BIN FULL ALERT

Bin*MAX* Product Sales Information

The Need

- Would like to know when bin is getting full
- Want to know when bin is full - before auger gets plugged / damaged or material spills
- Want to fill bin as full as possible to maximize bin capacity so need minimum amount of bins - but leave room for air circulation
- Don't want to climb bin - safety concerns
- Reasonable / affordable cost system
- Easy to install - for one person

What is Bin*MAX* and how does it work?

Components

- *Transmitter Socket – Sensor Cable Assembly* – consists of two material level sensors molded onto a cable and a housing that is mounted on the bin.

- *Transmitter* – a portable device that is inserted into the Transmitter Socket that monitors the sensors and broadcasts a radio frequency signal to the Pager.

- *Pager* – a portable device that is carried by the user that monitors the radio frequency signal sent by the Transmitter.

Features

- Installation
  - Innovative, compact sensor design is easy to install. Only a 7/16" diameter hole is required for each sensor. #8 self drilling / tapping screws hold sensor, cable and Transmitter Socket housing in place
  - All installation is on outside of bin wall. No need to go inside bin.

- Functional
  - The Transmitter is activated by inserting into the Transmitter Socket, which is mounted on the bin. The green light will flash slowly when the Transmitter is activated and functioning correctly.
  - The Pager is turned on and off by pressing and holding the ON/OFF – CANCEL button on the Pager for four seconds. The green light will flash slowly when the Pager is activated and functioning correctly.

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- When either Sensor senses material the corresponding colored indicator light on the Transmitter comes on and the Transmitter sends a signal to the Pager that indicates which sensor has sensed material. The corresponding colored indicator light on the Pager comes on and the Pager beeps and vibrates until the CANCEL button on the Pager is pressed briefly.
- The lights on the Transmitter and Pager indicate the following:
  RED - Flashing - Material at upper sensor.
  YELLOW - Flashing - Material at lower sensor.
  GREEN - Slow flash - All OK / Fast flash - Battery low / Solid - No communication with Transmitter or Pager / No light - Dead battery.
- If the sensors are installed as per the instructions on the Transmitter Socket – Sensor Cable package there will be approximately 300 bushels of bin capacity between the lower and the upper sensor and, approximately 100 bushels between the upper sensor and the bin roof, plus an air circulation gap allowance. Note - Due to different material filling characteristics and bin roof pitches these bushel volume estimates may vary by 10 - 20%.
- The Transmitter and Pager check for a change in status every 30 seconds (a battery life extending feature), so there may be a short delay from the time the material is sensed to the time the Pager alarm is sounded. This delay also prevents the sensor from being tripped by chaff or material bouncing off the sensor. The sensor will only trip when it is completely covered.
- Range – 100 yards (100 meters)
- Transmitter & Pager Battery – 9 volt

- Safety
  - Communication interruption – the Pager checks for a Transmitter communication signal every 30 seconds. If it does not receive a signal the green light will stop flashing and remain on constantly and the Pager will beep and vibrate.

  - Low battery – If the battery in either the Transmitter or Pager drop below a safe operating voltage the green light will flash rapidly.

Key Bin*MAX* Benefits

- *Safer* – No need to climb bin to know when it is getting full.
- *Easier* – Pager beeps and vibrates to let you know the bin is full, so you don't have to watch and wonder.
- *Save Money* – A cost effective / affordable alarm that lets you fill bins fuller without risking auger damage or spillage.

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Other Bin Level Sensing Products

LevAlert

- Operation - When grain reaches LevAlert it pushes against a rubber activator mounted on the inside of the bin which causes an indicator on the outside of the bin to change color.
- Cost – Approximately $100.00 each without installation.
- Installation - Can be installed from outside of bin through a 1 1/8" diameter hole.
- Comparison to BinMAX
    - Must be looking at and able to see to know grain level.
    - Can be difficult to see if it is bright, dark or used on a tall bin.
    - Cost of two LevAlerts is more cost than BinMAX (which includes two level sensors).
    - 1 1/8" hole for installation is significantly more difficult to make than 7/16" hole required for BinMAX sensor.

Saf-T-Fil

- Operation - Saf-T-Fil utilizes a "float" which is installed inside the roof of the bin to sense the grain level. When the grain reaches the float, it pushes it up and an indicator which is attached to the float protrudes through the roof of the bin.
- Cost – approximately $40.00 without installation.
- Installation – Requires two people – one on inside of bin roof and one on outside of bin roof. Two holes must be drilled in bin roof. Float is placed on inside of roof and secured from outside of bin roof.
- Comparison to BinMAX
    - Must be looking at and able to see to know grain level.
    - Can be difficult to see if it bright, dark or used on a tall bin.
    - Can only use one per bin, so only starts to sense when bin is almost full.
    - Cost is similar or greater if compare to a two sensor system (which BinMAX has) and installation cost is considered.
    - Installation is significantly more difficult and dangerous than BinMAX and requires two people.

Sight glass

- Operation – The sight glass is installed on the wall of the bin. The grain level is indicated when it becomes visible in the sight glass.
- Cost - $50 -100 (or more) without installation.
- Installation – May require two people. One on inside of bin wall and one on outside. Requires 2" – 4" diameter hole.
- BinMAX comparison
    - Must be looking at and able to see to know grain level.
    - Can be difficult to see if it is bright, dark or used on a tall bin.
    - Cost with installation of two sight glasses is more cost than BinMAX (which includes two level sensors).
    - 3" – 4" hole for installation is significantly more difficult to make than 7/16" hole required for BinMAX sensor.

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Pressure & Proximity Based Sensors

- Operation – A sensor is mounted on or through the wall of the bin which senses the level of the grain and closes an electrical contact or sends a signal to some type of electrical based indicator unit.
- Cost – $70.00 or more per sensor without installation plus requires some type of indicator and wiring.
- Installation – May require two people and, possibly, a certified electrician. Some types of sensors mount inside the bin and others through a 1” or larger diameter hole. This type of level indicator is usually wired (using conduit) into a centralized indicator panel.
- Comparison to BinMAX
    - Must be looking at central panel to know bin level. Some systems may have an audible alarm.
    - Cost without installation for two sensors with installation and central indicator is significantly more than BinMAX.

Bin Buddy

- Operation - Mounts on end of auger spout. When grain starts to back up in end of spout an alarm is sounded.
- Cost – approximately $500.00
- Installation – Replaces auger spout. Alarm is powered by 12 volt connection to tractor.
- Comparison to BinMAX
    - Alarm only sounds when grain is at end of auger spout. BinMAX provides a “getting full” warning.
    - Only indicates level of grain, not whether bin is full or not. Level alarm is dependent on spout height in bin so doesn’t guarantee bin is filled to capacity or that an air circulation gap is left between the grain and the roof.
    - Cost is approximately same as installing BinMAX on two bins.

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Why Bin*MAX* was developed

We looked at all the grain level sensing products on the market and came up with a product that answered the problems.

Problem #1 - Difficult to install. Large holes are difficult to make on bin wall or roof. Some products require two people to install - one on the inside of the bin and one on the outside. The pressure and proximity based sensing systems, must be hardwired and some require explosion proof installation, which requires a certified electrician.

Solution #1 - BinMAX is easy to install. Sensors only require a 7/16" diameter hole. The sensors, sensor cable and Transmitter Socket are held in place using #8 self drilling / tapping screws. Only one person is required to install the product.

Problem #2 - Visual indicator based systems must be watched to know when the grain is at the level of the sensor. The indicator can be difficult to see if it is bright, dark or used on a tall bin.

Solution #2 - BinMAX uses a Pager which is worn by the user. As long as the user is within 100 yards (100 meters) of the bin the Pager will beep and vibrate when the bin is getting full and when it is full. Different colored lights on the Transmitter and Pager indicate when the lower sensor is covered, when the upper sensor is covered and the operational status of the system components.

Problem #3 - Users like to have a warning that the bin is getting full, not just when it is full. Unless a two sensor based system is installed, you have no warning that bin is getting full. A two sensor system is not an option with some products and adds significant cost to other products.

Solution #3 - BinMAX comes standard with two sensors. One sensor to indicate when the bin is approximately 300 bushels from full (if installed as per the installation instructions) and one sensor to indicate when the bin is full (with a gap left for air circulation).

Problem #4 - Needs to be reasonable cost / affordable. Generally speaking, with bin level indicators, you get what you pay for. For $50.00 (plus a two person installation) per bin you can get an indicator that sticks through the roof when the bin is full; for hundreds of dollars per bin you can have multiple sensors wired into an indicator panel with an alarm.

Solution #4 - BinMAX costs approximately $160.00 to equip a bin with two sensors and a Transmitter Socket. The cost of the Transmitter / Pager kit is approximately $400.00 (one Transmitter / Pager can be used for several bins. The average cost per bin to equip five bins is $240.00 per bin. The cost to equip ten bins is $200.00 per bin.

An AGRITRONICS Product

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There are two key cost saving features of the BinMAX: 1) The sensors are a unique design that makes them relatively inexpensive to manufacture and; 2) The Transmitter is moved from bin to bin, which eliminates costly hardware that is left on the bin all the time.

The pressure and proximity based sensing systems, must be hardwired and may require explosion proof installation, which is costly. The BinMAX Transmitter and Pager operate off a self contained 9 volt battery.

Bin*MAX* Construction

- The sensor probe is a corrosion resistant metal alloy. Sensor housings and cables are manufactured from molded urethane, which is very durable. All electrical connections are over-molded, which provides a durable, weather-tight seal. The Transmitter Socket is molded from polyethylene which is also a very durable material. The expected life is 15 – 20 years.
- The Transmitter and Pager or encased in molded plastic housings and stored in a foam lined hard shell plastic case.

Bin*MAX* Material Sensing

The BinMAX sensors have been tested for their ability to sense cereal grains, oil seeds, legumes and fertilizer. For materials other than these we recommend that the user test a sample of the material to ensure that the sensors can sense the material.

Bin*MAX* Considerations & Limitations

- The BinMAX bin level alert is intended for use on bins which are filled at a rate of at least 2000 bushels per hour, which is the approximate capacity of a 7" diameter auger running at full speed. With slower fill rates the BinMAX may not properly sense the material level.
- The BinMAX is not intended for use at temperatures below 5 degrees F. / -15 degrees C.
- The BinMAX bin sensors can only sense the grain when the bin is being filled, not when the bin is being emptied.
- If the BinMAX Transmitter is unplugged from the socket after one or both sensors are covered with material, and then plugged in again, it will not sense the material covering the sensor, or sensors, again (until the sensor is uncovered and the Transmitter is plugged in).

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Bin*MAX* Installation Considerations

General Safety

- Use an appropriate, safe, means of elevating the person to the proper height to drill the holes for the sensors and to drive in the self tapping screws for the sensors and cable retainer clamps.
- Use a sharp drill bit in a fully charged cordless drill or a correctly grounded corded drill.

Sensor placement and installation

Placement
When mounting in smaller diameter bins or bins with a distributor, please note that the sensors must be mounted on an area of the bin wall where the grain will not discharge directly on to the sensor(s).
Before you mount the sensors, consider where you want to mount the Transmitter Socket (see below) and the length of cable.

The placement of the sensors will depend on the diameter of the bin and the roof slope, which can be obtained from the bin manufacturer. Please refer to the chart on the Transmitter Socket / Sensor Cable package for sensor (hole) locations:

The sensor placement should also be adjusted to allow for the bin wall corrugations. For bins with narrow wall corrugations, the sensors should be centered on the part of the corrugation that sticks out. For bins with large wall corrugations, ensure that the sensor is at least 1" away from the corner of the corrugation and is located on an out facing corrugation.

Sensor Installation
Drill a 7/16" diameter hole for each sensor using a self piloting drill bit or a pilot hole. Place the sensor probe fully in the hole and secure with a #8 x 3/4" self drilling-tapping screw. The self drilling – tapping screws will go in easier if a pilot hole is drilled. Repeat for both sensors.

IMPORTANT: 1) BE CAREFUL WHEN INSERTING THE SENSOR PROBE INTO THE HOLE THAT THE INSULATION AROUND THE BASE OF THE PROBE IS NOT DAMAGED, AS THE PROBE MUST BE INSULATED FROM THE BIN WALL TO WORK; 2) THE SCREWS THAT HOLD THE SENSORS TO THE BIN WALL SHOULD ONLY BE SNUG. DO NOT OVER-TIGHTEN OR THE SENSOR COULD BE DAMAGED.

Secure the Sensor Cable with the retainer clamps and #8 x 3/4" self drilling-tapping screws approximately every 24". Make sure that there is no slack in the cable between the clamps, so that it will not get caught on anything or move in the wind.

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Transmitter Socket placement and installation

Find a convenient location, approximately 5' above the ground to locate the Transmitter Socket. If there is any excess Sensor Cable, coil in the back of the Transmitter Socket housing. Place in the location on the bin where the housing will be mounted and secure in place using the #8 x 3/4" self drilling-tapping screws in the 3/4" wide recessed area in the middle of the Transmitter Socket.

Verify Sensors are working correctly

Once the Sensors and Transmitter Socket are installed, insert the Transmitter in the Transmitter Socket and turn on the Pager; go inside the bin and first touch the lower sensor, and then the upper sensor. [An alternative to touching the sensors is to mount some steel wool on a pole and touch the sensors] The Pager should respond accordingly.

Bin*MAX* Warranty – One year. Limited to product replacement. Product is returned to dealer for replacement.

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