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## Title

Selecting Continuous Level Sensors and Optimizing Material Inventory Decisions

## Introduction

Continuous level sensors can provide optimization of inventory management in regards to the storage of powders and bulk solids. In addition to detecting “high and low” levels, a continuous level sensor can actually help cut inventory costs by providing you with better control over re-ordering materials. It will also offer an obvious increase in personnel safety since employees would not have to climb up silos to check levels. So how does one select the right continuous level system for his / her application?

There are several different technologies available for use in “continuous level” and “inventory management” applications. The main technologies used for continuous level measurement and inventory control of powder and bulk solids stored in bins, hoppers and silos are: Non-Contact Radar, Guided Wave Radar, Weight & Cable (plumb-bob, yo-yo, etc.), Ultrasonic, Laser, 3D Scanner and Load Cells / Strain Gauges.

In addition, there are various operator interfaces available to deliver the information locally and / or remotely. Examples include HMI control consoles, PC Software and cloud-based inventory management. Most sensors also provide various communication protocol/output options to integrate with existing control systems.

Although a continuous level inventory measurement system sounds like a good idea, the inclination may be that “a point level works okay, no need to spend any money to upgrade or change.” So how does one justify the extra initial cost of a continuous level system? Many companies involved with dry bulk materials have adopted continuous level systems for some of the same reasons mentioned below.

Examples of how continuous level sensors can help optimize inventory management, maximize the storage capacity of their silos and save costs include:

> Receive level measurements in dynamic storage situations like in the “wet bins” of grain elevators during peak times.

- > Collect data for resource planning, such as calculating reorder points to prevent “downtimes” waiting for more material to arrive.
- > Minimize the amount of deliveries & transportation costs.
- > Take comfort in knowing the complete load you ordered fits in the silo(s), thereby avoiding any material return fees.
- > Take complete advantage of potential volume discounts by utilizing all of the available silo storage capacity.

### Practical Application Example

Creating a successful material inventory control system for a facility that has multiple storage silos, various locations, multiple processes or a combination of these may require the use of different continuous level sensors in order to achieve the most economical and effective solution.

For instance, a grain elevator and storage company located in the Midwest of the United States is arranged so that when they first get in a load of grain or soybeans, they place it in receiver bins while a sample of the load is being tested (for moisture content, etc.). Once the product is cleared it then gets placed into their regular storage silos. As you may imagine, during peak times product is going in and out of these receiver bins at a rapid pace. The company was looking for some type of level measurement system that could keep up with this dynamic situation. Plus, the soybeans and grain being moved around so quickly can cause some highly dusty conditions which also needed to be taken into consideration.

For their standard storage bins they were already using SiloPatrol® cable-based level sensors linked to SiloTrack™ inventory management system. Since they have two locations, they are able to monitor the inventory in the silos for both locations from the main office using SiloTrack. The SiloPatrol sensors work well for their regular grain storage silos; however, for the receiver bins they needed something that could provide "real-time" measurements and be reliable in extremely dusty surroundings.

The RadarRight™ non-contact radar system from Monitor Technologies was suggested to them for their receiver bins because it satisfied all of the criteria. It can provide “real-time” continuous level measurements and it has proven to work well in dusty conditions.



**Images (L to R)**

- RadarRight™ Level Sensor
- Dust shield on sensor repelled the dust in the receiver bin to ensure a reliable measurement.
- Location where the sensor was tested. Receiver bins are in front.

To make sure that everything was going to function properly, the company tested out one RadarRight unit with dust shield at first. After a period of time, they determined that the RadarRight sensor was able to reliably do everything they needed.

### In Conclusion

Continuous level sensors can provide practical solutions for “real-time” level measurements and material inventory control. They can also help with safety issues since using this type of sensor would considerably lessen the amount of times personnel would need to climb the

silos to check levels or perform maintenance. Plus, many varieties of continuous level sensors have been proven to be dependable in dusty, severe conditions like the radar sensors and cable-based units. If the decision is made to go with a continuous level sensor, there are a few important questions to answer when choosing a continuous level measurement / inventory control system to ensure the system will completely fit your application.

- How often do the levels need to be determined... is a “true” continuous system needed or will a periodic / “on demand” system work? How often do silos get refilled?
- Is a completely electronic sensor desired or will an electro-mechanical device best serve the application and facility staff?
- What are the material characteristics?
- Is contact with the material / process acceptable?
- Silo dimensions, flow stream and any internal obstacles?
- What type of “real-world” accuracy is needed?
- How much is the company looking to invest in a system?
- What type of operator interface and/or inventory management (data collection) software is required?

These are only a few items to be considered. One can contact various level sensor companies and talk to their sales / technical support staff that can assist in clearly identifying the application needs and then propose some solutions.

For more information or to find a representative in your area, please visit Monitor’s Web site at [www.monitortech.com](http://www.monitortech.com) or contact one of our Technical / Sales Support Representatives by e-mail: [techsupport@monitortech.com](mailto:techsupport@monitortech.com), by telephone: 1-800-601-6486 or 1-630-365-9403.



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