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Digital Transformation (DX)

Partner for Digital Transformation

Munich. With the CELOS X control platform, which was introduced in 2013 and has been continuously developed ever since, DMG MORI has established a standard that paves the way for end-to-end digitalized production. At the Open House in Pfronten, all machines on display will be equipped with the latest, optimized version of the app-based CELOS X manufacturing platform and will demonstrate its high degree of connectivity. DMG MORI will present this and other highlights of the Digital Transformation (DX) in the *DXperience* area—divided into the *DXoffice* and the *DXshopfloor* for practical purposes. The former showcases solutions for use in the office, such as CAD/CAM applications and CELOS DYNAMICpost for optimized NC program creation. *DXshopfloor* focuses on the machine environment and connectivity powered by DMG MORI. Networking enables the provision of machine data, availability status, productivity figures, and process data, among other things. Using the example of a DMU 50 including WH Cell workpiece handling, DMG MORI will present the latest innovations with which CELOS X further optimizes workshop-oriented manufacturing, including CELOS X apps for guided digital tool handling and Green Transformation (GX), as well as CELOS X widgets, self-service in my DMG MORI, and DMG MORI technology cycles on demand.

Air Leakage Monitoring

Since compressed air is one of the most expensive resources in a factory, early detection and repair of leaks can lead to significant cost savings and a marked increase in energy efficiency. This is where the CELOS X “Air Leakage Monitoring (ALM)” app comes in. With the help of a self-learning algorithm, it monitors the air flow and detects any leaks. As part of the CELOS “Energy Monitoring” app, it also provides information about compressed air energy consumption—which in practice is often an indication of a leak. The app is part of the GREENMODE MEASURE “Pneumatics Monitoring”—the corresponding package is required as hardware—and represents a new monitoring app in CELOS X. This includes ALM in addition to the pneumatic component in Energy Monitoring.

From presetting devices to machines with Tool Master and Tool Data Exchange

The correct entry and transfer of tool data are essential for reliable CNC machining. The CELOS X App “Tool Master” ensures reliability here because it guides even inexperienced users step by step through the setup of tools. It allows simple, intuitive tool handling and management across different control systems. For example, a tool requirements list is created and compared with the status of the tools in the magazine. The added value on the machine is obvious: guided work steps make setup safer and, especially for beginners, easier. In addition, the entire setup process is noticeably accelerated. As a useful addition to the CELOS X “Tool Master”, the “Tool Data Exchange” eliminates the need for manual entries on the machine control panel. All tools are quickly and reliably recorded using a handheld scanner via a data matrix code. All you have to do is load them into the machine. The machine

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automatically finds a free space and positions the magazine accordingly. This process reduces tool setup times by up to 80 percent and can be performed regardless of the skill level of the operating personnel.

Towards Green Transformation (GX) with CELOS X

Energy-saving and resource-efficient manufacturing is becoming increasingly important—both for a more sustainable future and in view of rising energy costs. The CELOS X apps “Energy Monitoring”, “Energy Saving”, and “Air Leakage Monitoring” make a significant contribution to this.

Energy Monitoring

The CELOS X app "Advanced Energy Monitoring" visualizes energy consumption and provides detailed analyses that can be used to derive measures to improve energy efficiency. Energy consumption is analyzed over time, per NC program execution, or aggregated (workpiece-related). The app also offers a factor-based calculation of energy costs and CO₂ emissions. It is also possible to export energy data or connect to Messenger.

Energy Saving

The Energy Saving app enables the use of the GREENMODE MEASURE “Advanced Auto Shutdown” function. The CELOS X app increases energy efficiency without additional hardware by switching off the screen, lighting, pneumatics, and drives, and by using an automatic wake-up/warm-up function. The basic idea is to shut down the machine units after a user-defined time, thus achieving standby operation with low power consumption. ECO/ECO+ mode is an extension of the previous automatic shutdown of individual components. In ECO mode, the machine remains at a constant temperature. This mode ensures that the machine is immediately ready for high-precision components after waking up. ECO+ mode switches off almost all components to achieve maximum energy savings.

Process integration made easy with CELOS X widgets

Through clear visualization of DMG MORI technology cycles and sensor data, CELOS X widgets create perfect synergy between process integration and machine operation. They are available for Siemens and HEIDENHAIN controls. The widgets shown at the Open House in Pfronten include MPC (Machine Protection Control), ETM (Easy Tool Monitor), CSG (Contact Sensor Graph for grinding, NEW), Application Connector Widget (NEW, for e.g. rotoLENS) and Drive Load Display/Graph. In addition, DMG MORI is demonstrating the new CELOS X Widget Application Connector in the CELOS Live Dashboard. Among other things, it connects the rotoLENS cameras directly to the NC control and shows the machining process live – in parallel with live data provided by the MPC or Drive Load widget, for example. DMG MORI is also demonstrating the ULTRASONIC Process Monitor, which is specifically designed for ultrasonic machining. It visualizes the ULTRASONIC process parameters as a diagram and displays the current working frequency and the performance of the running ULTRASONIC

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process. It enables easy monitoring of the ULTRASONIC control system and ensures process stability through live viewing. The widget can be displayed in the 1/3 view parallel to the Siemens Operate control, ensuring easy operation.

Self-Service with my DMG MORI

Every company aims to reduce machine downtime to a minimum. In the event of a malfunction, the personal customer portal my DMG MORI guarantees fast and transparent assistance from DMG MORI's service department. Now the machine tool manufacturer is going one step further: as soon as a service request is received via my DMG MORI, the system searches a database for suitable step-by-step instructions based on the error code. If a self-service solution is available, the customer is informed immediately. They have the choice of solving the problem themselves with the help of the instructions – and saving a lot of time – or contacting DMG MORI Service directly.

Spare parts for DMG MORI machines can also be found in my DMG MORI, in the DMG MORI Parts Shop. This offers users quick access to spare parts that are guaranteed to fit their existing machines. In addition to the classic search by item number and free text, the shop offers the option of machine-based spare part identification via photo and scan. Using a photo, the required spare part is identified in seconds and can be ordered directly via instant purchase. This reduces incorrect orders and returns to a minimum. A wish list for future orders, recommendations matching the existing machines, and the option of ordering machine-independent products such as lubricants are part of the extended range of functions offered by the DMG MORI Parts Shop.

DMG MORI Technology cycles on demand

DMG MORI technology cycles on demand are pre-installed on the machine and can be activated as needed before purchasing a full version—both for a risk-free test and for a specific machining operation. The selected DMG MORI technology cycles are offered on demand as a full version, flexible spindle hour packages, or as a one-time test license. The cycles available for this are Alternating Speed, Control of Program Status, Counter Spindle Tip, Fit in B-Axis Plunging, Multitool, Tool Sort Cycle, angularTOOL, Tilted measuring cycle, gearBROACHING, Interpolation, Turning 1.0, Keyway Broaching, Multi-Threading 2.0, Multi-Threading 2.0 Pro, Y-Axis Parting, gearSHAPING, Runtime Monitor, cCLAMP, Tool Balance Assistant, and Measuring Pro. They are available on the CLX 450 TC, CLX 550 TC, and CTX beta 450 TC machine types with Sinumerik One control as well as DMU 125 P duoBLOCK and DMU 125 P FD duoBLOCK.

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CELOS X for sustainable and future-proof manufacturing

The ability to securely integrate a machine into an existing infrastructure is becoming always more important and places demands on the manufacturing platform used, among other things. Based on a Linux operating system that runs directly on the machine, CELOS OS is at the heart of CELOS X. All machines come with a backup that can be restored by a technician at any time. Factory-locked USB ports can be managed by the customer, while the SMARTkey ensures secure access control with configurable levels (Access Level 4). Updatable systems keep the machines up to date at all times – making DMG MORI the partner of choice when it comes to secure integration.



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Company Profile // DMG MORI

DMG MORI is a leading global manufacturer of high-precision machine tools and is represented in 44 countries – with 124 sales and service locations, including 17 production plants. In the “Global One Company”, more than 13,500 employees are driving the development of holistic solutions in the manufacturing industry. Under the guiding principle of Machining Transformation (MX), DMG MORI combines four pillars for the efficient, sustainable production of the future: Process Integration, Automation, Digital Transformation (DX) and Green Transformation (GX).

DMG MORI stands for innovation, quality and precision. Our portfolio covers sustainable manufacturing solutions based on the technologies Turning, Milling, Grinding, Boring as well as Ultrasonic, Lasertec and Additive Manufacturing. With technology integration, end-to-end automation and digitization solutions we make it possible to increase productivity and resource efficiency at the same time.

At our production sites worldwide, we implement holistic turnkey solutions for the main sectors of aviation & space, automotive & e-mobility, die & mold, medical, and semiconductor. With the DMG MORI Qualified Products (DMQP) partner program, we offer perfectly matched peripheral products from a single source. Our customer-oriented services cover the entire life cycle of a machine tool – including training, repair, maintenance and spare parts service.

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