

CIT-10

**Compact Immunity Test System
according to IEC 61000-4-6
(EN 61000-4-6)**



- In one unit**
- Signal generator
 - RF millivoltmeter
 - RF power amplifier

All components may as well be used separately!



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General:

The international standard IEC 61000-4-6 (EN 61000-4-6) defines the testing and measuring methods for „testing the immunity to conducted disturbances induced by RF fields“.

The corresponding test systems may consist either of individual components whose control is realized via a separate PC and the corresponding control software via IEEE 488 Bus and/or RS 232 Bus, or of one compact unit like the CIT-10 which includes all necessary components and is easier to handle.

The use of individual components is recommended especially in those cases where these components are to be used also for further test assemblies, e.g. according to IEC 61000-4-3 or other applications. These components will then be designed already for multiple use, regarding frequency range and measuring range (please request our separate information material).

As a „stand-alone“ test system the CIT-10 is convincing by its easy and still comfortable handling and the excellent cost-performance ratio.

Set-up:

The CIT-10 is a PC-aided test equipment which may be operated by every commercial IBM compatible PC. A PCI DAQ Card for the data transfer between test equipment and PC (data registration and control) is included in the delivery. All settings of the equipment, e.g. start frequency, stop frequency, step widths, test voltage etc. are made by means of the control software which is also included in the delivery. The three functional units Signal generator, RF power amplifier and RF voltmeter are set automatically by the software, depending on the preset test parameters. Each component, however, may also be called and operated as a separate measuring and testing equipment. This means: using the CIT-10 as testing system, you have three full, additional „single units“ at your disposal, for which separate inputs and outputs are available as BNC connections. Due to the computer-aided control of the CIT-10, any modifications which may become necessary, for example, due to the revision of standards, may be performed without problems and without having to manipulate the hardware of the equipment.

Functioning:

The equipment is ready for operation immediately after installing the PCI card, the drivers and the control software. After starting of the control software, a selection menu with the functions **<Generator>** **<Voltmeter>** **<Test>** **<CDN-Calibration>** **<Self-Calibration>** is offered.

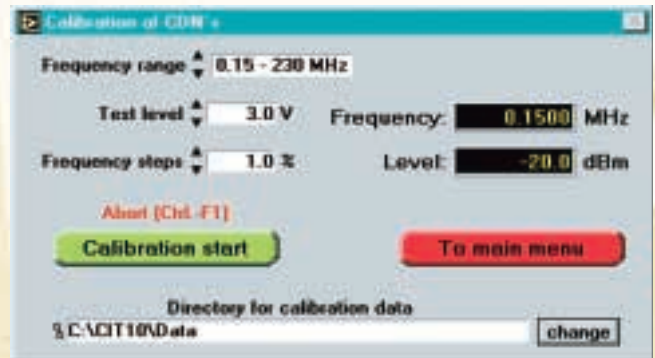


<Generator> and <Voltmeter>:

Generator and Voltmeter allow to operate these two integrated components as single units. The separate use of the RF power amplifier does not require any software adjustment. It is sufficient to connect the input and output of the amplifier correspondingly; in this case the voltmeter could again be used to measure the output power of the amplifier.

<CDN-Calibration>:

The CDNs (Coupling/Decoupling Networks) serve to inject the test voltage into the lines to be tested and/or to decouple any connected peripheral equipment from the EUT. The characteristics of the CDNs as well as of the power amplifier are not absolutely linear over the whole frequency range, i.e. the amount of power required to generate a constant test voltage over the whole frequency range varies slightly, depending on the frequency. In the calibration run, the frequency-dependent output level of the signal generator, which is necessary for a constant test voltage, will be determined and stored in the software, together with the defined frequency range and the desired test voltage. The data records thus created may then be stored and recalled for tests. When our CDNs are used, no calibration will be necessary since we also deliver the corresponding calibration files.



<Self-Calibration>:

When selecting this menu option, the test equipment will perform a self-calibration. In this case, the output of the signal generator must be connected to the input of the voltmeter.

<Test>:

The menu option <Test> offers the selection possibilities <Complete Test>, <Selective Test> and <Protocol>.

The settings for a test, e.g. start and stop frequency, step width and test voltage are made automatically via the calibration file of the selected coupling unit. It is now possible to decide whether the test is to be performed exactly according to these pre-settings, i.e. exactly as in the calibration, or whether modifications of the pre-settings shall be admissible. If the calibration run was performed, for example, for a test voltage of 10V, and the test

is to be performed now with 3V without having to perform a new calibration run for this purpose, this can be done by clicking the button „interpolation“.

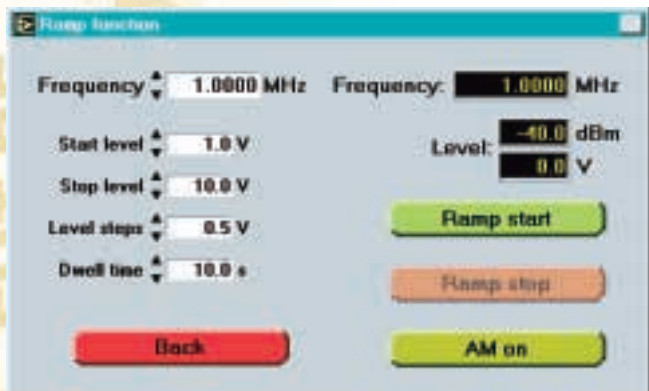
In the case of „Complete Test“, a test is performed over the complete selected frequency range; in this case the test frequency is increased by the control software according to the selected step width and the entered dwell time. If there is a malfunction of the EUT, the test may be stopped at any time. It is then possible to either increase or reduce the frequency by any number of steps, as well as to switch on and off the modulation and test voltage. Besides, a description of the malfunction occurred may be entered in a comment line which is included in the test record.



<Selective Test> offers the possibility of testing the EUT at discrete frequencies. This can be done either with a fixed test voltage or, optionally, with a ramp function. In case of the ramp function, the start and stop voltage, the step width by which the test

voltage is to be increased, as well as the dwell time between the individual steps may be preset by the tester.

The <Protocol> consists of the head of the protocol and a list of frequencies with the registered comments. In the head of the protocol the date and time are taken over from the computer; in addition, details like temperature, air humidity, tester, as well as testing set-up and EUT, may be registered. The list of frequencies may be treated even after conclusion of the test, i.e. individual frequencies may be added or deleted, and comments may be completed or modified.



The protocol may be printed directly or exported into other programs for further processing.

Coupling/Decoupling Units (CDNs), 150kHz to 230MHz:

Type:	Use for:	Number of lines	Type of connection
CDN-M1	unshielded mains supplies	1	4mm MC socket
CDN-M2	unshielded mains supplies	2	4mm MC socket
CDN-M3	unshielded mains supplies	3	4mm MC socket
CDN-M2+3	unshielded mains supplies	2 or 3	4mm MC socket
CDN-M5	unshielded mains supplies	5	4mm MC socket
CDN-S1	shielded lines	1	BNC
CDN-S2	shielded lines	2	XLR
CDN-S9	shielded lines	9	9 pole Sub-D
CDN-S25	shielded lines	25	25 pole Sub-D
CDN-AF2	asymmetric lines	2	connector block
CDN-AF8	asymmetric lines	8	connector block
CDN-T2	symmetric lines	2	connector block
CDN-T4	symmetric lines	4	connector block
CDN-T8	symmetric lines	8	connector block

EM coupling clamp:

The EM coupling clamp is used in all cases where CDNs are not advisable or not available. The lines to be tested are in this case inserted in the clamp and the test voltage is injected inductively.

Technical Data:

Signal generator

Frequency range	100 kHz to 266 MHz Resolution 1Hz
Output level	-40dBm to 0dBm Resolution 0.1 dB
Distortions	Harmonic <30dBc Non-harmonic <35dBc
Amplitude Modulation	1 kHz \pm 3%, 80% \pm 5% (internally) 10Hz to 100kHz, 0 to 90% (externally) Input resistance > 100 k Ω
Standing wave ratio	< 1.3 : 1

RF Power Amplifier

Frequency range	100 kHz to 266 MHz
Output power	>13 W (standard), 75 W (CIT-10/75)
Distortions	<20dBc at nominal power
Standing wave ratio	<1.2 : 1

RF Voltmeter

Frequency range	100 kHz to 266 MHz
Measuring range	+37dBm to -40dBm
Accuracy	\pm 0.5dB (+30dBm to -30dBm) \pm 1.0dB (remaining measuring range)
Resolution	0.1dB
Standing wave ratio	<1.1 : 1

Inputs, Outputs

EUT-fail: BNC (TTL level)
external modulation: BNC
artificial hand: 4 mm MC; 500 Ω /200F
signal generator, amplifier, RF voltmeter: BNC

General Data

Temperature range	0°C to 40°C
Housing	19" – 3HU
Weight	14 kg

Scope of Delivery

CIT-10 basic equipment
Digital I/O Card PCI - 6503
mains cable, 1.5 m BNC cable, 0.75 m grounding cable
3.0 m control cable
6 dB attenuator
system software

Optional

CIT-10 without integrated power amplifier
CIT-10/75 with integrated 75 W-power amplifier

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