Freq	1000 Hz or higher
Output Power	10 kW or more
Radar Signals[9]	Raw video, sync, heading marker and azimuth.
Antenna Polarization:	Horizontal [10]



Environmental specifications:

Temperature:	-30°C to +50°C
Humidity:	0 – 100 %RH
Ingress Protection:	IP 66

Electrical Data:

Supply voltage:	100 – 240Vac, 50-60Hz
Power consumption:	Nom. 250W, Max. 300W

Versions:

WaveSystem 100	For non-floating installations
WaveSystem 200	For floating installations; includes motion compensation

Notes

1. According to Wavex DNV GL Type Approval Certificate.
2. Theoretical measures.
3. Wave period range can be extended depending on site and configuration.
4. Using a Terma solid state radar on a fixed installation
5. The accuracy (standard deviation) of water level and wave variables, like Hs and Hm0, is mainly determined by the sea surface statistics, sensor data integration time (user selectable) and sensor site-specific properties. The speed of vessels in transit will impact the wave period measurements.
6. Typical values shown. Standard sensor range is 3 – 47m, optional range is 3-95m. Draught range is a function of sensors range and mounting height above draught reference line.
7. Complies with DNV-H101, recommended practice.
8. Lower antenna heights are possible depending on site and desired wave height range.
9. A selection of IP radars is also supported
10. Other polarizations should have similar or better performance, subject to further verification.

Specifications are subject to change without prior notice.