



COLLABORATIVE ROBOTICS

IN THE METAL INDUSTRY



UNIVERSAL ROBOTS

COBOTS IDEALLY MEET METALWORKING AND MACHINING INDUSTRY NEEDS

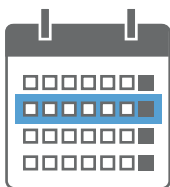
01

Constant industrial and technological progress have made the metalworking and machining industry highly competitive. The new challenge is to increase productivity and machine uptime without compromising on quality. Collaborative robotics provide one of the most promising avenues in meeting this challenge.

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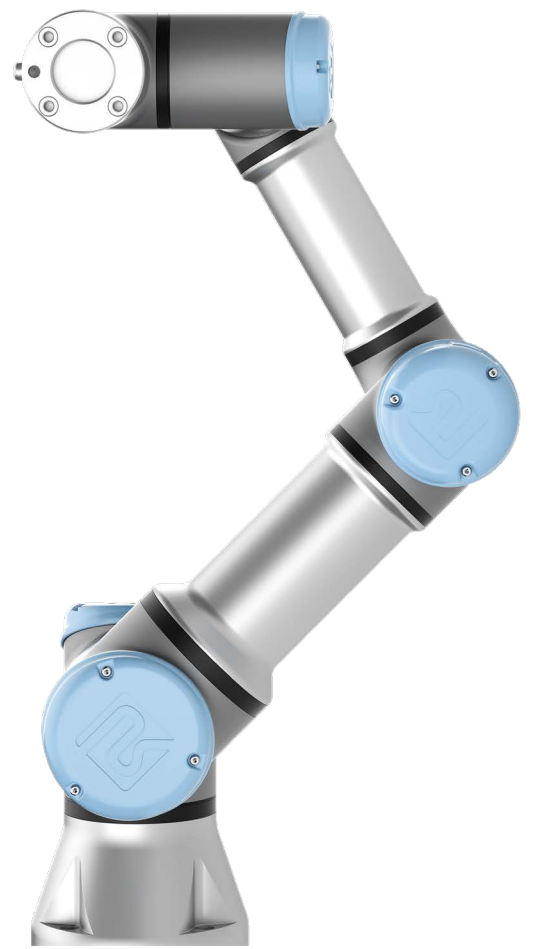
COBOT BENEFITS

Collaborative robots (cobots) provide highly attractive opportunities for automation in metalworking and machining for a wide range of applications and production facilities.



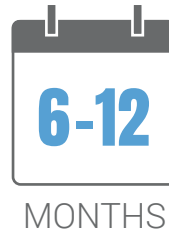
FAST IMPLEMENTATION AND PROGRAMMING

Cobots from Universal Robots excel in simple, intuitive operation and can be deployed in weeks not months. The cobot arms can easily be reconfigured and programmed in-house for a new task in as little as half a day.



INCREASED PRODUCTIVITY AND COST-EFFECTIVENESS

Collaborative robots cut production costs and increase productivity by keeping processes constantly running. Cobots are easy to reprogram and redeploy for different tasks without changing production layouts. This flexibility helps deliver fast ROI, with cobots routinely delivering payback within six to twelve months.



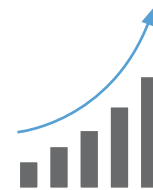
PRECISION AND QUALITY

Cobots have high levels of repeatability, featuring down to ± 0.03 mm (30 micron) for precise, around-the-clock consistency. This enables precision assembly and metrology applications such as vision-guided parts inspection.



EFFICIENCY AND WORKFORCE OPTIMIZATION

Collaborative robots relieve employees from monotonous, time-consuming tasks, giving them more time to focus on activities with higher added value. While human workers perform tasks ideal for their skills, cobots can perform physically demanding and dangerous activities, protecting workers from health risks due to poor ergonomics, unfavorable environments, repetitive stress, or injury from heavy or sharp workpieces.

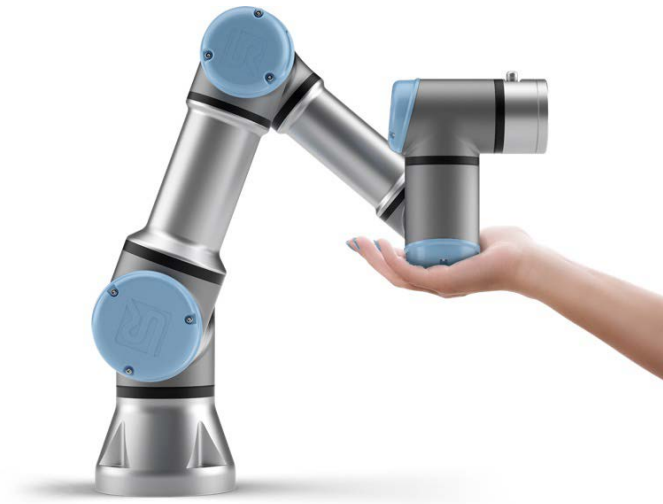


SAFETY AND COLLABORATION

Our cobots are equipped with a certified force limiting safety system, that causes the cobots to automatically stop operating if they encounter obstacles in their route. That means the cobots can work beside employees without the need for safety guarding after risk assessment.

03

SIGNIFICANCE OF HUMAN-ROBOT COLLABORATION IN THE METAL INDUSTRY



Metalworking and machining involve a variety of repetitive tasks that place physical strain on employees. Automation using collaborative robots is an ideal way of relieving employees from the dull, dirty and dangerous tasks while also adding value.

Our cobots can be used in a variety of automation solutions and are quick and easy to adapt to different machinery and processes, making them ideal even in high/mix low volume production runs.



MACHINE TENDING

Our cobots are ideal for increasing production rates in machine tending applications such as grinding, deburring, stamping, bending, and finishing.



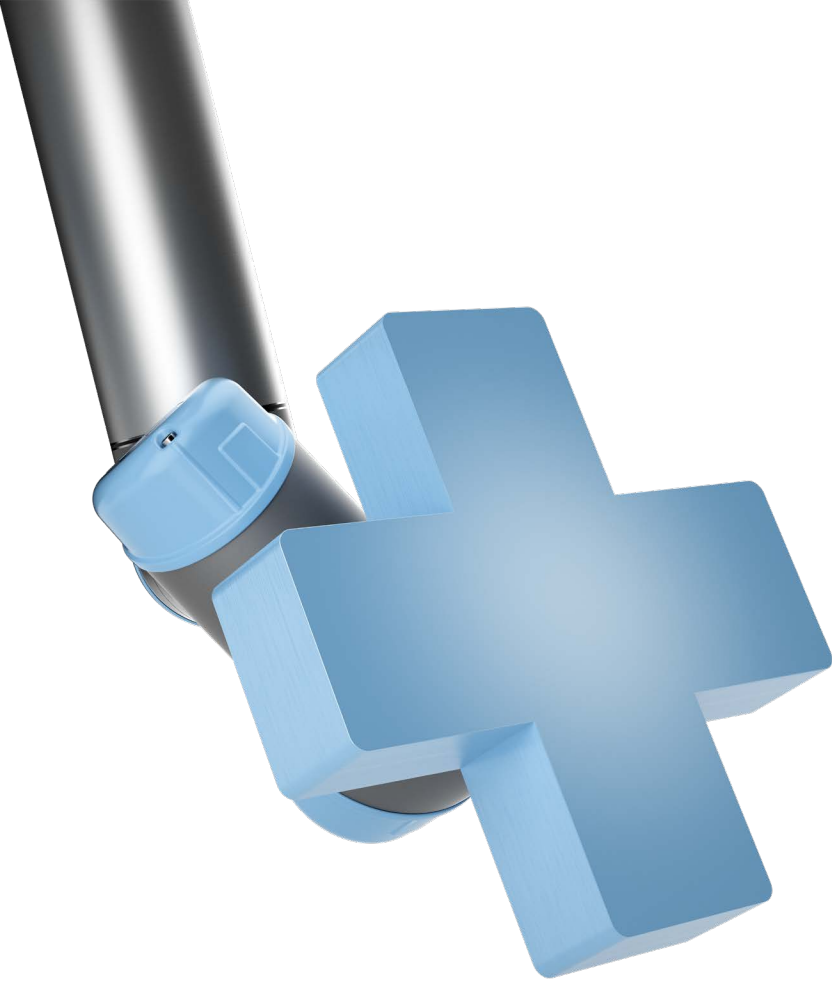
CNC

With UR cobots' repeatability down to 0.03mm (30 micron), even the most demanding precision machining tasks can be automated.



FABRICATING AND WELDING

The average age of today's welder in the U.S. is 55 years old, and fewer than 20 percent are under the age of 35, according to the American Welding Society. These demographics lead to a projected deficit of 400,000 welders by 2024 in an industry where weld shops are caught between a rock and a hard place; they already can't find enough skilled welders, and they can't automate the increasing amount of high/mix low volume production runs with traditional welding robots. UR cobots now power collaborative arc welding applications, offering flexible automation solutions with low upfront cost.



04

THE IDEAL COBOT CONFIGURATION FOR YOUR NEEDS

The UNIVERSAL ROBOTS+ (UR+) ecosystem ensures smooth integration of third-party innovative peripheral products and software to match your requirements for highly specific robot applications.

UR+ solutions are certified for our cobots and provide plug-and-produce compatibility for guaranteed immediate deployment.

UNIVERSAL ROBOTS+

A close-up photograph of an industrial robotic arm in a workshop. The arm is white and grey, with a blue light glowing from a joint. It is holding a white, fan-like component. In the background, a metal drill press is visible, and the scene is slightly blurred to emphasize the robot.

**READ THESE
METALWORKING AND
MACHINING CASE STUDIES
AND SEE FOR YOURSELF**

05



RCM INDUSTRIES

RCM Industries is an Illinois-based manufacturer of die-cast aluminum components for industries such as automotive and consumer products.

THE CHALLENGE

RCM Industries found itself in competition with low-wage suppliers in Mexico for a large outsourced project. The company needed to drive cost out of its product without reducing value.

THE SOLUTION

RCM Industries first automated a repetitive and monotonous washing task with a UR10 cobot. The cobot picks up metal rings from a lathe tended by a Cartesian robot, puts the parts in a wash tank to wash off any lubricants, then circulates the parts in front of a blower to dry them before placing the finished product on drums. The robot was so easy to program that an intern with no robotic experience was able to optimize the process. With that success, RCM Industries deployed two UR10e robots in a CNC machine tending process that requires high precision and repeatability. Each cobot tends two dual-spindle CNC lathes in the same cycle, manufacturing a consumer plumbing product. With force-torque sensing and 50 micron repeatability, the cobots are able to self-align the part on a chuck and sense and reject parts that are out of shape.

THE RESULT

RCM Industries immediately saw a 15 percent increase in throughput on the CNC machine tending application. In addition, the company was able to reduce staffing from three operators running machines on all three shifts to one person managing all operations in each shift. For the washing application, the cell runs in off-shifts with no operator, and the first shift operator checks all the parts that come off the second and third shifts, reducing staffing by another two people. These employees were all moved to more valuable positions.

»We had to look at how to drive cost out of the product without reducing the value that we provide our customers. Without the cobots, we would not have had a shot at that work.«

[See the video case study](#) 

Mike Higgins
Director of Sales and Marketing



ALL AXIS

All Axis Machining is a multi-disciplinary metal fabricator, providing products to a range of industries. The company now offers UR cobot integration services through All Axis Robotics, delivering turnkey solutions into standard machine shops or other manufacturing operations, including CNC machine tending, CNC brake presses, automated burr detection, robotic sanding, deburring, and part marking.

THE CHALLENGE

All Axis started to look at automation as the company faced a lack of available manual labor, causing unwanted downtime on machinery. A major obstacle in automating operations was legacy equipment with no direct interface for traditional industrial robots. The company also couldn't give up floor space for the fencing required by traditional robots, and need to be able to use robots for multiple tasks.

THE SOLUTION

After a Universal Robots demo, All Axis realized that the cobots offered easy integration through the controllers of its older machines using the free software development kits available through the UR+ platform. The company put its first UR10 cobot on a CNC machine and saw spindle up-time jump from about eight hours per day to about 20 effective hours. All Axis also discovered that the 50 microns accuracy of the UR10 was crucial in terms of precise insertion in laser marking and CNCs as well as in sanding and deburring.

»Integrating cobots into legacy machines is what will really drive manufacturing in the United States.«

Gary Kuzmin
Owner

THE RESULT

All Axis saw a 60 percent profit increase in its first cobot-automated job, which was delivered more than two months early. The company runs more than 20 different parts per day, and is able to move the cobots between machines, with change-overs in five to ten minutes. The company now has a new company, All Axis Robotics, dedicated to the integration of turnkey UR cobot solutions in the metal fabrication industry.

[See the video case study](#) 



ETALEX

Etalex is a Montreal, Canada-based manufacturer of metal shelving systems, metal fixtures, shelving, wood furnishings, and heavy-duty racking systems.

THE CHALLENGE

Before Universal Robots, an employee manually unloaded a large brake press for eight hours a day. The job is repetitive and dangerous, but with only six feet of space in front of the brake press, it could only be automated without bulky safety caging.

THE SOLUTION

A UR10 cobot unloads metal parts from the brake press in 10 different production cycles. A risk assessment allowed the cobot to be used without safety guarding, but a zone sensor that slows the robot when a worker enters its workspace provides added confidence. Manual operation has been reduced to an hour per day to inspect quality, making the workspace safer and more efficient. Etalex has since added UR10 cobots in palletizing applications as well.

»Before, you had to put your hands close to the brake press. There's always a chance of an accident happening at any time. But with the Universal Robots, there is no chance of anyone getting injured.«

Richard Clive
Machine Operator

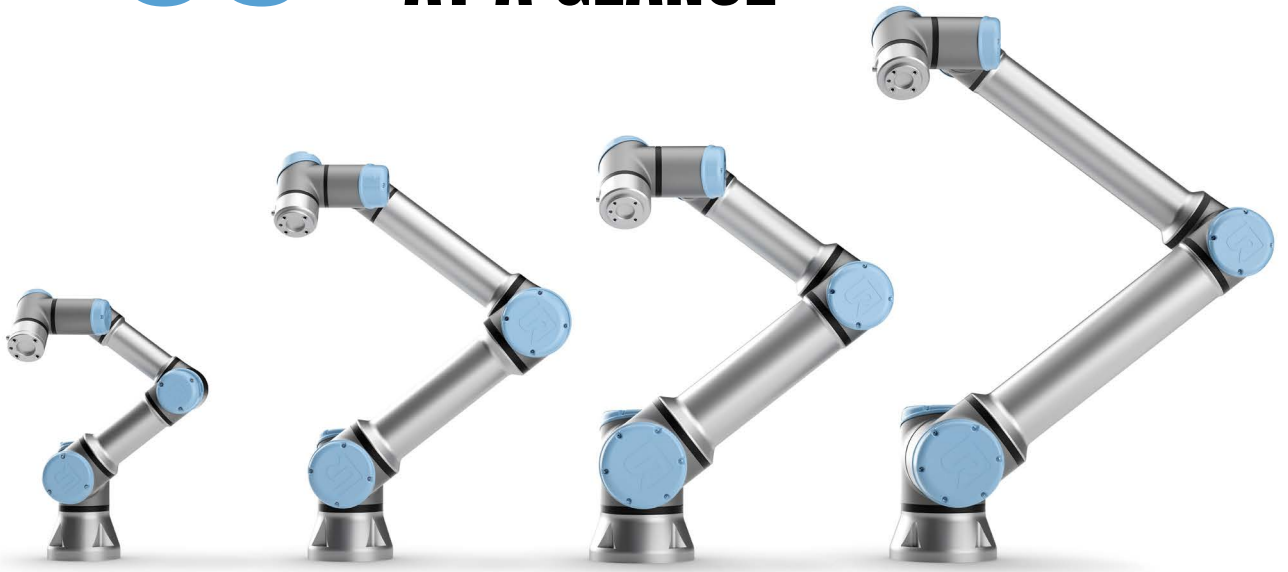
THE RESULT

The company has increased competitiveness and achieved a 40 percent increase in sales, allowing it to expand its market reach. Employees freed from manual and dangerous tasks have been moved to more challenging positions.

[See the video case study ▶](#)

06

OUR COBOTS AT A GLANCE



UR3e Small is beautiful

Our UR3e is a tabletop robot. Weighing in at just 11 kg (24 lbs), the UR3e is ideal for light assembly and workbench automation at payloads of up to 3 kg (6.6 lbs). Focus on the big picture and leave the UR3e to work on the details.

UR5e The multi-tasker

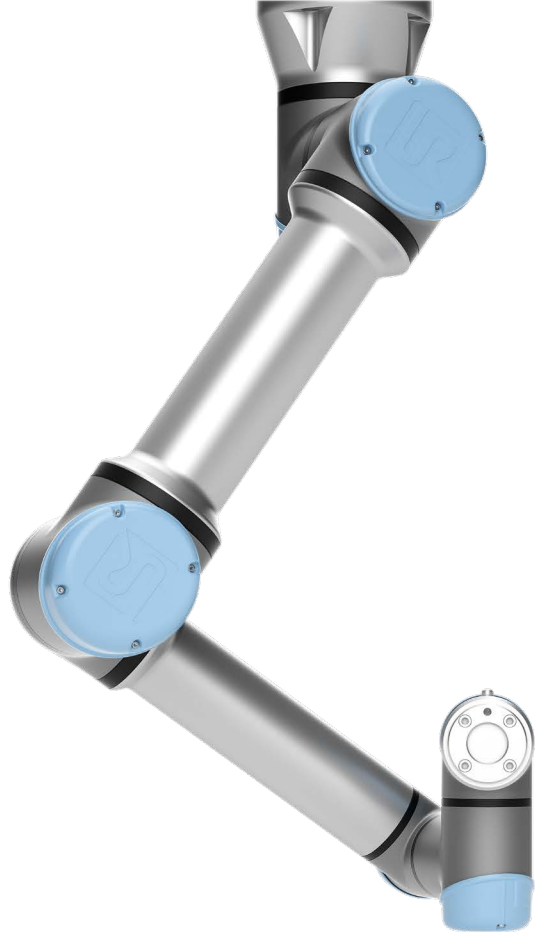
The UR5e has the inner poise to keep size and performance in perfect balance. The cobot combines a payload of 5 kg (11 lbs) and a reach of 850 mm (33.5 in), giving it enough versatility to tackle a wide range of applications with ease. Balance and versatility are the main strengths of our all-rounder.

UR16e Built to do more

Our highest payload cobot is ideal for handling heavier payloads or several parts at once. The 16 kg (35.2 lbs) payload is more than any other cobot in this reach class of 900 mm (35.4 in).

UR10e The workhorse

The UR10e offers the ideal combination of reach and payload, boasting a reach of 1.3 m (51.2 in) and a generous payload of 10 kg (22 lbs). The UR10 cobot has a reach comparable to a human operator.



ASK OUR EXPERTS

TO FIND OUT MORE
ABOUT AUTOMATING
USING OUR COBOTS

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