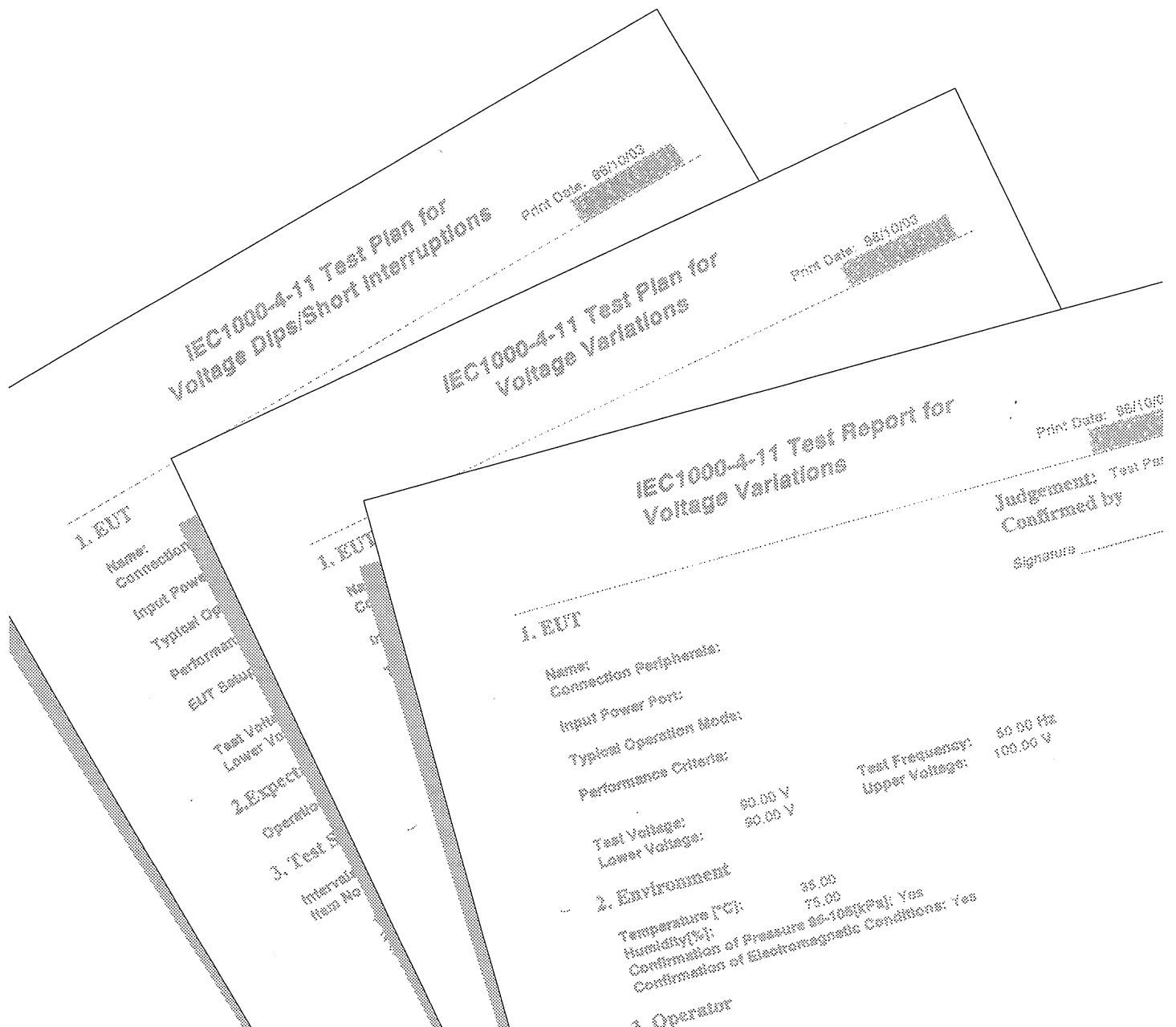




# IEC1000-4-11 IMMUNITY TESTERS

## SD02-IT01 (E) Ver. 1.0

### User's Manual



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# Introduction

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## Overview

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SD02-IT01 (IEC1000-4-11 Immunity Testers) is an application software, which supports single-phase and three-phase tests regulated by "Voltage dips, short interruptions, and voltage variations immunity tests" documented in IEC1000-4-11 standard. To execute test with the software, you need to prepare hardware such as a PCR-L/PCR-LT series (hereafter we call PCR-L/LT) AC Power Supply and your equipment under test (EUT).

IEC1000-4-11 Immunity Testers consists of the following four software.

1. Dip Interruption Tester (DipIntr.exe)

Performs "Voltage dips and short interruptions tests" regulated by the standard. This software satisfies conditions required by the standard only at dip phases (starting phases at which dips and interruptions begin) 0° and 180°. As for other dip phases, not all the required conditions are satisfied due to rise/fall time of PCR-L/LT outputs. The required rise/fall time is 1 to 5  $\mu$ s, although the PCR-L/LT's actual performance is 30 $\mu$ s (typical value).

2. Voltage Variations Tester (VoltVar.exe)

Performs "Voltage variations tests" regulated by the standard.

3. Peak Current Measurement (PeakMeas.exe)

Performs confirmation test that checks if your PCR-L/LT has enough capability to supply peak inrush current required by the standard, before performing actual "Voltage dips, short interruptions, and voltage variations immunity" tests.

4. Checksheet Generator (CSGen.exe)

Generates checksheet that can be used during test execution for recording test status and results.

For Windows Beginners:

IEC1000-4-11 Immunity Testers runs under Windows 95 or Windows NT 3.51. Basic operation such as windows, menus, and buttons are exactly the same as other Windows applications. If you are not familiar with Windows, please consult documentation for Microsoft Windows.

## Features

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IEC1000-4-11 Immunity Testers has the following features:

1. You can easily make **Test Plans** and **Test Results**, generate **Result Reports**, which are all required by the standard.

2. IEC1000-4-11 Immunity Testers suggests a concept **Test Grade** which makes the immunity tests comprehensive when setting test sequences. Complex test sequences can be configured by just selecting a test grade suitable for your EUT.
3. The software is compatible with single-phase PCR-L series, three-phase PCR-LT series, and PCR-L series with three-phase adapter cards.
4. Three kinds of overview provides information.
  - (1) Software Overview  
You can get overview about this software.
  - (2) Equipment You Need  
You can get hardware information you need prepare.
  - (3) How To Connect Peripherals  
You can get how to connect peripheral hardware.
5. You can perform immunity tests required by the standard by just entering required items referring on-line helps and tooltips.
6. You can choose a report language from Japanese or English. (Japanese version only. English only for the English version)
7. The software satisfies IEC1000-4-11 requirements at the following three conditions:
  - Dip phase 0° or 180°
  - In the case of that EUT inrush peak current is equal or less than 70% of PCR-L maximum output peak current. (In the case of that Peak Current Measurement test results passed.)
  - In the case of using PCR8000L or a large model as the test power supply, or case of that EUT input current is 20A or below at dip level 70% and 40% with using PCR4000L.

## **System Requirements**

---

To operate IEC1000-4-11 Immunity Testers, the following equipment are required.

### ***Personal Computer***

IBM PC/AT compatible that equips:

- i486 or faster microprocessor
- 16MB or more memory
- 1.44MB floppy disk drive
- Hard disk (12MB or more free space required)
- Microsoft mouse or compatible pointing device
- VGA or better display adapter and a colour monitor
- Printer compatible with Microsoft Windows

### ***Operating System***

Windows 95 or Windows NT3.51

### ***GPIB cards For Personal Computer***

National Instruments NI-488.2M compatible GPIB card  
(AT-GPIB/TNT, PCMCIA-GPIB, or PCI-GPIB with which NI-488.2M For  
Windows95/NT runs)

### ***GPIB Cable***

24pin cable compliant with ANSI/IEEE 488.1-1987

### ***Power Supply***

AC Power Supply PCR-L series, PCR-LT series (ROM version 2.04 or later)  
(You can also use PCR-L series with three-phase adapters.)

IEC1000-4-11 Immunity Testers uses GPIB device name DEV5 as default.  
Set PCR-L/LT GPIB address to 5.

### ***IB11-PCR-L***

GPIB interface adapter for PCR-L/LT series

### ***Equipment Under Test***

Equipment which observes EUT operational status or confirms EUT  
specification, or other equipment which operate EUT, as well as EUT itself.

## **Setup**

---

To use IEC1000-4-11 Immunity Testers, you need install all the software to  
the hard disk. Setup can be done using the setup program (SETUP.EXE)  
included in the program diskettes. Now we explain how to set up IEC1000-4-  
11 Immunity Testers.

### ***Setup From Windows 95***

1. Start Windows.
2. Insert the program diskette Disk1 to the drive A. (Another drive can be  
used.)
3. Click the **Start** button on the Taskbar and select **Run**.
4. Then type **A:SETUP** and then click the OK button. If the diskette drive is  
other than A. You may change the drive letter.
5. Continue the setup following the instruction.

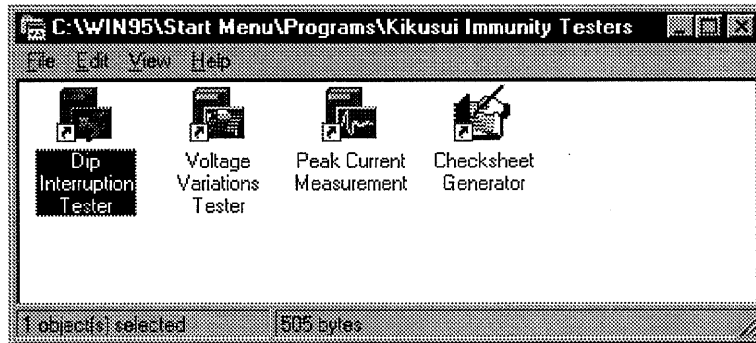
**Destination Directory** specifies where the application is to be installed to.  
Under Windows 95, the destination directory will be C:\Program  
Files\Kikusui\Immtester as default. If you want to install to another location,  
change the directory path.

**Program Folder** specifies the folder name for the application. It will be  
Kikusui Immunity Tester as default.



### ***Installation Complete Under Windows 95***

After installation complete, the Kikusui Immunity Testers folder will be generated in the Program in the Start Menu in the Windows folder.



Installation Complete Screen (example)

### ***Setup From Windows NT3.51***

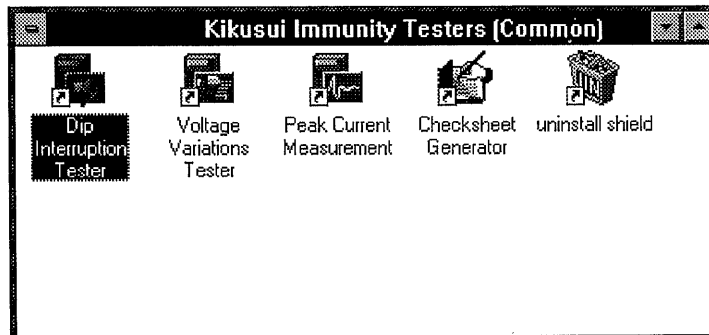
1. Start Windows.
2. Insert the program diskette Disk1 to the drive A. (Another drive can be used.)
3. Select **Run** from the **File** menu in the Program Manager.
4. Then type **A:SETUP** and then click the OK button. If the diskette drive is other than A. You may change the drive letter.
5. Continue the setup following the instruction.

**Destination Directory** specifies where the application is to be installed to. Under Windows NT3.51, the destination directory will be C:\Kikusui\Immtester as default. If you want to install to another location, change the directory path.

**Program Folder** specifies the folder name for the application. It will be Kikusui Immunity Tester as default.

### ***Installation Complete Under Windows NT3.51***

After installation complete, the Kikusui Immunity Testers group will be generated in the Program Manager.



Installation Complete Screen (example)

# Chapter 1 - Dip Interruption Tester

## Overview

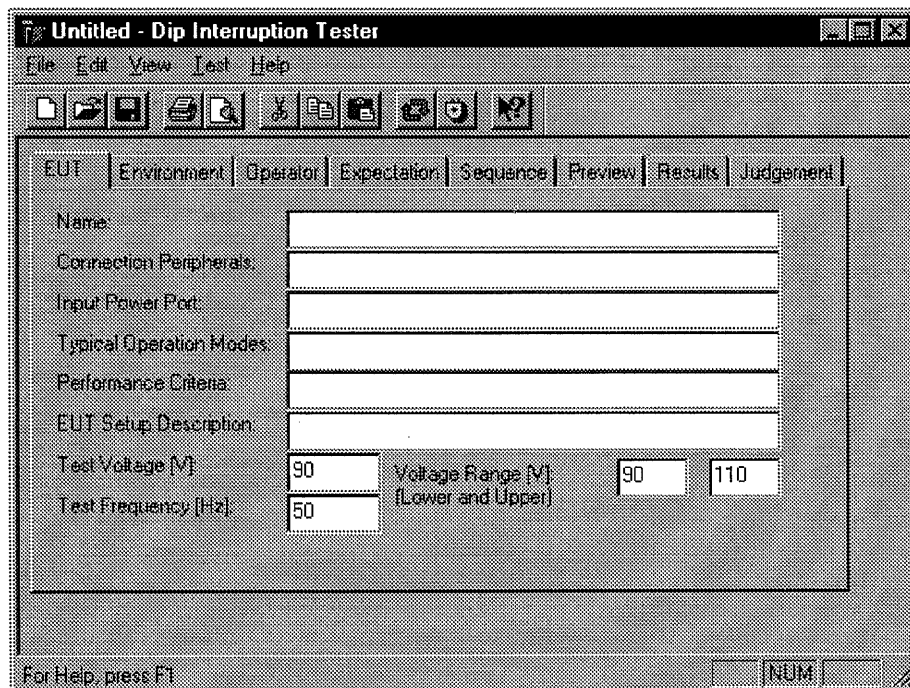
This program performs "Voltage dips and short interruptions tests" regulated by the standard. This software satisfies conditions required by the standard only at dip phases (starting phases at which dips and interruptions begin) 0° and 180°. As for other dip phases, not all the required conditions are satisfied due to rise/fall time of PCR-L/LT outputs. The required rise/fall time is 1 to 5  $\mu$ s, although the PCR-L/LT's actual performance is 30 $\mu$ s (typical value).

## Procedure For Test Operation

You make a test plan entering required items for each page. Next you execute the tests and then enter the results and judgements. After that you print the test plan sheet and the result report. During test execution, it will be convenient to make notes of test status and test progression with using check sheets generated by the Checksheet Generator.

## Start

To start the Dip Interruption Tester, double-click the Dip Interruption Tester icon from the Kikusui Immunity Testers folder.



Dip Interruption Tester start-up screen

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## Settings

---

Make the test plan filling out the required items in the following property pages:

### ***EUT***

Enter information about the EUT such as, name of the EUT, information about connection peripherals (plugs, terminals, etc.) and corresponding cables, peripherals, information about input power ports, items about the EUT, setting information about the EUT, performance criteria defined and used in technical specification notes, description about test settings and instrument's test voltage, upper/lower voltage applied to the instrument, and test frequency.

### ***Environment***

Enter information about test environment such as ambient temperature, humidity settings, confirmation if barometric pressure is within range, and confirmation of electromagnetic conditions of the test room or the laboratory.

### ***Operator***

Enter information about operator such as, operator name, location in which the test is performed, and date/time.

### ***Expectation***

Enter instrument's operational mode which is expected as test results. Actually enter items such as normal, out of order, or burnt.

### ***Sequence***

Enter the test sequence. Choose a test grade other than grade 0 from within 5 test grades we suggest and then select intervals and 3P option if you use three-phase system. By doing so you can easily generate the test sequences. In addition, you can enter test parameters directly to each of the generated sequences.

For Single Phase Users:

Choose **All** for the 3P option item.

For Three Phase Users:

Phase angle settings for three-phase test are based on U phase.

### ***Preview***

Confirm waveform shapes of the generated sequences. As for previews for the three-phase tests, the picture is based upon U phase.

## Printing Test Plan

---

### **Print Preview**

Choosing **File | Print Preview | Plan** menu, the print preview screen for test plan appears. It is recommended to confirm contents of the test plan with the print preview.

### **Report Language**

Choosing **View | Options** menu and select **Report Language**, you can set the language which is used for the plan and result report printings. The language variation you can choose differs depending upon the application's language version. If you are using Japanese version of software, you can select Japanese or English.

### **Print**

Choosing **File | Print | Plan** menu prints out test plans.

## Test Execution

---

After preparation is done, now execute the test. Starting test execution needs to control PCR-L or PCR-LT unit through the GPIB. When first time performing the test, you have to confirm that GPIB environmental setting is properly done.

### **GPIB Settings**

This application communicates with an external instrument using device name. Therefore you need to configure GPIB environment when the first time use for the GPIB.

To confirm or change GPIB settings, choose **View | Options** menu and the go to the GPIB page to specify the GPIB device name. Note that what you should specify is not a GPIB address but a GPIB device name. GPIB device name is defined by device driver software for the GPIB board. Immediately after installing this system first time, the default device name is DEV5. National Instruments GPIB driver prepares DEV1 through DEV16 as default which corresponds to GPIB addresses 1 through 16 respectively. Therefore, in order to connect to DEV5 device, your PCR-L/LT's GPIB address must be set to 5. Note that these default settings are not always true if the GPIB environmental settings have been changed.

GPIB device name has to be configured for each application software. For more information about National Instruments GPIB, please consult documentation which comes with the GPIB card.

### **Starting Test**

<Confirm>

Before starting test, confirm input voltage for the EUT, peripheral connections, GPIB connection to the PCR-L/LT, and GPIB environmental settings.

1. Open the test execution screen by clicking the **Execute** button on the toolbar or by choosing **Test | Execute** menu.
2. There are two kinds of execution modes **Auto Execution** and **Manual Execution**.
3. **Auto Execution** mode automatically executes specified test item and its subsequent. Checking the **Auto Execution** checkbox will immediately start test execution in **Auto Execution** mode. Therefore you don't have to click the **Execute** button. If you want to cancel **Auto Execution** mode just uncheck the **Auto Execution** checkbox. Although the cancelling operation doesn't show response soon because running test cannot stop soon, the test execution will stop after a while since the cancelling operation itself is truly acknowledged.
4. **Manual Execution** mode executes specified sequence only once. **Back** and **Next** buttons can be used to select starting sequence. Then clicking the **Execute** button starts test execution. If you want to run subsequent sequences you have to click the **Execute** button for each step.
5. If you want to abort running test, click the **Cancel** button. The test execution will stop after a while.
6. Clicking the **Emergency Stop** button allows you to immediately shut down the PCR-L/LT output.
7. After the final sequence has started, you can no longer specify another sequence to start. Close the test execution screen once to restart the test. After the final sequence completed, you can close the test execution screen with the **Close** button.

One test sequence for the Dip Interruption Tester consists of three test items. When selecting test grade 0, the first item executes three times because there is only one test item, though test execution screen displays test items 1-2-3. As for the test grade 1, the seventh item executes three times because there are only seven test items, though test execution screen displays test items 7-8-9.

<Notes>

If an alarm such as overload has been generated from the PCR-L/LT during test execution, go to local (SHIFT + F key) and clear alarm (SHIFT + CLR key), after eliminating cause of the alarm. This software doesn't do alarm clear operation.

Do not execute another type of test during test execution. Correct test operation cannot be performed mutually.

Although using the Emergency Stop button shuts down the PCR-L/LT output, turn off the power switch of the PCR-L/LT if really emergency state.

## Test Results And Judgement

After test execution has completed, enter test results and judgement according to the check sheets already filled in.

### **Results**

Choose EUT state during the test, and then select unsafe state or not. In addition you can enter any comments.

### **Judgement**

Check if the EUT could recover its operation by itself, and then enter duration how long the instrument had been lost its complete functional capability. Also enter PASSED/FAILED judgement and name of person who confirms the judgement.

## **Test Report Output**

---

### **Print Preview**

By clicking **Print Preview Report** toolbar button, the print preview screen for test report appears. It is recommended to confirm contents of the test report with the print preview.

### **Print**

Clicking **Print Report** toolbar button will start printing test report.

## **New File**

---

There are two methods for creating a new file – the method of creating from scratch and the method of creating using template. Choose **File | New** menu. It is convenient to use templates if you perform under the same environment for the same EUT. Template files have the same extension .DIP as well as project files, however, they have to be placed in a special template directory.

### **Template**

Choose **View | Options** menu and go to the **Template** page. Here you can set the directory path in which template files are placed. Template files have the same extension .DIP as well as project files, however, they are placed in a special template directory. Although the default template directory is Template immediately under the application's directory, you can change it by clicking the **Browse** button.

## **Storing Data**

---

Dip Interruption Tester allows you to store data for completed test execution on to disk. In the data file, not only the data itself but EUT information, environment, operator information are also included.

To store the data, choose **File | Save** menu or **File | Save As** menu. A dialogue box that prompts you to select file name appears as needed. Then give an appropriate name. The default file extension is .DIP.

## Retrieving Existing Data

---

You can retrieve a data file already saved to confirm data result later. To open the existing data file choose **File | Open** menu. Then a dialogue box prompting you to select a file name. Then select an appropriate file name.

## Special Notices (To Comply With IEC1000-4-11)

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- Prior to execute Dip Interruption Tester, perform Peak Current Measurement to confirm that your PCR-L/LT has enough capability to supply peak inrush current.
- If there are more than one representative operational mode of the EUT, perform the test for all the operational modes. In addition, if the input voltage range is wide (or if the width of input voltage range is 20% or greater than lower input voltage), test under both of lower voltage (V lower) and upper voltage (V upper) conditions.

<Example>

If there are two representative operational modes A and B and input voltage range is wide, you will have to perform four kinds of test:

A + V lower, A + V upper, B + V lower, B + V upper

- The software satisfies IEC1000-4-11 requirements at the following three conditions:
  1. Dip phase 0° or 180°
  2. In the case of that EUT inrush peak current is equal or less than 70% of PCR-L maximum output peak current. (In the case of that Peak Current Measurement test results passed.)
  3. In the case of using PCR8000L or a large model as the test power supply, or case of that EUT input current is 20A or below at dip level 70% and 40% with using PCR4000L.

## Chapter 2 - Voltage Variations Tester

### Overview

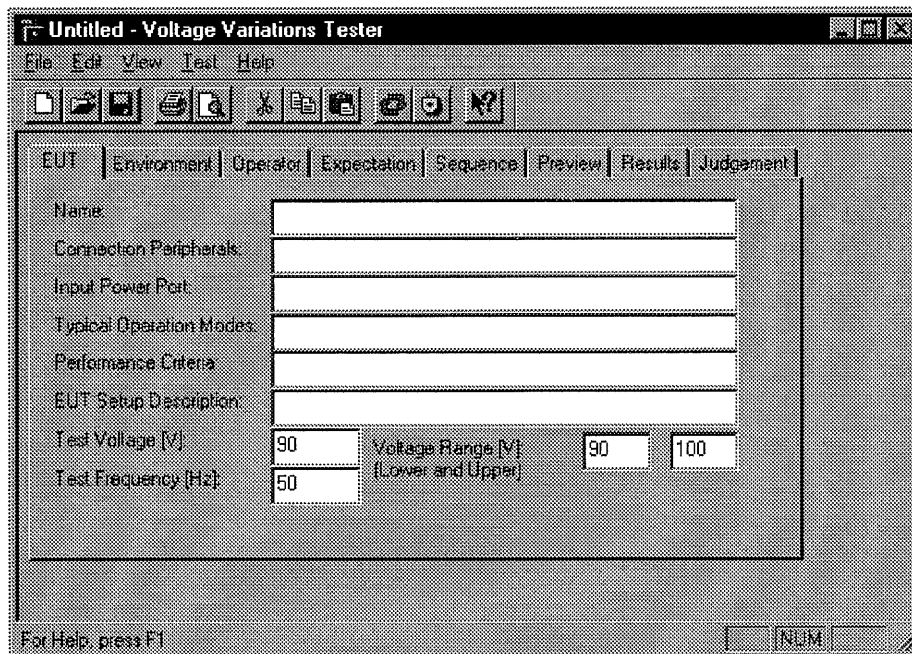
This program performs "Voltage variations tests" regulated by the standard.

### Procedure For Test Operation

You make a test plan entering required items for each page. Next you execute the tests and then enter the results and judgements. After that you print the test plan sheet and the result report. During test execution, it will be convenient to make notes of test status and test progression with using check sheets generated by the Checksheet Generator.

### Start

To start the Voltage Variation Tester, double-click the Voltage Variation Tester icon from the Kikusui Immunity Testers folder.



Voltage Variations Tester start-up screen

### Settings

Make the test plan filling out the required items in the following property pages:

#### ***EUT***

Enter information about the EUT such as, name of the EUT, information about connection peripherals (plugs, terminals, etc.) and corresponding



cables, peripherals, information about input power ports, items about the EUT, setting information about the EUT, performance criteria defined and used in technical specification notes, description about test settings and instrument's test voltage, upper/lower voltage applied to the instrument, and test frequency.

**Environment**

Enter information about test environment such as ambient temperature, humidity settings, confirmation if barometric pressure is within range, and confirmation of electromagnetic conditions of the test room or the laboratory.

**Operator**

Enter information about operator such as, operator name, location in which the test is performed, and date/time.

**Expectation**

Enter instrument's operational mode which is expected as test results. Actually enter items such as normal, out of order, or burnt.

**Sequence**

Enter the test sequence. Choose a test grade other than grade 0 from within 2 test grades we suggest and then select intervals and 3P option if you use three-phase system. By doing so you can easily generate the test sequences. In addition, you can enter test parameters directly to each of the generated sequences.

For Single Phase Users:
-------------------------

Choose <b>All</b> for the 3P option item.
---

**Preview**

Confirm waveform shapes of the generated sequences. As for previews for the three-phase tests, the picture is based upon U phase.

**Printing Test Plan**

---

This software also has print preview, print, report language setting functionality as well as Dip Interruption Tester described in Chapter 1. Refer to "Printing Test Plan" in Chapter 1 – Dip Interruption Tester in detail.

**Test Execution**

---

After preparation is done, now execute the test. Starting test execution needs to control PCR-L or PCR-LT unit through the GPIB. When first time performing the test, you have to confirm that GPIB environmental setting is properly done.

### **GPIB Settings**

This application communicates with an external instrument using device name. Therefore you need to configure GPIB environment when the first time use for the GPIB.

To confirm or change GPIB settings, choose **View | Options** menu and the go to the GPIB page to specify the GPIB device name. Note that what you should specify is not a GPIB address but a GPIB device name. GPIB device name is defined by device driver software for the GPIB board. Immediately after installing this system first time, the default device name is DEV5. National Instruments GPIB driver prepares DEV1 through DEV16 as default which corresponds to GPIB addresses 1 through 16 respectively. Therefore, in order to connect to DEV5 device, your PCR-L/LT's GPIB address must be set to 5. Note that these default settings are not always true if the GPIB environmental settings have been changed.

GPIB device name has to be configured for each application software. For more information about National Instruments GPIB, please consult documentation which comes with the GPIB card.

### **Starting Test**

<Confirm>

Before starting test, confirm input voltage for the EUT, peripheral connections, GPIB connection to the PCR-L/LT, and GPIB environmental settings.

1. Open the test execution screen by clicking the **Execute** button on the toolbar or by choosing **Test | Execute** menu.
2. There are two kinds of execution modes **Auto Execution** and **Manual Execution**.
3. **Auto Execution** mode automatically executes specified test item and its subsequent. Checking the **Auto Execution** checkbox will immediately start test execution in **Auto Execution** mode. Therefore you don't have to click the **Execute** button. If you want to cancel **Auto Execution** mode just uncheck the **Auto Execution** checkbox. Although the cancelling operation doesn't show response soon because running test cannot stop soon, the test execution will stop after a while since the cancelling operation itself is truly acknowledged.
4. **Manual Execution** mode executes specified sequence only once. **Back** and **Next** buttons can be used to select starting sequence. Then clicking the **Execute** button starts test execution. If you want to run subsequent sequences you have to click the **Execute** button for each step.
5. If you want to abort running test, click the **Cancel** button. The test execution will stop after a while.
6. Clicking the **Emergency Stop** button allows you to immediately shut down the PCR-L/LT output.
7. After the final sequence has started, you can no longer specify another sequence to start. Close the test execution screen once to restart the test.

After the final sequence completed, you can close the test execution screen with the **Close** button.

Voltage Variations Tester constructs a sequence iterating one test item three times.

<Notes>

If an alarm such as overload has been generated from the PCR-L/LT during test execution, go to local (SHIFT + F key) and clear alarm (SHIFT + CLR key), after eliminating cause of the alarm. This software doesn't do alarm clear operation.

Do not execute another type of test during test execution. Correct test operation cannot be performed mutually.

Although using the Emergency Stop button shuts down the PCR-L/LT output, turn off the power switch of the PCR-L/LT if really emergency state.

---

## Test Results And Judgement

After test execution has completed, enter test results and judgement according to the check sheets already filled in.

### **Results**

Choose EUT state during the test, and then select unsafe state or not. In addition you can enter any comments.

### **Judgement**

Check if the EUT could recover its operation by itself, and then enter duration how long the instrument had been lost its complete functional capability. Also enter PASSED/FAILED judgement and name of person who confirms the judgement.

---

## Test Report Output

This software also has print preview and printing functionality as well as Dip Interruption Tester described in Chapter 1. Refer to "Test Report Output" in Chapter 1 – Dip Interruption Tester in detail.

---

## New File, Storing Data, Retrieving Existing Data

This software also has new, save, and open functionality as well as Dip Interruption Tester described in Chapter 1. Refer to "New File," "Storing Data," and "Retrieving Existing Data" in Chapter 1 – Dip Interruption Tester in detail. Note that data file extension for Voltage Variations Tester is .VVR.

## Special Notices (To Comply With IEC1000-4-11)

---

- Prior to execute Dip Interruption Tester, perform Peak Current Measurement to confirm that your PCR-L/LT has enough capability to supply peak inrush current.
- If there are more than one representative operational mode of the EUT, perform the test for all the operational modes. In addition; if the input voltage range is wide (or if the width of input voltage range is 20% or greater than lower input voltage), test under both of lower voltage (V lower) and upper voltage (V upper) conditions.

<Example>

If there are two representative operational modes A and B and input voltage range is wide, you will have to perform four kinds of test:

A + V lower, A + V upper, B + V lower, B + V upper

- The software satisfies IEC1000-4-11 requirements at the following two conditions:
  1. In the case of that EUT inrush peak current is equal or less than 70% of PCR-L maximum output peak current. (In the case of that Peak Current Measurement test results passed.)
  2. In the case of using PCR8000L or a large model as the test power supply, or case of that EUT input current is 20A or below at dip level 70% and 40% with using PCR4000L.

## Chapter 3 - Peak Current Measurement

This program performs a test which confirms that your PCR-L or PCR-LT has enough capability to supply peak inrush current required by the standard, for use with "Voltage dips and short interruptions tests."

When performing "Voltage dips and short interruptions tests," make sure to perform this test also.

### Overview

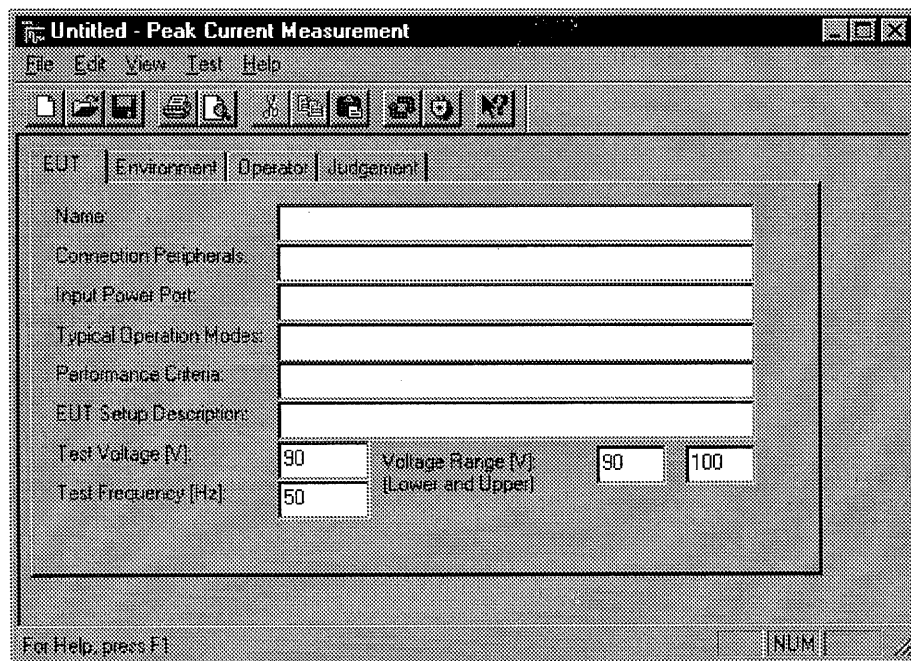
Performs "Peak Current Measurement" test. Since the method of test complies with IEC1000-4-11, the software measures four times – OFF→ON and ON→OFF→ON respectively at different phases.

### Procedure For Test Operation

You make a test plan entering required items for each page. Peak current measurement and judgement will be automatically done by the Peak Current Measurement. You can validate if your PCR-L or PCR-LT series is suitable for performing "Voltage dips and short interruptions tests" regulated by the IEC1000-4-11 standard, by the result from judgement – Passed or Failed. After entering test results, you print out the result report.

### Start

To start the Peak Current Measurement, double-click the Peak Current Measurement icon from the Kikusui Immunity Testers folder.



Peak Current Measurement start-up screen

## Settings

---

Make the test plan filling out the required items in the following property pages:

### *EUT*

Enter information about the EUT such as, name of the EUT, information about connection peripherals (plugs, terminals, etc.) and corresponding cables peripherals, information about input power ports, items about the EUT, setting information about the EUT, performance criteria defined and used in technical specification notes, description about test settings and instrument's test voltage, upper/lower voltage applied to the instrument, and test frequency.

### *Environment*

Enter information about test environment such as ambient temperature, humidity settings, confirmation if barometric pressure is within range, and confirmation of electromagnetic conditions of the test room or the laboratory.

### *Operator*

Enter information about operator such as, operator name, location in which the test is performed, and date/time.

## Test Execution

---

After preparation is done, now execute the test. Starting test execution needs to control PCR-L or PCR-LT unit through the GPIB. When first time performing the test, you have to confirm that GPIB environmental setting is properly done.

### *GPIB Settings*

This application communicates with an external instrument using device name. Therefore you need to configure GPIB environment when the first time use for the GPIB.

To confirm or change GPIB settings, choose **View | Options** menu and the go to the GPIB page to specify the GPIB device name. Note that what you should specify is not a GPIB address but a GPIB device name. GPIB device name is defined by device driver software for the GPIB board. Immediately after installing this system first time, the default device name is DEV5. National Instruments GPIB driver prepares DEV1 through DEV16 as default which corresponds to GPIB addresses 1 through 16 respectively. Therefore, in order to connect to DEV5 device, your PCR-L/LT's GPIB address must be set to 5. Note that these default settings are not always true if the GPIB environmental settings have been changed.

GPIB device name has to be configured for each application software. For more information about National Instruments GPIB, please consult documentation which comes with the GPIB card.

## Starting Test

<Confirm>

Before starting test, confirm input voltage for the EUT, peripheral connections, GPIB connection to the PCR-L/LT, and GPIB environmental settings.

1. Open the test execution screen by clicking the **Execute** button on the toolbar or by choosing **Test | Execute** menu.
2. There are two kinds of execution modes **Auto Execution** and **Manual Execution**.
3. **Auto Execution** mode automatically executes specified test item and its subsequent. Checking the **Auto Execution** checkbox will immediately start test execution in **Auto Execution** mode. Therefore you don't have to click the **Execute** button. If you want to cancel **Auto Execution** mode just uncheck the **Auto Execution** checkbox. Although the cancelling operation doesn't show response soon because running test cannot stop soon, the test execution will stop after a while since the cancelling operation itself is truly acknowledged.
4. **Manual Execution** mode executes specified sequence only once. **Back** and **Next** buttons can be used to select starting sequence. Then clicking the **Execute** button starts test execution. If you want to run subsequent sequences you have to click the **Execute** button for each step.
5. If you want to abort running test, click the **Cancel** button. The test execution will stop after a while.
6. Clicking the **Emergency Stop** button allows you to immediately shut down the PCR-L/LT output.
7. After the final sequence has started, you can no longer specify another sequence to start. Close the test execution screen once to restart the test. After the final sequence completed, you can close the test execution screen with the **Close** button.

<Notes>

If an alarm such as overload has been generated from the PCR-L/LT during test execution, go to local (SHIFT + F key) and clear alarm (SHIFT + CLR key), after eliminating cause of the alarm. This software doesn't do alarm clear operation.

Do not execute another type of test during test execution. Correct test operation cannot be performed mutually.

Although using the Emergency Stop button shuts down the PCR-L/LT output, turn off the power switch of the PCR-L/LT if really emergency state.

## Judgement

You confirm information about power supply instruments which performed the test, current measurement data, and judgement for the test.

## **Test Report Output**

---

This software also has print preview and printing functionality as well as Dip Interruption Tester described in Chapter 1. Refer to "Test Report Output" in Chapter 1 – Dip Interruption Tester in detail.

## **New File, Storing Data, Retrieving Existing Data**

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This software also has new, save, and open functionality as well as Dip Interruption Tester described in Chapter 1. Refer to "New File," "Storing Data," and "Retrieving Existing Data" in Chapter 1 – Dip Interruption Tester in detail. Note that data file extension for Peak Current Measurement is .PKM.



## Chapter 4 - Checksheet Generator

---

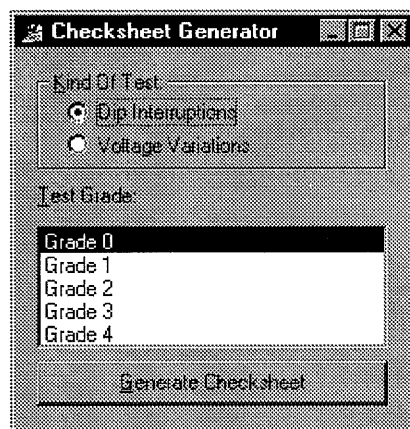
For convenience on performing tests with test grade we suggest, this software generates checksheet formats on which you can make notes.

This program performs a test which confirms that your PCR-L or PCR-LT has enough capability to supply peak inrush current required by the standard, for use with "Voltage dips and short interruptions tests."

### Start

---

To start the Checksheet Generator, double-click the Checksheet Generator icon from the Kikusui Immunity Testers folder.



Checksheet Generator start-up screen

### Checksheet Outputs

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1. Select one of **Dip Interruptions** and **Voltage Variations**.
2. Select a **Test Grade**.
3. Click the **Generate Checksheet** button.

## Appendix 1 – Error Messages

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### ***Application Error Messages***

#### ***This program requires PCR-L/LT rom version 2.04 or higher.***

You are using PCR-L/LT ROM version earlier than 2.04. The SD02-IT01 (IEC1000-4-11 Immunity Testers) requires ROM version 2.04 or later.

#### ***Insufficient memory. This application requires at least 4MB of free memory. Quit other needless application and then try again.***

There is not enough memory in your computer. Quit unnecessary application software to increase free memory space.

### ***GPIB Error Messages***

#### ***Unable to open instrument in [device name].***

GPIB access has been failed on initialization phase. (*device name* is actually a concrete name such as DEV1.) There might be a problem that GPIB driver is correctly installed or GPIB environment is not properly configured.

#### ***Error clearing instrument in [device name].***

Device clear cannot be performed for GPIB instruments. Confirm device name. Also check if the GPIB cable is correctly connected or PCR-L/LT is truly turned on.

#### ***Error writing to instrument in [device name].***

A communication error has been generated when writing data to GPIB instruments. Check if the GPIB cable is correctly connected, PCR-L/LT is truly turned on, or GPIB address is properly set.

#### ***Error reading from instrument in [device name].***

A communication error has been generated when reading data from GPIB instruments. Check if the GPIB cable is correctly connected, PCR-L/LT is truly turned on, or GPIB address is properly set.

#### ***Different model access in [device name].***

Incorrect instrument is connected to the GPIB. Possibly GPIB instruments other than PCR-L or PCR-LT are connected.

## Appendix 2 – Application Specification

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### Operational Environment

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#### *Personal Computer*

IBM PC/AT compatible  
 i486 or faster microprocessor  
 16MB or more memory  
 VGA or better display adapter and a colour monitor  
 1.44MB floppy disk drive  
 Hard disk (12MB or more free space required)  
 Microsoft mouse or compatible pointing device  
 Printer compatible with Microsoft Windows

#### *Operating System*

Windows 95 or Windows NT3.51

#### *GPIB cards For Personal Computer*

National Instruments NI-488.2M compatible GPIB card  
 (AT-GPIB/TNT, PCMCIA-GPIB, or PCI-GPIB with which NI-488.2M For  
 Windows95/NT runs)

#### *Power Supply*

AC Power Supply PCR-L series, PCR-LT series (ROM version 2.04 or  
 later) (You can also use PCR-L series with three-phase adapters.)  
 GPIB interface adapter for PCR-L/LT series required

#### *Dip Interruption Tester*

Measurement Phases	Single and Three-phase
Measurement Data	Voltage dips and short interruptions immunity tests
Compliant Standard	IEC1000-4-11
Test Sequences	Up to 168 sequences
Dip Levels	0%, 40%, 70%, or arbitrarily 0 to 100% (1% unit)
Dip Cycles	-0.5, 0.5, 1, 5, 10, 25, 50, or arbitrarily 2 to 3000 (1 unit)
Dip Phases (U phase when 3-phase mode)	0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°, or arbitrarily 0° to 359° (1°unit)
Time Intervals	10 to 100s (1s unit)
Triggers	Pre-Trigger and Post-Trigger
Voltage	0 to 305V
Lower Voltage	0 to 305V
Upper Voltage	0 to 305V
Report Generation	Test Plan and Test Results

**Voltage Variations Tester**

Measurement Phases	Single and Three-phase
Measurement Data	Voltage variations immunity tests
Compliant Standard	IEC1000-4-11
Test Sequences	Up to 2 sequences
Dip Levels	0%, 40%, or arbitrarily 0 to 100% (1% unit)
Decrease Time	1 to 100s (1s unit)
Reduced Time	1 to 100s (1s unit)
Increase Time	1 to 100s (1s unit)
Time Intervals	10 to 100s (1s unit)
Triggers	Pre-Trigger and Post-Trigger
Voltage	0 to 305V
Lower Voltage	0 to 305V
Upper Voltage	0 to 305V
Report Generation	Test Plan and Test Results

**Peak Current Measurement**

Measurement Phases	Single and Three-phase
Measurement Data	Peak current supply capability
Test Items	Four kinds (Phases applied to U phase when 3-phase) OFF/ON (90° and 270°) operation OFF time: 0 to 10 minutes (1min unit) (0 minute is for immediate operation) ON/OFF/ON (90° and 270°) operation ON time: 0 to 10 minutes (1min unit) (0 minute is for immediate operation) OFF time: 5 seconds (fixed)
Judgement	Automatic judgement
Voltage	0 to 305V
Lower Voltage	0 to 305V
Upper Voltage	0 to 305V
Report Generation	Test Results

**Checksheet Generator**

Checksheet Generation	Checksheets for Voltage dips and short interruptions tests, and Voltage variations tests
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## **Appendix 3 – Report Examples**

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## IEC1000-4-11 Test Plan for Voltage Dips/Short Interruptions

Print Date:96/12/16



### 1. EUT

Name:

Connection Peripherals:

Input Power Port:

Typical Operation Mode:

Performance Criteria:

EUT Setup Description:

Test Voltage: 90.00V      Test Frequency: 50.00Hz  
Lower Voltage: 90.00V      Upper Voltage: 110.00V

### 2. Expectation

Operation Modes As Results:

### 3. Test Setup

Item No	Intervals: Levels[%]	Duration (period)	Phase[°]
1	10 s 0	-0.50	0
2	0	0.50	0
3	0	1.00	0
4	0	5.00	0
5	0	10.00	0
6	0	25.00	0
7	0	50.00	0

## IEC1000-4-11 Test Report for Voltage Dips/Short Interruptions

Print Date:96/12/16

This report does NOT comply with IEC 1000-4-11 standard  
due to insufficient performance of PCR-L/LT's output  
rise/fall time except phase angles 0° and 180°.



### 1. EUT

Name:  
Connection Peripherals:  
Input Power Port:  
Typical Operation Mode:  
Performance Criteria:

Nominal Voltage:90.00 V    Frequency:                    50.00 Hz  
Lower Voltage: 90.00 V    Upper Voltage: 110.00 V

### 2. Environment

Temperature [°C]: 35.00  
Humidity[%]: 75.00  
Confirmation of Pressure 86-106[kPa]:            Yes  
Confirmation of Electromagnetic Conditions:            Yes

### 3. Operator

Name:  
Location:  
Date/Time:  
Comment:

### 4. Test Instruments

Power Supply Model Name: unknown

### 5. Results

Intervals: 10 s  
Test Voltage (Ut): 90.00 V  
EUT could recover its operation by itself: No  
Time interval during lost functionality:

Item No	Levels [%] (period)	Duration	Phase [°]	State	Unsafe	Comment:
1	0	-0.50	0	Normal	No	
2	0	0.50	0	Normal	No	
3	0	1.00	0	Normal	No	
4	0	5.00	0	Normal	No	
5	0	10.00	0	Normal	No	
6	0	25.00	0	Normal	No	
7	0	50.00	0	Normal	No	

## IEC1000-4-11 Test Plan for Voltage Variations

Print Date:96/12/16



### 1. EUT

Name:

Connection Peripherals:

Input Power Port:

Typical Operation Mode:

Performance Criteria:

Setup Description:

Test Voltage: 90.00 V  
Lower Voltage: 90.00 V

Test Frequency: 50.00 Hz  
Upper Voltage: 100.00 V

### 2. Expectation

Operation Modes As Results:

### 3. Test Setup

Intervals: 10 s  
Decreasing: 2 s  
Reduced: 2 s  
Increasing: 2 s

Item No	Levels[%]
1	40
2	0



## IEC1000-4-11 Test Report for Voltage Variations

Print Date:96/12/16



### 1. EUT

Name:  
 Connection Peripherals:  
 Input Power Port:  
 Typical Operation Mode:  
 Performance Criteria:

Test Voltage:	90.00 V	Test Frequency:	50.00 Hz
Lower Voltage:	90.00 V	Upper Voltage:	100.00 V

### 2. Environment

Temperature [°C]: 35.00  
 Humidity[%]: 75.00  
 Confirmation of Pressure 86-106[kPa]: Yes  
 Confirmation of Electromagnetic Conditions: 8.5

### 3. Operator

Name:  
 Location:  
 Date/Time:  
 Comment:

### 4. Test Instruments

Power Supply Model Name: unknown

### 5. Results

Intervals: 10 s  
 Decreasing: 2 s  
 Reduced: 2 s  
 Increasing: 2 s  
 Test Voltage (Ut): 90.00 V  
 EUT could recover its operation by itself: No  
 Time interval during lost functionality:

Item No	Levels [%]	State	Unsafe	Comment:
1	40	Normal	No	
2	0	Normal	No	

## IEC1000-4-11 Peak Current Measurement For PCR-L/LT

Print Date:96/12/16



### 1. EUT

Judgement: Not Tested

Name:  
Connection Peripherals:

Input Power Port:

Typical Operation Mode:

Performance Criteria:

Nominal Voltage:	90.00 V	Frequency:	50.00 Hz
Lower Voltage:	90.00 V	Upper Voltage:	100.00 V

### 2. Environment

Temperature [°C]: 35.00  
 Humidity [%]: 75.00  
 Confirmation of Pressure 86-106[kPa]: Yes  
 Confirmation of Electromagnetic Conditions: Yes

### 3. Operator

Name:  
Location:  
Date/Time:  
Comment:

### 4. Test Instruments

Power Supply Model Name: unknown  
 ROM Version: 0.00  
 Serial Number:  
 100V Range Used

### 5. Results

Ability to supply peak current (in 100V Range) [A]: 0.00  
 Ability to supply peak current (in 200V Range) [A]: 0.00

Peak Current Data [A]:

Test Items	Data
OFF/ON (90°)	0.00
OFF/ON (270°)	0.00
ON/OFF/ON (90°)	0.00
ON/OFF/ON (270°)	0.00

## **Immunity Tester Checksheet For Dip/Short Interruptions**

Test Grade: 2

Intervals: \_\_\_\_\_ s

ItemNo	Level	Duration	Phase [°]	State	Unsafe	Comment
1	70	-0.5	0			
2	40	-0.5	0			
3	0	-0.5	0			
4	70	0.5	0			
5	40	0.5	0			
6	0	0.5	0			
7	70	1.0	0			
8	40	1.0	0			
9	0	1.0	0			
10	70	5.0	0			
11	40	5.0	0			
12	0	5.0	0			
13	70	10.0	0			
14	40	10.0	0			
15	0	10.0	0			
16	70	25.0	0			
17	40	25.0	0			
18	0	25.0	0			
19	70	50.0	0			
20	40	50.0	0			
21	0	50.0	0			

## ***Immunity Tester Checksheet For Voltage Variations***

Test Grade:1  
Intervals: \_\_\_\_s  
Decrease: \_\_\_\_s  
Reduced: \_\_\_\_s  
Increase: \_\_\_\_s

ItemNo	Level	State	Unsafe	Comment
	[%]			

1	40			
2	0			