

Graigar HGM6110NC

Graigar SmartGen HGM6110NC Generator Controller User Manual

Model: HGM6110NC

1. INTRODUCTION AND OVERVIEW

The Graigar SmartGen HGM6100N series automatic controller integrates digital, intelligent, and network techniques for comprehensive genset control and monitoring. The HGM6110NC model specifically offers automatic start/stop, data measurement, alarm protection, and three remote functions: remote control, remote measurement, and remote communication.

This controller utilizes micro-processing technology for precise measurement, value adjustment, timing, and threshold settings. Its compact structure, simple connections, and high reliability make it suitable for various automatic control systems.

The HGM6110NC features a 132x64 LCD display with backlight, supporting multiple language interfaces including Chinese, English, Spanish, Russian, Portuguese, Turkish, Polish, and French. The panel is designed with an acrylic screen for improved wear and scratch resistance, and silica-gel keys for adaptability to varying temperatures.

An RS485 communication port is included, enabling "three remote" functions via the MODBUS protocol. This manual focuses on the HGM6110NC model, which includes the RS485 port.



Figure 1: Front view of the Graigar SmartGen HGM6110NC Genset Controller. It displays the LCD screen, control buttons for navigation, auto/manual/start/stop functions, and indicators for alarm and status.

2. PRODUCT VARIANTS

The HGM6100N series offers several variants, each designed for specific functionalities:

- **HGM6110N / HGM6110NC / HGM6110CAN:** These are Automatic Start Modules, designed to control a generator's start and stop operations based on a remote start signal.
- **HGM6120N / HGM6120NC / HGM6120CAN:** These models build upon the HGM6110N series by adding mains AC monitoring and automatic switching control between mains and generator (AMF - Automatic Mains Failure). They are particularly suited for automation systems involving both mains power and a genset.

Key distinctions among variants:

- **RS485 Port:** HGM6110NC and HGM6120NC models include an RS485 port for communication. HGM6110N and HGM6120N models do not.
- **CANBUS Port:** HGM6110CAN and HGM6120CAN models feature a CANBUS port. This allows connection to electronic injection engines with J1939 protocol, enabling monitoring of data such as water temperature, oil pressure, speed, and fuel consumption, as well as control of start, stop, high speed, and low speed functions.

3. KEY FEATURES

- **Automatic Control:** Functions for automatic start/stop, data measurement, and alarm protection.
- **Remote Capabilities:** Supports remote control, remote measurement, and remote communication ("three remote" functions) via RS485 and MODBUS protocol (HGM6110NC).
- **User Interface:** 132x64 LCD display with backlight, multi-language support, and push-button operation.
- **Durability:** Acrylic screen for enhanced wear and scratch resistance; silica-gel panel and keys for temperature adaptability.

- **Engine Monitoring (CANBUS models):** Monitors engine data (water temperature, oil pressure, speed, fuel consumption) and controls engine functions (start, stop, speed) via J1939 protocol.
- **Power System Adaptability:** Compatible with 3P4W, 3P3W, 1P2W, and 2P3W (120V/240V) AC power systems, 50Hz/60Hz.
- **Measurement and Display:** Capable of measuring and displaying 3-phase voltage, 3-phase current, frequency, and power parameters for both mains and genset.

4. SETUP AND INSTALLATION

Proper installation is crucial for the reliable operation of the HGM6110NC controller. This section provides general guidelines. Refer to the detailed wiring diagram for specific connections.

4.1 Mounting

The controller is designed for panel mounting. Ensure adequate space for ventilation and access to wiring terminals. Use the provided mounting clips to secure the controller firmly in place.



Figure 2: Included mounting clips and resistors. The clips are used to secure the controller to a panel, while the resistors may be used for specific wiring configurations.

4.2 Wiring Connections

All wiring should be performed by qualified personnel, adhering to local electrical codes and safety standards. The back panel of the controller features clearly labeled terminals for various connections.

- **Power Supply:** Connect the DC power supply to the designated terminals. Ensure correct polarity and voltage.
- **Mains/Gens Voltage Inputs:** Connect the appropriate 3-phase or single-phase voltage inputs for monitoring.
- **Current Transformer (CT) Inputs:** Connect CTs for current measurement. Ensure correct phasing and orientation.
- **Engine Control Outputs:** Connect to the generator's start, stop, fuel, and other control circuits.
- **Auxiliary Inputs/Outputs:** Utilize auxiliary terminals for additional monitoring or control functions as

required by your system.

- **RS485 Communication:** Connect the RS485 communication lines to the designated terminals for remote communication.
- **USB Interface:** The USB port is typically used for configuration and firmware updates via a PC.

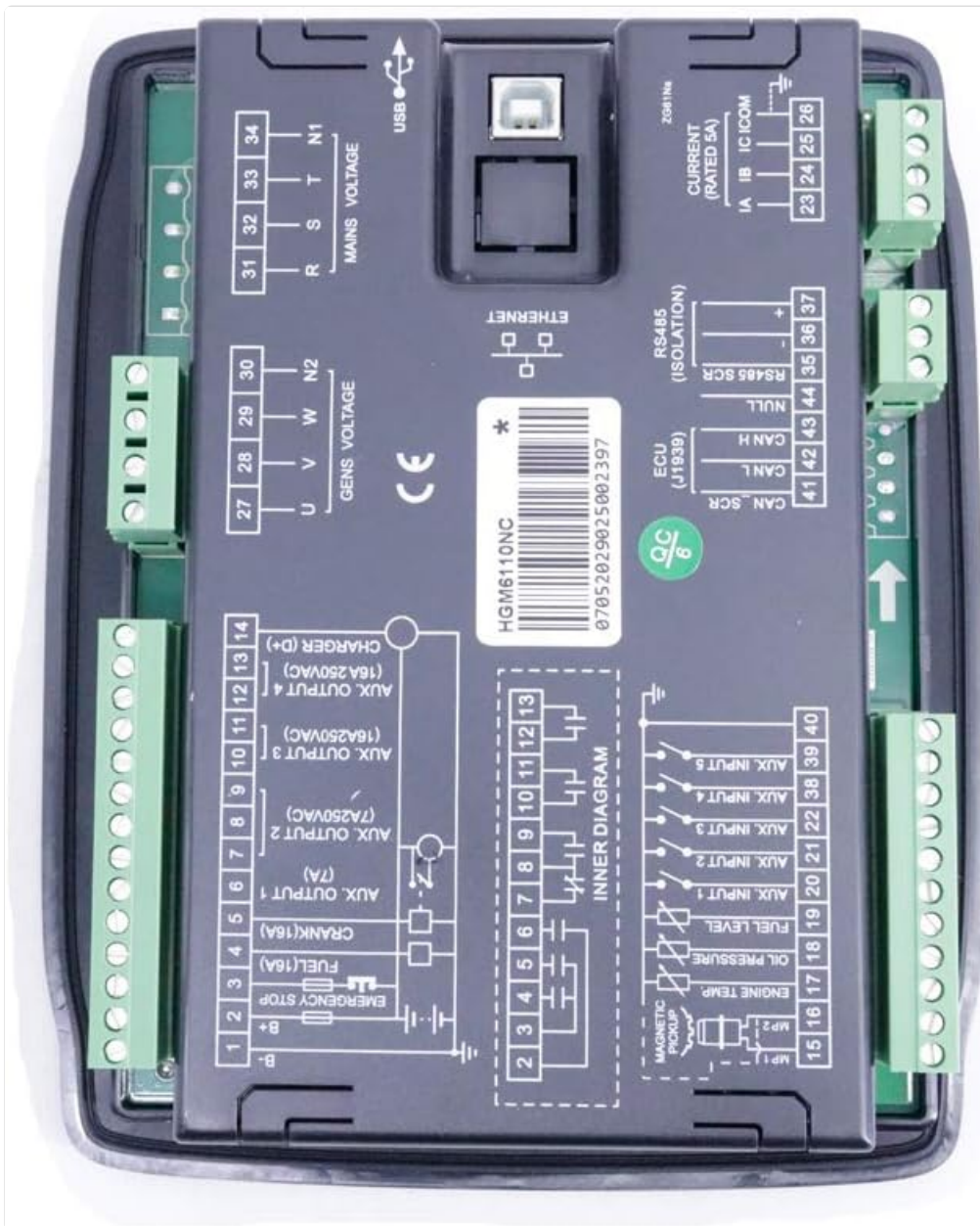


Figure 3: Rear view of the Graigar SmartGen HGM6110NC controller, showing the terminal blocks and internal wiring diagram. Key connections include USB, Ethernet, RS485, Mains Voltage, Gens Voltage, Charger, Auxiliary Outputs, Auxiliary Inputs, Fuel Level, Oil Pressure, Engine Temp, and Magnetic Pickup.

After all connections are made, double-check wiring for correctness and security before applying power.

5. OPERATING INSTRUCTIONS

The HGM6110NC controller offers both automatic and manual operation modes. Familiarize yourself with the front panel buttons and LCD display for effective control.

5.1 Power On/Off

- To power on, ensure the DC supply is connected. The LCD will illuminate, and the controller will perform a self-test.
- To power off, disconnect the DC supply. Ensure the generator is safely shut down before removing

power.

5.2 Navigation and Settings

Use the navigation buttons (Up, Down, Left/Right, OK) to browse through menus, view parameters, and adjust settings on the LCD display. The display provides real-time data on generator status, voltage, current, frequency, and alarms.

5.3 Operating Modes

- **Manual Mode:** Press the **Manual** button. In this mode, the generator can be started and stopped manually using the **Start** and **Stop** buttons.
- **Automatic Mode:** Press the **Auto** button. The controller will automatically manage the generator's start/stop sequence based on configured parameters, such as remote start signals or mains power status (for HGM6120NC variants).

5.4 Generator Start/Stop

- **Start:** In Manual mode, press the **Start** button. The controller will initiate the starting sequence.
- **Stop:** In Manual mode, press the **Stop** button. The controller will initiate the stopping sequence. In Auto mode, the generator will stop automatically when conditions are met (e.g., remote start signal removed, mains power restored).

5.5 Alarm Management

The controller continuously monitors the genset and will trigger alarms for abnormal conditions. Alarms are indicated on the LCD and via the alarm indicator. Address any alarms promptly to prevent damage or operational issues.

6. MAINTENANCE

Regular maintenance ensures the longevity and reliable performance of your HGM6110NC controller.

- **Cleaning:** Keep the controller's front panel clean using a soft, dry cloth. Avoid abrasive cleaners or solvents that could damage the acrylic screen or buttons.
- **Connections Check:** Periodically inspect all wiring connections for tightness and signs of corrosion. Loose connections can lead to intermittent operation or faults.
- **Environmental Conditions:** Ensure the operating environment remains within the specified temperature and humidity ranges to prevent damage to internal components.
- **Firmware Updates:** Check the manufacturer's website for any available firmware updates. Updates can improve performance, add features, or resolve known issues. Use the USB interface for updates as per manufacturer instructions.

7. TROUBLESHOOTING

This section provides general guidance for common issues. For complex problems, consult a qualified technician or the manufacturer's support.

- **Controller Not Powering On:**
 - Verify DC power supply connections and voltage.
 - Check fuses in the power supply circuit.
- **Generator Not Starting in Auto Mode:**

- Ensure the controller is in Auto mode.
- Check if the remote start signal is active.
- Verify all safety interlocks and engine parameters are within limits.

• **Communication Issues (RS485/USB):**

- Check physical cable connections for RS485 or USB.
- Verify communication settings (baud rate, parity) match between the controller and the connected device.
- Ensure correct drivers are installed for USB communication.

• **Alarm Indication:**

- Refer to the controller's display for the specific alarm code or message.
- Consult the full product manual (if available from manufacturer) for detailed alarm descriptions and corrective actions.

8. SPECIFICATIONS

Feature	Specification
Model	HGM6110NC
Brand	Graigar
Display Type	LCD (132x64 with backlight)
Communication Ports	RS485, USB Interface
Voltage Compatibility	240 Volts (compatible with 3P4W, 3P3W, 1P2W, 2P3W systems)
Frequency Compatibility	50Hz/60Hz
Material	Plastic
Color	Black
Item Weight	1.23 pounds (approx. 0.56 kg)
Package Dimensions	8.23 x 6.54 x 1.73 inches (approx. 20.9 x 16.6 x 4.4 cm)
Batteries Required	No
Included Components	Controller
UPC	761272050147

9. WARRANTY AND SUPPORT

For specific warranty information regarding your Graigar SmartGen HGM6110NC Generator Controller, please refer to the documentation provided with your purchase or contact the seller directly. Warranty terms typically cover manufacturing defects for a specified period from the date of purchase.

For technical support, troubleshooting assistance beyond this manual, or inquiries about spare parts, please contact Graigar customer service or your authorized distributor. Ensure you have your product model number (HGM6110NC) and purchase details available when seeking support.

You may also visit the official Graigar website for additional resources, updated manuals, and frequently asked questions.