NEW ENERGY

TOPBAND

CO-INNOVATING A SMARTER FUTURE

Energy Management System

——Microgrid,power generation-grids-load-energy storage,Photovoltaic-energy storage-charging

OVERALL INTRODUCTION

SUMMARIZE

The MG series microgrid controllers are high-performance communication control devi ces specially designed for new energy systems. They can be used as microgrid controll ers, power generation-grids-load-storage controllers controllers , EMS (Energy Manage ment System) controllers, control nodes of virtual power plants, communication mana gement devices, protocol converters, and energy storage controllers. Together with the EMS cloud platform, APP terminals and other microgrid controllers, they form a cloud-edge-terminal integrated IEMS (Intelligent Energy Management System) intelligent ener gy management system.

SYSTEM COMPONENT

EMS (Energy Management System) control terminal

Quick access to on-site equipment communication protocols, flexible customization of efficient system strategies, remote operation and ma intenance, support for multi-level architecture and distributed cascad ing, and the ability to flexibly build large-capacity energy managemen t systems.

Touch Screen

It offers a visual interface, supports various communication protocols, and enables convenient and rapid management and maintenance of diverse energy storage devices.

Mobile APP/Mini Program

It has functions like engineering implementation, project deployment, equipment management, and data operation and maintenance. It can monitor the information of power stations at any time and any place, w hich is convenient for remote management and rapid project implemen tation.

Cloud Platform

It is an integrated energy management platform that supports equipme nt management, benefit statistical analysis, data retrospective analysis, fault early warning analysis, operation log recording, remote deployme nt and services. It also supports public cloud applications and private c loud deployment.

Industrial and commercial energy storage

Power sources, grid, loads and energy storage

Microgrid system

Virtual power plant

Edge intelligent gateway

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The MG series supports the connection of devices such as BMS, PCS, EMS controllers, photovoltaic systems, energy storage systems, charging piles, meters, HVAC (Heating, Ventilation and Air Conditioning), and lighting. It is compatible with communication protocols including IEC61850, IEC104, Modbus, TCP/IP, DL/T645, MQTT, and HTTP.It supports optimal AI algorithms and can facilitate predictions for new energy power generation, demand-side response, charging pile prediction and scheduling, building load prediction and scheduling, as well as production load prediction.This series makes full use of renewable energy sources, coordinates the power supply and demand balance of the system, and achieves the optimal economy and the best carbon emission performance for the microgrid system.

Product characteristics

- High real-time performance, supporting millisecond-level data collection
- High compatibility, being compatible with equipment of third-party manufacturers and supporting commonly used industry protocols
- Abundant peripheral interfaces
- Supports a variety of control strategies, such as peak shaving and valley filling, demand control, peak-valley arbitrage, orderly charging, etc.
- Supports carbon emission management
- Optimized with the best AI algorithms
- Prevents reverse current and overloading
- Has local security control

Hardware parameters

MG500		
Hardware Interfaces/peripherals	**Resources**	**Remarks**
	System resources	
CPU	Four-core Cortex-A55	
NPU	1TOPS	
Main frequency	2GHz	
Memory	2GB/4GB LPDDR4	The memory can be optionally configured as 2GB or 4GB
storage	32GB+128G SSD	The SSD (Solid State Drive) can be optionally configured
system	Linux	
	Peripheral resources	
Power supply	Dual-channel redundancy	DC 9~36V
Glgabit Ethernet	1 (10/100/1000Mbps)	Either optical port or electrical port is available
100-Megabit Ethernet	4 (10/100Mbps)	Ethemetin the same network segment
RS485	8	Isolated type
RS232	2	Isolated type
CAN	2	Isolated type
DI	4	
DO	4	
USB3.0	2	
HDMI2.0	1	
Wireless communication	WiFi/BLE、4G/5G	Optional 5G
Indicator light	30	
	Environmental parameters	
operating temperature	-25-55°C	
operating humidity	5%~95% No condensation and no freezing	
operating altitude	Below 3000 meters	
	Mechanical characteristics	
Mechanical dimensions	200x235x52 mm	
Protection level	IP50	

Industrial and commercial energy storage

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EMS controllers

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Hardware parameters

MG800		
Hardware Interfaces/peripherals	**Resources**	**Remarks**
	System resources	
CPU	Four-core Cortex-A55	
NPU	1TOPS	
Main frequency	2GHz	
Memory	2GB/4GB LPDDR4	The memory can be optionally configured as 2GB or 4GB
storage	32GB+128G SSD	The SSD (Solid State Drive) can be optionally configured
system	Linux	
	Peripheral resources	
Power supply	Dual-channel redundancy	DC 9~36V
Glgabit Ethernet	2 (10/100/1000Mbps)	
RS485	16	Isolated type
RS232	2	Isolated type
CAN	2	Isolated type
DI	8	
DO	4	
USB3.0	1	
HDMI2.0	1	
Indicator light	40	
	Environmental parameters	
operating temperature	-25-55°C	
operating humidity	5%~95% No condensation and no freezing	
operating altitude	Below 3000 meters	
	Mechanical characteristics	
Mechanical dimensions	1U	Standard cabinet size
Protection level	IP50	

Industrial and commercial energy storage

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EMS controllers

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Hardware parameters

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CPU	Four-core Cortex-A55	
NPU	1TOPS	
Main frequency	2GHz	
Memory	2GB/4GB LPDDR4	The memory can be optionally configured as 2GB or 4GB
storage	32GB+128G SSD	The SSD (Solid State Drive) can be optionally configured
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	Peripheral resources	
Power supply	Dual-channel redundancy	DC 9~36V
Glgabit Ethernet	2 (10/100/1000Mbps)	
RS485	16	Isolated type
RS232	2	Isolated type
CAN	2	Isolated type
DI	8	
DO	4	
USB3.0	1	
	HMI	
Screen	4.3-inch LCD	
HDMI2.0	1	
Key	6	
Indicator light	40	
	Environmental parameters	
operating temperature	-25-55°C	
operating humidity	5%~95% No condensation and no freezing	
operating altitude	Below 3000 meters	
	Mechanical characteristics	
Mechanical dimensions	2U	Standard cabinet size
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TERMINAL EMS SYSTEM INTERFACE

01-Homepage

displaying the real-time data of devices such as PCS , BMS, electric meters, and air conditi oners.

02-SCADA

Display the wiring diagram of the project and dynamically show the key parameters of the corresponding nodes.

03-Data Monitoring

It supports the query of historical data of devi ces such as BMS, PCS, and electric meters.

04-Equipment Monitoring

Display the real-time data of equipment such as PCS, BMS, electric meters, and air conditio ners.

05-Energy Storage Mode

It supports configuring the operation time an d charging/discharging power of the peak-val ley mode of the energy storage cabinet.

06-Equipment Debugging

It supports the debugging of key parameters of devices such as BMS, PCS, and air conditio ners.

07-System Configuration

Supports functions such as configuring system parameters and off-grid parameters, synchron izing system time, and configuring IP settings.

08-Alarm Log

Displays the alarm information of the current system operation. All historical events can be queried based on combined criteria such as occurrence time, fault type, and equipment t ype.

INTELLIGENT ENERGY MANAGEMENT SYSTEM

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Intelligent Energy Management System

- Production data
- Weather data
- Edge controller
- Building controller

Photovoltaic energy storage

- Production data
- Electrochemical energy storage

Charging

- AC charging pile
- DC charging pile

Power distribution equipment

- Medium voltage switchgear
- Low voltage switchgear
- Medium voltage microcomputer protection device
- Low voltage distribution box
- Medium voltage vacuum circuit breaker
- UPS
- Low voltage frame circuit breaker

Energy metering

- Electric meter
- Barometer
- Water meter

HVAC (Heating, Ventilation and Air Conditioning)

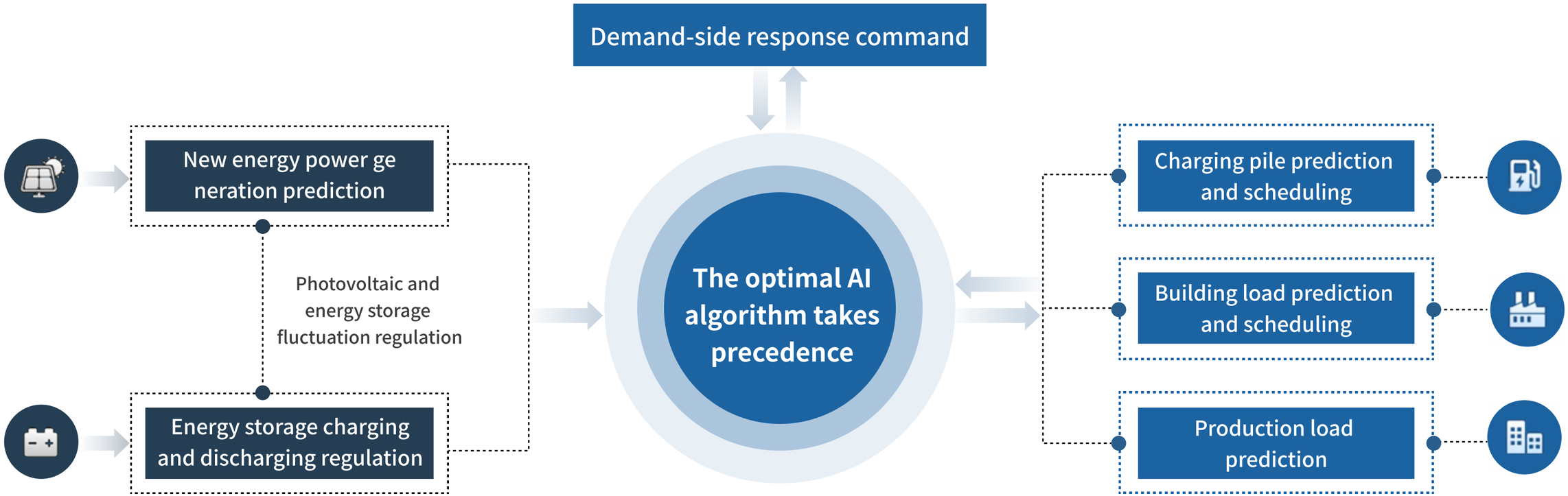
- VAV、PTAC Controller
- Air handling unit
- Transmission and meters
- Fresh air unit
- Water pump control
- Mixed air sensor

Lighting control

- Lighting control box
- DALI Gateway
- Infrared sensor
- Sunshade control
- Timer
- Illuminance sensor

IEMS SYSTEM COORDINATION AND OPTIMIZATION

TOPBAND



- Combine time period characteristics, weather characteristics, and load types, confirm and optimize the coupling relati onshipsamong various characteristics
- Improve the accuracy of machine learning algorithms by combining long-term data and static models
- Multiple target modes of economy/low-carbon/safety meet the needs of different scenarios

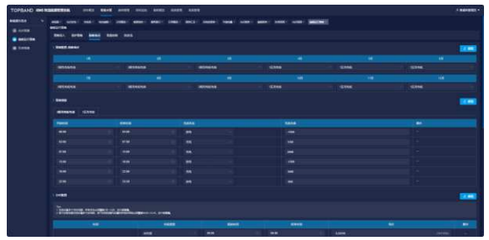
IEMS SYSTEM INTERFACE

01-Sub-station data Comprehensive perception

Collect and monitor the operation data and status of new energy sites, and conduct comprehensive analysis and evaluation

02-Intelligent decision-making Economically optimal

Combine the characteristics of time periods, weather, and load types, confirm and optimize the coupling relationships among these characteristics



03-Photovoltaic power generation Analysis and control

Real-time monitor the operation parameters and alarm information of the inverter, and formulate effective control strategies to maximize the absorption rate of photovoltaic power generation

04-Energy storage system Monitoring and management

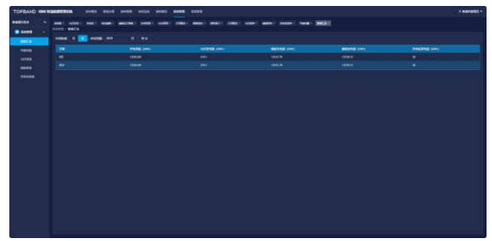
Unified monitoring and management of the real-time operation parameters and alarm information of each energy storage unit and PCS; Respond to commands and participate in frequency regulation

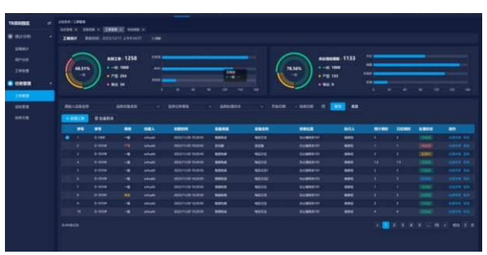
05-Energy consumption statistics Data analysis

Comprehensively collect data such as harmonics and inter-harmonics, voltage indicators, and three-phase imbalance within the new energy power station system and at the grid connection point, and conduct professional and intelligent analysis

06-Report management Facilitate reporting

Statistically analyze the specific electricity consumption of different devices, and one-click export the daily, monthly, and annual electricity consumption and specific earnings of the devices





07-Efficient operation and maintenance,Closed-loop management

Real-time monitor the power generation and consumption situation, uniformly schedule the operation and maintenance inspection plans, integrate online and offline operations, and improve the fault response speed and operation and maintenance efficiency

ADVANTAGES AND CHARACTERISTICS

TOPBAND

Protocol Docking

Capable of quickly docking with the communication protocols of all PCS, BMS, electric meters, inverters, charging piles and air conditioners available on the market.

Strategy Adaptation

Supports on-grid and off-grid operation, peak shaving and valley filling, anti-backflow, capacity expansion, islanding control, demand control, photovoltaic power consumption, system protection, and other customized strategies

Flexible Customization

Enable rapid device integration, strategy customization, and scenario application. The customized development cycle is short.

System Development

Both the edge side and the platform side support docking with third-party platforms or systems.

Intuitive Revenue

It is capable of multi-dimensional benefit calculation and analysis, enabling you to have an intuitive understanding of the revenue situation during any time period.

Remote operation

Remote debugging, upgrading, and operation and maintenance of the project can be carried out without on-site services. It is cost-effective, fast, and highly efficient.

APPLICATION OF MICROGRID

EMS Cloud platform

Mobile client

Cloud server

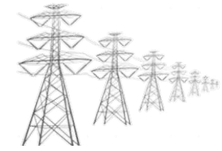
Communication line

Power line

Fiber optic/4G/5G

Microgrid controller

Grid-connected and off-grid power distribution cabinet



Grid

AC busbar

PV inverter

Energy storage systems

Load

Charging pile

Wind turbine controller

Photovoltaic panel

Wind turbine

Diesel generator

APPLICATION OF PHOTOVOLTAIC-ENERGY STORAGE-CHARGING

EMS Cloud platform

Mobile client

Cloud server

Communication line

Power line

Fiber optic/4G/5G

MG800

Transformer

Grid

AC busbar

PV inverter

Charging pile

Photovoltaic panel

MG500

Energy storage meter

HDMI

Touch screen

Air conditioner

PCS

BMS

Battery

ENERGY STORAGE SYSTEM

MG500

Energy storage meter

HDMI

Touch screen

Air conditioner

PCS

BMS

Battery

ENERGY STORAGE SYSTEM

APPLICATION OF ENERGY STORAGE SYSTEMS

EMS Cloud platform

Mobile client

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Communication line

Power line

Fiber optic/4G/5G

AC busbar

Transformer

Transformer side meter

Grid

MG500

Energy storage meter

HDMI

Load meter

Touch screen

Air conditioner

PCS

BMS

battery

ENERGY STORAGE SYSTEM

Load