

INDUSTRIAL CRANES
NUCLEAR CRANES
PORT CRANES
HEAVY-DUTY LIFT TRUCKS
SERVICE

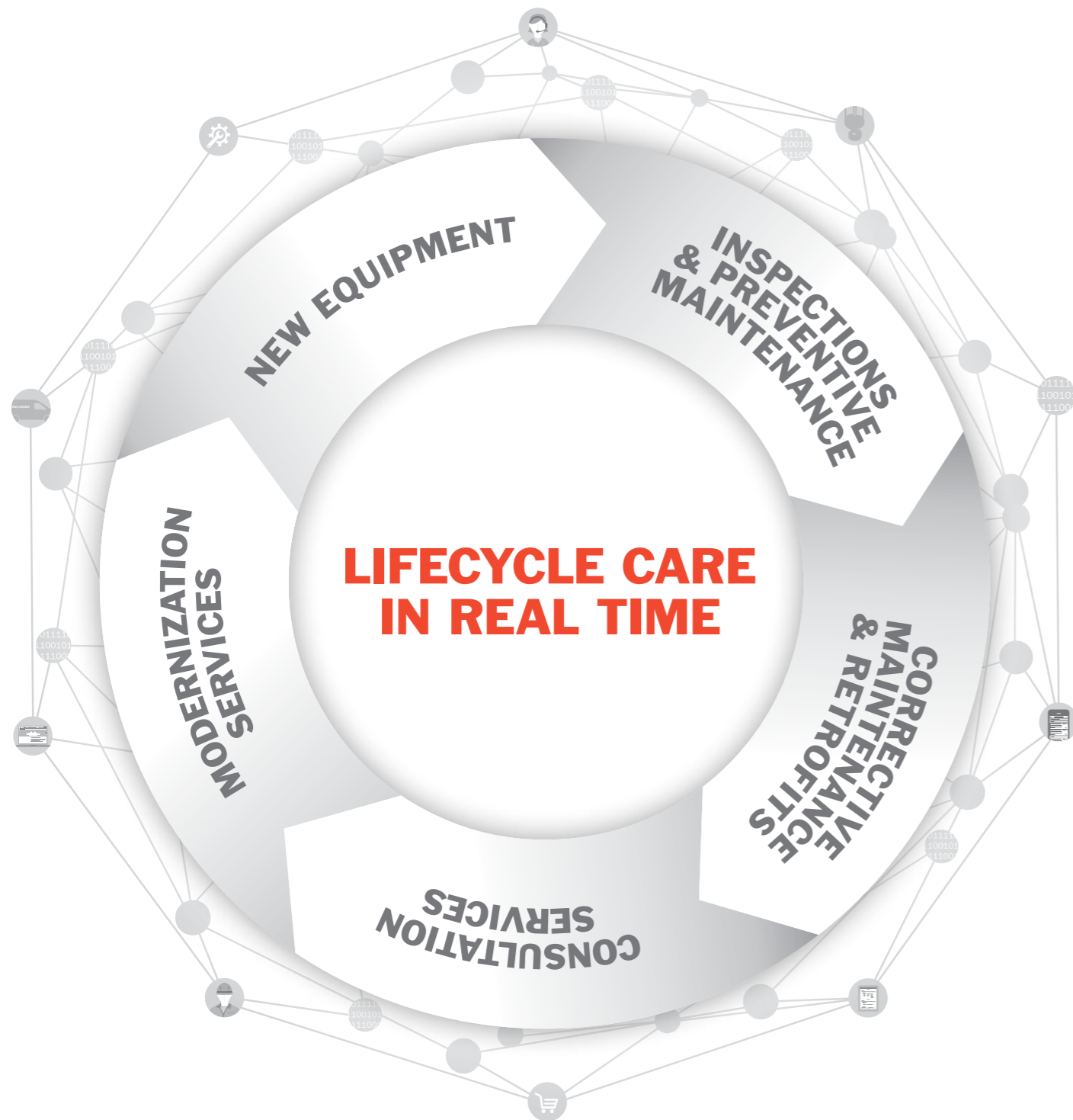
REMOTE SERVICE

KONECRANES[®]
Lifting Businesses[™]

TRUCONNECT[®] REMOTE SERVICE

LIFECYCLE CARE IN REAL TIME





CONNECTING DATA, MACHINES AND PEOPLE

Lifecycle Care is our comprehensive and systematic approach to maintenance, supported by world-class tools and processes. In order to deliver Lifecycle Care in Real Time, we use the Industrial Internet, connecting data, machines and people. We bring together usage data from TRUCONNECT® Remote Monitoring and maintenance data from MAINMAN on our customer portal yourKONECRANES.com. We use this data along with our knowledge and experience to provide insights that allow our customers to optimize their maintenance operations and activities.

CONNECT

In the field, our mobile-enabled inspectors and technicians enter inspection and maintenance data following the Risk and Recommendation Method, using our proprietary MAINMAN software. They can access maintenance history, equipment usage and operating information and look up spare parts and manuals.

TRUCONNECT Remote Monitoring uses sensors to gather usage data—running time, motor starts, work cycles and brake condition.

TRUCONNECT Remote Support provides 24/7 access to a global network of crane experts and specialists, offering problem solving and troubleshooting to help reduce unplanned downtime.

GET INSIGHTS

Customers have access to **yourKONECRANES.com**, our customer portal. Usage data, maintenance data and asset details are linked, giving a transparent view of events and activities over any selected time interval. Aggregated data can be viewed, analyzed and shared quickly, for a single asset or an entire fleet. Insights can be drawn by observing anomalies, patterns and trends, helping users make fact-based decisions.

Anomalies can show up as a one-time event – such as an overload. These events are considered abnormal and should be addressed promptly as they occur. Knowing when an overload occurs is the first step in identifying its cause.

Patterns help reveal relationships between variables. For example, operator training may reduce human-error downtime. Recurring alerts such as overheats indicate where changes in equipment or process may be desirable.

The study of **trends** can help prioritize corrective action and investments. Analyzing data behavior over time makes predictive maintenance increasingly feasible.

OPTIMIZE

Our consultative approach can help guide your decision-making. We take time to share our findings, provide recommendations and discuss how each action can optimize various aspects of your operations and maintenance.

- Regulatory compliance
- Record keeping
- Maintenance planning and prioritization
- Spare parts supply
- Equipment utilization
- Operator training
- Capital expenditure planning and justification

YOURKONECRANES.COM

A complete view of your assets and relationship with Konecranes on any web-enabled device.



TRUCONNECT

TRUCONNECT is a suite of remote service products and applications to support maintenance operations and drive improvements in safety and productivity. It is an important building block in delivering Lifecycle Care in Real Time.

WHAT IT DOES

BENEFITS

DATA

AVAILABILITY

RECOMMENDED FOR

TRUCONNECT REMOTE MONITORING

Sensors are placed on the crane to collect usage and operating data such as running time, motor starts, work cycles and emergency stops.

Notification of hoist overloads, emergency stops and over-temperature occurrences through text or email alerts.

- Provides asset usage and operating information that is used to assess crane condition
- Notifies you of hoist overloads, emergency-stops and over-temperature occurrences through text or email alerts, allowing for prompt response
- Gives you an estimation of the remaining design working period (DWP) of selected components, such as hoist brakes and structures

- Safety-related occurrences, such as over-temperatures, attempted overloads and emergency stops
- Pareto analysis of critical alerts
- Operating statistics, such as load spectrum, monitoring of hoist joggling, overloads, emergency stops, work cycles and running hours
- Estimates of remaining Design Working Period (DWP) of selected components, such as the hoist and hoist brake

Delivered with new Konecranes cranes such as CXT, SMARTON and engineered cranes, to sites where mobile network coverage is available. The remote service hardware can also be retrofitted on some existing cranes.

A TRUCONNECT Retrofit Kit has been designed to equip a crane not manufactured by Konecranes with the hardware required for TRUCONNECT Remote Monitoring.

A single crane or an entire fleet.

TRUCONNECT BRAKE MONITORING*

Provides continuous information regarding the wearing friction material, air gap and different brake faults.

Brake fault alerts can be sent by text message or email.

- Continuous knowledge of brake condition
- Detects brake faults, minimizing the risk of load drop
- Helps you avoid unnecessary brake disassembly for inspection
- Aids in maintenance planning by highlighting maintenance needs in advance, such as unexpected brake wear

- Data can indicate brake maintenance needs in advance and shows if air gap adjustment is proper after installation.
- Provides a clear picture of brake wearing intervals and replacement history, especially with unexpected brake problems.

Delivered with new SMARTON cranes. A retrofit is available for Konecranes CXT, SMARTON and selected engineered cranes, to sites where mobile network coverage is available.

Can also be retrofitted on existing cranes if the crane is equipped with electromagnetic disc brakes and the brake control current is under 6 amperes.

Especially useful for critical process cranes such as stamping line cranes and automated storage cranes and cranes in paper mills, waste to energy plants and steel mills.

TRUCONNECT REMOTE SUPPORT*

24/7 access to a global network of crane experts and specialists, offering problem solving and troubleshooting to help reduce unplanned downtime.

In controlled circumstances, two-way communication with the machines and their operators can be established in order to expedite corrective action.

- Begin troubleshooting soon after a breakdown or other event to minimize downtime
- Troubleshooting for problems that require high-level technical expertise
- Support for even extremely remote locations
- Responsive support 24/7 from one easy point of contact, available by phone
- Helps identify the need for corrective on-site maintenance actions and spare parts

TRUCONNECT Remote Monitoring data is available.

Available on rubber-tired gantry cranes and various engineered industrial cranes in selected regions.

Ideally suited for extremely remote locations.

* Brake Monitoring and Remote Support are additions to Remote Monitoring



yourKONECRANES.com

TRUCONNECT usage data is viewable on our cloud-based customer portal – yourKONECRANES.com. If you have a maintenance agreement with us, your maintenance data and asset details from MAINMAN are also available on the portal, giving you a transparent view of events and activities over any selected time interval.

Aggregated data can be viewed, analyzed and shared quickly, for a single asset or an entire fleet. Insights can be drawn by observing anomalies, patterns and trends, helping you make informed maintenance decisions.

TRUCONNECT DATA ON yourKONECRANES

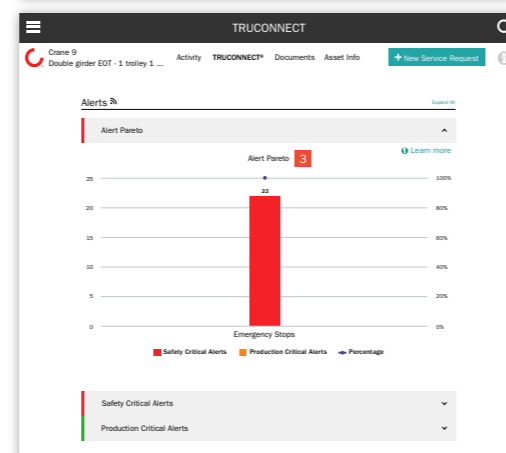
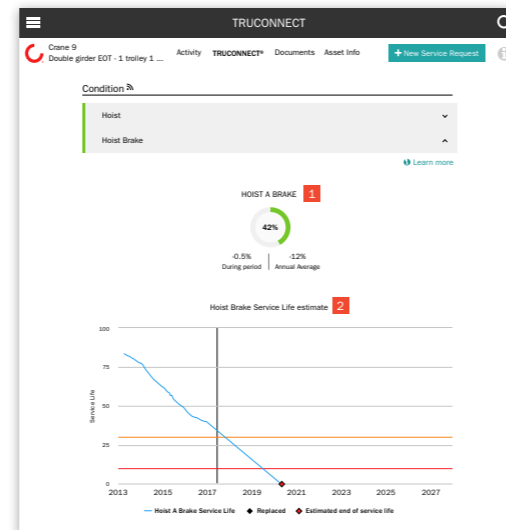
Condition monitoring shows the current condition of the components, any risks related to safety and production, and the estimated remaining service life based on the usage history. Condition monitoring can also be used to check the component replacement frequency, which provides a clear indication of upcoming maintenance needs and how changes in the operator's actions affect the service life of components. This information can be used to plan and schedule preventive maintenance in order to improve safety and reduce unplanned downtime.

The **Alerts** section highlights safety critical alerts and production critical alerts. 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.

¹ The working period/DWP of a new hoist brake is expressed as 100%. The remaining working period/DWP of a used hoist brake reduces toward 0%.

² The trend graph shows the remaining working period/DWP of the brake based on the operating history.

³ The Pareto analysis displays and ranks the most important causes of alerts related to safety and the usability of the crane. Alerts are ranked in the chart cumulatively from the most frequent to the least frequent alert.



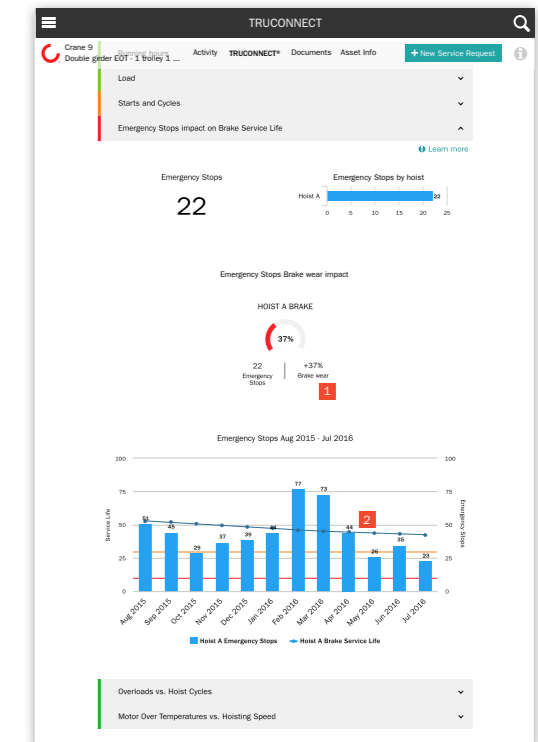
Operating Statistics show how different crane operating patterns affect the safe operation and condition of the crane and the service life of critical components.

Operating 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.

This section is 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.

¹ The impact of emergency stops on the brake wear percentage shows the effect of emergency/abnormal stops on the brake service life in addition to the hoist motor starts. The impact of a single emergency stop during lifting or lowering corresponds to 50 normal starts.

² The graph shows the cumulative number of emergency stops per period and the service life trend of the brake.





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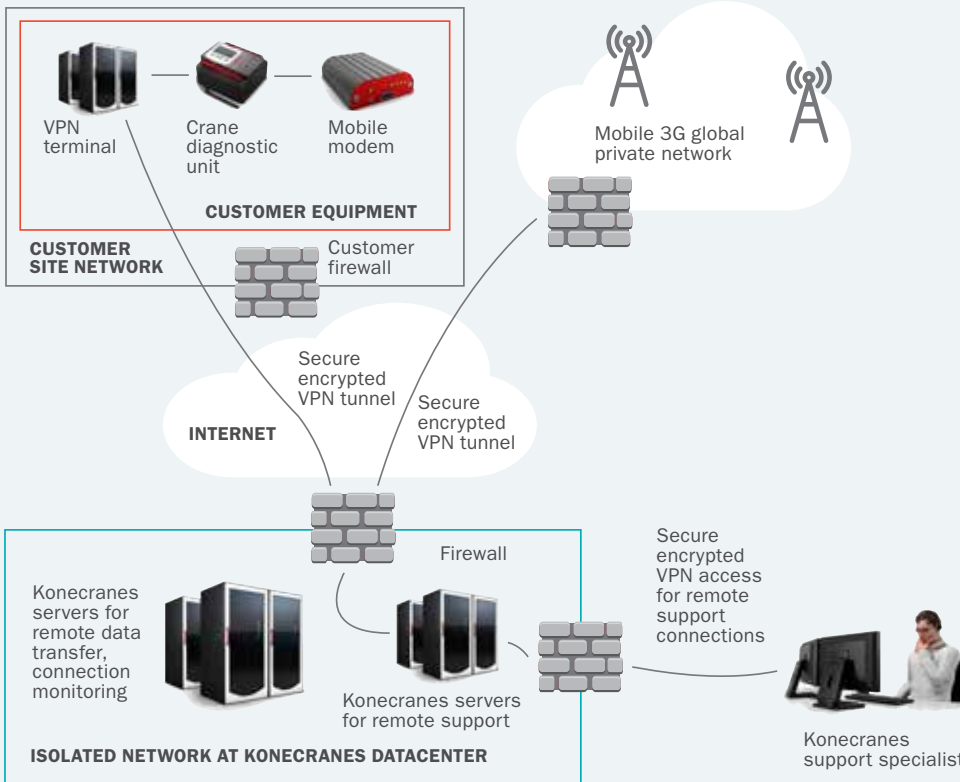
HEAVY-DUTY LIFT TRUCKS

SERVICE



Konecranes is a world-leading group of Lifting Businesses™, serving a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. Konecranes provides productivity enhancing lifting solutions as well as services for lifting equipment of all makes. The Group has 18,000 employees at 600 locations in 50 countries. Konecranes class A shares are listed on the Nasdaq Helsinki (symbol: KCR).

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DATA SECURITY

TRUCONNECT collects data through a condition monitoring unit installed on the asset. The data is then transmitted via a modem to a datacenter. Data is stored in a secured location outside of Konecranes premises.

The condition of the remote connections is monitored by Konecranes for the highest availability. And access to remote connections is strictly controlled and granted only to authorized personnel.

ADDITIONAL SECURITY

- The system is protected with anti-virus software installed in all workstations, specialist laptops and the remote data center
- Remote connections are isolated from the public Internet and all data traffic is encrypted
- Enforced password policies
- Continuous security monitoring and incident response