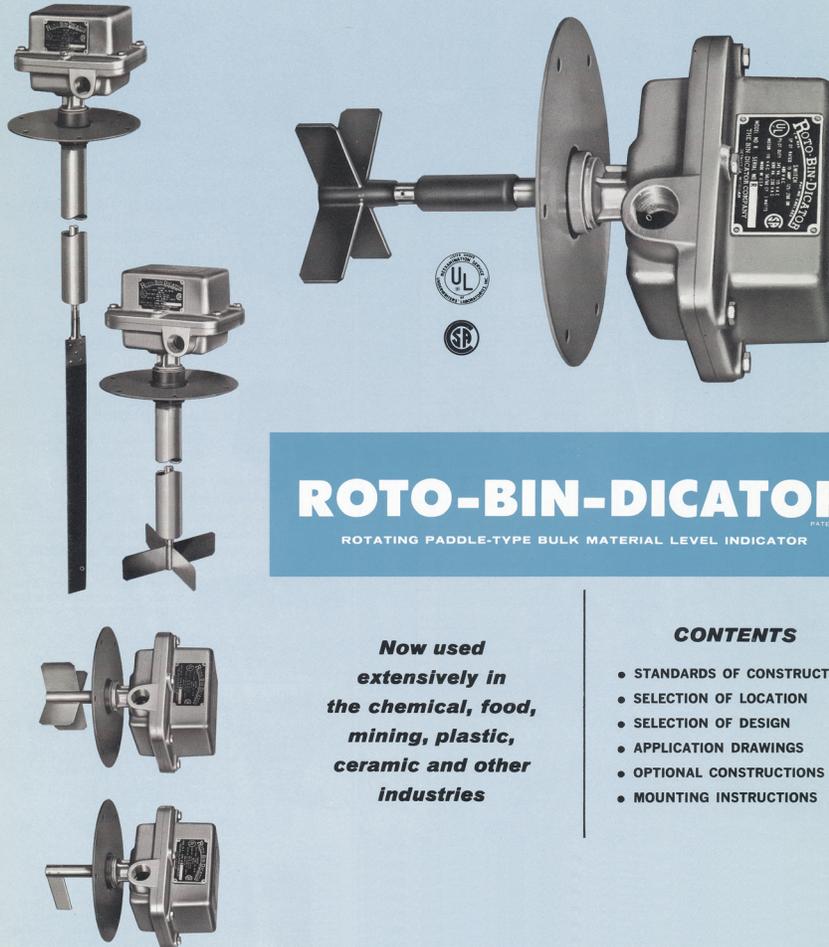


A GUIDE TO SAFE LEVEL CONTROL

Safe Level Control is best achieved by properly engineered use of reliable components, chief among which is the bulk material level indicator



ROTO-BIN-DICATOR®

ROTATING PADDLE-TYPE BULK MATERIAL LEVEL INDICATOR

Now used extensively in the chemical, food, mining, plastic, ceramic and other industries

CONTENTS

- STANDARDS OF CONSTRUCTION
- SELECTION OF LOCATION
- SELECTION OF DESIGN
- APPLICATION DRAWINGS
- OPTIONAL CONSTRUCTIONS
- MOUNTING INSTRUCTIONS

This catalog was published in 1964, nearly 30 years after Bindicator® began serving the industry.



THE ORIGINAL

Since 1936, Bindicator® has manufactured level devices to solve the toughest bulk material handling challenges. Bindicator has a long history and extensive experience in dry bulk level measurement with over one million level instruments at work every day around the world.

COMPLETE

Bindicator offers a full line of level measurement devices and accessories to make monitoring material as efficient and easy as possible.

SIMPLE

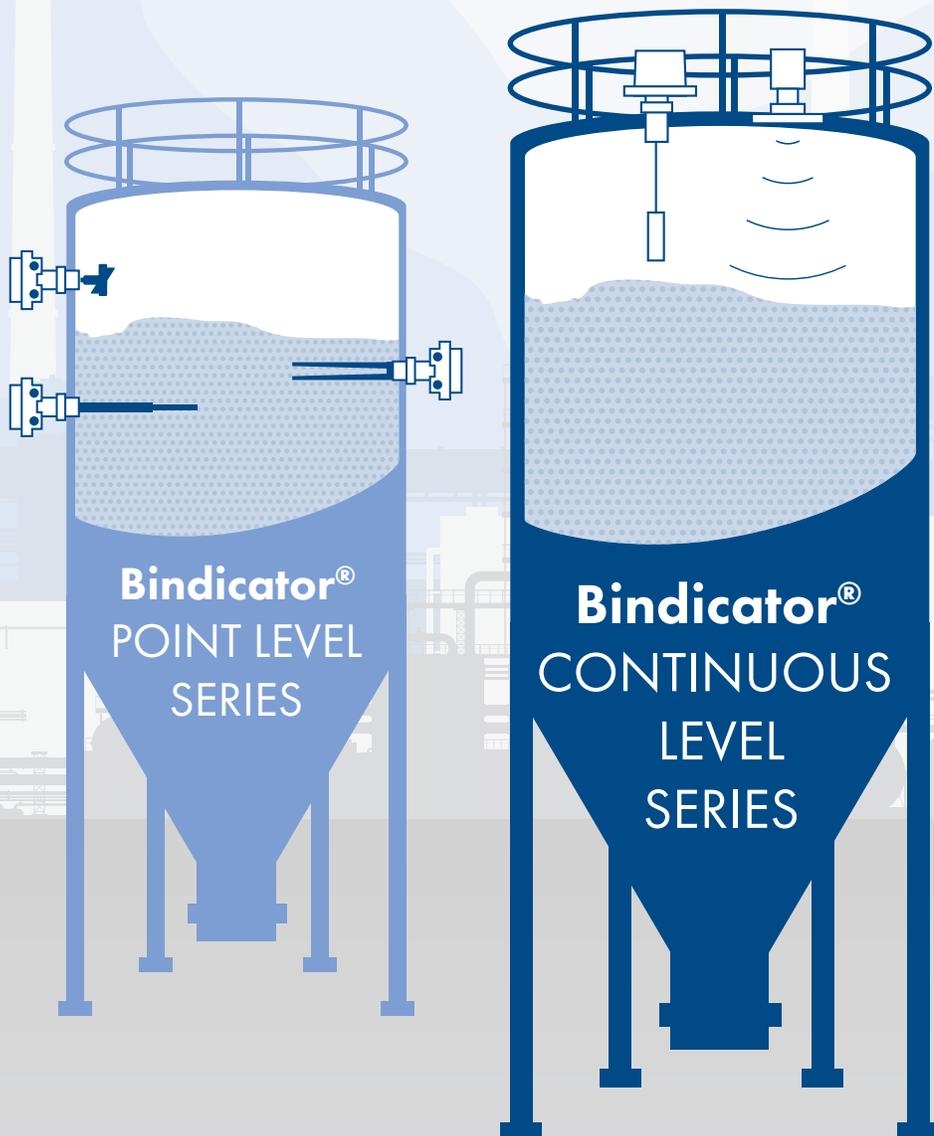
Bindicator, with a network of trained representatives in more than 40 countries worldwide, is committed to providing superior service and support to all of our customers.

RELIABLE

Bindicator has been providing quality bin level indicators to the dry bulk industry since 1936. Our commitment to investment in R&D will continue the legacy of Bindicator reliability as new products continue to launch.

BULK LEVEL MEASUREMENT

Bindicator® is a full service supplier of point and continuous level sensors for industrial applications. Since 1936, our bin level indicators have been preventing overflow spills, controlling surge bins, detecting plugged chutes and providing on/off control of pumps and conveyors in the dry bulk industry. Bindicator® products are designed and manufactured with the end user in mind, so installation and calibration will be straightforward and simple. Our level instruments are designed so that they can be customized with the options that customers need for the most challenging applications.



Roto-Bin-Dicator® PRO

ACTIVELY PROTECTING INVENTORY

The Roto-Bin-Dicator® PRO paddle wheel is unique in the bulk solid industry with its ability to

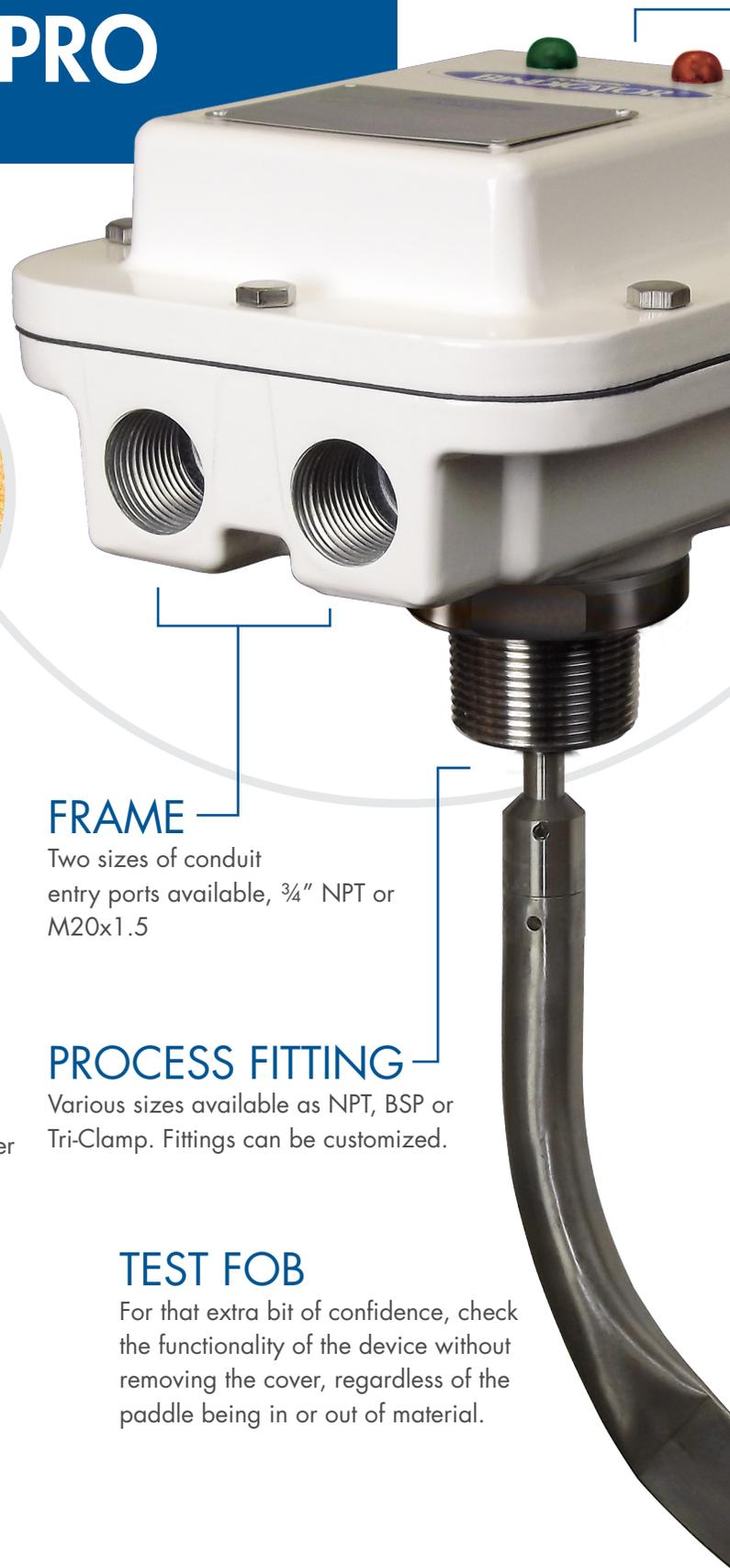
DETECT FAULTS WHILE THE PADDLE IS IN

MATERIAL. It is a true fail-safe device that is able to perform complete self-diagnostics in and out of material, compared to other devices that only provide diagnostics when the paddle is out of material. To truly know if your level device is working, regardless of whether or not the paddle is in material, the Roto-Bin-Dicator® PRO is the only choice.



Self-diagnostics are standard and not only detect faults, but **DIFFERENTIATE BETWEEN FAULTS.** By providing distinct flash codes, downtime is minimized and the Roto-Bin-Dicator PRO model provides an added level of confidence against costly overfills and outages. No other paddle wheel in the industry has this functionality.

Already a versatile product, the Roto-Bin-Dicator PRO meets the requirements of a **GREATER RANGE OF APPLICATIONS** with 3 sensitivity settings, a breadth of paddle choices and universal power. Sensitivity settings combined with different paddles allow the same unit to be used with a variety of materials. Universal input power and polarity detection allow for flexibility with different input voltages and prevent costly damage from miswiring.



FRAME

Two sizes of conduit entry ports available, 3/4" NPT or M20x1.5

PROCESS FITTING

Various sizes available as NPT, BSP or Tri-Clamp. Fittings can be customized.

TEST FOB

For that extra bit of confidence, check the functionality of the device without removing the cover, regardless of the paddle being in or out of material.

SELF-DIAGNOSTICS

Whether the paddle is in or out of material, PRO does a self-check for faults. If a fault is detected, PRO will differentiate and let you know which of the following has occurred:

- Supply Voltage Fault
- Motor Not Connected
- Motor Failure
- Gear train Failure
- Electronics Temperature Range
- Electronics Fault

GENUINE FAIL-SAFE

The PRO model provides an alarm relay that can be configured for high or low level fail-safe, and a separate auxiliary relay for self-diagnostics that operate when the paddle is in or out of material; giving you confidence that your system is functioning properly.

MOTOR PAUSE:

For applications where the material level seldom changes, motor function is suspended after prolonged periods where no change in material level has been detected to save power and extend the life of the unit. Motor pause is an optional setting.

SENSITIVITY SETTINGS

The motor torque can be adjusted +/- 30% to match materials of varying bulk densities.

TIME DELAY

Set when a delay in the activation and deactivation of the alarm relay is required. Four settings available, up to a 25 second delay.



Mounting Considerations

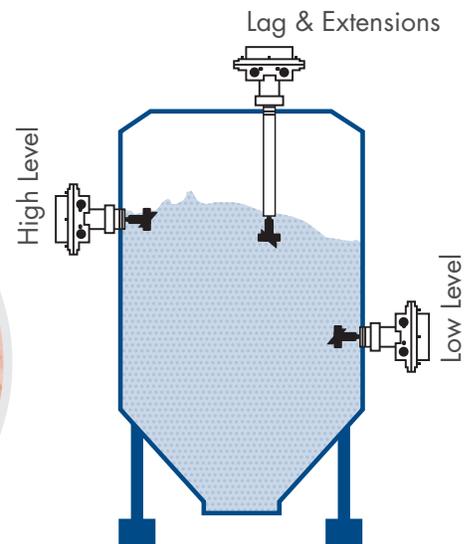
The Roto-Bin-Dicator® PRO can be installed in many different orientations and environments.

Horizontal or Vertical: Units can be positioned horizontally or vertically in a tank to better reach the level detection point. Multiple units can be installed in a single tank if various levels wish to be detected.

Mounting Plate: Due to the size of some of the paddles, a mounting plate may be required to attach the unit correctly to the tank. It may also be used to insert the PRO into a larger pre-existing opening in the tank.

Extension: Most often used with vertically mounted units, a pipe extension can be added to the paddle in order to position it further into the tank and reach the required point for level detection. For smaller materials that tend to pack into the hollow pipe, a lip seal can be incorporated to protect from clogging.

Lag: Used for high temperature applications, the distance between the housing and the process fitting is lengthened with pipe in order to move the electronics away from high process temperatures.



ROTO-BIN-DICATOR®

Rotary Paddle Level Switch

The Roto-Bin-Dicator® is the most universal of all level sensing technologies and is the most popular level switch used in dry bulk materials. The Roto-Bin-Dicator is a rotating paddle-type bulk material level sensor. It offers a wide variety of paddle options for unequalled application versatility. It is easy to install and requires no special tools or calibration.



Super Safe Roto-Bin-Dicator®

Easy to Install

- No calibration required
- Simple mechanical device
- Test in place with magnetic key FOB (SuperSafe versions)

Flexible

- Wide variety of paddle options
- Custom process fittings available
- Custom shaft extensions
- Mount in any orientation

Unique Design

- Few moving parts
- Motor heats cavity, reducing moisture build-up
- High and low level fail-safe protection
- Red and green lights indicate power and alarm status (SuperSafe versions)

Operating Principle

A mechanical motor turns the Roto-Bin-Dicator® paddle when bulk material is not present. When bulk material comes into contact with the paddle, the resistance to movement is sensed, causing the relay to change state. Unique to the Bindicator model, the motor continues to run when the paddle rotation stops, providing moisture and seize protection. The switch remains engaged until the paddle is free to turn again.

Multiple Configurations



Additional paddles and accessories available.

Quick Specs	Power Requirements	24/120/240 VAC, 24 VDC
	Fail-Safe Operation	Low and High depending on model
	Process Temperature	-40° to 200° F (-40° to 194° C) Standard Higher temps achieved with optional Extension
	Switch or Relay Output	SPDT up to 10 amps dependent on version
	Approvals	   

VRF® II SERIES

Variable Radio Frequency Level Switch

The VRF® II Series point level sensor detects dry bulk materials, liquids or slurries in a silo, bin or other vessel. The durability of the VRF II makes it well suited for challenging applications involving high temperature, high pressure or corrosive materials. The VRF II is also a highly sensitive device, making it ideal for detecting a wide range of materials including low dielectric fly ash or plastics.



Advanced VRF® II Series

Sensitivity and Control

- Adjustable sensitivity to detect a wide range of materials from grains to plastics
- Adjustable time delay
- Ignores non-conductive build-up on the probe
- Field selectable fail-safe

Flexible Design

- Universal Power: connect to AC or DC without adjustment
- Customized process fittings available
- Wide variety of probe options including cable probe and probe extensions
- Remote electronics, up to 100 ft (30 m)

Easy to Install and Calibrate

- Test in place and calibrate with magnetic key FOB
- Red and green lights indicate proper calibration and signal alarm
- Automatic calibration – no potentiometers involved

Operating Principle

The VRF® II continuously monitors the probe's impedance (capacitance, resistance and inductance) with respect to ground. When there is a change in the impedance, the digital signal processor changes the status of the output relay to indicate the presence or absence of material. Unique to Bindicator is the wide range of materials this technology can detect. Low dielectric materials such as fly ash and plastics are not a problem for this highly sensitive device.

Multiple Configurations



Quick Specs	Power Requirements	Universal 110-240 VAC, 50/60 Hz; 24-48 VDC
	Temperature	Electronics: -40° to 158° F (-40° to 70° C) Probe: -40° to 993° F (-40° to 534° C) depending on probe * Lagging and/or remote electronics available for higher temperature applications
	Output	DPDT 8A resistive @ 240 VAC or 30 VDC Auxiliary relay available
	Pressure Rating	Up to 150 psi (10 bar)
	Sensitivity	Materials with dielectric constants down to 1.2
	Remote Electronics Distance	Up to 100 ft (30 m)
	Approvals	    

PULSE POINT™ II SERIES

Vibrating Level Switch

Pulse Point™ II is designed for light weight solids such as sawdust, tobacco and dry cereals. The proven, highly sensitive technology and versatile design of Pulse Point II makes it the ideal solution for bulk level measurement in tanks and silos.



Advanced Pulse Point™ II

Flexible Design

- Universal Power: connect to AC or DC without adjustment
- Customized process fittings available
- Extended assemblies to 15 feet
- Remote electronics available

Versatile

- Liquid/solid interface for detection of solids in liquid
- Adjustable time delay
- Adjustable sensitivity settings detect material densities as low as 0.5 lbs/ft³ (8 kg/m³)
- Build-up detection

Ease of Use

- Test in place with magnetic key FOB
- Red and green lights indicate power and signal alarm
- No calibration required

Operating Principle

When electrical voltage is applied to the Pulse Point II, piezoelectric crystals at the base of the fork begin to oscillate at a fixed frequency. When material contacts the fork, the oscillation diminishes. This change in oscillation frequency causes the crystals to send a signal to the electronics which then change the state of the output relay.



EXTENDED VERSION:
Extends the unit further
into material or through a
vessel wall



90° EXTENSION:
For horizontal mounting

Quick Specs	Power Requirements	Universal 110-240 VAC 50/60 Hz; 24-48 VDC
	Temperature	Electronics: -40° to 158° F (-40° to 70° C) Fork: -55° to 302° F (-48° to 150° C) depending on fork * Lagging and/or remote electronics available for higher temperature applications
	Output	DPDT 8A resistive @ 277 VAC or 30 VDC Auxiliary relay available
	Pressure Rating	Up to 150 psi (10 bar)
	Sensitivity	Adjustable; bulk density down to 0.5 lbs/ft ³ (8 kg/m ³)
	Maximum Particle Size	³ / ₈ in. (9.5 mm)
	Remote Electronics Distance	Up to 100 ft (30 m)
	Approvals	    

BIN-DICATOR®

Diaphragm Level Switch

Bin-Dicator® diaphragm-type level switches were the original electromechanical point level devices in the industry. With their flush mount, easy to install design, they remain the go-to solution for applications where clearance is limited or where protrusions into a vessel are not acceptable. All installation and servicing can be done from outside the vessel. No power is required to operate the switch which is actuated by the pressure applied when material comes into contact with the diaphragm.



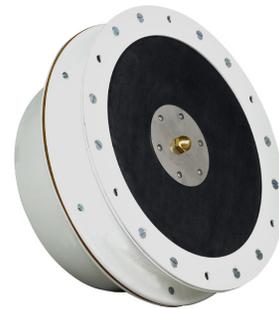
Bantam™

- 5³/₄ in. diameter
- Light duty
- Teflon® or Neoprene diaphragms available



Auto-Bin-Dicator®

- 8 in. diameter
- Explosion proof model available
- Neoprene or stainless steel diaphragm material



Model A

- 10¹/₄ in. diameter
- Explosion proof model available
- Several diaphragm material options

Quick Specs	Switch	SPDT up to 20 amp resistive @ 250 VAC
	Temperature	Up to 1000° F (538° C)
	Diaphragm Material Options	Neoprene Rubber, Canvas, Fiberglass, T-302 Stainless Steel, Silicone Rubber, Teflon® Coated Fiberglass

BIN-FLO®

A Simple & Efficient Aerator



The Bin-Flo® aerator is a simple and efficient means of introducing air into finely ground material and is widely used in the management of dry bulk materials. Bin-Flo aerators can be mounted from inside and outside a silo with various mounting kits available.



Bin-Flo® Aerators

Quick Specs	Diffuser	Cotton (Canvas): Up to 180° F (82° C); Fiberglass: Up to 600° F (316° C)
	Diffuser Frame	Galvanized Steel 16 mesh or 316 Stainless Steel mesh
	Body	Zinc plated steel or stainless steel
	Dimensions	L Series: 3.75 x 7.5 in. (9.5 x 19 cm); LL Series: 6 x 12 in. (15 x 30 cm)

FLO-GUARD™

Super Sensitive Flow Switch for Dust Detection



Flo-Guard™ provides reliable detection of leaks, broken bags and filter failures in powder and bulk solid applications. Flo-Guard detects the flow of dust and granular materials by using a floating reference point and a digital triboelectric microcontroller. This technique of measuring the flow of dry materials eliminates instability common in other flow switches.

Quick Specs	Probe	Available in lengths from 3 in. to 5 ft (7.6 to 152 cm)
	Pressure	50 psi (3.5 bar)
	Output	5A DPDT relay Field adjustable fail-safe
	Dust Concentration	Minimum 0.00028 gram/ft ³
	Enclosure Ratings	General purpose NEMA 4X; Explosion-proof NEMA 7/9
	Approvals	Hazardous Location: UL (US and Canada) Class 1, Groups C&D, Class II, Groups E, F, G

YO-YO™ SERIES

Weight and Cable Level Indicator

The Bindicator Yo-Yo™ provides reliable, continuous weight and cable level measurement specifically for inventory management of dry bulk materials.



Features

- Silo heights up to 200 ft with Mark-4
- Accurate readings with 1 cm resolution
- Isolated 4-20 mA output for connection to PLC or DCS
- MODBUS RS-485 communication
- ORB™ Compatible
- Angled roof mount kits available
- Unique inhibit feature to prevent Yo-Yo from taking measurement during fill process

Operating Principle

The Yo-Yo™ is a continuous level device that automates the mechanical drop-line technique. At programmed time intervals or on demand, a weight drops into the vessel, stops when it comes into contact with material and then returns to the top of the bin. The distance the weight has traveled is recorded and converted to a level measurement.

Quick Specs	Power Requirements	115/230 VAC
	Output	MODBUS, Analog 4-20 mA optically isolated (user sourced) into 600 ohms max
	Mounting	3" NPT, ANSI flange available
	Enclosure Rating	GP-4: NEMA 4; Mark-4: NEMA 4/7/9

Yo-Yo™ Display

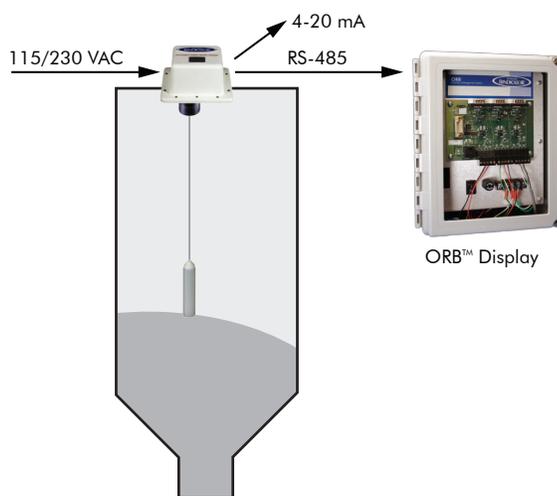
The Yo-Yo™ display programmer allows for configuration of either a single sensor or a whole system. An adjustable autotimer sets automatic measurement cycles ranging from 2 minutes to 1 week. While in operating mode, the display will show the sensor address, sensor name, measurement in the specified units, percentage and the status of the current device.



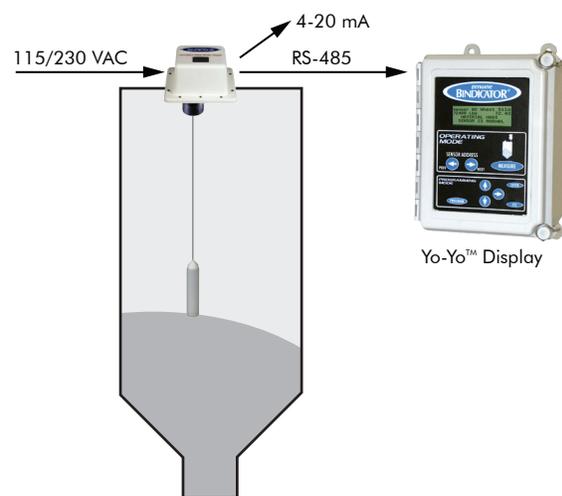
Yo-Yo™ Display

Features and Benefits

- Remote sensor set-up and configuration
- Easy to read LCD display
- Measurement on demand
- Enable/Disable Yo-Yo sensor
- Monitors up to 99 Yo-Yo sensors
- Optional heater for environments below -4° F (-20° C)
- Up to 4000 ft wired distance



Yo-Yo™ Wiring for ORB™



Yo-Yo™ Display Wiring

MP SERIES RADAR

Through Air Radar Level Transmitter

The MP Series radar sensor provides non-contact, continuous level measurement for bulk materials in bins, tanks and silos. Accurate and reliable in difficult environments, the MP Series is an ideal level meter for powder and bulk solid inventory management. The MP Series withstands corrosive environments and takes consistent measurements in steam, dust and other turbulent conditions.



MP Series

Features & Benefits

- Quick Start Wizard for easy configuration
- 78 GHz transmitting frequency with a narrow beam angle of 4°
- Standard, directional or aiming flange options to direct unit to optimal location
- 2-Wire 20 to 32 VDC Power Supply
- Measures up to 131 or 328 feet (40 or 100 m)
- Standard air purge connection

Operating Principle

The MP Series measures the level of material in a bin or silo by monitoring the time it takes for an emitted microwave pulse to travel from the level meter to the surface of the material being measured and back to the meter. This time is calculated into distance which is then translated into a level measurement.

Quick Specs	Power Requirements	24 VDC
	Output	4 to 20 mA, HART
	Maximum Measuring Distance	131 ft (40 m) or 328 ft (100 m)
	Transmitting Frequency	78 to 79 GHz FMCW
	Beam Angle	4 degrees
	Operating Temperature	Housing: -40° to 140° F (-40° to 60° C) Antenna: -40° to 302° F (-40° to 150° C)

SONO-TRACKER™

Ultrasonic Level System



The SonoTracker™ Ultrasonic System can monitor up to 16 transducers of various frequencies to measure level, flow and differential level of bulk materials. The SonoTracker controller has an integral keyboard and display providing easy access for programming and is available in AC or DC powered versions. Bindicator can help design a system solution to include the appropriate transducer for specific applications and environments.



Features & Benefits

- Robust, NEMA-4X Enclosure
- Non-contact sensors
- Built-in Optically Isolated Serial Port for reliable and flexible interfacing
- Quick, menu-driven set up, no special software required
- ORB-enabled for remote inventory communication
- Combine level, flow and differential level functions in one system
- Multiple transducers available to suit a variety of materials and distances

Quick Specs	Power Requirements	110/240 VAC or 24 VDC
	Measuring Distance	Up to 100 ft (30 m) depending on sensor
	Output	SPDT up to 10 A; plug-in modules of 2, 4, 5 and 8 relays each
		4-20 mA; plug-in modules of 2, 4 and 8 outputs with common isolation
		RS-422 for digital interface with ORB™
	PLC Interface Option	32 channel block transfer, 6 channel discreet transfers, Profibus-DP Slave
	Enclosures	NEMA 4X fiberglass reinforced polyester
Temperature	Up to 230° F (110° C) depending on transducer	

TDR-2000

Continuous Level Sensor

The TDR-2000 provides continuous level measurement utilizing guided wave radar technology. For many applications, the TDR-2000 is an economical and superior alternative to capacitance, ultrasonic or plumb bob technologies.



TDR-2000

Reliable in Dynamic Process Conditions

- Insensitive to changes in dielectric, pressure, conductivity, vacuum, humidity, dust, viscosity, vapor, bulk density, temperature or turbulence
- Ideal for dirty service applications

Easy Installation

- Simple to install in new tanks or retrofit in existing tanks.
- Can be installed while tank is in service
- Suitable for a broad range of tank sizes and geometries
- Factory calibrated and configured



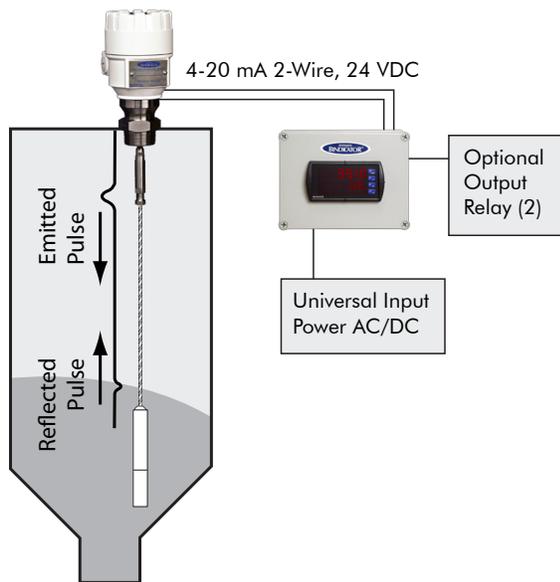
PRD1000 in NEMA 4X Enclosure

Power Supply and Local Display

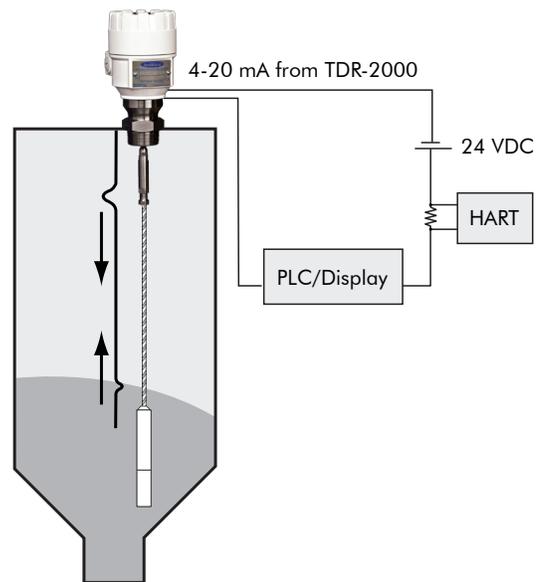
The PRD1000 is a power supply and local display meter for use with the TDR-2000. It is available in 85-265 VAC or 12-24 VDC with up to two relays. Optional features include a NEMA 4X enclosure and RS-485 serial adapter.

Operating Principle

The TDR-2000 uses a cable to guide a microwave signal to the material surface and back up to the sensor. Guided wave radar is a consistent and reliable technology that is not affected by dust or material characteristics such as dielectric constants.



TDR-2000 with PRD1000 24 VDC Power Supply



HART Enabled TDR-2000

Quick Specs	Power Requirements	24 VDC (18 to 35 VDC)
	Operating Pressure	232 psi (16 bar)
	Output	2-wire, 4-20 mA, HART Communication Relay optional with PRD1000
	Measuring Range	Flexible Probe: Max of 79 ft (24 m)
	Process Connection	1½" NPT
	Probe Materials	Flexible 316 SS Cable
	Temperature	-22° to 194° F (-30° to 90° C)

The ORB™ Remote Inventory Management System transforms inventory and process data into valuable information that can increase productivity and reduce supply chain costs. Connecting to instrumentation via serial and 4-20 mA dedicated interfaces, the ORB becomes a gateway between process instruments and the Internet. The ORB contains a database and an integrated web server which provide reliable means of gathering, storing and transmitting real-time inventory data via a LAN or the Internet. High volumes of data can be managed by users within the plant or remotely from any device that has internet connectivity.



ORB™ Input Box

Inventory Data Management

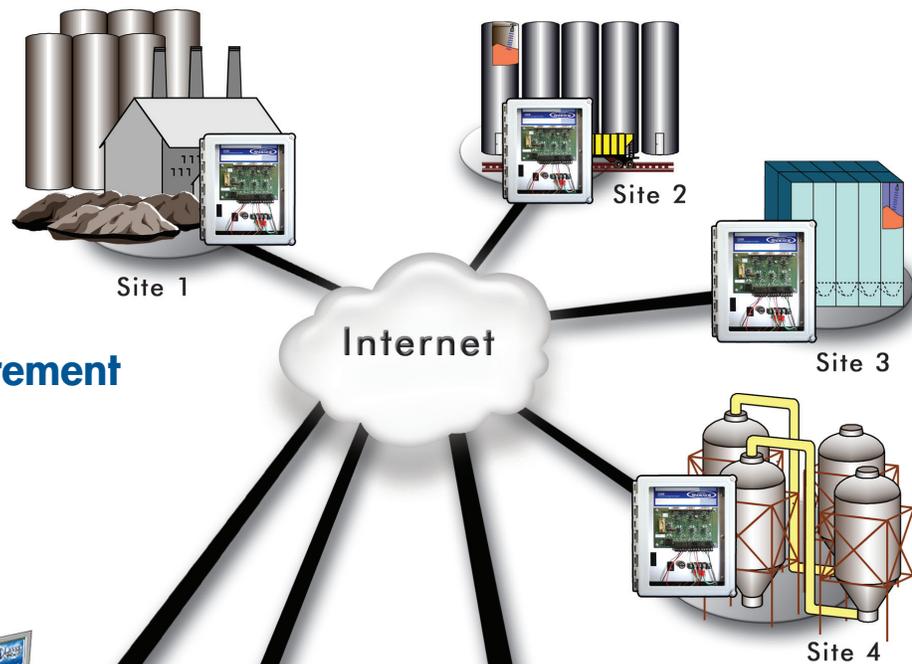
- Access inventory information and stored data from a remote location via the Internet
- Manage multiple sites with multiple vessels
- Set notifications/alarms to automatically send alerts via email
- Integrate or import data to the ERP System
- Store historical data
- Run reports for tracking trends or other statistical measures

Supply Chain Management

- Automate re-order process with suppliers
- Grant individual permissions for remote supplier communication
- Improve efficiencies with real-time accessibility to inventory levels and working capital utilization
- Facilitates multi-site inventory strategy and just-in-time replenishment

Site Maintenance Efficiency

- Store and replicate calibration settings for all vessels remotely
- Maintain instruments remotely
- Eliminate routine and manual inventory reporting



Operations/Procurement

- Ordering inventory
- Scheduling deliveries
- Balancing production
- Remote maintenance
- Email alerts



ERP Database

Real-time inventory data can be moved automatically into ERP systems.



Headquarters/Accounting

- Real-time inventory
- Usage trends
- Vendor managed inventory
- MS Excel compatible



150 Venture Boulevard
Spartanburg, SC 29306
Phone: (864) 574-8060
Toll Free: (800) 778-9242
Fax: (864) 574-8063
sales@bindicator.com
www.bindicator.com

venture
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