

Maximizing Energy Efficiency and Preventing Downtime in Automotive Paint Processes with ADI OtoSense Smart Motor Sensor



BACKGROUND

The automotive paint process involves high-cost equipment with less redundancy, making it vulnerable to equipment failures that directly lead to production line stoppages. These stoppages can result in significant financial losses and delays. Additionally, the paint process consumes substantial energy, primarily due to air conditioning in paint booths. ADI OtoSense SMS offers a predictive maintenance solution that helps detect anomalies early, preventing unexpected downtime and reducing energy consumption, thereby supporting SDGs by promoting energy efficiency and carbon neutrality.



CHALLENGE

- High cost of paint process equipment with no redundancy.
- Equipment failures in the paint process directly lead to production line stoppages.
- High energy consumption in the paint process.

SOLUTION BENEFIT

- Easy installation and operation with battery-powered, WiFi-enabled sensors.
- Automatic anomaly detection without the need for user analysis.
- Prevention of unexpected downtime, saving significant costs.

Motivation of The Trial Project

A major automotive manufacturer faced significant maintenance challenges due to the high cost and lack of redundancy in their paint process equipment. Equipment failures in this critical process directly led to production line stoppages, causing substantial financial losses and delays.

Deployment and Outcome

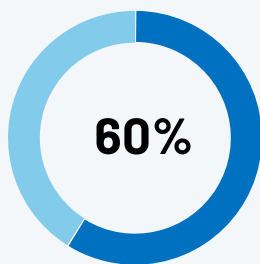
To address these issues, 30 ADI OtoSense SMS devices were installed on critical motors driving pumps and blowers. The sensor has automatically learned the motor's characteristics and started monitoring them. Within a month, two sensors detected anomalies in pump motors, indicating bearing issues. Maintenance personnel confirmed the anomalies and decided to replace the pumps during scheduled downtime, preventing unexpected production line stoppages. This proactive approach avoided a potential cost impact of at least \$50,000 per hour, which would have resulted from unplanned downtime.

Another Positive Impact

Additionally, it ensured timely deliveries to customers, avoiding further financial and reputational impacts. The manufacturer emphasized the importance of monitoring critical equipment in the paint process, as unexpected stoppages could lead to significant delays, product re-coating, manufacturing line restarts, and increased energy consumption. By using ADI OtoSense SMS, they were able to enhance operational efficiency, optimize energy consumption, and contribute to their sustainability goals, aligning with SDGs by promoting energy efficiency and carbon neutrality in their manufacturing processes.

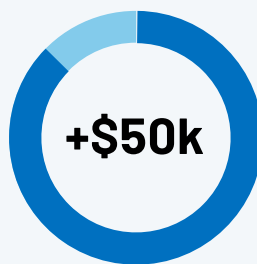


For Sustainable Factory



60% of total energy in an automotive factory is consumed in the paint shop, so reducing energy in this process offers significant benefits.

Hourly Cost Impact from Unplanned Downtime



Unplanned Downtime impact of the paint process is significant due to less redundancy.

Days required for the deployment



Battery operated wireless sensor device helps minimize the deployment effort. Installation of pipes and cables is unnecessary.



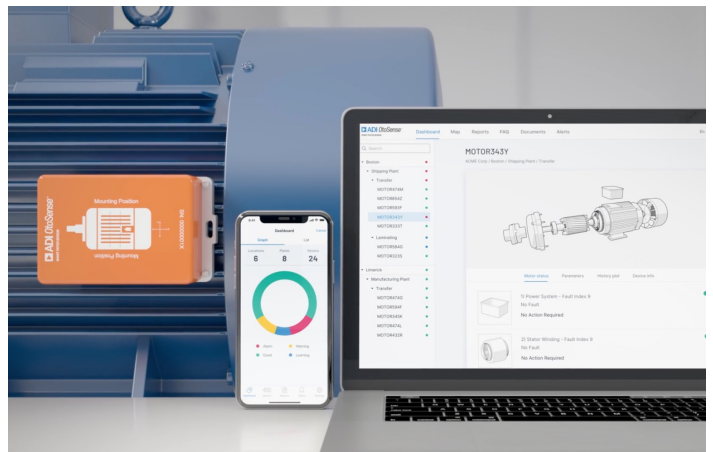


"I was pleasantly surprised by how easy it was to implement the ADI OtoSense SMS, thanks to its wireless communication and battery-powered design. The SMS automatically analyzes the data, so I didn't have to do anything. Within about a month of installation, we received a notification about a pump anomaly, and that's when I realized this technology is truly effective."

*Maintenance Manager
A Major Automotive Manufacture*

ADI OtoSense Smart Motor Sensor reduces overall costs:

- Reduces unforeseen downtimes and avoids catastrophic failures
- Extends period between overhauls
- Reduces route-based activities & optimizes maintenance resource allocation
- Supports more efficient spare parts management and stocking
- Facilitates extended equipment service life
- Optimizes motor efficiency
- Improves OEE (Overall Equipment Efficiency)



Benefits of ADI OtoSense Smart Motor Sensor:

1. Advanced diagnostics for prioritized action

- Identifies electrical and mechanical performance degradation
- Supports maintenance prioritization via assessment of severity levels
- Provides repair insights and recommendations

2. Sensing technologies for high quality

- Multi-axis, wide bandwidth vibration sensors monitor mechanical health
- Magnetic field sensors monitor electrical health
- Temperature sensors monitor ambient and motor skin temperature

3. Machine learning creates individualized motor models during operation

- Combines and interprets high quality, sensing data for higher reliability diagnostics
- Creates automated, brand agnostic motor models.
- Customized model for individual motor & the processes in which it is used

