

Mitsubishi Electric adds advanced condition monitoring capabilities to the FR-A800-E inverter series

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Mitsubishi Electric has extended the diagnostics capabilities of variable speed drives by integrating smart condition monitoring (SCM) technology in a new version of the FR-A800 inverter series. With the new FR-A800-E line, the company has advanced the concept of drive-based condition monitoring. The user is able to carry out condition monitoring functions directly within the inverter.

The additional capability comes via the integration of the SCM Kit-1 into the FR-A800-E inverters. The pre-configured, plug-and-play solution includes the FAG SmartCheck vibration sensor from e-Factory Alliance partner Schaeffler. Combined with the PLC function, also integrated within the FR-A800-E models of inverter, it provides a complete drive-based solution for preventative maintenance. It is the only solution of its kind on the market.

This integrated approach to monitoring the health of individual assets combines traffic-light indication of the asset through red, amber and green status lights on the sensor, plus more detailed analysis within the FR-A800-E series. Within the inverters operating temperature and vibration feedback from the SmartCheck sensor is combined with the monitoring of a full range of other external parameters, including speed, voltage and current information. Detailed diagnoses can be monitored remotely, or displayed on the FR-A800-E inverters' integrated screen.

In the event of a deterioration in operating conditions or a likely impending failure, the system will recommend countermeasures via clear text messages, or by forwarding them to higher-level systems. This means that maintenance personnel do not need any special diagnostics expertise in order to be able to identify faults. They can observe the drive messages, take the necessary actions and schedule any maintenance work required. As a result, downtime is minimised and system availability maximised – which in turn leads to further cost reductions. The net result is that system maintenance for critical assets can be planned in advance, resulting in a longer service life.

System configuration

Within the FR-A800-E models, the PLC function acts as the sensor controller for the SmartCheck sensor, eliminating the need for a separate controller. The sensor itself can be added to assets where required, being easily retrofitted to the fixing bolts of rotating machine components such as motors, shaft bearings, pumps, fans, drums and gearboxes. Once set up, the SCM provides 24/7 monitoring of the machine, with functions including bearing defect detection, imbalance detection, misalignment detection, lack of lubricant, temperature measurement, cavitation detection, phase failure recognition and resonance frequency detection.

Up to two further SmartCheck sensors can be added and wired over Ethernet to FR-A800-E type inverters as needed, and cabling requirements are minimised through the use of Power-over-Ethernet (PoE), so that the vibration sensor can be fully integrated using only a single cable.

While the display on the FR-A800-E models provides clear text messages, more detailed feedback and analysis can be provided by

connecting an optional Mitsubishi Electric GOT2000 HMI. This can display not only detailed status information relating to the machine condition, but also maintenance proposals, alarms with a time stamp or trend data. Early diagnosis enables initial or pre-emptive maintenance work to be carried out promptly.

Further, the FR-A800-E series provides an in-built web server, enabling operators to use a standard web browser to connect using PCs and mobile devices. Fine-tuning production settings and adjusting individual parameters in line with system requirements then becomes possible while on the move.

An app suitable for use with mobile devices, including iPhones and iPads, is also available and this expands the range of motor control and monitoring functions, from simple motor control functions through to managing alarms and operating parameters remotely. In addition, status information from the SCM solution is still shown on the display as clear text.

Today more than ever before, manufacturers need to respond to global competition, adapting their business models accordingly. A key aspect of the digital future of Industry 4.0 is the ability to control and optimise processes in real time, and this can only be achieved with intelligent monitoring systems. Together with its e-Factory Alliance partners, Mitsubishi Electric is developing the technologies that will help companies rise to the challenges of Industry 4.0, and the SCM solution is a prime example.

The FR-A800-E inverters with SCM Kit-1 will be officially launched in April. In the meantime, Mitsubishi Electric is already offering a separate SCM kit – the SCM Kit-1 COMPACT – which consists of a preconfigured control cabinet with sensor controller, a touch panel with

multilingual display and pre-assembled vibration sensor.

Note:

See how Mitsubishi Electric is able to respond to today's automation demands:

ie3a.mitsubishielectric.com/fa/en/solutions

Image Captions:



Picture 1: The pre-configured, plug-and-play solution includes the FAG SmartCheck vibration sensor from e-Factory Alliance partner Schaeffler. Combined with the PLC function, also integrated within the FR-A800-E models, it provides a complete drive-based solution for preventative maintenance.

[Source: Mitsubishi Electric Europe B.V., Thinkstock]



Picture 2: An app suitable for use with mobile devices, including iPhones and iPads, is also available and this expands the range of motor control and monitoring functions.

[Source: Mitsubishi Electric Europe B.V.]



Picture 3: The FR-A800-E series provides an in-built web server, enabling operators to use a standard web browser to connect using PCs and mobile devices.

[Source: Mitsubishi Electric Europe B.V.]



Picture 4: Mitsubishi Electric also offers a separate SCM kit – the SCM Kit-1 COMPACT – which consists of a preconfigured control cabinet with sensor controller, a touch panel with multilingual display and pre-assembled vibration sensor.

[Source: Mitsubishi Electric Europe B.V., Thinkstock]

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With around 135,000 employees the company recorded consolidated group sales of 38.8 billion US Dollars* in the fiscal year ended March 31, 2016.

Our sales offices, research & development centres and manufacturing plants are located in over 30 countries.

Mitsubishi Electric Europe, Industrial Automation – Irish Branch is located in Dublin, Ireland. It is a part of the European Factory Automation Business Group based in Ratingen, Germany which in turn is part of Mitsubishi Electric Europe B.V., a wholly owned subsidiary of Mitsubishi Electric Corporation, Japan.

The role of Industrial Automation – Irish Branch is to manage sales, service and support across its network of local distributors throughout Ireland

**Exchange rate 113 Yen = 1 US Dollars, last updated 31.3.2016 (Source: Tokyo Foreign Exchange Market)*

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