SICES®
Empowering your control

GC600

Controller for genset working in parallel in island mode and/or with the mains

DESCRIPTION

The highly capable GC600 processor-based genset controller, is extremely well featured for parallel applications, it includes a large PLC to ensure customers' onsite application requirements can be fully met.

A large full colour display makes these controllers suitable for a wide range of applications while presenting operating status in a clear easy to view format.

Available in two versions, It can be interfaced with both CANBUS J1939 electronic engines and traditional engines, with digital/analogue sensors.

Based on the type of plant, the most convenient version is available:

GC600 is well recommended in case of multiple gensets working in parallel In island mode.
Multiple parallel to the mains is also included.

GC600*Mains* is the perfect solution for the management of a single genset working in parallel to the mains by the internal power regulator.

This version is especially recommended in case of CHP plants, where some additional performances are required for the management of the auxiliary services of the plant.

Soft loading and unloading is automatically performed. In this case, the controller is able to directly control the Mains Circuit Breaker also in manual mode, through the specific button on the controller.

Both GC600 versions have a PLC with PID blocks. Customized logics are therefore available, avoiding the use of external traditional PLC.

Based on the load demand, the controller is able to automatically start/stop the genset.
A smart load management is available, in case of a power station composed by gensets of different nominal powers, it is possible to automatically select the most convenient gensets able to supply the load, avoiding any waste of fuel and power.
Automatic running hours equalization is also available.

GC600 and GC600*Mains* have a TFT 4.3" high-quality coloured display, for an easy and quick visualization of the genset measures and statuses.

Comprehensive communications are also available as standard, like USB, RS232, RS485 (insulated) and Ethernet for the remote monitoring. The adjustable parameters of the controller allow its use for standard and customized tasks.

All the parameters can be set directly by the controller's keyboard or, alternatively using the **free software tool** (**BoardPRG3**), available from SICES' website. It is also available a free PLC editor software, for PLC logic setting.

GC600 and GC600*Mains* provides storage for occurred events and periodical data.
Stored info can be accessed and viewed from the front panel display.

GC600 and GC600*Mains* include a hardware watchdog able to advise the user in case of the internal microcontroller failure.

INPUTS - OUTPUTS AND AUXILIARY FUNCTIONS

18 Digital inputs

18 Digital output

6 Analogue inputs

2 Analogue outputs

AND/OR
Logic control

537 Event
history log

16 Calendars

USB port

RS232

RS485

PLC Logic control

Ethernet connection

PWM output

TIER4 final
STAGE V

- N. 18 Opto-insulated digital Inputs.
- N. 18 Digital outputs.
- N. 6 Analogue inputs, if not used con be used to:
  - Digital inputs (not insulated),
  - Resistive analogue inputs,
  - analogue inputs 0...10V,
  - Current analogue inputs.
- N. 2 Insulated analogue outputs for frequency and voltage regulation.
- PWM (500Hz) direct interface with CATERPILLAR and gensets with similar regulation system.
- N. 18 Configurable digital outputs.

Communication:

- N. 2 MODBUS RTU Serial Ports: RS232 and insulated RS485.
- N. 1 Ethernet Port 10/100Mbps.
- N. 1 USB FUNCTION for the configuration.
- Internal clock with history log.
- Direct interface to SIMONE for remote plant supervision.

OPERATION MODE

OFF/RESET

Engine start inhibition.

The load is forced to be supplied from the mains.

When the engine is running and the operating mode is changed to 'OFF' position, the engine shutdown sequence is activated.

Reset of all alarms. Enable parameters change (programming).

PROGRAM

Access to all programmable parameters.

Programming access can be controlled by means a three-level password.

Some parameters can be changed even if the engine is running.

MANUAL

Engine manual START and STOP controls are enabled.

The genset protection functions are activated.

The starting command is automatically disabled when the engine is running.

MCB and GCB pushbuttons are enabled when the genset is in operating range.

Their function depend on the operating mode selected.

Manual synchronization can easily accomplished by built in function.

AUTOMATIC

The operating sequence depends on the selected application:

Single Prime Mover, Stand-by, Stand-by and Short Time Parallel, Single Parallel to Mains, Multiple Prime Mover, Multiple Parallel to Mains.

TEST

Automatic start for testing operations with safety protections enabled.

Test can be made unloaded, loaded or in parallel to mains.

Upon mains failure, the load is immediately supplied by the genset.

MAIN FEATURES

- Available in two versions: GC600 and GC600*Mains*.
- Graphic color display TFT 4.3'' - 480x272 pixel - Visual area 95 x 54 mm.
- PLC with PID functions included.
- Interfaced with both electronic and traditional engines.
- Measurements: Mains/bus and genset voltages, frequency; genset currents (.../5A or../1A).
- Active, reactive and apparent power measures.
- Engine speed and battery charge voltage.

MEASURES

Mains/Bus voltages:
L1-N, L2-N, L3-N, L1-L2, L2-L3, L3-L1.
True RMS measure.
Lx-N max. voltage < 300Vac cat. IV.
100/400V Nominal voltage input reading available with auto adjustment.

Generator voltages:
L1-N, L2-N, L3-N, L1-L2, L2-L3, L3-L1.
True RMS measure.
Lx-N max. voltage < 300Vac cat. IV.
100/400V Nominal Voltage input reading available with auto adjustment.

Generator currents:
L1, L2, L3, N (*).
True RMS measure.
Nominal max. current: 5Aac and 1Aac.
Integrated CTs.
(*) *Neutral generator current as alternative to differential protection or to be used for measure mains power from CT (Standard) or Tore (option).*

Generator and mains frequency meter:
Resolution = 0.1 Hz. Accuracy = ±50ppm, ±35ppm/°C (typical).

Battery voltmeter:
Resolution = 0.1V.

Oil pressure gauge:
VDO 0-10 Bar, VDO 0-5 Bar, Veglia 0-8 Bar (configurable curve based on sensors available).

Coolant or oil thermometer:
VDO, Veglia, BERU (configurable curve based on sensors available).

Fuel level:
VDO, Veglia, BERU (configurable curve based on sensors available).

Engine revolution counter:
By pick-up. Programmable teeth number. Same input can be used by W signal.

D+
for the measure of the alternator battery charger voltage.

Active and reactive power, power factor, are available as total measure and also for each single phase. Power and currents maximum reached values are stored with date and time. Additional analogical measures related to the engine are available in case of engines with CANBUS J1939 interface.

PROTECTIONS

Mains protections

- Rate of Change of Frequency (81R ROCOF).
- Vector shift.
- Undervoltage (27).
- Overvoltage (59).
- Underfrequency (81U).
- Overfrequency (81O).
- 27T - Low voltage protection time-dependent.
- 27Q - Low voltage protection with directional reactive power.
- (FNN-VDE Q-U-protection).

Generator protections

- Underfrequency (81U).
- Overfrequency (81O).
- Undervoltage (27).
- voltage unbalance wrong phases sequence (47).
- Overvoltage (59).
- Power reverse direction (32).
- Loss of excitation (Reverse reactive 40).
- Time dependent overcurrent (51) IDMT.
- Instantaneous overcurrent (50).
- Synchro-check (25).
- Negative sequence current (46).
- Maximum neutral current (50N).
- Earth fault protection (64).

Engine protections

- Overspeed (12).
- Incomplete sequence (48).
- Belt-break.
- coolant temperature warning and alarm.
- Oil pressure warning and alarm.
- Oil temperature warning and alarm.
- Water level warning and alarm.
- Max. power.
- Fuel level.
- Battery failure (min./max. voltage).

Automatic adjustment of the power output based on the mains frequency value.
This feature allows to actively support the mains in case of over/under production.

EMBEDDED FUNCTIONS

- Engine diagnostic code.
- Periodical test.
- Real Time Clock with internal rechargeable Lithium battery.
- Fuel pump management.
- Events log.
- Pre-glow and coolant heater management.
- Remote start and stop.
- Override function.
- Hours counter for maintenance schedule.
- Daily counter with embedded calendar for the maintenance.
- Embedded horn alarm.
- Engine speed measurement by pick-up, frequency or W.
- Programmable by PC or using the keyboard of the controller.
- Remote firmware update.
- SMS communication.
- SNMP, NTP (for the automatic clock update), DNS and DHCP support.
- N. 1 Threshold as load shedding. Additional logics available with the PLC functions.
- Internal active and reactive powers regulation.
- Internal load-sharing.
- Internal synchronizer.
- Powerful load management suitable for plants composed by gensets of different powers.
- Insulated CAN interface for PMCBUS application (LOAD–SHARING and parallel management).
- Up to 16 gensets connected together.
- Up to 16 MC100 supported.
- Up to 4 alternative configurations.
- Easy plant configuration.
- N. 3 Levels of power reserve for unexpected changes of load request.
- Ramp modulations for load and unload.

COMMUNICATIONS

GC600/GC600*Mains*

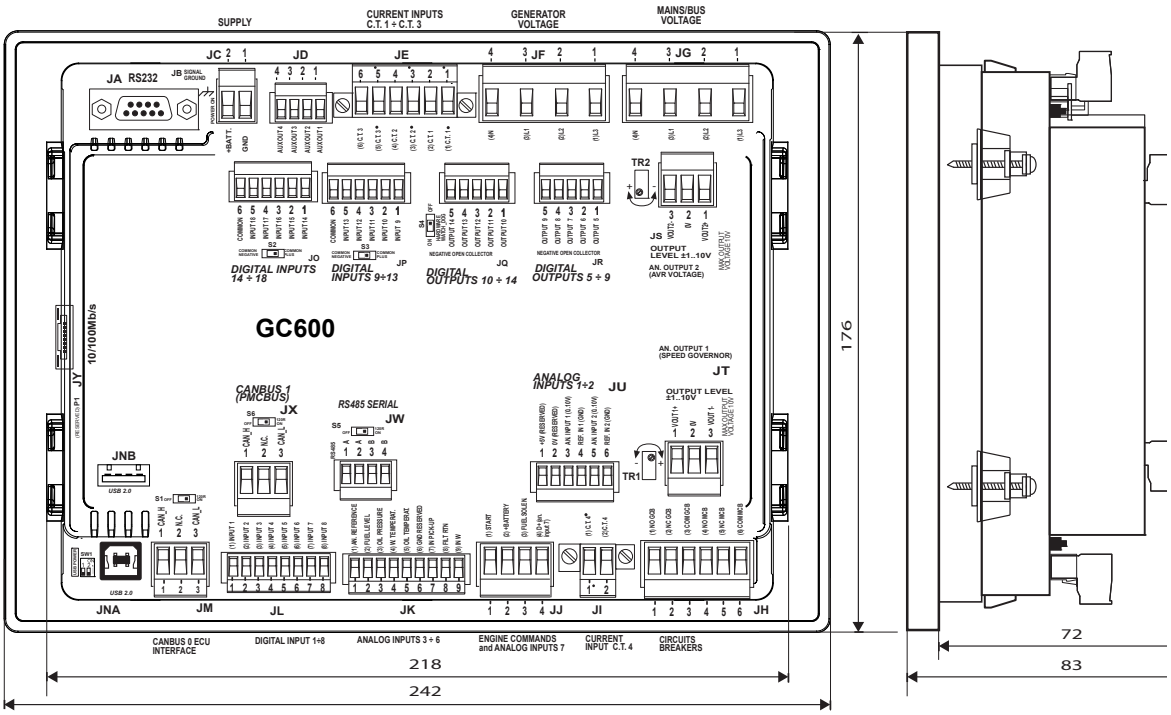
- N. 1 USB FUNCTION for the configuration.
- N. 1 RS232 Serial port Modbus RTU (external modems can be connected here).
- N. 1 RS485 Insulated serial port Modbus RTU.
- N. 1 RJ45 Port as Ethernet interface TCP/IP.
- N. 1 Insulated CANBUS J1939 and MTU MDEC interface.
- N. 1 Insulated CANBUS (PMCBUS) for the load sharing.

As option

- REWIND - GPRS/GSM/GPS Device.
- PSTN/GSM Modem.

TECHNICAL DATA

- Supply voltage: 7...32 Vdc.
- Power consumption: typical less than 2W.
- (Auto mode, Standby, AMF active, LCD Lamp Saving active).
- Operating frequency 50Hz or 60Hz.
- LCD with backlight.
- Operating temperature: -25 °C to +65 °C.
- Storage temperature: -30 °C to +80 °C.
- Protection degree: IP65 (gasket included).
- Weight: 600gr.
- Overall dimension: 244 (W) x 178 (H) x 83 (D) mm.
- Panel cut-out: 218 (W) x 159 (H) mm.
- Specific function for French market EJP / EJP-T.
- EMC: conform to EN61326-1.
- Safety: built in conformity to EN61010-1.



CERTIFIED MANAGEMENT SYSTEM
ISO 9001 - ISO 14001
BS OHSAS 18001

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S.I.C.E.S. SRL

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