

Renepoly Microgrid Energy Management System



Introduction

The EMS controller is a rail-mounted controller specifically developed by Guangzhou Renepoly Energy Technology Co., Ltd. for smart microgrid systems.

Built on the latest Linux 6.6.48 Real-Time operating system, the controller enables precise equipment control and ensures deterministic transmission of every communication command.

The EMS controller features an industrial-grade wide-temperature design capable of continuous operation from -40°C to 80°C.

The EMS controller establishes a risk factor library for parameters including individual battery cell voltage and temperature, high-voltage compartment temperature, and PCS temperature in energy storage cabinets. By utilizing AI automated algorithms for comprehensive equipment monitoring, it enhances the safety and reliability of the energy storage cabinets.

With modular architecture in both hardware and software, the system supports customized functional development based on on-site requirements. It can meet various functional requirements of customers, offering flexibility and efficiency akin to Lego bricks.

Features

With modular architecture in both hardware and software, the system supports customized functional development based on site requirements.

The hardware supports various standard expansion plug-ins, such as 2/3/4/5G communication modules and storage modules. Software supports various protocol libraries and microgrid operational logic.

Applications

The EMS controller terminal is adaptable to multiple scenarios:

PV (Photovoltaic) power generation, smart energy storage, Integrated PV and Storage, integrated PV, Storage and Charging, and off-grid Solar, Storage and Diesel Generator System.

• Photovoltaic Power Generation

Integrate PV generation with AI forecasting for intelligent monitoring and output optimization.

• Smart Energy Storage

Control charge/discharge cycles to enhance efficiency and extend battery life. Enable intelligent resource dispatch.

• Integrated PV and Storage

Providing green charging for electric vehicles, balancing grid loads, and enabling energy recycling

• Integrated PV-BESS-Charging System

Provide electric vehicles green charging while balancing grid loads and enabling energy recycling.

• Off-grid Solar, Storage and Diesel Generator System

Engineered for remote areas without grid access. Integrate PV, storage, and diesel generator with intelligent EMS for stable power. Reduce diesel use and O&M costs in villages, islands, mining sites, etc.



Guangzhou Renepoly Energy Technology Co., Ltd.

U3 Building, No.6 Lianpu Street, Huangpu District, Guangzhou, China
+86 (020)31800796 info@renepoly.com

Functional Features

·Open Communication Protocol & Universal Compatibility
 Downward support: Modbus RTU IEC60870-5-104(IEC 104)Modbus TCP IEC 60870-5-1367-1(1367.1)
 Upward support: Modbus TCP DL/T645 Customised protocols etc. IEC6180 IEC 61850 IEC 60870-5-104(IEC 104)MQTT Protocol.

Beyond seamless integration with smart energy storage monitoring platforms, the system also supports connectivity to investor cloud platforms, enables direct links with virtual power plants (VPP) and grid dispatch edge devices, and facilitates data reporting and execution of telecontrol commands. This allows the energy storage power station to meet diverse requirements at a lower cost and with higher efficiency, while significantly reducing derivative costs associated with subsequent station operation and maintenance.

The terminal features advanced algorithms for millisecond-level data acquisition, offering faster response times and better control. It reduces large fluctuations, protects the battery, and ensures more efficient charging and discharging, improving the storage system's economy and reliability.

It also manages the voltage and state of charge (SOC) of individual battery cells within the energy storage cabinet, using flexible pulse charging and discharging. The system ensures full discharge without damage and keeps the battery voltage balanced, boosting overall efficiency by over 5%, extending battery life, and improving storage utilization.

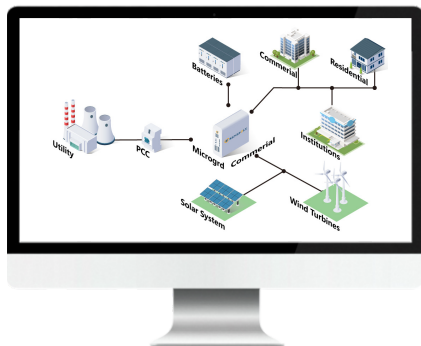


Fig. 1 - Advanced monitoring and control via ReneCloud

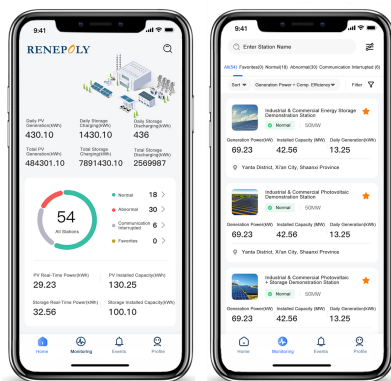


Fig.2 – Fast and flexible management via ReneApp

Specifications

Main Power Supply	Requires a >90W, 9-30V DC power supply due to DO (Digital Output) loads
Communications Protocol	Modbus RTU, Modbus TCP, USB2.0 customised communication
RS485 Interface	13
CAN Interface	2
Ethernet Interface	4
Digital Input	8
Digital Output	8
Mechanical Relay Output	4
Optocoupler - isolated Relay	4
Device system	Linux 6.6.48
CPU	ARM A7 dual-core 650 MHz
RAM	1G DDR3L
Memory	8G EMMC
Size (W x D x H)	154*50*150mm
Weight(g)	420g
Operating Temperature	-40°C-80°C
Operating Humidity	5-95%
Installation	DIN35MM rail mounting

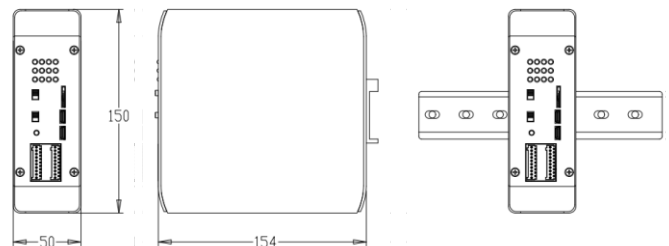


Fig. 3 – Product Dimension