# Generator Start Control Module

Part# GSCM-A

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*Please include the generator make & model, inverter brand, & battery bank voltage.*

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# 1. Features & Applications

- 2-wire to 3 or 4-wire start controller for electric start 3 or 4-wire gas, propane, or diesel generators
- Supports many types of 3 or 4 wire generator control: Momentary, Pulse, Ignition, Glow Plug, Prime, Load Control, etc.
- Wireless configuration interface for making changes to adjustable settings — no app or internet connection required
- Wide-input SEPIC power supply: operates from 6V–38V DC and remains stable through voltage sag during cranking
- Adjustable crank time, delay, and attempts
- Adjustable battery voltage monitoring thresholds
- User-serviceable, faceplate-mounted mini-blade fuse holders next to each relay — replace a blown fuse without opening the enclosure
- Form C (N/O and N/C) contacts on both Relay 2 and Relay 3 for advanced shutdown, ignition, or interlock logic
- Dedicated external Fault terminal for remote alert lights or buzzers
- Over-the-air (OTA) firmware updates through the local web configuration page
- ABS case and conformal coating for harsh environment operation

# 2. Description

The GSCM-A is a micro-controller-based generator start-stop module, designed to automatically start and stop generators that need a 3 or 4-wire connection when the start command is from a 2-wire signal (dry contact or 2–60VDC). The GSCM-A automatically disconnects the starter when it receives a remote start indication lamp signal (DC voltage connected to the GEN DC FB terminal) or an AC Hz signal from the generator (AC connected to the L1 and N terminals). Various LEDs will flash or turn on to indicate the run or fault status of the GSCM-A. If a fault has occurred, manually resetting the GSCM-A by removing and then reconnecting power removes any lockout and returns it to normal operation.

The GSCM-A is powered from 6V to 38V DC, most commonly from the generator starter battery. An onboard SEPIC power supply keeps the module's logic stable even if the battery voltage sags as low as 6V during hard cranking — eliminating the false resets and lockouts that a momentary brownout can cause on a fixed 12V-only design.

The GSCM-A can also monitor the voltage of a battery or battery bank connected to the Voltage Sense terminal, and can be configured to start and stop the generator at selected voltage levels to keep that battery bank charged.

*Note: A 48-volt battery bank must not be connected directly to the +V DC IN terminal. Route 48V systems through an external step-down converter to keep the supply voltage within the 6–38V operating range.*

# 3. Modes of Relay Operation

## Relay 1 —

Relay 1 cranks the starter on the generator or sends a pulsed start signal. The crank time is adjustable from 0 to 30 seconds. A setting of 5 seconds or more acts as a traditional starter crank; 1–4 seconds acts as a pulse signal, with Crank Time set to 1 second exposing an additional Pulse Width setting (1–1000ms) for generators that need an even shorter pulse — some units only respond reliably to a pulse averaging around 250ms. (Some generators — including certain Onan models — use a longer pulse of roughly 10 seconds to activate glow-plugs before cranking begins; the full 1–30 second range accommodates this.) A setting of 0 puts Relay 1 into a maintained 2-wire dry contact mode, where the relay simply follows the Start Signal — closing while it is present and opening when it is removed — rather than pulsing or cranking for a fixed duration.

## Relay 2 —

Relay 2 is most often used to activate a shutdown circuit (momentary pulse or constant) or as an ignition switch. Available functions are None, Stop, Switch Control, and Glow and Stop. Unlike the legacy GSCM-Wifi, Relay 2 now provides both Normally Open (N/O) and Normally Closed (N/C) contacts, allowing it to be wired into a wider range of shutdown and interlock circuits.

## Relay 3 —

Relay 3 can be configured to perform a variety of functions: None, Glow Plugs, Switch Control, Prime, Load Control, Choke Control, or Signal Start Only. When set to Signal Start Only, Relay 3 activates only when a start is commanded from the external Start Signal terminal and remains inactive if the start was triggered automatically by the onboard Voltage Sense low-battery function. This isolates auxiliary equipment from unattended, autonomous starts.

# 4. Operational Sequence Example

The following is an example of a typical sequence of operations for the GSCM-A when starting a generator:

1. The GSCM-A will be in an idle state. The “Start” light will be blinking slowly.
2. When a start signal is received on the Start Signal terminal, the “Start” light will turn on.
3. If Relay 2 is configured as a power/ignition switch, it will activate.
4. After the Initial Crank Delay, Relay 1 will be activated. This will crank the starter or send a start pulse to the generator.
5. Once the generator starts, Relay 1 will deactivate.
6. The “Run” light will then turn on, and the GSCM-A will be in an active state.
7. When the start signal is removed, the “Run” light will turn off.
8. If Relay 2 is configured as a Stop or Glow and Stop function, it will activate for the configured Relay 2 Timing to shut down the generator.
9. The “Start” light will return to a slow blink and the GSCM-A will return to an idle state.

*Due to the number of settings available, there are many possible operation sequences — the above is only a representative example.*

# 5. Terminal Identification & Wiring Guide

Unlike the legacy GSCM-Wifi, the GSCM-A's terminals are identified with text labels printed directly on the faceplate rather than numbers, eliminating the need to cross-reference a terminal chart in the field.

## Top Terminal Block — DC Power & Signal Inputs

| Label | Description |
|---|---|
| GND | Connects to the negative (–) terminal of the generator starter battery. Any chassis ground is suitable if the chassis is properly bonded to the battery negative post. |
| +V IN | Primary power connection, 6V–38V DC. Can connect to the generator battery (+) terminal. However, a separate supply is preferred. Protect with a 1 Amp inline fuse. Do not connect to the (+) terminal on the starter. Do not connect to a 48V source directly — use a step-down converter. |
| Voltage Sense | Optional connection to monitor the voltage of a battery or battery bank, 10–60V DC. |
| Start Signal | Signals the GSCM-A to attempt to start and run the generator. Accepts a dry-contact closure or a voltage trigger in the range of either 0–0.6V (treated as a low/ground signal) or 2–60V DC (treated as a valid high signal); 0.6–2V is an unused deadband. |
| Gen DC FB | Generator DC run-feedback input. Applying a DC voltage here tells the GSCM-A the generator is running. Accepts 0-0.6V or 2–60V DC. The minimum voltage is adjustable. |
| Fault | Dedicated auxiliary output to drive a remote fault indicator light, cabin buzzer, or auxiliary inverter fault input when the GSCM-A enters a lockout condition. This terminal provides a negative ground connection when active.<br>Maximum current rating: 50mA. |
| WIFI Toggle | Physical pushbutton on the faceplate that wakes or toggles the local wireless configuration network. |

## Left Terminal Block — Generator AC Feedback

| Label | Description |
|---|---|
| L1 | Generator AC hot line input (240V Maximum), used with N to sense engine speed (Hz) and confirm the generator is running. Must be protected by a dedicated 1 Amp inline fuse and wired with insulated connectors — Warning: exposed AC connections are a shock hazard. |
| N | Generator AC neutral line input. If no neutral is available on the generator, connect this terminal to the L2 output through a 1 Amp fuse. |

*Use either DC feedback (Gen DC FB) or AC feedback (L1 & N) to detect that the generator is running — not both at the same time.*

## Bottom Terminal Block — Control Relay Outputs

| Label | Description |
|---|---|
| Relay 1 | COM and N/O contacts. Primary relay used to pulse or close the generator's starting circuit. |
| Relay 2 | COM, N/O, and N/C contacts (Form C). Multipurpose relay for engine shutdown, ignition, or pre-heat sequences. |
| Relay 3 | COM, N/O, and N/C contacts (Form C). Auxiliary utility relay for fuel priming, electronic chokes, glow plugs, or load control switching. |

# 6. Wiring Examples

Because generator manufacturers frequently revise internal wiring and wire colors — sometimes even within the same model number — Atkinson Electronics provides model-specific wiring diagrams rather than a single generic wiring guide. When ordering online, provide your generator's make and model and the correct diagram will be included with your unit.

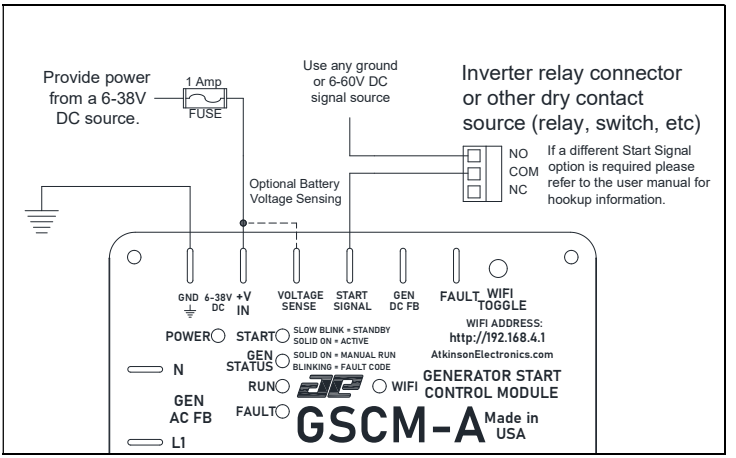


*Figure 1 – Typical dry contact signal top wiring example*

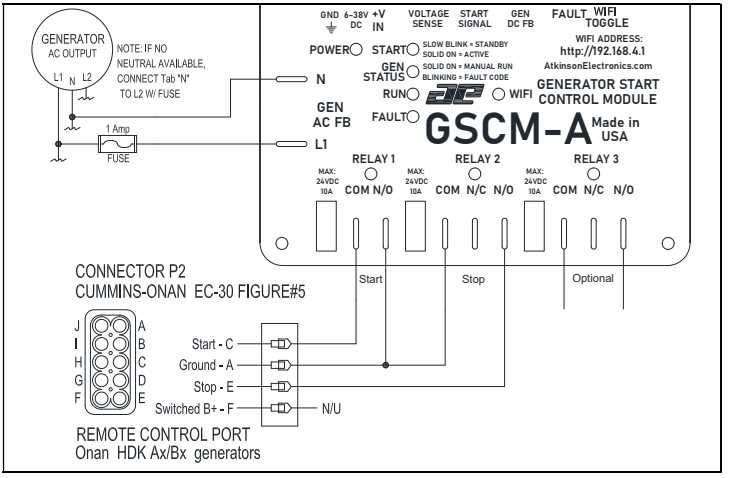


*Figure 2 - Example of AC feedback and Generator connection*

# 7. LED Indicators

| LED | Description |
|---|---|
| Power | Indicates a suitable 6–38V DC power supply has been connected to GND and +V IN. |
| Start | Slow blink = standby, ready for a start signal. Solid on = active, running due to an external start request. |
| Gen Status | Solid on = Indicates that the GSCM-A did not get a signal to start the generator, but the GSCM-A detects the generator running via AC or DC feedback.<br>Blinking = a fault code (see below). |
| Run | On indicates the GSCM-A started the generator and it is currently running. |
| Fault | On indicates a fault condition has occurred, and the GSCM-A is in lockout. Remove and reconnect power to reset. |
| Relay 1 / 2 / 3 | Indicate the corresponding relay's active/inactive status. |
| WIFI | On indicates the built-in wireless configuration network is active. |

## Gen Status Fault Codes

| Blink Pattern | Meaning |
|---|---|
| Slow blink | Under-Hz condition — generator AC output frequency dropped below the Under Speed Cutoff. |
| Fast blink | Over-Hz condition — generator AC output frequency rose above the Over Speed Cutoff. |
| Double blink | Start failure — the generator did not start after the configured number of Crank Attempts. |
| Four blinks | Generator shut down before the GSCM-A could send a stop signal. There was either an internal fault in the generator, or the generator was stopped manually |
| Five blinks | The generator did not shut down after a stop signal was sent. |

# 8. Wireless Configuration & Web UI Access

The GSCM-A serves its own configuration dashboard locally over its built-in Wi-Fi access point. No internet connection or mobile application download is required.

## Accessing the Configuration Page

1. Press the WIFI TOGGLE button on the front face of the GSCM-A. The WIFI LED will illuminate to confirm the network is active.
2. On a mobile phone or wireless-enabled PC, connect to the wireless network named “GSCM-A” broadcast by the module. Note: it is an “Open” network with no password.
3. Open a web browser and navigate to http://192.168.4.1, or alternatively http://gscm.local.
4. The configuration page will load, showing live status, presets, and adjustable settings.

## Live Status

The top of the page updates every 2 seconds and shows Battery Voltage, Generator State, Time Since Last Reboot, Current Run Time, Last Run Time, and Total Run Time (with a Reset button to clear the historical run-time log).

## Presets

The Presets dropdown lets you select from several pre-configured settings profiles matching legacy Atkinson GSCM models. Selecting a preset changes the values on the page to match that profile. The dropdown will appear blank on page reload — this is expected; the underlying settings are retained once saved.

# Relay 1 / Startup / Crank Settings

| Setting | Range / Notes |
|---|---|
| Crank Time | 0–30 sec. Duration Relay 1 is held to start the generator.<br>5 seconds or more is a cranking profile<br>1–4 seconds is a pulse profile<br>0 enables a maintained 2-wire dry contact mode.<br>Setting Crank Time to 1 second activates the Pulse Width field for sub-second pulses. |
| Pulse Width (ms) | 1–1000ms. Only shown when Crank Time is set to 1 second. Sets a sub-second pulse width for generators that require a short start pulse rather than a full 1-second pulse — some units only respond to a pulse averaging around 250ms. |
| Initial Crank Delay | 1–120 sec. Time to wait before the first crank attempt. |
| Is a double press required? | Yes/No. Required for some modern inverter generators (e.g. certain Predator models) that need an initial pulse to wake the ECU before the start signal. |
| Retry Crank Delay | 5–120 sec. Rest time between crank attempts if the generator fails to start. |
| Crank Attempts | 1–10. Maximum start attempts before the module locks out on an over-crank fault. |
| Crank Cutoff Hz | Normally 30–35Hz. AC frequency at which cranking stops (direct-crank profiles only, not pulsed). |
| DC Feedback Cutoff | Sets the voltage at which the GSCM will recognize a DC feedback condition. The default is 10 Volts |

## Relay 2 Settings

| Setting | Range / Notes |
|---|---|
| Relay 2 Function | None – Relay 2 is not used<br>Stop – Relay 2 sends a stop signal to shutdown the generator<br>Switch Control – Relay 2 is used as a switch. Activates before cranking and turns off when the generator needs to be shutdown.<br>Glow and Stop – Relay 2 activates before cranking to operate glow plugs or a prime circuit, then also activates when the generator needs to be shutdown |
| Relay 2 Glow Plug Time | 0–255 sec. Only shown when Relay 2 Function is Glow and Stop. Sets how long to hold the glow plugs before cranking |
| Relay 2 Timing | 1–255 sec. (default: 3 Sec)<br>When function is “Stop” or “Glow/Stop”: Sets how long the Stop function holds after the generator has shut down<br>When function is “Switch Control”: Sets how long the GSCM-A will wait to send a start signal after Relay 2 is activated |

## Relay 3 Settings

| Setting | Range / Notes |
|---|---|
| Relay 3 Function | None – Relay 3 not used<br>Glow Plugs – Relay 3 used to activate glow plugs<br>Switch Control – Activates before cranking to control a Battery Switch, Ignition Switch, or other device<br>Prime – controls a prime circuit<br>Load Control - activates after the generator starts and turns off before shutdown.<br>Choke Control – controls a choke lever or solenoid<br>Signal Start Only – Relay 3 will only activate from the “Start Signal” terminal. Will not activate on a low battery signal. |
| Relay 3 Timing | 1–255 sec. Time Relay 3 is active before cranking (glow, prime, choke, switch) or delay before load control activation. |
| Relay 3 Shutoff Delay | 0–20 sec. Delay before deactivating Relay 3 after start (Glow Plugs) or after cranking begins (Choke Control). |

## Battery Settings

| Setting | Range / Notes |
|---|---|
| Min Battery Charging Time | 0–255 min. Shortest the generator will run once started for battery charging. |
| Max Battery Charging Time | 60–720 min. Generator shuts down if the battery bank hasn't reached target within this window. |
| Battery Low Delay | 5–1200 sec. Time voltage must remain below Cut-in before a start is triggered. |
| Battery High Delay | 5–1200 sec. Time voltage must remain above Cut-out before shutdown is triggered. |
| Battery Cut-in Voltage | 10–60V. Below this, the Battery Low Delay countdown starts. |
| Battery Cut-out Voltage | 10–60V. Above this, the Battery High Delay countdown starts. |
| Battery Voltage Limit | 10–60V. Safety ceiling; exceeding this while charging forces an immediate shutdown. |

## AC Settings

| Setting | Range / Notes |
|---|---|
| AC Hz Tracking Enabled | Yes/No. When enabled, the GSCM-A tracks the AC output frequency for under/over-speed protection. |
| Nominal AC Hz | Normally 50 or 60Hz. Sets the expected AC output frequency. |
| Under Speed Cutoff | Normally 45 or 55Hz. Generator shuts down with a fault if AC output stays below this for more than 10 seconds. |
| Over Speed Cutoff | Normally 55 or 65Hz. Generator shuts down with a fault if AC output stays above this for more than 10 seconds. |

## Other Settings

| Setting | Range / Notes |
|---|---|
| Wifi Timeout | 5–60 min. How long the wireless network stays active before automatically turning off. |

*After adjusting settings, click the Save button to write the values into non-volatile memory. It is recommended to change settings only while the generator is off.*

# 9. Utilities Page

The Utilities page provides access to lower-level configuration and maintenance functions, separate from the day-to-day settings on the main configuration page.

## Accessing the Utilities Page

1. Scroll to the bottom of the main configuration page.
2. Click the gear icon at the far right of the copyright text.
3. Click Return to Main Page at any time to exit back to the main settings screen.

## Utilities Menu

| Menu Item | Function |
|---|---|
| Voltage Sense Calibration | Apply a manual voltage offset. Measure the actual battery voltage with a calibrated multimeter, compare to the dashboard reading, and enter the variance to correct threshold tracking. |
| Firmware Update | Opens the OTA firmware update utility to browse for and upload a new firmware file supplied by Atkinson Electronics. |
| Date and Time | Sets the internal real-time clock so run-time logs and timestamps match local site records. If the GSCM-A is reset it will not retain the time and date setting. |

# 10. Troubleshooting

Most field issues reported on GSCM products trace back to wiring or configuration issues. Work through the following in order before assuming a hardware failure.

## 1. Verify the Wiring

Confirm every connection against the wiring diagram for the specific generator and inverter/charging system in use. Check that each wire lands on the correct terminal, that relay outputs are wired to the correct contact (COM, N/O, or N/C) for the intended function, and that all connections are clean and secure. A large share of “no-start,” “won't stop,” and false-fault complaints are resolved by correcting a miswired terminal. Also, make sure all the grounds on all equipment are connected to each other. Improper or incomplete grounding will keep the GSCM-A from correctly recognizing the various input signals.

## 2. Check for Blown Fuses

Inspect the mini-blade fuse next to each relay's contact terminals on the faceplate. Before installing a replacement fuse, determine why it blew — simply replacing it without addressing the cause will often result in the new fuse blowing as well. Common causes include:

- A wiring short between a relay output and ground or another conductor
- A connected load that exceeds the relay's 24VDC / 10A rating
- A miswired or shorted external component (starter solenoid, glow plug circuit, ignition switch, etc.) on that relay's circuit

## 3. Review the Configuration Settings

Confirm the settings on the web configuration page match the requirements of the specific generator — Crank Time, Initial Crank Delay, Crank Attempts, Relay 2 and Relay 3 Function assignments, and the Start Signal Trigger Voltage are the most common settings that need adjustment for a given generator model. Selecting the wrong preset or leaving a relay function set to None when the generator's start sequence requires it, is a frequent cause of a failed or incomplete start.
If needed, all the GSCM-A settings can be reset to their defaults by holding down the Wifi Toggle button for 10 seconds. The calibration data for the input and voltage sense terminals will not be reset.

## 4. Check the Inverter or Start Signal Source

If the Start Signal is being driven by an inverter's automatic generator start (AGS) output rather than a simple dry contact, confirm the inverter's AGS function is enabled and correctly configured, and that it is actually producing a signal when a start is requested. Verify the signal's voltage and polarity match the GSCM-A's Start Signal Trigger Voltage setting — an inverter sending an unexpected voltage, or one configured for a different trigger type, will prevent the GSCM-A from recognizing a valid start request.

## 5. Confirm the Generator Feedback

Start the generator manually (not through the GSCM-A) and confirm the Gen Status LED turns on solid. A solid Gen Status LED during a manual run confirms the GSCM-A is correctly detecting that the generator is running. If the light does not turn on, the run-feedback connection should be checked — verify the Gen DC FB wiring (or the L1 & N AC feedback wiring) matches the wiring diagram and is making a solid, correctly-polarized connection.

# 11. Specifications

| Parameter | Value |
|---|---|
| Size | 5.5” x 3.25” x 2” (same enclosure as GSCM-Wifi) |
| Power Input (+V IN / GND) | 6.0V DC to 38.0V DC |
| Crank Voltage Tolerance | Operational down to 6.0V DC during active cranking |
| Voltage Sense Input | 10–60V DC |
| Start Signal / Gen DC FB Input | Hardware tolerance 0–0.6V and 2–60V DC (0.6–2V deadband) |
| AC Hz Input (L1 & N) | 24–220V AC, 0–100Hz |
| Relay Contacts (Relay 1, 2, 3) | 24V DC max, 10A max |
| Fault Output | 50mA max |
| Wireless Connectivity | Local 2.4GHz Wi-Fi access point, SSID “GSCM-A” (no external network join)<br>It is an “Open” network with no password |
| Default Configuration Address | http://192.168.4.1 (or http://gscm.local) |
| Fuses | User-replaceable, faceplate-mounted standard automotive mini-blade fuses, one per relay, Relay fuses should be a maximum of 10 Amps. |

# 12. Limited Warranty

Atkinson Electronics, Inc. gives this express warranty (along with extended warranty endorsements, where applicable) in lieu of all other warranties, express or implied, including (without limitation), warranties of merchantability and fitness for a particular purpose. This constitutes Atkinson Electronics, Inc.'s sole warranty and obligation with regard to our products as well as the Customer's sole remedy.

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All products manufactured by Atkinson Electronics, Inc. are warranted to be free from defects in material and workmanship in accordance with and subject to the following terms and conditions:

1. This warranty is limited to the original customer only. It cannot be transferred or assigned to third parties unless the intent to transfer to a third party is expressly indicated in a purchase order and/or warranty processing arrangements have been agreed upon in writing by Atkinson Electronics, Inc.

2. Atkinson Electronics, Inc. will correct any defects in material or workmanship which appear within two (2) years from the date of shipment by Atkinson Electronics, Inc. (or its authorized distributors) to the original Customer. Atkinson Electronics, Inc. will repair or replace, at our option, any defective products, provided that our inspection discloses that such defects developed under normal and proper use. This warranty does not extend to goods subjected to misuse, neglect, accident or improper installation, or to maintenance or repair of products which have been altered or repaired by anyone except Atkinson Electronics, Inc., unless otherwise stated in writing.

3. An appropriate charge (25% of product list price) may be made for testing, repairs, replacement and shipping for a returned product which is not defective or found to be defective as the result of improper use, maintenance or neglect.

4. Atkinson Electronics, Inc. will not accept responsibility for any invoiced goods or services that are not covered by an Atkinson Electronics, Inc. written purchase order. Under no circumstances does Atkinson Electronics, Inc. agree to pay for labor or other related expenses associated with the troubleshooting and/or repair of our product without prior specific written authorization.

5. Information in our descriptive literature is based on product specifications that are current at the time of publication.

Product specifications, design and descriptive literature are subject to change as improvements are introduced. Although we announce changes as they occur, we cannot guarantee notification to every Customer. Atkinson Electronics, Inc. warrants delivered products to conform to the most current specifications, design and descriptive literature.

# Notes