

DATASHEET  
**SFX-LR5x**



### ► Highlights

- OleumTech® field-proven technology running on the global Sigfox Low-Power Wide Area (LPWA) network
- 3-in-1 level monitoring capabilities: Product, interface, and temperature
- SFX-LR51: 1/4" resolution / ± 1/8" accuracy
- SFX-LR53: 1/2" resolution / ± 1/4" accuracy
- Flex (PTFE) or rigid (316 SS) sensor option  
Sensor sold separately
- "Set it and forget it" one-time calibration
- Powered by a replaceable internal battery pack
- Battery life up to 8 years<sup>1</sup>
- NEMA 4X / IP66 / -40 °C to 70 °C
- Industrially-hardened self-contained design
- A global solution – Zones RCZ1/2/4
- Remote antenna-ready option available
- Intrinsically safe, Class I, Div 1 (Zone 0) certified



US Patent #8,763,455 B1



OleumTech Sigfox Ready Transmitters



Sigfox Base Stations



Sigfox Cloud™



Third-Party Customer IT

## ► Unlock the True Potential of IoT (Internet of Things)

### Easiest Way to Get Data in the Cloud

The OleumTech® Sigfox Ready SFX-LR51 and SFX-LR53 Wireless Resistive Level Transmitters are designed for deployment anywhere in the world that Sigfox has network coverage. By leveraging the Sigfox Low Power Wide Area (LPWA) network, you can take advantage of the world's leading Internet of Things (IoT) connectivity service, offering a software-based communications solution where all the network and computing complexity is managed in the Sigfox CLOUD™.

### Designed for Use in Hazardous Locations

The Resistive 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. These devices provide the ability monitor up to three process variables: product, interface, and temperature levels. The SFX-LR51 provides 1/4" level resolution while the SFX-LR53 offers 1/2" resolution.

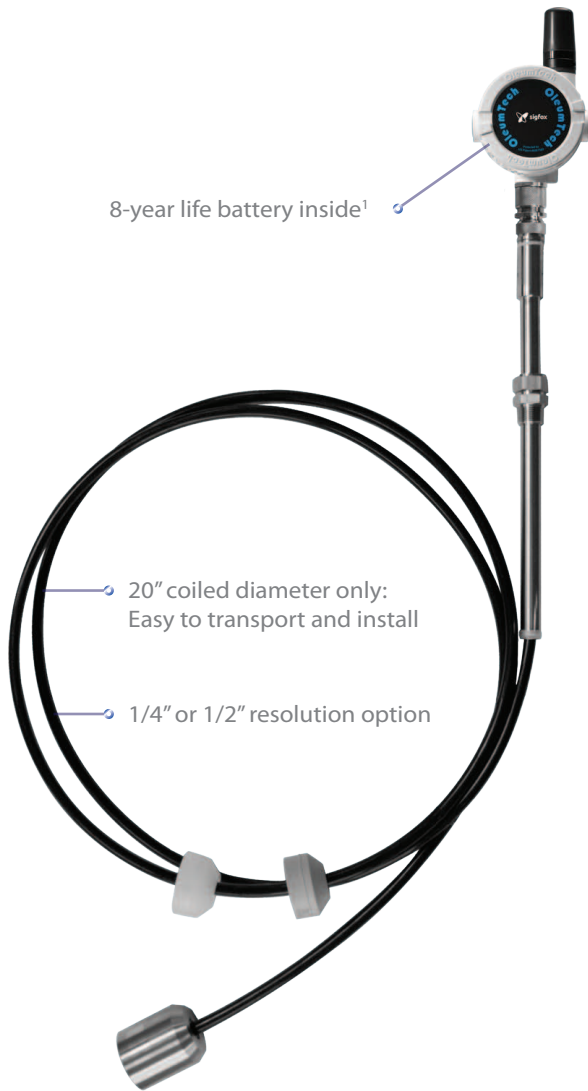
### Inherently Secure

The Sigfox Ready Transmitters take advantage of the built-in firewall since they are not directly connected to the internet and do not use Internet Protocol. Layered on top of this secure foundation, OleumTech provisions each device with a unique symmetrical authentication key. Each message sent by the transmitter contains a cryptographic token that is computed based on this authentication key and verified by each Sigfox Base Station.

### Extremely Reliable

The Sigfox architecture is based on multiple base stations receiving each broadcasted and repeated message, building redundancy into the solution. Data Integrity, availability, and confidentiality are at the core of the offering.

**SFX-LR51 Shown with  
a 1/4" Resolution Flex Sensor**



8-year life battery inside<sup>1</sup>

20" coiled diameter only:  
Easy to transport and install

1/4" or 1/2" resolution option

**SFX-LR53 Shown with  
a 1/2" Resolution Rigid Sensor**



Quick Connect eliminates wiring error  
and gets workers safely off the process faster

Adjustable compression fitting

Limited lifetime warranty against  
H2S damage and paraffin buildup

Sensor supports wide temperature range  
-40 °C to 120 °C / -40 °F to 248 °F

"Set it and forget it" one-time calibration

**SFX-LR51 Works With:**

- 1/4" resolution Resistive Level Sensors only
- Provides  $\pm 1/8"$  or  $2/16"$  accuracy
- Flex sensor kit part number starts with "TH"  
Length: 024" to 252" (2 ft to 21 ft) in 1 ft increments
- Rigid sensor kit part number starts with "ZH"  
Length: 096" to 456" (8 ft to 38 ft) in 1 ft increments

**SFX-LR53 Works With:**

- 1/2" Resolution Resistive Level Sensors Only
- Provides  $\pm 1/4"$  accuracy
- Flex sensor kit part number starts with "TG"  
Length: 024" to 252" (2 ft to 21 ft) in 1 ft increments
- Rigid sensor kit part number starts with "ZG"  
Length: 096" to 456" (8 ft to 38 ft) in 1 ft increments

# Technical Specifications

## HARDWARE FEATURES

Device Functionality	· Class I, Division 1 (Zone 0) IoT Wireless Transmitter Supporting OleumTech Resistive Level Sensors
Embedded Controller	· Ultra-Low Power RISC Microcontroller with Internal FLASH (Field Upgradeable)
Configuration	· OleumTech Sigfox Ready Transmitter Configuration Tool via RS232 Serial
Model Configuration	· LR51: 1/4" Resolution; Product, Interface and Temperature (8-pin Quick Connect) · LR53: 1/2" Resolution, Product, Interface and Temperature (6-pin Quick Connect)
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, Temperature: ± 1 °C · 6.4 mm Resolution Sensor: ±3.2 mm Accuracy; 12.7 mm Resolution Sensor: ±6.4 mm Accuracy
Reportable Values	· Product Level / Interface Level / Temperature Level / Battery Voltage
Device Diagnostics	· Health Tag: Battery Voltage

## WIRELESS COMMUNICATIONS

Sigfox Radio Zones/Regions Supported	· RCZ1: Europe, Oman, South Africa   Certificate ID: P_009D_53CD_01 · RCZ2: USA, Canada, Mexico, Brazil   Certificate ID: P_009D_D78E_01 · RCZ4: Australia, New Zealand, Colombia, Peru, Singapore   Certificate. ID: P_009D_D78E_01
Wirelessly Connects To	· Sigfox Base Stations
Data Reporting Mode	· Interval Only

## 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	· 5" (W) x 7.9" (H) x 4.4" (D) / 127 mm (W) x 201 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)
Weight	· Net: 4 lbs / 1.8 kg; Gross: 7 lbs / 3.2 kg
Connection Fittings	· Quick Connect Adapter to Sensor - No Wiring Required (LR51: 8-pin / LR53: 6-pin)
Enclosure Casing Material	· Aluminum, NEMA 4X, IP66
Mounting Holes	· 4x M5 Female Threads; Horizontal Spacing: 2.76" (70 mm); Vertical Spacing: 3.70" (94 mm)

## ELECTRICAL SPECIFICATIONS

Power Source	· SX1000-BP3, Internal 3.6 Vdc Lithium Battery
Internal Battery Life	· Up to 8 Years, Based on User Defined Reporting Intervals <sup>1</sup>

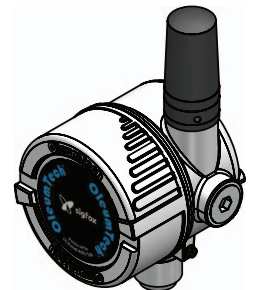
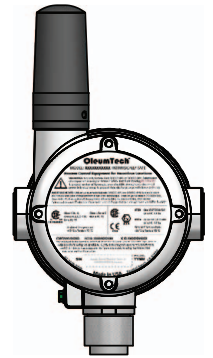
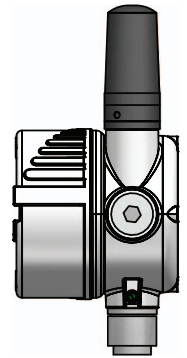
## GENERAL SPECIFICATIONS

Operating Conditions	· Ambient Temperature (Class I, Division 1 / Zone 0): -40 °F to 158 °F (-40 °C to 70 °C) / LCD: -20 °C to 70 °C · Ambient Temperature (ATEX/IECEx): -22 °F to 158 °F (-30 °C to 70 °C) · Humidity: 0 to 99 %, Non-Condensing
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Warranty	· 2-Year Parts and Labor
Country of Origin	· USA

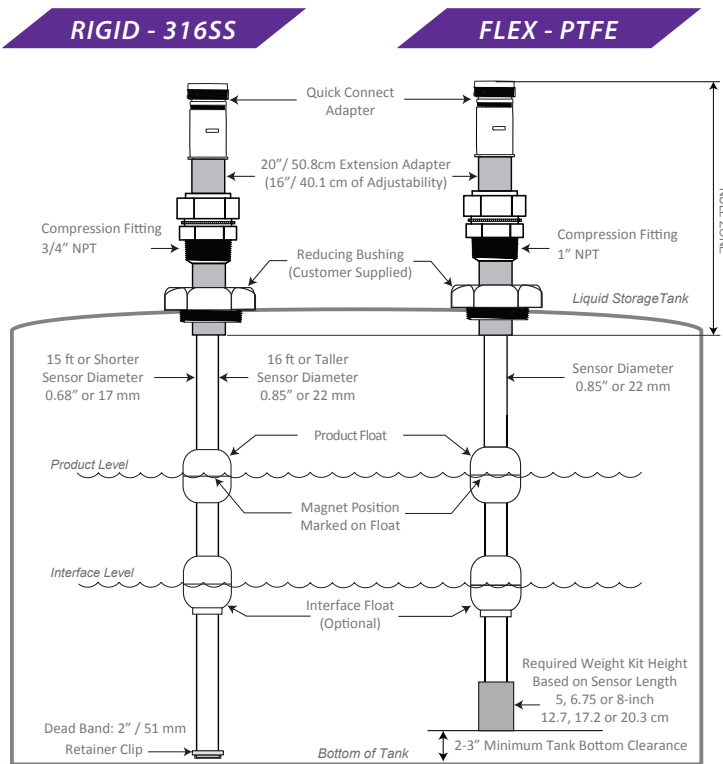
## ORDERING INFORMATION

Model Number(s)	· RCZ1: SFX-RCZ1-LR51 (1/4" Resolution / 8-pin)   SFX-RCZ1-LR53 (1/2" Resolution / 6-pin) · RCZ2: SFX-RCZ2-LR51 (1/4" Resolution / 8-pin)   SFX-RCZ1-LR53 (1/2" Resolution / 6-pin) · RCZ4: SFX-RCZ4-LR51 (1/4" Resolution / 8-pin)   SFX-RCZ1-LR53 (1/2" Resolution / 6-pin)
Model Number(s) for Remote Antenna-Ready Option	· RCZ1: SFX-RCZ1-LR51-P (1/4" Resolution / 8-pin)   SFX-RCZ1-LR53-P (1/2" Resolution / 6-pin) · RCZ2: SFX-RCZ2-LR51-P (1/4" Resolution / 8-pin)   SFX-RCZ1-LR53-P (1/2" Resolution / 6-pin) · RCZ4: SFX-RCZ4-LR51-P (1/4" Resolution / 8-pin)   SFX-RCZ1-LR53-P (1/2" Resolution / 6-pin)
Battery Model Number	· Use Only SX1000-BP3, 3.6 V Lithium Battery Pack
Configuration Cable	· SX1000-CC2, 20-ft All-in-One Configuration Cable



<sup>1</sup> Ambient temperature and 140 transmissions per day were used to calculate battery life. The data only applies to a new battery part number SX1000-BP3. Actual battery life may vary depending on environmental factors, application, and usage. Use data shown above only as general point of reference.





### 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  $\pm 1/4$ " accuracy  
"TG" & "ZG" resistive sensor kit numbers
- 1/4" resolution with  $\pm 1/8$ " 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 $\pm 1/4$ -inch ( $\pm 6.4$ mm) Accuracy (6-pin Quick Connect) Option 2: 1/4-inch (6.4 mm) Resolution with $\pm 1/8$ -inch ( $\pm 3.2$ 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	$\pm 1$ °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:	*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) 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) 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 $\leq$ Tamb $\leq$ 70 °C ATEX: Sira 16ATEX2229X; Ex ia IIB T4 Ga, -40 °C $\leq$ Tamb $\leq$ 70 °C IECEx: SIR 16.0079X; Ex ia IIB T4 Ga, -40 °C $\leq$ Tamb $\leq$ 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 $\pm 1/4$ -inch Accuracy	60-4001-xxx	60-4101-xxx
Model #: 1/4" Resolution with $\pm 1/8$ -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