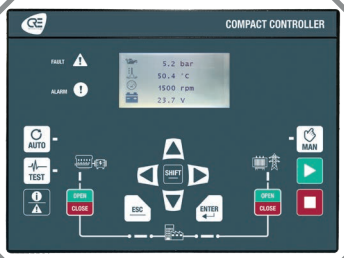
CATALOGUE 2022 - 2023



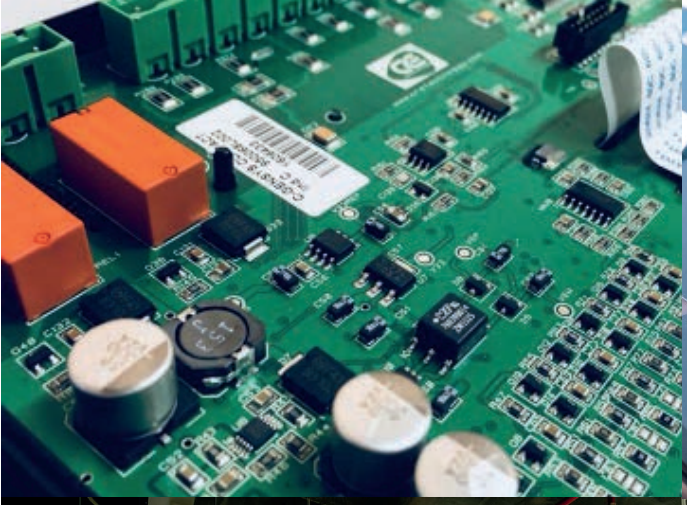
www.cretechnology.com

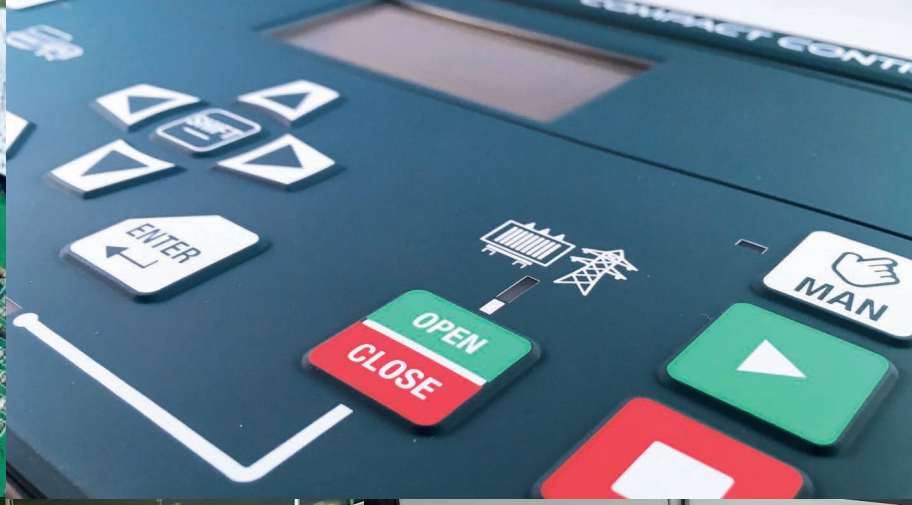
CRE TECHNOLOGY - 130, allée Charles-Victor Naudin - Zone des Templiers - SOPHIA ANTIPOLIS - 06410 BIOT - FRANCE
Phone: + 33 (0)4 .92.38.86.82 - www.cretechnology.com - info@cretechnology.com

CRE TECHNOLOGY CATALOGUE_EN_D2022

Visit our website to get all the product information and downloads

www.cretechnology.com





CRE TECHNOLOGY
French Quality

CRE TECHNOLOGY is a French manufacturer, ISO 9001 certified, founded in 1980, based in Sophia Antipolis, and currently employing a team of 30 professionals.
We offer electronic products and electrical solutions dedicated to the control and the protection of industrial and marine generators.

We are reknown for our expertise, and appreciated for value-added solutions and technical skills.

Pre-sales engineering and technical support.
Help desk support, on-site technical assistance and training sessions worldwide.
Innovation-focused development team for new products and customization of existing solutions.
Stock availability is a key of CRE service strategy.

MADE IN FRANCE

SUMMARY

GENERATOR CONTROL

BASIC UNIT RANGE (MDA - MDM - MNS) 5
ACGEN 2.0 & ICGEN 2.0 7
AMF COMPACT 9
RDM 1.0 13

PARALLELING

GENSYS COMPACT PRIME 15
GENSYS COMPACT MAINS 19
PV COMPACT 23
BAT COMPACT 27
i4Gen Range 31
MASTER COMPACT RANGE 33
BTB COMPACT 37
SYNCHRO COMPACT 41
SCR 2.0 43
C2S 45
GENSYS 2.0 RANGE 47
MASTER 2.0 51
RDM 2.0 54

MARINE

GENSYS 2.0 MARINE RANGE 56
RDM 2.0 MARINE 59

ACCESSORIES

BATTERY CHARGERS 61
DC/DC CONVERTERS 63
MAGNETIC PICK-UP 65
DV2 67

CRE TRAININGS

Develop your technical skills with CRE TECHNOLOGY. Join us during one of our trainings!

CRE TECHNOLOGY expertise is available for you

Let our team of expert instructors guide you through our curriculum and hands-on laboratory training at our training centre in Sophia Antipolis. You will receive state-of-the-art, results-oriented training and be armed with the practical skills and knowledge required to work in today's generator environments. The programme is designed to equip participants with the skills, confidence and demonstrated abilities required in today's generator environments.

The primary language of delivery for the CRE courses is French. Courses in English and Spanish are available. All written course materials and laboratory guides are available in French and English. All courses devote a significant percentage of time to practical laboratory training to ensure that participants acquire a sound practical knowledge.

HOW TO JOIN US

- By email: support@cretechnology.com
- By phone: Phone: +33 (0)4 92 38 86 86

These trainings will also allow you to familiarize yourself with all CRE TECHNOLOGY products as well as our new solutions for generator control and paralleling:

- ASM, ATS & AMF products,
- All the products of the COMPACT range,
- Hybrid range (PV COMPACT & BAT COMPACT)
- i4Gen software,
- And so much more...

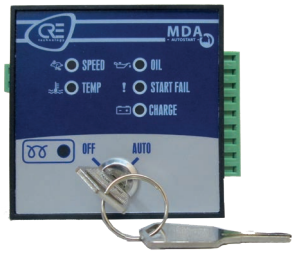
BASIC UNITS RANGE

MDA - MDM - MNS

CRE TECHNOLOGY offers 3 basic microprocessor modules 72 x 72 for generator control. These modules display all information on leds and 10A relay outputs.

- **MDM:** is a basic, microprocessor controlled unit designed to start and stop the genset manually using the key switch and pushbuttons on the front panel.
- **MDA:** is a basic, microprocessor controlled unit designed to start and stop the genset automatically on request of an ex external Remote Start signal.
- **MNS:** s a basic, microprocessor controlled unit designed to monitor 3-phase mains voltages, send remote start commands to the generating set, and manage changeover of both the generator and the mains contactors.

MDM MODULE
FRONT FACE KEYSWITCH



MDA MODULE
FRONT FACE KEYSWITCH

MNS MODULE
REAR FACE

FEATURES

A SIMPLE PRODUCT FOR BASIC APPLICATIONS

- MDM: The manual start and stop sequences have been reduced to their simplest form. The front panel provides “RUN” and “OFF” positions, with a preheat button when required. The alarm LEDs show any engine fault condition: overspeed, underspeed, high engine temperature, low oil pressure, auxiliary shutdown.
- MDA: When the engine is running, the unit monitors fault conditions and shuts down the engine automatically if an alarm occurs. The alarms are identified by LEDs. On an OFF position, the module is de-energized and the remote start is disabled with no current consumption. The unit uses high current two part connectors for easy replacement.
- MNS: The functions have been reduced to the minimum. The front panel diagram provides information about the mains and generator power availability as well as contactor positions. The MNS continuously monitors the AC mains phase voltages. If at least one of the phase voltages goes outside set limits, it triggers a transfer cycle.

ENERGIZE TO STOP CONTROL

- The MDM is also able to control ‘Energize to Stop’ engines. When the ‘Energize to Stop’ option is selected, the auxiliary relay output will be energized during the stop timer and the led associated with this condition will be turned on. The choice of engine type is made using a jumper switch.
- The MDA is also able to control ‘Energize to Stop’ engines. When the ‘Energize to Stop’ option is selected, the auxiliary relay output will be energized during the stop timer and the LED associated with this condition will be switched on. The selection of engine type is made by a jumper switch

COMPATIBILITY

- MDM: The limits for the correct generator frequency are 25 to 57 Hz when in 50Hz operation and 25 to 68Hz for 60Hz operation.
- MDA: The unit is able to operate with both 50 and 60 Hz systems. The selection is made with a jumper switch
- MNS: The unit may be used with most commercially available or custom built engine control systems. The lower limit of the mains and genset voltages may be manually adjusted via the potentiometer found on the left hand side of the unit. The upper voltage limit is factory set. The unit uses two part connectors for easy replacement

RELIABLE AND EASY TO USE

- The MDM is dedicated to basic applications which tolerate no extra costs or expensive hardware. The MDM has passed EMC and low voltage tests, and all units are 100% tested before delivery.
- The MDA is dedicated to basic applications which need no extra costs or expensive hardware. The MDA has passed EMC and low voltage tests, and all units are 100% tested before delivery.
- The MNS is dedicated to basic applications which allow no extra costs or expensive hardware. All CRE Technology products aim to provide the same level of satisfaction. The MNS has passed EMC and low voltage tests, and each unit is 100% tested before delivery.

OPTIONS

- MDM: Engine control (without alternator).
- MDA: Preheat with activate to start and energize to stop without preheat.
- MNS special test mode function: it provides a TEST pushbutton allowing the genset to be tested without a mains failure. The Test mode can serve as Emergency Backup mode to keep the generator running and trigger a quick transfer in the event of a mains failure.

CE EAC

Part number: A60Z3 - MDM Module
Part number: A60Y1- MDA Module
Part number: A60W1- MNS Module

RELATED PRODUCTS & CABLES

ACGEN 2.0 – Ref A63Z1
Complementary UNIGEN Products …

APPLICATIONS

Basic units are easy to use and made for small genset refit or manual backup system, there is no PC requires for settings.

SPECIFICATIONS

MDM: CURRENT, VOLTAGE AND FREQUENCY

- Alternator voltage: 15 to 300 V_{AC}
- Alternator frequency: 50 or 60 Hz nominal.
- Overspeed: nominal frequency + 14% (+24% overshoot)
- Underspeed: 25Hz
- DC supply range: 8 to 33 V_{DC}.
- Current consumption: 80mA max. (Outputs open).
- Charge fail threshold: 6 V_{DC}.
- Charge excitation current: via a 82 Ω resistor connected to the FUEL output.

MDM: INPUTS, OUTPUTS

- DC supply: 12 or 24 V_{DC}, (+) and (-) terminals.
- L1: generator phase voltage.
- Neutral: generator neutral terminal.
- High temp switch, low oil pressure.
- Aux: spare fault input. A negative supply connected to this input will cause the engine to be stopped immediately and an alarm to be triggered (independent of the protection hold-off timer).
- Charge: this terminal will supply the excitation current and measure the voltage of the charge alternator.
- Output: Fuel solenoid: 10A@28V_{DC} / Start: 10A@28V_{DC} / Auxiliary: 10A@28V_{DC}

MDA: CURRENT, VOLTAGE AND FREQUENCY

- Alternator voltage: 15 to 300 V_{AC}
- Alternator frequency: 50 or 60 Hz nominal.
- Overspeed: nominal frequency + 14% (+24% overshoot)
- DC Supply Range: 8 to 33 V_{DC}.
- Current consumption: 80mA max. (Outputs open)
- Charge fail threshold: 6 V_{DC}
- Charge excitation current: via 82 Ω resistor connected to the FUEL output

MDA: INPUTS, OUTPUTS

- DC supply: 12 or 24 V_{DC}, (+) and (-) terminals.
- L1: generator phase voltage.
- Neutral: Generator neutral terminal.
- High temp switch/ Low oil pressure: negative closing switch input.
- Remote start: a negative supply connected to this input will run the engine.
- Charge: connect the charge alternator's D+ output to this terminal. This terminal will supply the excitation current and measure the voltage of the charge alternator
- Output: Fuel solenoid: 10A@28V_{DC} / Start: 10A@28V_{DC} / Auxiliary: 10A@28V_{DC}

MNS: CURRENT, VOLTAGE AND FREQUENCY

- DC SUPPLY: 12 or 24 VDC, (+) and (-) terminals.
- R-S-T: mains phase voltages.
- MN: mains neutral terminal.
- G: Generator phase voltage / GN: Generator neutral terminal.
- Output: Normally closed relay output connecting the phase-R voltage to the terminal. (10A@250VAC)

MNS: CURRENT, VOLTAGE AND FREQUENCY

- Alternator Voltage: 15-300 VAC (Ph-N) / Mains voltages: 300 VAC max (Ph-N)
- DC supply range: 9 to 33 VDC.
- Current consumption: 80mA max. (Outputs open).
- Low Voltage Limit: Adjustable from 70 to 270VAC.
- High voltage Limit: 320 VAC Ph-N (fixed)

MNS: GENERATOR CONTACTOR

Normally open relay output connecting the phase-G voltage to the terminal. (10A@250V_{AC})

MNS: REMOTE START:

Normally open engine start request relay output. Connects the battery positive to the terminal.
(10A@28VDC)

DIRECTIVES

- EMC & Low Voltage

ENVIRONMENT

- Operating temperature: -20°C (-4°F) to 70 °C (158°F).
- Storage temperature: -30°C (-22°F) to 80 °C (176°F).
- Maximum humidity: 95% non-condensing.

SIZE AND WEIGHT

- Dimensions: 72x72x38mm (WxHxD)
- Panel cut-out dimensions: 68x68 mm
- Weight: 140g (approx.)

ACGEN 2.0 & ICGEN 2.0

Enhanced microprocessor modules for generator control

CRE TECHNOLOGY offers 2 enhanced microprocessor modules for generator control.

These modules can be fully programmed either by the front face or either with a PC software free of charge and offer: A graphic display, Events logging with date and time, Modbus RTU RS85 communication port, Configurable Inputs / Outputs and 2 years warranty.

- **ACGEN 2.0:** Auto start controller with remote start/stop
- **ICGEN 2.0:** Auto transfer switch controller

ACGEN 2.0 MODULE

ICGEN 2.0 MODULE

FEATURES

ACGEN 2.0 BENEFITS

The ACGEN 2.0 is a complete auto start controller with remote start/stop for a single generating set operating in standby mode. This controller is used for automatic and manual control of generators. The test feature allows you to set various daily or weekly self tests of the generator. ACGEN2.0 module also handles OpEx feature for the control of fuel costs.

- Back-lit LCD graphic display with multiple information pages
- Help button for on-board instructions and multiple password access
- 57 configurable alarms and protections, high accuracy TRMS measurement
- Date and time (real time clock with battery)
- 3 languages available on board (English, French, Italian)
- 250 engine history events log and data-logger
- System statistics: engine, alternator
- Fully programmable by keyboard & easy set up
- Engine speed measurement with magnetic pick-up or alternator frequency
- Modbus communication

PROTECTIONS

- Low oil/ coolant level
- Ground protection alarm & High fuel consumption
- Start/Stop phase
- Battery maintenance & stop failure
- Fuel low/High leakage
- Unexpected consumption & service
- Refueling timeout & Remote start/stop
- Warranty expired
- Charger alternator failure & Test failed
- Low/High temperature alarm (digital)
- Battery charger alarm & emergency button
- Feedback generator breaker & System locked
- User alarm 1/2/3
- Faulty start & Mechanical fault
- Low/High frequency generator
- Low/High voltage generator
- Wrong phase sequence generator
- Current overload & short-circuit
- High temperature prealarm/alarm (analog)
- Low fuel prealarm/alarm (analog)
- Low oil pressure prealarm/alarm (analog)
- Low/High battery voltage
- Low/High RPM value & low autonomy

ICGEN 2.0 BENEFITS

The ICGEN 2.0 is a complete auto transfer switch controller with remote start/stop for a single generating set operating in standby mode. All mains parameters are checked and in case of failure, the controller will provide a remote start signal to the generator.

When the mains reappear, the ICGEN 2.0 opens the genset breaker, switches back the load on the mains and stops the generator after a programmable cooling time.

- Back-lit LCD graphic display with multiple information pages, help button for on-board instructions, multiple password access
- 26 configurable alarms and protections, high accuracy TRMS measurement
- Date and time (real time clock with battery),
- 3 languages available on board (English, French, Italian)
- System statistics: alternator and mains
- Fast & easy setup, 250 engine history events log, Modbus communication.

PROTECTIONS

- Ground protection alarm & Test active
- Battery maintenance, faulty mains & Test failed
- Battery charger alarm & Emergency button
- Feedback KG/Feedback KR, system locked & Faulty start
- Low/High frequency generator & voltage generator
- Wrong phase sequence generator
- Current overload & short-circuit
- Low/High frequency mains & voltage mains
- Wrong phase sequence mains, user alarm 1/2/3
- Feedback generator breaker & System locked

CE EAC

Part number: A63Z1 - ACGEN 2.0 Module
Part number: A63Z2 - ICGEN 2.0 Module

RELATED PRODUCTS & CABLES

TCGEN 2.0 – Ref A63Z0
CRE MONITOR - Configuration software

APPLICATIONS

ACGEN 2.0 is flexible and complete, ideally made for Genset panel refit, especially large series panels like Power Wizard, PCC or manual local panels.

ICGEN 2.0 is a user friendly ATS controller offering complete features and the capability of being entirely setup from the front panel display.

SPECIFICATIONS

ACGEN 2.0 CURRENT, VOLTAGE AND FREQUENCY

- DC range: 8 to 32 V_{DC} / AC supply range: 50 to 500 V_{AC}
- Typical standby current: 100 mA_{DC}
- Maximum operating current: 350 mA_{DC}
- Generator breaker relay output: 8 A / 250V
- DC outputs: 6A / 28V and 2A/28V
- Charge excitation current: 54mA @ $12V_{DC}$.
- Voltage dropouts immunity on the power supply : 0V for 200ms

ACGEN 2.0 COMMUNICATION PORTS

- 1 RS232 & 1 RS485 port for Modbus RTU communication
- 1 CAN bus J1939 for engine communication (Scania EMS, Volvo EMS, Volvo EDC, Perkins, John Deere, Deutz, Iveco, Cummins, MTU)

ICGEN 2.0 CURRENT, VOLTAGE AND FREQUENCY

- DC range: 8 to 32 V_{DC} / AC supply range: 50 to 500 V_{AC}
- Typical standby current: 100 mA_{DC}
- Maximum operating current: 350 mA_{DC}
- Generator breaker relay output: 8 A / 250V
- Mains breaker relay output: 8 A / 250V
- DC outputs: 6 A /28V and 2 A/28V
- Voltage dropouts immunity on the power supply : 0V for 200ms

ICGEN 2.0 COMMUNICATION PORTS

- 1 RS232 & 1 RS485 port for Modbus RTU communication

ICGEN 2.0 MEASURMENTS

GENERATOR

- V_{AC}:L1/L2-L2/L3-L3/L1
- V_{AC}:L1N-L2N-L3N
- kVA, kW & kVAR: L1-L2-L3-Total
- kWh
- cos (φ): L1-L2-L3 / Frequency (Hz) / Run hours

LOAD

- Currents: L1-L2-L3

MAINS

- V_{AC}: L1/L2-L2/L3-L3/L1
- V_{AC}: L1N-L2N-L3N
- kVA, kW & kVAR: L1-L2-L3-Total
- kWh
- cos (φ): L1-L2-L3
- Frequency (Hz)

DIRECTIVES

- EN61000-6-(2), (4)
- IEC61000-4-(2), (3), (4), (5), (6)
- IEC60086-2- (1), (2), (6) +
- IEC60086-2-30 - CISPR 16-1

ENVIRONMENT

- Operating temp.: -30°C + 70°C
- Maximum humidity: 95% non-condensing.
- Front panel protection: IP65

SIZE AND WEIGHT

- Dimensions: 245x182x40mm
- Panel cut-out dimensions: 220x160 mm minimum.
- Weight: 750 g

AMF COMPACT

Enhanced Auto Mains Failure genset controller

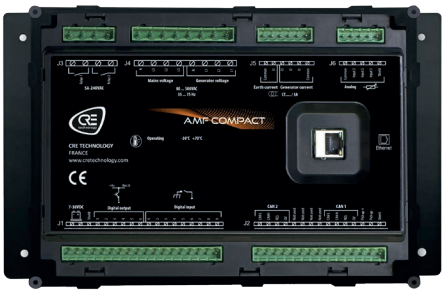
The **AMF COMPACT** is one controller of a complete range for Energy sources and power plant management: Generators, Mains, Photovoltaic, Batteries storage, Tie breakers. This controller is dedicated to a large variety of standby diesel or gas generators, offering an automatic management of transfer switch on mains failure, as well as monitoring, control and protection of engine, alternator and power Bus bars. It offers flexibility and time saving thanks to its simple wiring, all features included (no option), and easy programming.

HARDWARE AND DISPLAY

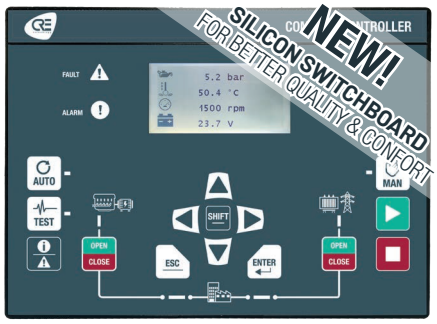
AMF COMPACT is available in both switchboard panel mounted version with display, or core base mounted version and compatible with **i4Gen** touchscreen color display range.

SOFTWARE

AMF COMPACT is configurable from its front panel display, from **i4Gen HMI**, or through the free **i4Gen Suite** 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. Automatic management of the standard frames.
- **New** : **New :** Possibility to create and configure up to 10 customized J1939 frames (read and write). Management of DTC and DPF/SCR (Tier 4 final and Stage 5 engines. Engine ECU address automatic detection. Sniffer/Spy function to analyse the CAN frames. Start/Stop control, speed, 50/60Hz selection.
- Mains failure detection and changeover.
- Override mode (protections inhibition + dedicated hour meter) following NFE 37-312 certification.
- Non-essential load trip control on overload or under frequency (Load shedding).
- 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 over 100 J1939 parameters available for electronic engines
- Generator electrical parameters:
  - Voltage (3 phases RMS, L-L and L-N)
  - Current (3 phases RMS)
  - Frequency
  - Active power (3 phases + total)
  - Reactive power (3 phases + total)
  - Power factor (3 phases + total)
  - Calculated active energy (KWh)
  - Calculated reactive energy (KWARh)
- Mains electrical parameters:
  - Voltage (3 phases RMS, L-L and L-N)
  - Frequency
  - Current (1 phase RMS)
  - Active and reactive power
  - Power factor
- Record of 500 events/alarms/faults with timestamps. Displayed on controller screen & I4Gen with advanced filter.
- Configurable event logger and info pages.

CONFIGURABLE EVENTS LOGGER

- Configurable list of parameters needed
- Configurable frequency record
- 1350 logged events with timestamp and real-time value available, 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: ANSI Code 37P, 32P
  - <KVAR, >KVAR: ANSI Code 37Q, 32Q
  - Unbalance I and V
- Mains electrical protections:
  - <F, >F: ANSI Code 81L, 81H
  - <U, >U: ANSI Code 27, 59
  - <KW, >KW: ANSI Code 37P, 32P
  - <KVAR, >KVAR: ANSI Code 37Q, 32Q
  - Unbalance V

BREAKERS CONTROL

- Adjustable pulses or latched contact for breaker closing.
- Adjustable pulses or latched contact for breaker opening.
- MN/MX coil management.
- Allows the control of 1 changeover or 2 separate breakers.
- The breakers positions feedback could be connected or not.
- 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.
  - **New** : Debug mode displaying in real time the status or value of all variables in the programming lines
- 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** PC software, you will automatically be suggested for a firmware update to the latest version if applicable.

MODBUS TCP SLAVE & MASTER COMMUNICATION PORT

In Slave application:

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

New - In Master application:

- Possibility to create and configure customized frames

REMOTE SUPERVISION WITH I4GEN (7, 10 OR 15 INCHES)

- Internet connection: Wan port or Wifi hotspot or 4G modem or Smartphone Access point.
- Visualization - configuration - programming - remote power plant control.
- Up to 10,000 power plants with a single Zoho Assist account. (Zoho Assist PC, MAC, Smartphone application).
- **New :** Monitoring and control of the complete power plant (generators, mains, photovoltaic, batteries storage,..) through a single line diagram generated automatically.
- 1 single i4Gen can monitor the entire power plant.
- Sending emails on events.

Part numbers:
A56-AMF-10 Core base mounted version
A56-AMF-00 Switchboard mounted version with display

RELATED PRODUCTS AND CABLES

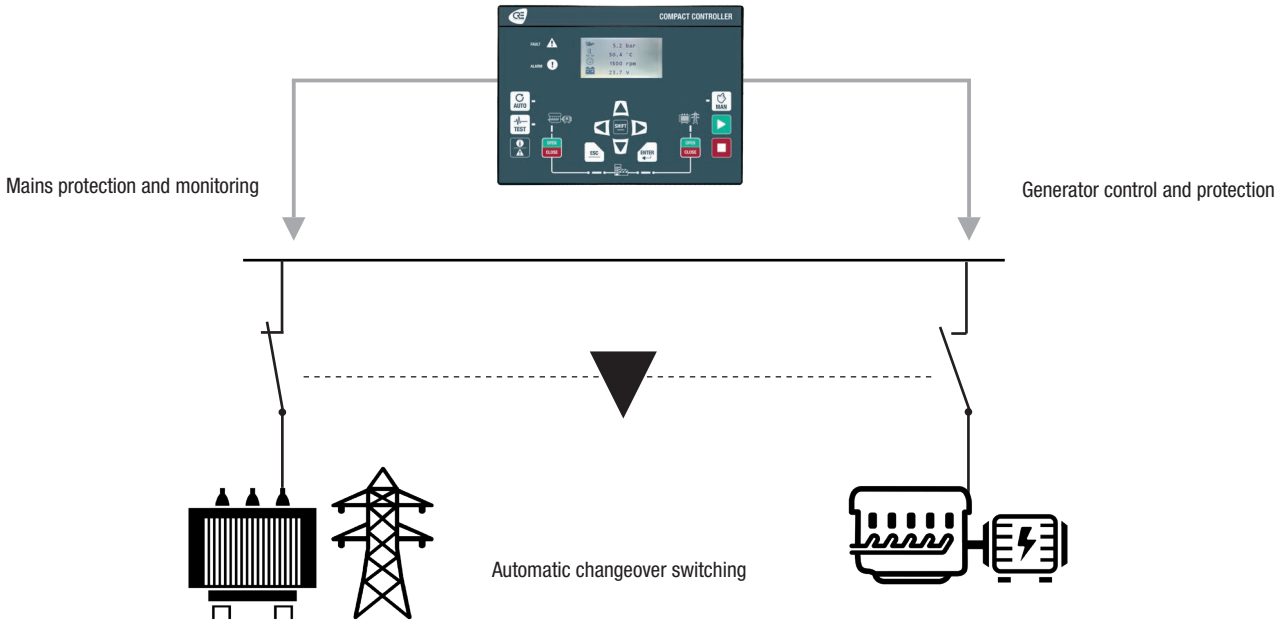
i4GEN Touchscreen color display range – Ref A56Vxx
I/O Expansion – Ref BK5150 + KL1488 + KL2408 …
PC Connection Ethernet cable – Ref A53W1
CANbus J1939/CRE/CANopen communication cable – Ref A40xx

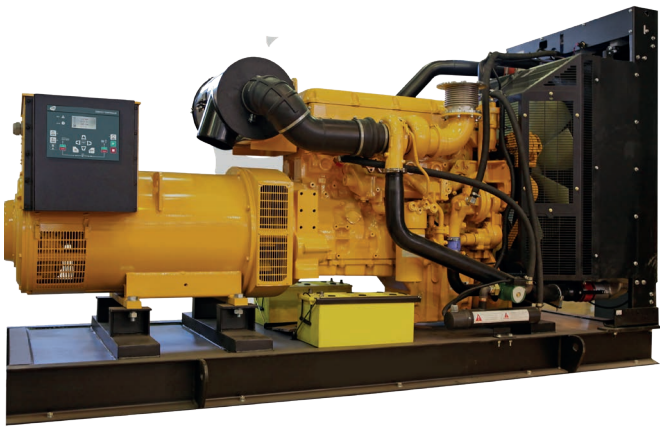
APPLICATIONS

The **AMF COMPACT** is an Automatic Mains Failure unit, ensuring a complete management of standby generator in backup of mains supply, by continuously monitoring utility input and starting the generator in case of operator request or emergency. The **AMF COMPACT** allows user control, test operation on schedule or from switchboard.

Its flexibility provides a large capability of features usable on the controller inputs/outputs or the 32 I/O expansions and the 16 analog inputs expansions that can be connected on CANbus. A ModBus TCP access is available on the Ethernet port, also used for PC connection.

STANDBY GENERATOR WITH MAINS IN AUTOMATIC MAINS FAILURE





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 or Earth. 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 input 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 output expansion via CANopen.
- 2 x Relay outputs (breaker control): 5A, 240V_{AC}.
- 2 x Analog outputs +/-10VDC: isolated output with adjustable span and offset.
- Magnetic pick up input: Frequency 50Hz...10KHz, Voltage 0.5...40V_{AC}.

COMMUNICATION PORTS

2 isolated com ports are available:

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

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 (8.7x6.3in).
- 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).

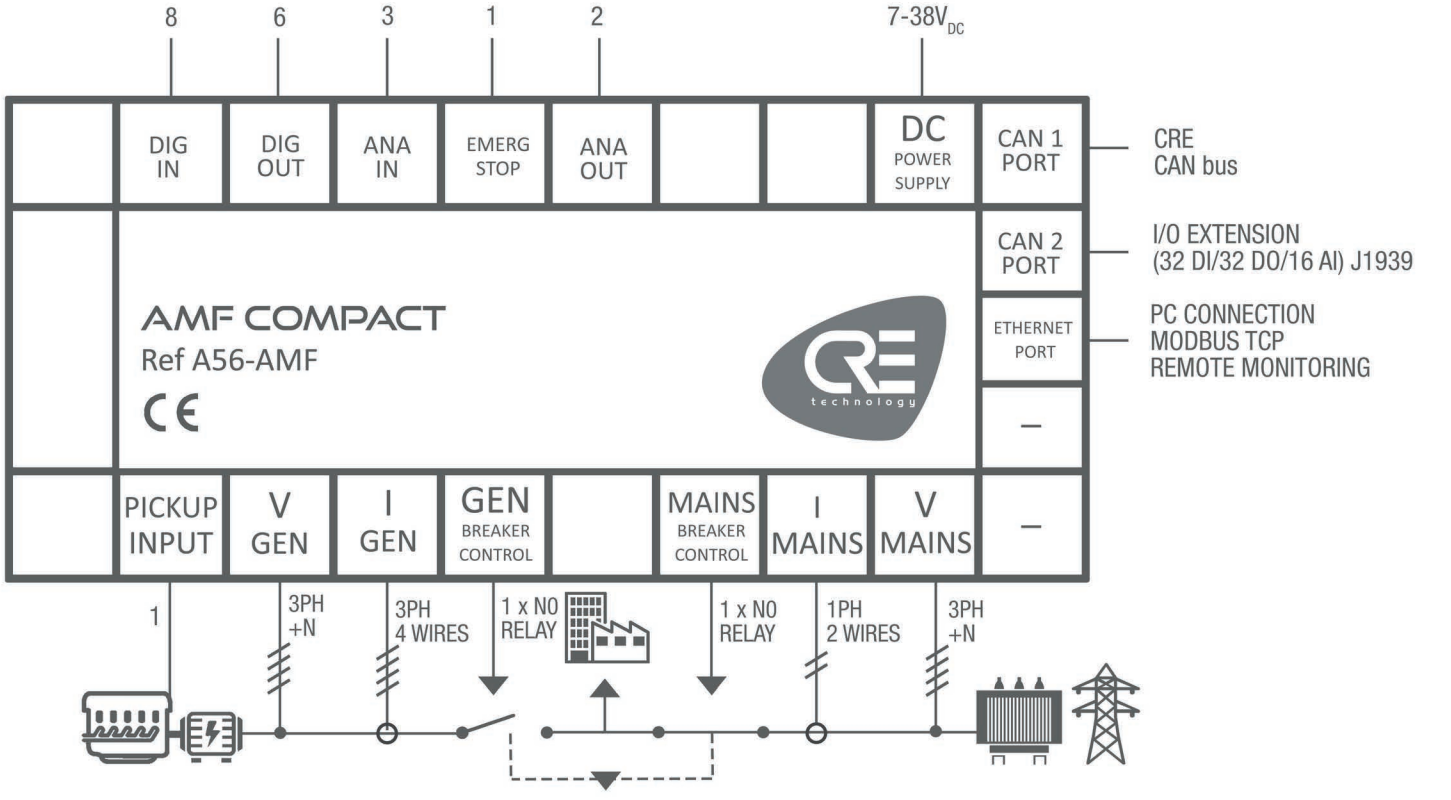
LCD DISPLAY CHARACTERISTICS

- Size: 40x70mm (1.50x2.75in).
- Pixels:1024x512Backlight:50cd/m2typical,configurable.
- Contrast: adjustable.

LANGUAGES

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

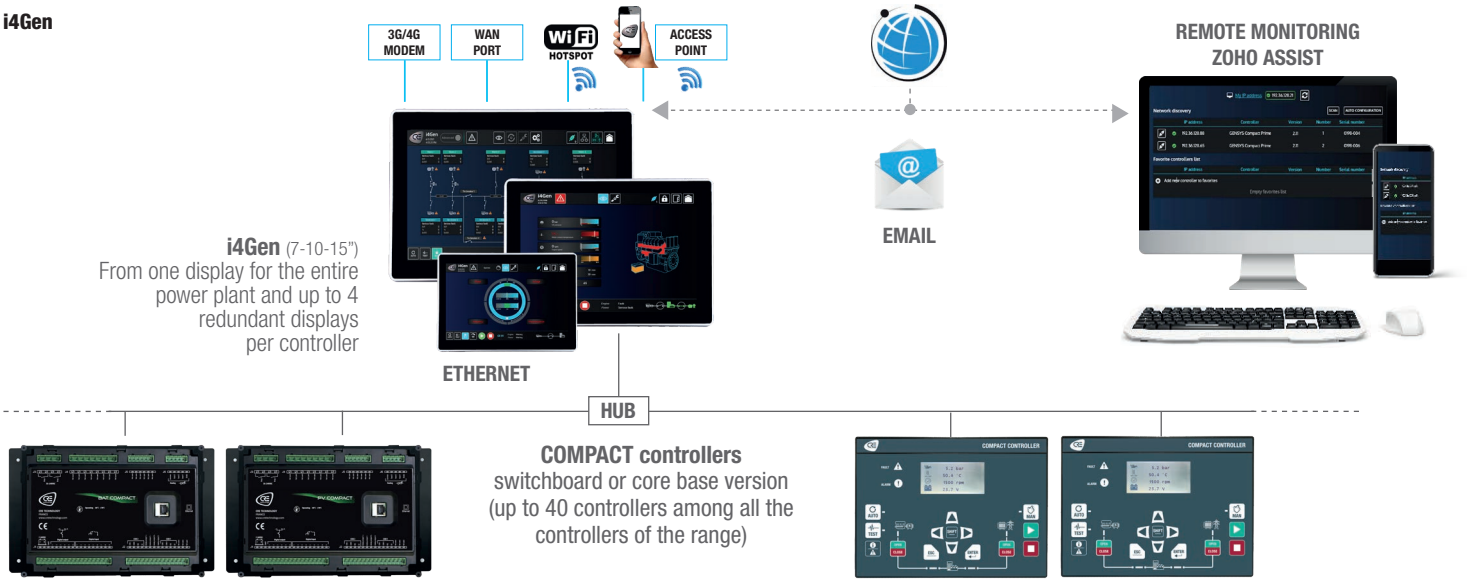
WIRING DIAGRAM



AMF COMPACT

Enhanced Auto Mains Failure genset controller

ASSOCIATED I4GEN MULTI-TOUCHSCREEN RANGE & MAIN FUNCTIONS



- **The i4Gen touchscreen and color display range (7, 10 and 15 inches) is available for the COMPACT controllers.**
- **i4Gen offers configuration, control, monitoring and logging (parameters, measures, events) of COMPACT controllers.**
- **i4Gen display can be duplicated on computer locally by LAN or remotely by internet or GPRS**
- **Thanks to its WIFI function, i4Gen offers also the capability of remote service and support by connecting your smartphone in connection sharing.**

NEW - SINGLE LINE DIAGRAM AUTOMATICALLY GENERATED FROM EACH COMPACT CONTROLLER CONFIGURATION

In addition to its very advanced functions, the i4Gen now offers you the display of the single-line diagram of your complete power plant, as well as the production curves of each source.

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 trough 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 of the power supply…

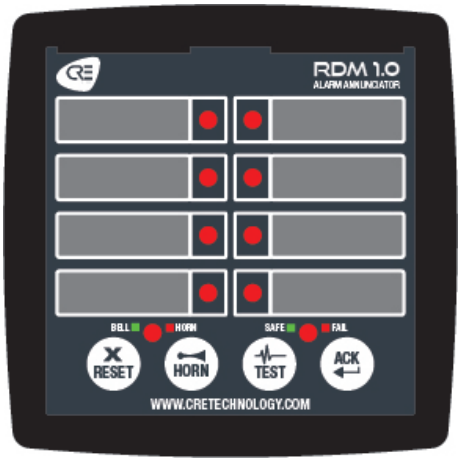
RDM 1.0

Alarm annunciator

The **RDM 1.0** is a new, robust and easy to use alarm annunciator suitable for industrial generators applications. The **RDM 1.0** is an 8 channels, 96x96mm module.

This product offers the following advantages:

- Front face and dip switch configuration (no computers needed)
- Power supply from 19-150VDC
- 8 digital fault inputs (opto-isolated)
- Filter delays of input can be set (from 2ms to 500ms),
- Watchdog function (led and digital output information)
- Leds colou set-up (green or red), to differenciate alarms priorities and to activate 2 different outputs
- Internal buzzer 80dB
- ModBus RTU-RS485
- A tool provided to print alarms names' tags



FEATURES

BENEFITS

The RDM 1.0 is a robust quality alarm anunciator thanks to the European standard manufacturing experience. The unit features ultra-bright, bicolor (red-green) led indicators. Alarms may be assigned to different priority levels in order to reduce confusion. Using front panel pushbuttons, alarms may be cleared and resetted and the unit tested. The configuration of the module is performed with dipswitch placed on the back panel. Additional programming may be performed from the front panel.

DISPLAYED INFORMATION

- Alarm leds
  - Fast flash: at the first detection of the fault or if fault is detected at LED steady on condition.
  - Slow flash: activated when the ACK (alarm acknowledge) pushbutton is pressed and if the fault signal is still active.
  - Steady on: activated if the fault signal disappears at SLOW FLASH condition. Alarm led will fast flash fast if fault signal occurs again.
  - Led off: the alarm led turns off when RESET pushbutton is pressed and fault signals is not present.
- Information Leds
  - HORN/BELL Led: If the HORN relay turns on, the "red" led turns on. If the HORN relay is not on and if the BELL relay is on, then the "green" led turns on. If both relays are off then the led is off. HORN led will flash if HORN relay is passive.
  - SAFE/FAIL Led: If an internal fault condition is detected at self-test, then this led will turn on "red", else it turns on "green".

AFTER SALES SERVICE

Like every CRE TECHNOLOGY products, the unit also benefits from our technical support. All CRE TECHNOLOGY products are delivered with one year warranty.

PUSHBUTTON FUNCTIONS

- ACK: When ACK is pressed, fast flashing leds switch to slow flash (or steady on) mode, the internal buzzer turns off, horns and bell relays turn off.
- RESET: When RESET is pressed, all alarm leds horn and bell relays turn off. If fault signal is present, then the alarm will occur again.
- TEST: When pressed, all leds will turn on "red/green" alternatively and the buzzer sounds
- HORN: When pressed, HORN and BELL relays will turn on alternatively for 1 second.

INTERNAL BUZZER

- When a fault signal is detected, the internal buzzer turns on with a period of 1 second. If ACK pushbutton is pressed, the buzzer turns off. If ACK is not pressed within 1 minute, then it switches to slow sound mode (beeps once every 10 seconds).

INPUTS, OUTPUTS

- Optically isolated digital inputs are equipped with noise suppressing filters and are capable of operating smoothly in high electrical noise environments. The detection delay of inputs are adjustable between 2 and 500ms.
- Relay Outputs:
  - Horn Relay: If any "red" alarm led turns on, then the horn relay will also turn on. The relay turns off when ACK pushbutton is pressed. The HORN RELAY can be made active/passive by holding pressed the HORN RELAY for 3 seconds.
  - Bell Relay: If any "green" alarm led turns on, then the bell relay will turn on. The relay turns off when ACK pushbutton is pressed.
  - Watchdog Relay: At startup the relay turns on. If the boards fails, then the watchdog relay turns off.

MODBUS RTU COMMUNICATION

- The isolated RS-485 ModBus RTU communication port is free from ground potential differences and allows safe transfer of measured parameters to automation and monitoring systems. (DATA Rate: 9600-19200baud)

NOMINAL VOLTAGE DC SUPPLY

- 19 to 150VDC
- Power Consumption <4VA

ENVIRONMENT

- Operating temperature: -20°C...+70°C (-4°F...158°F).
- Storage temperature: -40°C ...+85°C (-40°F …185°F).
- Humidity: 95% non-condensing.
- IP Protection: IP65 (Front with gasket) and IP30 for the rear
- Size and weight:
  - Dimensions: 102x102x53mm (WxHxD)
  - Panel cutout: 92x92mm
  - Weight: 200gr

CERTIFICATIONS

- European Union Directives : 2006/95/EC (LVD), 2004/108/EC (EMC)
- Reference standards: EN61010 (Safety), EN61326 (EMC)

CE

Part number: A60PO

RELATED PRODUCTS & CABLES

AMF COMPACT - Ref A56-AMF-X0
GENSYS COMPACT PRIME - Ref A56-PRIME-X0
GENSYS COMPACT MAINS - Ref A56-MAINS-X0

RELATED PRODUCTS

The **GENSYS COMPACT PRIME** is dedicated for generators used in power plant applications requiring synchronizing, active and reactive load sharing and electrical/mechanical protections.

GENSYS COMPACT PRIME offers flexibility and time saving thanks to its simple wiring, and easy programming.

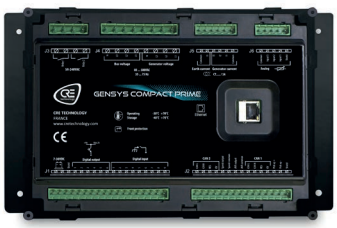
The **GENSYS COMPACT MAINS** is used on standalone generator in mains paralleling application. **GENSYS COMPACT MAINS** offers flexibility and time saving thanks to its simple wiring, and easy programming.

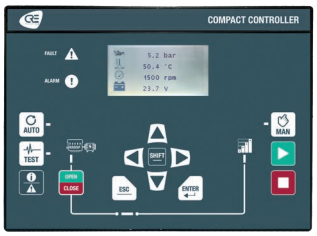
HARDWARE AND DISPLAY

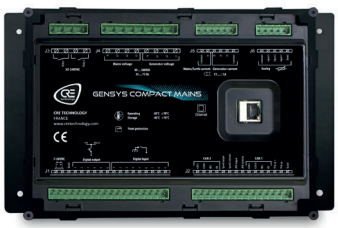
GENSYS COMPACT PRIME and **GENSYS COMPACT MAINS** are available in both switchboard panel mounted version with display, or core base mounted version and compatible with i4Gen touchscreen color display.

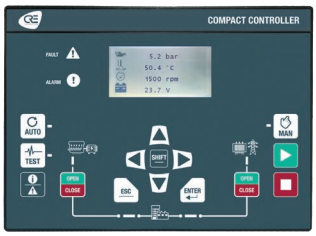
SOFTWARE

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

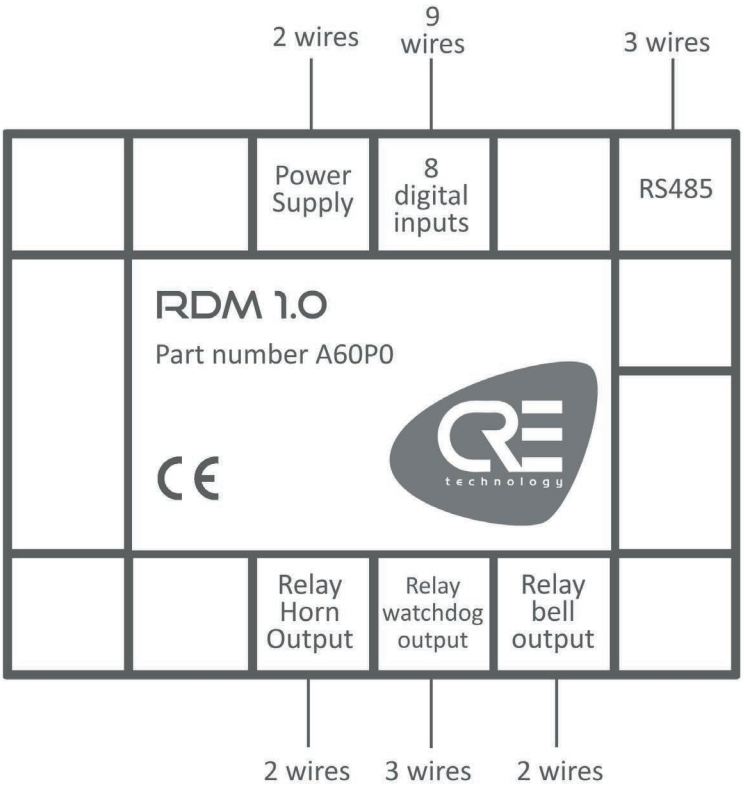


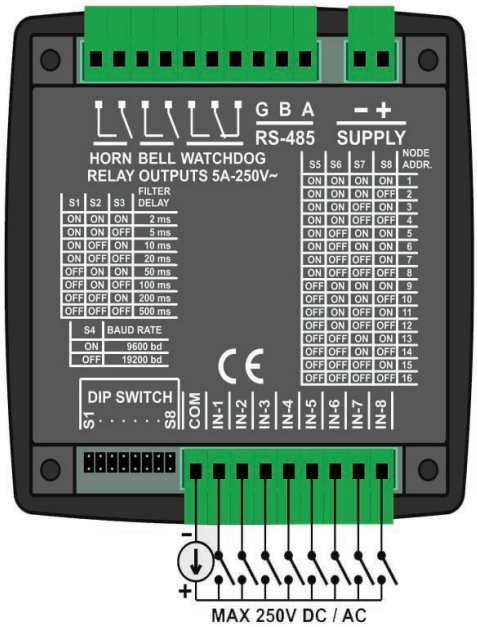






WIRING DIAGRAM





GENSYS COMPACT PRIME

All-in-one synchronizing & paralleling controller

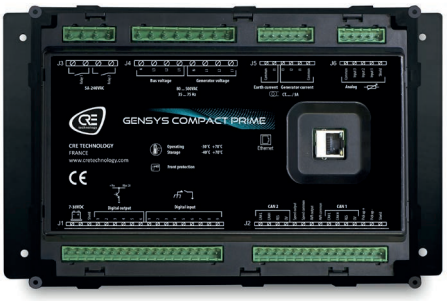
The **GENSYS COMPACT PRIME** is one controller of a complete range for Energy sources and power plant management : Generators, Mains, Photovoltaic, Batteries storage, Tie breakers. This controller is dedicated for generators used in power plant applications requiring synchronizing, active and reactive load sharing and electrical/mechanical protections. It offers flexibility and time saving thanks to its simple wiring, and easy programming.

HARDWARE AND DISPLAY

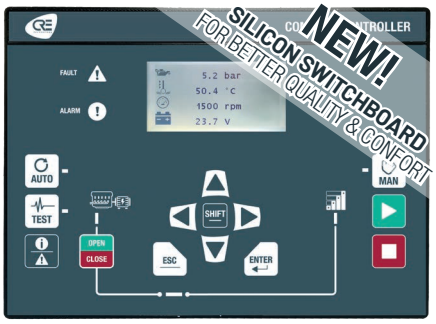
GENSYS COMPACT PRIME is available in both switchboard panel mounted version with display, or core base mounted version and compatible with **i4Gen** touchscreen color display range.

SOFTWARE

GENSYS COMPACT PRIME 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. Automatic management of the standard frames.
- **New :** Possibility to create and configure up to 10 customized J1939 frames (read and write). Management of DTC and DPF/SCR (Tier 4 final and Stage 5 engines. Engine ECU address automatic detection. Sniffer/Spy function to analyse the CAN frames. Start/Stop control, speed, 50/60Hz selection.
- Isochronous and Iso-voltage active and reactive load sharing.
- Fixed kW/kVAR base load or droop mode.
- Frequency and voltage control compensation for generators with droop governors and/or AVR/DVR.
- Synchronization and dead Bus management
- Static synchronization: generators breakers closing without excitation.
- Dynamic 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 control on overload or under frequency (load shedding).
- Reserve power management for application with high load variation.
- Battery boost management.
- Configurable maintenance cycle.
- 3 password levels: end user, technician, advanced technician.
- Automatic clock synchronization by CANbus.

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)
  - Current (3 phases RMS)
  - Frequency
  - Active power (3 phases + total)
  - Reactive power (3 phases + total)
  - Power factor (3 phases + total)
  - Calculated active energy (KWh)
  - Calculated reactive energy (KWARh)
- Bus electrical parameters:
  - Voltage (3 phases RMS, L-L and L-N)
  - Frequency
  - Active and reactive power (calculated)
  - Power factor (calculated)
- Synchroscope, differential voltmeter and frequency meter and synch check relay authorization values.
- Record of 500 events/alarms/faults with timestamp. Displayed on controller screen and i4Gen with advanced filter.
- Configurable event logger and info pages.

CONFIGURABLE EVENTS LOGGER

- Configurable list of parameters needed.
- Configurable frequency record
- 1350 logged events with timestamp and real-time value, 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 : ANSI Code 60P

BREAKERS CONTROL

- 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.
- Closing failure, opening failure, unexpected closure, unexpected opening alarm management.

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.
  - **New** : debug mode which display in real time all programming lines variables state or value.
- 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** PC software, you will automatically be asked for a firmware update to the latest version if applicable

MODBUS TCP SLAVE & MASTER COMMUNICATION PORT

- In Slave application :
  - All data are accessible by ModBus TCP locally or remotely (web, GPRS).
  - Read and write functions + 300 free ModBus TCP address available for custom mapping.
- **New** - in Master application :
  - Possibility to create and configure customized frames.

REMOTE SUPERVISION WITH I4GEN (7, 10 OR 15 INCHES)

- Internet connection: Wan port or Wifi hotspot or 4G modem or Smartphone Access point.
- Visualization - configuration - programming - remote power plant control.
- Up to 10,000 power plants with a single Zoho Assist account. (Zoho Assist PC, MAC, Smartphone application).
- **New :** Monitoring and control of the complete power plant (generators, mains, photovoltaic, batteries storage,..) through a single line diagram generated automatically.
- 1 single i4Gen can monitor the entire power plant.
- Sending emails on events.

Part numbers:
A56-PRIME-10 Core base mounted version
A56-PRIME-00 Switchboard mounted version with display

RELATED PRODUCTS AND CABLES

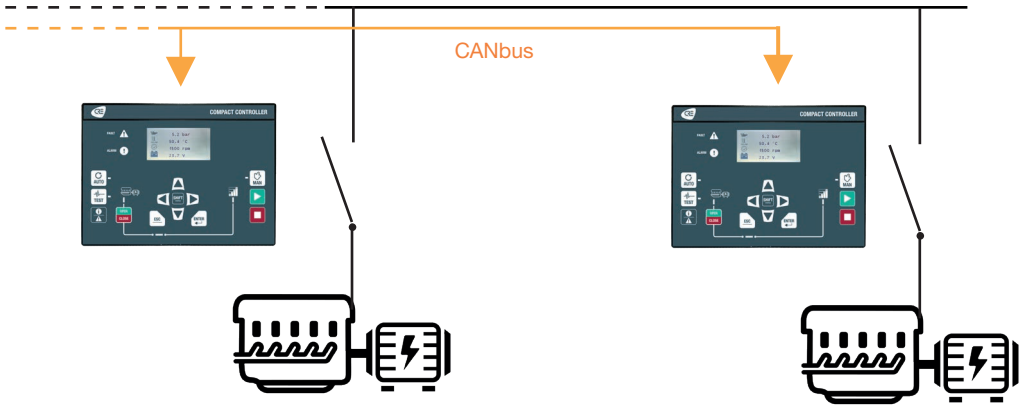
i4Gen Touchscreen color display range – Ref A56Vxx
MASTER COMPACT – A56-MAST
Additional I/O – Ref BK5150 + KL1488 + KL2408 …
PC Connection Ethernet cable – Ref A53W1
CANbus J1939/CRE/CANopen communication cable – Ref A40xx
Demonstration suitcase – Ref A56X1

APPLICATIONS

GENSYS COMPACT PRIME is well-suited for any application requiring paralleling of 2 generators or more (up to 32), and an automatic management of load control, synchronization process (on live Bus bar or dead Bus bar), load dependent start/stop and protections.

GENSYS COMPACT PRIME is able to manage diesel, gasoline 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 PRIME** offers also a solution for redundancy system, with an automatic switch Master to Slave.

Up to 32 generators in parallel



- Synchronizing and load sharing
- Automatic Start/Stop depending on load

GENSYS COMPACT PRIME

All-in-one synchronizing & paralleling controller

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 ouput.
- AC Voltage inputs: 80...500V_{AC}. Consumption = 100mA max. Accuracy: 1%. 3ph + N for generator / 3ph + N for Bus. Neutral terminal does not need to be connected.
- AC Current inputs: 4 wires. (3ph) for generator / 2 wires (1ph) for Earth. 0...5A. 1VA. Overload 15A during 10s. Accuracy: 0.5%.
- AC Frequency measurement: 35...75 Hz; 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, 240VAC.
- 2 x Analog outputs +/-10VDC : isolated output with adjustable span and offset. Could be used for Speed/ frequency and Voltage control or could be used to display any analog variable.
- Magnetic pick up input: Frequency from 50Hz...10kHz, Voltage 0.5...40VAC.

COMMUNICATION PORTS
3 isolated com ports are available:
- 1 CANbus: J1939 electronic engine and I/O extensions.
- 1 CANbus: CRE protocol for communication between all COMPACT controllers.
- 1 Ethernet: PC communication/ModBus TCP.

FREQUENCY AND KW CONTROL
- Configurable +/-10VDC analog output.
- Pulses outputs control (+f/-f).
- J1939 CANbus port for Baudouin, Caterpillar, Cummins, Daimler, Detroit, Deutz, Doosan, FPT/Iveco, John Deere, MAN, MTU, MWM, Perkins, Scania, Volvo, Waukesha, Weichai, Weifu, yanmar, Yuchai, Zenith…
- Alarm of speed control output abnormal deviation.
- **New** : patented feature Easy Calib : this feature allows the speed governor stability control and adjusting automatically the speed analog outputs (offset, range and direction).

VOLTAGE AND KVAR AND POWER FACTOR CONTROL
- Configurable +/-10VDC analog output.
- Pulses outputs control (+U/-U).
- Compatible with: AEM, AVK, Basler Electric, Caterpillar, Kia, Leroy Sommer, Marathon, Marelli Motori, Meccalte, Sincro, Stamford…
- Alarm 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 outputs (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 version.
- IP Rear: IP20/NEMA rating 1.

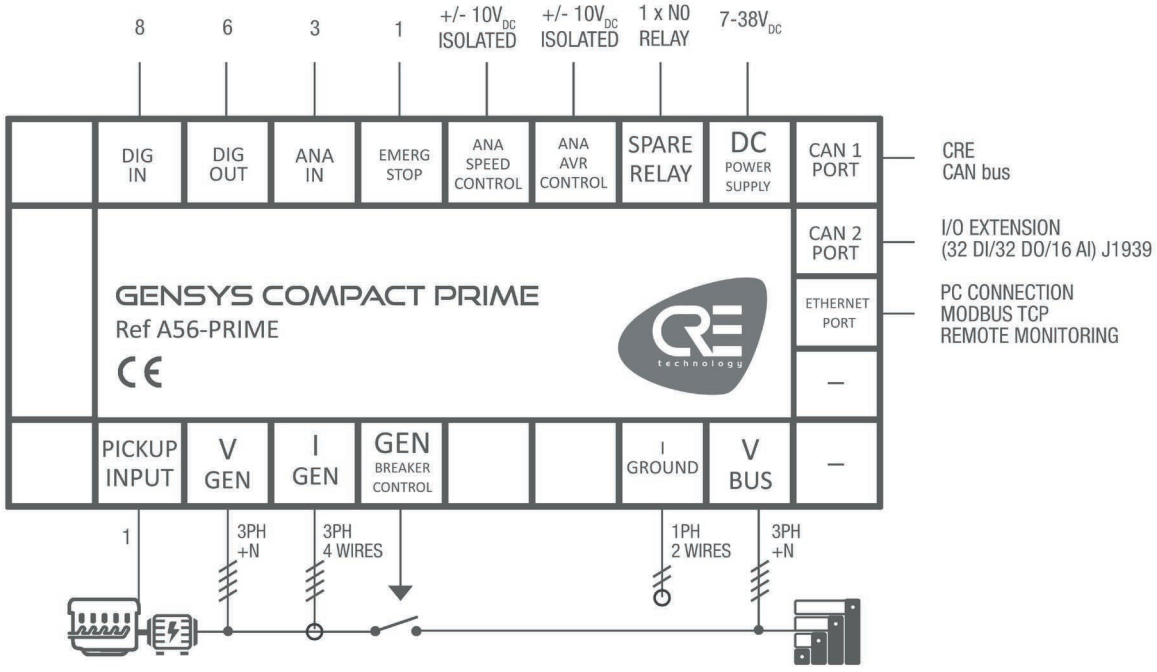
DIRECTIVES
- EMC Directive 2014/30/UE - EMC General Requirements EN 61326-1: Immunity according with EN 61000-6-2 and Emission according with EN 61000-6-4.
- Electrical Safety Directive 2014/35/UE: According with EN 60950-1.
- Vibrations and shocks: According with EN(IEC) 60068-2-6 and IEC 60068-2-27.
- 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 (8.7x6.3in).
- 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.Backlight:50cd/m²typical,configurable.
- Contrast: configurable.

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

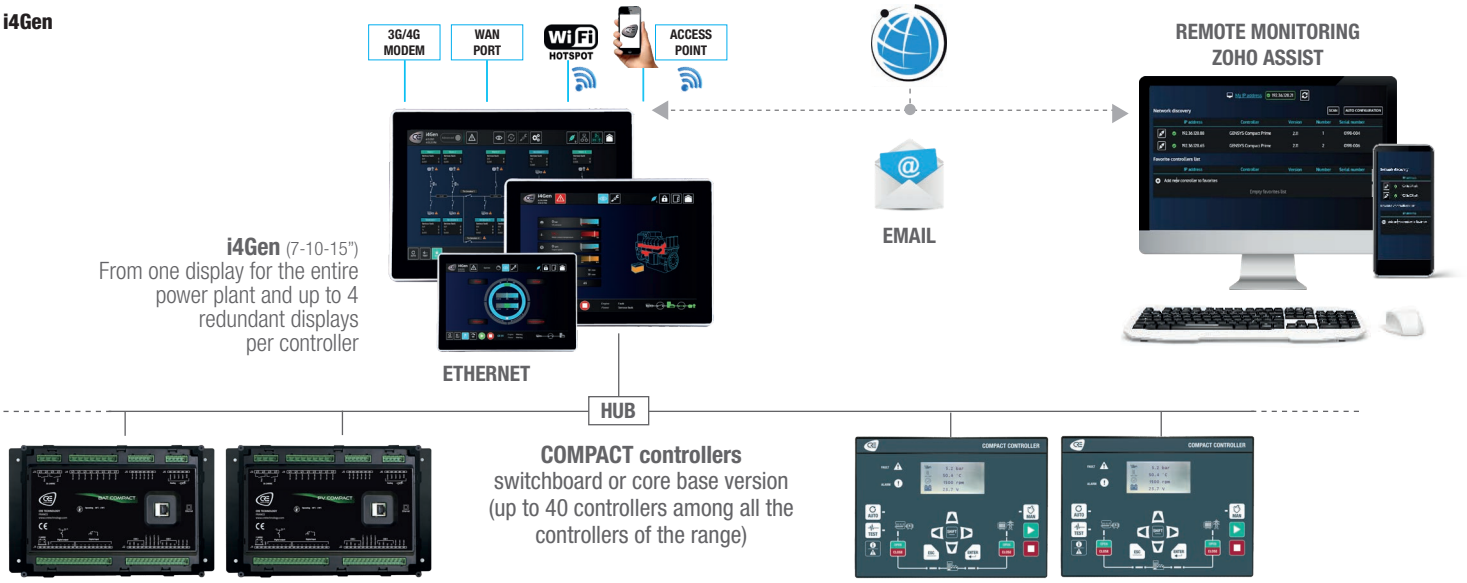
WIRING DIAGRAM



GENSYS COMPACT PRIME

All-in-one synchronizing & paralleling controller

ASSOCIATED I4GEN MULTI-TOUCHSCREEN RANGE & MAIN FUNCTIONS



- **The i4Gen touchscreen and color display range (7, 10 and 15 inches) is available for the COMPACT controllers.**
- **i4Gen offers configuration, control, monitoring and logging (parameters, measures, events) of COMPACT controllers.**
- **i4Gen display can be duplicated on computer locally by LAN or remotely by internet or GPRS**
- **Thanks to its WIFI function, i4Gen offers also the capability of remote service and support by connecting your smartphone in connection sharing.**

NEW - SINGLE LINE DIAGRAM AUTOMATICALLY GENERATED FROM EACH COMPACT CONTROLLER CONFIGURATION

In addition to its very advanced functions, the i4Gen now offers you the display of the single-line diagram of your complete power plant, as well as the production curves of each source.

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 trough 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 of the power supply…

GENSYS COMPACT MAINS

All-in-one generator controller & mains paralleling unit

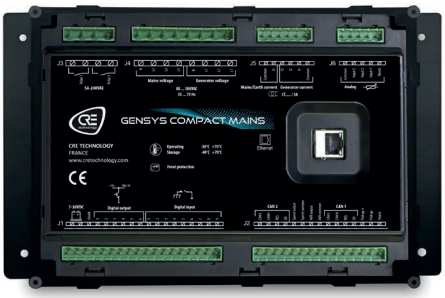
The **GENSYS COMPACT MAINS** is used on standalone generator in mains paralleling application. It offers flexibility and time saving thanks to its simple wiring, and easy programming. This controller is one controller of a complete range for Energy sources and power plant management: Generators, Mains, Photovoltaic, Batteries storage, Tie breakers.

Hardware Display

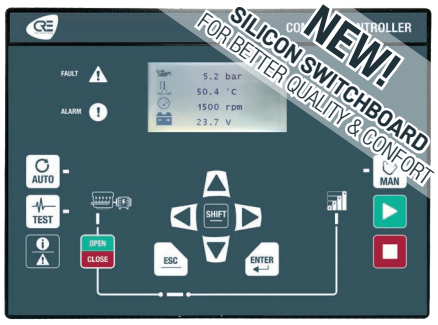
GENSYS COMPACT MAINS is available in both switchboard panel mounted version with display, or core base mounted version and compatible with **i4Gen** touchscreen color display range.

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. Automatic management of the standard frames.
- **New :** Possibility to create and configure up to 10 customized J1939 frames (read and write). Management of DTC and DPF/SCR (Tier 4 final and Stage 5 engines. Engine ECU address automatic detection. Sniffer/Spy function to analyse the CAN frames. Start/Stop control, speed, 50/60Hz selection.
- 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 Mains or Generator 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 (Synchoscope 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 ex 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 (KWARh)
- 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.

CONFIGURABLE EVENTS LOGGER

- Configurable list of parameters needed
- Configurable frequency record
- 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
  - **New:** Debug mode which display in real time all programming lines variables state or value.
- 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 proposed for a firmware update to the latest version if applicable.

MODBUS TCP SLAVE & MASTER COMMUNICATION PORT

In Slave application :

- 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.

New - in Master application :

- Possibility to create and configure customized frames

REMOTE SUPERVISION WITH I4GEN (7, 10 OR 15 INCHES)

- Internet connection: Wan port or Wifi hotspot or 4G modem or Smartphone Access point.
- Visualization - configuration - programming - remote power plant control.
- Up to 10,000 power plants with a single Zoho Assist account. (Zoho Assist PC, MAC, Smartphone application).
- **New :** Monitoring and control of the complete power plant (generators, mains, photovoltaic, batteries storage,..) through a single line diagram generated automatically.
- 1 single i4Gen can monitor the entire power plant.
- Sending emails on events.

Part numbers:
A56-MAINS-10 Core base mounted version
A56-MAINS-00 Switchboard mounted version with display

RELATED PRODUCT AND CABLES

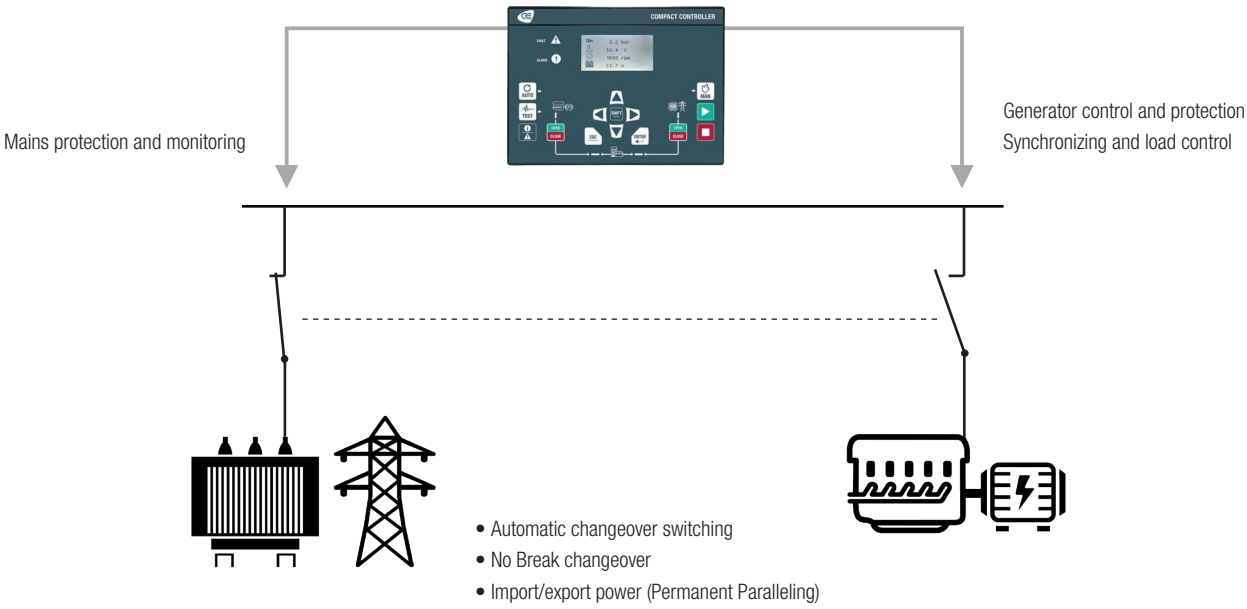
i4GEN Touchscreen color display range – Ref A56Vxx
Additional I/O – Ref BK5150 + KL1488 + KL2408 …
PC Connection Ethernet cable – Ref A53W1
CANbus J1939/CRE/CANopen communication cable – Ref A40xx
Demonstration suitcase – Ref A56X1

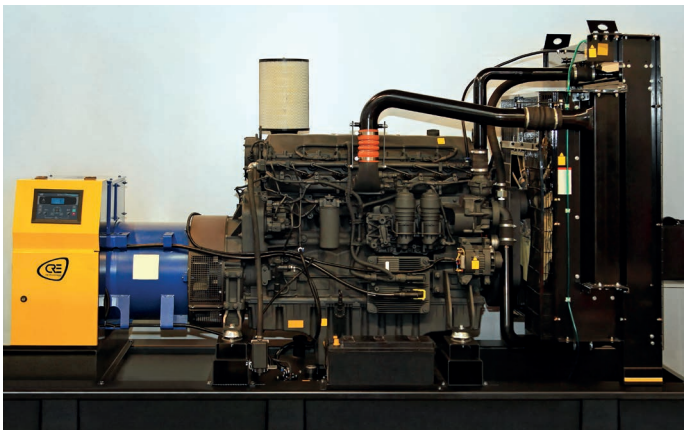
APPLICATIONS

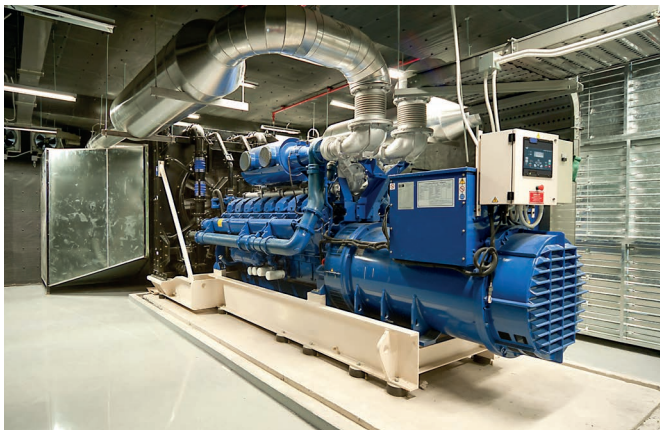
GENSYS COMPACT MAINS suits for all standby generator requiring the capability of synchronizing with mains power, controlling active and reactive load with mains power as well as electrical and engine protections, and moreover an automatic management of the installation; examples:

- 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 Slave connection for supervising purposes (BMS) and ModBus TCP Master connection for control purpose.







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.
- 2 x Analog outputs +/-10VDC: isolated output with adjustable span and offset. Could be used for Speed/ Frequency and Voltage control or could be used to display any analog variable.
- 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 : CRE protocol for communication between all COMPACT controllers.
- 1 Ethernet: PC communication/ModBus TCP.

FREQUENCY AND KW CONTROL
- Configurable +/-10V_{DC} analog output.
- Pulse outputs control (+f/-f).
- J1939 CANbus port for Baudouin, Caterpillar, Cummins, Daimler, Detroit, Deutz, Doosan, FPT/Iveco, Generac, GM, Hatz, Isuzu, John Deere, kohler, Kubota, Lombardini, MAN, MTU, MWM, Perkins, Scania, Volvo, Waukesha, Weichai, Weifu, Yanmar, Yuchai, Zenith, ...
- Alarm of speed control output abnormal deviation.
- **New:** patented feature Easy Calib: this feature allows controlling speed governor stability, and adjusting automatically the speed analog outputs (offset, range and direction).

VOLTAGE AND KVAR AND POWER FACTOR CONTROL
- Configurable +/-10VDC analog output.
- Pulse outputs control (+U/-U).
- Compatible with: AEM, AVK, Basler Electric, Caterpillar, Kia, Leroy Sommer, Marathon, Marelli Motori, Meccalte, Sincro, Stamford…
- Alarm of voltage control output abnormal deviation.
- **New:** patented feature Easy Calib: this feature allows controlling AVR voltage stability, and adjusting automatically the voltage analog outputs (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.

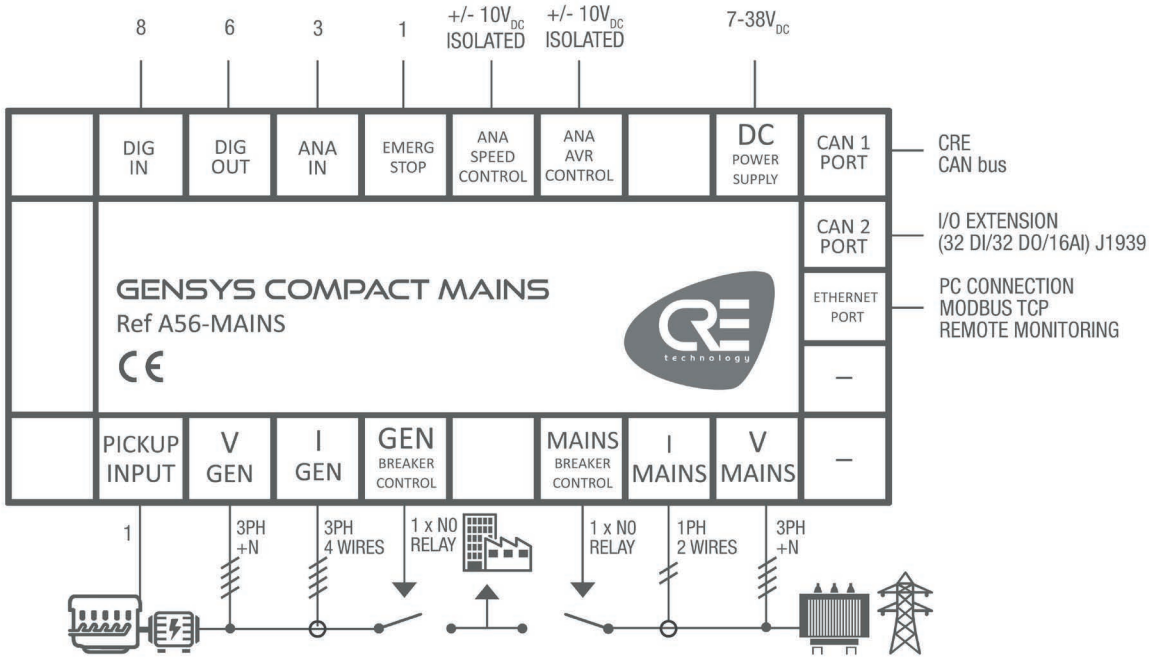
DIRECTIVES
- EMC Directive 2014/30/UE - EMC General Requirements EN 61326-1: Immunity according with EN 61000-6-2 and Emission according with EN 61000-6-4.
- Electrical Safety Directive 2014/35/UE: According with EN 60950-1.
- Vibrations and shocks: According with EN(IEC) 60068-2-6 and IEC 60068-2-27.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

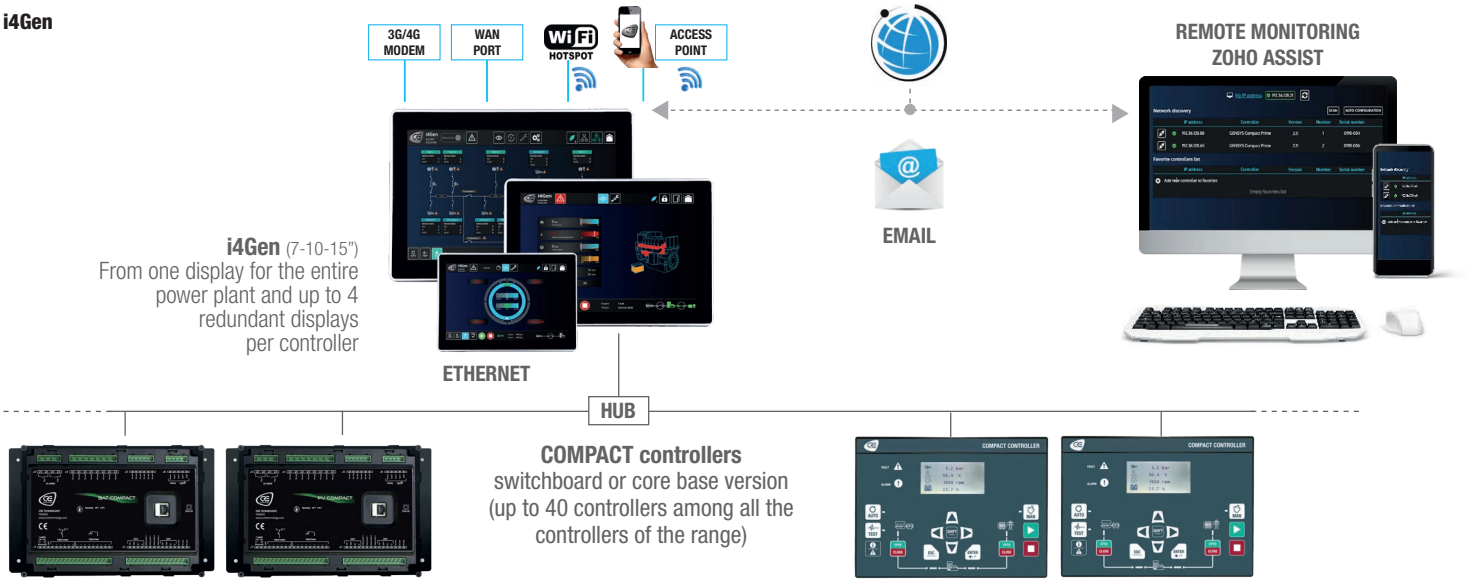
WIRING DIAGRAM



GENSYS COMPACT MAINS

All-in-one generator controller & mains paralleling unit

ASSOCIATED I4GEN MULTI-TOUCHSCREEN RANGE & MAIN FUNCTIONS



- **The i4Gen touchscreen and color display range (7, 10 and 15 inches) is available for the COMPACT controllers.**
- **i4Gen offers configuration, control, monitoring and logging (parameters, measures, events) of COMPACT controllers.**
- **i4Gen display can be duplicated on computer locally by LAN or remotely by internet or GPRS**
- **Thanks to its WIFI function, i4Gen offers also the capability of remote service and support by connecting your smartphone in connection sharing.**

NEW - SINGLE LINE DIAGRAM AUTOMATICALLY GENERATED FROM EACH COMPACT CONTROLLER CONFIGURATION

In addition to its very advanced functions, the i4Gen now offers you the display of the single-line diagram of your complete power plant, as well as the production curves of each source.

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 trough 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 of the power supply…

PV COMPACT

All-in-one photovoltaics inverters control

The **PV COMPACT** is one controller of a complete range for Energy sources and power plant management: Generators, main, Photovoltaic, Batteries storage, Tie breakers.

It controls photovoltaic inverters in grid-connected applications and/or one/several generators and/or batteries storage. The **PV COMPACT** offers flexibility and time saving thanks to its simple wiring and easy programming.

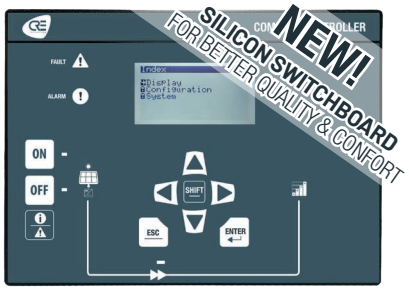
HARDWARE AND DISPLAY

The **PV COMPACT** is available in both switchboard panel mounted version with display, or core base mounted version and compatible with **i4Gen** touchscreen color display range.

SOFTWARE

The **PV COMPACT** 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

(DEPENDING ON THE PARAMETERS AVAILABLE IN THE INVERTER)

- ModBus TCP Sunspec « Plug & Play" communication with all the inverters on the market with the ability to create and configure additional custom read and write frames.
- Control of the max power KWc solar such a way as to keep a minimal power on the generator(s), while maintaining a fixed frequency (isochronous mode).
- Control of the reactive power KVAR solar: either by imposing a configurable fixed cosphi, or by sharing KVARs between solar energy and other sources, while maintaining a fixed tension (iso-tension mode).
- Manual and automatic control of the closing and opening of the PV generation relay. Immediate stop of the solar production in case of power return on the generator(s) (so as to keep the installation undervoltage).
- Start/stop of the generator(s) depending on the solar energy produced and the desired power reserve.
- Acquisition of the inverter's electrical parameters via ModBus TCP SUNSPEC or via traditional current/voltage inputs (optional).
- Non-essential load shedding management in case of overload or underfrequency.
- Simple, intuitive and free PC display and configuration software.
- Compatible and communicating with GENSYS COMPACT (generators), MASTER COMACT (network), BTB COMPACT (Tie-Breakers) and BAT COMPACT (battery inverters). Compatible with the i4Gen range of color touchscreen IHM for display and control of solar energy among all available energy sources.
- 10 configurable maintenance cycles (on energy meter or on number of calendar days).
- 3 passwords levels: user, technician, advanced technician.

DISPLAYED INFORMATION

(DEPENDING ON THE PARAMETERS AVAILABLE IN THE INVERTER)

- Photovoltaic inverter 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)
  - Active energy (KWh)
  - Reactive energy (KVARh)
- Record of 500 events/defaults/alarms with timestamps. Displayed on controller screen and i4Gen with advanced filter
- Configurable event logger and info pages
- Values and production curves of the different energy sources displayed on the i4Gen

CONFIGURABLE EVENTS LOGGER

- Configurable list of parameters needed
- Configurable frequency record
- 1350 logged events with timestamps and real-time value available on non-volatile memory.

ELECTRICAL PROTECTION OF THE PV INVERTER

(DEPENDING ON THE PARAMETERS AVAILABLE IN THE INVERTER)

- <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

PROGRAMTION 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 can be programmed on scheduled operation (cyclic or one-time).
- Easy Flex :
  - 50 lines of programming with logic and arithmetic operators, and execution conditions.
  - All the input/output and variables available.
  - **New:** Debug mode displaying in real time the status or value of all variables in the programming lines.
- Generic threshold management functions with hysteresis.
  - 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 proposed for a firmware update to the latest version if applicable.

MODBUS TCP SLAVE & MASTER COMMUNICATION PORT

In Slave application :

- 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.

In Master application :

- Reading PV inverter parameters
- Control of the PV inverter with SUNSPEC protocol
- Possibility to create and configure customized frames

REMOTE SUPERVISION WITH I4GEN (7, 10 OR 15 INCHES)

- Internet connection: Wan port or Wifi hotspot or 4G modem or Smartphone Access point.
- Visualization - configuration - programming - remote power plant control.
- Up to 10,000 power plants with a single Zoho Assist account. (Zoho Assist PC, MAC, Smartphone application).
- **New :** Monitoring and control of the complete power plant (generators, mains, photovoltaic, batteries storage,..) through a single line diagram generated automatically.
- 1 single i4Gen can monitor the entire power plant.
- Sending emails to events.

Part numbers:
A56-PV-10 Core base mounted version
A56-PV-00 Switchboard mounted version with display

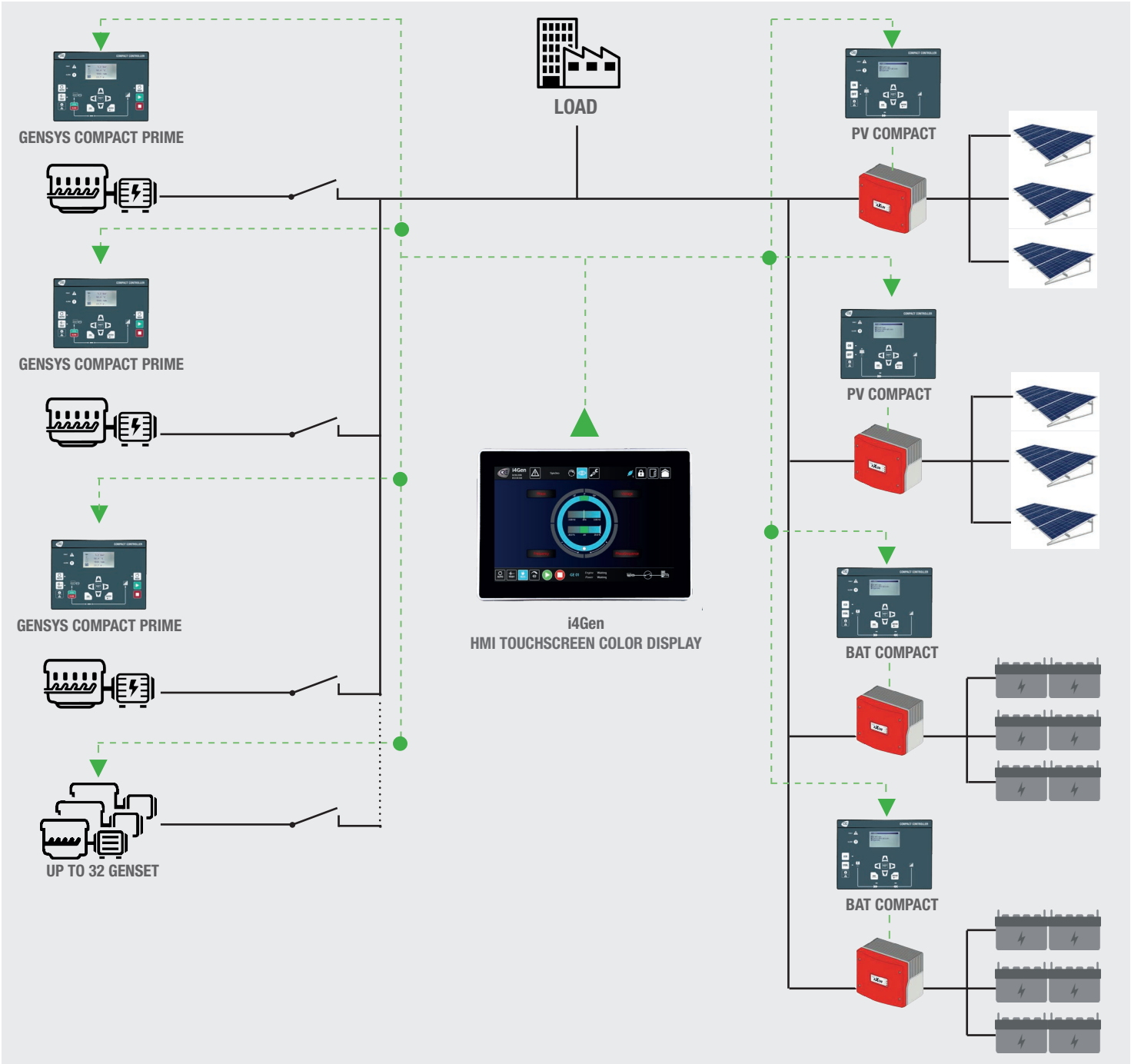
RELATED PRODUCT AND CABLES

Controllers: A56-PRIME, A56-MAST, A56-MAST1, A56-BTB, A56-BAT
I4GEN Touchscreen color display range – Ref A56Vxx
Additional Input/Output – Ref BK5150 + KL1488 + KL2408…
PC Connection Ethernet cable – Ref A53W1
CANbus J1939/CRE/CANopen communication cable – Ref A40xx

APPLICATIONS

- The **PV COMPACT** is suitable for stand-alone (off-grid) applications with generator(s) and/or battery storage, and for grid-connected applications, with the possibility of also having generator(s) and/or battery storage.
- The **PV COMPACT** controls PV inverters in “Grid Following” mode, meaning the inverters do not manage the control of the voltage and frequency which are imposed by the additional source (Generator or Grid or Batteries).
- The **PV COMPACT** can be combined with GENSYS COMPACT PRIME modules (up to 32) if there are one or more generators, with MASTER COMPACT or MASTER COMPACT 1B modules if there are one or more grids, with the BTB COMPACT modules if there are one or more tie-breakers and with BAT COMPACT modules if there are storage batteries.
- One **PV COMPACT** module is required per photovoltaic inverter when using multiple inverters, allowing the solar energy production of all operational inverters to be maintained in case of failure of one inverter.

In the case of grid coupling, the **PV COMPACT** will manage the amount of solar energy exported to the grid or imported from the grid according to the contract with the grid operator.



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...38VDC, Max voltage 45VDC during 15mn, current consumption at 24VDC = 130mA + the sum of maximum consumption of each logic output.

Optional:
- AC Voltage inputs: 80...500VAC. Consumption = 100mA max. Accuracy: 1%.
- AC Current inputs: 4 wires. 0...5A. 1VA. Overload 15A during 10s. Accuracy: 0,5%.
- AC Frequency measurement: 35...75 Hz; 15VAC 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, 240VAC.
- 2 x Analog outputs +/-10VDC with adjustable gain and offset

COMMUNICATION PORTS
3 isolated com ports are available:
- 1 CANbus: I/O extensions
- 1 CANbus: CRE protocol for communication between all Compact controllers.
- 1 Ethernet: PC communication/ModBus TCP SUNSPEC.

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 480VAC. Up to 5000m for 400VAC.
- IP Front: IP65/NEMA rating 4 - IP20/NEMA rating 1 for core base version.
- IP Rear: IP20/NEMA rating 1.

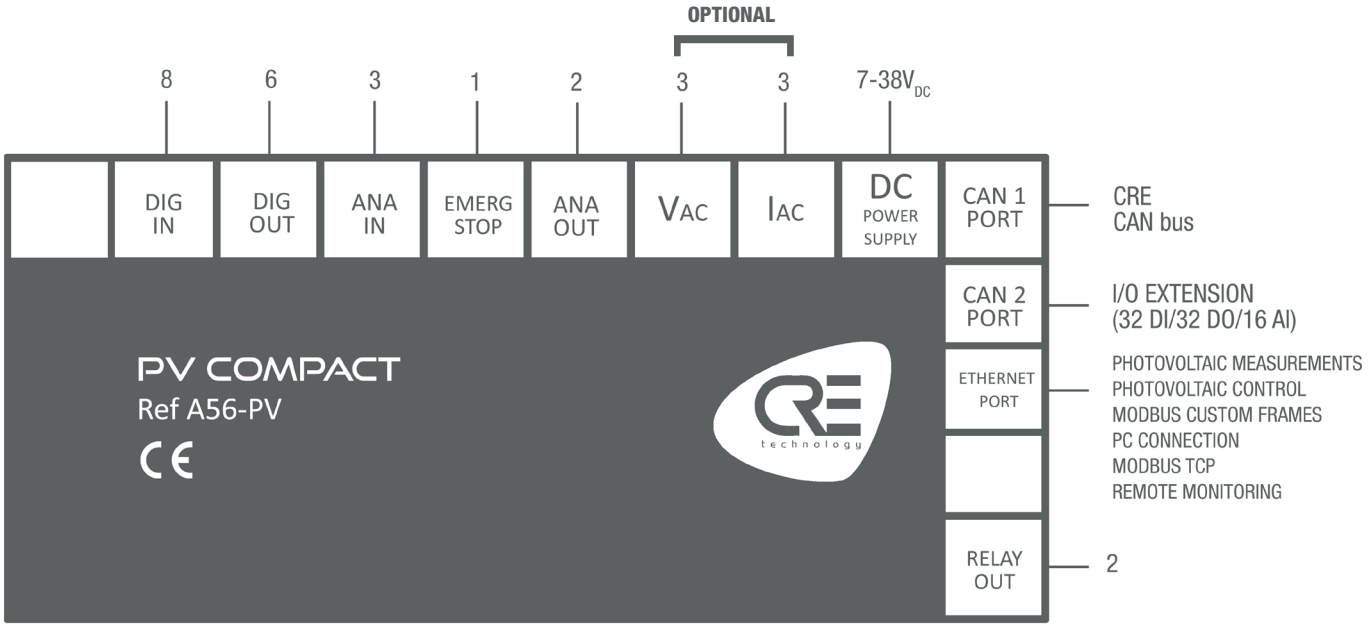
DIRECTIVES
- EMC Directive 2014/30/UE - EMC General Requirements EN 61326-1: Immunity according with EN 61000-6-2 and Emission according with EN 61000-6-4.
- Electrical Safety Directive 2014/35/UE: According with EN 60950-1.
- Vibrations and shocks: According with EN(IEC) 60068-2-6 and IEC 60068-2-27.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

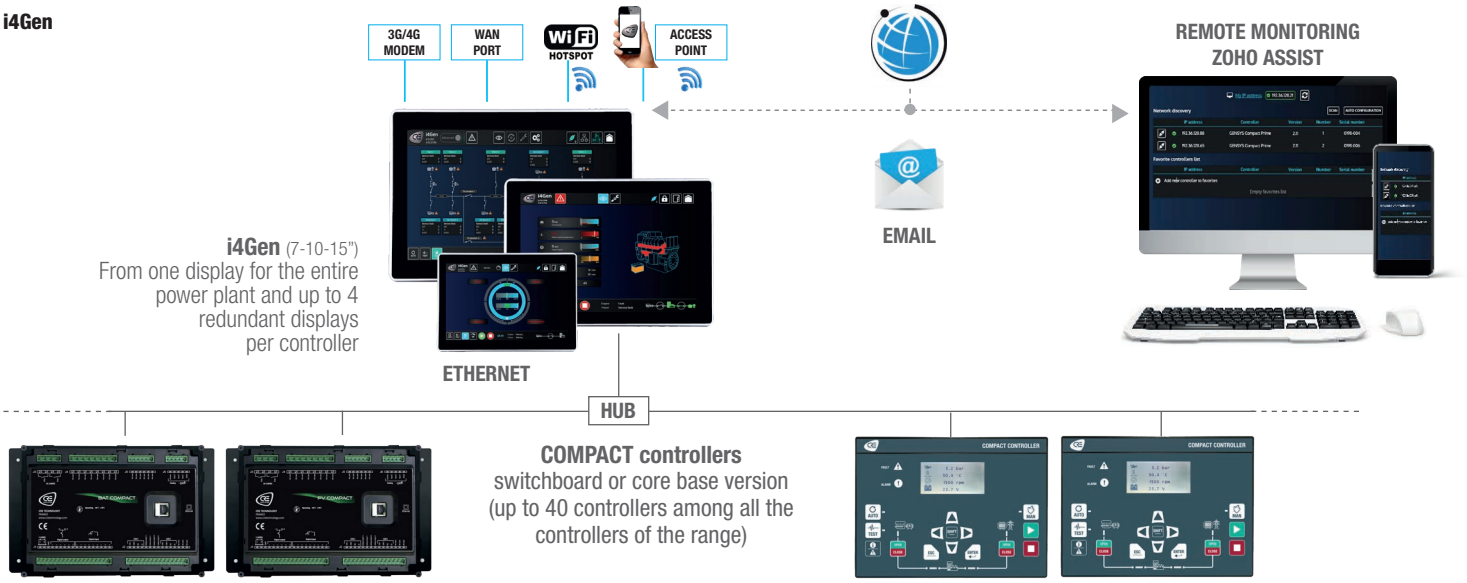
LCD DISPLAY CHARACTERISTICS
- Size: 40x70mm (1.50x2.75in).
- Pixels: 1024x512. Back light: 50cd/m² typical, configurable.
- Contrast: configurable.

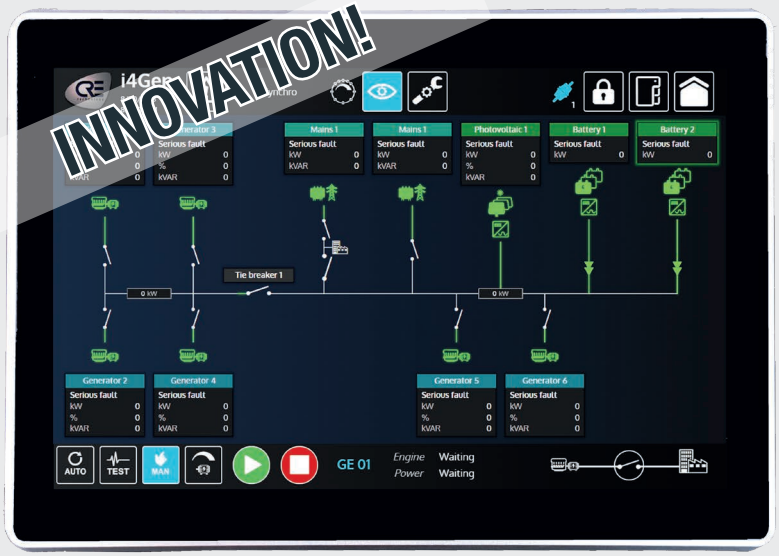
LANGUAGES
English, French, Italian, Spanish in standard. Portuguese, Russian, German and other custom languages are available on request.

WIRING DIAGRAM



ASSOCIATED I4GEN MULTI-TOUCHSCREEN RANGE & MAIN FUNCTIONS



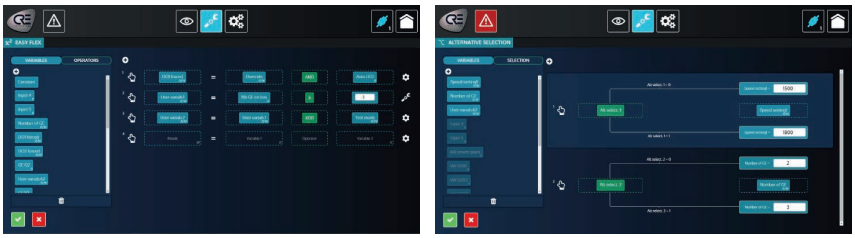


- **The i4Gen touchscreen and color display range (7, 10 and 15 inches) is available for the COMPACT controllers.**
- **i4Gen offers configuration, control, monitoring and logging (parameters, measures, events) of COMPACT controllers.**
- **i4Gen display can be duplicated on computer locally by LAN or remotely by internet or GPRS**
- **Thanks to its WIFI function, i4Gen offers also the capability of remote service and support by connecting your smartphone in connection sharing.**

NEW - SINGLE LINE DIAGRAM AUTOMATICALLY GENERATED FROM EACH COMPACT CONTROLLER CONFIGURATION

In addition to its very advanced functions, the i4Gen now offers you the display of the single-line diagram of your complete power plant, as well as the production curves of each source.

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 trough 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 of the power supply…

BAT COMPACT

All-in-one batteries inverters control

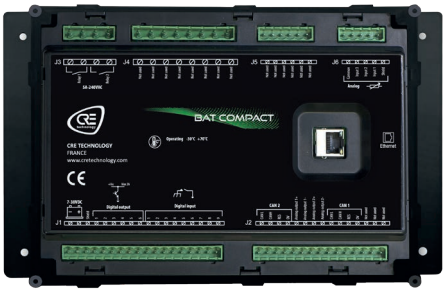
The **BAT COMPACT** is one controller of a complete range for Energy sources and power plant management: Generators, main, Photovoltaic, Batteries storage, Tie breakers. It controls batteries inverters in grid-connected applications with one or several photovoltaics inverters, and one or several generators. The **BAT COMPACT** offers flexibility and time saving thanks to its simple wiring and easy programming.

HARDWARE AND DISPLAY

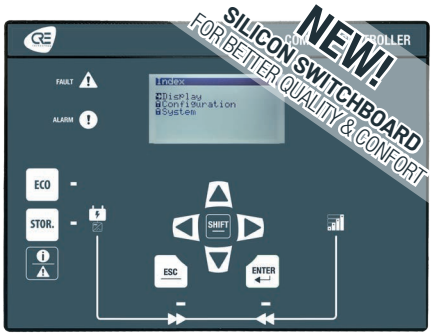
The **BAT COMPACT** is available in both switchboard panel mounted version with display, or core base mounted version and compatible with **i4Gen** touchscreen color display range.

SOFTWARE

The **BAT COMPACT** 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

(DEPENDING ON THE PARAMETERS AVAILABLE IN THE INVERTER)

- ModBus TCP communication with most of the inverters on the market with the ability to create and configure additional custom read and write frames.
- Start/stop of the generator(s) depending on a configurable low battery of charge (SOC) threshold, a configurable max current supplied by the batteries and the desired power reserve.
- Control of the reactive power KVAR batteries: either by imposing a configurable fixed cosphi, or by sharing KVARs between the battery energy and the other sources.
- Management of the battery power imported (charge) or exported (discharge) to the installation.
- Management of ECO mode (possibility to stop all the generators and charge/discharge the batteries according to the sun) or STORAGE mode (one generator, at least, always started and the batteries always fully charged).
- Acquisition of the inverter's electrical parameters via ModBus or via traditional current/voltage inputs (optional).
- Immediate stop of the battery production in case of power return on the generator(s).
- Non-essential load shedding management in case of overload or underfrequency.
- Simple, intuitive and free PC display and configuration software.
- Compatible and communicating with GENSYS COMPACT (generators), MASTER COMACT (network), BTB COMPACT (Tie-Breakers) and PV COMPACT (photovoltaic inverters). Compatible with the i4Gen range of color touchscreen IHM for display and control of storage batteries energy among all available energy sources.
- 10 configurable maintenance cycles (on energy meter or on number of calendar days).
- 3 passwords levels: user, technician, advanced technician.

DISPLAYED INFORMATION

(DEPENDING ON THE PARAMETERS AVAILABLE IN THE INVERTER)

- Battery inverter electrical parameter :
  - 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)
  - Active energy (KWh)
  - Reactive energy (KVARh)
- Record of 500 events/defaults/alarms with timestamps. Displayed on controller screen and i4Gen with advanced filter
- Configurable event logger and info pages
- Values and production curves of the different energy sources displayed on the i4Gen.

CONFIGURABLE EVENTS LOGGER

- Configurable list of parameters needed
- Configurable frequency record
- 1350 logged events with timestamps and real-time value available on non-volatile memory

ELECTRICAL PROTECTION OF THE BATTERIES INVERTER

(DEPENDING ON THE PARAMETERS AVAILABLE IN THE INVERTER)

- <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

PROGRAMTION 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 can be programmed on scheduled operation (cyclic or one-time).
- Easy Flex :
  - 50 lines of programming with logic and arithmetic operators, and execution conditions.
  - All the input/output and variables available.
  - **New:** Debug mode displaying in real time the status or value of all variables in the programming lines.
- Generic threshold management functions with hysteresis.
  - 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 proposed for a firmware update to the latest version if applicable.

MODBUS TCP SLAVE & MASTER COMMUNICATION PORT

In Slave application :

- 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.

In Master application :

- Reading battery inverter parameters
- Control of the battery inverter
- Possibility to create and configure customized frames

REMOTE SUPERVISION WITH I4GEN (7, 10 OR 15 INCHES)

- Internet connection: Wan port or Wifi hotspot or 4G modem or Smartphone Access point.
- Visualization - configuration - programming - remote power plant control.
- Up to 10,000 power plants with a single Zoho Assist account. (Zoho Assist PC, MAC, Smartphone application).
- **New :** Monitoring and control of the complete power plant (generators, mains, photovoltaic, batteries storage,..) through a single line diagram generated automatically.
- 1 single i4Gen can monitor the entire power plant.
- Sending emails to events.

Part numbers:
A56-BAT-10 Core base mounted version
A56-BAT-00 Switchboard mounted version with display

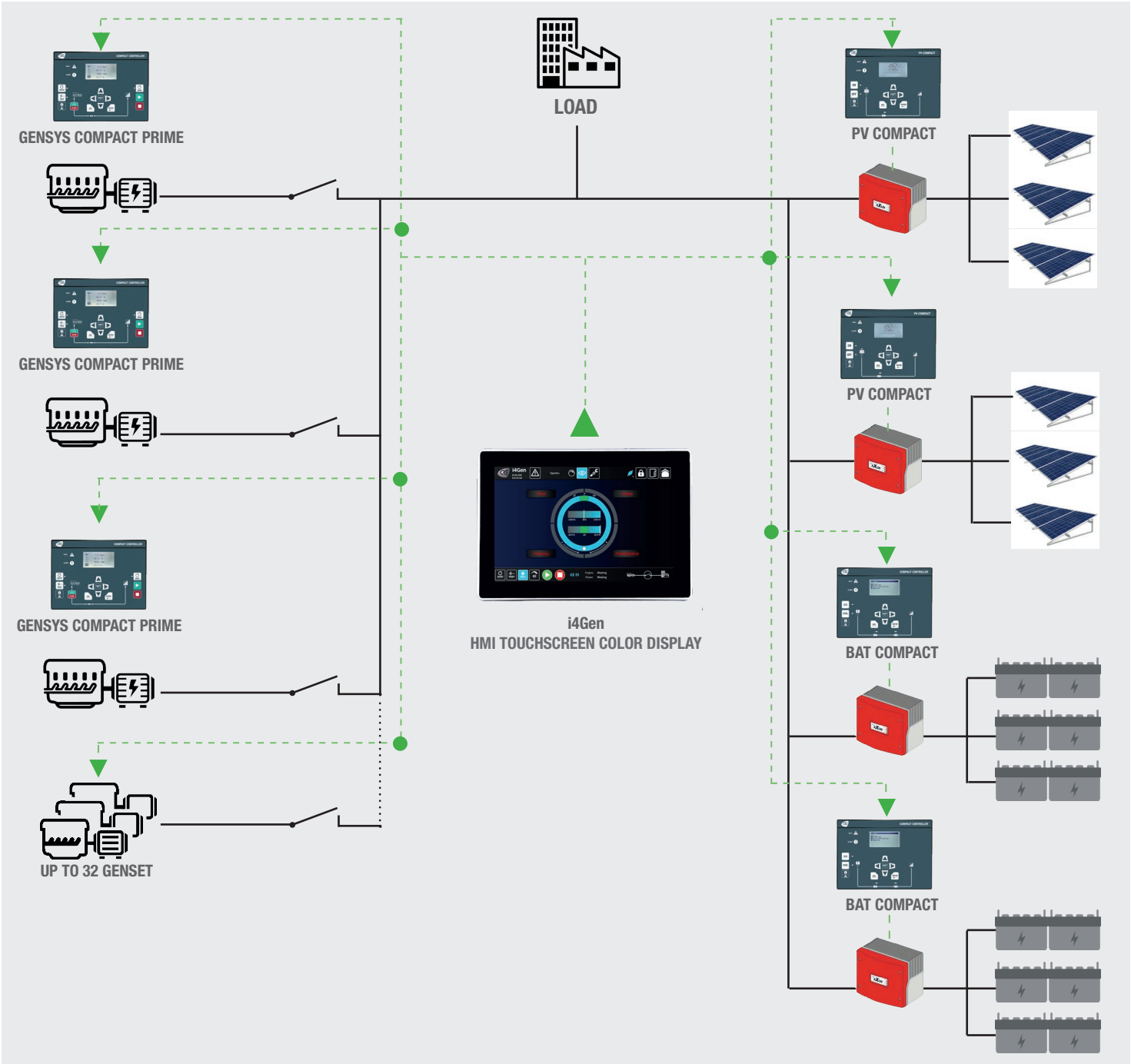
RELATED PRODUCT AND CABLES

Controllers: A56-PRIME, A56-MAST, A56-MAST1, A56-BTB, A56-BAT
I4GEN Touchscreen color display range – Ref A56Vxx
Additional Input/Output – Ref BK5150 + KL1488 + KL2408…
PC Connection Ethernet cable – Ref A53W1
CANbus J1939/CRE/CANopen communication cable – Ref A40xx

APPLICATIONS

- The **BAT COMPACT** is suitable for stand-alone (off-grid) applications with generator(s) and/or photovoltaic panels, and for grid-connected applications, with the possibility of also having generator(s) and/or photovoltaic panels.
- The **BAT COMPACT** controls battery inverters in “Grid Following” mode, meaning the inverters do not manage the control of the voltage and frequency which are imposed by the additional source (Generator or Grid) or in “Grid Forming” mode, meaning the inverters manage the voltage and frequency control (applicable when only batteries and PVs are in operation).
- The **BAT COMPACT** can be combined with GENSYS COMPACT PRIME modules (up to 32) if there are one or more generators, with MASTER COMPACT or MASTER COMPACT 1B modules if there are one or more grids, with BTB COMPACT modules if there are one or more tie-breakers and with PV COMPACT modules if there are photovoltaic panels.

One **BAT COMPACT** module is required per battery inverter when using multiple inverters, allowing the batteries energy production of all operational inverters to be maintained in case of failure of one inverter.



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...38VDC, Max voltage 45VDC during 15mn, current consumption at 24VDC = 130mA + the sum of maximum consumption of each logic output.

Optional:
- AC Voltage inputs: 80...500VAC. Consumption = 100mA max. Accuracy: 1%.
- AC Current inputs: 4 wires. 0...5A. 1VA. Overload 15A during 10s. Accuracy: 0,5%.
- AC Frequency measurement: 35...75 Hz; 15VAC 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, 240VAC.
- 2 x Analog outputs +/-10VDC with adjustable gain and offset

COMMUNICATION PORTS
3 isolated com ports are available:
- 1 CANbus: I/O extensions
- 1 CANbus: CRE protocol for communication between all Compact controllers.
- 1 Ethernet: PC communication/ModBus TCP SUNSPEC.

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 480VAC. Up to 5000m for 400VAC.
- IP Front: IP65/NEMA rating 4 - IP20/NEMA rating 1 for core base version.
- IP Rear: IP20/NEMA rating 1.

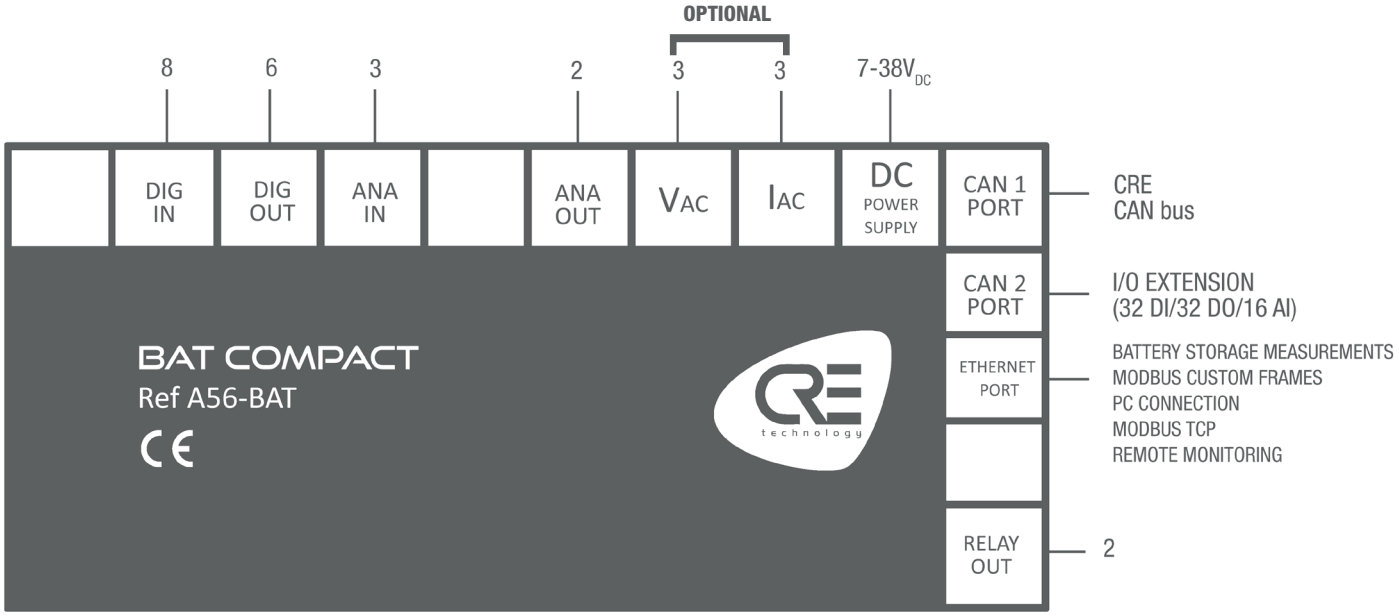
DIRECTIVES
- EMC Directive 2014/30/UE - EMC General Requirements EN 61326-1: Immunity according with EN 61000-6-2 and Emission according with EN 61000-6-4.
- Electrical Safety Directive 2014/35/UE: According with EN 60950-1.
- Vibrations and shocks: According with EN(IEC) 60068-2-6 and IEC 60068-2-27.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

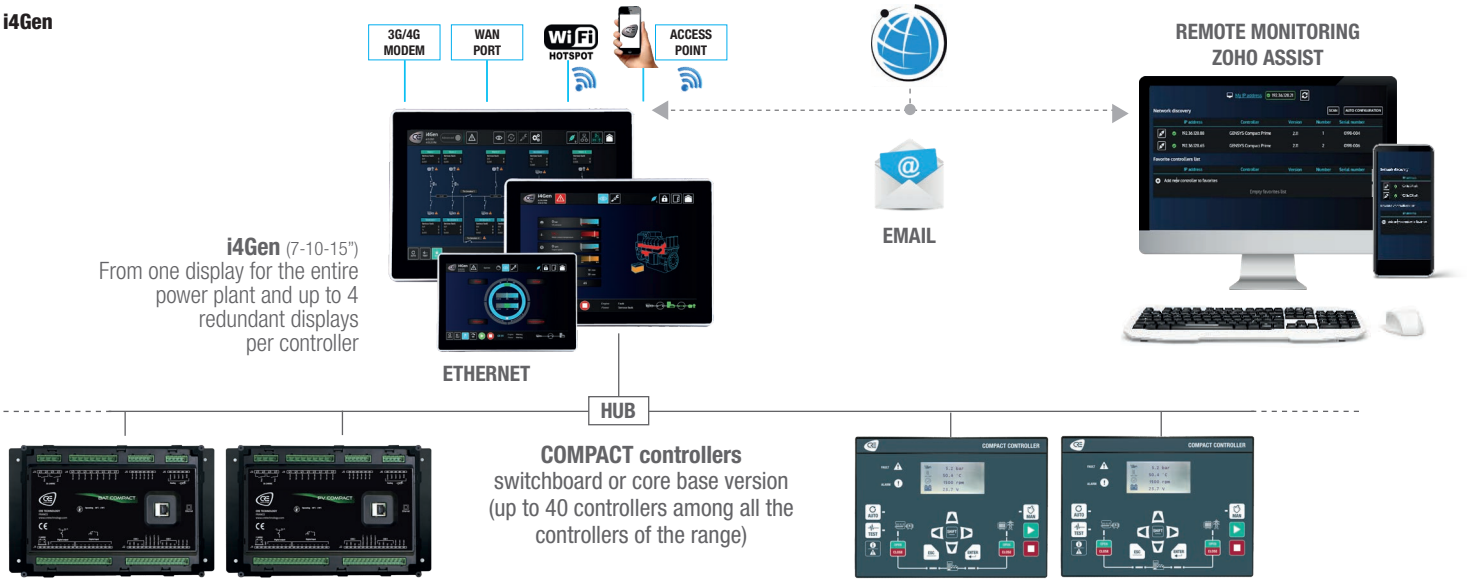
WIRING DIAGRAM

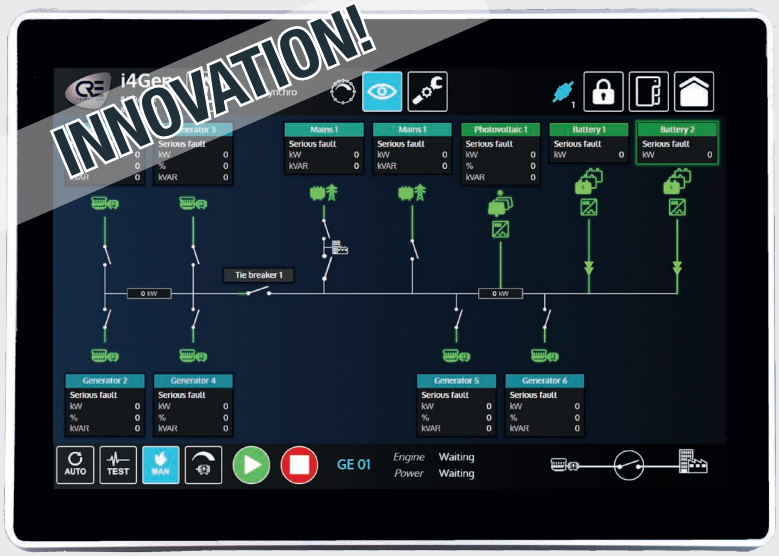


BAT COMPACT

All-in-one batteries inverters control

ASSOCIATED I4GEN MULTI-TOUCHSCREEN RANGE & MAIN FUNCTIONS





- **The i4Gen touchscreen and color display range (7, 10 and 15 inches) is available for the COMPACT controllers.**
- **i4Gen offers configuration, control, monitoring and logging (parameters, measures, events) of COMPACT controllers.**
- **i4Gen display can be duplicated on computer locally by LAN or remotely by internet or GPRS**
- **Thanks to its WIFI function, i4Gen offers also the capability of remote service and support by connecting your smartphone in connection sharing.**

NEW - SINGLE LINE DIAGRAM AUTOMATICALLY GENERATED FROM EACH COMPACT CONTROLLER CONFIGURATION

In addition to its very advanced functions, the i4Gen now offers you the display of the single-line diagram of your complete power plant, as well as the production curves of each source.

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 trough 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 of the power supply…

I4GEN RANGE

Multi-touch screen color display & complete management software

The **i4Gen range** is a user interface made by **CRE TECHNOLOGY** to offer users a complete monitoring of **CRE TECHNOLOGY** controllers.

The unit hardware is a multi-touch screen color display developped for harsh environment and industrial areas, providing access to all controllers' data for control and measurement.

With our advanced touch screen panel, it is possible to manage remote control and monitoring, through an internet access (Wifi – LAN connection), with ZOHO assist platform, and to use e-mail services, for alarms/faults management.

I4GEN.7' '(*)
TOUCHSCREEN & COLOR HMI

I4GEN.10"
TOUCHSCREEN & COLOR HMI

I4GEN.15' '(*)
TOUCHSCREEN & COLOR HMI

(*) ONLY ON THE COMPACT PLATFORM

FEATURES & SPECIFICATIONS

CONTROL AND MANAGEMENT

Direct display

The **i4Gen** is able to display information from 1 to 32 controllers using the Ethernet connection and shows a basic overview of the power plant by using controller CANbus data when applicable.

Single line diagram & SCADA

The i4Gen now offers you the display of the single line diagram of your complete power plant , as well as the production curves of each source. It allows monitoring and global control just with settings of the controllers.

Easy Connect

This function permit to quickly switch the connection between controllers. Automatically detects CRE TECHNOLOGY controllers on an Ethernet network.It allows to automatically configure CRE TECHNOLOGY controllers IP address to be able to access them with the current network configuration.

Multi user display

Several **i4Gen** can be securely connected by an Ethernet hub to a single controller (or a group of controllers). An **i4Gen** display has two Ethernet communication ports. Easy to use for redundancy application multi-level access or long-distance monitoring panel. One **i4Gen** display can also be connected to different and several COMPACT platforms.

Internet connection

With WIFI connection, or LAN cable connexion, the **i4Gen** can be easily connected on internet, to manage remote monitoring or remote control, and emails management.

EVENTS DISPLAYED/RECORDED

An innovative feature will turn major events into 3D graphical object display, to warn the operator about an important event and to facilitate immediate diagnosis (ex: coolant tank will light up in red in case of coolant temp fault or in orange in case of coolant temp alarm). An event recorder is also available on a dedicated display page, indicating time stamp, status, acknowledgment and corresponding variable; the event page can be filtered for diagnosis and investigation of selected variables.

LCD Display Panel

- IP Front: IP65
- Color, touch screen, capacitive,
- Display active screen size:
  - i4Gen.7": 152.4 ×91.44mm (6 x3.6in)
  - i4Gen.10": 257.1×159.7mm (10.1x6.29in)
  - i4Gen.15": 345.23 x 194.54mm (13,59x7,63in)
- Aspect ratio:
  - i4Gen.7": 16:10
  - i4Gen.10": 16:10
  - i4Gen.15": 16:9
- Physical resolution:
  - i4Gen.7" & i4Gen.10": 1280×800 pixels
  - i4Gen.15": 1920x1080 pixels
- Colors displayed: 16.2M
- Brightness:
  - i4Gen.7" & i4Gen.10": 400cd/m²
  - i4Gen.15": 450cd/m²
- Contrast: 800:1
- Typical reaction time Tr/Tf: 30ms
  - i4Gen.7": 13ms
  - i4Gen.10": 30ms
  - i4Gen.15": 35ms
- Visual angle horizontal/vertical:
  - i4Gen.7": 176/176°
  - i4Gen.10" & i4Gen.15": 170/170°
- Backlight/Backlight lifetime: LED/20,000h
- Touch Technology: Projected capacitive 10-Point Multitouch
- Surface Hardness: 6H

OPERATION / MECHANICAL / ENVIRONMENT

- Operating temperature: -10...60°C (14...140°F)
- Humidity: 5...80%
- Net weight:
  - i4Gen.7": 1kg (2.20lb)
  - i4Gen.10": 2kg (4.41lb)
  - i4Gen.15": 8.8kg (19.40lb)
- Sizes:
  - i4Gen.7": LxWxH: 190,40x132,44x51,70mm (7.5x5.2x2in)
  - i4Gen.10": LxWxH: 268,49x186,5x59,7mm (10.6x7.36x2.36in)
  - i4Gen.15": LxWxH: 398,81x249,12x68,80mm (15.7x9.8x2.7in)
- Material: Aluminium/Iron
- Quad core processor
- Mounting VESA 100

POWER

- Working power:
  - i4Gen.7": 12VDC
  - i4Gen.10" & i4Gen.15": 9...36VDC
- Reverse polarity protection (with convertor provided)
- Overload protection (with convertor provided)

EXTERNAL CONNECTORS

For i4Gen.7"
- 2 x USB 3.0
- 1 x Ethernet (LAN)
- 1 x WIFI (VLAN)
- 1 x DC-In (connectors screwable): 12VDC
- 1 x On/Off button
- 1 x RS485 port for RTU modbus

For i4Gen.10" and i4Gen.15"
- 4 x USB 3.0
- 2 x Ethernet (LAN)
- 2 x WIFI (VLAN)
- 1 x DC-In (connectors screwable): 9...36VDC
- 1 x On/Off button
- 2 x RS485 port for RTU modbus

CE EAC

Fanless | Low Power | DDR3L | AiRD | IP65

SSD DRIVES

Part number:
i4Gen.7": A56V0-07-00 (Compact Platform)
i4Gen.10" : A56V0-10-00 (Compact Platform)
i4Gen.15" : A56V0-15-00 (Compact Platform)

RELATED PRODUCTS & CABLES

All 56-xx & A53Zxx references controller
Ethernet cable – Ref A53W1
Ethernet switchs - Ref EDS-208A

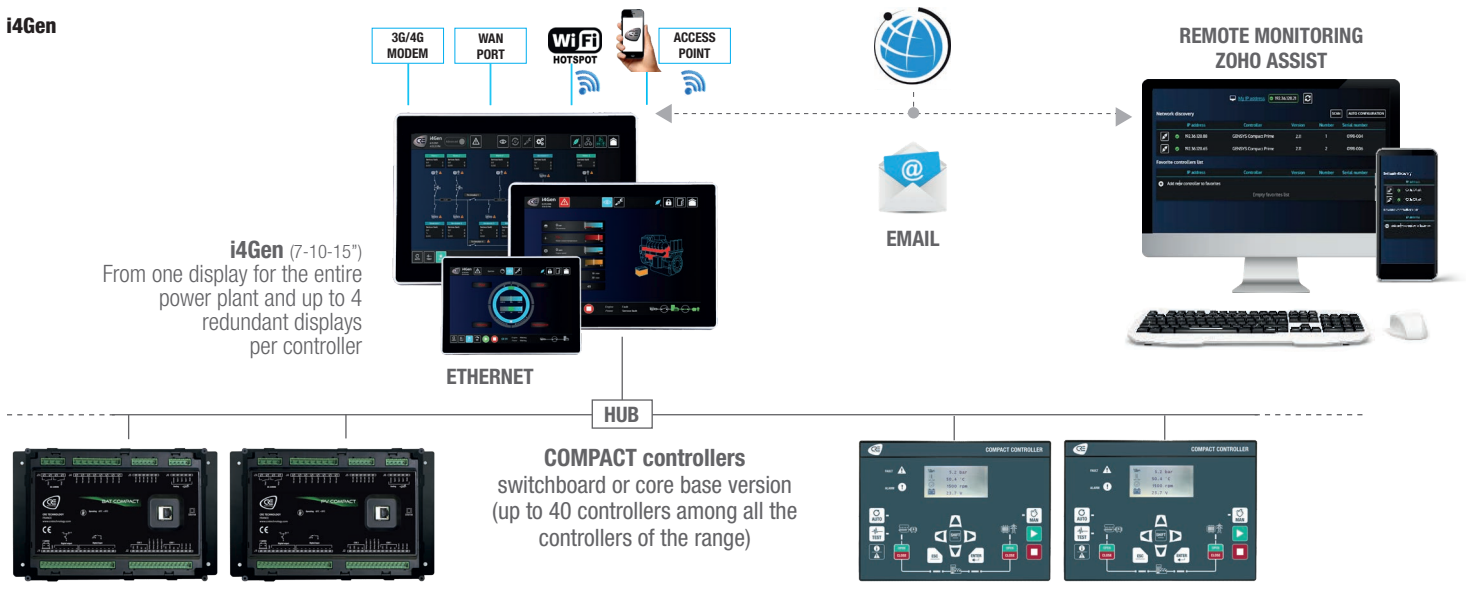
I4GEN RANGE

Multi-touch screen color display & complete management software

APPLICATIONS

- Remote display, with touch screen and colors technology,
- Single line diagram & SCADA mode
- Remote monitoring with ZOHO assist through internet access (WIFI or LAN cable),
- Emailing management for alarms and defaults management,
- Adding the RS485/ RTU ModBus on COMPACT platform.

REMOTE MONITORING/CONTROL AND EMAILING MANAGEMENT



MASTER COMPACT RANGE

All-in-one controller for generator power plant in mains paralleling

The **MASTER COMPACT & MASTER COMPACT 1B** are two controllers of a complete range for Energy sources and power plant management: Generators, Mains, Photovoltaic, Batteries storage, Tie breakers. Those 2 controllers made to manage generator power plants from 1 to 32 generators in parallel with mains. **The MASTER COMPACT** is suitable for applications with 2 circuit-breakers (Bus and mains) while the **MASTER COMPACT 1B** is suitable for applications with 1 circuit-breaker (no breaker on Bus). **MASTER COMPACT** range offers flexibility and time saving thanks to its simple wiring and easy programming.

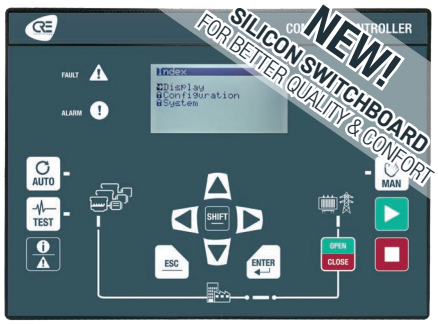
HARDWARE AND DISPLAY

Both modules are available in switchboard panel mounted version with display, or core base mounted version and compatible with **i4Gen** touchscreen color display range.

SOFTWARE

Both modules are configurable from their 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

- Power plant frequency/KW and Voltage/KVAR control through CANbus.
- Power plant electrical parameters acquisition from wiring (PT – CTs) or from CANbus (CRE).
- Remote start and test mode available On/Off load.
- Mains failure detection and No Break changeover with adjustable load transfer time and paralleling time.
- **New:** Possibility of operator mains transfer validation.
- Mains permanent paralleling in fix load or peak shaving and PF control.
- Synchronization: Frequency, Phase and Voltage synchronization (Synchoscope 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 Frequency/kW and Voltage/kVAR regulation which does not require PID adjustment in the MASTER (except for the phase synchronisation).
- Unload breakers management according with generators power available and load demand.
- 3 password levels: end user, technician, advanced technician.
- Automatic application management with several mains (up to 32).
- Automatic management of CANbus inhibitions in applications with Bus Tie Breaker.
- Automatic clock synchronization by CANbus.

DISPLAYED INFORMATIONS

- Power plant electrical parameters:
  - Voltage (3 phases RMS, L-L and L-N)
  - Current (3 phases RMS through CANbus or 1 phase RMS through CT)
  - Frequency
  - Active and reactive power
  - Power factor
- Mains electrical parameters:
  - Voltage (3 phases RMS, L-L and L-N)
  - Frequency
  - Current (3 phase RMS)
  - Active power (3 phases + total)
  - Reactive power (3 phases + total)
  - Power factor (3 phases + total)
- Synchroscope, differential voltmeter and frequency meter, synch check relay authorization values.
- Record of 500 events/alarms/faults with timestamps and real-time values. Displayed on controller screen and i4Gen with advanced filter.
- Configurable event logger and info pages.

CONFIGURABLE EVENTS LOGGER

- Configurable list of parameters needed
- Configurable frequency record
- 1350 logged events with timestamp and real-time value are available, on non volatile memory.

ELECTRICAL PROTECTIONS

- Power plant electrical protections:
  - <F, >F: ANSI Code 81L, 81H
  - <U, >U, U unbalance: ANSI Code 27, 59, 47
  - <KW, >KW, -KW: ANSI Code 37P, 32P, 32RP
  - <KVAR, >KVAR, -KVAR: ANSI Code 37Q, 32Q, 32RQ
- Mains electrical protections:
  - <F, >F: ANSI Code 81L, 81H
  - <U, >U, U unbalance: ANSI Code 27, 59, 47
  - I unbalance: ANSI Code 46
  - <KW, >KW, -KW: ANSI Code 37P, 32P, 32RP
  - <KVAR, >KVAR, -KVAR: ANSI Code 37Q, 32Q, 32RQ
  - Vector Jump, ROCOF: ANSI Code 78, 81

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.
- Closing failure, opening failure, unexpected closure, unexpected opening alarm management

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…) 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
  - **New:** Debug mode which display in real time all programming lines variables state or value.
- 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 PC software, you will automatically be suggested for a firmware update to the latest version if applicable.

MODBUS TCP SLAVE & MASTER COMMUNICATION PORT

In Slave application :

- 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.

New - In Master application :

- Possibility to create and configure customized frames

REMOTE SUPERVISION WITH I4GEN (7, 10 OR 15 INCHES)

- Internet connection: Wan port or Wifi hotspot or 4G modem or Smartphone Access point.
- Visualization - configuration - programming - remote power plant control.
- Up to 10,000 power plants with a single Zoho Assist account. (Zoho Assist PC, MAC, Smartphone application).
- **New :** Monitoring and control of the complete power plant (generators, mains, photovoltaic, batteries storage,..) through a single line diagram generated automatically.
- 1 single i4Gen can monitor the entire power plant.
- Sending emails on events.

Part numbers:

A56-MAST-10 Core base mounted version
A56-MAST-00 Switchboard mounted version with display
A56-MAS1B-10 Core base mounted version
A56-MAS1B-00 Switchboard mounted version with display

RELATED PRODUCTS AND CABLES

i4GEN Touchscreen color display range – Ref A56Vxx
GENSYS COMPACT Prime – Ref A56-PRIME
Additional I/O – Ref BK5150 + KL1488 + KL2408 …
PC Connection Ethernet cable – Ref A53W1
CANbus J1939/CRE/CANopen communication cable – Ref A40xx

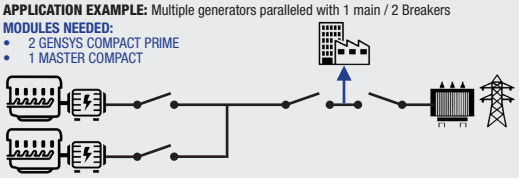
APPLICATIONS

MASTER COMPACT and **MASTER COMPACT 1B** offer changeover, synchronizing and load control of the power plant to the mains in manual or automatic mode. The different applications are

- Changeover mode: when mains failure occurs, **MASTER COMPACT** will start automatically the complete power plant and will supply the load. When the main is restored **MASTER COMPACT** will transfer the load back on the mains in changeover mode (no synchronization).
- No Break changeover mode: when main failure occurs, **MASTER COMPACT** will start automatically the complete power plant and will supply the load. When the main is restored **MASTER COMPACT** will synchronize and transfer smoothly the load back on the mains.
- Permanent mains paralleling: **MASTER COMPACT** is able to run the power plant in mains permanent paralleling in base load (fix power on generators) or in peak shaving (fix power on mains).

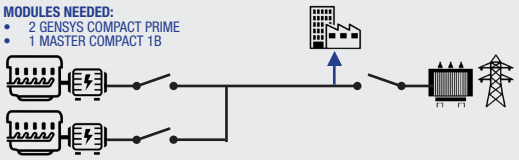
APPLICATION EXAMPLE: Multiple generators paralleled with 1 main / 2 Breakers

MODULES NEEDED:
- 2 GENSYS COMPACT PRIME
- 1 MASTER COMPACT



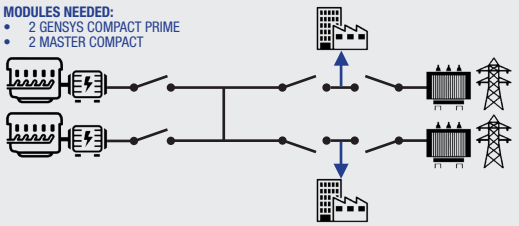
APPLICATION EXAMPLE: Multiple generators paralleled with 1 main / 1 Breaker

MODULES NEEDED:
- 2 GENSYS COMPACT PRIME
- 1 MASTER COMPACT 1B



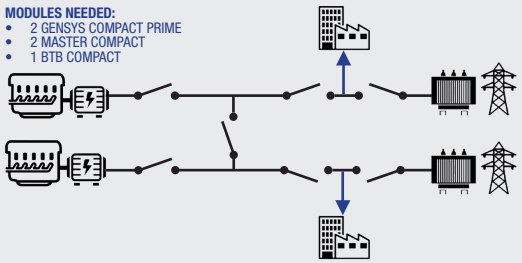
APPLICATION EXAMPLE: Multiple generators paralleled with multiple mains

MODULES NEEDED:
- 2 GENSYS COMPACT PRIME
- 2 MASTER COMPACT



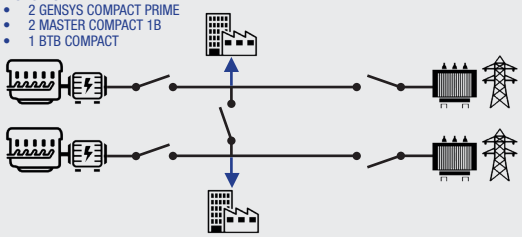
APPLICATION EXAMPLE: H Configuration with Bus Tie Breaker and mains 2 Breakers

MODULES NEEDED:
- 2 GENSYS COMPACT PRIME
- 2 MASTER COMPACT
- 1 BTB COMPACT



APPLICATION EXAMPLE: H Configuration with Bus Tie Breaker and mains 1 Breaker

MODULES NEEDED:
- 2 GENSYS COMPACT PRIME
- 2 MASTER COMPACT 1B
- 1 BTB COMPACT



For applications with multi mains connected directly together, you have to use 2 breakers manage by the MASTER COMPACT. Only one breaker manage by the MASTER COMPACT 1B couldn't manage all sequences.

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 mains / 3ph + N for power plant. Neutral terminal does not need to be connected.
- AC Current inputs: 4 wires (3ph) for mains / 2 wires (1ph) for power plant. 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 input 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 +/-10VDC: isolated output with adjustable span and offset.

COMMUNICATION PORTS
3 isolated ports available:
- 1 CANbus: I/O extensions.
- 1 CANbus : CRE protocol for communication between all COMPACT controllers.
- 1 Ethernet: PC communication/ModBus TCP.

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.

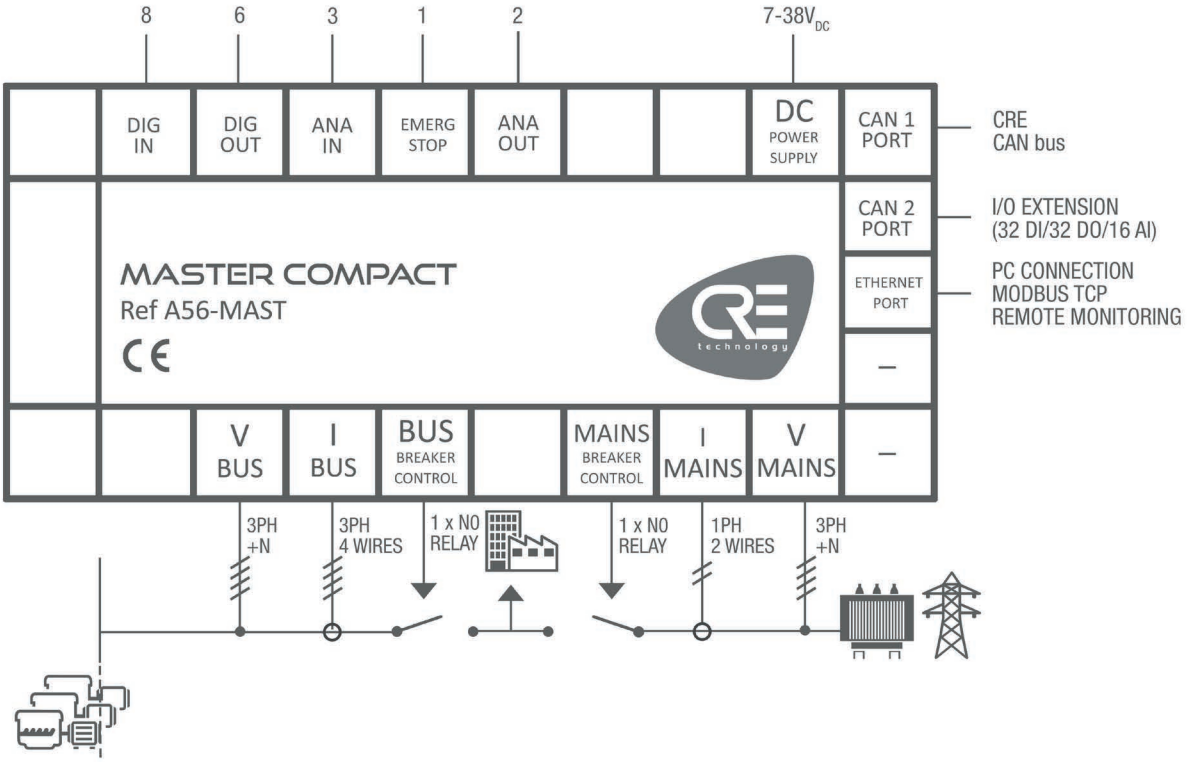
SIZE AND WEIGHT
- Switchboard mounted version with display:
  - Dimensions: 245x182x40mm (9.64x7.16x1.57in).
  - Panel cut out: 220x160mm (8.7x6.3 in).
- Core base mounted version:
  - Dimensions: 260x157x44mm (10.24x6.18x1.73in) (depth with connectors).
  - Fixing dimensions (4 screws): 238x129mm (9.37x5.08in). 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.

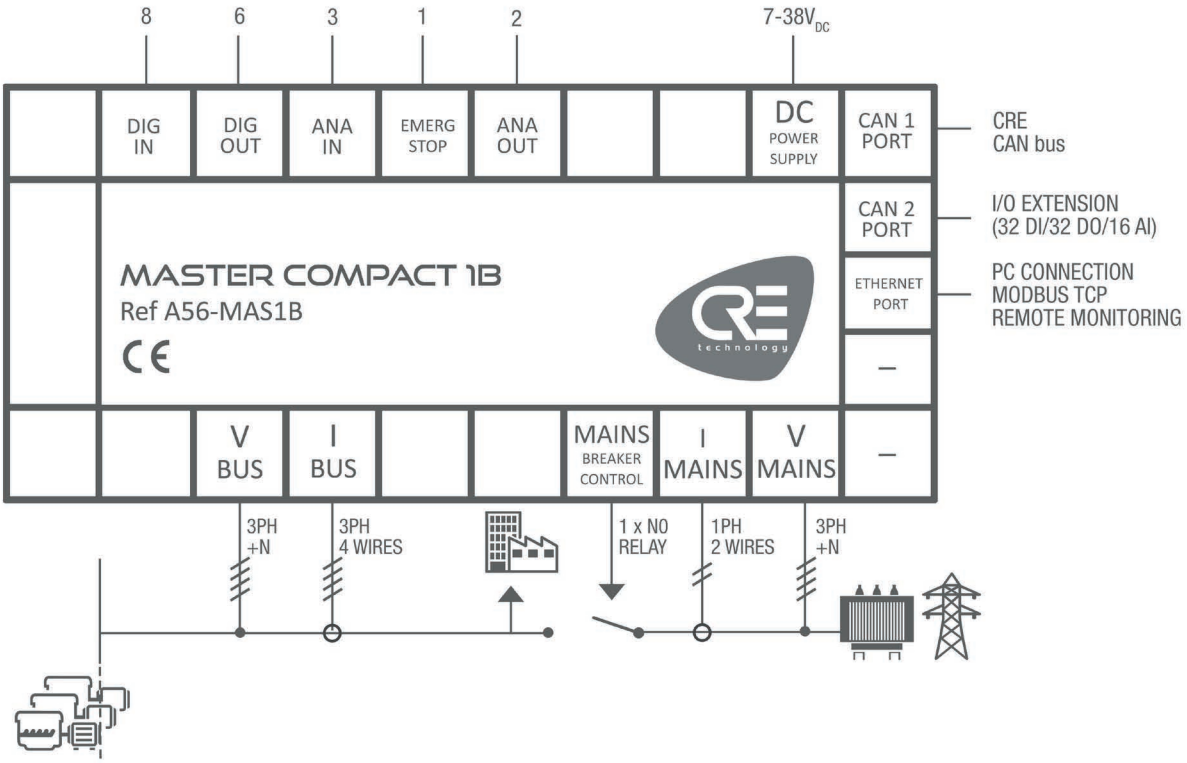
LANGUAGES
English, French, Italian, Spanish in standard.
Portuguese, Russian, German and other custom languages are available on request.

WIRING DIAGRAMS

MASTER COMPACT



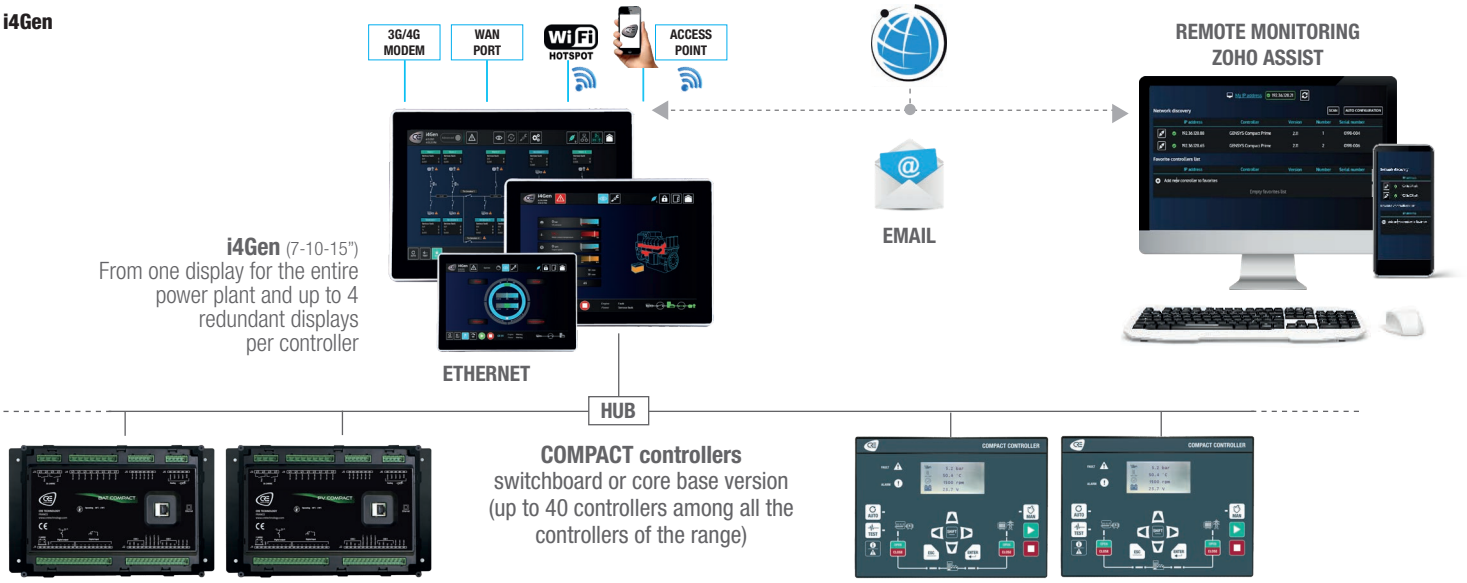
MASTER COMPACT 1B



MASTER COMPACT RANGE

All-in-one controller for generator power plant in mains paralleling

ASSOCIATED I4GEN MULTI-TOUCHSCREEN RANGE & MAIN FUNCTIONS



- **The i4Gen touchscreen and color display range (7, 10 and 15 inches) is available for the COMPACT controllers.**
- **i4Gen offers configuration, control, monitoring and logging (parameters, measures, events) of COMPACT controllers.**
- **i4Gen display can be duplicated on computer locally by LAN or remotely by internet or GPRS**
- **Thanks to its WIFI function, i4Gen offers also the capability of remote service and support by connecting your smartphone in connection sharing.**

NEW - SINGLE LINE DIAGRAM AUTOMATICALLY GENERATED FROM EACH COMPACT CONTROLLER CONFIGURATION

In addition to its very advanced functions, the i4Gen now offers you the display of the single-line diagram of your complete power plant, as well as the production curves of each source.

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 trough 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 of the power supply…

BTB COMPACT

Controller for bus tie-breaker applications

The **BTB COMPACT** is one controller of a complete range for Energy sources and power plant management: Generators, Mains, Photovoltaic, Batteries storage, Tie breakers.

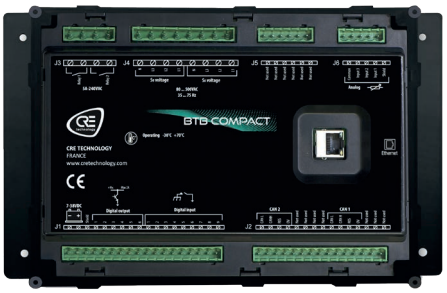
This controller is made to manage bus tie-breaker applications up to 32 bus tie-breaker. It operates in combination with **GENSYS COMPACT PRIME** (for generators) and **MASTER COMPACT/MASTER COMPACT 1B** (for mains) modules. It offers flexibility and time saving thanks to its simple wiring and easy programming.

HARDWARE AND DISPLAY

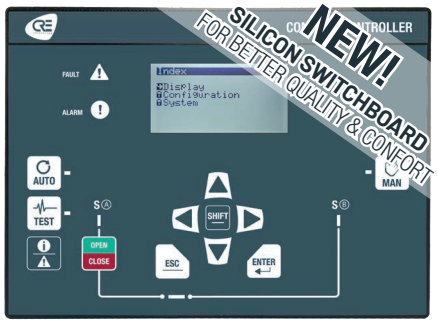
The **BTB COMPACT** is available in both switchboard panel mounted version with display, or core base mounted version and compatible with **i4Gen** touchscreen color display range.

SOFTWARE

The **BTB COMPACT** is configurable from its front panel display, from **i4Gen HMI**, or through the free **i4Gen Suite** software.



CORE BASE DIN RAIL MOUNTED VERSION



SWITCHBOARD MOUNTED VERSION WITH DISPLAY

FEATURES

CONTROL AND MANAGEMENT

- Electrical parameters acquisition from wiring (PT) and from CANbus (KW, KVAR) of **GENSYS COMPACT PRIME** and **MASTER COMPACT**.
- Synchronization: Frequency, Phase and Voltage synchronization from Source A to Source B or from Source B to Source A (Synchro scope 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).
- Adjustable KW ramp and KVAR ramp after synchronization. The 2 ramps are independents and allow managing properly the active and reactive power equalization if KW/KVAR ratio are different on source A and source B before tie-breaker closure.
- Optimized frequency/KW and Voltage/KVAR regulation which does not require PID adjustment in the **BTB COMPACT** (except for the phase synchronization). The PID control is managed by each generator with **GENSYS COMPACT PRIME**.
- Automatic detection of mains paralleling on source A or source B. Synchronization from mains to generators will be detected and not allowed. Only synchronization from generators to generators and from generators to mains will be allowed.
- 3 password levels: end user, technician, advanced technician.
- Automatic management of CANbus inhibitions according with tie-breaker closed or opened
- Automatic clock synchronization by CANbus.

DISPLAYED INFORMATIONS

- Source A electrical parameters:
  - Voltage (3 phases RMS, L-L and L-N)
  - Frequency
  - Active and reactive power (from CANbus)
  - Power factor (from CANbus)
- Source B electrical parameters:
  - Voltage (3 phases RMS, L-L and L-N)
  - Frequency
  - Active and reactive power (from CANbus)
  - Power factor (3 phases + total) (from CANbus)
- 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.

CONFIGURABLE EVENTS LOGGER

- Configurable list of parameters needed
- Configurable frequency record
- 1350 logged events with timestamp and real-time value are available, on non volatile memory.

ELECTRICAL PROTECTIONS:

- Source A electrical protections:
  - <F, >F: ANSI Code 81L, 81H
  - <U, >U, U unbalance: ANSI Code 27, 59, 47
- Source B electrical protections:
  - <F, >F: ANSI Code 81L, 81H
  - <U, >U, U unbalance: ANSI Code 27, 59, 47

BREAKERS CONTROL

- 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.
  - **New** : Debug mode which display in real time all programming lines variables state or value.
- 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** PC software, you will automatically be suggested for a firmware update to the latest version if applicable.

MODBUS TCP SLAVE & SLAVE COMMUNICATION PORT

In Slave application :

- 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.

New - In Master application :

- Possibility to create and configure customized frames

REMOTE SUPERVISION WITH I4GEN (7, 10 OR 15 INCHES)

- Internet connection: Wan port or Wifi hotspot or 4G modem or Smartphone Access point.
- Visualization - configuration - programming - remote power plant control.
- Up to 10,000 power plants with a single Zoho Assist account. (Zoho Assist PC, MAC, Smartphone application).
- **New :** Monitoring and control of the complete power plant (generators, mains, photovoltaic, batteries storage,..) through a single line diagram generated automatically.
- 1 single i4Gen can monitor the entire power plant.
- Sending emails on events.

Part numbers:
A56-BTB-10 Core base mounted version
A56-BTB-00 Switchboard mounted version with display

RELATED PRODUCTS AND CABLES

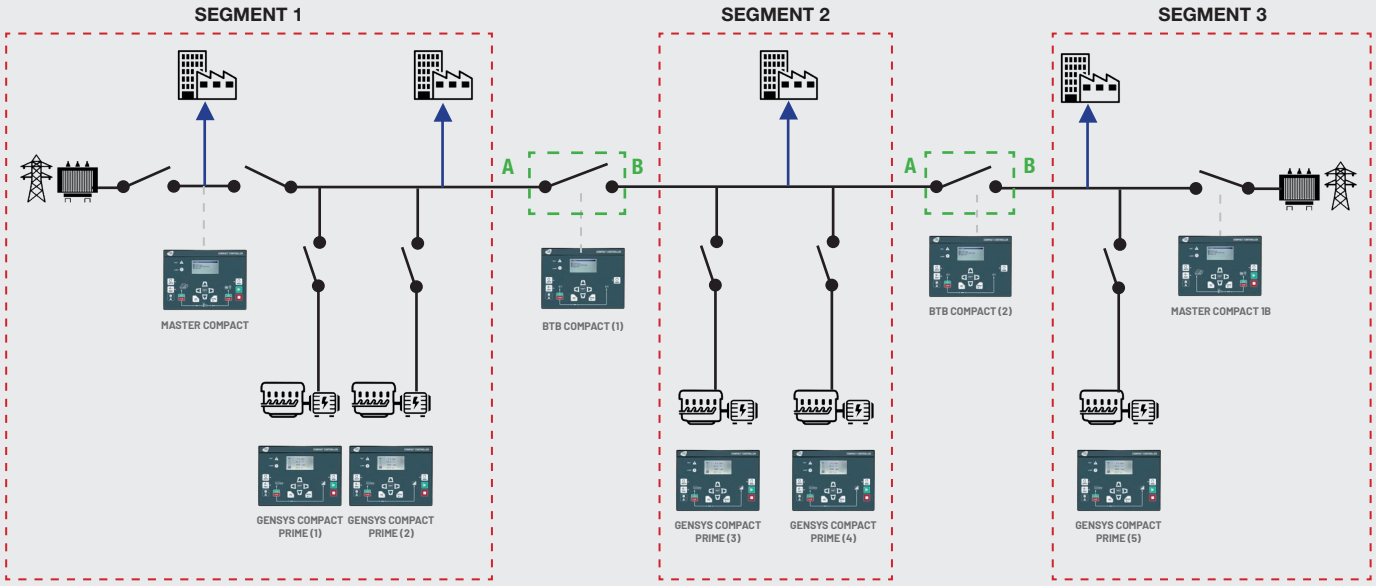
i4Gen Touchscreen color display range – Ref A56Vxx
GENSYS COMPACT PRIME – Ref A56-PRIME
MASTER COMPACT– Ref A56-MAST
MASTER COMPACT 1B – Ref A56-MAS1B
Additional I/O – Ref BK5150 + KL1488 + KL2408 …
PC Connection Ethernet cable – Ref A53W1
CRE/CANopen communication cable – Ref A40xx

APPLICATIONS

BTB COMPACT associated with **GENSYS COMPACT PRIME** and **MASTER COMPACT** allows full automatic operation with the best easy way of the market:

- 32 modules **BTB COMPACT** and **MASTER COMPACT** + 32 modules **GENSYS COMPACT PRIME** limited to 40 modules in total could be used together on the same application.
- The complete power plant is divided in segments. A segment is a group of **MASTER COMPACT** and **GENSYS COMPACT PRIME** module which will always communicate each other. Each **BTB COMPACT** has a different segment on source A side and on source B side.
- When the tie-breaker is opened, modules of segment on source A communicate each other but do not communicate with modules of segment on source B. When the tie-breaker is closed, modules of segment on source A communicate each other but also with modules of segment on source B.
- When manual “start” or remote automatic “start” is activate on **BTB COMPACT**, synchronization signal will be sent through CANbus to all operating **GENSYS COMPACT PRIME** of segment A to synchronize frequency, phase and voltage with segment B (or **GENSYS COMPACT PRIME** of segment B with segment A according with your configuration).
- After breaker closure, **BTB COMPACT** will send KW control signal and KVAR control signal through CANbus to equalize smoothly with adjustable ramp the active and reactive power of segment A and segment B.

APPLICATION EXAMPLE WITH MULTI BTB COMPACT AND MULTI MASTER COMPACT AND MULTI GENSYS COMPACT PRIME, AND PARAMETERS CONFIGURATION FOR EACH MODULE:



MODULE	PRODUCT NUMBER	QUANTITY OF GENSYS COMPACT PRIME	QUANTITY OF MASTER COMPACT/ BTB COMPACT	SEGMENT	SEGMENT A	SEGMENT B
MASTER COMPACT	1	5	4	1	NOT AVAILABLE	NOT AVAILABLE
MASTER COMPACT 1B	2	5	4	3	NOT AVAILABLE	NOT AVAILABLE
BTB COMPACT 1	3	5	4	NOT AVAILABLE	1	2
BTB COMPACT 2	4	5	4	NOT AVAILABLE	2	3
GENSYS COMPACT PRIME 1	1	5	4	1	NOT AVAILABLE	NOT AVAILABLE
GENSYS COMPACT PRIME 2	2	5	4	1	NOT AVAILABLE	NOT AVAILABLE
GENSYS COMPACT PRIME 3	3	5	4	2	NOT AVAILABLE	NOT AVAILABLE
GENSYS COMPACT PRIME 4	4	5	4	2	NOT AVAILABLE	NOT AVAILABLE
GENSYS COMPACT PRIME 5	5	5	4	3	NOT AVAILABLE	NOT AVAILABLE

BTB COMPACT

Controller for bus tie-breaker applications

SPECIFICATIONS

ELECTRICAL SYSTEM

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

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 Source A / 3ph + N for Source B. Neutral terminal does not need to be connected.
- 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 +/-10VDC: isolated output with adjustable span and offset.

COMMUNICATION PORTS

3 isolated ports available:

- 1 CANbus: I/O extensions.
- 1 CANbus : CRE protocol for communication between all COMPACT controllers.
- 1 Ethernet: PC communication/ModBus TCP.

ENVIRONMENT

- Operating temperature: -30... 70°C (-22...158°F).
- Storage temperature: -40...70°C (-40...158°F).
- Humidity: 95% non-condensing.
- 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).

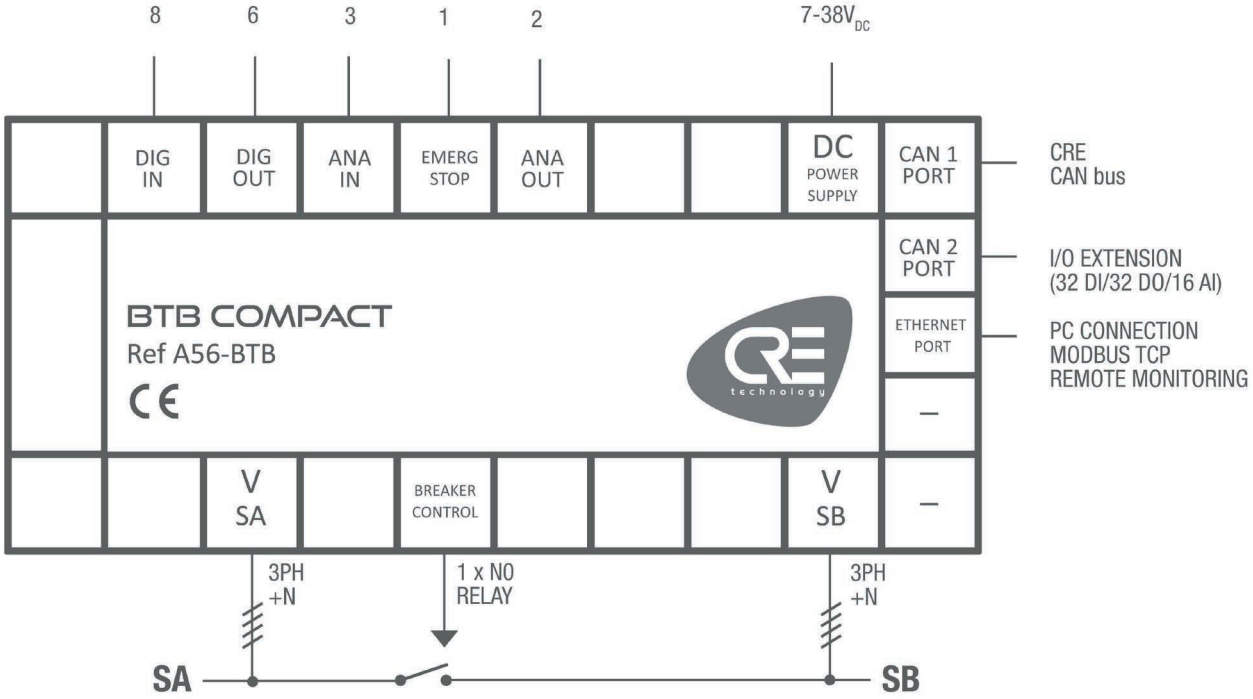
LCD DISPLAY CHARACTERISTICS

- Size: 40x70mm (1.50 x 2.75in).
- 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.

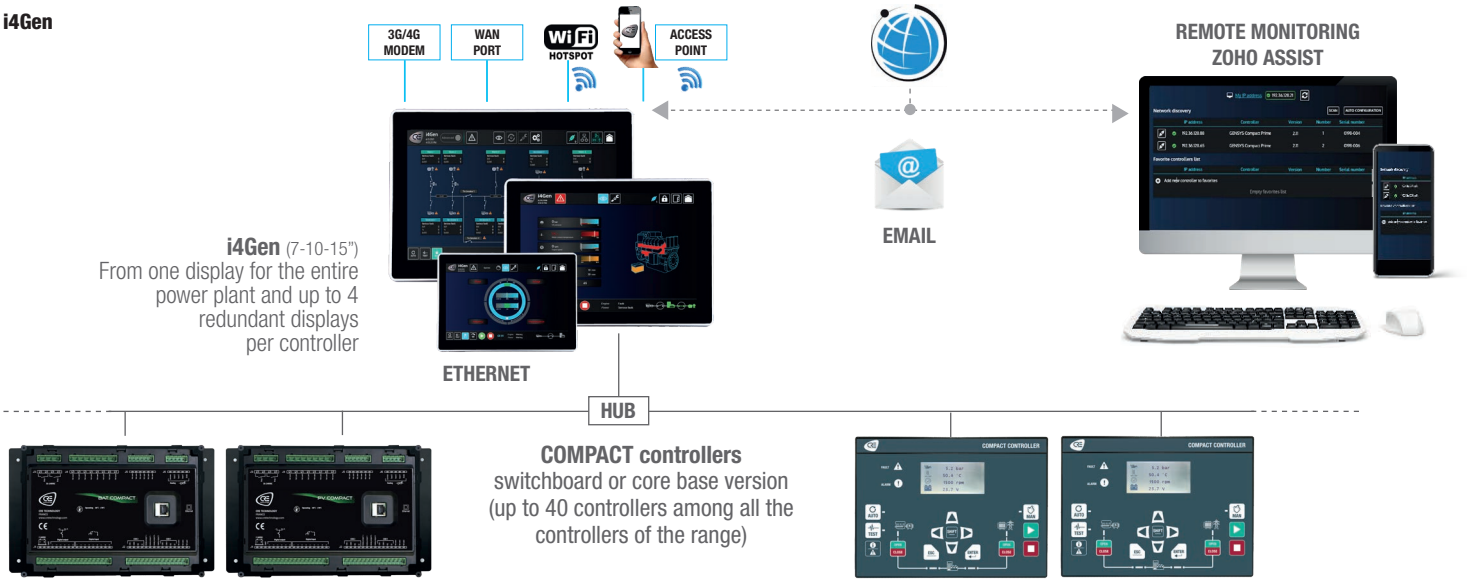
WIRING DIAGRAM



BTB COMPACT

Controller for bus tie-breaker applications

ASSOCIATED I4GEN MULTI-TOUCHSCREEN RANGE & MAIN FUNCTIONS

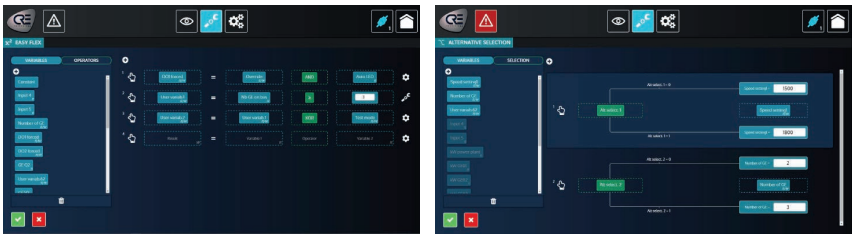


- **The i4Gen touchscreen and color display range (7, 10 and 15 inches) is available for the COMPACT controllers.**
- **i4Gen offers configuration, control, monitoring and logging (parameters, measures, events) of COMPACT controllers.**
- **i4Gen display can be duplicated on computer locally by LAN or remotely by internet or GPRS**
- **Thanks to its WIFI function, i4Gen offers also the capability of remote service and support by connecting your smartphone in connection sharing.**

NEW - SINGLE LINE DIAGRAM AUTOMATICALLY GENERATED FROM EACH COMPACT CONTROLLER CONFIGURATION

In addition to its very advanced functions, the i4Gen now offers you the display of the single-line diagram of your complete power plant, as well as the production curves of each source.

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 trough 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 of the power supply…

SYNCHRO COMPACT

Synchronizing and protection controllers

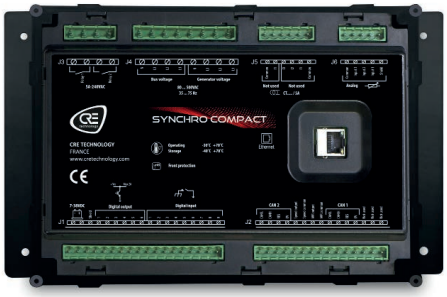
The **SYNCHRO COMPACT** offers synchronizing and protections. The **SYNCHRO COMPACT** offers flexibility and time saving thanks to its simple wiring, all features included (no option), and easy programming.

HARDWARE AND DISPLAY

The **SYNCHRO COMPACT** is a generator controller range available in both switchboard panel mounted version with display, or core base mounted version and compatible with **i4Gen**touchscreen color display.

SOFTWARE

The **SYNCHRO COMPACT** is configurable from its front panel display, from **i4Gen**, or through the free **CRE PC** software.



CORE BASE DIN RAIL MOUNTED VERSION

SWITCHBOARD MOUNTED VERSION WITH DISPLAY

FEATURES

CONTROL AND MANAGEMENT

- Compatible with all engines ECUs in J1939, speed governors, alternators and AVRs/DVRs voltage regulators.
- Synchronization and dead Bus management.
- Dynamic synchronization: Frequency, Phase and Voltage synchronization (Synch display available on screen). Synch check (ANSI 25) + Phase sequence protection.
- New optimized PID loop with exceptional performance in synchronization.
- 2 password levels.
- Automatic clock synchronization by CANbus.

DISPLAYED INFORMATIONS

Generator electrical parameters:
- Voltage (3 phases RMS, L-L and L-N)
- Frequency

Bus electrical parameters:
- Frequency
- Active and reactive power (calculated)

- Synchroscope and synch check relay authorization values.
- Log of alarms and faults with timestamps and real-time values.
- Configurable event logger and info pages.

EVENTS LOGGER

- 1350 logged events with timestamp and real-time value, on a non volatile memory.
- The last 30 logged alarms/faults and 15 active alarms/faults are available on front panel display.

ELECTRICAL PROTECTIONS:

- Generator electrical protections:
  - <F, >F: ANSI Code 81L, 81H
  - <U, >U: ANSI Code 27, 59

BREAKERS CONTROL

- Adjustable pulses or latched contact for breaker closing.
- Adjustable pulses or latched contact for breaker opening.
- MN/MX coil management.

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

AUTOMATIC FIRMWARE UPDATE:

When module is connected to **CRE PC** 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 address available for custom mapping.

Part numbers:
A56-SYNCH-10-A: SYNCHRO COMPACT core base version
A56-SYNCH-00-A: SYNCHRO COMPACT switchboard version

RELATED PRODUCTS AND CABLES

i4Gen Touchscreen color display – Ref A56Vxx
I/O Expansion – Ref KL1488 + KL2408 …
PC Connection Ethernet cable – Ref A53W1
CANbus J1939/CRE/CANopen communication cable – Ref A40xx

SPECIFICATIONS

ELECTRICAL SYSTEM

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

VOLTAGE AND FREQUENCY

- DC Power supply: 7...38VDC, Max voltage 45VDC during 15mn, current consumption at 24VDC = 130mA + the sum of maximum consumption of each logic output.
- AC Voltage inputs: 80...500VAC. Consumption = 100mA max. Accuracy: 1%. 3ph + N for generator / 3ph + N for Bus/ mains. Neutral terminal does not need to be connected.
- AC Frequency measurement: 35...75Hz; 15VAC 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.
- 6 x Digital outputs: NE or ND. 1.8A, over-current protected.
- 32 x Digital outputs expansion via CANopen.
- 2 x Relay outputs (breaker control): 5A, 240VAC.
- 2 x Analog outputs: Speed/Frequency and Voltage control: +/-10VDC isolated output with adjustable span and offset.
- Magnetic pick up input: Frequency from 50Hz...10kHz, Voltage 0.5...40VAC.

COMMUNICATION PORTS

2 isolated com ports are available:

- 1 CANbus: I/O extensions.
- 1 Ethernet: PC communication/ModBus TCP.

FREQUENCY AND KW CONTROL

- Configurable +/-10VDC analog output.
- Pulses outputs control (+f/-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.

VOLTAGE CONTROL

- Configurable +/-10VDC analog output.
- Pulses outputs control (+U/-U).
- Compatible with: AEM, AVK, Basler Electric, Caterpillar, Kia, Leroy Sommer, Marathon, Marelli Motori, Meccalte, Sincro, Stamford…
- Protection of volt control output abnormal deviation.

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 480VAC. Up to 5000m for 400VAC.
- 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 (8.7x6.3in).
- 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).

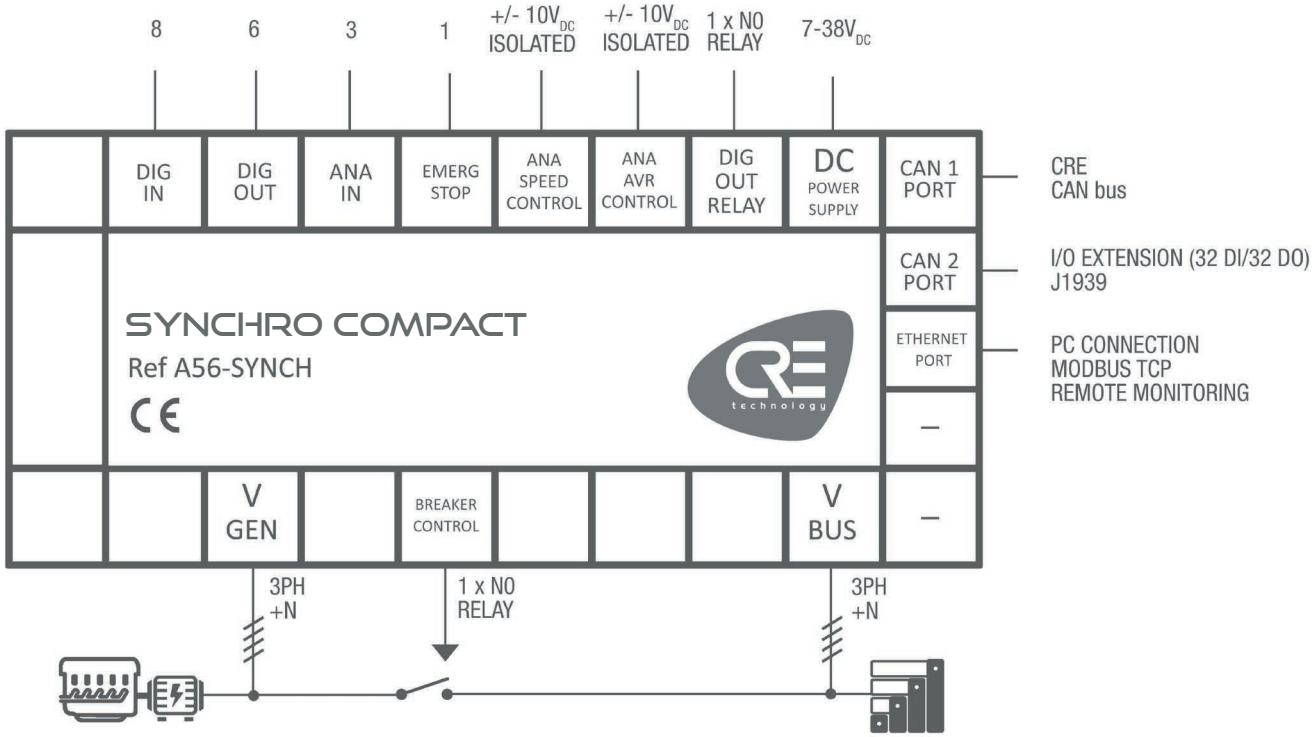
LCD DISPLAY CHARACTERISTICS

- Size: 40x70mm (1.50 x 2.75in).
- Pixels: 256x128. Back light: 50cd/m² typical, configurable.
- Contrast: adjustable.

LANGUAGES

English, French, Italian, Spanish in standard.
Custom languages available on request.

WIRING DIAGRAM



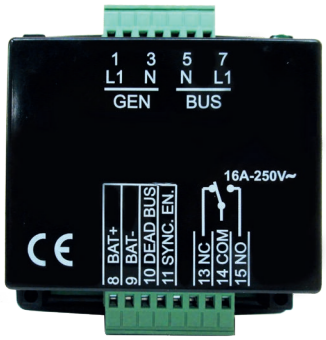
SCR 2.0

Synchroscope/Synch check relay

SCR 2.0 is a microprocessor controlled synchroscope with programmable synch check relay in a DIN96 front panel mounted package. It monitors the voltage and frequency of 2 independent power sources as well as the instantaneous phase angle between them.

The measured parameters are displayed on the 3 digit display and the 24 led circular synchroscope displays the phase angle between the 2 power source. The synchroscope display is only activated if both power source voltages are within the set limits.

ADVANTAGES
- Synch check relay
- Front panel configurable
- 50/60 Hz comptability
- Basic unit



SCR 2.0 MODULE
REAR VIEW

SCR 2.0 MODULE
FRONT VIEW

FEATURES & SPECIFICATIONS

A SIMPLE PRODUCT FOR SAFETY FUNCTIONS
Synchronization checking is enabled either via the SYNCH CHECK ENABLE signal input or by pressing the front panel SYNCH pushbutton. If all the necessary conditions are satisfied:
- busbar phase (busbar phase voltage) voltage between set limits
- generator phase voltage between set limits
- busbar-generator frequency difference below the set limit
- busbar-generator voltage difference below the set limit
- busbar-generator phase difference (phase difference below) below the set limit

The SYNCH CHECK relay will be energized. If the busbar is not powered up, the synch checking may be overridden with the DEAD BUS ENABLE signal input.

FRONT PANEL CONFIGURATION
SCR2.0 provides a comprehensive set of digitally adjustable threshold and timers. All settings are modified via front panel pushbuttons, and do not require an external unit. The MENU pushbutton allows the digital display to navigate between various measured parameters. The front panel is IP65 for the front panel, IP30 for the rear.

RELIABLE AND SIMPLE
SCR2.0 is dedicated to basic applications which require no extra costs or expensive hardware. All CRE TECHNOLOGY products aim to provide the same satisfaction levels. The SCR2.0 has passed EMC and low voltage tests, and each unit is 100% tested before delivery.

RELAY OUTPUTS
The unit provides a synch check relay output with voltage free contacts.

FEATURES
24 led circular synchroscope, programmable ΔV, Δf, Δφ for check synch relay, 1 phase genset & busbar voltage input, auto power off, adjustable parameters, lug-in connection system for easy replacement.

CURRENT, VOLTAGE AND FREQUENCY
- Generator voltage: 300 V_{AC} max. (Ph-N)
- Generator frequency: 0-100 Hz.
- Busbar voltage: 300 V_{AC} max. (Ph-N)
- Busbar frequency: 50/60 Hz.
- Digital inputs: 0 - 30 V_{DC}
- DC supply range: 9.0 to 33.0 V_{DC}
- Current consumption 100 mA-DC /
- Max. operating current: 150 mA-DC (Relay outputs open)
- Synch check relay output: 16A/250V_{AC}

DIMENSIONS AND WEIGHT
- Dimensions: 102x102x57mm (WxHxD)
- Panel cut-out dimensions: 92x92mm minimum
- Weight: 170 g (approx.)
- Installation: Flush mounted with retaining plastic brackets

ENVIRONMENT & PROTECTIONS
- Operating temperature: -20°C (-4°F) to 70 °C (158°F).
- Storage temperature: -30°C (-22°F) to 80 °C (176°F).
- Maximum humidity: 95% non-condensing.
- Case: High Temperature ABS (UL94-V0, 100°C)

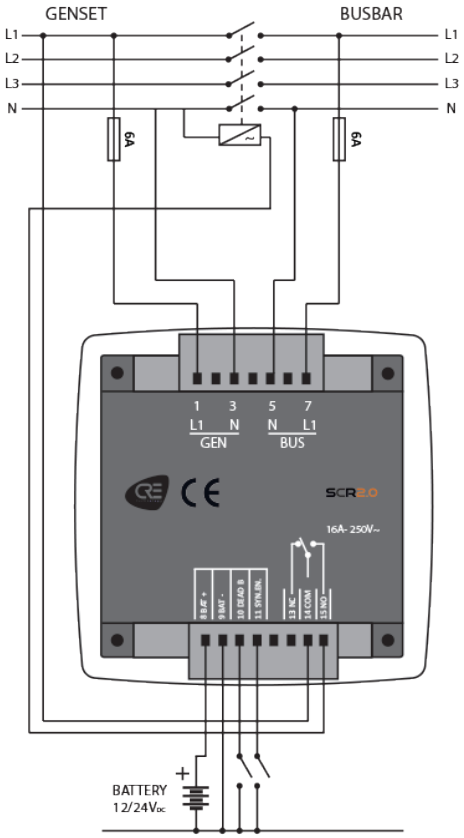
DIRECTIVES
- Low voltage
- EU Directives: 2006/95/EC (LVD), 2004/108/EC (EMC)
- Normes of reference: EN61010 (safety)/EN61326 (EMC)

Part number: A60X2 SCR 2.0 Module

RELATED PRODUCTS & CABLES
Advanced UNIGEN FAMILY
C2S Module

APPLICATIONS

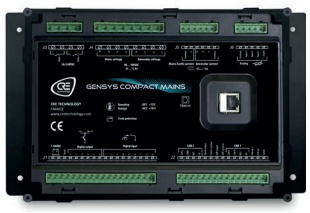
- The SCR 2.0 unit works in High-Voltage/Low-Voltage applications where it will test the phase-to-phase synchronization in 100V (rather than phase-to-neutral). Adjust parameters accordingly.



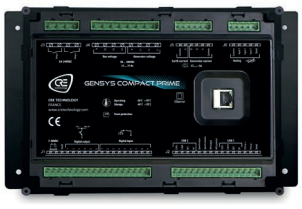
RELATED PRODUCTS

The **GENSYS COMPACT PRIME CORE** is made for gensets used in power plant applications requiring synchronizing, active and reactive load sharing and electrical/mechanical protections. **GENSYS COMPACT PRIME CORE** offers flexibility and time saving thanks to its simple wiring, all features included (no option), and easy engineering & programming.

The **GENSYS COMPACT MAINS CORE** is used on standalone genset in mains paralleling application. **GENSYS COMPACT MAINS CORE** range offers flexibility and time saving thanks to its simple wiring, all features included (no option), and easy engineering & programming.



GENSYS COMPACT MAINS CORE BASE MOUNTED VERSION



GENSYS COMPACT PRIME CORE BASE MOUNTED VERSION

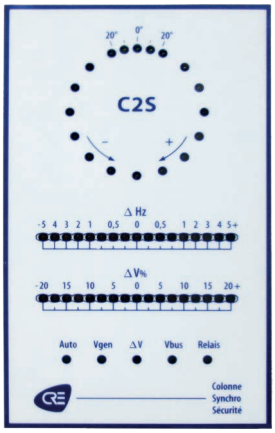
C2S

Auto synchroniser & safety column

This second generation of microprocessor module combines all the visualization and control functions needed to couple a generator to a bus bar manually: display of the phase, frequency and voltage differences, a safety relay which monitors these three parameters and indicates the status of the installation.
This new version does not need an external DC power supply, as it takes it from the busbar. The reduced size allows the use of DIN92 format tools and its heavy duty metal case can operate in extreme environment.

ADVANTAGES

- Led synchroscope
- Protections
- Manual/Auto modes



C2S MODULE
FRONT VIEW

C2S MODULE
REAR VIEW

FEATURES & SPECIFICATIONS

SYNCHRONIZATION COLUMN

- Led synchroscope: 18 LEDs spread over 360° display the phase difference. The synchroscope
- lines up when the frequency difference is less than 0.5 Hz.
- Differential frequency meter: The frequency difference is displayed by a 17 LED bar graph corresponding to ± 5 Hz with an expanded scale over 1 Hz.
- Differential voltmeter: The voltage difference is displayed by a 17 LED bar graph corresponding to ± 20%.

SAFETY RELAY

The coupling authorization relay monitors the difference in frequency, voltage and phase. It authorizes coupling only when all the parameters meet the requirements of the installation.

- Frequency difference: Coupling authorization is given for a frequency difference of less than 0.1 Hz.
- Phase difference: The phase difference which authorizes coupling is adjustable between ± 5° and ± 20°.
- Voltage difference: The voltage difference which authorizes coupling is adjustable between ± 2.5% and ± 20%.

LED INFORMATION

- Presence of generator voltage (Vgen): Shows that the voltage of the generator or the power source to be coupled is between 85% and 115% of its nominal value.
- Presence of bus voltage (Vbus): Shows that the voltage of the bus to which the generator must be coupled is between 85% and 115% of its nominal value.
- Voltage difference fault (ΔV): Shows that the voltage difference between the generator and the bus is greater than the safety relay setting.
- Coupling in automatic mode (Auto): Shows that the installation is in automatic coupling mode. The synchronization column is active but the other signalling LEDs and the safety relay are inactive.
- Safety relay: Shows that the safety relay which authorizes coupling is closed.

CURRENT, VOLTAGE AND FREQUENCY

- Output relay: Isolated contact
- 8 A with the 250 VAC nominal voltage, maximum voltage 440 VAC
- 2000 VA switched power on resistive load.

ENVIRONMENT

- Operating temperature: -20 to +85°C.
- Can be mounted in all positions.
- Humidity: will function normally in humid conditions (Tropic-proof circuits).
- Dimensions and weight:
- Weight: 0.9 Kg
- Size: 160x96x68mm
- Fixing: 4 x 3mm screws with 82x 150mm spacing

DIRECTIVES

- CE Mark: the C2S complies with European Mark requirements.

MEASUREMENTS

Measuring generator voltage [50 & 60 Hz (maximum consumption <4 VA)]

- Reference A25Z0: 100 V_{AC}
- Reference A25Z1: 230 V_{AC}
- Reference A25Z2: 400 V_{AC}

Measuring bus voltage input ±15% [50 & 60 Hz (maximum consumption <0.1 VA)]

- Reference A25Z0: 100 V_{AC}
- Reference A25Z1: 230 V_{AC}
- Reference A25Z2: 400 V_{AC}

CE EAC

Part number: A25Z0 C2S Module AC Input voltage 100VAC
Part number: A25Z1 C2S Module AC Input voltage 230VAC
Part number: A25Z2 C2S Module AC Input voltage 400VAC

RELATED PRODUCTS & CABLES

Advanced UNIGEN FAMILY
GENSYS 2.0 RANGE Products

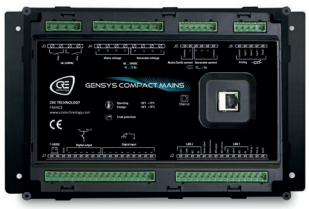
APPLICATIONS

C2S is a metallic housing Synchroscope made for manual synchronization system where it is used as a monitoring tool and Synch Check protection Relay, it can also be used as an additional display on panel or as a protection relay for synchronization check, especially in harsh environment thanks to its metallic casing.

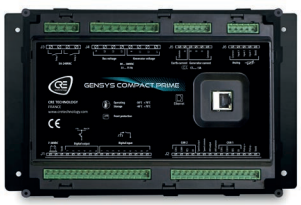
RELATED PRODUCTS

The **GENSYS COMPACT PRIME CORE** is made for gensets used in power plant applications requiring synchronizing, active and reactive load sharing and electrical/mechanical protections. **GENSYS COMPACT PRIME CORE** offers flexibility and time saving thanks to its simple wiring, all features included (no option), and easy engineering & programming.

The **GENSYS COMPACT MAINS CORE** is used on standalone genset in mains paralleling application. **GENSYS COMPACT MAINS CORE** range offers flexibility and time saving thanks to its simple wiring, all features included (no option), and easy engineering & programming.



GENSYS COMPACT MAINS CORE BASE MOUNTED VERSION



GENSYS COMPACT PRIME CORE BASE MOUNTED VERSION

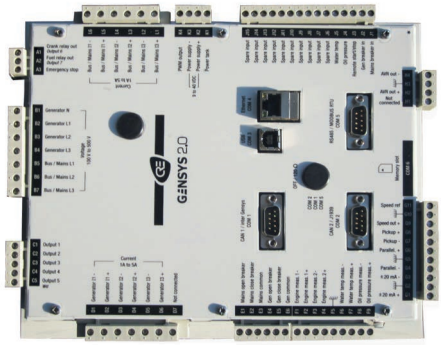
GENSYS 2.0 RANGE

Paralleling unit with integrated PLC

The **GENSYS 2.0** is a control unit designed for generator electrical panels. It combines all necessary functions:

- Automatic transfer on mains failure, engine start/stop and protection,
- Alternator control and protection,
- Mechanical and electrical parameters display, generator synchronization and load sharing by kW & kVAR control,
- Manual and automatic paralleling with mains (frequency, phase, voltage),
- kW power management with several modes, permanent paralleling in base load & in peak shaving mode,

GENSYS 2.0 configured via its front panel or via a PC with **CRE Config software**. The unit has analog load sharing inputs and is compatible with all types of analog load sharing modules.



CORE BASE MOUNTED VERSION

SWITCHBOARD MOUNTED VERSION WITH DISPLAY

FEATURES

PROGRAMMING BY EQUATIONS
The GENSYS 2.0 controller is a PLC on its own rights as logical equations and sequences can be programmed directly by the user with text editor software or Easy PLC software.

INPUTS / OUTPUTS WITH NO LIMIT
The number of inputs/outputs that can be added is one of the most important on the market. Extension modules (DIN rail mounting) can be added on the CAN bus. This extends a large number and a large diversity of inputs/outputs up to 128 digital inputs, 64 digital outputs, 44 analog inputs, 32 analog outputs and CANopen standard module.

MINIMUM OPTIONS
The GENSYS 2.0 is offered with a minimum of options to fit all types of application without expensive add-on packages. The standard GENSYS 2.0 unit is recommended for all types of power plant, from 1 to 32 generators.
For specific needs, the following options are available :

- Mains paralleling
- Phase shift compensation (ie: Dyn11)
- External start module management

INTER-UNIT ISOLATED CAN BUS
The GENSYS 2.0 features an isolated CANbus dedicated to inter-module communication (dead busbar management, kW and kVAR load sharing...).
CANbus technology provides high reliability communication while maintaining low wiring cost and complexity.

GENSETS WITH MAINS
When several generators are paralleled with mains, the MASTER 2.0 is used (using CAN bus communication) for:

- Three phase mains failure
- Paralleled gensets with several mains control
- Electrical protection for power plant and mains
- Electrical parameters display for power plant and mains
- Manual and automatic paralleling with mains (frequency, phase and voltage)
- Power factor control when paralleling with mains.
- kW power management with several modes:
  - No break change over with load transfer
  - Permanent paralleling in base load
  - Permanent paralleling in peak shaving mode (export/import)

DISPLAYED INFORMATIONS

- Engine parameters display: oil pressure, water temp, speed, hours run meter (5 programmable information pages)
- Generator electrical parameters display:
  - Phase-phase Voltage (3 phase RMS)
  - Phase-neutral voltage (3 phase RMS)
  - Current (3 phase RMS)
  - Frequency
  - Active power (3 phase + total)
  - Reactive power (3 phase + total)
  - Power factor (3 phase + total)
  - Active power energy (kWh)
  - Reactive power energy (kVARh)
- Mains electrical parameters display:
  - Phase-phase Voltage (3 phase RMS)
  - Current (3 phase)
  - Frequency
  - Active & reactive power
  - Power factor
  - Import active power energy (kWh)
  - Import reactive power energy (kVARh)

EVENTS LOGGER

- The 50 lastest alarm and the latest 50 faults are recorded in non volatile memory.
- EEPROM Data logging & SD Data logging

ELECTRICAL PROTECTIONS

- Generator electrical protections:
  - <F, >F : ANSI Code 81L, 81H
  - <U, >U : ANSI Code 27, 59
  - >I, >In : ANSI Code 50, 51, 50N, 51G
  - >P, <P, <-P
  - >Q, <Q, <-Q
- Mains electrical protections (option) : <F, >F, <U, >U, >P, <P, <-P, >Q, <Q, <-Q, phase shit, df/dt.
- Phase sequence protection, phase shift compensation.
- Mains electrical protections (option):
  - <F, >F : ANSI Code 81L, 81H
  - <U, >U : ANSI Code 27, 59
  - >P, <P, <-P
  - >Q, <Q, <-Q
  - Phase shit, df/dt.

PROGRAMMING FEATURES

- Manual and automatic engine control.
- J1939 compatibility (Cummins, Volvo, Scania, MTU, CAT...)
- Automatic start/stop control depending on load demand.
- Dead busbar management.
- Isochronous or droop kW load sharing control (via CAN bus, up to 32 generators)
- Constant voltage or droop kVAR load sharing control (via CAN bus, up to 32 generators)
- Power factor control when paralleling with mains.
- kW control (base load or peak shaving) when paralleling with mains.

SYNCHRONIZATION

- Manual and automatic frequency and phase synchronization (differential frequency meter + synchroscope available on screen).
- Manual and automatic voltage synchronization (differential voltmeter available on screen).

CE EAC

Part number: A53Z1 GENSYS 2.0 CORE base mounted version
Part number: A53Z0 GENSYS 2.0 Switchboard mounted version with display

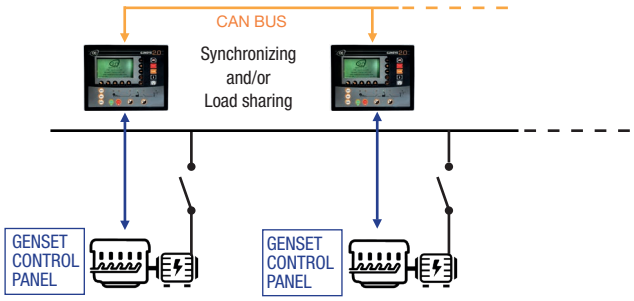
RELATED PRODUCT & CABLES

i4Gen Touchscreen color display – Ref A56Vxx
Additional I/O – Ref KL1488 + KL2408 …
PC Connection Ethernet cable – Ref A53W1
CAN bus J1939/CRE/CAN open communication cable – Ref A40xx
Remote monitoring gateway BSD2.0 – Ref A61Y2
Demonstration suitcase – Ref A56X1
MASTER 2.0

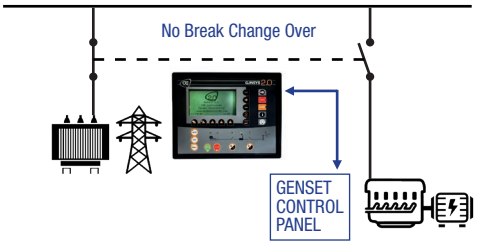
APPLICATIONS

- Turbo-alternator
- Synchronization & power management module (without engine control).
- 1 generator in change over mode with mains.
- 1 generator in parallel with mains: Base load or Peak shaving.
- 2 to 32 gensets in parallel and change over with mains.
- 2 to 32 gensets in parallel and paralleled with mains for load transfer. In this case, the MASTER 2.0 is used for mains paralleling via CAN bus.
- Static paralleling
- Tie breaker management.

APPLICATION EXAMPLE:
Power plant up to 32 gensets in parallel, requesting Synchronizing and Load sharing.



APPLICATION EXAMPLE:
Single genset with mains requesting load transfer with synchronization.



GENSYS 2.0 RANGE

Paralleling unit with integrated PLC

SPECIFICATIONS

CURRENT, VOLTAGE AND FREQUENCY

- DC voltage power supply input: 8 to 40V_{DC}, 750mA at 12V_{DC} and 400mA at 24V_{DC}.
- AC voltage inputs: 100 to 480V_{AC}, 100mA max. Neutral terminal does not need to be connected.
- AC current inputs: 0 to 5A, 1VA. Each phase is isolated from the others.
- AC current overload: 15A during 10s.
- Frequency measurement: 45 to 70 Hz – 15V_{AC} minimum between phase and neutral.
- Voltage control signal: The voltage control (AVR) is made either by a +/-5V_{DC} output with adjustable span and offset or by voltage+/voltage- contacts.

INPUTS, OUTPUTS

- Digital inputs: NO or NC to ground.
- Emergency stop input: Normally Closed 24V.
- Relay outputs (crank and fuel): 5A. The 24V is provided through the emergency push button.
- Relay outputs (breakers): 5A, 230V_{AC} max. NO + NC available.
- Transistor outputs: 350mA, over-current protected.
- Analog inputs (oil pressure and water temp): 0 to 400 Ω. Calibration is configurable.
- Analog inputs (spare 1 and spare 2): 0 to 10 kΩ.
- Calibration for speed and frequency control, either by a +/-10V_{DC} output with adjustable span and offset or by speed+/speed- contacts.
- Magnetic pick up input: 100 to 10kHz, 2V_{AC} minimum.
- PWM output for CAT and Perkins engines

COMMUNICATION PORTS

- Isolated serial ports are available:
  - RS485 for Modbus RTU (read and write)/ male Sub-D9 120Ω resistor selected by micro-switch.
  - CAN bus for inter-GENSYS/MASTER 2.0 connection: male Sub-D9 120Ω resistor selected by micro-switch
  - CAN bus dedicated to options J1939, I/O extensions: male Sub-D9 120Ω resistor selected by micro-switch
  - Ethernet: PC communication/ Modbus TCP
  - SD card reader

FREQUENCY & KW CONTROL

- Configurable +/-10V_{DC} analogue output.
- Pulses outputs control (+f / -f).
- J1939 CAN bus port for Caterpillar, Cummins, Detroit, Deutz, Iveco, John Deere, MTU, Perkins, Scania, Volvo electronic engine, …
- Protection of speed control output abnormal deviation.

VOLTAGE & KVAR & POWER FACTOR CONTROL

- Configurable +/-10V_{DC} analogue output.
- Pulses outputs control (+U / -U).
- Compatible with: AEM, AVK, Basler Electric, Caterpillar, Kia, Leroy Sommer, Marathon, Marelli Motori, Meccalte, Sincro, Stamford, …
- Protection of volt control output abnormal deviation.

ENVIRONMENT

- Operating temperature: -20°C... +70°C (-4...+158°F).
- Storage temperature: -40°C...+80°C (-40...+176°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.
- 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 & Emission according with EN 61000-6-4.
- Electrical Safety Directive 2014/35/UE: According with EN 60950-1.
- Vibrations & 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

- Size: 248x197x57mm (9.76x7.76x2.24in).
- Panel cut out: 177x228mm (7x9cm).
- Weight: 1.9kg (4.2lb)
- CORE base dimensions: 248x197x57mm (9.76x7.76x2.24in).
- Back size: 250x200mm (9.84x7.878in)
- Weight: 1kg (2.2lb)

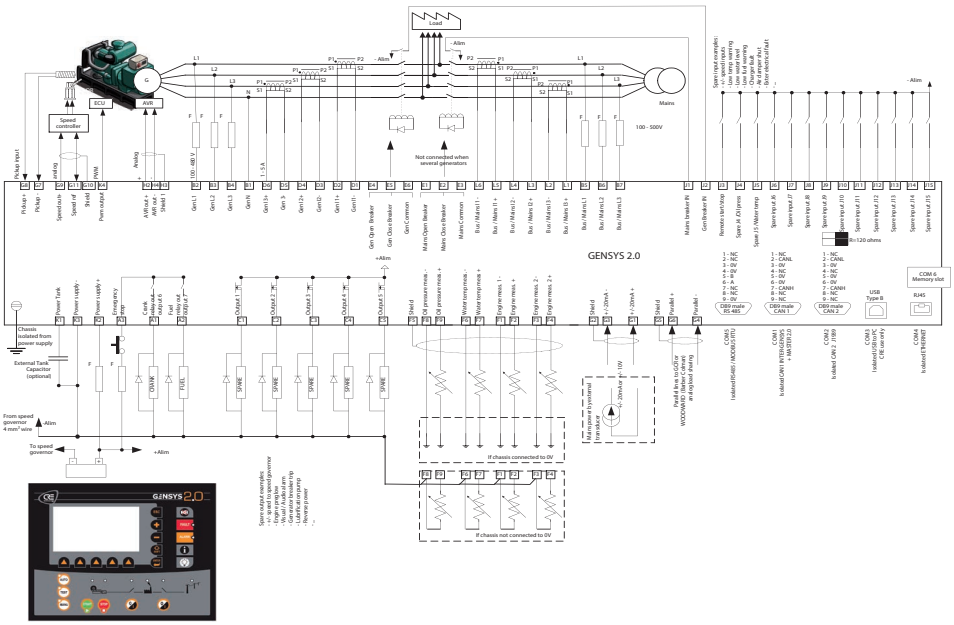
LCD DISPLAY CHARACTERISTICS

- Size: 40 x 70mm (1.50 x 2.75in).
- Pixels: 256 x 128. Back light: 50 cd/m² typical, configurable.
- Contrast: configurable.

LANGUAGES

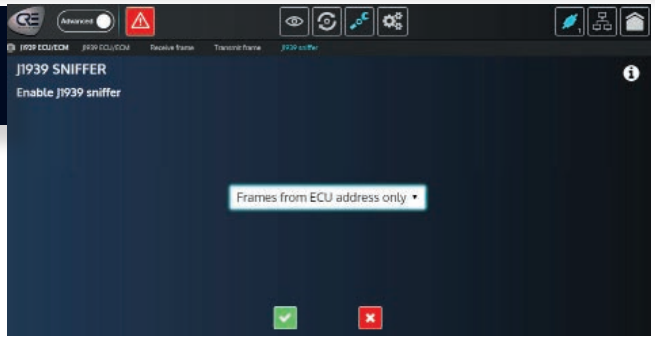
English, French, Italian, Spanish in standard.
Customs languages available for download.

WIRING DIAGRAM

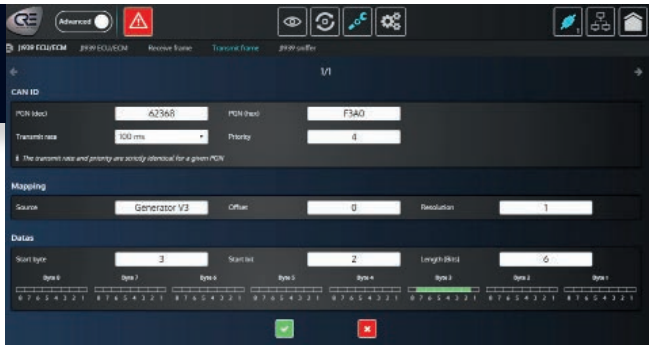


J1939 ELECTRONIC ENGINE MANAGEMENT

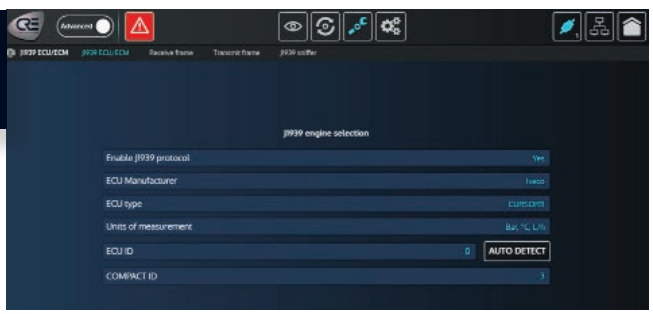
1



2



3



There are always more innovations! Discover the advanced and exclusive functions for J1939 electronic engines management

How does it work?

1. J1939 Sniffer/Spy function to record and analyze all J1939 frames without any external tools.
2. Creation of custom frames receiving RX or transmitting TX J1939 to customize the communication with the engine.
3. Automatic detection of the ECU address

- Need technical information? Contact us now
- For more information on our products, please visit our website

MASTER 2.0

All-in-one mains parallaling unit with integrated PLC

The **MASTER 2.0** is a power plant controller for gensets in parallel with one or several mains.This "all-in-one" unit includes all necessary functions:

- Multi mains management, three phase mains failure detection
- Electrical protection and electrical parameters display
- Manual and automatic paralleling with mains (frequency, phase and voltage)
- kW power management with several modes:
  - No-break changeover with load transfer
  - Permanent paralleling in base load
  - Permanent paralleling in peak-shaving mode
- Power factor control when paralleling with mains.
- Dyn11 capabilities (HV phase compensation)
- Analog control for all load sharing modules.

SWITCHBOARD MOUNTED VERSION WITH DISPLAY

FEATURES

MASTER 2.0 is able to manage import and export power from power plant to grid, in peak shaving or base load, and can manage several mains incomers with priority. A load shedding function is also available.

PROGRAMMABLE EQUATIONS

The MASTER 2.0 controller is a real PLC unit where equations and sequences can be programmed directly by the user with text editor software or Easy PLC software.

INPUTS / OUTPUTS WITH NO LIMITS

The number of input/outputs that can be added is one of the most important on the market. Both digital & analog I/O extension modules can be connected through CAN bus.

MAINS AND POWER PLANT ELECTRICAL PARAMETERS

Not only the MASTER 2.0 parallels the power plant with mains, but it also protects the power plant and measures electrical parameters.

APPLICATIONS

- Constant generating set power (base load) : In this mode, the generating sets provide constant power. Mains power varies according to the load.
- Constant mains power (peak shaving) : In this mode, the mains power (imported or exported) remains constant. The generating sets vary their power according to the load.
- Power plant control with several mains:
  - 1 MASTER 2.0 per mains
  - No-break change-over with load transfer
  - Transfer-switch unit control.

EXTENSIONS - With I/O external modules

A large range of modules are compatible with the MASTER 2.0 via CAN bus. You can add more than 250 analog and digital I/Os:

- Analog inputs: PT100, 0-400Ω, 4-20mA, 0-10V, ...
- Analog outputs: 4-20mA, 0-10V, PWM...
- Digital inputs
- Digital outputs

CABLES AND CONNECTORS

- A53W1: MASTER2.0 to PC cable - USB/USB - 3m.
- A40W8: CAN© inter GENSYS 2.0 / MASTER 2.0 cable for 2 generators - DB9/DB9 - 7m.
- A40W2: CAN© inter GENSYS 2.0 / MASTER 2.0 cable for more than 2 generators or CANopen© I/O modules - DB9/ free wires - 7m.
- A40W3: DB9/Terminals connector to be used with more than 2 generators for double connection (with screws).
- A40W4: communication cable (RS485, CAN, RS232) – per meter.

INFORMATION DISPLAY

- Power plant electrical parameters display:
  - Power plant overview
  - Generator state
  - Individual generator alarm
  - Phase-phase Voltage (3 phase RMS)
  - Phase-neutral Voltage (3 phase RMS)
  - Current (3 phase RMS)
  - Frequency
  - Active & reactive power (3 phase + total)
  - Power factor (3 phase + total)
  - Active power energy (kWh)
  - Reactive power energy (kVARh)
- Mains electrical parameters display:
  - Phase-phase voltage (3 phase RMS)
  - Phase-neutral voltage (3 phase RMS)
  - Current (3 phase RMS)
  - Frequency
  - Active & reactive power (3 phase + total)
  - Power factor (3 phase + total)
  - Active power energy (kWh)
  - Reactive power energy (kVARh)

SYNCHRONIZATION

- Manual/automatic frequency and phase synchronization (differential frequency meter + synchroscope available on screen).
- Manual/automatic voltage synchronization (differential voltmeter available on screen).
- Active power control (by CAN bus, up to 32 GENSYS 2.0/ MASTER2.0 units).
- Power factor control (by CAN bus, up to 32 GENSYS 2.0/ MASTER2.0 units).
- Power management with several mains.
- Phase sequence protection.
- Phase shift compensation (ie: Dyn11).
- Short-circuit protection.

ELECTRICAL PROTECTIONS

- Generator electrical protections:
- <F, >F,
- <U, >U,
- >I, >In,
- >P, <P, <-P, >
- Q, <Q, <-Q
- Mains electrical protections (option) :
- <F, >F,
- <U, >U,
- >P, <P, <-P,
- >Q, <Q, <-Q,
- phase shift, df/dt.
- The 50 lastest alarm and the latest 50 faults are recorded in non volatile memory.

EQUATION

MASTER 2.0 integrates a real PLC unit in which user equations and sequences can be written using a simple text editor or graphically designed using the Easy PLC software.

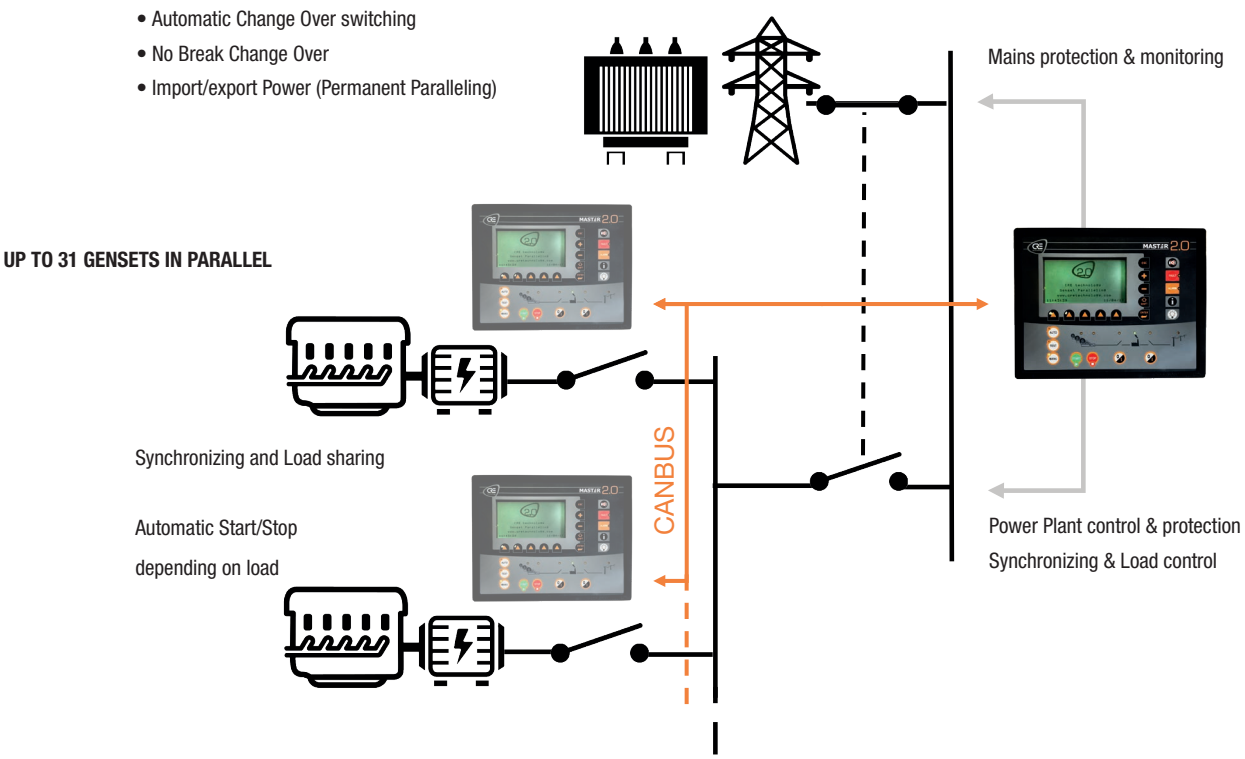
Part number: A53Y0 Switchboard mounted version with display

RELATED PRODUCTS & CABLES

i4Gen Touchscreen color display – Ref A56Vxx
GENSYS 2.0 RANGE (GENSYS 2.0 / GENSYS 2.0 LT / GENSYS 2.0 CORE)
Additional I/O – Ref KL1488 + KL2408 …
PC Connection Ethernet cable – Ref A53W1
CAN bus J1939/CRE/CAN open communication cable – Ref A40xx
Remote monitoring gateway BSD2.0 – Ref A61Y2

APPLICATIONS

MASTER 2.0 offers synchronizing and load control of the power plant to the mains power, and an automatic management of the installation.



MASTER 2.0

All-in-one mains parallaling unit with integrated PLC

SPECIFICATIONS

CURRENT, VOLTAGE AND FREQUENCY

- DC voltage power supply input: 8 to 40V_{DC}, 750mA at 12V_{DC} and 400mA at 24V_{DC}.
- AC voltage inputs: 100 to 480V_{AC}, 100mA max. Neutral terminal does not need to be connected.
- AC current inputs: 0 to 5A, 1VA. Each phase is isolated from the others.
- AC current overload: 15A during 10s.
- Frequency measurement: 45 to 70 Hz – 15V_{AC} minimum between phase and neutral.
- Digital inputs: NO or NC to ground.
- Emergency stop input: normally closed, 24V.
- Relay outputs: 5A. The 24V is provided via the emergency push button.
- Relay outputs (breakers): 5A, 230V_{AC} max. NO + NC available.
- Transistor outputs: 350mA, over-current protected.

INPUTS, OUTPUTS

- 2 analog inputs: 0 to 400 Ω. Calibration is configurable.
- 2 analog inputs (spare 1 and spare 2): 0 to 10kΩ. Calibration is configurable.
- Analog input (+/-20mA or +/-10V): 50 Ω (current) or 20 kΩ (voltage).
- Analog output between +/- 10 V_{DC}

COMMUNICATION PORTS

- Ethernet for connected module and embedded website
- 4 digital inputs and 4 digital outputs
- Maximum distance bewteen a module and a RDM 2.0: 100
- Isolated communication ports are available:
  - RS485 for Modbus RTU (read and write)/ male Sub-D9 120Ω resistors selected by micro-switch.
  - CAN bus for inter-GENSYS/MASTER 2.0/GENSYS 2.0 COREconnection: male Sub-D9 120Ω resistors selected by micro-switch
  - CAN bus dedicated to options I/O extensions: male Sub-D9 120Ω resistors selected by micro-switch
  - Ethernet: PC communication/ Modbus TCP
  - SD card reader

FREQUENCY & KW CONTROL

- CAN bus (CRE).
- Configurable +/-10V_{DC} analogue output.
- Pulses outputs control (+f / -f).
- Protection of speed control output abnormal deviation.

VOLTAGE & KVAR & POWER FACTOR CONTROL

- CAN bus (CRE).
- Configurable +/-10V_{DC} analogue output.
- Pulses outputs control (+U / -U).
- Protection of volt control output abnormal deviation.

ENVIRONMENT

- Operating temperature: -20°C... +70°C (-4...+158°F).
- Storage temperature: -30°C...+80°C (-40...+176°F).
- Humidity: 5 to 95% non-condensing.
- IP Front: IP65 / NEMA rating 4 - IP20 /NEMA rating 1 for CORE.
- 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 & Emission according with EN 61000-6-4.
- Electrical Safety Directive 2014/35/UE: According with EN 60950-1.
- Vibrations & 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

- Size: 248x197x57mm (9.76x7.76x2.24in)
- Panel cut out: 177x228mm (6.97x8.98in)
- Weight: 0.9kg (2lb)

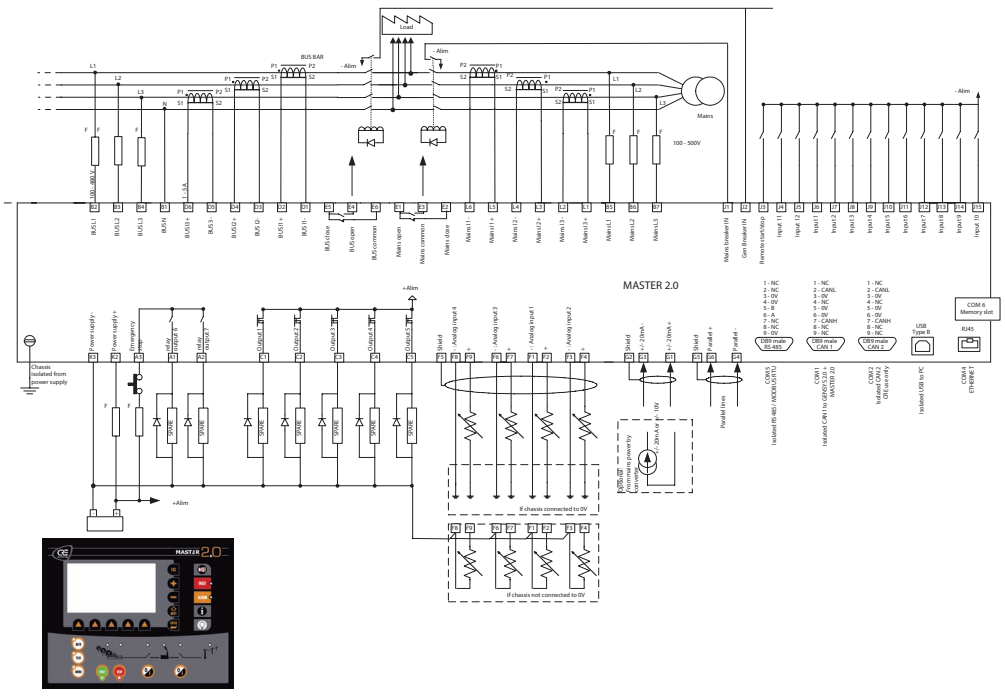
LCD DISPLAY CHARACTERISTICS

- Size: 40 x 70mm (1.50 x 2.75in).
- Pixels: 256 x 128. Back light: 50 cd/m² typical, configurable.
- Contrast: configurable.

LANGUAGES

English, French, Italian, Spanish in standard.
Customs languages available for download.

WIRING DIAGRAM



RDM 2.0

Remote display module for all-in-one generator control & paralleling unit

The **RDM 2.0** works as a remote display and, combined with the **GENSYS 2.0 CORE**, can control a single or a multiple generating sets power plant. Connected to a **GENSYS 2.0**, a **GENSY 2.0 LT** or a **MASTER 2.0**, the **RDM 2.0** can be used as an additional remote display. **RDM 2.0** screen displays the same data as the **GENSYS 2.0**. The display shows engine and electrical parameters for intuitive operation.

ADVANTAGES

- Same multi-function graphic display than the **GENSYS 2.0,**
- Same front panel than the **GENSYS 2.0**.

SWITCHBOARD MOUNTED VERSION
WITH DISPLAY

FEATURES & SPECIFICATIONS

RDM 2.0 to be connected to the GENSYS 2.0 CORE. RDM 2.0 can be used as an additional remote display with the GENSY 2.0, the GENSYS 2.0 LT or with the MASTER 2.0. Same multi-function graphic display and same front panel as the GENSYS 2.0

INFORMATION DISPLAY

- Engine parameters display: oil pressure, water temp, speed, hours run meter...
- Generator electrical parameters display:
  - Phase-phase Voltage (3 phase RMS), phase-neutral Voltage (3 phase RMS)
  - Current (3 phase RMS), frequency
  - Active power (3 phase RMS + total) and reactive power (3 phase RMS + total)
  - Power factor (3 phase RMS + total)
  - Active power energy (kWh) and reactive power energy (kVARh)
- Mains electrical parameters display:
  - Phase-phase Voltage (3 phase RMS), current (3 phase RMS), frequency, active and reactive power, power factor, import active power energy (kWh) and import reactive power energy (kVARh)

POWER SUPPLY

- DC voltage power supply input: 8 to 40V_{DC}, 600mA at 12V_{DC} and 300mA at 24V_{DC}
- Standard languages: English, Spanish, French, Italian. Other custom languages are downloadable on request

COMMUNICATION PORTS

- Ethernet for connected module and embedded website, 4 digital inputs and 4 digital outputs
- Maximum distance bewteen a module and a RDM 2.0: 100 meters (NB. This lengh can be longer if a hub or a swith is used)

ENVIRONMENT

- Operating temperature: -20 to +70°C
- Storage temperature: -30 to +80°C
- Humidity: 5 to 95%. Tropic-proof circuits for normal operation in humid conditions.
- Front panel: IP64 protection.
- Rear panel: IP20 protection.

SIZE AND WEIGHT

- Size: 248x197x57mm (9.76x7.76x2.24in)
- Panel cut out: 177x228mm (6.97x8.98in)
- Weight: 0.9kg (2lb)

DIRECTIVES

- European Union Directives: EN 50081-2, EN 50082-2, 73/23EEC

OTHER

- LCD characteristics: 114x64mm, 60 cd/m² backlight, 3 character sizes.
- Terminals: 2 piece connectors, 2,5mm²

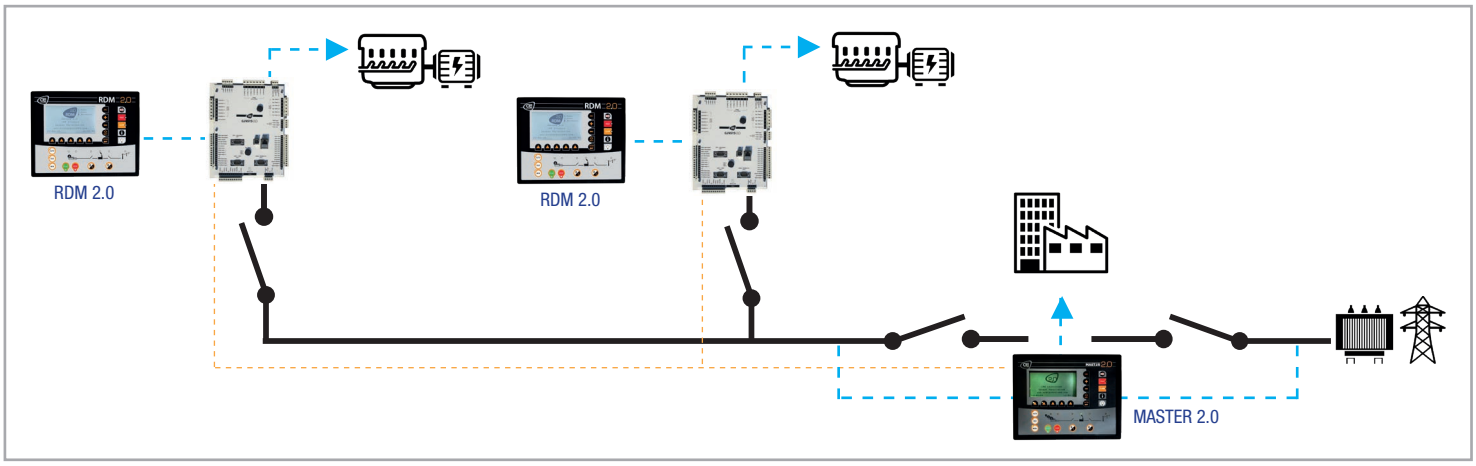
Part number: A53Y0

RELATED PRODUCTS & CABLES

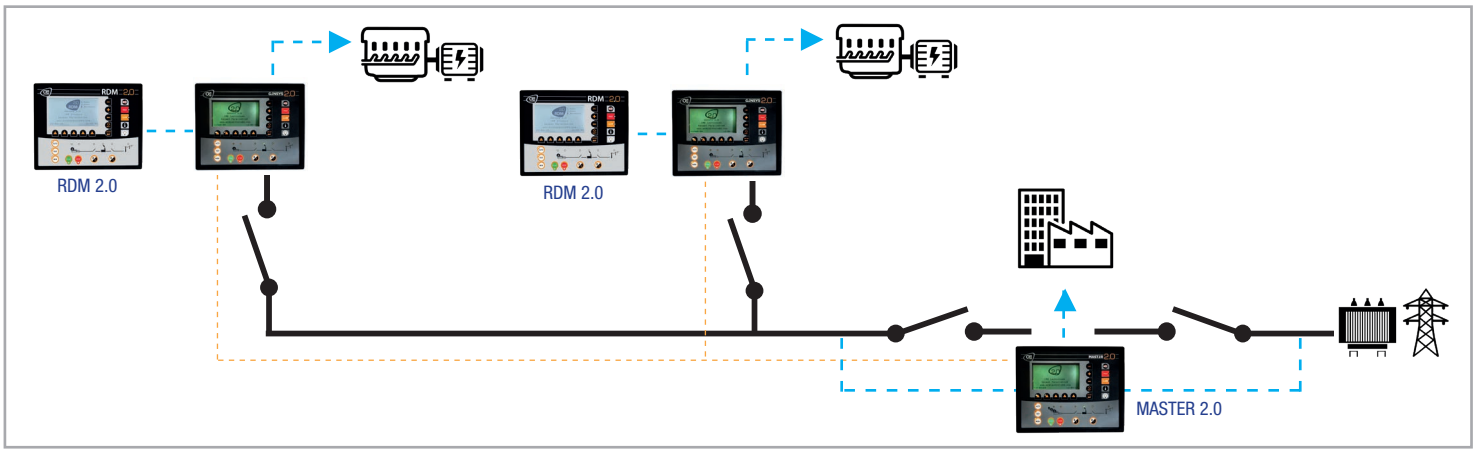
All 56-xx & A53Zxx & A54Zxx references controller
Ethernet cable – Ref A53W1

POWER PLANT CONFIGURATIONS

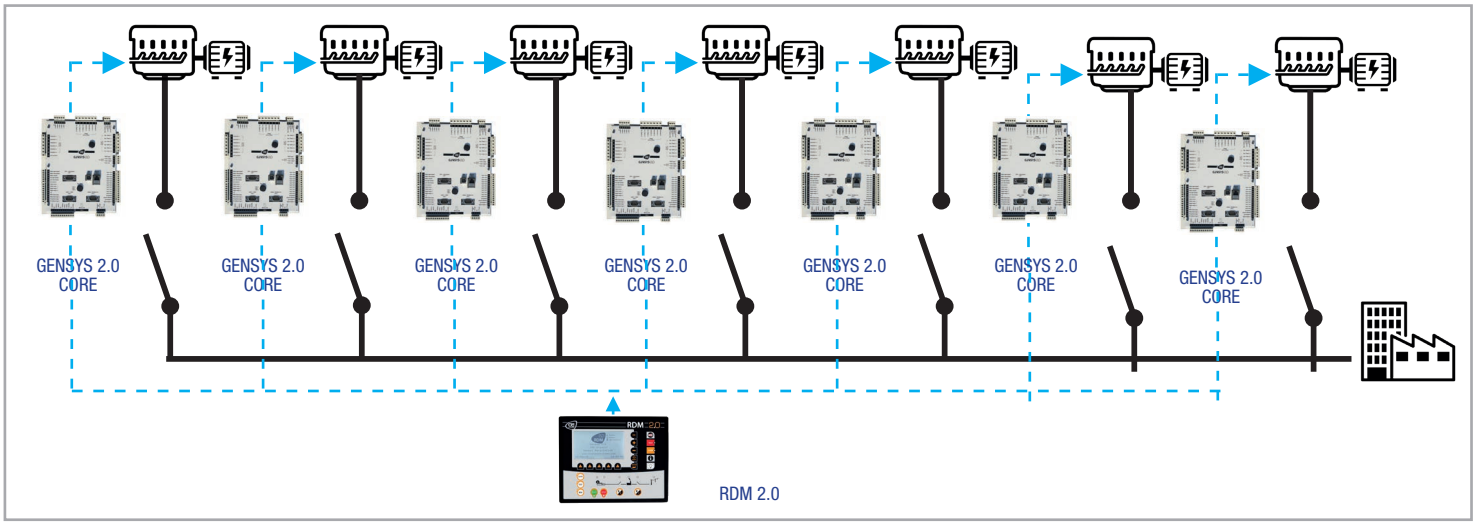
• Standard configuration



• Remote display configuration



• Multi control HMI

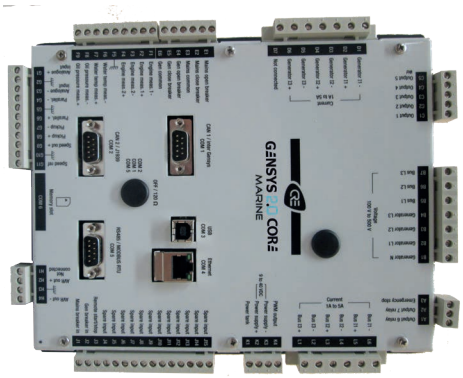


GENSYS 2.0 MARINE RANGE

All-in-one paralleling unit for marine applications: PMS

The **GENSYS 2.0 MARINE** is a control unit designed for marine generator switch panels. This Power Management System unit combines all necessary functions:

- Engine start/stop and protection,
- Alternator control and protection,
- Mechanical and electrical parameters display,
- Generator synchronization,
- Load sharing by kW and kVAR control,
- kW power management with several modes,
- Synchronization with shore,
- kW and kVAR Load/Unload Management,
- Tie breaker control by instructions,
- GENSYS 2.0 MARINE is configured via its front panel or via a PC with CRE Config Software.



CORE BASE
MOUNTED VERSION

SWITCHBOARD MOUNTED VERSION
WITH DISPLAY

FEATURES

PROGRAMMING BY EQUATIONS

The GENSYS 2.0 MARINE controller is a PLC on its own right as logical equations and sequences can be programmed directly by the user with a Easy PLC software (cf p 66) or a simple text editor software.

INPUTS / OUTPUTS WITH NO LIMIT

The number of inputs/outputs that can be added is one of the most important on the market. Extension modules (DIN rail mounting) can be added on the standard CANopen bus. This extends the inputs/outputs up to 128 digital inputs, 64 digital outputs, 44 analog inputs and 8 analog outputs.

MINIMUM OPTIONS

GENSYS 2.0 MARINE is offered full features with a minimum of options to fit all types of application without expensive add-on packages. The unit is recommended for all types of marine projects, from 1 to 32 generators.

INTER-UNIT ISOLATED CAN BUS

The GENSYS 2.0 MARINE features an isolated CAN bus dedicated to inter-module communication (dead busbar management, static paralleling, kW and kVAR load sharing...).
CAN bus technology provides high reliability communication while maintaining low wiring cost and complexity.

HEAVY CONSUMER MANAGEMENT & NON ESSENTIAL LOAD TRIPPING

These functions are used in Marine applications such as using a crane in a harbour, manoeuvring a ship in/out of harbour using bow thrusters, etc.

NON ESSENTIAL LOAD TRIPPING

If the generator reaches the overload or under frequency threshold, the GENSYS 2.0 MARINE triggers outputs to trip non essential loads.

HEAVY CONSUMER MANAGEMENT

Some parameters must be checked by the GENSYS 2.0 MARINE units before accepting heavy consumer load:

- If the Power Plant can accept the load, each GENSYS 2.0 MARINE accepts load.
- If the Power Plant cannot accept the load, another engine is started.
- Analysis of available kW, number of generator on Busbar, or both.

CONTROL AND MANAGEMENT

- Manual and automatic engine control.
- J1939 compatibility (Cummins, Volvo, Scania, MTU, CAT...)
- Automatic start/stop control depending on load demand.
- Dead busbar management.
- Isochronous or droop kW load sharing control (up to 32 generators via CAN bus port,)
- Constant voltage or droop kVAR load sharing control (via CAN bus serial port, up to 32 generators)
- Shore paralleling (1 generator).
- Power factor control when paralleling with shore.
- kW control (base load or peak shaving) when paralleling with shore

INFORMATION DISPLAYED

- Engine parameters display: oil pressure, water temp, speed, hours run meter….
- Generator electrical parameters display:
- Phase-phase voltage (3 phase RMS)
- Phase-neutral voltage (3 phase RMS)
- Current (3 phase RMS)
- Frequency
- Active power (3 phase + total)
- Reactive power (3 phase + total)
- Power factor (3 phase + total)
- Active power energy (kWh)
- Reactive power energy (kVARh)
- Shore electrical parameters display:
- Phase-phase voltage (3 phase RMS)
- Frequency
- Import active power energy (kWh)
- Import reactive power energy (kVARh)

PROTECTIONS

- Generator electrical protections:
  <F, >F, <U, >U, >I, >In, >P, <P, <-P, >Q, <Q, <-Q
- Phase sequence protection, phase shift compensation.

SYNCHRONIZATION

- Manual and automatic frequency and phase synchronization (differential frequency meter + synchroscope available on screen).
- Manual and automatic voltage synchronization (differe tial voltmeter available on screen).

ALARMS AND EVENTS LOGGING

- The last 50 alarms and last 50 faults are recorded in non volatile memory.
- User selectable data logging.

OTHER

- “Watchdog” digital output for microprocessor life signal. Ask CRE sales team

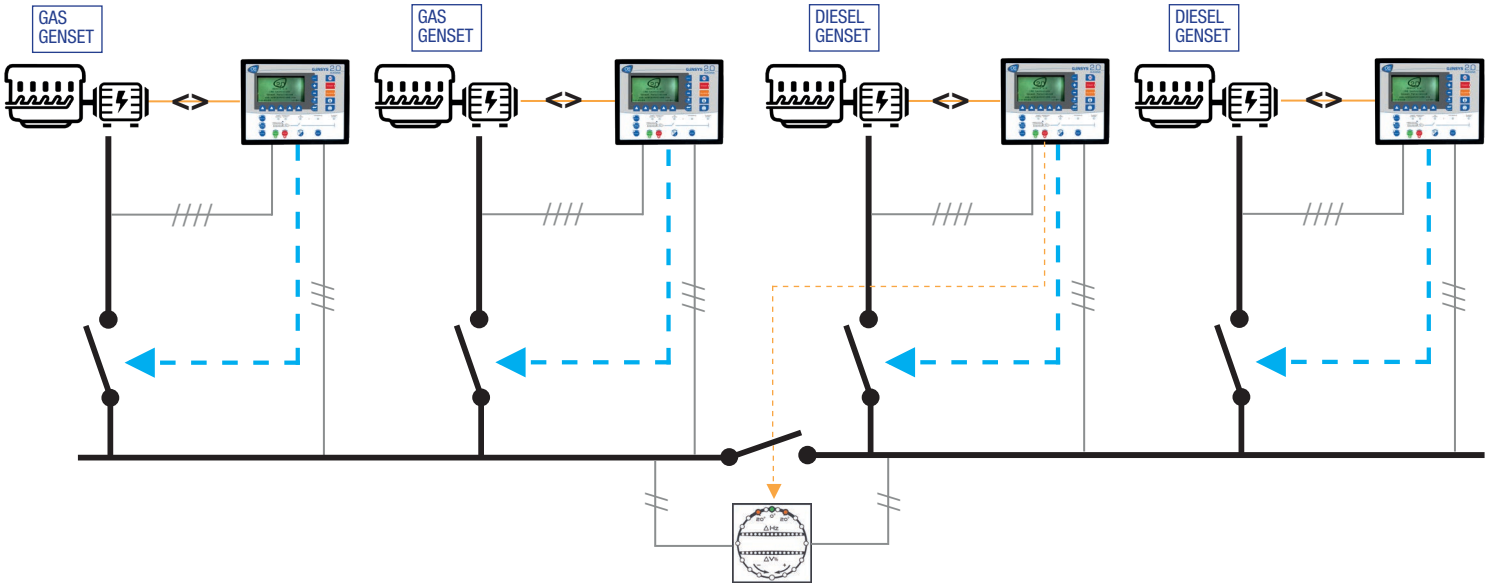
Part number: A53Z2 GENSYS 2.0 MARINE Switchboard mounted version with display
Part number: A53Z4 GENSYS 2.0 CORE MARINEbase mounted version

RELATED PRODUCT & CABLES

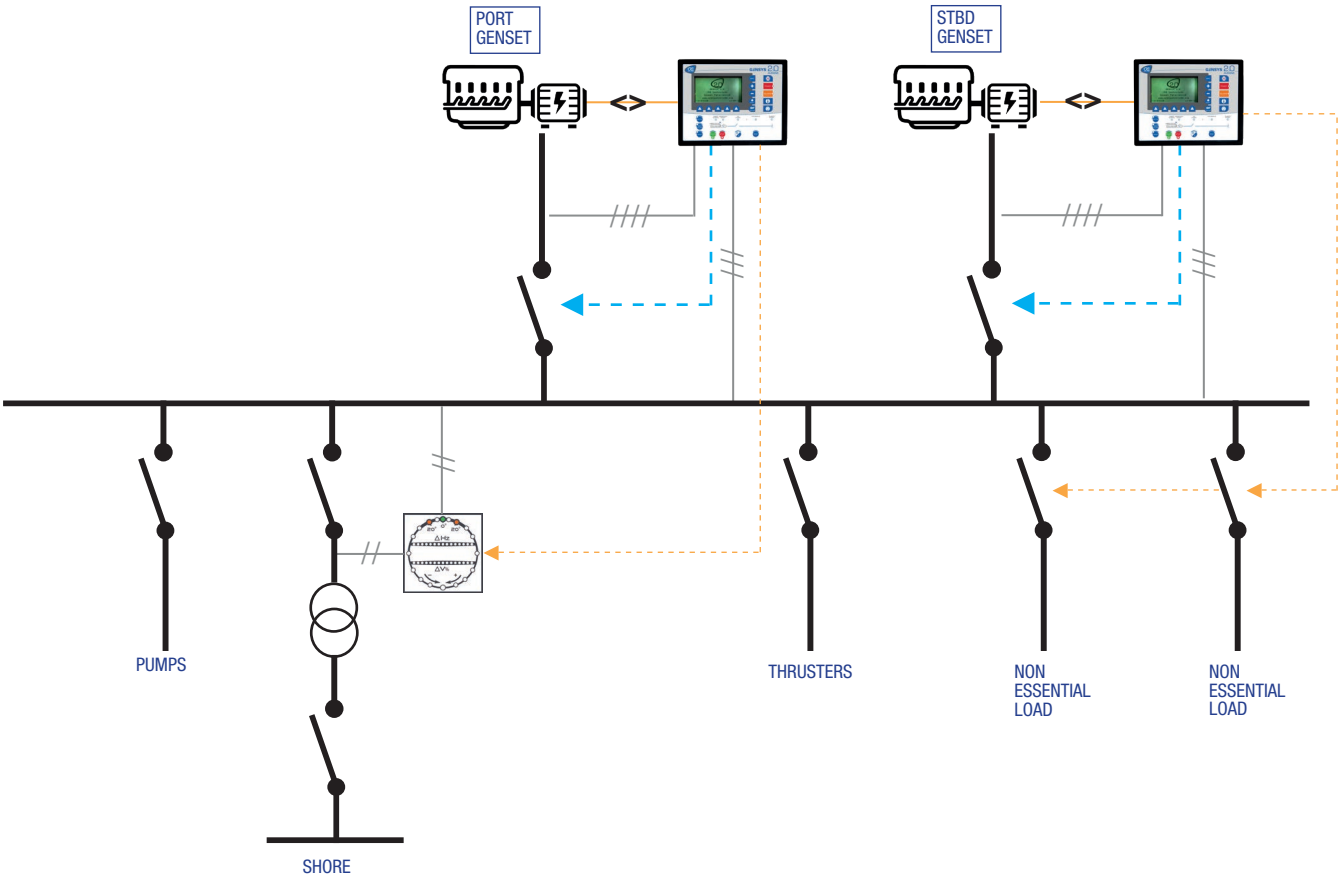
CRE CONFIG SOFTWARE / EASY PLC
Additional I/O – Ref KL1488 + KL2408 …
PC Connection Ethernet cable – Ref A53W1
CAN bus J1939/CRE/CAN open communication cable – Ref A40xx
Remote monitoring gateway BSD2.0 – Ref A61Y2
Demonstration suitcase – Ref A56X1
RDM 2.0 MARINE

APPLICATIONS

- Marine applications with synchronization and load management of each generator



- Marine applications with shore paralleling



GENSYS 2.0 MARINE RANGE

All-in-one paralleling unit for marine applications: PMS

SPECIFICATIONS

CURRENT, VOLTAGE AND FREQUENCY

- 8 to 40V_{DC} power supply input: 750mA at 12V_{DC} , 400mA at 24V_{DC}.
- AC voltage inputs: 100 to 480V_{AC}, Neutral terminal does not need to be connected.
- AC current inputs: 0 to 5A, 1VA. Each phase is isolated from the others.
- AC current overload: 15A during 10s.
- Frequency measurement: 45 to 70 Hz – 15V_{AC} minimum between phase and neutral.
- Voltage control signal: AVR is controlled either by a +/- 5V_{DC} output (adjustable span and offset) or by voltage+/ voltage- contacts.

INPUTS, OUTPUTS

- Digital inputs: NO or NC to ground.
- Emergency stop input: Norm. closed 24V.
- Relay outputs (crank and fuel): 5A/24V is provided through the emergency push button.
- Relay outputs (breakers): 5A, 230V_{AC} max. NO + NC available.
- Transistor outputs: 350mA, over-current protected.
- Analog inputs (oil pressure and water temp): 0 to 400 Ω. Calibration is configurable.
- Analog inputs (spare 1 and spare 2): 0 to 10kΩ.
- Speed and frequency control, either by a +/-10V_{DC} output with adjustable span and offset or by speed+/speed- contacts.
- Magnetic pick up input: 100 to 10.000Hz, 2V_{AC} minimum.

COMMUNICATION PORTS

- Isolated communication ports are available:
- RS485 for Modbus RTU (read and write)/ Integrated 120Ω termination resistors selected by micro-switch.
- CAN bus for inter-GENSYS communication: Integrated 120Ω termination resistors selected by micro-switch

FREQUENCY & KW CONTROL

- CAN bus (CRE).
- Configurable +/-10V_{DC} analogue output.
- Pulses outputs control (+f / -f).
- Protection of speed control output abnormal deviation.

ENVIRONMENT

- Operating temperature: -20 to +70°C
- Storage temperature: -30 to +80°C
- Humidity: 5 to 95%. Tropic-proof circuits for normal operation in humid conditions.
- IP65: front panel / IP20: rear panel

DIRECTIVES

- EMC Directive 2014/30/UE - EMC General Requirements EN 61326-1: Immunity according with EN 61000-6-2 & Emission according with EN 61000-6-4.
- Electrical Safety Directive 2014/35/UE: According with EN 60950-1.
- Vibrations & 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.

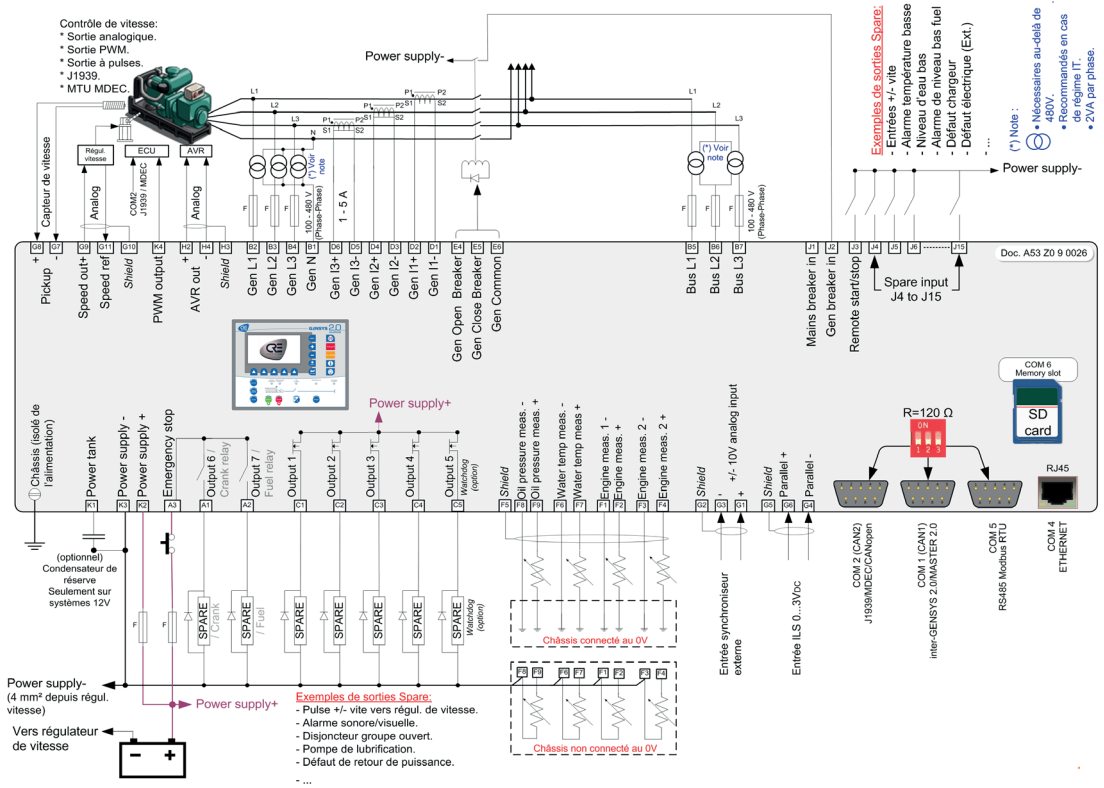
SIZE AND WEIGHT

- Size: 248x197x57mm (9.76x7.76x2.24in)
- Panel cut out: 177x228mm (6.97x8.98in)
- Weight: 1.9kg (4.2lb)

LANGUAGES

English, French, Italian, Spanish in standard.
Customs languages available for download.

WIRING DIAGRAM



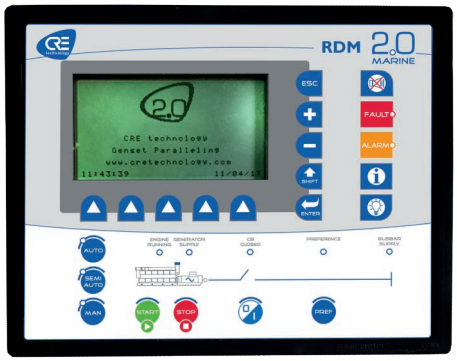
RDM 2.0 MARINE

Remote display module for all-in-one generator control and paralleling unit

The **RDM 2.0 MARINE** works as a remote display and, combined with the **GENSYS 2.0 CORE MARINE**. It offers a control panel and display to manage a complete power plant.

The display shows all live parameters for intuitive operation, and let the customer access the manual operation through the keys.

As **RDM2.0** is an independent display, it has no impact on the control system, and can be switched off or disconnected safely.



RDM 2.0 MARINE
SWITCHBOARD MOUNTED VERSION WITH DISPLAY

FEATURES

BENEFITS
- Offers a local display and control on the power plant equipped with CORE modules.
- Avoid power cable wiring on the front door.

COMPATIBILITY
- Ethernet connection to CORE unit or switch

CONTROL AND MANAGEMENT
- Mode selection
- Manuel control keys

INFORMATION DISPLAYED
- Engine parameters display: oil pressure, water temp, speedhours run meter... (RDM2.0)
- Generator/bus electrical parameters display:
  - Phase-phase Voltage (3 phase RMS)
  - Phase-neutral Voltage (3 phase RMS)
  - Current (3 phase RMS)
  - Frequency
  - Active power (3 phase + total)
  - Reactive power (3 phase + total)
  - Power factor (3 phase + total)
  - Active power energy (kWh)
  - Reactive power energy (kVARh)

INFORMATION DISPLAYED
- Mains/SHORE electrical parameters display:
  - Phase-phase Voltage (3 phase RMS)
  - Current (3 phase)
  - Frequency
  - Active power and reactive power
  - Power factor
  - Import active power energy (kWh)
  - Import reactive power energy (kVARh)

EVENTS DISPLAYED/RECORDED
- Display last 50 alarms/faults + 50 active alarms/faults
- 50 parameters for user in Info page

DIRECTIVES
- European union directives: EN 50081-2, EN 50082-2, 73/23EEC
- Lloyds Register marine certification
- DNV Marine Certification

SIZE AND WEIGHT
- Size: 248x197x57mm (9.76x7.76x2.24in)
- Mounting: functions in any position.
- Weight: 1kg (2.2lb)

LANGUAGES
English, French, Italian, Spanish in standard.
Customs languages available for download.

Part number: A53Y3 RDM 2.0 MARINE

RELATED PRODUCT & CABLES
CRE CONFIG SOFTWARE / EASY PLC
Additional I/O – Ref KL1488 + KL2408 …
PC Connection Ethernet cable – Ref A53W1
CAN bus J1939/CRE/CAN open communication cable – Ref A40xx
Remote monitoring gateway BSD2.0 – Ref A61Y2
Demonstration suitcase – Ref A56X1
GENSYS 2.0 MARINE
GENSYS 2.0 CORE MARINE

SPECIFICATIONS

CURRENT, VOLTAGE AND FREQUENCY

- DC voltage power supply input: 8 to 40VDC, 750mA at 12VDC and 400mA at 24VDC.
- AC voltage inputs: 100 to 480VAC,100mA max. Neutral terminal does not need to be connected.
- AC current inputs: 0 to 5A, 1VA
- Each phase is isolated from the others
- AC current overload: 15A during 10s
- Frequency measurement: 45 to70 Hz – 15VAC minimum between phase and neutral

INPUTS, OUTPUTS

- 15 Digital Inputs: NO or NC to ground.
- 4 Analogue Inputs: 4-20mA or resistive (0...10000 Ω).
- 5 Digital Outputs: 0.3A
- 4 Relay Outputs (2 for breaker control): 5A, 230VAC
- 2 Analog output: +-/10VDC for analog control & parallelines.
- 1 Analogue input : +/-10VDC or +/-20mA for power transducer

COMMUNICATION PORTS

- RS485 for Modbus RTU (read and write)/male Sub-D 9 pins 120 Ω resistors selected by micro-switch.
- CAN bus for inter-GENSYS connection: male Sub-D 9 pins 120 Ω resistors selected by micro-switch
- CAN bus dedicated to options I/O extensions: male Sub-D 9 pins 120 Ω resistors selected by micro-switch
- Ethernet: PC communication/Modbus TCP
- SD card reader

ENVIRONMENT

- Operating temperature: -20°C to +70°C
- Storage temperature: -30 to +80°C
- Humidity: 5 to 95%. Circuits topicalization for normal operation in humid conditions.
- Rear panel protection: IP20

BATTERY CHARGERS

Voltage regulator for generators

CRE TECHNOLOGY's range of battery chargers is designed to supply voltage to the battery with a permanent connection and a maximum of efficiency.

4 RANGES

The BP+305, Compact, BP and the BPRB series are available:

- From 3A to 40A in $12V_{DC}$ or $24V_{DC}$
- Single or three-phase input, all chargers support 50Hz and 60Hz
- Voltage input range from $85V_{AC}$ to $550V_{AC}$

BP+ 305 RANGE - FROM 3A TO 10A

The BP+ battery chargers range offers a range of input voltages in monophase, a range of output current from **3A to 10A** and voltage output from **$12V_{DC}$ to $24V_{DC}$**. They integrate a permanent short-circuit protection and accept without damage the electrical starters inrush current. Their ergonomic design allows you to easily integrate it into your plant thanks to their lightness, compactness and Din Rail support.

- With Diode integrated
- Can be installed on DIN Rail
- Competitive price

BP+ 0512M-305

BP+ 0324M

BP+ 1012M-305

BP+ 0524M-305

BP+ 1024M-305

REFERENCES	OUTPUT CURRENT	OUTPUT VOLTAGE	DC VOLTAGE ADJUSTABLE	INPUT VOLTAGE RANGE	INPUT FREQUENCY RANGE	EFFICIENCY (TYPICAL)	WORKING TEMPERATURE	STORAGE TEMPERATURE	WIDTH	HEIGHT	DEPTH	WEIGHT	FAILURE RELAY	BOOST MODE (ACTIVATED BY EXTERNAL CONTACT)
UNIT	A	V_{DC}	-	V_{AC}	Hz	%	°C	°C	mm	mm	mm	kg	-	
BP+ 305 RANGE														
BP+ 0512M-305	5	12 - 15	Yes	90 ~ 305	47 - 63	83	-20 / +70	-40 / +85	32	125.2	102	0.51	No	No
BP+ 0324M	3	24 - 28	Yes	90 ~ 264	47 - 63	87	-20 / +70	-40 / +85	32	125.2	102	0.51	No	No
BP+ 1012M-305	10	12 - 15	Yes	90 ~ 305	47 - 63	84	-20 / +70	-40 / +85	40	125.2	113.5	0.57	No	No
BP+ 0524M-305	5	24 - 28	Yes	90 ~ 305	47 - 63	87	-20 / +70	-40 / +85	40	125.2	113.5	0.57	No	No
BP+ 1024M-305	10	24 - 28	Yes	90 ~ 305	47 - 63	87	-20 / +70	-40 / +85	63	125.2	113.5	1	No	No

COMPACT RANGE - FROM 3A TO 5A

CRE TECHNOLOGY range of battery chargers Compact serie has been designed to supply constant voltage to the battery with a permanent connection and a maximum of efficiency.

- Protecti ons: Short circuit/ Overload/ Over voltage
- LED indicator for power on
- Cooling by free air convecti on
- Can be installed on DIN rail TS-35/7.5 or TS-35/15
- FAULT contact, no load power consumpti on <0.75W
- 100% full load burn-in test
- 3 years warranty

BPR0324S
MULTIANGLE VIEW

REFERENCES	OUTPUT CURRENT	OUTPUT VOLTAGE	DC VOLTAGE ADJUSTABLE	INPUT VOLTAGE RANGE	INPUT FREQUENCY RANGE	EFFICIENCY (TYPICAL)	WORKING TEMPERATURE	STORAGE TEMPERATURE	WIDTH	HEIGHT	DEPTH	WEIGHT	FAILURE RELAY	BOOST MODE (ACTIVATED BY EXTERNAL CONTACT)
UNIT	A	V_{DC}	-	V_{AC}	Hz	%	°C	°C	mm	mm	mm	kg	-	
COMPACT RANGE														
BPR 0324S	2.5	24 - 28	Yes	85 ~264	47 - 63	88	-20 / +70	-40 / +85	40	90	100	0.33	Yes	No
BPR 0512S	5	12 - 15	Yes	85 ~ 264	47 - 63	88	-20 / +70	-40 / +85	40	90	100	0.33	Yes	No

BPRB RANGE - FROM 2A TO 20A

The **BPRB SERIES** offers a wide range of input voltages, a wide range of output current from **5A to 20A** and voltage output from **12V$_{DC}$ to 24V$_{DC}$**. Their ergonomic design allows you to easily integrate it into your plant thanks to their lightness, compactness and Din Rail support. Included a Fail Output Relay, and a **Boost Mode** Input.

- Protecti ons: Short circuit/ Overload/ Over voltage/ Over temperature
- Boost mode (connector and wires provided)
- Cooling by free air convecti on
- Can be installed on DIN rail TS-35/7.5 or TS-35/15
- Fault relay contact
- 100% full load burn-in test
- 3 years warranty

BPRB 0524 M
BOOST MODE

BPRB 1012 M
BOOST MODE

BPRB 1024 M
BOOST MODE

BPRB 2024 M
BOOST MODE

REFERENCES	OUTPUT CURRENT	OUTPUT VOLTAGE	DC VOLTAGE ADJUSTABLE	INPUT VOLTAGE RANGE	INPUT FREQUENCY RANGE	EFFICIENCY (TYPICAL)	WORKING TEMPERATURE	STORAGE TEMPERATURE	WIDTH	HEIGHT	DEPTH	WEIGHT	FAILURE RELAY	BOOST MODE (ACTIVATED BY EXTERNAL CONTACT)
UNIT	A	V_{DC}	-	V_{AC}	Hz	%	°C	°C	mm	mm	mm	kg	-	
BPRB RANGE														
BPRB 0524M	5	24 - 29	Yes	180 ~ 550	47 - 63	91	-25/ +70	-40 / +85	40	125.2	113.5	0.65	Yes	Yes
BPRB 1012M	10	12 - 15	Yes	180 ~ 550	47 - 63	89.5	-25/ +70	-40 / +85	40	125.2	113.5	0.65	Yes	Yes
BPRB 1024M	10	24 - 28	Yes	180 ~ 550	47 - 63	90	-25/ +70	-40 / +85	63	125.2	113.5	1	Yes	Yes
BPRB 2024M	20	24 - 28	Yes	180 ~ 550	47 - 63	91	-25/ +70	-40 / +85	85.5	125.2	128.5	1.7	Yes	Yes

BP RANGE - FROM 20A TO 40A

The BP battery chargers range offers a wide range of input voltages in single or three-phase, a wide range of output current from **20A to 40A** and voltage output of **24V$_{DC}$**. They integrate a permanent short-circuit protection and accept without damage the electrical starters inrush current. Their ergonomic design allows you to easily integrate it into your plant thanks to their lightness, compactness and Din Rail support.

- Protections: Short circuit/ Overload/ Over voltage/ Over temperature
- Cooling by free air convecti on, LED indicator for power on
- Can be installed on DIN rail TS-35/7.5 or TS-35/15
- 100% full load burn-in test
- Fixed switching frequency at 55kHz
- 3 years warranty

BP 2024 S

BP 2024 T+
TREEPHASE
DC OK RELAY OUTPUT

BP 4024 T+
TREEPHASE
DC OK RELAY OUTPUT

REFERENCES	OUTPUT CURRENT	OUTPUT VOLTAGE	DC VOLTAGE ADJUSTABLE	INPUT VOLTAGE RANGE	INPUT FREQUENCY RANGE	EFFICIENCY (TYPICAL)	WORKING TEMPERATURE	STORAGE TEMPERATURE	WIDTH	HEIGHT	DEPTH	WEIGHT	FAILURE RELAY	BOOST MODE (ACTIVATED BY EXTERNAL CONTACT)
UNIT	A	V_{DC}	-	V_{AC}	Hz	%	°C	°C	mm	mm	mm	kg	-	
BP RANGE														
BP 2024S	20	24 - 28	Yes	90 ~ 264	47 - 63	92.5	-20 / +70	-40 / +85	85.5	125.2	128.5	1.5	No	No
BP 2024T+	20	24 - 28	Yes	340 ~ 550 phase-to-phase	47 - 63	92.5	-30 / +70	-40 / +85	85.5	125.2	128.5	1.51	Yes	No
BP 4024T+	40	24 - 28	Yes	340 ~ 550 phase-to-phase	47 - 63	94	-30/+60	-40 / +85	110	125.2	150	2.47	Yes	No

CRE TECHNOLOGY's DC/DC converters are used for various purposes, such as transforming socket voltage from 24VDC to 12VDC for microprocessors, stabilising voltage fluctuations, and simple galvanic isolation. There are countless possible applications.

- DC output adjustable (+/-10%)
- Cooling by free air convection
- Can be installed on DIN rail TS-35/7.5 or 15
- Protections: Short circuit, overload, over voltage, input reverse polarity, input under voltage protection
- 4Kdc I/O isolation (reinforced isolation)
- 3 years warranty

DC0512
12VDC —> 12VDC
24VDC —> 12VDC

DC0324
12VDC —> 24VDC
24VDC —> 24VDC

DC0524-12
12VDC —> 24VDC

DC0524-24
24VDC —> 24VDC

FEATURES

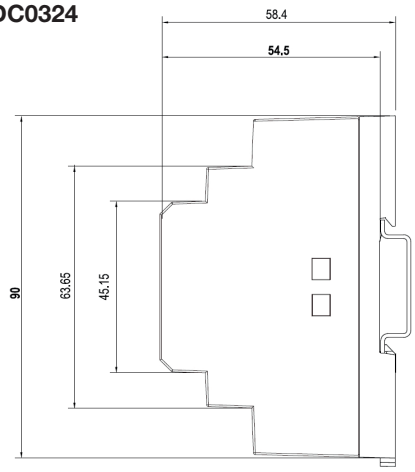
		DC0512	DC0324	DC0524-12	DC0524-24
OUTPUT	DC VOLTAGE	12V	24V	24V	24V
	RATED CURRENT	5A	2.5A	4.2A	5A
	CURRENT RANGE	0 ~ 5A	0 ~ 3A (2.5A)	0 ~ 4.2A	0 ~ 5A
	RATED POWER	60 W		100.8 W	120 W
	PEAK CURRENT	N/A	N/A	6.3A	7.5A
	PEAK POWER	N/A	N/A	150W (3sec.)	180W (3 sec.)
	RIPPLE & NOISE (Max.)	75mVp-p	100mVp-p	50mVp-p	
	VOLTAGE ADJ. RANGE (By default)	9 ~ 13.2V	21.6V ~ 28V	24 ~ 28V	
	VOLTAGE TOLERANCE	+/- 2.0%		+/- 1.0%	
	LINE REGULATION	+/- 0.5%		+/- 0.5%	
	LOAD REGULATION	+/- 0.5%		+/- 1.0%	
	SETUP, RISE TIME	120ms, 85ms at full load		500ms, 60ms at $12V_{DC}$	500ms, 60ms at $24V_{DC}$
INPUT	VOLTAGE RANGE	9 ~ $36V_{DC}$		9 ~ $18V_{DC}$	16.8 ~ $33.6V_{DC}$
	EFFICIENCY (Typ.)	91%		88.5%	89.5%
	DC CURRENT (Typ.)	3A/$24V_{DC}$		11.2A@$12V_{DC}$	5.6A@$24V_{DC}$
	INRUSH CURRENT (Typ.)	20A/$24V_{DC}$		5A/$12V_{DC}$	5A/$24V_{DC}$
PROTECTION	OVERLOAD	105 ~ 130% rated output power			
		Protection type: constant current limiting, recovers automatically after fault condition is removed.		Normally works within 150% rated output power for more than 3 seconds and then constant current protection 105 ~135% rated output power with auto-recovery.	
	OVER VOLTAGE	13.8 - 16.2V	28.8 - 34V	28.8 ~33.6V	
		Protection type: shut down o/p voltage, re-power on to recover			
	REVERSE POLARITY	By internal MOSFET, no damage, recovers automatically after fault condition removed			
	UNDER VOLTAGE LOCKOUT	24Vin: Power ON ≥ 9V, OFF ≤ 8.5V		12Vin: Power ON ≥ 9V, OFF ≤ 8.5V	24Vin: Power ON ≥ 16.8V, OFF ≤ 16.5V
ENVIRONMENT	WORKING TEMPERATURE	(-)40 ~ (+)85°C		(-)40 ~ (+)70°C	
	WORKING HUMIDITY	5 ~ 95% RH non condensing			
	STORAGE TEMP, HUMIDITY	(-)40 ~ (+)85°C, 5 ~ 95% RH non-condensing			
	TEMP. COEFFICIENT	(+/-)0.03%/°C (0 ~ 60°C)		(+/-)0.03%/°C (0 ~ 55°C)	
	VIBRATION	Component: 10 ~ 500Hz, 2G 10min./1cycle, period for 60min each along X, Y, Z axes ; Mounting (for DC0512 & DC0324): Compliance with IEC60068-2-6.		Mounting (for DC0524-12 & DC0524-24): Compliance with IEC61373	
	OPERATING ALTITUDE	2000 meters		5000 meters	
OTHERS	MTBF	611Khrs min MIL-HDBK-217F (25°C)		214.6Khrs min MIL-HDBK-217F (25°C)	
	DIMENSION (W x H x D)	52.5 x 90 x 54.5mm		32 x 125.2 x 102mm	
	PACKING	216g		510g	

COMPLEMENTARY INFORMATION

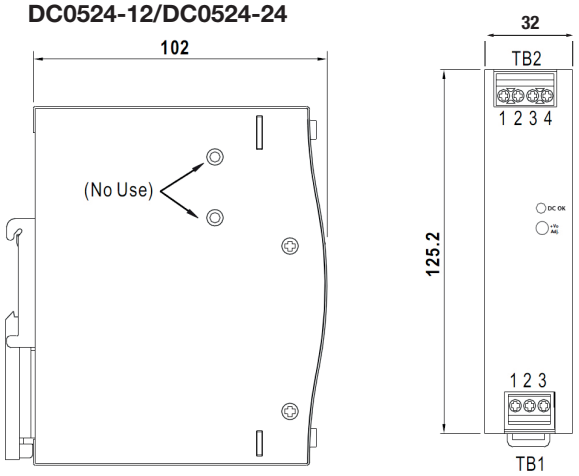
		DC0512	DC0324	DC0524-12	DC0524-24
SAFETY & EMC	SAFETY STANDARDS	IEC 62368-1 (LVD), AS/NZS 62368.1 approved.			
	WITHSTAND VOLTAGE	I/P-O/P:4KV$_{DC}$		I/P-O/P:4KV$_{DC}$	
	ISOLATION RESISTANCE	I/P-O/P>100M Ohm / 500V$_{DC}$ / 25°C / 70% RH		I/P-O/P, I/P-FG, O/P-FG:>100M Ohm / 500V$_{DC}$ / 25°C / 70% RH	
	EMC EMISSION	EN55032 Class A, EN55032 Class A for 1m I/O cable, Class B for 30cm I/O cable, EN61000-3-3.		For DC052412 & DC0524-24: EN55032 Class B, EN61000-3-3	
	EMC IMMUNITY	EN55024, EN61000-6-2 (EN50085-2), EN61000-4-2 Level 3, 8KV air. Level 3, 6KV contact; criteria A, EN61000-4-3 Level 3, 10V/m; criteria A, EN61000-4-4 Level 3, 2KV; criteria A, EN61000-4-5 Level 3, 1KV/Line-line; criteria A, EN61000-4-6 Level 3, 10V; criteria A, EN61000-4-8 Level 4, 30A/m; criteria A		EN55024, EN61000-6-2 (EN50085-2), EN61000-4-2 Level 3, 8KV air. Level 3, 6KV contact; criteria A, EN61000-4-3 Level 3, 10V/m; criteria A, EN61000-4-4 Level 3, 2KV; criteria A, EN61000-4-5 Level 3, 1KV/Line-line; Level 3, 2KV/Line-Line-FG; criteria A, EN61000-4-6 Level 3, 10V; criteria A, EN61000-4-8 Level 4, 30A/m; criteria A	

MECHANICAL SPECIFICATIONS

DC0512/DC0324

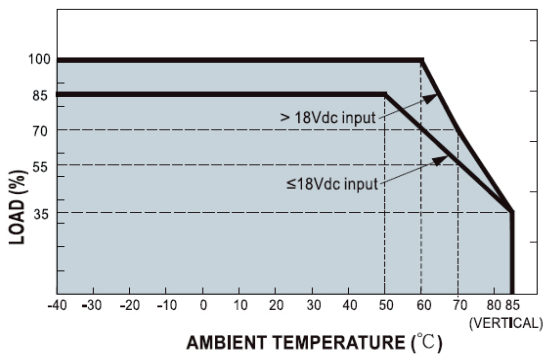


DC0524-12/DC0524-24

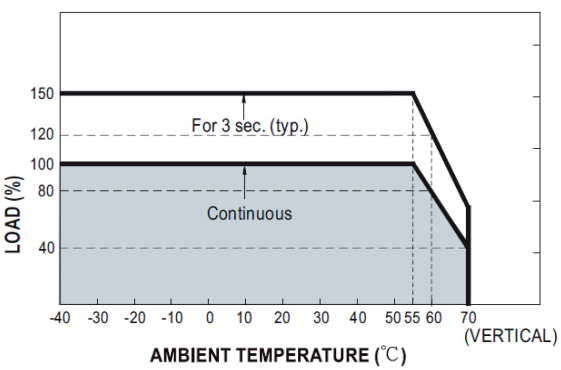


DERATING CURVES/TEMPERATURE

DC0512/DC0324



DC0524-12/DC0524-24



MAGNETIC PICK-UP

Speed sensors: Convert engine speed to a frequency signal

The **MAGNETIC PICK-UP** (MPU) is the communication link between the engine and the electronic controller. The MPU is installed next to the drive shaft gear made of a material which reacts to a magnetic field.

As the flywheel rotates it interrupts the MPU's magnetic field and produces an AC signal corresponding to the engine speed.

This range offers advantages as:

- Detects steel sensing gears
- Produces electrical frequency
- Easy installation on engine
- Different sizes & connectors

M16 RANGE

5/8" RANGE

3/8" - 24 UNF

3/4" - 16 UNF

COW 500

FEATURES

EASY-TO-USE PRODUCT

- Screw magnetic pickup into flywheel housing until contact is made with top surface of gear tooth on flywheel. Back magnetic pickup out one complete revolution and tighten nut.
- Connect electrical leads.
- The MPU must show a minimum of 2.5V with controller connected for an efficient speed reading.

FULLY COMPATIBLE WITH ALL ENGINES

Whether in inches or in metrics, CRE TECHNOLOGY provides a range of MPUs: they are available in different lengths, thread and connector types.

AFTER SALES SERVICE

Like every CRE TECHNOLOGY products, the unit also benefits from our technical support. All CRE TECHNOLOGY products are delivered with one year warranty.

DIFFERENT REFERENCE AVAILABLE

Our range of magnetic pick-ups allow you to choose the best product to fit your application and offer you the best speed sensors in order to make sure speed reading and overspeed protection are effective.

MAGNETIC PICK UPS WITH METRIC THREADS (THREAD: M16 X 1.5)

- COM 16-70S: Lenght 70mm, threads M16 x 1,5, connecting 2x "1/4 spade Faston,
- COM 16-54C: Lenght 54mm, threads M16 x 1,5, connecting 2 pins connector,
- COM 16-92C: Lenght 92mm, threads M16 x 1,5, connecting 2 pins connector.

MAGNETIC PICK UPS WITH SAE THREADS (THREAD: 5/8-18 UNF)

- CO 5/8-70S: Lenght 70mm, threads 5/8" - 18 UNF, connecting 2x "1/4 spade Faston,
- CO 5/8-54C: Lenght 54mm, threads 5/8" - 18 UNF, connecting 2 pins connector,
- COM 5/8-92C: Lenght 92mm, threads 5/8" - 18 UNF connecting 2 pins connector,
- CO 3/8-60W: Lenght 60mm, threads 3/8" - 24 UNF, connecting 2m shielded cable,
- CO 3/4-70W: Lenght 70mm, threads3/4" - 16 UNF, 2 wires.

CONNECTORS AND CABLES

This range of products is also composed with connectors and cables.

All the references are compatible with the following magnetic pick ups:

- COM 16-54C
- COM 16-92C
- COM 5/8-54C
- COM 5/8-92C

LENGTH: 5 meters

CRE TECHNOLOGY has provided its range of Magnetic Pick Up speed sensors for years, the sensor is use for speed information display, idle speed control and engine speed protection.

CE

Part number: COM 16-70S, COM 16-54C, COM 16-92C.
Part number: COM 5/8-70S, COM 5/8-54C, COM 5/8-92C.
Part number: COM 3/8-60W, COM 3/4-70W.

RELATED PRODUCT & CABLES

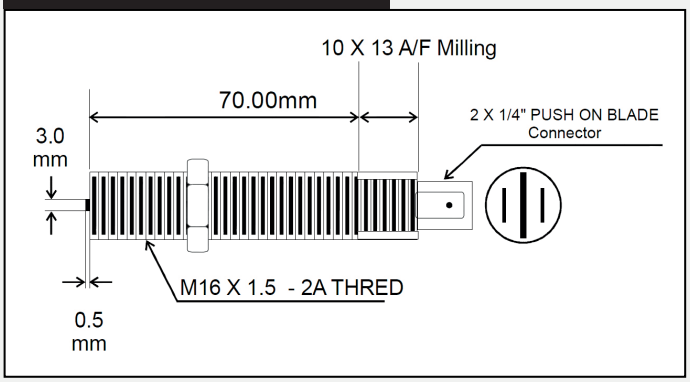
GENSYS COMPACT PRIME
GENSYS COMPACT MAINS
BATTERY CHARGERS BP+ RANGE
BATTERY CHARGERS BPRB RANGE

APPLICATION

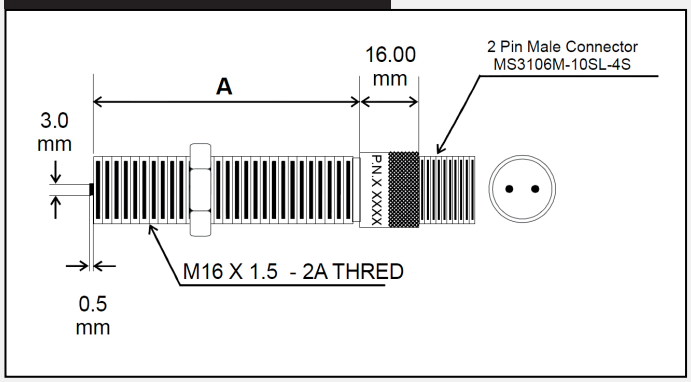
- Off highway vehicles applications are various and often equipped with systems identical or similar than Gensets, like speed governors, solenoids, CAN controllers, overspeed protections…),
- Sprinkler pump application,
- Compact excavator,

WIRINGS

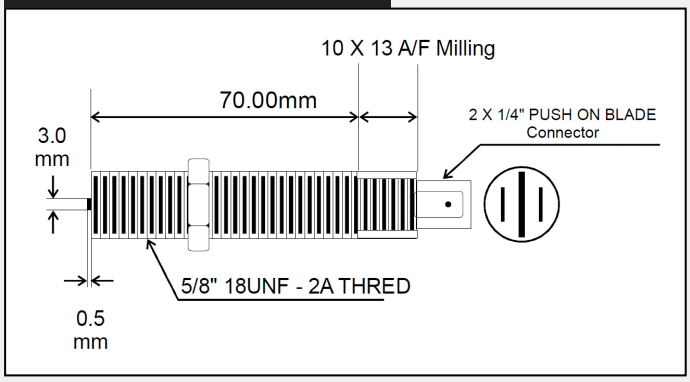
COM 16 - 70S



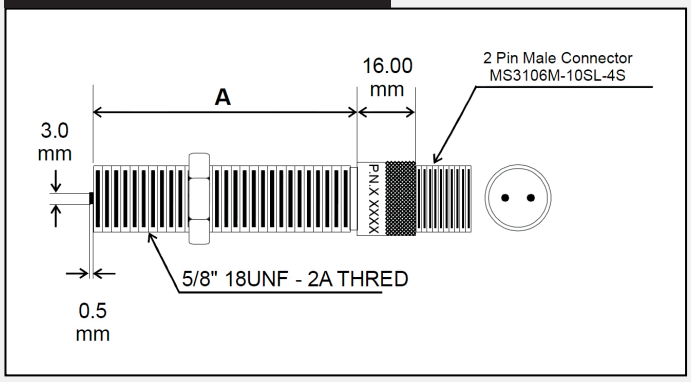
COM 16 - 54C/92C



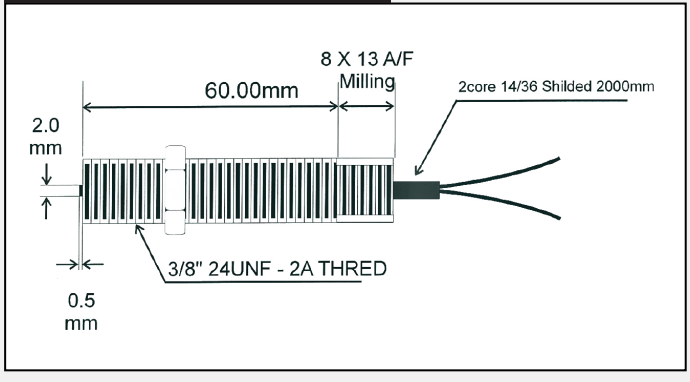
CO 5/8 - 70S



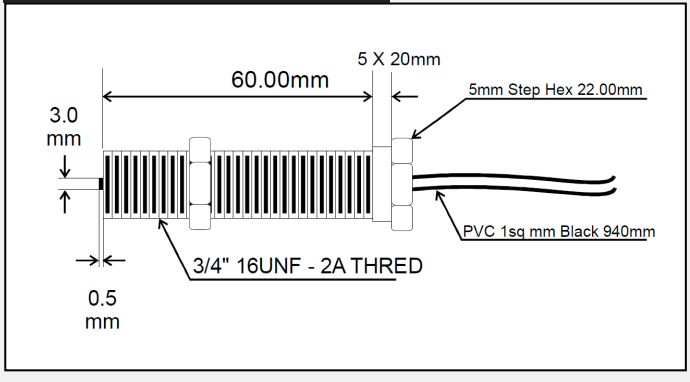
CO 5/8 - 54C/92C



CO 3/8 - 60W



CO 3/4 - 70W



DV2

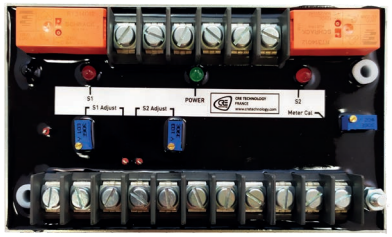
Electronic Speed Switch

The **DV2** is a new, robust and an easy to use Electronic speed switch suitable for industrial engines and generators applications.

The **DV2** has 2 seperated speed switches terminal output.

This product offers the following advantages:

- Speed sensing from Magnetic Pick-up or from Alternator AC,
- Meter output for optional RPM indicator,
- Resin encapsulated for harsh environments,
- Screw-clamp terminals for ease of connection,
- 16A “Volt-Free” contact sets.



FEATURES

BENEFITS

The DV2 is a robust and superior quality product thanks to the European standard manufacturing experience.
The DV2 offers you an easy-to-use product to manage 2 separate speed switches terminal output, independently set between 10% and 140% of rated speed. Factory values are at 40% for crank cut and 114% for overspeed.

CONTROL AND MONITOR

12VDC and 24VDC operation is provided via separate terminals. Two “programming” terminals allow hardwire selection for each speed switch to operate in latched or un-latched mode and further “programming” terminal selects the frequency range for ALT or MPU speed sensing.
The “meter” can be a temporary voltmeter to help calibration or a permanent RPM indicator.

DISPLAYED INFORMATION

- Red LED’s are on to indicate when their respective relay is energised.
- Green LED on when the unit is powered.

AFTER SALES SERVICE

Like every CRE TECHNOLOGY products, the unit also benefits from our technical support.

All CRE TECHNOLOGY products are delivered with one year warranty.

ALT/MPU SELECTION

- Speed sensing input ALT = 50 to 280 Vrms ‘CAL’ Range = 40Hz to 230 Hz
- Speed sensing input MPU = 1-85Vpk-pk
‘CAL’ Range = 1200 Hz to 7000 (48 to 280 teeth @ 1500 RPM).

INPUTS, OUTPUTS

- ‘CAL’ potentiometer adjusted for correct RPM indication at nominal speed.
- Relays S1 and S2: NO/NC Volt free contact 16A at 32VDC resistive load or 115/230VAC1
- RPM indication (optional): 0-1mA 75Ω

NOMINAL VOLTAGE DC SUPPLY

- 12VDC: 8 to 16VDC
- 24VDC: 16 to 32VDC

ENVIRONMENT

- Operating temperature: -20°C...+70°C (-4°F...158°F).
- Storage temperature: -40°C ...+70°C (-40°F …158°F).
- Humidity: 90% non-condensing.

CERTIFICATIONS

- European Union Directives : EC EMC Directive 2014/30/EC, EC Machine Directive 89/392/EC.
- Low voltage Directive 2015/35/EEC, EN50124 : 2001, EN50082-2 :1996, EN 50092-1 :1996, EN61000-4-5: 2014.

CE

Part number: A27Y0

RELATED PRODUCTS & CABLES

Magnetic Pick-up COM 16-70S, COM 16-54C, COM 16-92C.
Magnetic Pick-up COM 5/8-70S, COM 5/8-54C, COM 5/8-92C.
Magnetic Pick-up COM 3/8-60W, COM 3/4-70W.
Pick-up cable

RELATED PRODUCTS

The **MAGNETIC PICK-UP (MPU)** is the communication link between the engine and the electronic controller. The **MPU** is installed next to the drive shaft gear made of a material which reacts to a magnetic field.

As the flywheel rotates it interrupts the MPU's magnetic field and produces an AC signal corresponding to the engine speed.

This range offers advantages as:

- Detects steel sensing gears
- Produces electrical frequency
- Easy installation on engine
- Different sizes & connectors

EASY-TO-USE PRODUCT

- Screw magnetic pickup into flywheel housing until contact is made with top surface of gear tooth on flywheel. Back magnetic pickup out one complete revolution and tighten nut.
- Connect electrical leads.
- The MPU must show a minimum of 2.5V with controller connected for an efficient speed reading.

FULLY COMPATIBLE WITH ALL ENGINES

Whether in inches or in metrics, CRE TECHNOLOGY provides a range of MPUs: they are available in different lengths, thread and connector types.

M16 RANGE

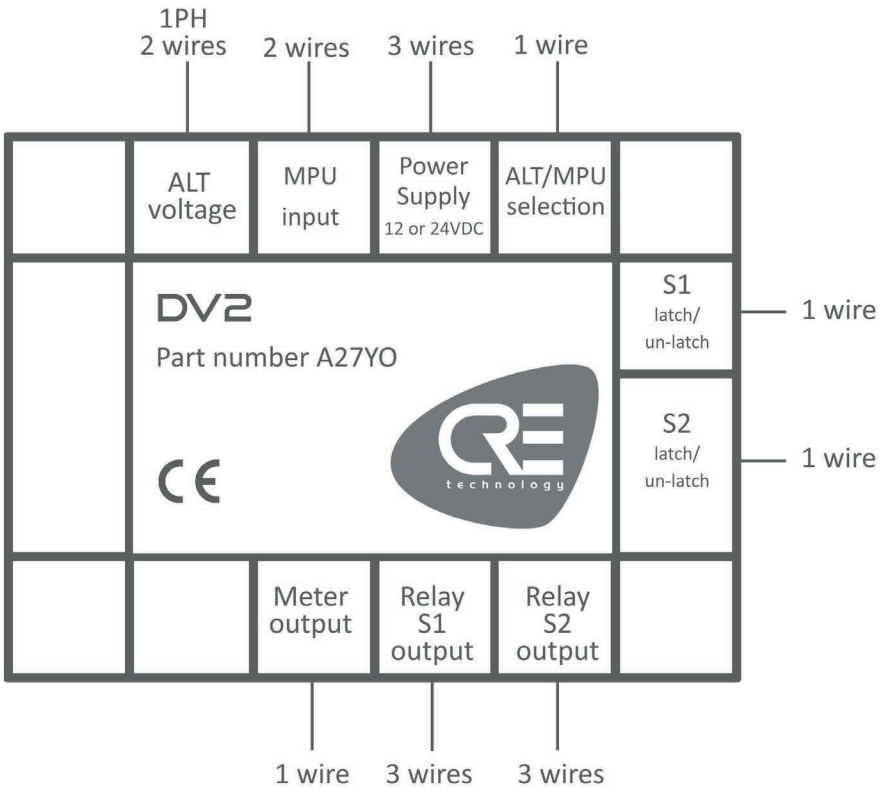
5/8" RANGE

3/8" - 24 UNF

3/4" - 16 UNF

COW 500

WIRING DIAGRAM



CRE TECHNOLOGY

130 allée Charles-Victor Naudin
Les Templiers, Sophia-Antipolis
06410 BIOT - FRANCE
+33 (0)4 92 38 86 82
info@cretechnology.com

www.cretechnology.com