

CUBIC

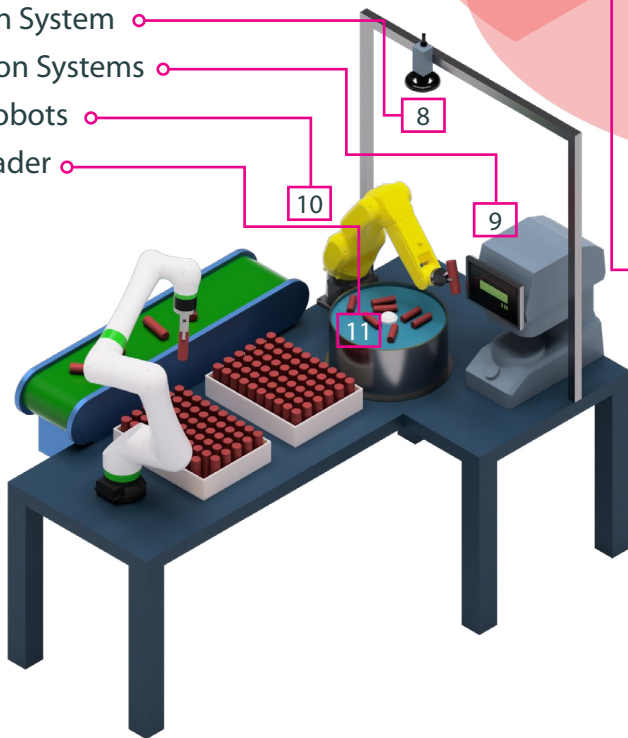
AUTOMATION



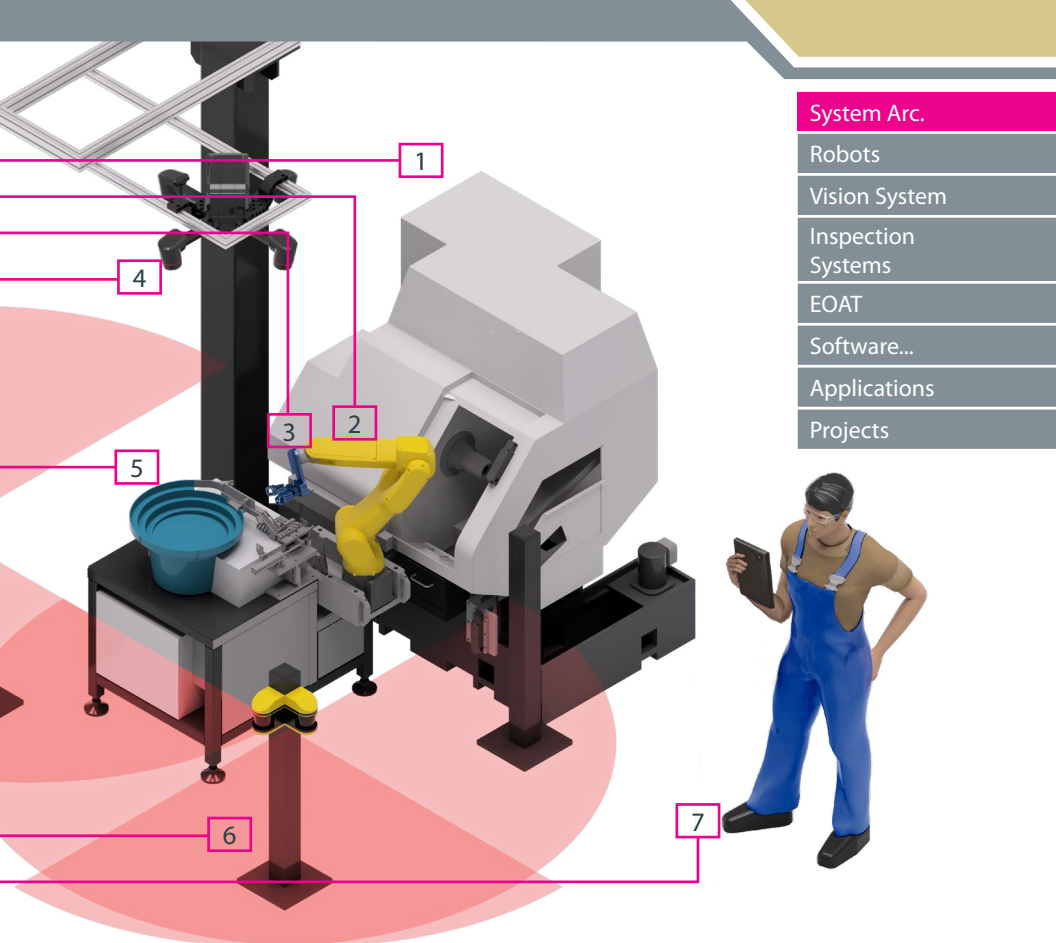
1. GT mini Plus
2. Fanuc Robot
3. End of Arm Tooling (EOAT)
4. 3D Vision System
5. Custom Loader
6. Safety Laser Scanner
7. Remote Monitoring

Inspection and Packaging Section

8. 2D Vision System
9. Inspection Systems
10. Fanuc Robots
11. Flexi-Loader



EXAMPLE LAYOUT



System Arc.

Robots

Vision System

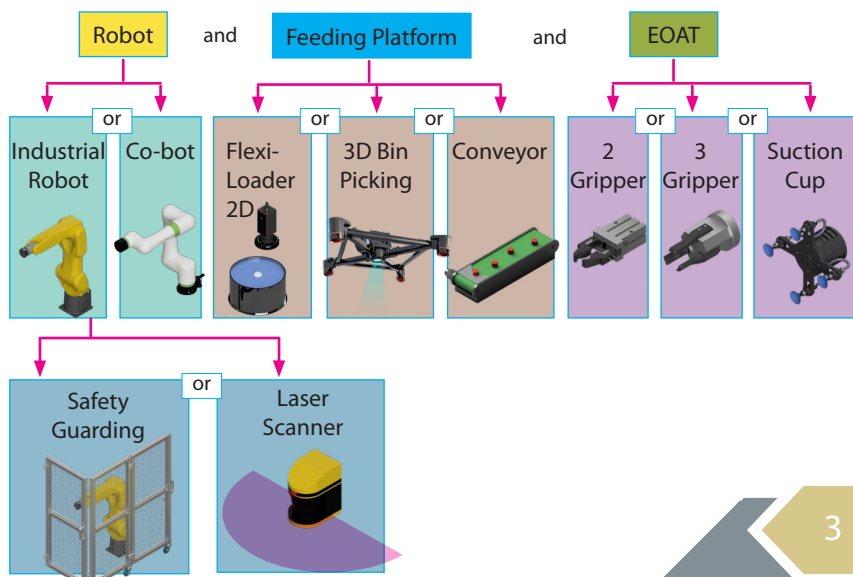
Inspection
Systems

EOAT

Software...

Applications

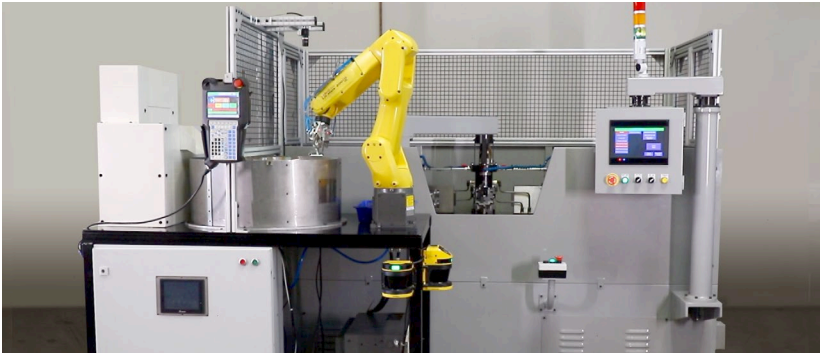
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Robots

We offer articulated robots, SCARA robots, delta robots, etc with precision and speed for automation.

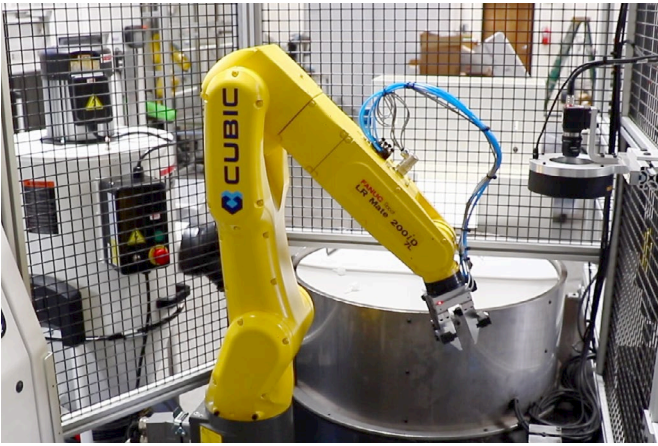
Robots can perform repetitive and dangerous tasks with high accuracy 24/7.



Outstanding Selection of Robots

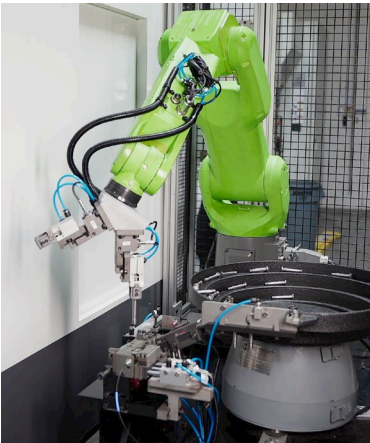
Cubic is an authorized integrator for Fanuc, Mitsubishi, UR, and Epson robots meaning you will always be recommended the best robot for your application.





Industrial Robots

With proper safety guarding an industrial-style robot is the most productive option when automating using a robot.



Collaborative Robots

Integrated force sensors and speed limitations allow for a traditional robotic arm to become a tool for collaboratively working near human operators without the need for a safety cage or guarding.

Vision Systems

2D and 3D vision systems for inspection, guidance, and measurement.

Vision systems enable precise and flexible automation via machine vision and deep learning.



3D Vision Systems

Keyence 3D vision-guided robotics is a technology that combines 3D machine vision with robotics to automate complex manufacturing processes. It uses 4 cameras and sensor fusion to capture depths of objects and then analyzes those images to determine the location and orientation of the objects in 6 dimensions.

With this information, the robotic system can then perform precise and accurate movements to grasp the objects for pick-and-place, assembly, or inspection. The system can also adapt to changes in the environment or object positions making it highly flexible and suitable for a wide range of applications.

2D Vision Systems

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Pick and Place

2D robotic vision systems use cameras to capture images of an object and then use image processing algorithms to locate the object's position and orientation.



© Keyence

These systems typically rely on techniques such as edge detection, feature recognition, and template matching to identify the object and calculate its position and orientation relative to the robot.

Once the object's location and orientation have been determined, the robot can use this information to accurately grasp and manipulate the object in a pick and place application.

Feature Location

2D robotic vision systems can be programmed to recognize specific features, such as a lock-wire hole on a bolt, in a deburr application.



© Keyence

The system can then use this information to precisely guide a tool or orient the product.

Safety Sensors



We use a variety of safety sensors like light curtains, laser area scanners, and safety interlocks to ensure the safety of end users.

Cobots and area sensors enable safe human-robot collaboration.



Inspection Systems



Keyence IM-8000

The Keyence IM-8000 series is an optical comparator that can be used in automated inspection systems to perform rapid and accurate measurements of parts and components, without requiring manual intervention..

By utilizing the IM-8000's simple operation and stable edge detection algorithm, high-volume manufacturing environments can achieve consistent and reliable measurements, increasing production efficiency and reducing the risk of errors or defects.



© Mitutoyo

Mitutoyo QV Active

The Quick Vision Active Vision Measuring System can be used in automated inspection applications to achieve accurate and reliable 3D touchless measurements without the need for manual intervention. Its automatic focus feature, interchangeable zoom lenses and an optional touch probe enable the

system to measure complex dimensions on a variety of workpieces, while the programmable LED stage and ring light sources improve responsiveness and measurement throughput, making it an ideal solution for high-volume manufacturing environments.

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© Sylvac

Sylvac S25T

The Sylvac S25T vertical optical measuring machine can be used in automated inspection applications for the precise measurement of various elements on small cylindrical parts, including threads, bone screws, dental implants, and more. Equipped with

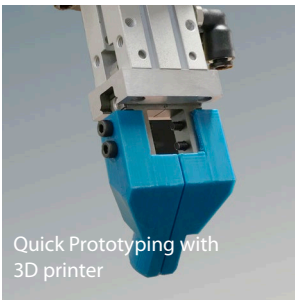
an exclusive optics tilting system, a bi-telecentric optical system, and a high-resolution CMOS camera, the S25T can quickly and easily measure parts without prior programming, making it an ideal solution for high-volume manufacturing environments.

End of Arm Tooling (EOAT)

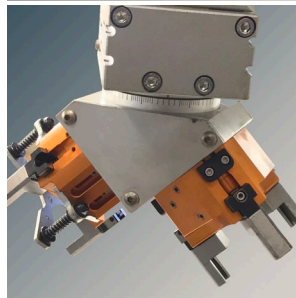
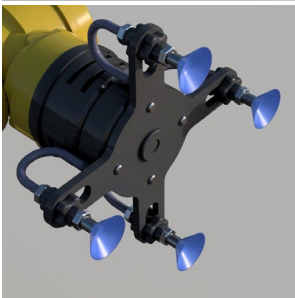
We design and manufacture custom grippers, fixtures, and EOAT to grasp and manipulate parts for your applications.

Fixtures are designed specifically for your parts and produced in-house.

Easily order replacements and new part numbers.



Quick Prototyping with
3D printer



Software and Integration

We develop software and systems to control and integrate all equipment for a cohesive solution. HMI, PLC, and robot programming software allow for easy programming and monitoring.

Human Machine Interface (HMI)

Cubic will develop an HMI tailored to your application and production strategy.

This will allow ease of use for operators and cut setup time with the ability to store part numbers in specific programs.



Remote Monitoring

Track production numbers such as hourly output, tool life, reject rate, etc. on screen with the ability to send this info to a larger interconnected data management system.

Feedback Control

With tool life monitoring, anomaly servo overload detection, overload sensors and process controller you will be able to automatically send program offsets to the monitored system. This will avoid making scrap when operating without human attention.

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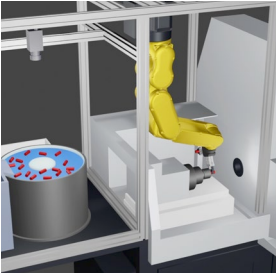
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Machine Tending

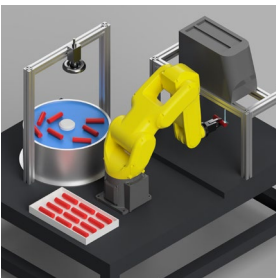
Robotic machine tending can significantly improve manufacturing productivity by reducing cycle times, increasing throughput, and improving product quality through consistent and accurate handling. Additionally, by automating the machine tending process, manufacturers can reduce the risk of workplace injuries and accidents, enhancing workplace

safety. Furthermore, robots can work continuously without rest, reducing downtime and increasing overall equipment effectiveness.



Deburring

Robotic Deburring cells use sensors to precisely control the robot's movements and apply the correct amount of force to remove burrs without damaging the part. The robot can be equipped with various EOATs such as sanding tools, grinding tools, or with brushes depending on the material and shape of the part.

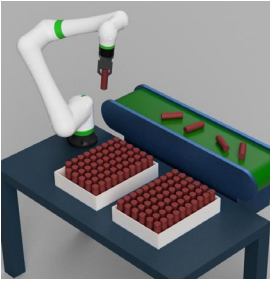


Laser Marking

When it comes to using a robot in laser marking, the process can be fully automated, increasing efficiency and accuracy. The robot can be programmed to pick up a product from a conveyor belt or other location, place it in the laser marking area, and perform the marking process before placing the product back on the conveyor belt or moving it to the next stage of the production line.

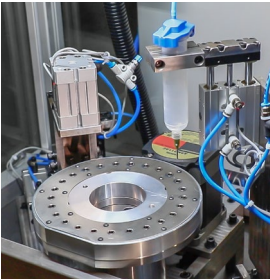
Examples of applications: assembly, packaging, material handling, welding, painting, etc.

Our solutions improve quality, throughput, and productivity for a range of applications.



Packaging

Robotic packaging involves the use of robots to automate various tasks in the packaging process, including picking, placing, and labeling products. Tracking data and barcode shipping libraries can be created and stored for product traceability.



Glue Dispensing

An automated gluing process is a manufacturing method that uses robots or other types of automated equipment to apply adhesives or glue to products or components. The process can involve a range of techniques, such as spray, bead, or dot application, and is used in various industries, including automotive, electronics, and packaging.



Inspection

The automated inspection involves capturing and analyzing data from the products or components to determine if they meet certain specifications or quality standards. Automated inspection can be used in various industries, including manufacturing, electronics, and pharmaceuticals, and offers benefits such as increased inspection accuracy, faster inspection times, and reduced labor costs.

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Centerless Grinder Automation

- ▶ Customer pain point: Existing solutions are 5~10 times more expensive.
- ▶ Our solution: Automated feed system utilizing simple pneumatics and servos allows for fast consistent load time with large load capacity. Optionally, utilizing a Fanuc control the wheel dressing routine can be performed with part numbers and unique contours stored in memory. Operators need only to load the fresh wheel and select the part number.



Automotive Part Loading

- ▶ Customer pain point: Manual loading of parts into a machine was not good enough for competitive automotive market.
- ▶ By utilizing a track/magazine loader we allowed the customer to load many parts that could be fed through the spindle for machining. After a parts catcher deposited the parts onto a conveyor which lead to a probing inspection station.



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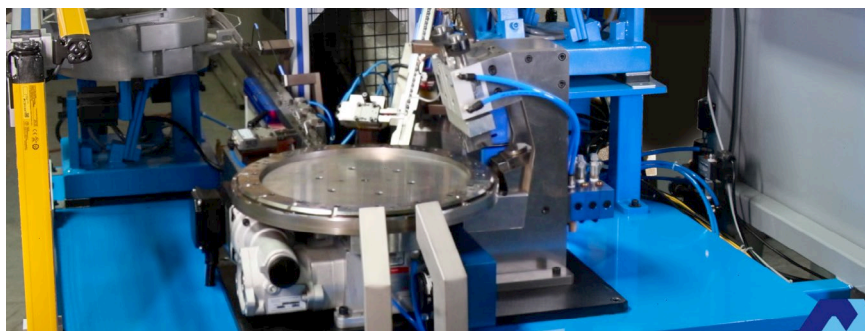
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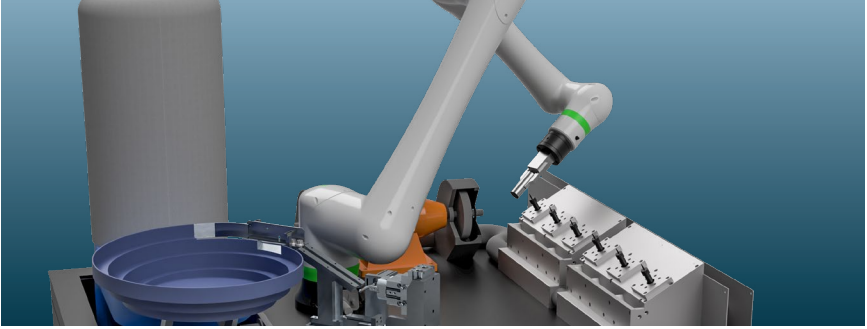
Connector Shell 2nd Op

- ▶ Customer pain point: Loading parts that have clocking feature was time consuming
- ▶ Our solution: We developed a system in which parts were loaded from one of 10 trays. Touch probe mounted on gang tool plate locate the part's clocking feature and adjust the program by macro.



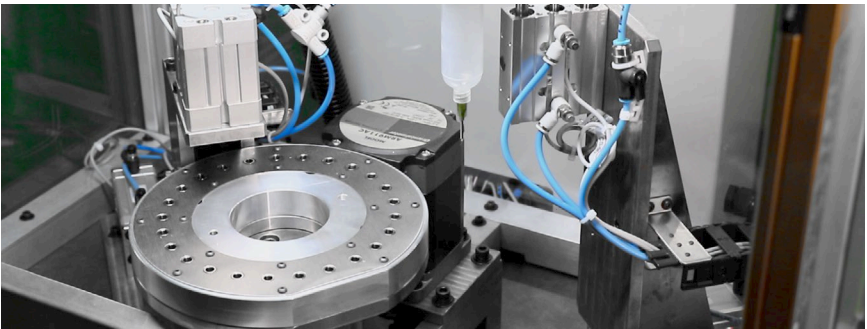
Nut Assembly Machine

- ▶ Customer pain point: Original Automation was done decades ago, needed a new approach.
- ▶ Our solution: Working with owner supplied hardware, Cubic developed the PLC control and HMI and modernized the system for ease of use and maintenance.



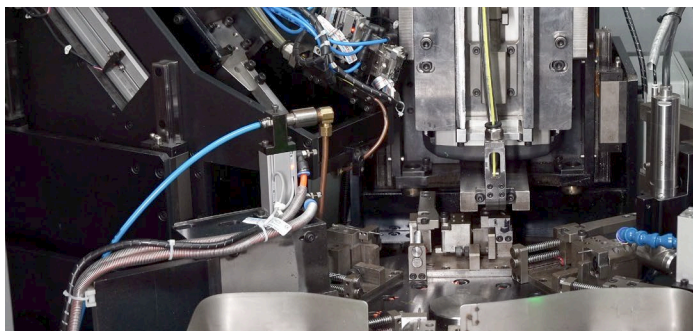
Automated Deburring Cell

- ▶ Customer pain point: Manual deburring after machining was time-consuming and tedious work with inconsistent results from operator to operator.
- ▶ Our solution: We implemented a robot deburring system to automatically remove Burrs and improve surface finish. This reduced labor costs and increased throughput and consistency the customer saw faster production times, lower costs and higher quality parts.



Glue Dispensing Machine

- ▶ Customer pain point: Lack of in-house engineer to design production equipment, especially ones requiring multiple disciplines.
- ▶ Our solution: We built a miniature transfer machine to automate the precise glue application process. This ensured consistent adhesion and reduced waste, resulting in higher product quality. The customer experienced lower costs, improved productivity, and more reliable products.



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Nylon Insertion Transfer Machine

- ▶ Customer pain point: Old system did not have required throughput and was prone to downtime.
- ▶ Our solution: We created a dial transfer machine to automate the nylon insertion process for a component manufacturer. The system can handle different processes on the same machine.



Robotic Sawing Machine

- ▶ Customer pain point: Home grown sawing system required too much operator attention and was not able to keep up with demand.
- ▶ Our solution: We created an integrated solution to handle the sawing process. Loading and unloading are now automated. A 4-station transfer machine was designed and built to match the throughput requirement. A vision guided robot was chosen to identify parts and load parts onto the fixture, freeing the operator to do other things in the shop.







**CUBIC
MACHINERY**

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