



# TEST SYSTEMS SOLUTIONS

FLEXIBLE AND  
MODULAR FUNCTIONAL  
TEST SOLUTIONS



## Ensuring product integrity at different stages of your production line.

**Industrial test systems** enable product validation during different stages of the production process from the beginning to the end of the production line.

Controlar has been developing **test systems solutions** for a wide range of automotive infotainment products, such as car radios, instrumentation clusters, displays, GNSS systems and other types of ECUs, for more than 25 years.

Our Test Systems Business Unit is comprised of experienced and highly qualified technicians and engineers that bring together several skills and expertise for the development and conception of:

### PCB Testing (in-line and off-line)

- ▶ In-Circuit Test (ICT)
- ▶ Boundary Scan
- ▶ ISP/Flash and Functional Test (FCT)
- ▶ Fixtures (bed-of-nails, consoles, etc.)
- ▶ Customized PCB Solutions

### EoL (End-of-Line) Testing

- ▶ Flash
- ▶ Vision Calibration & Validation
- ▶ Functional Test (FCT)
- ▶ Troubleshooting

### Quality Control

- ▶ Highly Accelerated Life Test (HALT)
- ▶ Vibration test
- ▶ Exercisers' testing

### Benefits

- Production traceability and reliability
- Validation of product industrialization
- Higher efficiency of production process
- Product compliance guarantee
- Prevention of production failures

### Highlights

- Flexible and easy-to-use mechanical systems with modular and scalable design
- Quick ChangeOver method, for flexible and dynamic production, reducing operating times, improving flow and machine availability
- Customized PCB design
- Suitable for production lines or laboratory

### Equipment integration

- NI
- Rohde & Schwarz
- Keysight Technologies
- Pickering
- Ingun
- VPC
- ODU
- Konica Minolta
- Datalogic
- Drew Technologies
- GÖPEL electronic
- SMH Technologies
- Microscan

### Communications

- CAN bus
- LIN® bus
- Boundary Scan
- Automotive Ethernet
- FlexRay®
- LVDS, APIX
- A2B®
- MOST®
- Wi-Fi
- Bluetooth
- CANFD
- SDARS
- DAB
- USB3.0...

### Software

- NI Labview™ (CLAD and CLD certified)
- NI TestStand™
- C, C++, C#, Python
- JAVA
- MS SQL, MySQL
- GitLab



Product Description

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Key Features

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Reference Tech Specs

### TSIM - Test System Intelligent Machine

Performs different levels of functional tests on electronic devices and components at the end of the production line (EoL) to ensure correct functionality of the DUTs.

- Highly flexible and modular (from PCB level to complete assembled device on the same base machine)
- User-centered eco-design to meet high ergonomic standards
- Remote assistance using augmented reality goggles or tablet
- Auto diagnosis and validation of the system to ensure proper functionality and test repeatability

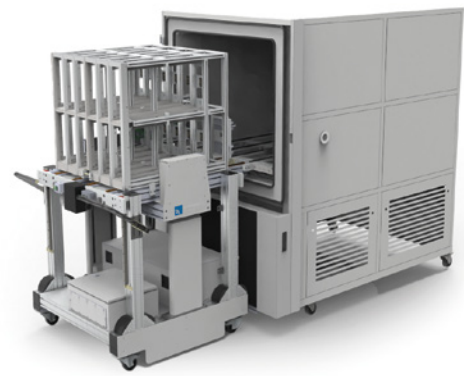
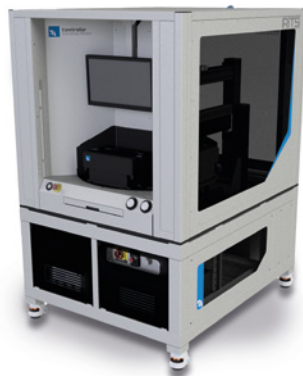
**Dimensions (in mm):** 800(w) x 1115(l) x 2160(h)  
**Communication:** Host-link/ LXI /Proprietary protocol  
**Measurements:** DC/AC voltage, current consumption, frequency, power factor, power level, resistance, capacity, temperature, audio and RF characteristics (S/N ratio, THD, SINAD, etc.).

### TSIM with Shielded Box for Wireless Tests

Functional test system for wireless in-vehicle systems (IVS) and infotainment devices with integrated antennas (e.g.: GNSS, Bluetooth, Wi-Fi) tested in a shielded /anechoic environment.

- Highly flexible and modular (from PCB level to complete assembled device on the same base machine)
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- Remote assistance using augmented reality goggles or tablet
- Auto diagnosis and validation of the system to ensure proper functionality and test repeatability

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Product Description

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Key Features

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Reference Tech Specs

### RiTS - Rotational Simultaneous Test System

This semi-automatic End-of-Line test machine features a dynamic rotative plate with 4 positions, offering extensive versatility for a wide range of tests. It ensures thorough testing of critical automotive components optimizing production time, improving workflow, and maximizing machine availability.

- Multifunctionality and extensive versatility for a wide range of tests
- Rotating plate enabling simultaneous testing in up to 4 positions
- Ability to perform power, communication and electrical tests simultaneously in all positions
- Uninterrupted connectivity even during rotation

**Dimensions (in mm):** 1285(w) x 1550(l) x 2030 (h)  
**Communication:** Broad-Reach™/CAN-FD/CAN-XL/FlexRay® /LIN® bus  
**Measurements:** Luminance, visual, sound, haptics, cosmetic inspections, DC/AC voltage, current consumption, frequency, power factor, power level, resistance, capacity, temperature, audio and RF characteristics (S/N ratio, THD & SINAD, etc.).

### AST - Accelerated Stress Test System

Allows the functional testing of a wide range of products through environmental stimuli (temperature and humidity) in the production line (EoL). Prepared to test a high number of units inside a climatic chamber to ensure product reliability and, ultimately to accelerate its reliability growth.

- Suitable for Highly Accelerated Life Tests (HALT)
- Highly modular grating cost efficiency, space saving and friendly maintenance
- Simultaneous "test to pass"/ screening of a high number of units
- Ergonomic design following customers' requirements

**Dimensions (in mm):** Rack: 800(w) x 800(l) x 1200(h)  
**Climatic chamber (Weiss Technik – ClimeEvent C/340/70/3):** 1100(W)x2100(L)x1960(H)  
**Measurements:** DC/AC voltage, current consumption, audio, video, FM/AM, BT/Wi-Fi, GSM/LTE, GNSS, etc.



### TS-DMS Test Solution for Driver Monitoring Systems

Platform for testing vehicle ADAS - Advanced Driver-Assistance Systems – Driver Monitoring Systems, working on the Near Infrared (NIR) wavelength.

- Suitable for testing Camera-based Active Driver Monitoring Systems as well as other camera setups
- Capable of calibrating and testing intrinsic & extrinsic camera parameters, field of view and Modulation Transfer Function (MTF)
- Head and eye-gaze tracker test with realistic human head setup

**Dimensions (in mm):** 1100(w) x 1800(l) x 2300(h)  
**Calibration/Testing of cameras intrinsic and extrinsic parameters:** FoV, MTF, Straylight.



### PARTS - Automotive Radar Test System

High-resolution test solution for testing automotive radars in the production line (EoL). It ensures automated pass/fail validation for quality control and safety compliance.

- OTA (Over-the-Air) testing performed in a shielded/anechoic environment
- Simultaneous characterization of the radar antenna's radiation diagram
- Robust connectors and modular fixturing for dozens of thousands of mating cycles

**Dimensions (in mm):** 1030(w) x 1750(l) x 2160(h)  
**Frequency bands:** 24; 76-77; 77-81 GHz  
**Multiple target simulation with control of specific parameters:** RCS, distance, velocity, etc.

Product Description

Key Features

Reference Tech Specs



### AOI - Test System for Automated Optical Inspection

Performs functional test and vision test validation on displays and automotive clusters to ensure quality control at the end of the production line or between assembly stations. By using the Mura test concept, the test flow is improved, and the production loss and output variability are reduced.

- Functional testing and optical inspection of automotive components for quality control
- Featuring modularity and flexibility
- Comprehensive scanning of the total device test area
- Improved efficiency of manufacturing cycles reducing operating times

**Dimensions (in mm):** 900(w) x 1300(l) 2200(h)  
**Communication:** Host-link/Gigabit Ethernet  
**Measurements:** DC/AC voltage, current consumption and illuminance.

Product Description

Key Features

Reference Tech Specs



### Test/Download Stations

Manual or automatic load/upload of DUT solutions to measure voltage, current consumption, DUT status check, etc., using PPS, DMM, CAN device, etc. Available in different versions: Compact, Multi-DUTs, Automatic or semi-automatic Load and with Multi and Combined Functionality (Run-in, Burn-in, download station).

- Easily scalable, cost efficient and highly modular solutions granting space saving and easy maintenance
- Custom made solution – stations can be designed to optimize customer desired number of DUTs per stations
- Reflash station (Download)

**Dimensions (in mm):** according to model and customer requirements  
**Communication:** CAN/Ethernet/BroadR-Reach/UART  
**Measurements:** DC/AC voltage, current consumption, resistance and temperature.

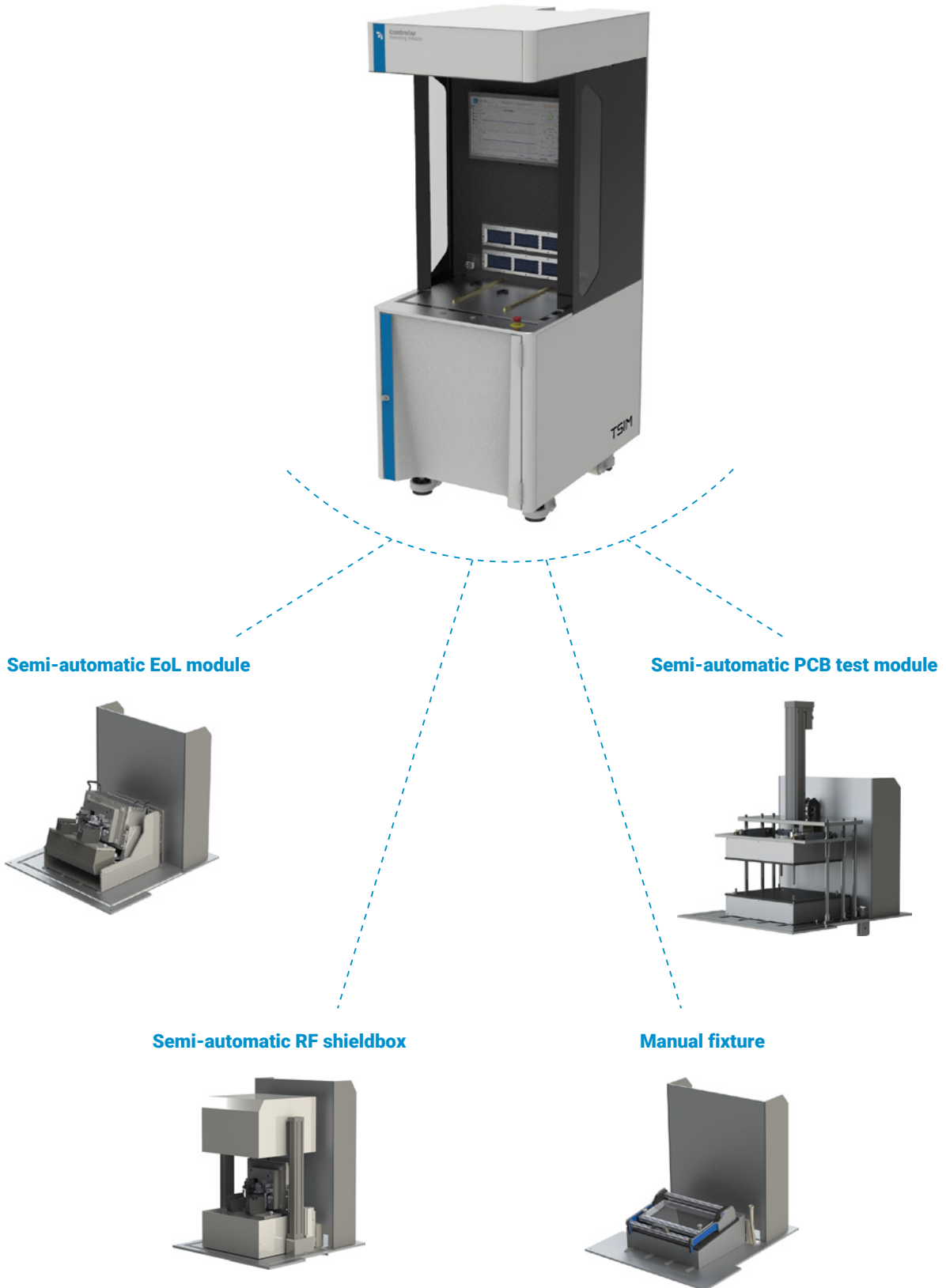
Product Description

Key Features

Reference Tech Specs

# Flexible Functional Test System Concept

Our Flexible Functional Test System concept allows different levels of functional tests on a wide range of infotainment technology devices from a simple PCB level to complete assembled devices. Using the same base machine, Controlar specific product fixtures can be easily and quickly replaced to create different test systems, improving standardization, maintenance and a fast return of investment.



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



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