

NEWS | TECHNOLOGY

FANUC Advances Physical AI and Intelligent Automation at IMTS 2026

At IMTS 2026, Vention will showcase MachineAgent and Physical AI capabilities that enable faster automation design, deployment, operation and scaling.

By **Ankit Kankar** | September 13, 2026



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FANUC America, a global automation leader, will showcase the future of manufacturing at IMTS 2026 (Booth 338900), demonstrating how trusted automation powered by [Physical AI](#) is bringing together advanced CNC technologies, machining automation and robotics to improve productivity, increase

flexibility and accelerate deployment.

"Manufacturing is entering a new era where Physical AI enables robots to see, reason and act in real-world production environments, allowing manufacturers to automate increasingly complex tasks with greater intelligence and adaptability," said Mike Cicco, President and CEO of FANUC America. "At IMTS 2026, FANUC will demonstrate how AI-powered robots, cobots, CNC technologies and digital twin and virtual commissioning solutions are helping manufacturers simplify programming, bring automation online faster and improve productivity."

Physical AI

Industry leaders including Google Cloud, NVIDIA and Amazon Web Services (AWS) are working with FANUC to advance Physical AI technologies that enable robots to perceive their environments, make decisions and perform tasks autonomously in manufacturing operations. A featured demonstration developed with Google Cloud shows how AI agents can interpret handwritten instructions and direct robots to identify, locate and kit the parts needed for manufacturing operations. Attendees will also see how generative AI and natural-language commands can be used to automatically generate Python code and robot programs through FANUC's CRX Vibe Coding demonstration, enabling robots to perform tasks based on verbal instructions.

"AI agents and multimodal reasoning are transforming manufacturing operations from rigid automation into intelligent collaboration," said Praveen Rao, Global Head of Manufacturing Industry at Google Cloud. "By combining FANUC robotics with Gemini Enterprise, we are linking real-time camera and sensor feeds with advanced AI reasoning. This allows robots to dynamically perceive their environment, safely execute complex physical tasks alongside human workers, and operate through intuitive natural-language controls—dramatically cutting programming time and scaling automation across the plant floor."

Physical AI demonstrations will include a dual-arm [CRX-5iA](#) robotic connector assembly application with AI that helps robots use vision and force data to perform complex connector insertion and assembly tasks. An intelligent bolt tightening demonstration on moving parts will use Inbolt Physical AI tracking technology and NVIDIA-powered processing with FANUC's [CRX-20iA/L](#) and [R-30iB Mini Plus Controller](#).

FANUC will also feature several Physical AI examples showing what is possible with AI-driven machining through FANUC CNC solutions. Exhibits will include AI-powered optimal toolpath

generation, intelligent program generation that reflects user instructions, automated machining improvements based on digital twin technology, and an autonomous failure recovery demonstration.

Digital Twins and Virtual Commissioning

FANUC will demonstrate how digital twin and virtual commissioning technologies help manufacturers simulate robotic and machining applications, evaluate process changes and improve engineering decisions before equipment is installed.

For CNC machining operations, the following technologies in FANUC's digital twin suite help manufacturers simulate, validate and optimize machining processes before production begins, preventing machining issues, improving surface quality and reducing wasted time and materials:

- [CNC Reflection Studio](#) creates digital twin machines to simulate and check CNC programs and real-world machining processes
- [CNC Guide 2](#) imports real machine data to accurately reproduce a real mechanical system
- [Surface Estimation](#) replicates real-world surface finish results in digital simulations to accurately check part shape and machining quality level
- [Tool Path Optimizer](#) uses CAD data to adjust the toolpath in a machining program to create a high-quality finish
- [Smart Digital Twin Manager](#) keeps track of digital twin manufacturing workflow changes and processes

For robotic automation, digital twin technologies help manufacturers design, validate and optimize applications before installation. By identifying issues earlier and reducing commissioning time, digital twins provide a faster path from concept to production.

[NVIDIA Isaac Sim](#) will be featured in a live digital twin of a robotic spot-welding application and integration with [ROBOGUIDE](#). "Developing and scaling physical AI requires advanced simulation tools that let robots learn and validate complex tasks in virtual environments before operating in the real world," said Amit Goel, head of robotics partnerships at NVIDIA. "By integrating NVIDIA Isaac Sim as an open framework within a live digital twin tied to FANUC ROBOGUIDE, FANUC is giving developers a faster path to build, test and deploy AI-driven manufacturing solutions."

A Digital Twin CRX-5iA demonstration will show a cobot handling computer hard drives for a data server application, illustrating how changes made in ROBOGUIDE or on a physical robot can be

synchronized and reflected across both platforms.

Collaborative Robots

FANUC continues to expand the capabilities of its CRX collaborative robot portfolio with the introduction of the new portable [CRX-3iA](#), featuring a 3 kg payload and lightweight (11 kg) design, and broader availability of the new R-50iA controller platform across the CRX lineup. Making its debut at IMTS, the new [R-50iA](#) Compact DC Controller is designed specifically for CRX applications mounted on autonomous mobile robots (AMRs). Supporting direct 24V to 48V DC battery power, the lightweight controller eliminates the need for a separate inverter, reducing system complexity and simplifying mobile robot integration. Featured in a connected manufacturing demonstration, CRX robots powered by the R-50iA platform showcase advanced assembly, machine tending, part transport, inspection and washing operations. The R-50iA also delivers industry-leading cybersecurity certification, advanced vision capabilities, Ethernet connectivity and Python support for easier system integration.

Additional exhibits will showcase an inverted-mounted [CRX-30iA](#) application, illustrating how collaborative robots can be deployed in space-constrained environments while maintaining their accessibility, flexibility and ease of use.

CNC Automation Innovation

Factory Automation exhibits will highlight the [500i-A CNC](#), FANUC's next-generation control platform designed to improve manufacturing performance, simplify programming and enhance ease of use. Demonstrations will showcase reduced cycle times, automatic programming from CAD models and advanced tool management capabilities.

Also on display will be FANUC's new industrial PC models, delivering intelligent, touch-based programming solutions directly on the CNC machine. Other demonstrations include FANUC's next-generation [servo motor \$\alpha\$ -i-D Series](#), as well as retrofit and 5-axis machining applications designed to enhance productivity and machining performance.

New ROBOMACHINE Products

IMTS 2026 will mark the debut of FANUC's next-generation ROBODRILL DC Series machining centers featuring FANUC's latest CNC and servo technologies:

- The D54CS performs heavy drilling, high-speed drilling and tapping on S50C steel with the 10k high torque spindle paired with Smart Spindle Load Control
- The D74CS performs high-speed cutting capabilities with the new 12k high-acceleration spindle, showcasing the latest in software functions and G-codes exclusive to ROBODRILL for cycle-time reduction
- The D116CS introduces the expansion of the X-Axis stroke to 1100 mm and Y-Axis to 600 mm; using the high-inertia DDR-TiB, FANUC performs high-precision positioning and high-speed processing of large electric vehicle instrument panels

Assembly

FANUC will showcase advanced assembly technologies designed to simplify integration, improve precision and expand access to automation. A transmission assembly demonstration performed by a CRX-30iA and R-50iA Mate Controller will use integrated force control to assemble a planetary gear system, illustrating how collaborative robots can perform increasingly complex assembly tasks without external force sensors.

Another exhibit will highlight a CRX-30iA and R-50iA Mate Controller in a high-torque bolt tightening application that provides real-time process feedback, torque validation and quality verification.

Material Joining and Robotic Machining

FANUC will demonstrate how robotic automation continues to advance welding and material joining applications across industries. The new CRX-3iA will showcase vertical-up welding on structural steel, highlighting how collaborative robots can support flexible welding applications in environments such as shipbuilding.

An additional exhibit will feature two new R-2000 E Series robots in automotive spot welding application, highlighting the maintenance-free design, enhanced axis speeds, increased wrist load capacity and digital twin capabilities of FANUC's latest industrial robot platforms powered by NVIDIA Isaac Sim. Together, these applications illustrate how manufacturers can improve quality, increase throughput and support more efficient production using advanced robotic welding and material joining solutions.

The new [M-810/190-20B](#) robot will be used in a wet machining demonstration that shows robot-based milling, drilling and tool changing capabilities powered by FANUC CNC and robot G-Code

technologies.

Painting

Robotic painting technologies will demonstrate how manufacturers can improve quality, consistency and process control. The new [P-55/15-21A](#) paint robot will use integrated overhead conveyor line tracking to maintain precise paint application on swaying football helmets, demonstrating how robotic finishing systems can adapt to dynamic production environments while maintaining consistent coating quality. The application also showcases the new R-50iA controller, which simplifies system architecture by consolidating functions into a single cabinet. In another exhibit, the CRX-10i A/L Paint Interactive Cell will illustrate how collaborative robots can bring greater flexibility and ease of use to paint and finishing operations.

In addition to automation and machining technologies, FANUC will feature connected manufacturing and service solutions that help customers monitor equipment performance, maximize uptime, support workforce training and extend the value of their automation investments. Exhibits will include Factory AI, Zero Down Time powered by AWS, AI Servo Monitor, customer portal technologies and connected solutions designed to provide actionable insights across manufacturing operations.

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