TOOLING AND FIXTURING

FOR ALL TYPES OF APPLICATIONS

Controlar
innovating industry

Custom Fixture Solutions Designed For Your Needs - And Your Budget.

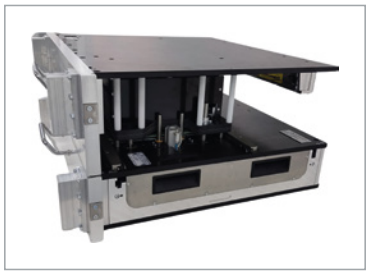
Controlar develops and provides tooling and test fixtures for a wide range of systems and applications: In-Circuit Testing (ICT), Functional Testing (FCT), In-System Programming (ISP - Flash), End-of-Line (EoL) testing, and more.

- We support both in-line and off-line systems with mechanical, pneumatic, or vacuum operation. Our portfolio covers the full spectrum of handling systems used in today's market.
- From simple mechanical fixtures with a few hundred probes for low-volume applications to advanced systems with thousands of probes, double-sided probing, dual actuation and other advanced capabilities, we have the expertise and resources to deliver the right solution for your specific needs.

Fixtures for Controlar Systems

Fixtures and tooling designed and built specifically for Controlar's own systems and machines, ensuring full integration, performance, and reliability across all test and automation solutions.

Flash and FCT fixture for XILS handlers (pneumatic, inline)



RF fixture for RFILS-1000 handler

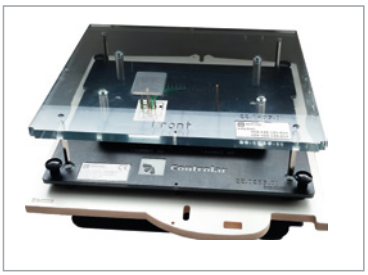
ICT and LED testing fixture for XILS handlers

Fixtures for Third-Party Systems

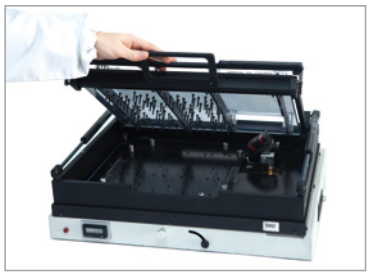
Custom tooling and fixtures developed for third-party equipment and brands, tailored to meet specific requirements and seamlessly integrate into existing production or testing setups.

ICT fixture for TRI handler (pneumatic, offline)

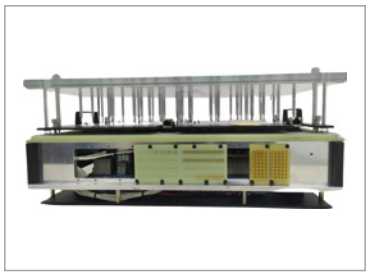
ICT fixture for Teradyne TSH52 handler (vacuum, inline)



Fixture for SPEA 3030 ICT (vacuum, offline)



ICT Fixture for Aeroflex handler (vacuum, offline)



Interchangeable Kit Ingun FCT fixture

Manual Test Jigs

Fixtures Engineered for Your Product

Every product is unique, and so is every bed-of-nails fixture.

- With decades of experience, we've streamlined the process of developing, customizing, and manufacturing fixtures, ensuring short lead times without compromising quality.
- Our team of fixture specialists works closely with you to understand your requirements and propose the optimal solution, combining our tried and tested methods with technical innovation.

Examples of project adaptation to meet customer requirements:

Lateral actuation with pneumatic cylinders or stepper motors.
Detection of mechanical interlocking.
Connector pin contacting (different levels of probe actuation).
Testjet/Opencheck/FrameScan sensors or other solutions.
Custom-designed parts for product/component connection: Signal conditioning with instrumentation amplifiers, frequency dividers, etc. Generation of stimuli and noise filtering. Development of specific PCBs for watchdog, interfacing, switching, etc. Discharge and protection circuits. Specific loads.

Turn-key Projects

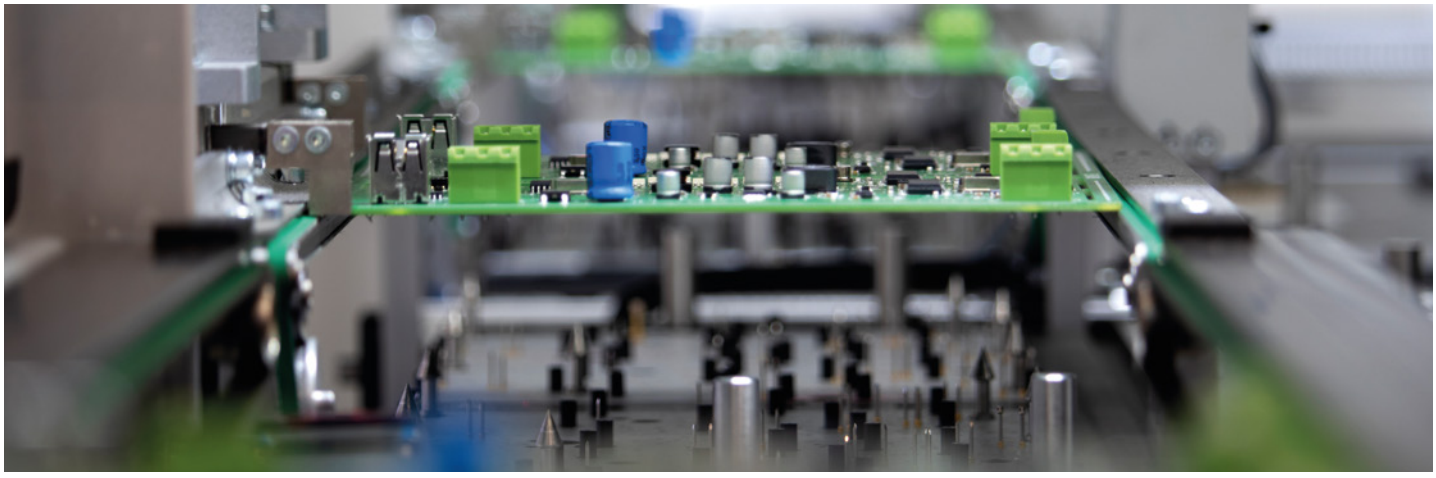
Whether you require fixtures, or the complete turn-key project (fixture + application), Controlar delivers both. We design, integrate and support aplications from development to production ramp-up, including:

- ICT applications in several platforms, including MDA, Testjet, Digital/Hybrid tests, Boundary Scan, Functional and LED tests.
- Customized circuits for signal conditioning, noise filtering, discharge, watchdog, loads, etc.
- Additional test equipment such as LED analysers, flash programmers, communication devices, etc.
- Production tuning and ramp-up support at customer facilities.

With the integration of different technologies:

Checksum
Digital Test
TRI
Aeroflex
Goëpel
Teradyne
Keysight

Testing ICT fixtures



Integration of Different Technologies

Boundary Scan (Digital/Hybrid Tests)

Controlar holds extensive expertise in Boundary Scan testing and proudly serves as an official partner of Goepel (www.goepel.com).

Over the years, we have delivered countless turn-key test systems that integrate Checksum and Goepel platforms, providing reliable, high-coverage solutions for complex digital and hybrid testing needs.

LED Testing

While ICT systems can perform electrical tests on LEDs - such as diode testing - certain applications require optical analysis, which falls beyond the scope of ICT systems.

To provide this capability, Controlar partnered with FEASA (www.feasa.com) integrating their equipment into our ICT systems, enabling comprehensive LED and display analysis.

In-System Programming (ISP)

Controlar provides In-System Programming (ISP) for In-Circuit and In-System devices, eliminating the limitations of traditional on-socket or preprogrammed methods. This approach streamlines board and system-level design and manufacturing, offering greater efficiency, flexibility, and scalability in programming processes.

Programming of flash memories integrated in ICT Test, Functional Test or Boundary Scan.

Dedicated Flash Stations

- Inline or offline
- Gang programming

Dedicated Programmers vs. Universal Programmers

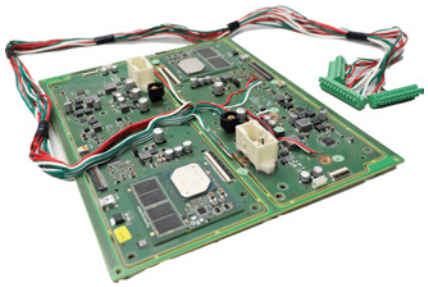
Controlar is an official partner of SMH – FlashRunner (www.smh-tech.com), integrating their universal programmers into numerous projects.

Advanced Technologies for Precision Manufacturing and Stress Control

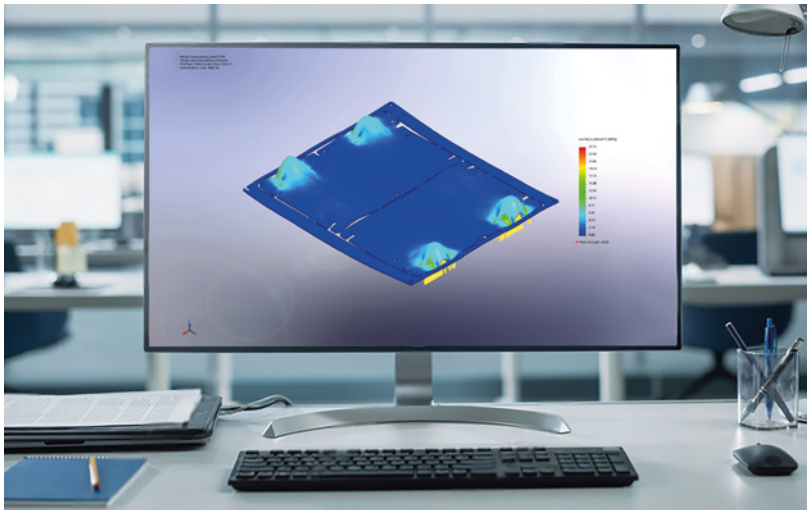
We continually seek out innovative technologies and the most advanced resources to deliver the best combination of pricing, top-notch quality, and technical capabilities.

The potential mechanical stress resulting from PCB deflection during the fixture closing operation can have significant implications. To mitigate this issue, Controlar employs a comprehensive set of tools for conducting stress analysis.

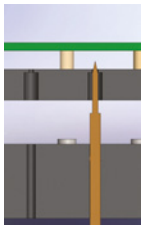
Strain gauge tests with extensometer sensors and dedicated equipment from HBM
Whenever requested by the customer, fixtures are validated using HBM measurement equipment in conjunction with a "Golden Sample" product. Regularly conducting this test is considered a best practice for re-validating the fixture's performance.



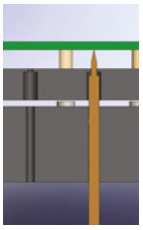
Finite Element Analysis (FEA) for Software Simulation
Before fixture construction, Finite Element Analysis (FEA) simulates mechanical behavior and identifies critical stress areas. Probe and pusher positions are then adjusted as needed until the simulation confirms all requirements are met.



Testing with packed PCBA's layouts



Probe not actuated



Probe actuated

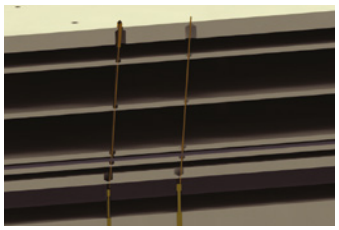
Precision Mobile Plate

Sometimes, there is simply no space!

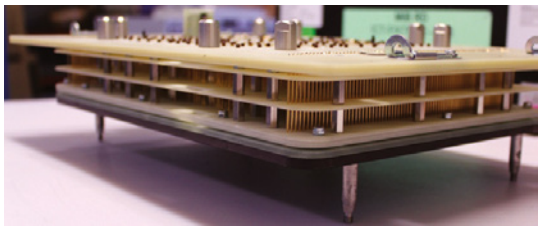
The test pad diameters or the spacing between their centers can become minimal in "standard" fixture manufacturing. We specialize in applying advanced technologies to address every unique layout challenge.

Precision Mobile Plates (Floating plate guiding)
Zoom technology
Fine pitch probing

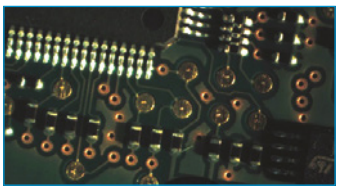
Detail of a fixture project using zoom technology



Precision Mobile Plate



Fixture Validation – Probe Impact Analysis

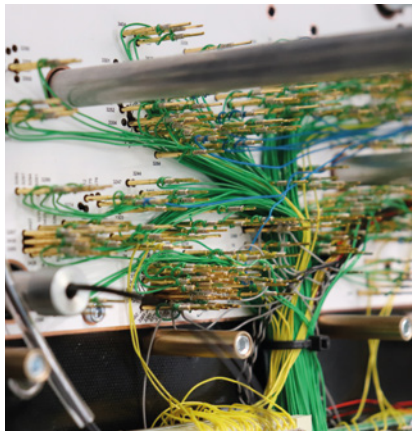


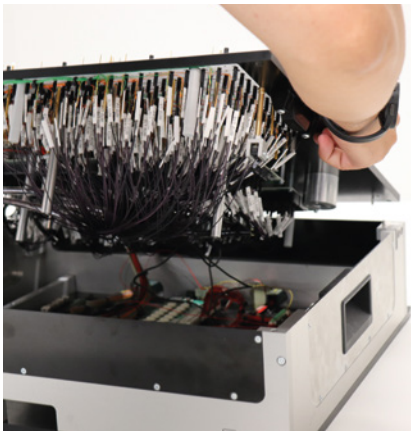
Microscope PCB photo detail after probe actuation)

In our standard fixture production validation process, we employ microscopes to conduct Probe Impact Analysis on the PCB.

In the process between assembly and wiring, a preliminary study verifies probe plate drilling.

Once the fixture is fully prepared, a final verification is performed, and the results recorded and included in the fixture documentation.





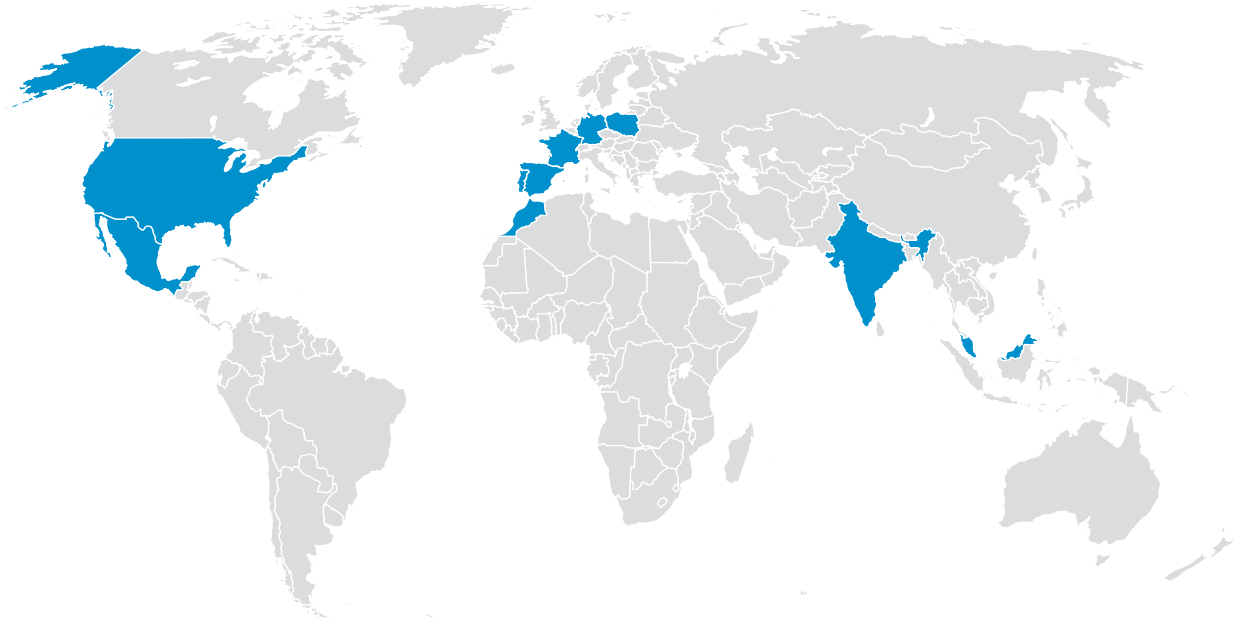
Innovation, Quality and **Passion for Engineering.**

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.



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