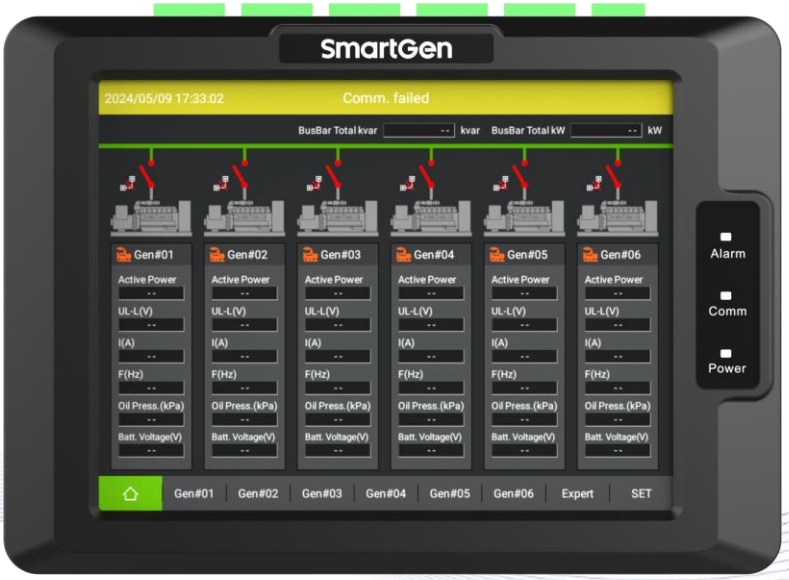
SmartGen

MAKING CONTROL SMARTER

HMU8N

REMOTE MONITORING CONTROLLER

USER MANUAL



郑州众智科技股份有限公司

SMARTGEN(ZHENGZHOU)TECHNOLOGY CO.,LTD.

SmartGen Registered trademark
No.28 Xuemei Street, Zhengzhou, Henan, China
Tel: +86-371-67988888/67981888/67992951
+86-371-67981000(overseas)
Fax: +86-371-67992952
Email: sales@smartgen.cn
Web: www.smartgen.com.cn
www.smartgen.cn

Table 1 – Software Version

Date	Version	Note
2024-05-10	1.0	Original release.
2025-05-27	1.1	Add the precaution about the grounding for the enclosure.
2025-07-28	1.2	Add the monitoring products list.

Table 2 – Symbol Instruction

Symbol	Instruction
NOTE	Highlights an essential element of a procedure to ensure correctness.
CAUTION	Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment.
WARNING	Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly.

CONTENTS

1 OVERVIEW

HMU8N Remote Monitoring Controller is used for remote monitoring of single/multiple gensets, which can realize remote start/stop, auto/manual mode switch, close/open operation and data measurement, alarms display functions. It fits with 8-inch capacitive touch screen, realizing multi-level operation authorities with simple and reliable operation.

HMU8N Remote Monitoring Controller adopts Android operation system, it can communicate with genset controller via RS485 port or Ethernet port, and can read and display real-time parameters, data curves, historical records and alarm information. Up to 6 genset controllers can be connected simultaneously with flexible configuration and easy operation.

2 PERFORMANCE AND CHARACTERISTICS

HMU8N: suitable for the remote data monitoring and control of single/multiple genset controller. Its main characteristics are as follows:

- Apply ARM processor, 8-inch capacitive touch LCD (800*600 resolution); Android operation system, HMI display, optional Chinese and English operation interface;
- With power indicator and alarm indicator;
- With multi-level brightness, it can be manually adjusted according to requirements;
- With 4-way RS485 communication port, 1-way CAN port, 1-way Ethernet port, it can communicate with master control module via 4-way RS485 or Ethernet port, while the CAN port is reserved;
- USB device port for the firmware upgrade;
- USB host port can export data to U-disk;
- One or up to 6 genset controllers can be monitored remotely;
- With one-key stop function, which can stop all the running gensets;
- Real-time display genset parameters and alarm information;
- Real-time data curve and historical data curve can be exported;
- With Real-time clock display, operation history and alarm records functions, which can be exported;
- Can automatically detect the connection status of master control module, modification and manual added of the module are available, the parameters will not be lost even power off;
- The controller is fixed with metal clips;
- Modular design, pluggable wiring terminals, built-in mounting, compact structure with easy installation.

3 SPECIFICATION

Table 3 – Performance Parameter

Item	Content
Working Voltage	DC10.0V~DC36.0V continuous power supply
Overall Consumption	Up to 7W
RS485	4-way RS485 ports adopt MODBUS-RTU communication protocol, isolated, half-duplex, baud rate can be set
Ethernet	Self-adaption 10/100/1000Mbit
CAN	Isolated, the maximum communication length is 250m, using Belden 9841 cable or equivalent
Vibration	Frequency Range：5Hz~8Hz：Displacement ±7.5mm Frequency：8Hz~500Hz：a ±2g IEC 60068-2-6
Shock	Peak acceleration: 50g, pulse time: 11ms, pulse waveform: half-sine, complete shock test from three directions, and 18 times shock for each test IEC 60068-2-27
Bump Test	Peak acceleration: 20g, pulse time: 16ms, pulse waveform: half-sine
Production Compliance	According to EN 61010-1 installation category (over voltage category) III, 300V, pollution class 2, altitude 3000m
Overall Dimensions	221mm x 163mm x 51mm
Panel Cutout	205mm x 147mm
Working Temperature	(-25~+70)˚C
Working Humidity	(20~95)%RH
Storage Temperature	(-30~+80)˚C
Protection Level	Front Panel: IP65
Weight	1.38kg

4 DISPLAY AND OPERATION

4.1 FRONT PANEL OF DISPLAY MODULE

Fig.1 – Front Panel Drawing

Table 4 – Indicator Description

Indicator	Description
Alarm	Stop Alarm: fast flashing; Trip and Stop Alarm: fast flashing Trip: fast flashing; Warning: slow flashing; Block: slow flashing; No Alarm: extinguished.
Comm	Always illuminated after all controller connected. Extinguished when all controller disconnected.
Power	Always illuminated after power on and operation. Extinguished when power off.

4.2 DISPLAY INTERFACE AND OPERATION

The display module has four types of interfaces: homepape, details, expert mode and setting interface. Each controller has its own detailed interface. They can be switched by the button icon in switch bar of the bottom page.

4.2.1 HOMEPAGE

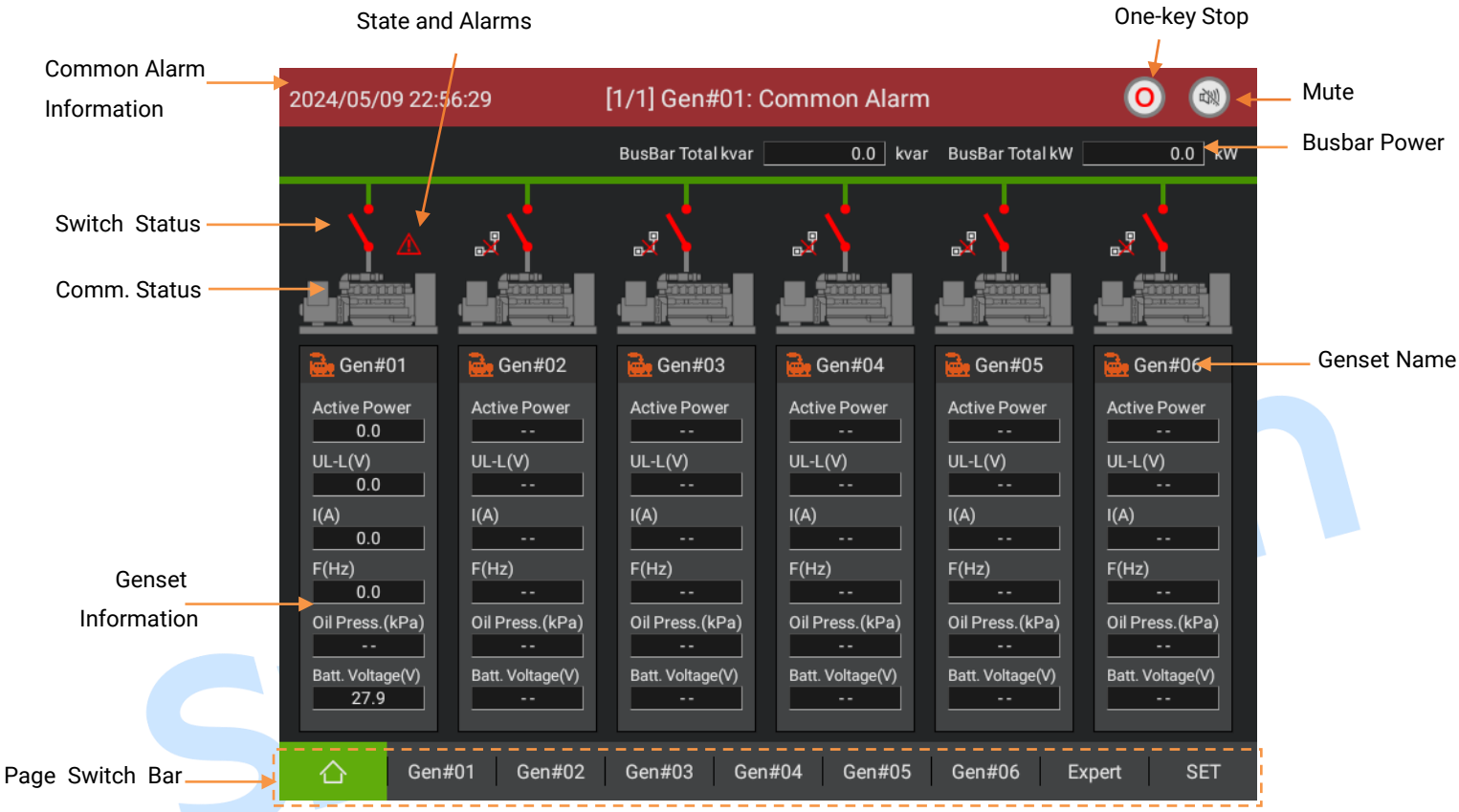


Fig.2 – Homepage Interface

Common Alarm Information: rolling display the unit common alarm information. If there is a common stop alarm, common trip and stop alarm, common trip alarm,common safety stop alarm, common safety trip alarm, the backgroud is red; if there is a common warning alarm, common block alarm, the backgroud is yellow.

Mute Button: the buzzer will sound if there is a new alarm. Press the buzzer to mute and press it again to cancle the mute. If there is no alarm , the buzzer will automatically mute the sound.

One-key Stop: all the gensets with alarm will execute the shutdown instruction.

Busbar Power: display the total active power and total reactive power of Busbar.

Switch Status: display the open/close status of switch, closing displays green connection, opening displays red disconnection.

Communication Status: normal communication with controller is green background and other situations are all grey background.

State and Alarms: if there is a common stop alarm, common trip and stop alarm, common trip alarm, common safety stop alarm, common safety trip alarm, the icon is red; if there is a common warning alarm, common block alarm, the icon is yellow. If the genset is normal running, the icon is green.

Communication Failure: if the communication with controller is failed, it will display the communication failure icon.

Genset Name: display the custom genset name, it can be modified in "Setting"----"Module Management".

Genset Information: display the current active power, average generation line voltage, max. generation current, generation frequency, oil pressure and battery voltage.

Time& Date: display the current date and time.

Page Switch Bar: click to switch the homepage, genset detailed information, expert mode and setting page. The current display interface is green and the expert mode is displayed only with engineer's permission.

4.2.2 GENSET DETAILS INTERFACE

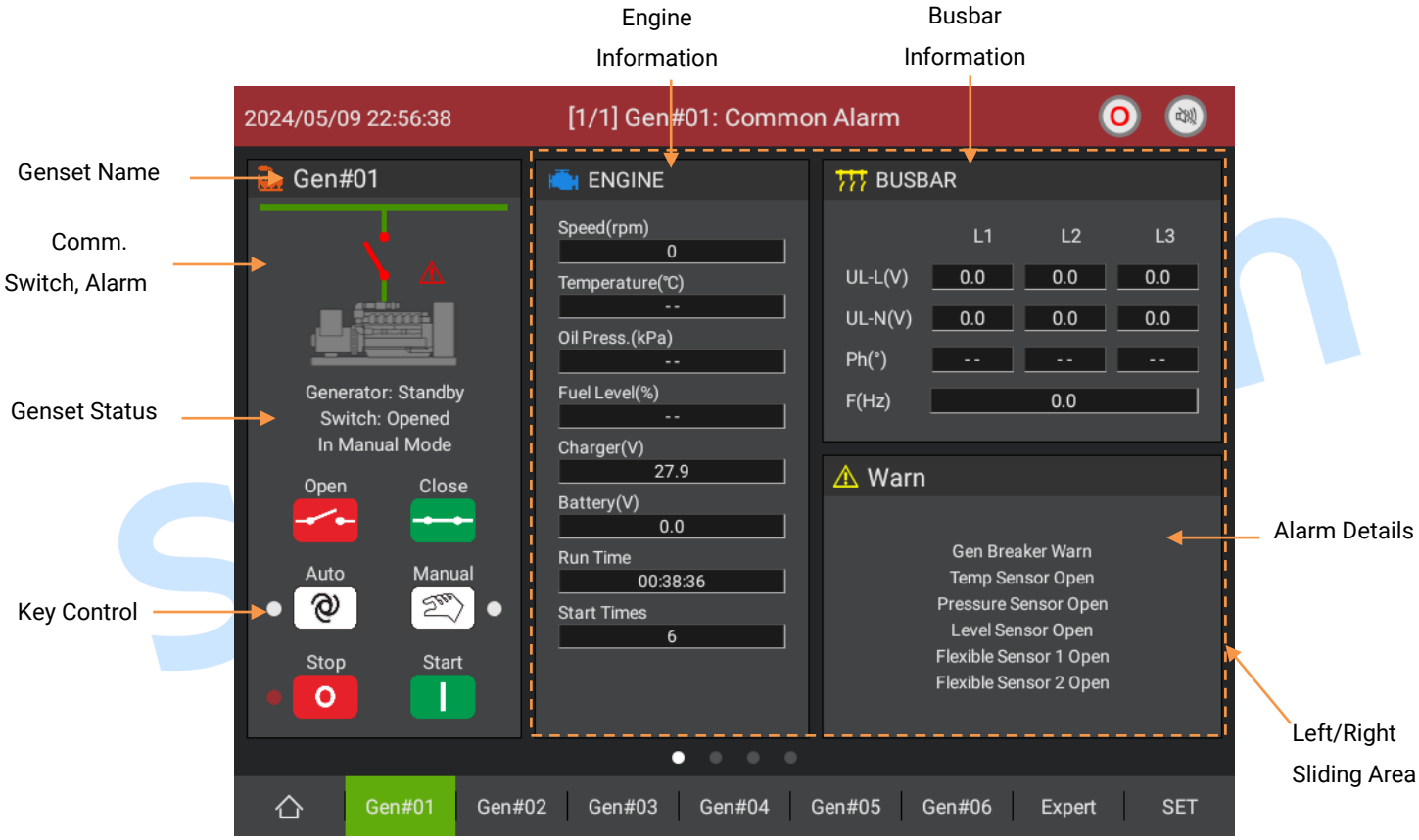


Fig.3 – Genset Details Interface

Genset Name: display the genset name.

Communication, Switch, Alarm: display as the homepage. If the communication with controller fails, the icon is displayed. closing displays green connection, opening displays red disconnection.

Genset Running Status: normal running is green background and other situations are all grey background.

Genset Status: display the generator, gen switch status, display system mode (stop, auto, manual) by stage.

Alarm Details: rolling display stop alarm, trip and stop alarm , trip alarm, safety stop alarm, safety trip alarm and warnings.

Engine Information: display the current speed, temperature, oil pressure, fuel level, battery voltage, running time and boot times of the engine.

Busbar Information: display the line voltage, phase voltage, phase and frequency of the Busbar.

Generator Details: slide to the right to display the line voltage, phase voltage, phase, gen frequency, gen current, active power, reactive power, apparent power, power factor, total kW energy, total kvar energy and total apparent energy.

Sliding Area: slide to the right to switch to generator details and the data analysis page.

Key Control: If genset is in sotp status or auto mode (or manual mode), the corresponding status displays , otherwise displays .

Table 5 – Key Control

Icon	Key	Description
	Start	In manual mode, press this key to start the genset.
	Stop	In manual/auto mode, press this key to stop the running genset.
	Auto	Press this key to make the controller in auto mode.
	Manual	Press this key to make the controller in manual mode.
	Close	In manual mode, press this key to control closing.
	Open	In manual mode, press this key to control opening.

4.2.3 DATA ANALYSIS INTERFACE

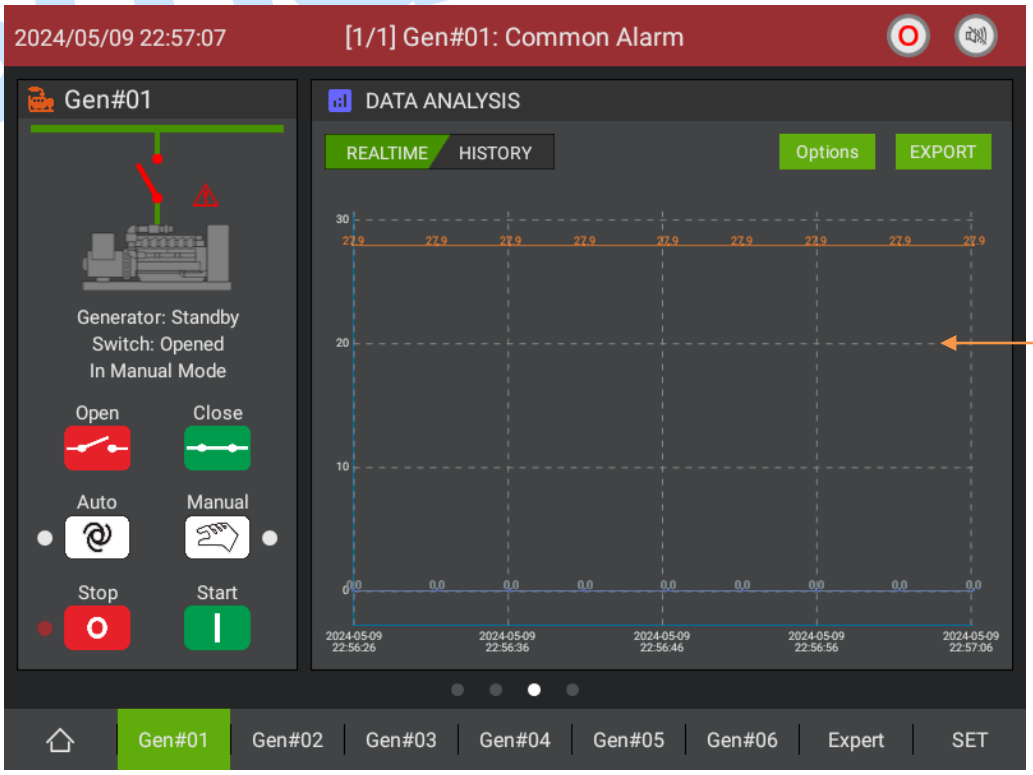


Fig.4 – Data Analysis Interface

Real-time Data: display the recent 20 items of the real-time data, the interval of the data is 5s.

Historical Data: display the selected time period and the parameter of the historical data.

Time Selection: select the start time and end time of the historical data.

Export: after the U-disk is connected, the original data could be exported to the root directory of the U-disk as a CSV file.

4.2.4 HISTORICAL RECORDS INTERFACE

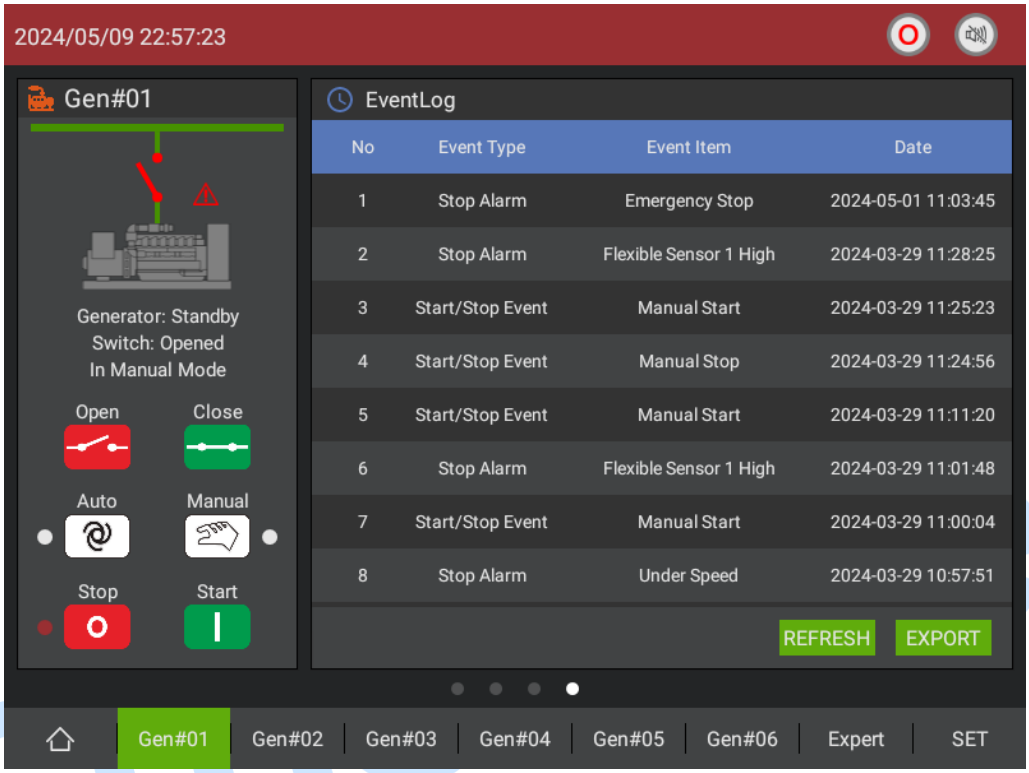


Fig.5 – Historical Records Interface

Refresh: click it to refresh and obtain the historical records of controller alarms.

Export: after the U-disk is connected, the historical records could be exported to the root directory of the U-disk as a CSV file.

Sliding Area: slide up to display more historical records.

4.2.5 EXPERT MODE INTERFACE

The expert mode is available only for engineers.

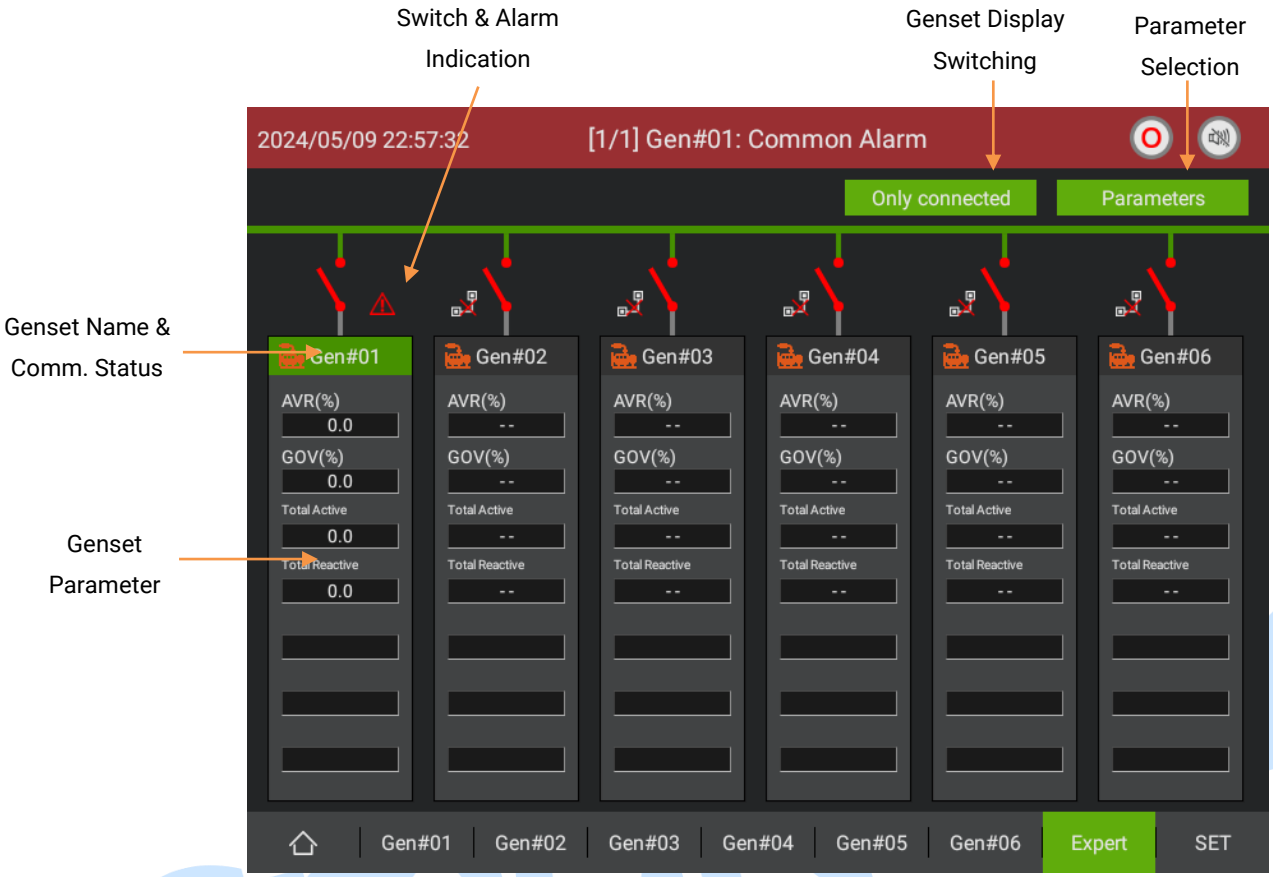


Fig.6 – Expert Mode Interface

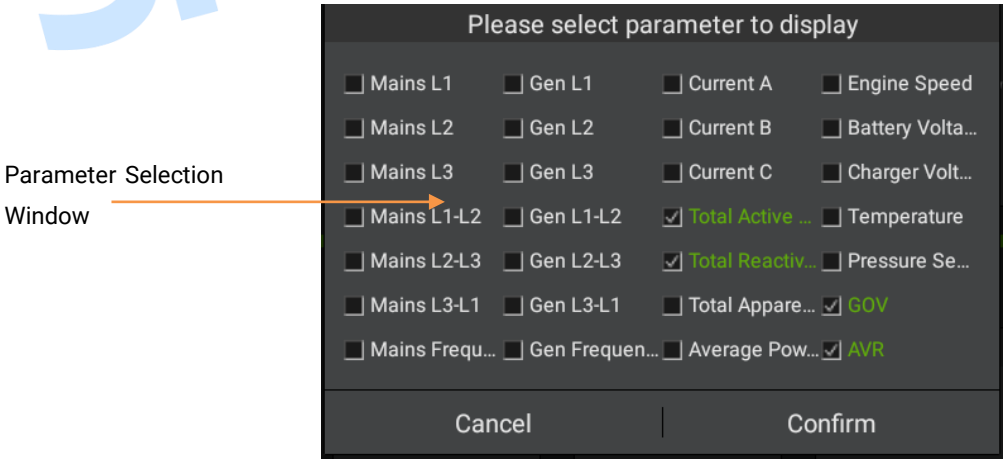


Fig.7 – Parameter Selection Window

Genset Parameter: display the current selected parameter of the genset.

Genset Display Switching: switch to display all the gensets and successfully communicating gensets only.

Parameter Selection: click and display parameter selection window, up to 7 items of parameters can be selected at the same time.

4.2.6 SETTING INTERFACE

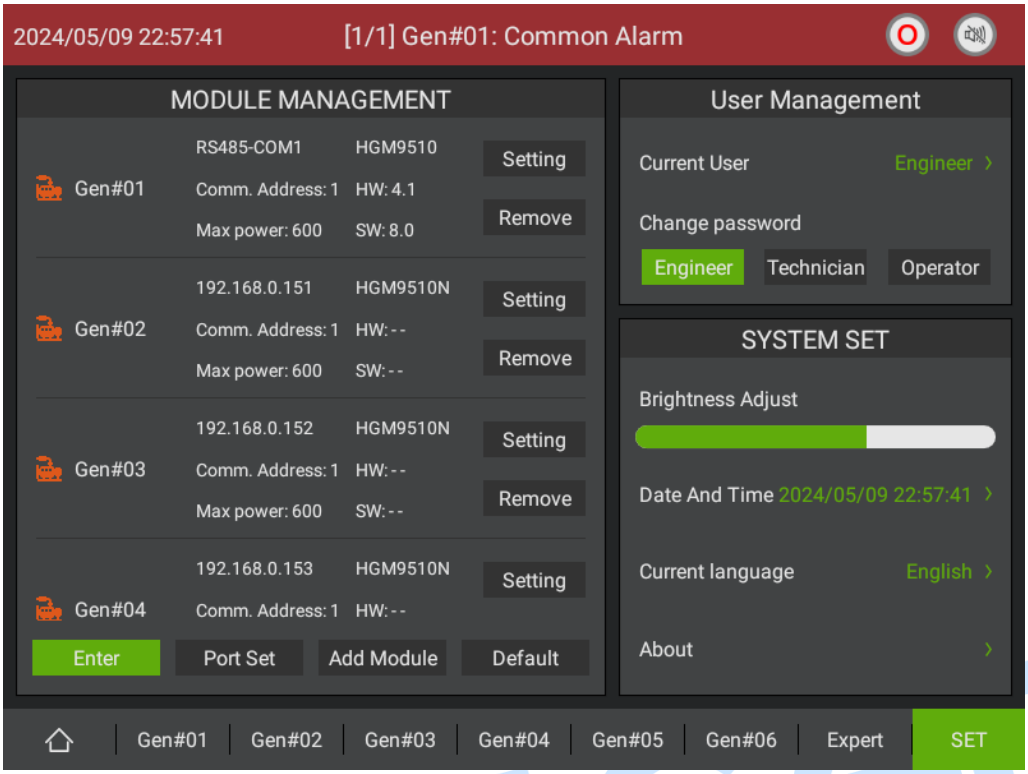


Fig.8 – Setting Interface

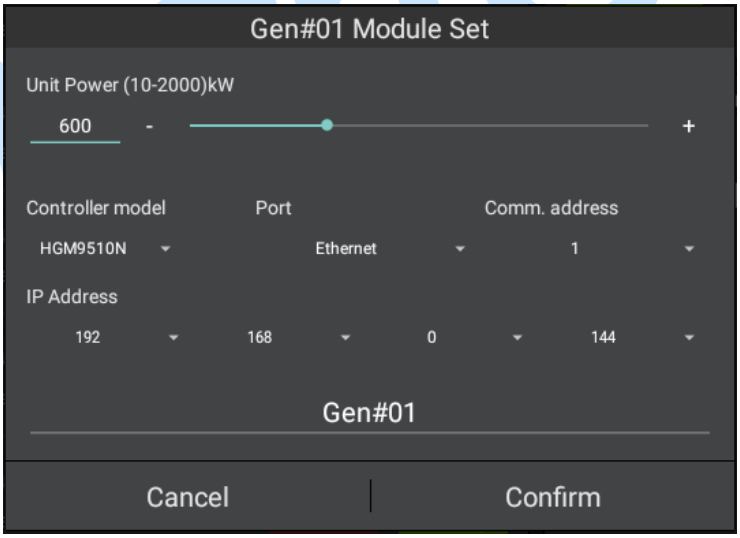


Fig.9 – Module Configuration Window

Users Management: click “Current User” to display the window of “Authority Selection”, the selected authority will be switched if entering the correct password. The user authorities include “Operator”, “Technician” and “Engineer”. The “Operator” can view the data, adjust the brightness; “Technician” has the authority of “Key Control” and all authorities of “Operator”; “Engineer” has the authorities of “Export the Data”, “Module Management”, “Expert Mode”, “Port Setting”, “Manual Added", “Time and Date Modification”, “ Language Switching”, “Program Updating” and all the authorities of “Technician”.

Password Modification: the password of the current user is only available for the current user to change. The default original password is 0318.

Port Setting: to modify the baud rate, data bit , parity bit and stop bit of RS485 port.

Module Adding: the system supports up to 6 modules. If the current number of the modules reaches 6, the module needs to be removed before adding a new one.

Default Setting: enter the password “8912” to download the default configuraion.

Module Configuration: the permission of engineer is required. Switch to engineer authority and click “Open Management”. The operation button in module management displays green or red and can be clicked. The information of all the modules will be displayed when sliding up/down, including module name, RS485 communication port, IP address, communication address and max. power of the genset. Click “Module Configuration” to modify the module name, controller model, max. power displayed, communication port, IP address and communication address. Click “Remove Module” to remove the current module.

Brightness Adjustment: slide the indicator to adjust the screen brightness manually on demand.

Time Setting: to modify the date and time of the system.

Language Switching: restart the software to switch between Chinese and English.

Testing Mode: click “About”-“Hardware Test” to enter the hardware testing mode and check whether the functions are normal or not.

About: display the IP, software version, hardware version, system version and PD number.

4.2.7 MONITORING PRODUCTS LIST

No.	Product Model
1	HGM9530N
2	HGM9510N
3	HGM9510N_SD
4	HGM9510
5	HGM8510
6	HGM9560
7	HGM6110CAN
8	HGM8110CAN
9	HGM9420N
10	HGM6110LT
11	HGM6120LT
12	HGM8151Z

You can switch the controller model by going to the Settings page - Module Configuration - selecting the controller model. Once you have confirmed the port (communication method) and communication address, you can connect to the controller to monitor and control its data.

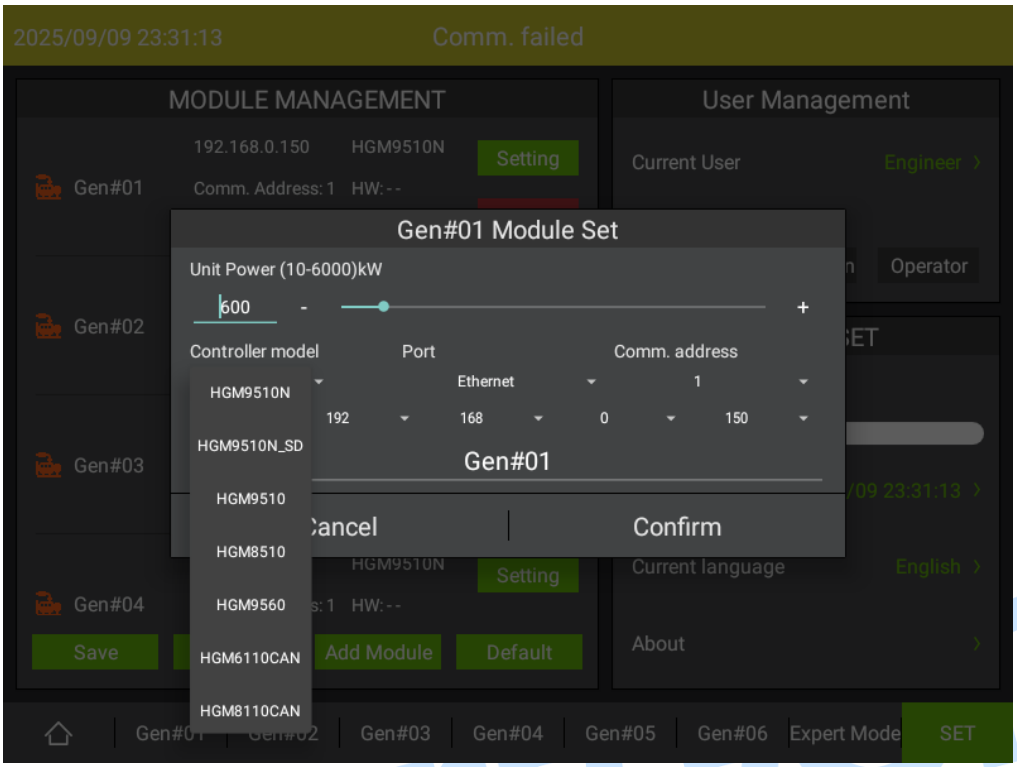


Fig.10 – Model Setting

5 ETHERNET COMMUNICATION

HMU8N Remote Monitoring Controller can output the monitoring data to PC via Ethernet port and support the requests of ModbusTCP, Http and Websocket. Users could program according to communication protocol.

Modbus TCP Protocol: the slave computer IP address is : 192.168.0.111, the port number is: 502. The module communication address is the module serial number, i.e.The first module communication number is 1.

Http Protocol: using Http testing tool and sending the GET request of http://192.168.0.111:8080, all the modules of response json format keep the register data, among which the bytes are the byte array of corresponding module.

```
{
    "timestamp": 1640975438537,
    "data": [
        {
            "name": "Gen#01",
            "hwModel": "HGM9510N",
            "bytes": [···
            ]
        },
        {
            "name": "Gen#02",
            "hwModel": "HGM9510N",
            "bytes": [···
            ]
        }
    ]
}
```


Fig.10 – Http and Websocket Response

Websocket: the communication address is: ws://192.168.0.111:9090, any string is available and the response content is the same as Http request.

6 WIRING CONNECTION

The back panel of HMU8N remote monitoring controller is below:

Fig.11 – Back Panel Drawing

Table 6 – Terminal Connection Description

端子号	功能	线规	描述
1	B-	1.0 mm²	Connect to negative pole.
2	B+	1.0 mm²	Connect to positive pole.
3	PE	/	
4	Terminal Matching Resistance (120Ω)	/	Impedance-120Ω shielding wire is recommended, its single-end connect with ground.
5	CAN L	0.5 mm²	
6	CAN H	0.5 mm²	
7	PE1	/	
8	Terminal Matching Resistance (120Ω)	/	Impedance-120Ω shielding wire is recommended, its single-end connect with ground.
9	RS485B-1(+)	0.5 mm²	
10	RS485A-1(-)	0.5 mm²	
11	PE2	/	
12	Terminal Matching Resistance (120Ω)	/	Impedance-120Ω shielding wire is recommended, its single-end connect with ground.
13	RS485B- 2(+)	0.5 mm²	
14	RS485A- 2(-)	0.5 mm²	
15	PE3	/	
16	Terminal Matching Resistance (120Ω)	/	Impedance-120Ω shielding wire is recommended, its single-end connect with ground.
17	RS485B- 3(+)	0.5 mm²	
18	RS485A- 3(-)	0.5 mm²	
19	PE4	/	
20	Terminal Matching Resistance (120Ω)	/	Impedance-120Ω shielding wire is recommended, its single-end connect with ground.
21	RS485B-4(+)	0.5 mm²	
22	RS485A-4(-)	0.5 mm²	
23	PE5	/	

Note 1: The ETHERNET port can be directly connected to the conroller through a network cable or multiple controllers through exchanger. The IP address of the monitoring screen is 192.168.0.111. The IP address of the controller must be in the same network segment but different from the monitoring screen.

Note 2: USB-HOST is used for data export of the U-disk.

Note 3: USB-DEVICE port is used for connecting with PC to upgrade the firmware. There are two pinholes on the left side of the monitoring screen, the upper one is BOOT key and the lower one is RESET key.

The upgrade procedure are as follows:

1. Power on the monitoring screen;
2. Press the “BOOT” key;
3. Press the “RESET” key;
4. Release the “RESET” key;
5. Release the “BOOT” key, then HMU8N will enter into the “FLASH MODE”;
6. Connect with PC via the USB-DEVICE on the monitoring screen;

7. Uncompress the upgrade package and double click the "**mftool2.vbs**" file;
8. If there is a "HID Standard Supplier Defined Device", it means that the indentification is successful.

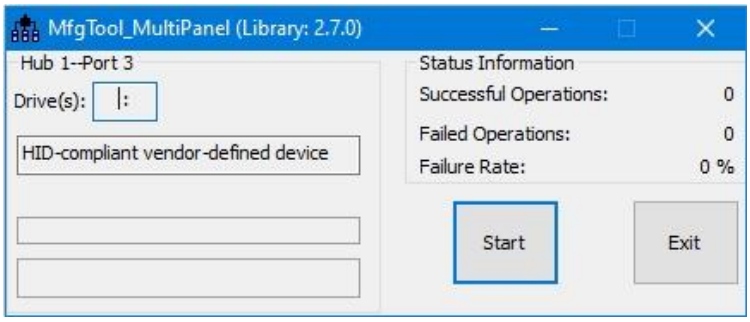


Fig.12 – Flash Mode

9. Click "Start" button to begin the burn images, click "Stop" to stop downloading and click "Exit" to exit the flash software.
10. Disconnect HMU8N and PC, press "RESET" key and release it to restart HMU8N.

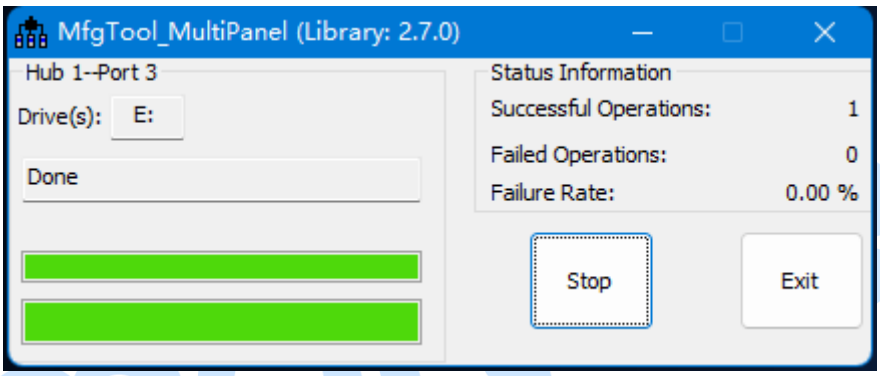


Fig.13 – Successful Firmware Upgrade

7 TYPICAL APPLICATION

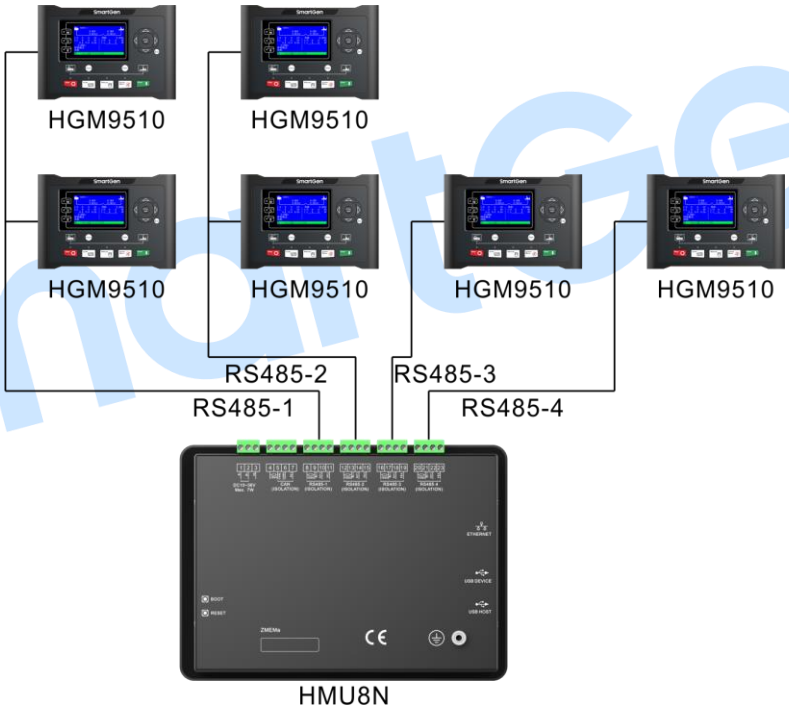


Fig.14 – Typical Application Diagram 1

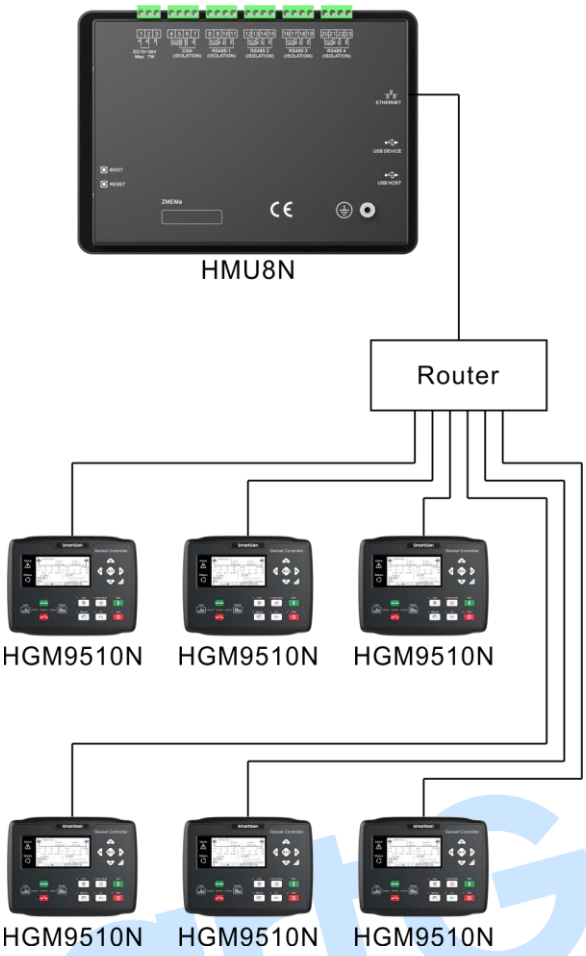


Fig.15 – Typical Application Diagram 2

8 CASE DIMENSIONS AND PANEL CUTOUT

Unit: mm

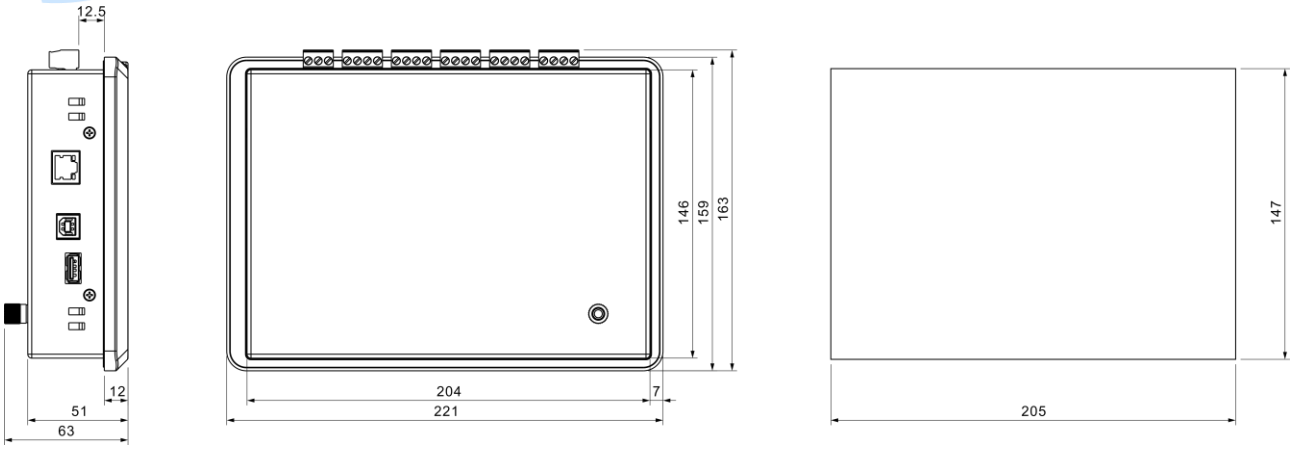


Fig.16 – Case Dimensions and Panel Cutout

9 FAULT FINDING

Ensure that all the cable connectors are firmly connected to HMU8N;
Please do not press the display screen of HMU8N with force or hard object.

Ensure that the enclosure's grounding post is well grounded.