

Bulk/Belt Conveyor Systems Application

INTRODUCTION

The global conveyor systems market was valued at \$5.42 billion in 2021 and is projected to grow to \$7.76 billion by 2029, with a CAGR of 4.8%. Growth is being driven by e-commerce expansion and the adoption of Industry 4.0. Conveyors remain an essential part of the production line, chosen for efficiency and durability over traditional transport methods. At the same time, the IIoT transformation of supply chains is compelling organizations to adopt more innovative technologies that enhance efficiency, reduce downtime, and meet consumer demands.

PROBLEM

The continuous flow of conveyors allows materials to be transported across long distances. However, the constant stress placed on these systems increases the likelihood of breakdowns—often when least expected.

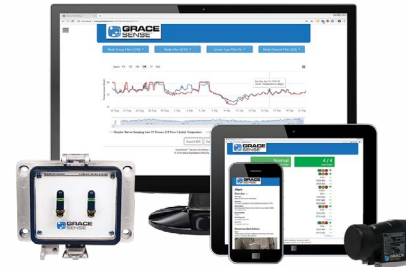
Troubleshooting failures can be tedious and time-consuming, as pinpointing the exact location of the failure is challenging. To avoid catastrophic interruptions, equipment is sometimes over-maintained due to fears of breakdown, consuming unnecessary resources. When breakdowns do occur:

- Production losses mount quickly due to unplanned downtime.
- Repairs are delayed by unpreparedness and a lack of replacement parts.
- Worker safety risks increase significantly during reactive maintenance events

Personnel safety is at much greater risk during events of reactive maintenance.

SOLUTION

The GraceSense Machine Health Monitoring Solution delivers a more innovative, IIoT-enabled approach to conveyor maintenance. By integrating wireless vibration and temperature sensors with the cloud-based Maintenance Hub, plant personnel gain continuous insights into system health, receive early warnings of anomalies, and are provided with clear remediation steps.



Vibration Monitoring

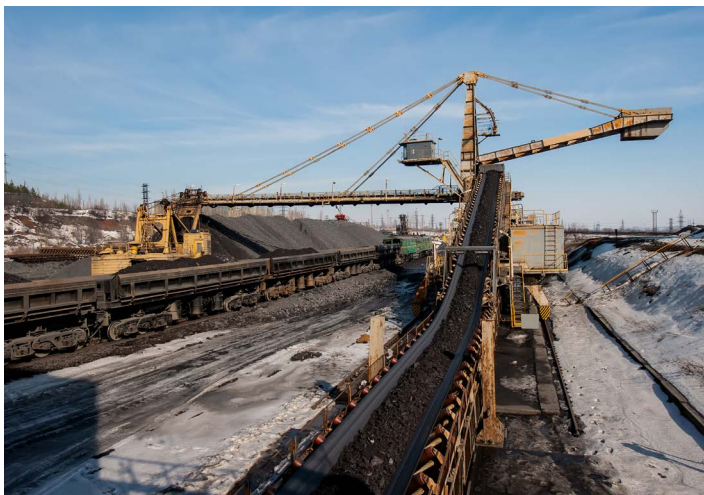
- Anomalous vibration occurs when a breakdown is impending.
- GraceSense sensors provide early detection of abnormal harmonics, giving personnel additional time to prepare necessary repairs.
- Continuous vibration monitoring enables teams to schedule maintenance and avoid unexpected failures.



Temperature Monitoring

- Misalignment or bearing failure creates rising heat across motors and drive systems.
- GraceSense™ temperature sensors capture these increases well before failure.
- Automated SMS/email alerts notify personnel that immediate inspection is required, enabling rapid response and preventing prolonged downtime

GraceSense Machine Health Monitoring **transforms conveyor reliability, reduces downtime, and enhances safety** by replacing reactive maintenance with proactive, data-driven insights.



ABOUT THE GRACESENSE™ MACHINE HEALTH MONITORING

The GraceSense Machine Health Monitoring Solution is an IIoT-enabled asset health platform that combines wireless and wired sensors with advanced analytics.

- Provides asset managers with deep insights into machine health, helping them prioritize resources and maximize maintenance budgets.
- Improves reliability, safety, and efficiency by continuously monitoring equipment and alerting personnel to anomalies.
- Sends timely SMS/email notifications with pre-configured, step-by-step remediation instructions.
- Frees maintenance teams from unnecessary routine checks while preventing downtime caused by missed failures.

GS-PMS-CS1-EN 2509