

# TRUCONNECT Remote Service





# Crane condition and usage information at your fingertips

Preventive maintenance is essential for keeping your cranes in top operating condition. TRUCONNECT Remote Service along with a Konecranes service program provides valuable usage and operating data that can be used along with inspection and maintenance information for a comprehensive view of equipment maintenance needs and performance.

Incorporating predictive maintenance elements including TRUCONNECT Remote Service into a service program can further optimize maintenance activities, reduce unplanned downtime and improve equipment safety, productivity and lifecycle value.

Predictive maintenance utilizes condition monitoring, advanced inspections and data analytics to predict the need for maintenance due to component wear or fatigue or other factors such as environmental stresses. Recommendations to repair or replace components are driven by a combination of preventive and predictive maintenance findings.

Analyzing and identifying anomalies, patterns and trends in TRUCONNECT data helps us make informed, component-specific predictions, and prioritize recommendations and actions.



# Are you ready to connect?

## Optimize crane safety, productivity and maintenance

TRUCONNECT is a suite of remote service products and applications that supports maintenance operations and drives improvements in safety and productivity. TRUCONNECT provides the visibility you need to fully understand the day-to-day use of your cranes. The data can help you make decisions on maintenance, safety concerns, training, productivity, and service and equipment investments.

In between regular inspections and preventive maintenance, issues can arise due to operator error, irregular crane usage or other unforeseen events. TRUCONNECT data can alert you to problems with

your cranes before they give way to critical issues that can impair safety and performance, helping you plan and leaving less room for surprises. Analyzing TRUCONNECT data can also help you develop an operational baseline and identify opportunities for maintenance and process improvements.

TRUCONNECT data can help you increase operational safety and save time and expenses with less downtime. And it doesn't take a data scientist to interpret the information—TRUCONNECT data is presented in easy to read graphs and color indicators on the Konecranes Portal.



**Anomalies** are abnormal events that can show up as faults and should be addressed promptly as they occur. A good example is an overload. Knowing precisely when an overload has occurred is the first step in identifying its cause and taking steps to prevent it from happening again.



**Patterns** are recurring events that might show up on a daily, weekly or monthly basis, or follow some other correlation. A pattern of excessive starts or emergency stops can indicate a need for inspections because these actions can cause components to wear faster.



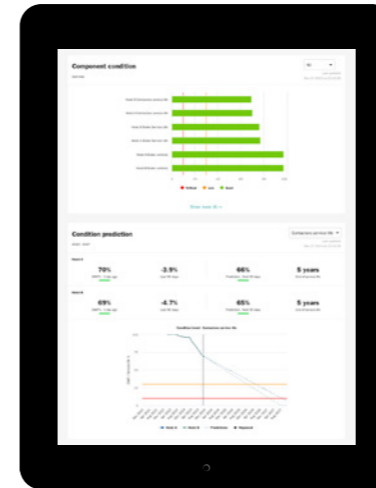
The study of **trends** can help uncover targets for safety and productivity improvements. Data charts and graphs provide visual cues of things that are increasing or decreasing. Analyzing data behavior over time supports investment decisions and the development of predictive maintenance.

# TRUCONNECT Remote Service

WHAT IT DOES	BENEFITS	DATA	AVAILABILITY	RECOMMENDED FOR
<p><b>TRUCONNECT Remote Monitoring</b></p> <p>Collects condition and usage data from control systems and sensors on an asset and provides alerts of certain anomalies.</p> <p>Remote Monitoring data is used in maintenance planning and in predicting possible component or equipment failure.</p>	<ul style="list-style-type: none"> <li>• Supports predictive maintenance.</li> <li>• Maintenance actions can be planned based on estimated component condition i.e. estimated remaining life.</li> <li>• Provides knowledge of the remaining design working period (DWP) and remaining service life of selected components such as hoist, brakes, structures and contactors.</li> <li>• Provides asset usage and operating information that is used to assess crane condition and safety.</li> <li>• Notifies you of brake service life, hoist overloads, emergency-stops and over-temperature occurrences through text or email alerts, allowing for prompt response.</li> </ul>	<p>Collected data varies depending on asset make and model but typically covers:</p> <ul style="list-style-type: none"> <li>• Condition and expected service life of critical components.</li> <li>• Running time.</li> <li>• Lifted loads.</li> <li>• Motor starts.</li> <li>• Work cycles.</li> <li>• Emergency stops.</li> <li>• Additional TRUCONNECT options allow certain assets to be equipped with hoisting brake and/or inverter monitoring.</li> </ul>	<p>Can be delivered with new Konecranes cranes such as CXT, SMARTON, Konecranes M-series, new waste to energy cranes and select engineered cranes, to sites where mobile network coverage is available.</p> <p>The remote service hardware can also be retrofitted on some existing cranes including Konecranes equipment, Demag hoists with SafeControl, and non-Konecranes brand hoists.</p>	<p>A single crane or an entire fleet. Ideal partner to a preventive maintenance program and a requirement in order to effectively implement predictive maintenance.</p>
<p><b>TRUCONNECT Brake Monitoring</b></p> <p>Uses a condition monitoring device to collect the status of brake air gap, mechanical and electrical faults from the electromagnetic disc brakes.</p> <p>The service provides visibility into current brake condition, estimates remaining service life and indicates brake faults.</p>	<ul style="list-style-type: none"> <li>• Provides visibility to brake condition between normal inspection visits.</li> <li>• Helps minimize the risk of load drop with the detection of brake faults.</li> <li>• Helps you avoid unnecessary brake disassembly for inspection.</li> <li>• Enables predictive brake maintenance.</li> <li>• Assists in further optimization of maintenance activities to reduce unplanned downtime and to improve equipment safety, productivity and lifecycle value.</li> </ul>	<ul style="list-style-type: none"> <li>• Indirect measurement of brake air gap status and friction material wear.</li> <li>• Alerts of electrical faults.</li> <li>• Alerts of mechanical faults.</li> </ul>	<p>Delivered with new Programmable Logic Controlled (PLC) SMARTON cranes.</p> <p>A retrofit is available for Konecranes CXT, selected S-series hoists, SMARTON, M-series and selected engineered cranes, to sites where mobile network coverage is available.</p> <p>Can also be retrofitted on existing cranes, including non-Konecranes brands, if the crane is equipped with electromagnetic disc brakes.</p>	<p>Ideal for cranes in heavy use, especially if safety is a high priority. Brake Monitoring information is used in predictive maintenance and can also be used for brake maintenance planning.</p>
<p><b>TRUCONNECT Wire Rope Monitoring</b></p> <p>Reveals both visible exterior defects as well as internal defects that are not detectable with a visual inspection.</p> <p>Specialized and patented sensors continuously monitor the wire rope while the crane is in normal operation and alerts via email occur when rope condition deteriorates below set limits.</p>	<ul style="list-style-type: none"> <li>• Know the condition of your wire ropes in an instant and at any time.</li> <li>• Helps you discover defects that are not visible in periodic inspections.</li> <li>• Helps reduce the risk of load drop and other safety risks related to wire ropes.</li> <li>• No shutdown needed to inspect rope condition.</li> <li>• Offers potential to optimize rope change intervals and let you plan ahead to have the wire rope replaced during a planned shutdown.</li> <li>• Rope safety can be monitored remotely without interrupting crane operations.</li> </ul>	<ul style="list-style-type: none"> <li>• Condition of the wire rope.</li> <li>• Number of broken wires and risk indicated with traffic light indicators.</li> <li>• Detailed view of rope defects and location in the full rope length.</li> </ul>	<p>Can be pre-installed on new engineered cranes with a wire rope diameter of 22–28 mm.</p> <p>Wire Rope Monitoring is available as a retrofit for Konecranes SMARTON cranes.</p>	<p>Ideal for cranes in process critical use, especially if safety is a high priority.</p>
<p><b>TRUCONNECT Remote Support</b></p> <p>24/7 access to a global network of crane experts and specialists, offering problem solving and troubleshooting to help reduce unplanned downtime.</p> <p>In controlled circumstances, two-way communication with the machines and their operators can be established in order to expedite corrective action.</p>	<ul style="list-style-type: none"> <li>• Short lead time to begin troubleshooting helps minimize downtime.</li> <li>• Troubleshooting for problems that require high-level technical expertise.</li> <li>• Quick response support for even extremely remote locations.</li> <li>• Support 24/7 from one easy point of contact, available by phone.</li> <li>• Helps identify the need for corrective on-site maintenance actions and spare parts which may eliminate unnecessary site visit.</li> </ul>	<ul style="list-style-type: none"> <li>• Konecranes Global Technical Support has remote access to crane diagnostic unit for fault history and events.</li> </ul>	<p>Available on select Programmable Logic Controlled (PLC) engineered industrial or standard cranes in selected regions.</p>	<p>Ideally suited for extremely remote locations. Compliments a preventive maintenance program for critical engineered cranes.</p>



## TRUCONNECT data on the Konecranes Portal

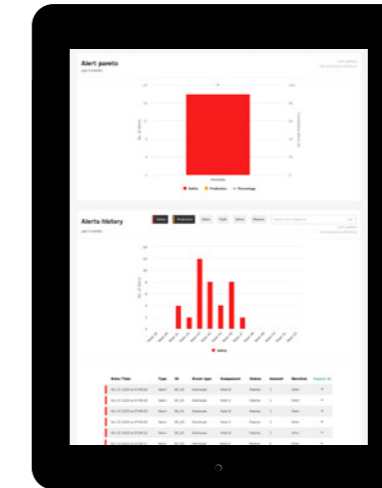


### Condition

Get a quick view of the current condition of components, any risks related to safety and production, and estimated remaining service life based on usage history.

Condition details can also be used to check the component replacement frequency, which provides a clear indication of upcoming maintenance needs and how changes in the operator's actions affect the service life of components.

This information can be used for predictive maintenance and to plan and schedule preventive maintenance in order to improve safety and reduce unplanned downtime.

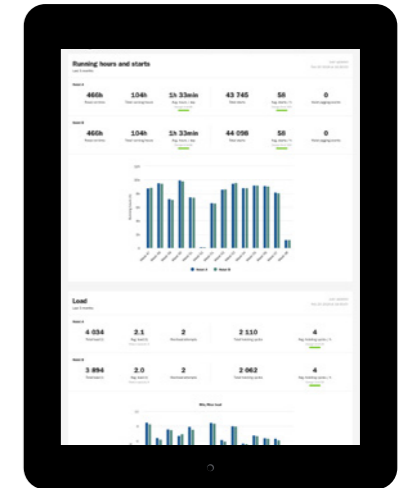


### Alerts

Safety-critical alerts and production-critical alerts are highlighted in the alert details. Safety-critical alerts indicate a safety risk to the crane or its operation. Safety-critical risks can include emergency stops, overloading and brake faults.

Production-critical alerts indicate production risks that result in crane stoppage or production downtime. Production-critical risks can include motor overheating, inverter faults and control system faults.

The Pareto analysis displays and ranks the most important causes of alerts related to the safety and usability of the crane.



### Usage

Usage shows how different crane operating patterns affect the safe operation and condition of the crane and the service life of critical components.

Usage patterns can significantly influence the service life and safety of individual components. This section also shows usage rate differences between different hoists and the subsequent differences in their remaining service life.

Usage details are designed to promote appropriate operation in order to achieve optimal results in terms of the safety, service life and maintenance costs of the crane investment.

# Data-driven insights

When you connect your crane fleet with TRUCONNECT Remote Service it expands your view of your lifting equipment, providing a complete timeline of all crane usage and condition data, rather than a static look at one crane at a time. Having a comprehensive view can help keep you from missing a minor usage abnormality—or help you connect seemingly unrelated problem patterns—before it becomes or contributes to a larger problem.

Looking at your data on the Konecranes Portal can provide powerful insights into the condition and expected service life of critical components, running time, lifted loads, motor starts, work cycles and emergency stops.

TRUCONNECT also provides alerts that call attention to anomalies or events that may threaten safety or production and can be used for troubleshooting purposes. These issues should be promptly investigated so corrective actions can be taken.

Konecranes Portal makes it easy to see what needs attention with color-coded indicators and graphs. These are some of the things you can insights on from the data on the Portal:

Safety-critical alerts make it easy to see what needs the most immediate attention. Seeing how your cranes are being used can also indicate the need for operator training to address unsafe practices.

Production issues can result in crane stoppage or production downtime. Seeing how your cranes are being operated gives insights into how the production process is working and alerts call attention to problem areas.

Issues related to maintenance can include when to replace components or perform overhauls. Data can also indicate a need to review inspection and maintenance schedules.

## Data security

TRUCONNECT and the Konecranes Portal have been awarded ISO/IEC 27001:2013 certification for information security management. The ISO/IEC 27001 certificate demonstrates a commitment to proactively manage the information security of Konecranes digital services and ensure compliance with legal and customer requirements.





Konecranes is a global leader in material handling solutions, serving a broad range of customers across multiple industries. We consistently set the industry benchmark, from everyday improvements to the breakthroughs at moments that matter most, because we know we can always find a safer, more productive and sustainable way. That's why, with around 16,600 professionals in over 50 countries, Konecranes is trusted every day to lift, handle and move what the world needs. In 2023, Group sales totaled EUR 4.0 billion. Konecranes shares are listed on Nasdaq Helsinki (symbol: KCR).

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