

Fraunhofer Institute and Mitsubishi Electric demonstrate human orientated machine operation at EMO 2017

EMO Hannover 2017, 18th – 23rd September 2017, Hannover

Hall 13 / Stand C85 and Hall 25 / Stand B94

Mitsubishi Electric is providing a glimpse of the future with human orientated monitoring and training for CNC-machines at EMO 2017, using smart devices offering direct integration with machine control systems. Developed as a pilot project with the Fraunhofer Institute for Production Technology IPT, the demonstration on the Mitsubishi Electric stand shows how smart tablets and smart glasses can be used as the user-interface with a CNC controller on a 5-axis CNC machine to support the user on a new digital level.

The great potential of smart devices in industrial applications lies in the flexibility they offer users for machine operation, production monitoring, system start-up and machine training, as well as for support/service and maintenance. Direct communication between the device and the machine controller provides a visual, easy to understand interface, delivering an innovative solution for real-time data analysis and evaluation within the information system. For machine monitoring, operators can display up-to-date machine and production information, such as progress, remaining time, machine status or overall equipment effectiveness (OEE).

Making such a system work depends on a direct exchange between the machine control system and the smart device. At the same time, the communications between the machine controller and the smart device must be close to real-time, as information is often time-critical, requiring immediate action on intervention. What it opens up is a higher level of real-time information transparency for the operator, as raw data is continually processed, visualised and automatically updated within the smart device. Should unexpected production interruptions or errors occur, the operator is automatically provided with pop-up information. Pre-defined error libraries and codes are translated into meaningful messages conveying possible causes and instructions for rectification. The result is that the reaction time to solve issues is reduced and OEE is increased.

Major boost for training and predictive maintenance practices

The technology also supports [predictive maintenance](#). Engineers are provided with data analysis results and component life-cycle information via the smart device. An example might be the indication of wear on a spindle drive. The engineer would be informed of an impending service requirement in ample time to affect a repair before failure. To aid in repair or replacement, a 3D model of the spindle drive is superimposed on the actual field of view in an augmented reality environment, clarifying and simplifying the maintenance task.

The same technology can also aid with operator or maintenance staff training, perhaps with a library of videos, PDFs or other training content that can then be displayed within the smart devices. The training content can also take advantage of augmented reality to help guide personnel around the machine to reduce learning curves.

Connectivity is one of the key features of the solution

Making use of smart devices in a practical industrial environment depends on the integration and linking of the device into the relevant system, and this has been one of the main focuses of the cooperation between the Fraunhofer Institute for Production Technology IPT and Mitsubishi Electric.

The proof-of-concept application on the Mitsubishi Electric stand at [EMO 2017](#) shows how communication between the smart device and the [M850W](#) CNC controller can be implemented using the seamless message protocol (SLMP) on an Android/PLC interface. It highlights how many different Android OS devices could be integrated. Other protocols such as OPC UA can also be utilised in the system.

Human orientated support technology for the digitalisation at shop floor level

The development work that the [Fraunhofer Institute for Production Technology IPT](#) and Mitsubishi Electric have undertaken shows that smart devices represent a sensible, logical and practical extension of the classical interface between the machine control system and the operator. As businesses drive towards Industry 4.0 production, operators will need more flexibility and real-time information presented to them, alongside direct machine interaction. The ability for direct retrieval, local processing, and convenient visualisation will be one of the key enablers for business to move forwards, and in that context smart devices have an important role to play.

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Note:

Learn more about Mitsubishi Electric's presence at EMO:

eu3a.mitsubishielectric.com/emo2017

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

eu3a.mitsubishielectric.com/fa/en/solutions

Image captions:



Photo 1: At this year's EMO 2017 Fraunhofer Institute for Production Technology IPT and Mitsubishi Electric show how smart tablets and smart glasses can be used as the user-interface with a CNC controller on a 5-axis CNC machine for demonstration of human orientated machine operation in a digital manufacturing environment.

[Source: Mitsubishi Electric Europe B.V., Getty Images, ODG – Osterhout Group Inc.]

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About Fraunhofer IPT

The Fraunhofer Institute for Production Technology IPT in Aachen, Germany, brings together many years of knowledge and experience from all fields of production technology. In the areas of process technology, production machines, production quality and metrology as well as technology management, Fraunhofer IPT offers its customers and project partners applied research and development for a networked, adaptive production. The institute's range of services is orientated towards the individual tasks and challenges within certain industries, technologies and product areas, including automotive and supply, energy, life sciences, aviation, mechanical and plant engineering, optics, precision and microtechnology as well as tool and mold making.

Further information: <https://www.ipt.fraunhofer.de/en>

About Mitsubishi Electric

With over 95 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation is a recognised world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, as well as in products for the energy sector, transportation and building equipment.

With around 138,700 employees the company recorded consolidated group sales of Yen 4,238.6 billion (\$ 37.8 billion*) in the fiscal year that ended on March 31, 2017.

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

CNC Business Unit

Mitsubishi Electric Europe, CNC Business Unit is located in Ratingen near Dusseldorf, Germany. It is a part of the Factory Automation - European 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 the CNC Business Unit is to manage sales, service and support across its network of local branches and distributors throughout the EMEA region.

**Exchange rate 112 Yen = 1 US Dollars, last updated 31.03.2017 (Source: Tokyo Foreign Exchange Market)*

Further Information:

www.mitsubishi-cnc.de/en

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