ACCU-100 Microgrid Energy Controller

Installation Manual V1.0

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1. Overview

ACCU-100 microgrid energy controller is an intelligent coordination controller used in microgrids, distributed power generation, energy storage, etc. The device meets the system requirements for the access of photovoltaic systems, wind power generation, energy storage systems, charging piles and other equipment. It collects and analyzes data from the microgrid system at all times, monitors the operating status of photovoltaic, wind power, energy storage systems, and charging piles, and on this basis, takes safe and economical optimized operation as the goal, obtains the optimal control strategy, and then implements regulation and control of the microgrid.

2. Features

- **Data collection:** supports serial port, Ethernet and other multi-channel access, meeting the access requirements of various wind power and photovoltaic inverters, energy storage and other equipment;
- **Communication protocol:** supports Modbus RTU, Modbus TCP, IEC 60870-5-101, IEC 60870-5-103, IEC 60870-5-104, MQTT and other communication protocols, and can realize OTA upgrade, local/remote switching, and local human-computer interaction;
- **Edge computing:** flexible alarm threshold settings, active upload of alarm information, data merging and calculation, logic control, breakpoint resume, data encryption, and 4G communication;
- **Strategy management:** anti-backflow, planning curve, peak shaving and valley filling, demand control, active/reactive power control, PV-storage coordination, etc., and supports strategy customization;
- **System security:** User permissions designed based on untrusted models prevent illegal intrusion; based on data encryption and data security verification technology, data calibration and anti-tampering mechanisms are adopted to achieve data authentication and traceability;

- **Operational safety:** Collect and analyze station-wide signals and measurement data including battery, temperature control, and fire protection to achieve early warning and prediction of operational safety.

3. Product Parameters

ACCU-100 microgrid energy controller is mainly responsible for data collection, local control strategy and cloud data interaction of industrial and commercial photovoltaic storage and charging new energy power stations. Supported capacity: energy storage capacity: ≤400kW, photovoltaic capacity: ≤400kWp.

Figure 3-1 ACCU-100

Parameters

Item	Parameter
CPU	ARM Cortex-A7 528MHz
RAM	256MB DDR3 + 256MB NAND Flash
Freq & PD	50Hz（45～65Hz）, ≤10W
Power Supply	AC/DC 220V（85-265V）
RS485 Port	8-channel optocoupler isolation
RJ45 Port	2-channel 10/100M adaptive
Other Port	1*RS232 management serial port + 1*USB2.0 + SD Card standard slot + 4G interface; (DI, DO optional)
Protocol	Device side: Modbus Rtu/TCP, DL/T 645-1997, DL/T 645, etc.; Master side: Modbus TCP, 104, SNMP, MQTT protocol, etc.;
Security	Power frequency withstand voltage: 1 minute between power supply and communication terminals: 2kV (220V equipment), 1.5kV (24V equipment)
	Insulation resistance: Under normal test atmospheric conditions, the input and output terminals to the housing> 100MΩ

Environment	Operating temperature: -20℃～+55℃
	Storage and transportation temperature: -25℃～+70℃
	Humidity: ≤95% (+25℃)
	Altitude: ≤2500m

4. System Structure

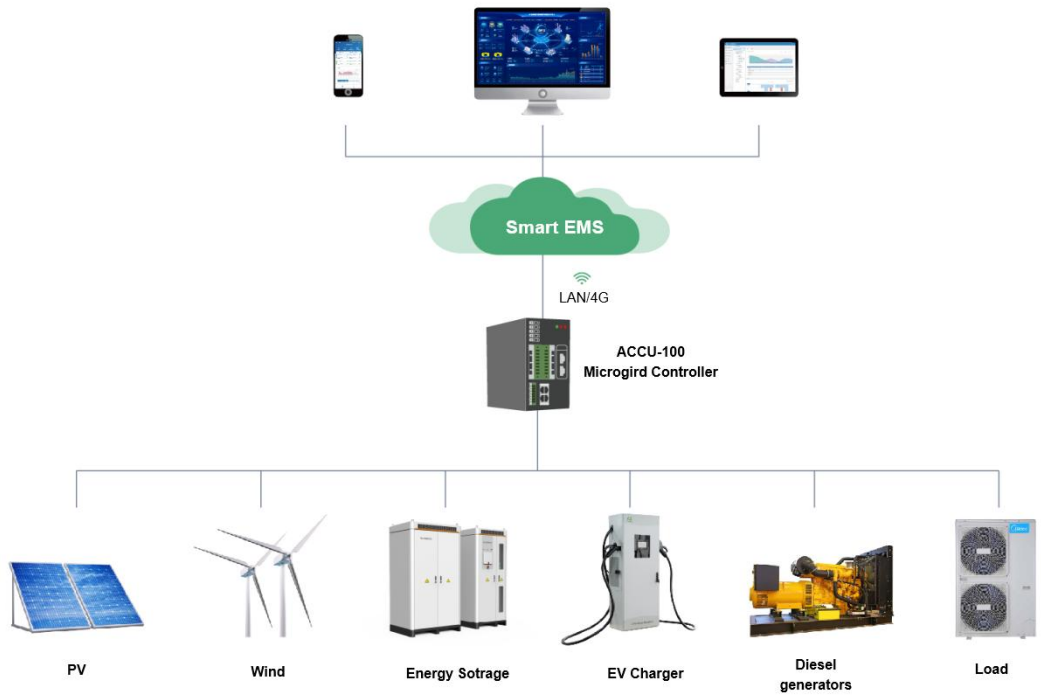

Figure 4-1 System Structure

ACCU-100 coordination controller: controls the output and power demand of energy storage equipment, distributed energy, and adjustable load equipment, and can replace solar energy with storage to reduce abandoned solar energy based on the economic benefit model and under the premise of meeting the dispatch requirements. It also interacts with the cloud platform and responds to cloud strategy configuration.

Smart Energy Management Cloud Platform EMS3.0: It can meet the access of massive data across sites and regions, and realize the calculation and control of

indicators such as resources, power, loss, indicators, maintenance, and contribution of each site through data analysis. It can also analyze the trend of power generation and consumption through diversified forecasting, and provide the best control solution by combining electricity price data, production plan, and load demand. It also provides remote monitoring and operation and maintenance functions.

5. Performance Indicators

Item	Indicator
Telemetry response time	≤10s
Telemetry comprehensive error rate	≥99.9%
Remote signal change response time	≤2s
Remote signal accuracy	≥99.9%
Remote control command response time	≤5s
Remote control accuracy	≥99.9%
System availability	≥99.9%
Timing accuracy	≤1S
Data recording time stamp accuracy	≤1ms
System support status	≤30000
System supports analog	≤30000
System support control volume	≤30000
Protocol support	IEC 104/Modbus/MQTT/HTTP

6. Energy Scheduling

Model	Control Logic
Manual Control	It supports manual switching of microgrids on and off the grid, issuing commands for distributed generation, energy storage, and other adjustable equipment, and support remote control.
Plan control	Users can configure the electricity price template according to the local electricity price, set the charging and discharging power of energy storage in different time periods, and form a control strategy template; it provides the function of configuring strategy templates by day and week. It is suitable for multi-region and multi-electricity price strategy operation modes.
Demand Control	The demand value is collected in real time by the electric meter on the main incoming line. When the demand value reaches the limit value (which can be set), the demand

	control is triggered. The system reduces the charging and discharging of the energy storage, reduces the charging power of the charging pile, or reduces the power consumption of the adjustable load according to the configured parameters.
Dynamically increase transformer capacity	The transformer load rate is collected in real time by the electric meter on the main incoming line. When the transformer load rate reaches the limit value (which can be set), the protection is triggered. The system reduces the charging and discharging of the energy storage, reduces the charging power of the charging pile, or reduces the power consumption of the adjustable load according to the configured parameters.
Green energy consumption	By collecting reverse power data in real time from the electric meter on the main incoming line, when reverse power occurs and reaches the limit value (which can be set), the energy storage system is preferentially dispatched to absorb excess photovoltaic energy; when the energy storage system is fully charged, the output power of the photovoltaic inverter is adjusted (if there is a reverse flow protection requirement).
Anti-backflow control	By collecting reverse power data in real time through the electric meter on the main incoming line, when reverse power occurs and reaches the limit value (settable), the system will take actions such as static storage, reduced discharge, charging, or photovoltaic power reduction according to the configured parameters. The system's anti-reverse flow strategy is implemented as software protection. If you need to achieve faster response and more reliable protection, you need to add a corresponding reverse power protection device, and immediately trip the protection when reverse flow is detected.
Backup power function	During system operation, the energy storage system operates within the set SOC range, and a certain power range is reserved for backup capacity. The backup capacity can be customized to provide emergency power to the load when the grid is out of power.
Others	Different strategies can be customized according to customer needs

7. Wiring

ACCU-100 microgrid energy controller adopts standard rail installation. After the device is plugged into the network cable, the green LINK light will light up and flash when there is data. The yellow SPEED light will light up at 100Mb/s and turn off at 10Mb/s. The red RX light will flash when the device has data transmission, and the green TX light will flash when sending data.

Both the rear plate and the bottom plate can be installed with guide rail holders.

8. Size

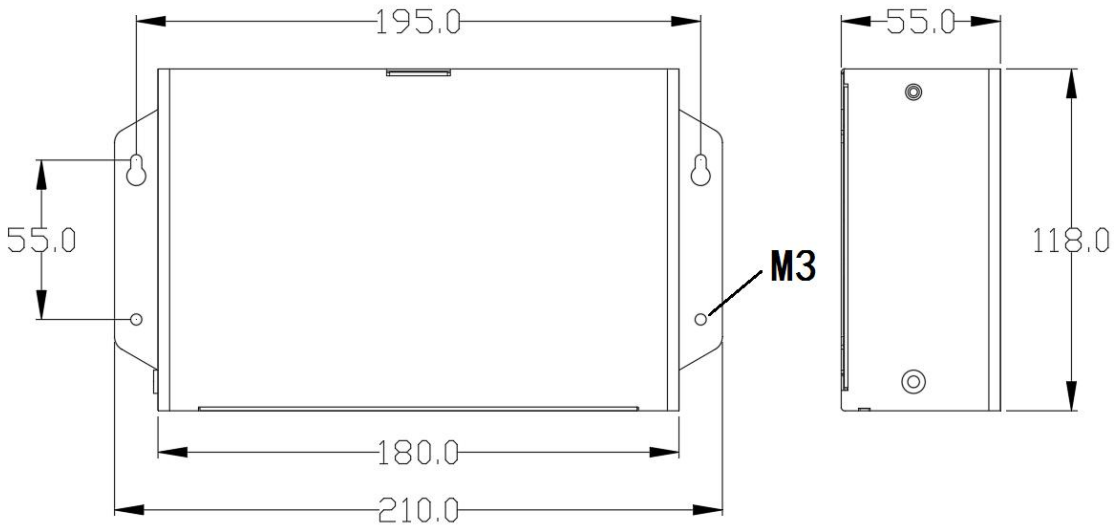

Figure 9-1 Appearance and dimensions of the device