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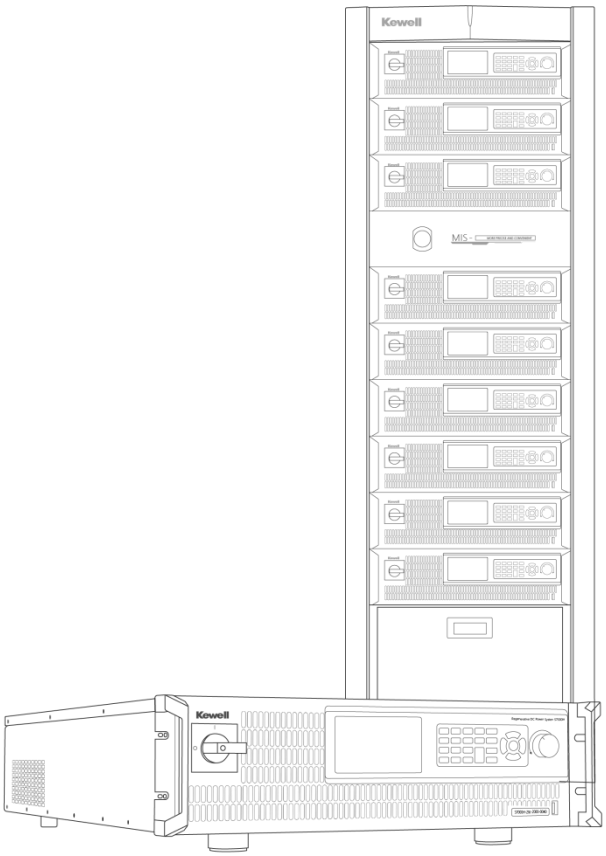


S7200PG SERIES

BI-DIRECTIONAL PROGRAMMABLE DC SOURCE-LOAD SYSTEM

Dec. 2025 Version: A/1

KEWELL TECHNOLOGY CO., LTD.

www.kewelltest.com

CONTENTS

1 Summary

The S7200 series integrates the functions of bi-directional DC power supply and DC electronic load, featuring free/active source-load mode switching to meet users' diversified testing requirements. In the bi-directional DC power supply mode, it has both source and sink capabilities, the former for providing power and the latter for returning the energy absorbed from the device under test (DUT) back to the grid. In the DC electronic load mode, there are multiple loading modes available such as the basic and the composite modes, ensuring no power output.

The S7200 series is equipped with built-in output simulations for various types of batteries, including lithium manganese oxide, lithium cobalt oxide, lithium iron carbonate, nickel-metal hydride batteries, ternary lithium, lithium titanate. It also offers diverse functionalities such as IV simulation, battery charge and discharge, custom waveform, and automotive power curve simulation, catering to the testing requirements of various products.

The S7200 series is widely used in industries such as PV & energy storage, electric vehicles, aviation, as well as testing performed by universities and colleges, and third-party laboratories.

2 Product Highlights

2.1 Wide Range Design

A single device can output a maximum voltage of 2400V and a maximum current of 80A (take S7200PG-30K-2400-80 as an example), meeting various testing requirements of customers.

2.2 Ultra-high Power Density

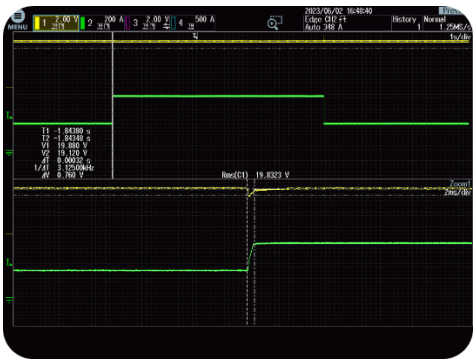
Maximum power density per unit up to 30kW/3U, light weight and space-efficient.

2.3 Source and Load in One

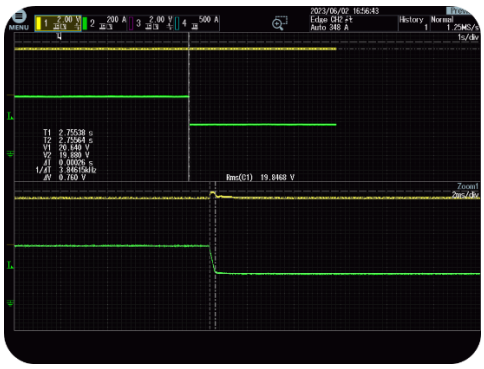
It features free source-load switching, with the bi-directional source supporting seamless switching in two quadrants to meet testing needs in multiple scenarios.

2.4 Quick Dynamic Response

Microsecond response to sudden loading/unloading, with minimum response time of 500us.



50%-100% loading



100%-50% unloading

2.5 Flexible Parallel Connection

The communication rate of the S7200 series can reach GHz levels, enabling flexible paralleling for higher power capacity expansion.

2.6 Built-in Standard Curves

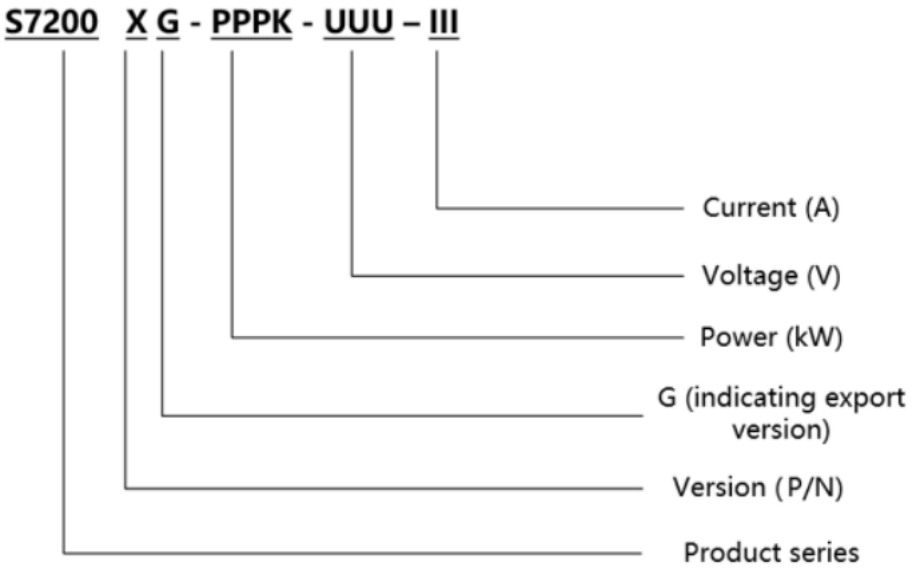
Built-in standard curves such as EN50530 can be called up by one click.

2.7 CC/CV Priority

CV mode supports voltage switching at high speed while CC mode supports switching without overshoot.

3 Product Specification

3.1 Product Model Description



e.g.: S7200PG-30K-2400-80

3.2 Technical Parameters

Model	Rated power [kW]	Rated voltage [V]	Rated current [A]
S7200PG-15K-1200-100	15	1200	100
S7200PG-20K-800-200	20	800	200
S7200PG-20K-1200-100	20	1200	100
S7200PG-30K-800-240	30	800	240
S7200PG-30K-1200-100	30	1200	100
S7200PG-30K-2400-80	30	2400	80

Model		S7200PG-15K-1200-100	S7200PG-20K-800-200	S7200PG-20K-1200-100	S7200PG-30K-800-240	S7200PG-30K-1200-100	S7200PG-30K-2400-80
Power supply parameters							
Output range	Output voltage*1	0~1200V	0~800V	0~1200V	0~800V	0~1200V	0~2400V
	Output current	0~100A	0~200A	0~100A	0~240A	0~100A	0~80A
	Output power	0~15kW	0~20kW	0~20kW	0~30kW	0~30kW	0~30kW
Read-back resolution	Voltage	0.001V					
	Current	0.001A					
	Power	0.1W					
Accuracy	Voltage	≤0.01%F.S.					
	Current	≤0.05% F.S.					
Line regulation	Voltage	≤0.02%F.S.					
	Current	≤0.02%F.S.					
Load regulation	Voltage	≤0.05%F.S.					
	Current	≤0.05%F.S.					
Ripple	Voltage Vpp (20MHz)	< 2000mV	<1000mV	< 2000mV	<1200mV	< 2000mV	< 2400mV
	Voltage (rms)	< 400mV	<200mV	< 400mV	<200mV	< 400mV	< 400mV
	Current(rms)	< 200mA	<400mA	< 200mA	<150mA	< 200mA	< 200mA
Slope/ Slew rate	Voltage (no load)	0.001V/ms ~ 500V/ms					
	Voltage (full load)	0.001V/ms ~ 500V/ms					
	Current	0.001 ~ 150A/ms	0.001 ~ 450A/ms	0.001 ~ 150A/ms	0.001 ~ 450A/ms	0.001 ~ 150A/ms	0.001 ~ 150A/ms
Dynamic response time		< 500μs					

AC input	Voltage	342 ~ 528Vac					
	Frequency	47Hz ~ 63Hz					
	Max. current	27A	37.8A		53.8A		
	Max. apparent power	16kVA	22.4kVA		32kVA		
Load parameters							
Rated values	Input voltage	1200V	800V	1200V	800V	1200V	2400V
	Input current	100A	200A	100A	240A	100A	80A
	Input power	15kW	20kW	20kW	30kW	30kW	30kW
	Input resistance	7500Ω					
	Min. operating voltage at max. current	65V@100A	25V@200A	65V@100A	25V@240A	65V@100A	65V@80A
Read-back resolution	Voltage	0.001V					
	Current	0.001A					
	Power	0.1W					
	Resistance	0.001Ω					
Accuracy	Voltage	≤0.01%F.S.					
	Current	≤0.05% F.S.					
	Power	≤0.1% F.S.					
	Resistance	≤1%Rmax (0 ~ 10%Rmax); ≤5%Rmax (10% ~ Rmax)					
General parameters							
Withstand voltage		3000Vdc	2000Vdc	3000Vdc	2000Vdc	3000Vdc	3000Vdc
Efficiency		92%	93.0%	93%	95.5%	94%	95.5%
Power factor		> 0.99					
Protections		OVP, OCP, OPP, OTP, islanding protection, Sense reverse polarity protection					

Communication interface	RS232/LAN/CAN/USB/Analog IO/Digital IO	
IP rating	IP20	
Storage temperature	-20°C ~ +70°C	
Operating temperature	0 ~ 40°C	
Humidity	0 ~ 90%RH, 25°C non-condensing	
Altitude	2000m	
Dimensions (mm)	669(D)*445(W)*130(H)	
Weight (net weight)	37kg	40.5kg

*1: The voltage output threshold is up to 1.02 times the max. set value.

The above specifications are subject to future updates without further notice.

3.3 Optional Configuration

Optional functions	
GPIB communication interface	GPIB communication

4 Product Features

4.1 Bi-directional DC Power Supply

- **Bi-directional DC Power Supply**

S7200 is a high-speed bi-directional power supply that enables high-speed switching between source and load modes. The current can be seamlessly switched from input to output and the other way around, effectively avoiding voltage and current overshoot (Figure 4-1). The series is widely used in the fields such as battery, charging pile, and PCS testing.

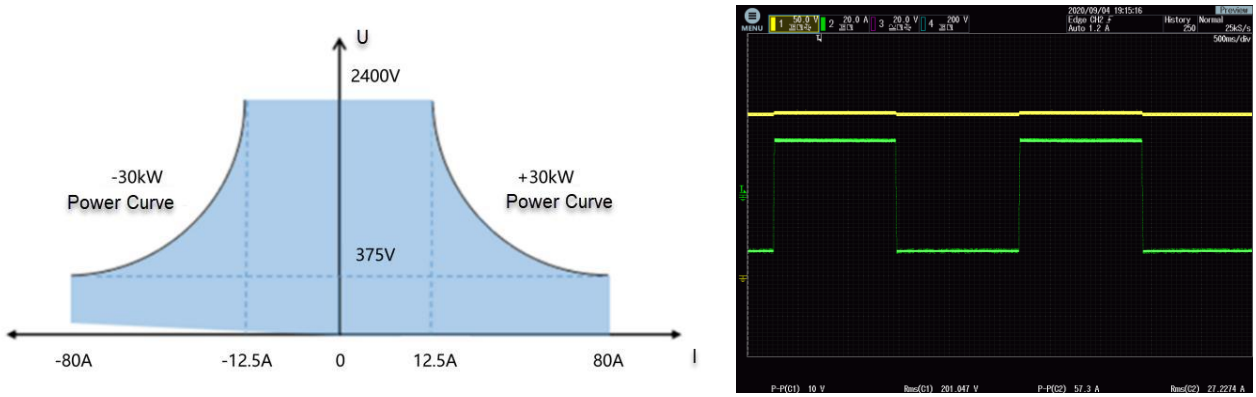


Figure 4-1 Bi-directional DC power supply function (take S7200PG-30K-2400-80 as an example)

- **Multi-step operation:**

The S7200 series features a multi-step programming output mode, supporting the editing of multiple sets of constant voltage or constant current steps. Steps can be set in cycles, as shown in Figure 4-2.

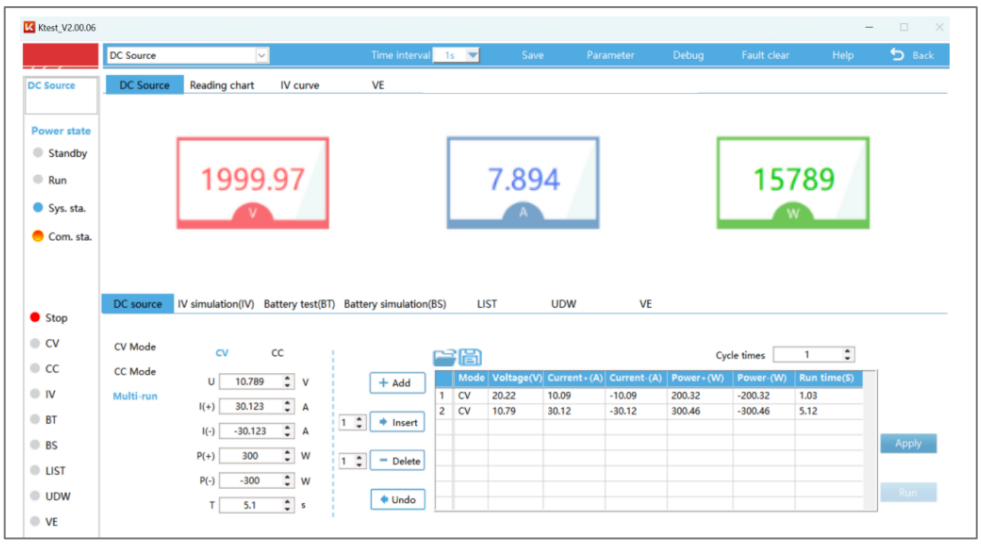


Figure 4-2 Multi-step operation mode

- **List**

Equipped with a list output mode, it supports programming for up to 10 groups of test files, with each group containing 10 editable sequences. A single step can be set to as short as 1ms. In CV mode, it simulates timing sequence changes and supports nested loops, cycle times ranging from 1 to 65,535, as shown in Figure 4-3.

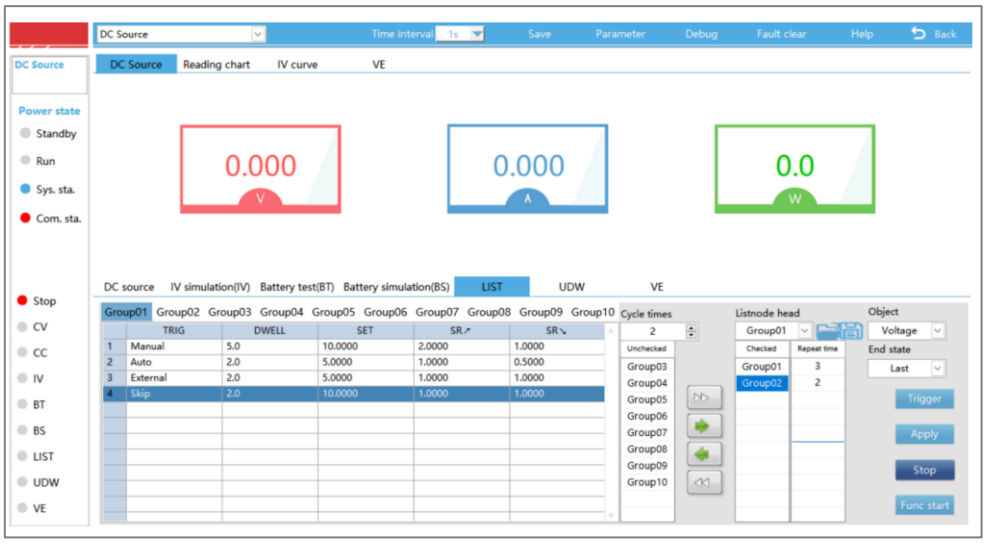


Figure 4-3 List output mode

4.2 Battery Simulation Function

Basic type mode: parameter: [Initial Soc], [Discharge limit], [Charge limit], [Fully charged voltage], [Fully discharged voltage], [Battery internal resistance], [Capacity], [Number in parallel], [Number in series] could be set for testing. As shown in Figure 4-4.

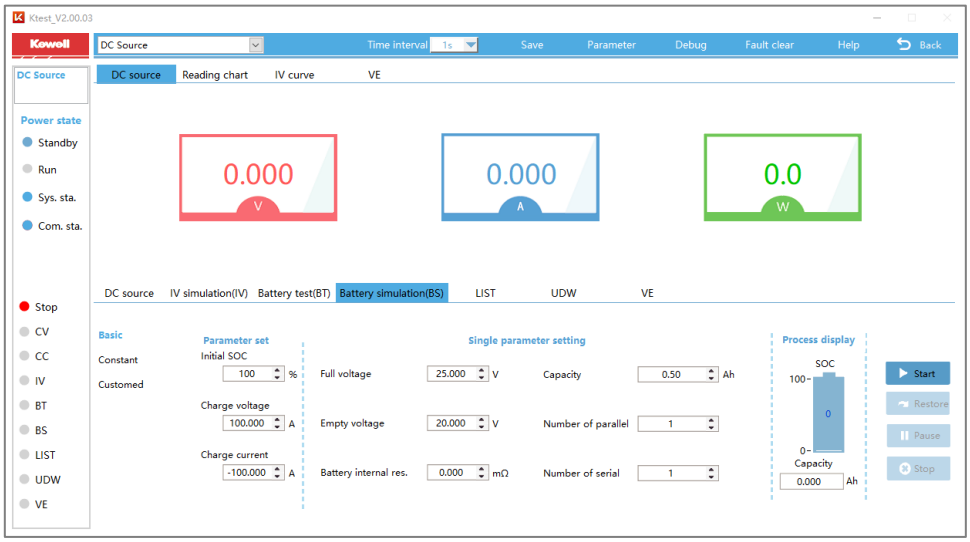


Figure 4-4 Basic mode

Fixed battery type (constant) mode: Lithium manganese oxide, lithium cobalt oxide, lithium iron carbonate, nickel-metal hydride batteries, ternary lithium, lithium titanate and other battery types with standard cell voltage can be selected for simulation. As shown in Figure 4-5.

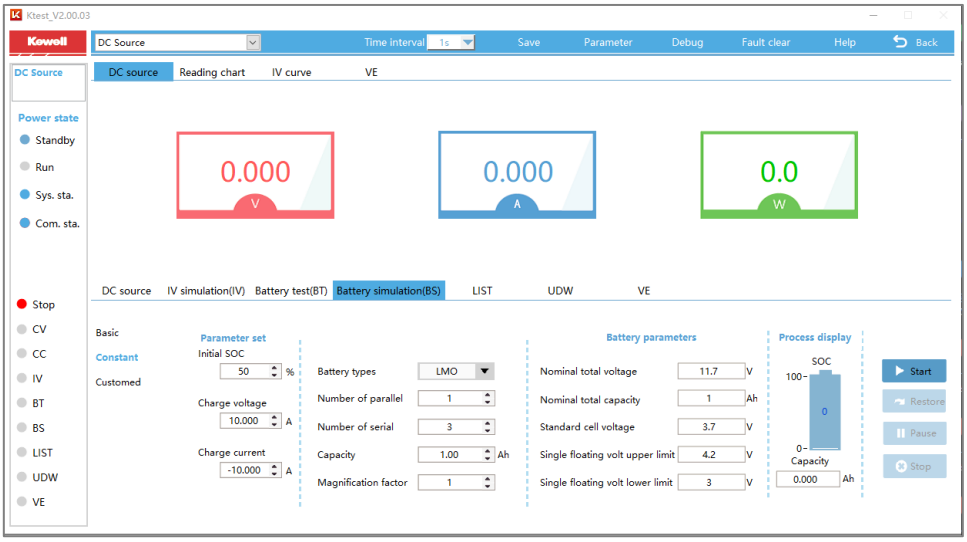


Figure 4-5 Constant mode

Custom battery type: At a given temperature and SoC, fill in the open circuit voltage and internal resistance in the table, or load the Excel file written in advance, then set other parameters and start running. As shown in Figure 4-6.

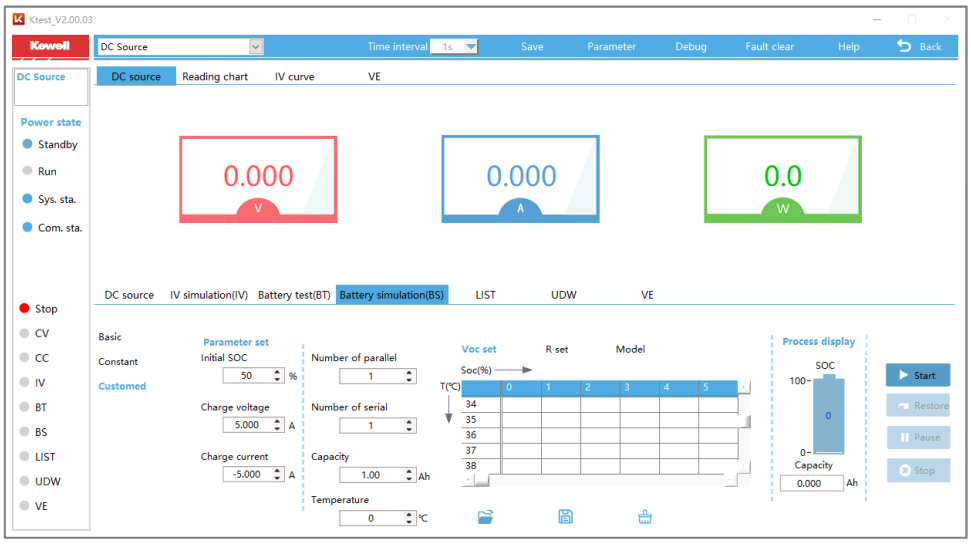


Figure 4-6 Customed mode

4.3 Battery Charge and Discharge Function

Static charging mode: User can set parameters such as charging voltage, charging current, and

charging power. Additionally, user also can set charging cut-off conditions, including parameters like charging end current, capacity, and time, as shown in Figure 4-7.

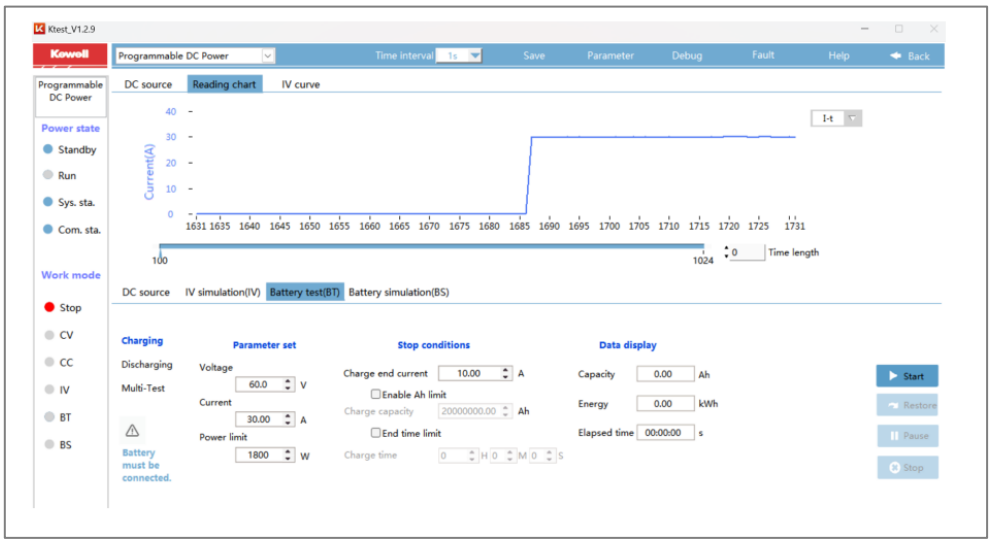


Figure 4-7 Static charging mode

Static discharging mode: User can set parameters such as discharging current and discharging power. Additionally, user also can set discharging cut-off conditions, including parameters like discharging end voltage, capacity, and time, as shown in Figure 4-8.

Figure 4-8 Static discharging mode

Battery test mode: User can set parameters such as static charging/discharging mode, and static duration to simulate multiple operating conditions, as shown in Figure 4-9.

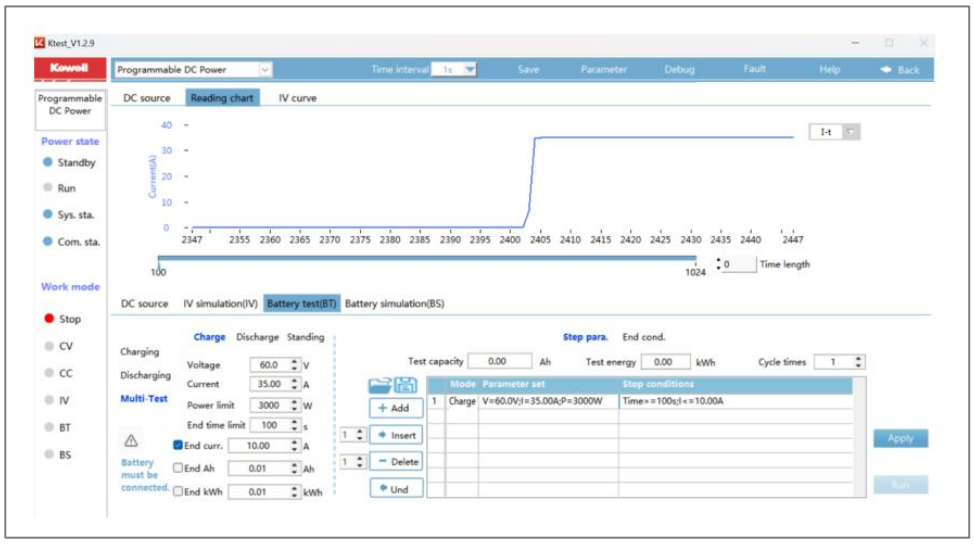


Figure 4-9 Battery testing mode

Note: When performing battery tests, it is necessary to install a soft start box between the DC output and the battery to ensure that the circuit is disconnected before wiring.

4.4 IV Simulation Function

Three modes: single-point, double-point and multi-point setting, as shown in Figure 4-10.

Figure 4-10 IV simulation function

- **Multi-step IV mode**

Up to 100 IV curves can be set up, with the option to import IV curve files to run. As shown in Figure 4-11.

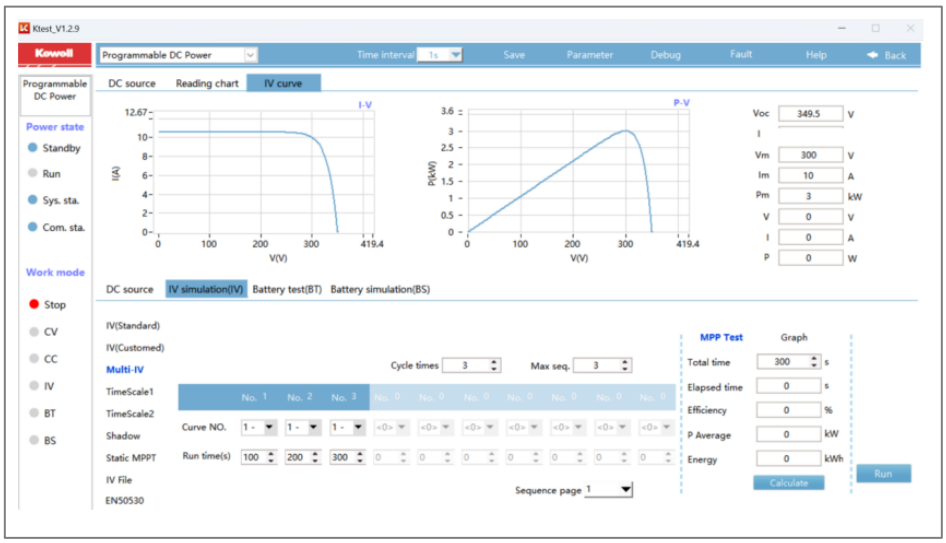


Figure 4-11 Multi-step IV mode

- **Shadow shading (Multimodal shadow curve) function**

S7200 can simulate the IV curve (multimodal shadow curve) of shaded solar panels: When solar panels are shaded by clouds, buildings, trees, or other obstacles, the output characteristics of the panels will change. S7200 can simulate the output characteristics of solar panels with different levels of shading intensity and areas. In the shadow function interface, users can set the array type, environmental parameters (light intensity and temperature), and finally configure the shading intensity and area, as shown in Figure 4-12.

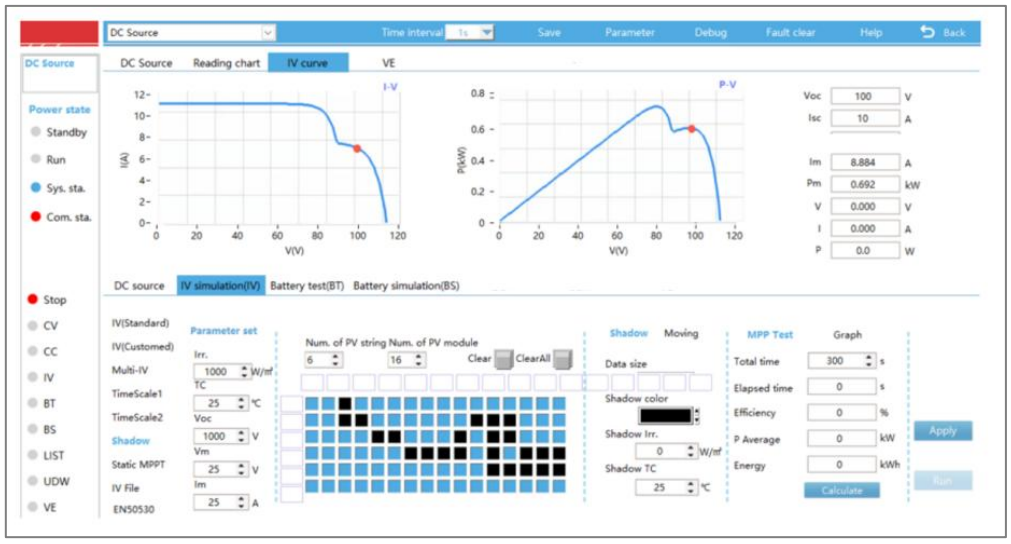


Figure 4-12 Shadow condition function

- **Time scaling**

The S7200 series can simulate and scale the IV curves under varying daylight conditions throughout the day: S7200 simulates the operating environment of solar panels over a 24-hour period or longer within specified time. Users can set the characteristic mode, array type, and light intensity and temperature parameters for different time periods in the time scaling function interface to simulate the real-world operating environment of solar panels. This allows the typical output variations of the panels during specific time periods to be output within a shorter timeframe, thereby shortening the testing cycle. Here, users can set the light intensity, temperature, and runtime, as shown in Figure 4-13.

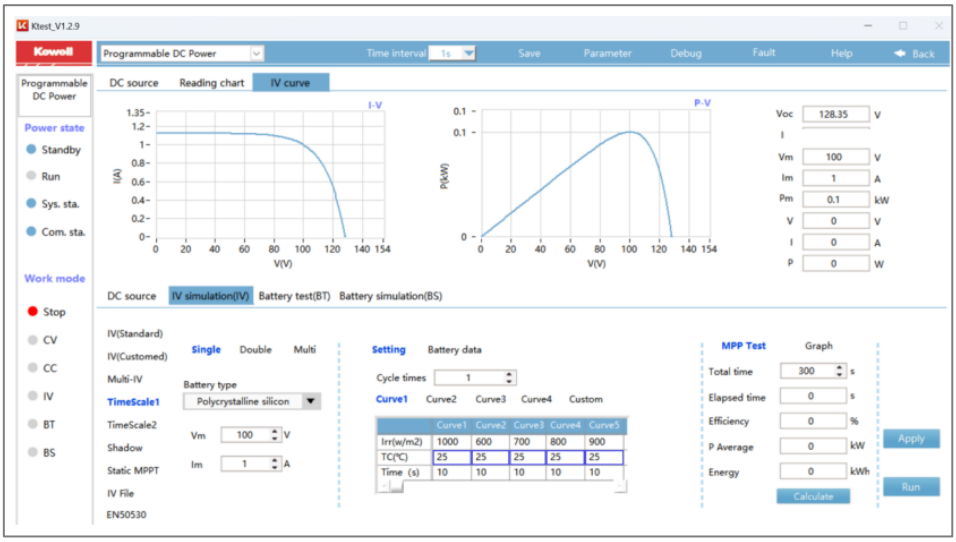


Figure 4-13 Time scaling function

- **Static MPPT test**

Single or multi-step configuration mode can be set to test static MPPT performance. As shown in Figure 4-14.

Figure 4-14 Static MPPT test

- **Dynamic MPPT test**

There is the built-in dynamic test environment according to EN50530 standard, with three power bands “1%-10%”, “10%-50%” and “30%-100%”, enabling detailed testing of the dynamic tracking performance of the PV inverter. As shown in Figure 4-15.

Figure 4-15 Dynamic MPPT test

4.5 Custom Waveforms

It is equipped with built-in waveforms such as triangular wave, square wave, and sine wave, allowing for the setting of output parameters such as amplitude, offset, and time. Additionally, it supports programming files, enabling users to customize waveform outputs easily and conveniently, as shown in

Figure 4-16.

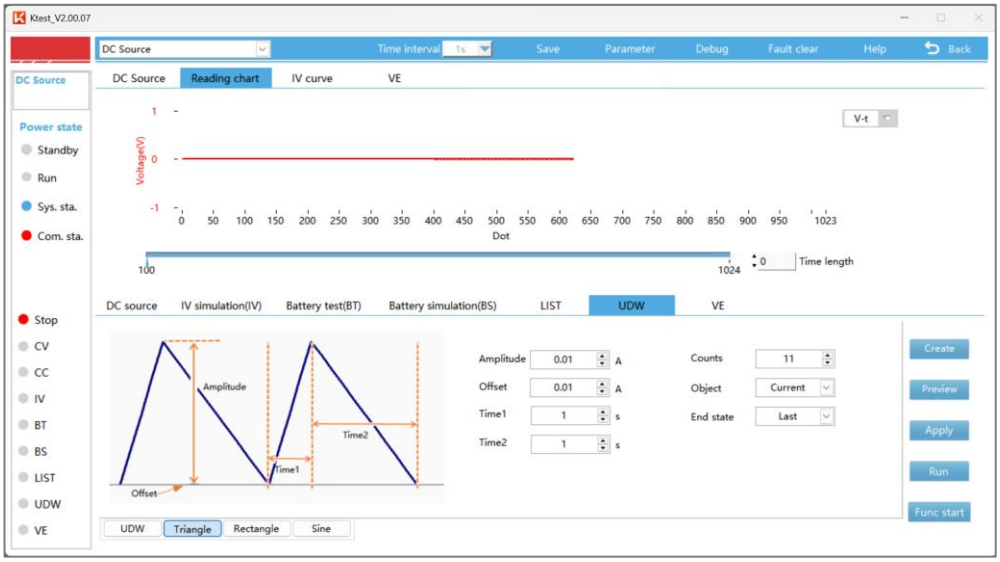


Figure 4-16 Custom wave

4.6 Automotive Power Curve

One click to call built-in industry standards for vehicle electronics such as ISO16750-2 for environmental conditions and testing of electrical and electronic equipment in road vehicles, LV123 for electrical characteristic testing standards of high-voltage components in new energy vehicles, and DIN40839 for automotive start-up waveform simulation, as shown in Figure 4-17.

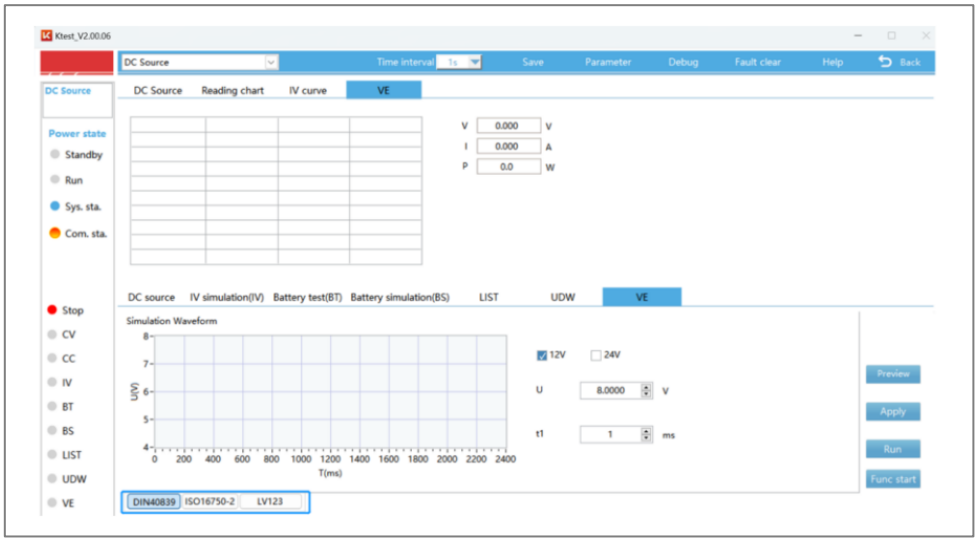


Figure 4-17 Automobile power curve

4.7 Regenerative Load Function

It offers multiple operating modes to accommodate testing requirements under various operating conditions. These include basic operating modes: Constant Current (CC), Constant Voltage (CV), Constant Power (CP), Constant Resistance (CR), and composite operating modes: CV+CC, CV+CR, CC+CR, CV+CC+CP+CR, as shown in Figure 4-18.

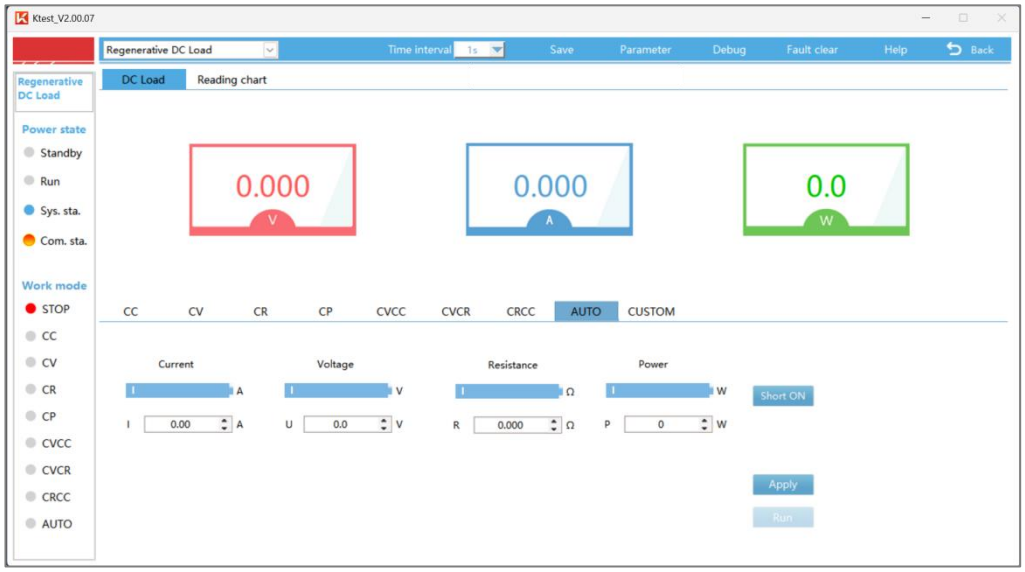
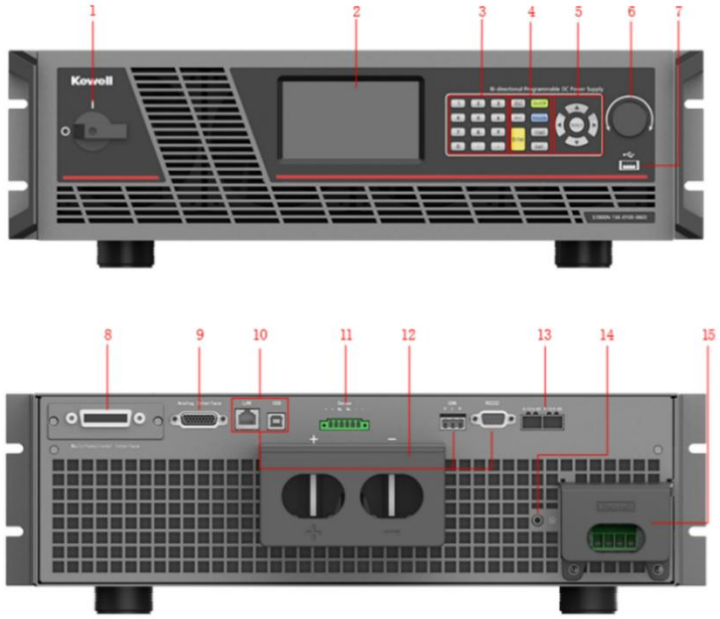


Figure 4-18 Regenerative load function

5 Appearance

5.1 Single Device



No.	Name
1	Power switch
2	TFT touch screen
3	Numeric keys
4	Function keys
5	Arrow keys
6	Push-button knob
7	USB port for system upgrade
8	GPIB
9	Analog port
10	Communication interface (RS232/LAN/USB)
11	Remote sense interface
12	DC output port
13	Parallel port
14	Grounding port
15	AC input port

Figure 5-1 S7200 Series appearance

5.2 Rack Solution

Model	Number	Dimensions (W*D*H)	Weight(Cabinet alone)
HK-15U	2~3 devices	610*1026*1006mm	130kg
HK-29U	4~6 devices	610*1026*1554mm	220kg
HK-42U	7~9 devices	610*1026*1999mm	280kg

Figure 5-2 Parallel connection (dimensions unit: mm)