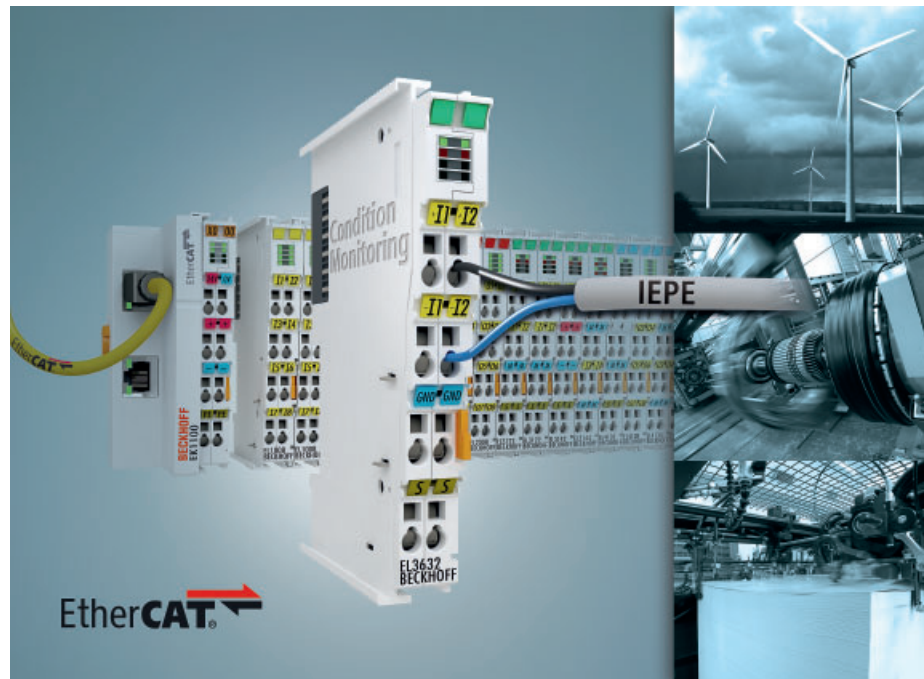


Scientific Automation: EL3632 EtherCAT Terminal records status data via IEPE accelerometers

Condition Monitoring functions can be integrated simply and cost-effectively into the EtherCAT I/O system from Beckhoff using the EL3632 EtherCAT Terminal. For the user, this means: no additional hardware, optimum integration into the control system and considerable cost reductions. The signals are analyzed on the PC using either TwinCAT automation software or user software. The EtherCAT real-time Ethernet system offers the ideal network for high-performance communication of all measured data back to the PC.



Condition Monitoring functions can be integrated simply and cost-effectively in the PC-based control system using the EL3632 EtherCAT Terminal.

Condition Monitoring: an integral part of PC-based control

Condition Monitoring systems for tracking the status of a machine or plant undoubtedly help reduce downtime and maintenance costs. To this end, the ever-changing physical variables such as vibration and temperature are measured on the machine. The EL3632 EtherCAT Terminal enables the direct connection of various accelerometers via an IEPE (Integrated Electronics Piezo-Electric) or ICP (Integrated Circuit Piezoelectric) interface. These sensors record vibrations in a machine, bearing or motor so that, by means of analysis, wear and damage can be detected before a breakdown occurs, avoiding unplanned downtime or prolonged maintenance intervals. A central, PC-based controller here is advantageous, particularly if large amounts of data from different devices need to be referred to for analysis or if damage frequencies need to be evaluated in relation to rotary speeds.

Condition Monitoring becomes an integrated part of the controller when using the EL3632. The data is recorded by the standard I/O system and made available to the superordinated PC controller. The measurement signals are evaluated on the PC using a TwinCAT library or user software; the warning and shutdown thresholds are set accordingly. Adjustable filters and supply currents for matching various sensors enable the user-specific adaptation of the Condition Monitoring terminal.

Through interfacing via EtherCAT and support of the distributed clocks function, the measurement results – and any detected defects – can be precisely allocated to an axis position. In this way, the user knows what is happening at each axis position on the machine. By matching positions to acceleration values, conclu-

sions can be drawn about possible sources of error. On the software side, the EL3632 is supported by various TwinCAT libraries, e.g. with high-quality filters such as FFT (Fast Fourier Transformation), digital high-pass or low-pass filters, or envelope monitoring. TwinCAT Scope is also being expanded to include Condition Monitoring functions.

The EL3632 Condition Monitoring terminal is easy to integrate in the control system and is easy to retrofit. Its range of applications is extremely versatile, extending from mechanical engineering and process technology to status monitoring in wind turbines.

Traditional Condition Monitoring systems are expensive, constructed as separate hardware devices and need to be coupled elaborately with the automation system. Other solutions merely report the respective operating status without supplying detailed information to the controller. In EtherCAT, a capable communication system is available for the high-performance relaying of the recorded status data to the PC controller. The "Scientific Automation" concept is applied on the central PC: besides sequential control, Motion Control and HMI, TwinCAT also integrates additional functions such as Condition Monitoring on a software and hardware platform. In addition to the perfect integration of all components and the reduction of hardware costs, engineering efforts are also greatly simplified: configuration, programming and diagnostics take place on one system using TwinCAT.

www.beckhoff.com/EL3632