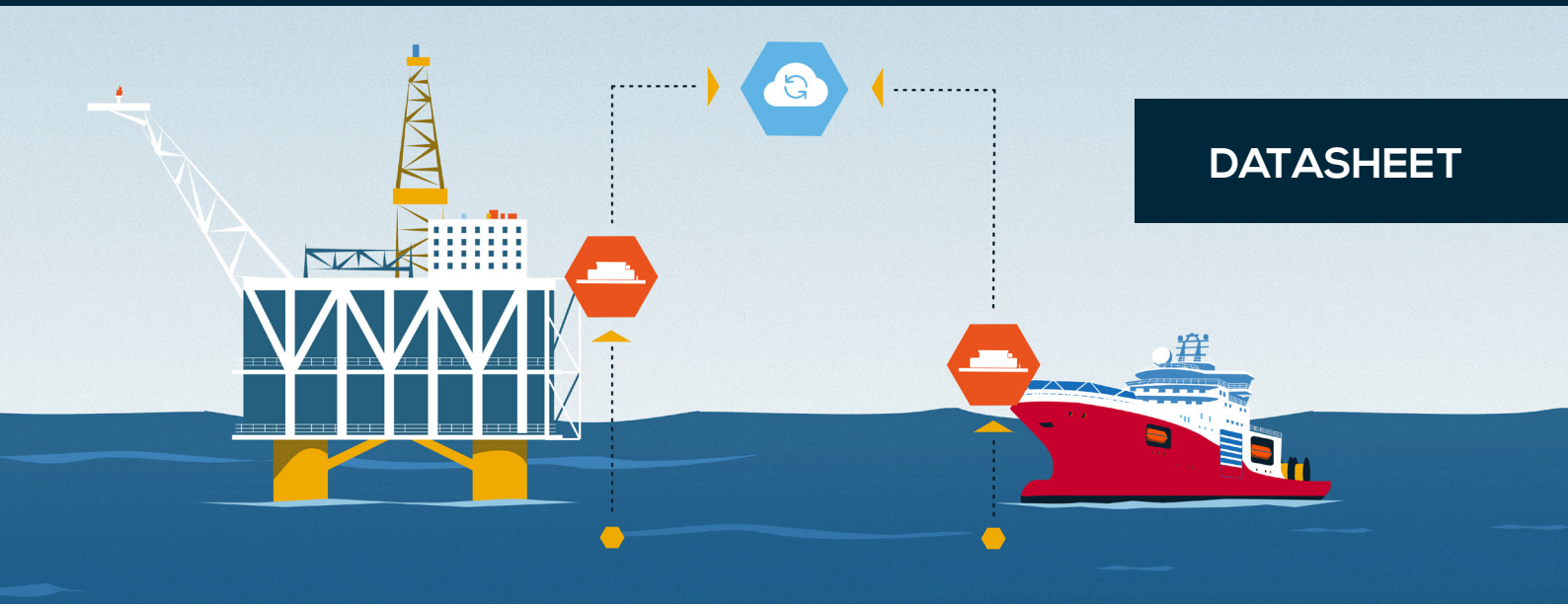
MIROS RANGEFINDER

THE ULTIMATE STAND-ALONE SENSOR FOR AIR GAP, TIDE, WATER LEVEL, DRAUGHT AND WAVE MEASUREMENTS



DATASHEET

The Miros RangeFinder is a dry-mounted, radar-based sensor purpose-built to deliver accurate, real-time measurements of water level, tide, non-directional wave parameters, and air gap measurements.

Offering market-leading range and accuracy specifications, measurements are not impacted by fog, rain, or water spray. The RangeFinder is Cloud-integrated, allowing for easy, secure access to local sea state data anywhere, anytime and on any device.

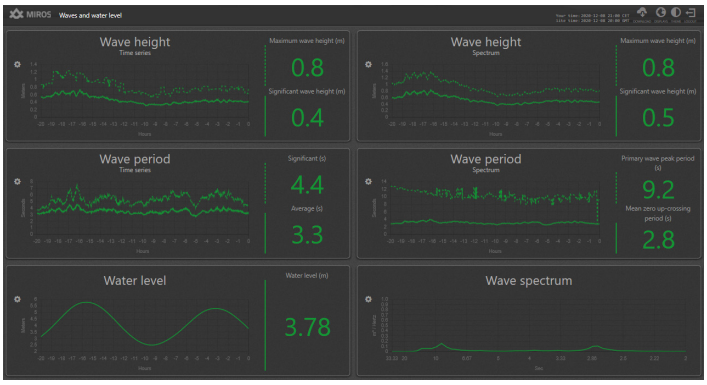
The versatile Miros RangeFinder is available with two antenna alternatives, either a 10° wide or 5° narrow beam width antenna with a smaller footprint, to suit different applications. Measurement ranges from 1–23 m to 2–95 m. The wide beam sensor is also available in an Ex-approved version.

KEY FEATURES

- High sampling rate and accuracy
- No parts submerged in water
- Low maintenance costs
- Available with motion-compensation and/or Ex certification
- Not impacted by fog, rain or mist
- Embedded data processing
- Integrates with third-party systems
- IoT-enabled for easy data access

ESSENTIAL FOR

- Accurate air gap, water level, draught and non-directional wave measurements from both fixed or floating locations
- Weather-critical maritime operations
- Structural integrity verification
- Tide gauge according to WMO TD 1339



The triangular FMCW (Frequency Modulated Continuous Wave) microwave sensor accurately measures the distance to the water surface, with a sampling frequency up to 200Hz.

Wave variables are calculated both from the wave point spectrum and from time-series analysis.

The sensor is a self-contained, network connected device with an integrated web-based user interface.

The RangeFinder is an IoT-enabled device with embedded processing, enabling easy and secure data access, whether integrated with local or remote systems. It can also be complimented with various value-adding cloud services from Miros, such as data access, data applications, web displays, additional sensor data integration, data storage and device management service

SPECIFICATIONS

Data	Range [1]	Resolution	Accuracy [2]
Distance (Air Gap)	1 - 23 m [3]	1 mm	< 5 mm [6]
	2 - 95 m [4]		
Wave Height	< 22 m [5]	1 cm	< 1 cm [6]
	< 93 m [5]		
Wave Period	0.5 - 128 s [5]	0.1 s	0.1 s

Internal Sampling Rate: 50 - 200Hz, depending on range

Interfaces

Data Transmission:	TCP/IP over CAT5e or better
Serial Interface:	RS-232 (Standard) RS-422 (Optional)

Displays/GUI

Data, Status, Configuration	Web GUI [7]

Output Interfaces

Sensor Data & Status:	NMEA, proprietary formats JSON over HTTP and Cloud
Data Output Rate:	Up to 50Hz via TCP/IP or serial

Input Interfaces

Position:	NMEA - GGA/GLL
Date/Time:	NTP

Electrical Data

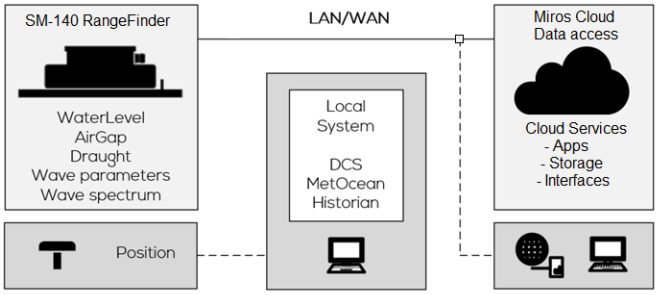
Frequency of Operation:	9.4 - 9.8 GHz, Triangular FM
Transmitted Power:	2 dBm ± 3 dB (Nominal 1,6mW)
Beam Width:	5° (-3 dB one way)
Supply Voltage:	12 – 36 VDC (Nominal 24 VDC)
Power Consumption:	< 7 W
RED:	2014/53/EU (Pending)

Environmental Specifications

Temperature:	-30°C to +50°C
Humidity:	0 – 100 %RH
Ingress Protection:	IP 67

Physical Specifications

Dimensions	
H x Diam. [mm]:	SM-140/W/02: 122 x 340
H x W x D [mm]:	SM-140/N/02: 136 x 500 x 440
Weight [kg]:	SM-140/W/02: 8.0
	SM-140/N/02: 11.0
Material:	Al. EN AW 5052 / EN AW 6082
Finish/Colour:	Enameled / Grey RAL 7035



Versions

SM-140/W/02/20 [3]	Range 1 -23 m
SM-140/N/02/90 [4]	Range 2 - 95 m
SM-140/xx/02/xx/RSxxx [8]	Serial-line, RS-422/RS-232
SM-140/xx/02/xx/M	Floating Installations

Accessories & Options

MP-327	Mounting Bracket
101720	Juntion Box
Cloud Services	

Notes

1. Wave point spectrum (range 0,0039 – 2 Hz, 0.0039 Hz resolution)
   A selection of wave parameters from the wave spectrum
   Wave parameters from time-series analysis (8Hz sampling for 256sec)
2. The accuracy (standard deviation) of water level and wave variables, like Hs, Hm0 and T is mainly determined by the sea surface statistics, site specific properties, sensor mounting height and data integration time (user selectable)
3. For SM-140/W/02/20: Range: 1 – 23m. Recommended for short range water level, tide and air gap measurements
4. For SM-140/N/020/90: Configurable range: 2-23 m, 2-45 m or 2-95 m Recommended for wave measurements and all long-range measurements
5. Depending on sensor elevation above sea level and selected sensor range
6. Typical accuracy for averaged measurement is ± 5mm. For measurements to a fixed target in a controlled environment, the accuracy is ± 1mm
7. WEB GUI with real-time and historical data, operational alarms, sensor status and sensor configuration
8. Serial line version, 4,8 – 115.2 kb/s. For this version:
   No Web GUI or position/time inputs available
   MirLog06 and MirUtil01 software utilities are included

Specifications are subject to change without prior notice.