BINMASTER®

SMARTBOB®

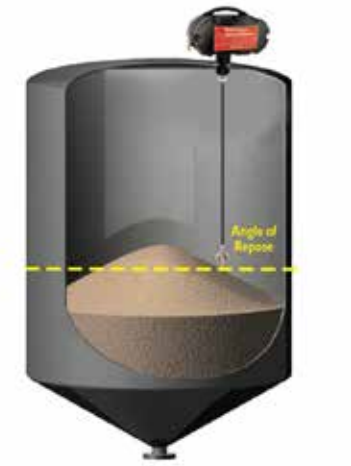
SMARTBOB

Level Sensor for Automated Inventory Control

Automate level measurement of powders and bulk solids with SmartBob. Eliminate the need to climb silos and enhance safety with a proven system of sensors and data delivery options. Working like an automated tape measure, SmartBob takes measurements at preset time intervals or on demand. It is manufactured to order in Lincoln, Nebraska, USA and customized with a wide range of cables, probes, and mounting options – making SmartBob suitable for most any solid, powder, slurry, or liquid. When combined with BinView or Binventory software and push-button consoles, it is a robust inventory management system for process operations of any size.

How SmartBob Works

The SmartBob sensor works like an automated tape measure. Mounted on top of the silo, the sensor drops a weighted cable to the material surface. Upon impact, the cable retracts while counting pulses that are converted to a level measurement. Measurements are programmed at predetermined time intervals to monitor changes in inventory over time.



Mounting SmartBob

SmartBob is ideally mounted 1/6 of the diameter from the outside perimeter for center-fill, center-discharge silos. This distance is proven to provide the most accurate inventory data, accounting for the angle of repose in free-flowing materials.

Data Access

Level data from the sensor can be sent to Binventory software installed on a PC on a local area network. Alternatively, data can be accessed from the internet using the BinView web app on a smartphone, tablet, or PC. A SmartBob with an analog output option sends data directly to a PLC.

Smart Design

- Measures vessels up to 150 feet tall
- ± 0.25% distance measurement accuracy
- Simple mounting via a 3” NPT connection
- Molded polycarbonate enclosure rated NEMA 4X, 5, 9, and 12
- Class II, Groups E, F & G hazardous location approvals
- Immune to airborne dust, steam, and temperature changes
- Repeatable results in dry bulk solids, powders, liquids, and slurries
- Software for data sharing and vendor managed inventory

SmartBob Measures Up

SmartBob is used in vessels up to 150 feet tall that contain solids, powders, liquids, slurries, or in brine tanks. It is proven reliable in dusty and demanding applications. It is used for on-premise, corporate-wide, and vendor managed inventory monitoring. Plastics, chemicals, coal, concrete, food ingredients, pharmaceuticals, feed, grain, and aggregates processors are just a few industries where SmartBob excels.

Polystyrene in a polymer manufacturing facility

Corn in a grain storage silo

Carbon black at a rubber belt plant

Sawdust at a wood product facility

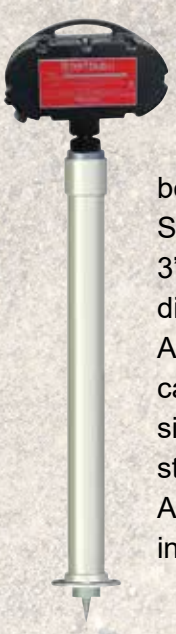
Salt submersed in water at a brine plant

Heated molasses at a liquid feed plant

Specialized Options

Analog Output

The SmartBob AO has a built-in 4-20 mA output and integrated keypad. It is wired to a 4-20 mA input to automatically transmit an analog signal containing measurement data to a PLC. The AO is programmed to take measurements at preset intervals using the onboard keypad. Two configurable relay outputs can alert to high or low measurements or be used as an error alarm.



Super High Temperatures

For extreme process temperatures between 500˚and 1000˚F, use the SmartBob SHT. It includes a 36” long, 3” diameter galvanized standoff pipe to distance the sensor from the heat source. A 1-1/4” galvanized pipe extension encases a bronze cable guide. The extension prevents the probe from entering the standpipe and level with the vessel top. Aluminum pulleys replace Delrin pulleys in the mechanical compartment.

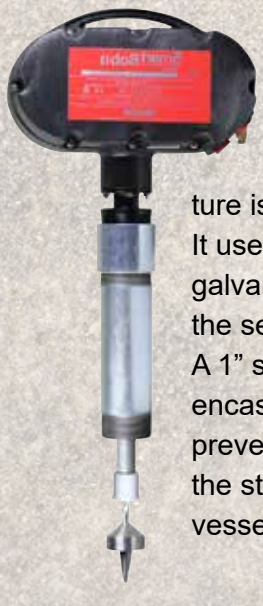
Submersed Solids

Measure solids settled at the bottom of a tank using the SmartBob SS instead of a sight tube. Often used in brine tanks, it comes equipped with corrosive-resistant stainless-steel cable, a 3” CPVC pipe extension, and Suredrop cap to keep unwanted material out of the standpipe.

MultiBob

Designed for large diameter vessels, the SmartBob MB system uses two to 32 SmartBob sensors mounted on a single vessel.

Binventory software reports measurements for each sensor, calculates an average level, and estimates a percentage full for the entire bin.

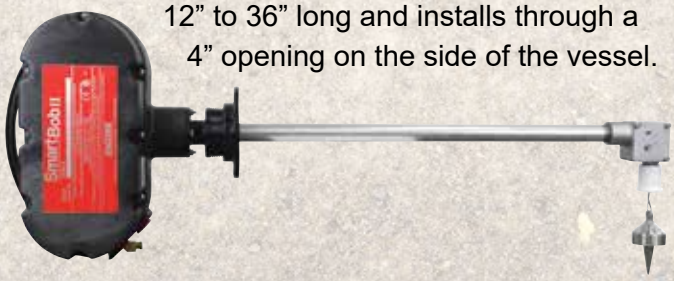


High Temperatures

The SmartBob HT is used where the process temperature is between 240°F and 500°F. It uses a 12” long, 3” diameter galvanized standoff pipe to distance the sensor from the heat source. A 1” stainless steel pipe extension encases a Teflon cable guide to prevent the probe from entering the standpipe and level with the vessel top.

Side Mounting

The SmartBob HM mounts horizontally. It is used when it is not possible to mount the sensor on top of the bin. This modification includes a rigid extension that is custom-made in lengths from 12” to 36” long and installs through a 4” opening on the side of the vessel.



Instant Data Access

BinView

BinView is a cloud-based software-as-a-service that allows for inventory monitoring from a phone, tablet, or PC. It is compatible with SmartBob and other sensors with a 4 to 20 mA analog output or Modbus RTU. It is scalable to handle multiple vessels and locations. BinView offers real-time monitoring and automated alerts wherever there is internet service on premises or away from the plant.

Binventory

Binventory management software installs on a local area network. It is used to manage level data for up to 255 vessels at one or multiple sites. It is compatible with SmartBobs and other sensors using Modbus RTU protocol. Inventory data is updated continuously as measurements are taken. High and low-level alerts are automatically sent via email or text. Levels are displayed graphically for one or multiple vessels. Details for each vessel and historical reports can reviewed on the software, emailed, or exported.

C-100 Console

This compact NEMA 4X console is centrally located for ground-level access to measurement data or at a truck loadout. Push-button functionality allows users to scroll through level data for up to 120 vessels. Measurements are displayed as distance to material, height of material, and percentage full. Estimated volume can be converted to feet, cubic feet, US gallons, bushels, or metric tons. Settings and last measurements are stored in a non-volatile memory in the case of power loss.

C-50 Console

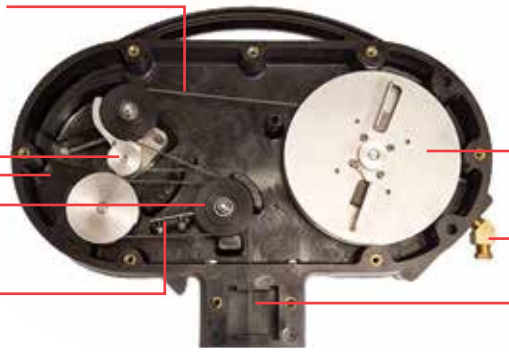
An analog expansion console is added when the C-100 is used for networked communications. Each C-50 can hold up to six cards, with each card supporting up to four 4-20 mA outputs. Up to five expansion consoles can be used in a daisy-chained network to accommodate up to 120 SmartBobs.

Smart Design

Two-Compartment Design

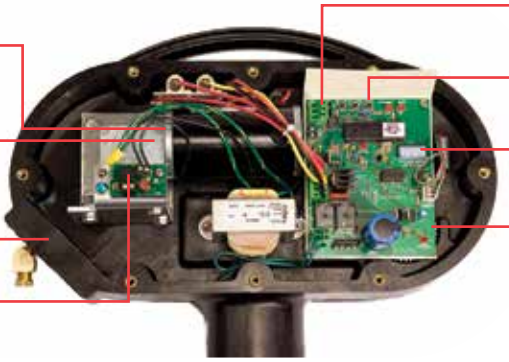
Unique to SmartBob are dual compartments that separate the mechanical and electronic components. To extend service life, the electronics compartment is fully sealed to protect the sensor from dust, debris, and condensation. Mechanical components including the cable and pulley system are housed separately and protected by a wiper that cleans the cable each time it retracts. The housing is Class II rated for hazardous locations.

Mechanical features



- Select from nylon or Teflon®-jacketed, bare stainless steel, or FDA-approved cable
- Idler arm brake keeps probe from sliding down the angle of repose in active vessels
- Captive pulley system prevents cable from jumping off pulleys
- Sealed bearings for trouble-free operation
- Pulley channel scraper keeps the pulley channel free of debris
- Cable-leveling supply pulley ensures proper cable spooling
- Standard air purge connection for use in harsh environments
- Cable wiper wipes cable with each retraction to keep it clean

Electronic features



- Direct-drive reversible motor with electronic torque control for maximum pull strength
- Optional motor gearbox heater for optimal operation in cold climates
- Dual conduit entries
- 110/220 VAC power options
- Removeable wire terminals for easy installation
- Test button to remotely initiate a measurement
- Set a unique sensor address using a dip switch panel
- Protected optical encoder and sensor wheel

SureDrop

The SureDrop cable release system keeps the sensor probe from sticking due to material buildup or freezing. A Teflon® cap and ball seal the mechanical compartment from dust

while the unit is not taking a measurement. If the Teflon® caps sticks, the ball above it will strike the cap with the full weight of the sensor probe to dislodge it.

A Probe for Every Purpose

Heavy Spike

Made of stainless steel, the B1 is the most common probe. It is suitable for materials with a bulk density greater than 20 pounds per cubic foot. This heavy probe can drop through water to measure submersed solids. The B2 is the same probe made of 416 stainless steel that can be picked up by a magnet. Coated with Teflon,® the B14 resists sticky materials.

6” Inverted Cone

The B4 is a 6” hollow inverted cone made of stainless steel. It is suitable for liquids and very light solids or powders with a bulk density of at least 3 pounds per cubic foot. The Teflon®-coated B13 model is available for sticky materials.

Glass Spike

Commonly used in frac sand, the B11 glass spike is filled with sand and is used to eliminate the risk of metal being introduced into the production process.

Plastic Bottle

The 32 ounce “digestible” bottle can easily pass through a rotary valve or screw conveyor without damaging equipment. The B5 model comes filled with food-grade paraffin wax. The B6 is empty for filling in the field. The B12 is filled with wax and magnetic stainless-steel balls.

6” Sphere

The B9 is a round 6” sphere is made of stainless steel. It is used in liquids, slurries, and light powders. For sticky materials, the B13 is coated with Teflon.®

4” Inverted Cone

Made of stainless steel, the B3 is a weighted 4” inverted hollow cone. It is used in light solids and powders with a bulk density of more than 8 pounds per cubic foot.

SmartBob Accessories

Heater

The SmartBob can be configured with a motor gearbox heater and thermostat for climates where temperatures consistently fall below 32°F.

Cable

The C1 nylon-jacketed cable with a temperature range up to 250°F is most common. For temperatures up to 500°F, the C2 Teflon®-jacketed cable is used. The C3 bare cable is used in extreme temperatures up to 1000°. For food operations, the C5 is an FDA-approved nylon-jacketed cable.

Extensions

A pipe extension option keeps the probe flush with the vessel top and prevents the probe from being pulled up into a standpipe. It acts as a bushing to protect the cable from fraying. Extensions come in custom lengths of 4 inches to 20 feet made of galvanized, stainless steel, or CPVC.

Mounting Plates

The 3” NPT mounting plates are made of powder-coated carbon steel. They come in 0°, 5°, 10°, 15°, 20°, 24°, 30°, 35° and 40° angles to accommodate flat or slanted roofs.

Simplify installation and reduce wiring costs using wireless data transmitters. A point-to-point network wireless solution eliminates running RS-485 cable from the control source on the ground to the first SmartBob II sensor in a single group of vessels. A multi-point solution eliminates running RS-485 cable from the control source to the first SmartBob II sensor in multiple groups of vessels.

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