COLLABORATIVE ROBOTICS

IN THE AUTOMOTIVE INDUSTRY

UNIVERSAL ROBOTS

COBOTS IDEALLY MEET AUTOMOTIVE INDUSTRY NEEDS

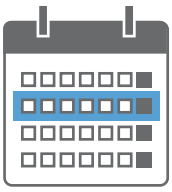
01

Competitive pressures and dynamic market demands have made the automotive industry the most automated in the world. But today, it's about more than just fast, repetitive, high-volume production. Automotive consumers want customized products and tight integration with their mobile information and entertainment needs. To meet these needs, collaborative robots offer automotive OEMs and suppliers the ideal balance of repeatability and flexibility, even in processes that haven't been suitable for automation until now.

02

COBOT BENEFITS

Collaborative robots (cobots) provide attractive opportunities for automation in a wide range of automotive 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.

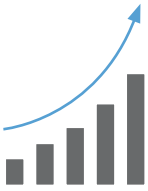
MONTHS

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

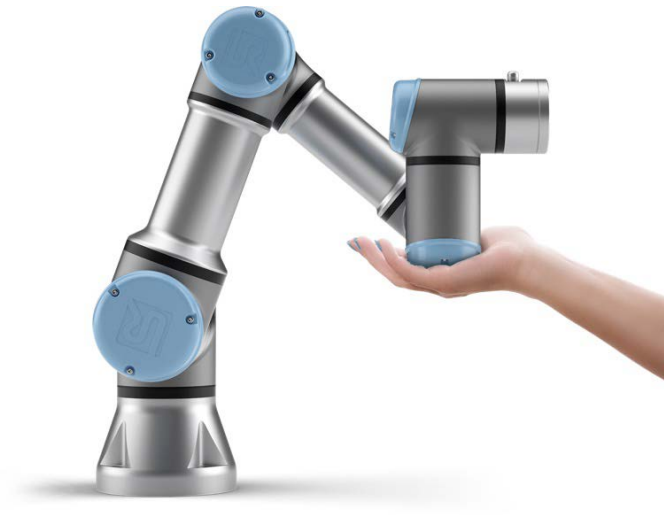
Collaborative robots relieve employees from monotonous, time-consuming tasks, giving them more time to focus on activities with higher added value. While human workers perform tasks ideal for their skills, cobots can perform physically demanding and dangerous activities, protecting workers from health 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 AUTOMOTIVE INDUSTRY

The automotive industry is already highly automated, but many tasks are not ideally handled by traditional industrial robots that require safety caging, significant investment, and deployment time.

Our cobots offer a number of automation solutions specific to the automotive industry:

ASSEMBLY

Our cobots are ideal for increasing production rates and process quality while lowering the risk of accidents for employees working near heavy machinery. The cobot's arms can assemble parts made of plastic, metal or other materials.

SCREW DRIVING

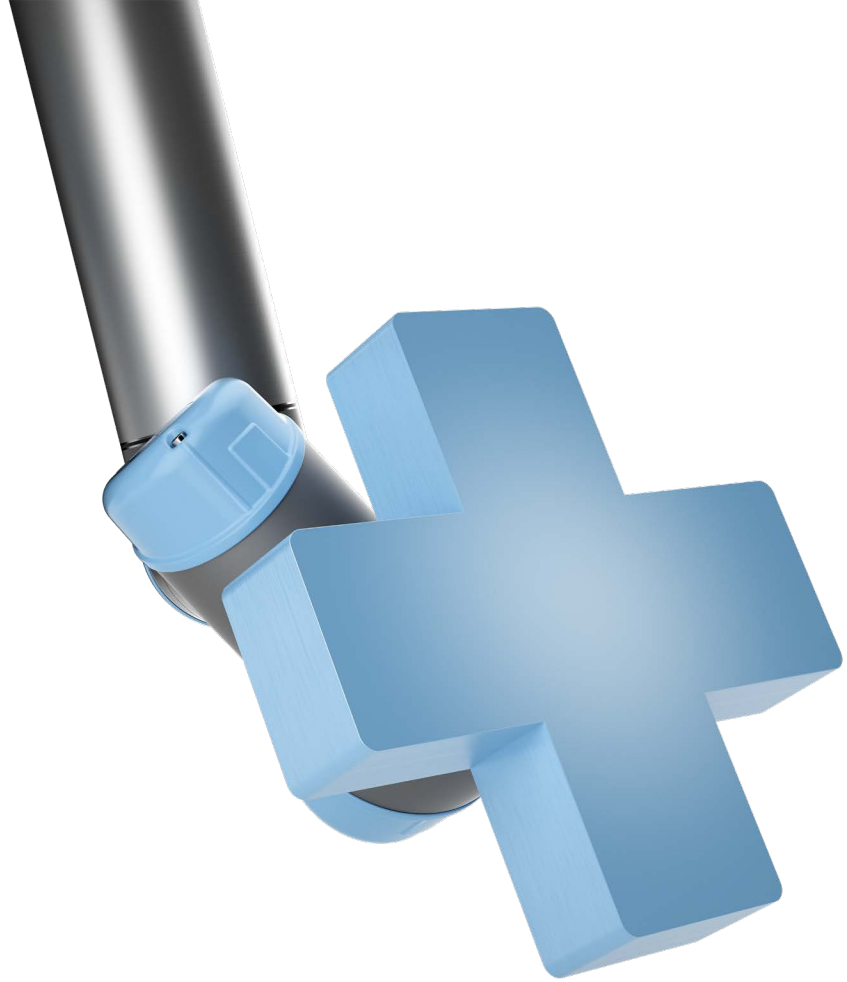
Collaborative robotic arms increase product quality by maintaining the required torque while tightening in specified processes with a high degree of repeatability. UR cobots can work together on multi-station production lines.

PICK AND PLACE

Collaborative robots boost process accuracy and cut down on waste in automated pick-and-place processes, which can continue in lights-out operation. The lightweight design and small footprint mean that the robotic arms are suitable for operation and retooling for various processes in constricted spaces.

MACHINE TENDING

Cobots increase production rates in this monotonous activity while relieving employees from this ergonomically unfriendly task. Automating machine tending with cobots ensures spindle uptime and increased machine utilization.



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+

READ THESE CASE STUDIES FROM THE AUTOMOTIVE INDUSTRY AND SEE FOR YOURSELF

05

PROCESSED METAL INNOVATORS (PMI)

Wisconsin-based Processed Metal Innovators (PMI) is a metal fabricator that produces hundreds of different stamped and welded metal parts for automotive and other industries. PMI turned to the Universal Robots cobot-powered BotX welder to dramatically increase productivity and profitability.

THE CHALLENGE

With a tight labor market, few available certified welders, and traditional robotic welders unable to handle small runs, PMI was frustrated by having to turn business away.

THE SOLUTION

The company had already used cobots from Hirebotics to tend mechanical presses, so when the PMI team heard of Hirebotics' new BotX welder, they jumped at the opportunity. The BotX welder is designed for easy implementation and programming, and combines extensive welding expertise and two years of development collaboration with Red-D-Arc, Airgas, and Air Liquide. Programming is as simple as using a smartphone, with built-in welding libraries, including pre-certified welds that don't require a certified welder. With Hirebotics, the welder is billed hourly with no up-front costs.

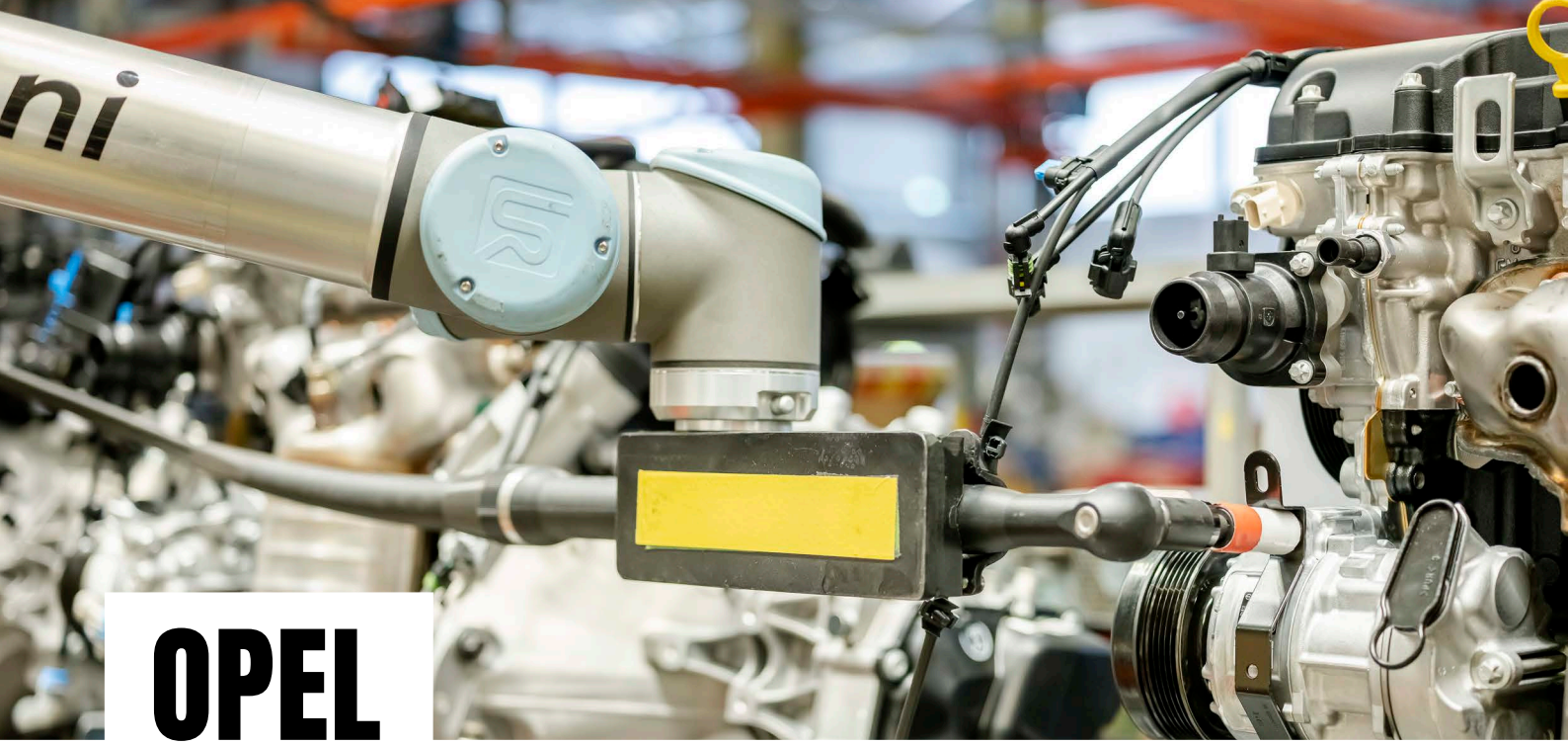
THE RESULT

PMI is now able to quote work it previously had to turn away due to the shortage of workers. With larger profit margins on larger weldments, the company is able to allocate skilled welders to those projects, while the robotic welder easily turns out high-quality welds on other jobs. As a bonus, the robots appeal to younger workers who are often hard to hire and retain for manufacturing jobs.

See the video case study

»With the new BotX system we can bring in one robot and run it for three shifts and not have to hire three welders, so if we needed 30 welders, we could have ten robots running. We do have to hire employees to run the robots, but now they don't have to be skilled welders. It really frees up a lot of resources for us.«

Erik Larson
VP of Operations at PMI



OPEL

Opel is a leading European car manufacturer. The company's 1,400 employees in its Eisenach, Germany plant play a key role in efficient production.

THE CHALLENGE

The continuing skills shortage poses a challenge to the Eisenach-based car manufacturer. Opel has identified continuous procedures that can be automated to relieve plant employees. One of the manufacturer's decisions was to automate the process of bolting air conditioning compressors onto engine blocks using collaborative robotics.

THE SOLUTION

The team opted for a UR10 due to its reach and compelling ease of programming. Opel took charge of the application in-house from end effector to installation on the production line. The cobot currently works together with the staff in a stop-and-go cycle, tightening three bolts to exactly 22 nm every two minutes. The robotic arm deals with a total of thirty engines of up to seven different types every hour.

One of the main differences between the cobot and conventional robotics is the communication between cobot and production line. The UR10 does not have to be reprogrammed to "know" which engine type needs to be worked on and tightens the bolts accordingly.

»The Eisenach plant has been a byword for team spirit and best-in-class production quality since time immemorial. We've been able to implement new deployment scenarios to support our employees thanks to cobots from Universal Robots.«

Steve Geinitz
Manufacturing Engineer at Opel Eisenach

THE RESULT

Opel has implemented the new cobot application to automate an activity previously reserved for a human operator, thus relieving a specific employee's task. The manufacturer has plans to develop on the success of this pilot application; another UR10 is already ready to go in the development workshop. The company is testing the cobot for new applications and using it to train staff in dealing with this innovative technology, which is increasingly becoming reality in the Thuringian manufacturing plant.

Read the full case study

PSA

PSA is Europe's second-largest car manufacturer. The French company relies on continuous optimization in industrial processes to remain competitive.

THE CHALLENGE

Car manufacturers need to identify optimization potential in their own processes on a continuous basis in order to respond to increasingly complex technologies and demanding customer expectations. PSA developed plans to modernize its locations, consolidate production lines, and reduce vehicle costs while relieving factory workers from ergonomically unfriendly tasks. The manufacturer opted for cobots on the assembly line at its factory in Sochaux, France.

THE SOLUTION

The cobot at Sochaux is used for bolting on the two sides of the vehicle without disrupting factory employees working on other assembly procedures. The UR10 is ideal due to its reach. The cobot is fixed to a strut that moves under the vehicle during the production process. The robotic arm follows a clearly defined cycle: The UR10 screws in three bolts on the right-hand side and three on the left, then pivots back into its starting position before the next vehicle arrives. The cobot works safely at reduced speed next to the employees without requiring a protective fence. PSA has registered national and international patents for its unique UR10 application.

THE RESULT

PSA is extremely satisfied with the results from the robotic arms. Not a single fault has been reported from more than 200,000 vehicles produced. The cobots have also improved ergonomics and safety. The manufacturer now plans to use UR cobots at other production locations.

See the video case study

»We've reduced the cost price for our cars while improving geometric dimensioning and tolerance (GD&T) by up to 10% with these cobots.«

Cedric Grandjean
Architect Element Specialist
Finish Assembly Line

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

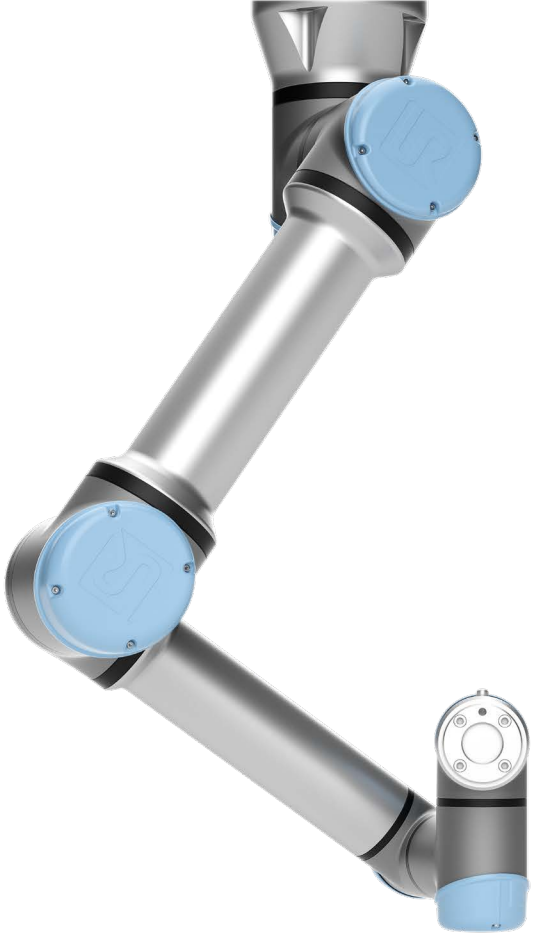
The UR5e has the inner poise to keep size and performance in perfect balance. The cobot combines a payload of 5 kg (11 lbs) and a reach of 850 mm (33.5 in), giving it enough versatility to tackle a wide range of applications with ease. Balance and versatility are the main strengths of our all-rounder.

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.



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ABOUT AUTOMATING
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