Quick Immunity Sequencer
Power Line Disturbance Immunity Testing Software
SD003-PCR-LA

Intended for IEC61000-4 Series standard compliance testing and preliminary testing
Allows parameters to be set to arbitrary values (for margin tests)
Preview function permits output waveforms to be checked in advance
Sequence chain function streamlines the testing process
Export function displays test conditions and results

KIKUSUI

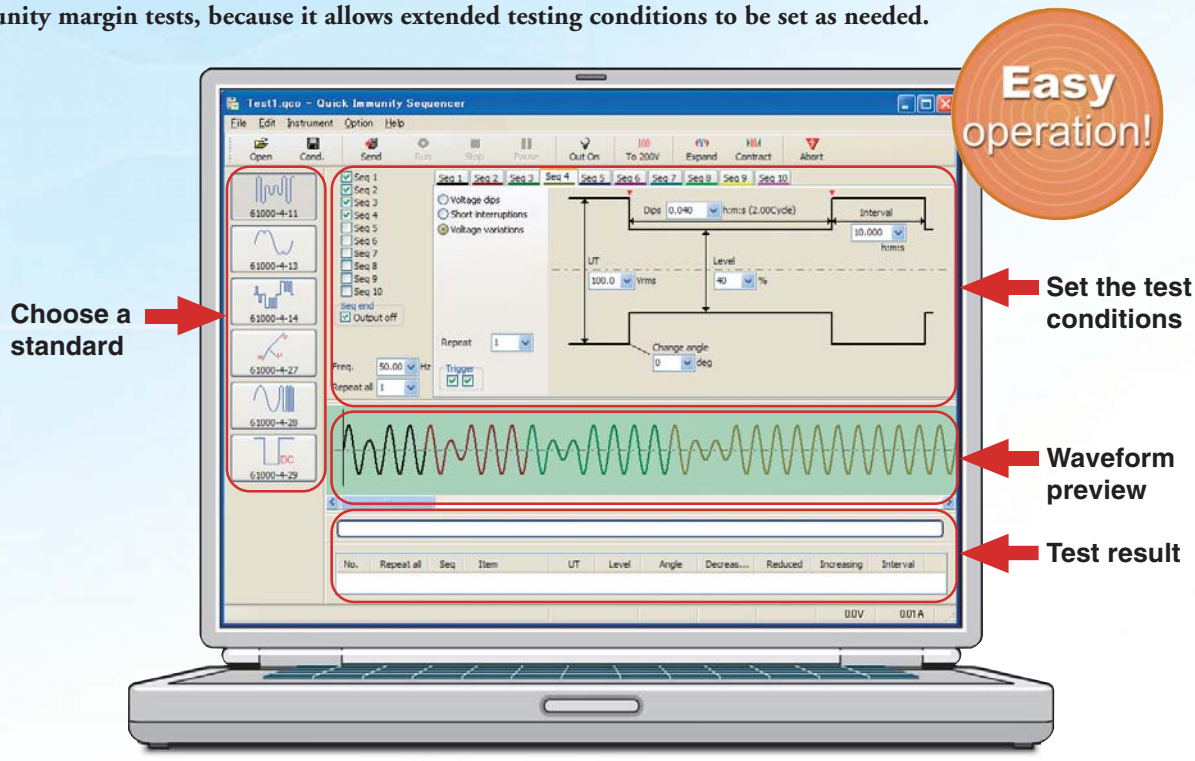
Supporting the latest IEC61000-4 standards!

Power Line Disturbance Immunity Testing Software

SD003-PCR-LA

(Quick Immunity Sequencer)

SD003-PCR-LA (Quick Immunity Sequencer) is an application software to perform immunity test with our multifunctional AC power supply, PCR-LA series for Immunity testing standard (IEC61000-4 Series) of EMC standard which complies to Power Line Disturbance Immunity testing, a suite of international specifications concerning power line disturbances. Not only can it be used for compliance testing based on the latest standards and for some types of preliminary testing, but the software can also be employed for advance checking in development phases and for immunity margin tests, because it allows extended testing conditions to be set as needed.



Features

- Supports standard compliance testing for IEC61000-4-11, 4-13, 4-14, 4-27, 4-28 and 4-29, as well as preliminary testing.
- Allows parameters to be set to arbitrary values (for margin tests).
- Supports three-phase operations and DC operations as well as single-phase operations.
- Graphics-based screen design that makes the software easy to operate.
- Preview function permits output waveforms to be checked in advance.
- Sequence chain function streamlines the testing process (10 sequences max).
- Export function displays test conditions and results (in CSV format).
- Trigger function facilitates observation of output waveform.
- Pause function can be used when checking or replacing the EUT.

Operating environment

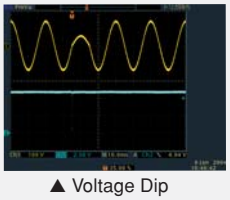
OS: Windows XP/2000/Me/98SE
CPU: Pentium 233 MHz or faster
Memory: 128 MB or more
HDD: 100 MB or more required at installation;
10 GB or more of free space recommended for data
CD-ROM: For installation
Mouse: Required
Monitor: 1024 x 768 and higher; 16-bit color or higher

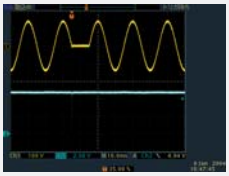
Driver: VISA library (one of the following)
- KI-VISA 2.2.X or later*
- NI-VISA 2.6 or later
- Agilent IO Libraries K01.00 or later
- ActiveX instruments driver pcrldrv Ver. 2.91 or later*

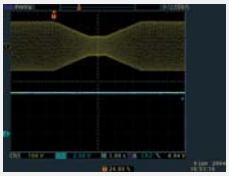
Interface: RS-232C or GPIB

*Latest version may be downloaded from the Kikusui website.

IEC61000-4-11 standard test
[Actual waveform (example)]


▲ Voltage Dip


▲ Short Interruption


▲ Voltage variation

Items that can be tested and range of parameter values

SD003-PCR-LA lets you choose any of the six standards listed below, as well as the test types to be conducted.
As the testing conditions, you can either select the standard-specified parameters or enter arbitrary values.

Standard	Test Type	Test Conditions To Be Set (Parameters To Be Input)
IEC61000-4-11	Voltage dip	Test level % UT (0/40/70) Repetition interval (0.01/0.02/0.1/0.2/0.5/0.6/1/arbitrary)
	Short interruption	Test level % UT (0/40/70) Repetition interval (0.01/0.02/0.1/0.2/0.5/0.6/1/5/6/arbitrary)
	Voltage variation	Voltage decreasing time, voltage increasing time, and reduced voltage time (2 seconds/arbitrary)
IEC61000-4-13	Flat curve	sin ω t Test level (0.95xU1x√2/0.9xU1x√2/0.8xU1x√2)
	Overswing	3rd/5th degree harmonics (phase 0˚/180˚) (Voltage ratio 0.0% to 100.0%)
	Sweep in frequency	The step is an integral multiple of the basic wave frequency (specified by the harmonic degree)
	Odd harmonics (non-multiple of 3)	Set the level, phase angle, and time.
	Odd harmonics (multiple of 3)	Set the level, phase angle, and time.
	Even harmonics	Enter an even number from 2 to 40, and set the level, phase angle, and time.
IEC61000-4-14	Voltage fluctuation	Range of voltage fluctuation (-50% to +50%)
	Interval	Repetition interval (0.003 seconds to 999 hours, 999 minutes, 999.999 seconds)
IEC61000-4-27	Three-phase unbalance	Ua, Ub, Uc, and phase angle (0.0% to 150.0% and 1˚ to 360˚)
IEC61000-4-28	Power frequency variation	Variation ratio Δf+f1 (-50% to +50%)
IEC61000-4-29	DC voltage dip	Test level % UT (40/70)
	DC short interruption	Lasting time (0.001 seconds to 999 hours, 999 minutes, 999.999 seconds)
	DC voltage variation	Voltage decreasing time, voltage increasing time and reduced voltage time in seconds (0.1/0.3/1/3/10/arbitrary)

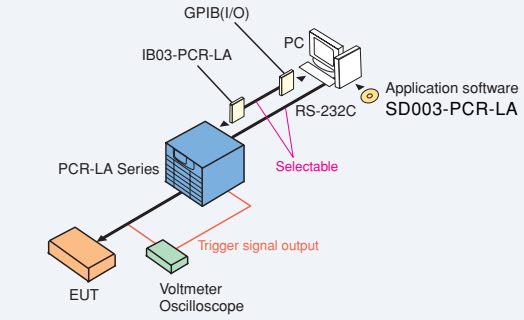
* For details of the setting of the testing conditions and the parameter value ranges for the individual standards, please contact our distributors.

Test system configuration

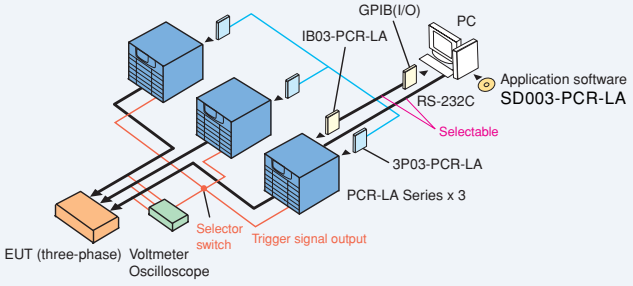
An immunity test requires the devices shown in the figure below, in addition to SD003-PCR-LA.
Also, depending on the target standard and the content of the test, a different combination of devices is necessary.
Please consult with our distributors when purchasing the software and building the system.

Example of the test system configuration

[For single-phase and DC devices]



[For three-phase devices]



[Notes] ● The personal computer and following products should be necessary.
In case of using GPIB: GPIB interface card and GPIB cable
In case of using RS-232C: RS-232C cable
● The voltmeter, oscilloscope (for monitoring output waveforms), and selector switch should be procured as needed.
● SD003-PCR-LA supports the following manufacturer's GPIB interface cards:
• National Instruments Corp. • Agilent Technologies, Inc. • CONTEC Co., Ltd. (API-GPIB driver) • Interface Corp. (GPC-4301N)
● For the detailed specifications of the PCR-LA Series AC power supply, refer to the catalog of the power supply device.
● This software is designed to run only with the PCR-LA Series AC power supply devices incorporating firmware of Version 3.10 or later.

Compliance list for EMC standard tests

●Compliance test possible, ●Comply with specified requirements, ■Do not comply with some of the specified requirements (intended for preliminary tests)

Standard No.	Immunity Test Name		Compliance with Standard Test		
IEC61000-4-11 Ed.2 (2004-03)	Voltage dips, short interruptions, voltage variations*1		Single-phase	●	For voltage dips and short interruptions of class 1 and 2 (when IT01-PCR-L is used)
			Single-phase	■	Only pre-examination is possible for class 3 tests
			Three-phase	■	For preliminary tests
IEC61000-4-13 (2002-03)	Harmonics and interharmonics*2	Flat curve	Single/three-phase	●	Comply with specified requirements
		Overswing	Single/three-phase	●	Comply with specified requirements
		Sweep in frequency	Single/three-phase	■	Sweep with integral degree harmonic components
		Individual harmonics	Single/three-phase	■	For preliminary tests
IEC61000-4-14 Ed.1.1 (2002-07)	Voltage fluctuation		Single/three-phase	■	For preliminary tests
IEC61000-4-27 (2000-08)	Unbalance		Three-phase	■	For preliminary tests
IEC61000-4-28 Ed.1.1 (2002-07)	Variation of power frequency		Single/three-phase	●	Comply
IEC61000-4-29 (2000-08)	Voltage dips, short interruptions, voltage variations on DC		DC	■	For preliminary tests (only when PCR6000LA is used)

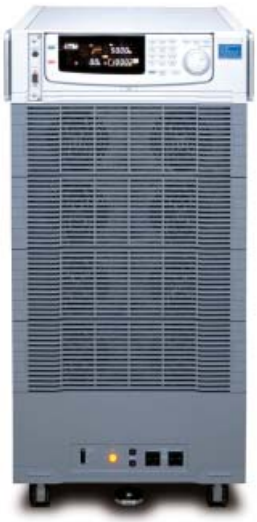
*1 Standard revision trend: IEC61000-4-11 Ed.2 (2004-03). This revision introduces classification, defining a test level for each class. The voltage variations test is optional in the standard.
*2 The functions for interharmonics and meister curve testing are not supported.

■ AC Power Supply PCR-LA Series

PCR4000LA/PCR6000LA

• RS-232C Interface equipped as standard.

For detailed specifications, refer to the relevant PCR-LA Series catalog.



PCR4000LA

	PCR4000LA	PCR6000LA
Output ratings (AC RMS values)		
Number of phases	Single phase	
Voltage (range 100 V/200 V)	1 V to 150 V/2 V to 300 V	
Maximum current	40 A/20 A	60 A/30 A
Maximum peak current	Four times the maximum current (RMS value)	
Power capacity	4 kVA	6 kVA
Frequency	1 Hz to 999.9 Hz	
Output ratings - DC mode		
Voltage (range 100 V/200 V)	DC 1.4 V to 212 V/2.8 V to 424 V	
Maximum current	20 A/10 A	30 A/15 A
Power capacity	2 kW	3 kW
Output voltage stability		
Input voltage variation (with respect to changes in the rated range)	Within ±0.1%	
Output current variation (with respect to 0% to 100% changes in the rating)	Within ±0.1 V/±0.2 V (range 100 V/200 V)	
Output frequency variation - AC mode (40 to 999.9 Hz)	Within ±0.3%	
Output voltage waveform distortion	0.3% or less	
Circuit method	Linear amplifier system	
Input ratings (AC RMS values)		
Voltage (range 100 V/200 V)	85 V to 132 V/170 V to 250 V	
Number of phases, frequency	Single phase, 47 Hz to 63 Hz	
Apparent power	Approx. 8 kVA	Approx. 12 kVA
Power factor	0.95 (typical value)	
Current (range 100 V/200 V)	96 A/48 A or less	72 A or less
Input/output terminal board connection screws	M6	
Supplied input power cable	3 single-core cables	
Dimensions	430(455)W x 839(920)H x 550(605)Dmm*	430(455)W x 1105(1190)H x 550(605)Dmm*
Weight	Approx. 120kg	Approx. 160kg

*Values in parentheses indicate the maximum dimensions

■ Immunity Tester

IT01-PCR-L

This is a hardware component used to conduct voltage dip/short interruption immunity tests in accordance with the IEC61000-4-11 standards. It employs a semiconductor switch to enable high-speed voltage switching (1 to 5 µs) required by the IEC standards.

*Does not comply with the test Ed.2 of class 3.

Input voltage range		85 V to 250 V
Input frequency		50/60 Hz
Input current		0.7 A or less
Input apparent power		80 VA or less
Operating voltage range		0 to 300 Vrms (setting value in the standard: 120 to 230 Vrms)
Maximum output current	rms value peak value	40 Arms (When the test voltage is 40% of Ut) 500 Apeak (1 s or less)
Current-monitoring output	Accuracy	1 V/100 A (Load impedance: 10 k or more) Within ±3% (At 16 A rms output current)
Voltage-monitoring output	Accuracy	1 V/100 V (Load impedance: 10 k or more) Within ±3% (When the test voltage is Ut 230 Vrms)
WAIT IN signal input		Maximum input voltage: ±5 V
TRIG OUT signal output		Trigger pulse width: 10 µs or more (Load impedance: 10 k or more) Trigger level: 0 to +5 V (Load impedance: 10 k or more) Low level: 0.5 V or less (Load impedance: 10 k or more) High level: 2.5 V or more (Load impedance: 10 k or more)
Wire connection screws for the input and output terminal boards		M6
Dimensions		430(450)W x 217(280)H x 545(600)Dmm*
Weight		Approx. 45kg

*Values in parentheses indicate the maximum dimensions

■ Three-phase Output Driver

3P03-PCR-LA

The use of these drivers allows three PCR-LA Series power supply devices to be connected in a star topology, thereby implementing three-phase output operation.

Main accessory : 2 drive signal cables (0.6m)

■ Interface

IB03-PCR-LA (for GPIB)

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