TG-EP

INTELLIGENT CONTROL SOLUTION FOR ENERGY STORAGE

BMS | EMS

Shenzhen Tringo Control Co., Ltd.
Email: tringo@tg-ep.com

TG-EP
www.tg-ep.com

TG-EP

CONTENTS

Tringo Control is committed to providing safe, stable, and efficient solutions for smart control of energy storage.

Our businesses cover products and technical services related to electrical control and cloud data in energy storage applications, such as C&I and household energy storage BMS, Data center backup power BMS, Large-scale energy storage BMS, and also Battery life cycle management platform and Energy management system, etc.

Headquartered in Shenzhen, our company has three advanced laboratories and four automated SMT production lines, and has already set up technical service centers in Southeast Asia, Our team is composed of experienced technical experts and market elites who are full of enthusiasm and creativity.

Creation of differentiated performance advantages and product strategies as the core competitiveness and continuous investment in fund, equipment,and R&D provide strong support for the company to step into the forefront of the industry.

ABOUT US

VISION

Create a globally respected brand for smart control of green energy.

MISSION

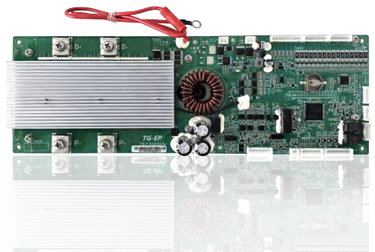
Pursue more efficient and smarter control solutions and promote faster energy transformation towards sustainability.

VALUES

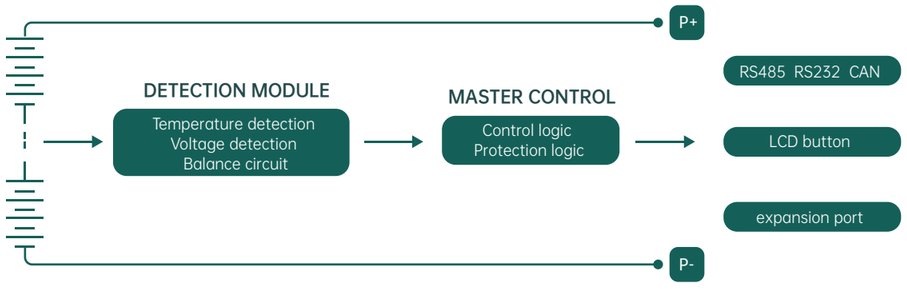
People oriented, morality first, quality equals life.

LOW-VOLTAGE RESIDENTIAL ENERGY STORAGE

Manage up to 8 or 16 strings of lithium batteries, collect voltage and temperature parameters of each string of cells. Various alarms and protections includes over/under-voltage, overcurrent, insulation, and can be used in parallel with multiple groups of batteries through RS485; Provide APP data viewing and system setting.



MODEL	TB-P08S	TB-P16S
Number of strings	8	16
Working temperature	-20~70℃	-20~70℃
Number of NTCs	3	6
Data capacity	1000(Expandable)	1000(Expandable)
Performance parameters	Voltage detection accuracy: ⩽±0.1V Current detection accuracy: ±2% (When below 50A,error⩽1A) Temperature detection accuracy: ⩽±2℃	Voltage detection accuracy: ⩽±0.1V Current detection accuracy: ±2% (When below 50A,error⩽1A) Temperature detection accuracy: ⩽±2℃
Communication	1*CAN ,2*RS485,1*RS232, WIFI/4G/Bluetooth(Optional)	1*CAN ,2*RS485,1*RS232, WIFI/4G/Bluetooth(Optional)
Rated Current	100/120/150/200A	100/120/150/200A
Max continuous discharging current	100/120/150/200A	100/120/150/200A
Extendable function	4G,WIFI,I/O ports,LCD	4G,WIFI,I/O ports,LCD
Size	300×100mm	300×100mm

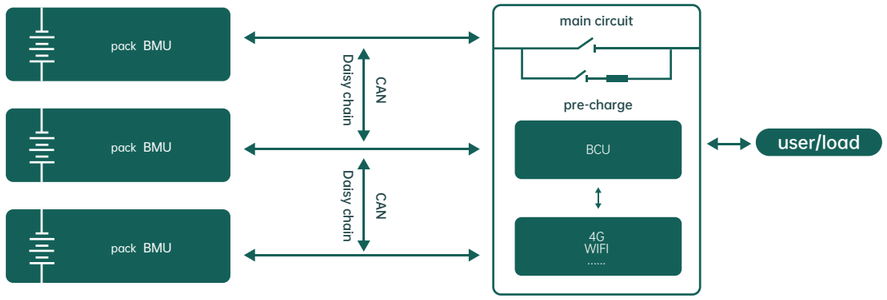


- **Customization**
  Implement differentiated customization based on mature and flexile software design platform, support multiple communication protocols
- **High reliability**
  Ensure compliance with various safety requirements through rigorous reliability tests
- **Man-machine interaction**
  Data can be controlled and viewed through mobile and PC
- **Control strategy**
  Online data analysis of SOC/SOH to improve battery life
- **Expandability**
  Modular design, provide extended multiple communications and peripheral control ports

HIGH-VOLTAGE RESIDENTIAL ENERGY STORAGE

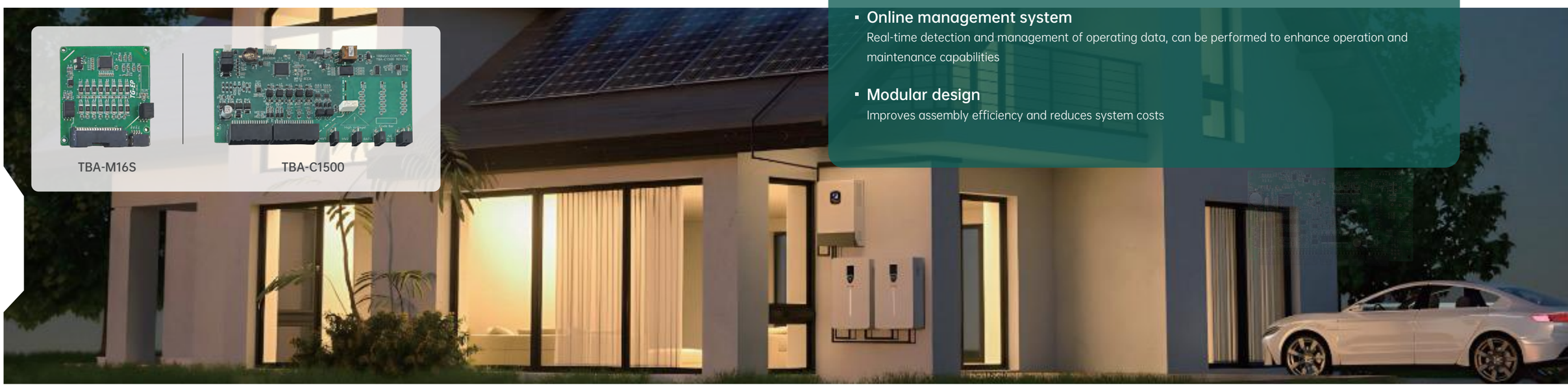
Suitable for the way of battery pack stacking, adopts a two-levels architecture form to control and manage the battery cluster. It can flexibly configure the battery module through the daisy chain and CAN communication to provide different capacity options.

Model	TBA-M16S	TBA-C1500
Control level	1st level control	2nd level control
Working voltage	36V-60V	12/24V
Working temperature	-20~70℃	-20~70℃
Data capacity	/	1000 (Expandable)
Performance parameters	Voltage detection accuracy: ⩽±10mV Temperature detection accuracy: ⩽±2℃	Voltage detection accuracy: ⩽±0.5%FSR Current detection accuracy: ±2% (When below 50A,error⩽1A) Temperature detection accuracy: ⩽±2℃
Communication	SPI,CAN	SPI,CAN, RS485, Ethernet/WIFI/4G/Bluetooth(Optional)
Basic function	Cell voltage acquisition Cell temperature acquisition	Insulation detection, Automatic coding, Over-undervoltage protection, Overcurrent protection, Overtemperature protection, Balance
Upgrade method	/	Local/Remote
Solution accessories	TB-DP43	4.3-inch touch screen; 12V/24V; RS485 communication port
	TB-PD500V100A/ TB-PD500V250A	High-voltage control box, provide system assemblies including contactors, circuit breakers, etc



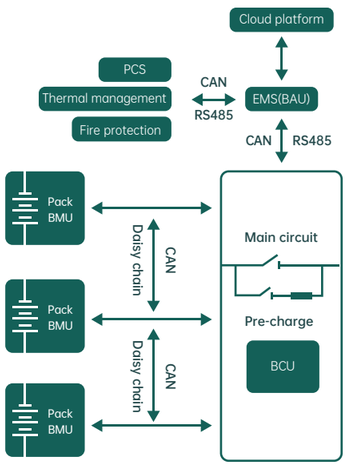
- **Expandability**
  Flexible stacking of battery modules can be achieved through communication connections
- **High accuracy**
  Provides data support for battery management ,extend the battery life scientifically
- **Online management system**
  Real-time detection and management of operating data, can be performed to enhance operation and maintenance capabilities
- **Modular design**
  Improves assembly efficiency and reduces system costs

TBA-M16S TBA-C1500



- **2-levels or 3-levels architecture**
  Achieve flexible configuration of single-cluster or multiple clusters
- **Integration**
  EMS controller integrated with the 3-level architecture, better cost-performance
- **Cloud control**
  Provide intelligent online calibration of SOC and SOH
- **Linkage**
  Joint control of peripheral devices such as fire protection, access control, and air conditioning
- **High reliability**
  Compliance with various safety requirements and environmental adaptability through rigorous reliability tests

COMMERCIAL AND INDUSTRIAL ENERGY STORAGE



The commercial and industrial energy storage solution adopts a two-levels or three-levels architecture, supports multi-cluster parallel or single-cluster independent operation, and provides solutions such as data collection, data analysis, and logical processing. It can provide overcharge, overdischarge, overcurrent, overtemperature, and short-circuit protection for the battery pack, real-time detect, diagnose faults, and safe warnings of the state of the battery. It can accurately evaluate SOC/SOH to ensure the efficient, reliable, and safe operation of the energy storage system.

MODEL	TB-M16S	TB-M52S	TBA-C1500
Control level	1st level control	1st level control	2nd level control
Working voltage	36-60V	36-60V	12/24V
Number of clusters	/	/	⩽16 clusters
Working temperature	-20~70℃	-20~70℃	-20~70℃
Data capacity	/	/	1000 (Expandable)
Performance parameters	Voltage detection accuracy: ⩽ ±10mV Temperature detection accuracy: ⩽±2℃	Voltage detection accuracy: ⩽ ±10mV Temperature detection accuracy: ⩽±2℃	Voltage detection accuracy: ⩽±0.5%FSR Current detection accuracy: ±2% (When below 50A,error⩽1A) Temperature detection accuracy: ⩽±2℃
Communication	CAN,SPI	CAN,SPI	SPI,CAN, RS485, Ethernet/WIFI/4G/Bluetooth(Optional)
Basic function	Cell voltage acquisition Cell temperature acquisition	Cell voltage acquisition Cell temperature acquisition	Insulation detection, Automatic coding, Over-undervoltage protection, Overcurrent protection, Overtemperature protection, Balance
Upgrade method	/	/	Local/Remote
Solution accessories	3rd level master+EMS	TB-E100	Data acquisition, processing, storage and analysis, Visual monitoring, Alarm management, statistical reports, etc. Also provide planned curves,Peak cut intelligent control
	High voltage control integrated unit	TB-PD1000 TB-PD1500	1000V voltage level, provide system assemblies including contactors, circuit breakers, etc 1500V voltage level, provide system assemblies including contactors, circuit breakers, etc
	Touch screen	TB-DP70	7.0 inch touch screen ,12V/24V ,RS232/RS485

- **3-levels architecture**
  Achieve flexible configuration of single or multiple clusters
- **Integration**
  EMS controller integrated with the 3-level architecture, better cost-performance
- **Cloud control**
  Provide intelligent online calibration of SOC and SOH
- **Linkage**
  Joint control of peripheral devices such as fire protection, access control, and air conditioning
- **High reliability**
  Compliance with various safety requirements and environmental adaptability through rigorous reliability tests

TB-M52S

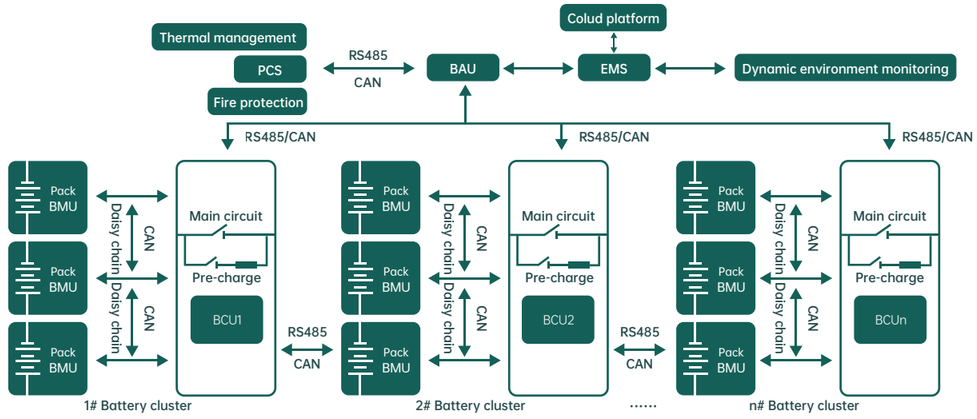
TB-M16S

TB-C1500

LARGE-SCALE ENERGY STORAGE

Adopts 3-levels architecture and supports 16 clusters operation in parallel. It is capable of applying data acquisition of the power station, algorithm analysis, logical processing, and data storage, while also monitors the total voltage/current, insulation resistance, and relay adhesion. It detects and troubleshoots the safety status of the cell in real time, and ensures the safe and reliable operation of the power station system through accurate SOC/SOH and SOE estimation.

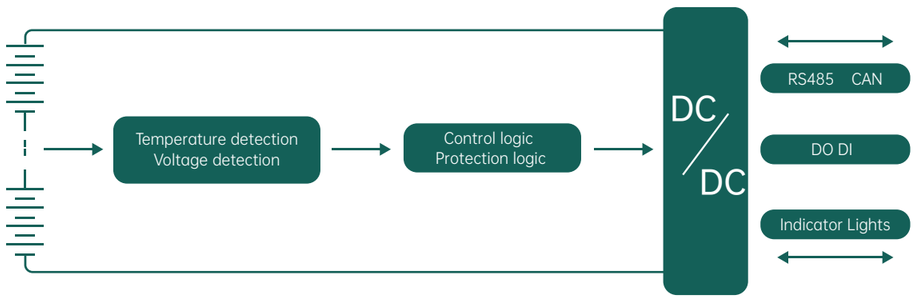
MODEL	TB-M52S	TBA-C1500
Control level	1st level control	2nd level control
Working voltage	36-60V	12/24V
Number of clusters	/	⩽16 clusters
Working temperature	-20~70℃	-20~70℃
Data capacity	/	1000 (Expandable)
Performance parameters	Voltage detection accuracy: ⩽±10mV Temperature detection accuracy: ⩽±2℃	Voltage detection accuracy: ⩽±0.5%FSR Current detection accuracy: ±2% (When below 50A,error⩽1A) Temperature detection accuracy: ⩽±2℃
Communication	CAN,SPI	SPI,CAN, RS485, Ethernet/WIFI/4G/Bluetooth(Optional)
Basic function	Cell voltage acquisition Cell temperature acquisition	Insulation detection, Automatic coding, Over-undervoltage protection, Overcurrent protection, Overtemperature protection, Balance
Upgrade method	/	Local/Remote
Solution accessories	3rd level master+EMS: TB-E100 — Data acquisition, processing, storage and analysis, Visual monitoring, Alarm management, statistical reports, etc. Also provide planned curves,Peak cut intelligent control	
	High voltage control integrated unit: TB-PD1000 — 1000V voltage level, provide system assemblies including contactors, circuit breakers, etc	
	High voltage control integrated unit: TB-PD1500 — 1500V voltage level, provide system assemblies including contactors, circuit breakers, etc	
	Touch screen: TB-DP70 — 7.0 inch touch screen ,12V/24V ,RS232/RS485	



COMMUNICATION BASE STATION ENERGY STORAGE

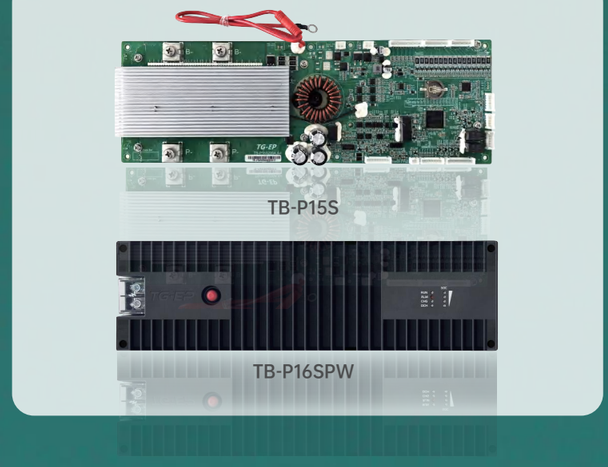
The communication base station BMS solution is suitable for the management of communication backup power systems with 16/15 strings or less. The BMS provides protection and recovery functions such as Over/under-voltage, Overcurrent, High/low temperature, Short circuit, and Reverse connection. It is capable of accurate measurement of SOC during charging and discharging, and statistics of SOH health status. It can communicate with the dynamic loop monitoring or upper computer platform through RS485/RS232/CAN ports, and supports parameter configuration and monitoring online. It is suitable for various application scenarios such as Integrated base stations, Marginal stations, Solar base stations, and Microgrid energy storage stations.

MODEL	TB-P15S	TB-P16SPW
Number of strings	15/16	12~16
Working temperature	-20~70℃	-20~70℃
Number of NTCs	6	6
Data capacity	1000(Expandable)	1000(Expandable)
Performance parameters	Voltage detection accuracy: ⩽±0.1V Current detection accuracy: ±2% (When below 50A,error⩽1A) Temperature detection accuracy: ⩽±2℃	Voltage detection accuracy: ⩽±0.1V Current detection accuracy: ±2% (When below 50A,error⩽1A) Temperature detection accuracy: ⩽±2℃
Communication	1*CAN ,2*RS485,1*RS232, WIFI/4G/Bluetooth(Optional)	1*CAN ,2*RS485,1*RS232, WIFI/4G/Bluetooth(Optional)
Rated Current	100/200A	120A
Max continuous discharging current	100/200A	120A
Extendable function	4G,WIFI,I/O ports,LCD	4G,WIFI,I/O ports,LCD
Size	300×100×30mm	433×130×50mm



TG-EP

- **Customization**
  Implement differentiated customization based on mature and flexile software design platform, support multiple communication protocols
- **High reliability**
  Ensure compliance with various safety requirements through rigorous reliability tests
- **Man-machine interaction**
  Data can be controlled and viewed through mobile and PC
- **Control strategy**
  Online data analysis of SOC/SOH to improve battery life
- **Expandability**
  It supports jointly control with environment supervision in data center



HIGH VOLTAGE CONTROL INTEGRATED UNIT

500V/1000V/1500V Optional
Supports manual or automatic trip modes of DC circuit breaker
Supports CAN communication or daisy-chain communication
Supports fault diagnosis such as fuse blowing, relay adhesion, and relay open circuit
Two-color panel indicator lights, display operating, alarm, fault, and other states

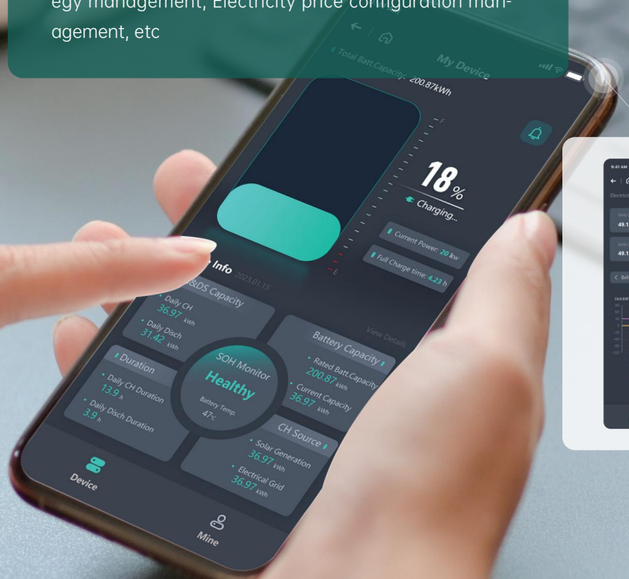
DC24V power supply
Supports temperature detection of key contact points to ensure reliable contact
Supports multiple redundant safety strategies includes total battery voltage and rear-end total voltage
Supports black-start function and off-grid operation mode
Component selection with UL/CE dual-certification

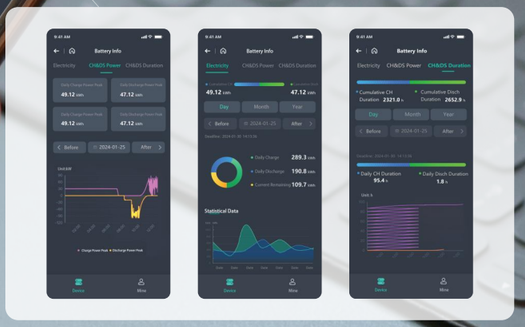
BMS/EMS CLOUD PLATFORM

- **System Monitoring**
  Operating and alarm data of battery, PCS, Power meter, Fire protection, Air conditioning, Liquid cooling unit, CCTV, and Access control, etc

- **Power Station Operations**
  -Charge and discharge control, Anti-overload, Anti-backflow, Peak cut, etc
  -Repair work orders, Intelligent operation and maintenance, etc
  -Electricity consumption report, Revenue reports and other Configurable reports
  -Power analysis, Energy analysis, Health status assessment, etc

- **Backend Management**
  Role permission management of Integrators, Operators, Owners, etc
  Power station information maintenance, Template strategy management, Electricity price configuration management, etc





TG-EP