

APPLIANCES • TEST & AUTOMATION

SMART TEST & AUTOMATION FOR APPLIANCE MANUFACTURING

Smart test and automation solutions for appliances — ensuring quality and reliability.

TMCS designs and builds custom test systems for appliance manufacturers — from controller and motor testing to end-of-line functional and electrical safety stations — integrating NI platforms, PLCs and custom electronics into one connected, traceable test environment.



9+

Fortune 500 companies served

500

Projects executed

8+

Global coverage

80+

Team members

01 THE APPLIANCE TESTING CHALLENGE

Rising variant count

More models and SKUs on shared lines demand fast, recipe-driven changeover.

Safety-critical checks

Every unit must pass electrical safety tests before it leaves the line.

Manual inspection

Operator-dependent checks vary between shifts and are hard to audit.

Traceability

Warranty analysis needs serial-level test data linked to each unit.

02 TEST & AUTOMATION SOLUTIONS

01

End-of-Line (EOL) Test Stations

Automated functional run-tests and pass/fail grading at the end of the assembly line.

02

Electrical Safety Testing

High-voltage, insulation resistance, ground bond and leakage-current test integration.

03

Controller & PCB Testing

Functional and fault-diagnostic testing of appliance control boards and display PCBs.

04

Motor & Drive Testing

Electrical, thermal and load testing of motors, BLDC drives and compressor drives.

05

Data Acquisition & Endurance

Multi-channel DAQ for temperature, power, noise and vibration, and life-cycle tests.

06

Traceability & Line Monitoring

Barcode/QR traceability, SCADA dashboards and test-data logging to a central database.

03 APPLIANCE CATEGORIES & TEST SCOPE



Washing Machines & Dryers

- ✓ Drum & motor run-test
- ✓ Door-lock & valve checks
- ✓ Noise & vibration



Refrigerators & Freezers

- ✓ Compressor & fan checks
- ✓ Temperature pull-down DAQ
- ✓ Electrical safety



Air Conditioners

- ✓ Indoor/outdoor PCB tests
- ✓ Motor & drive checks
- ✓ Power-consumption logging



Water Heaters

- ✓ Heating-element checks
- ✓ Thermostat & cut-off tests
- ✓ Leakage current & IR



Kitchen Appliances

- ✓ Functional run-test
- ✓ Heating & power checks
- ✓ Electrical safety



Fans & Small Appliances

- ✓ BLDC drive testing
- ✓ Speed & power checks
- ✓ High-volume EOL

04 PROVEN TMCS TEST BUILDING BLOCKS



Relevant to: fan, pump and compressor drives

BLDC Motor Drive Test System

- ✓ 12 DUTs tested simultaneously
- ✓ Temperature rise, kWh, line & load regulation
- ✓ Automated report generation



Relevant to: noise & vibration grading

Power Window Regulator Test System

- ✓ Current, displacement & sound monitoring
- ✓ Motor noise analysis in acoustic chamber
- ✓ Variant-based tolerance limits



Relevant to: appliance assembly lines

Line Traceability & Assembly Monitoring

- ✓ QR-based traceability across variants
- ✓ LabVIEW SCADA with OPC-UA PLC link
- ✓ BOM-based part validation



Relevant to: control-board testing

PCB Test & Validation (VayuMATE)

- ✓ Electrical, functional & parametric checks
- ✓ Modular PXI architecture
- ✓ High fault coverage, rapid isolation

Systems shown were delivered by TMCS for automotive and aerospace programmes; the same platforms and engineering are applied to appliance test requirements.

05 OUR APPROACH

1

Understand Requirements

Technical discovery of product variants, test specifications and line takt.

2

Design & Architecture

Test strategy, hardware selection, fixtures and safety design.

3

Development & Integration

Software, panels and fixtures built and integrated in-house.

4

Deployment & Support

Installation, commissioning, training and long-term support.

06 TECHNOLOGY PLATFORM & WHY TMCS

PLATFORM & SOFTWARE

NI PXI NI CompactDAQ NI CompactRIO LabVIEW
NI TestStand PLC integration SCADA / OPC-UA
MySQL data logging Python

WHY TMCS

Decade of Excellence Authorised NI Partner
Certified LabVIEW Professionals CE-Compliant Systems
100% Custom-Built In-house Panel Engineering
Single-Vendor Ownership On-site & Remote Support

Ready to automate your appliance testing?

Share your product range, test specifications and line requirements — TMCS will propose a test architecture tailored to your production.

Phone +91 20 6763 6001
Email marketing@tmcs.in
Web www.tmcs.in
Office 3rd Floor, MCCIA Building, Tilak Road, Pune 411002, Maharashtra, India
Factory Satyam Industrial Estate, Sr. No. 25, Mahadev Nagar, Nanded Gaon, Sinhagad Road, Pune 411041