EMS Controller RMC-DR-01



Introduction

EMS Controller RMC-DR-01 is a rail-mounted controller specifically developed by Renepoly Technology for smart microgrid systems.

Built on the latest Linux RT 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℃ to 80℃.

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.

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Functional Features

- Multi-protocol Support:

Supports industrial communication protocols (e.g., Modbus TCP/RTU) and the MQTT messaging protocol for seamless interoperability with mainstream BMS, PCS, PV inverters, and other peripherals.

- Flexible Data Acquisition and Control:

Supports multiple digital inputs/outputs and relay control to meet complex system integration requirements.

- Local and Remote Management:

Enables both on-site interaction via HMI and remote access via the cloud platform for real-time monitoring, strategy deployment, and alarm generation.

- High Reliability and Scalability:

Operates over a wide temperature range (-40 °C to 80°C) with 22–26V DC input voltage. DIN rail mounting facilitates integration and maintenance.

- Security Protection Mechanisms:

Features hardware isolation, software permission control, and operation log recording to ensure system operational security.

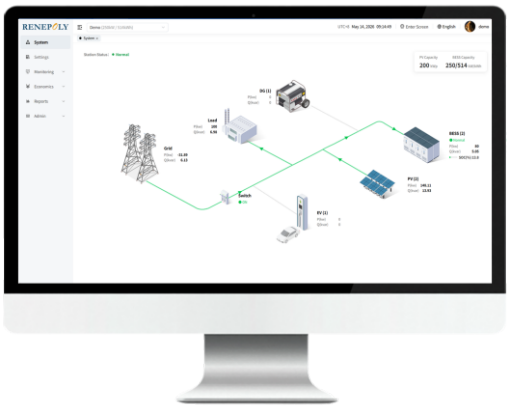


Fig.1 - Advanced monitoring and control via ReneCloud

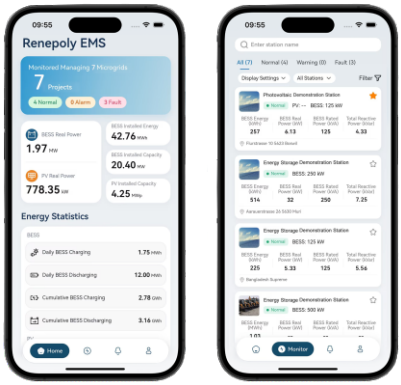


Fig.2 – Fast and flexible management via ReneApp

Specifications

Power Supply	24V DC ±2V, >20W plus DO load power required.
Power Consumption	24V DC ±2V, typical power consumption of 16W.
DO Load Capacity	Additional power may be required for DO (Digital Output) loads. Up to 36W when 8 DO channels support external loads. (24V DC output, total current ≤1.5A, max. 0.7A per channel.)
Communication Protocol (Standard)	Modbus TCP/RTU、MQTT
Communication Protocol (Licensed / Chargeable options)	60870-5-104、DNP3、OCPP、OPC-UA
RS485 Interface	10
CAN Interface	1
Ethernet Interface	4
Digital Inputs	8, Input level meets Type 1 requirements (high-level threshold ≥ 15 V)
Digital Outputs	8
Mechinical Relay Outputs	4
Device System	Linux RT
Processor	ARM A7 Dual-Core 650 MHz (Max 650 MHz) + ARM Cortex-M4 (Max 209 MHz)
USB 2.0 Interfaces	2
Type-C Interface	1
TF Card Slot	1（supports up to 128G）
Nano SIM Card Slot	1（supports 4G）
Dimensions	154*150*50mm (excluding DIN rail clip)
Weight	700g
Operating Temperature	-40˚C to 80˚C
Operating Humidity	5%-95%

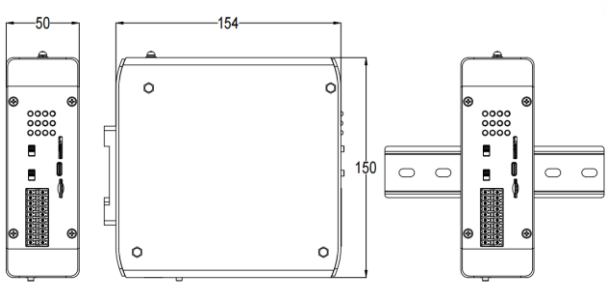


Fig. 3 – Product Dimension

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Specifications are subject to change without notice. Updated October 2026.