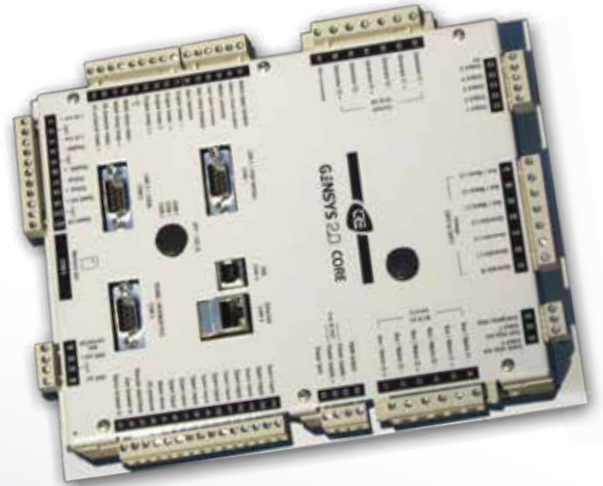# GENSYS 2.0 CORE MARINE

Core unit for all-in-one genset control and paralleling unit with integrated PLC : PMS

- Rear mounted control and paralleling module
- To be used with remote display module :,
- I/O flexibility
- Isolated communication ports: RS485, 2 CAN bus,
- Ethernet + SD card reader
- Fully compatible with all speed governors and AVRs
- Engineering services for specific applications
- Marine sequencies
- Marine approval : DNV

The GENSYS 2.0 CORE MARINE is an easy-to-use rear-mounted, control and paralleling module which can synchronize up to 32 generators.

GENSYS 2.0 CORE MARINE is configured with CRE Config software or via its embedded Web site.

PROGRAMMING BY EQUATIONS
The GENSYS 2.0 CORE MARINE module is a real PLC unit where 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 EXTENSION
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 CORE MARINE is offered full features with a minimum of options to fit all types of application without expensive add-on packages. For specific needs, the following options are available:
- Phase shift compensation (ie: Dyn11)

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

FEATURES

Control and management

- Manual and automatic engine control.
- Automatic start/stop control depending on load demand.
- Dead busbar management.
- Isochronous or droop kW load sharing control (via CAN bus serial port, 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.

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 shit, df/dt.
- 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 (differential voltmeter available on screen).

Alarms and events

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

Other

- "Watchdog" digital output for microprocessor life signal.

CHARACTERISTICS

Current, voltage and frequency

- DC voltage power supply input: 8 to 40V_{DC}, 600mA at 12V_{DC} and 300mA 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 digital outputs +/- pulses.

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.
- IP20

Inputs, outputs

- 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 10KΩ.
- Calibration for speed and frequency control is made 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.
- PWM output for CAT and Perkins engines

Ports

- Isolated communication ports are available:
  - RS485 for Modbus RTU (read and write)/ male Sub-D 9 pins 120 Ω resistors selected by micro-switch.
  - CAN bus for inter-GENSYS/ MASTER 2.0 connection: male Sub-D 9 pins 120 Ω resistors selected by micro-switch
  - CAN bus dedicated to options J1939, I/O extensions: male Sub-D 9 pins 120 Ω resistors selected by micro-switch
  - Ethernet: PC communication/ GENSYS 2.0 CORE and RDM 2.0 connection/ Modbus TCP
  - SD card reader

Size and weigh

- Size: 248x197x57mm (9.76x7.76x2.24in)
- Panel cut out: 177x228mm (6.97x8.98in)
- Weight: 1kg (2.2lb)

Certifications

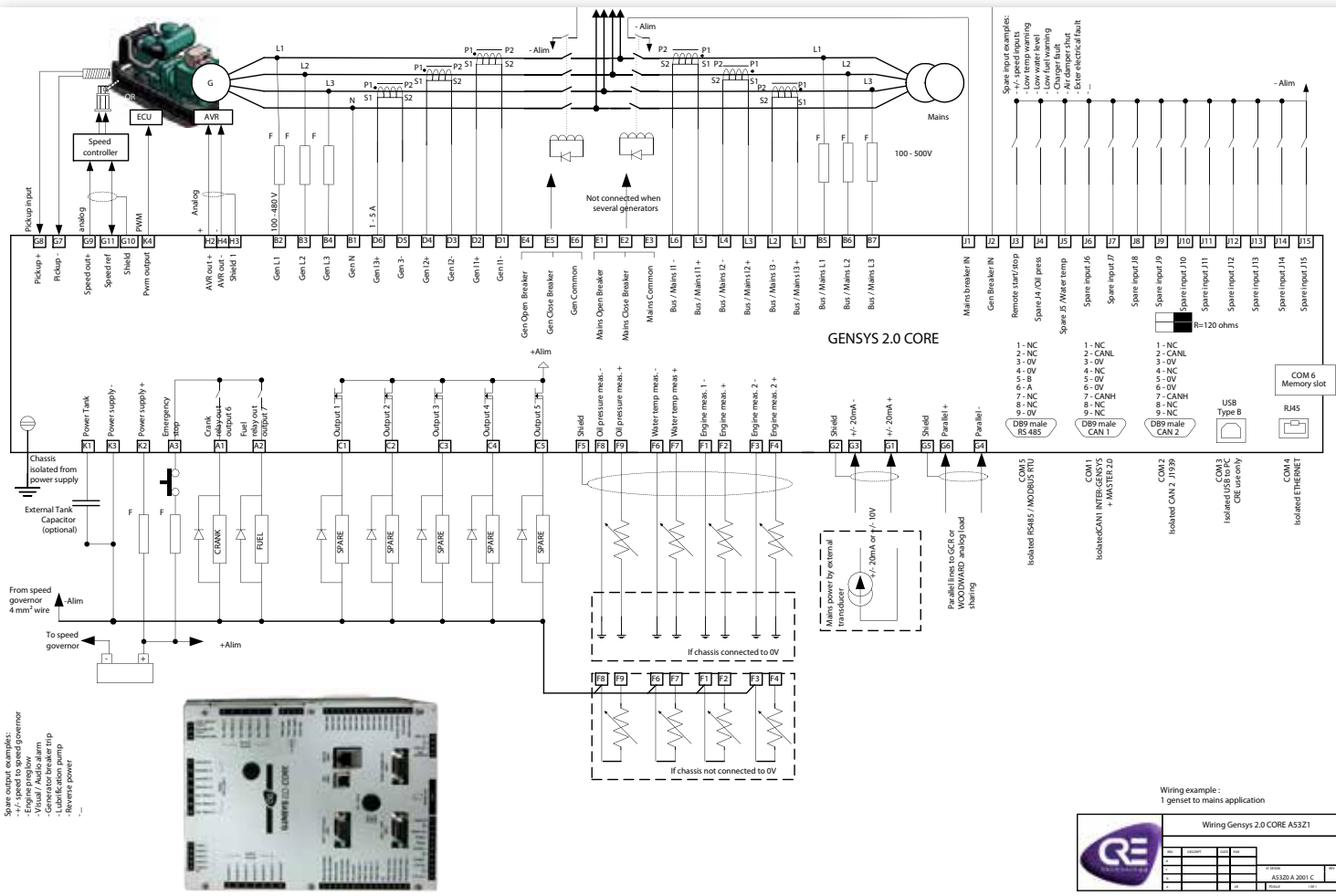- European Union Directives: EN 50081-2, EN 50082-2, 73/23EEC

PART NUMBER
A53Z1

SOFTWARE
CRE Config / Easy PLC

GENSYS 2.0 CORE MARINE

GENSYS 2.0 CORE

Not connected when several generators

100 - 500V

Mains

100 - 480 V

1 - 5 A

Spare input examples:
- +/- speed inputs
- Low temp warning
- Low water level
- Low fuel warning
- Charger fault
- Air damper shut
- Exter electrical fault

R=120 ohms

COM 6
Memory slot

USB Type B

RJ45

Pickup input

Speed controller

ECU   AVR

OR

G

Labels (top row terminals):
G8 Pickup +, G7 Pickup -, G9 Speed out+, G11 Speed ref, G10 Shield, K4 Pwm output
H2 AVR out +, H4 AVR out -, H3 Shield
B1 Gen L1, B3 Gen L2, B4 Gen L3, B1 Gen N, D6 Gen I3+, D5 Gen I3-, D4 Gen I2+, D3 Gen I2-, D2 Gen I1+, D1 Gen I1-
E4 Gen Open Breaker, E5 Gen Close Breaker, E6 Gen Common, E1 Mains Open Breaker, E2 Mains Close Breaker, E3 Mains Common
L6 Bus / Mains I1 -, L5 Bus / Mains I1 +, L4 Bus / Mains I2 -, L3 Bus / Mains I2 +, L2 Bus / Mains I3 -, L1 Bus / Mains I3 +
B5 Bus / Mains L1, B6 Bus / Mains L2, B7 Bus / Mains L3
J1 Mains breaker IN, J2 Gen Breaker IN
J3 Remote start/stop, J4 Spare J4 /Oil press, J5 Spare J5 /Water temp, J6 Spare input J6, J7 Spare input J7, J8 Spare input J8, J9 Spare input J9, J10 Spare input J10, J11 Spare input J11, J12 Spare input J12, J13 Spare input J13, J14 Spare input J14, J15 Spare input J15

DB9 male RS 485 (COM 5 — Isolated RS485 / MODBUS RTU):
1 - NC
2 - NC
3 - 0V
4 - NC
5 - B
6 - A
7 - NC
8 - NC
9 - 0V

DB9 male CAN 1 (COM 1 — Isolated CAN1 INTER-GENSYS + MASTER 2.0):
1 - NC
2 - CANL
3 - 0V
4 - NC
5 - 0V
6 - 0V
7 - CANH
8 - NC
9 - NC

DB9 male CAN 2 (COM 2 — Isolated CAN 2 J1939):
1 - NC
2 - CANL
3 - 0V
4 - NC
5 - 0V
6 - 0V
7 - CANH
8 - NC
9 - NC

COM 3 Isolated USB to PC CRE use only
COM 4 Isolated ETHERNET

Lower section:
Chassis isolated from power supply

External Tank Capacitor (optional)

From speed governor 4 mm² wire
To speed governor
-Alim
+Alim

Spare output examples:
- +/- speed to speed governor
- Engine preglow
- Visual / Audio alarm
- Generator breaker trip
- Lubrication pump
- Reverse power

K1 Power Tank, K3 Power supply -, K2 Power supply +, A3 Emergency stop, A1 Crank relay out output 6, A2 Fuel relay out output 7, C1 Output 1, C2 Output 2, C3 Output 3, C4 Output 4, C5 Output 5
CRANK, FUEL, SPARE, SPARE, SPARE, SPARE, SPARE

+Alim

F5 Shield, F8 Oil pressure meas. -, F9 Oil pressure meas. +, F6 Water temp meas. -, F7 Water temp meas. +, F1 Engine meas. 1 -, F2 Engine meas. +, F3 Engine meas. 2 -, F4 Engine meas. 2 +

S2 Shield, G3 +/- 20mA -, G1 +/- 20mA +, G5 Shield, G6 Parallel +, G4 Parallel -

Mains power by external transducer
+/- 20mA or +/- 10V

Parallel lines to GCR or WOODWARD analog load sharing

If chassis connected to 0V

F8 F9 F6 F7 F1 F2 F3 F4

If chassis not connected to 0V

Wiring example:
1 genset to mains application

Wiring Gensys 2.0 CORE A53Z1

A53Z0 A 2001 C

CABLE
A53W1

ASSOCIATED PRODUCTS
GENSYS 2.0
Complementary: RDM 2.0