HazardPRO™
Wireless Hazard Monitoring

Contact Electro-Sensors today to see how HazardPRO can change the way you safeguard your people, processes, and facilities.

ELECTRO•SENSORS

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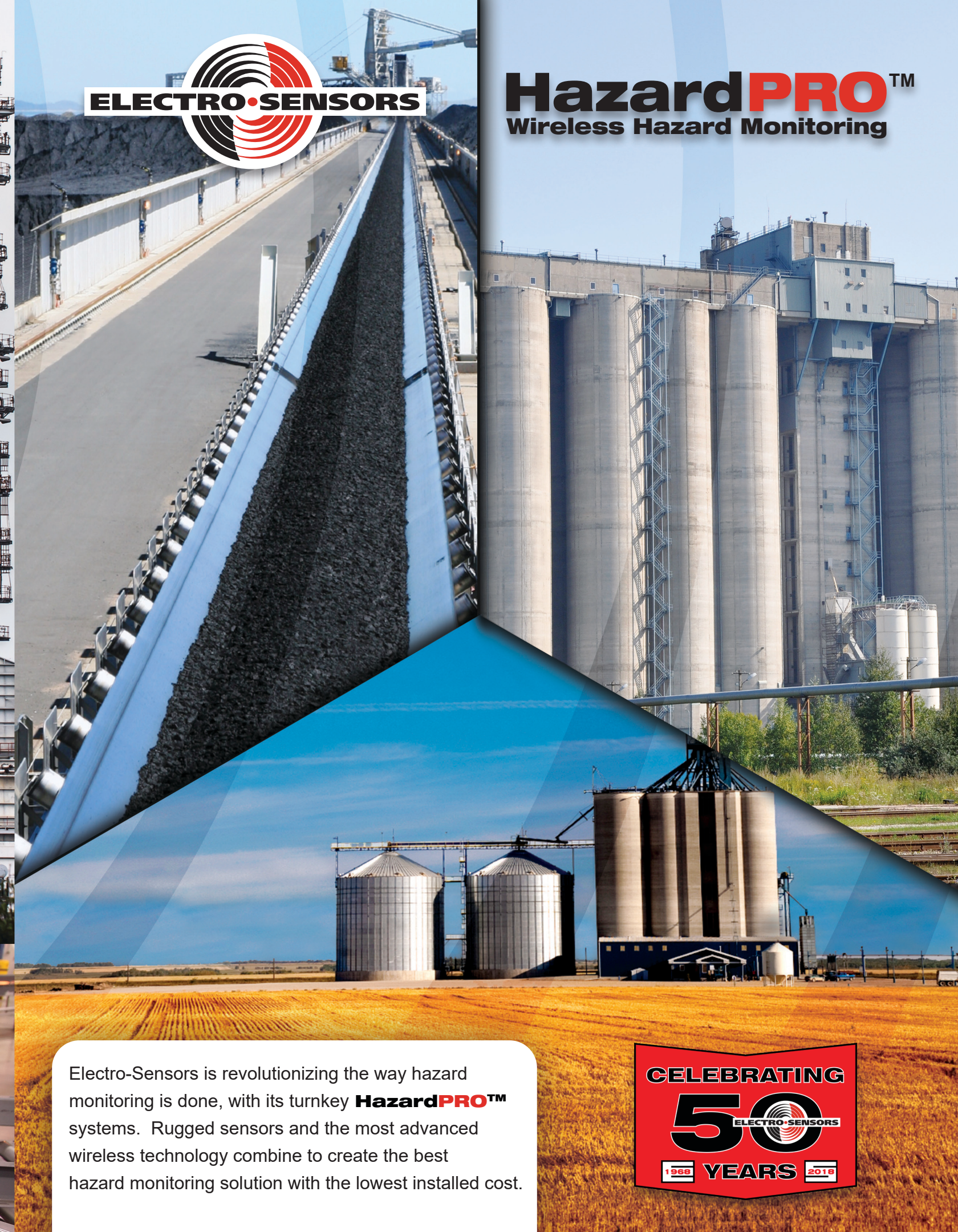

Electro-Sensors is revolutionizing the way hazard monitoring is done, with its turnkey **HazardPRO™** systems. Rugged sensors and the most advanced wireless technology combine to create the best hazard monitoring solution with the lowest installed cost.

HazardPRO™
Wireless Hazard Monitoring

Reliable • Simple • Complete

When it comes to hazard monitoring, we know it simply has to work. **HazardPRO** was designed from the ground up to provide turnkey, reliable, and consistent protection for your most valuable assets, products, facilities, and most importantly, people. Consistent operation is ensured with built-in tools such as self-diagnostics, transmission logging, and redundant transceivers providing you confidence that your critical processes are being monitored and logged at all times.

As a truly integrated system built expressly for hazard monitoring, **HazardPRO** captures and displays key information in an intuitive format allowing the user to quickly and comprehensively understand the status of their processes. The simple but powerful interface will give you insight into your operations as you strive to maximize safety and facility runtime, while minimizing costs associated with unscheduled maintenance and unplanned downtime.

Status At-A-Glance

- Quickly view what processes are running and their condition from the status screen
- Easy touchscreen navigation guides the user through equipment information

Real-Time Information

Intelligent transmitter nodes send information both on a scheduled periodic basis and when important changes are detected, ensuring that there are no polling delays or lapses in monitoring.

- Live charts continually update
- View sensor status over time leading up to an event
- Evaluate trending with interactive history charts
- Data, alerts, and alarms available through secured wireless networks
- Access information via tablets, smartphones, and PCs with Internet access

Accountability & Security

- User access levels are set by plant administrators
- Events are automatically logged for review
- Only users with password-validated authority can edit or close events
- Users can document event cause and resolution
- Full password protection

Full Integration With Your Controls

Easily integrate to your existing plant control or PLC system via:

- Modbus TCP/IP communication
- A traditional switch input/relay output system

Wear-Detect Belt Alignment

- No need to shut down the conveyor belt for rub block inspection
- A warning will be displayed when a replacement belt alignment sensor is needed
- Rate-of-rise setpoints provide additional protection

Ambient Sensors – Fewer False Alarms

- Multiple ambient temperature sensors automatically adjust setpoints eliminating the need for broad setpoint ranges
- Absolute shutdown settings are maintained to prevent catastrophic events

Approvals

HazardPRO™ Sensors

- Intrinsically Safe (I.S.) in:
  - Class II, Div. 1, Groups E, F, G; Class III

HazardPRO™ Node

- Intrinsically Safe (I.S.) apparatus located in:
  - Class II, Div. 1, Groups E, F, G; Class III
- Providing Intrinsically Safe (I.S.) circuits for use in:
  - Class II, Div. 1, Groups E, F, G; Class III

Industries Served

- Grain, Feed & Milling
- Ethanol Processing
- Waste Water
- Bulk Materials
- Bio Mass
- Mining/Quarries
- Port Handling
- Food Processing
- Packaging
- Timber Processing

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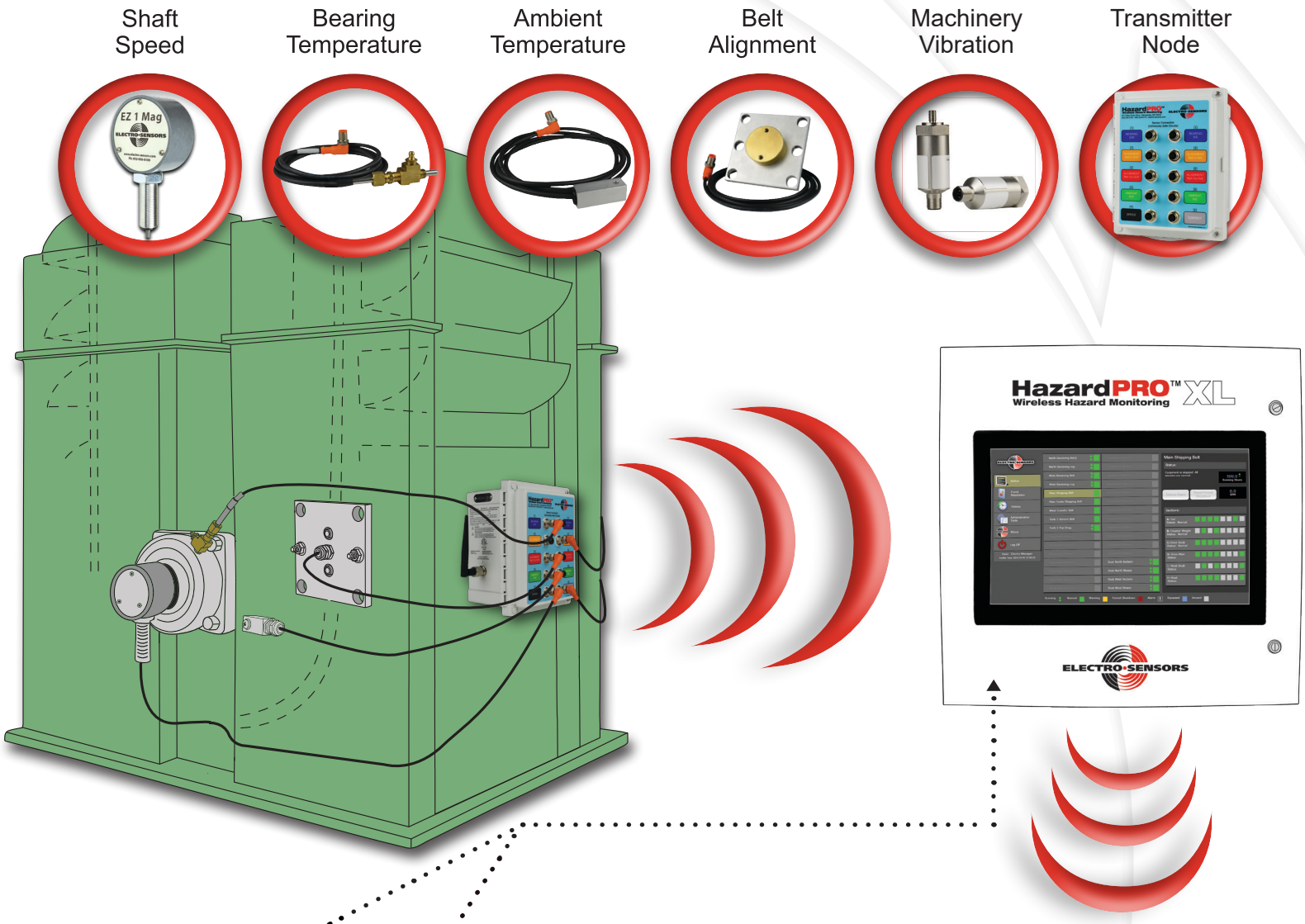
FEATURES & CONCEPT



Plant Control System

- Modbus TCP/IP
- Run/Stop input switches
- Run/Stop output relays

Any device, anytime, anywhere.
View status, receive and respond to alerts, silence alarms, or shut down equipment.

Remote Access

- PC/Laptop
- Tablet
- Smartphone

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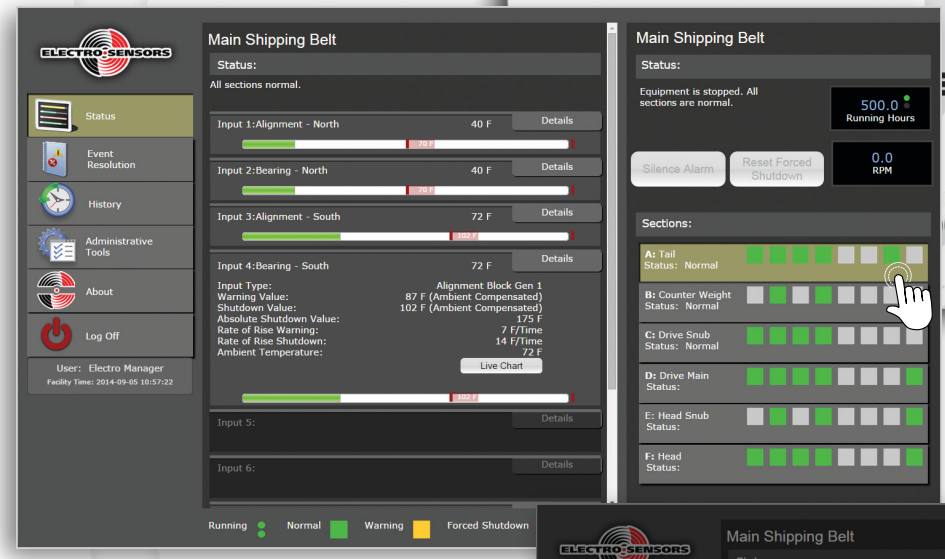
HazardPRO™ XL
Wireless Hazard Monitoring

HazardPRO XL System Manager
System Status Screen



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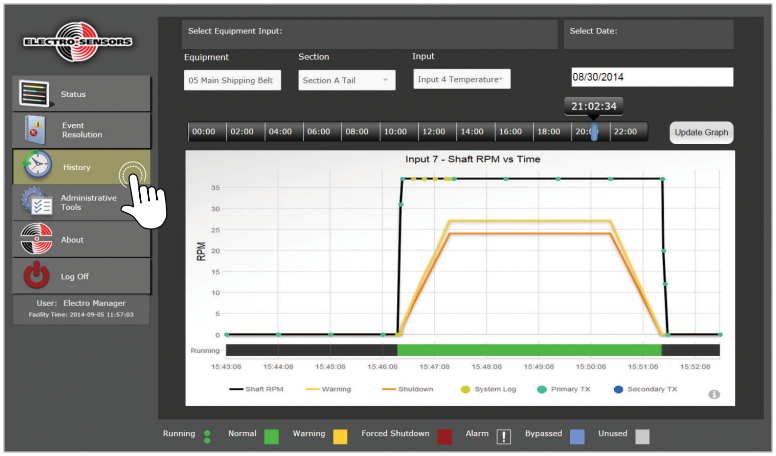
Node View Screen
Sensor values, setpoints, and alarm conditions

Sensor Trend Screen
Live Chart

USER INTERFACE

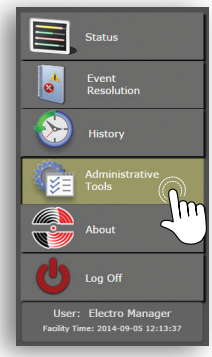
Event Screen

- Time-stamped event log
- Event overview details with graphical snapshot and input identification
- Cause of event and resolution text fields for logging event information
- Sign-off and date stamp



History Screen

- Historical graph for all sensors
- Selectable 24-hour window
- System Events Archive records all system events for future viewing
- Internal data storage



1. Quickly and easily add equipment as needed
2. Warning/shutdown events and resolutions are archived
3. Set the company's facility information
4. View gateway information and enter/edit settings
5. Allows periodic conveyor operation in cold weather to prevent freeze-up
6. View PLC and I/O board interface information and enter/edit settings
7. Enter e-mail addresses for select individuals to receive notifications for specified events
8. Slowdown test to verify the correct operation of the hazard monitoring system and the plant control system
9. View and print historical slow-Down test reports
10. Set the system-wide default settings
11. Modify and/or add new users to the system

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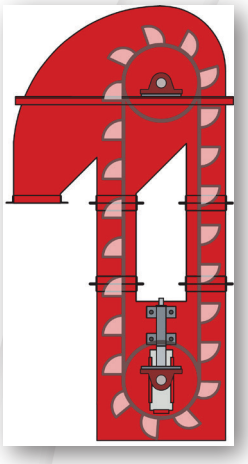
APPLICATIONS

Bucket Elevators

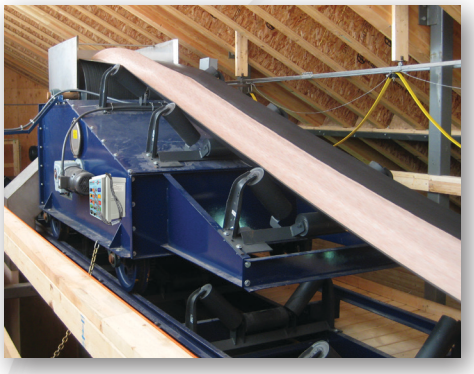


Bucket elevators are key to grain elevator operations. Monitor your alignment, temperature, and speed to provide safe and streamlined operations in your facility.

Industrial Automation

Industrial Automation applications require reliable operation in order to maximize facility efficiency. **HazardPRO** can monitor and archive Sensor data from each monitored point of your facility. This insight into machine performance makes possible the continuously operation of automated systems.

Tripper Cars



Tripper cars are instrumental to grain storage. Tripper cars provide unique opportunities for hazard monitoring as the movement makes Class II Div. 1 monitoring difficult. **HazardPRO** Wireless Sensors can be mounted directly to the tripper car, providing monitoring for Speed, Temperature and Alignment. Wireless hazard monitoring provides a solution to the most difficult equipment to be monitored in your facility.

Overhead Cranes

Overhead cranes handle and load endless amounts of merchandise and product. Monitoring the moving segment of a crane for speed and bearing temperature provides you with the confidence that is needed to ensure that your facility remains operational at all times.

Conveyors

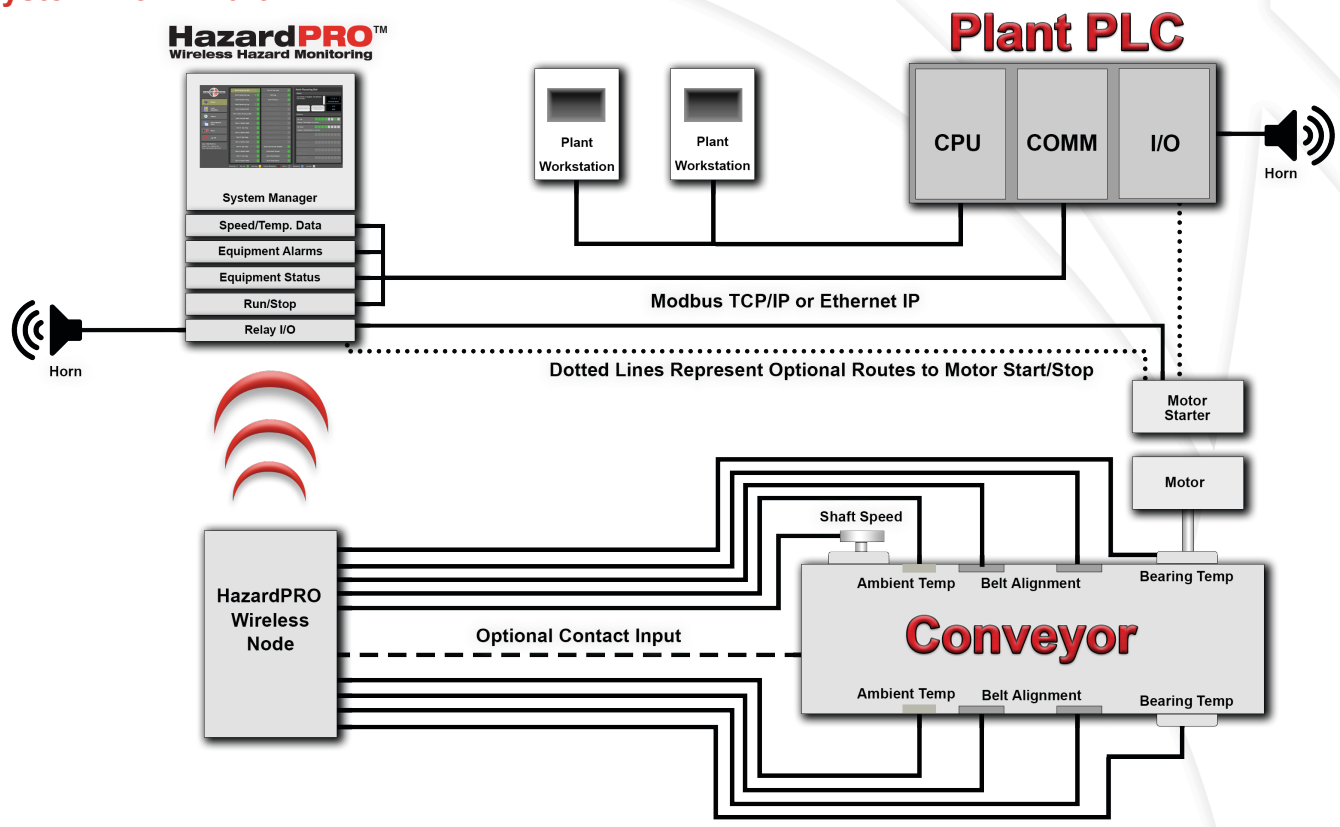
Whether your conveyor is handling rock, grain, coal, waste, or any material vital to operations, you can be confident that your machinery will continue operating without unexpected failure. Monitoring conveyor speed, temperature, and alignment will keep your equipment running better, longer, and more efficiently. Monitored data can be viewed and used to perform preventive maintenance.

Wood Processing

Panel manufacturing plants that are responsible for the production of MDF & OSB panels deal with a lot of combustible dust. Wireless hazard monitoring provides a dust certified solution for large facilites. Monitoring bearings for rising temperature keeps production lines rolling while also ensuring the safety of plant personnel.

Plant Integration

System Flow Chart



Register Control & Relay Output

HazardPRO systems are completely stand-alone and capable of providing monitoring data for any plant equipment. Modbus TCP/IP or Ethernet IP connection allows plant control systems to receive status or register information from the **HazardPRO** system manager. This is very useful for facilities that require integration of hazard monitoring equipment with their plant control system.

Run/Stop Interface

Equipment #	Modbus Register	Value
1	40001	0
2	40002	1
3-31	⋮	⋮
32	40032	0

Equipment State Interface

Node #	Modbus Register	Value
1	41001	Node State
	41002	Comm Link OK
	41003	Node Health OK
	41004	Sensor 1 Value
	⋮	
	41013	Sensor 10 Value
	⋮	
	41016	Sensor 1 State
	⋮	
	41025	Sensor 10 State
2-95	⋮	
96	47361	Node State
	⋮	
	47390	Sensor 10 State

Equipment State Interface

Equipment #	Modbus Register	Value
1	40101	1
2	40202	3
3-31	⋮	⋮
32	40232	0

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System Manager

System Manager

- Modbus TCP/IP communication
  **Ethernet IP Option available*
- SPDT relay for each piece of equipment
- Dedicated relay for audible notification
- Controlled levels of access
- Real-time information and live charting
- Redundant transceivers for error-free communication

Sizes

- XS (1-4 pieces of equipment, 12 Nodes, 120 Sensors)
- XM (Up to 16 pieces of equipment, 48 Nodes, 480 Sensors)
- XL (Up to 32 pieces of equipment, 96 Nodes, 960 Sensors)

Wireless Savings

Ease of Installation
With **HazardPRO** wireless systems all Nodes and Sensors are certified Intrinsically Safe by ETL and do not need to be wired for power. This means that whenever you install a Wireless Node and the Sensors you do not need an electrician. This makes installation quick and cost effective to you.

Conduit-Free Installations
HazardPRO does not require the conduit or labor costs that are required to install traditional hazard monitoring systems. As such, you can count on substantial savings to the bottom line of your system installation.

No Software Programming
When your facility decides to monitor additional equipment, you can simply add equipment without making any software changes. Adding extra equipment is now easier than ever.

Reduced Facility Downtime
With other systems, installation can be a nightmare for plant managers but with **HazardPRO** your entire hazard monitoring system can be installed in a matter of days. This results in significantly reduced down time, which results in increased productivity during installation.

Preventive Maintenance
Preventive maintenance is an important aspect for any facility. **HazardPRO** tracks live sensor values and displays them in data graphs, these graphs provide valuable insight into your plant equipment. This allows you to see negative trending patterns before they turn problematic.

Wireless Nodes

Class II Div. 1

Intrinsically Safe (I.S.) apparatus located in:
Class II, Div 1, Groups E, F, G; Class III
providing Intrinsically Safe (I.S.) connections for use in:
Class II, Div 1, Groups E, F, G; Class III

Class II Div. 2

Intrinsically Safe (I.S.) associated apparatus located in:
Class II, Div 2, Groups F, G
providing Intrinsically Safe (I.S.) circuits for use in:
Class II, Div 1, Groups E, F, G; Class III

Installation Flexibility

- **HazardPRO** Wireless Nodes do not need conduit, This allows installations to be completed in a few days as opposed to the weeks or months that traditional systems need.
- Nodes can easily be mounted in almost any location, magnetic mounting options provide quick and effortless mounting solutions .
- No wired power needed, Wireless Nodes can be mounted on any moving machinery. This benefit allows for entirely new monitoring solutions for your facility.

Signal Reliability

- Every time a transmission is sent, an acknowledgement must be returned by the receiver. The transmitter uses different channel frequencies on retries to ensure that the data gets through. Each transmission is logged and regular “health” checks must arrive when they are expected.

Certified Hazard Monitoring

- Independently powered Nodes provide breakthrough wireless hazard monitoring solutions while still keeping the critical Class II Div. 1 approvals.

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SYSTEM COMPONENTS

Transmitter Node

- Transmit-on-change keeps data current
- Heartbeat transmissions verify reliable communications
- Standard M12 sensor connection for easy installation
- No external power required
- 5+ year battery life
- 10 inputs available for: shaft speed, belt alignment, bearing temperature, ambient temperature, and contact closure

Class II Div. 2

Class II Div. 1

Shaft Speed Sensor

- Measure shaft RPM speeds between 0-300
- Multiple mounting configurations
- Optional mounting magnet if shaft is not tapped
- Tap with 1/2” thread
- Automatic calibration of 10 and 20 percent slow down

Bearing Temperature Sensor

- No calibration required, set points adjusted to ambient sensor
- Stainless steel probe with zerk (grease) fitting
- Probe lengths available 2”, 4”, 6”
- Replaces existing zerk (grease) fitting
- Measure between -40 °F → 248 °F (-40 °C → +120 °C)

Ambient Temperature Sensor

- Monitoring local ambient temperature continuously adjusts set points on bearing and belt alignment sensors
- Multi-point placement on each side of equipment for highly accurate tracking

Vibration Monitor

- Measures RMS vibration velocity
- Monitor Vibration Levels
- Stainless steel housing with 1/4-28 threaded mount

SYSTEM COMPONENTS

Belt Alignment Sensor

- Brass rub block with easy-install mounting plate
- No calibration required, set points adjusted to ambient sensor
- Built-in, wear-detect feature notifies user when the belt alignment sensor needs to be replaced
- Bolt on assembly or Electro-Sensors rub-block door options

Stud Mounted Temperature Sensor

- Compatible with any standard Electro-Sensors rub block
- Intrinsically safe 3/8-16” temperature probe
- Universal threaded sensor for multitude of applications

Optional

- Magnetic surface mount for hassle-free temperature monitoring

Diaphragm Switch

- Point level detection in bins and hoppers
- Optimal for plugged chute applications
- Adaptable sensitivity

Cable Types

- All Sensors are offered with polyurethane or steel jacket cable
- Standard 3 meter cable length on sensors
- Extension lengths available upon request

5-Year Warranty on System Components, 1-Year on System Manager.

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