

# TEST SYSTEMS SOLUTIONS

FLEXIBLE AND  
MODULAR FUNCTIONAL  
TEST SOLUTIONS



**Controlar**  
innovating industry



## Transversal solutions by Controlar



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innovating industry

## 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 20 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:

- Integrated Circuit test systems (ICT)
- In-System Programming (ISP)
- Software Download Stations
- Functional Test Systems (FCT)
- Highly Accelerated Life Test Systems (HALT): stress tests in climatic chambers, burn-in and run-in.
- Custom Systems for MURA testing, Noise, Vibration and Hardness (NVH) tests, among others.
- Systems integration in the different production stages.

### 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

- Datalogic
- Drew Technologies
- GÖPEL electronic
- Ingun
- Keysight Technologies
- SMH Technologies
- National Instruments
- Omron/ Microscan
- Rittal
- Rohde & Schwarz
- Schroff
- Feasa

### Communications

- CAN bus
- LIN® bus
- Boundary Scan (by JTAG Technologies)
- BroadR-Reach™ (by Broadcom)
- FlexRay® bus (by FlexRay Consortium)
- A2B® (by Analog Devices)
- MOST® bus (by Microchip Technology)
- Ethernet
- Wi-Fi
- Bluetooth

### Software

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



### 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):** 810(w) x 1150(l) x 2100(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.

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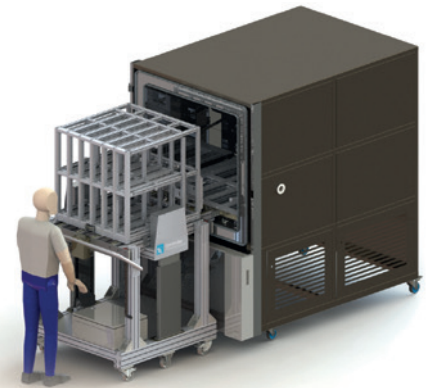


### Vibration Test System

Highly stable test system with vibration to determine the extent to which the DUT can withstand mechanical vibrations and fatigue damage that could be encountered in handling and transportation, among others.

- Minimization of applied forces and camouflaged noise due to silent-block mounted platforms
- Highly stable and safe thanks to anti-vibration supports
- Simulation of the product actual working and transportation condition
- Improved design granting excellent level of comfort for the operator

**Dimensions (in mm):** 963(w) x 925(l) x 1639(h)  
**Communication:** CAN/LIN/UART/Broad-Reach  
**Measurements:** DC/AC voltage, current consumption and adapted to other functional tests that require vibration loads.



### AST - Accelerated Stress Test System

Allows the functional testing of a wide range of products though 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 granting 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):** 976(w) x 1750(l) x 2030(h)  
**Frequency bands:** 24; 76-77; 77-81 GHz  
**Multiple target simulation with control of specific parameters:** RCS, distance, velocity, etc.



### 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.



### 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.

# 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 device. 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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