

A SMOOTH Link to Simple Shop Floor Monitoring

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Mazak SMOOTH Link

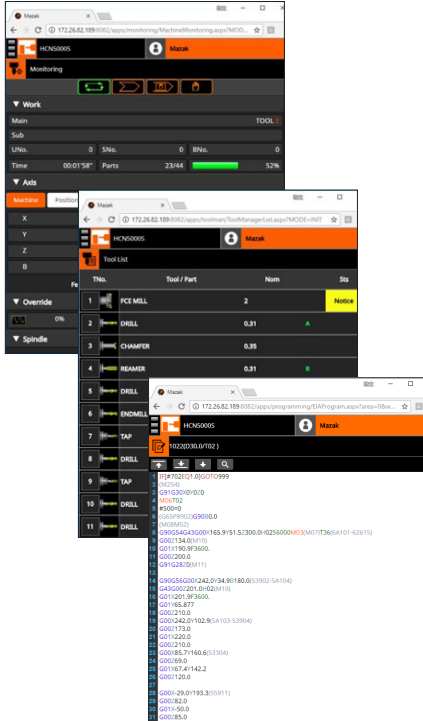
The Industrial Internet of Things (IIoT) revolution and digital connectivity continue to positively impact manufacturers across nearly all industries. Unfortunately, one group tends to remain hesitant — job shops and other small-scale manufacturers.

For these and other uncertain manufacturers, the advantages of a fully integrated digital workspace can seem small in comparison to the difficulty they expect to encounter when onboarding these somewhat sophisticated networks, especially given the relatively modest number of machines in use. Job shop owners and principals want the advantages of monitoring the real-time manufacturing data that is essential to obtain optimal part processing, but feel they don't need full high-end systems/networks to do so and are skeptical that the benefits would outweigh the costs incurred by adding such systems.

With these hesitant manufacturers in mind, Mazak created SMOOTH Link — one of the company's SMOOTH TECHNOLOGY digital solutions — to provide a simpler, more affordable and unimimidating solution for easy entrance into the world of IIoT and process monitoring. SMOOTH Link requires no existing factory network to connect modern smartphones, tablets and other mobile devices directly to machine tools, allowing for real-time process monitoring anywhere.

SMOOTH LINK

The SMOOTH Link function is part of Mazak's MAZATROL Smooth CNC controls and operates via a simple commercial-off-the-shelf wireless router, providing both small and large shops alike an easy first step on the road to digital connectivity. Through the function's easy-to-use interface, shops can monitor part processing applications from any modern mobile device or computer, all with existing Internet Explorer®, Firefox®, Google Chrome®, Microsoft Edge® or Safari® software. Additionally, admin and general permission levels make it simple to provide users with exactly the functionality they need to perform their job responsibilities.



SMOOTH LINK FEATURES THREE MAIN APPLICATION SCREENS

Machine Monitoring

This application screen provides comprehensive information regarding the operational status of a machine and any workpiece currently in production. This real-time information also includes machine in-cycle/alarm signals, alerts that can also be viewed in the other application screens.

Tool Management

A list on this screen includes information on all of the machine's tool layouts and data, including lengths, diameters and offsets as well as the tool types for each of the machine's assigned tool changer pocket numbers/positions. Additionally, users with tool data editing permissions can rewrite data remotely.

Programming

Just like the MAZATROL Smooth CNC platforms themselves, SMOOTH Link shows all of the MAZATROL programs and EIA programs saved to the machine and the remaining storage space available.

In addition to its ease of use, Mazak SMOOTH Link is easy to set up. Instead of requiring a cloud-based networking solution, SMOOTH Link can be installed directly into the machine's MAZATROL Smooth CNC control or any Windows PC. Once installed, the software runs independently of the mobile device's operating system and automatically adjusts its screen to any display size. Shops eliminate the need for a server PC or license – one installation on one MAZATROL Smooth control or PC is sufficient for wirelessly connecting all Mazak machines via a typical Wi-Fi network.

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MAZATROL SMOOTH CNC

SMOOTH Link takes advantage of the next generation of intuitive human-machine interfaces from Mazak — MAZATROL Smooth CNCs. The controls and their advanced, versatile MAZATROL programming language allow manufacturers to machine in ways never thought possible. Within the MAZATROL Smooth family of controls are the SmoothC, SmoothG and SmoothX.

Mazak's MAZATROL SmoothC technology is simple but innovative and sports several features that enhance cutting capabilities. The control makes it easy for operators to generate programs for basic turning, milling, drilling and tapping operations.

The MAZATROL SmoothG CNC optimizes programming and makes it easy to generate programs for processing complex parts through off-centerline machining as well as angled drilling, milling and tapping. The control incorporates a wide variety of advanced programming functions that allow it to offer complete ease of use and ensure high-speed, high-accuracy machining performance.

For highly advanced programming, the MAZATROL SmoothX CNC is the most progressive control available and significantly reduces part cycle times, especially in fine increment programs for full simultaneous 5-axis machining on applicable Mazak machines. The control has a processing speed four times faster than that of its predecessor.

As with previous generations of Mazak CNC solutions, the company's MAZATROL advanced conversational programming language uses the same G-codes as conventional EIA/ISO CNC machines. This similarity ensures that machine operators can run programs made for non-Mazak machines with little or no editing beyond confirming axis strokes and cutting conditions.

SMOOTH TECHNOLOGY helps manufacturers stay at the forefront of technological innovation and includes everything necessary to achieve complete process optimization.

SMOOTH TECHNOLOGY

Both SMOOTH Link and the MAZATROL Smooth CNC controls are part of Mazak's SMOOTH TECHNOLOGY platform, a dynamic, complete process-performance technology paradigm that spans the entire part production landscape from programming and metal removal to automation and data collection. This all-encompassing platform seamlessly brings unmatched speed, accuracy, functionality and ergonomics to virtually every type of metalworking application.

Comprised of four core facets – CNC technology, SMOOTH TECHNOLOGY solutions, engineering support and advanced machine designs – SMOOTH TECHNOLOGY helps manufacturers stay at the forefront of technological innovation and includes everything necessary to achieve complete process optimization.

In addition to solutions like SMOOTH Link, SMOOTH TECHNOLOGY also includes Mazak's wider catalogue of digital connectivity hardware and software. The unification of these systems is simplified through the use of MTConnect®, an open, royalty-free manufacturing communications protocol.

MTConnect fosters greater interoperability between manufacturing devices and software by providing connectivity and the capability to monitor and harvest data from the entire production floor, including machines, cells, devices and processes. The standard makes this possible through its basis in XML and HTTP internet technologies that enable real-time data sharing.

As part of its SMOOTH TECHNOLOGY platform, the company developed the Mazak SmartBox, a launch platform designed for the connectivity of machines and devices for enhanced monitoring, analytical capabilities and cybersecurity. The unit mounts to the side of a machine without the need for any direct connection to its electrical cabinet, and with standard input or connecting ports, the SmartBox can quickly and easily connect to any standard off-the-shelf sensors for machine-data gathering and condition monitoring. One SmartBox can even serve several machine tools and their associated manufacturing equipment, depending on the application.





A more sophisticated system, the Mazak SmartBox ensures full network isolation thanks to a Layer 3 Managed Switch, preventing any unauthorized access to or from the machines and equipment on a network. It satisfies the critical security concerns of IT departments when connecting legacy equipment to a plant's main network for the purpose of gathering manufacturing data through the MTConnect protocol. Despite this advanced cybersecurity, however, the SmartBox provides predictive diagnostics regardless of machine type, model or age without requiring the reconfiguration of an entire system's network software.

SUMMARY

SMOOTH Link is an easy connection to the job shop floor for process monitoring and managing. As part of Mazak's Digital Solutions, it is yet another tool — along with SMOOTH TECHNOLOGY, MTConnect and the Mazak SmartBox — developed for the end goal of manufacturing process optimization and thus increased productivity.

ABOUT MAZAK

Mazak Corporation is a leader in the design and manufacture of advanced technology solutions including Multi-Tasking, HYBRID Multi-Tasking, 5-axis, milling, turning, CNC controls, automation and digital integration for job shops, OEMs and Tier 1 suppliers in every industry. From its world-class Mazak iSMART Factory™ in Florence, Kentucky, the company produces more than 100 machining centers models through its "Production-On-Demand" practice. Mazak provides local hands-on applications, service and sales support to customers from eight Technology Centers across North America.