

ABB LASER LEVEL MEASUREMENT APPLICATION



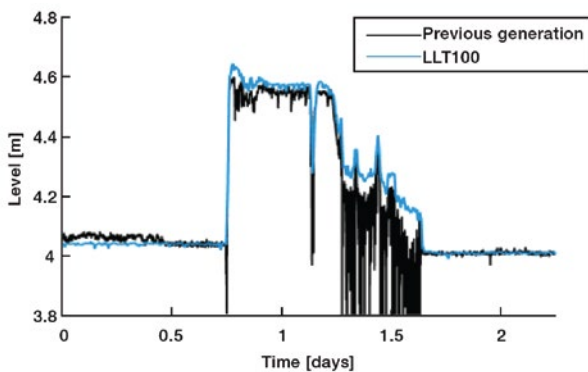
Clear Water Level Measurement using the LLT100

Water Treatment Plant

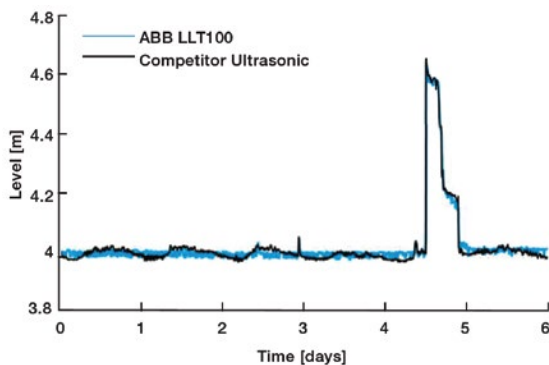
LLT100 units were installed in several water treatment plants. These units have been working for several months showing great performance. Significant improvement is seen compared to the previous generation of the product.



Results are reliable even over ambient temperature changes, level fluctuations, and water agitation. Plots of the level recorded over time shows how the LLT100 is superior to the previous generation when measuring clear liquids.



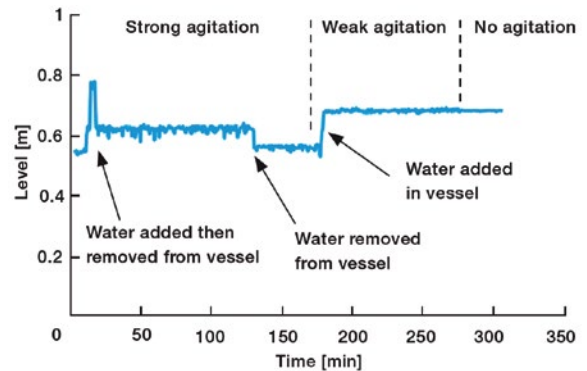
Furthermore, the LLT100 was also installed next to a competitor's ultrasonic sensor for reference. The results also show the stability of the LLT100 output, unaffected by the daily temperature changes, the LLT100 line is straight when no filling occurs, while the competitor's product line shows a daily oscillation.



Clear Water Level Measurement

The measurement of clear liquids was extensively tested in a number of different conditions. LLT100 performed well on all tested liquids, from coloured liquids to transparent ones. Reliable measurements can be done at distances up to 30m.

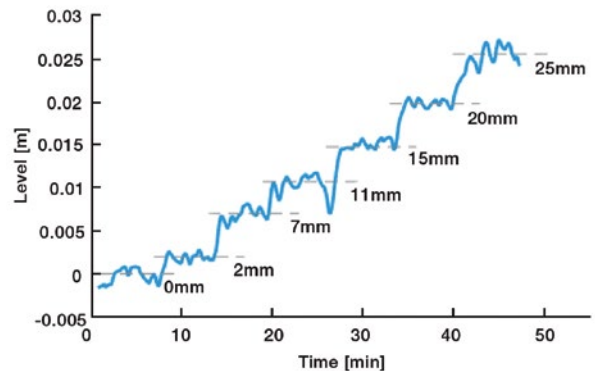
LLT100 also tracks the liquid surface level even in the presence of waves and surface agitation. In the figure below, waves are created in a clear water tank. There is no damping, so fast changes can be observed. As can be seen, LLT100 always detects the surface even in strong agitation. When no agitation is present, on the right of the plot, the standard deviation of the measured level is $\pm 1\text{mm}$, showing the repeatability and resolution of the measurement.



In the presence of dense foam, the LLT100 will return the level of the top of the foam. However, the LLT100 is not confused by foam and the measurement is not lost or erratic.

Tracking Small Level Changes

In this experiment, a clear water tank is filled by very small increments. Note that the level increments are of the order of a few milliliters.



As can be seen, it is possible to track very small level changes. In this example, LLT100 tracks changes of the order of 5mm and as small as 2mm. Fluctuations are mostly due to agitation during filling the vessel.