



Ensuring Reliability and Precision in Extreme Outdoor Conditions: The HS35X Avtron™ Encoder Modernizes Grain Elevator Operations in Canada

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INTRODUCTION

The modernization of grain elevator systems is critical for improving operational efficiency and reducing downtime in agricultural distribution. In harsh Canadian climates, where extreme heat in the summer and subzero temperatures in the winter is the norm, robust and reliable solutions are paramount.

This white paper highlights how the **HS35X** Avtron Encoder played a key role in modernizing a grain elevator and distribution system with a custom programmable logic controller (PLC)-based solution, delivering real-time monitoring and precise control over conveyors, augers, distributors, and bins from a central control panel designed and installed by Pro Electric located in London, Ontario, Canada.

OVERVIEW OF GRAIN ELEVATOR MODERNIZATION

Grain elevators are complex systems comprising multiple mechanical and electrical components, such as augers, conveyors, and distributors. Distributors are responsible for directing grain into specific bins. Effective position monitoring of these distributors is essential to ensure the accurate and efficient routing of grain. Historically, manual monitoring or less advanced technologies were prone to inaccuracies and mechanical wear, resulting in lost productivity, grain spoilage, and costly maintenance.

To address these challenges, a custom PLC-based control system was implemented, integrating HS35X encoders to monitor distributor positions and convey real-time data to a human-machine interface (HMI) in the grain elevator office.



HS35X Avtron Encoder







WHY THE HS35X AVTRON ENCODER?

The HS35X Avtron Encoder was chosen for its proven durability, reliability, and precision under extreme environmental conditions. The key features that make the HS35X ideal for grain elevator modernization include:

1. Rugged Design for Harsh Environments

- Temperature Tolerance: The HS35X is designed to operate reliably in a wide temperature range, from extreme summer heat exceeding 50°C to winter cold below -40°C, a critical factor in Canada's fluctuating climate (HS35X is rated at -40°C to +100°C).
- Sealed Construction: Dust, dirt, and moisture are common in grain-handling environments. The encoder's IP67-rated housing prevents contamination, ensuring long-term performance without the need for frequent maintenance.

2. Vibration and Shock Resistance

Grain elevator operations generate significant mechanical stress. The HS35X encoder features superior shock and vibration resistance, making it suitable for heavy-duty applications where other encoders may fail.

3. Non-Contact Magnetic Sensing Technology

Unlike traditional optical encoders, the HS35X utilizes magnetic sensing technology, which is less prone to failure from dust or debris accumulation. This feature enhances long-term reliability, reduces maintenance costs and is not as vulnerable to contaminants ingression like optical encoders are.

4. Advanced Diagnostics

The HS35X Avtron Encoder is equipped with LED diagnostics that provide real-time status monitoring, allowing operators to identify issues quickly and minimize downtime.

INTEGRATION WITH A CUSTOM PLC-BASED SOLUTION

The modernization project involved integrating the HS35X encoder with a custom PLC system designed to provide centralized control and monitoring of the grain elevator's mechanical components. Key functionalities included:

• Real-Time Position Monitoring: The HS35X encoders provided precise position data for the grain distributors, ensuring accurate grain routing to selected bins.

- HMI Visualization: Position data from the encoders was displayed on an HMI located in the elevator office, enabling operators to monitor and control the entire grain handling system from a single interface.
- Automated Control: The PLC system allowed for automated control of conveyors, augers, and distributors, reducing manual labor and increasing throughput.

BENEFITS REALIZED

The deployment of the HS35X Avtron Encoders yielded significant operational and maintenance benefits:

- Increased Reliability: The robust design of the HS35X eliminated position monitoring failures that had previously caused system downtime.
- Enhanced Precision: Accurate distributor positioning reduced grain misrouting, minimizing waste and improving overall efficiency.
- Reduced Maintenance: The magnetic sensing technology and sealed construction reduced wearand-tear-related failures, lowering maintenance costs and frequency.
- **Operational Visibility:** Real-time position data displayed on the HMI improved decision-making and allowed for rapid issue resolution.

CONCLUSION

Modernizing a grain elevator system with a custom PLC-based solution and the HS35X Avtron Encoder delivers unmatched reliability and performance in the extreme outdoor environments of Canada.

By integrating durable, precise position monitoring with centralized control, operators can enhance efficiency, reduce downtime, and ensure smooth grain distribution operations. The HS35X Avtron Encoder stands as a cornerstone technology for industries demanding robust solutions in challenging conditions.

Please call us at: 216-642-1230 or email us at: encoderhelpdesk@nidec-industrial.com for ordering information.