SmartGen

MAKING CONTROL SMARTER

HMC4000RM

REMOTE MONITORING CONTROLLER

USER MANUAL

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Table 1 Software Version

Date	Version	Content
2017-08-29	1.0	Original release
2018-05-19	1.1	Change installation dimensions drawing.
2021-04-01	1.2	Change “A-phase power factor” described in 4th Screen of Screen Display to “C-phase power factor”.
2023-12-05	1.3	Change lamp test description; Add contents and ranges of parameter setting.

CONTENT

1 OVERVIEW

HMC4000RM remote monitoring controller integrates digitization, intelligentization and network technology which are used for remote monitoring system of single unit to achieve remote start/stop functions. It fit with LCD display, and optional Chinese/English languages interface. It is reliable and easy to use.

2 PERFORMANCE AND CHARACTERISTICS

Main features are as follows:

- 132*64 LCD with backlit, optional Chinese/English interface display, and push-button operation;
- Hard-screen acrylic material been used to protect screen with great wear-resisting and scratch-resisting functions;
- Silicone panel and buttons with great performance to work in high/low temperature ambient;
- Connect to host controller via RS485 port to achieve remote start/stop control in remote control mode;
- With LCD brilliance level (5 levels) adjusting button, it is convenient to use in different occasion;
- Waterproof security level IP65 due to rubber seal installed between the controller enclosure and panel fascia.
- Metal fixing clips are used;
- Modular design, self extinguishing ABS plastic enclosure and embedded installation way; small size and compact structure with easy mounting.

3 SPECIFICATION

Table 2 Technical Parameters

Items	Content
Working Voltage	DC8.0V to DC35.0V, uninterrupted power supply.
Power Consumption	<2W
RS485 Communication Baud Rate	2400bps/4800bps/9600bps/19200bps/38400bps can be set
Case Dimension	135mm x 110mm x 44mm
Panel Cutout	116mm x 90mm
Working Temperature	(-25~+70)°C
Working Humidity	(20~93)%RH
Storage Temperature	(-25~+70)°C
Protection Level	Front panel IP65
Insulation Intensity	Apply AC2.2kV voltage between high voltage terminal and low voltage terminal; The leakage current is not more than 3mA within 1min.
Weight	0.22kg

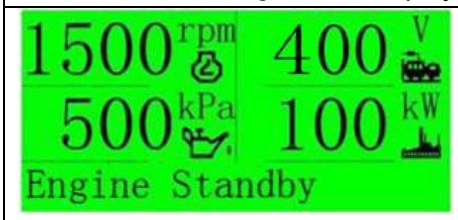
4 OPERATION

Table 3 Pushbuttons Description

Icons	Function	Description
	Stop	Stop running generator in remote control mode; When generator set is at rest, pressing and holding the button for 3 seconds will test indicator lights (lamp test);
	Start	In remote control mode, press this button will start generator-set.
	Dimmer +	Press this button to increase LCD brightness.
	Dimmer -	Press this button to decrease LCD brightness.
	Lamp Test	After pressing this button, LCD highlighted with black and all LEDs on the front panel are illuminated. Hold and press this button to eliminate the alarm information of local controller.
	Set/Confirm	Function is standby.
	Up/Increase	Press this button to scroll the screen up.
	Down/Decrease	Press this button to scroll the screen down.

5 SCREENS DISPLAY

Table 4 Screen Display

1st Screen	Description
Generator is running screen display	
	Engine speed, generator-set UA/UAB voltage
	Oil pressure, Load power
	Engine status
Generator is at rest screen display	
	Engine speed, water temperature
	Oil pressure, power supply voltage
	Engine status
2nd Screen	Description
Temp 35℃ Power 24.5V Oil Temp 20℃ D+ 24.5V	Engine water temperature, controller power supply
	Engine oil temperature, charger voltage
Total Running Time 10.2h	Engine total running time
Total Start Times 5 Local Mode	Engine start attempts, controller currently mode
3rd Screen	Description
UL-L 400 400 400 V	Wire voltage：Uab，Ubc，Uca
UL-N 230 230 230 V	Phase voltage：Ua，Ub，Uc
I 500 500 500 A	Load current：IA，IB，IC
P 345 kW Q 0 kvar	Load active power, load reactive power
Pf 1.00 50.0 Hz	Power facter, frequency
4th Screen	Description
P(kW) Q(kvar) S(kVA)	Active power, reactive power, apparent power display
A: 115 0 115	A-phase kW, A-phase kvar, A-phase kvA
B: 115 0 115	B-phase kW, B-phase kvar, B-phase kvA
C: 115 0 115	C-phase kW, C-phase kvar, C-phase kvA
PF 1.00 1.00 1.00	A-phase power factor, C-phase power factor, C-phase power factor
5th Screen	Description
Total kWh: 0kWh	Accumalated active electric energy
Total kvarh 0kvarh	Accumulated reactive electric energy
6th Screen	Description
I: 1 2 3 4 5	Input port name

┘ ┘ ┘ ┘ ┘ O: C 1 2 3 4 5 ┘ ┘ ┘ ┘ ┘ ┘ 2017-07-15 10:10:10	Input port status
	Output port name
	Output port status
	system present time
7th Screen	Description
Warning Alarm Generator Under Volt.	Alarm type
	Alarm name
Remark: if there is no electric parameters display, the 3rd, 4th, and 5th screen will be shielded automatically.	

6 CONTROLLER PANEL AND OPERATION

6.1 CONTROLLER PANEL

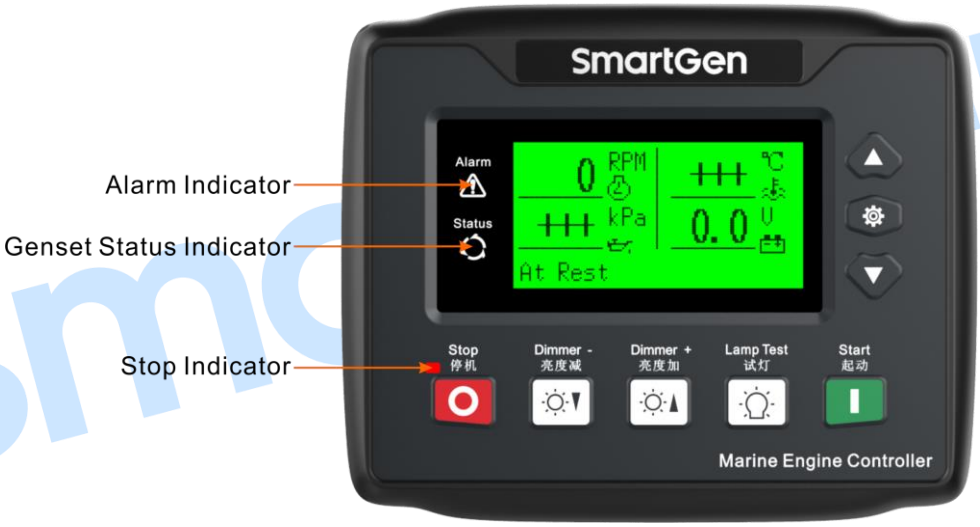


Fig.1 HMC4000RM Front Panel

NOTE: Part of indicator lights illustration:

Alarm Indicators: slowly flash when warning alarms occurred; fast flash when shutdown alarms occurred; light is off when there are no alarms.

Status Indicators: Light is off when genset is standby; flash once per second during start up or shut down; always on when normal running.

6.2 REMOTE START/STOP OPERATION

6.2.1 ILLUSTRATION

Press  of the host controller HMC4000 to enter into remote control mode, after remote control mode is active, users can remotely control HMC4000RM start/stop operation.

6.2.2 REMOTE START SEQUENCE

- When remote start command is active, “Start Delay” timer is initiated;
- “Start Delay” countdown will be displayed on LCD;
- When start delay is over, preheat relay energizes (if configured), “preheat delay XX s” information will be displayed on LCD;
- After the above delay, the Fuel Relay is energized, and then one second later, the Start Relay is engaged. Genset is cranked for a pre-set time. If genset fails to fire during this cranking attempt then the fuel relay and start relay are disengaged for the pre-set rest period; “crank rest time” begins and wait for the next crank attempt.
- Should this start sequence continue beyond the set number of attempts, the start sequence will be terminated, and Fail to Start fault alarm will be displayed on the alarm page of LCD.
- In case of successful crank attempt, the “Safety On” timer is activated. As soon as this delay is over, “start idle” delay is initiated (if configured).
- After the start idle, controller enters into hi-speed “Warning Up” delay (if configured).
- After “Warning Up” delay expired, the generator will enter into Normal Running status directly.

6.2.3 REMOTE STOP SEQUENCE

- When the remote stop command is active, controller starts hi-speed “Cooling” delay (if configured).
- Once this “Cooling” delay has expired, the “Stop Idle” is initiated. During “Stop Idle” Delay (if configured), idle relay is energized.
- Once this “Stop Idle” has expired, the “ETS Solenoid Hold” begins, and whether or not stop completely will be judged automatically. ETS relay is energized while fuel relay is de-energized.
- Once this “ETS Solenoid Hold” has expired, the "Wait for Stop Delay" begins. Complete stop is detected automatically.
- Generator is placed into its standby mode after its complete stop. Otherwise, fail to stop alarm is initiated and the corresponding alarm information is displayed on LCD (If generator is stop successfully after “fail to stop” alarm has initiated, engine will enter into standby status).

7 WIRING CONNECTION

HMC4000RM controller back panel layout:

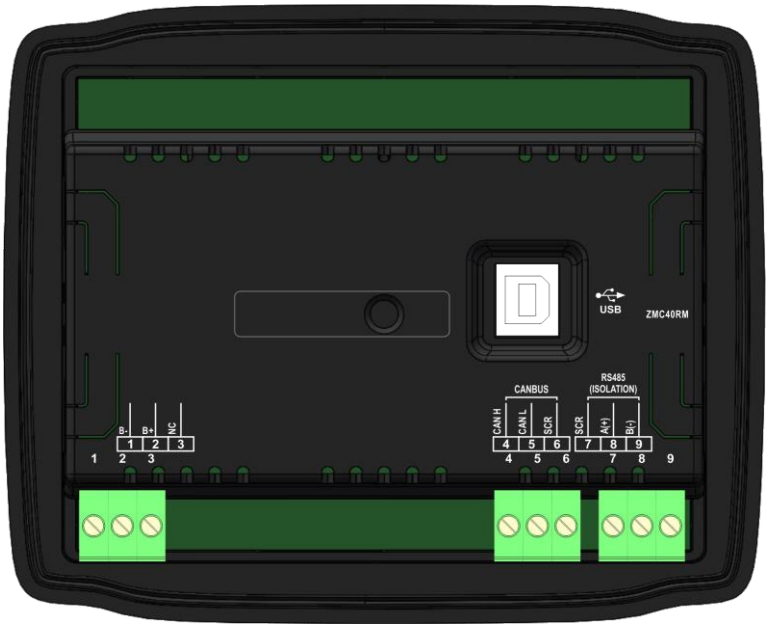


Fig.2 Controller Back Panel

Table 5 Description of Terminal Connection

No.	Function	Cable Size	Remark
1	B-	2.5mm^2	Connected with negative of power supply.
2	B+	2.5mm^2	Connected with positive of power supply.
3	NC		Not used
4	CAN H	0.5mm^2	This port is expand monitoring interface and reserved temporarily. Shielding line is recommended if used.
5	CAN L	0.5mm^2	
6	CAN Common Ground	0.5mm^2	
7	RS485 Common Ground	/	Impedance-120Ω shielding wire is recommended, its single-end earthed. This interface is used to connect with host controller HMC4000.
8	RS485+	0.5mm^2	
9	RS485-	0.5mm^2	

NOTE: USB port in the back is system upgrade port.

8 RANGES AND DEFINITIONS OF PROGRAMMABLE PARAMETERS

Table 6 Contents and Ranges of Parameter Setting

No.	Item	Range	Default	Description
Module Setting				
1	RS485 Baud Rate	(0-4)	2	0: 9600bps 1: 2400bps 2: 4800bps 3:19200bps 4：38400bps
2	Stop Bit	(0-1)	0	0:2 Bits 1:1 Bit

9 TYPICAL APPLICATION

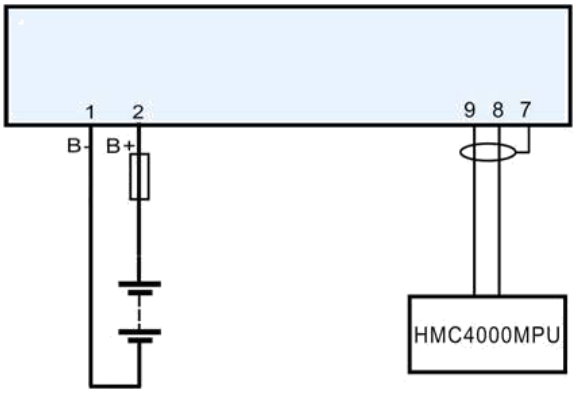


Fig.3 HMC4000RM Typical Application Diagram

10 INSTALLATION

10.1 FIXING CLIPS

— Controller is panel built-in design; it is fixed by clips when installed.

— Withdraw the fixing clip screw (turn anticlockwise) until it reaches proper position.

— Pull the fixing clip backwards (towards the back of the module) ensuring two clips are inside their allotted slots.

— Turn the fixing clip screws clockwise until they are fixed on the panel.

NOTE: Care should be taken not to over tighten the screws of fixing clips.

10.2 OVERALL DIMENSIONS AND CUTOUT

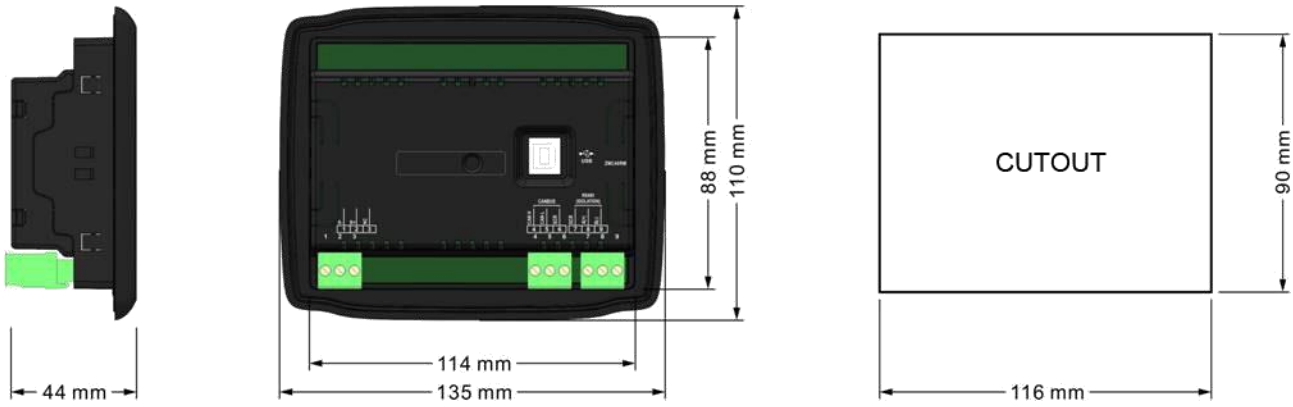


Fig.4 Case Dimensions and Panel Cutout

11 TROBLESHOOTING

Table 7 Troubleshooting

Problem	Possible Solution
Controller no response with power.	Check starting batteries; Check controller connection wirings; Check DC fuse.
Communication failure	Check whether RS485 connections are correct; Check whether communication baud rate and stop bit are consistent.