Intelligent monitoring of machines

FAG SmartCheck is an innovative online system that can be used to monitor various machines. Typical tasks include the monitoring of electric motors, pumps, compressors, ventilators, fans and gearboxes. Schaeffler Industrial Aftermarket (IAM) is a division of Schaeffler Group, a world leading automotive and industrial supplier. With precision components and systems within the motor, gearbox and chassis as well as rolling and slide bearings solutions the Schaeffler Group contributes significantly to the mobility in tomorrow's world.

With FAG SmartCheck, Schaeffler offers its customers a compact, easy to operate and at the same time economical solution for the monitoring of machines on the basis of both classical and oscillation-based process parameters.

FAG SmartCheck reliably detects possible damage to machines at an early stage, thereby helping to avoid unplanned stoppages and to prevent expensive consequential damage. Complemented by a comprehensive range of services from Schaeffler in the areas of machine diagnosis and bearings, FAG SmartCheck makes a valuable contribution to process optimization and to the reduction of life-cycle costs (LCC) and thus to the Total Cost of Ownership (TCO).

Characteristic patterns in the oscillation signals from components such as shafts, pulleys and fans provide an early indication that damage is starting to occur. In combination with process parameters such as torque, load and rpm, precise statements can be made about the progress of the damage. An integrated sensor determines temperature parameters.

The Schaeffler Online Monitoring Center offers customers further advantages such as remote maintenance, system updating as well as the administration and archiving of measurement data, and support.

Consolidation of build automation and system tests

At the centre of the joint project between Schaeffler Industrial Aftermarket (IAM) and emlix was the target of making it possible for Schaeffler to maintain and service

FAG SmartCheck

The FAG SmartCheck monitoring device can be operated easily and intuitively using two capacitive buttons. The software FAG SmartWeb, which is integrated into the device, can be accessed via a web interface using any standard browser.

For Mitsubishi controllers of the L and Q series the communication protocol SLMP is implemented. This protocol enables the direct transfer of information on the status of the components being monitored such as bearing damage, components that are out of balance, misalignment or temperature deviations. This information can be presented by the controller as text, for example on the operating terminals.

The adjustability of the alarm threshold facilitates a secure alarm system. An LED on the device displays an alarm warning immediately. The alarm can be passed on to the central control point via an interface. A free „app“ can enable any smartphone to receive alarm messages via the WiFi network of the operator.

The alarm status of the FAG SmartCheck system can also be called up using mobile devices.

the Schaeffler Embedded Linux Platform more efficiently through an improved and adapted software management and build system.

A further aim was to enable efficient development and maintenance of product variants on the basis of unified software versions whilst ensuring process security.

Innovations and error reports from the open source community can be spotted as early as possible through continuous monitoring and carefully checked to see whether, and when, they should be incorporated into a new software version. This makes it possible to react to security threats immediately if they affect the FAG SmartCheck systems.

A particular challenge was that the product had already been successfully launched on the market and the changes to the development tools and processes could not be allowed to negatively affect the product characteristics. Through the use of the emlix Test Automation Framework (TAF), the system integrity as well as the functional capability of the system could be tested using automated procedures throughout the entire development process.

Optimized security for industrial use

The high level of innovation of FAG SmartCheck combined with the short development time made agile software development spread across multiple locations necessary. In a first step, emlix supported Schaeffler with the design and installation of an adapted development environment.

Parallel to this, in close cooperation between the Schaeffler and emlix teams, new and additional functions on the level of the operating system were integrated and tested.

For example, tailored to the industrial areas of application of FAG SmartCheck, a new update and emergency system that is even better secured against malfunctions as well as an adapted boot loader with a redundant configuration environment were developed. All these measures concentrate on keeping the availability of FAG SmartCheck at the highest possible level at all times.

emlix GmbH

solutions @ emlix.com
http://www.emlix.com

Phone +49 (0) 551 / 30664-0
Fax +49 (0) 551 / 30664-11