

LLT100

Laser level transmitter solves powder storage issues



Laser transmitters are working reliably for powder silo inventory management

Measurement made easy

Laser level transmitter LLT100
on powder silo

Introduction

With the increasing demand for powder products like calcium carbonate, storage and handling of large quantities of these powders have become increasingly complex, making it essential to have reliable and precise measurement systems in place.

Accurate level measurement is critical in ensuring efficient and safe operation of powder silos in industries like pulp and paper, plastics, water treatment, and food/beverage. This application note will provide an overview of level measurement techniques used for powder silos and their benefits, limitations, and considerations for effective implementation.

Additional Information

Additional documentation on LLT100 is available for download free of charge at www.abb.com/level. Alternatively simply scan this code:



Challenge

—
01 Laser level transmitter
LLT100 on powder silo

—
02 Laser level transmitter
LLT100

There have been many products introduced specifically for measuring bulk silos through the years. One of the most common is the plumb bob method which utilizes a weight and cable tied to a lowering and raising electromechanical system that outputs level.

In recent years, the introduction of microprocessor-based electronics, such as [ultrasonic](#), [microwave radar](#), and [lasers](#) have been steadily replacing these systems. However, it is still considered best practice to have redundant point level measurement for preventing overfill on these silos.

The limitations of each of these range from high maintenance and safety concerns for plumb bobs, which often require manual resetting, to mounting locations on ultrasonic, measuring distances on microwave radar, and supply air considerations for laser transmitters.



01

The ABB Solution

The ABB LLT100 is a high-performance laser transmitter that accurately measures level, distance, and position over short and long ranges.

It is a non-contact level measuring instrument designed for industrial applications and harsh environments.



02

Some important considerations must be factored in when selecting the proper instrument to better automate powder silo measurement:

- Is measurement while filling required?
- Is there instrument air supplied?
- Is the silo being filled from the top for proximity of transmitter?
- How tall and wide is the silo for calculating tensile loads or beam angle?
- Is measurement required in the conical bottom?

Knowing the answers to these questions and the limitations of the instrumentation will quickly determine the correct technology.

In many cases, ABB laser technology can overcome these challenges, as it can be mounted on the outermost area of a silo and the beam can be aimed into a conical bottom.

However, there's always the case of performance while a silo is being filled when almost all microprocessor-based instrumentation is running blind. As a best practice, it's still recommended to have high alarm switches implemented to assist while the silo is being filled.

Rationalization

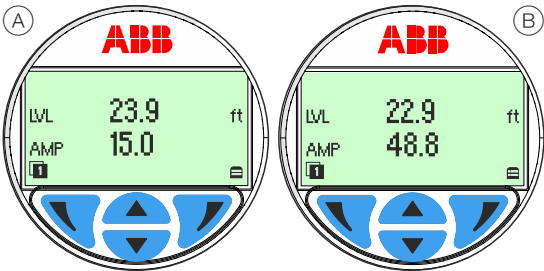
03 LLT100 level and amplitude reading without and with air purge

04 ABB RVG200 recorder showing totaled volumes

05 Interface of custom linearizer available in the ABB RVG200 recorder

That said, some plants simply aren't ready for digitalization. What's meant by this is that microprocessor-based technology offers live diagnostics regarding the health of the signal.

In the case of the LLT100, the signal amplitude is almost as important as the level reading itself.



- (A) Amplitude and level reading without air purge
- (B) Amplitude and level reading with air purge

03

However, if the plant isn't pulling that data over a communication protocol and is only using the analog 4 to 20 mA signal, if any of the microprocessor-based instruments fail, they will only see that it's failed.

Adding a controller and data recorder can help alleviate this issue and become a predictive maintenance indicator versus reactive maintenance.

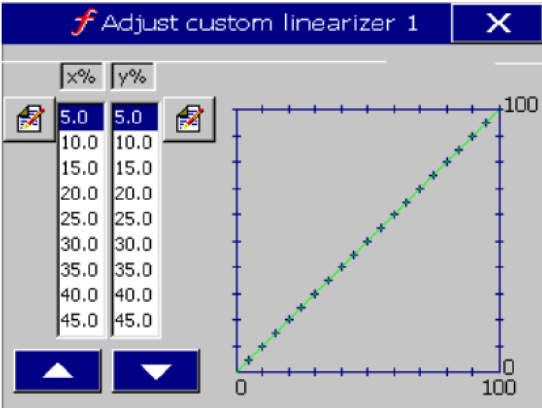


04

The [ABB RVG200](#) can plot the level signal as (Pv), but also output alarms based on low or high values. It can also calculate the volume based on basic dimensions and formulas that are preprogrammed into the recorder.

The recorder can display as well as archive level signals in a bar graph, digital or plotted chart style format.

Onboard math and logic allow for customized equations to perform volume and dimension calculations, as well as two custom linearizers which can be applied to any input.



05

ABB Measurement & Analytics

For your local ABB contact, visit:
www.abb.com/contacts

For more product information, visit:
www.abb.com/level



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