

THE FUTURE IS DITO

DITO: THE ONLY ESD SIMULATOR WITH AUTOMATIC DATA COLLECTION AND STORAGE

For simulation of electrostatic discharge according to
IEC 61000-4-2, ISO 10605 and related standards



**NOTHING CAN
STOP PROGRESS
NOW**

dito: THE VISION HAS BECOME REALITY

The future is dito. dito is the finger (Italian). dito is small, light, flexible and ergonomic. dito is performance. dito has unlimited possibilities. dito is simply ingenious and brilliantly simple. dito is progress. dito is for global use. dito has been requested by customers. dito is a vision. dito is ... finally here.



THE HIGHEST POWER ESD SIMULATOR INTO THE SMALLEST PACKAGE – THAT'S HOW EASY PROGRESS IS ACHIEVED.

**Testing with an easy touch, even under unfavorable conditions – only dito can accomplish this:
dito, the super light weight ESD-simulator from EM TEST.**

dito weighs about 2 pounds (940 grams), can be operated with one hand and allows full visibility of the discharge tip and display while testing. For the first time, the battery backed power booster allows for long term testing during battery operation.

dito is **the only** ESD-simulator that can record test results, and is **the only** one with standardized, customized, preprogrammed and savable test protocols – and dito is **the only** ESD-simulator with the ingenious ditoControl® software.



dito: NO OTHER PRODUCT IS AS ERGONOMIC FOR ESD TESTING . . .

The ingenious Lightweight Champion

Due to the low weight and its perfect ergonomic design, dito offers more advantages than any other ESD-simulator has ever done before. dito allows for greater maneuverability, especially when working with large test objects. dito may be operated with only one hand while the discharge tip and display can still be easily observed from any position.

The clear display, the functional control panel and the field tested experience make test routines easy and mistake free. With the help of the optical interface and the ditoControl® software, the user has access to the standards library at any time. Individual test routines can be preprogrammed and transferred to dito. The test proceed automatically and the test data is recorded during the testing process.



EVERYTHING IS ACCESSIBLE



dito – its ergonomic shape and light weight allows for working with an easy touch. Even the tightest corners are accessible with dito.

EVERYTHING IN ONE HAND



dito was developed according to the principle “All ESD Tests performed with just one Hand”. This ambitious task pays off again and again. Test objects of different design and size can be tested fast and efficiently.

EVERYTHING WITHIN VIEW



dito is an example of EM TEST's understanding of user friendly products. The comfortable one hand operation combined with the ability feature to observe the display and discharge tip in any position, makes dito a unique instrument.

EVERYTHING DONE



Based on the prepared test plan the user is guided through the test step by step, from test point to test point. Everything done to avoid that test points are missed. All results and events are summarised in a test report. Everything is on record.

... AND SO INNOVATIVE.

Ready for new Standards?

Just switch Modules!

True innovations are known for their ease of handling. dito was designed in such a manner that by switching the R/C-Discharge Modules, new standards or customized needs can be obtained.

The actual R/C-Combination will be displayed immediately. That's how simple top performance can be...



dito: SIMPLY INGENIOUS - BRILLIANTLY SIMPLE

User friendly

Regardless, if menu driven or operated with the ditoControl® software, dito always remains the first choice!

The practical menu with preprogrammed test routines offers maximum user friendliness for every application. Additionally, it prevents the user from making mistakes during the test which follows all the required steps up to the final test level. Polarity will be switched automatically. Everything operates fully automatic and does not require user intervention.



Data from the discharge module are displayed and can be stored – using the ditoControl® software.

Unsurpassed Performance

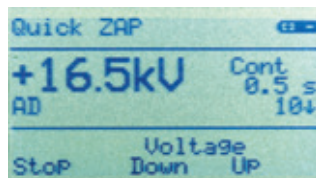
That's how easy dito provides mistake free performance. dito is equipped with a time control function for discharge intervals. An audio signal draws the user's attention to the resumption of his test. The actual discharge voltage is also detected and displayed. The user will be immediately notified, should a low and therefore incorrect voltage discharge occur. In this case the discharge will not be counted as part of the test result. The preprogrammed test routines assure that all steps up to the final test level are correctly completed. Additionally, the individual tests are immediately saved online for final documentation of the test results. It couldn't be easier.

The Menues



"EASY ZAP"

Serves as the final check with standard test voltages. A very easy and fast test program. During the test the test level can be changed from level 1 to level 4 through the touch of a button.



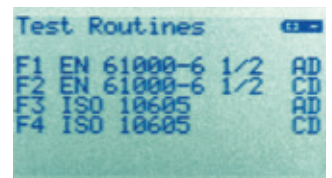
"QUICK ZAP"

Serves to determine the interference threshold of the test object. A very simple and fast test program. During the test the voltage can be changed by pre-determined voltage levels through the touch of a button. The data of the discharge module is shown in the display.



"EVALUATION"

To find the weak spots of the test object. A very easy test program. The input of the pulse frequency is done in Hz. If during the test with air discharge the distance between test tip and test object is too short, and the voltage drops below a certain value, an audible alarm will be heard.



"TEST ROUTINES"

Includes 8 preprogrammed test programs according to EN 61000-6-1/2 (Generic Standards) and ISO 10605. In addition, individual test sequences as well as test programs can setup with ditoControl® software.

... THE INTELLIGENT POWER PACKAGE

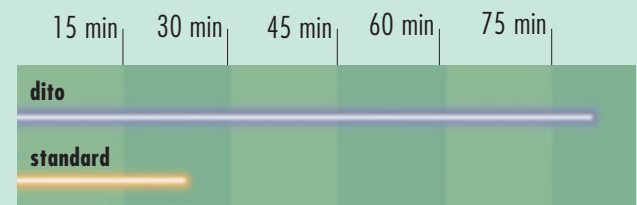


Power-Booster

The advantage of superior performance:

The ability to discharge 150,000 impulses at 10 kV per battery charge meets all known performance requirements. In this respect dito is the first ESD simulator to perform a complete long term test under worst case conditions using battery operation.

Length of Operation



The Quick-Charge Magazine

Charging batteries is absolutely simple and safe. Each battery can be recharged in less than 1.5 hours. The charging device is designed to prevent the "Memory Effect".



SOFTWARE? GENIUSWARE!



Software ditoControl®: EVERYTHING HERE - EVERYTHING INCLUDED

THE VISION OF COMPLETE AND FORWARD LOOKING ESD TEST ADMINISTRATION BECOMES REALITY WITH DITOCONTROL® SOFTWARE. BUT THAT'S NOT ALL, THE DITOCONTROL® SOFTWARE CAN ACCOMPLISH MUCH MORE...

| STANDARDS LIBRARY

Why waste more time and energy than necessary? There are many specific standards for different applications and products available in

the standards library of the ditoControl® software. All that's necessary is the touch of a button and everything is ready for use.

| TEST PROTOCOL

With ditoControl® software a complete test protocol can be prepared. It contains all the important data required for testing as well as the check points of the test object. At a later date the entire test process

can be reproduced with the help of the test protocol. Also, the ditoControl® software completely manages all test protocols.

| TEST PROGRAMS

This was never possible before: All test programs are generated and saved in memory. dito can save up to 8 different test programs. During the entire test process dito controls most of the important

operational and monitoring functions while assuring maximum operator mistake free testing.

| TEST REPORT

With its test report function the ditoControl® software prevents the possibility of mistakes in the test report: Should problems occur with the test object during the testing procedure, failure check markers will be placed and saved together with the comments of the user.

This information together with the other test data will be transferred to the computer for further evaluation. Even large numbers of test data will be securely saved with ditoControl® software and stored without error.

MEETING THE ESD GOAL IN 3 STEPS:

STEP 1: SET UP THE SELECTION AND DEVELOPMENT OF TEST ROUTINES IN EASY MODE

Flow Chart for Easy Mode operation:

Select Test Programs

- | Selection of a manufacturer specific Test Program from those stored in dito by the operator
- | Selection of a Standard from the Standard Library (Test Program Standard Assistant)

Load Program into dito

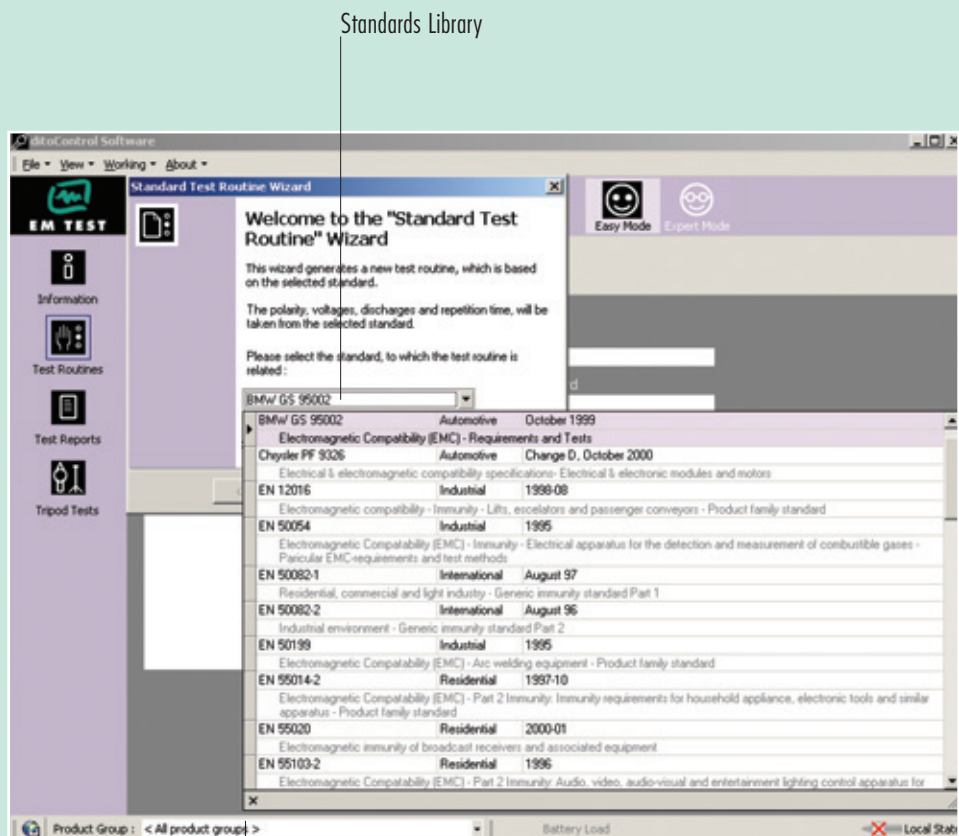
Complete Test

Load Test Results from dito into Computer

Prepare Test Report

Easy Mode: Selection of an already existing test routine from the Standards Library

In the EASY Mode the user develops the test program by taking the existing basic standards, special standards and product standards from the standards library. Then the test data is completely integrated for the test process as required by the standard. Since all test parameters are predetermined, there is no possibility for operational mistakes. A file name is assigned to this test program which will be shown in the display after being transferred via optical link.



From here the user can choose the appropriate standard for different products such as home, industry, international, medicine, telecom, traffic or "all products".

... OR IN EXPERT MODE

Flow Chart for Expert Mode operation:

Developing the test program

- | Using already existing Test Routines
- | Selecting a Standard from the Library

Developing the Test Protocol

Load Program into dito

Test Program Standard Assistant

Complete Test

at Test Points as indicated in Test Protocol ① ② ③ ④

Place of Failure Check Markers

A malfunction of the test object during the testing process will be registered by placing a "failure check marker" in dito.

Load Test Results from dito into Computer

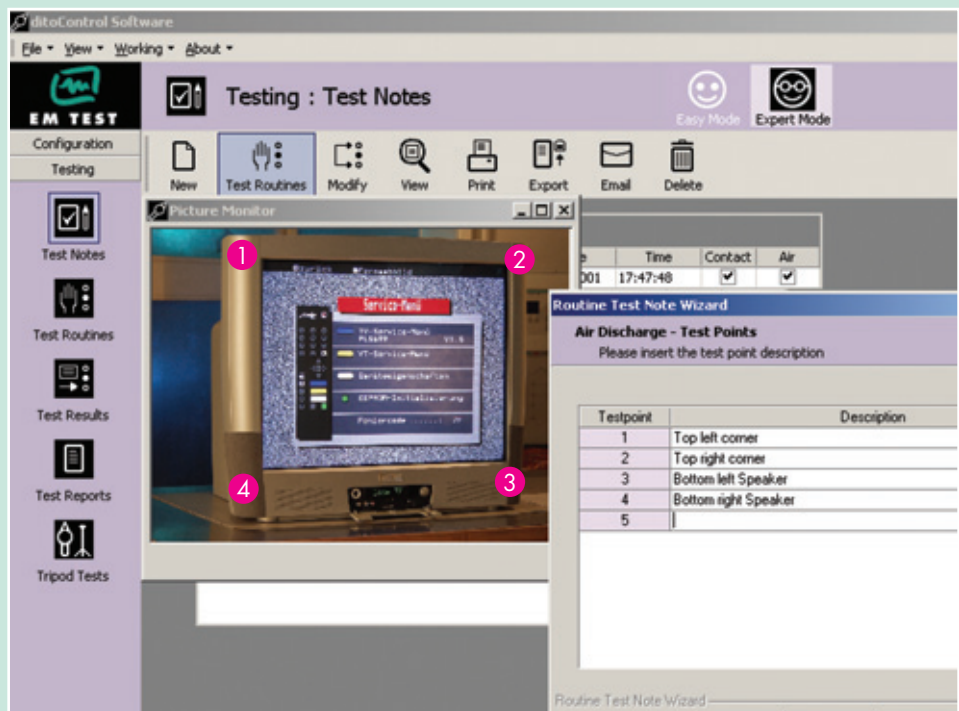
Prepare the Test Report

Expert Mode: Development of a test protocol for an individual test

In this mode the user can prepare his own test protocol. This protocol contains all the general data which has to be determined and are important for the test process. The user is given the opportunity to include a digital picture of his test object into the test protocol, showing all the test points.

Then the defined test routines are transferred to dito, whereby all test parameters are set automatically.

All the user has to do is to contact the test points recommended in the display of dito and the entire test process runs automatically.



STEP 2: THE ESD TEST.

Test programs which were loaded into dito, are automatically processed. The user is informed about the status of the test by an audio signal and is notified on the display to which test point he is supposed to move on. At the next test point the test is continued by pushing the **“Start”** button.

The major advantage is that the manual adjustment of test parameters, voltage changes and polarity switches for each individual test point is not necessary, since dito runs the prearranged test programs **“independently”**.

Should malfunctions on the test object occur, the user can apply the so-called **“Failure Marker”**, add individual comments and save everything. These **“Failure Markers”**, together with all the other test data, will eventually be loaded into the computer and the comments are placed in the proper location.

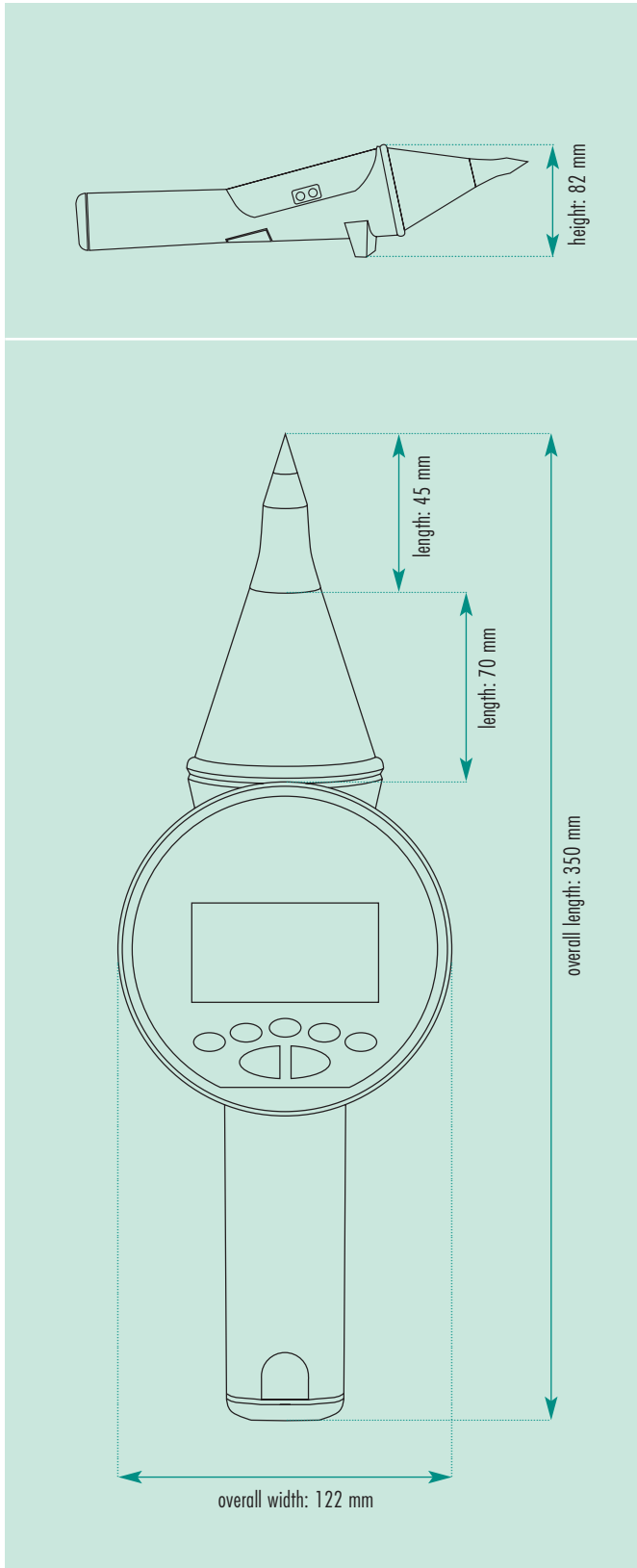


ESD Test Protocol

- 1
- 2
- 3
- 4

Test points on test object as predetermined by the user

TECHNICAL DATA.



Test voltage

Contact discharge	500 V to 10 kV
Air discharge	500 V to 16.5 kV
Resolution	min. 100 V-per step
Tolerance	±5 %
Polarity	Positive, negative, alternating

Trigger mode

Single	Release of a single discharge
Continuous	Release of discharges as long as the trigger button is pressed
Auto	Automatic release of discharges (tripod)
External	External release of discharges via optical link

Display and control

Display	LCD, graphical display with 128 x 64 pixel
Function keys	5 function keys, 2 step keys and 1 trigger button
Counter	Counts up or down

Power Supply

Battery mode	Continuous operation for 1.5 h (NiCd)
Sleep mode	Auto-Switch-Off after 10 minutes with no input from operator

Housing

ABS not flammable as per-UL94V0

General data

Environment temperature	15 – 35°C
Relative humidity	20 – 80 %
Weight	app. 940 g

Battery charger

Power mains supply	100 – 240 V ± 10 %; 50 – 60 Hz
Fast charge mode	Controlled by m-controller; overload protected
Charging time	< 1.5 h

Accessories (included)

Instrument case with the following items:

- 1 ESD simulator type dito
- 2 Ground return cable
- 3 1 rechargeable battery
- 4 1 battery charger
- 5 Discharge tip 1:
Discharge tip for AD mode
- 6 Discharge tip 2:
Discharge tip for CD

Manual and short from introduction
Calibration certificate

The individual discharge modules can easily be changed. The following R/C-networks are standard: 150 pF/330 Ω, 150 pF/2000 Ω, 330 pF/2000 Ω and 100 pF/1500 Ω. Other R/C-networks are available on special request: C; 50 pF to 500 pF and R; 10 Ω to 10kΩ.

The discharge modules can use 2 different type of discharge tips:

- Discharge tip (sharp) for Contact Discharge (CD)
- 8 mm discharge tip (round) for air discharge (AD)

The discharge tips can be easily removed and changed depending upon test mode.

Discharge module as per IEC/EN 61000-4-2

Test voltage	0.5 – 16.5kV for AD and 0.5 – 10kV for CD
Discharge capacitor	150 pF ± 10 %
Discharge resistor	330 Ω ± 10 %
Holding time for air discharge	5 s
Discharge mode	Air and Contact discharge

Pulse parameters for contact discharge (CD) as per IEC/EN 61000-2-4

	2 kV	4 kV	6 kV	8 kV
Rise time t_r	0.7–1.0 ns	0.7–1.0 ns	0.7–1.0 ns	0.7–1.0 ns
I Peak	7.5 A ± 10 %	15.0 A ± 10 %	22.5 A ± 10 %	30.0 A ± 10 %
I at 30ns	4.0 A ± 30 %	8.0 A ± 30 %	12.0 A ± 30 %	16.0 A ± 30 %
I at 60ns	2.0 A ± 30 %	4.0 A ± 30 %	6.0 A ± 30 %	8.0 A ± 30 %

Discharge modules as per ISO 10605

Test voltage	0.5 – 16.5 kV for AD and 0.5 – 10 kV for CD
Discharge capacitor	150 pF ± 10 % or 330 pF ± 10 %
Discharge resistor	2000 Ω ± 10 % or 2000 Ω ± 10 %
Holding time for air discharge	5 s
Discharge mode	Air and Contact discharge

Pulse parameters for contact discharge (CD) as per ISO 10605

	2 kV	4 kV	6 kV	8 kV
Rise time t_r	0.7–1.0 ns	0.7–1.0 ns	0.7–1.0 ns	0.7–1.0 ns
I Peak	7.5 A ± 10 %	15.0 A ± 10 %	22.5 A ± 10 %	30.0 A ± 10 %
Pulse duration (150 pF/2000)	300 ns	300 ns	300 ns	300 ns
Pulse duration (150 pF/2000)	660 ns	660 ns	660 ns	660 ns

Optional Items:

- ⑦ 1 additional battery
- ⑧ Power mains supply adapter
- ⑨ Software "dito control"
- ⑩ 1 additional discharge module
- ⑪ Bleeder wire/resistor (up to 30 kV)
- ⑫ Optical link; interface adapter together with ditoControl®



As leading the manufacturer of EMC test generators EM TEST is actively working in numerous different Standard committees and working groups. This guarantees to our customers that they will always be on top of the actual development of national and international standards in different fields of industry.

The carrying case assures a safe storage and transportation of dito and its accessories. In addition, there is enough space to store additional options.



EM TEST

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Information about scope of delivery, visual design and technical data correspond with the state of development at time of printing. Technical data subject to change without further notice.

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