

Orion3 Test System extended-range gantry option

Robotic charged device model (CDM) test system

The Thermo Scientific™ Orion3 Test System is designed to meet all popular CDM test standards, allowing both field-induced CDM (FICDM) air discharge methods and low impedance contact CDM (LI-CCDM) methods.

The extended-range gantry option provides the same features of the Orion3 Test System, while providing a 300 x 220 mm test area (charge plate area is 300 mm²) for testing large devices, modules, or PCB assemblies.

Substantial dividend returns

The Orion3 Test System is designed to test for potentially destructive effects of ESD, enabling the identification and hardening of sensitive structures prior to full-scale production. Given the extremely high cost of IC production, as well as customer demands for precisely timed component delivery schedules, the Orion3 Test System can save substantial costs in terms of time, material, and lost opportunity (time to market).

Rapid device positioning

The high-resolution dual cameras permit easy and rapid discharge pin alignment during the test setup routine. Both the x and y axes are displayed simultaneously. The cameras may be left on during the test to monitor the pin alignment. Vacuum hold-down enables device testing regardless of device types and sizes.

Reproduction of real-world CDM events

The Orion3 Test System is capable of performing FICDM testing to all popular industry standards. An event detector confirms each discharge occurs as expected, ensuring proper alignment and contact between the device and the system discharge pin.

Events are logged and reported upon test completion, providing confirmation of pin discharge and the indication of non-stressed pins that require retesting. Testing can also be performed using the LI-CCDM contact test method, which both charges and discharges the device through a controlled impedance environment, eliminating testing issues that can be seen when using air-discharge methods.

Automated waveform capture

Waveform capture/verification can be performed using a built-in waveform monitor connected to an oscilloscope. Waveforms can also be analyzed using Thermo Scientific™ EvaluWave Waveform Verification Software, which provides waveform parameters and Pass/Fail information based on the appropriate test standard. EvaluWave Software also allows you to perform data distributions on different parameters of the captured waveforms.

Define, achieve, and sustain your test objectives

The Orion3 robotic CDM tester base system includes the system controller, flat panel display, and operating software. The emergency stop switch and a wrist grounding strap connector are conveniently located on the front panel of the system.

Ground planes and charge plates, associated hardware, and calibration disks specified in the test standards are available. The test area is fully enclosed with a transparent safety cover, which allows the test area to be purged with nitrogen or dry air when testing in high-humidity environments. The Orion3 Test System will retain its value, particularly as device package geometries become smaller and more powerful.

Reach the next level of success

Experience the many benefits of working together with recognized experts in the field of ESD and latch-up testing. We support you with lifelong service, from applications support, calibration services, and preventive maintenance scheduling to full technical field support.

Key Benefits

Supports all popular test standards: JS-002, JEDEC, ESDA, AEC, and LI-CCDM method

Bench-height test area allows for an ergonomic work process

High-resolution dual GigE cameras and optional 5-megapixel cameras for contact testing permit easy discharge pin alignment during test plan setup

Environmental monitoring within the test area allows control of humidity levels during testing by flooding the area with user-supplied dry air or nitrogen

Event detector confirms ESD discharge and reports when a pin is not stressed

Automatic waveform capture for calibration or device testing. Stores I_{peak} and min/max values for each captured waveform

Intuitive test setup and test execution using Thermo Scientific™ Scimitar Software

Device definitions can be imported from legacy applications, other Scimitar applications, and in text-based (x, y) formats. In addition, they can also be created from imported package images, using our Package Recognition feature



Specifications

Test area	300 x 300 mm (11.81 in x 11.81 in)
Mechanism travel	290 x 220 mm (11.42 in x 8.66 in)
Motion system	- x, y axis: minimum step size 0.001 in with 0.00025-in accuracy (minimum step size 25.4 μm with 4-μm accuracy) - z axis: vertical travel to 1.5 in with 0.00025-in accuracy (vertical travel to 200 mm with 4-μm accuracy)
Bench height, test area	71.12 cm (28 in)
Test voltage range	± 25 V to $\pm 2,000$ V (± 1 V steps), optional testing to ± 4 kV
DUT chuck vacuum (internal)	11.8 in Hg
Temperature range	- Operating temperature: $+15^{\circ}\text{C}$ to $+30^{\circ}\text{C}$ ($+59^{\circ}\text{F}$ to $+86^{\circ}\text{F}$) - Non-operating temperature: $+4^{\circ}\text{C}$ to $+60^{\circ}\text{C}$ ($+40^{\circ}\text{F}$ to $+140^{\circ}\text{F}$)
Humidity range	30–60% non-condensing (recommended test chamber range is less than 20%)
Dimensions	56 cm (22 in) W x 89 cm (35 in) D x 140 cm (55 in) H
Weight	88 kg (194 lb)
Power requirements:	
System	110-240 VAC, 15 A, 50/60 Hz
Computer/monitor	110-240 VAC, 6.5 A, 50/60 Hz
Customer-supplied	Dry air/nitrogen: 0.25 scfm @ 60 psi max
Dual high-resolution color GigE cameras	- Rapid, accurate device positioning; enables monitoring of pin alignment during test while vacuum holds device positioned during testing - Optional 5-megapixel cameras for testing bare die or fine pitch device when performing testing using the LI-CCDM contact method
Test densities to less than 0.4 mm pitch or as large as 300 x 300 mm packages	Allows testing of today's and tomorrow's complex, high-density, large platform parts

Scimitar Software features

Scimitar Software makes test programming easy:

- Enables the user to program test voltages, polarity, charge times, and delay times between pulses
- Subtests can be created within a test plan for individual groups, which can include different test parameters
- Includes tree-like logical view of tests and test plans, making it easier to understand the test flow
- Device file contains pin type and pin grouping information, making it easier to perform testing on particular pin groups

Integrated package outline editor allows creation of any package (including off-grid):

- Allows import of text-based (.txt, .csv, .xml) package definitions including the x, y coordinate information
- Allows import of existing device outlines from RCDM (.out) and Orion (.dev) and Orion2 (.ndv) Test Systems, formerly produced by FEI
- Allows import of existing device files from Thermo Scientific™ ZapMaster™ Fixtures (.dev) and MK2 (.zdd) Test Systems, and Paragon (.dvc), formerly produced by FEI
- Allows import of device information from other Scimitar applications, such as Thermo Scientific™ MK1, MK2, and MK4 (device.xml) Test Systems
- Allows import of package images to create an outline using an image recognition feature
- Allows 3-point outline creation, when package dimensional information is not available

Device file pin coordinates are referenced to the system x, y mechanism coordinates, making it easier for subsequent device alignment

2 teach points for package pin alignment; position of all other pins automatically calculated

3D representation of motion control makes it easier to align the device

High-resolution cameras with zoom capabilities make it easier to align even the smallest pin pitch packages

Comprehensive results viewer that provides:

- ESD data viewing capabilities
- Captured waveforms are stored within the results file
- Sorting in ascending or descending order by various columns within the results Flexible data storage provides the ability for the end-user to query the data

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Pause/resume test capabilities that allow a device to be realigned or allow review of the captured waveforms

Control of external oscilloscopes through the use of Scimitar Software's user-programmable plug-in capabilities

Automated waveform capture capabilities:

- Each waveform is stored and its Ipeak value is used to create a histogram of all Ipeak values captured during a test
- Allows for the analysis of the captured waveforms using the embedded EvaluWave Software feature
- EvaluWave Software also allows the user to perform data distributions on different elements of the captured waveforms; i.e., Ip, Tr, FWHH

Cross-tester platform architecture:

- Scimitar Software's design allows it to be used across a number of Thermo Scientific™ tester platforms, which means test plans can be used on multiple systems, eliminating the need to recreate tests
- Regardless of which tester platform a test plan was executed on, results can be viewed on any system or even offline for data manipulation

 Learn more at thermofisher.com/orion-3

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