DATASHEET

LL3 | LL3-D

LL3 | LL3-T

LL3-D | LL3-DT

Highlights

- Monitor product, interface & temperature using a single Resistive Level Sensor
- Advanced local LCD display interface
- Up to a 10-year battery life[1]
- 1/2" or 1/4" resolution option
- ± 1/8" accuracy on 1/4" sensor (T Version)
- ± 1/4" accuracy on 1/2" sensor
- Flex (PTFE) or rigid (316 SS) sensor option
- "Set it and forget it" one-time calibration
- Installs in minutes: Quick Connect eliminates sensor wiring error and hassle
- Self-contained, rugged design
- IP66, -40 ˚C to 70 ˚C (Transmitter)
- 900 MHz / 2.4 GHz / 868 MHz
- Secure AES encryption
- Class I, Division 1 (Zone 0), Intrinsically Safe

US Patent #6967589 & #8,763,455 B1

The Most Reliable Wireless Tank Level Monitoring System

Ultimate Level Sensing Solution

The OleumTech® WT Series Resistive Transmitter and Level Sensor combination is the superlative wireless tank level monitoring solution. The Resistive Transmitter provides the ability to monitor product, interface, and temperature levels using a single, high precision Resistive Tank Level Sensor.

OleumTech's patented Resistive Sensors are offered in both flexible (PTFE) and rigid (316 SS) materials in various custom lengths.

The 1/4" resolution sensors mate with the LL3-T and LL3-DT Transmitter versions. The 1/2" resolution sensors mate with the LL3 and LL3-D versions.

Get even more functionality out of your Level Transmitter by selecting the discrete inputs version. It is ideal for use with the OleumTech high level switches for spill prevention, and thief hatch switches to meet EPA methane regulatory requirements.

The ultra-low-powered transmitter is powered by a replaceable battery pack that provides up to a 10-year life.[1]

Reliable, Scalable, and Safe

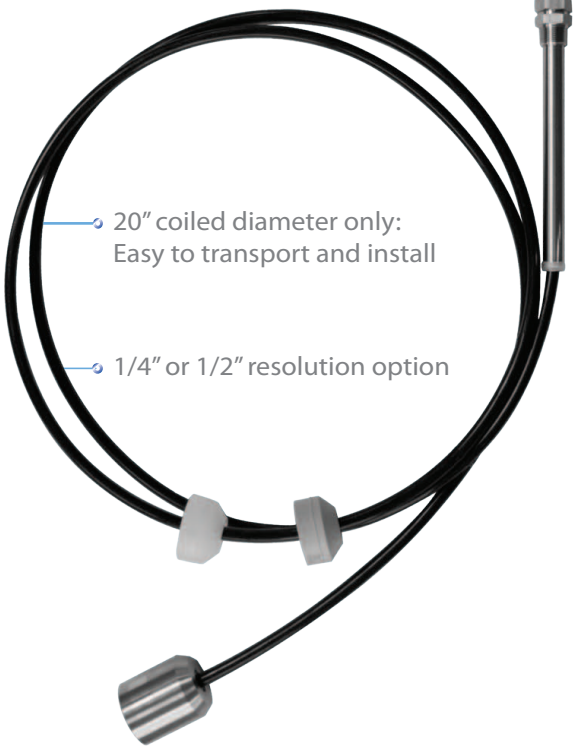
The field-proven wireless level transmitter communicates with an assigned wireless gateway within the OTC Wireless Sensor and I/O Network, creating a highly scalable network, accommodating virtually any I/O requirement.

OleumTech Wireless Level Transmitters are certified for use in Class I, Division 1 (Zone 0) hazardous locations. It is intrinsically safe, designed not to cause a spark and can be serviced without being removed from a process.

LL3 or LL3-T

- Instant read push button
- Configure device, calibrate sensor and connect to the network without using a PC or another device
- Quick Connect eliminates wiring error and gets workers safely off the process faster

Flex (PTFE) Resistive Sensor



- 20" coiled diameter only: Easy to transport and install
- 1/4" or 1/2" resolution option

LL3-D or LL3-DT w/ a Discrete Input

- 1x discrete input for integrating a level switch or a thief hatch monitoring switch
- Height-adjustable compression fitting
- Dual-level monitoring capabilities + temperature

Rigid (316 SS) Resistive Sensor

- Limited lifetime warranty against damage from H2S and paraffin buildup
- Sensor supports wide temperature range -40 ˚C to 120 ˚C / -40 ˚F to 248 ˚F
- 1/4" or 1/2" resolution option

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

Technical Specifications

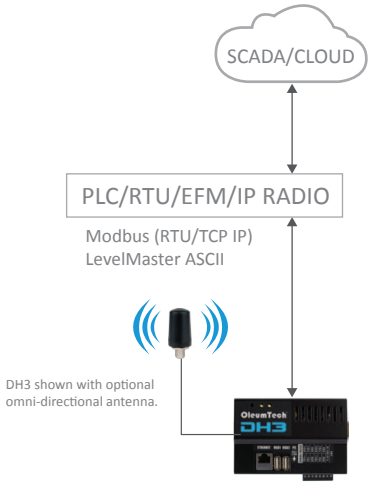
HARDWARE FEATURES	
Device Functionality	· OTC Wireless Transmitter that Supports Resistive Level Sensors
Model Configuration	· LL3: 1/2" Resolution; 3-in-1 Monitoring: Product, Interface and Temperature (6-pin Quick Connect) · LL3-D: 1/2" Resolution, 4-in-1: Discrete Input + Product, Interface and Temperature (6-pin Quick Connect) · LL3-T: 1/4" Resolution; 3-in-1 Monitoring: Product, Interface and Temperature (8-pin Quick Connect) · LL3-DT: 1/4" Resolution, 4-in-1: Discrete Input + 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-inch (6.4 mm) or 1/2-inch (12.7 mm)
Accuracy	· 1/4" Resolution Sensor: ±1/8" 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
Power Source	· Self-Contained, Internal 3.6 Vdc Lithium Battery
Internal Battery Life	· Up to 10 Years, Based on User Defined Reporting Intervals[1]
Local LCD Display	· 32-Character Display (16x2 Lines) with 4 Function Keys + Read Button
Instantly Readable Data	· Product / Interface / Temperature / Battery Voltage / RF Status
Local Configuration	· Integral LCD with Four Push Button Interface
Device Diagnostics	· Health Tags: Battery Voltage, Received Signal Strength Indication (RSSI), RF Refresh, RF Timeout, Error Codes
WIRELESS COMMUNICATIONS	
Type: 900 MHz / 915 MHz 2.4 GHz / 868 MHz	· ISM Band, Spread Spectrum · 900 MHz: FHSS (Frequency Hopping), FSK, AES Encryption 256-bit (900 MHz), 128-bit (915 MHz) · 2.4 GHz: DSSS (Direct-Sequence), AES Encryption 128-bit · 868 MHz: LBT (Listen Before Talk), AFA (Adaptive Frequency Agility), AES Encryption 128-bit
Bit Rate	· 900 MHz: 9600 bps / 115.2 kbps; 2.4 GHz: 250 kbps; 868 MHz: 80 kpbs
Output Power (Max)	· 900 MHz: 10 mW; 2.4 GHz: 63 mW; 868 MHz: 25mW
Receiving Sensitivity	· 900 MHz: -110 dBm @ 9600 bps, -100 dBm @ 115.2 kbps · 2.4 GHz: -100 dBm @ 250 kbps; 868 MHz: -101 dBm @ 80 kbps
RF Range	· 900 MHz: Up to 7500 Feet (2.3 km) with Clear Line of Sight[2] · 2.4 GHz: Up to 5.7 Miles / 9.2 km with Clear Line of Sight[2] · 868 MHz: Up to 5.2 Miles / 8.4 km with Clear Line of Sight[2]
CERTIFICATIONS & COMPLIANCE	
EMC/EMI	· FCC Part 15 (USA), IC ICES-003 (Canada), ACMA (Australia)
Safety	· Class I, Division 1, Groups A, B, C, D T3C; Ex ia IIC T3 · Class I, Zone 0; AEx ia IIC T3 · ATEX: Sira 13ATEX2142X; Ex ia IIC T3 Ga; II 1 G · IECEx: SIR 13.0054X; Ex ia IIC T3 Ga
MECHANICAL SPECIFICATIONS	
Dimensions: LL3, LL3-T	· 5.5" (W) x 7.9" (H) x 4.4" (D) / 140 mm (W) x 201 mm (H) x 112 mm (D)
Dimensions: LL3-D, LL3-DT	· 5.5" (W) x 12.9" (H) x 4.4" (D) / 140 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	· LL3: ~5.5 lbs / 2.5 kg | LL3-D: 7 lbs / 3.2 kg
Connection Fitting	· Quick Connect Adapter to Sensor - No Wiring Required
Enclosure Casing Material	· Type 4X Aluminum; IP66
GENERAL SPECIFICATIONS	
Operating Conditions	· Ambient Temperature (Class I, Division 1 / Zone 0): -40 °F to 158 °F (-40 °C to 70 °C) LCD Screen -4 °F to 158 °F (-20 °C to 70 °C) · Ambient Temperature (Non-Hazardous Applications): -40 °F to 176 °F (-40 °C to 80 °C) LCD Screen -4 °F to 158 °F (-20 °C to 70 °C) · Humidity: 0 to 99 %, Non-Condensing
Warranty	· 2-Year Parts and Labor
Country of Origin	· USA
ORDERING INFORMATION	
Model Numbers	· 900 MHz: WT-0900-LL3, WT-0900-LL3-T, WT-0900-LL3-D, WT-0900-LL3-DT · 915 MHz: WT-0915-LL3, WT-0915-LL3-T, WT-0915-LL3-D, WT-0915-LL3-DT · 2.4 GHz: WT-2400-LL3, WT-2400-LL3-T, WT-2400-LL3-D, WT-2400-LL3-DT · 868 MHz: WT-0868-LL3, WT-0868-LL3-T, WT-0868-LL3-D, WT-0868-LL3-DT
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" TG-xxx-Fx-x (Flex) and ZG-xxx-Fx-x (Rigid) Works with LL3, LL3-D
1/4" Sensor Kits w/Float(s)	1/4" TH-xxx-Fx-x (Flex) and ZH-xxx-Fx-x (Rigid) Works with LL3-T, LL3-DT
Flex Sensor Part #	Flex 1/2": 60-4101-xxxx; Flex 1/4": 60-4102-xxxx
Rigid Sensor Part #	Rigid 1/2": 60-4001-xxxx; Rigid 1/4": 60-4002-xxxx

[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]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.

©2018 OleumTech Corporation. All rights reserved. OleumTech and BreeZ are registered trademarks of OleumTech Corporation in the United States. All other trademarks and trade names are the property of their respective holders. Specifications, design, and product descriptions subject to change without notice. This device contains proprietary intellectual property protected by US Patent #6967589 and #8,763,455 B1. Document ID: 67-4046-001_T

Networking Diagram



OTC GATEWAY

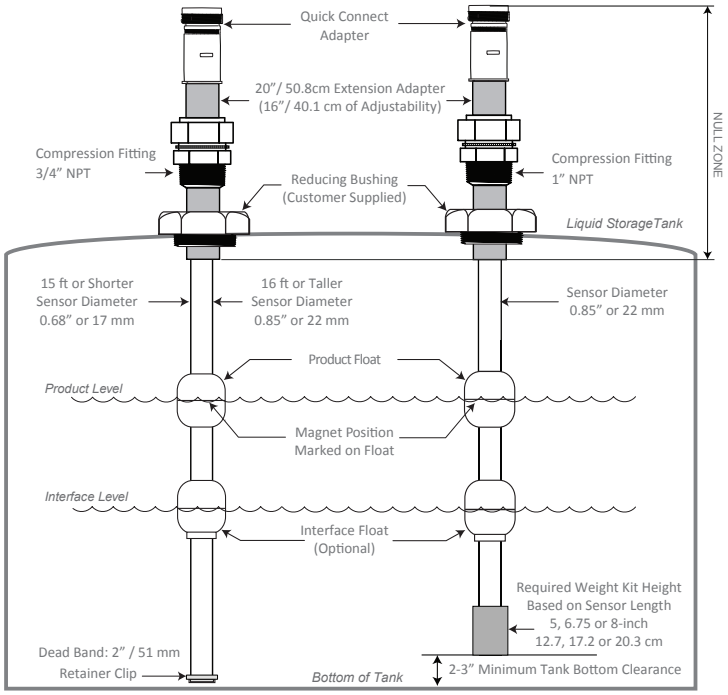
OTC TRANSMITTERS

Point-to-Multipoint
"Star Topology"

MADE IN USA

RIGID - 316SS

FLEX - PTFE



Highlights

- Extremely reliable, accurate & robust performance
- OleumTech's flagship level sensing solution
- Monitor product, interface & temperature levels from a single sensor
- Lifetime limited warranty against H2S damage and paraffin buildup
- 1/2" or 1/4" resolution option
- 1/2" resolution with ±1/4" accuracy
  "TG" & "ZG" resistive sensor kit numbers
- 1/4" resolution with ±1/8" or 2/16" accuracy
  "TH" & "ZH" resistive sensor kit numbers
- "Set it and forget it" one-time calibration
- Quick and easy to install
- Class I, Division 1 (Zone 0), Intrinsically Safe
- Supports wide temperature range -40 °C to 120 °C / -40 °F to 248 °F

US Patent 8,763,455 B1

SENSOR	RIGID: 316 Stainless Steel "SS"	FLEX: Polytetrafluoroethylene "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 21 ft Length in 1 ft Increments	8 to 38 ft Length in 1 ft Increments
Lengths Offered in Metric	0.61 to 6.4 m in 0.31 m increments	2.44 to 11.58 m in 0.31 m increments
Resolution and Accuracy	Option 1: 1/2-inch (12.7 mm) Resolution with ±1/4-inch (±6.4 mm) Accuracy (6-pin Quick Connect) Option 2: 1/4-inch (6.4 mm) Resolution with ±1/8-inch (±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	
Sensor Rod/Tubing Diameter	0.68" (17 mm): 15 ft Sensor or Shorter 0.85" (22 mm): 16 ft Sensor or Taller	0.85" (22 mm)
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 - Standard*	440 PSI / 30 Bar	N/A
Sensor w/ 316 SS Float - Large	363 PSI / 25 Bar	142 PSI / 9.8 Bar
Sensor w/ Polypropylene (PP) Float	72 PSI / 5 Bar	72 PSI / 5 Bar
Float Options:		
316 Stainless Steel - Standard, 440 PSI/30 Bar	*Compatible Only with Rigid Sensor Length up to 15 ft Prod: 0.64 SG, Intf: 0.96 SG, ID 0.72" (18.3 mm) OD 2.05" (52.1 mm), Inner Clearance: 0.1" (2.6 mm)	
316 Stainless Steel - Large, 363 PSI/25 Bar	Product: 0.62 SG, Interface: 0.95 SG, ID 1.1" (27.9 mm), OD 2.76" (70.1 mm), Inner Clearance: 0.5" (12.7 mm)	
Polypropylene (PP), 72 PSI/5 Bar	Product: 0.64 SG, Interface: 0.96 SG, ID 1.1" (27.9 mm), OD 2.91" (73.9 mm), Inner Clearance: 0.5" (12.7 mm)	
Operating Temp. Sensing Area	-40 °F to 248 °F (-40 °C to 120 °C)	
Certifications	Class I, Division 1, Groups C, D T4; Ex ia IIB T4 Ga; Class I, Zone 0, AEx ia IIB T4 Ga, -40 °C ≤ Tamb ≤ 70 °C ATEX: Sira 16ATEX2229X; Ex ia IIB T4 Ga, -40 °C ≤ Tamb ≤ 70 °C IECEx: SIR 16.0079X; Ex ia IIB T4 Ga, -40 °C ≤ Tamb ≤ 70 °C	
Power (Wireless)	SX1000-BP3, 3.6 V Lithium Replaceable Battery Pack, 10-Year Life @ 1 min Read Interval	
Wireless Compatibility	OTC - WT / SM Series Resistive Transmitters and Sigfox-enabled Resistive Transmitters	
Minimum Sensor Read Interval	Down to 5 Seconds	
Model #: 1/2" Resolution with ±1/4-inch Accuracy	60-4001-xxx	60-4101-xxx
Model #:1/4" Resolution with ±1/8-inch Accuracy	60-4101-xxx	60-4102-xxx
Kit #: 1/2" Resolution with Float(s)	ZG-xxx-Fxx	TG-xxx-Fxx
Kit #: 1/4" Resolution with Float(s)	ZH-xxx-Fxx	TH-xxx-Fxx