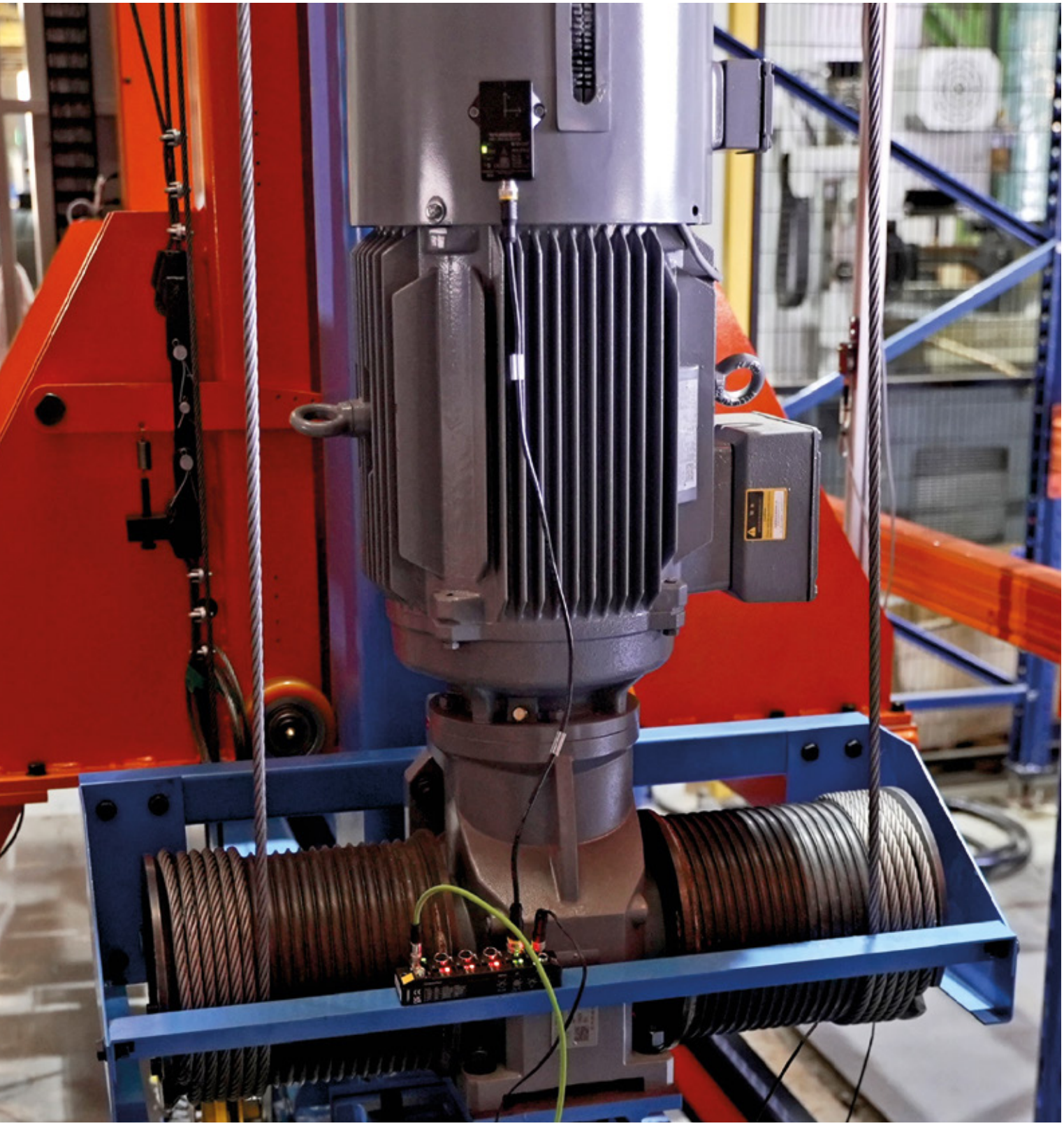
Logistics Pilot

Efficient condition monitoring directly at the motor: The TBEN-S2-4IOL module (below) is the link between the CMVT sensor (above) and other components of the control system

Siasun Robotics increases the availability of its automated storage system with a condition monitoring solution based on Turck's CMVT vibration and temperature sensor



For trade and logistics, tight schedules with high reliability and efficiency are the order of the day. Countless processes in ultra-modern logistics centers ensure the continuous flow of goods in a complex interplay. In this demanding environment, storage and retrieval machines and stacker cranes are often indispensable players that form the basis for smooth processes. Unplanned machine downtimes due to delayed or improper maintenance create costs and bottlenecks in the logistics and production chain. In this challenging environment, systems that monitor plants and proactively prevent potential failures could make all the difference. Intelligent production technologies and increasingly digitalized processes, supplemented by artificial intelligence, smart data, driverless transport systems (DTS) and digital twins, are playing an ever greater role in overcoming these challenges.

As one of the leading system suppliers and specialists for intelligent manufacturing in the Chinese logistics industry, Siasun Robot & Automation Co. Ltd. based in Shenyang was tasked with optimizing an automated warehouse system. Stacker cranes form the heart of this system and are essential for a smooth operation. The cranes move on three axes, with a motor for each axis. Precise monitoring and analysis of the motor's condition are implemented to minimize unplanned failures and downtime. Siasun therefore looked for a solution to handle the data acquisition and predictive maintenance.

Three CMVT sensors are used for each stacker crane, one for each motor

Integrated condition monitoring solution for reliable monitoring

The requirements for the condition monitoring solution to be integrated into the storage system were manifold. Data had to be logged in real time in order to be able to react in good time. Intelligent functions also had to be added to the storage system. Relevant condition parameters such as voltage, current, temperature, noise and vibrations had to be transmitted to the control system. The aim was to ensure reliable monitoring of the entire system through data analysis and evaluation. Another objective was to provide recommendations for timely maintenance measures to ensure long-term production stability.

CMVT sensor: reliable monitoring under demanding conditions

Turck's condition monitoring solution relies on the monitoring of vibrations and temperatures as well as data transmission via IO-Link technology. The key components of this solution are the CMVT combined vibration temperature sensor and the TBEN-S2-4IOL compact IO-Link master module with multiprotocol Ethernet. The solution can be easily integrated into existing infrastructures and is also extremely cost-efficient.

Each stacker crane in the warehouse moves on three axes, each of which has its own motor. To identify abnormal vibration behavior of the motors, Siasun uses the CMVT sensor on each motor. The collected data is transmitted via IO-Link using the TBEN-S2-4IOL multiprotocol I/O module.

The CMVT sensor was specially developed to monitor vibrations and temperatures in real time. The sensor records vibrations precisely and reliably across three axes and evaluates the measurement data internally. The high measuring sensitivity of the sensor with its highly developed MEMS technology enables precise detection of even the smallest vibrations, which is crucial for accurately recording the movement behavior of stacker cranes.

The IP68/IP69K protection rating ensures resistance to moisture and dust in demanding environments. Its robust design furthermore ensures a high shock resistance of 200 g. The timely detection of anomalies and the triggering of alarms when certain threshold values are exceeded enable potential failures to be

QUICK READ

To ensure smooth operation, the Chinese high-tech company Siasun Robotics wants to improve the condition monitoring of its automated storage system. This requires the continuous logging and transmission of temperature data to the higher-level control system. Turck's easy to retrofit system solution for condition monitoring offers a cost-effective and reliable solution. The digitalization of all monitoring parameters makes production monitoring more efficient, reduces downtimes and improves processes.

»Turck's vibration and temperature sensors are very easy to integrate into our system and also offer a significant cost advantage«

Jing Dachuan | Siasun

identified at an early stage so that proactive measures can be taken.

TBEN-S2-4IOL: efficient integration and reliable data transmission

The TBEN-S2-4IOL multiprotocol I/O module from Turck serves as a link between the CMVT sensor and the PLC. By supporting common protocols such as Profinet, Ethernet/IP and Modbus TCP, the TBEN-S2-4IOL can be flexibly adapted to a wide range of different installations and control systems, making it easier to integrate into existing infrastructures. Operation of the CMVT sensor and the TBEN-S master module is extremely user-friendly, so everything can be easily integrated into existing systems – without complex installations or expensive training.

"Turck's vibration and temperature sensors are very easy to integrate into our system and at the same time offer a significant cost advantage," says Jing Dachuan, technical manager of Siasun's logistics department. "Given our customers' diverse condition monitoring requirements, Turck offers an extremely simple and reliable solution for vibration measurement."

The CMVT combined vibration and temperature sensor records vibrations across three axes and evaluates them internally

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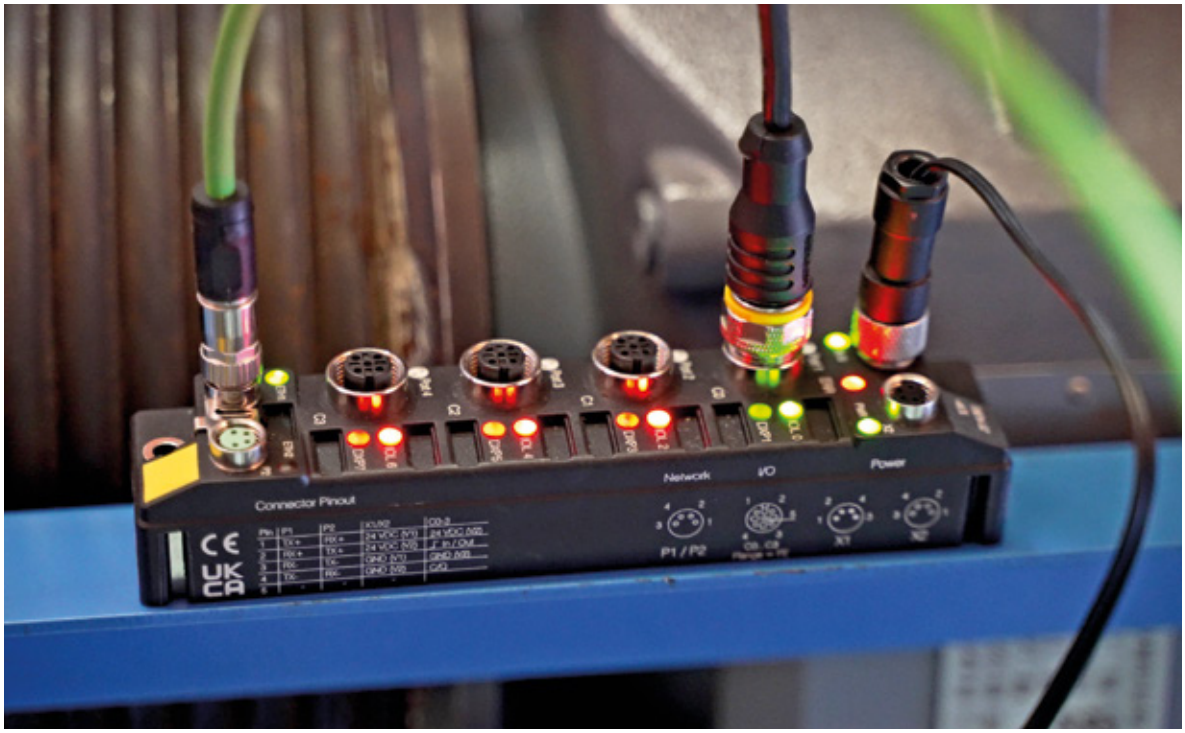

The TBEN-S2-4IOL multiprotocol I/O module adapts itself to different control systems, making it easier to integrate into existing infrastructures