Remote measurement of directional waves, wave spectra and surface current.

The SM-050 Wave and Current Radar is a unique high-performance remote sensor for measurement of directional wave spectra and surface current. It is the only sensor which utilizes dual-footprint pulse Doppler method for wave measurements, and microwave dual frequency method for measuring surface currents.

The sensor provides excellent quality wave-spectrum and -parameter data. The accuracy of which has been verified in a number of independent comparisons.

The SM-050 enables data to be easily and securely accessible both locally and remotely by utilizing modern IoT technologies.

The sensor has proved its ruggedness and reliability through years of service in extreme weather conditions, including heavy precipitation, all over the world.

**Key Features:**
- Embedded data processing and WEB-server
- Easy data access, locally and remotely
- No parts submerged in water
- High reliability
- Low maintenance cost
- For fixed and floating installation.

**Essential For:**
- Real-time sea state and surface current monitoring
- Marine operations
- Offloading operations
- Crane operations
- Structure integrity verification
- Collection of in-situ data, on- and offshore
- Strengthening of forecasts
The SM-050 at Gosan, South Korea.

The radar observes the ocean surface in a semi-circle at a distance of 180 – 450 m depending on the installation height, typically 25 – 80 m.

The radar frequency gives a strong echo from the capillary waves normally present at wind-speeds > 2 m/s. It is not affected by heavy precipitation.

The water particle velocity is measured by use of Pulse-Doppler technique and provides accurate measurements even in harsh weather situations.

The SM-050 is a modern IoT-enabled device that can be easily and securely integrated both with local and remote systems. It 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-050/04 Wave and Surface Current Radar

<table>
<thead>
<tr>
<th>Wave data: Directional Spectra</th>
<th>Bins</th>
<th>Range</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directions</td>
<td>36</td>
<td>–</td>
<td>10°</td>
</tr>
<tr>
<td>Frequencies</td>
<td>37</td>
<td>0.03 - 0.3 Hz</td>
<td>0.0078 Hz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>0 – 4 m</td>
<td>0.1 m</td>
<td>±0.2 m</td>
</tr>
<tr>
<td>Period</td>
<td>4 – 30 m</td>
<td>0.1 m</td>
<td>±5%</td>
</tr>
<tr>
<td>Direction</td>
<td>3 – 30 s</td>
<td>0.1 s</td>
<td>±5%</td>
</tr>
<tr>
<td></td>
<td>1 – 360°</td>
<td>1°</td>
<td>±7°</td>
</tr>
</tbody>
</table>

Update Interval: 2.5min. Averaging time: 45 min default

### Surface Current data:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Range</th>
<th>Resolution</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>0 – 25 m/s</td>
<td>0.01 m/s</td>
<td>±0.05 m/s</td>
</tr>
<tr>
<td>Direction</td>
<td>1 – 360°</td>
<td>1°</td>
<td>±7°</td>
</tr>
</tbody>
</table>

Update Interval: 15 min. Averaging time: 90 min. default

### Interfaces:

- **Standard Interface:** TCP/IP over CAT5e STP
- **Displays / GUI:** Web-based system UI

### Output Interfaces:

- **Sensor data:** NMEA, proprietary formats
- **Status:** JSON over HTTP and Cloud

### Input Interfaces:

- **Heading:** NMEA - HDT
- **Position:** NMEA - GGA/GLL
- **Date/Time:** NTP

### Electrical Data:

- **Frequency of operation:** 5.8 GHz pulse
- **Bandwidth:** 20 MHz
- **Transmitted Power:** 275 mWaverage (10 W peak)
- **Supply voltage:** 110VAC or 230 VAC ±10%
- **Frequency of operation:** 50-60 Hz
- **Power consumption:** SM-050/04/5F - 85 W
- **EMC:** RED 2014/53/EU

### Environmental Specifications:

- **Temperature:** -15°C (-25°C) to +40°C (40°C²)
- **Humidity:** 0 – 100 %RH
- **Ingress Protection:** IP 66

### Physical Specification:

- **Dimensions, H x W x D:** 860 x 897 x 696 [mm]
- **Weight:** 47kg (95 lbs)
- **Material:** Aluminium EN AW 5052-H32
- **Finish / Colour:** Enamelled / Grey RAL 7035

### Versions:

- **SM-050/04/5F**
- **SM-050/04/SM**
- **SM-050/04/TF**
- **SM-050/04/TM**

### Accessories and options:

- **Cloud services:** See the Miros Cloud data sheet
- **MP-309/03:** Pedestal
- **MP-294/03:** Shock absorber
- **SM-050/04/xxA:** Alternative frequency
- **Tbd:** Built-in Ethernet SHDSL Extender, for extended cable distance to several km.

### Notes:

1. On request, contact Miros for details.
2. Tropical version with sunshield and cooling fan (versions SM-050/04/xxT).
3. The radar is designed for stationary use. Reasonable measurements may be obtained during transit at speeds up to 64 knots.
4. WEB UI with real-time and historical wave and current data, operational alarms, status sensor and status configuration.

Specifications are subject to change without prior notice.