LST200
Ultrasonic level transmitter

Quick Start Guide

Professional measurement starts from easy and intelligence

—
LST200

Ultrasonic level transmitter

Introduction

The LST200 is a microprocessor-based ultrasonic level transmitter that transmits ultrasonic pulses in the direction of product surface. When some of the energy is reflected and travels back towards the sensor, by measuring the time elapsed between the initial pulse and the reflected one, the electronics can calculate the distance.

For more information

Detailed user manual, training material and videos guide are available:
https://new.abb.com/products/measurement-products/level/ultrasonic-level-transmitters-and-switches/lst200
or by scanning this code:

Contents

1   Basic safety

Personnel

> ⚠ **WARNING**
>
> **Only properly certified and authorized personnel** should be charged with the installation, electrical connection, commissioning, operation and maintenance of the instrument.
>
> Any process media released may cause severe injuries.
>
> Carefully plan any installation, modification or repair before proceeding.
>
> Read the LST200 operating instructions carefully before working with the product. For personal and system safety and for optimum performance, make sure you thoroughly understand the contents before installing, using or maintaining this instrument.

Electrical

> ⚠ **WARNING**
>
> **All connections must be established in a de-energized state. Before working on the circuit, secure the breaker to prevent any accidental power-up.**
>
> **Electronic components are sensitive to electrostatic discharges. Before performing any connection, operators shall make sure that they have discharged all static electricity from their body before touching electronic components.**

2   Improper use

The following are instances of improper use of the device:
- Measuring in a medium other than air, for example in the presence of heavy gas vapors
- Use as a climbing aid, for example for mounting purposes
- Use as a support for external loads, for example to support the tank.
- Addition of material, for example by painting over the name plate.
- Removal of material, for example by spot drilling the housing

Sales

Service

3   What's in the box

Check for damages to the included parts:
- LST200 (see below picture)
- Quick Start Guide
- Cyber security label (only for LCD option)
- Certificate of calibration and inspection

Should any part of the package be damaged upon reception, contact ABB customer service as indicated on the back cover of your user guide.
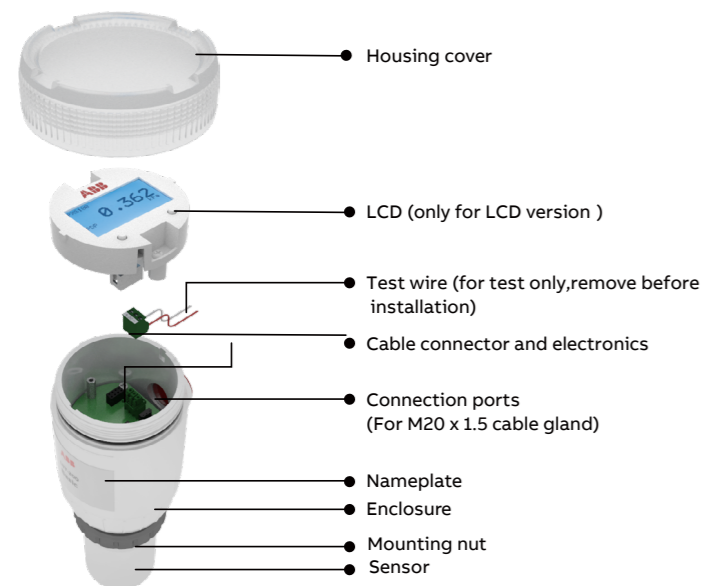

Figure 1: Main components of LST200

Housing cover

LCD (only for LCD version)

Test wire (for test only,remove before installation)

Cable connector and electronics

Connection ports (For M20 x 1.5 cable gland)

Nameplate
Enclosure

Mounting nut
Sensor

4   Installation

The LST200 transmitter can be mounted directly on a tank/flange using either a nut or a sleeve.

Using the thread
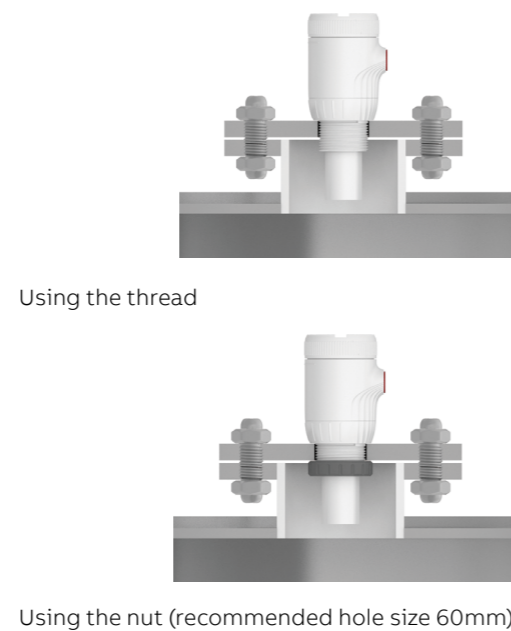

Using the nut (recommended hole size 60mm)

Figure 2: Direct mounting variations

5   Mounting with bracket

For open channel or basin, mounting bracket may be needed, contact ABB if you need the brackets or further suggestion.
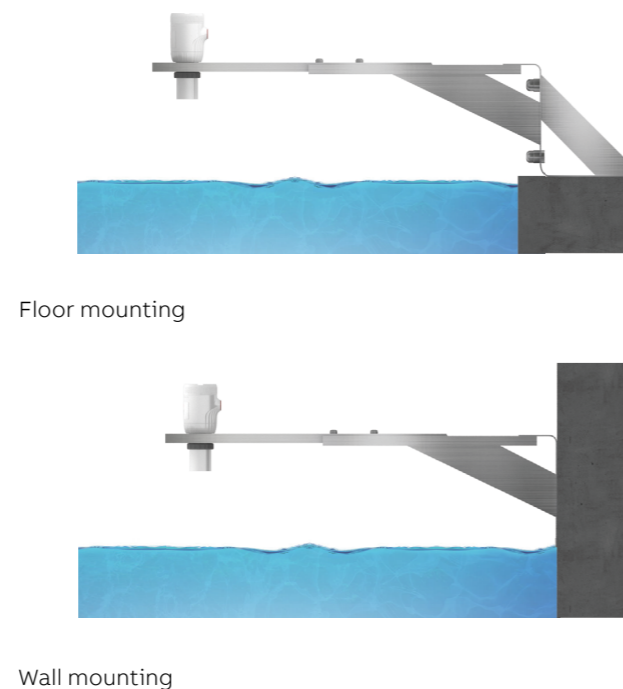

Floor mounting

Wall mounting

Figure 3: Mounting with bracket

6   Typical LST200 connection

LST200 can be setup either through the LCD or on a computer and it's a 2-wire loop powered device that can be connected directly with DCS or PLC
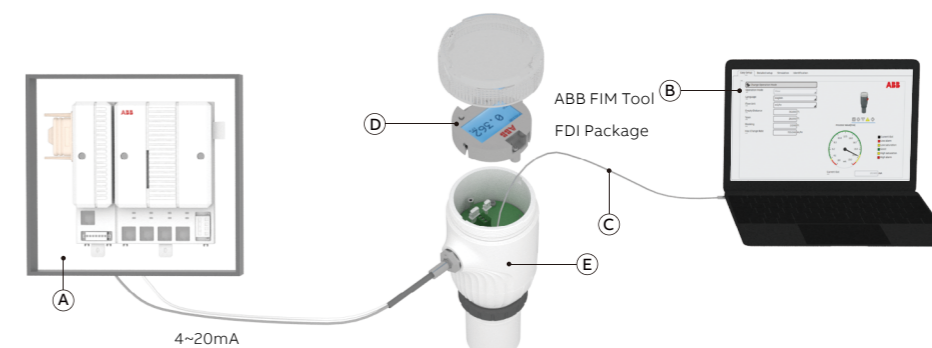

ABB FIM Tool
FDI Package
4~20mA

Figure 4: Typical connection

Ⓐ   DCS or PLC

Ⓑ   Computer with configuration software (through ABB FIM tool with FDI package)

Ⓒ   Interface cable (specially designed for LST200)

Ⓓ   LCD

Ⓔ   LST200

7   To connect the LST200 instrument

Interface cable and LCD port

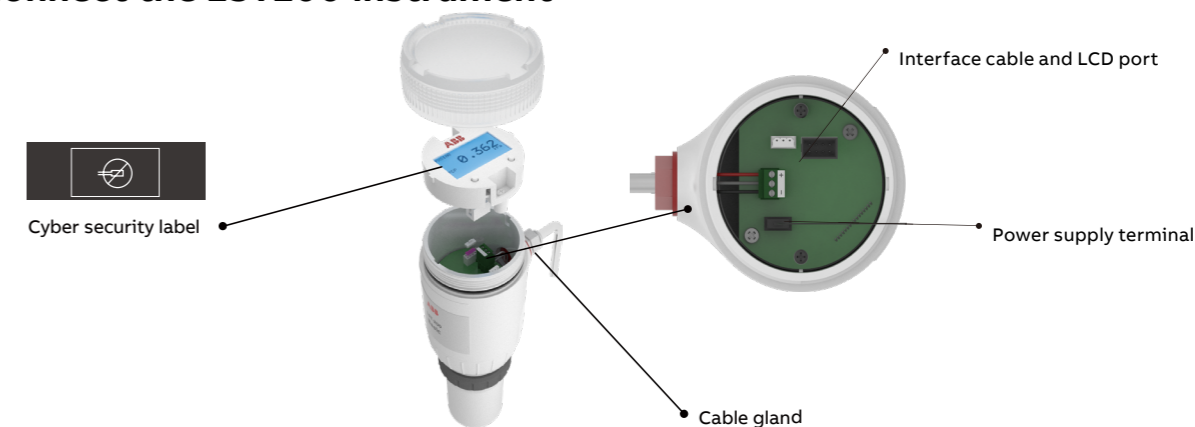Cyber security label

Power supply terminal

Cable gland

Figure 5: Cable connection

1. Remove the temporary plastic cap from the electrical connection port
2. Remove the housing cover and the LCD (for LCD option)
3. Remove the green terminal with + - mark
4. Route the connection cable through the cable gland and the electrical connection port
5. Connect the positive lead to the + terminal, and the negative lead to the – terminals. Connect the shielding layer to GND if possible
6. Put back the green terminal
7. For LCD version, put back the LCD and paste the cyber security label to cover one of the LCD screws
8. Put back the housing cover. Turn it so as to seat the O-ring into the housing, then continue tightening by hand until the cover contacts the housing
9. Power up the instrument by switching on the circuit breaker

NOTICE

After an interval of several weeks, increased force will be required to remove the housing cover. This situation is normal; it is caused by the type of gasket used

After power-on, there would be 50s or less before LST200 fully started

8 Configuring using the Easy Setup menu

Your LST200 instrument comes configured with certain default parameters, but you still need to select certain options and set specific values for your instrument to work as you expect.

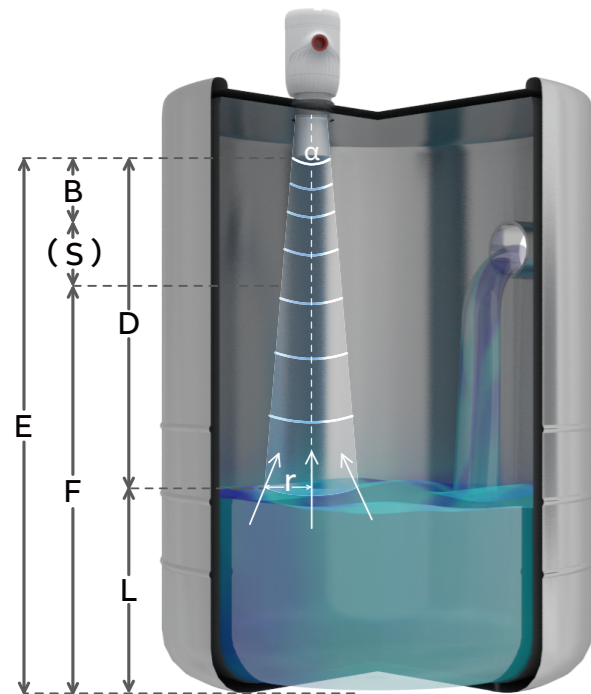To start the configuration, you need to understand the parameters below:

Figure 6: Typical installation and key parameters

B	Blanking area	Should be set ≥ 350 mm, signals within this area would be ignored
D	Distance	Distance from sensor surface
E	Empty distance	Max. 8 m, set according to the distance from tank bottom to sensor
L	Level	Level from tank bottom (defined by empty distance) sensor
F	Full range (Span)	Set according to users' 100% output point, suggest leave a safety distance "S" from blanking area
α	Emitting angle 10°	Detection range reference, avoid obstructions (Filling water, switches, weld seam) in thisrange. Reference for best performance:distance from tank bottom to sensor D=8 m, r=694 mm D=6 m, r=519 mm D=5 m, r=431 mm D=4 m, r=344 mm D=2 m, r=169 mm D=1 m, r=81 mm

Scan for video of installation and setup

[Video: How to connect LST200](#)

[Video: how to install and setup LST200](#)

After start-up, the indicator shows the current PV value and percentage. You can push the right button to enter the main menu and the left button for diagnostic information if errors existed. In the Main menu, use left button for scrolling and right button for entering
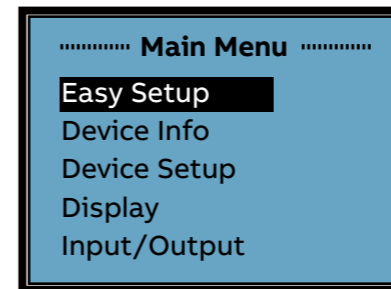

Figure 7: LCD and menu

The most common configuration parameters are summarized in the Easy Setup menu, including:

Language	English, Chinese
Operation Mode	Level Mode, Flow Mode, Volume Mode, Distance Mode
Length Unit	m, cm, mm, feet, inch
Empty Distance	0 to 8000 mm
Span	0 to 8000 mm
Blanking	350 to 8000 mm
Max change rate	0 to 720 m/h

Tips:
• After you set the empty distance and span, the 0% (4 mA point) and 100 % (20 mA point) will link to 0mm (bottom of the tank) and the span value you entered. If you want to change the mapping, go to the "Input/Output" menu.
• Max change rate can help you ignore the sudden level change (the change rate larger than the setting). This could be used when unexpected obstacles and noise randomly occur. Be careful that the real change might be ignored if the value was set too small. Disable this function by setting the value to '0' .
• For your reference: Very Slow: <1 cm/min ,Slow: <5 cm/min ,Medium: <25 cm/min ,Fast: 1 m/min ,Very Fast: <5 m/min
• The blanking is better to be set at a larger value to filter unexpected noise.

9 Configuring using the ABB FIM with LST200 FDI package

ABB's Field Information Manager (FIM) software employs Field Device Integration (FDI) technology and is equipped with high-performance and innovative graphical user interface that helps technicians to effectively work with the process instrumentation.To connect the PC with LST200, a specially designed interface cable should be ordered from ABB with part number : 3KXL065113U0100
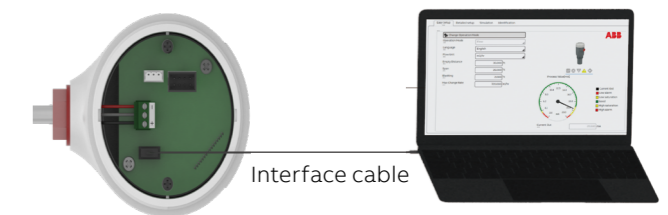
Figure 8: Interface cable connection