



**Level gauges  
for your  
purposes**



**LIMACO**

[www.limaco.ru](http://www.limaco.ru)

# ULM radar level gauges are a ready-made solution for containers with liquid and granular materials.



*Innovative technology, unique performance characteristics, wide range of application.*

Over the years of its operation, LIMACO has become one of the leading Russian companies specialized in the development and production of measuring instruments for different industries. Today we can offer you various radar methods of level gauging in accordance with your purposes. ULM level gauges are designed on the operating principle of LFM-radiodetector (FMCW) that guarantees the high accuracy of level gauging under weak reflection conditions. The different types of mechanical connections, variety of assembly tools, and simplicity of installation ensure the stable, effective and economically rational level gauging.

ULM radar level gauges are easy to install and operate. ULM level gauges, unlike

the majority of other radar level gauges, have the ample opportunities for remote configuration and can be easily mounted on the tanks due to their small size. Our level gauges are maintenance-free and characterized by the increased reliability as they don't contain mechanically movable parts and are fully isolated from the interior content of the controlled container.



## Non-standard operating conditions?

**We'll help you select the appropriate configuration meeting your special requirements.**

### *Innovations*

LIMACO became the first company in the world to develop and use the serial production of radar level gauges operating at a frequency of 90 GHz and, by some characteristics, leaving all the internationally known radar level gauges behind.

The high performances have been achieved by using the inventions and unique technologies worked out by our personnel.

### *Reliability*

Level gauges produced by our company prove their high application performances in practice. Hundreds of large-scale enterprises operating in chemical, petrochemical, metal mining, food and other industries in Russia and abroad are equipped with LIMACO level gauges.

### *Quality*

Working in close contact with the clients, LIMACO Ltd specialists promptly respond to ANY Customers' requests. The effective designer supervision of level gauges operation is a priority for LIMACO Ltd personnel.

LIMACO devices have all the Certificates and Licenses required for their usage in Russia.

## Main advantages:



Free from atmospheric precipitation influence.

Environmental temperature from  $-60^{\circ}\text{C}$ .

Mounted entirely outside the tank.

Antenna is located inside the level gauge housing, while being heated and protected by the fluoroplastic lens.

Narrow gauging beam - ease of installation, reliability of measurements.

Level gauging accuracy doesn't depend on the internal container temperature.

Measurements are influenced neither by evaporations nor by dust.

Level gauging of boiling liquid.

Level gauging of corrosive environments. No contact, no corrosion - reliable easurements.

Warranty period – 3 years.  
Service life – 25 years.

The calibration is performed every 2 years without dismantling the level gauge from the container and doesn't require the Customer to have a special calibration outfit.

*ULM level gauges are able to measure the following products:*

- petroleum;
- oil products;
- fuel oil;
- bitumen;
- gasoline and other light-oil products;
- acids;
- alimentary products;
- beer;
- alcohol;
- milk;
- condensed gas;
- sewage water;
- melts;
- phenol;
- ore mineral;
- cement;
- grain;
- coal dust;
- solvents;
- crushed stone;
- mineral fertilizers;
- paint;
- products in stirred reactors;
- anthracene oil;
- coal tar;
- chark;
- treacle



## Unique software makes ULM level gauges easily configurable and intuitive, and at the same time functionally rich.

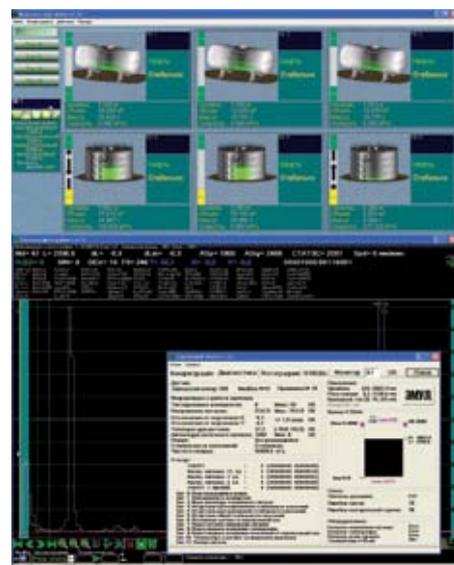
### *UlmCfg configuration package*

UlmCfg configuration package is a powerful but simple and comprehensible tool for configuration and adjustment of the level sensors that are the parts of ULM level gauges. The program package maintains connection with the level sensor by RS-485 standard industrial interface providing the configuration and adjustment in a long distance from the device installation site, therefore, “field works” are not required.

The simple interface of UlmCfg software package rules out any mistakes while configuring the level sensor for a particular reservoir, thus allowing the operating personnel to perform all the adjustments required for correct operation of the device without exterior help.

The diagnostic component of the software package provides a user with full information about the device operation, indications of device internal testing system, presence and indications of auxiliary integrated equipment.

The software inside the level sensor is regularly updated. The firmware updating package allows a user to update the level sensor software without removing it from the tank.



# Universal solution for such different products as liquids, granular materials and condensed gases.

## *ULM-11 level gauge*

One solution for tasks of any complexity. The maximum possible electromagnetic signal frequency (UHF) of 94 GHz (as opposed to other existing level gauges), gauging beam width of 4°, and maximum absolute error of  $\pm 1$  mm ensure the achievement of best performances under any operating conditions. The operating environmental temperature in the place of the level sensor installation varies from  $-60^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ . The additional heater warmers or heater units are not required while operating under low temperature conditions. In this case, the successful performance is ensured by the internal independent heating system that maintains the necessary operating temperature inside the level gauge. The level sensors of ULM-11 level gauge are characterized by the protected principle of the antenna installation that makes it maintenance-free.



The antenna is entirely located inside the level sensor housing and isolated from the outside environment by a fluoroplastic

lens of the special convex form. Due to this form, liquid drains from the lens surface and temperature of protective lens outer surface always exceeds the environmental temperature (dew always appears on the colder surfaces). Such measures ensure that dew doesn't appear on the antenna and also help to avoid soiling that can influence the level gauging accuracy and stability. Due to its construction, the level sensor of ULM-11 level gauge can be fully isolated from the tank interior content by the radiotransparent layer. This option is useful when it's necessary to gauge the level of corrosive materials (acids, alkalis, etc.), alimentary or overheated products as well as substances preserved in the tanks under excessive pressure.

## *ULM-11A1 level gauge*

ULM-11A1 level gauge is optimized for solving general technological tasks of noncontact level gauging in different tanks with liquid products and granular materials. ULM-11A1 level gauge is based on the use of the innovative technology of FMCW adaptive adjustment applied in ULM-11 and ULM-31A2, so it measures the level of liquid products and various granular materials with the same stability.



The applied technologies provide the maximum sensitivity while gauging the level of such materials as fuel oil, bitumen, petroleum, oil, cement, coal, technical carbon, ore mineral, etc.



LIMACO

[www.limaco.ru](http://www.limaco.ru)

### *ULM-31A1 level gauge*

ULM-31A1 level gauge is an exclusive device. This level gauge combines the time-proven radar technology with innovative engineering solutions, including a planar microstrip antenna, high-sensitivity microwave system and high-performance digital signal processing complex. These features make it suitable for level gauging not only under severe conditions, but also in situations where a cost-effective solution is required, as the level gauge is sold at a moderate price. ULM-31A1 level gauge ideally suits for level gauging of granular materials.

The planar microstrip antenna guarantees the protection against the abrading effect of measured product dust, and high-performance measuring system ensures the measuring stability and accuracy. ULM-31A1 level gauge is designed for level gauging of cement, ore mineral, slug, grain, flour, coal, gypsum, and many other liquid and granular products. The level gauge is easy to install and adjust, it can be equipped with PL-01 remote-control device to perform configuration and diagnostics.



### *ULM-31A2 level gauge*

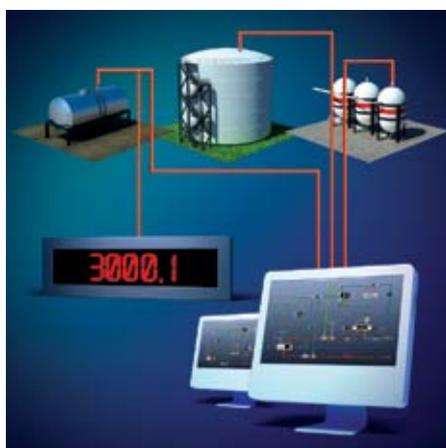
ULM-31A2 level gauge has been designed as the easiest-to-handle and cheapest general-purpose instrument for level gauging that can be used in the technological tanks with various liquid and granular products, including corrosive substances.

The measuring accuracy of ULM-31A2 level gauge with ULM4-5 level sensors doesn't depend on characteristics of the atmosphere above the product (air film), i.e. humidity, dust conditions, pressure, environmental temperature, and temperature of the controlled product.



## Comprehensive approach. Smart solutions.

## All ULM level gauges are fully compatible in terms of protocol and electrical interfaces.



Different level gauges can be used in a particular tank depending on the required measuring accuracy. At the same time, all the level sensors are connected to the same data line and operate with the same high-level software that makes it possible to create the best level gauging system in terms of price-quality relationship.



Specifications	ULM-11	ULM-11A1	ULM-31A1	ULM-31A2
<b>Principle of measurement</b>	Radar, continuous	Radar, continuous	Radar, continuous	Radar, continuous
<b>Level gauging accuracy</b>	±1 mm	±3 mm	±3 mm	±10 mm
<b>Additional thermal error</b>	Not detected	Not detected	Not detected	Not detected
<b>Range of level gauging</b>	0,6 – 30 m	0,6 – 30 m	0,6 – 30 m	0,6 – 15 m
<b>Gauging beam width</b>	4°	15°	15°	22°
<b>Environmental temperature</b>	from -60 to +50 °C	from -60 to +50 °C	from -40 to +50 °C	from -40 to +50 °C
<b>Temperature of measured medium</b>	Not limited - temperature has no influence on measuring accuracy			
<b>Contact with product</b>	Not required	Not required	Not required	Not required
<b>Contact with container interior content</b>	Not required - can be fully isolated from the tank interior content by the radiotransparent layer			
<b>Measurements' dependence on dust level</b>	Not detected	Not detected	Not detected	Not detected
<b>Measurements' dependence on evaporations</b>	Not detected	Not detected	Not detected	Not detected
<b>Embodiment</b>	Explosion-proof, 1ExdIIBT6	Explosion-proof, 1ExdIIBT6	Non-explosion-proof, IP55	Non-explosion-proof, IP55
<b>Power supply voltage</b>	24V DC 220V 50Hz	24V DC 220V 50Hz	24V DC	24V DC
<b>Output analog interface</b>	4-20 mA	4-20 mA	4-20 mA	4-20 mA
<b>Output digital interface</b>	RS485, Modbus RTU	RS485, Modbus RTU	RS485, Modbus RTU	RS485, Modbus RTU
<b>Warranty period</b>	3 years	3 years	3 years	3 years



**LIMACO**

[www.limaco.ru](http://www.limaco.ru)

Tula, +7 (4872) 26-44-09, [in@limaco.ru](mailto:in@limaco.ru)