

# LST100

## Ultrasonic level transmitter for upstream oil and gas

Accurately track and measure the most expensive consumable on your site – chemicals.

Measurement made easy

### Features

#### Keep track of your chemical usage and stock

- Track chemical use
- Monitor chemical stock levels
- Remote access with Totalflow RTU

#### Designed for use in chemical applications

- FM approved for Zone 1 Div 2 without barrier
- FM approved for Zone 1 Div 1 with a barrier
- Corrosion resistant

#### Ultra-low power consumption

- Designed for use in battery and solar applications
- Power consumption not dependent on measurement
- Low power consumption reduces cost of ownership



# LST100

## Ultrasonic level transmitter for upstream oil and gas

### Introduction

The LST100 is an ultrasonic level transmitter capable of measuring the liquid level of applications up to 10 m (30 ft.). The transmitter has a single 1 to 5 V DC analog output with RS485 digital communications. The transmitter is fitted to the top of a tank, facing down towards the material being measured.

The transmitter's microprocessor simultaneously fires an electronic pulse at the transducer and starts a timer. The transducer converts the electronic pulse to an acoustic pulse and directs it at the surface of the material being measured. When the acoustic pulse contacts the surface of the material, it is reflected back to the transducer. The transducer converts the reflected pulse to an electronic pulse and sends it to the microprocessor, which then stops the timer and determines the signal's 'time-of-flight'. By comparing the speed of sound through air with the 'time-of-flight' of the pulse, the microprocessor accurately determines the level in the tank. Powerful software removes false echoes from the signal and electronic filters remove ambient noise.

### Designed for solar or battery power

The LST100 is designed to operate from a 12 V solar / battery power source.

- The instrument remains fully functional on voltages as low as 9 V, enabling it to operate seamlessly, even when batteries are running low. It is further protected from false measurements by ensuring an error state is entered with appropriate alarms. Thanks to this technology, you can trust the accuracy of the LST100 output.
- The LST100's output does not limit the power consumption to the current output as most instruments do. This means that the LST100 operates at the equivalent power consumption of a 24 V instrument at 4 mA.
- Low power consumption enables the maximum amount of instruments to run on either a solar panel or a battery power source. Reduced power consumption results in a lower cost of ownership.



Fig. 1: Solar powered level application

## Reliable measurement, all the way to the top of the tank

Ultrasonic level transmitters usually have a dead zone where no measurement is possible. The LST100 is designed to enable reliable readings all the way to the top of the tank.

- The LST100, with its class-leading blanking system, can provide a highly accurate measurement to within 75 mm (3 in.) of the top of the tank when used with an optional mounting bracket.
- Most instruments would lose the measurement when it reaches the blanking distance, but the LST100 can reliably detect a ‘full tank’ condition. When a full tank is detected, an alarm is logged, and the output remains at the maximum level output.

## Easy installation and configuration

The LST100 is designed to get you up and running in minutes.

- Install the LST100 quickly using the specially-designed mounting bracket.
- Configure the LST100 using the quick-start menu structure that guides you through the most important steps needed to set up a functional level measurement.
- If you have multiple tanks of the same shape and size in one location, you can easily duplicate the setup of one LST100 to an entire site. The ability to download and upload a configuration makes large scale installations a snap.



Fig. 2: LST100 mounted using the mounting bracket

# LST100

## Ultrasonic level transmitter for upstream oil and gas

### Non-contact measurement means no maintenance

ABB ultrasonic level instruments have no moving parts so nothing ever wears out – you get a maintenance-free device that delivers the highest levels of reliability throughout its operational life.

The advanced sensor design has leading beam angle and sensitivity resulting in the most reliable level instrument on today's market – even during changing seasons, high humidity conditions or flooding; the LST100 will not let you down.

### Best-in-class accuracy

The LST100 includes temperature compensation to ensure class-leading accuracy at all temperatures. The speed of sound changes when temperature changes but the LST100 measures temperature and compensates automatically for changing conditions.

An easy-to-use, 2-point calibration enables the best possible accuracy in your application. By calibrating the measurement to two known good points, you'll be sure to get the most out of your instrument.

### Pay only for the functions you need

Most products on the market are designed to be used in a large variety of conditions. This results in expensive instruments with more functionality than is needed for most applications.

For cost-sensitive applications (for example, chemical tank level measurement), this means most instruments available today are not cost-effective. With LST100, you pay only for the functionality you need.

## Specification

### Measurement

#### Range

0.85 to 20 ft / 1.15 to 30 ft

#### Beam angle (at -3dB)

5° (20 ft version) / 7° (30 ft version)

#### Accuracy

±1/2 in. or 0.25% of full span (largest of the two)

#### Repeatability

±0.25 % of measurement range

### Mechanical data

#### Housing material

PVDF

#### Dimensions

Height – 122 mm (4.8 in.) minimum (excluding glands)

Diameter – 78 mm (3.07 in.) – excluding glands

#### Weight

1.0 kg (2.2 lb)

#### Cable entry type

One 1/2 in. threaded bore for cable gland, directly on housing  
Supplied with 1 x 1/2 in. NPT cable gland

### Electrical data

#### Terminals

9 terminals for power supply and communication purposes  
accommodating wire cross sections of up to 1 in. (14 AWG)

#### Power supply

3 terminals for power supply (PE/+/-): The LST100 operates  
from 9 to 16 V DC and is protected against reversed polarity.

#### Analog output (1 to 5 V)

2 terminals for analog output (+/-): 1 to 5 V related to level,  
or full compensation for temperature effects

#### RS485 communication

2 terminals for RS485 communication (+/-): RS485  
communication for setting parameters, monitoring  
measurement results and diagnostics messages

#### Option for connecting ground

2 terminals as a jumper switch for ground earth. Connection  
the transducer to ground is optional and is done using this  
jumper.

### Environmental data

#### Hazardous area approvals

Intrinsic Safety type of protection:

Approval according to FM US and Canada

IS Class 1 Div 1/GP ABCD- CL II/ DIV 1/ GP EFG, CL 1, Zone  
1,

'Non Incentive' type of protection:

Approval according to FM US and Canada

NI Class 1 Div 2/GP ABCD- DIP CL II/ DIV 2/ GP EFG, CL 1,  
Zone 2, AExnA IIC T6; IP66/67.

#### Electromagnetic compatibility (EMC)

Meets requirements of EN 61326

Overvoltage strength (with surge protection): 2 kV  
(in acc. with IEC 61000-4-5)

#### Temperature

-40 to 185 °F, according to EN 60068-2-14, 1K/min,  
100 cycles

#### Humidity

Relative humidity: Up to 100 %

Condensation, icing: Not permissible

#### Pressure

Measurement functional from -4 to 44 psi (-0.25 to 3.0 bar)

#### Vibration resistance

Acceleration up to 1 g at frequencies of up to 2,000 Hz  
(according to IEC 60068-2-64).

#### Humid and dusty atmospheres (degree of protection)

LST100 is dust and sand-proof and protected against  
immersion effects as defined by EN 60529 (1989) to IP 66/67  
or by NEMA 4X.

# LST100

## Ultrasonic level transmitter for upstream oil and gas

### Ordering information

Ultrasonic level transmitter	ab	cd	efg	hi	jk	lm	no
LST100/							
<b>Explosion protection certification</b>							
cFMus energy limited, Class 1 Division 2			F3				
cFMus intrinsically safe Class 1 Division 1 including energy limited (Division 2)			F4				
<b>Sensor type and range</b>							
Corrosion-resistant transducer, range 10 m (approx. 30 ft)			C10				
Corrosion-resistant transducer, range 6 m (approx. 20 ft)			C06				
<b>Process connection type</b>							
1½ in. universal thread (NPT and BSP compatible)				U5			
1½ in. universal thread (NPT and BSP compatible) including 4 in. mounting bracket				U6			
2 in. universal thread (NPT and BSP compatible)				U2			
<b>Housing material / cable glands</b>							
PVDF / 1 piece 1/2 in. NPT, cable gland mounted						N1	
<b>Power supply</b>							
9 to 16 V DC							B1
<b>Output signal</b>							
RS485 digital communication including 1 to 5 V analog output							R1

Notes

# Contact us

**ABB Inc.**  
**Process Automation**  
**Main Office**  
7051 Industrial Boulevard  
Bartlesville, OK 74006  
USA  
Tel: +1 918 338 4888  
+1 800 341 3009  
Fax: +1 918 338 4699

**ABB Inc.**  
**Process Automation**  
3700 W Sam Houston Parkway  
South, Suite 600  
Houston, TX 77042  
USA  
Tel: +1 713 587 8000  
Fax: +1 713 266 4335

**ABB Inc.**  
**Process Automation**  
3900 South County Road 1290  
Odessa, TX 79765  
USA  
Tel: +1 432 563 5144  
Fax: +1 432 563 8043

**ABB Inc.**  
**Process Automation**  
150 Eagle Ford Road  
Pleasanton, TX 78064  
USA  
Tel: +1 830 569 8062  
Fax: +1 830 569 8094

**ABB Inc.**  
**Process Automation**  
2 Acee Drive  
Natrona Heights, PA 15065  
USA  
Tel: +1 724 295 6100  
Fax: +1 724 295 6560

**ABB Inc.**  
**Process Automation**  
4300 Stine Road, Suite 405-407  
Bakersfield, CA 93313  
USA  
Tel: +1 661 833 2030  
Fax: +1 661 833 2034

**ABB Inc.**  
**Process Automation**  
2705 Centennial Boulevard  
Liberal, KS 67901  
USA  
Tel: +1 620 626 4352  
Fax: +1 620 626 4354

[www.abb.com/upstream](http://www.abb.com/upstream)

## Note

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents - in whole or in parts - is forbidden without prior written consent of ABB.

Copyright© 2015 ABB  
All rights reserved



Sales



Service



Software