

CLEAR VISION SOUND STRATEGIES

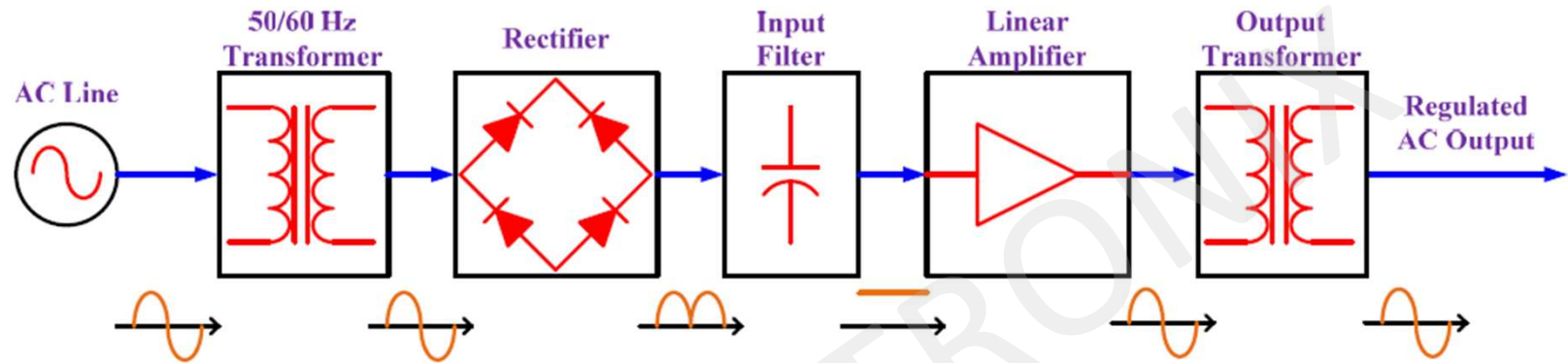
SOLID PERFORMANCE



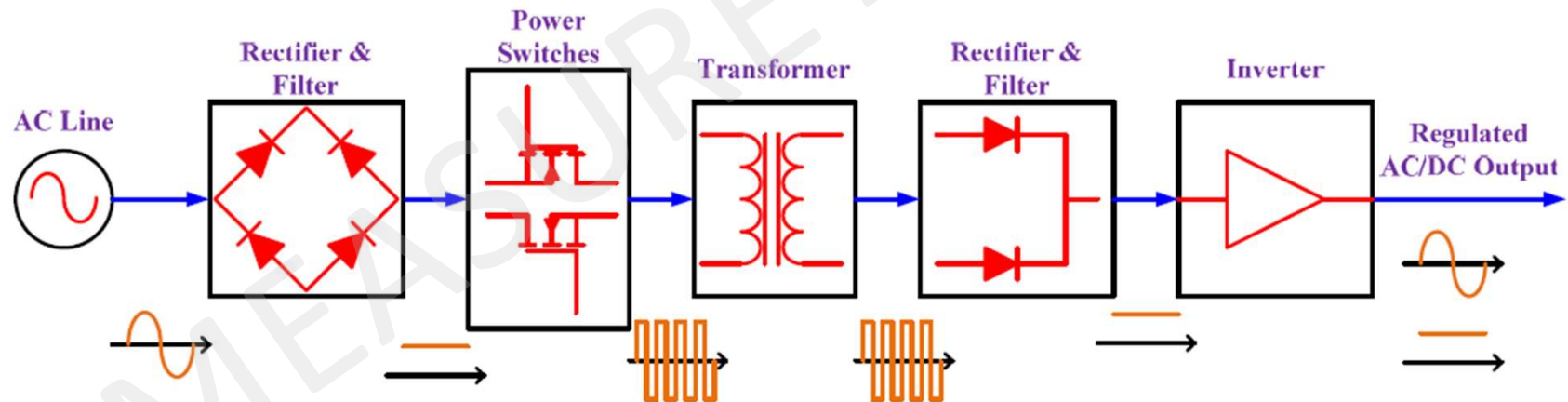
Programmable AC/DC Power Source

AC Power Supply Topologies

Linear with Output Transformer



Switched Mode



AC Source Key Applications

High frequency / Fast Transient

Power Bus simulation / Compliance test

- Aircraft bus
 - Boeing 787
 - Mil DO-160; MIL -704
 - Airbus ABD0100 ; AMD24
- Automotive
 - Hybrid
 - Conventional

Fast Transient / Measurement

AC Power Stimulus with measurement for conducted EMC test

- Conducted EMC to EN / IEC 61000
 - Harmonics
 - Flicker
 - AC Voltage Dips and Variations
 - Three phase AC Voltage Unbalance
 - Voltage Dips and Interruptions

AC Power Stimulus for radiated EMC compliance test

- Radiated EMC to
 - EN / IEC 61000
 - FCC regs

Basic 50 /60 /400Hz Frequency Converter

General purpose R&D

General Purpose service and repair

General Purpose acceptance test

- Appliance / white goods
- Consumer electronics
- Avionics
- Marine / shipboard equipment
- Aircraft avionics
- AC to DC power supplies

V/Freq /Phase Control

AC Motor test

AC Motor driver test

Remote Vehicle power

Applications

- Basic voltage and frequency conversion
- Unique lab power
- Stabilize facility power
- ATE
- Avionics
- IPS
- IEC
- Motor test
- Power supply test
- Tools
- Electronics
- Medical Equipment
- UPS
- Grid tie inverters
- Appliances
- Relay testing
- Watt hour meters
- Life cycle testing
- Wire harness test
- Oil exploration
- Ballast test
- Burn-In
- Product validation
- EMC
- Inverter test



Electric Vehicle



Motors/Compressors



Medical Equipment



Laboratory



Home Appliances



Switches



Smart Grid



Factory Production Line

California Instruments i/iX Series II

3000–15000 VA


General purpose AC power sources

150–300 V

- Combination AC and DC Power Source and Power Analyzer
- 3000 VA - 15000 VA of Output Power
- Arbitrary Waveform Generation
- Built-in Digital Power Analyzer
- Scope Capture Capability
- EN61000-3-2 and EN61000-3-3
- Powerful Programming Software
- Constant Power Mode



0–120 A

	208	230	400
	208	230	

ETHERNET   RS232

Avionics Test



Power Simulation



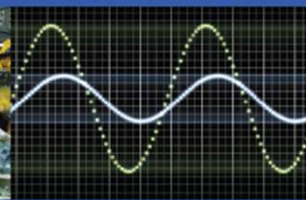
ATE Applications



Manufacturing



Frequency Conversion

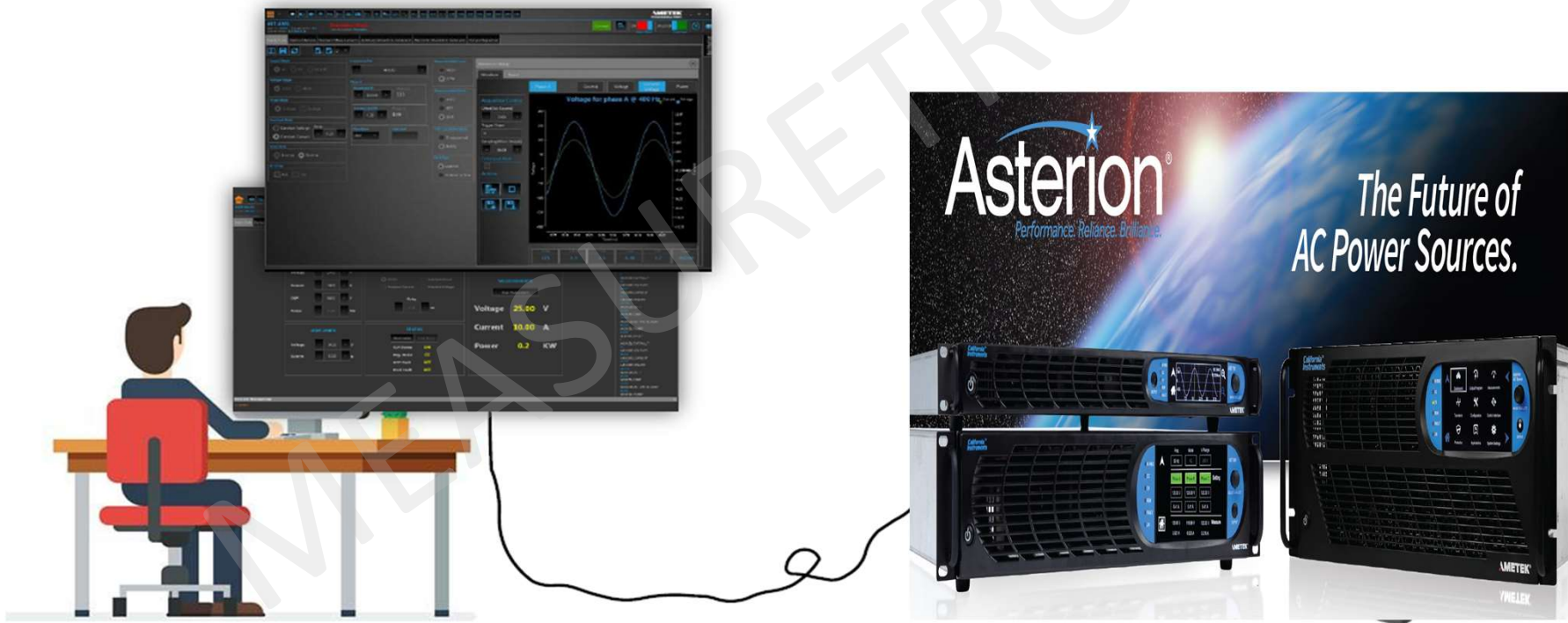


IEC Standards Testing



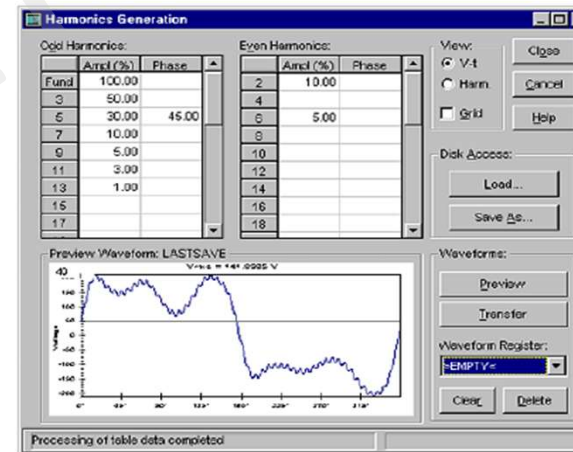
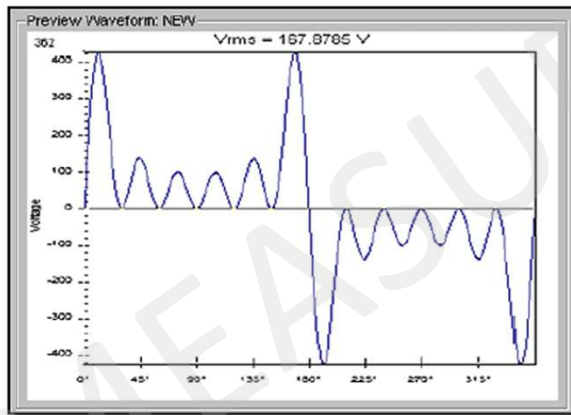
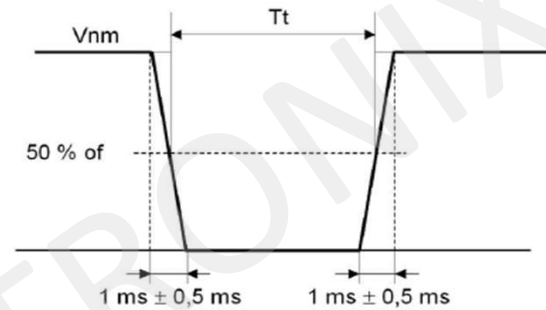
Asterion Customer Advantages – Virtual Panels

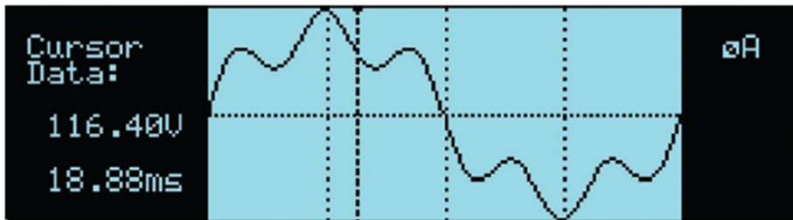
- All of our new products take advantage of our newest Virtual Panels GUI software
 - Available for both AC & DC power supplies
- Allows full remote control of the instrument from any pc



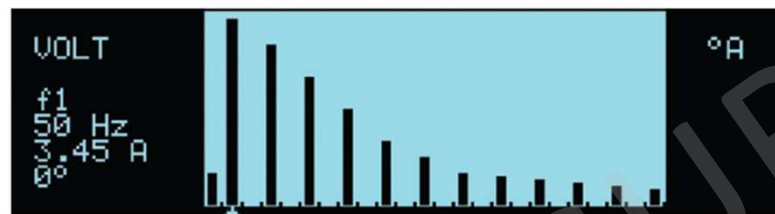
Key Features

- Arbitrary waveform generation
- Harmonic waveform generation
- Transient generation





Two hundred user defined waveforms.



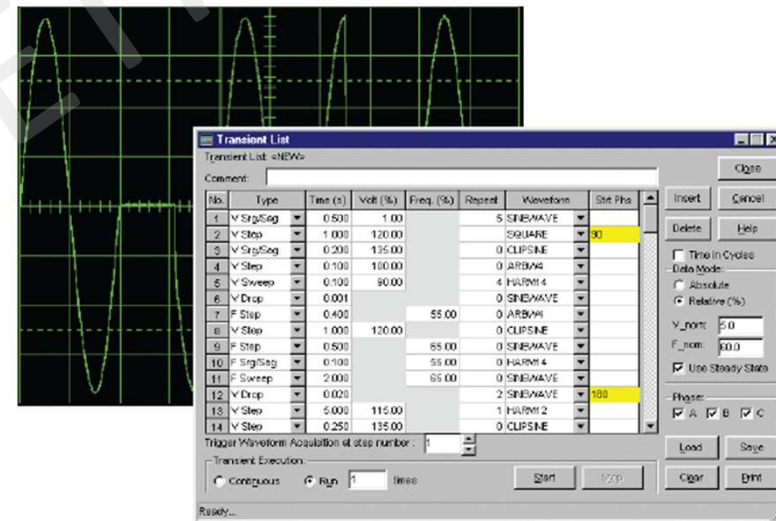
Absolute amplitude bar graph display of current harmonics with cursor positioned at the fundamental (iX Display).

VOLT HARMONIC MEASUREMENTS mA					
HR#	AMPL.	PHASE	HR#	AMPL.	PHASE
0	0.00	0.0	1	151.42	0.0
2	0.33	46.9	3	116.17	351.4
4	0.57	90.1	5	85.24	29.6
6	0.59	131.8	7	54.72	67.0
8	0.45	171.4	9	24.55	100.6

Voltage harmonic measurement table display in absolute values (iX Display).



Transient List Data Entry from the front panel



Transient List Data Entry in GUI program.

การใช้ software California IX สร้างรูปคลื่น

Transient List Sample

Frequency: 100.0 Hz

Output Mode: AC DC

Output Relay: Closed

Ampl (V):

Lim (A):

Phase (°):

Waveforms: A: SINUSOID

Transient List

File Edit Transient Help

Transient List: <NEW>

Comment: User comment

No.	Type	Time (s)	Voltage	Freq.	Repeat	Waveform	Strt Phs
1	V Step	10.000	10.00		1	SINUSOID	1
2	V Step	10.000	40.00		1	SQUARE	1
3	V Step	10.000	100.00		1	SINUSOID	1
4	V Drop	3.000			1	SINUSOID	1
5	V Step	10.000	100.00		1	SINUSOID	1
6	Empty						
7	Empty						
8	Empty						
9	Empty						
10	Empty						
11	Empty						
12	Empty						
13	Empty						
14	Empty						

Phase: A B C

Data Mode: Absolute Relative (%)

V_nom: 120.0

F_nom: 60.0

Use Steady State

Time in Cycles

Trigger Waveform Acquisition at step number: 1

Monitor output.

Transient Execution: Run 1 times Continuous

Trigger Source: Immediate External Trigger GPIB bus GET

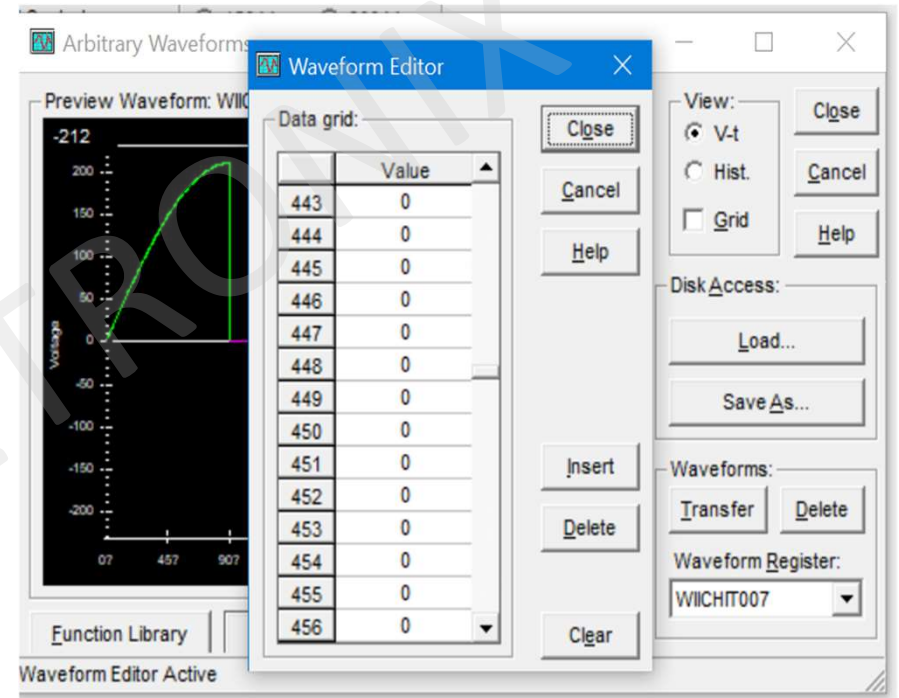
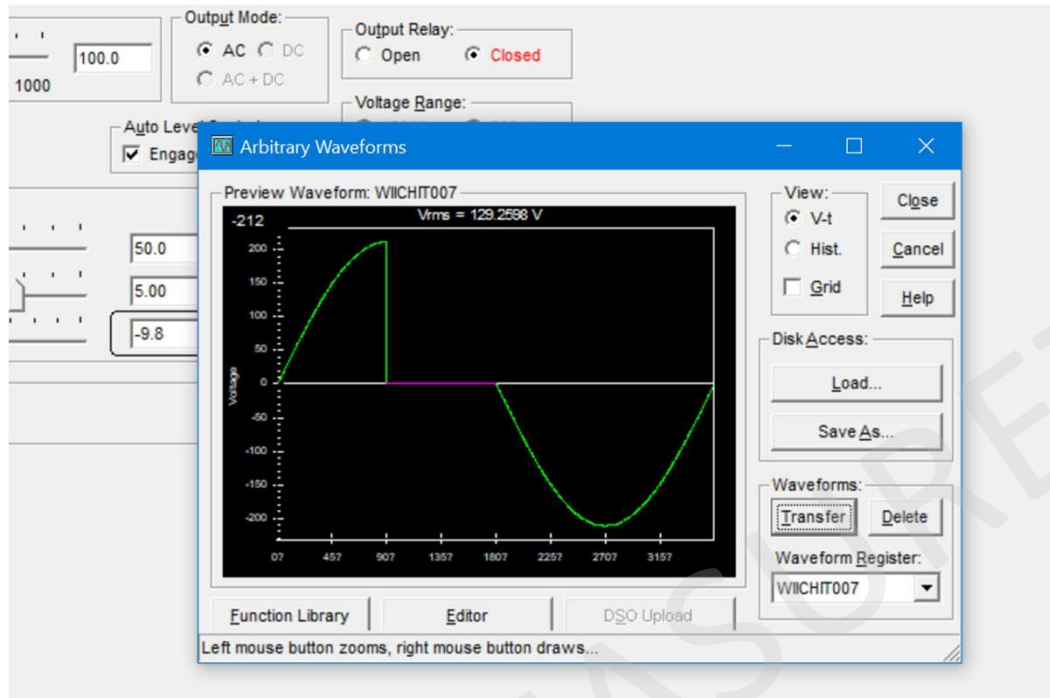
Step: Auto Once

Show Popup when done

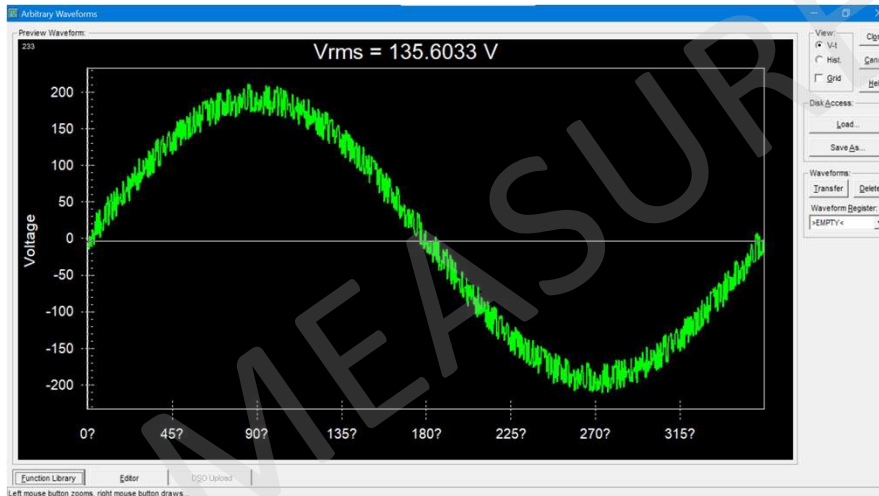
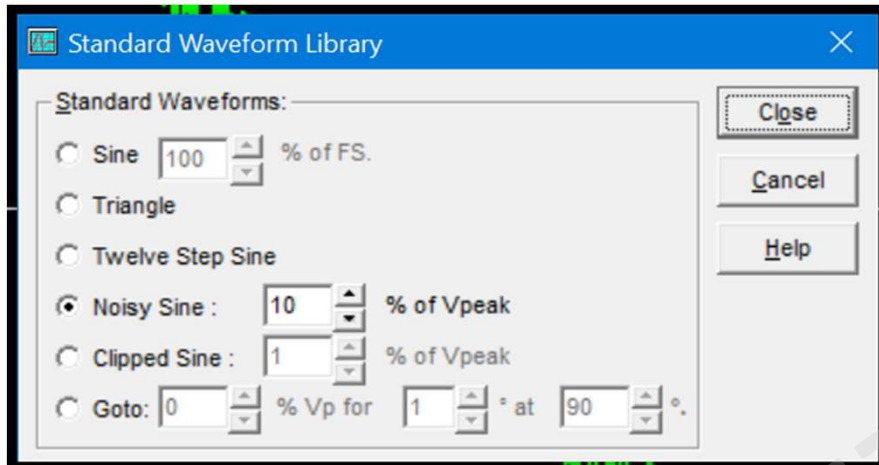
Start Stop

Transient Execution pass number 1

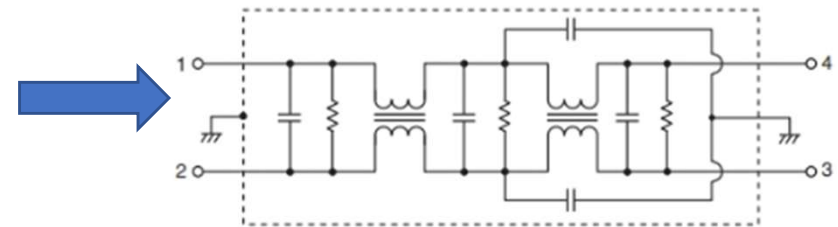
ARBITRARY Mode ทำการตัดแรงดันในช่วงเฟสต่าง ๆ ที่ต้องการ



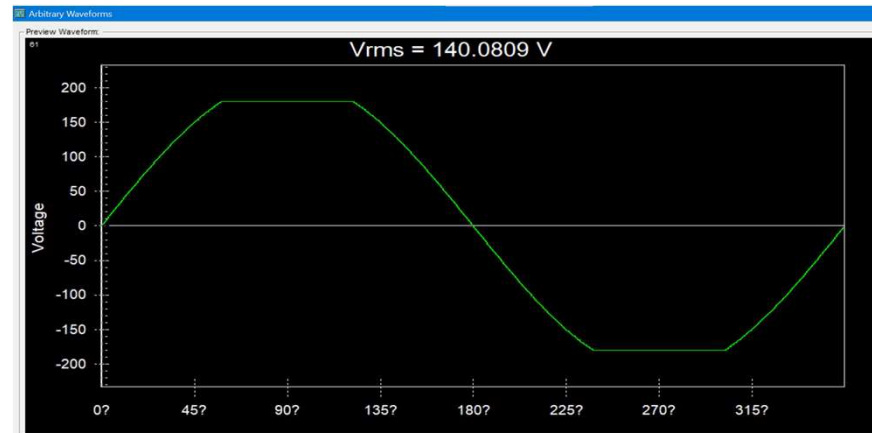
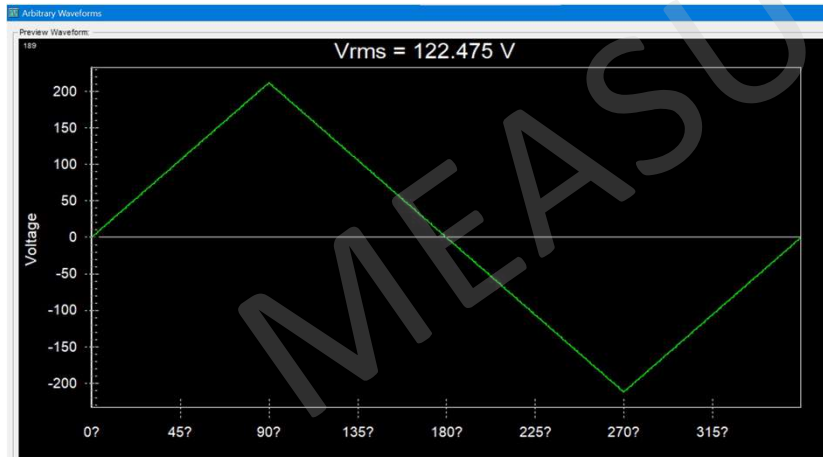
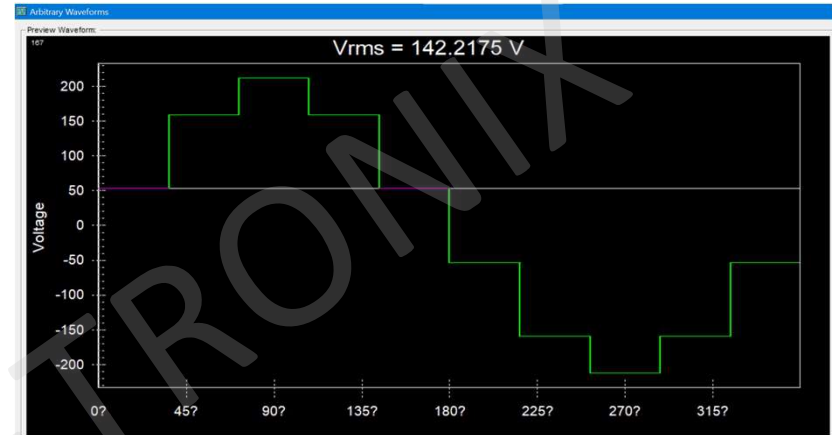
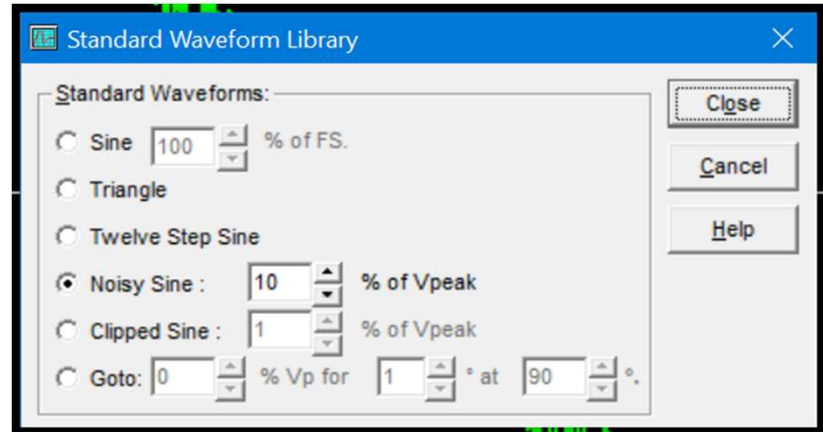
โหมด ARBITRARY การสร้างรูปคลื่นไฟฟ้า และสอดแทรกสัญญาณรบกวน (Noise)



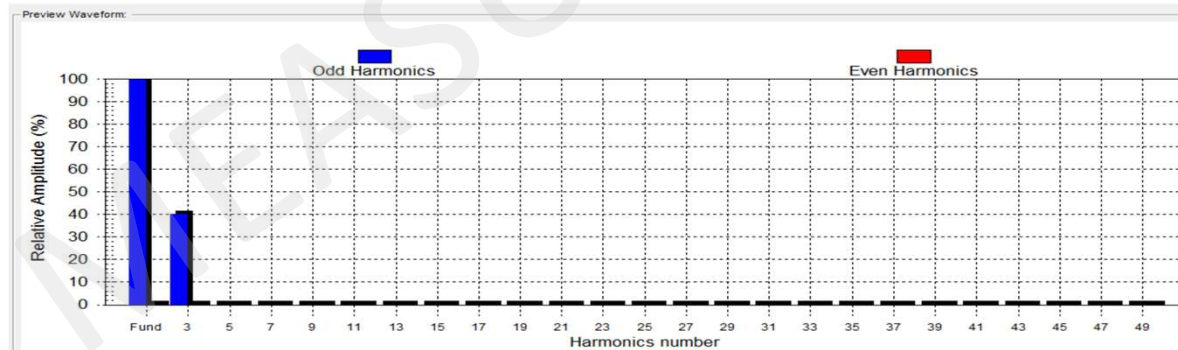
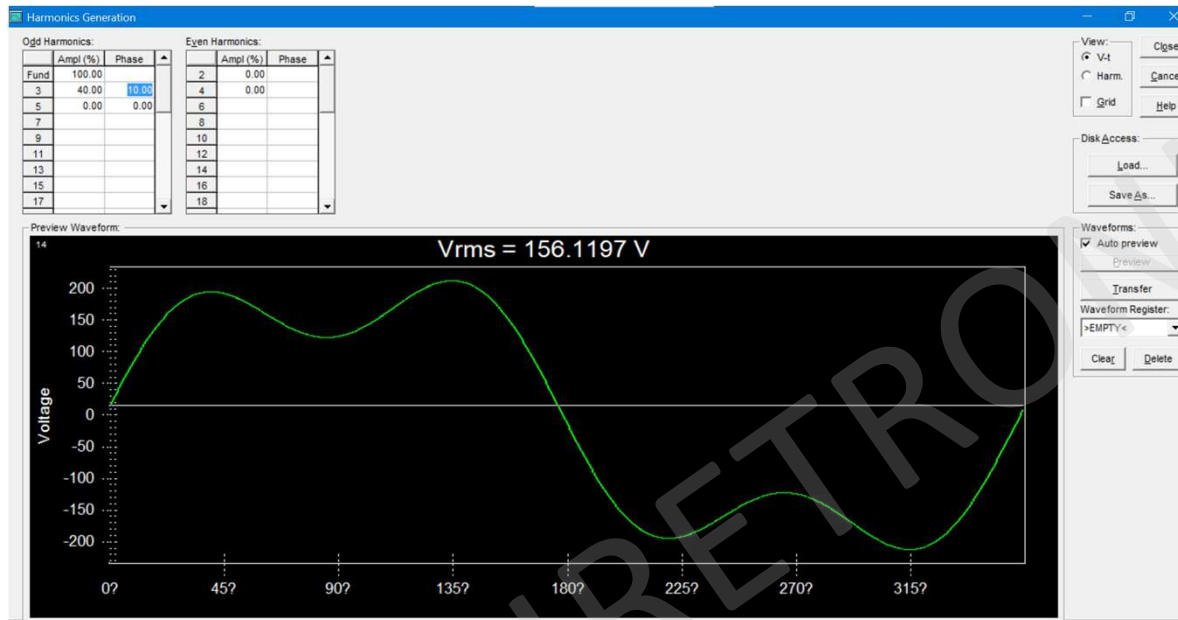
ทดสอบ ออกแบบ AC Line Noise Filter



ใน Arbitrary Mode ก็สามารถสร้างรูปคลื่นต่าง ๆ พร้อมนำไปทดสอบได้อย่างง่ายดาย



การสร้างรูปสัญญาณ Main + Harmonic ในลำดับต่าง



AC Power Source มีภาคการวัด Measurement มมพร้อมใช้งานได้เลย โดย monitor ผ่าน Software

iXCGui - 751iX-160-704-704F-A350-ABD-AMD-B787-WHM S/N: [FW = 0.3]

File Source Waveforms Measurements Options Applications Help

Frequency: 16 Output Mode: Output Relay:

F (Hz) 16

Ampl (V) CLim (A) Phase (*) Waveforms: A: SINUSOID

Measurements

Measurements:

Freq (Hz): 60.00 Phase A Phase B Phase C

<input checked="" type="checkbox"/> Voltage (V rms):	79.77	0.0	0.0
<input checked="" type="checkbox"/> Current (A rms):	5.872	0.00	0.00
<input checked="" type="checkbox"/> Phase (°):	0.0	0.0	0.0
<input checked="" type="checkbox"/> Power (W):	398.18	0.00	0.00
<input checked="" type="checkbox"/> Appt.Power (VA):	398.18	0.00	0.00
<input checked="" type="checkbox"/> Power Factor:	0.85	0.00	0.00
<input checked="" type="checkbox"/> Peak Curr (A):	19.979	0.0	0.0
<input checked="" type="checkbox"/> Crest Factor:	2.95	0.00	0.00
<input type="checkbox"/> DC Offset:	0.00	0.00	0.00

Mode: Once Cycle

V (L-L) Averaging

Log Data every 5 secs to: dummy.txt File... Stay on Top

Harmonic Analysis

File Measurements Graph Setup Help

Parameter: Voltage Graph: Bar Chart-Absolute Print Format Table

Odd Harmonics:

	rms	rel. (%)	Phase
Fund	80.000	100.00	0.00
3	4.728	5.91	-1.40
5	6.886	8.61	-0.48
7	32.504	40.63	2.17
9	4.473	5.59	-0.64
11	23.430	29.29	0.38
13	24.783	30.98	-1.43
15	16.394	20.49	0.12
17	17.310	21.64	-0.79

Even Harmonics:

	rms	rel. (%)	Phase
2	2.927	3.66	-0.09
4	2.015	2.52	0.84
6	0.375	0.47	2.06
8	1.335	1.67	0.76
10	0.938	1.17	0.41
12	2.389	2.99	-2.32
14	1.261	1.58	0.71
16	0.236	0.29	-1.51
18	2.040	2.55	1.63

THD (%): Volt: 70.95 Curr: 29.59

Graph: Absolute Voltage Harmonics for Phase A @ 60.00 Hz

Use left mouse button to zoom graph...

APS-7000 Series

500/1000 VA Programmable AC Power Source



SELECTION GUIDE

Model Name	Max. Output Current	Power Rating	Output Voltage
APS-7050	4.2A/2.1A	500VA	0~310.0 Vrms
APS-7100	8.4A/4.2A	1000VA	0~310.0 Vrms

FEATURES

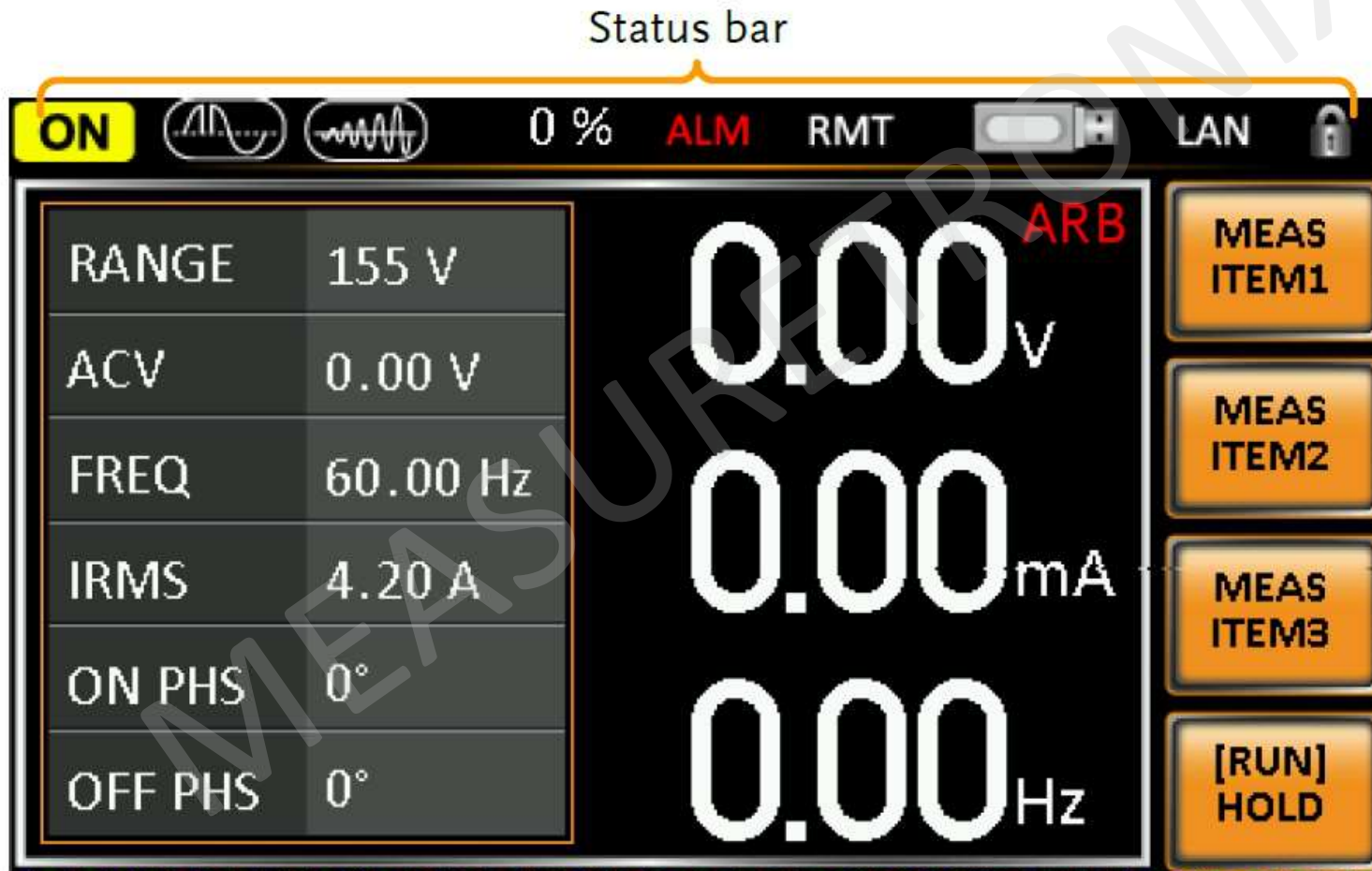
- 4.3" large LCD Display
- Measurement Function :
Voltage, Current, Power, Frequency, Power Factor, Crest Factor, Apparent Power, Ipeak, Ipk hold
- Surge/Dip Control Mode
- Frequency : 45.0 ~ 500.0Hz (Std); 45.0 ~ 999.9Hz (Opt)
- Voltage Range (RMS) : 155V (Std)/310V (Std)/600V (Opt)
- OVP/OCP/OTP Protection
- Simulate Mode, Sequence Mode, Program Mode
- Ramp Control Function
- ARB (Function Waveform) Mode
- Standard Interface : USB/LAN
- Optional Interface : RS-232 & USB CDC/GPIB

Features

- 4.3-inch TFT-LCD
- Output capacity : APS-7050(500VA、 310Vrms、 4.2Arms)
APS-7100 (1000VA、 310Vrms、 8.4Arms)
APS-7200(2000VA、 310Vrms、 16.8Arms)
APS-7300 (3000VA、 310Vrms、 25.2Arms)
Output augmentation by options (0~600Vrms/45~999.9Hz)
- **Low Ripple & Noise**
- Measurement and test functions include VOLT、 CURR、 PWR、 VA、 IPK、 IPKH、 FREQ、 PF、 CF
- **Support a small AC current measurement 2mA ~ 35A, Min. resolution 0.01mA(APS- 7050& APS-7100)**
- **Reverse Current Alarm Function**
- 10 sets of Sequence function to Edit Output Waveforms/ 10 sets of simulate mode to Rapidly Simulate Transient Power Supply/ 10 sets of Program mode to Define Measurement Sequence
- Automatic Execution of Sequence、 Simulate、 Program mode when the Power is on
- Standard Interfaces: USB Host, USB Device, LAN
- Optional Interfaces: GPIB (APS-001) ;
RS-232 / USB CDC(APS-002 for APS-7050& APS-7100 only)
RS-232(APS-007 for APS-7200& APS-7300 only)

จอแสดง Status ของเครื่อง

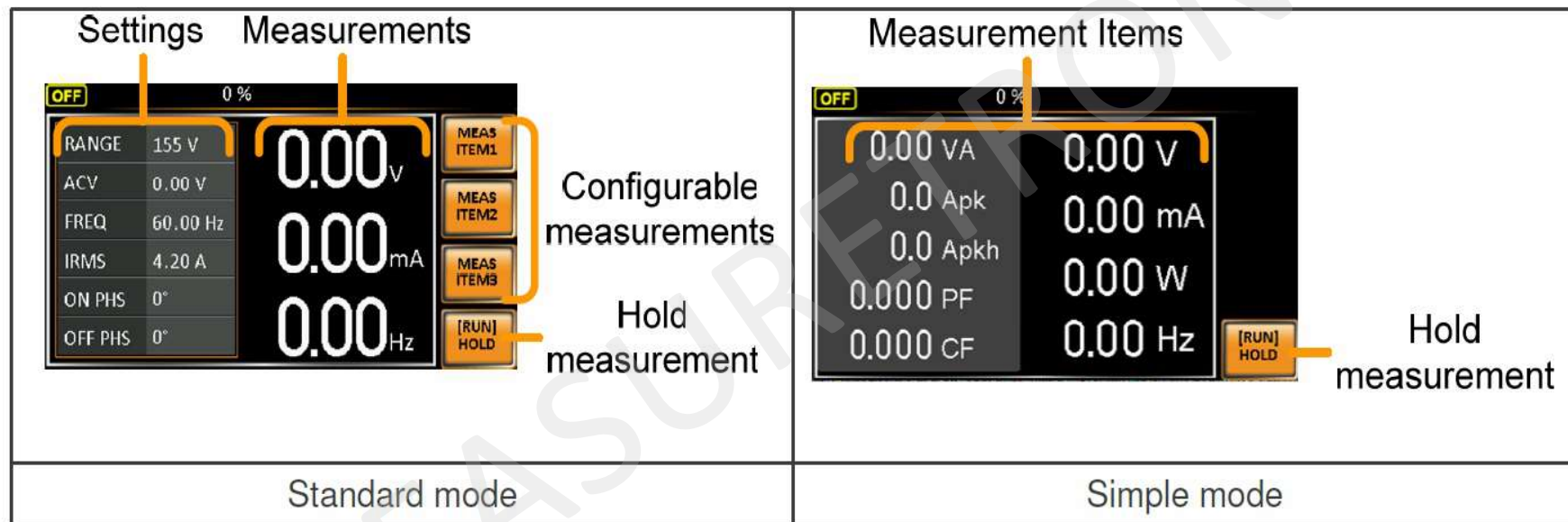
Status Bar Icons



หน้าจอของ Setting Menu / Measurement Display

สามารถแสดงพารามิเตอร์การวัด 9 ชนิด

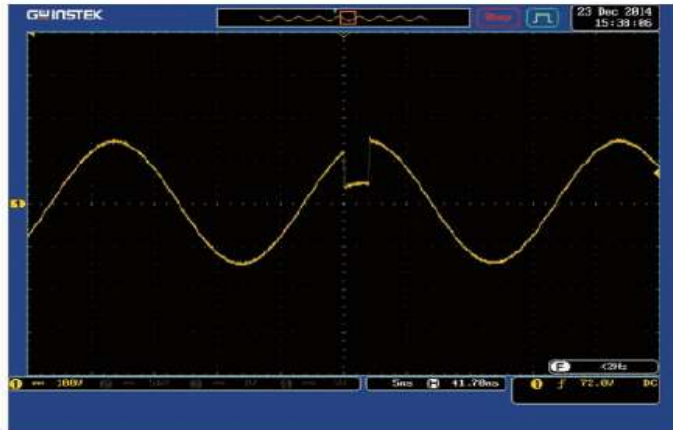
Vrms , Irms , F, Ipk , W , VA , PF, Ipk hold , CF



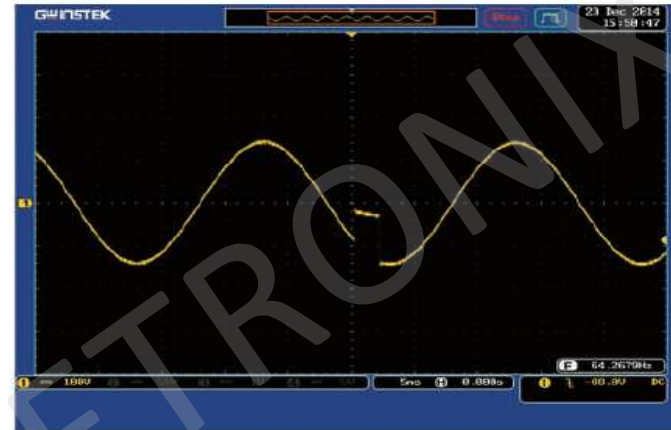
- อุปกรณ์ Switching Supply มีหลากหลายมีระดับกระแสสูงไปจนถึงกระแสต่ำมากๆ ตัว APS7000 มีภาคการวัดที่มีความละเอียดซึ่งเหมาะกับการทดสอบ Power Consumption

การจำลองไฟฟ้าเกิดการ Dip /Surge

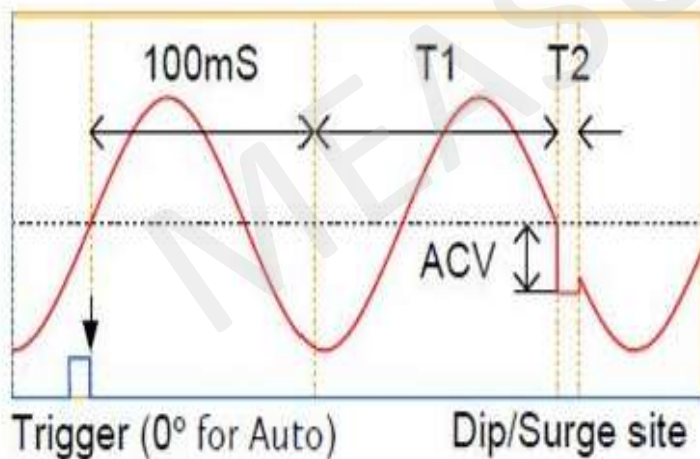
F. SURGE/DIP CONTROL



Dip



Surge



ACV → Sets the ACV surge/ dip level from the 0 volt level.

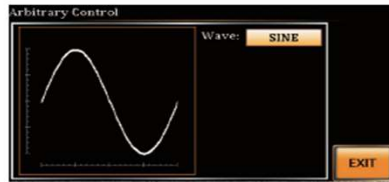
T1 → Sets the T1 time

T2 → Sets the width of the surge/ dip

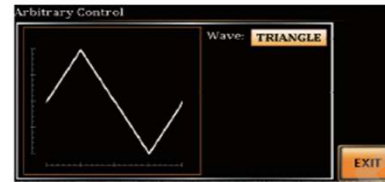
* Fixed 100ms delay after triggering.

ARBITRARY MODE

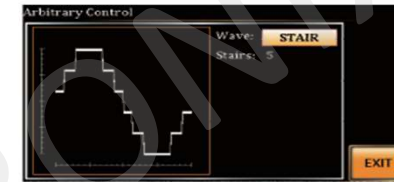
APS-7000 ได้เตรียมรูปคลื่นแบ่งเป็น 7 กลุ่ม ซึ่งสร้างสัญญาณมาตรฐานไฟฟ้าจนถึงจำลองความผิดเพี้ยน เพื่อใช้ทดสอบได้อย่างง่ายดาย



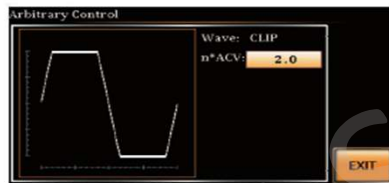
Sine Waveform
Standard AC Waveform



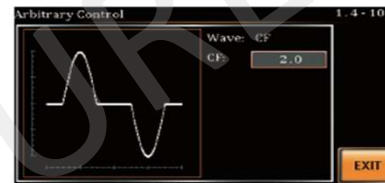
Triangle Waveform
Power harmonic output simulation is triangle waveform



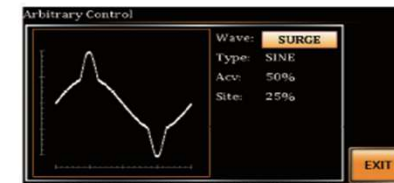
Staircase Waveform
Simulate square waveform and staircase waveform for commercial UPS



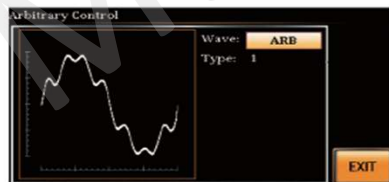
Clipped Sinewave
Simulate grid power supply heavy load waveform



Crest Factor Waveform
Simulate rectified filter current waveform by capacitor input



Surge Waveform
Simulate grid power supply's peak over-voltage

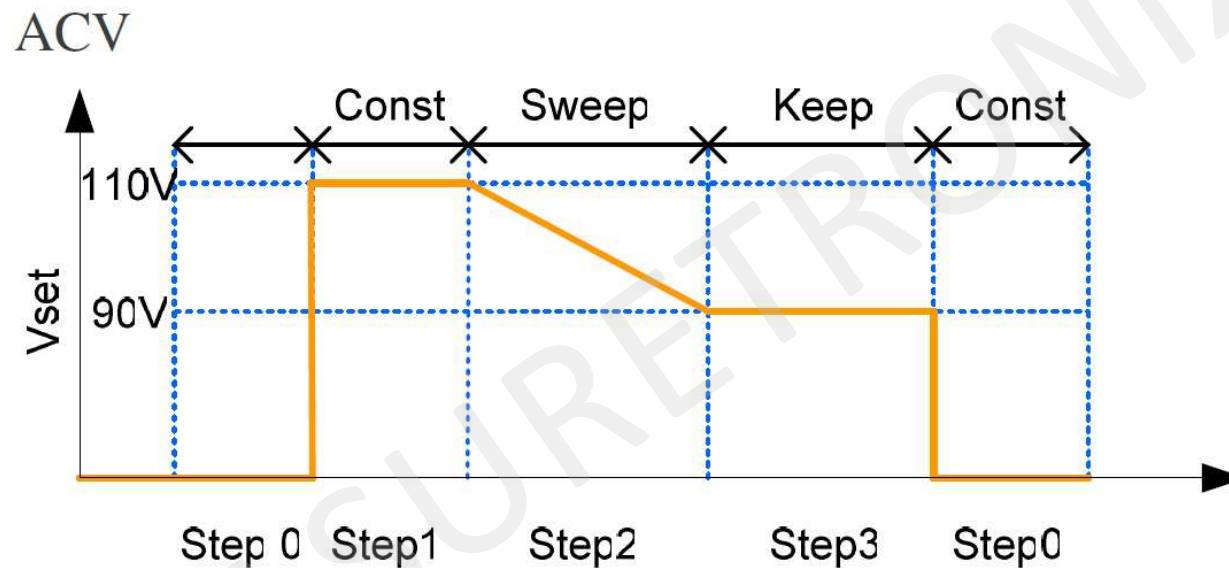


Fourier Series Synthesized Waveform

Simulate real output power waveform. Distorted power waveform is produced due to output impedance and non-linear effect such as inductance, capacitance, and parasitic capacitance effect.
For example : motor.

Sequence mode

ฟังก์ชันนี้ใช้รูปคลื่น AC แบบอิสระ (Arbitrary Waveform) โดยการกำหนดแต่ละ Step ได้ตามตัวอย่าง (กำหนดได้สูงสุด 255 steps)



- ตัวอย่างการ Setting ในโหมด Sequence

Step no.	0	1	2	3
Vset (V)	0	110	90	N/A
2 nd Setting	CT	CT	SP	KP

โหมด SIMULATE มีทั้งหมด 6 Steps

- เป็นโหมดที่ใช้ทดสอบโหลด เช่น จำลองไฟตก ไฟเกิน เช่น การทดสอบ POWER SUPPLY

