As an energy storage component, batteries play a key role in solar power stations, electric vehicles and other fields. Due to the product characteristics of the battery, each application specification of the battery must be tested under all possible electrical and environmental conditions.

As an advanced battery simulator, bidirectional DC power supply of BriPower ESD series can not only cover the full range of battery charge and discharge voltage and current, reproduce the accuracy of the charge and discharge curve, but also simulate all the features of the electrochemical storage elements in any charge or discharge activity.

The BriPower ESD series provides battery simulation software (optional), which can simulate different types of batteries, lithium-ion batteries, lead-acid batteries, nickel-cadmium batteries, nickel-metal hydride batteries, etc., supporting multiple parameter settings, including: battery capacity, the number of cells in series and parallel, the state of charge, etc.

Software instructions: Select "Battery Mode" (Figure 1-2②), click 'Import', import the default battery simulation curve, then set the parameters, click "Apply" → "Power On" → "DC Output" → "Output Switch". The power supply starts to simulate the battery characteristics according to the default battery simulation curve.
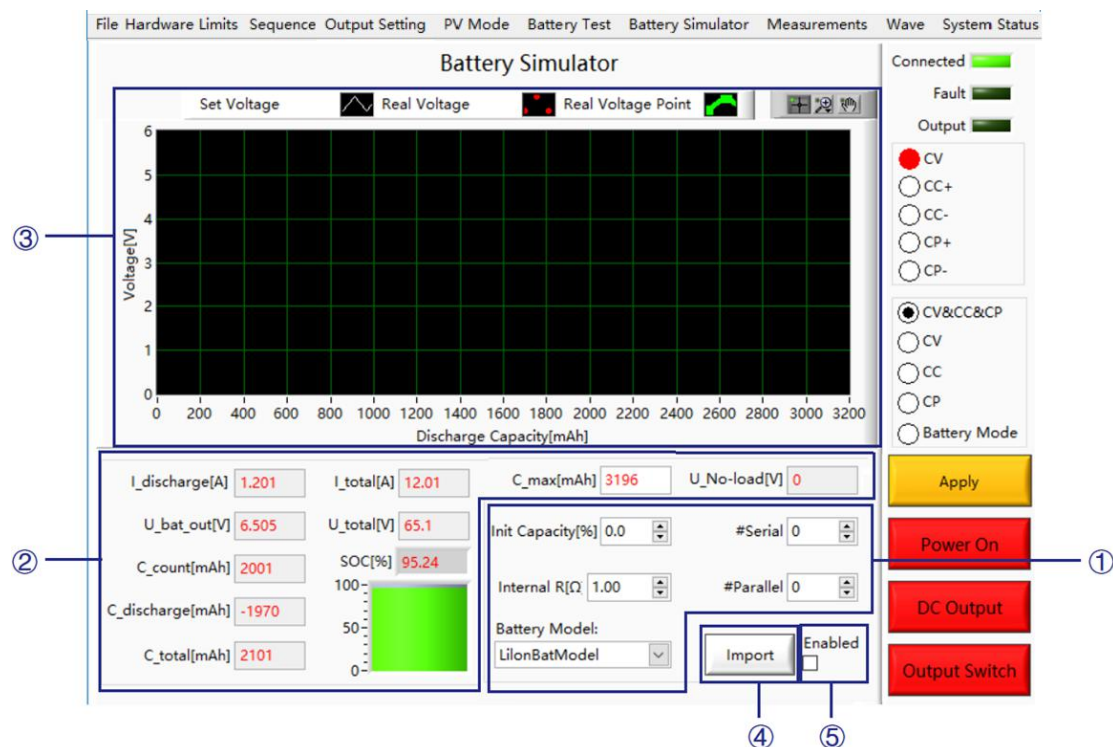

Figure 1   Battery simulation

Table 1

| Number	Name	Note
①	Parameters setting	The user can set parameters such as battery type (Battery Model), number of serial / parallel batteries (# Serial / # Parallel), battery internal resistance (Internal R), initial capacity (Init Capacity), etc. according to actual test requirements.
②	Parameters display in real-time	The battery or battery discharge current (I_discharge), battery voltage (U_bat_out), battery capacity (C_count), discharge capacity (C_discharge), maximum capacity (C_total), total current (I_total), total voltage (U_total), State of charge (SOC), maximum capacity value (C_max) and no-load voltage value (U_No-load) displays in Real-time.
③	Waveform display	It displays battery charge / discharge waveform.
④	Import button	Click " Import" to import the curve.
⑤	Enable	When the battery simulation based on other curves needs to perform, select Enable, click "Import" to import battery simulation curve (.csv file) (Figure 4-11) of the user , and then set parameters, click "Apply" → "Power" On "→" DC Output "→" Output Switch ", the power supply starts to simulate the battery characteristics according to the imported curve.
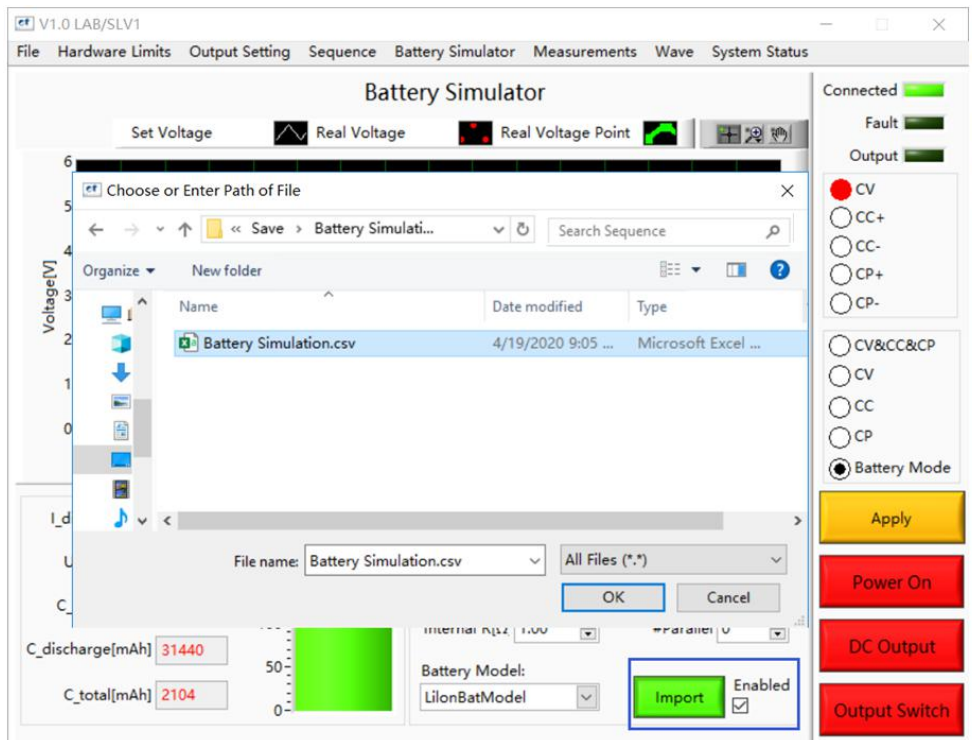
Figure 2 Import non-default battery simulation curve