

Bin Fill Detection Solutions



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Challenges of Bin Fill Detection

Variable Material Dimensions

Materials that vary in size and shape can lead to inconsistent bin filling. Overflowing, underfilled, and unevenly filled bins reduce system efficiency and can lead to product loss or downtime.

Dynamic Bin Sizes and Locations

Operations that use multiple bin sizes or move bins between different stations must adapt to these variations without manual recalibration of their bin monitoring system.

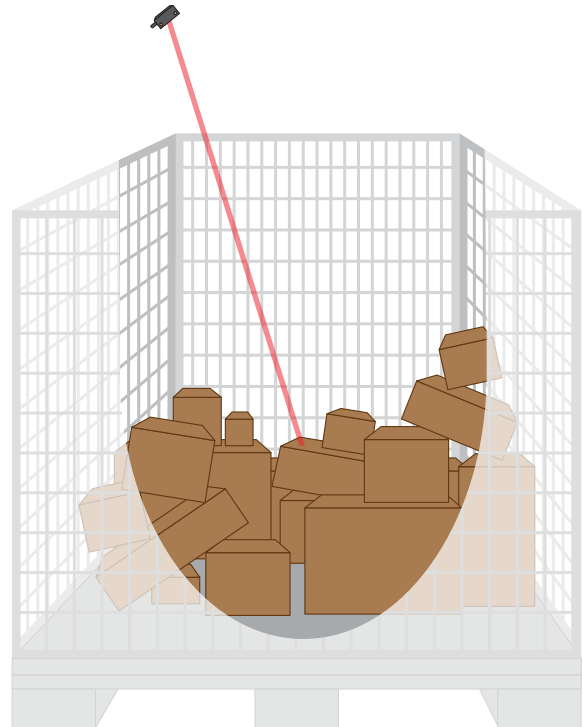
Integration with Existing Systems

Bin fill solutions must integrate smoothly with upstream equipment (e.g., conveyors, feeders) and downstream processes (e.g., packing or palletizing). Ensuring compatibility with legacy systems is often a hurdle.

Cycle Time and Throughput Requirements

High-throughput environments require efficient operation and precise coordination at every stage. Inaccurate bin fill measurement can cause delays and create disruptive bottlenecks.

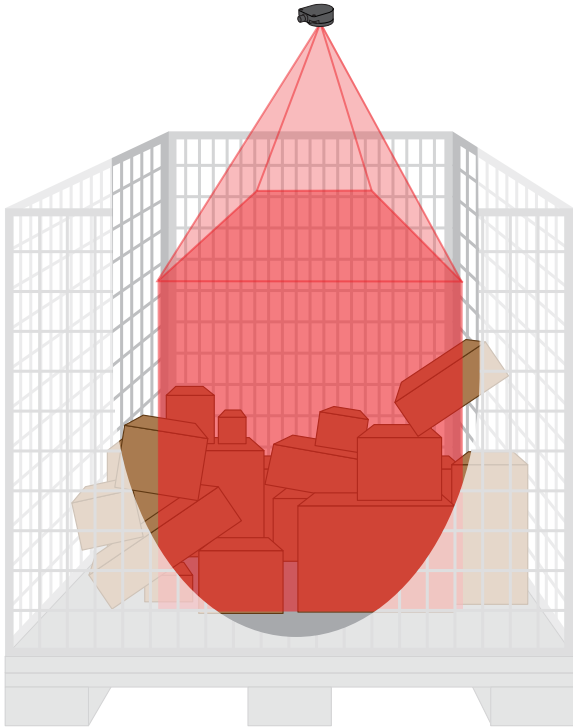
Single-Point Measurement



Q20-2 Compact Sensor

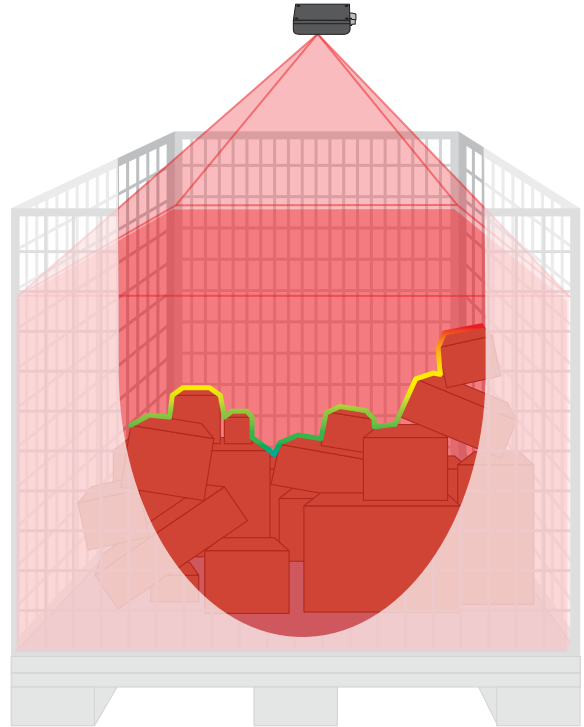
Monitor fill level using a single beam for a cost-efficient solution where full surface coverage is not essential.

3D Measurement



K50Z Multipoint Sensor

Simultaneously monitor average fill level and peak height conditions across a large area to prevent overfill, using two independently configurable outputs and up to 64 measurement points over the entire $45^\circ \times 45^\circ$ field of view.



ZMX 3D Measurement Sensor

Closely monitor fill level and peak height conditions across a larger area using over 56,000 measurement points over the entire $60^\circ \times 45^\circ$ field of view, while changing configuration on the fly and accessing measurement data through industrial protocols.

Choosing a Banner Sensor



Q20-2



K50Z

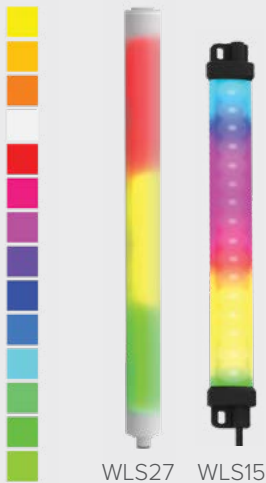


ZMX

Minimum Range (mm)	20	20	200
Maximum Range (mm)	3,000	2,000	2,500
Beam Angle	–	45° x 45°	60° x 45°
Resolution	–	8 x 8	272 x 208
IP Rating	IP67	IP67	IP65

I/O Type

Discrete Output	•	•	•
Pulse Pro I/O	•	•	•
IO-Link	•	•	
Ethernet IP			•
Modbus TCP/IP			•



Visually Indicate Bin Fill without a Controller

Pulse Pro I/O uses Pulse Frequency Modulation (PFM) to digitally represent distance measurement values from a discrete sensor. Banner Engineering uses this technology to simplify the connection and communication between a sensor and an indicator, providing an immediate visual representation of a distance measurement without the need for a controller. Installing a Pulse Pro I/O-enabled sensor and indicator in bin fill detection applications provides high-visibility detection and distance indication that enhances efficiency.

