Electro-Sensors, Inc.
Machine Monitoring Sensors & Hazard Monitoring Systems
Company History

• Founded by James P. Slattery in 1968 to serve material handling & process control applications in industrial plants
• Products designed & manufactured at our facility
• Located in Minnetonka, MN
• $7.6M revenue (2015)
• 36 employees
• Publically held company NASDAQ Symbol ELSE
Major Industries Served

- Grain, Feed & Milling
- Ethanol and Bio-Fuels
- Water Utilities
- Waste Management
- Power Generation
- Mining & Aggregates
- Food Processing
- Packaging
- Bulk Materials Handling
- Pulp & Paper
Core Business Applications

- Belt, Screw, Drag & Vibratory Conveyors
- Crushers/Hammer mills
- Rotary Airlocks
- Fans/Blowers
- Packaging Machines
- Bucket Elevators
- Pumps
- Centrifuges
- Turbines
- Slide Gates & Valves

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Products

- Shaft Speed Sensors
- Shaft Speed Switches
- Pulse Generators
- Bearing, Belt Alignment & Temperature Sensors
- Hazard Monitors (Wireless and Wired)
- Tachometers, Counters & Displays
- Slide Gate & Angle Position
- Signal Conditioners & Interface
- Vibration & Tilt
- Closed Loop Motor Control
- Motrona Products for Automation & Motor Control
Speed Sensors, Switches & Pulsers

- Non-contact Hall Effect & Magnetoresistive sensors
- Large gap distance (up to \( \frac{1}{2} \)"
- Flexible sensor system
- Explosion proof & water resistant sensors
- Pulser discs & split collar wraps
  - Variety of materials & configurations
- NEMA C face motor ring kits available
- Encoders & traction wheel assemblies
Shaft Speed Sensors

- Hall Effect or Magnetoresistive
- Pulse (NPN, PNP) or 4-20 mA output
- Single channel or quadrature
- Large sensing gap distance
- DC powered
- Explosion proof housing options
- IS Approvals
ST420 Shaft Speed Sensors

- 2-wire, loop-powered
- 4-20 mA output directly proportional to shaft speed
- No user calibration – easy to install or retrofit
- Stainless steel M18x1 housing, NEMA 4X/IP67, Dust Ignition proof & Intrinsically Safe models

ST420-LT Sensors

EZ-18mm Mounting Bracket
EZ-18mm & EZ-3/4in
Easy Mount for Barrel Sensors

- For use with 906, 932, ST420, Series 18
- Mounts directly to the tapped shaft or can be used with optional mounting magnet if shaft is not tapped
- Pulser disc is included with assembly
- Fully-enclosed to protect against dirt, debris & misuse
Shaft Speed Switches

- Under-, over-, zero-speed or reverse detection
- Analog or digital electronics
- Many output options
- Number of setpoints
- Failsafe
- Integrated or discrete sensor
- Input power (DC, AC)
- Explosion proof or enclosure install with easy mount options
FB420 Speed Sensor with Relay

- Shaft speed feedback sensor
- Outputs a 4-20mA signal across the RPM range of the shaft
- 1 relay with 2 programmable functions (over or under speed)
- Housed in a rugged, XP housing
- Compatible with standard PLCs, meters & data acquisition systems
EZ-100 & EZ-SCP Easy Mount for Explosion Proof Sensors

- EZ Mount assemblies simplify installation & operation
- No additional hardware required
- EZ-100 for use with the M-Series, FB420, 907 XP
- EZ-SCP for use with SCP-Series switches
- Rated for use up to 300 rpm
Pulse Generators

- Many magnetic counts (PPR)
- Sensor face or edge read
- Material: Nylon, PVC, Stainless Steel, Aluminum
- Narrow
- High speed
- Custom – special
Temperature

- Self-powered
- Many forms
- Wide temp. range
- Expensive
- Non-linear output

- Stable signal
- Accurate
- Non-linear output
- Expensive

- High output
- Relatively fast
- 2-wire resistance measurement
- Non-linear output

- Electro-Sensors
- Most linear
- Very accurate
- Noise immune

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Temperature Sensors

- Flange, stud, probe, magnetic & lug styles
- 2-wire loop-powered – eliminates expensive thermocouple wires
- 4-20 mA output calibrated -40 °F to 248 °F
- Compatible with any PLC or data acquisition system
Easy to install 2-wire device
- 4-20 mA Output factory calibrated -40 °F to 248 °F (-40 °C to +120 °C)
- 1/8” or 1/4” NPT grease fitting permits lubrication
- Adjustable probe depth for accurate measurement
Rub Block Door Assemblies

- Three versions:
  1. Adjustable
  2. Standard
  3. Unistrut

- Adjustable rub block for optimal positioning & longer life
- Now all white epoxy finish minimizes heating
- Unistrut mounts almost anywhere
SG1000 Position Sensors

- Absolute encoder-based feedback
- Interface to PLC or Display
- 4-20 mA output
- 2- or 3-point, push-button calibration
- Rugged NEMA 4X/XP housing
Tachometer & Counter Products

- Rate metering
- Product, sum, or difference
- Process, batch, or total counting
- Highly programmable (PLC-like)
- Relay & analog outputs
Signal Conditioning & Interface Products

- Remote Modus RTU connectivity & control
- Pulse to 4-20 mA conversion
- Pulse to frequency conversion
- DeviceNet

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Vibration & Tilt Products

- Vibration Switch
  - Over- or under-vibration
  - Explosion proof available

- Tilt indicator for presence or absence of bulk material
Wired Hazard Monitors

Targeted at grain, feed & milling as required by OSHA (USA)

Electro-Sentry 1 Single-Leg Hazard Monitor
• Monitor speed, belt alignment & bearing temperature

Electro-Sentry 16 Hazard Monitor
• Monitors 16 bearing and/or belt alignment sensors
HazardPRO™ Features

• Designed for hazardous locations
• Field-proven reliability
• Intuitive touchscreen display
• Lower total installed cost
• Real-time display of system data
• Remote access via email & web
• Continuous system self-check routines
• ETL Class II, Div. 1 approvals
Approvals

**HazardPRO™ Node**
- 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

**HazardPRO™ Sensors**
- Intrinsically Safe (I.S.) in:
  - Class II, Div. 1, Groups E, F, G; Class III
Transmitter Node

- Transmit-on-change keeps data current & lengthens battery life
- No external power
- 5+ year battery life
- Quick connect sensors for easy installation & equipment maintenance
- 6 inputs for bearing/alignment/ancillary equipment, 2 inputs for ambient temperature, 1 input for speed, 1 input for contact

Offering Class II, Div.1 & Class II, Div. 2 models
Shaft Speed Sensor

- Automatically calibrates setpoint to 10% & 20%
- Multiple mounting configurations
- Optional mounting magnet, ideal for bucket elevators
- Flexible stainless steel jacketed cable available
Belt Alignment

• 2” brass rub block

• No calibration required

• Built-in wear detect feature notifies user when the block needs to be replaced

• Flexible stainless steel jacketed cable available
Bearing Temperature

- No calibration required
- 4” & 6” stainless steel probe with 1/8” & 1/4” NPT Zerk (grease) fitting
- Grease around the probe
- Flexible stainless steel jacketed cable available
Ambient Temperature

• Localized ambient temperature compensation continuously adjusts setpoints

• Multi-point placement on each side of equipment for highly accurate tracking

• Flexible, stainless steel jacketed cable available
Stud-Mount Temperature

- 2-wire (current loop type)
- 3/8"-16 threaded stud for mounting
- Optional brass block magnet mount adapter
- Flexible stainless steel jacketed cable available
System Sizes

- **XS**
  - 1-4 pieces of equipment
  - 15” touchscreen

- **XM**
  - Up to 16 pieces of equipment
  - 15” touchscreen

- **XL**
  - Up to 32 pieces of equipment
  - 21” touchscreen
System Manager

- TCP/IP Modbus communication
- Relay outputs
- Controlled levels of authority
- Data & history logging
- Testing reports
- Real-time information & live charting
• Touchscreen is easy to use & understand
• Explanations in plain English, not code
• Color coded status
• Customer-specified equipment names
• Users with the proper authority can close events & record the cause & resolution
Next Steps

1. Assessment of project needs
2. Configure a solution
3. Conduct a site survey
4. Prepare a quotation
Choose Electro-Sensors

- Rugged, Reliable Industrial Duty Systems
- Improve Processes
  - Safeguard Systems, Reduce Downtime, Prevent Waste
- Most Standard Products Ship within Two Days
- 5-Year Limited Warranty on Most Products
- Top Notch Customer Service & Technical Support
- 45+ Years of Industry Experience
- ISO9001:2008 Quality Certified

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Conveyor Speed

Bucket Elevator

Coal Feeder

Blower Speed
• 907 XP Sensor
• EZ-100 Bracket
• EZ-255 Disc
SG1000A Slide Gate Position Sensor Monitoring Grain Bucket Elevator
• M100T Speed Switch
• EZ-100 Mount
• EZ-255 Disc
• Disc Guard
SCP1000 Speed Switch Monitoring a Conveyor Roller
• Belt Alignment Monitoring
• TT420S Temperature Sensor & Right Angle Conduit Fitting
• Standard Rub Block Door Assembly
SG1000E Position Sensor on a Clam Shell Bucket
• Chemical Processing
• Series 18 Speed Sensor
• Stainless Steel Wrap
• TT420Z-LT Bearing Temperature Sensor
• TT420S-LT Right-Angle Temperature Sensor
• Standard Rub Block Door Assembly for Belt Alignment
• BA-100 Monitoring Belt Alignment on Exposed Coal Conveyor
• VS1 Vibration Monitor
• FB420 Speed Sensor with relay monitoring speed on a grain elevator (with EZ-100 Mount and EZ-255 Pulser Disc)
• TT420Z-LT Bearing Temperature Sensor
• SG1000B Monitoring a Truck Dumping Station
• TR400 Tachometers & Explosion Proof Enclosure Option
• SCP1000 Speed Switch monitoring speed in a power plant application

• EZ-SCP Mount

• EZ-255 Pulse Disc
• M100T Speed Switch monitoring feed drag conveyor
- Boiler Pump Application
- 906B Quadrature Speed Sensor
- Narrow Aluminum Split Collar Pulser Wrap
• 906 Speed Sensor
• EZ-3/4in Mounting Bracket Assembly
Thank You for Your Interest in Electro-Sensors!