



DRIVING UPTIME FOR MACHINE TENDING

How to automate your workflow
faster with ABB Robotics

LET'S GET TO IT

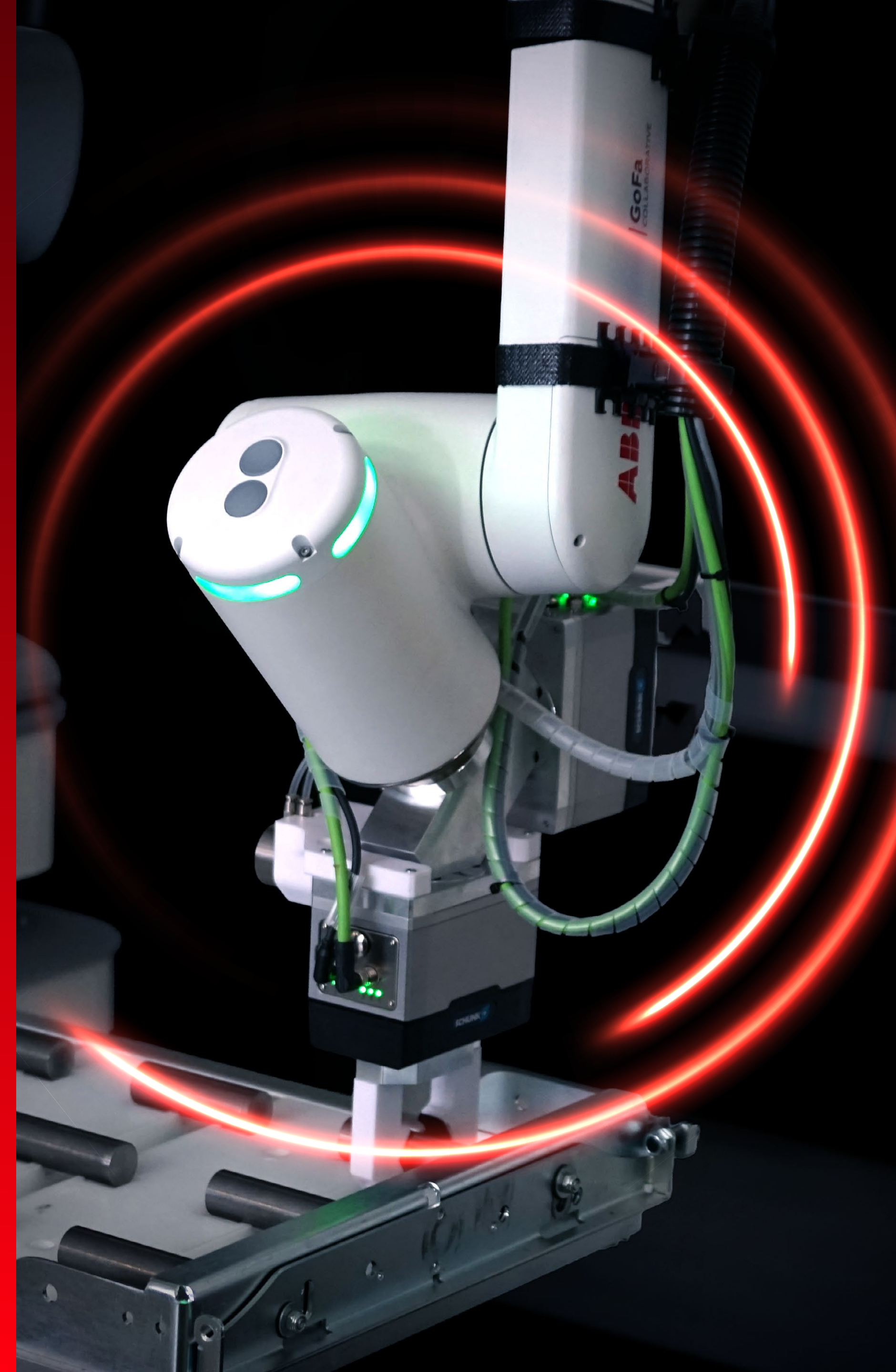


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INTRODUCTION

Across CNC machining, injection moulding, casting, assembly, and more, machine tending is a critical link in the manufacturing chain. When done effectively, it keeps production moving, removing bottlenecks and unlocking productivity for people and machines.

Machine tending is one of the first processes manufacturers choose to automate. Tasks are repetitive, predictable and often physically demanding, so automation can deliver immediate ROI through reduced cycle times, higher uptime and increased output, without changing the underlying process. Low risk and fast to implement, it scales easily across machines and can be complemented with additional processes to build a broader automation solution.



THIS GUIDE IS FOR YOU IF:

- **You're a manufacturer looking for a ready-to-run solution**
You want to automate machine tending without a lengthy installation project or specialist programming knowledge.
- **You're a manufacturer or system integrator designing a custom cell**
You're building a tailored machine tending solution for a specific production environment or customer requirement.
- **You're an engineering team evaluating your options**
You're assessing the performance, safety credentials, and software capabilities that will underpin a robust, long-term machine tending deployment.

Our machine tending solutions are designed to work across a wide range of production equipment, including:

- | | |
|--|-------------------------------------|
| • Computer Numerical Control (CNC) Machines | • 3D Printers |
| • Injection Moulding Machines | • Laser Cutting Machines |
| • Casting Machines | • Press Machines |
| • Assembly Machines | • Test Equipment |
| • Robotic Welding Stations | • Surface Finishing Machines |
| • Packaging Machines | • Robotic Packaging Systems |

ABB ROBOTICS PROVIDES A COMPLETE SOLUTION FOR MACHINE TENDING

ABB Robotics provides a complete machine tending solution for manufacturers of every size, from large industrial facilities to small and medium-sized enterprises. Whether you're running a high-volume production line or a smaller workshop environment, our industrial and collaborative robots mean automation is within reach for you.

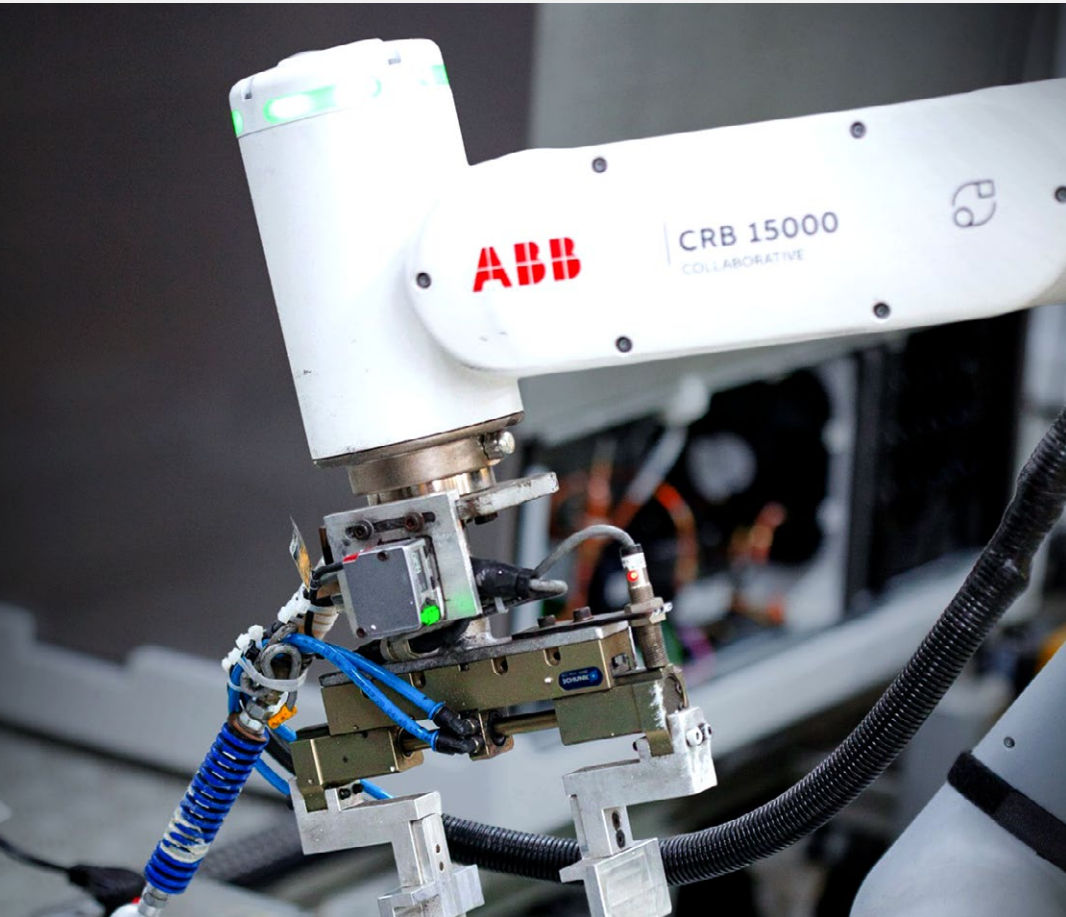
Take a look

ABB Robotics machine tending solutions deliver three core benefits:

- **Improved productivity** – Reduced idle time means greater uptime, faster cycle times, and better utilization of robots and production equipment.
- **Simplified setup and operation** – Intuitive software allows machine tending applications to be configured and adapted easily and quickly, without requiring advanced programming skills.
- **Flexible, scalable automation** – Our modular approach supports everything from single-machine cells to complex multi-cell environments, making automation a justifiable, long-term investment.

Ready to learn more? Let's get to it.

ONE ECOSYSTEM FOR MACHINE TENDING



01

OmniVance™ – Ready to run from day one

A standardized, pre-engineered machine tending cell that combines robot, gripper, tray system, controller, and software in a single integrated package.



02

Choose the right robot for your customized cell

GoFa™ – Built for high-mix, low-volume environments that require accuracy and safe human collaboration.

PoWa™ – Industrial-grade performance across six payload categories, purpose-built for high-throughput machine tending.



03

Connected software, components, and support

ABB Robotics supports every stage of your automation journey, from design to day-to-day operation.

Start with simulation and programming

Our software portfolio lets you design and validate your cell virtually before committing to hardware – testing layouts, cycle times, and robot reach with up to 99% simulation-to-reality accuracy. And now, with our Machine Tending Template, it is even easier than before.

Build with plug-and-play components

Our accessories give you all you need to configure a machine tending cell around a cobot – including grippers, robot bases, and vision cameras that are pre-engineered to work together.

Tailored services

Extend your solution’s lifecycle and maximise performance with our services, from spare parts and technical support to training and service agreements.

Industrial robots

For high-volume, heavy-duty machine tending that needs maximum speed, reach, and payload capacity, ABB Robotics offers a range of versatile, high-performance industrial robots.

[Discover IRB 2600](#) [Discover IRB 4600](#)

ONE ECOSYSTEM FOR MACHINE TENDING

THE ABB ROBOTICS MACHINE TENDING ECOSYSTEM

With pre-engineered automation cells, high-speed and high-precision collaborative robots, and the industry's leading programming software, automated machine tending enables manufacturers to remove barriers to automation, reduce engineering effort, and gain a competitive edge.

It operates as one ecosystem, with hardware, software, and safety through a common platform, powered by OmniCore™. OmniCore is the leading-edge robot controller platform connecting configuration, programming, safety settings, and performance data across robots, software, and operator interfaces. These are designed to work with ABB Robotics' range of industrial and collaborative robots, all engineered for the speed, precision, and repeatability required for machine tending workloads.

Designed to run the widest range of robots and manipulators on the market, OmniCore delivers class-leading motion control, integrated AI and vision processing, built-in cybersecurity, and support for all major industrial communication protocols – accelerating commissioning times from weeks to days.

OMNICORE DELIVERS:

- Class-leading motion control, with an average path accuracy of less than 0.6 mm even at speeds of up to 1,600 mm/sec.
- ABB Robotics Advanced Path Planning (APP) automatically optimises robot trajectories to maximise performance, cut hardware stress and save up to an additional 30% in operating energy and cycle time.
- All major communication protocols integrated in one controller platform, accelerating commissioning time from weeks to days. Leading number of pre-engineered application software tools and over 1,000 features.
- Enables motion, force, and sensor applications, all out of a single unified system.
- Built-in cyber security and traceability features allow businesses to increase quality and productivity by reducing downtime.
- OmniCore has achieved full compliance with the new safety standard ISO 10218:2025, covering both functional safety and cybersecurity.
- OmniCore includes up to 100 different safety configurations to meet the needs of different use cases.



ONE ECOSYSTEM FOR MACHINE TENDING

HOW IT WORKS IN PRACTICE:

- RobotStudio® models the cell, validates robot reach and cycle times, and generates verified programs.
- OmniCore™ enables the robot to integrate with the CNC machine, conveyors, and any existing PLC infrastructure.
- Operators adjust tending sequences as parts change and monitor the shared workspace continuously.
- OmniCore allows the same software tools and operator interfaces to scale with the operation – whether adding robots, serving additional machines, or adopting a higher-payload variant.



Running on top of OmniCore is a coordinated set of software tools, each addressing different needs in the automation lifecycle:

- **Wizard Easy Programming** lets operators create and adjust machine tending programs directly on the robot or via a connected device.
- **AppStudio** supports operator interface customization, allowing system integrators or robot operators to create tailored robot interfaces using drag-and-drop functionality.
- **RobotStudio** handles planning, commissioning, and ongoing optimization, letting engineers program and test the entire cell virtually before anything is installed.
- **SafeMove** is integrated into the OmniCore controller, to replace physical barriers with configurable virtual safety zones so GoFa™ and PoWa™ can work alongside people without fencing.
- **OmniCore EyeMotion** integrates hardware-agnostic 2D and 3D vision directly into the OmniCore ecosystem to support part recognition, position verification, or adaptive path planning.
- **Machine Tending Template** provides a modular, customizable software template that helps integrator saving up to 50% programming and commissioning time, and offers an intuitive interface for operators

Let’s get to the detail.

Our software portfolio



OMNIVANCE™ COLLABORATIVE MACHINE TENDING CELL

THE FASTEST ROUTE TO AUTOMATED MACHINE TENDING

For manufacturers looking to make the move from manual to robotic machine tending, the OmniVance Collaborative Machine Tending Cell removes typical barriers such as long installation projects and specialist programming knowledge.

OmniVance Collaborative Machine Tending Cell, powered by OmniCore™, is a compact, portable, and ready-to-run automation cell, combining collaborative robots with an integrated tray system, gripper, and user-friendly software. It is pre-engineered to shorten installation and program in minutes.

Unlock flexibility and simplicity in manufacturing

Up and running in a day

All major components of the cell are pre-assembled and pre-tested, removing the barrier of complex integration or specialist knowledge. Basic engineering skills are enough to get the cell operational, while the dedicated WebApp means operators can learn to run it themselves without in-depth training.



WHAT OMNIVANCE DELIVERS

- **Up to 60% reduction in time spent on machine tending tasks**, freeing operators to focus on other work and business growth.
- **Increased spindle time**, from around 50% with manual operation to 75% with automation.
- **Fuller production cycles**, as high tray capacity means the cell can run extended cycles without intervention.
- **Consistent quality**, as precise, repeatable performance eliminates the variability of manual handling, cutting scrappage and rework.
- **Faster return on investment**, with lower operational costs and higher productivity.

BUILT AROUND OUR COBOTS

At the heart of OmniVance Collaborative Machine Tending Cells are our collaborative robot, GoFa™. These certified solutions are designed for every manufacturing environment, working with RobotStudio® software to help human teams unlock the full potential of machine tending automation.

Lead-through programming lets operators guide the robot physically through movements, offering greater control without specialist coding knowledge.

ABB ROBOTICS COBOTS FOR MACHINE TENDING

Collaborative robots (cobots) are hugely valuable in machine tending, providing a safe and efficient way to perform repetitive, precise tasks, unlock efficiency, and meet growing production demands.

Our cobots, GoFa™ and PoWa™, are available as standalone collaborative robot arms, deployable across a wide range of machine tending configurations.

If you're a systems integrator designing and deploying customized cells for customers, or an end user looking to automate your own production environment, GoFa and PoWa provide the robot foundation to create tailored machine tending solutions at any scale.

Get to it.

Discover our range of cobots



POWA™

Industrial-grade speed with simple collaboration

PoWa is for manufacturers who require the throughput of an industrial robot alongside safe collaboration with people, rapid deployment, and adaptability.

PoWa is the fastest cobot family in its class, reducing cycle times across machine tending, material handling, palletising, welding, and screwdriving, with a payload range from 7kg to 30kg.

Speed that makes a difference

In machine tending, cycle time is everything. PoWa's exceptional speed and torque enable faster loading and unloading cycles, higher machine utilization, and greater output per shift.

Into production in under an hour

Plug-and-play setup, no-code programming, and arm-side programmable buttons mean operators can get PoWa working in as little as 60 minutes. The Cobot Peripheral Connectivity System supports configurable signals, fieldbus connectivity, and simultaneous integration of gripper and vision systems – reducing engineering complexity out of the box.

Fenceless operation for a smaller footprint

Built-in Power and Force Limiting (PFL) and Speed and Separation Monitoring (SSM) allow PoWa to work safely alongside people without physical guarding. On space-limited floors where installing fencing is impractical, this offers a big, practical advantage. Plus, with IP65/IP67 protection and ISO Class 4/5 cleanroom compatibility, PoWa can operate reliably in any environment.

Built for scale

With six variants spanning 7kg to 30kg payload and reach options up to 2.10m, the PoWa portfolio covers a wide range of machine tending applications within a single, consistent product architecture. Manufacturers can start with one and scale within the same ecosystem, according to automation needs.

Explore PoWa™ 1910

Explore PoWa™ 1920



PoWa 10 and PoWa 13 achieve top speeds exceeding 5.8m/s at rated payload – setting the benchmark for collaborative robots.²

²<https://www.abb.com/global/en/areas/robotics/products/robots/collaborative-robots/powa>



GoFa Ultra Accuracy offers path accuracy to 0.03mm and absolute position accuracy of 0.1mm – over 10× greater than competitive cobots.³

³<https://www.abb.com/global/en/areas/robotics/products/robots/collaborative-robots/gofa>

GOFA™

Precision, speed, and safe collaboration

GoFa is ABB Robotics' collaborative robot arm for applications that need accuracy, adaptability, and safe human-robot collaboration. Designed to work continuously alongside people without barriers or fencing, GoFa gives manufacturers flexibility to integrate automation into workflows without reorganizing the space around it.

Class-leading accuracy

Standard GoFa delivers best-in-class repeatability of $\pm 0.02\text{mm}$, among the tightest tolerances available in a collaborative robot. GoFa Ultra Accuracy enables precise positioning, such as for gluing and sealing in consumer electronics, laser welding of automotive components, composite layering in aerospace, or precision laser cutting in metal fabrication.

Performance that keeps pace with production

GoFa's TCP speed of up to 2.2m/s puts it ahead of comparable cobots in its class, enabling more operations per shift without sacrificing precision. Reach of up to 1.62m means it can serve a wider variety of work, reducing the need for repositioning or multiple units.

Safe by design

GoFa offers collaborative safety, with integrated torque sensors in each joint for superior power and force limiting that means the robot halts immediately on contact with a person. GoFa is certified to Category 3, Performance Level d, meeting rigorous industrial safety standards for shared workspaces.

Easy to deploy, easy to adapt

- **Intuitive graphical apps** on the FlexPendant simplify setup and configuration
- **Lead-through programming** anywhere on the arm allows fast demonstration of new routines
- **Offline programming** via RobotStudio® realizes up to 99% simulation-to-reality match, minimizing commissioning adjustments

Explore GoFa™

OMNIVANCE™, GOFATM OR POWATM? CHOOSING THE RIGHT SOLUTION

If you’re not sure where to start, here’s a straightforward guide to which solution fits your situation.



OMNIVANCE FOR WHEN YOU NEED TO GET UP AND RUNNING FAST

OmniVance is a compact, pre-engineered machine tending cell that combines robot, gripper, tray system, controller, and software in a single integrated package. It is designed with a flexible, ready-to-use set up for fast deployment requiring minimal installation effort and no need for advanced robotics expertise.

- Pre-assembled and pre-tested before delivery for fast, repeatable installation.
- High tray capacity lets the cell run extended cycles unmanned.
- Built around GoFa so it works safely alongside your team without barriers or fencing.
- Consistent, repeatable loading and unloading every cycle.
- Portable design means it can move between machines depending on production priorities.



POWA FOR POWER, SPEED AND THROUGHPUT

PoWa is designed for high-volume, productivity-driven environments where cycle time is the critical variable. It suits fast pick-and-place, palletising, material loading and unloading, welding, and screwdriving – and can handle heavier payloads across a broader range of applications.

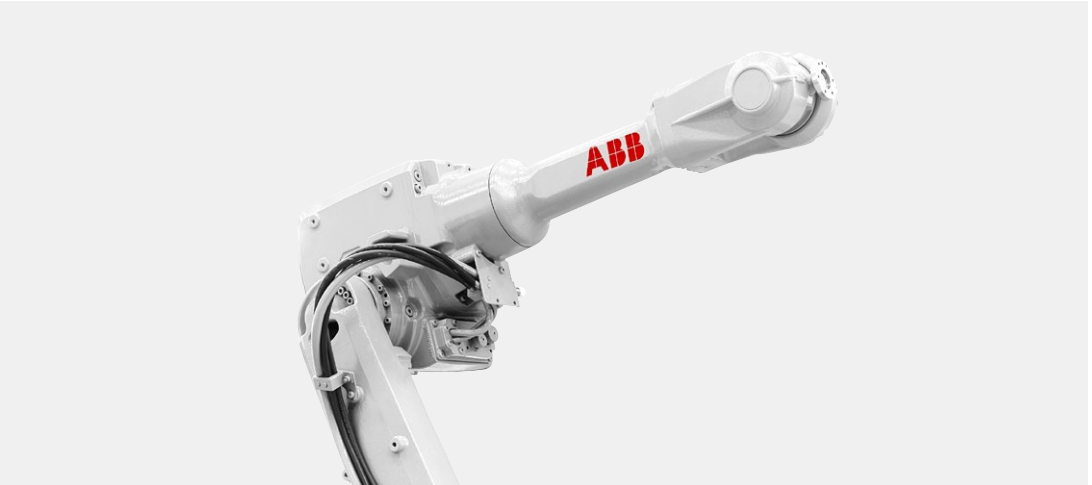
- Industry-leading speed.
- Payloads from 7kg to 30kg.
- Deployment in under 60 minutes.
- Powered by OmniCore™ for advanced motion control and integration.



GOFA FOR PRECISION WITH ADAPTABILITY

GoFa is designed for applications that require accuracy, delicacy, and close collaboration with people across a variety of tasks. It suits dispensing, polishing, assembly, lab automation, and precision welding, while the Ultra Accuracy option provides most path-accurate cobot on the market.

- Repeatability of ±0.02 and path accuracy to 0.03mm with Ultra Accuracy.
- Integrated torque sensors in each joint offer the smoothest, safest lead-through on the market.
- 10× higher accuracy than typical cobots in precision-critical applications.
- Designed for sectors including electronics, automotive OEM/Tier 1, and lab automation.



INDUSTRIAL ROBOTS FOR DEMANDING MACHINE TENDING

Collaborative machine tending isn’t the right fit for every environment. If you’re running high-volume production with heavy parts, tight cycle times, and no requirement for human-robot collaboration in the shared workspace, ABB Robotics’ industrial robot range may be the smart choice.

The IRB 2600 and IRB 4600 are built for demanding machine tending applications where maximum speed, reach, and payload capacity take priority over collaborative operation – handling parts up to 60kg with exceptional accuracy and reliability across long production runs.

[Explore IRB 2600](#) [Explore IRB 4600](#)

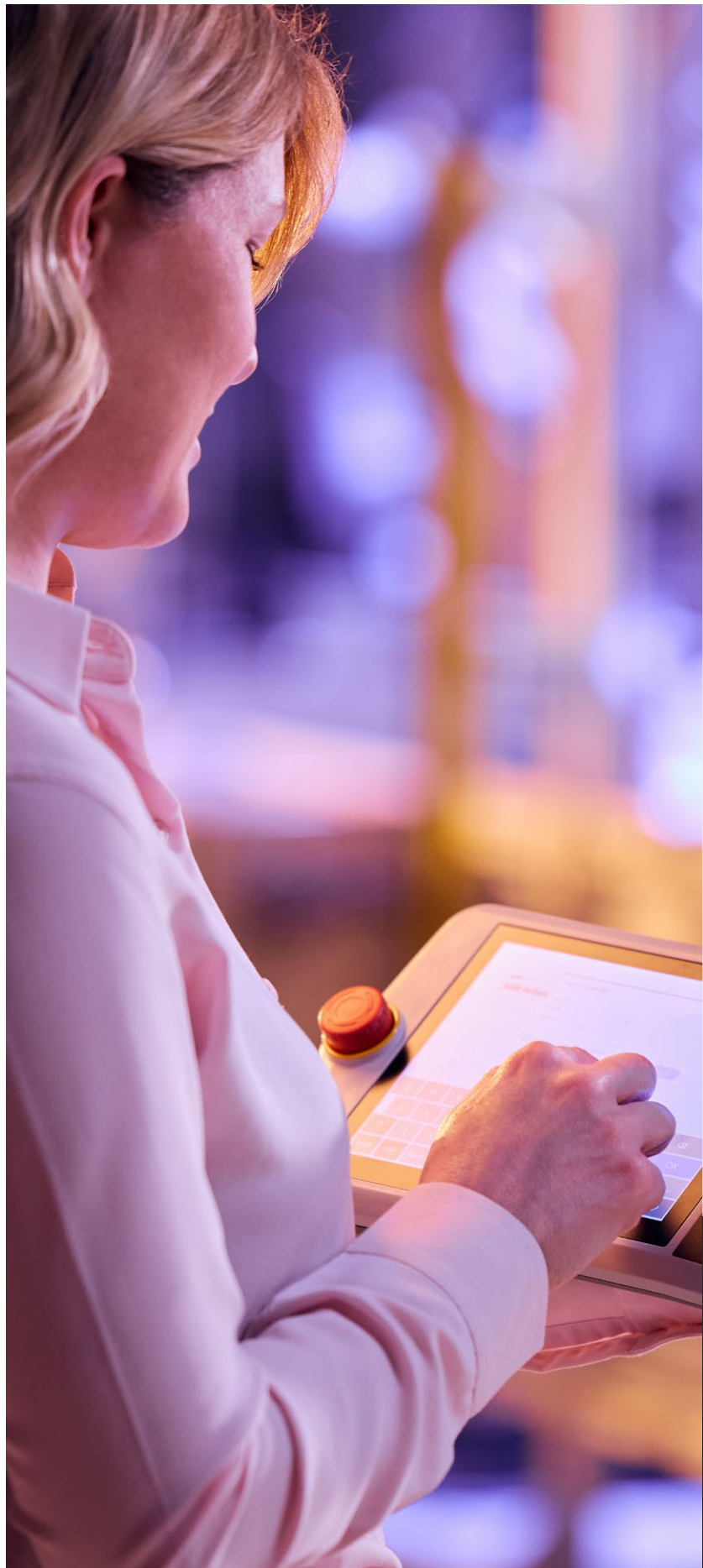
ROBOTSTUDIO®

OFFLINE PROGRAMMING AND SIMULATION FOR THE FULL MACHINE TENDING LIFECYCLE

RobotStudio is ABB Robotics’ offline programming and simulation platform – and the world’s most widely used tool of its kind. It allows engineers to design, program, and test robot cells in a virtual environment before anything is installed on the floor.

Practically, this helps cut commissioning times by up to 90%, with a simulation-to-reality match of up to 99% with our robots, so that programs validated in the model run reliably in production.

RobotStudio’s cloud-based licence means multiple team members can access it simultaneously, from any device, to keep projects moving. The integrated AI assistant guides experienced programmers and first-time users, reducing the learning curve and making the platform accessible.



WHAT ROBOTSTUDIO ENABLES

- **In planning and design** – model new cells, test layouts, and validate robot programs before physical installation.
- **During commissioning** – reduce on-site commissioning from days to hours, with programs verified in simulation to cut the time between installation and production-ready operation.
- **In ongoing operation** – program new parts and routines offline, without halting production, and test process changes virtually before implementing them on the live cell.
- **For sustainability** – upfront simulation and process optimization reduces energy usage, material waste, and rework.
- **Machine Tending Software Template** – an easy-to-use, customizable software template that can reduce development costs by 50% with a pre-built template.

CLOSING THE GAP BETWEEN SIMULATION AND REALITY

RobotStudio HyperReality takes virtual commissioning to a new level, integrating NVIDIA Omniverse into RobotStudio to deliver photorealistic, physics-accurate simulation environments and near-perfect correlation between virtual training and real-world performance.

For machine tending, this means you can design, test, and optimise your cell virtually before installing a single component – with AI-based learning models that train robots on multiple simulated scenarios.

• Up to 99% sim-to-real accuracy	• Reduce engineering and production costs by up to 40%
• Cut commissioning time by up to 80%	• Accelerate time to market by up to 50%

[Explore RobotStudio® HyperReality](#)

In machine tending, RobotStudio allows new part programs to be created and validated without production downtime, with cell layouts optimized for reach and cycle time – within a virtual environment.

CUSTOMER STORY:

AUTOMATED MACHINE TENDING IN ACTION

How METEC Boosted Efficiency with GoFa™

The challenge

METEC CNC Präzisionsteile GmbH – a German engineering firm – faced labor shortages amid growing production demands. To handle the volume of orders, they needed to unlock more capacity and efficiency in their CNC machine tending operations.

The solution

Working with automation expert STiMA, METEC implemented a system featuring ABB Robotics’ GoFa collaborative robot to automate their CNC machine tending process. The cobot handles tasks including loading, unloading and cleaning parts, helping to streamline machine tending operations while ensuring safe, flexible collaboration on the shop floor.

In practice, the cobot picks up the raw part, communicates to the CNC machine to open its safety door, and enters the workspace to exchange parts using a double gripper. Before loading a new part, the vise is cleaned using a blow-off nozzle to ensure consistent quality. The finished part is then removed and transferred out of the machine to complete the fully-automated cycle.



The result

With GoFa, METEC has **doubled production** capacity and can efficiently handle larger orders, including batches of **up to 120,000 units annually**. By automating these tasks, the solution improves productivity and enables skilled workers to focus on more complex, value adding activities.

METEC CUSTOMER STORY

Watch the full video



GETTING THE BEST OUT OF YOUR COBOTS FROM INSTALLATION AND BEYOND

ABB Robotics supports the full lifecycle of every deployment, not just the initial sale.

- **Spare parts and consumables:** Genuine, OEM-certified parts, including motors, wrists, balancing units, and boards – with 98% parts availability worldwide.
- **Connected services:** A cloud-based platform for remote monitoring, diagnostics, and condition-based maintenance.
- **Technical support:** 24/7 global support with over 1,600 specialists across more than 53 countries.
- **Training:** Virtual or hands-on training for operators and programmers in over 36 locations.
- **Service agreements:** Tailored packages ranging from preventative maintenance to full-service coverage.

[Discover our services](#)

[Check out our spare parts](#)

IT'S TIME TO TURN AUTOMATION INTO AN ADVANTAGE

As manufacturers navigate skills shortages, rising costs, safety challenges and complex integrations, the path to automation can be intimidating.

ABB Robotics offers solutions designed and built to take manufacturers forward. With OmniVance™ Collaborative Machine Tending Cell, our cobots and RobotStudio®, both systems integrators and end users can deploy and scale automation safely and effectively.

Ready? Let's get to it.

[Discover our portfolio](#)

[Get a machine tending assessment](#)





ABB is a global technology leader in electrification and automation, enabling a more sustainable and resource-efficient future. By connecting its engineering and digitalization expertise, ABB helps industries run at high performance, while becoming more efficient, productive and sustainable so they outperform. At ABB, we call this ‘Engineered to Outrun’. The company has over 140 years of history and around 110,000 employees worldwide. ABB’s shares are listed on the SIX Swiss Exchange (ABBN) and Nasdaq Stockholm (ABB). [abb.com](https://www.abb.com)

ABB Robotics as one of the world’s leading robotics companies, is the only company with a comprehensive and integrated AI-powered portfolio covering robots, cobots and Autonomous Mobile Robots (AMRs), designed and orchestrated by our value-creating software. We help companies of all sizes and sectors - from automotive to electronics and logistics – to outperform by becoming more resilient, flexible and efficient. ABB Robotics is at the forefront of developing and commercializing a new generation of Autonomous Versatile Robotics (AVR), leading a global innovation ecosystem of partners in advancing efficient hardware and intelligent software with industrial performance. The business employs approximately 7,000 people. go.abb.com/robotics

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