



Global monitoring of lifting technology

Industry 4.0 solution for cranes and hoists, also suited for retrofit

Worldwide Remote Condition Monitoring via mobile radio

STAHL CraneSystems supplies its modern hoists to crane manufacturers, who can then install them on site of the end user. The new Hoist Condition Monitor oversees the operating parameters and, among other things, improves operational and occupational safety.

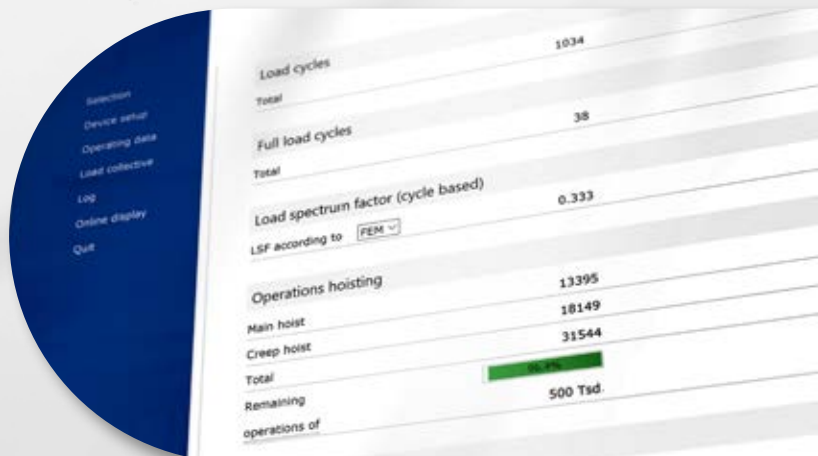


1

The IoT Edge Gateway DATAEAGLE 7050 takes over the relevant machine or system data from the control unit and transmits them - after one Preprocessing - using its globally valid eSIM-card via the regionally strongest

2

The Device Cloud handles the device management, the billing of the mobile phone costs and optionally also the visualization of the data. STAHL CraneSystems realizes the dashboard in its own cloud.





Application: Monitoring of industrial cranes and hoists

It is hard to imagine any industrial manufacturing without cranes and hoists to transport raw materials, goods, or equipment. Today, with the rise of Industry 4.0, these cranes, operating in a wide range of industries, can connect to the people responsible for them. [This is of interest to suppliers and operators of cranes and hoists, as well as to service and maintenance personnel. They all can benefit from monitoring important operational parameters of these machines and their control units in close-to real-time.](#) The goal of this preventive maintenance is to ensure that engines, brakes, wire rope hoists etc. are running smoothly, for maximum machine availability, and for enhanced operational and occupational safety.



Challenges: Reliable connectivity and a complex value chain

Cranes are often scattered around the globe, operating in ports, production plants, on construction sites etc. Some of these locations can be very remote, and communication infrastructure may be inadequate, e.g. with internet access blocked for this type of use, or even no internet at all. Also, there probably is no trained service personnel available onsite. These circumstances demand, that the [crane and hoists manufacturers continually transmit operational data from the machinery to a centralized platform, via a globally applicable connectivity solution. The monitoring data presented on the platform then can be evaluated to ensure reliable operation.](#) Recently, this challenge was taken up by STAHL CraneSystems, a world-leading German manufacturer of hoists well-known for its innovative solutions. In this setup the complex value chain of a crane solution plays an important role: STAHL CraneSystems supplies its sophisticated lifting gear to crane manufacturers, who install the cranes onsite at the end customer. An external agent then takes over the servicing of the lifting gear.



Solution: Mobile radio and IoT Edge Gateway

STAHL CraneSystems, in close cooperation with Schildknecht AG, decided to develop a solution utilizing the communication technology with the strongest presence worldwide - mobile radio. Realizing the potential of mobile radio at an early stage, Schildknecht has transformed it into powerful device technology by developing the IoT Edge Gateway DATAEAGLE 7050. [This edge gateway receives machine and system data from the hoist's control unit, pre-processes the data, and transmits it via a globally applicable eSIM card to a Device Cloud.](#) [The system automatically chooses the most powerful mobile radio network available in the region \(Unsteered Roaming\).](#) The Device Cloud enables authorized maintenance specialists to access and analyse the data. The Device Cloud (DATAEAGLE Portal) allows for device management as well, like software updates or billing of mobile radio costs. [Additional features like visualization can be integrated via the DATAEAGLE Portal, although in this instance it is done in STAHL CraneSystems' own cloud.](#) Data is synchronized through an API and only stored temporarily in the Device Cloud. Collaborating closely, the two companies adapted [the functionality of the DATAEAGLE 7000 to the well-proven hoist control SMC \(Stahl Multi-controller\) based on OEM principles.](#) The compact module is connected to an RS 232 interface on the SMC's front through which it receives data from the control unit, making this innovation ideal for retrofitting of already installed systems.



Result: Data based global monitoring for reliable and secure operations

The close collaboration between two innovative companies demonstrates, how quickly an Industry 4.0 solution can be developed and realized: With Schildknecht only needing a few weeks of development time, STAHL CraneSystems was able to present and demonstrate a fully functional solution at the LogiMAT 2019 fair in Stuttgart. Now, the [STAHL CraneSystems-Cloud allows crane builders and external service providers to examine a wide range of data sets: Operating data acquisition; load spectrum recorder; automatic load control \(ALC\); motor management; load monitoring; extended speed range \(ESR\); load early warning, break monitoring, and much more.](#) This information is particularly important for compliance with relevant regulations regarding service life (maximum number of lifting cycles), occupational safety, and automated notification of service providers in case of malfunction. The STAHL CraneSystems-Cloud, now enhanced with a truly global Industry 4.0 connectivity solution, is a great step forward for operators responsible for running globally installed crane and hoist systems in a reliable and safe way.

