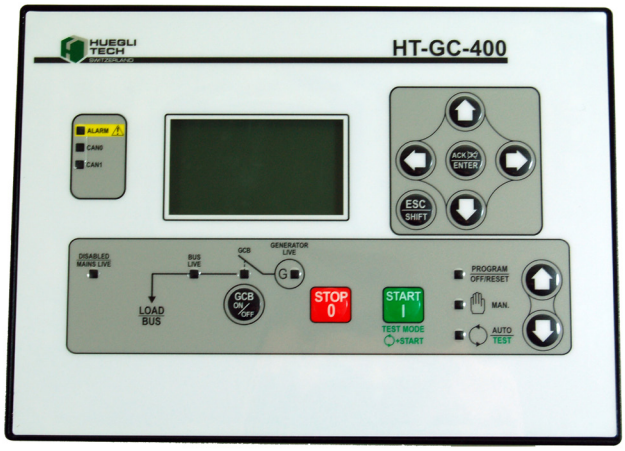
HT-GC-400

Synchro/Parallel applications

- HT-GC-400 is the perfect genset controller able to manage the Synchro/Parallel operations for MPM (Multiple Prime Mover) and MSB (Multiple Stand-by) applications.
- HT-GC-400-Mains is your solution for SSTP (Single Short Time Parallel to Mains) applications where the back or reserve synchro are required. The controller includes, in effect, the regulation of the active and reactive power.
- HT-GC-400-Link is the special versions with GPRS/GPS modem included
- True RMS readings on generator voltages and currents. Neutral measure included. Additional current measurement for neutral or ground fault protection (50N+87N)
- Active, Reactive and Apparent power measurement
- Engine speed measurement by pick-up, frequency or W
- 8+1 fully digital Inputs + 4 programmable analogue Inputs and 8 digital Outputs
- Graphic display with self or manual adjustable contrast based on the temperature
- SI.MO.NE supervision system with App iOS and Android and Supervisor for the remote control



Genset controller

HT-GC-400 is an entry level, but also a comprehensive controller particularly suggested for managing different types of Synchro/Parallel applications.
In detail, HT-GC-400 is perfect for MPM (Multiple Prime Mover) and MSB (Multiple Stand-by) power plants, where the synchronization and the put in parallel of several gensets is required.
Its design allows an easy and fast installation, thanks to the internal Load Sharing and Synchronizer.
HT-GC-400-Mains is the perfect controller for those plants where the back synchro (also called reverse synchronization) is required in order to avoid any voltage drop on the load.
In both cases, all the necessary protections and features are included. No extra dongles are required.
HT-GC-400 has a direct interface via CAN J1939 with a wide range of electronic engines (Volvo Penta, Scania, Perkins, MTU, Deutz, Cummins, John Deere, Caterpillar and others) and it can be also used with traditional engines whose measurements are done by the embedded analogue sensors.
HT-GC-400 can be used with all Huegli Tech controllers, as HT-GC-600 etc.
The parameters are programmed using the free software tool (BoardPrg), which can be downloaded through Huegli Tech website or directly using HT-GC-400 keyboard.
The graphic display is a user-friendly human interface useful for an immediate visualization of measures and alarms coming from the genset.
Events and DTC logs can be accessed from the front panel and read on the display.
HT-GC-400 supports several communication devices/tools for the local or remote control.
The Link version is available including the GPRS/GPS modem, which is perfect for the remote control of groups of rental gensets.

HUEGLI TECH
SWITZERLAND

Technical Specification

Measures

Mains Voltage:
L1-N, L2-N, L3-N, L1-L2, L2-L3, L3-L1
True RMS measure.
Lx-N max. voltage < 300Vac cat. III
Option 100V available on demand
Generator Voltages:
L1-N, L2-N, L3-N, L1-L2, L2-L3, L3-L1
True RMS measure
Lx-N max. voltage < 300Vac cat. III
Option 100V available on demand
Generator Currents:
L1, L2, L3, N (*)
True RMS measure.
Rated current: 5Aac
Overload measurable current : 4 x 5Aac (sinusoidal).
(*) Neutral generator current as alternative to differential protection or to be used for measure mains power from CT (Standard) or Tore (option)
Bus Reading:
L1-N, L2-N, L3-N, L1-L2, L2-L3, L3-L1
True RMS measure
Lx-N max. voltage < 300Vac cat. III
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
(Settable curve based on sensors available)
Water or Oil Thermometer:
VDO, Veglia, BERU
(Settable curve based on sensors available)
Fuel Level:
VDO, Veglia
(Settable 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 voltage alternator battery charger

Power and power factor measures are available as total measure and also for each single phase.
Maximum power and current reached values are memorized with date and time.

Additional measures available based on the Isolated and Auto-supplied CAN J1939 .

Protections

A set of high efficiency LEDs are used for signalling the current status of the Genset and for the visualization of alarm occurred. By means of text messages it is possible to know the type of the alarm/shutdown occurred.

Status
Mains live / Disabled
Generator live
GCB status
MCB status (for HT-GC-400-Mains only)
BUS live
Engine running
Engine cooling
Engine start and stop

Engine protections
Fuel reserve
Max./Min fuel level
Battery failure (min./max. Voltage)
Min./Low oil pressure
Min./Max. engine temperature
Closing of mains contactor or genset contactor failed
Engine over crank
Over speed from generator frequency or pick-up or W
Generator overload (from external contact of circuit breaker)
Belt breakage
Min./Max. battery voltage
Min./Max. auxiliary current
Operating conditions not reached
Emergency Stop

Generator protections
Underfrequency (81U)
Overfrequency (81O)
Undervoltage (27)
Overvoltage (59)
Power direction (32P)
Loss of excitation (Reverse reactive 32RQ)
Time dependent overcurrent (51)
Instantaneous overcurrent (50, 50V)
Synchro-check (25)
Phase sequence (47)
Current and Voltage unbalance (46/47)
Differential protection (50N)
Ground fault protection (87N)
Negative sequence (46-I2)

Mains protections:
Rate of Change of Frequency (81R ROCOF)
Vector shift
Undervoltage (27)
Overvoltage (59)
Underfrequency (81U)
Overfrequency (81O)

Inputs, outputs and aux. functions

N. 8+1 Programmable digital Inputs (N.1 for the Emergency stop push button)
N. 4 Analogue Inputs, if not used, can be used as not isolated digital inputs
N. 4 Digital programmable Outputs (4A)
N. 2 Aux. Relay (5A) for fuel solenoid + Crank
N. 2 Relay (10A) for the changeover management
N. 2 Analogue and isolated Outputs -10 / +10V for the regulation of the speed control and AVR

Further virtual Inputs and Outputs are available with AND / OR logics for selectable functions.

As option:
N. 32 Additional and configurable digital I/O with DITEL module
N. 10 Additional and configurable analogical Input for sensors measure from Pt100 (DIGRIN), Thermocouples (DITHERM) or 0...10mA - 0...20mA (DIVIT)
N. 10 Additional and fixed analogical Input listed in CANBUS J1939 protocol
N. 4 Additional and configurable analogical Output (DANOUT)

Load management

In case of multiple plants with several gensets connected in synchro/parallel on the same bus, it is possible to set different automatic logics for start/stop gensets based on the load request. In detail:
Manual setting of the master genset by means of a selector switch on the control panel
Automatic rotation of the Master genset after a fixed time per day.
Automatic rotation of the Master genset after an elapsed time.
Automatic selection of working gensets having a matching power with the request on load (NEW) (*)
Automatic start/stop of gensets in order to maintain "ON" the minimum quantity of gensets able to supply the load (NEW) (*).

(*) Functions available for a max of 5 gensets.

Load sharing

The Load sharing is accomplished in parallel operations by means of a CAN interface or analogue interface. HT-GC-400 controls the speed regulation in order to have the same percentage power among generator sets

Power modulation

The Power regulation is allowed through internal power regulator.
For electronic engines a CAN interface is available for speed regulation, for traditional engines is however available a proper analogical interface.

Reactive power regulation

HT-GC-400-Mains controls AVR directly in order to manage the reactive power.

Embedded functions

Engine diagnostic code
Periodical test
Real Time Clock with internal rechargeable Lithium battery
Fuel pump management
126 Events log
Pre-glow and coolant heater management
Remote start and stop
Override function
Hour counter for the maintenance schedule
Daily counter with embedded calendar for the maintenance
Embedded alarm horn
Engine speed measurement by pick-up, frequency or W
Possibility of graphic customization with low costs
Programmable by PC or using the keyboard of the controller
Remote firmware update
SMS communication
NTP Support
N.1 Threshold as load shedding
Internal active and reactive regulation
Internal Load-sharing
Internal Synchronizer
Powerful Load Management suitable for plants composed by gensets of different powers

CAN interface for ECU interface (J1939 and MTU MDEC)
Isolated CAN interface for PMCBUS application (LOAD–SHARING and parallel management)
Up to 16 generator sets connected together
Up to 4 different configurations
Easy plant configuration
N.3 Levels of power reserve for unexpected changes of load request
Ramp modulations for load and unload
In case of multiple gensets in parallel to mains where the back synchronization is required, it is necessary to use one HT-GC-400 for each genset + one HT-MC-200 for the management of the MCB
Multilingual device. The display languages available are: English, Italian, French, Russian, Spanish and Portuguese/ Brazilian

Communication

HT-GC-400 / HT-GC-400-Mains
N.1 USB Port
N.1 RS232 Serial port Modbus RTU for external modem
N.1 RS485 Isolated serial port Modbus RTU
N.1 RJ45 Port as Ethernet interface TCP/IP
N.1 Isolated CANBUS J1939 Interface
N.1 Additional CANBUS (PMCBUS) for the load sharing

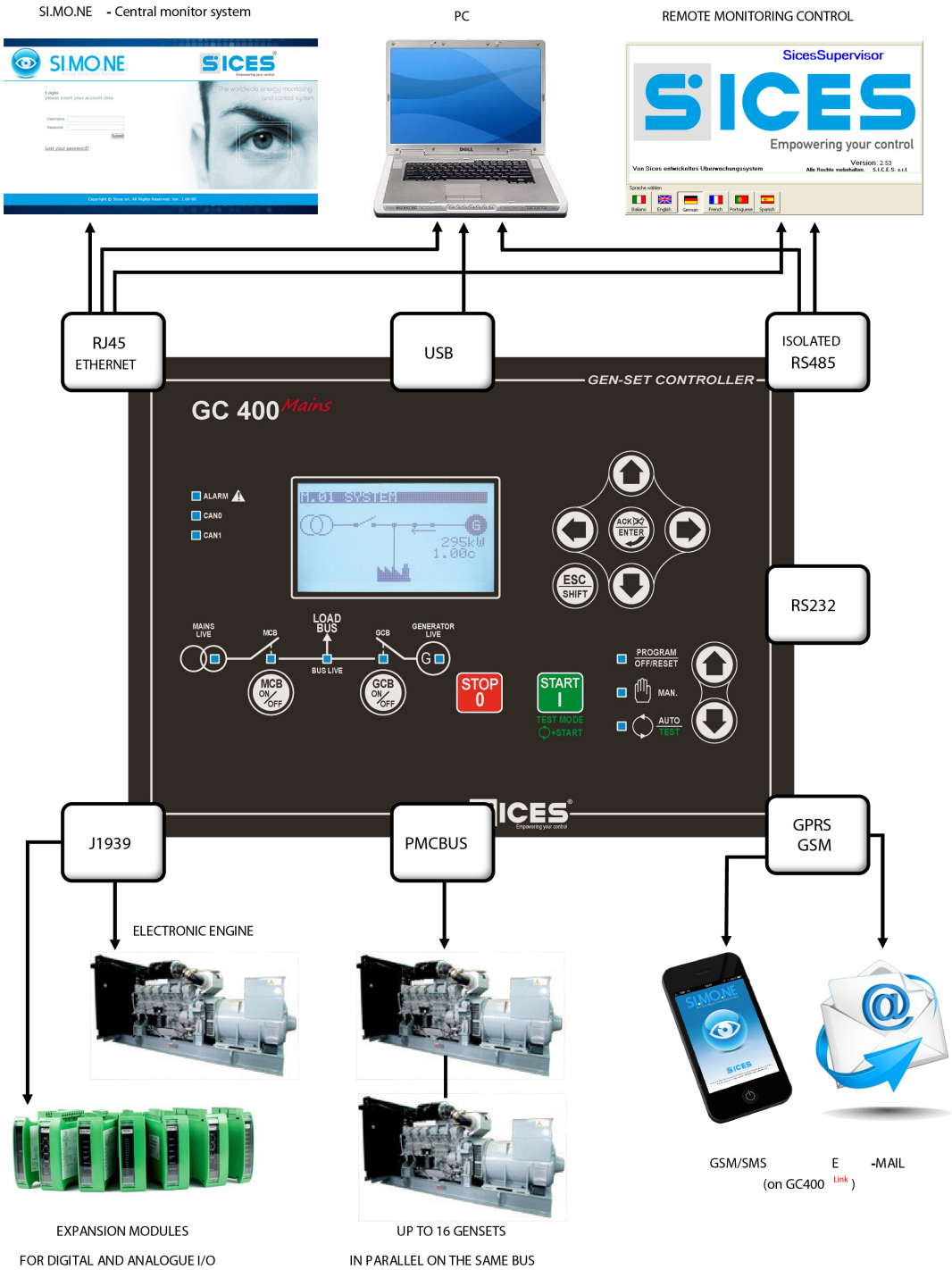
HT-GC-400-Link
N.1 USB Port
N.1 RS232 Serial port Modbus RTU for external modem
N.1 RS485 Isolated serial port Modbus RTU
N.1 Isolated CANBUS J1939 Interface
N.1 Additional CANBUS (PMCBUS) for the load sharing
GPRS/GPS modem

As option:
REWIND - GPRS/GSM/GPS Device (needed for SI.MO.NE)
PSTN/GSM Modem management and data call in case of alarm and warning

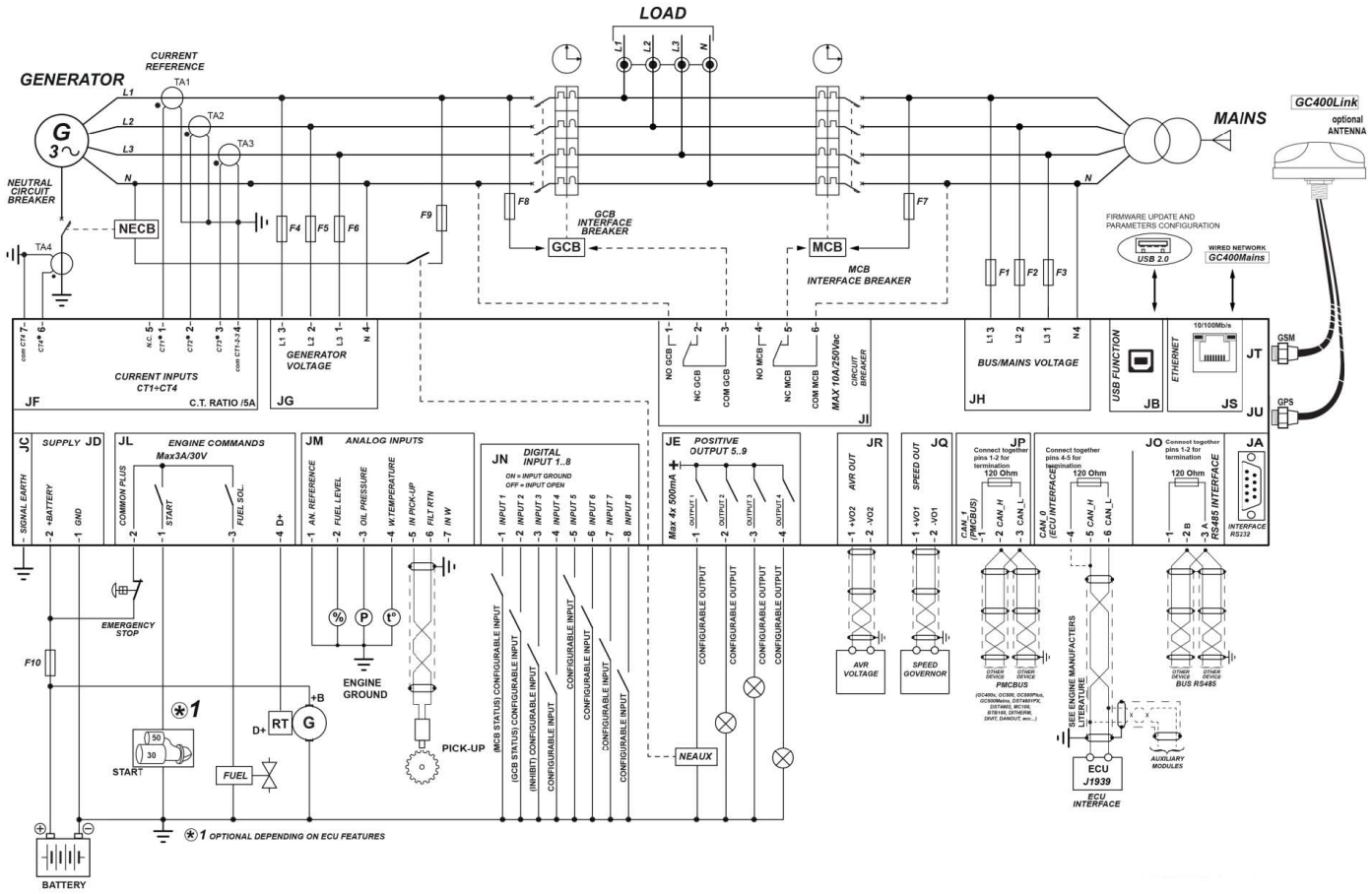
Additional technical data

Supply voltage: 7…32 Vdc
Power consumption: typical less than 2W (Auto mode, Stand-by, AMF active, LCD Lamp Saving active)
Operating frequency 50Hz or 60Hz
LCD with backlight
Operating temperature: -25 °C to 60 °C
Burn in @ 50°C for 48h with test report for each controller
Protection degree: IP65 (gasket included)
Weight: 750gr
Overall dimension: 247(L)x187(H)x40(D) mm
Panel cut-out: 218x159 (LxH) mm
Graphic display dimensions: 70x38mm - 128x64 pixel
Specific function for French market EJP / EJP-T
EMC: conform to EN61326-1
Safety: built in conformity to EN61010-1

HT-GC-400


SI.MO.NE - Central monitor system
PC
REMOTE MONITORING CONTROL
SICES
SicesSupervisor
Empowering your control
RJ45
ETHERNET
USB
ISOLATED
RS485
GEN-SET CONTROLLER
GC 400 Mains
ALARM
CAN0
CAN1
ESC
SHIFT
ACK
ENTER
RS232
MAINS
LIVE
MCB
LOAD
BUS
BUS LIVE
GCB
GENERATOR
LIVE
STOP
0
START
I
TEST MODE
+START
PROGRAM
OFF/RESET
MAN.
AUTO
TEST
J1939
PMCBUS
GPRS
GSM
ELECTRONIC ENGINE
GSM/SMS
E
-MAIL
(on GC400
Link
)
EXPANSION MODULES
FOR DIGITAL AND ANALOGUE I/O
UP TO 16 GENSETS
IN PARALLEL ON THE SAME BUS

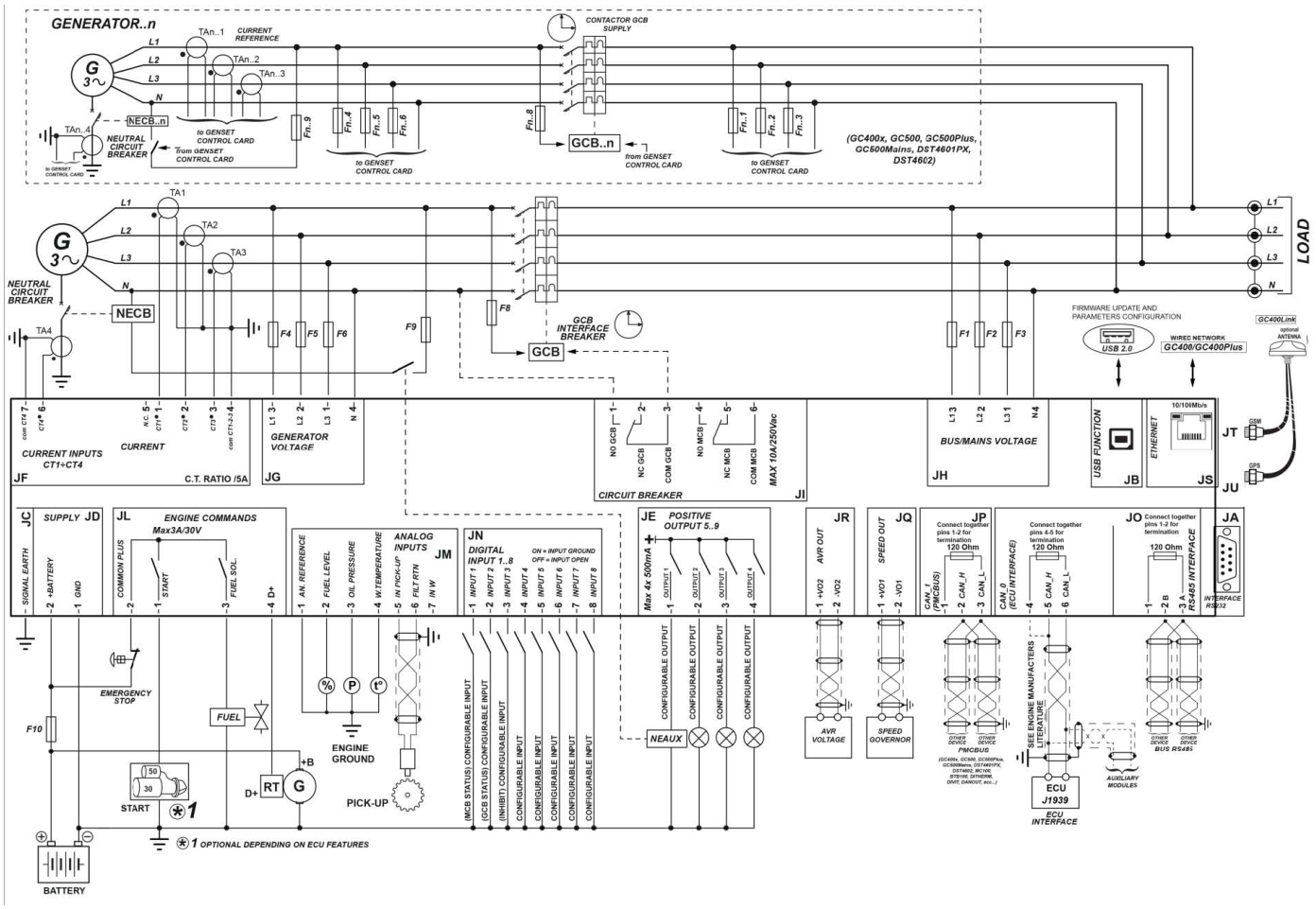
SPtM + SSB (SINGLE PARALLEL to MAINS + SINGLE STAND-BY)



Genset Controller

HT-GC-400

MMB (MULTIPLE PRIME MOVER)



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