Operating Instructions

LC 100, LC 101, LC 102, LC 103

Contactless tank content measurement
With ullage indication

DESIGN & DEVELOPMENT BY
ESI
easy software integration

Order number: 507066 – 507068 – 507069 - 507070

Contents

Dokument: 03 2012 LC E M 03_C

General Instruction

The LC is used for simple measurement of tank contents usally in poor visibility conditions. The measurement is performed by means of ultrasound echo measurement. It measures the distance of the sensor to the surface of the liquid. The result is displayed on the display in liters and percent. The conversion of the measurement is based on the entered parameters tank. (See page 5 of the input parameters tank)
The accuracy of the summary is based on the setting and the prevailing conditions at the tank. The LC has an accuracy of + \ - 1 cm on the distance of 0.19 m to 2.70 m.

Safety Instructions

Please read this document carefully before installing the LC device.
LC must not be installed in a hazardous environment and must not be used for the following liquids: Gasoline, Ethanol, aggressive chemical products like acids and aggressive chemicals.
The LCD device has no features that prevents your tank overfilling.
The LC gives no security against the tank becoming empty.
Please use only high quality batteries. The manufacturer of the equipment shall not be liable for damages caused by batteries Improper use and any resulting damages the manufacturer
cannot take any responsibility.
Modifications on the product are prohibited. Service repair and maintenance shall be done by the manufacturer or authorised service facilities only.

Product Description

Main Advantages:
- Tank capacity in litre and volume percent
- Ullage display (how many litres can be refuelled)
- Calculation of average day demand in litres per day
- Berechnung der Tankreichweite in Tagen
- Calculation of the remaining days based on average day demand
- 3 different tank shapes are supported by appropriate calculations
- Easy Installation
- No moving components in the tank
- Contactless measurement with ultra sonic pulses for optimal reliability

Applications:
- Heating Oil Tanks
- Waste Oil Tanks
- Water tanks
- Rainwater Tanks
- As replacement for mechanical gauge indicators…

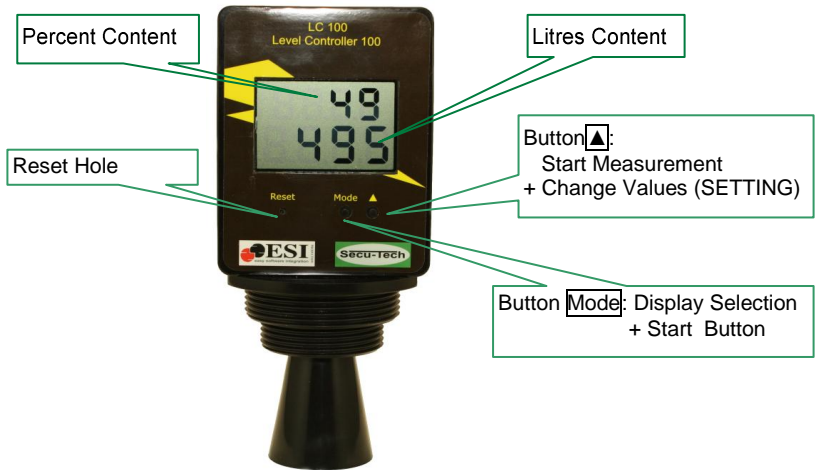Instruction for installation

- Before you make a purchase please check for possible problems at the installation,
- Discuss on the phone, write, and e-mail or use the possibility of an individual meeting with our field staff.
- Use the device only in the right ambient conditions (read the specifications).
- The device must not be installed in a hazardous environment (94/9/EG)
- If the device is installed too near to a wall, it is possible that reflections can cause problems to the measurement, because of the characteristic of the ultra sonic pulses are reflected on the wall.
- The device should be installed in the middle of the tank, as indication you can take a min. distance of 5 cm from the wall to the aperture.
- The indicator should be on a place, where the ultra sonic pulses can beam unhindered to the bottom of the tank.
- Built- in parts can disturb the ultrasonic pulses and may result a false measurement (e.g. pipe, manhole, cross beam).
- Check the installations-situation when the tank is empty, because if the tank is full you can not see the built-in parts which can reflect the ultra sonic pulses.
- The calculated medium value (will be calculated by the measured distance) always relates to the level of the sensor inside of the conus (this sensor is situated at the height of the bigger worm).
- The maximal distance between medium level and sensor can be adjusted with the offset.
- The device has a min. and max. Measurement range (look at the specifications), if you work beyond this specifications you get wrong or no data.
- For a correct measurement you have to consider that the distance from the sensor to the maximum filling level is not lesser as the min. measurement range.
- The device must be installed perpendicular to the fluid surface, because otherwise the reflected ultra sonic pulses can´t be received.
- The sensor and the controller are not allowed to contact the medium which you want to measurement.
- Be sure, that your tank manufacturer allows the installation and the tank has a minimum entry of 1.5 inch, ideally 2" BSP thread.
- The mathematical calculation in this device is designed only for cylindrical and cubic tank types, special shapes can´t be considered.
- Only a specialist licensed company is allowed to modify the tank, in case there is a need to drill or cut holes in the tank! – you lose the warranty and in case of damage you are personally liable.
- Wrap the thread with Teflon tape to ensure the impermeability of the tank.
- For devices with cable to the sensor, look at the legal electronic instructions (e.g.: separate cable routing of low-voltage lines).
- If the tank is refuelled (actual tank contents is higher than the value from the day before) the statistics (average day demand, remaining days) are reset automatically.
- Please note that the battery life of the device depends from settings like permanent display.
- The LC is a simple device, which helps you to measure tank contents. This is an electronic device and so it is possible to get an error so that the display shows wrong values. Always monitor the system to ensure it provides correct data and allows you to ensure manage your stocks to avoid problems, e.g. an empty tank.
- Take the time (which you have saved with our device) and control the tank continuous, so that it is always in good order and condition.
- Please note the legal requirements for your tank and if you have concerns ask a license specialty company.
- Always take a look to the service intervals of your tank and a specialist licensed company should advise you, that your tank meets the legal requirements (e.g. heating oil tanks should be equipped with a limit indicator for working with overfill protection systems).

Checking the contents of delivery

Please, check the contents of delivery immediately after receipt and unpacking.
In case of missing components or transport damages contact your local dealer or our representative.

Hint: Please keep the original packing material if you have to send the instrument to a service facility. Keep these operating instructions in case you hand over the instruments to another person.

Operating Elements

Percent Content

Litres Content

Reset Hole

Button ▲:
   Start Measurement
+ Change Values (SETTING)

Button Mode: Display Selection
                + Start Button

Preparation

Preparation LC 100 / LC 103 (Battery use)

Open back cover by unscrewing the 4 fixing screws.
Insert the 4 x 1.5 V batteries into the battery holder.
The device displays installed software version and launch a measurement.
Close cover with 4 fixing screws .
If 25 seconds no key is pressed LC is leaving the setting mode.Functionality in battery use

If no button is pressed for more than 35 seconds the device switches over to the energy saving mode.

Set Up LC 100 / LC 103

The LC is shipped ready for use, tank type, volume in litres and height in cm has been defined (if we have been provided with the data).

1, Press the Mode button one time – the LC will show the last measured value.

2,   For an actual tank contents measurement it can be initiated at any time.
2.1 ,Press mode button (the unit will be activated)
2.2 Press arrow button, some seconds the actual tank content is on the display.

Preparation LC 101 / LC 102 (Power supplied units))

Plug in to power socket. (230 V).
1, The installed software version is displayed. 2. A measurement is accomplished.
3. Unit display with standard configuration data´s appears.

Functionality Power use (230V / 6V)

In power use display is all time on.

Set Up (Power Supply)

The LC is shipped ready for use, tank type, volume in litres and height in cm has been defined (if we have been provided with the data).
1, Press the Mode button one time – the LC will show the last measured value.
2, An actual tank contents measurement can be initiated at any time.
2.1 ,Press mode button (the unit will be activated)
2.2 Press arrow button, some seconds the actual tank content is on the display.

LC takes a measurement every 24 hours automatically

Setting up the tanking data, press the Mode button in the standard display for more than 3 seconds.

Button ▲ : increment the selected digit (blinking) by one
If you press the Mode button again you see the next settings.The set value is stored.

1, Configuration

1.1 Selection of Tank Type (1, 2 or 3) The selected tank type is blinking in the right bottom corner.

Tank Type 1	Tank Type 2	Tank Type 3	
			Select with ▲ Button Tankform 1,2 oder 3
Cubic	Cylindrical horizontal	Cylindrical vertical	
			Confirm with Mode

1.2 Configuration

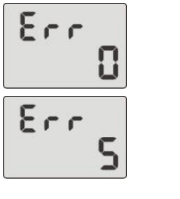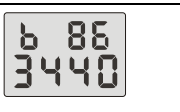**Hint:** Button ▲ next , Button Mode confirm, next selection part

Tank content Litres ①	Tank height in cm ②	Power Safe Modus ③	Offset ④
Activate display Enter tank volume in litres	Enter the height of the tank „H" in cm	Default is 0, the display is turned off after 35 s	Distance from the sensor to the max. level
Tank type in upper left corner	Tank type in upper left corner	0: the display is turned off after 35 s 1: continuous display Warning: increasing energy consumption (batteries)!!	It´s necessary i.e. for installation in a manhole pit

1.3 Get Actual Demand Data
Press Mode Button for actual tank data´s (launch from standard)

①	②	③	④	⑤	⑥	⑦
Standard Display	Litres	Percent of content	Ullage	Measured depth	Average	Remaining Days
Top level : Percent Bottom line : Litres	Litres Up t0 4 digits	Percent Tank content	Ullage In Litres	Distance from sensor to fluid surface	Average consumtion for last 5 days	Number of remaining days

Special information and error indications

Err 0 Err 5	Error message codes: 0 - no error 1 - software error 2 - measuring error (distance is more than 4 m, probe defective) 3 - the measured depth is higher than the setup value 4 - over-range, volume is more than 9.999 l 5 - battery is low
b 86 3440	In case of 80% weak batteries the symbol "**b**" appears in the top line. Please, replace all batteries! Statistical data are kept in memory during battery replacement.
r FULL	For depth values less than 20 cm (distance sensor to fluid) "tank full" is indicated by "**FULL**" after the measurement.
L OUEr	Overfill for more than 9.999 litres

2, Installation Instruction

2.1 : LC 102 or 103 (Sensor connection with 5m cable)
You will receive with the LC with a wall bracket included 8 (2x4) pieces Velcro dots. Mount the wall bracket to secure suitable place to display with the Velcro dots on the mounted bracket. In that way it can easy removed from the screen and then hang up to replace. (eg. battery replacement).

2.2 Cable :
If the cable is carried out through a wall, they need a 1cm diameter hole.

2.3 Mounting on tank thread.
LC has 2 threads (1 1/2 Inch and 2 Inch).Screw the device into the tank manufacturer opening provided for the fuel gauge. We recommend the use of a Teflon tape. Please screw the LC only with your hands power into the thread. Over-tightened screws may lead to fault measurements.

Start measurement
Press **Reset:** The display shows for 6 seconds the installed Software-Version and start first measurement inside the tank; from now on the LC100 makes daily a measurement every 23 h 45 minutes.

Function Reset
If the device behaves strange it is recommend to restart.
On the front side there is a small opening to access the **Reset** button with a thin tool.

The software version is displayed afterwards for some seconds.

Reset performs the following actions:
- The internal controller a restarted
- The new measurement interval starts at the time of the reset
- Statistical data are deleted (litres/day, remaining days)
- Tank type, volume, and height are kept in memory
- The setting for "PS" display turnoff function is kept
- LC resumes the operation in the standard mode

Maintenance, Troubleshooting, Service

The device does not need any maintenance.
Clean the inside of the sensor cone once a year with a dry cloth to avoid
dirt and debris which could influence the beam of the ultra sonic pulses.
Make a visual check of the batteries once a year.
If the device shows unexpected behaviour try to reset the instrument
by using the reset button.
Check your installation (look at the instruction for installation).
If the problem persists contact our service team
or send the device to an authorised service facility.
If the device is damaged, remove it immediately from your tank
send it to an authorised service facility.
If the device is removed close the tank entry after that so that the vapours can´t escape.

Warranty

For the actual services and conditions see our home page www.secu-tech.at,
 see the GTCS – General Terms and Conditions of Sale.

Technical Specification

Power supply:

LC 100, LC 103
Batteries: 4x 1.5 V, Mignon, type AA, alkaline
Wattage: during the measurement 19 mA
                                        Energy-saving mode 0,45 mA

Battery life time: typically 2 years in energy saving mode with min. 2000mA/h per battery,
                                        symbol "b" for low batteries (ca. 20% rest)

LC101, LC 102
Mains adapter: 230 V AC with Euro plug or UK plug, fixed connected

Dimensions (w x d x h):
LC 100, 101, 102, 103   75 mm x 42 mm x 170 mm

Protection: IP 20, for indoor usage only

Display: LC-display 51 mm x 35 mm,
                                        2 lines with 4 digits 12 mm and 14 mm high

Weight (mass):   220g – 620g depending on version
Material: ABS, black, oil resistive
Measurement range: 19 cm … 270 cm, 0 … 9.999 litres
Accuracy: ±1 cm
Measurement interval: Normal mode: one measurement per 23:45 hour
Operating temperature: -10°C ... +45°C
Engineering Standards: CE, ROHS

All LC 100 Product Application´s

LC 100:
Order. Nr.: 507066

LC 101:
Order Nr: 507068

LC 102:
Order. Nr.: 507069

LC 103:
Order.: - 507070

For your tank data´s

Tank Type	Tank Content	Tank Height	Power Safe	Offset
1 cubic				
2 cyl. horizontal				
3 cyl. vertical				

Notes

Note your tank parameters in the table.
Your tank data´s are stored on the tank surface provided by your tank manufacturer.

To familiarize with the functions before installation on the tank we recommend to make a test outside before storage the unit on the tank. Hold the funnel opening in 90 ° angle against a smooth flat surface (floor, ceiling, wall ..) and do some measurements.

Important: These technical specifications can be changed any time by

© SECURITY & ELECTRONIC TECHNOLOGIES GmbH
Adress: Aumühlweg 3/1
Place: A-2544 Leobersdorf
Telefon: +43 2256 201 77
Fax: +43 2256 201 77 11
Internet: www.secu-tech.at
E-Mail: office@secu-tech.at

03 2012 LC1 E M 03_C

Security & Electronic Technologies GmbH   Aumühlweg 3   A - 2544 Leobersdorf   Austria
Tel: +43 2256 20177-0   Fax: +43 2256 20177-11   secu-tech   office@secu-tech.at   www.secu-tech.at

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