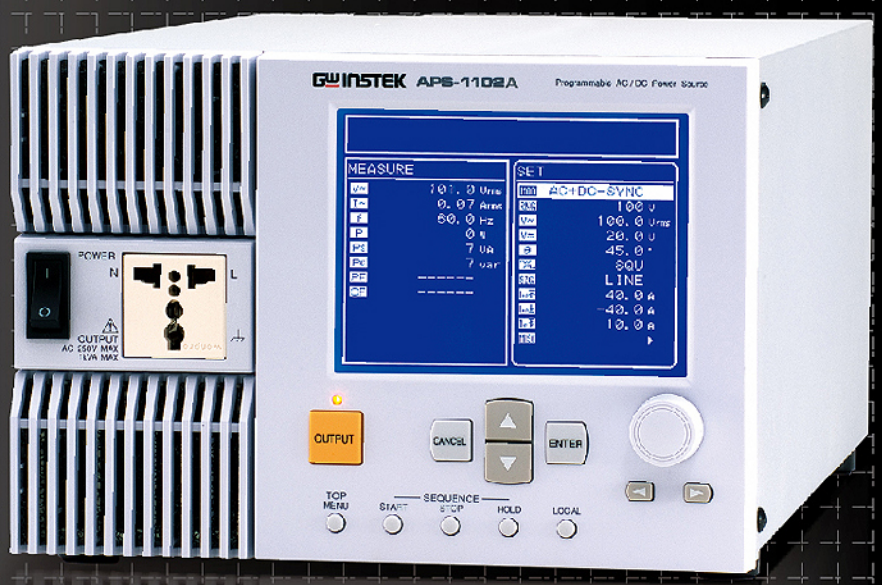


APS-1102A

PROGRAMMABLE A.C./D.C. POWER SOURCE

FEATURES

- 5.7" Large LCD Display
- Output Capacity : 750VA (for AC 100V Input)/1kVA (for AC 200V Input)
- Output Modes : AC and AC+DC Combined with any of the Four Signal Sources
- Signal Sources : Internal (INT), External (EXT), Internal + External (ADD) and Sychronization (SYNC)
- Arbitrary Waveform Power Output
- Power Amplifier of External Signal
- Measurement Functions : Voltage, Current, Power, Frequency, Power Factor, CF, and Harmonic Current
- Capacitor Input Load Supported
- Sequence Function Allows Programming of Output Patterns
- Limiter Function (Upper/Lower Limits Function)
- 30 Sets of SAVE/RECALL Memory
- Output On/Off Switch
- USB (USBTMC) and RS-232 Standard for Remote Control

GW INSTEK
Simply Reliable

APS-1102A is not only a precision AC/DC power source, but also a powerful analyzer, containing abundant features for the testing and characteristic analysis of power supplies, electronic devices, components and modules. In addition to AC/DC power, APS-1102A is fully programmable to simulate different power outputs. Sequences can be created using arbitrary waveforms as well as voltage or frequency sweeps. Output is divided into two main operation modes: AC and AC+DC. Each mode can be combined with four signal source modes: internal (INT), external (EXT), internal + external (ADD) and external synchronization (SYNC) to provide flexible power settings. Voltage, current, power, frequency, load power factor, load crest factor and harmonic current output can be monitored in real-time. Even Inrush Current can easily be measured during the power-up of capacitive loads. All parameters and values as well as measurement results are displayed simultaneously on the 5.7 inch LCD screen. APS-1102A includes multi functional easy-to-use software that can be used with a USB or RS-232 interface. The software is used to remotely control panel settings, and to create and edit sequences and arbitrary waveforms. APS-1102A also has a universal power outlet on the front that is suitable for most countries as well as output terminal on the rear panel.

A. OUTPUT MODES

The power output function of APS-1102A includes AC and AC+DC main modes. Each mode can be combined with one of the signal sources, including internal, external, internal + external, and external synchronization, to provide a powerful tool for the generation of a power source with abnormal variations.

Output of Arbitrary Waveforms

Arbitrary waveforms can be edited on the PC and transferred via USB or RS-232 interface to APS-1102A as the internal signal source for power output. 16 sets of waveform memory with 4k words waveform length each are available for arbitrary waveform generation and storage.

Amplifier of External Signal

APS-1102A can be used as an amplifier for the external signal to generate output power source. By selecting the external signal source mode (AC-EXT or AC+DC-EXT) and connect the external signal to the external signal input/external sync signal input terminal (EXT SIG IN/EXT SYNC IN), APS-1102A generates the power output according to the waveform of the external signal input.

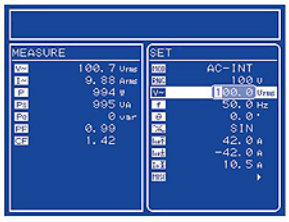
Power output synchronization with External Signal

The externally synchronized oscillation of APS-1102A allows the output power source to be frequency-synchronized with the external signal at TTL level in the frequency range from 40Hz to 500Hz.

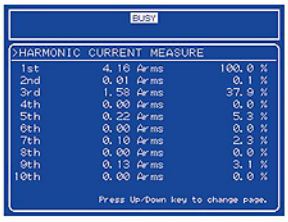
B. MEASUREMENT FUNCTIONS

APS-1102A is equipped with the following measurement functions

- Voltage (RMS, Average DC, Peak)
- Current (RMS, Average DC, Peak, Peak hold)
- Power (Effective, Reactive, Apparent)
- Synchronization frequency (external synchronization)
- Load power factor
- Load crest factor
- Harmonic current (50/60Hz fundamental, up to 40th harmonics)



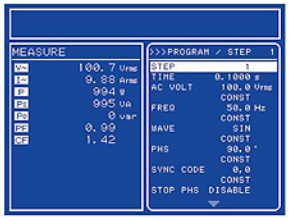
Measurement Results and Setting Values



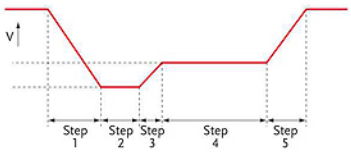
Measurement of Output Harmonic Current

C. SEQUENCE OPERATION

In the Sequence Operation programming, DC, sine waves, square waves, and 16 arbitrary waveforms captured via USB interface can be used as components for sequence editing. Among the total 255 sequence steps, as maximum capacity, the waveform, level, and time duration can be set , and constant / keep / sweep can be chosen in each individual step. APS-1102A is also equipped with other functions, such as the branching to a specified step during a sequence operation. All the data of start, stop, or hold of a sequence operation are saved into the sequence memory to perform the Sequence Operation automatically.



Setting Screen for the Sequence Function (Set for Each Step)



Voltage Fluctuation Test Pattern

D. APPLICATION FIELDS

- R & D and Testing of wide variety but small quantity power supply manufacturers
- R & D and Testing of wide variety and compact consumer device manufacturers
- Testing of battery-powered modules
- Used as the power source for relay and switch characteristic testing
- Used as the power source for product inspection lines of devices in wide variety
- Used as the power source for LCD or battery formation

E. UNIQUE FEATURES

Inrush Current Measurement and Inrush Current Limiter

For an electronic device containing a capacitor type rectifier, an inrush current, which is larger than the rated current of the device, may flow through the power line immediately after the device is turned on. APS-1102A , with peak current hold capability, is able to measure this short time inrush current. On the other hand, the large inrush current flows through the power line may cause the voltage drop, so the electronic device should be able to limit this effect to a certain extent. APS-1102A can supply four times as large peak current as the rated current to support this test.
The output current can be limited by setting the maximum output current(peak/average current) in advance, so the prototypes can be protected from abnormal current damage during development evaluation. However, to measure the inrush current of a completed product, the peak current limiter should be set at the maximum value to get a correct measurement result.

Harmonic Current Measurement Function

Switching power sources are widely used in both consumer and industrial electrical products in today's market. With the capacitor type rectifier, the switching power source has its disadvantages using an input AC source carrying significant amount of harmonic current. When a large amount of harmonic current flows through the power source line, the switching power supply in the device may experience operation faults caused by the voltage distortion, which can lead to transformer overheat and possibly result in a hazardous accident. APS-1102A includes a harmonic current measuring function, which can be performed under AC-INT mode at the fundamental wave setting (panel frequency setting) of either 50 Hz or 60 Hz. Absolute values of harmonic current in RMS and the harmonic to fundamental ratios up to the 40th harmonics(2 kHz at 50 Hz fundamental)can be measured and displayed.

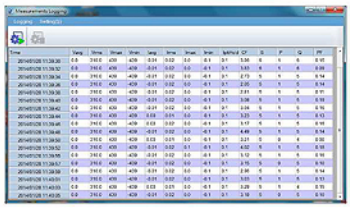
F. APPLICATION EXAMPLES

- DC to DC converter verification: As in the general environment the input source of DC to DC converter couldn't be a perfect DC. It may contain some AC ripples riding on a DC source due the simple rectifier and filtering circuit used in the consumer products. As of this, AC+DC source is used as the simulation of input power to do the characteristic verification of DC to DC converter.
- Transformer verification : Ideally the voltage flows through transformer should be a pure AC, however, in the general environment it may also contain a DC component, which may cause magnetic saturation of the transformer and therefore reduce its efficiency. AC +DC source is the simulation of such power environment.
- Capacitor verification : The main function of a capacitor is to block the DC voltage and connect the AC voltage in most of the circuits. The DC voltage imposed on the Capacitor, however, will generate extra heat and gradually degrade the function of the capacitor. AC +DC source could be used to test the durability and reliability of a capacitor.
- LCD formation : APS-1102A provides various types of power source that suits the application of the formation of LCD panel in the manufacturing process. The power source could be AC or AC + DC at various levels of output. Formation is an important process to format the liquid crystal cells inside the panel, so the polarity of the crystal cells could be well-arranged to become functional.

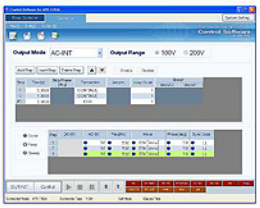
G. REMOTE CONTROL SOFTWARE

APS-1102A includes a multi-functional and user-friendly software, which supports the remote control of panel operations, Sequence editing and execution, Arbitrary waveform editing and transfer, and Data logging. The remote control software is included to perform the following functions via USB & RS-232 interface :

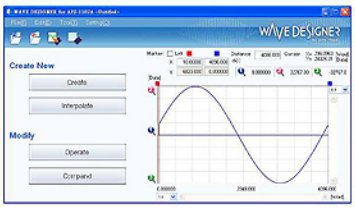
A. Data logging , B. Sequence editing and execution, C. Arbitrary waveform editing and transfer, D. Remote control of panel operations



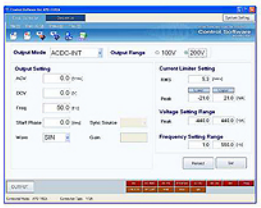
A. Logging of Measurement Values



B. Sequence Editing



C. Creation of Arbitrary Waveform



D. Remote Control Screen

PANEL INTRODUCTION

CE | USB | PC Software | Labview Driver | Remote I/O | RS-232

1. Function Keys
2. Modify Knob
3. Digit Key
4. Shortcut Keys
5. External Sync Signal Input Connector
6. RS-232 Connector
7. USB Connector
8. External Control I/O Connector
9. Output Outlet

SPECIFICATIONS

MAXIMUM OUTPUT CAPACITY	AC Input (100 ~ 180V) Input (180 ~ 250V) DC Input (100 ~ 180V) Input (180 ~ 250V)	750VA 1000VA 750W 1000W		
OUTPUT VOLTAGE	AC 100V 200V DC 100V 200V	0.0V ~ 155.0Vrms 0.0V ~ 310.0Vrms -220.0V~+220.0V -440.0V~+440.0V		
OUTPUT MAX. CURRENT	AC 100V 200V DC 100V 200V	10A 5A 10A 5A		
OUTPUT MAXIMUM PEAK CURRENTS	100V 200V	40Apk 20Apk		
FREQUENCY	Setting Range Setting Accuracy	1.0Hz ~ 550.0Hz ±0.01% of set (1.0Hz~550.0Hz, 23±5℃)		
WAVEFORM	SINE WAVE, SQUARE WAVE, ARBITRARY WAVE (Up To 16 Types Can Be Saved) Output Voltage Distortion Rate	When signal source mode is INT and ADD mode only 0.5% MAX(50Hz/60Hz), ±50% or higher of the rated output voltage, the maximum current or lower ; THD+N		
LINE VOLTAGE REGULATION **LOAD VOLTAGE REGULATION**	0.2% MAXIMUM 0.5% MAXIMUM	Power input voltage 100V/120V/230V, no load ,rated output At output terminal under no load and rated resistance load		
MEASUREMENT		**RANGE**	**RESOLUTION**	**ACCURACY**
	Frequency Counter	1.0 ~ 550.0 Hz	0.1Hz	0.01 % of set (1.0Hz~550.0Hz,23±5℃)
	RMS Volt-Meter(AC+DC)	At 45Hz~65Hz		
		Full Scale 100V:250.0Vrms	0.1Vrms	±(0.5 % of rdg+0.3Vrms); at 23±5℃
		Full Scale 200V:500.0Vrms	0.1Vrms	±(0.5 % of rdg+0.6Vrms); at 23±5℃
		At DC 40Hz~550Hz		
		Full Scale 100V:250.0Vrms	0.1Vrms	±(0.7 % of rdg+0.9Vrms); at 23±5℃
		Full Scale 200V:500.0Vrms	0.1Vrms	±(0.7 % of rdg+1.8Vrms); at 23±5℃
	RMS Amp-Meter(AC+DC)	At 45Hz~65Hz		
		Full Scale 15.00Arms	0.01Arms	±0.5% of rdg+0.04Arms ; at 23±5℃
		At DC 40Hz~550Hz		
		Full Scale 15.00Arms	0.01Arms	±0.7% of rdg+0.08Arms ; at 23±5℃ Output Current is 5%~100% of the Maximum Current
	Wattage Meter	At 45Hz~65Hz		
		Full Scale 1200W	1W	±2% of rdg+1W ; at 23±5℃
		At DC		
		Full Scale 1200W	1W	±3% of rdg+12W ; at 23±5℃ 50V or higher output voltage, output current is 10% to 100% of the maximum current
	Load Power Factor Measurement	0.00 ~ 1.00	0.01	
	Load Crest Factor Measurement	0.00 ~ 50.00	0.01	
	External Synchronization			
	Frequency Measurement	38.0Hz ~ 525.0Hz	0.1Hz	±0.2Hz; at 23±5℃
	Phase When Output Is On	0.0°~ 359.9°	0.1	When signal source mode is INT and ADD mode only
PROGRAM (SEQUENCE PROGRAMMING)	Memory Step Range(Each Memory Set) Step Time Setting	1~30 Sets 1~255 Step 0.0001 S ~ 999.9999 S	 0.0001S (=0.1mS)	
EXTERNAL SIGNAL INPUT (EXT Mode , ADD Mode)	Gain Setting Range	100V range 0~220.0 times (Initial Value : 100.0) 200V range 0~440.0 times (Initial Value : 200.0)	0.1 0.1	± 5% (DC or 45Hz to 65Hz , gain is at initial value, with the rated voltage output, no load) ± 5% (DC or 45Hz to 65Hz , gain is at initial value, with the rated voltage output, no load)
OUTPUT MODE	AC - INT Mode AC + DC - INT Mode AC - ADD Mode AC + DC - ADD Mode AC - EXT Mode AC + DC - EXT Mode AC - SYNC Mode AC + DC - SYNC Mode			
MEMORY	Save/Recall 30 sets			
POWER SOURCE	AC100V ~ 230V ±10% ; 50Hz / 60Hz ±2Hz (Signal Phase)			
POWER CONSUMPTION/FACTOR	1.4kVA max / 0.95min (AC100V) ; 0.9min (AC200V)			
INTERFACE	USB(USBTMC) & RS-232 Standard			
DIMENSIONS & WEIGHT	258(W) X 176(H) X 440(D) ; Approx. 9.7 kg			

Specifications subject to change without notice. PS-1102AGD1BH

ORDERING INFORMATION

APS-1102A 1kVA Programmable AC/DC Power Source

ACCESSORIES

User Manual x 1, Power Cord x 2, (15A/125V ; 2m ; for Japan) (10A/250V ; 1.5m without plug, for Japan, North America, and Europe only), CD-ROM (Remote Control Software) x 1

OPTIONAL ACCESSORIES

GRA-409 Rack Adapter Panel (19" , 4U)
GTL-234 RS232 Cable

FREE DOWNLOAD

Remote Control Software
LabView Driver

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