

GC800

ADVANCED SYNCHRONISING & LOAD SHARE GENERATOR CONTROLLER

**Mecc Alte GC800 paralleling genset
controller for complex & critical applications**

SYSTEM DESCRIPTION

The GC800 is the high-end control module among the Mecc Alte paralleling controllers range, featuring fast and modern microprocessor cores, enabling highly developed and sophisticated control system capabilities.

Composed of two devices: The SCM (System Control Module) basebox and the HMI (Human Machine Interface), the SCM mounts inside the control panel for easy and secure access to its wiring terminals, while the door-mounted HMI is a high-resolution colour touchscreen enabling all control and programming functionalities of the system.

APPLICATIONS

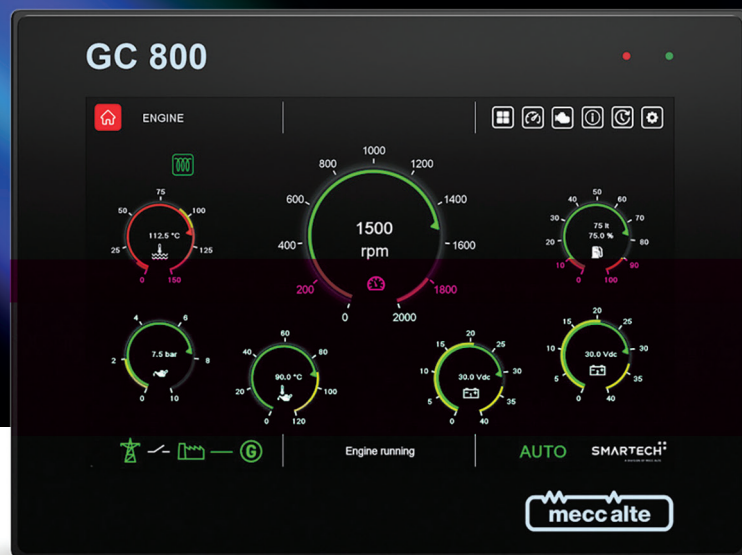
The GC800 is suited for generator operations as a high-quality basebox + touchscreen system. Especially suited for demanding redundancy applications, it's ideal for hospitals and data centres, where a single point of instrumentation or control system failure could expose a critical supply to risk.

Hot-redundancy is a specialist feature of the GC800 system, with two SCM units communicating over a redundancy link, continuously harmonising their firmware and PLC logic functions together. Should a failure occur on the master unit, the backup unit immediately seizes control of the asset, safeguarding the uninterrupted operation of the plant.

With the controller's high level of configurability, AFR control and powerful, fully-included PLC system, it suits CHP power plants equipped with Gas or Diesel engines, and complex custom applications.

Networked with other Mecc Alte controllers, the GC800 can provide extensive and highly detailed load sharing capabilities.

 20 Digital Inputs	 16 Digital Outputs	 6 Analogue Inputs
 2 Analogue Outputs	 Function block PLC	 Pre-event history logging
 IP65 Front Display	 Cyber secure SmartCloud	 HMI or PC configurable



MAIN FEATURES

- Hot redundancy swap with no interruptions including all PLC logic
- Large capacitive 10.1" touch screen TFT graphic colour display
- Aluminium construction
- True RMS measurements of voltages, currents and power with highly accurate 14-bit conversion
- Suits a wide range of application types covering island parallel, single parallel-to-mains, multiple parallel-to-mains (with MC controllers) or standalone genset and drive only
- 10 different (switchable) plant application types, factory embedded
- CANBUS integration with Mecc Alte SmartReady AVR range
- 3 Ethernet ports; 3 CANBUS ports; 3 MODBUS RTU ports
- Extensive suite of grid protections / support functions
- Mains, genset and neutral earthing circuit breaker management
- True independent controller watchdog circuit
- Dual redundant power supply inputs
- Dual cranking battery management
- Close-before-excitation (CBE) scheme
- Lambda or MAP air fuel ratio control and CANBUS gas mixer support
- Additional current measurement: Toroid for neutral or differential protection
- 2 PWM Outputs
- 256 Digital + 32 analogue shared I/O independent channels



SCM

TECHNICAL DATA

Supply voltage	Two DC power supply inputs. Common negative
	8...32VDC
	Reverse polarity protection with self-resetting fuse
Power consumption	< 8.4W (5W in standby)
Standby	380mA @ 12VDC, 210mA @ 24VDC
Operation	590mA @ 12VDC, 320mA @ 24VDC
Power supply dropout immunity	0VDC for maximum 40ms from a nominal of 12VDC
Starting voltage minimum	≥ 5.0VDC for indefinite time

MEASUREMENTS

Rated genset frequency	50 or 60Hz
Measurement range	3-99Hz
Voltage nominal range	100-690 VAC (Ph-Ph)
Measurement category	CAT. III: 690 VAC (Ph-Ph) CAT. IV: 520 VAC (Ph-Ph)
Measurement range	8-840 VAC (Ph-Ph)
Measurement details	True RMS. 14-bit resolution. 10 kHz sampling rate. 0.1 V & 0.1 A resolution displayed
Voltage accuracy	±0.5% of full-scale reading
Current accuracy	±0.2% of full-scale reading
CT scale	1A or 5A
CT burden per phase	0.5 VA
Aux CT input	Toroidal with 0.5-100mA range

20 DIGITAL INPUTS

Type	Opto-insulated
14 Inputs	Activated to ground
	Inbuilt diodes to allow parallel connection to another SCM
	Including 2 high-speed pulse counter inputs (65ms)
6 Inputs	Selectable as activated to ground or to +VE voltage source
	No inbuilt diodes
	All can be used as high-speed pulse counter inputs (15ms)

16 DIGITAL OUTPUTS

2 volt-free NO/NC relay Outputs	8A @ 250VAC each – for AC breaker controls
2 NO relay Outputs	4A @ 32VDC each or 4A total for both +VE output fed from emergency stop terminal – for fuel and crank
4 NO relay Outputs	4A @ 32VDC each or 4A total per each pair +VE or -VE output fed by a common terminal
8 NO Outputs	350mA @ 32VDC each or 1.5A total across all -VE output
(2 Outputs additional function)	Usable as PWM – 1Hz to 2.5kHz
1 volt-free NO watchdog contact	1A @ 32VDC – dedicated hardware watchdog

6 ANALOGUE INPUTS

Type	Non-insulated
Supported	0-10VDC, 0-20mA, 4-20mA, resistive, PT100, thermocouple J,E,K,N or set to digital inputs
4 Inputs	Voltage, current, resistance, temperature (25Hz update speed)
2 Inputs	Voltage, current, resistance, temperature (200Hz update speed)
Configuration	Built-in curves supporting various sensors or customisable

2 ANALOGUE OUTPUTS

Type	Galvanically insulated
Supported	±10mA, ±20mA, 0-20mA, ±10VDC
2 Outputs	Speed and voltage regulation, gas mixing or other functions
Hardware	Built-in trimmer pots – maintaining 16-bit resolution at reduced output levels

CHARGE ALTERNATOR

D+ or analogue/digital input	1 excitation input/output for +D charge alternator
	Configurable as 0-40VDC analog input or digital input activated by +VE

MAGNETIC PICKUP

Mag pickup or "W" input	60 VAC max.
	1 - 30,000 Hz

SCM

COMMUNICATIONS

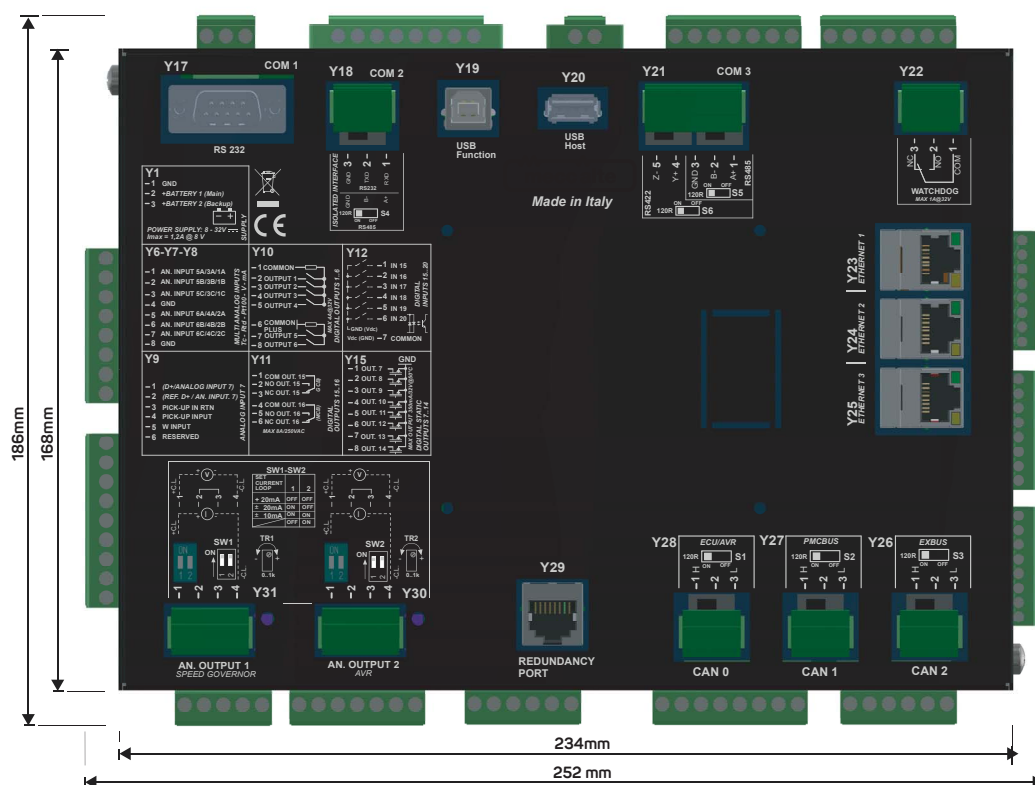
3 Ethernet ports	10/100Mbps with redundancy
	Protocols: Modbus/TCP, DHCP, DNS, SNMP, NTP
	Independent - allowing 3 separate networks
3 CANBUS ports	Cyber-secure connection to Mecc Alte SMARTCLOUD
	Galvanically insulated
	CAN0: ECU / AVR / gas mixer
	CAN1: Mecc Alte PMCBus controller network
3 MODBUS RTU serial ports	CAN2: Expansion modules
	COM1: (DB9M): RS232
	COM2: Galvanic insulated. RS232 / RS485 (Modbus Engines, RTU Slave/Master)
1 Serial RS232 (RJ45)	COM3: RS485 / RS422 (Modbus RTU Slave)
	Used for hot redundancy
3 USB ports	USB Port 1 (Type B): Slave mode for Mecc Alte software connection
	USB Port 2 (Type B): RESERVED
	USB port 3 (Type A): USB drive host for firmware updating

PHYSICAL AND ENVIRONMENTAL

Case construction	Aluminium
Weight	1350g
Overall dimensions	251.6 (W) x 186.5 (H) x 85.5 (D) mm
Panel mounting	DIN rail
Protection grade	IP20
Operating temperature	-30°C to +70°C
Storage temperature	-40°C to +80°C
Relative humidity	5%-95% with no condensation

SCM & HMI COMPLIANCES

EMC: compliant with	EN 61326-1:2022
	EN 61000-6-2:2019
	EN 61000-6-4:2019
Safety: built in compliance with	EN 61010-1:2010
	EN 61010-1:2010/A1:2019
	EN 61010-1:2010/AC:2019



HMI

TECHNICAL DATA

Supply voltage	7...32 VDC
	Reverse polarity protection with self-resetting fuse
Power consumption	< 11.2W (max brightness) - Min brightness: 310mA @ 12VDC, 185mA @ 24VDC 50% brightness: 580mA @ 12VDC, 315mA @ 24VDC - Max brightness: 880mA @ 12VDC, 450mA @ 24VDC
Power supply dropout immunity	0VDC for maximum 20ms from a nominal of 12VDC
Starting voltage minimum	≥ 5.0VDC for indefinite time
Display type	IPS transmissive colour active matrix TFT LCD
Touchscreen	Waterproof capacitive touch with glove support - Level 1 (wet fingers) - Level 2 (condensation) - Level 3 (water droplets)
Active display area	10.1 inch diagonal
Display resolution	1280 x 800 pixel (WXGA)
24-bit colour. Brightness	900 cd/M². Contrast ratio: 800:1
Viewing angle [CR > 10]	-85° to +85° (H/V)

INPUTS & OUTPUTS

Inputs	4 opto-insulated digital inputs Activated to ground Internal diodes
Outputs	1 digital output NO/NC & common 1A @ 32Vdc (RESERVED)

COMMUNICATIONS

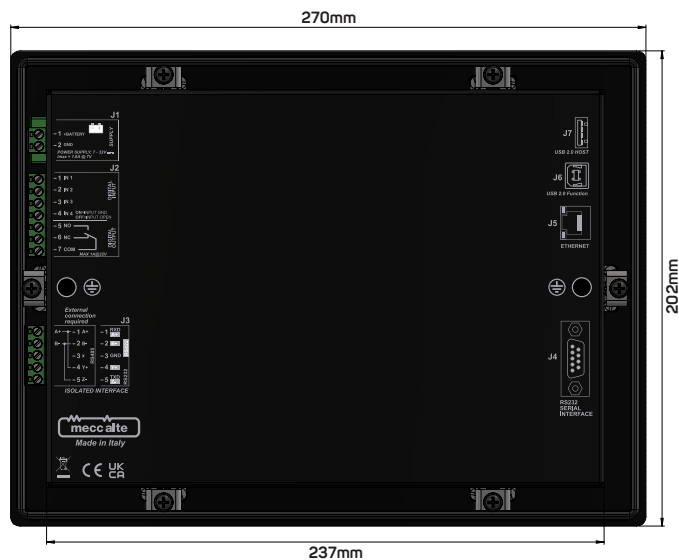
1 Ethernet port	10/100 Mbps
	Modbus TCP, DHCP, DNS protocols
	Supports connection to GC800-SCM
2 MODBUS RTU serial ports	COM1: RS232 (Modbus RTU slave)
	For firmware updating and programming
	COM2: Galvanic insulated RS232 / RS485 / RS422 (Modbus RTU Master)
2 USB ports	Supports connection to GC800-SCM
	USB Port 1: USB 2.0 Type B. Slave mode
	For Mecc Alte software connection
	USB Port 2: USB 2.0 Type A. USB drive host
	For firmware updating

PHYSICAL AND ENVIRONMENTAL

Case construction	Aluminium with 2mm glass
Weight	1400g
Overall dimensions	270 (W) x 202 (H) x 48 (D) mm
Panel cut-out	241 (W) x 174 (H) mm
Panel mounting	6 fixing clamps. 1-4mm panel thickness
Protection grade	IP65 external with panel gasket IP20 internal
Operating temperature	-20°C to +70°C
Storage temperature	-30°C to +80°C
Relative humidity	5-95% with no condensation
Impact protection	IK06 (front panel) IK08 (internals)

AUXILIARY FUNCTIONS

- Ambient light sensor for auto brightness control
- Internal temperature sensor increasing display backlight for improved response at low temperatures
- Brightness control scheme at low voltages
- Screensaver
- Light and dark theme support
- Front panel RGB LEDs for status/alarm indication
- Multilanguage interface with UNICODE support: English, Italian, Chinese, Arabic (plus future releases)
- Connect up to 12 displays to one SCM
- Internal horn (60dB) for alarms
- Real time clock



SYSTEM

AUXILIARY FUNCTIONS

- Synchronous and asynchronous generators support
- Paralleling options: isochronous, droop, baseload, import/export, peak lopping, power de-rate with PID Loops & dead band regulations
- Redundant inter-controller dual CANBUS networks (with addition of CANBRIDGE module)
- Automatic integration with other Mecc Alte controllers on the PMCBus
- Integrated breaker-fail system between generators
- 6 schemes for generator priority management
- Supports up to 31 generators on the same bus
- Load shedding & dummy load control
- Large selection of ECU types inc. TIER4 final STAGE V
- 4 engine de-rate functions
- Automatic fuel transfer system from a bulk tank
- Powerful functional block PLC with no fixed block limits – constrained only by total memory
- Additional AND/OR Logic with timers
- 16 calendars
- 3 types of operation schedulers
- Up to 3 generator maintenance interval notifications
- Selectable operation mode on power on
- Static Modbus registers
- Additional expansion modules:
 - 160 x Digital inputs
 - 160 x Digital outputs
 - 112 x Analogue inputs
 - 32 x Analogue outputs
- 4 alternative configurations
- 3 level password access control
- Configurable on-event records - up to 4673 data points
- Configurable periodical records - up to 4673 data points
- Configurable pre-trigger records - up to 4673 data points
- Device internal temperature warnings
- Full configuration programmable through HMI including I/O
- All features and capabilities included as standard

PROTECTION

Grid voltage protections

- Undervoltage (27<<)
- Overvoltage (59>>)
- Under frequency (81U<<)
- Over frequency (81O>>)
- Voltage unbalance (47)
- Phase sequence (47)
- Rate of change of frequency (81R ROCOF)
- Vector shift (78)
- Grid stability after prot. Trip (27, 59, 81U, 81O, Time)
- Frequency & voltage limitations when parallel
- Insensitivity to voltage (27T)

Generator protections

- Underfrequency (81U<<)
- Over frequency (81O>>)
- Undervoltage (27<<)
- Overvoltage (59>>)
- Reverse power (32R)
- Loss of excitation (reverse reactive 40)
- Time dependent overcurrent (51) IDMT
- Instantaneous overcurrent (50)
- Phase overcurrent with voltage restraint/ control (50V/51V)
- Sync-check (25)
- Phase sequence (47)
- Current and voltage unbalance (46/47)
- Ground fault protection (64) as alternative to neutral protection (50N)
- Negative sequence (I2)
- Max exported reactive power (32Q)

Engine protections

- Overspeed (12)
- Incomplete sequence (48)
- Belt-break
- Temperature warnings and alarms
- Pressures warning and alarms
- Maximum engine power (32)
- Fuel levels
- Emergency stop