

# SmartGen

MAKING CONTROL SMARTER

## HMC9100RM REMOTE MONITORING CONTROLLER USER MANUAL



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**Table 1 Software Version**

Date	Version	Content
2025-03-01	1.0	Original release.

**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.

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## 1 OVERVIEW

**HMC9100RM Remote Monitoring Controller** integrates digital, intelligent and network technologies, which is designed for engine automation and remote monitoring system of single unit to achieve remote start/stop and other functions. It fits with LCD display, optional languages interface (Chinese and English), and it is reliable and easy to use. It can fit with HMC9100A/S diesel engine controller.

## 2 PERFORMANCE AND CHARACTERISTICS

- Core of 32-bit ARM micro-processor, 5-inch LCD display with backlight, optional Chinese/English language, touch-button operation.
- CAN BUS (REMOTE) interface is able to connect with master control module to start/stop engine in remote control mode;
- One Ethernet interface, which supports 100Mbps network communication with a transmission distance of less than 100m;
- Six auxiliary inputs to control the local controller remotely via remote input signal;
- One passive output for audio alarm, which can be connected to an alarm horn;
- Support 10-level dimming, enabling adjustment of LCD brightness and LED indicators across 10 brightness levels;
- Silicone panel and push buttons can be used in extreme temperature environment
- Hard-screen acrylic material is used to protect screen with great wear-resisting and scratch-resisting functions
- Sealing is designed for enclosure and IP65 of whole protection class;
- Modular design, embeded mounting, compact structure with small volume and easy installation.

3 SPECIFICATIONS

Table 3 Performance Parameters

Item	Contents
Working Voltage	DC18.0V ~ DC35.0V, DC reverse connection protection (Only for 24V system) Resolution: 0.1V Accuracy: 1%
Overall Consumption	<3W (Standby mode: ≤2W)
REMOTE CAN Interface	Isolated, default communication baud rate 250kbps, and the baud rate can select 125kbps in master control. The communication distance is less than or equal to 100m (250kbps).
ETHERNET Interface	Support 100Mbps network communication with a transmission distance of less than 100m
Aux. Relay Output	7A, connect with the COM output
Vibration	5Hz~8Hz: ±17mm 8Hz~500Hz: a=4g 100Hz~500Hz: a=2g IEC 60068-2-6
Shock	50g, 11ms, half-sine, complete shock test from three mutually perpendicular directions, totally 18 times IEC 60068-2-27
Bump	20g <sub>n</sub> (200m/s <sup>2</sup> ), 16ms, IEC 60255-21-2
Case Dimension	242mm x 178mm x 55mm
Installation Method	By screw clips
Working Temperature	(-25~+70)°C
Working Humidity	(20~93)%RH
Storage Temperature	(-30~+80)°C
Protection Level	IP65, when adding a waterproof gasket between controller and screen
Weight	0.85kg

## 4 OPERATION

### 4.1 PANEL DESCRIPTION



Fig.1 HMC9100RM Front Panel Indication

### 4.2 KEY FUNCTION DESCRIPTION

Table 3 Key Function Description

Icon	Keys	Description
	Stop	1. Press it to stop the running engine in remote mode. 2. Press it again during stop process to stop the unit quickly.
	Start	In remote mode, press it to start the genset.
	Alarm Reset	Press it to reset the alarm if there is alarm information on LCD. And it can reset the local alarm, too. If communication with the local equipment fails after the controller is powered on, a reset is required before normal data communication can resume.
	Lamp Test	Press it to test whether the panel indicator is OK.
	Mute	Press it to stop the audible alarm of controller. When communication is normal, it can simultaneously stop the audible alarm of the local controller.

Icon	Keys	Description
	Brightness+	Press it to adjust the LCD backlight and increase the brightness of LED indicator.
	Left	Turn the page to view the content displayed on other information screen.
	Up	Scroll up to view the content displayed on other information screen.
	Down	Scroll down to view the content displayed on other information screen.
	Right	Turn the page to view the content displayed on other information screen.
	Brightness-	Press it to adjust the LCD backlight and decrease the brightness of LED indicator.

## 4.3 REMOTE START/STOP OPERATION

### 4.3.1 ILLUSTRATION

Firstly, make HMC9100 controller enter the “Module Setting”, then select the “HMC9100RM Module Enable” of module setting and make HMC9100RM enable via HMC9100. When remote control mode is active, HMC9100RM start/stop operation will be activated.

### 4.3.2 REMOTE START SEQUENCE

- 1) When the genset is started by HMC9100RM module, press the Start key, then the controller will enter the “Start Delay”;
- 2) When start delay is over, preheat relay energizes (if configured), “Preheat Delay XX s” will be displayed on LCD;
- 3) After the preheating, the fuel relay is energized (if configured), and then the start relay (if configured) is energized;
- 4) If the engine 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;
- 5) Within the cranking attempts, if the engine fails to start, an alarm of start failure will be issued by controller and displayed on LCD;
- 6) During any cranking, if engine starts successfully, it enters “Safety on Delay”;
- 7) After safety on delay, it enters into “Start Idle” directly (if configured);
- 8) After the start idle, it will enter “High-speed Warming Up” (if configured);
- 9) When the delay is over, engine will run normally.

### 4.3.3 REMOTE STOP SEQUENCE

- 1) When the genset is stopped by HMC9100RM module, press the Stop key, then the controller will enter the “Stop Delay”;
- 2) When stop delay is over, the controller will enter the “High-speed Cooling” stage;
- 3) When “High-speed Cooling” delay is over, “Stop Idle” is initiated (if configured), idle relay is energized;
- 4) Once this “Stop Idle” has expired, the “ETS Solenoid Hold” begins. ETS relay is energized while ignition relay and fuel relay are de-energized;
- 5) Once this “ETS Solenoid Hold” has expired, “Fail to Stop Delay” begins. Complete stop is detected

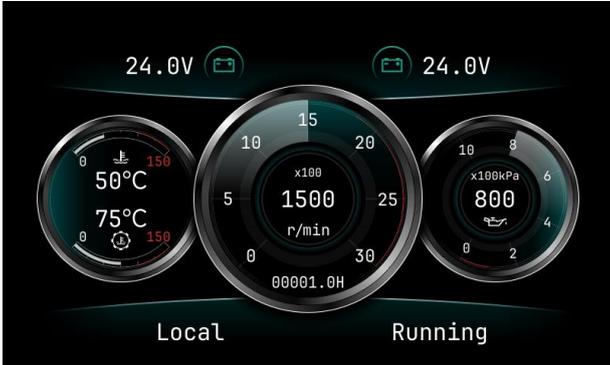
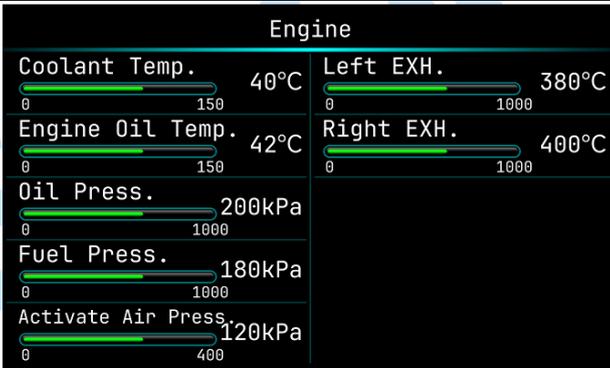
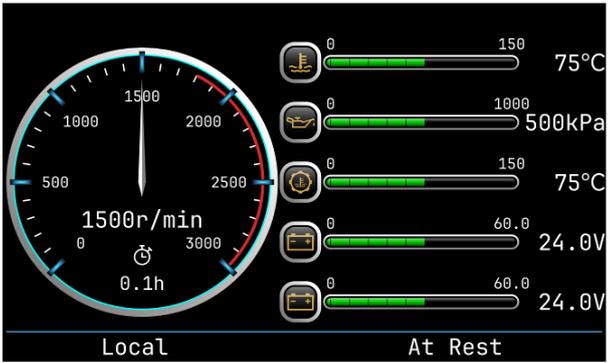
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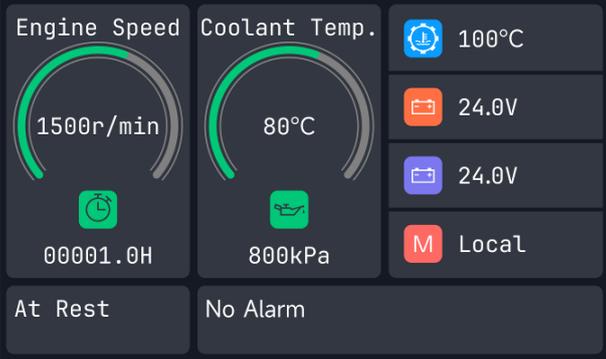
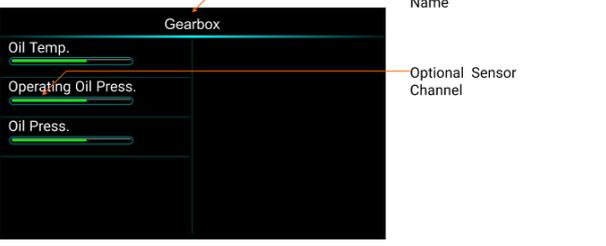
- 6) Engine is placed into its standby mode after its complete stop. Otherwise, fail to stop alarm is initiated (If engine stops successfully after “fail to stop” alarm is initiated, it will enter standby mode).

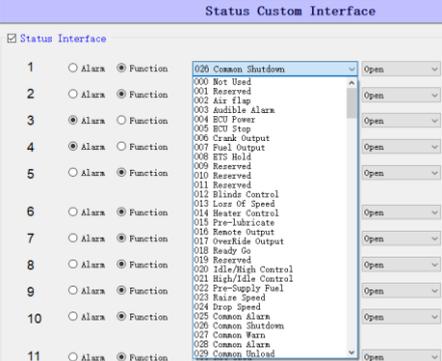
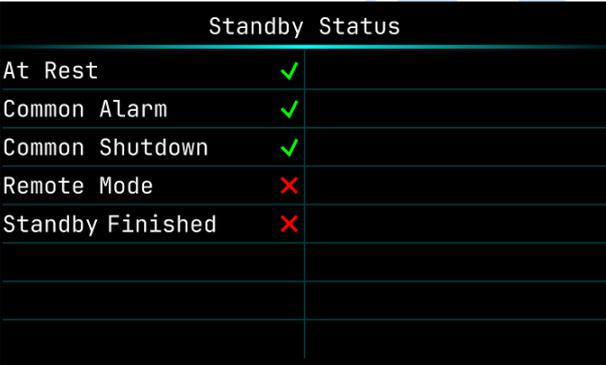
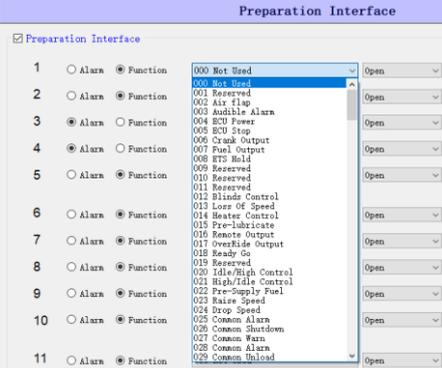
## 4.4 CONTROLLER INFORMATION DISPLAY

There are three types of theme interfaces displayed in the HMC9100RM, it can display the same theme of local controller synchronously, and the real-time local module data simultaneously.

**Table 5 Main Screen Display**

Position	Content	Description
Main screen (Theme1)		<ol style="list-style-type: none"> <li>1: Main screen displays 2-way power voltage.</li> <li>2: Display 1-way speed.</li> <li>3: Display 1-way water temperature. (display channel can be selected. 1# sensor is defaulted.)</li> <li>4: Display 1-way oil temperature. (2# sensor)</li> <li>5: Display 1-way oil pressure. (display channel (display channel can be selected, 5# sensor is defaulted)</li> <li>6: Display controller mode.</li> <li>7: Display engine status.</li> </ol>
Sensor Screen (Theme1)		<p>The screen title, corresponding sensor channel and the Chinese/English name for the sensor channel can be configured. The displayed sensor contents can be customized.</p>
Main Screen (Theme2)		<ol style="list-style-type: none"> <li>1: Main screen displays 2-way power voltage.</li> <li>2: Display 1-way speed.</li> <li>3: Display 1-way water temperature. (display channel can be selected. 1# sensor is defaulted.)</li> <li>4: Display 1-way oil temperature. (2# sensor)</li> <li>5: Display 1-way oil pressure. (display channel (display channel can be selected, 5# sensor is defaulted)</li> <li>6: Display controller mode.</li> </ol>

Position	Content	Description
		7: Display engine status.
Sensor Screen (Theme2)		The title, corresponding sensor channel and the Chinese/English name for the sensor channel can be configured. The displayed sensor contents can be customized.
Main Screen (Theme3)		<ol style="list-style-type: none"> <li>1: Main screen displays 2-way power voltage.</li> <li>2: Display 1-way speed.</li> <li>3: Display 1-way water temperature. (display channel can be selected. 1# sensor is defaulted.)</li> <li>4: Display 1-way oil temperature. (2# sensor)</li> <li>5: Display 1-way oil pressure. (display channel (display channel can be selected, 5# sensor is defaulted)</li> <li>6: Display controller mode.</li> <li>7: Display engine status.</li> </ol>
Sensor Screen (Theme3)		The title, corresponding sensor channel and the Chinese/English name for the sensor channel can be configured. The displayed sensor contents can be customized.
Screen Editing		Custom screen:
Screen Editing		Content and theme of the screen can be customized by using PC software. Max.5 themes can be set and also max.5 pages of each screen can be set.

Position	Content	Description
		
<p>Custom Status Screen</p>		<p>Custom status display: Up to 16 states are selected to display separately by using PC software. See the output port setting list for selections.</p> 
<p>Standby Status Screen</p>		<p>Custom standby status display: Up to 16 states are selected to display separately by using PC software. See the output port setting list for selections.</p> 

5 WIRING CONNECTION

HMC9100RM back panel is showed as below:

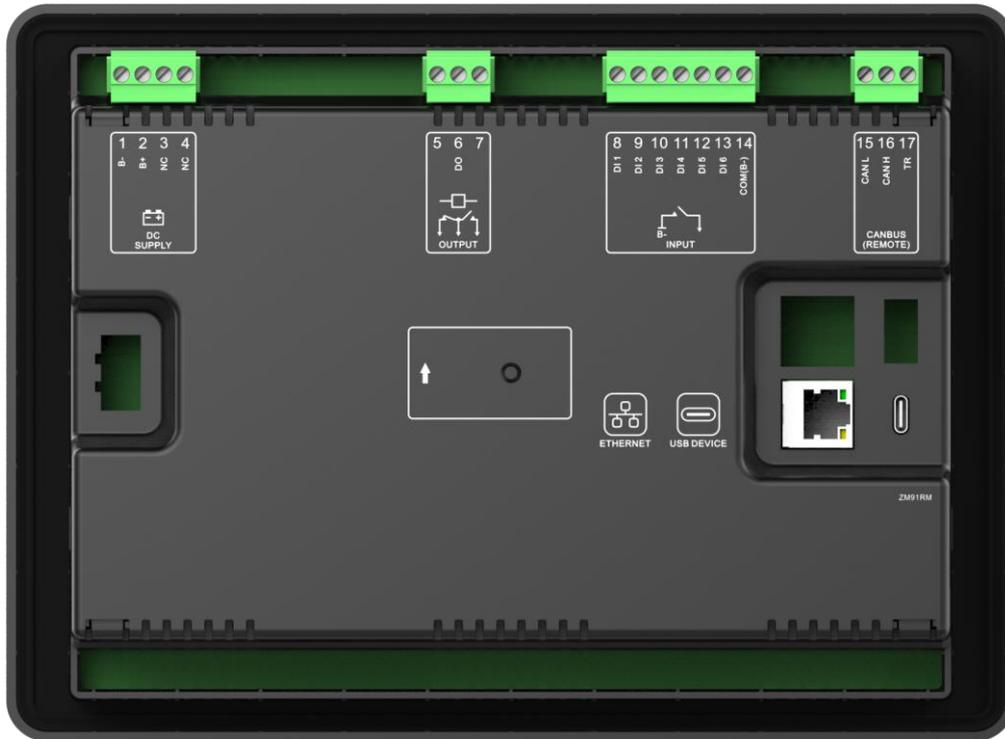


Fig.2 HMC9100RM Back Panel

Table 6 Terminal Connection Description

No.	Function	Cable	Remark
1	B-	1.5mm <sup>2</sup>	Connected with negative of power supply.
2	B+	1.5mm <sup>2</sup>	Connected with positive of power supply. If wire length is over 30m, better to double wires in parallel. Max. 20A fuse is recommended.
3	NC	/	Null
4	NC	/	Null
5	Aux. Output	1.5mm <sup>2</sup>	Passive output, rated current 7A. Function: Audible alarm
6			
7			
8	Aux. Input 1	1.0mm <sup>2</sup>	Digital Input. Function: Speed up input.(The features need to correspond to specific models)
9	Aux. Input 2	1.0mm <sup>2</sup>	Digital Input. Function: Speed down input. (The features need to correspond to specific models)
10	Aux. Input 3	1.0mm <sup>2</sup>	Digital Input. Function: Idle speed input. (The features need to correspond to specific models)
11	Aux. Input 4	1.0mm <sup>2</sup>	Digital Input. Function: Rated speed input. (The features need to correspond to specific models)
12	Aux. Input 5	1.0mm <sup>2</sup>	Digital Input. Function: Reserved.
13	Aux. Input 6	1.0mm <sup>2</sup>	Digital Input. Function: Reserved.
14	COM(B-)	1.0mm <sup>2</sup>	Common port of Aux. Input Port.
15	CAN L	0.5mm <sup>2</sup>	Impedance-120Ω shielding wire is recommended, its single-end earthed. If a 120Ω resistor is needed, please
16	CAN H	0.5mm <sup>2</sup>	

No.	Function	Cable	Remark
17	TR	0.5mm <sup>2</sup>	short connect Terminal 16 and 17, so that it can connect with master controller.
18	ETHERNET		The Ethernet port.
19	USB DEVICE		The USB port.

**NOTE 1:** USB interfaces on back panel can supply power for controller in short-time.

**NOTE 2:** CANBUS(REMOTE) interfaces on back panel can communicate with master controller.

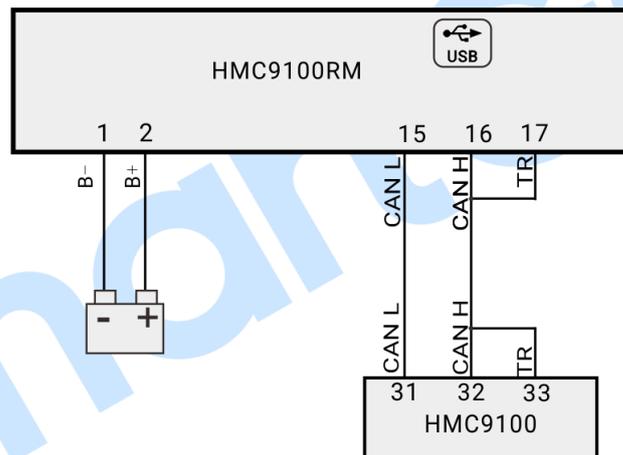
**Cable size requirements:** CAN Communication Wire: 0.5mm<sup>2</sup>

## 6 COMMISSIONING

The following checks are recommended before running the system:

- Check all the wirings are correct and the wire diameter is appropriate;
- The connection between controller and the positive/negative of power supply is correct, and the switch of power supply is closed;
- Check the wirings of remote monitoring module, press the start key of the module in remote mode, the engine will start;
- If there is any other question, please contact SmartGen's service.

## 7 TYPICAL APPLICATION



**Fig.3 HMC9100RM Typical Application Diagram**

8 INSTALLATION

8.1 CASE DIMENSIONS AND PANEL CUTOUT

Unit:mm

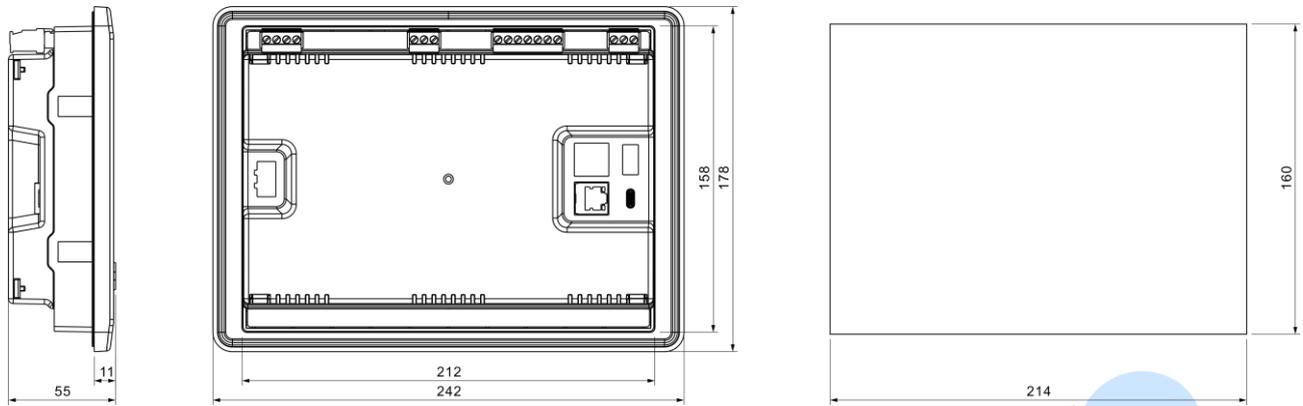


Fig.4 Case Dimensions and Panel Cutout

9 TROUBLESHOOTING

Table 6 Troubleshooting

Problem	Possible Solution
Controller no response with power	Check starting batteries; Check controller wirings; Check DC fuse.
CAN Communication failure	Check if CAN wires are plugged tightly and not damaged; Check if a 120Ω matching resistor needed to be connected.