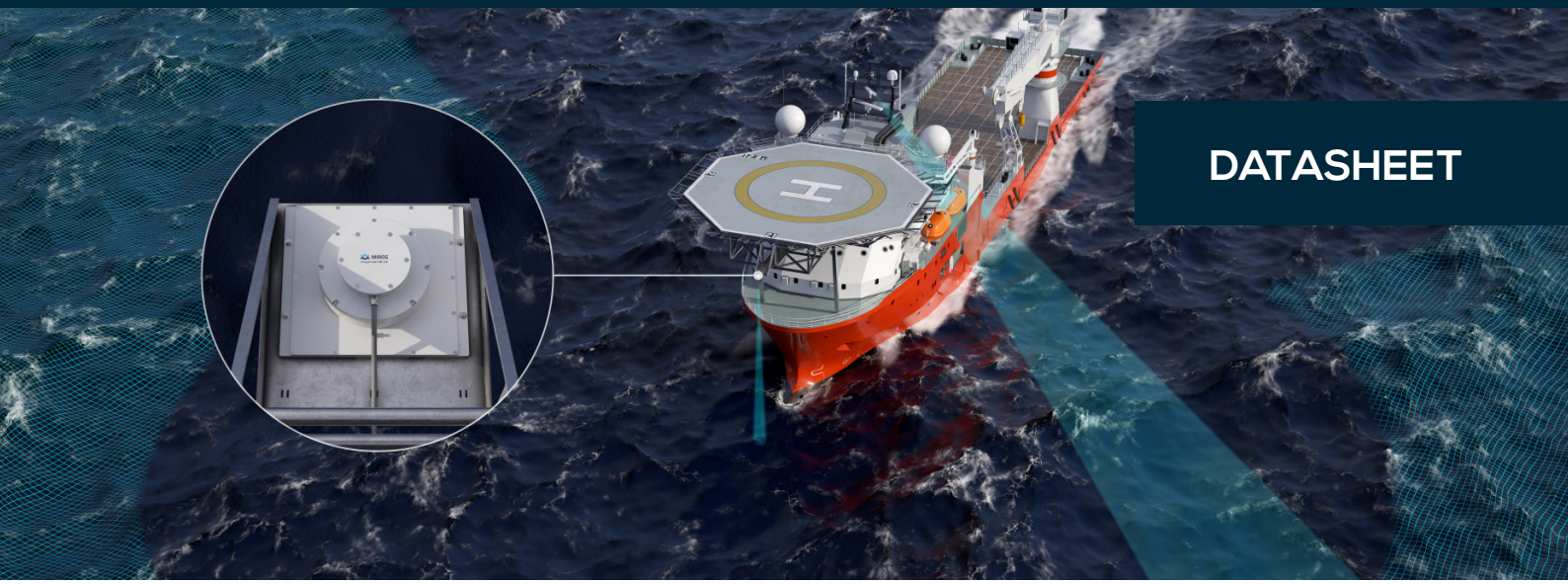
MIROS WAVESYSTEM

A COMPREHENSIVE MONITORING SYSTEM FOR VESSELS & INSTALLATIONS PROVIDING DRAUGHT, DIRECTIONAL WAVE & SURFACE CURRENT DATA



DATASHEET

The Miros WaveSystem is designed to provide accurate wave, current and draught data for weather-critical marine operations. The system provides real-time measurements of the local sea state and, combined with the Miros Cloud solution, allows the user to gain a overview of the sea and environment challenges.

The data can be accessed from anywhere by anybody in the organization allowing quick decision making and enhancing safety and efficiency in the daily operations. The system provides data both during transit and when stationary, as the sensors can be equipped or integrated with the Motion Reference Unit.

Miros sensors are completely dry-mounted, with no parts submerged in water, meaning they benefit from much more efficient and simpler installation and maintenance procedures as compared to traditional, in-water instrumentation.

KEY FEATURES

- Real-time sea state and draught data
- Easy data access, locally or remotely
- No parts submerged in water
- Low maintenance costs
- Directional wave and surface current data
- Embedded data processing
- Integrates with third-party systems
- IoT-enabled for easy data access

ESSENTIAL FOR

- Weather-critical marine operations
- Lifting & jacking operations
- Wind turbine installation and overhaul
- Structural integrity verification
- Cable & pipelay campaigns
- Diving support operations
- ROV launch & recovery

The Miros WaveSystem combines measurements from two different sensors - the X-band radar-based Miros Wavex and the downward-looking Miros RangeFinder.

Through robust, accurate and adaptive algorithms the Wavex calculates directional wave and surface current data. It will interface with a 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.

The downward looking SM-140 RangeFinder is used for calculating non-directional wave data, water level and draught to high accuracy and operates independently of wind and rain conditions

The devices can be complemented with various value adding Cloud services from Miros, such as weather sensors integration, web displays, data download, data push and device management services.

SPECIFICATIONS

Wave Data	**Range**	**Resolution**	**Std. Dev.**
Wave Height	0 - 5 m	0.1 m	0.2 m
	5 - 10 m	0.1 m	6 %
	10 - 15 m	0.1 m	20 %
	>15 m	0.1 m	
Wave Period	3.2 - 5.0 s	0.1 s	0.5 s
	5.0 - 13.0 s	0.1 s	10 %
	13.0 - 25.3 s	0.1 s	20 %
Direction	0 - 360°	1°	20°, 2°

Surface Current Data Transit & Stationary			
Speed	0 - 5 m/s	0.01 m/s	0.05 m/s
Direction	0 - 360°	1°	10°

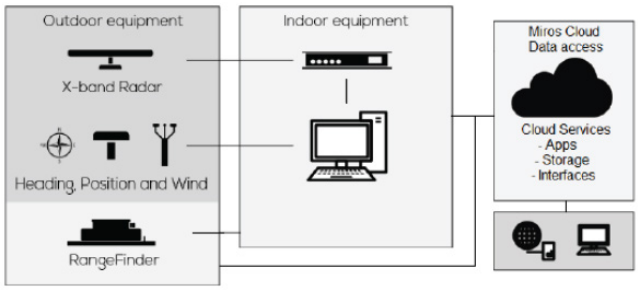
Speed Through Water			
Speed	any	0.01 m/s	0.05 m/s
Direction	0 - 360°	1°	1°

Non-Directional Wave & Draught Data Stationary			
Height	< 93 m	0.1 m	1 cm
Period	2 - 64 s	0.1 s	0.1 s
Airgap	1 - 95 m	0.01 m	< 5 mm
Draught	Variable [1]	0.01 m	< 5 cm

Data Integration Options	
Local	LAN and Serial
	NMEA, proprietary formats
Remote	JSON and CSV format from Miros Cloud

Input Interfaces	
Heading [2]	NMEA - HDT
Position [2]	NMEA - GGA/GLL
Draught	NMEA - XDR, or Modbus
Wind	NMEA - MWV
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 [3]
Pulse Mode	Short pulse (50 - 80 ns)
Pulse Rep. Freq.	1000 Hz or higher
Output Power	10 kW or more
Radar Signals	Raw video, sync, heading marker and azimuth
Antenna Polarization	Horizontal [4]



Electrical Data RangeFinder	
Supply Voltage	12 – 36 VDC (Nominal 24 VDC)
Power Consumption	< 7 W

Electrical Data Wavex	
Supply Voltage	100 – 250 VAC, 50/60 Hz
Power Consumption	< 200 W

Compliance	
EU Directives	LVD, EMC
Environmental Data	IEC60945, IMO Res A694(17)
Communication Interfaces	IEC61162-1, IEC61162-450
Zone 1	ATEX, IEC Ex

Notes

1. The draught range is a function of the sensors range and mounting height above draught reference line.
2. Required for moving installations.
3. Lower antenna heights are possible depending on site and desired wave height range.
4. Other polarizations should have similar or better performance, subject to further verification.

For data accuracy resolution refer to the resource section on the Miros website.

Specifications are subject to change without prior notice.