100V50A-H Module & PACK Testing System

Technical Agreement

Data

Voltage accuracy
±0.02% of FS

Current accuracy
±0.05% of FS

Current response time
10%FS to 90%FS
≤3ms

Current switching time
-90%FS to 90%FS
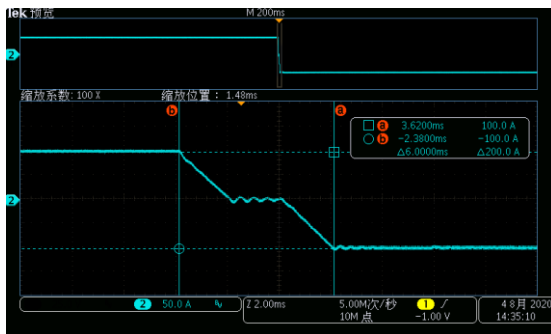
Minimum pulse width
100ms
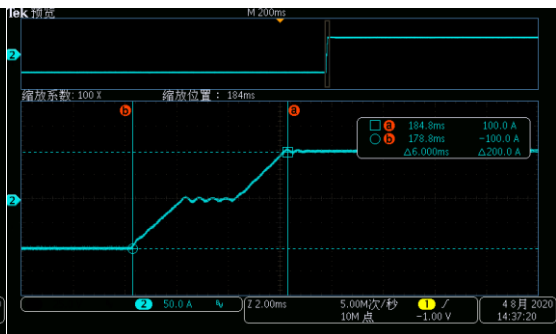
Data recording frequency
100Hz

Overall efficiency
90%

Working condition simulation
Support 1 million rows of
data downloading

Switch from charging to discharging

Switch from discharging to charging

System Architecture

The whole system adopts a three-layer architecture design (power system layer, centralized monitoring layer, remote interaction layer), and each layer is independent and performs its own duties to ensure the reliable operation of the system.
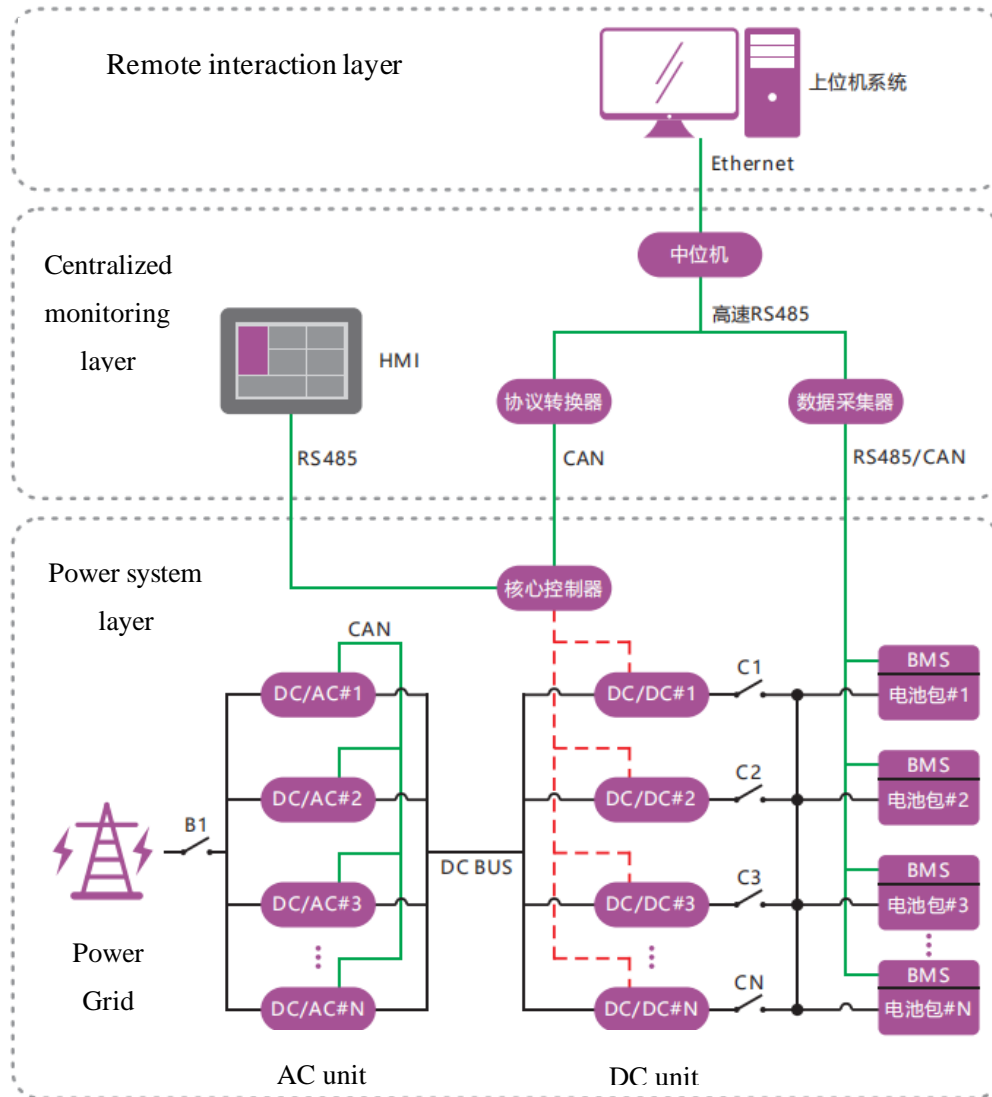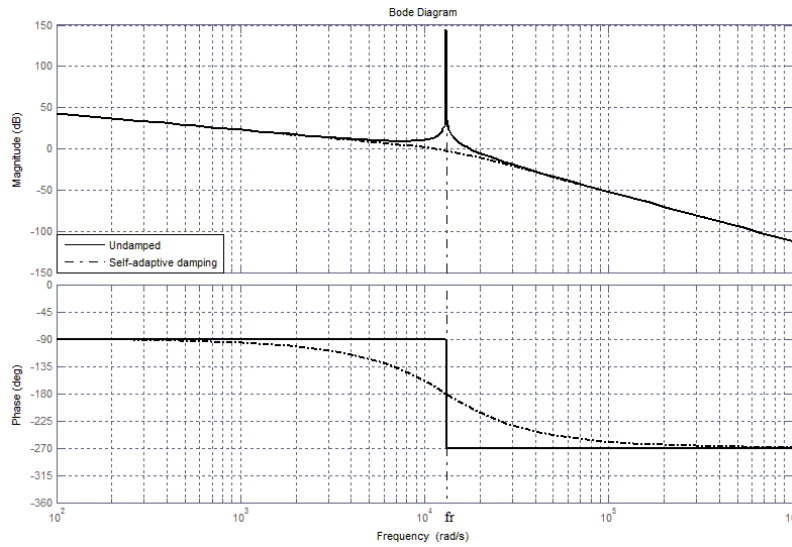
System Design

Rigorous simulation verification

- Build and improve the MTALAB simulation model;
- Ensure the optimal design of various parameters and indicators.
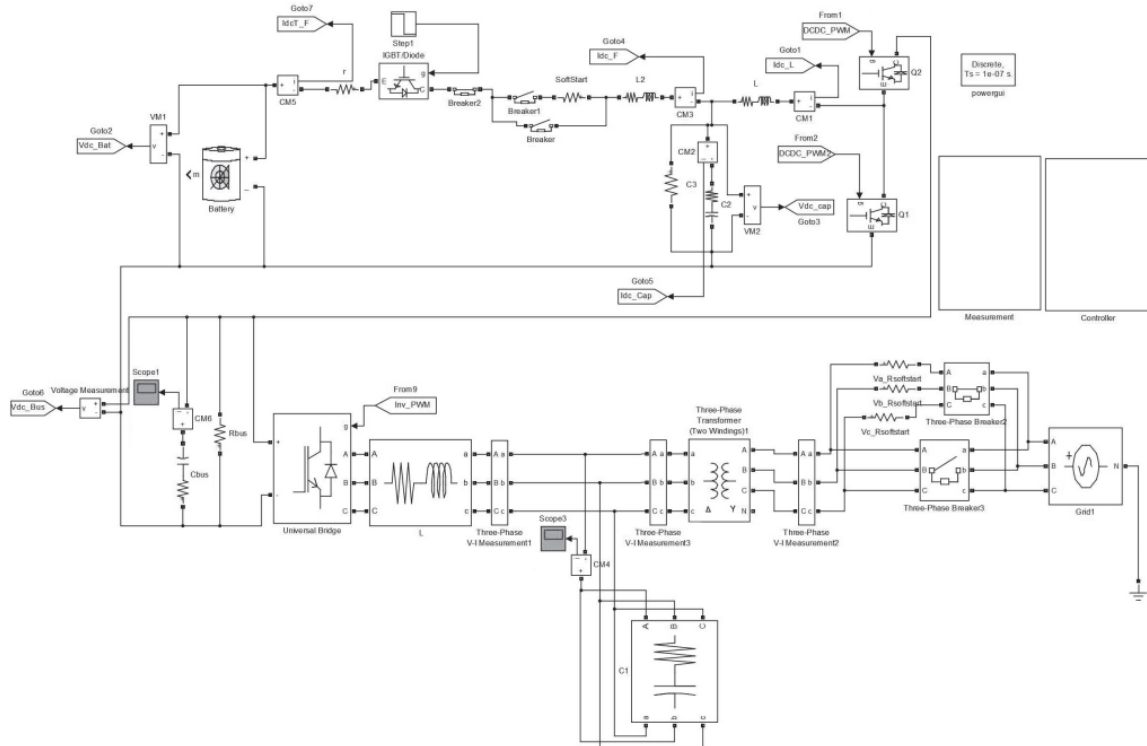
2、Original adaptive damping control algorithm

- Effectively suppress the resonant peak generated by LCL filter to ensure the stability of the closed-loop system.

Test Data Chart
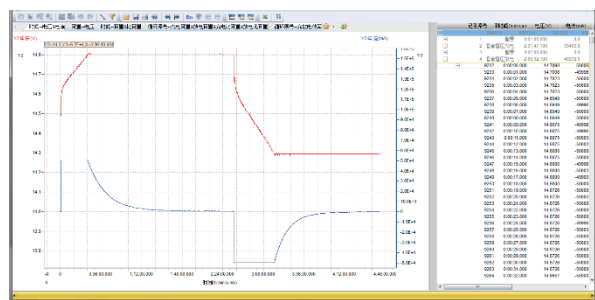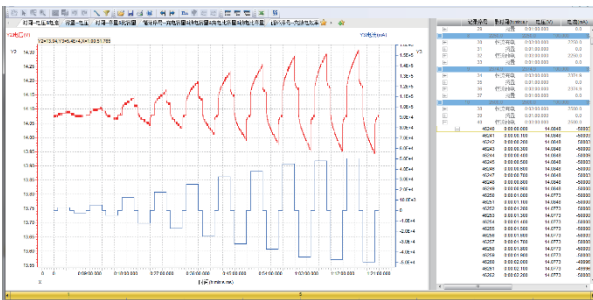
Constant current charge/discharge test

Constant current and constant voltage charge/discharge test
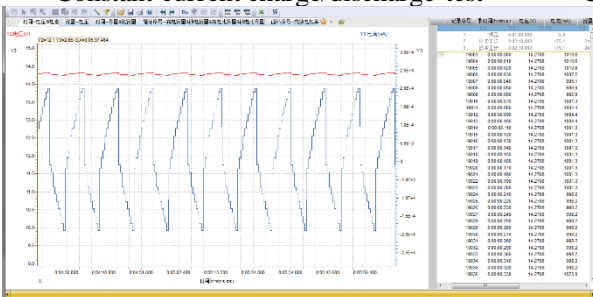
100ms pulse width
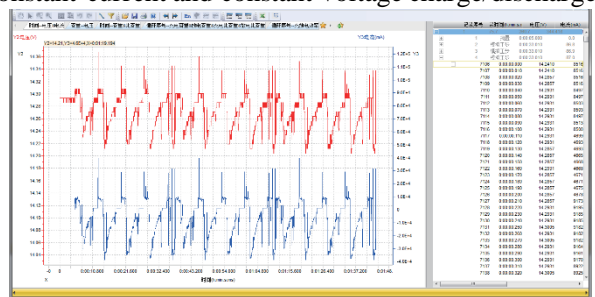
Working condition simulation test
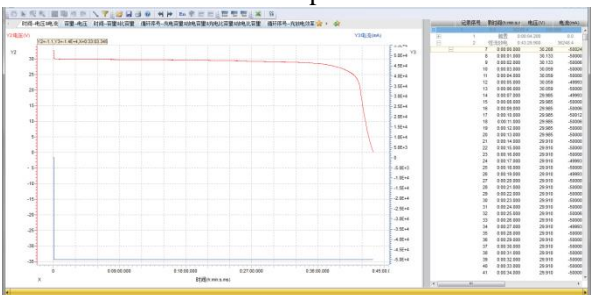
Discharge to 0V test (0 negative pressure model) DBC configuration function

System Construction

功率拓扑图
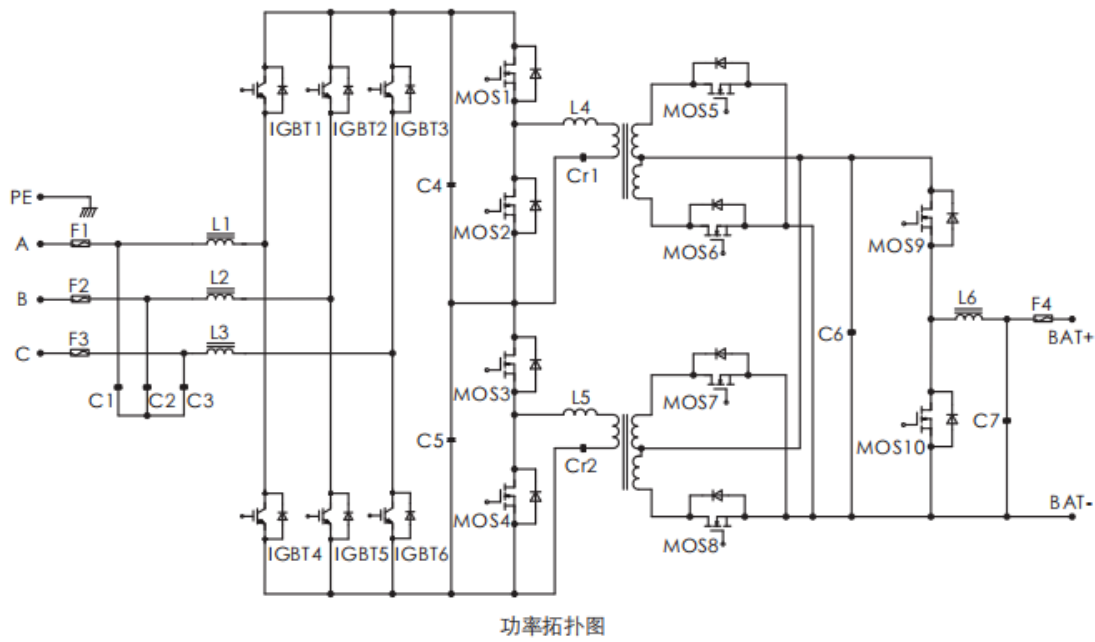
BTSDA (Battery Testing System Data Analyzer), the test data analysis software of the battery testing and dividing system, has a variety of data analysis methods and export schemes, and supports powerful curve comparison
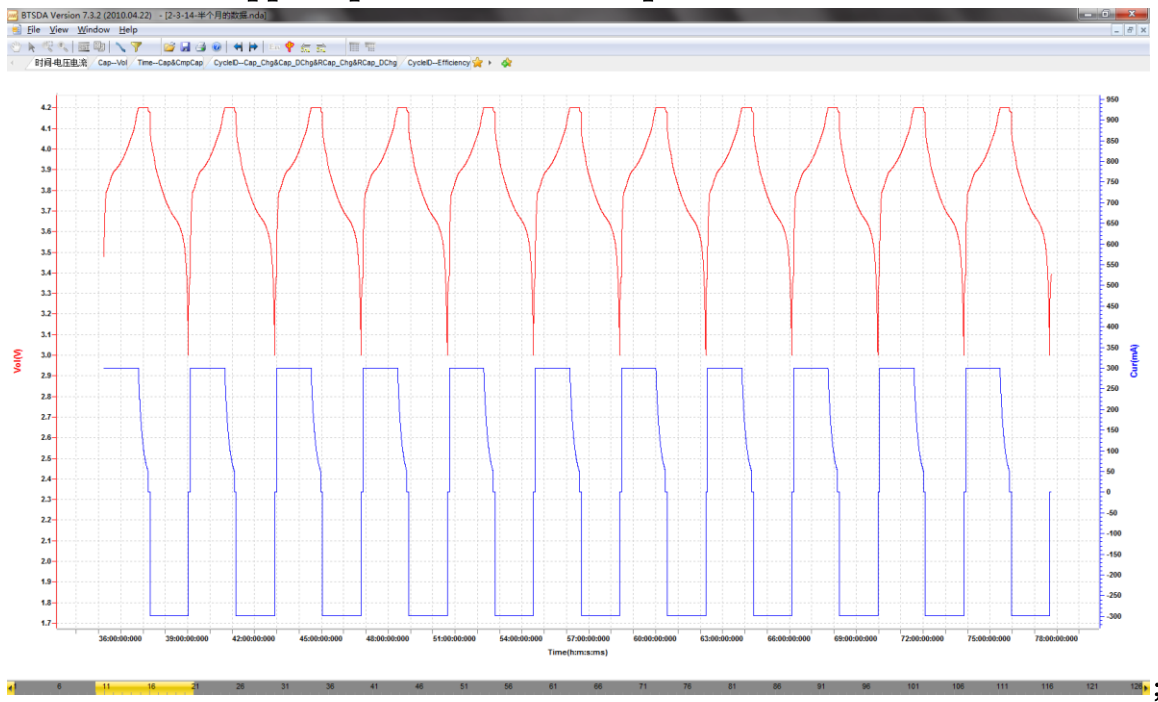
Fig. 1 Voltage and Current Curves of BTSDA Cycle Life
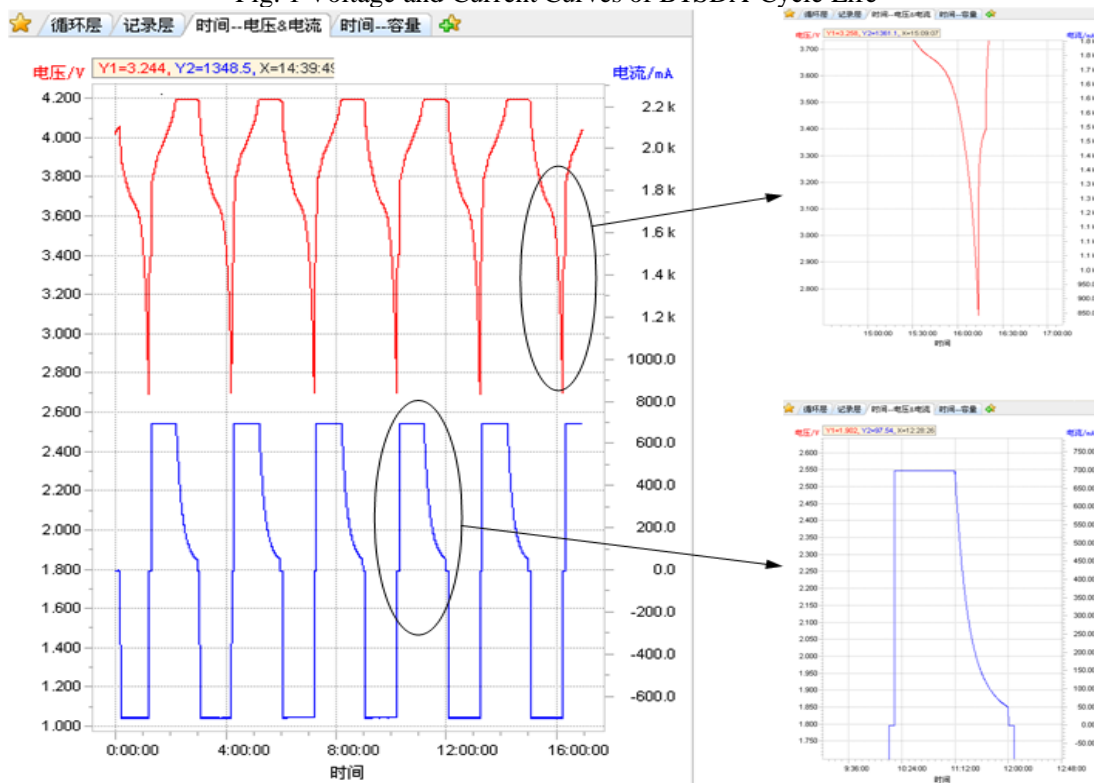
Fig. 2 Seamless switching diagram of constant current and constant voltage
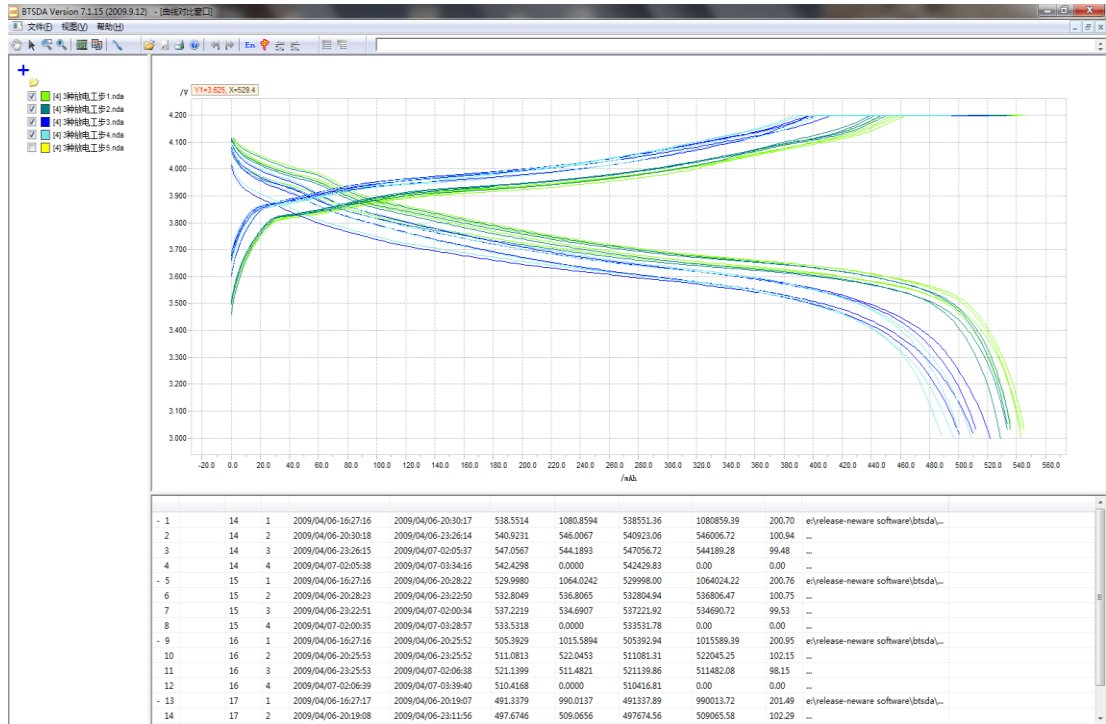
Figure 3 Curve comparison function

System Network Deployment Diagram

Based on the original office network and the working platform of computer equipment, the BTS battery detection, formation and capacity distribution system is easy to implement, simple to operate, and users can remotely log in to the system through the Internet to achieve various operations on the equipment; Network connection and SQL database are adopted to centrally control multiple equipment cabinets, and centrally manage, analyze and count all data. Figure 4 shows the network deployment of BTS battery detection equipment.
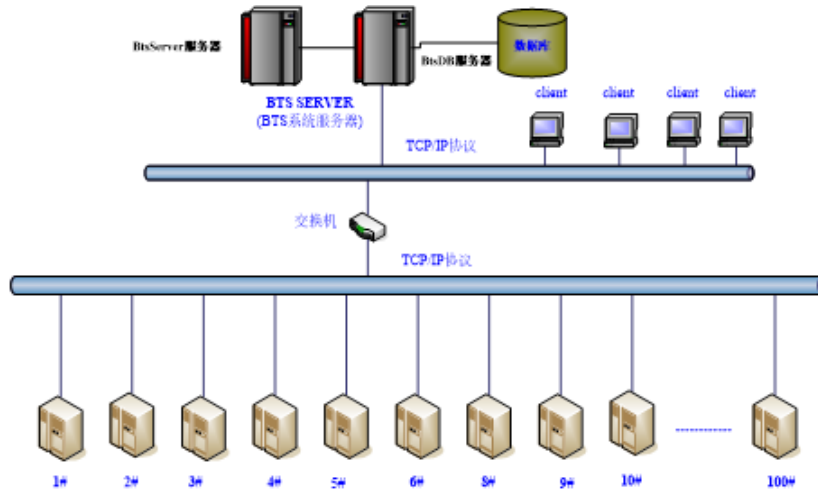
Figure 4 BTS battery detection equipment network deployment diagram

Technical Specifications

Equipment model

1、Material Mode	**100V50A-H**

Channel Info

1、Number of channel	Channels per cabinet	8
2、Main channel	Channel characteristics	CC-CV Constant current source and constant voltage source adopt double closed loop structure
	Channel control mode	Independent Control
	Channels in parallel	It supports parallel connection of up to 4 channels, and does not support pulse and simulation test after parallel connection

Input indicators

1、Input power		AC380V±15% 50/60±5Hz
2、power factor		≥99%（Max）
3、THDi		≤5%（Max）
4、Input impedance		≥1MΩ
5、Input power		47.1KW
6、Input Current		71.5A
7、Overall efficiency (Max)		90%
8、Noisy		≤65dB
9、Voltage and current detection sampling		Four wire connection (same port for charging and discharging)
10、Power control module type		MOSFET
11、Input power wiring mode		Three phase five wire

12、Protection		Anti surge, anti islanding, over and under frequency, over and under voltage, phase loss protection, etc

Function and performance index

1、Voltage	Measuring range of each channel	Charge:0V～100V
		Discharge:3V～100V
	Minimum discharge voltage	3V
	Accuracy	±0.02% of FS
	resolving power	24bit
2、Current	Measuring range of each channel	0.25A～50A
	Accuracy (independent range)	±0.05% of FS
	Constant voltage cut-off current	50mA
	resolving power	24bit
3、Power	Single channel output power	5KW
	Overall output power	40KW
4、Time	Current response time	≤3ms
	Current switching time	≤6ms
	Minimum working time	0.1s
5、Charge & discharge mode	Charge & discharge mode	Constant current charging, constant voltage charging, constant current constant voltage charging (constant current constant voltage smooth transition, to prevent current spikes and large current impact on the battery, and to protect the battery), constant power charging

		Constant current discharge, constant voltage discharge, constant power discharge, constant resistance discharge
	Cut off conditions	Voltage, current, relative time and capacity、-ΔV
6、Working condition simulation step	Charging mode	Current，power
	Discharging mode	Current，power
	Switch	Support continuous switching between charging and discharging
	Cut off conditions	Time and line number
	Download data volume	Up to 1 million lines can be downloaded
7、Pulse working step	Charging mode	Current，power
	Discharging mode	Current，power
	Minimum pulse width	100ms
	Number of pulses	A single pulse working step can support 32 different pulses
	Continuous switching of charging and discharging	One pulse working step can realize continuous switching from charging to discharging
	Cut off conditions	Voltage，relevant time
8、DCIRDC internal resistance test		Support user-defined point fetching for DCIR calculation
9、Safety protection	Software protection	Power loss data protection
		With offline test function
		The safety protection conditions can be set, and the parameters can include: lower voltage limit, upper voltage limit, lower current limit, upper current limit, and delay time

	Hardware protection	Anti reverse connection protection, over-voltage protection, over-current protection, over temperature protection, etc

Data management and analysis

1、Step setting mode		Chart edition
2、data record	Recording Condition	Minimum time interval: 10ms (100ms for access to auxiliary channel)
		Minimum voltage interval: 0.2V
		Minimum current interval: 0.1A
	Recording frequency	100Hz
3、Data base		Centralized management of test data using MySQL database
4、Data output mode		Excel、Txt
5、Curve line style		Customizable drawing, 4 Y axes
6、Scanning		Support barcode scanning function, which can be realized through battery barcode
		Management and traceability of historical data

Communication mode

1、Communication mode of upper computer		Based on TCP/IP protocol
2、communication interface		Internet
3、Lower computer communication baud rate		1M
4、Communication baud rate of upper computer		10M～100M
5、Networking mode		Set up LAN through switches and routers

6、COMMUNICATION EXPANSION		Support CAN, RS485 communication and BMS communication, with DBC configuration function
Environmental requirements, dimensions and weights		
1、Operating temperature		-10℃~40℃（Within the range of 25 ± 10 ℃, ensure the measurement accuracy: the accuracy drift is 0.005% of FS/℃）
2、Storage temperature		-20℃~50℃
3、Relative humidity of working environment		≤70% RH（No water vapor condensation）
4、Relative humidity of storage environment		≤80% RH（No water vapor condensation）
5、Equipment size W＊D＊H		600*800*1300(mm)
6、Weight		199.1KG
7、Equipment appearance (for reference only)		

AUX auxiliary test system (optional)		
1、Temperature auxiliary channel	temperature range	Thermistor：-30°C～120°C
		Thermocouple：-200°C～260°C
	temperature Assurance	±1°C
	Temperature resolution	0.1°C
2、Voltage auxiliary channel	Voltage range	0V～5V
	Voltage accuracy	±0.1% of FS
	Voltage resolution	0.1mV
3、AUX PROFILE	It is mainly used to monitor the surface and lug temperature during battery testing. The test accuracy is high. The test data can be bound with the main voltage and current data. The temperature measured at the same time can be used as the control and protection conditions for process steps.	

V4.0