



GENSYS 2.0 MARINE RANGE

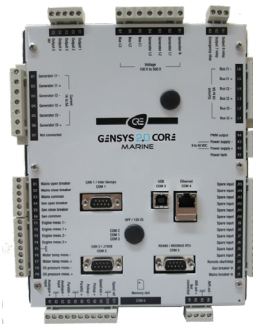
Genset control for marine applications controller (PMS)

The **GENSYS 2.0 MARINE** is a microprocessor module dedicated to generator control, including engine management, synchronization, active and reactive power control, electrical protection and marine sequences.

This Power Management System unit combines all necessary functions:

- Three-phase mains failure control
- Engine starting, control and protections
- Alternator control and protections
- Mechanical parameters display
- Electrical parameters display
- Synchronization with other generators
- Load sharing and kW control
- Load sharing and kVAR control
- Management of mains setpoints (EJP)

The **GENSYS 2.0 MARINE** is configurable via its front panel or via a PC with CRE Config software.



VERSION SOCLE POUR MONTAGE EN FOND D'ARMOIRE



SWITCHBOARD MOUNTED VERSION WITH DISPLAY

Part numbers:

A53Z3 GENSYS 2.0 MARINE Switchboard mounted version with display

A53Z4 GENSYS 2.0 MARINE Core base Din rail mounted version

KEY FEATURES

▶ PROGRAMMING BY EQUATIONS

The **GENSYS 2.0 MARINE** controller is a real PLC unit where equations and sequences can be programmed directly by the user with a Easy PLC software 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

The **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

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 generators on Busbar, or both.

▶ 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.

▶ 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)
- Vector phase compensation for step-up transformer (ex Dyn 11)

▶ DISPLAYED INFORMATIONS

- **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)

▶ ALARMS AND EVENTS LOGGING

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

▶ 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



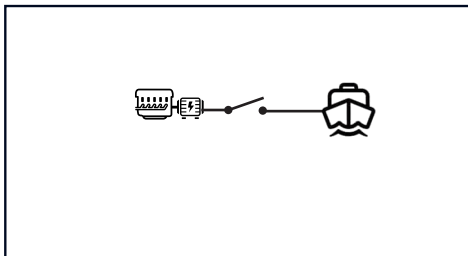


GENSYS 2.0 MARINE RANGE

Genset control for marine applications controller (PMS)

APPLICATION EXAMPLES

➤ SINGLE GENSET IN ISLAND MODE



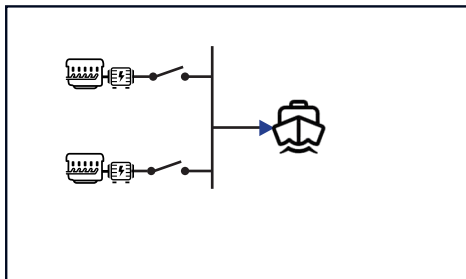
FEATURES

- Start and stop
- Mechanical parameters display
- Mechanical protections
- Communication J1939 for electronic engines
- Catalyst regeneration control and management
- Heavy consumer management
- Non-essential load management
- Marine approval certification

PRODUCTS REQUIRED

- 1 x GENSYS 2.0 MARINE

➤ MULTIPLE GENSETS PARALLELED IN ISLAND MODE



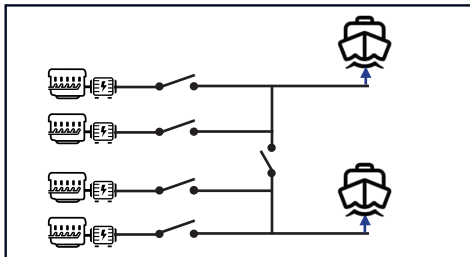
FEATURES

- Start and stop
- Mechanical protections
- Communication J1939 for electronic engines
- Circuit breaker control
- Synchronization of voltage, frequency, phase and control phase sequences
- Active and reactive load control
- Dead busbar management with static paralleling option
- Load shedding
- Electrical protections
- Power reserve management
- Heavy consumer management
- Non-essential load management
- Marine approval certification

PRODUCTS REQUIRED

- 2 x GENSYS 2.0 MARINE

➤ MULTIPLE GENSETS PARALLELED WITH 1 TIE BREAKER



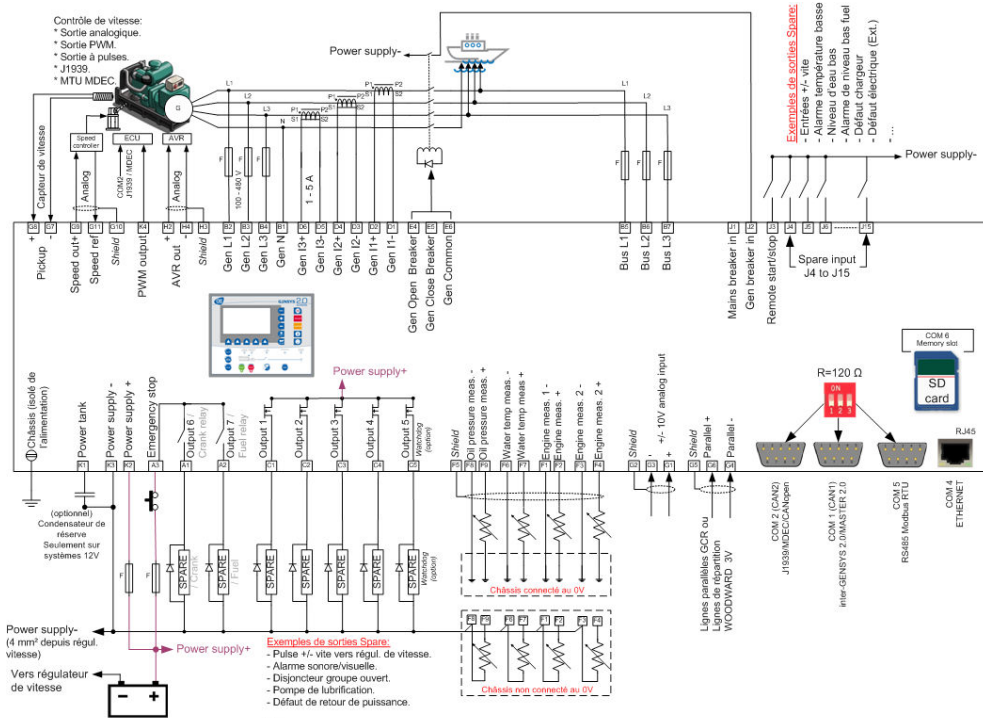
FEATURES

- Start and stop
- Mechanical protections
- Communication J1939 for electronic engines
- Circuit breaker control
- Synchronization of voltage, frequency, phase and control phase sequences
- Active and reactive load control
- Dead busbar management with static paralleling option
- Load shedding
- Electrical protections
- Power reserve management
- Heavy consumer management
- Non-essential load management
- Marine approval certification

PRODUCTS REQUIRED

- 4 x GENSYS 2.0 MARINE

WIRING DIAGRAM





GENSYS 2.0 MARINE RANGE

Genset control for marine applications controller (PMS)

SPECIFICATIONS

ELECTRICAL SYSTEM

Electrical system Compatible with 3 or 4 wires three-phase, or twophase or single phase systems

DC POWER SUPPLY

Power supply range 8...40 V_{DC}
Current consumption (at 12 V_{DC}) 750 mA
Current consumption (at 24 V_{DC}) 400 mA

AC VOLTAGE MEASUREMENT

Generator measurement inputs 3ph + N (Neutral optional)
Bus measurement inputs 3ph
Measurement range 100...480V_{AC}
Current consumption 100 mA max
Voltage control signal AVR is controlled either by a +/-10VDC output (adjustable span and offset) or by voltage+/voltage-contacts
Frequency range 45 to 70 Hz – 15VAC minimum between phase and neutral

AC CURRENT MEASUREMENT

Generator measurement inputs 3ph RMS
Measurement range 0...5A; 1VA Each phase is isolated from the others
Overload Overload 15A during 10s

INPUTS

Digital inputs 15: NO or NC to ground
Emergency stop input 24V_{DC}
Digital inputs expansion 128: via CANopen
Analog inputs 2 inputs 0 to 400 Ω (oil pressure and water temperature).
2 inputs 0 to 10 kΩ (Spare 1 and Spare 2). Input calibration is configurable.
Analog inputs expansion 44 : via CANopen (0-20mA, 0-10V_{DC}, PT100, Thermocouple, ...)

OUTPUTS

Digital outputs (Crank and fuel) : 5A. The 24V is provided through the emergency push button & (5Transistor outputs): 350mA, over-current protected
Digital outputs expansion 64: via CANopen
Relay outputs (breaker control) 1: 5A, 230V_{AC} max. NO + NC available
Analog outputs expansion 8: via CANopen
Analog outputs 2: +/-10V_{DC} : isolated output with adjustable gain and offsets
PWM CAT and Perkins engines
«Watchdog» output Digital output for microprocessor life signal

MAGNETIC PICK-UP

Voltage input range 2V_{AC} minimum
Frequency input range 100 to 10kHz

COMMUNICATION PORTS

CAN 2 isolated port:
- CAN 1: inter-GENSYS/MASTER 2.0 connection (male Sub-D9 120Ω resistor selected by microswitch)
- CAN 2: J1939, I/O extensions (male Sub-D9 120Ω resistor selected by micro-switch)
RS485 For Modbus RTU (read and write)/ - 120 Ω termination resistor configuration selected by micro-switch
Ethernet (PC communication/ GENSYS 2.0 CORE and RDM 2.0/ Modbus TCP connection)
Memory slot SD card reader

ENVIRONMENT

Operating temperature -20...70°C (-4...158°F)
Storage temperature -30...80°C (-22...176°F)
Humidity 95% non-condensing
IP Front IP Frontal: IP65 / NEMA rating 4 - IP20 /NEMA rating 1 for CORE
IP Rear IP20/NEMA rating 1

DIRECTIVES / CERTIFICATIONS

European Union Directives EN 50081-2, EN 50082-2, 73/23EEC
Marine Certifications DNV, LLOYDS REGISTER

DIMENSIONS - SWITCHBOARD MOUNTED VERSION WITH DISPLAY

Overall (W x H x D) 248 x 197 x 57mm (9.76 x 7.76 x 2.24 in)
Panel cut out (W x H) 177 x 228mm (7 x 9cm)

DIMENSIONS - CORE BASED MOUNTED VERSION

Overall (W x H x D) 248 x 197 x 57mm (9.76 x 7.76 x 2.24 in)
Back size 250 x 200mm (9.84 x 7.878 in)

WEIGHT

Controller 1.9kg (4.2lb)

LCD DISPLAY CHARACTERISTICS

Size 114 x 64mm (4.48 x 2.52 in)
Back light 60 cd/m², 3 tamaños de caracteres
Terminals 2 piece connectors, 2,5mm²

LANGUAGES

Supported languages English, Spanish, French, Italian. Other custom languages: downloadable on request





GENSYS 2.0 MARINE RANGE

Genset control for marine applications controller (PMS)

PROTECTIONS

GENERATOR ELECTRICAL PROTECTIONS

DESCRIPTION	ANSI CODE
Under frequency	81L
Over frequency	81H
Under voltage	27
Over voltage	59
Over current	50
Neutral over current	50N
Unbalance current	46
Minimum active power	37P
Maximum active power	32P
Minimum reactive power	37Q
Maximum reactive power	32Q
Reverse active power	32RP
Reverse reactive power	32RQ

MAINS ELECTRICAL PROTECTIONS

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

SYNCHRONIZATION PROTECTIONS

DESCRIPTION	ANSI CODE
Phase sequence	47

PRODUCTOS RELACIONADOS

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)

BATTERY CHARGERS

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

HMI

MARINE	RDM 2.0 MARINE
--------	----------------

CABLE

A53W1	Ethernet cable, (3 meters long) CAT 5 CROSSED CABLE
-------	---

