INDUSTRIAL AUTOMATION SOLUTIONS

FROM CONCEPT DESIGN, PLANNING AND EXECUTION, TO INSTALLATION AND ASSISTANCE

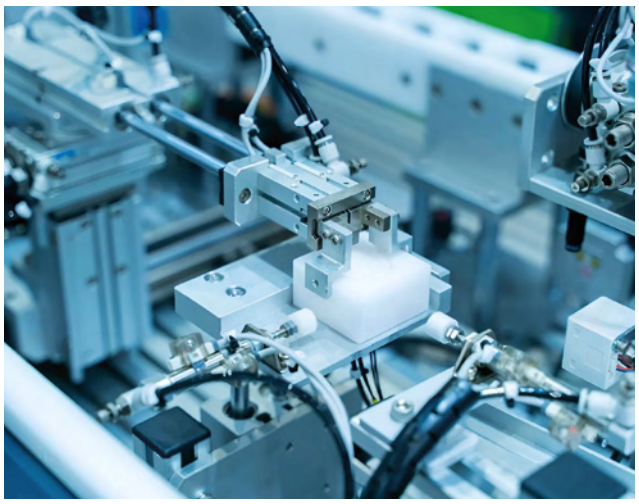
Controlar
innovating industry

Controlar
automation systems

Engineering Expertise Powering Your Production

Backed by a deep knowledge of industrial automation and a proven record in designing large scale product lines, Controlar's mission is to help manufacturers overcome **automation challenges with customised solutions.**

We collaborate **closely** with our customers to ensure every project is technically robust and **fully aligned** with your workflow, requirements and **production goals** — whether it's a simple application or a highly **automated** integration.



Where Advanced Technology Meets Industrial Know-How

Taking advantage of the various interdisciplinary competencies within our companies and workforce, we operate at all stages of **project development,** from **concept design** and planning to execution, installation and **technical support:**

- Development of **machines** and **production lines**.
- **Automation** and modernization of machines and processes.
- **HMI** (Human Machine Interface) and **PLC** (Programmable Logic Controller) programming.
- Integration and programming **Robots** for assembly, quality control and palletisation.
- **Vision** systems implementation for quality control.
- **Traceability** application development or based on customers' database management and **MES** (Manufacturing Execution System).
- Process monitoring solutions using **SCADA** systems (Supervisory Control and Data Acquisition).
- Software development for production control and efficiency monitoring – **OEE** (Overall Equipment Effectiveness).

Equipment Integration

ABB · SIEMENS · KUKA · STÄUBLI · FANUC · BECKHOFF · rexroth A Bosch Company

FESTO · Rockwell Automation · SMC · EPSON EXCEED YOUR VISION · UNIVERSAL ROBOTS Certified System Integrator · IAI Quality and Innovation · HARTING

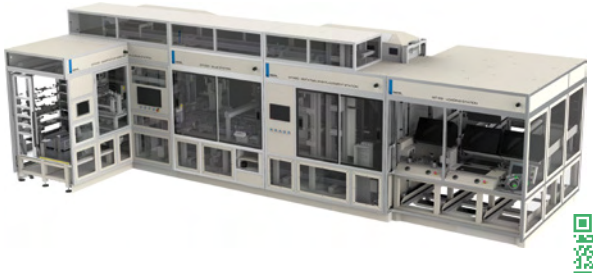
igus · OMRON MICROSCAN · Weidmüller The Interface Partner · PHOENIX CONTACT · cab · RITTAL

Communications

- PROFINET
- EtherCAT
- OPC-UA
- EtherNET/IP
- Modbus TCP/IP
- CANopen

Software

- Siemens TIA Portal
- Rockwell Automation FactoryTalk
- Bosch Nexeed Automation (certified)
- Beckhoff TwinCAT
- ABB RobotStudio
- Omron Sysmac Studio



Automated Assembly Line for Infotainment Displays

The Automated Assembly Line for CID (Central Information Display) and DD (Driver Display) units is designed to precisely bring together the display housing, frame, and display screen. It is divided into two distinct sections dedicated to a specific stage of the assembly process: one to gluing and the other focused on screwing. Each section comprises four dedicated stations, such as a loading station, a rotation and placement station, and an assembly & curing station.

Key Features

- Incorporating various automated setups with diverse functionalities.
- Equipped with robotic alignment technology that ensures displays are assembled consistently and accurately.
- Assembly process enhanced by a vision system to continuously measure deviations and provide offset values for precise robotic repositioning.
- Two conveyor systems, comprising linear tracks, lifts, indexing units, and customized components designed specifically for transferring carriers with parts.

Automatic Test Line for BMS (Battery Management Systems)

Our Automatic BMS Testing Line is meticulously designed to conduct a comprehensive battery of quality validation tests on Battery Management Systems (BMS). These critical tests encompass hipot testing, resistance assessments, functional evaluations, RF power level checks, OMF flashing, provisioning, network connectivity testing, conformal coating application, certification, and the application of end-item labeling.

Key Features

- Comprehensive testing: capable of conducting a wide range of tests.
- Early-stage validation indispensable for validating BMS performance in both the early stages of development and during manufacturing, ensuring reliability and functionality.
- Employing robotics and automation for precise handling of BMS units to minimize human error and increase testing efficiency.
- Ability to adapt to testing multiple BMS types, accommodating different product specifications.
- Certification to ensure the BMS meets relevant industry standards and regulation.

Automated Assembly Line for Electrical Vehicle (EV) Cell Management Control (CMC) of Batteries

This fully automated assembly line features a remarkable 13-second cycle time, ensuring swift and accurate processing of batteries at every stage. The line is strategically divided into two sections: **an automated assembly line and an automated test line.**

Automated Assembly Line

The first section, designed for product assembly, features a wide range of capabilities distributed across15 stations. These include automatic loading, plasma treatment, gluing and UV curing, PCB assembly, screwdriving, laser soldering, 3D inspection, among other assembly operations.

Key Features

- Robotic precision and speed, delivering flawlessly tested units in just 13 seconds.
- Modular design ensuring adaptability and simplifying configuration changes to accommodate different products or versions, reducing downtime.
- Cutting-edge software, enabling seamless connectivity and integration with various systems and configurations.
- Easily performed adjustments and calibrations, enhancing operational flexibility.
- Stringent quality control to ensure every CMC unit leaving the production line meets the highest industry benchmarks.

Automated Test Line

The test section comprises a high voltage (HIPOT) test station, a curing station, a leak test station, an End-of-Line (EoL) test station and an automatic labeling and inspection system boosting efficiency and productivity, while guaranteeing quality control.

Key Features

- Comprehensive assessments ensuring battery functionality and compliance before leaving the assembly line.
- Modular stations, enabling swift line adaptability for testing similar products by changing the nests.
- Rotating gripper at the HIPOT station to handle two parts simultaneously, reducing cycle times and enhancing productivity.
- Leak and EoL stations housing six lightweight and easily removable modules, simplifying maintenance tasks.
- Automatic labeling and inspection granting accurate identification and tracking of batteries throughout their lifecycle.

Automated Assembly System for Medical Plastic Connectors

Designed to optimize and fully automate the assembly process of IV Spikes, this machine features a 12 position rotary indexing table, enabling the simultaneous assembly of two units per cycle.
Each station performs a specific step of the process, from automated component feeding and precise placement, to controlled tightening, real-time inspection through an artificial vision system, and automatic rejection of faulty parts.

Key Features

- Full flexibility to handle different product versions simultaneously.
- Automated feeding and pick & place systems to ensure fast, accurate, and repeatable component placement.
- Integrated quality control, with artificial vision technology ensuring process validation in real time.
- Torque and axial force monitoring during cap tightening.
- High productivity, delivering up to 3,600 pieces per hour, with autonomous operation for approximately 2 hours.

Semi-Automatic Assembly Line

This Automatic Assembly Line was developed to perform semi-automatic assembly and inspection of electronic and plastic components, with the minimum of human intervention.
Hand labor is only required for the supply of the devices to be tested on the different setups. In this particular case it was possible to automate an assembly process with high repeatability and inspection in order to maximize production and error detection, reducing variability, bottlenecks and providing a consistent quality output.

Key Features

- Precision and reliability (each component is assembled with the same specifications and process every time).
- Quick and safe storage, sorting, orientation, positioning and insertion without damaging the product.
- Ability to handle multiple tasks and to perform highly detailed assembly tasks.
- Consistent quality and yield output.
- Traceability Control on each DUT (Device Under Test) during each stage of the production.

Automatic PCBA Test and Calibration System

Advanced automated solution designed for the verification and calibration of electronic products, integrating ICT testing, In-System Programming and functional testing with a cycle time of less than 10 seconds per PCBA.
Its design facilitates the automated processing of up to 11 product references with the potential for future expansion, while ensuring high calibration accuracy.

Key Features

- Fast cycle time of less than 10 seconds per PCBA.
- High versatility, processing up to 11 product references with efficient tray management.
- Advanced automation, with over 72 minutes of autonomous operation without intervention.
- Integrated testing and calibration.
- Maximum precision, with an error margin below 2% in intensity and under 0.001 in color chromaticity.

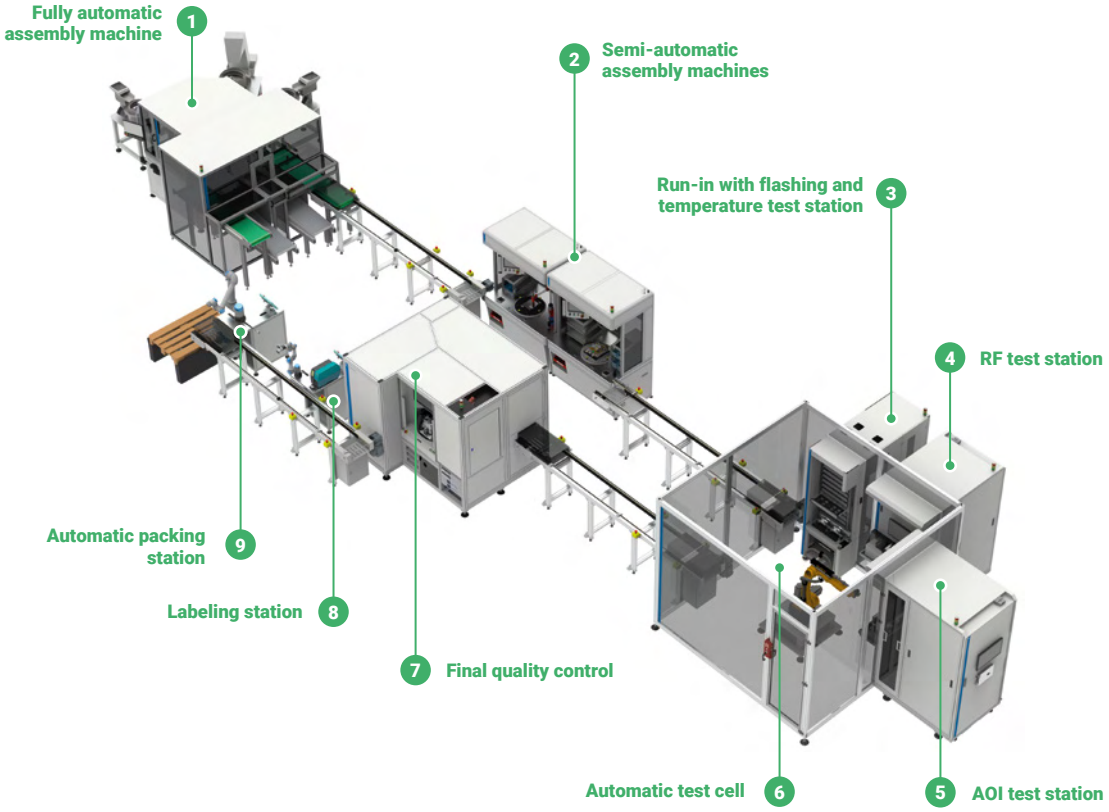
OLED Module Assembly Station

With its advanced technology, this machine represents a comprehensive solution for fast and precise assembly of OLED modules. Its operating cycle begins with the loading, calibration and automated preparation of components, and ends with final inspection. The machine integrates a vision and weighing system to ensure that elements are placed accurately, from loading the brackets to adhering the OLED module.

Key Features

- Automated robots for loading, adhering, and verification tasks.
- Vision technology to verify the correct placement of components and conduct final inspections, ensuring assembly quality.
- Surface treatment to brackets, improving adhesive bonding and long-term durability of the assembly.
- Adaptable to various model variants, aligned with each module's manufacturing needs.

Integrated Automatic
Assembly, Test, and Quality Control Line



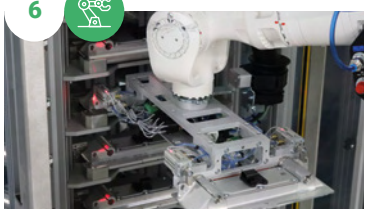
Fully automatic assembly machine with bowl feeders, robots and vision systems for lower cycle time operations.

Semi-automatic stations for assembly, screwing and greasing of electronic components.

Automatic station for flashing and run-in tests with controlled temperature.

Station for RF tests with interchangeable fixtures for quick product changeover.

Vision test station for black MURA, white point calibration, flicker, and luminance tests.



Robot cell for test parts manipulation all over the test stations.

Quality tests for product validation at the End-of-Line (EoL).

Automatic print and placement of barcode labels on products or pallets.

Automatic packing station with collaborative robotic arm.

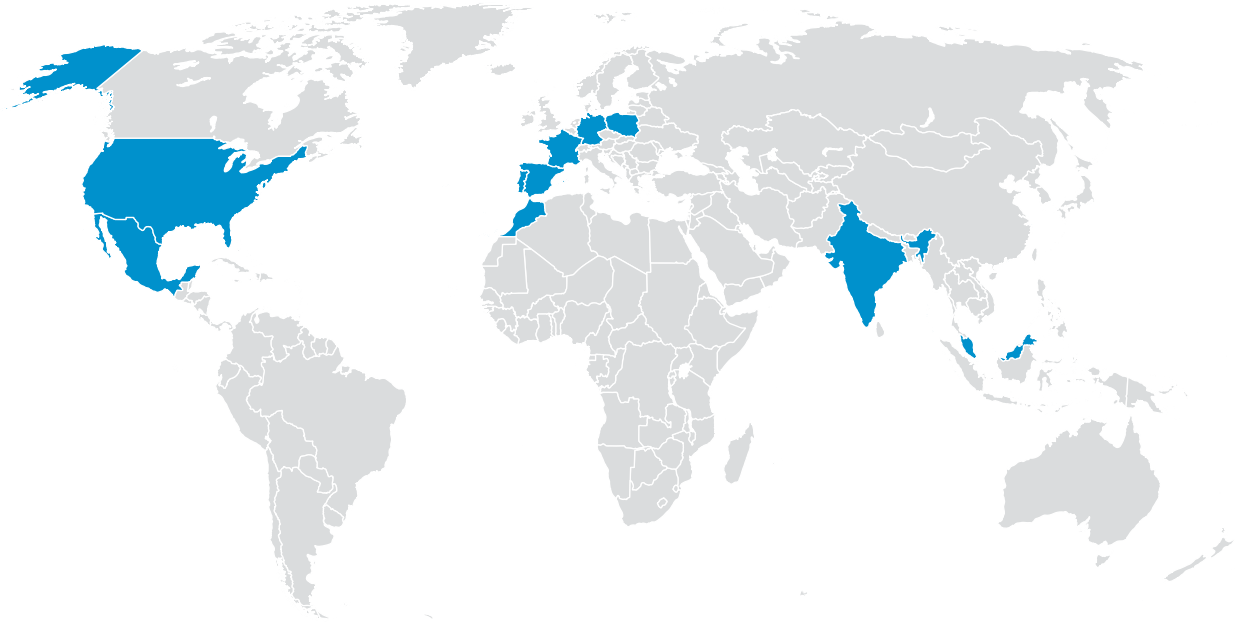
Innovation, Quality and **Passion for Engineering.**

About Controlar S.A.

Controlar is a global provider of advanced industrial automation and test systems supporting electronics manufacturing across multiple industries.

The company provides a wide range of services, including the design, development, and integration of automated test systems, data acquisition and analysis, production line automation, and quality control.

With 400 employees globally, Controlar operates a global network of production units, companies, and offices in Portugal, Spain, France, Germany, Poland, Morocco, Mexico, the USA, India, and Malaysia.



PORTUGAL | SPAIN | GERMANY | FRANCE | POLAND | MEXICO | UNITED STATES | MALAYSIA | INDIA | MOROCCO

+351 225 898 410
info@pt.controlar.com
Rua do Caulino, 314
4445-259 Alfena
Portugal

+34 918 904 614
info@es.controlar.com
Camino Robledo de Chavela,
9-B28210 Valdemorillo - Madrid
Spain

Controlar test systems

Controlar automation systems

Controlar solutions & partners

Controlar aerospace & defense

Start Your Project.

www.controlar.com

Management System ISO 9001:2015 ISO 14001:2015 ISO 56001:2024 — TÜVRheinland CERTIFIED — www.tuv.com ID 9105055164

EMPRESA CERTIFICADA eiC ISO/IEC 27001 Segurança da Informação

kiwa CERTIFICADO ISO 27001 2020-5/25

AENOR AEROSPACE QUALITY EN 9100 OP-0006/2014

AENOR GESTIÓN DE LA CALIDAD ISO 9001 ER-0947/1997 — IQNET RECOGNIZED CERTIFICATION

Management System ISO 9001:2015 — TÜVRheinland CERTIFIED — www.tuv.com ID 9105055164