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.
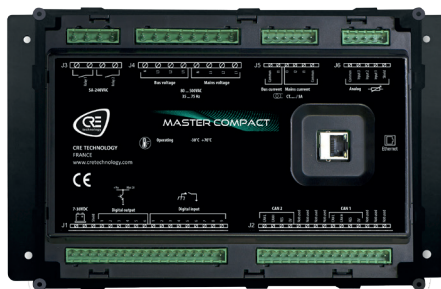
CORE BASE DIN RAIL MOUNTED VERSION

NEW!
SILICON SWITCHBOARD FOR BETTER QUALITY & CONFORT
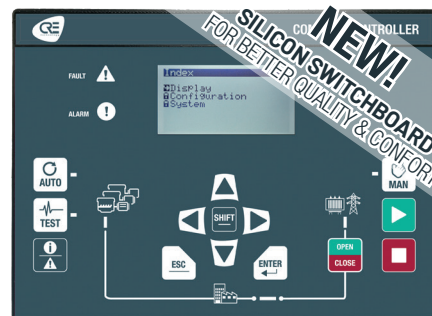
SWITCHBOARD MOUNTED VERSION WITH DISPLAY

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.

ϵ CE (UL) EAC

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
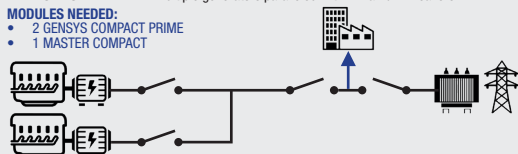
APPLICATIONS

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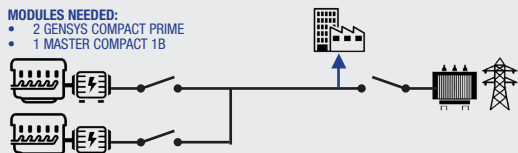**MODULES NEEDED:**
- 2 GENSYS COMPACT PRIME
- 1 MASTER COMPACT

APPLICATION EXAMPLE: Multiple generators paralleled with 1 main / 1 Breaker
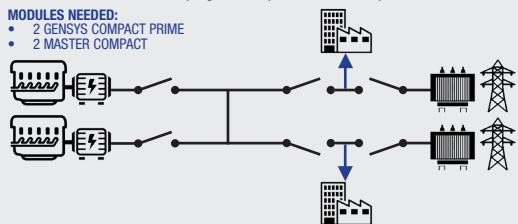**MODULES NEEDED:**
- 2 GENSYS COMPACT PRIME
- 1 MASTER COMPACT 1B

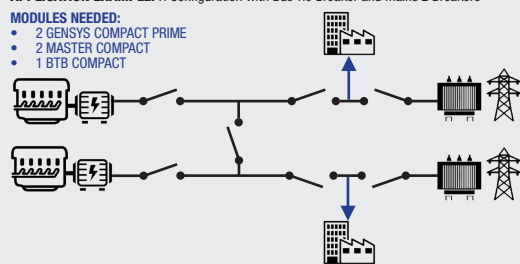**APPLICATION EXAMPLE:** Multiple generators paralleled with multiple mains
MODULES NEEDED:
- 2 GENSYS COMPACT PRIME
- 2 MASTER COMPACT

APPLICATION EXAMPLE: H Configuration with Bus Tie Breaker and mains 2 Breakers
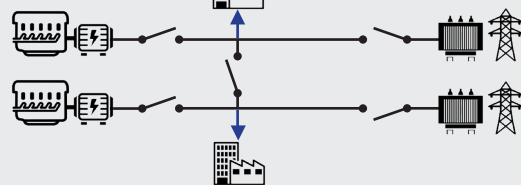**MODULES NEEDED:**
- 2 GENSYS COMPACT PRIME
- 2 MASTER COMPACT
- 1 BTB COMPACT

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.
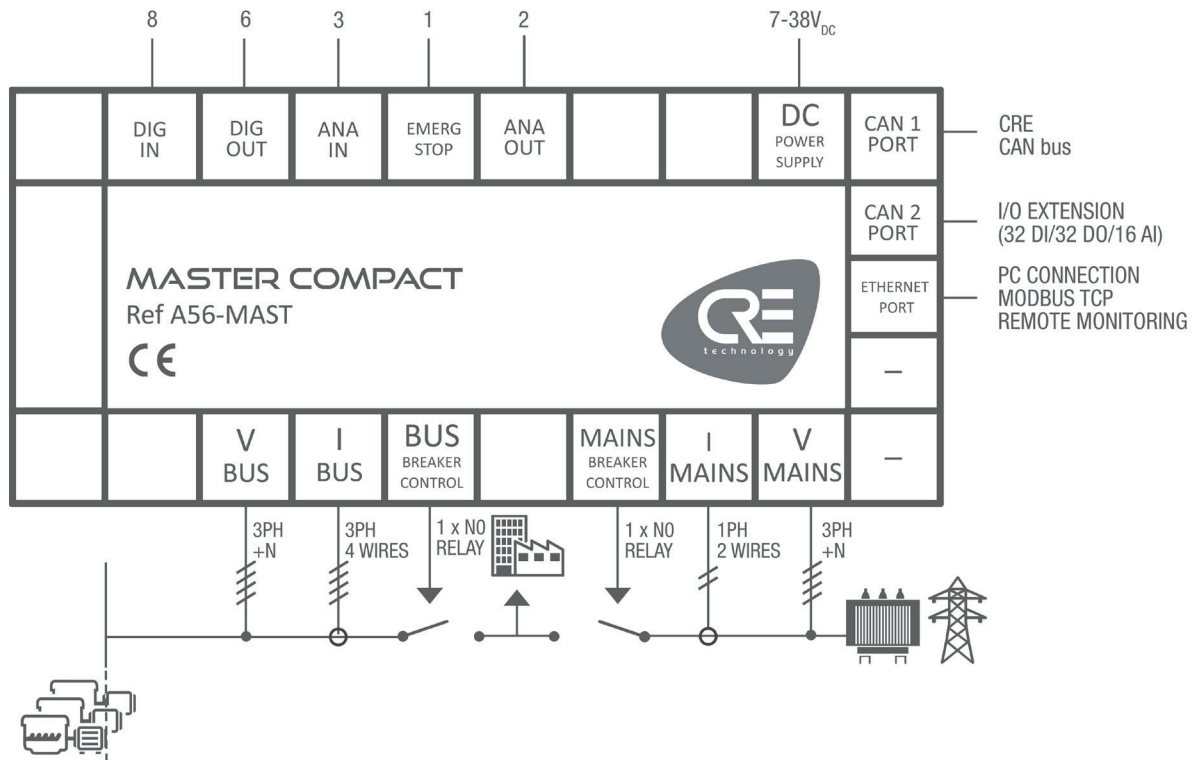- Contrast: configurable.

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

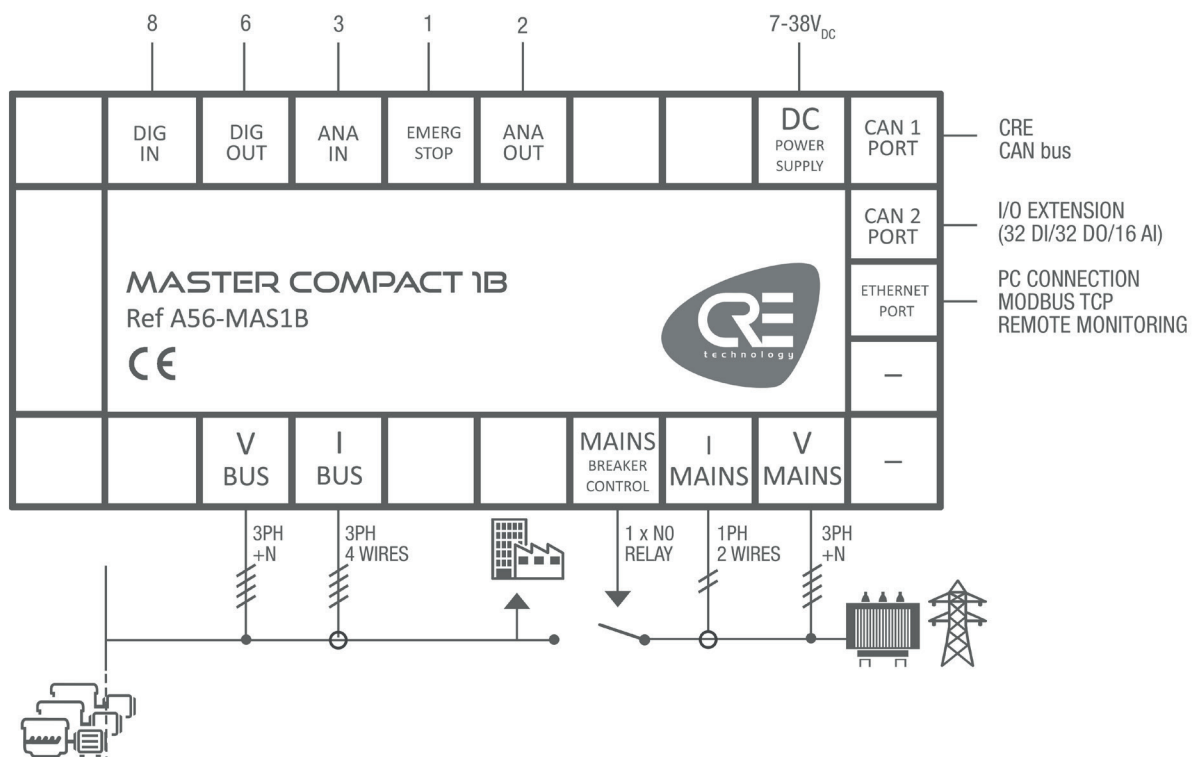CRE TECHNOLOGY - 130, allée Charles-Victor Naudin - Zone des Templiers - SOPHIA ANTIPOLIS - 06410 BIOT - FRANCE
Phone: + 33 (0)4 .92.38.86.82 - www.cretechnology.com - info@cretechnology.com

MASTER COMPACT RANGE_SALES DOCUMENTATION_EN_E2022
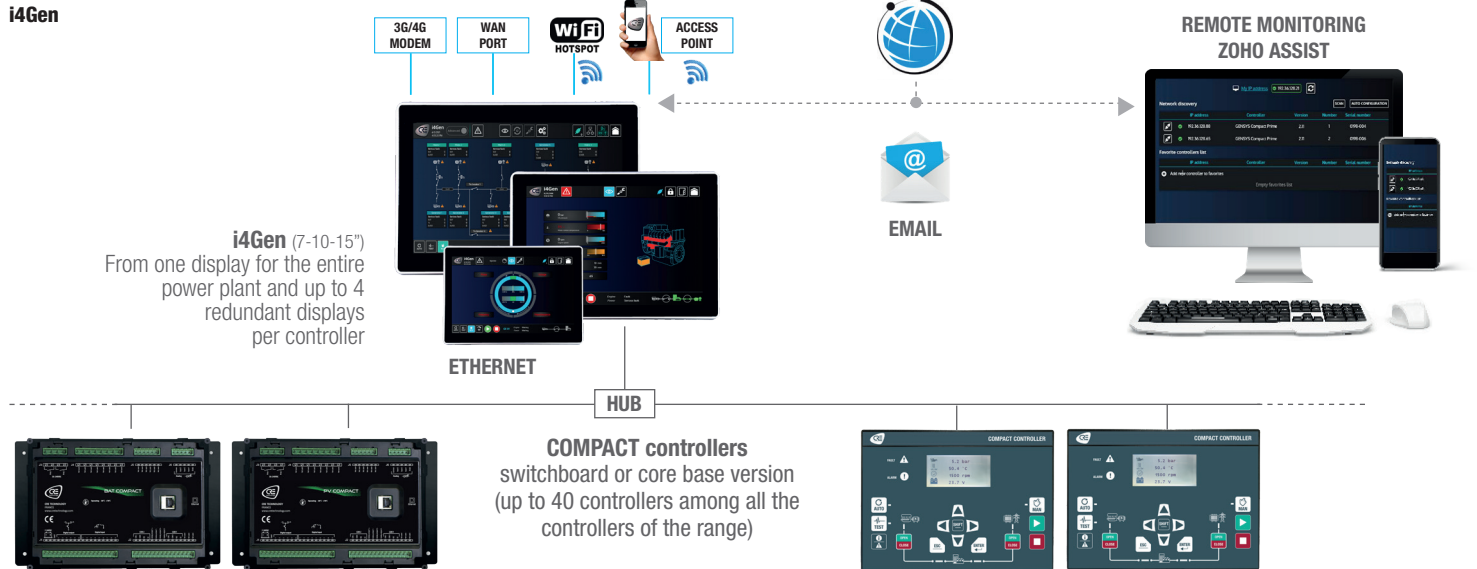
WIRING DIAGRAMS

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

i4Gen

3G/4G MODEM | WAN PORT | WiFi HOTSPOT | ACCESS POINT

REMOTE MONITORING ZOHO ASSIST

EMAIL

i4Gen (7-10-15")
From one display for the entire power plant and up to 4 redundant displays per controller

ETHERNET

HUB

COMPACT controllers
switchboard or core base version
(up to 40 controllers among all the controllers of the range)

COMPACT CONTROLLER

INNOVATION!

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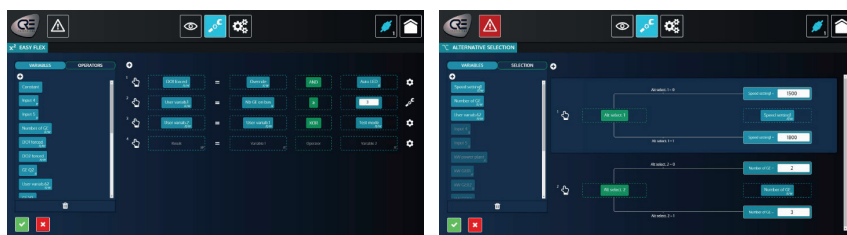
It is possible to customize your application by programming specific features with **Easy Flex**, available directly from **i4Gen Suite** PC software. **Easy Flex** allows user to write up to 50 lines of equation trough an intuitive editor, giving the opportunity to fit with any specific application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