Laser Level Sensor

The laser level sensor (AL40) is a non-contact, level measuring instrument designed for granular solid materials and opaque liquids.

The characteristic narrow beam divergence of the laser permits direct aiming to the target surface without interference from structure or falling material. With both continuous 4-20 mA and single point relay outputs, the AL40 can operate as a process control sensor while simultaneously providing high and low alarms. Whether measuring a few meters into the confined space of a crusher, or to the bottom of the tallest silo, the AL40 with its laser pointer and long range is the plug-and-play solution to level measurement.

Applications:

Petrochemicals

Chemical Processes

Food & Beverage industries

Mining Industries

Metal Industries

Grain, Seed & Feed

Cement & Aggregates

Pulp & Paper

AL40

- Cost effective instrument
- Fast setup, configuration & commissioning
- Maximum up to 40m
- Accuracy 0.1% of full range
- Power supply 240Vac and 24Vdc
- 4-20mA output with local display
- 2 x relay NC/COM/NO 5A at 250Vac
- IP65 enclosure

For pricing or any further information, please contact Omni Instruments Ltd.

Measurement and data acquisition solutions

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Range	0.1-40m distances and level format
Resolution	0.01m
Accuracy	0.1% of full range
Update rate	10 readings per second

DISPLAY	
LOCAL LED	4 Digit 7-segment led display 0.10-40.00

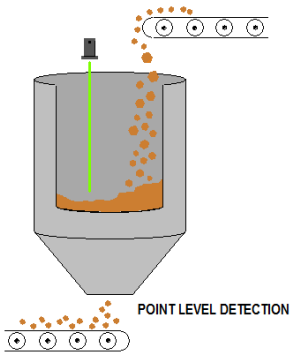
SETUP	
Local setup	Manual setup using buttons and local display

TECHNICAL DATA	
Power supply	90-240vac and 12-24vdc
Current consumption	200mA
Output	4-20mA NAMUR compliant
Relays	2 x relay NC/COM/NO 5A at 250vac

DIMENSIONS	
Diameter	75mm (Base mounting 95mm)
Height	145mm
Flange optional	3” flange with dust tube
Material	Powder coated aluminium

OPTICAL DATA	
Optical aperture	55mm
Beam angle	Less than 1 degree
Lens	Impact resistant acrylic
Laser safety	Class 1M. Do not view laser directly

ENVIRONMENT DATA	
Operating temperature	-20°C to +60°C
Pressure	Atmospheric
Enclosure rating	IP65

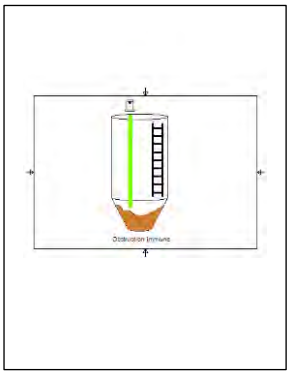
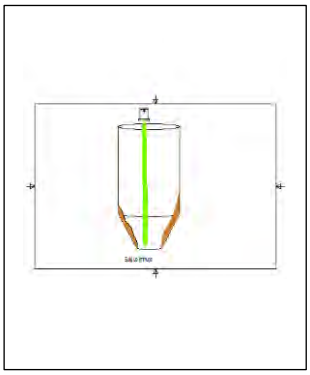
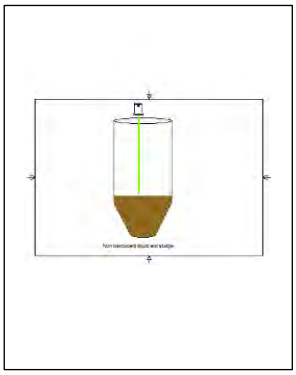
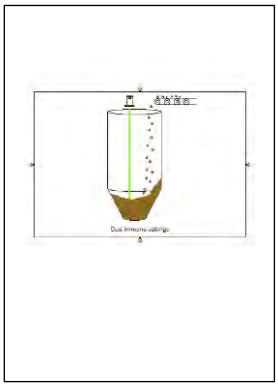


Level Measurement using Laser Level Sensors

The AL40 uses a high speed laser pulse to measure distance. The laser light is emitted towards the surface and some of it reflects back to the instrument where it is detected by a sensitive optical receiver. The time it takes for the light to travel to the surface and back to the instrument is directly proportional to the distance between the instrument and the surface. Using a time-of-flight calculation, and knowing the height of the vessel, the AL40 accurately measures the distance to the target surface using the equation below:

$$\text{Level} = \text{height} - \frac{\text{speed of light} \times \text{time-of-flight}}{2}$$

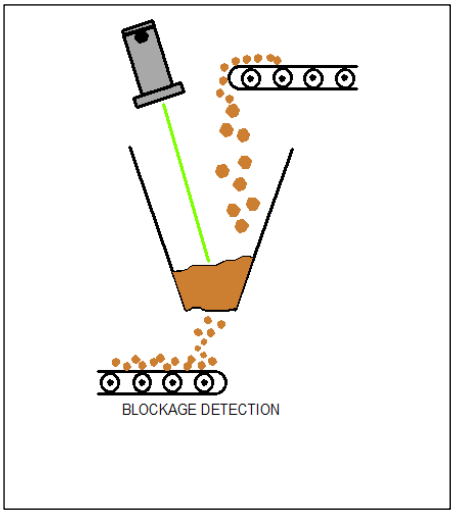
The unique characteristics of laser light give the AL40 significant performance advantages over other technologies. The narrow, long range beam can measure both near and far distances while the optical wavelength makes it easy to evaluate applications. If you can see the surface clearly, the AL40 can measure the level.

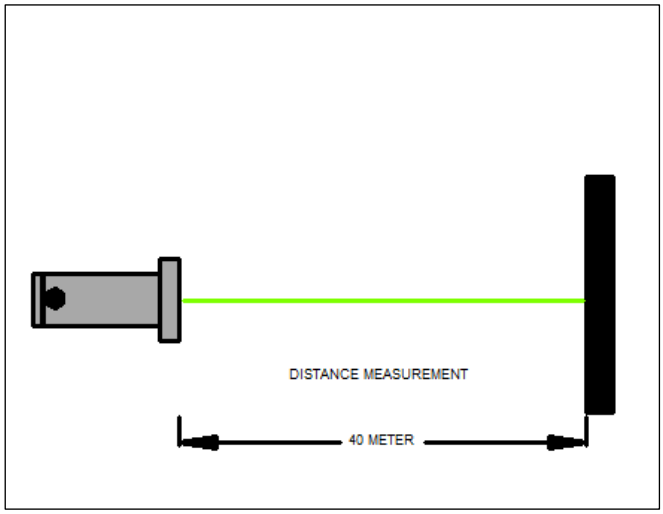





The AL40 is mounted on top of a storage vessel aiming downwards towards the surface. Using the visible laser pointer, the position and angle of the AL40 can be adjusted so that the instrument measures all the way to the bottom of the vessel. Settings such as: the distances for the 4-20 mA output; and the relay switching points, can be entered into the instrument either before installation, or in situ using the laser configuration (LCD2) accessory. Another recommended accessory is the stainless steel dust tube which keeps the optical system of the AL40 clean for long periods.

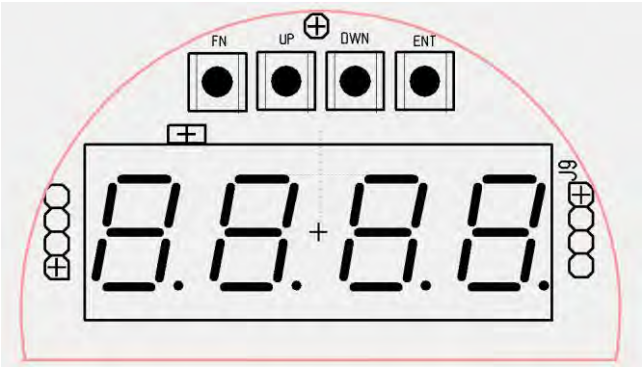
Range

The AL40 is able to measure the level in silos because of the inherent long distance capability of laser technology. The laser has a natural advantage because it gets strong, clear signals from most types of granular solid materials. As the laser beam doesn't spread out and lose strength as it travels, there is little signal loss with increased distance.

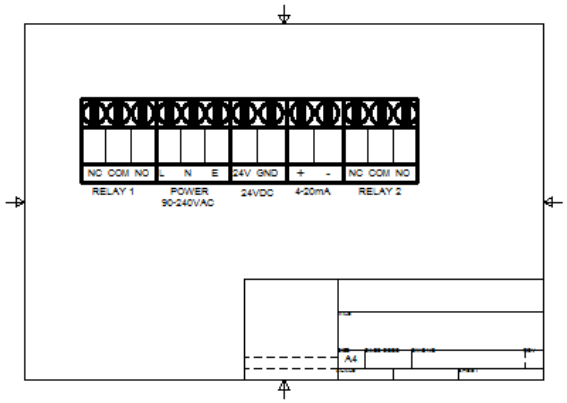




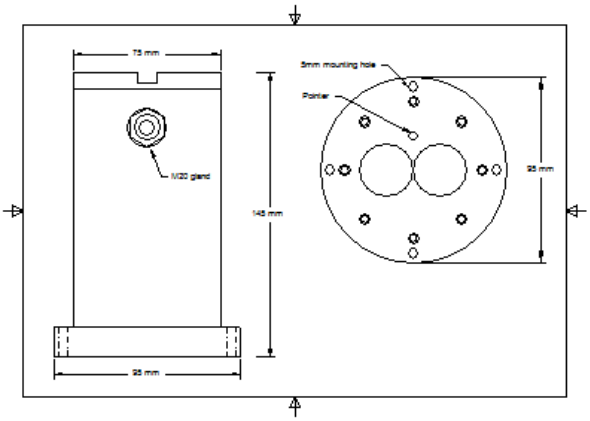
Laser Level Sensor Drawings



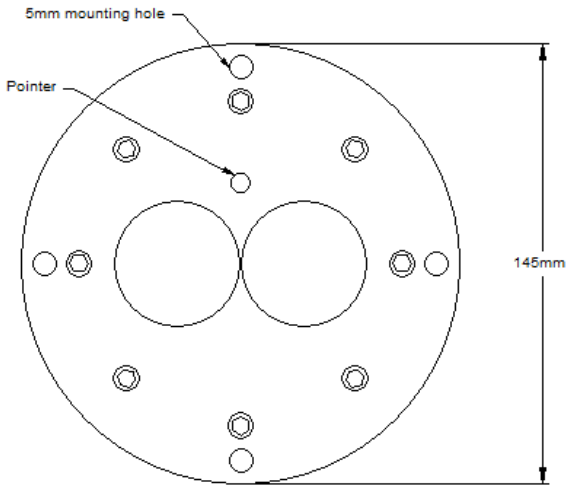
AL40 Display & Buttons



AL40 Terminal Connections



AL40 Laser Face & Housing



AL40 Laser Face