DATASHEET

SM-RL1
SM-RL1-T
SM-RL2
SM-RL2-T

SM-RL1
SM-RL1-T

SM-RL2
SM-RL2-T

2 Discrete Inputs Provided

Highlights

- Monitor product, interface & temperature using a single Resistive Level Sensor
- Up to a 10-year battery life[1]
- ± 1/8" accuracy on 1/4" sensor* (T option) *API 18.2-compliant
- ± 1/4" accuracy on 1/2" sensor
- Flex (PTFE) or rigid (316 SS) sensor option
- Multiple liquid compatibility
- Sensor requires a one-time only calibration
- Installs in minutes: Quick Connect eliminates sensor wiring error and hassle
- Highly resistant to H2S damage, scaling, and paraffin buildup (Limited lifetime warranty, please contact your OleumTech representative for details)
- Supports Over-the-Air (OTA) functionality for updating the device configuration/calibration[2]
- Self-contained, rugged design, IP66
- Sensor supports a wide temperature range -40 ˚C to 120 ˚C / -40 ˚F to 248 ˚F
- 900 MHz
- Secure AES encryption
- Class I, Division 1 (Zone 0), Intrinsically Safe

C US

US Patent #6,967,589 & #8,763,455 B1

The Most Reliable Wireless Tank Level Monitoring System

Ultimate Level Sensing Solution

OleumTech® designed the OTC Wireless Resistive Level Transmitter to connect and power its flagship line of Resistive Tanks Level Sensors for enabling remote collection of critical tank level data. The self-contained, battery-powered transmitter and sensor combination delivers exceptional performance, reliability, and accuracy, and is made to thrive under extreme outdoor conditions.

All OleumTech Resistive Level Sensors offer industry-leading 3-in-1 monitoring capabilities of product (oil), interface (water), and temperature from a single instrument. Ordering the SM-RL2 and SM-RL2-T transmitter option provides two additional discrete inputs, giving you a total of 5-in-1 monitoring capabilities.

The SM-RL1-T and SM-RL2-T options are compatible with the 1/4" resolution sensors providing API 18.2 compliance for handling custody transfer applications while the SM-RL1 and SM-RL2 work with 1/2" resolution sensors. A single, replaceable battery pack powers both the transmitter and sensor and can last up to 10 years.[1]

Reliable, Scalable, and Safe

The field-proven wireless level transmitter communicates with an assigned wireless gateway within the OTC Wireless Sensor and I/O Network, creating a highly scalable network, accommodating virtually any I/O requirement.

OleumTech wireless level transmitters are certified for use in Class I, Division 1 (Zone 0) hazardous locations. They are intrinsically safe, designed not to cause a spark and can be serviced without being removed from a process.

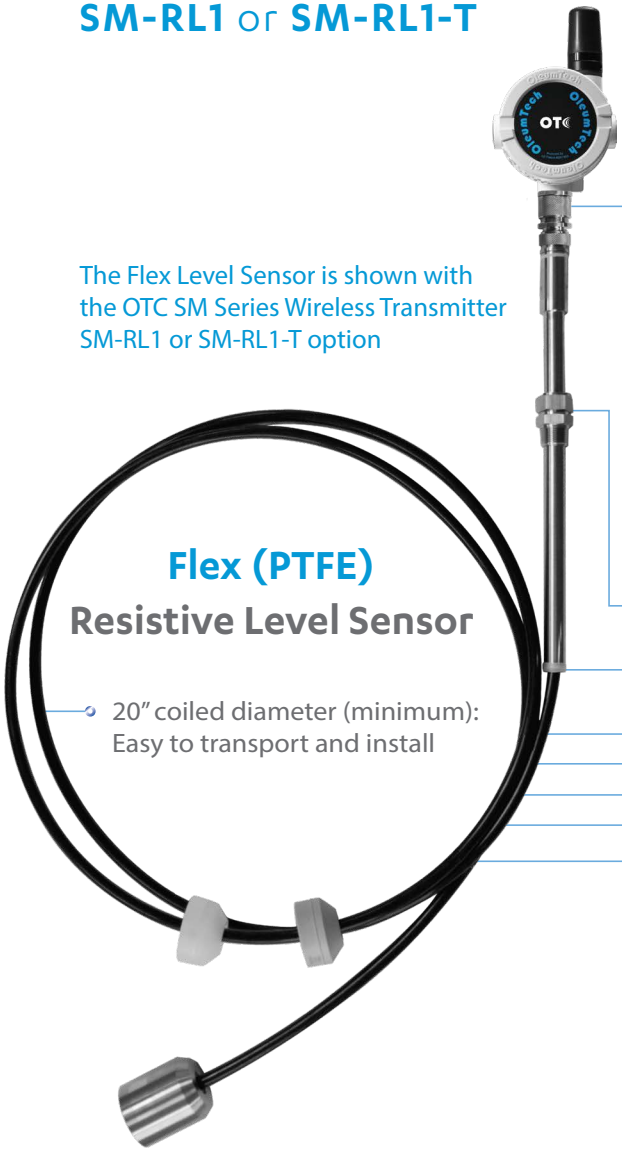
Wireless: 900 MHz, 915 MHz, 2.4 GHz, 868 MHz
Battery-powered, life up to 10 years

OleumTech Level Sensors are Ideal for:

Production Tanks | Water Tanks | SWD Locations | Separators
Condensate Tanks | Midstream Collection and Blend Tanks
Refinery Holding Tanks | Chemical Tanks | and Many Others

SM-RL1 or SM-RL1-T

The Flex Level Sensor is shown with the OTC SM Series Wireless Transmitter SM-RL1 or SM-RL1-T option



Flex (PTFE)
Resistive Level Sensor

- 20" coiled diameter (minimum): Easy to transport and install

SM-RL2 or SM-RL2-T

The Rigid Level Sensor is shown with the OTC SM Series Wireless Transmitter SM-RL2 or SM-RL2-T option

Rigid (316 SS)
Resistive Level Sensor

- 2 discrete inputs available for SM-RL2 and SM-RL2-T
- Quick Connect allows for faster installs and gives ability to program on or off the tanks
- Height-adjustable compression fitting
- Sensor only requires a one-time calibration
- Monitor product, interface, and temperature using a single sensor
- Supports a wide temperature range -40 ˚C to 120 ˚C / -40 ˚F to 248 ˚F
- Multiple fluid compatibility
- Highly resistant to H2S damage, scaling, and paraffin buildup (Limited lifetime warranty, please contact your OleumTech representative for details)
- 1/4" resolution with ±1/8" accuracy*
  *API 18.2-compliant
  1/2" resolution with ±1/4" accuracy

OTC Transmitters | OTC Gateway | Network Infrastructure | Cloud (Analytics)

Technical Specifications (Transmitter)

HARDWARE FEATURES	
Device Functionality	· OTC Wireless Transmitter with Support for Resistive Level Sensors
Model Configuration	· SM-RL1: 1/2" Resolution, Product, Interface and Temperature (6-pin Quick Connect) · SM-RL2: 1/2" Resolution, 2 DI + Product, Interface and Temperature (6-pin Quick Connect) · SM-RL1-T: 1/4" Resolution, Product, Interface and Temperature (8-pin Quick Connect) · SM-RL2-T: 1/4" Resolution, 2 DI + Product, Interface and Temperature (8-pin Quick Connect)
Embedded Controller	· Ultra-Low Power RISC Microcontroller with Internal FLASH (Field Upgradeable)
Configuration	· Standard RS232 Serial / BreeZ® Software for PC (v5.5 or higher for 1/4" Resolution Models)
Resolution	· Resolution Depends on Sensor Type: 1/4" (6.4 mm) or 1/2" (12.7 mm)
Accuracy	· 1/4" Resolution Sensor: ±1/8" (2/16") Accuracy; 1/2" Resolution Sensor: ±1/4" Accuracy · 6.4 mm Resolution Sensor: ±3.2 mm Accuracy; 12.7 mm Resolution Sensor: ±6.4 mm Accuracy
2 Discrete Inputs	· Dry Contact, NPN (Sink), Debounce Filter 20 - 2000 ms, 16-bit Counter (Available on SM-RL2/SM-RL2-T)
Minimum Sensor Read Interval	· 5 Seconds
Power Source	· Self-Contained, Internal 3.6 Vdc Lithium Battery
Internal Battery Life	· Up to 10 Years, Based on User Defined Reporting Intervals [1]
Device Diagnostics	· Health Tags: Battery Voltage, Received Signal Strength Indication (RSSI), RF Refresh, RF Timeout
WIRELESS COMMUNICATIONS	
Radio Band	· ISM Band (License-Free)
900 MHz	· FHSS, FSK, AES Encryption 256-bit (900 MHz)
Bit Rate	· 9600 bps
Output Power (Max)	· 10 mW
Receiving Sensitivity	· -110 dBm @ 9600 bps, -100 dBm @ 115.2 kbps
RF Range	· Up to 7500 Feet / 1.4 Miles / 2.3 km with Clear Line of Sight [2]
CERTIFICATIONS & COMPLIANCE	
EMC/EMI	· FCC Part 15 (USA), IC ICES-003 (Canada)
Safety	· Class I, Division 1, Groups A, B, C, D T3C; Ex ia IIC T3 · Class I, Zone 0; AEx ia IIC T3 · IECEx: SIR 13.0054X; Ex ia IIC T3 Ga
MECHANICAL SPECIFICATIONS	
Dimensions, RL1	· SM-RL1/SM-RL1-T: 5" (W) x 7.9" (H) x 4.4" (D) / 127 mm (W) x 201 mm (H) x 112 mm (D)
Dimensions, RL2	· SM-RL2/SM-RL2-T: 5" (W) x 12.9" (H) x 4.4" (D) / 127 mm (W) x 328 mm (H) x 112 mm (D)
Package Dimensions	· 10.25" (W) x 14" (H) x 6.5" (D) / 260mm (W) x 356mm (H) x 165mm (D)
Package Weight	· SM-RL1/SM-RL1-T: ~5.5 lbs / 2.5 kg, SM-RL2/SM-RL2-T: 7 lbs / 3.2 kg
Connection Fitting	· Quick Connect Adapter to Sensor - No Wiring Required, RL2: 2 3/4" NPT Female Ports (Both Plugged)
Enclosure Casing Material	· Type 4X Aluminum; IP66
GENERAL SPECIFICATIONS	
Operating Conditions	· Sensor: Ambient Temperature (Class I, Division 1): -40 °C to 120 °C (-40 °F to 248 °F) · Transmitter: Ambient Temperature (Class I, Division 1 / Zone 0): -40 °C to 70 °C (-40 °F to 158 °F) · Transmitter: Ambient Temperature (Non-Hazardous Applications): -40 °C to 80 °C (-40 °F to 176 °F) · Humidity: 0 to 99 %, Non-Condensing
Warranty	· 2-Year Parts and Labor
Country of Origin	· USA
ORDERING INFORMATION	
Model Numbers	· 1/2": SM5000-RL1 / 1/4": SM5000-RL1-T / 1/2" w/DI: SM5000-RL2 / 1/4" w/ DI: SM5000-RL2-T
Wirelessly Connects To	· OTC Wireless Gateway
Configuration Cable	· SX1000-CC2, 20-ft All-in-One Configuration Cable
Replacement Battery	· Use OleumTech SX1000-BP3 Only
SENSOR COMPATIBILITY	
1/2" Sensor Kits w/Float(s)	· 1/2" TGxxxFxx (Flex) and ZGxxxFxx (Rigid) Works with SM-RL1 and SM-RL2
1/4" Sensor Kits w/Float(s)	· 1/4" THxxxFxx (Flex) and ZHxxxFxx (Rigid) Works with SM-RL1-T and SM-RL2-T

[1] Ambient temperature and one transmission per 1 min interval without any retries were used to calculate battery life. Actual battery life may vary depending on environmental factors, application, and usage. Use data shown above only as general point of reference. See OleumTech Battery Life Expectancy Chart for predicted battery life based on reporting interval.

[2] OTA functionality does not support changing the radio settings or upgrading the device firmware.

[3] The maximum RF range data was collected under optimal test conditions, including a clear line of sight between antennas. Actual wireless RF range may vary depending on location, RF interference, weather, antenna type, cable type, and line of sight.

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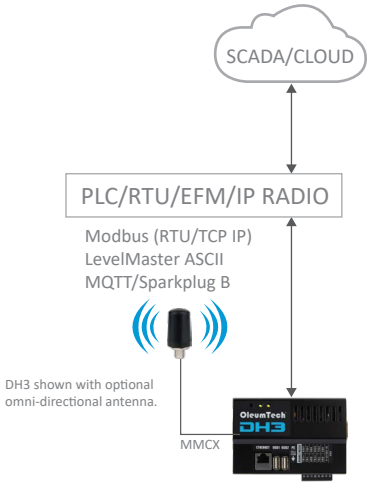
Networking Diagram



OTC GATEWAY

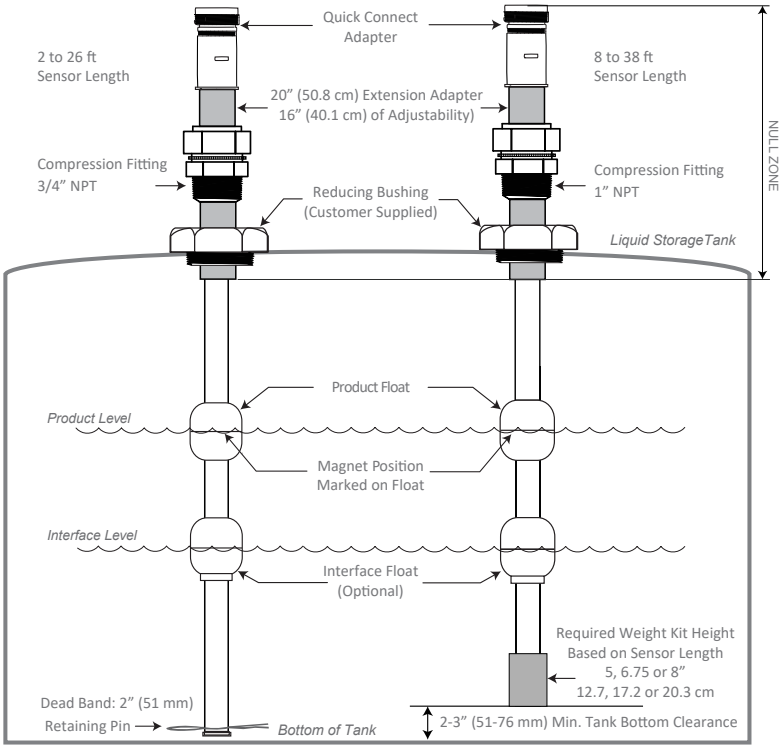
OTC TRANSMITTERS

Point-to-Multipoint
"Star Topology"

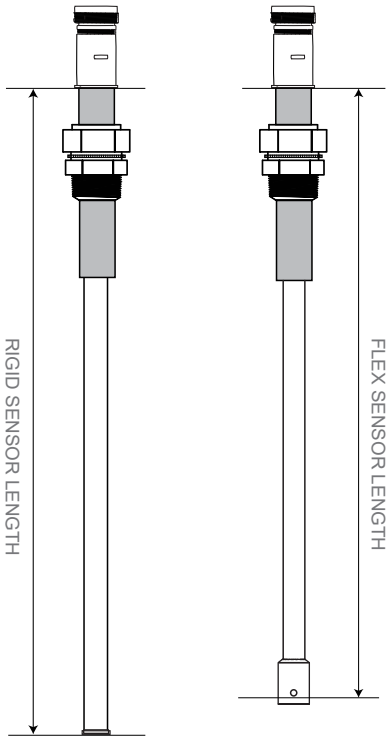
MADE IN USA

RIGID - 316SS

FLEX - PTFE



ORDERING LENGTH



Technical Specifications (Level Sensors)

SENSOR	RIGID: 316 Stainless Steel "SS"	FLEX: Polytetrfluoroethylene "PTFE"
Type	Extremely Reliable and Accurate Resistive Reed Switch Technology	
Measurement Capabilities (3-in-1)	Product, Interface, and Temperature	
Lengths Offered in US Units	2 to 26 ft Length in 1 ft Increments	8 to 38 ft Length in 1 ft Increments
Lengths Offered in Metric	0.61 to 7.9 m in 0.31 m increments	2.44 to 11.58 m in 0.31 m increments
Resolution and Accuracy	Option 1: 1/2" (12.7 mm) Resolution with ±1/4" (±6.4 mm) Accuracy (6-pin Quick Connect) Option 2: 1/4" (6.4 mm) Resolution with ±1/8" (±3.2 mm) Accuracy (8-pin Quick Connect)	
Sensor to Interface Mating Connection (No Wiring Solution)	316 SS Quick Connect: 6-pin Connection for 1/2" Resolution, 8-pin Connection for 1/4" Resolution	
Tank Mating Connection (Adjustable Compression Fitting)	3/4" NPT Male	1" NPT Male
Temperature Accuracy	±1 °C	
Anchor Weight Diameter	N/A	2.4" / 60.3 mm
Height of Anchor Weight	N/A	8 to 19 ft Sensor: 5" 20 - 28 ft Sensor: 6.75" / 29 - 38 ft Sensor: 8"
Coiled Diameter	N/A	20" (50.8 cm) Coiled Diameter
Minimum Measurement from Bottom (Deadband)	2" (50.8 mm) from Bottom	From Top of Anchor Weight
Pressure Rating	Float Dependent	Float Dependent
Sensor Only without Float(s)	569 PSI (39 Bar)	142 PSI (9.8 Bar)
Sensor w/ 316 SS Float - Small*	440 PSI (30 Bar)	N/A
Sensor w/ Polyvinylidene Fluoride (PVDF) Float	72.5 PSI (5 Bar)	72.5 PSI (5 Bar)
Float Options:		
*316 Stainless Steel - Small, (Fx0)	*Compatible Only with Rigid Sensor Length up to 7 ft, Product: 0.64 SG, Interface: 0.96 SG, ID 0.72" (18.3 mm), OD 2.05" (52.1 mm), H 2.71" (68.83 mm)	
Polyvinylidene Fluoride (PVDF), (Fx3)	Product: 0.64 SG, Interface: 0.96 SG, ID 1.18" (30 +0.3/-0 mm), OD 2.83" (72 +/-0.25 mm), H 1.77" (45 +/-1 mm)	
Operating Temp. Sensing Area	-40 °C to 120 °C (-40 °F to 248 °F)	
Certifications	Class I Division 1, Class I, Group A, B, C, D, Zone 0, Ex ia IIC T4, AEx ia IIC T4 Ga ATEX: Sira 16ATEX2229X; Ex ia IIC T4 Ga IECEx: SIR 16.0079X; Ex ia IICT4 Ga	
Device Compatibility	OleumTech WT, SM, and H Series Resistive Level Transmitters	
Power	The Sensor is Powered by the Transmitter	
Kit Ordering #: 1/2" Resolution with Float(s)	ZGxxxFxx	TGxxxFxx
Kit Ordering #: 1/4" Resolution with Float(s)	ZHxxxFxx	THxxxFxx