



# MASTER COMPACT 1B

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

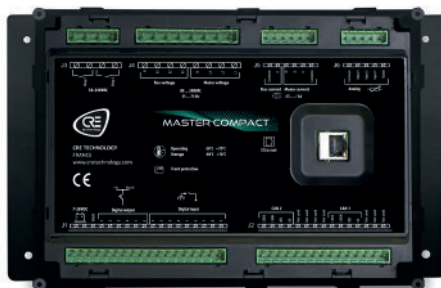
**MASTER COMPACT 1B** is a controller of a complete range for energy sources and power plant management: generators, mains, PV/wind, batteries storage, tie breakers. This controller made to manage generator power plants from 1 to 32 generators in parallel with mains. MASTER COMPACT 1B is suitable for applications with 1 circuit-breaker (no breaker on bus). MASTER COMPACT 1B offers flexibility and time saving thanks to its simple wiring and easy programming.

### Hardware display

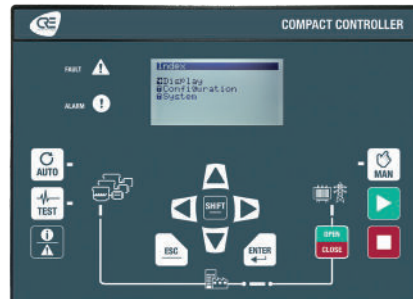
The controller is available in both switchboard panel mounted version with display, or core base mounted version and compatible with i4Gen touchscreen color display range.

### Software

The controller 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



### Part numbers:

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

## KEY FEATURES

### ➤ Single line power plant overview

An interactive and adaptative single-line diagram is generated automatically from the configuration. It provides a global view of the power plant and the possibility to switch between controllers in one click.

### ➤ Easy connection to controllers

Automatic detection of controllers on the Ethernet network for fast and easy connection.

### ➤ Compatibility with generator and grid controllers

Compatibility with PRIME, HYBRID, BAT and BTB controllers of the COMPACT range to manage complete hybrid power plants.

### ➤ Guided experience

- Only parameters and measurements relevant to the user are accessible
- 2 operating modes available: standard and advanced, to suit the skill level of the user
- Built-in documentation in i4Gen
- Dynamic display of the mimic diagram and the control buttons.

### ➤ Enhanced graphical display

Important information are displayed on easy-to-read graphical widgets: numerical values, bar graphs, gauges, curves, animated synchroscope....

### ➤ User friendly equations programming

Easily program your own equations using the drag & drop Easyflex feature.

### ➤ Remote access (optional)

- Supervise, configure and control your power plant from anywhere through a reliable and secured remote communication provided by Zoho Assist
- Receive E-mails from i4Gen when an event, an alarm or a fault is triggered.

### ➤ On-board modbus TCP client and server for integration with other devices

- Client (master): create custom frames in reception or transmission to read or write datas
- Server (slave): allow other devices to read/write the controller registers (with 300 registers available for custom mapping).

### ➤ Automatic versions update

Automatic update of controller firmware and PC software versions.

## OTHER FEATURES

### Power control and management

- Datas shared between the controllers through CANbus for optimised control of the power plant: load sharing, clock synchronization, generator start/stop, sharing of electrical measures....
- Mains failure detection and no break changeover.
- Optimized PID loop with exceptional performance for synchronization and active/reactive power control & Dynamic curves to make PID configuration easier.
- Synchronization management of frequency, phase, voltage and phase sequence (dynamic or static).
- Active/Reactive load sharing.
- Slave mode: for synchronization and load sharing management only.
- Generators base load control.
- Mains peak shaving when importing or exporting power.
- Load shedding management to ensure that priority loads are supplied in case of mains failure.
- Unload breakers management according to available generators power and load demand.
- Automatic management of multiple mains (up to 32).
- Automatic or manual control of circuit breakers with malfunction alarms management.

- Management of complex power plants with multiple generators, grids, BESS, PV/wind systems, tie breakers (up to 40 of them in one power plant).

### Displayed information

- Alarms and events logging: Detailed history log with timestamps of the 500 last events, alarms and faults for easy and fast troubleshooting.
- Electrical measures supervision.
- Synchronization measures supervision.
- Inputs/Outputs status.

### Programming

- Scheduler: Periodic or one-off execution of specific functions and modes can be scheduled.
- Alternative parameters values configurable and switchable using digital inputs or through modbus TCP.

### Options

- Phase offset for D/Y transformers.



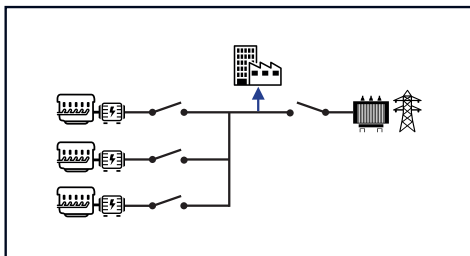


# MASTER COMPACT 1B

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## APPLICATION EXAMPLES

### ▶ MULTIPLE GENSETS PARALLELED WITH 1 MAINS BREAKER



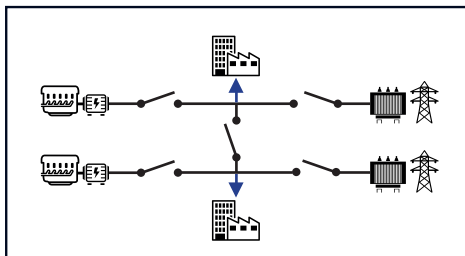
#### FEATURES

- Start/Stop control
- Genset mechanical & electrical protections
- Breakers management
- Synchronization
- Generator load sharing
- Mains paralleling and power management
- Load shedding

#### PRODUCTS REQUIRED

- 3 GENSYS COMPACT PRIME
- 1 MASTER COMPACT 1B

### ▶ H CONFIGURATION WITH BUS TIE BREAKER AND 1 MAINS BREAKER



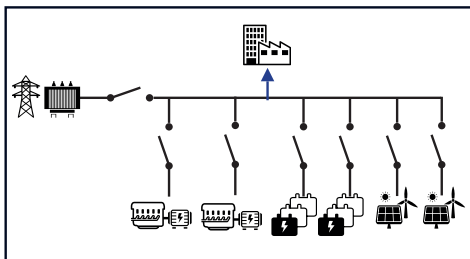
#### FEATURES

- Start/Stop control
- Genset mechanical & electrical protections
- Breakers management
- Synchronization
- Generator load sharing
- Mains power management
- Load shedding
- Mains paralleling
- Bus & Tie breaker management

#### PRODUCTS REQUIRED

- 2 GENSYS COMPACT PRIME
- 2 MASTER COMPACT 1B + 1 BTB COMPACT

### ▶ HYBRID APPLICATION WITH GENSETS, PV/WIND SYSTEMS AND BESS



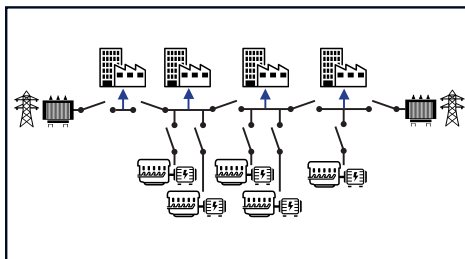
#### FEATURES

- Start/Stop control
- Genset mechanical & electrical protections
- Breakers management
- Synchronization
- Generator load sharing
- Mains power management
- Load shedding
- Mains paralleling
- Communication ModBus & Spec
- Control PV/wind & battery inverter
- Control of the reactive power kVAR batteries & PV

#### PRODUCTS REQUIRED

- 2 GENSYS COMPACT PRIME
- 1 MASTER COMPACT 1B
- 2 HYBRID COMPACT + 2 BAT COMPACT

### ▶ COMPLEX APPLICATION WITH MULTIPLE GENSETS, MAINS, BUS TIE BREAKERS



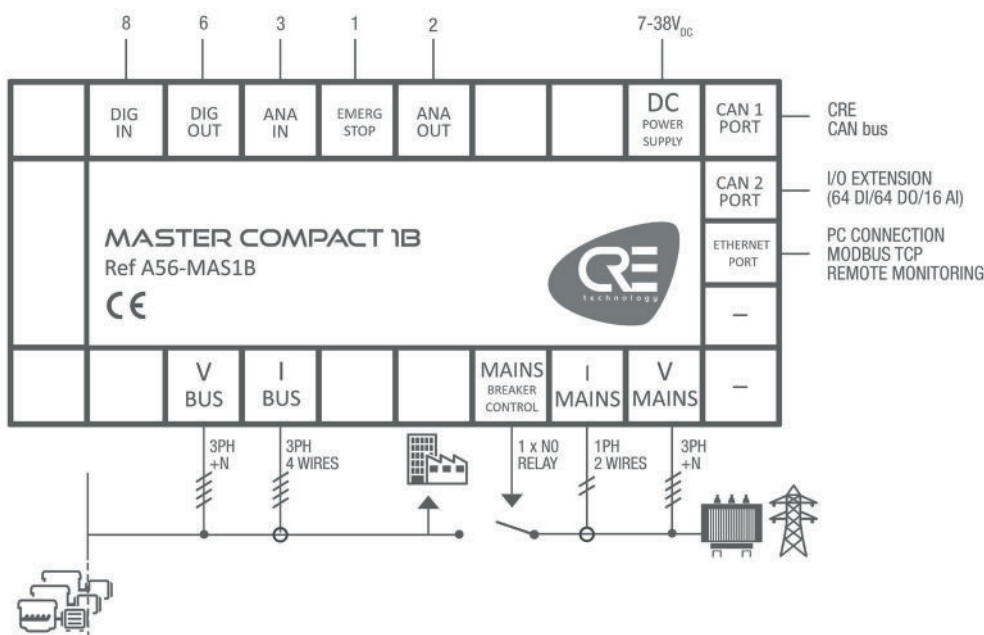
#### FEATURES

- Start/Stop control
- Genset mechanical & electrical protections
- Breakers management
- Synchronization
- Generator load sharing
- Mains power management
- Load shedding
- Mains paralleling
- Bus & Tie breaker management

#### PRODUCTS REQUIRED

- 5 GENSYS COMPACT PRIME
- 1 MASTER COMPACT + 1 MASTER COMPACT 1B + 1 BTB COMPACT

## WIRING DIAGRAM





# MASTER COMPACT 1B

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## SPECIFICATIONS

ELECTRICAL SYSTEM	
Electrical system	Compatible with 3 or 4 wires three-phase, or two-phase or single phase systems
DC POWER SUPPLY	
Power supply range	7...38 VDC
Maximum voltage	45 VDC during 15mn
Current consumption (at 24 VDC)	130 mA + the sum of maximum consumption of each digital output
AC VOLTAGE MEASUREMENT	
Mains measurement inputs	3ph + N (Neutral optional)
Power plant measurement inputs	3ph + N (Neutral optional)
Measurement range	80...500VAC
Current consumption	100 mA max
Accuracy	1%
Frequency range	35...75 Hz, 15VAC minimum between phase and neutral
AC CURRENT MEASUREMENT	
Mains measurement inputs	4 wires (3ph)
Power plant measurement inputs	2 wires (1ph)
Measurement range	0...5A; 1VA
Overload	Overload 15A during 10s
Accuracy	0.5%
INPUTS	
Digital inputs	9 : NO or NC to ground. Adjustable timer On and Off
Digital inputs expansion	64 : via CANopen
Analog inputs	3 : 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
Analog inputs expansion	16 : via CANopen (0-20mA, 0-10VDC, PT100, Thermocouple, ...)
OUTPUTS	
Digital outputs	6 : NE or ND. 1.8A, over-current protected. Adjustable timer.
Digital outputs expansion	64 : via CANopen
Relay outputs (breaker control)	2 : 5A, 240VAC
Analog outputs	2 : +/-10VDC: isolated output with adjustable gain and offset
COMMUNICATION PORTS	
CAN	2 isolated port: - CAN 1: CRE protocol for communication between all COMPACT controllers - CAN 2: I/O extensions
Ethernet	Isolated port: 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 480VAC. Up to 5000m for 400VAC

IP Front	IP65/NEMA rating 4 for HMI version IP20/NEMA rating 1 for core 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
DIMENSIONS - SWITCHBOARD MOUNTED VERSION WITH DISPLAY	
Overall (W x H x D)	245 x 182 x 40mm (9.64 x 7.16 x 1.57in)
Panel cut out (W x H)	220 x 160mm (8.7 x 6.3in)
DIMENSIONS - CORE BASED MOUNTED VERSION	
Overall (W x H x D)	260 x 157 x 44mm (10.24 x 6.18 x 1.73in) (depth with connectors)
Fixing dimensions (W x H)	238 x 129mm (9.37 x 5.08in) (4 screws)
Fixing hole	Ø5.24mm (0.21in)
Mounting	DIN rail
WEIGHT	
Controller	0.7kg (1.54lb)
LCD DISPLAY CHARACTERISTICS	
Size	40x70mm (1.50x2.75in)
Pixels	1024x512. Back light: 50cd/m <sup>2</sup> typical, configurable
Contrast	Configurable
LANGUAGES	
Supported languages	English, French, Spanish in standard. Italian, Portuguese, Russian, German and other custom languages are available on request





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## PROTECTIONS

### BUS ELECTRICAL PROTECTIONS

DESCRIPTION	ANSI CODE
Under frequency	81L
Over frequency	81H
Under voltage	27
Over voltage	59
Unbalance voltage	47

### SYNCHRONIZATION PROTECTIONS

DESCRIPTION	ANSI CODE
Synch check	25
Phase sequence	47

### MAINS ELECTRICAL PROTECTIONS

DESCRIPTION	ANSI CODE
Under frequency	81L
Over frequency	81H
Under voltage	27
Over voltage	59
Unbalance voltage	47
Unbalance current	46
Minimum active power	37P
Maximum active power	32P
Reverse active power	32RP
Minimum reactive power	37Q
Maximum reactive power	32Q
Reverse reactive power	32RQ
Vector jump	78
ROCOF	81

## RELATED PRODUCTS

### CONTROLLERS

A56-PRIME	GENSYS COMPACT PRIME
A56-MAST	MASTER COMPACT
A56-BTB	BTB COMPACT
A56-PV	HYBRID COMPACT
A56-BAT	BAT COMPACT

### ADDITIONAL INPUTS/OUTPUTS

BK5150	CANopen bus coupler
KL9010	End connection terminal
KL1488	8 digital inputs - 0 VDC
KL1889	16 digital inputs - 0 VDC
KL2408	8 digital outputs - 24VDC 0.5A
KL2809	16 digital outputs - 24VDC 0.5A
KL3044	4 analog inputs (0-20mA)

### REMOTE DISPLAYS

A60P0	RDM 1.0 alarm reporting module
A56VXX	i4Gen Touchscreen color display range

### BATTERY CHARGERS

BPXX	3A, 5A, 10A, 20A, 40A. 12VDC, 24VDC
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