GENSYS 2.0 MARINE

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

- Compact «all-in-one» module
- 5 isolated serial ports: USB, RS485, 2 CANbus, Ethernet
- SD card reader
- I/O flexibility
- New multi-function graphic display
- Internal, programmable by equations, logic sequences
- Predefined sequences dedicated to marine applications
- Fully compatible with all speed governors and AVRs

The Gensys 2.0 Marine is a control unit designed for marine generator switch-boards panels.

This Power Management System unit combines all necessary functions:

- **Engine start/stop and protections**
- **Alternator control and protections**
- **Mechanical parameters display**
- **Electrical parameters display**
- **Genset synchronization (speed and voltage)**
- **Load sharing and kW control**
- **Load sharing and kVAR control**
- **Breaker control**
- **Synchronization with shore**
- **KW and KVAR Load/ Unload Management**
- **Tie Breaker control**
- **TCP Modbus**

Gensys 2.0 Marine is configurable via its front panel or via a PC with CRE Config software.

The Gensys 2.0 Marine controller has an analogue load sharing line compatible with all types of analogue load sharers.

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 text editor software or Easy PLC Software.

INPUT / OUTPUT EXTENSIONS

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 CANbus port dedicated to options. This extends the inputs / outputs up to 128 digital inputs, 64 digital outputs, 44 analogue inputs and 8 analogue outputs.

MINIMUM OPTIONS

This compact controller is offered with a minimum of options to fit all types of application without expensive add-on packages. The standard Gensys 2.0 Marine unit is recommended for all types of power plant, from 1 to 14 generators.
For specific needs, Gensys 2.0 Marine can be configured accordingly.

INTER-UNIT ISOLATED CANBUS

The inter-unit CANbus allows more information exchanges between modules and reduces the wiring and the number of I/O used on each module.

The Gensys 2.0 Marine has an inter-unit isolated CANbus port for information transfer (dead busbar management, KW and KVAR load sharing...).

APPLICATIONS

- Gas and fuel generators
- Synchronization and power management module (without engine control).
- 1 generator in parallel with shore: Base load or Peak shaving.
- 2 to 14 gensets in parallel and change over with shore.
- 2 to 14 gensets in parallel and paralleled with shore for load transfer.

FEATURES

Control & Management

- Manual & automatic engine control.
- Automatic start/stop control depending on load demand (kW and kVAR).
- Dead busbar management.
- Isochronous or droop kW load sharing control (via CANbus serial port, up to 14 generators)
- Constant voltage (or droop) kVAR load sharing control (via CANbus serial port, up to 14 generators)
- Power factor control when paralleling with shore.
- kW control (base load or peak shaving) when paralleling with shore
- Shore paralleling (1 generator).

Protections

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

Synchronization

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

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 + 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)
  > Current (3 phase)
  > Frequency
  > Active power
  > Reactive power
  > Power factor
  > Import active power energy (kWh)
  > Import reactive power energy (kVARh)

Alarms & events

- The last 50 alarms and last 50 shutdowns are recorded on non volatile memory.
- Data logging every 100ms.

Other

- Electronic droop function (droop <1%). Allows load sharing without inter-unit communication. Quasisochronous® load sharing.
- “Watchdog” digital output for microprocessor life signal.

CHARACTERISTICS

Voltages, currents & frequency

- DC voltage power supply input: 8 to 40VDC, 600mA at 12VDC & 300mA 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 to 70Hz – 15VAC minimum between phase and neutral.

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.

Inputs, outputs

- Digital inputs: NO or NC to ground.
- Emergency stop input: Norm. Closed 24V.
- Relay outputs (crank & fuel): 16A. The 24V is provided through the emergency push button.
- Relay outputs (breakers): 5A, 230VAC max. NO + NC available.
- Transistor outputs: 350mA, over-current protected.
- Analogue inputs (oil pressure & water temp): 0 to 400 Ohms. Calibration is configurable.
- Analogue inputs (spare 1 & spare 2): 0 to 10KOhms.
- Calibration for speed and frequency control is made either by a +/-10VDC output with adjustable span and offset or by speed+/speed- contacts.
- Voltage control signal: The voltage control (AVR) is made either by a +/-10 VDC output with adjustable span and offset or by voltage+/voltage- contacts.
- Magnetic pick up input: 100 to 10.000Hz, 2VAC minimum.

Compatibility

- PWM output for CAT and Perkins engines 500Hz
- Fully compatible with all speed governors and AVRs
- Pulse output to control speed and AVRs

Ports

- 5 serial ports are available.
- Ethernet for PC connection.
- TCP Modbus.
- RS485 for Modbus RTU (read and write) – male Sub-D 9 pins - 120 ohms resistors selected by micro-switch.
- CANbus for inter-Gensys 2.0 connection– male Sub-D 9 pins - 120 ohms resistors by selected by micro-switch.
- CANbus for J1939 – male Sub-D 9 pins - 120 ohms resistors selected by micro-switch.
- SD card reader
- USB for factory use only.

Size and weigh

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

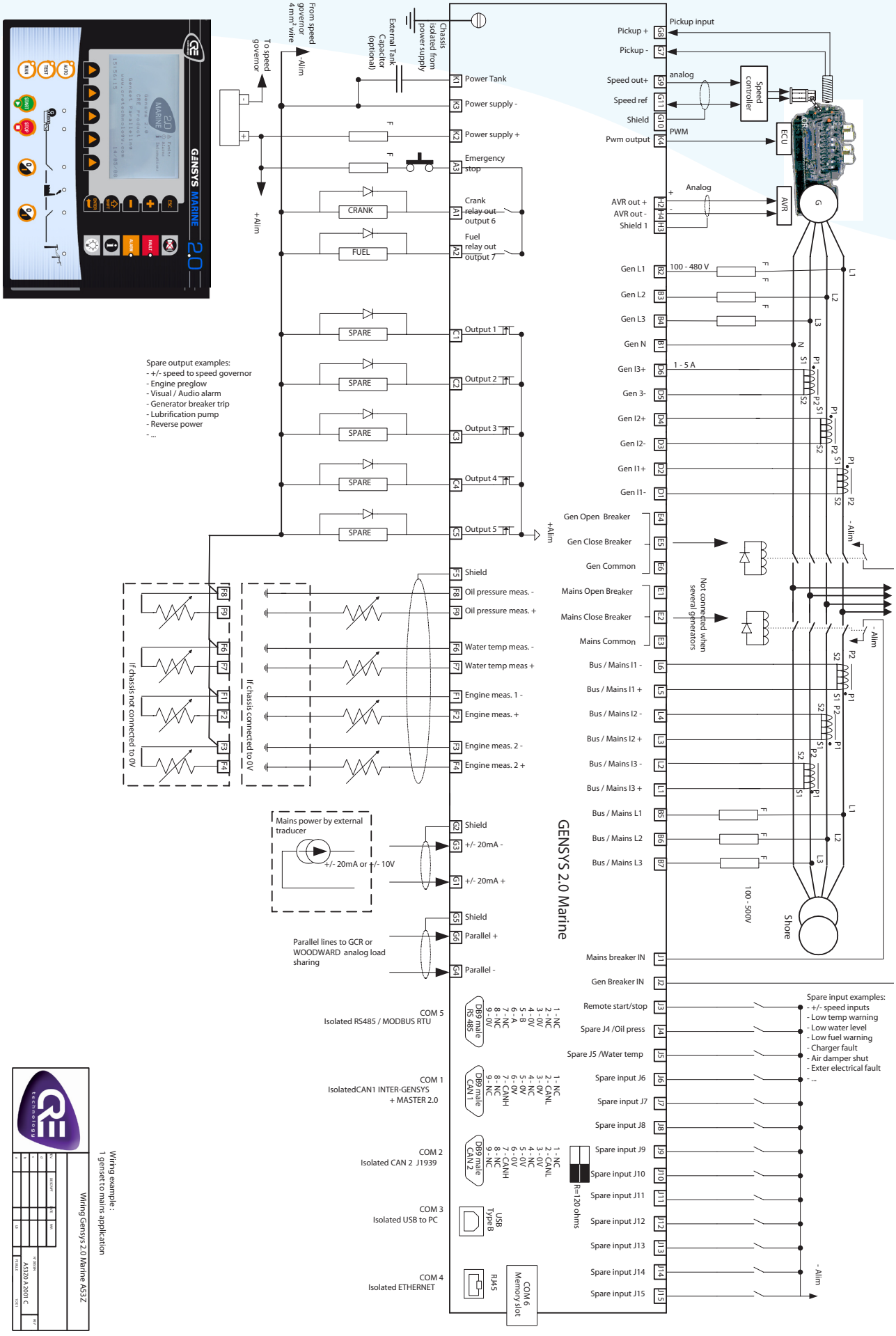
Certifications

- European Union Directives: EN 50081-2, EN 50082-2, 73/23EEC
- Front panel: IP54 protection. Back panel: IP20 protection.
- DNV Marine Certification

Other

- LCD characteristics: 114x64mm, 60 cd/m² backlight, 3 character sizes.
- Terminals: 2 piece connectors, 2,5mm².
- Standard languages: English, Spanish, French, Italian.
- Other custom languages: downloadable on request.

PART NUMBER
A53Z3
ASSOCIATED PRODUCTS
GENSYS 2.0
MASTER 2.0


GENSYS MARINE 2.0
From speed governor 4 mm² wire
To speed governor
-Alim
+Alim
Chassis isolated from power supply
External Tank Capacitor (optional)
Power Tank
Power supply -
Power supply +
Emergency stop
CRANK
Crank relay out output 6
FUEL
Fuel relay out output 7
SPARE
Output 1
Output 2
Output 3
Output 4
Output 5
Spare output examples:
- +/- speed to speed governor
- Engine preglow
- Visual / Audio alarm
- Generator breaker trip
- Lubrification pump
- Reverse power
- ...
Shield
Oil pressure meas. -
Oil pressure meas. +
Water temp meas. -
Water temp meas +
Engine meas. 1 -
Engine meas. +
Engine meas. 2 -
Engine meas. 2 +
If chassis not connected to 0V
If chassis connected to 0V
Mains power by external traducer
+/- 20mA or +/- 10V
Shield
+/- 20mA -
+/- 20mA +
Shield
Parallel +
Parallel -
Parallel lines to GCR or WOODWARD analog load sharing
COM 5
Isolated RS485 / MODBUS RTU
D89 male RS 485
COM 1
IsolatedCAN1 INTER-GENSYS + MASTER 2.0
D89 male CAN 1
COM 2
Isolated CAN 2 J1939
D89 male CAN 2
R=120 ohms
COM 3
Isolated USB to PC
USB Type B
COM 4
Isolated ETHERNET
RJ45
COM 6 Memory slot
Pickup input
Pickup +
Pickup -
Speed out+
Speed ref
Shield
Pwm output
analog
PWM
Speed controller
ECU
Analog
AVR out +
AVR out -
Shield 1
AVR
G
Gen L1
Gen L2
Gen L3
Gen N
Gen I3+
Gen 3-
Gen I2+
Gen I2-
Gen I1+
Gen I1-
100 - 480 V
1 - 5 A
Gen Open Breaker
Gen Close Breaker
Gen Common
Mains Open Breaker
Mains Close Breaker
Mains Common
Not connected when several generators
Bus / Mains I1 -
Bus / Mains I1 +
Bus / Mains I2 -
Bus / Mains I2 +
Bus / Mains I3 -
Bus / Mains I3 +
Bus / Mains L1
Bus / Mains L2
Bus / Mains L3
100 - 500V
Shore
GENSYS 2.0 Marine
Mains breaker IN
Gen Breaker IN
Remote start/stop
Spare J4 /Oil press
Spare J5 /Water temp
Spare input J6
Spare input J7
Spare input J8
Spare input J9
Spare input J10
Spare input J11
Spare input J12
Spare input J13
Spare input J14
Spare input J15
Spare input examples:
- +/- speed inputs
- Low temp warning
- Low water level
- Low fuel warning
- Charger fault
- Air damper shut
- Exter electrical fault
- ...
- Alim
Wiring example :
1 genset to mains application
Wiring Gensys 2.0 Marine A53Z
A5320.A2001 C

focus on HEAVY CONSUMER MANAGEMENT AND 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.

Heavy consumers Management

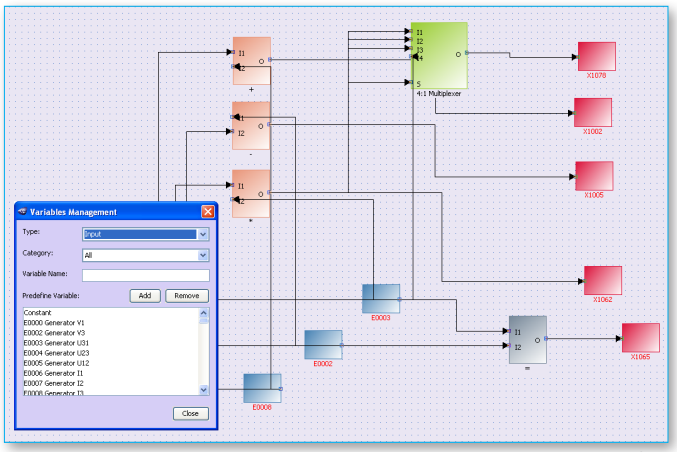
Some external parameters must be analysed by the Gensys Marine units before accepting heavy consumer load:

- If the Power Plant can accept the load, each Gensys Marine accepts the 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 Marine triggers outputs to trip non essential loads.

EASY PLC SOFTWARE



screenshot

CUSTOMIZED LOGICAL SEQUENCES

Available parameters:

- Inputs
- Outputs
- Arithmetic equations
- Logical sequences

CRE TECHNOLOGY SERVICES

Like every CRE Technology product, the unit also benefits from our technical support.

All CRE products are delivered with one year warantee, and if necessary we will be happy to come on site for product commissioning or troubleshooting.

CRE Technology and their distributors can also provide pre-programmed Gensys 2.0 Marine according to customer requirements.

The company offers specific trainings to control the large Gensys Marine applications and program the module.

CONTACT US

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