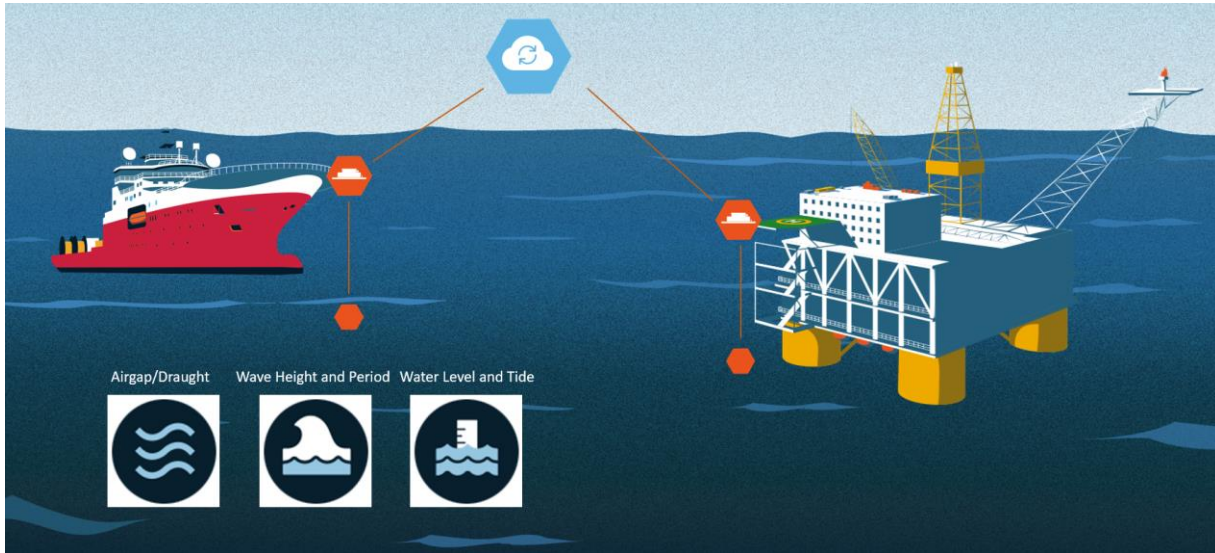


# RangeFinder & WaveFinder Ex



## The ultimate stand-alone sensor for air gap, tide, water level, draught and wave measurements.

The versatile Miros RangeFinder (or WaveFinder, when motion compensation is added) is purpose-made to deliver accurate measurements of the vertical distance to the water surface. The sensor offers market-leading range and accuracy specifications. Measurements are not impacted by fog, rain, or water spray. The sensor is available with a 5° narrow beam antenna with a measurement range of 2 – 95m. RangeFinder Ex and WaveFinder Ex are ATEX IEC Ex certified (Ex db eb ib T6) to be used in Zone 1.

The sensors provide accurate air gap data at high sampling rates. Water level and draught are calculated where averaging periods and reference points are configurable. Wave variables are calculated from both the wave spectrum and time series.

These Ex-certified sensors are stand-alone instruments with embedded processing, enabling easy and secure data access, both locally and remotely, utilising modern IoT technologies.

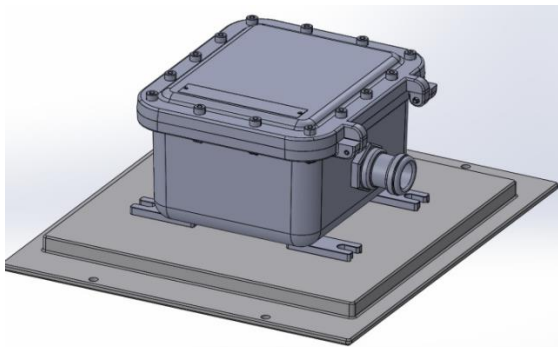
The RangeFinder and WaveFinder have proven their ruggedness and reliability through decades of service in extreme weather conditions, all over the world.

### Key Features:

- High sampling rate and accuracy
- Embedded data processing and browser-based user interface
- IoT-enabled for easy data access locally and remotely
- No parts submerged in water
- Low maintenance costs

### Essential For:

- Accurate air gap, water level and draught measurements
- Tide gauge according to WMO TD 1339
- Accurate non-directional wave measurements calculated from both wave spectrum and timeseries
- Weather-critical maritime operations



SM-140 RangeFinder Ex (5° Antenna)

The triangular FMCW (Frequency Modulated Continuous Wave) microwave sensor accurately measures the distance to the water surface, with a sampling frequency of up to 200Hz. Wave variables are calculated from both the wave point spectrum and time series analysis.

The sensors are self-contained, network-connected devices with an integrated web-based user interface.

Both the RangeFinder Ex, and the motion-compensated WaveFinder Ex, are IoT-enabled devices that can be easily and securely integrated with both local and remote systems. The sensors can also be complimented with various value-adding Cloud services from Miros, such as web displays, database integration, data processing and device management services.

## SPECIFICATIONS

### SM-140 RangeFinder & WaveFinder Ex IoT

Data	Range	Resolution	Accuracy
Distance (air gap)	2 – 95 m	1 mm	<5 mm
Wave height	< 93 m	1 cm	<1 cm
Wave period	0.5 – 128 s	0.1 s	0.1
Internal sampling rate:	50 – 200Hz, depending on range		

#### Interfaces:

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

#### Displays / GUI:

Data, status and configuration:	Web GUI
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#### Output Interfaces:

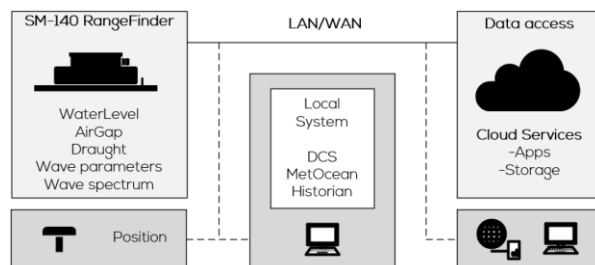
Sensor data and status:	MQTT, from 2019 Q4 NMEA, proprietary formats JSON over HTTP and Cloud
Data output rate:	Up to 50Hz via TCP/IP or serial

#### 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 1.6 mW)
Beam width:	5° (-3 dB one way)
Supply voltage:	12 – 36 VDC (Nominal 24 VDC)
Power consumption:	< 7 W
EMC:	RED 2014/53/EU (pending)



#### Environmental Specifications:

Temperature:	-30°C to +50°C
Humidity:	0 – 100 %RH
Ingress Protection:	IP 67 (IEC/EN 60529)
ATEX IEC Ex	Ex db eb ib T6 for Zone 1 use

#### Physical Specifications:

Dimensions	H x W x D: 210 x 500 x 440 [mm]
Weight:	15 kg
Material:	Al. EN AW 5052 / EN AW 6082
Finish / Colour:	Enameled / Grey RAL 7035 ExD Housing, Cast Aluminium Finish

#### Accessories and Options:

MP-327	Mounting Bracket
101720	ExE Junction Box
	Cloud services

*Specifications are subject to change without prior notice.*