SmartGen HGM9510

SmartGen HGM9510 Generator Controller Instruction Manual

Model: HGM9510

1. Product Overview

The HGM9510 controller is engineered for manual and automatic parallel system generators, accommodating units of similar or differing capacities. It supports single-unit constant power output and mains paralleling. This controller facilitates automatic start/stop, parallel running, data measurement, alarm protection, and remote control, measurement, and communication functions. Featuring a 4.3-inch TFT-LCD display, it offers multilingual interfaces (including English and Chinese) for user convenience. The controller integrates GOV (Engine Speed Governor) and AVR (Automatic Voltage Regulator) control functions for automatic synchronization and load sharing. It monitors engine status, indicating operational and fault conditions accurately. In case of abnormal conditions, it isolates the bus and shuts down the genset, displaying precise failure information on the LCD. An SAE J1939 interface allows communication with various ECU (Engine Control Unit) systems. Its 32-bit Microprocessor ensures precise parameter measurement, adjustment, and time settings. Most parameters are configurable via the front panel, or through a PC via USB or RS485 interfaces. Its compact structure, advanced circuits, simple connections, and high reliability make it suitable for various automatic gen-set control systems.

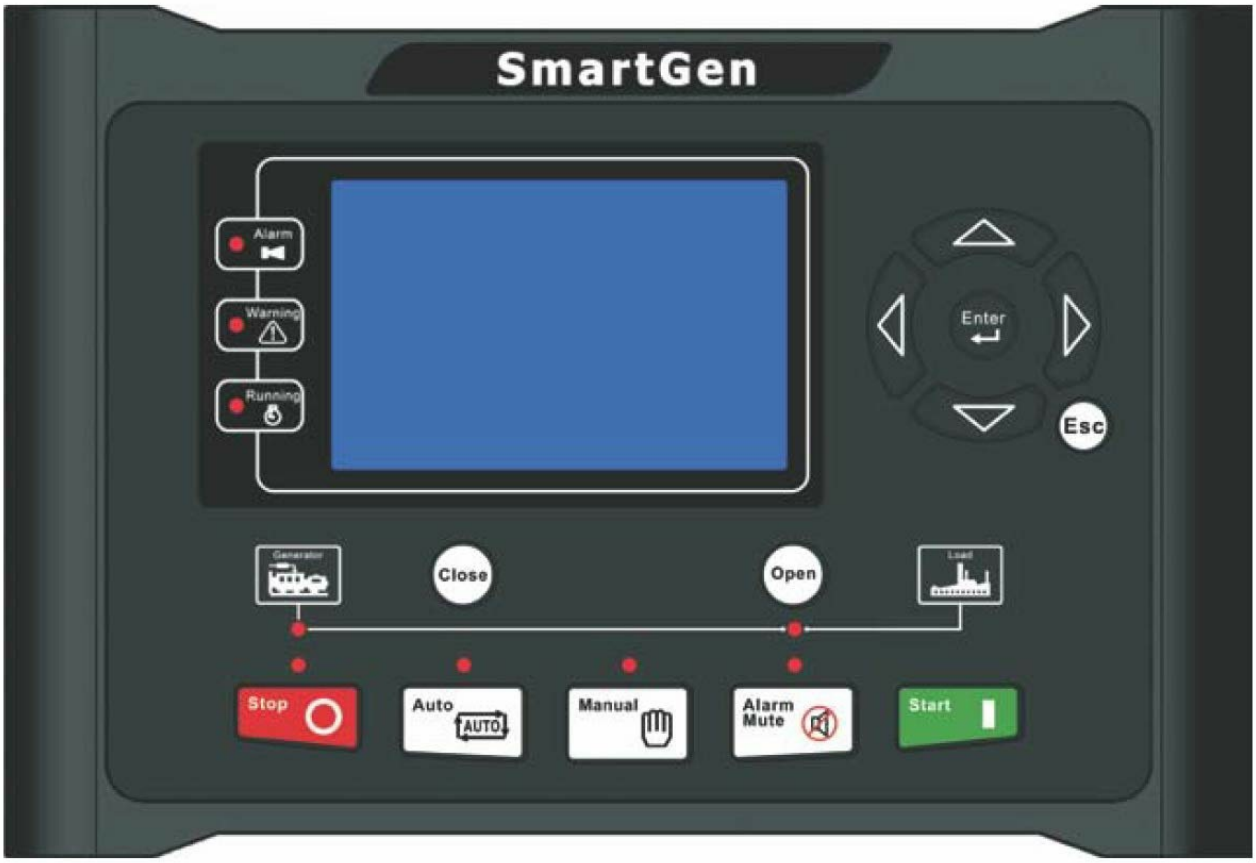

Figure 1.1: SmartGen HGM9510 Generator Controller Front Panel

Figure 1.2: Excerpt from HGM9510 Manual - Overview

2. Features and Characteristics

The HGM9510 controller offers a robust set of features designed for comprehensive generator management:

- Improved LCD wear-resistance and scratch resistance due to hard screen acrylic.
- RS485 communication port enables remote control, remote measuring, and remote communication via ModBus protocol.
- Suitable for 3-phase 4-wire, 3-phase 3-wire, single phase 2-wire, and 2-phase 3-wire systems with voltage 120/240V and frequency 50/60Hz.

- Protection: automatic start/stop of the gen-set, ATS (Auto Transfer Switch) control with perfect fault indication and protection function.
- Can control engine heater, cooler, and fuel pump.
- ARM-based 32-bit SCM for high hardware integration and reliability.
- 480x272 LCD with backlight, multilingual interface (English, Chinese, etc.) selectable on-site.
- Silicon panel and pushbuttons for improved operation in high/low temperature environments.
- CANBUS port for communication with J1939 gensets, monitoring data (water temperature, oil pressure, engine speed, fuel consumption) and controlling start, stop, raising speed, and speed droop.
- Collects and displays 3-phase voltage, current, power parameter, and frequency of Bus/Mains.
- For Bus, controller has loss of phase and phase sequence wrong detection functions; for generator, controller has over voltage, under voltage, over frequency, under frequency, over current, over power, reverse power, loss of phase, phase sequence wrong detection functions.
- Synchronization parameters: Voltage Difference Between Bus and Mains, Frequency Difference Between Bus and Mains, Phase Difference Between Bus and Mains.
- Multiple running modes in auto state: load running, off load running, demand parallel running.
- Ramp on and ramp off function.
- 3 fixed sensors (temperature, oil pressure, and liquid level).
- 2 configurable sensors can be set as sensor of temperature, oil pressure, or fuel level.
- More kinds of curves of temperature, oil pressure, fuel level can be used directly and users can define their own sensor curves.
- Precision measurement and display parameters about Engine, Temp. (WT) °C/°F (unit) both displayed, Oil pressure (OP) kPa/psi/bar(unit) all displayed, Fuel level (FL) %(unit), Speed (SPD) r/min(unit), Battery Voltage (VB) V (unit), Charger Voltage (VD) V (unit).
- Hour count (HC) can accumulate Max. 65535 hours. Start times can accumulate Max. 65535 times.
- Parameter setting: parameters can be modified and stored in internal EEPROM memory and cannot be lost even in case of power outage; most of them can be adjusted using front panel of the controller and all of them can be modified using PC via USB or RS485 ports.
- Multiple crank disconnect conditions (speed sensor, oil pressure, generator frequency) are optional.
- Widely power supply range DC(8~35)V, suitable to different starting battery voltage environment.
- Event log, real-time clock, scheduled start & stop generator (can be set as start genset once a day/week/month whether with load or not).
- Accumulative total run time and total electric energy of A and B. Users can reset it as 0 and re-accumulate the value.
- With maintenance function. Actions (warning, trip and stop, shutdown) can be set when maintenance time out.
- All parameters used digital adjustment, instead of conventional analog modulation with normal potentiometer, more reliability and stability.
- IP55 waterproofness level can be achieved with the help of rubber-ring gasket between shell and control panel.
- Metal fixing clips enable perfect in high temperature environment.
- Modular design, self-extinguishing ABS plastic shell, pluggable terminal, built-in mounting, compact structure with easy installation.

Figure 2.1: Excerpt from HGM9510 Manual - Performance and Characteristics (Part 1)

Figure 2.2: Excerpt from HGM9510 Manual - Performance and Characteristics (Part 2)

2.1 Module Comparison

The HGM9510 offers advanced features compared to other models in the series:

Figure 2.3: Module Comparison Table

3. Technical Specifications

Parameter	Details
Working Voltage	DC8.0V to 35.0V, uninterruptible power supply
Overall Consumption	<4W (Standby mode: ≤2W)
AC Input (3 Phase 4 Wire)	AC 15V - 360V (ph-N)
AC Input (3 Phase 3 Wire)	AC 30V - 620V (ph-ph)
AC Input (Single Phase 2 Wire)	AC 15V - 360V (ph-N)
AC Input (2 Phase 3 Wire)	AC 15V - 360V (ph-N)
Alternator Frequency	50Hz/60Hz
Speed Sensor Voltage	1.0V to 24V (RMS)
Speed Sensor Frequency	Maximum 10,000 Hz
Start Relay Output	16A DC28V power supply output
Fuel Relay Output	16A DC28V power supply output
Flexible Relay Output 1	7A DC28V power supply output
Flexible Relay Output 2	7A DC28V power supply output

Parameter	Details
Flexible Relay Output 3	7A DC28V power supply output
Flexible Relay Output 4	7A 250VAC passive output
Flexible Relay Output 5	7A 250VAC passive output
Flexible Relay Output 6	7A 250VAC passive output
Case Dimensions	266mm x 182mm x 45mm
Panel Cutout	214mm x 160mm
CT Secondary Current	Rated 5A
Working Conditions	Temperature: (-25~+70)°C, Humidity: (20~93)%RH
Storage Conditions	Temperature: (-30~+80)°C
Protection Level	IP55 Gasket
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	0.95kg

Figure 3.1: Excerpt from HGM9510 Manual - Technical Specifications

4. Installation and Wiring Diagram

Proper installation and wiring are crucial for the safe and correct operation of the HGM9510 controller. Refer to the typical application diagram below for connection details. Ensure all connections are secure and follow local electrical codes.

Figure 4.1: HGM9510 Typical Application Wiring Diagram

Note: Fuse F1: min. 2A; max. 20A. Fuse F2: max. 32A. Users should select suitable fuses depending on the practical application.

5. Operation

5.1 Indicator Lights

The HGM9510 controller features several indicator lights on its front panel to provide immediate feedback on the system's status. Understanding these indicators is essential for monitoring and troubleshooting.

Figure 5.1: Indicator Lights and Their Functions

Warning indicator and Alarm indicator description:

Alarm Type	Warning Indicator	Alarm Indicator
Warning	Slow flashing	Slow flashing
Trip Alarm	Slow flashing	Slow flashing
Shutdown Alarm	Off	Fast flashing
Trip and Stop Alarm	Off	Fast flashing

Running indicator: Illuminated from crank disconnect to ETS while off during other periods.

Generator normal light: It is lit when the generator state is normal; flashing when the generator state is abnormal; off when there is no generator power.

6. Maintenance

Regular maintenance ensures the longevity and reliable operation of your SmartGen HGM9510 controller. Perform the following checks periodically:

- **Visual Inspection:** Check for any signs of damage, loose connections, or corrosion on the controller and its wiring.
- **Cleaning:** Keep the controller's display and buttons clean using a soft, dry cloth. Avoid abrasive cleaners or solvents.
- **Firmware Updates:** Check the manufacturer's website for any available firmware updates to ensure optimal performance and access to new features.
- **Parameter Review:** Periodically review the controller's settings to ensure they align with your generator system's requirements.
- **Environmental Conditions:** Ensure the operating environment remains within the specified temperature and humidity ranges to prevent damage.

7. Troubleshooting

If you encounter issues with your HGM9510 controller, consider the following basic troubleshooting steps:

- **No Power:** Verify the DC power supply connections and ensure the voltage is within the specified range (DC8.0V to 35.0V). Check for blown fuses (F1, F2 as per wiring diagram).
- **Display Issues:** If the display is blank or unreadable, check power supply. If power is present, contact support.
- **Generator Not Starting/Stopping:** Check all wiring connections to the generator, including start/stop relays, fuel pump, and speed sensor. Verify that all protection functions are correctly configured and not preventing operation.
- **Communication Errors (RS485/CANBUS):** Ensure communication cables are correctly connected and terminated. Verify communication settings in the controller and connected devices.
- **Alarm Indication:** Refer to the 'Indicator Lights' section (5.1) to identify the type of alarm. Consult the full manual for specific alarm codes and their remedies.
- **Incorrect Readings:** Check sensor connections and calibration. Ensure the correct sensor type is selected in the controller's parameters.

For complex issues or persistent problems, it is recommended to consult the comprehensive SmartGen HGM9510 user manual or contact SmartGen technical support.

8. Warranty and Support

The SmartGen HGM9510 Generator Controller is backed by a manufacturer's warranty. Please refer to the warranty card included with your product or visit the official SmartGen website for detailed warranty terms and conditions.

For technical assistance, product support, or service inquiries, please contact SmartGen customer service or your authorized dealer. You can typically find contact information on the SmartGen official website: www.smartgen.cn

When contacting support, please have your product model (HGM9510) and any relevant purchase information ready to facilitate faster service.