It is time to put an end to climbing bins. Knowing the volume and value of what is stored in grain bins is surprisingly simple and inexpensive. Installing a solution that measures grain bin levels automatically and lets you access inventory from your phone or computer can improve inventory accuracy, save time, and keep employees safe from the perils of climbing bins.

Sensors measure sans climbing
Many grain facilities still rely on climbing bins and dropping tape measures to see how much room is left in grain bins. An automated tape measure, also known as a weight and cable or bob, has been one of the most common technologies for grain level measurement for about 25 years. These sensors work by periodically dropping a weighted cable into the bin and when the weight reaches the grain surface, the cable retracts and measures by counting pulses that are converted into a distance by the electronics.

The SmartBob remote is ideally mounted one-sixth from the outer perimeter of the bin to provide the most accurate volume for a centre-fill, centre discharge bin. It is programmed to take measurements at predetermined time intervals, generally ranging from once-an-hour to once-a-day. Measurements can also be taken manually when needed. It is accurate within six millimetres and highly reliable as it always takes the measurement in the same spot, unlike a person who may not drop the tape measure in the same spot consistently.

SmartBobs are a very economical sensor with a price range of UK £1300-to-1500. They are highly dependable, simple to operate, and have a long service life. Bob systems well more than a decade old are still in service and working reliably harvest after harvest.

Bobs and other types of continuous level sensors are relatively simple to install. Most grain storage facilities install the sensors themselves without the need for bringing in an electrician or contractor. There are even new models of sensors that run on battery power, so no wiring is necessary. Installation is as easy as putting a battery in a flashlight.

Beyond the bob, there are other types of level sensors used for inventory management of grain. Non-contact radars provide continuous level measurement in very dusty environments. They measure a single point in the bin with very high accuracy and update very quickly. 3DLevelScanners are the best solution for large diameter storage bins or those with multiple filling or emptying points. The scanner can detect irregular grain piling, cone up or down conditions, and sidewall buildup. A 3DLevelScanner is also the only type of level sensor to generate...
a three-dimensional image of the bin’s grain topography.

Connecting sensors to the software
Setting up an inventory management system is relatively simple. It was not that long ago intervention from the IT department or an engineer might be needed. Programming sensors today is a lot like using an app on your cell phone. Some sensors are set up using Bluetooth. Others are set up using onboard programmers such as a BinDisc with push-button controls. Quite often, setting up and monitoring a system is done on a website.

Wireless connectivity both simplifies system installation and significantly reduces wiring costs. Equipment such as wireless transceivers and gateways eliminate the need for running long spans of wiring. Daisy-chaining is a wiring scheme often used in grain operations with multiple bins that reduces the need for wiring and requires less equipment.

A daisy-chain entails multiple sensors wired together in a ring. This allows a single wireless gateway to send level data for multiple sensors seamlessly to the cloud for processing. This is a commonly recommended configuration for large grain storage facilities such as cooperatives, elevators, or ports. Daisy-chaining allows an entire facility to be connected at a much lower expense than traditional wiring.

Antennas and wireless transceivers can also be used to span large distances.
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LoRa or long-range communications can be used for distances up to one mile with an unobstructed line of sight.

Monitor bins on-site or remotely

Measurements from SmartBobs or other types of level sensors are monitored on a computer or phone via an internet connection. BinView® is a web-based application that allows you to set up your bins and monitor levels in real-time. It is compatible with sensors using either a 4-20mA output or Modbus RTU. Its intuitive interface is used to set up bin parameters, such as height, diameter, material, and the bin location for easy identification. A graphical interface displays inventory levels for each bin. High and low-level alerts can be set to automatically send a text or email when bins are nearly full or empty.

Measurement data can also be accessed from a push-button console. The C-100 provides walk or drive up access to bin levels when installed at a convenient location. It eliminates the need to go to the control room to check how much space remains in the bin. During harvest, drivers can access bin data to know which bins have space available to unload grain for winter storage. Your facility can optimise storage capacity with a system that knows when bins are full.

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Reliable rotaries prevent overfills

Perhaps the most essential, economical, and simple solution for grain storage facilities is the rotary level indicator. The rotary is the workhorse of the point level indicators and is used widely throughout the grain industry. The rotary is used as a high-level indicator to know when to stop filling a bin to prevent overfilling. It is often used to turn an auger off or is wired to a light or horn as an automated alert. It can also alert to low levels when a bin is almost empty when mounted at the bottom or in the cone of a bin.

Rotaries are also used together with SmartBobs or other types of continuous level sensors as a redundant point level indicator for added protection against overfilling bins. A rotary can be configured for top or side mounting and with a variety of paddles, including a convenient collapsible paddle that can facilitate installing the rotary without entering the bin.

For top mounting, the rotary can be extended down into the bin up to two metres to prevent filling to the very top of the bin and potentially damaging a continuous level sensor or other equipment or structure in the bin.

Take the first (or next) step

Installing a grain inventory management system is not expensive or intimidating. Start with the sensor, connect sensors to the system, choose software or console access (or both), and top it with a rotary for added protection. A quick consultation and quote are all that is needed to make grain inventory simpler and safer.

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