



GENSYS COMPACT MAINS

All-in-one generator controller and mains paralleling unit

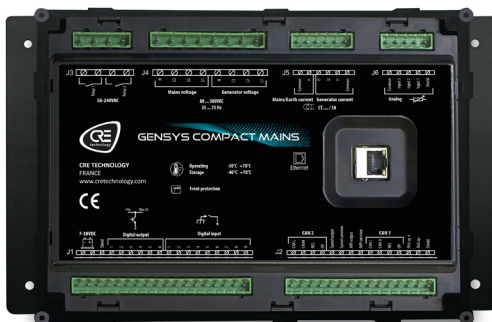
The **GENSYS COMPACT MAINS** is used on standalone generator in mains paralleling application. **GENSYS COMPACT MAINS** offers flexibility and time saving thanks to its simple wiring, and easy programming.

Hardware Display

GENSYS COMPACT MAINS is available in both switchboard panel mounted version with display, or core base mounted version and compatible with i4Gen touchscreen color display.

Software

GENSYS COMPACT MAINS is configurable from its front panel display, from i4Gen HMI, or through the free i4Gen suite PC software.



CORE BASE DIN RAIL MOUNTED VERSION



SWITCHBOARD MOUNTED VERSION WITH DISPLAY

FEATURES

CONTROL AND MANAGEMENT

- Complete engine control of diesel, gasoline or gas generators (preheating, pre-glow, ignition, start/stop...).
- Alternative or consecutive multiple starter management.
- Warm-up and cool down at idle or nominal speed.
- Remote start and test mode available On/Off load.
- Compatible with all J1939 electronic engines.
- Mains failure detection and No Break changeover with adjustable load transfer time and paralleling time.
- Possibility of operator mains transfer validation.
- Mains permanent paralleling in fix load and PF control. Isochronous and Iso-voltage or droop mode.
- Frequency and voltage control, compensation for generators with droop governors and/or AVR/DVR.
- Synchronization: Frequency, Phase and Voltage synchronization (Synch display available on screen). Synch check (ANSI 25) + Phase sequence protection. Phase shift between 0 and 360 degrees could be added on the synch check relay function (for example to compensate DYN11 MT/BT transformers).
- New optimized PID loop with exceptional performance in synchronization, KW and KVAR control.
- Override mode (protections inhibition + dedicated hour meter) following NFE 37-312 certification.
- Non-essential load trip on overload or overfrequency
- Battery boost management.
- Configurable maintenance cycle.
- 3 password levels: end user, technician, advanced technician.

DISPLAYED INFORMATIONS

- Engine parameters: oil pressure, coolant temperature, speed, hour run meters (normal and override), number of start attempts, battery voltage, ... and more than 100 parameters available from J1939 ECUs.
- Generator electrical parameters:
 - Voltage (3 phases RMS, L-L and L-N)
 - Frequency
 - Current (3 phases RMS)
 - Active power (3 phases + total)
 - Reactive power (3 phases + total)
 - Power factor (3 phases + total)
 - Calculated active energy (KWh)
 - Calculated reactive energy (KVARh)
- Mains electrical parameters:

- Voltage (3 phases RMS, L-L and L-N)
- Frequency
- Current (1 phase RMS)
- Active and reactive power
- Power factor
- Synchroscope, differential voltmeter and frequency meter, synch check relay authorization values.
- Record of 500 events/alarms/faults with timestamps. Displayed on controller screen and i4Gen with advanced filter.
- Configurable event logger and info pages.

EVENTS LOGGER

- 1350 logged events with timestamp and real-time value available on non volatile memory.

ELECTRICAL PROTECTIONS

- Generator electrical protections:
 - <F, >F: ANSI Code 81L, 81H
 - <U, >U: ANSI Code 27, 59
 - >I, >>I, >In, >Ig: ANSI Code 50, 51, 50N, 51G
 - <KW, >KW, -KW: ANSI Code 37P, 32P, 32RP
 - <KVAR, >KVAR, -KVAR: ANSI Code 37Q, 32Q, 32RQ
 - Unbalance I and V
- Mains electrical protections:
 - <F, >F: ANSI Code 81L, 81H
 - <U, >U: ANSI Code 27, 59
 - <KW, >KW, -KW: ANSI Code 37P, 32P, 32RP
 - <KVAR, >KVAR, -KVAR: ANSI Code 37Q, 32Q, 32RQ
 - Vector Jump, ROCOF: ANSI Code 78, 81
 - Unbalance I and V

BREAKERS CONTROL

- Allows the control of 1 changeover or 2 separate breakers.
- The breakers positions feedback could be connected or not.
- Adjustable pulses or latched contact for breaker closing.
- Adjustable pulses or latched contact for breaker opening.
- MN/MX coil management.
- Alarm management for closing failure, opening failure, unexpected closure, unexpected opening.

PROGRAMMING FEATURES

- Alternative selection: up to 16 parameters values can be modified by triggering any digital input or ModBus TCP variable.
- Scheduler: Specific functions or modes (ex: auto start,

- test mode Boost...) can be programmed on scheduled operation (cyclic or one-time).
- Easy Flex@:
 - 50 lines of programming with logic and arithmetic operators, and conditions.
 - All inputs/outputs and variables available.
- Generic filling feature:
 - High and low set point from digital or analog input.
 - Up or down direction configurable.
- User variables:
 - 100 user variables are available for programming.
 - Each variable has its own label + unit + accuracy.

AUTOMATIC FIRMWARE UPDATE

When module is connected to **i4Gen Suite** software, you will automatically be asked for a firmware update to the latest version if applicable.

MODBUS TCP SLAVE COMMUNICATION PORT

- All data are accessible by ModBus TCP locally or remotely (web, GPRS).
- Read and write functions + 300 free ModBus TCP addresses available for custom mapping.

REMOTE SUPERVISION WITH I4GEN

- Internet connection: Wan port or Wifi hotspot or 4G modem or Smartphone Access point.
- Monitoring and control of the generator.
- Complete remote controller configuration.
- Alert messages by emails.



Part numbers:

- A56-MAINS-10** Core base mounted version
- A56-MAINS-00** Switchboard mounted version with display

RELATED PRODUCT AND CABLES

- i4Gen Touchscreen color display – Ref A56Vxx
- Additional I/O – Ref LC5100 + KL1488 + KL2408 ...
- PC Connection Ethernet cable – Ref A53W1
- CANbus J1939/CRE/CANopen communication cable – Ref A40xx
- Demonstration suitcase – Ref A56X1

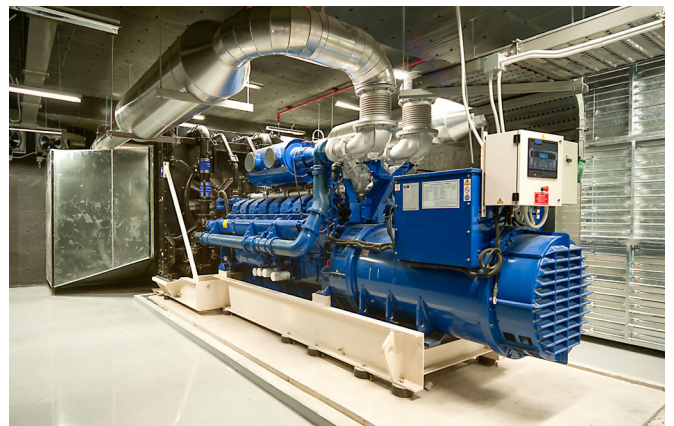
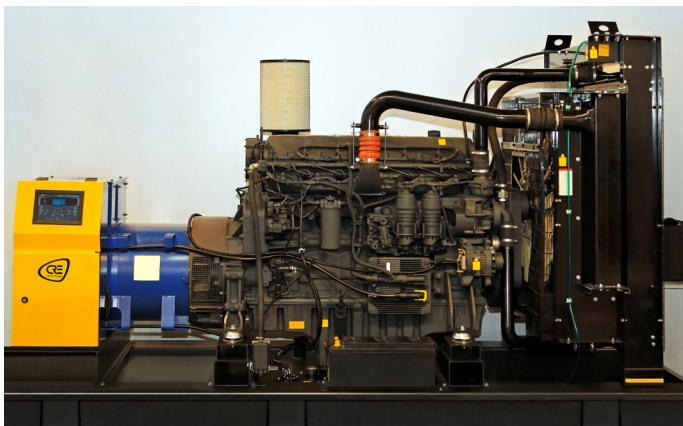
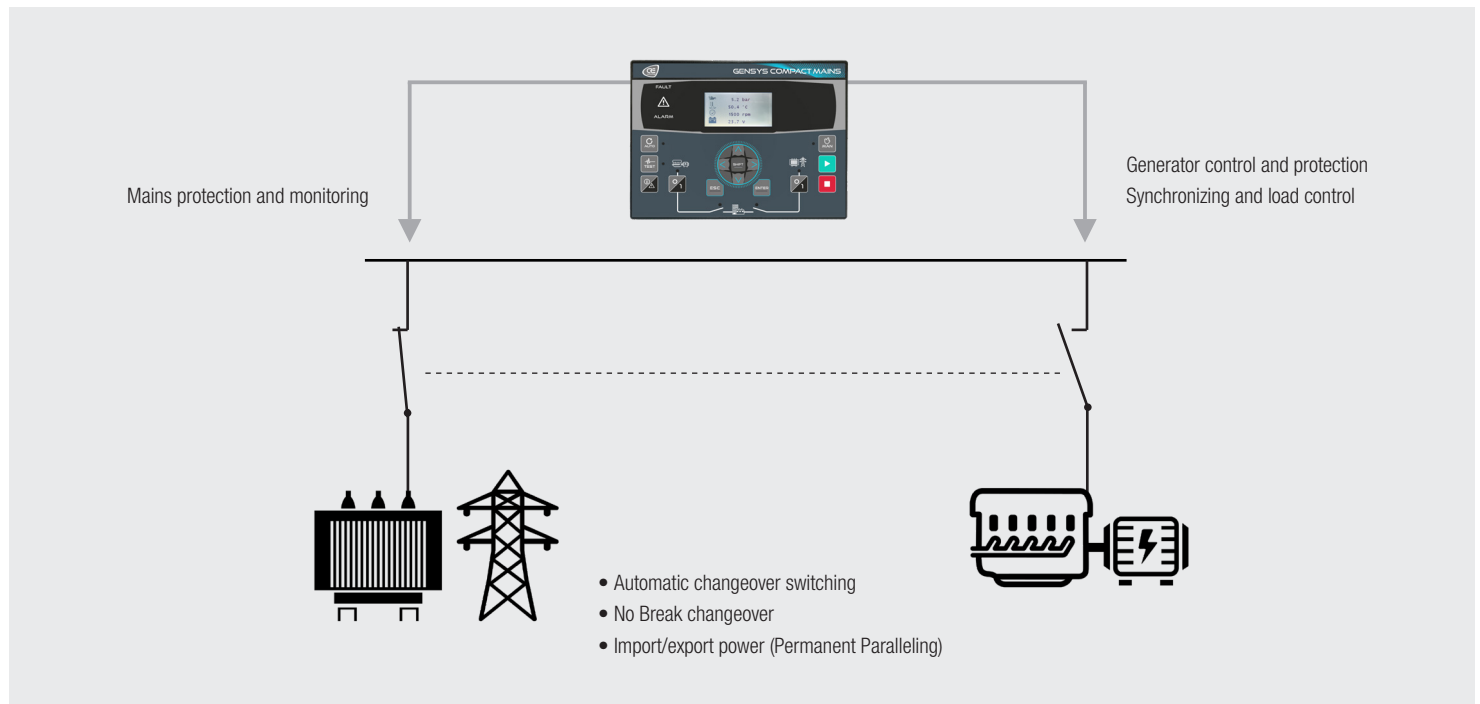


APPLICATIONS

GENSYS COMPACT MAINS suits for all standby generator requiring the capability of synchronizing with mains power, controlling active and reactive load with mains power as well as electrical and engine protections, and moreover an automatic management of the installation; examples:

- Changeover application on mains failure: Unit monitor mains and start generator automatically on mains failure to supply backup power; once mains (utility) is back to normal conditions, **GENSYS COMPACT MAINS** will transfer the load after synchronizing with mains (No Break changeover).
- Mains paralleled application (CHP, SmartGrid, mains support, permanent paralleling): **GENSYS COMPACT MAINS** will continuously run the generator in parallel with the mains, and will automatically manage the power (PF control, KW control...) according to the user expectation, including specific protections df/dt and ROCOF.
- Load Test: On standby application with No Break changeover, it is possible to allow mains paralleled load test without switching off the mains circuit breaker, to prevent any unexpected event resulting in a blackout.

GENSYS COMPACT MAINS is able to manage diesel or gas engine start and stop sequences, as well as interfacing with Auto-Start controllers and ECUs, by using I/Os or J1939 CANbus protocol. **GENSYS COMPACT MAINS** offers also an Ethernet port for PC connection and ModBus TCP connection for supervising purposes (BMS).



GENSYS COMPACT MAINS

All-in-one generator controller mains paralleling unit

SPECIFICATIONS

ELECTRICAL SYSTEM

Compatible with 3 or 4 wires three-phase, or two-phase or single phase systems.

CURRENT, VOLTAGE AND FREQUENCY

- DC Power supply: 7...38V_{DC}, Max voltage 45V_{DC} during 15mn, current consumption at 24V_{DC} = 130mA + the sum of maximum consumption of each logic output.
- AC Voltage inputs: 80...500V_{AC}, Consumption = 100mA max. Accuracy: 1%. 3ph + N for generator / 3ph + N for mains. Neutral terminal does not need to be connected.
- AC Current inputs: 4 wires. (3ph) for generator / 2 wires (1ph) for mains. 0...5A. 1VA. Overload 15A during 10s. Accuracy: 0.5%.
- AC Frequency measurement: 35...75Hz; 15V_{AC} minimum between phase and neutral

INPUTS, OUTPUTS

- 9 x Digital inputs: NO or NC to ground. Adjustable timer On and Off.
- 32 x Digital inputs expansion via CANopen.
- 3 x Analog inputs: Resistive (0...500Ω) or 0...20mA (with external resistor). Could be used as digital input. Library of sensors available. Configuration curve with up to 31 points.
- 16 Analog inputs expansion via CANopen (0-20mA, 0-10VDC, PT100, Thermocouple,...)
- 6 x Digital outputs: NE or ND. 1.8A, over-current protected. Adjustable timer.
- 32 x Digital outputs expansion via CANopen.
- 2 x Relay outputs (breaker control): 5A, 240V_{AC}
- 2 x Analog outputs: Speed/Frequency and Voltage control: +/-10V_{DC} isolated output with adjustable span and offset.
- Magnetic pick up input: Frequency 50Hz...10kHz, Voltage 0.5...40V_{AC}

COMMUNICATION PORTS

3 isolated com ports are available:

- 1 CANbus: J1939 electronic engine and I/O extensions.
- 1 CANbus available.
- 1 Ethernet: PC communication/ModBus TCP.

FREQUENCY AND KW CONTROL

- Configurable +/-10V_{DC} analog output.
- Pulse outputs control (+/-f).
- J1939 CANbus port for Caterpillar, Cummins, Detroit, Deutz, Iveco, John Deere, MTU, Perkins, Scania, Volvo electronic engine...
- Protection of speed control output abnormal deviation
- New patented feature: Easy Calib®: this feature allows the control of speed governor stability, and adjusting automatically the speed analog output (offset, range and direction).

VOLTAGE AND KVAR AND POWER FACTOR CONTROL

- Configurable +/-10V_{DC} analog output.
- Pulse outputs control (+U/-U).
- Compatible with: AEM, AVK, Basler Electric, Caterpillar, Kia, Leroy Sommer, Marathon, Marelli Motori, Meccalte, Sincro, Stamford...
- Protection of voltage control output abnormal deviation.
- New patented feature: Easy Calib®: this feature allows the control of AVR voltage stability, and adjusting automatically the voltage analog output (offset, range and direction).

ENVIRONMENT

- Operating temperature: -30... 70°C (-22...158°F).
- Storage temperature: -40...70°C (-40...158°F).
- Humidity: 95% non-condensing.
- Altitude: Up to 4000m for 480V_{AC}. Up to 5000m for 400V_{AC}.

- IP Front: IP65/NEMA rating 4 - IP20/NEMA rating 1 for core base.
- IP Rear: IP20/NEMA rating 1.

DIRECTIVES

- EMC Directive 2014/30/UE - EMC General Requirements EN 61326-1: Immunity according with EN 61000-6-2 and Emission according with EN 61000-6-4.
- Electrical Safety Directive 2014/35/UE: According with EN 60950-1.
- Vibrations and shocks: According with EN(IEC) 60068-2-6 and IEC 60068-2-27.
- Temperature: EN(IEC) 60068-2-30; EN(IEC) 60068-2-1; EN(IEC) 60068-2-2; EN 60068-2-78.

SIZE AND WEIGHT

- Switchboard mounted version with display:
 - Dimensions: 245x182x40mm (9.64x7.16x1.57in).
 - Panel cut out: 220x160mm (8.7x6.3 in).
- Core base mounted version:
 - Dimensions: 260x157x44mm (10.24x6.18x1.73in) (depth with connectors).
 - Fixing dimensions (4 screws): 238x129mm (9.37x5.08in). Fixing hole: Ø5.24mm (0.21in).
 - Optional DIN rail mounting.
 - Weight: 0.7Kg (1.54lb).

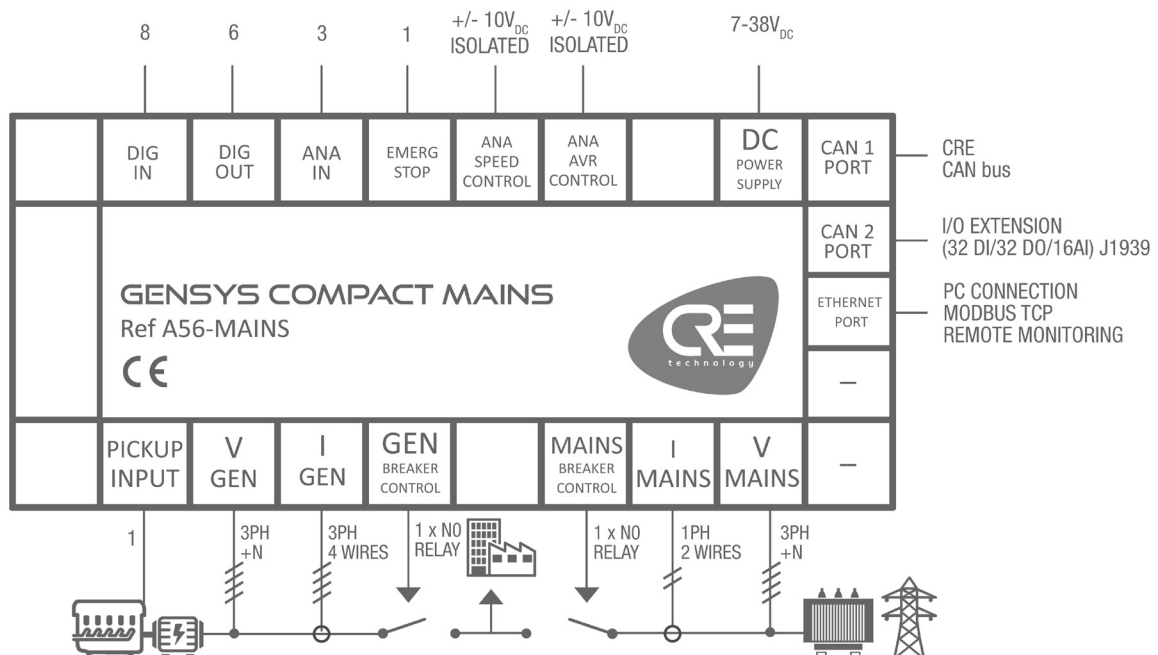
LCD DISPLAY CHARACTERISTICS

- Size: 40x70mm (1.50x2.75in).
- Pixels: 1024x512. Back light: 50cd/m² typical, configurable.
- Contrast: configurable.

LANGUAGES

English, French, Italian, Spanish in standard. Portuguese, Russian, German and other custom languages are available on request.

WIRING DIAGRAM



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ASSOCIATED I4GEN MULTI-TOUCHSCREEN DISPLAY FEATURES HIGHLIGHTS

i4Gen



i4Gen
Up to 4 display units

GENSYS COMPACT MAINS
switchboard or
core base version

The i4Gen touchscreen and color display is available for GENSYS COMPACT MAINS.

- i4Gen offers configuration, control, monitoring and logging (parameters, measures, events) of CRE TECHNOLOGY controllers.
- i4Gen display can be duplicated on computer locally by LAN or remotely by internet or GPRS.
- Thanks to its WIFI option, i4Gen offers also the capability of remote service and support by connecting your smartphone in connection sharing.



EASY FLEX® PROGRAMMING EXAMPLE

It is possible to customize your application by programming specific features with **Easy Flex®**, available directly from **i4Gen Suite** PC software. **Easy Flex®** allows user to write up to 50 lines of equation through an intuitive editor, giving the opportunity to fit with any specific application and to extend standard features. Ex: Programmable relays, timers, sensor treatment, dynamic modification...

