

INTEGRATED SEA MONITORING RADAR SYSTEM FOR OIL SPILL DETECTION AND WAVE MEASUREMENT



Based on high performance X-band radar system, the Sea monitoring system provides detection of oil spills and extraction of wave parameters, combined in one system. The elaboration relies on reflection of radar electromagnetic waves by wind generated capillary sea surface waves.

In case of oil spill, the absence of radar reflections is investigated to detect potential oil spills, whereas exactly the inverse happens in case of wave measurement because wave reflections are needed for the proper estimation.

OIL-SPILL DETECTION



Oil spill elaboration process is subdivided in the following phases:

1. identification and tracking of possible Oil-Spill for operator defined search areas combined with operator supervised oil-spill analysis and indications
2. characterization of oil spill position and extension
3. estimation of Oil Spill predicted movement as function of wind and current data

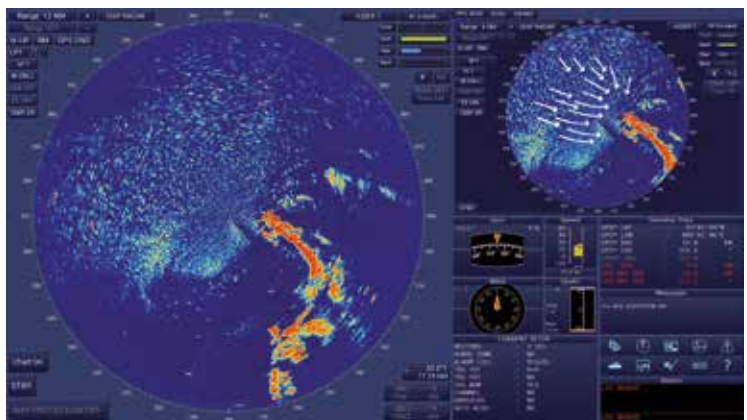
WAVE MEASUREMENT

Wave measurement process works as follows:

1. selection of observation area
2. conversion of received signal to RCS
3. RCS used as a tool for measuring significant wave height
4. transformation from spatial measurement to wave speed / wave frequency by 2D / 3DFFT analysis

Estimated wave parameters:

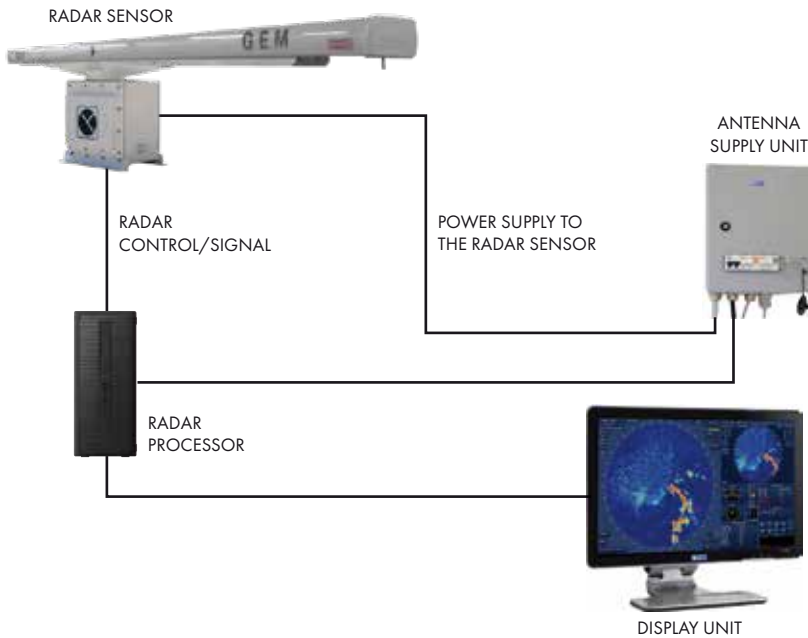
- significant wave height
- wave direction
- wave frequency
- wave speed
- sea state estimation



During system setting up, it is recommended to calibrate the system with corner reflectors and wave buoys.

SYSTEM COMPOSITION

- Antenna
- Rotation Unit with Embedded Transceiver
- Power Supply
- Processing Unit
- Man-Machine Interface



SPECIFICATIONS

- Frequency band: 9410 +/- 30 MHz
- Antenna length: 12'
- Antenna polarization: vertical
- Antenna beamwidth: 0.65°
- Transceiver peak power: 25 kW
- Pulse lengths: from 80 ns to 1.2 usec
- PRF: up to 3000 kHz
- Rotation rate: up to 40 r.p.m.
- Display: 24" - 16:9 widescreen
- Power supply: 115/220 VAC

ENVIRONMENTAL AND SUPPLY

Temperature (IEC 60945)	- 15°C to 55°C (display) - 25°C to 55°C (External Unit)
Enclosure	Waterproofing IPX5
Power Voltage	220 VAC 50/60 Hz Single Phase
Power consumption	< 700 W

