GE Power & Water
Water & Process Technologies

Fact Sheet

Leakwise

ID-227WL/GSM Oil Sheen Monitoring System

GSM Wireless System for Marine Applications

Applications

The Leakwise* ID-227WL/GSM Oil Sheen Monitoring System is a floating wireless sensor that detects the presence and monitors the buildup of hydrocarbons on water. The ID-227WL/GSM is designed for installation offshore where GSM reception is available. Applications include detecting and monitoring floating hydrocarbons near the intake of desalination plants, jetty and monobuoy oil loading terminals, and oil rigs and platforms; as well as in ports, lakes, rivers, open channels, and large retention ponds.

ID-227WL/GSM System Description

This system has a wireless oil detection unit mounted on a wave rider buoy and a wireless data receiver unit.

The oil detection unit includes:

- A wave rider buoy
- An oil detection sensor
- A digital low power controller
- A GSM cellular modem with antenna
- A solar panel with battery and battery charger
- A sensor AutoCleaner unit

The receiver includes:

- A GSM cellular modem with antenna
- A digital controller with display and keypad
- Various output options
- A power supply

The wave rider buoy is designed to maintain the sensor's detecting antenna at the liquid/air interface, despite fluctuations in the liquid level due to waves and tide. The sensor can detect the presence of 0.3 mm (0.01 in) oil on water and monitor the layer growth up to 20 mm (0.79 in) reliably, repeatedly, and without false alarms. Continuous built-in diagnostics monitor system operation.

Principle of Operation

The Leakwise ID-227WL/GSM sensor uses an industry-leading technology of Electromagnetic Energy Absorption. A high-frequency signal is transmitted through the liquid/air interface to the antenna immersed in the monitored fluids. Higher energy absorption of the fluid causes more loading on the antenna. Since water absorbs more energy than hydrocarbons and air, the loading in water is higher. If the antenna is surrounded by an oil layer or an oil/water mixture, the loading is reduced in proportion to the reduction in water content. This unique, patented technique enables the detection of small layers of oil. Furthermore, it enables continuous monitoring of an oil buildup and the measurement of its thickness.

ID-227WL/GSM Technical Specifications[1]

Sensor Specifications

Operating Range

Detection Range	0.3–20 mm (0.01–0.79 in) of hydrocarbon on water or brine
Working Wave Height	Maximum 2 meters (6.6 ft)
Tide Range	Unlimited, depending on mooring
Current	Up to 4 knots (6.8 ft/sec)
Survival Conditions	Extreme sea conditions. depending on appropriate mooring
Minimum Liquid Depth	30 cm (~12.0 in)
Mooring	Supplied by customer. Should enable free flotation of the Wave Rider in all water conditions.
Water Temperature	0 °C to 50 °C (32 °F to 122 °F); no freezing
Air Temperature	-10 °C to 60 °C (14 °F to 140 °F)

Sensor Specifications (continued)

Materials & Dimensions

Sensor and Wave Rider	Hydrocarbon resistant polymers, 316 stainless steel
Wave Rider Buoy	Diameter: 1,100 mm (3.7 ft), height 700 mm (2.3 ft), weight: 35 kg (77 lb)

Electrical

Built-In Power Supply	12 V @ 18 W solar panel, a 12 V @ 7AH sealed lead-acid battery, and a battery charger
Power Autonomy	Continuous operation on sunny days (minimum three hours of sun per day); autonomous operation for five sunless days

Wave Rider Mounted Controller Specifications

Description	An analog signal processor receives the signal from the sensor and then feeds its filtered output to a digital controller. The digital controller determines if the signal changed significantly enough to initiate a wireless transmission. Sensor signal is compared to programmable calibration thresholds, and status indication is generated for the SMS messages sent to the user. The digital controller also controls the low power consumption of the wave rider by using an efficient programmable sleep mode: The sensor is activated every 1–4 minutes (user selectable), otherwise the system is in sleep mode. .
Programmability	Operational parameters and calibration data can be remotely programmed from a cell phone or from a PC with GE GSM-Shell program and a GSM modem. Direct PC connection is possible.
GSM Cellular Modem	Quad band GSM frequencies with omni-directional antenna. Sends and receives SMS messages to/from multiple cell phones and computers equipped with a GSM modem. A SIM card is required (supplied by customer).
Sensor AutoCleaner	An automatic electro-mechanical unit controlled by the digital controller that operates for a short period, once per hour. It keeps sensor antennas free from biofilm growth, reduces maintenance, and maintains good detection sensitivity.

GSM Receiver

GSM Cellular Modem	Quad band GSM frequencies with omni-directional antenna. Receives SMS messages from multiple wave riders. The information normally received includes a time stamp, sensor name, status, sensor signal value, estimated oil layer and battery voltage. A SIM card is required (supplied by customer).
Digital Processor	Connected to the GSM cellular modem and processes the incoming messages. Status indication is generated and displayed on lights and the LCD on the front panel.
Relay Outputs Option	Five dry contact relays with 230VAC / 24VDC @ 1A status relays for each sensor.
4-20mA Output	One 4-20mA output for each sensor to reflect status and oil layer.
Programmability	The receiver can be configured and programmed by connecting to a PC with GE GSM-Shell program. The GSM-Shell can be used to display and inquire the status of a remote wave rider, configure its' parameters, and set the calibration points.

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Sensor and System Certifications

ID-227WL Sensor	Intrinsically safe —ATEX and IECEx Ex ia IIC T4 Ga (Ta = -40 °C to +70 °C)
Performance	EPA — Technology conforms to EPA/530/UST-90-009 for groundwater monitoring systems TÜV — Type approval in accordance with WHG (Water Resources Law) § 19 h; EPA tested
Manufacturing	ISO 9001 Certified

* Trademark of General Electric Company; may be registered in one or more countries.
[1] Contact GE for applications that deviate from these specifications. Note that specifications may be subject to change without prior notice.

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