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BINMASTER

**3D LEVEL
Scanner**

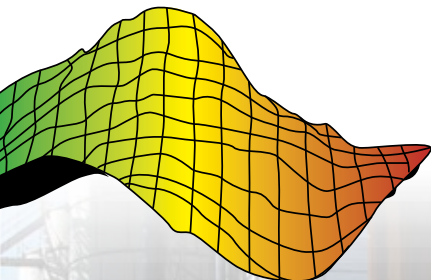
Multiple-Point Measurement

Mapping material delivers highly-accurate 3D data

See bulk material in 3D with the Level Scanner. It measures topography in silos, bins, and bunkers while mapping multiple points on material surface. A 3D image of material indicates buildup, cone up or down conditions. 3DVision software accounts for irregular material surfaces when calculating volume.

The 3D Level Scanner's acoustics-based technology penetrates dust ensuring reliable measurements. This non-contact technology accurately measures solids and powders, including low dielectric materials.

And you can get it only from BinMaster.





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3D Level Scanning

How 3D Works

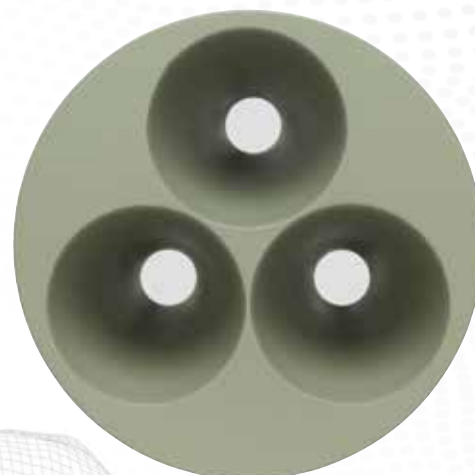
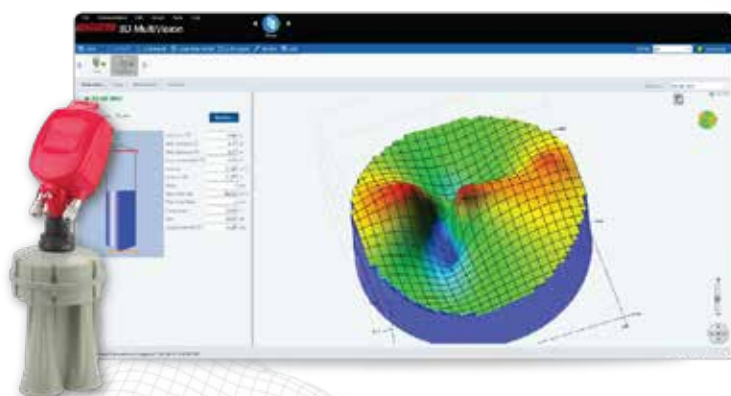
The 3D Level Scanner uses acoustics-based transducers to send very low frequency sound waves to the material surface. The sensor receives echoes back from multiple points on the surface which are converted to distance measurements.

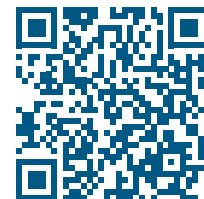
Advanced algorithms in the software assign each measurement an XYZ coordinate that is mapped into a 3D image. The software generates a graphical representation of the material topography in the bin. Surface variations are accounted for in volume calculations.



What Makes 3D Unique?

- Measures multiple points on the material surface
- Generates a 3D image of the material topography
- Volume accuracy surpasses any single-point device
- Reports minimum, maximum, and average distances
- Detects cone up or down conditions
- Sees sidewall buildup that could cause structural damage
- Measures topography in segmented silos
- Accurate volume in large bins using multiple scanners





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Industries & Applications

3D Measures Many Industries

The most accurate bulk measurement device holds a proven track record of delivering for multiple industries and applications.



Grain, Seed & Feed Corn, soybeans, wheat, rice, milo used in human and animal food production.



Chemical Processing Materials used in the making of paints, fertilizers, or detergents



Pulp, Paper & Wood Pellets, biomass, wood chips, or sawdust used in making paper, furniture, or biofuels.



Mining & Minerals Fine powders such as bauxite, bentonite, alumina, potash, talc, or calcium carbonate.



Ethanol & Bioenergy Accurate volume for corn storage and measuring dried distiller's grains.



Plastic Manufacturing Resins of all types including pellets, flakes, and powders, or low-dielectric materials.



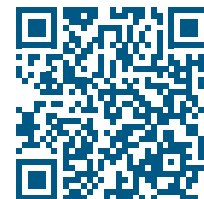
Cement & Concrete Measuring limestone, aggregates, clinker, and finished cement.



Food or Beverage Processing Non-contact measurement of ingredients like flour, salt, sugar, or cocoa.



Construction Materials Silos containing roofing granules and gypsum for making drywall.



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3D Makes a Difference

BinMaster 3D Level Sensors measure multiple points on a material surface. It generates a 3D image of material topography. 3D's volume accuracy surpasses any single-point device. It reports minimum, maximum, and average distances. No other technology displays cone up or down conditions. Visualizing conditions like sidewall buildup could cause structural damage. The flexible sensors work in segmented silos and offer accurate volume in very large bins using multiple scanners.



Dust Penetrating

Reliable operation and level measurement in suspended dust.



Multiple Measurements

The only level sensor to detect surface variations.



Volume Accuracy

Considers irregular material topography in calculating volume.



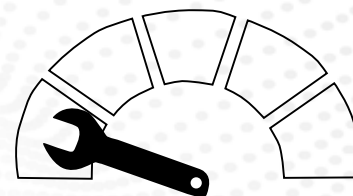
Non-Contact

No risk of contamination or interference with equipment inside the bin.



Detects Silo Buildup

Detects and alerts to excessive piling that could stress silo walls.

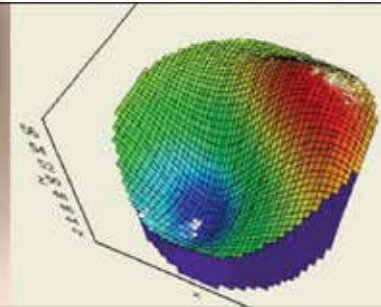
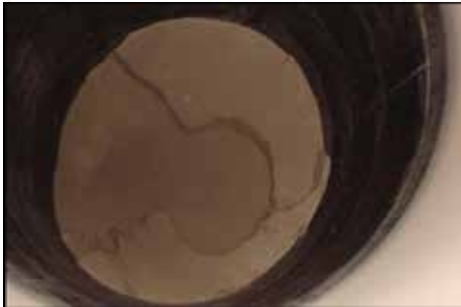


Low Maintenance

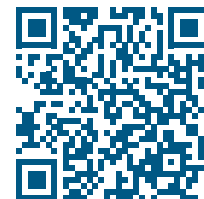
No air purge needed for self-cleaning transducers that resist dusty buildup.



Sensors, coated with dust, have self-cleaning properties to keep transducers clean and functional.



3D Level Sensors detect irregular topography and reflects it in a 3D image.



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3D Models

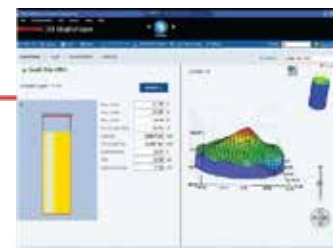


M Maps & Measures

The M model takes measurements within in a 70° beam angle. It reports the highest, lowest, and average level. 3DVision software provides highly accurate level and volume data.

MV Adds 3D Image

The MV has all the capabilities of the M model, but also generates a 3D representation of the material surface. Plants that work with materials that bridge, rat hole, or build up along bin walls may prefer to add 3D imagery.



MVL Measures Big Bins

The MVL provides volume accuracy in large diameter bins. Multiple scanners are mounted in strategic locations to account for surface variations across the material surface. The software synchronizes the level data from all sensors to create a single 3D image and calculate bin volume.

S for Average Volume

The S model determines the average volume of stored materials based on a 30° beam angle. It is used to measure materials in silos up to 14' diameter and 200' tall.



RL Single-Point Measurement

The RL model measures in a 15° beam angle and reports a single distance. It excels in harsh, high dust environments and problematic low dielectric materials. It provides highly reliable level data and is often used in narrow silos or silos with structure.

HT High Temperature Applications

With an operating temperature up to 356°F (180°C), the HT model of the 3D Level Scanner accommodates high temperatures often caused by material which is heated during processing and is conveyed to storage silos and bins. This model is ideal for industries that deal with dust, high humidity, and massive silos where material surfaces are uneven and difficult to measure. This is a great scanner if you store and measure clinker, alumina oxide, silica sand, fly ash, frac sand, and more.





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3D Use Guide

What's the Best Model for my Application?

Model	M	MV	MVL	S	RL
Bin Height	Up to 200' tall	Up to 200' tall	Up to 200' tall	Up to 200' tall	Up to 200' tall
Bin Diameter	10' diameter is the minimum	10' diameter is the minimum	10' diameter is the minimum	10' diameter is the minimum	10' diameter is the minimum
Beam Angle	70°	70°	70°	30°	15°
3D Visualization	No	Yes	Yes	No	No
Output Data	Volume plus minimum, maximum, and average distance	3D visualization, volume plus minimum, maximum, and average distance	Volume plus minimum, maximum, and average distance, 3D visualization.	Average volume	Single distance
Best Application	Wide bins, taller than they are wide	Wide bins, taller than they are wide	Very wide bins with multiple filling or discharge points	Narrow silos up to 14' in diameter	Narrow silos or basic level indication

The M and MV can be used on larger diameter bins than specified, but with decreased accuracy since the beam angle will not span the entire surface. The MVL is used on large diameter bins to increase volume accuracy.

View Multiple Bins on One Screen



Installed on a local network, easy-to-use MultiVision software gives plants the ability to view multiple bins in a single window. Automated high or low-level alerts simplify inventory oversight. With one click, users can zoom into detailed information and the 3D profile for a single bin.

Why MultiVision?

- All users view the same inventory data
- Inventory is updated automatically
- Each user can customize their screen
- Compatible with all 3DLevelScanner models
- Reporting for purchasing, finance, and logistics





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Mounting Plates & Accessories

Flat Mounting Flanges

0° Mounting Flange fits in an opening of 8-1/2" or larger opening in the bin roof. To secure and stabilize the sensor on flat bin roofs, a 0° mounting flange is used to suspend the transducer into the bin while keeping the sensor head outside of bin for programming access.



Angled Mounting Flanges

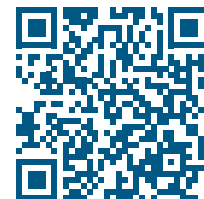
Up to 30° Mounting Flanges are essential the 3D Level Scanner for vertical mounting. To ensure the sensor is mounted properly on angled bin roofs, BinMaster offers mounting flanges for 5°, 10°, 15°, 20° and 30° angles.



Neck Extensions

3D Level Scanner optional neck extensions are used to lower the transducer assembly below structure or obstacles that may interfere with operation. Neck extensions also are used for mounting on thick cement bin roofs or on a raised socket where distancing the head from the transducer is necessary. Neck extensions come in 1', 2', 4', 6', and 10' lengths.





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3D Measurement Characteristics

Measurement Characteristics

Frequency	2 to 10 kHz
Beam Angle	15 to 70 degrees

Materials, Non-Wetted Parts

Housing	Painted aluminum die casting
Inspection Window in Housing Cover	Polycarbonate
Antenna	Painted aluminum die casting
Flange	Steel

Weight

12.3 lb (5.6 kg)	
Output Variable	
Output Signal	4-20 mA/HART, Modbus, RS-485
Resolution	10 μ A
Fault Signal	Current output unchanged, 22 mA > 3.6 mA (adjustable)
Current Limitation	22 mA

Load

4-wire sensor	Max 50 Ohm
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Ambient Conditions

Ambient, storage and transport temp	-40° to +185°F (-40° to 85°C) Standard, -40° to +356°F (-40° to 180°C) High Temperature
Relative humidity	10% to 85%
Altitude	16,400 ft (5,000 m)

Process Conditions

Vessel Pressure	-0.2 to 3 bar (-2.9 to 41.5 psi or -20 to 100 kPa)
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Process Temperature

Measured on Process Fitting	-40° to +185°F (-40° to 85°C) Standard, -40° to +356°F (-40° to 180°C) High Temperature
Vibration Resistance	Mechanical vibrations with 2 g and 5 to 200 Hz

Electromechanical Data

Cable Entry/Plug	1 x cable entry M20x1.5 (cable- \varnothing 8 to 12mm) 1 x blind stopper M20x1.5 OR 2 x cable entry 1/2 NPT
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Display Panel

LCD	1 x cable entry M20x1.5 (cable- \varnothing 8 to 12mm)
Adjustment Elements	1 x blind stopper M20x1.5
Protection	IP67

Power Supply-4 wire instrument (active)

Supply Voltage	20 to 32 VDC
Power Consumption	Max 1.5W @ 24 VDC

Electrical Protective Measures

Protection	IP67 according to IEC 60529
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Approvals

Hazardous Locations	CFM Intrinsically Safe Class I, II, Division I, Groups C, D, E, F, G (US & Canada) IECEx/
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CE

EMC	
Emission	EN 61326:1997 (Class B)
Susceptibility	IEC / EN 61326:1997 + A1:1998 + A2:2001 + A3:2003
NSR (73/23/EWG)	EN 61010-1:2001

FCC

Conformity	To part 15 of the FCC regulations FCC 47 CFR part 15:2007, subpart B, class A
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