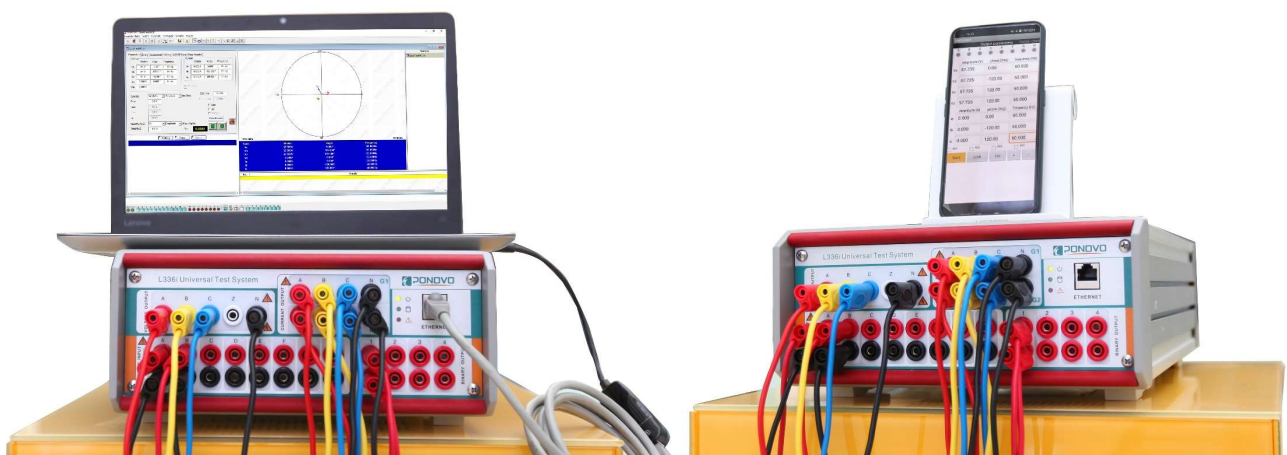# L336i
SUPER-LIGHT Protection Relay Test Set

the smallest and lightest 6-phase protection relay test set in the world

Model: L336i

PONOVO POWER CO., LTD.
www.ponovo.net

New Light Weight Relay Testing Equipment

We are proud to announce the new L336i relay testing system which is the lightest in weight and the smallest in size in the world!

Equipment

More options for different testing requirement

- Standard Version-L336i: 6×15A, 4×300V
- Economic Version-L336i-E: 3×20A, 4×300V

Features

- Light weight with only 8.6kg, 1/3 of the weight of traditional testing system
- Tracing the signal generation with digital technology
- Stable signal output with high accuracy
- Binary inputs with adjustable threshold
- Use LAN port for connecting to external PC
- Use powerful PowerTest software with ready test modules, realizing the maximum control flexibility over test process
- Can be upgraded to support the test of IEC61850 compatible relay
- Can support wireless control by smart phone APP (Android) for testing relays

➢ **Real-Time Outputs Display**

❖ Real-time output waveform display helps the fast troubleshooting of wiring and test circuitry before test actual started.
❖ User can also use this provision to analyze the external signals, such as phase angle, power, harmonic, etc.
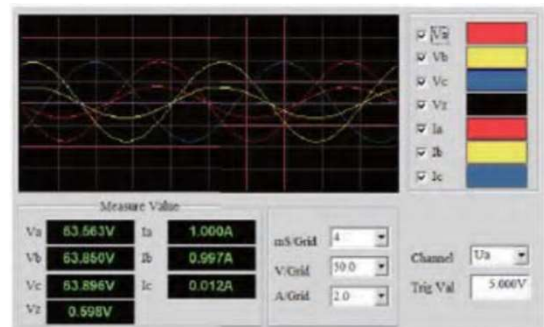
➢ **IEC 61850 Function**

❖ L336i and L336i-E provides analog voltage/current signal to relay and the GOOSE message from relay is received and analyzed by relay test set.

Protection relay

Analog signal hard-wired

GOOSE IEC61850

Applications

- ### Relay test

  Distance protection

  Differential protection

  Directional relay

  Time-inversed current relay

  Auto-reclosing, etc.

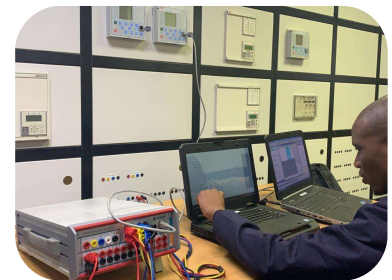- ### Measuring and control device

  Synchronizer

  Energy meter

  df/dt, etc.

- ### System simulation

  Transient, steady-state fault simulation

  Playback of COMTRADE format file

- ### Calibration

  0.5 Class energy meter

  Disturbance recorder

  Indicating meters, etc.

Test functions according to IEEE relay code

IEEE. NO.	DEVICE	IEEE. NO.	DEVICE
2	Time Delay Starting or Closing Relay	61	Density switch or sensor
21	Distance Relay	62	Time-Delay Stopping or Opening Relay
24	Volts per Hertz Relay	64	Ground Detector Relay
25	Synchronizing or Synchronism-Check Device	67/67N	AC Directional Overcurrent Relay
27/27N	Undervoltage Relay	68	Blocking or "out of step" Relay
30	Annunciator Relay	74	Alarm Relay
32	Directional Power Relay	76	DC Overcurrent Relay
36	Polarity or Polarizing Voltage Devices	78	Phase-Angle Measuring Relay
37	Undercurrent or Underpower Relay	79	AC-Reclosing Relay
40	Field (over/under excitation) Relay	81/81U/O/R	Frequency Relay
46	Reverse phase or Phase-Balance Current Relay	82	DC load-measuring reclosing relay
47	Phase-sequence or phase-balance voltage relay	85	Carrier or pilot-receiver relay
50/50N	Instantaneous Overcurrent	86	Lock-out relay
51/51N	AC Time Overcurrent Relay	87	Differential Protective Relay
52	AC Circuit Breaker	91	Voltage Directional Relay
53	Field Excitation Relay	92	Voltage and Power Directional Relay
55	Power Factor Relay	94	Trip Relay
56	Field Application Relay	Other Functions (Optional)	IEC61850 Energy meter
58	Rectification failure relay		
59/59N	Overvoltage Relay		
60	Voltage or Current Balance Relay		

L336i Front Panel

Voltage outputs: 4×300V

Current outputs: 6×15A

4 binary outputs

8 binary inputs

L336i Rear Panel

GPS Interface

IP reset

Power switch

Mains supply connector

Earth socket

L336i with PC Powertest software for testing relay

L336i with smart phone APP for testing relay

L336i-E Front Panel

Voltage outputs: 4×300V

Current outputs: 3×20A

4 binary outputs

8 binary inputs

L336i-E Rear Panel

GPS / Transducer measuring Interface

IP reset

Power switch

Mains supply connector

Earth socket

L336i-E with PC Powertest software for testing relay

L336i-E with smart phone APP for testing relay
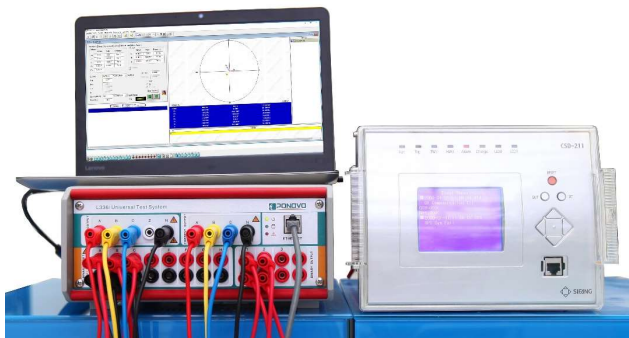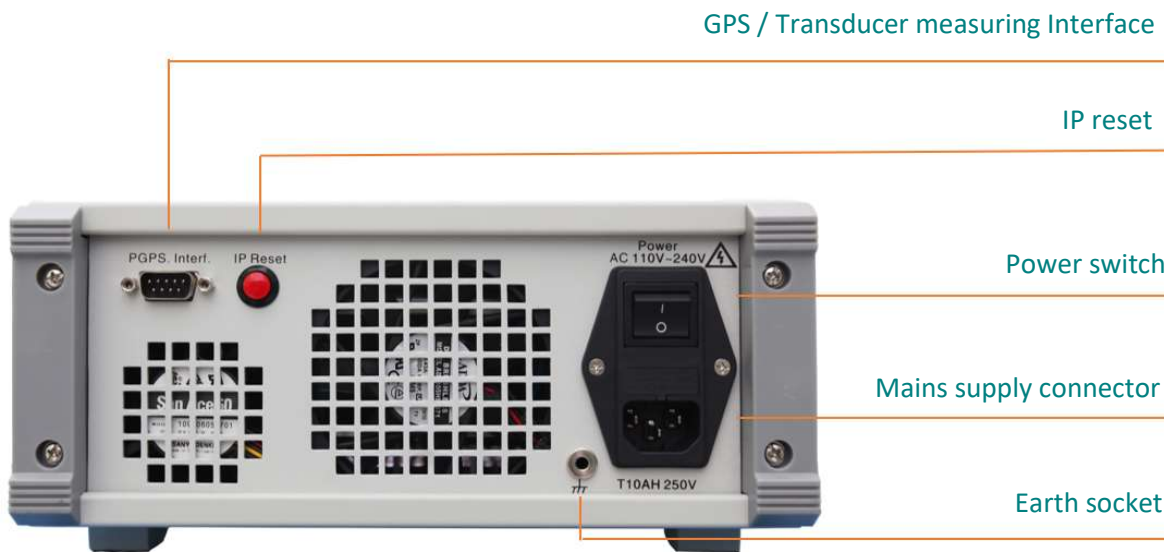
PowerTest - Relay Test Set Software

For all the three phase or six phase relay testers of PONOVO, one universal software can be used, the name is **PowerTest** software. PowerTest is a relay test software that includes different test packages, the **Basic** package, **Protection** package, **Advanced** package, **Special** package, **New Modules**, which packages includes different testing module, that can be used for all kinds of relay testing, and it also has the special package for more testing application, such as energy meter, etc.
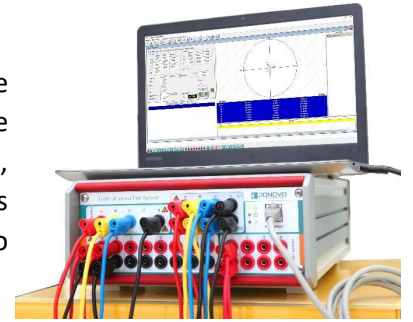
➢ Basic Package

In the **Basic** package, there are different Quick Test modules, Time module, State Sequence, Ramp, Harmonic, CB Operation, Non-electricity Check, and TransPlay for playing back the comtrade file.
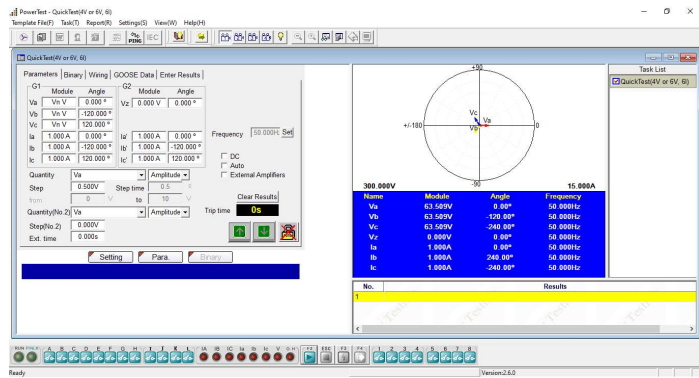

QuickTest (4V、3I)

- ❖ 4 voltage and 3 current sources available for test relay
- ❖ Amplitude, phase angle and frequency of voltage and current sources can be controlled independently
- ❖ Test can be in manual or auto mode
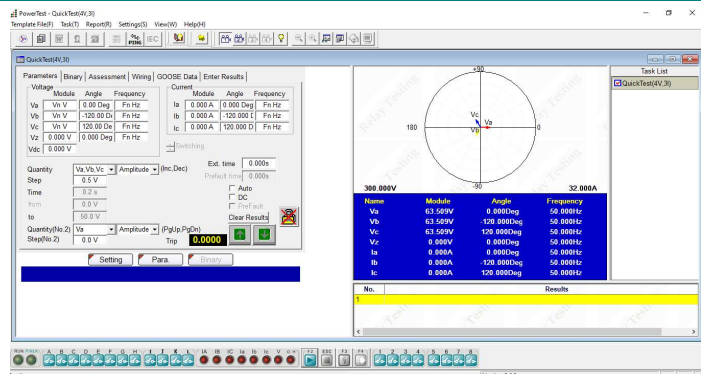
QuickTest (4V,6I)

❖ 4 voltage and 6 current sources available for test relay

❖ Amplitude, phase angle and frequency of voltage and current sources can be controlled independently

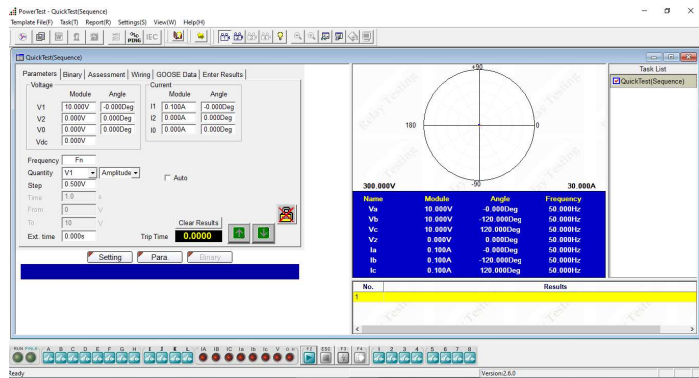❖ Test can be in manual or auto mode

❖ This module can be used by L336i only

QuickTest (VL-L, 3I)

❖ Easy to control the phase-phase voltage, 3V0 (zero sequence voltage) and 3 currents

❖ Amplitude, phase angle and frequency of current sources and phase-phase voltage, zero sequence voltage can be controlled independently

❖ Test can be in manual or auto mode
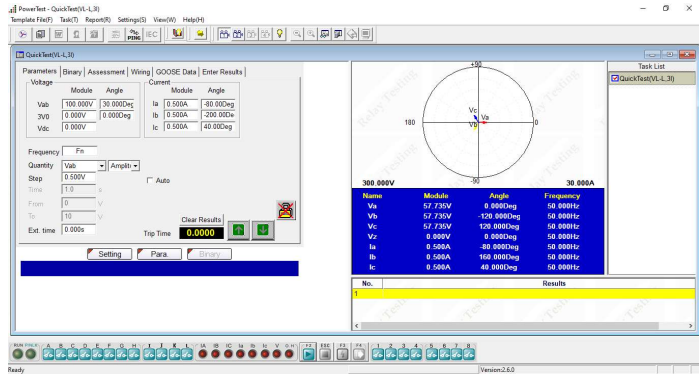
QuickTest (Sequence)

❖ Easy to control the sequence components (positive sequence, negative sequence and zero sequence) for voltage and current

❖ Amplitude and phase angle of the sequence components of voltage and current can be controlled independently

❖ Test can be in manual or auto mode

QuickTest (Power)

❖ Easy to control the output of power, including active power, reactive power and apparent power

❖ Amplitude of active power, reactive power and apparent power can be controlled independently
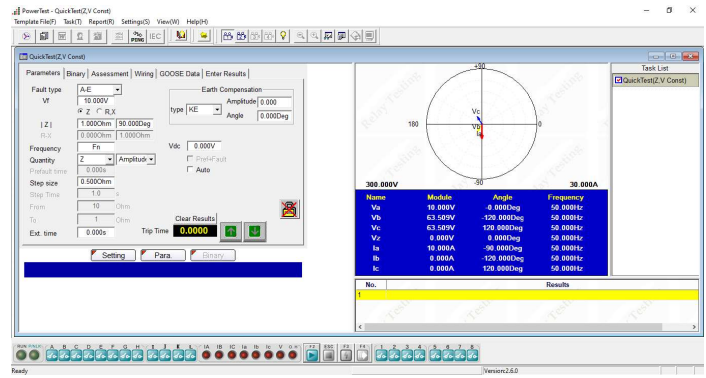
❖ Test can be in manual or auto mode
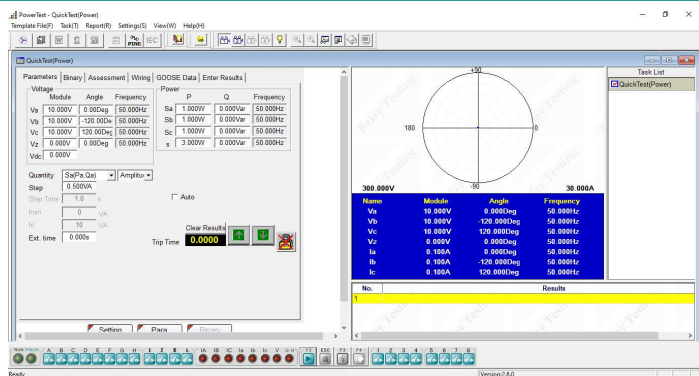
QuickTest (Z, I Const)

❖ Easy to test impedance relay with constant current

❖ Set the fault impedance and fault current, obtain the amplitude and phase angle of each phase voltage and current according to the fault type

❖ Can manually or automatic search the relay operation value
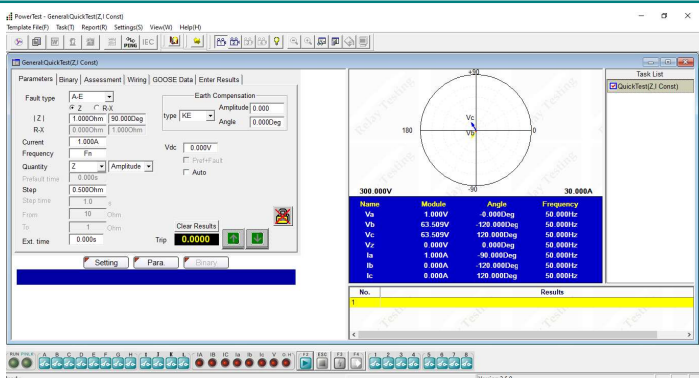
QuickTest (Z, V Const)

❖ Easy to test impedance relay with constant voltage

❖ Set the fault impedance and fault voltage, obtain the amplitude and phase angle of each phase voltage and current according to the fault type

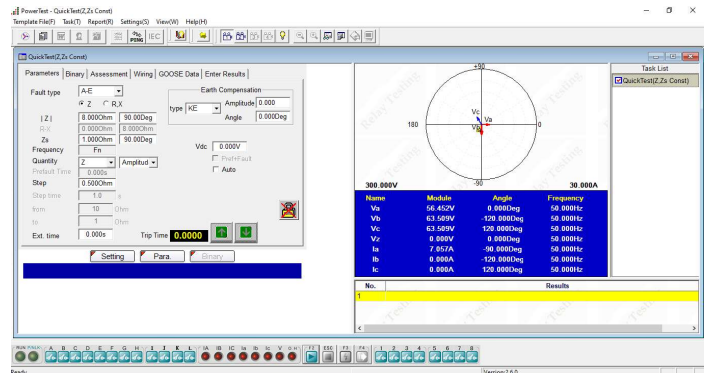❖ Can manually or automatic search the relay operation value

QuickTest (Z, Zs Const)

❖ Easy to test impedance relay with constant system impedance

❖ Set the fault impedance and system impedance, obtain the amplitude and phase angle of each phase voltage and current according to the fault type

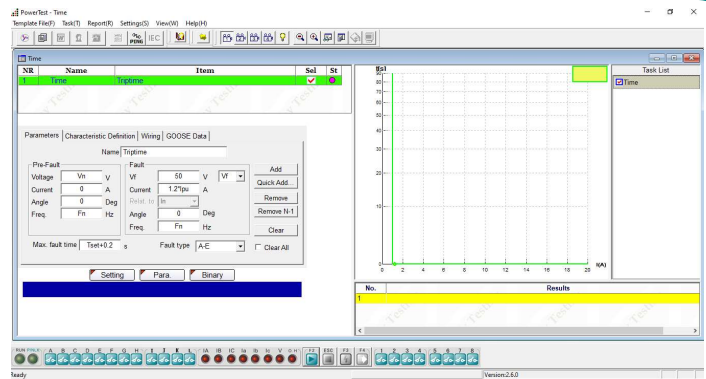❖ Can manually or automatic search the relay operation value

Time

❖ Time module is used to test trip delay time of protection relay

❖ Various value can be set separately, such as pick up value, delay time, pre-fault time, post-fault time, binary input/output, the voltage and current at pre-fault and fault state, characteristic definition, etc.


State Sequence (4V, 3I)

❖ Used to define multiple continuous state sequences for special test applications, such as generate a series of states to test the tripping time and close time

❖ 4 voltage and 3 current sources available for each state

❖ Trigger condition in each state can be set separately
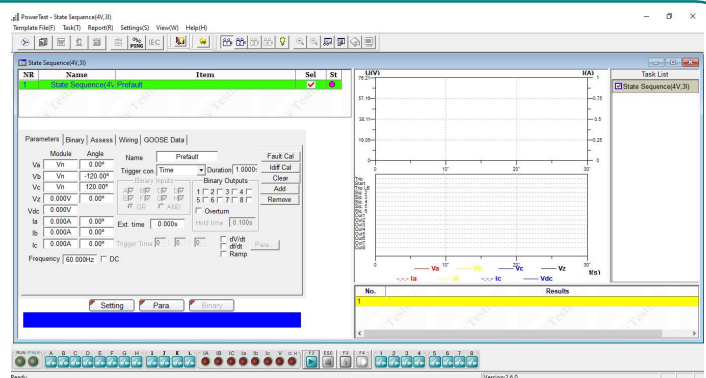
State Sequence (4V, 6I)

❖ Used to define multiple continuous state sequences for special test applications, such as generate a series of states to test the tripping time and close time

❖ 4 voltage and 6 current sources available for each state

❖ Trigger condition in each state can be set separately

❖ This module can be used by L336i only
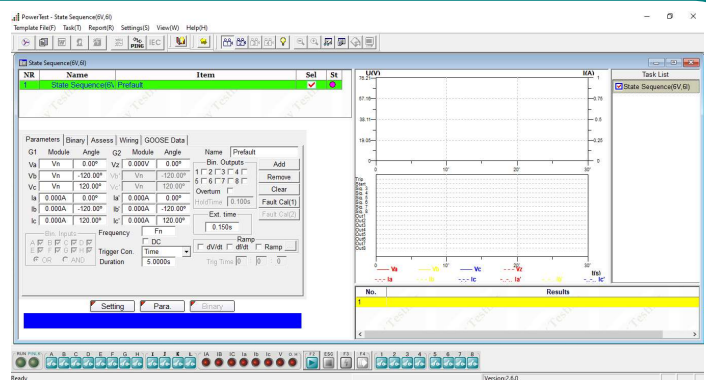
Ramp (3I)

- ❖ Specially designed to realize RAMP for different test applications, such as pick up/drop off value checking, directional relay testing, maximum torque angle checking etc.
- ❖ Both pulse ramp and linear ramp available
- ❖ Can search the relay operation value automatically

Pulse ramp   Linear ramp
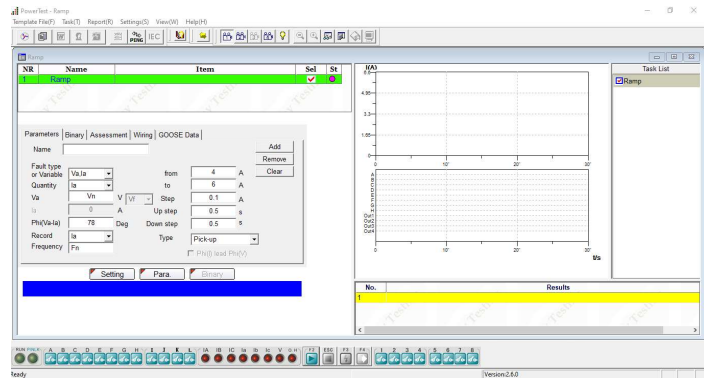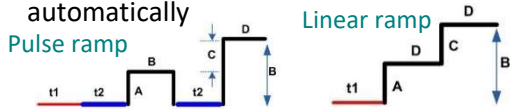
Harmonic

- ❖ Can generate harmonics for all voltage and current outputs
- ❖ Can check the 2nd /3rd / 4th /5th harmonic restraint of current differential
- ❖ Can check the harmonic measurement of the relay up to 31st harmonic
- ❖ Can set the harmonic for each channel separately
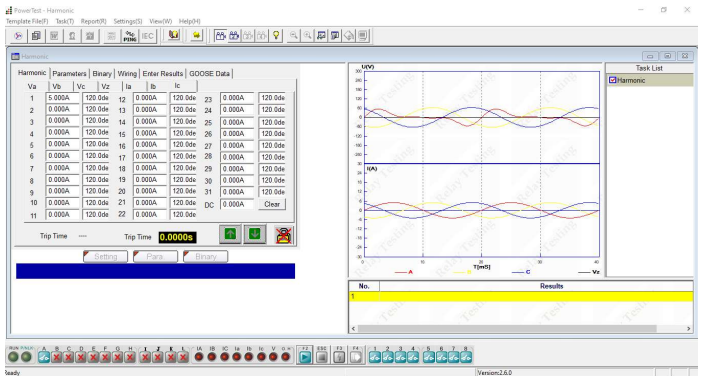
CB Operate

- ❖ Can check different types of line protection system, including over current, distance, etc.
- ❖ Can check the whole relay system, including auto-reclosing and circuit breaker simulate
- ❖ Can set different fault type
- ❖ Can do end-to-end test with GPS control mode
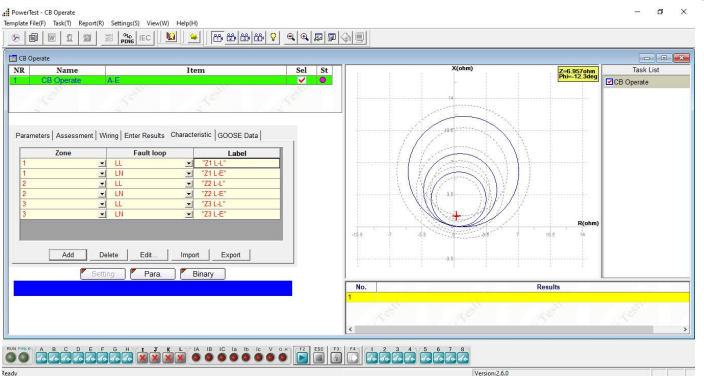
Non-electricity

- ❖ Give tips before and after testings to have test scheme prepared well and finished well
- ❖ Neither has any output value nor judge the binary input. It only generates a complete report for project check from appearance and safety.
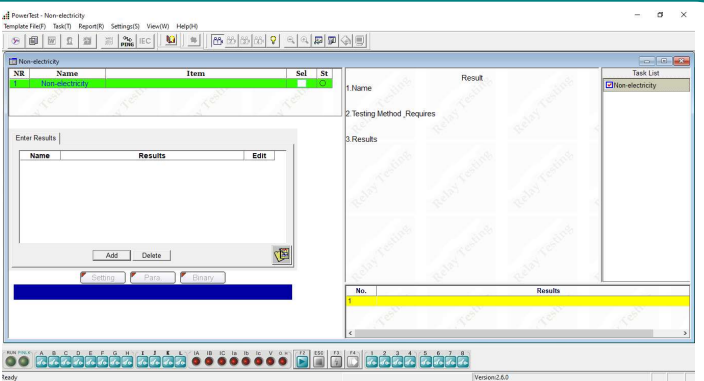
Transient Playback (4V,3I)

- ❖ Can play back the COMTRADE format file which records 4 voltage channels and 3 current channels
- ❖ Display the waveform and data of the imported COMTRADE file
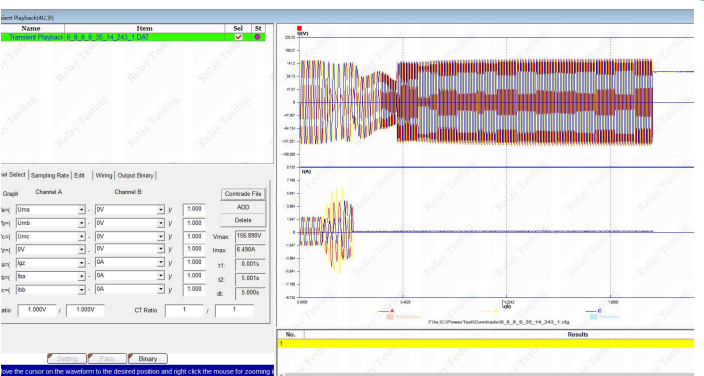
➢ Protection Package

In protection package, there are more testing modules for relay's characteristics testings, such as Distance, Differential, Directional, Time Inversed Current, Time Inversed Voltage, Frequency, Auto-Reclosing etc.

Distance (R-X)
- ❖ Can test impedance relay with R-X setting in different ways
- ❖ Input impedance characteristic to Z plain
- ❖ Associate the characteristic with relay settings
- ❖ Select test point/ items directly on Z plain or in setting box
- ❖ Zone verification
- ❖ Z-T test
- ❖ Edit new characteristic
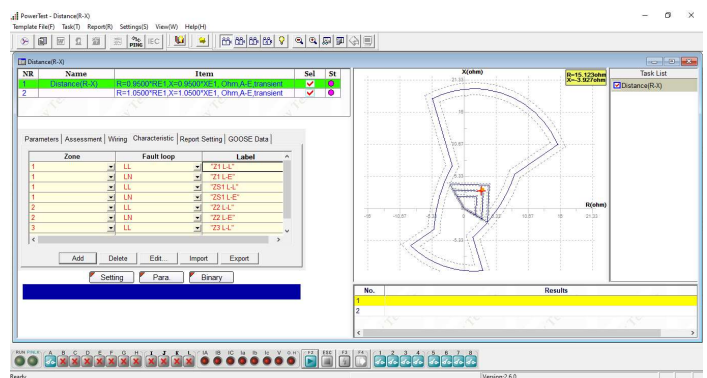
Distance (Z-Phi)
- ❖ Can test impedance relay with Z-Phi setting in different ways
- ❖ Input impedance characteristic to Z plain
- ❖ Associate the characteristic with relay settings
- ❖ Select test point/ items directly on Z plain or in setting box
- ❖ Zone verification
- ❖ Z-T test
- ❖ Edit new characteristic

Directional

- ❖ Can search maximum torque angle and two boundary angles (Lead and lag angles)
- ❖ Can set angle define, V lead I or I lead V
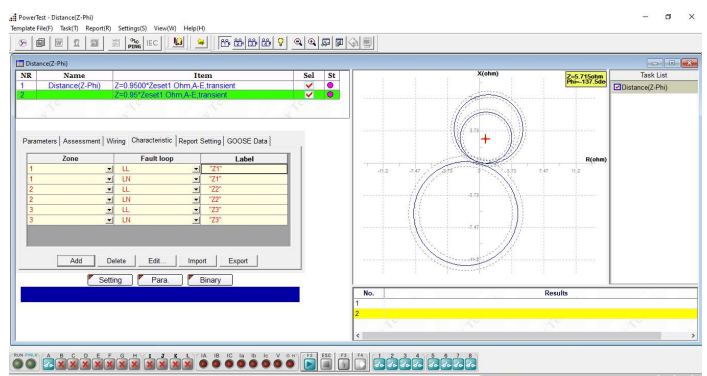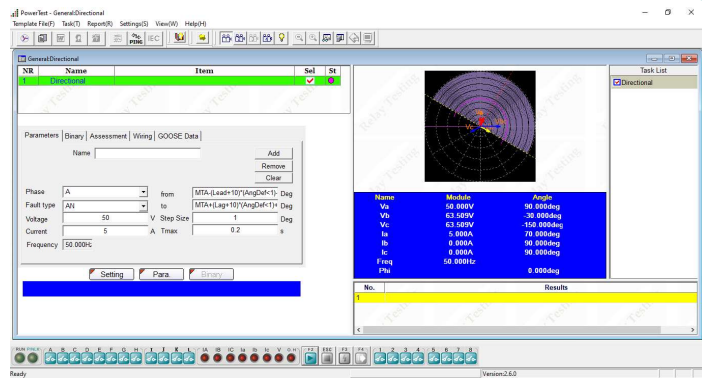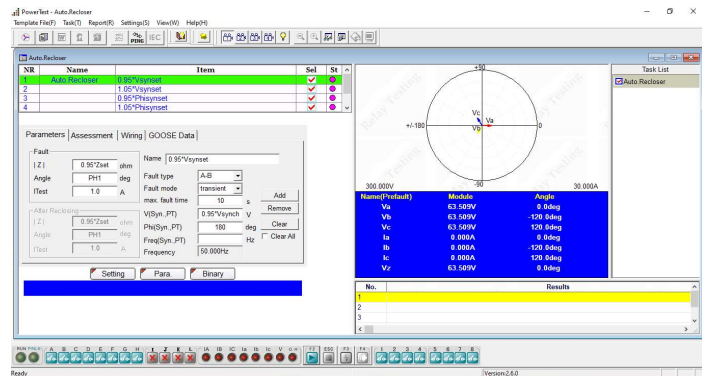- ❖ Can set fault type, singe phase, phase-phase or three phase fault

Auto-Reclosing

- ❖ Can test the reclose function
- ❖ Realize relay automatic reclosing with checking the difference between two systems, checking the synchronization setting, reclose set time checking and automatic evaluating of testing results.

Differential (3I)

- ❖ Can search out the percentage restraint curve, harmonic restraint, trip time for single phase fault
- ❖ Can search the percentage restraint curve
- ❖ Can check 2nd harmonic restraint
- ❖ Can check 3rd harmonic restraint
- ❖ Can check 5th harmonic restraint
- ❖ Can check tripping time of set points
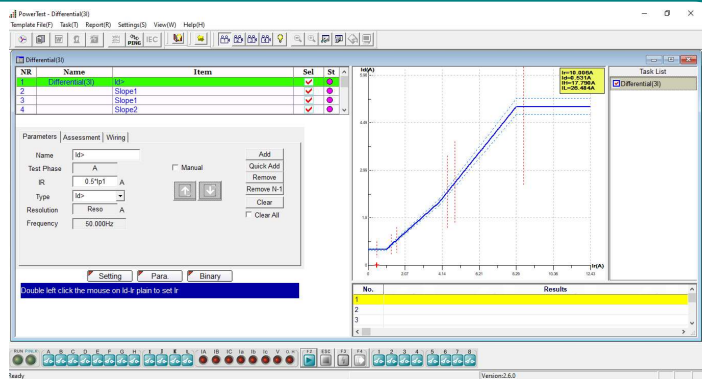
Differential (6I)

- ❖ Suitable for 6 output current channels' relay tester, such as transformer, generator and bus bar etc. differential protection equipment test
- ❖ Realize the two sides 3 phase/phase-phase/single phase test between relay tester and relay equipment.
- ❖ Can search the percentage restraint curve, harmonic restraint, trip time
- ❖ This module can be used by L336i only
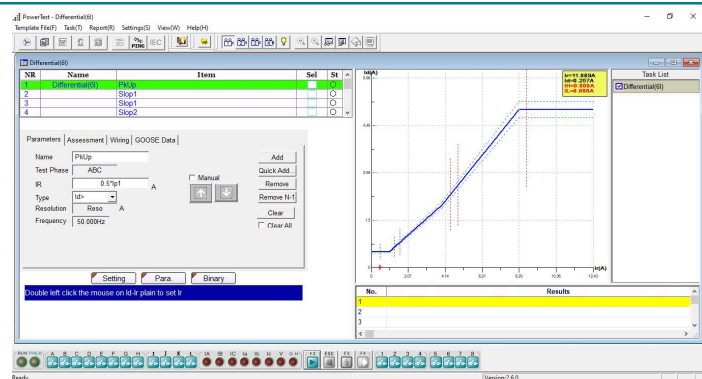
Time Inversed Current

- ❖ Realize the directional over-current test and non-directional over-current test
- ❖ Include testing positive sequence, negative sequence and zero sequence inverse-time over-current, definite-time over-current, over-heat protection.
- ❖ Can import the IEC and IEEE standard curve or user defined curve
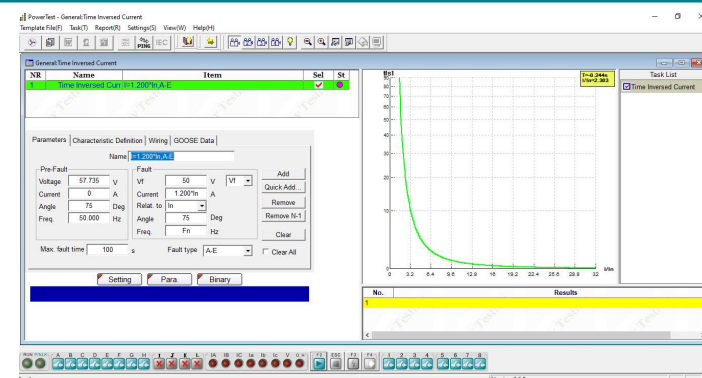
Time Inversed Voltage

❖ Can test time inversed over voltage and time inverse under voltage relay

❖ Include testing directional, time definite and with time delay voltage relay

❖ Can simulate three phase, phase-earth fault, and phase-phase fault
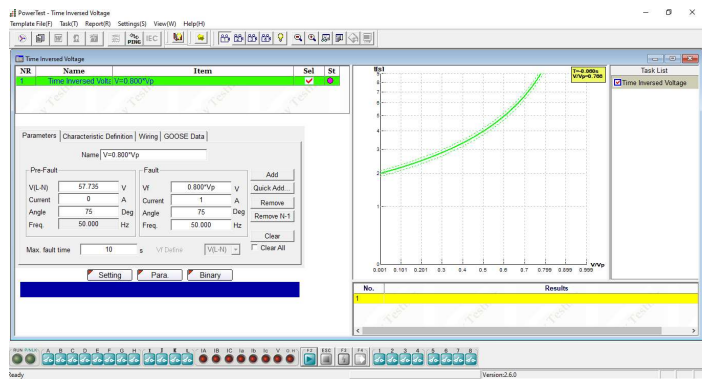
Frequency Relay

❖ Can test frequency protection relay, such as over frequency, under frequency, df/dt trip, df/dt blocking

❖ Including pick up frequency, trip time, df/dt setting value, voltage blocking value and current blocking value test
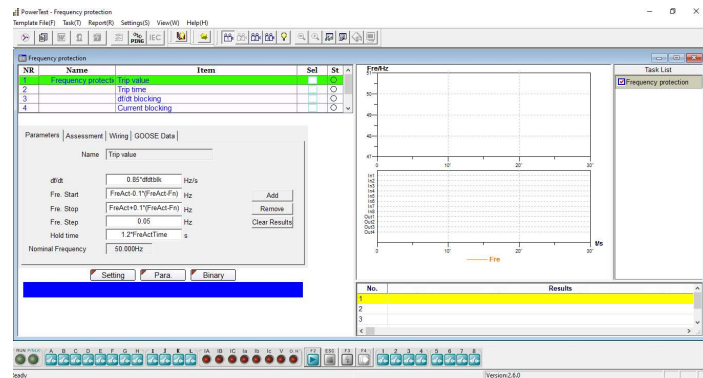
Voltage Relay

❖ Can test voltage protection relay including under voltage and over voltage

❖ Can test pick up voltage, trip time and dv/dt setting value
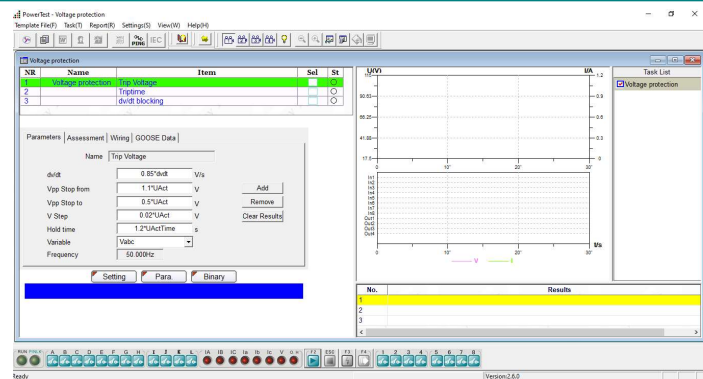
U. I. T Relay (AC)

❖ Can test AC type auxiliary/intermediate relay and AC type time relay

❖ Can test AC voltage type electromagnetic relay

❖ Can test AC current type electromagnetic relay

❖ Can test electromagnetic time relay picked-up by AC voltage

❖ Can test electromagnetic time relay picked-up by AC current
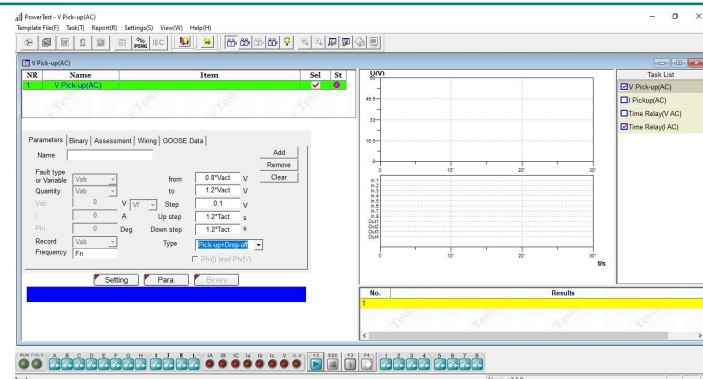
U. I. T Relay (DC)

❖ Can test DC type voltage relay. Auxiliary DC source Vdc is used for this test. Also DC current can be generated for some relays when it is required.

❖ Can test DC type current relay. Current source is used for this test. DC voltage can be generated for some relays when it is required.
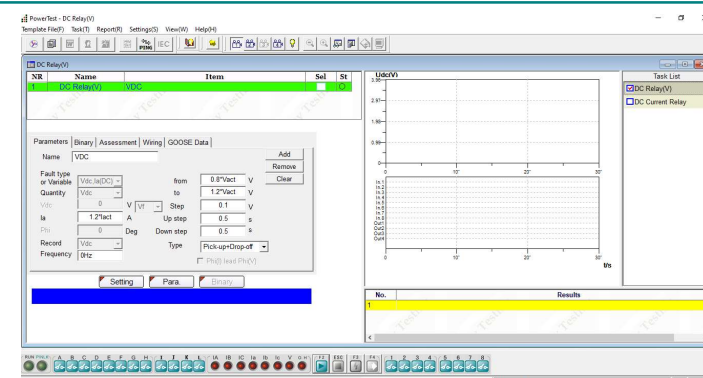
➢ Advanced Package

In the advanced package, the centralization testing the RX Characteristic Sweep, testing for distance relay, Advanced Differential, Advanced Transplay, Synchronization, etc.


Advanced Differential (3I)

- ❖ Can search the percentage restraint curve, harmonic restraint, trip time for single phase fault
- ❖ Can automatic to calculate the matching factor via the transformer parameter and CT/PT parameter
- ❖ Only check single phase fault
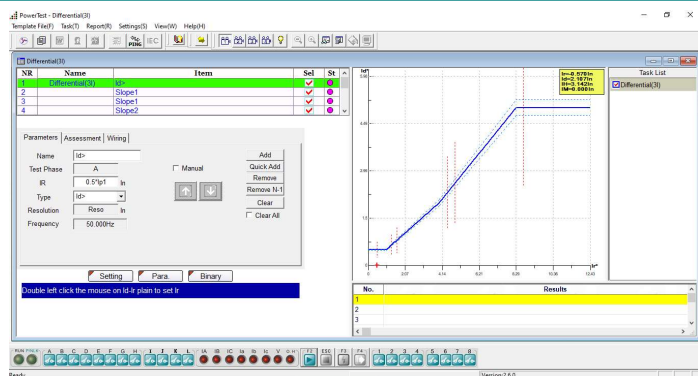
Advanced Differential (6I)

- ❖ Can search the percentage restraint curve, harmonic restraint, trip time
- ❖ Can automatic to calculate the matching factor via the transformer parameter and CT/PT parameter
- ❖ Can test single phase, phase-phase，three-phase fault
- ❖ This module can be used by L336i only
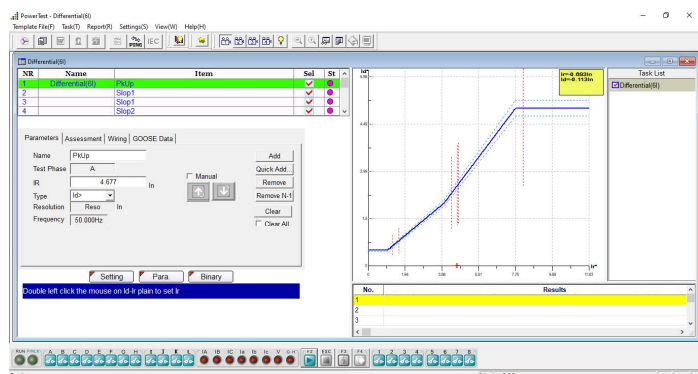
Advanced TransPlay(4V,3I)

❖ Can play back the COMTRADE format file, including CFG, which describe signal names, sampling frequencies, etc. and DAT which contains the sampling values for each channel.

❖ Can edit the COMTRADE data
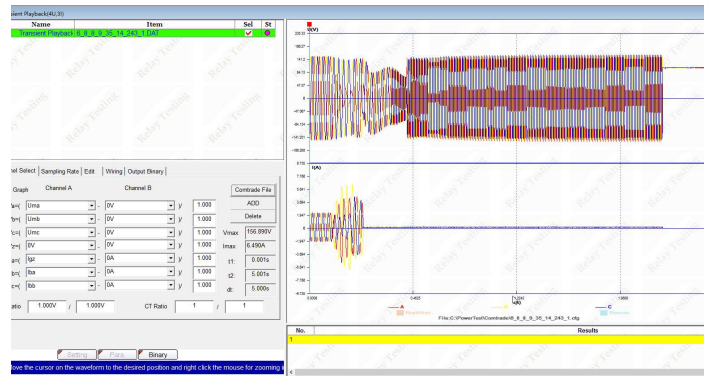
RX Characteristic Sweep

❖ Can search the characteristic boundary of the impedance relay

❖ Can find the boundary at different angles
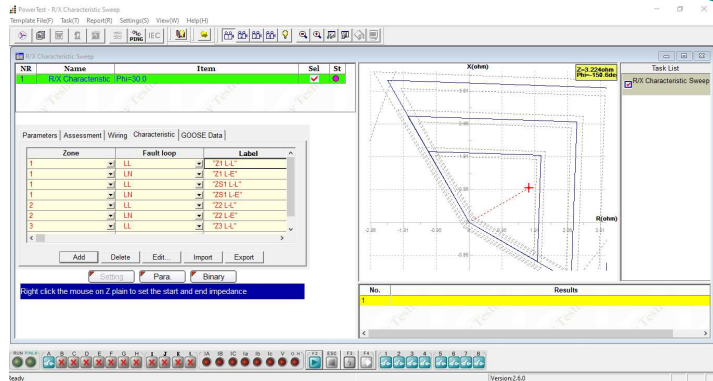
Synchronizer

❖ Can check synchronizing relay

❖ Can check voltage difference

❖ Can check frequency difference

❖ Can check leading time and leading angle

❖ Can check pulse width for frequency adjustment

❖ Can check pulse width for voltage adjustment

❖ Can check auto-adjusting function with both voltage and frequency varying
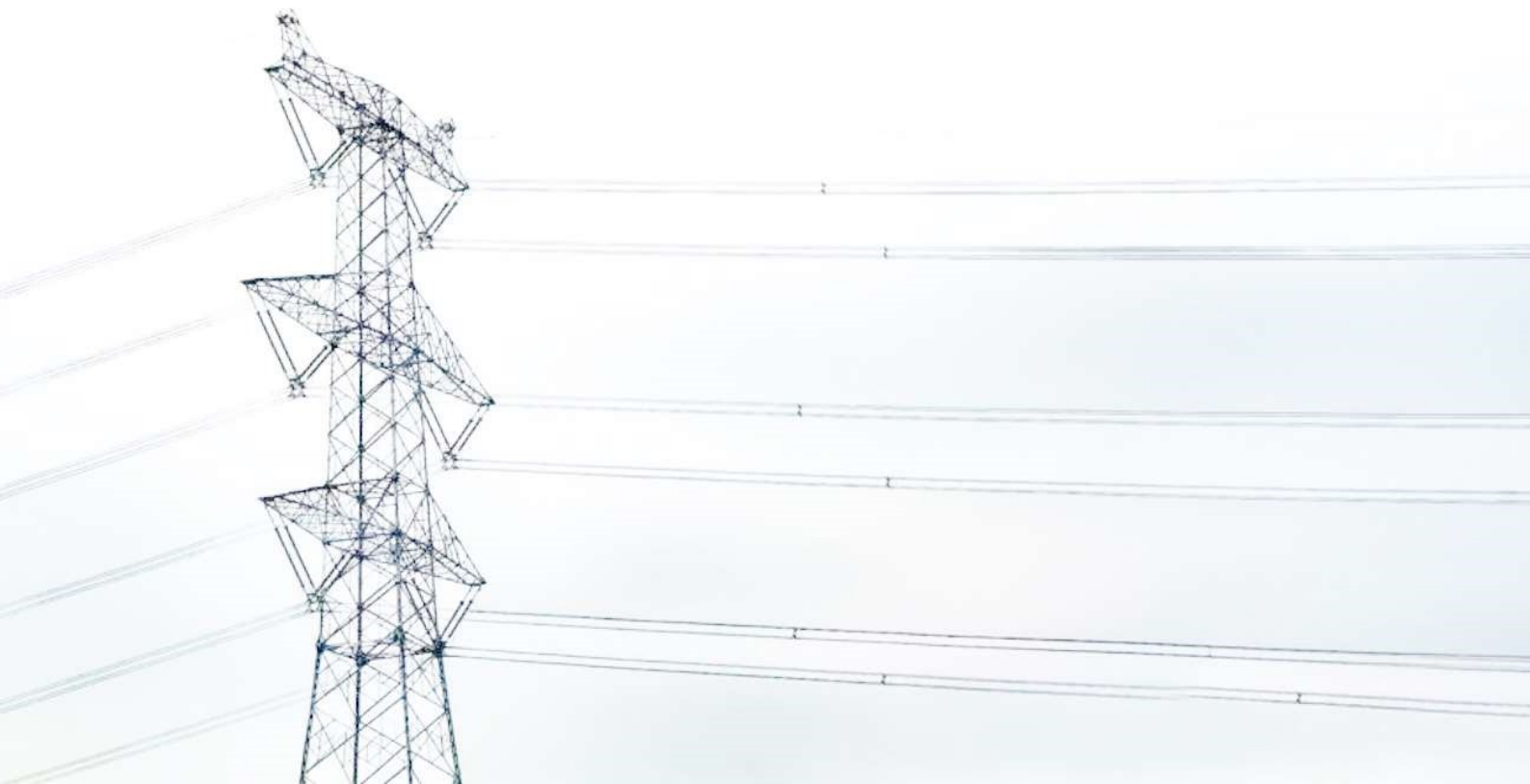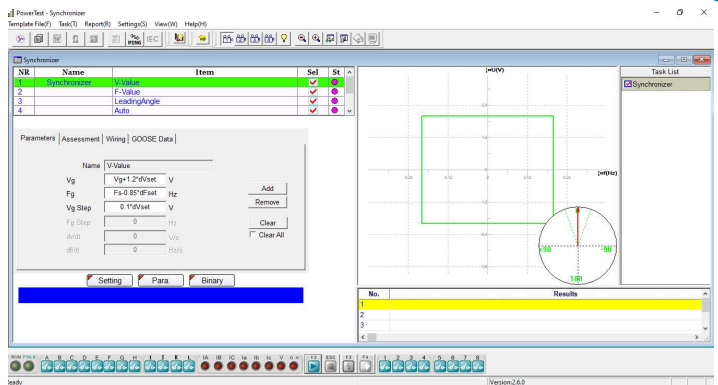
➢ Special Package

In the special package, there are energy meter module, power swing simulation module and Transducer module can be used by L336i or L336i-E.
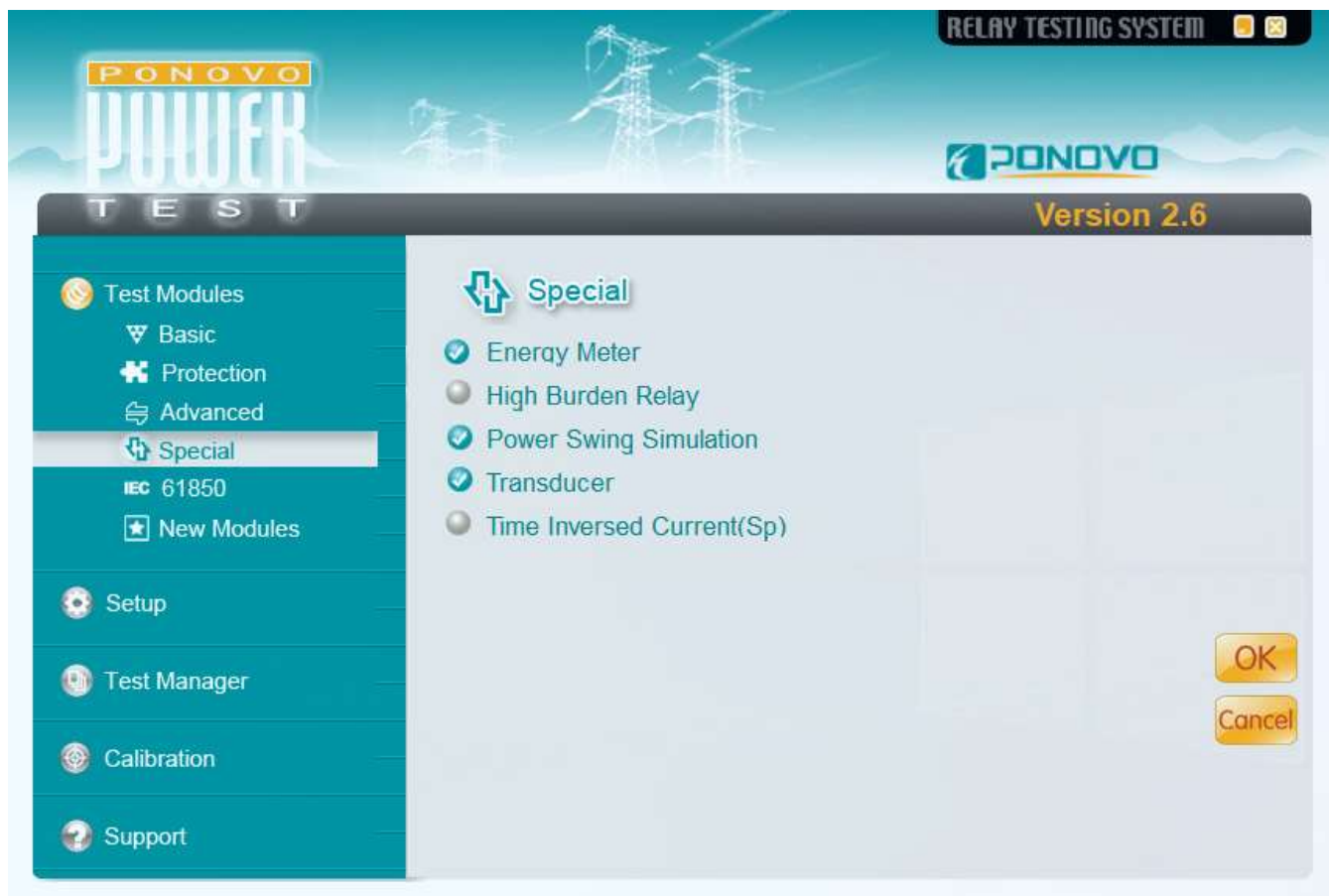
Energy Meter

- ❖ Can check the functionality and accuracy of energy meter with or without optional accessory PACB108
- ❖ 1-phase or 3-phase energy meters can be checked
- ❖ Active power meter, reactive power meter, and apparent power meter can be checked
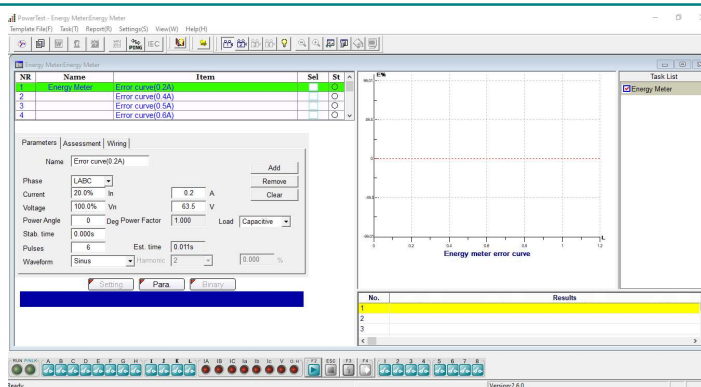
Power Swing Simulation

- ❖ Can really simulate the oscillations in power flow reference the power parameter
- ❖ Can simulate Out-Of-Step and Stable swing
- ❖ Can simulate increase and decrease swing
- ❖ Can be a tool for relay test engineer to observe the relay behavior during dynamic power swing process.
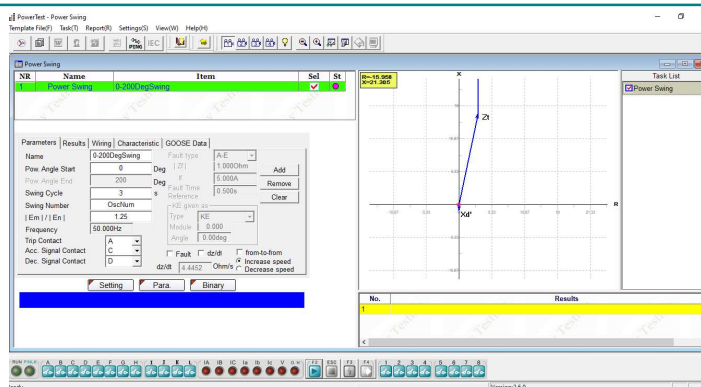
Transducer

❖ Can check accuracy of transducer
❖ This module can be used by L336i-E only
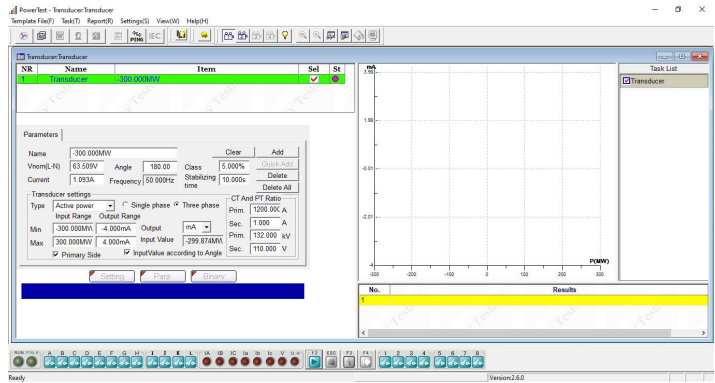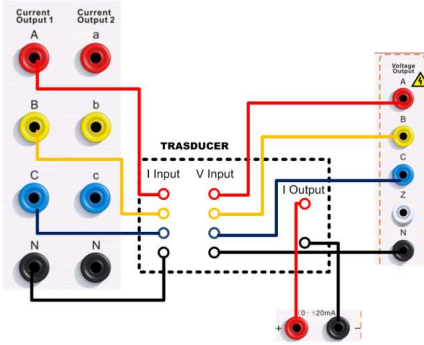
➢ New Modules Package

In the New Modules package, there are modules loss of excitation, QuickTest(harmonic) and Transply(6V, 6I) applied for L336i or L336i-E.

Loss of excitation

❖ Can search for two different excitation loss characteristics
❖ During the test process a series of shots will be generated to search out the boundary along this shot line. Then next shot at a different angle will be generated. In this way we can then find out the boundary at different angles.
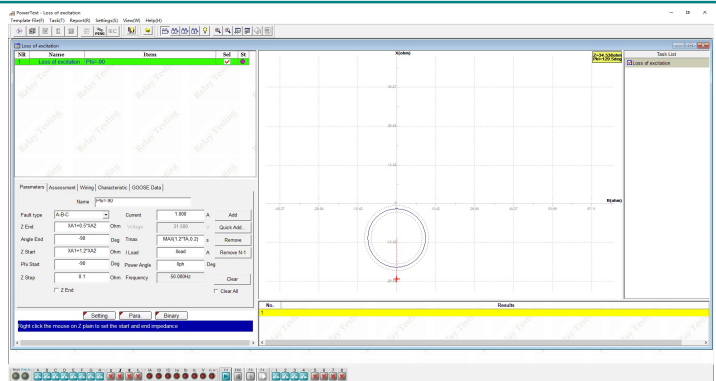
QuickTest (Harmonic)

- ❖ Can automatically and manually superposition harmonics with user-defined frequency
- ❖ The fundamental and harmonic of voltage and current sources can be controlled independently
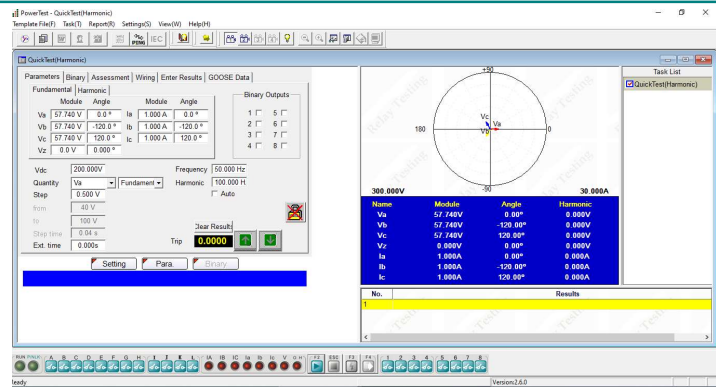
Transplay (6V, 6I)

- ❖ Can play back the COMTRADE format file which records 4 voltage channels and 6 current channels
- ❖ Display the waveform and data of the imported COMTRADE file
- ❖ This module can be used by L336i only
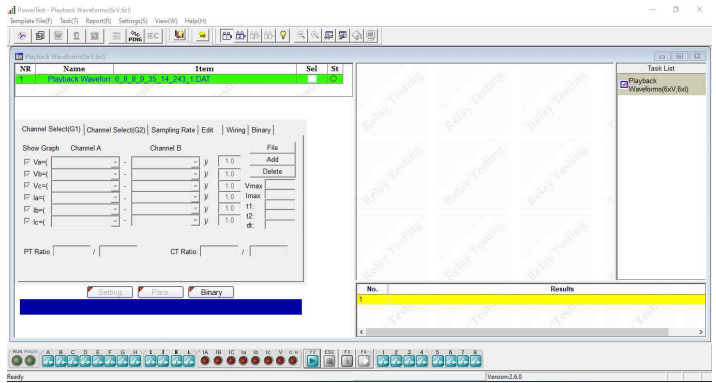
PONOVO Template Service

Besides the above standard test modules, the relay templates are provided for the automatic testing purposes. Every relay template is created based on each relay model and its function from different relay manufacturers, and the setting names in the templates are the same as what they are in the relay, so it is easy for the engineer to conduct the site testing and simplify the works greatly. There are more than 500 different relay templates available for customers to download from the website for free.

The CSV/RIO/XIRO files can be imported into the templates by PowerTest.

The optional service such as offering the customized templates and reports is provided by PONOVO.
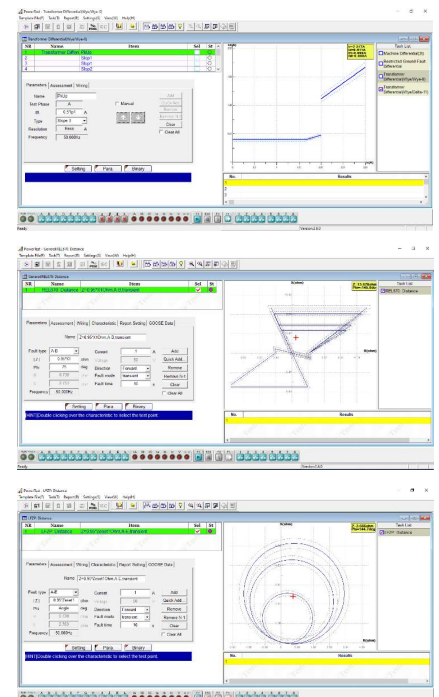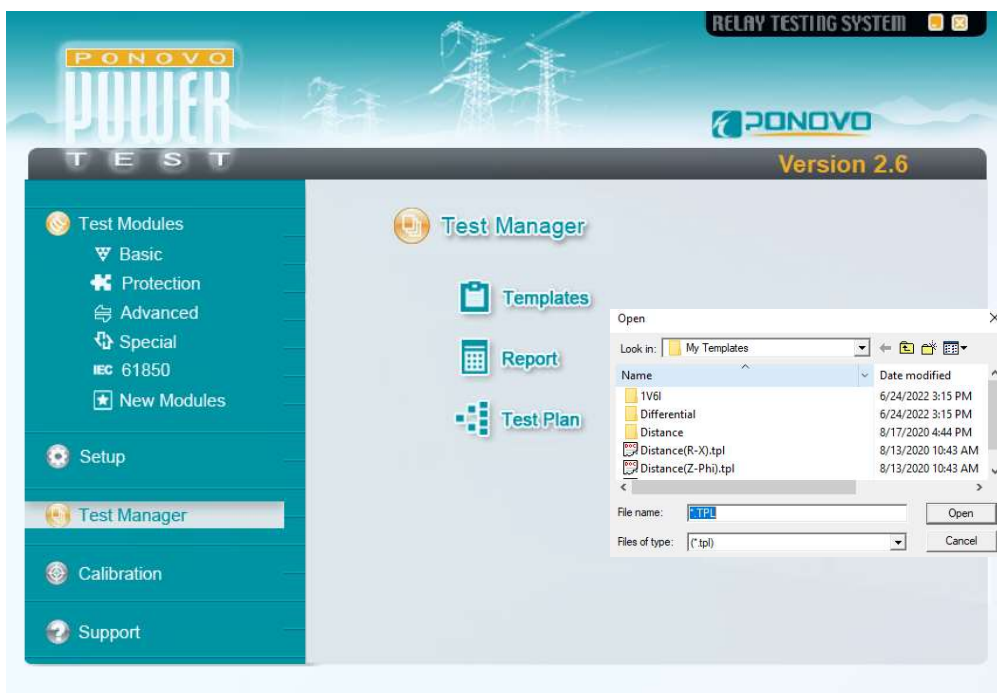
More Templates can be download from our website www.ponovo.net

AREVA

• CAG17	• CTU	• P115	• P142	• P343	• P438	• P941	• VAGM22
• CTIG	• DIFB	• P120	• P143	• P344	• P441	• P942	• VAPM
• CTIGM	• MFVUM	• P121	• P144	• P345	• P442	• P943	• P632
• CTMFM	• Micromho	• P122	• P145	• P430	• P443	• PPX	• P633
• CTMM	• MVAPM	• P123	• P241	• P433	• P921	• PVMM	• P634
• CTNM	• MWTU	• P124	• P242	• P435	• P922	• Quadromho	• P642
• CTT	• Optimho	• P127	• P243	• P436	• P923	• SKE	• P643
• CTTM	• P111	• P141	• P342	• P437	• P940	• SKD	• P645 •••

SEL

• SEL300	• SEL411
• SEL351	• SEL311C
• SEL587	• SEL311L
• SEL311B	• SEL321
• SEL487B	• SEL421
• SEL487E	• SEL501
• SEL167	• SEL587 •••

SIEMENS

• 7RW600	• 7SD5	• 7ST6
• 7SA6XX	• 7SD52	• 7UM61
• 7SA511	• 7SD63	• 7UM62
• 7SA513	• 7SJ61	• 7UM512
• 7SA518	• 7SJ63	• 7UM515
• 7SA519	• 7SJ80	•••
• 7SA522	• 7SS52	

ABB

• LZ96	• REC670	• REL356	• REL670
• REG100	• REF542	• REL511	•••
• REL511	• REG216	• REL512	
• REL531	• REL300	• REL521	
• MSOC	• REL316	• REL531	
• RAZFE	• REL350	• REL561	
• REB670	• REL352	• REL650	

NR

• PCS-902	• PCS-9611
• RCS-915	• PCS-902H
• RCS-931	• PCS-931D
• RCS-993	• PCS-9611C
• RCS-902	•••

GE

• SR489	• D60
• SR745	• DLPD
• F650	• G30
• SR750	• L90
• GT60	• GE345
	•••

Schneider Electric

• SEPAM 10	
• SEPAM 80	
• SEPAM 2000	
• SEPAM S42	
• T20	•••

WOODWARD

• MRA4
• MRDT4
• MRI4
• MRM
• MRN •••

TOSHIBA

• GRB100
• GRD110
• GRD140
• GRD150
• GRF100
• GRL100 •••

ERL

• F _PRO
• L _PRO
• T_ PRO •••

VAMP

• VAMP 255
• VAMP 265 •••

SIFANG

• 326GD •••

www.adv-cs.com

• PCT210 •••
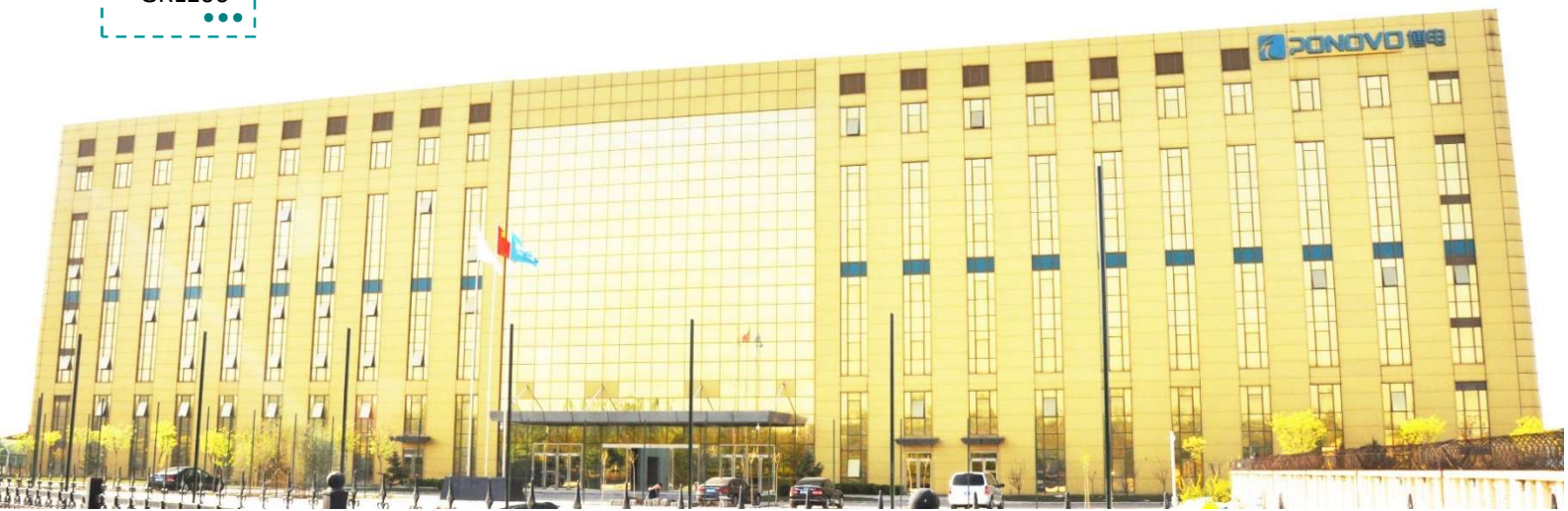
Optional Accessories

• PW-VP50 CT Polarity checker

2 units. Master machine injects pulse current to primary side of CT, slave machine receives and analysis the waveform of induced pulse current at the secondary side so as to judge the polarity is positive or negative automatically by the LED indicator on the kits.

• GPS synchronization (PGPS02/PGPS04i)

PGPS02

PGPS04i

PGPS02: It provides GPS synchronization signal in PPS (pulse per second) or PPM (pulse per minute) for synchronized test. Trigger time can be set for end‑ to‑end test application.

PGPS04i: The PGPS04i is a multi-functional time synchronization device that integrates with GPS time synchronization, IRIG-B (DC-TTL/DC-RS422/optical) outputs, IRIG-B (DC-TTL/DC-RS422/fiber) pulse input, 1PPS/1PPM (DC-TTL/DC-RS232 /fiber) pulse output, timing set of whole trigger points, real-time clock auto-generating and other relevant functions.

• Circuit breaker simulator (PSS01)
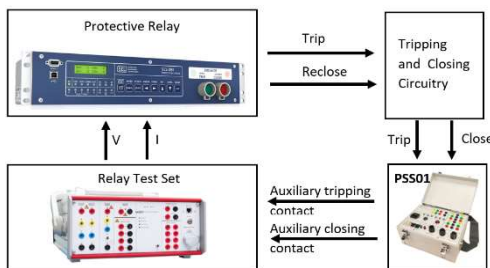
Working together with PONOVO relay testing device, PSS01 is to be used to simulate the circuit breaker operation for checking the relay scheme performance. Complicated software settings can be avoided by using this simple accessory.

• Scanning Head (PACB108)

PACB108

The passive optical scanning head PACB108 detects the status of an LED, that is either an optical pulse output from an energy meter or the binary status of a protective relay or other similar optical source.

L336i
SUPER-LIGHT Protection Relay Test Set

Specifications

AC Current outputs

Control	Independent control of amplitude, frequency and phase angle
Range	6×15A / 3×30A / 1×60A
Accuracy	error < 0.08 % rd. + 0.02 % rg. guar.
	error < 0.03% rd. + 0.02 % rg. typ.
Resolution	1mA
Output power	≥210VA (at 30A, LN)
	≥105VA (at 15A, LN)
Output response time	<100μs
Distortion (THD%)	<0.05% type.,<0.1% guar., at >0.5A
Frequency- Amplitude characteristic	≤± 0.1%~± 0.5% (1Hz~1kHz)
Output time	continuous (<10A/channel)
	>70s (10~20A/channel)
	>15s (≥20A/channel)
Operation indication	Overload, distortion, open circuit, over heat

AC voltage outputs

Control	Independent control of amplitude, frequency and phase angle
Fourth voltage (Uz)	0~300V

Setting range

4-phase ac(L-N)	4×0~300V
1-phase ac(L-L)	1×0~600V

Power

4-phase ac(L-N)	4×75VA typ., at 300V
	4×50VA guar., at 300V
3-phase ac(L-N)	3×100VA typ., at 300V
	3×85VA guar., at 300V
1-phase ac(L-L)	1×200VA typ., at 600V
	1×170VA guar, at 600V
Accuracy	error < 0.08 % rd. + 0.02 % rg. guar.
	error < 0.03% rd. + 0.02 % rg. typ.
Resolution	1mV(<30V), 10mV(30V~300V)
Output response time	<100μs
Distortion (THD%)	<0.05% type., <0.1% guar., at 30V-300V
Frequency- Amplitude characteristic	≤± 0.1%~± 0.5% (1Hz~1kHz)
Output time	Continuous at rated output condition
Operation indication	Overload, distortion, short circuit, over heat

Frequency

Sine signal	DC, 0.001Hz~1000Hz
Accuracy	0.3ppm
Resolution	0.001Hz
Output characteristic	Can simulate 2nd -20th harmonic or DC

Phase angle

Range	-360°~+360°
Accuracy	±0.05° type., ±0.1° guar.
Resolution	0.001°

Synchronization time between current and voltage outputs

	≤10μs

DC Current outputs

Range	3×0~10A / 1×0~30A
Accuracy	±5mA (0.2A~1A) ±0.5% (1A~10A)
Resolution	1mA
Output power	3×100W at 10A / 1×300W at (30A 10V)
Operation indication	Overload, distortion, open circuit, over heat

DC voltage outputs

Range	4×±0~300V / 1×±0~600V
Accuracy	±50mV (2V ~10V), ±0.5% (10 ~300V)
Resolution	10mV
Output power	100W at 300V

Binary inputs

Number	8
Input characteristics	0~400Vdc/400Vac Peak threshold or potential free
Time resolution	50μs
Max. measuring time	Infinite
Debounce/Deglitch time	0~25ms
Counting function	<3kHz, at pulse width>150μs

Binary output

Number	4
Characteristic	Potential free relay contact
Break capacity ac	Vmax：250V(AC)/Imax：0.5A
Break capacity dc	Vmax：250V(DC)/Imax：0.5A

IEC61850 upgrade (Optional)

Interpretation hardware is in-built. Please contact the supplier for options to activate the IEC61850 software support function

Power Supply

Input	110-240Vac
Frequency	50/60Hz
Max. current	6.3A

Environmental conditions

Operation temperature	0~+50℃
Storage temperature	-25~+70℃
Relative humidity	5~95% non - condensing
EMC(E&I)	EN/IEC61326-1 EN/IEC 61000-3-2/3
	EN/IEC61000-4-2/3/4/5/6/8/11/18
Environment	EN/IEC 60068-2-1/2/3/6/27
Safety	EN/IEC 61010-1/1-12/2-030 EN/IEC 60255-25/27
Others	FCC Part 15:Sub B ECS-001:2006 LVD EU

Others

PC connection	Ethernet，10M/100M
Wireless control	Cellphone APP(optional)
GPS interface	DB9
Ground Socket (earth)	4mm banana socket
Dimension(W×H×D)	256mm × 110mm× 395mm
Weight	8.6 kg

Specifications are subject to modification without notice

L336i-E

SUPER-LIGHT Three-phase Relay Test Kit

Specifications

AC Current outputs

Control	Independent control of amplitude, frequency and phase angle
Range	3×20A / 1×60A
Accuracy	error < 0.08 % rd. + 0.02 % rg. guar.
	error < 0.03% rd. + 0.02 % rg. typ.
Resolution	1mA
Output power	≥140VA at 20A, LN
Output response time	<100μs
Distortion (THD%)	<0.05% type.,<0.1% guar., at >0.5A
Frequency- Amplitude characteristic	≤± 0.1%~± 0.5% (1Hz~1kHz)
Output time	continuous (<10A/channel)
	>70s (10~20A/channel)
	>15s (≥20A/channel)
Operation indication	Overload, distortion, open circuit, over heat

AC voltage outputs

Control	Independent control of amplitude, frequency and phase angle
Fourth voltage (Uz)	0~300V

Setting range

4-phase ac(L-N)	4×0~300V
1-phase ac(L-L)	1×0~600V

Power

4-phase ac(L-N)	4×75VA typ., at 300V
	4×50VA guar., at 300V
3-phase ac(L-N)	3×100VA typ., at 300V
	3×85VA guar., at 300V
1-phase ac(L-L)	1×200VA typ., at 600V
	1×170VA guar, at 600V
Accuracy	error < 0.08 % rd. + 0.02 % rg. guar.
	error < 0.03% rd. + 0.02 % rg. typ.
Resolution	1mV(<30V), 10mV(30V~300V)
Output response time	<100μs
Distortion (THD%)	<0.05% type.,<0.1% guar., at 30V-300V
Frequency- Amplitude characteristic	≤± 0.1%~± 0.5% (1Hz~1kHz)
Output time	Continuous at rated output condition
Operation indication	Overload, distortion, short circuit, over heat

Frequency

Sine signal	DC, 0.001Hz~1000Hz
Accuracy	0.3ppm
Resolution	0.001Hz
Output characteristic	Can simulate 2nd -20th harmonic or DC

Phase angle

Range	-360°~+360°
Accuracy	±0.05°type., ±0.1°guar.
Resolution	0.001°

Synchronization time between current and voltage outputs

	≤10μs

Power Supply

Input	110-240Vac
Frequency	50/60Hz
Max. current	6.3A

DC Current outputs

Range	3×±0~10A / 1×±0~30A
Accuracy	±5mA (0.2A~1A) ±0.5% (1A~10A)
Resolution	1mA
Output power	3×100W at 10A / 1×300W at (30A 10V)
Operation indication	Overload, distortion, open circuit, over heat

DC voltage outputs

Range	4×±0~300V / 1×±0~600V
Accuracy	±50mV (2V ~10V), ±0.5% (10 ~300V)
Resolution	10mV
Output power	100W at 300V

Binary inputs

Number	8
Input characteristics	0~400Vdc/400Vac Peak threshold or potential free
Time resolution	50μs
Max. measuring time	Infinite
Debounce/Deglitch time	0~25ms
Counting function	<3kHz, at pulse width>150μs

Binary output

Number	4
Characteristic	Potential free relay contact
Break capacity ac	Vmax：250V(AC)/Imax：0.5A
Break capacity dc	Vmax：250V(DC)/Imax：0.5A

DC voltage measuring input

Measuring range	0~ ±10V
Accuracy	error <0.02% rg. typ. (<0.05% rg. guar.)
Input impedance	100KΩ

DC current measuring input

Measuring range	0~±20mA
Accuracy	error <0.02% rg. typ. (<0.05% rg. guar.)
Input impedance	50Ω

IEC61850 upgrade (Optional)

Interpretation hardware is in-built. Please contact the supplier for options to activate the IEC61850 software support function.

Environmental conditions

Operation temperature	0~+50℃
Storage temperature	-25~+70℃
Relative humidity	5~95% non - condensing
EMC(E&I)	EN/IEC61326-1 EN/IEC 61000-3-2/3
	EN/IEC61000-4-2/3/4/5/6/8/11/18
Environment	EN/IEC 60068-2-1/2/3/6/27
Safety	EN/IEC 61010-1/1-12/2-030 EN/IEC 60255-25/27
Others	FCC Part 15:Sub B ECS-001:2006 LVD EU

Others

PC connection	Ethernet, 10M/100M
Wireless control	Cellphone APP(optional)
GPS interface	DB9
Ground Socket (earth)	4mm banana socket
Dimension(W×H×D)	256mm × 110mm× 395mm
Weight	8.6 kg

Specifications are subject to modification without notice

Professional Solution Provider For The Power World

*Since 2001, **Ponovo Power** has been focusing on providing professional solutions to over 5000 clients in the fields of intelligent testing and power quality control in China and aboard*