

Miros WaveWeather



A wave and weather monitoring system for ports tidal stations and offshore wind-farms, providing accurate wave, water level, tide, air-gap and weather data

The compact and easy to install Miros WaveWeather is designed to deliver accurate, real-time measurements of the local sea and weather conditions to any user on any device.

The system comprises a Miros RangeFinder and a Vaisala Weather Transmitter. The compact Weather Transmitter provides wind, temperature, humidity and pressure data utilizing the unique Vaisala solid state technology. The RangeFinder accurately measures the vertical distance to the sea-surface, undisturbed by fog, rain or water-spray. The sensor provides accurate air-gap, and calculated water level and draught data where averaging periods and reference points are configurable. Wave variables are calculated both from the wave spectrum and from timeseries.

Data is integrated into the Miros Cloud, making it immediately accessibility anywhere, without the need for any external processing. Miros Cloud enables easy integration with tidal tables, weather forecasts and other relevant data sources.

The sensors have proved their ruggedness and reliability through many years of service in extreme weather conditions, all over the world.

Key features:

- Real-time monitoring of wave, water level and weather data
- Easy data access anywhere
- No parts submerged in water
- Low maintenance cost

Essential for:

- Weather-critical maritime operations
- Wind turbine installation and overhaul
- Ports and harbour navigation
- Planning and operational support
- Post-operation and incident analysis



The WaveWeather consists of a Miros RangeFinder and a Vaisala WTX 536 Weather Transmitter connected to a Miros Edge solution enabling easy and secure interface to the Miros Cloud. A suitable 4G modem is available as an option.

Miros Cloud provides various web displays and a data download capability.

Additional Miros Cloud features are available including third-party integration by data push or pull, device management and integration with weather- and tidal-forecast services where available.

SPECIFICATIONS

Measured and calculated data:

Data	Range	Resolution	Accuracy
Distance ¹	3 – 95 m ²	1 mm	<5 mm ^{3,6}
Wave height ³	< 92 m ^{2,4}	1 cm	<1 cm ^{3,6}
Wave period ³	0.5 – 128 s ⁴	0.1 s	0.1 s ³
Wind speed ⁷	0 – 60 m/s	0.1 m/s	±0.3° C ⁸
Wind direction	1 – 360°	1°	±3% ⁸
Air temperature	-52 – + 60° C	0.1° C	±0.3° C ⁷
Air humidity	0 – 90% RH	0.1% RH	±.3% RH
	90 – 100% RH		±.5% RH
Air pressure	600 – 1100 hPa	0.1 hPa	±0.5° hPa ⁹
Rainfall intensity	0 – 200 mm/h	0.1 mm/h	
Rainfall		1 mm	

Interfaces:

Standard interface TCP/IP over CAT 5e or better

Displays / GUIs Via Miros Cloud

Output Interfaces:

Sensor data and status: Miros Cloud

Data output rate: 1/60 Hz

Environmental specification:

Sensors:

Temperature: -30°C to +50°C

Humidity, sensors: 0 – 100 %RH

Ingress Protection:

RangeFinder IP 67

Weather Transmitter: IP 66¹⁰

Central equipment: Indoor and outdoor versions available

Electrical Data:

Supply voltage: 24 Vdc or 100 – 240Vac, 50-60 Hz

Power consumption: Nom. 15 W, Max. 17 W

With optional heater Nom. 25 W, Max. 36 W

RangeFinder:

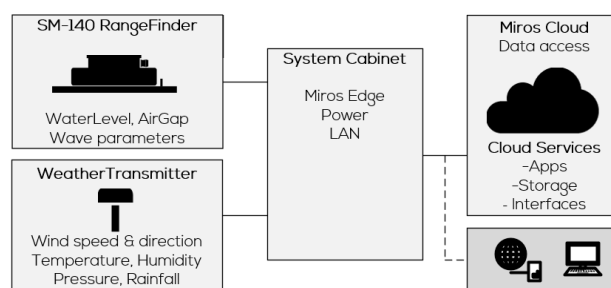
Frequency of operation: 9.4 – 9.8 GHz, Triangular FM

Transmitted power 2 dBm ±3dB (nominal 1.6mW)

EMC EU RED pending

Weather Transm., EMC IEC 60945 & 61326 -1

Central Equipment, EMC EN 55032/24



Accessories and options:

SM-140/W/02/20:	Range 1 – 23 m
MP-327	Range Finder mounting bracket
WXT 536 Bird Spike	
WXT 536 Mounting Kit	
4G modem	
Miros Cloud	Additional services

Notes

- Including air-gap, water level and tide measurements
- For the optional SM-140/W/02/20: Range: 1 – 23m / Wave height: <22m.
- The accuracy (standard deviation) of water level and wave variables, like H_s, H_{m0} and T_i is mainly determined by the sea surface statistics, site specific properties, sensor mounting height and data integration time (user selectable).
- Wave variables are calculated both the wave point spectrum (range 0.0039 – 2 Hz, 0.0039 Hz resolution) and from time-series analysis.
A selection of wave parameters from the wave spectrum:
 - Significant wave height, H_{m0}
 - Maximum wave height, H_{max} (most likely value in 30 min interval)
 - Peak period, T_p
 - Average period, T_{m02}
 Wave parameters from time-series analysis (8Hz sampling for 256sec):
 - Significant wave height, H_s
 - Maximum wave height, H_{max}
 - Significant wave period, T_s
 - Period of wave with max. height, T_{Hmax}
- Depending on sensor elevation above sea level and selected sensor range.
- Typical accuracy for averaged measurement is ± 5mm. For measurements to a fixed target in a controlled environment, the accuracy is ± 1mm
- Average, gust and lull values at sensor height
- Wind: at 10 m/s wind speed, Temperature: for sensor element at 20° C
- For T_{amb} 0 – 30° C. For entire range: ±1.0 hPa
- With the optional WXT mounting kit

Please confer the SM-140 RangeFinder and Vaisala WTX 536 data sheets for additional information.

Specifications are subject to change without prior notice.