
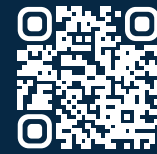




Engineering that combines robotics and machine vision, driven by artificial intelligence!

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**ROBSEN**



PRODUCTS & SOLUTIONS

2024

**ROBSEN**



A close-up photograph of a yellow industrial robotic arm with a white gripper. The gripper is positioned over a cardboard tray containing a grid of small, gold-colored cylindrical components. The background shows a blurred industrial setting with various mechanical parts and structures.

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AND ASSEMBLY

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SURFACE FINISHING

# About Robsen Robotics

Welcome to Robsen Robotics, the leading developer of robotic solutions for the metal industry. Located in a technology park, we are constantly developing new solutions to meet the ever-changing needs of our customers. At Robsen, we have a passion for new technologies and innovative thinking, and we strive to apply these principles to all aspects of our work.

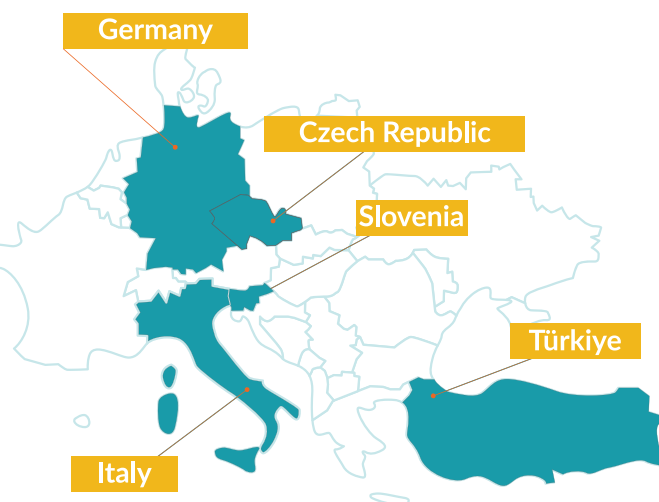
We work closely with metal-shaping companies to develop automation solutions that streamline their processes, increase efficiency, and reduce costs. Our solutions are designed to meet each customer's unique requirements, and we take great care to ensure that they are effective, reliable, and easy to use.

At Robsen, we believe that research and development are key to staying at the forefront of our industry. That's why we collaborate with universities and research centres to conduct R&D activities within different platforms. By staying up to date with the latest advances in technology, we can continue to offer cutting-edge solutions to our customers.



Technology Park

*Engineering that combines robotics and machine vision, driven by artificial intelligence!*



150+ Projects   10+ Installation Sites   5 Countries

Our success is built on trust, and we have developed strong relationships with our customers and suppliers over the years. We believe that honesty, integrity, and reliability are essential to building long-term partnerships, and we are committed to upholding these values in our interactions.

Thank you for considering Robsen Robotics to help you achieve your business goals. We are confident that our expertise and solutions can help you improve your processes, reduce costs, and increase customer satisfaction.

**Our Partners**



## MILESTONES

**2014**  
IROVISION  
IROPICK 2D DEVELOPMENT



2D MACHINE VISION SOFTWARE

**2018**  
ROBOTICS EXTRACTION  
CELL FOR DIE CASTING



HIGH PRESSURE DIE-CASTING

**2023**  
GRINDING & POLISHING  
ROBOTICS CELL



SURFACE FINISHING

**2015**  
IROCUBE F7



MACHINE TENDING APPLICATION

**2021**  
IROVISION  
QUALITY INSPECTION DEVELOPMENT



QUALITY CONTROL AND ASSEMBLY

## MATERIAL HANDLING

Our material-handling robotic project is designed to handle a wide range of tasks, from palletizing and depalletizing to sorting and transporting materials.

Our robots, equipped with advanced sensors and controls, can operate in complex environments. This enhances productivity while minimizing the risk of workplace injuries.

### Efficiency and Productivity

Our robotic solutions enhance efficiency and productivity by automating tasks with speed and precision. They are versatile, capable of handling multiple assignments, operating 24/7, and managing production stages that may pose risks to human health. This frees up workers for other tasks and improves overall safety by addressing potential hazards in the production process.

Investing in our solutions future-proofs your business and keeps it adaptable to changing market demands, helping you stay ahead of the competition.



## MACHINE TENDING

Investing in robotic solutions for machine tending applications can lead to increased efficiency, reduced downtime, improved safety, and overall cost savings.



### Turning Lathes

With a small footprint, our TF series is designed to fit into even the tightest of spaces, ensuring maximum efficiency without taking up valuable floor space. Incredibly easy to install thanks to its plug-and-play design, allowing you to get up and running in no time at all.

So whether you're looking to optimize your Turning lathe operations, or simply want to streamline your workflow and save on costs, our TF series is the perfect solution for you. Try it out today and experience the difference for yourself.



### Transfer Machines

We are introducing our robotic solution for Transfer Machines - the perfect solution for manufacturers who demand speed, accuracy, and safety.

Transfer Machines are renowned for their fast operation, requiring a rapid feeding process to keep up with the pace of production. Our robotic solution streamlines this process, allowing you to feed parts to the machine quickly and safely.

### Vertical Machining Center

Our robotic solution for vertical machining is designed to provide maximum efficiency and ease of use.

With our Irovision software, you don't need any additional fixtures. Irovision is specifically developed to match parts and seamlessly guide the robot to feed the parts into the machine.

Our robotic solution is a smart investment that pays for itself in a short amount of time. The reduced labor costs, increased efficiency, and minimized errors lead to a significant return on investment. With our solution, you can focus on growing your business while our robots handle the repetitive and time-consuming tasks.



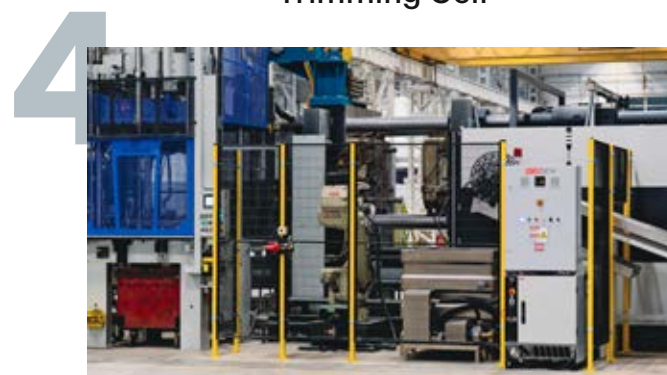
Machine Tending



Trimming Cell



Press Tending



HPDC

## IROCUBE

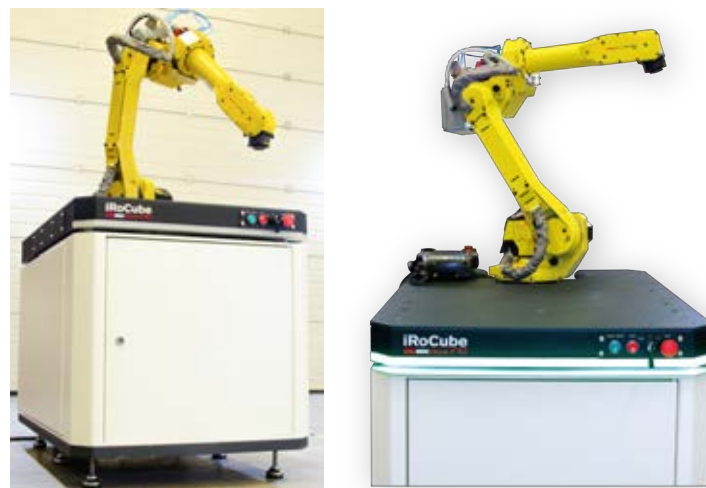
*no fixture,  
just efficiency*



IROCUBE MF7/MF7L/MF10L



IROCUBE TF7/TF10



IROCUBE PLUS SERIES

This series is the perfect solution for automating your Fanuc Robodrill. It is a flexible and versatile cell that can be customized to meet your specific needs. Whether you are looking for a basic load-unload solution or a complex washing, drying, and leaking test station, the IROCUBE MF7/MF7L/MF10L has you covered.

This product's most outstanding achievement is its ability to handle complex geometric parts.

Tailored for turning lathes, the TF series streamlines operations with a conveyor feeding parts to the robot, a rotating conveyor for finished components, and the advanced IroVision system. By swiftly feeding parts within seconds, IROCUBE minimizes downtime and unlocks remarkable efficiency gains, boosting your productivity from the same equipment.

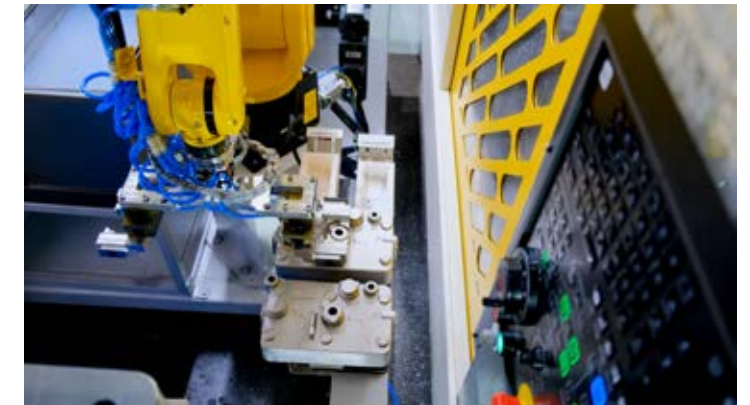
IROCUBE Plus is a compact and flexible robotic platform that is perfect for automating complex manufacturing processes. The system features a camera-integrated EOAT that enables CAD-based vision capabilities, allowing you to automate complex geometry parts and processes with precision and efficiency.

IROCUBE Plus offers a wide range of modules that enable you to configure your robotics cell to meet your requirements. Through this, unlimited customized manufacturing solutions can be created.

## KEY ADVANTAGES

### Flexible machine tending for virtually unlimited range of parts

Experience unmatched flexibility powered by IroVision software. There is no need for separate fixtures; IROCUBE seamlessly feeds a wide array of parts, provided they fit the robot's weight capacity.

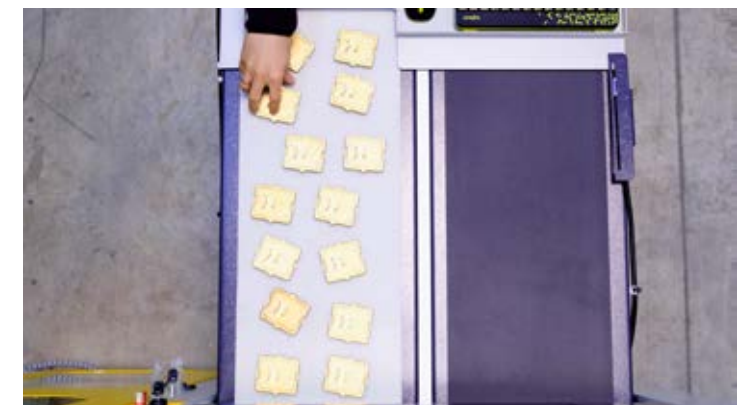


### Highly accurate, robust, user friendly vision system

IroVision is thoughtfully crafted for all members of your team, spanning from operators to engineers. Its user-friendly interface streamlines model training – as effortless as sketching an apple in paint.

### Conveyors for loading & unloading

Irocube's conveyor design facilitates the ease of use for load and unload conveyors, compacts the system footprint, and provides the ability to arrange systems side by side, enabling the operation of multiple systems with a single operator.



### Small Footprint & Plug and Play

The IROCUBE, with a footprint of just 4m<sup>2</sup>, features a front-facing design for efficient side-by-side arrangement, saving significant space. Its plug-and-play functionality ensures quick commissioning, reducing complexity, and provides streamlined operations.



## ROBOTICS SOLUTION FOR FORGING

### TRIMMING CELL

Hydraulic trimming presses are used in forging plants to remove flash on the brass and aluminium forged parts. Our trimming line solution consists of a high-performance rotary table press and a complete robotic solution for tending the press.

Trimming is a dangerous operation for operators; our solution maximizes safety for the whole process.

Our machine vision technology, iRoPick 2D, makes it possible to pick complex geometries accurately with any orientation.

Our machine tending software decreases set-up times and grants to manage low-volume production. Also, it eliminates the need for high-skilled labour.

### Trimming made simple with our all-in-one robotic cell.

**Support for machining centers:** Fast and efficient trimming can support your machining center by reducing the time it takes to process each part. This can help you optimize the use of your equipment and improve the return on your investment in this expensive machinery.



### PRESS TENDING

Hot forging is one of the initial stages in the manufacturing of metal parts, but it can also be one of the most dangerous.

Our robotic cell is designed to handle the entire hot forging process from start to finish, including part transfer and loading.

Using a robot to handle these tasks eliminates the need for human operators to come into contact with the hot parts, reducing the risk of injury and ensuring a safer working environment for everyone involved.

#### Eliminating direct contact

Robotic solutions eliminate the need for human operators to come into direct contact with the hot parts. This reduces the risk of burns, cuts, and other injuries when handling hot parts manually.

#### Reducing exposure to fumes and particulates:

Hot forging can produce fumes and particulates that are hazardous to human health. By using a robotic cell to handle the hot parts, we can reduce operators' exposure to these harmful substances, improving overall air quality in the workplace.



With our robotic solution, the part is transferred to the robot by a conveyor. The robot then loads the part into the press, which performs the hot forging operation. Once the forging is complete, the robot removes the part and places it onto a cooling conveyor.

Designed to work seamlessly with your existing hot forging equipment, making it easy to integrate into your production line.

### ROBOTICS CELLS FOR EXTRACTION DIE-CASTING

In today's competitive die-casting industry, robot-based automation is essential for success. Our robotic solutions are designed to help foundries increase productivity, enhance safety, and improve efficiency.

Our state-of-the-art applications, which include part extraction and insertion, are designed to optimize throughput in die-casting processes cost-effectively.



#### Operate Reliably

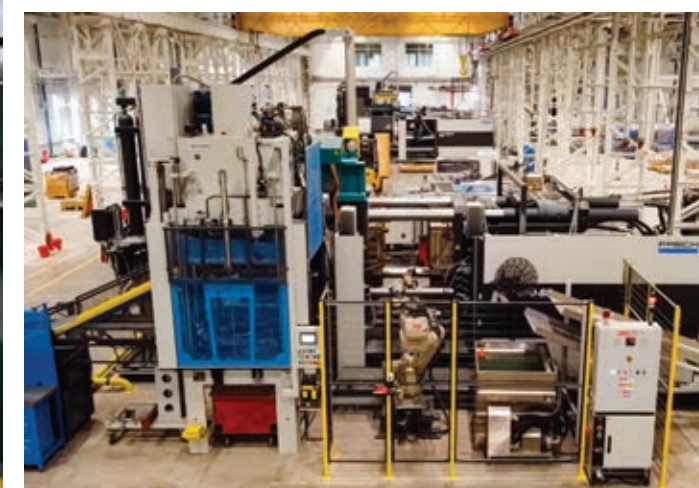
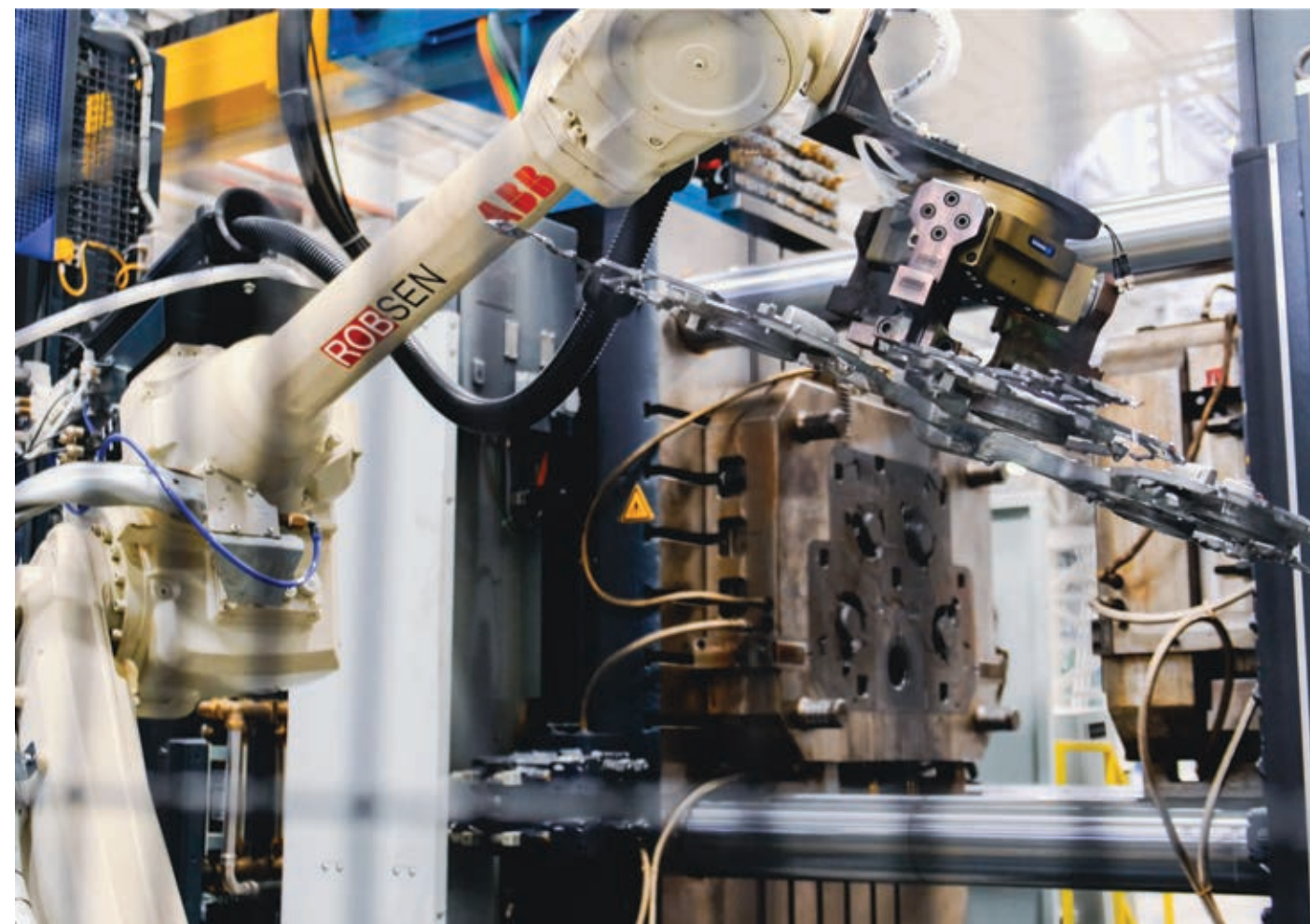
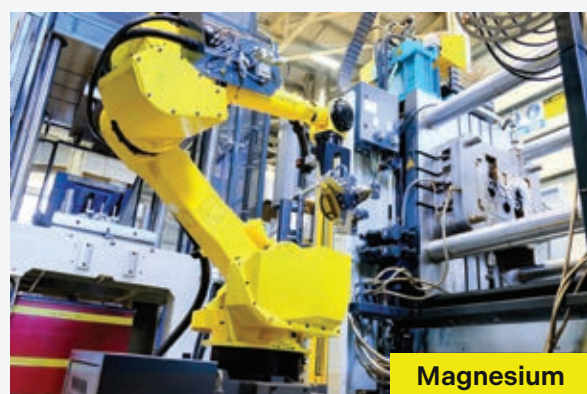
Our robotics cell solutions for HPDC operations ensure safe production processes. They are designed to automate dangerous and repetitive tasks, reducing the risk of accidents and injuries associated with manual operations.

#### Minimize Downtime

Downtime in HPDC operations can be costly in terms of lost productivity. Our robotics cell solutions are designed to minimize downtime by automating tasks and improving the efficiency and consistency of production processes.

#### Digitize The Process

Our advanced technology also supports foundries in their digitalization efforts, enabling them to monitor the die-casting process in real time and improve the performance of their die-casting cells.





## FAST ROI

Here's a of the key features that make our system a Fast ROI solution:

**Digitalization Advantage:** All processes are fully digitized, allowing for precise planning related to the lifespan, tracking, and replacement of consumables.

**Operator Independence:** The system's full automation eliminates the need for highly experienced operators, freeing up skilled personnel to contribute to more valuable departments within your company.

**Continuous Operation:** The independent cell feature enables non-stop, 24/7 system usage without interruptions.

**Plug-and-Play Efficiency:** The system is plug-and-play, significantly reducing installation and maintenance time and leading to substantial time and cost savings.

## ROBOTIC CUTTING AND GRINDING SYSTEMS

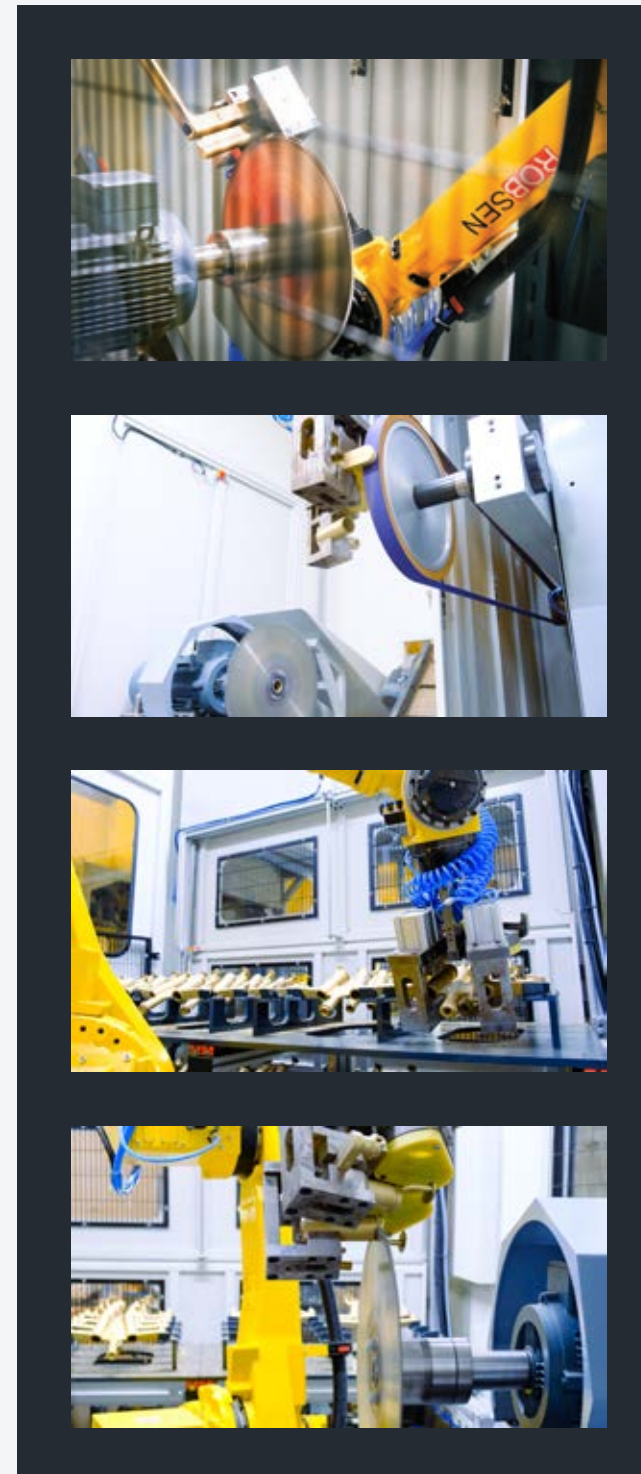
Robotic solutions eliminate the need for human operators to handle materials directly. It reduces the risks of the metal processing stages, such as injuries from moving components, exposure to chemicals, and contact with generated dust.

### 01 CONFIGURABLE

These systems boast cutting, grinding, and deburring stations tailored to your needs. These stations are fully customizable based on your component's size and geometry. For instance, the saw type can be adjusted according to the part's dimensions, and the grinding unit can be customized based on the alloy values of the part and the targeted surface quality.

### 02 CYCLE TIME

Our customized system for a "basin faucet" manufacturing client completed the cutting and gate grinding stages in an impressive 70 seconds. This entails the robot handling the part from the cell, processing it through all required operations, and returning the final product to the cell within a short 70-second timeframe. This rapid cycle time underscores our commitment to swift and efficient manufacturing processes.



### 1 HIGH PRECISION CUTTING

Robotic cutting ensures top-level precision and consistency, providing optimization and predictability in subsequent production stages, enhancing operational excellence.

### 2 INCREASE SURFACE QUALITY

Advanced 6-axis robots in our systems ensure unparalleled precision and surface quality throughout the processing stages. This promises optimization in subsequent production processes like machining, coating, and painting and guarantees a flawless final product.

### 3 INDEPENDENT CELLS

Our system incorporates 4 independent cells operating continuously. This unique design enables the seamless flow of operations – while some cells are engaged in loading and unloading, others are actively processing, allowing for a continuous supply of new parts and the retrieval of final products simultaneously.

### 4 ENSURE SAFETY

The manual execution of these tasks poses certain risks, including high-speed rotating components, sharp saws, and the airborne dispersion of dust during sanding. Our system operates with a fully enclosed logic, eliminating these potential hazards and providing a secure working environment.





Irovision is an advanced machine vision software developed by Robsen. It is designed for robotic feeding projects and quality control systems, eliminating the need for fixtures in feeding projects and identifying manufacturing defects in quality control processes.

# IROVISION

*matching // quality control*

*Compatible with*

**BASLER** OPTO **DAHENG** **HALCON**



## MATCHING

*no fixture*

*Irovision's matching feature allows robotic feeding systems together parts from conveyors, ensuring flexibility without requiring fixtures.*

### Shape-based --- CAD-based

Successful and rapid part detection through 2D matching (shape-based match) and model training on CAD data (CAD-based match) is achievable with Irovision.

### All in one

Thanks to the iRoVision program, camera calibration, camera settings configuration, model training, model testing, and communication with robots and/or PLCs can be seamlessly performed through a single application.

### User friendly

Combining the test and train processes provides rapid training and validation advantage due to their integration.



## QUALITY CONTROL

*no flaw*

*Irovision's quality control capability identifies surface defects, performs precise measurements, and ensures a flawless final inspection for parts.*

### Precision Inspection

In Irovision's precision inspection projects, we have successfully achieved 30 microns and below sensitivities. We utilize custom lighting for the inspected components, elevating our measurement precision to the next level.

### OCR function

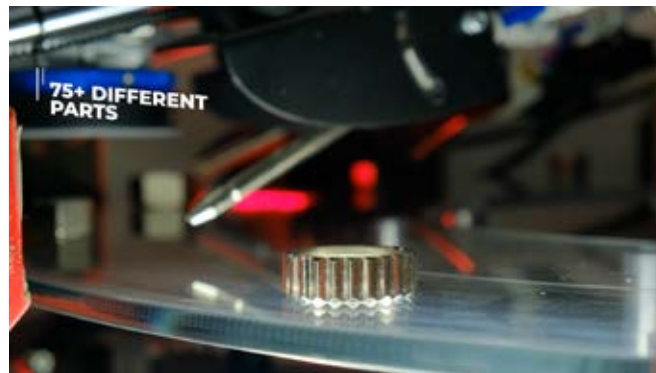
The OCR feature in Irovision transforms text on parts into digital data, offering users notable convenience. It allows users to tailor packaging according to the text or QR codes on the part. Codes at different stages identify the part's progress, empowering efficient process management. This enhances flexibility and traceability in production.

## QUALITY CONTROL AND ASSEMBLY

Quality Control and Assembly play a pivotal role in production facilities, ensuring the overall quality and satisfaction of end-users.

Consider a brass product, such as a faucet part, going through multiple stages—from melting and hot forging to trimming, machining, washing, assembly, and finally packaging for customer delivery. Unfortunately, defects in the product led the customer, regardless of size, to encounter issues, resulting in returns.

This indicates that without effective quality control and precise packaging, the entire production process, encompassing customer satisfaction, internal R&D, and logistic expenses, may face setbacks that could have been avoided with early error detection.



### Nut Sorting

Our nut sorting machine is a cutting-edge solution designed to streamline the sorting, inspection, and packaging of nut parts.

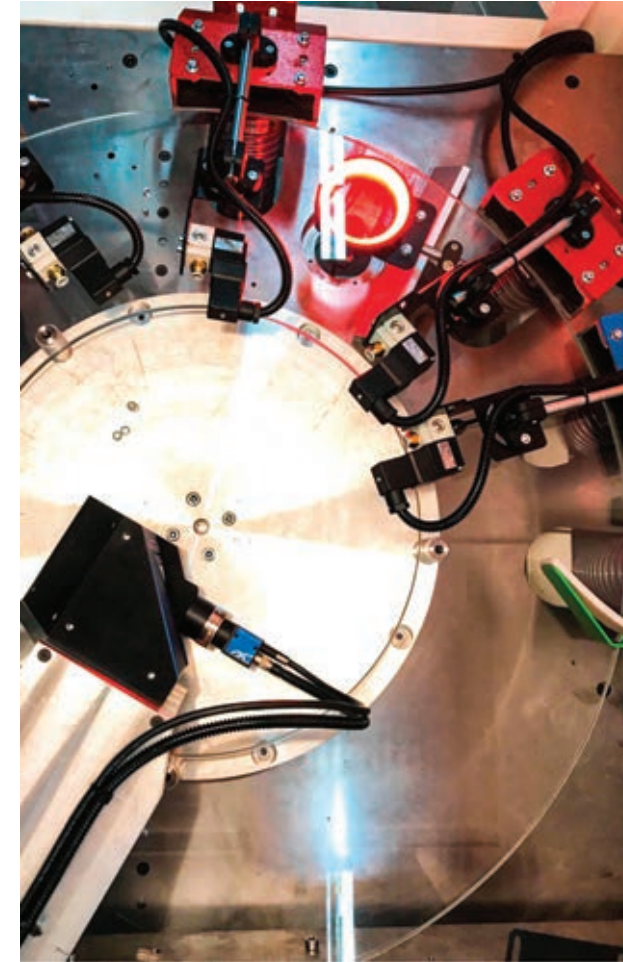
This automated system efficiently handles the quality control process of more than 75 various nut parts, ensuring precision and accuracy in the final output.



### Final Control, Assembly And Packaging Machine

We developed a compact machine allowing measurement and inspection of 100% of metal parts, o-ring assembly, and packaging into carton boxes.

Remote access, machine monitoring, and intelligent diagnostics are the machine's other feature



### Feed The Machine

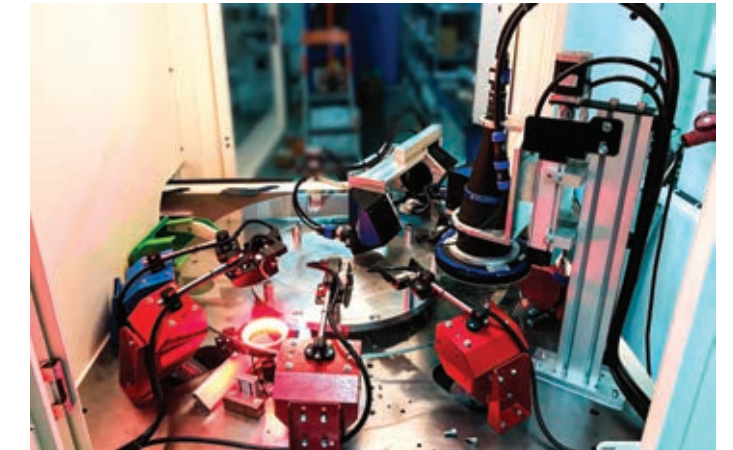
The initial step involves feeding the box tipping system with a crate filled with pieces. This crate is loaded with thousands of parts.



### Bowl Feeder

The box tipping system conveys the parts to the Bowl Feeder, which boasts a high capacity. It continues to feed pieces to the rotation table until the crate is replaced, ensuring an uninterrupted and continuous system operation.

## NUT SORTING



### Precision And Calibration

The nut parts undergo a comprehensive quality inspection process. High-tech sensors and imaging systems meticulously examine each part, assessing integrity, dimensions, and surface quality.

The system employs a sophisticated calibration method that fine-tunes its measurements, achieving an impressive accuracy of 30 microns for both length and diameter. This precise calibration enhances the reliability of the inspection process. With the ability to run 12 parts in a second, our machine ensures high throughput without compromising accuracy.



### Labeling and Packaging

Once the pieces have passed inspection, they are filled into boxes using a conveyor system. Each box is labeled based on the characteristics of its contents and is then arranged on a pallet by a palletizing robot.



## FULL AUTOMATIC

**Designed For Continuous Operation:** The system features a dual design for trays and boxes, ensuring continuous operation.

**Autonomous Swapping Mechanism:** When a tray becomes empty, or a box is filled, the cartesian robot promptly replaces it with a new one. Simultaneously, the SCARA robot continues to pick components and places them into the empty box.

**Initial Loading By Operator:** The operator initiates the system by feeding 50 trays (4000 parts) filled with parts and 25 empty boxes for packaging.

**Uninterrupted Autonomous Operation:** Once initiated, the system operates autonomously without intervention until:

- Components are depleted or
- Trays become empty.

## FINAL CONTROL, ASSEMBLY AND PACKAGING MACHINE

Robson Robotics has developed a compact final control, assembly and packaging machine allowing 100% measurement and inspection of produced metal parts, o-ring assembly, and packaging into carton boxes.

### 01 DIMENSIONAL MEASUREMENT

Dimensional measurement refers to the process of assessing and recording various physical dimensions and geometric characteristics of components within the "final control and packaging" system. This includes measurements such as length, width, height, diameter, angle, and other geometric parameters.

### 02 SURFACE INSPECTION

Surface inspection plays a crucial role in our system by allowing us to detect and address various imperfections and defects present on the surface of components. This meticulous examination encompasses identifying issues such as cracks, processing errors, stains, and other surface irregularities that may impact the quality and functionality of the final product.

### 03 DETECTION OF BURR

Detection of burrs" refers to the process of identifying and assessing any unwanted raised edges or protrusions, known as burrs, on the surface of components within our system. These burrs can be the result of various manufacturing processes, such as cutting, stamping, or machining, and they need to be meticulously detected and removed to ensure the highest quality in the final product.



### 1 TRAY CARTESIAN ROBOT

The Tray Cartesian Robot is a crucial component in our system designed for industries where certain parts are unsuitable for transfer using vibratory systems. This specialized cartesian robot is responsible for handling trays filled with components. Its primary function is to bring a tray filled with parts to the front of the SCARA robot and unload an empty tray.

### 2 MEASUREMENT-INSPECTION-ORING STATION

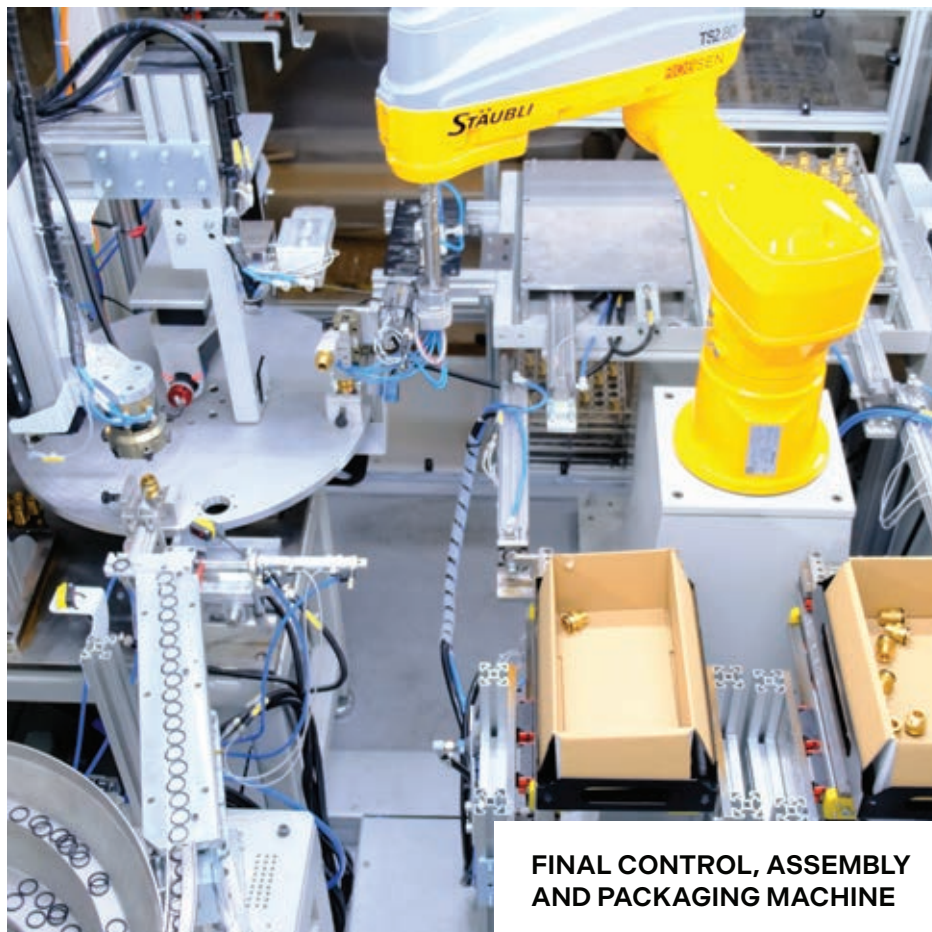
At this station, we use an automated tool to install the o-ring onto the component. The system then performs inspections and measurements to ensure each part meets quality standards. If a part passes, it moves to the packaging stage. Fail parts are transferred to the "Not Okay" tray for further assessment.

### 3 PACKAGING

A robot arranges the components at this station neatly inside a box with separators. This stacking method provides precise packaging, ensuring that each part is delicately placed in the box. The use of separators enhances the protection of the components during transportation and offers an efficient packaging solution.

### 4 BOX CARTESIAN ROBOT

This station has 25 compartments. There are always two boxes in front of the robot to keep the packaging process continuous. When one box is full, the robot places it on the shelf while the SCARA robot starts filling the empty box. This ensures the system operates without interruptions, maintaining a smooth packaging workflow.



FINAL CONTROL, ASSEMBLY AND PACKAGING MACHINE

