Assembly automation

Harnessing the manufacturing potential with semi or fully automated assembly solutions. Engineered for performance, flexibility, and reliability—from single unit to full-scale systems.

inea.eu

Precision, stability, and efficiency as our fundamental principles

Our assembly automation solutions are tailored to your product, volume, and process needs—whether for continuous flow or flexible configurations. Built on precision, stability, and efficiency, they feature strict in-line quality control, presence and orientation checks, and MES/SCADA integration for full process transparency.

Modular and scalable by design, our solutions form closed-loop systems that boost productivity, reduce scrap, and enable us to engineer resilient, fully automated solutions for any industry.

Trusted by

Rimac · Forvia · Continental · Renault · Honeywell

Faster cycles
Accelerate production cycle time with optimized workflows

Lower costs
Reduce labour and minimize material waste

Higher output
Scale production volume without compromising quality

In-line quality control
Detects defects in presence, placement, and orientation

Real-time insight
MES/SCADA integration for full process visibility

Flexibility for high adaptability

Our highly adaptable assembly process ensures operational flexibility, quickly adjusts to newly set delivery times or production output targets and helps mitigate financial consequences associated with production modifications. This capability also allows minor changes in product specifications without requiring new assembly lines, thus reducing material and energy consumption.

Quality assurance for full transparency

Quality assurance guarantees the assembly process to follow KPIs such as first-pass yield, mean time between failure, technical availability, and scrap rate. It includes preset quality milestones during delivery process, encompassing design validations and Machine Capability Analysis (MCA). All data is captured, validated, and sent to higher-level systems ensuring complete transparency of the process.

Standardization for expedite delivery

Through the continuous refinement of processes and operations, insights gathered across all stages, from design to production, are leveraged to standardize production line operations. This standardization reduces the need for spare parts, optimizes resource utilization, and expedites the delivery of individual production line operations without requiring additional tests and validations.

Real-time monitoring for smarter control

MES and SCADA integration enables continuous monitoring of production process, allowing real-time detection of deviations, automated quality checks, and fast corrective actions. Statistical process control and traceability support data-driven decisions, root cause analysis, and consistent product quality. All process data is logged, analysed, and reported to ensure compliance with performance targets and support continuous improvement.

Applications

From single production unit to full-scale system

Feeding mechanism

The feeding mechanism includes automatic and manual feeding systems with a diverse array of material packaging types, designed to meet client-specific requirements. Options include tray feeding (50×50 mm to over 1500×600 mm), foil feeding with stack lifters, vacuum pads, and air jet nozzles for foil-like products, as well as vibrating feeding for bulk materials with the option for camera integration for precise orientation.

Dispensing

The dispensing application addresses fluids or materials with various viscosity. It can be executed through volumetric dispensing, regulating the volume of dispensed material, or gravimetric dispensing, managing the weight of dispensed material. Operations are conducted utilizing either a static dispensing module or a module linked to a robotic or XYZ arm. Our capabilities encompass the entire process, from preparation and mixing to dispensing, testing, and cleaning.

Poka-Yoke

Poka-Yoke implementation involves both mechanical techniques, utilizing precise tolerances, unidirectional operation elements, and visual cues, and automated methods like vision system control, sensor checking, and DMC checking. It serves as a foundational logic within assembly processes, anticipating and mitigating errors to ensure seamless workflow. This application is considered highly significant in manufacturing operations.

Curing

The curing application involves the utilization of an industrial furnace to harden materials from various states to enhance their properties. This process is crucial across industries, including automotive, aerospace, and electronics, for achieving desired material characteristics such as strength, durability, and thermal stability.

Robot application

Specializing in robot integration, the service includes full simulations of load, reach, cycle times, and motion. Robots—from 3-axis to 6-axis, including collaborative types—deliver high-speed, precise pick & place handling of loads beyond human capacity. Self-correction mode allows autonomous return to desired operation stages, reducing the need for operator intervention.

Robotic screwdriving

Controlled screwdriving supports both torque and force control with seating point detection. These processes smoothly transition from step feeding to sword feeding and provide options for standard mechanical screw gripping or vacuum screw feeding and gripping, ensuring adaptability across various screw types. The system is configurable for full or semi-automation, facilitating seamless integration into specific assembly lines.

Pressfit

The pressfit module application, commonly employed in the electronic industry, facilitates the secure binding of components without the need for energy-demanding and expensive processes like connector soldering for electronics production. This technique is favoured for its ability to create robust connections in electronic assemblies, ensuring reliable performance and longevity.

Repress operation

The repress operation includes applications such as securing PCB connectors to refining the appearance of cosmetic display covers and retaining plates post-gluing. Common in manufacturing across electronics, automotive, and consumer goods, it uses servo drive systems, pneumatic cylinders controlled by proportional valves, and can be adapted to meet specific process requirements.

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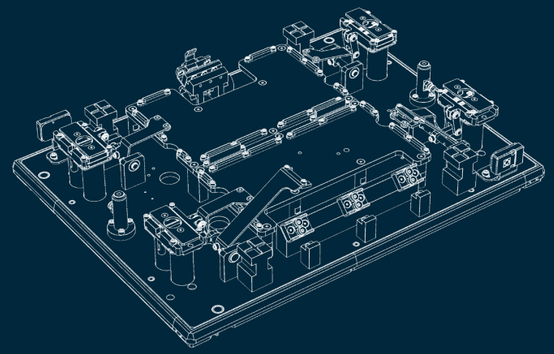
Automated display assembly lines

Fully automated display assembly, inspection and testing for simple or complex shapes. Designed for efficient resource use, easy maintenance and full traceability via MES and in-line quality control.



Optimal resource usage

Material waste, packaging, and energy costs are reduced through efficient line design and cleanroom emulation at the cell level. Automated loading via AGVs minimizes human access and enables fully interoperable, low-impact operation.

Continuous quality control

In-line inspection at every critical step ensures early defect detection and minimal scrap. Input and output are monitored with placement tolerances down to 5 µm. Fastening parameters—torque, rotation, and stroke—are continuously tracked for precise attachment.

Optical Bonding

Dry optical bonding of touch displays using advanced adhesive application for a bubble- and defect-free process. Soft-to-hard and hard-to-hard lamination with optically clear adhesive ensures uniform coating and optical clarity. Integrated UV curing and autoclaves provide solid, visually flawless bonds.

Backlight Assembly

Completely automated assembly line and process optimization with energy saving capabilities and automatic feeding mechanism for long line autonomy. Custom tooling ensures precise application and quick product changeover. Each station features in-house developed ISO 7 cleanroom emulation.

Final Assembly

Modularly designed automatic and semiautomatic lines feature AI vision systems for component positioning and tolerance measurement. Where vision is impractical, digital contact sensors measure thickness, flatness, and parallelism with high accuracy. Servo-controlled presses handle delicate press operations, guided by force sensors for even distribution.

I’d like to highlight the impressive support and response time from the INEA team throughout and after the project, so we had a smooth ramp-up and kept the standard high the whole time.

— New Product Launch Manager, Automotive Technologies

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