

EMCP 3.2 GENERATOR SET CONTROLLER

GENERAL DESCRIPTION

The Cat® EMCP 3.2 places fully featured power metering, protective relaying, engine and generator control and monitoring, and expanded AC metering at your fingertips. Engine and generator controls, diagnostics, and operating information are accessible via the control panel keypads; diagnostics from EMCP 3 optional modules can be viewed and reset through the EMCP 3.2. The EMCP 3.2 features a graphical display with an adjustable backlight as well as an advanced engine monitoring system. These features add to the sense of value and dependability that comes with your purchase of Caterpillar products.

OPERATOR INTERFACE

- Graphical display with positive image, transreflective LCD, adjustable backlight/contrast
- Two LED status indicators (1 red, 1 amber)
- Three Engine Control Keys & Status Indicators (Run/Auto/Stop)
- Lamp Test Key
- Alarm Acknowledgement Key
- Display Navigation Keys
- Two Shortcut Keys: Engine Operating Parameters & Generator Operating Parameters

FEATURES/BENEFITS

- A 33 x 132 pixel, 24 mm x 95 mm, backlit graphical display denotes text alarm/event descriptions.
- Textual display with multiple language capability, including character languages such as Arabic, Chinese and Japanese.
- Ability to view and reset diagnostics on EMCP 3 optional Network modules via the control panel removes the need for a separate service tool for troubleshooting.
- Fully featured power metering, protective relaying, engine and generator parameter viewing, and expanded AC metering are all integrated into this controller.
- Real-time clock allows for date and time stamping of diagnostics and events in the control's logs as well as service maintenance reminders based on engine operating hours or calendar days.
- Customer programmable protective relaying, available as alarm and shutdown, protects against undervoltage, overvoltage, underfrequency, overfrequency and overcurrent.
- Digital, 32-bit microprocessor-based system eliminates the need for multiple switches, meters, transducers, relays, and sending units, which translates to less wiring and fewer opportunities for mechanical failures.
- Expanded remote customer communications are supported by MODBUS RTU (½ duplex) protocol using RS-485, which easily interfaces with existing plant systems and equipment.
- Simultaneous viewing of AC L-L voltages and AC line currents or AC L-N voltages and AC line currents.
- User-friendly, convenient, customer programmability directs the customer to logical parameter groups (Ex. AC metering, protective relaying, engine monitoring) for quick keypad access.

FEATURES/BENEFITS (CONT'D)

- Set points & software are stored in nonvolatile memory, preventing loss during a power outage.
- Compatibility with both mechanical and electronic engines makes it versatile.
- True RMS sensing ensures AC metering accuracy to within $\pm 1\%$ of rated AC voltage (L-L and L-N) and current.
- kW and kVA metering to within $\pm 5\%$ of rating.
- Three levels of security allow for configurable operator privileges.
- Single, standard 70-pin connector

COMMUNICATION

- J1939 (Primary Data Link)
- J1939 #2 (Accessory Data Link)
- MODBUS RTU (1/2 duplex); RS-485 (Customer Communication)

ENVIRONMENTAL SPECIFICATIONS

- Environmentally sealed front face rated for IP56. Resistant to chemical splash, including: diesel fuel, engine oil and machine oil.
- Protection level IP22 for rear of controller
- Resistant to salt spray
- Vibration: withstands 4.3G @ 24-1000 Hz
- Shock: withstands 15G
- Monitoring Functionality & Controls Operational from -40°C to 70°C (-40°F to 158°F)
- Display Operational from -20°C to 70°C (-4°F to 158°F)
- Storable from -40°C to 85°C (-40°F to 185°F)
- 0 to 95% Humidity, non-condensing from 30°C to 60°C (86°F to 140°F)

STANDARDS

- UL 508 Listed
- CSA C22.2 No.100,14, 94
- Complies with all necessary standards for CE Certification
 - 98/37/EC Machinery Directive
 - BS EN 60204-1 Safety of Machinery
 - 89/336/EEC EMC Directive
 - BS EN 50081-1 Emissions Standard
 - BS EN 50082-2 Immunity Standard
 - 73/23/EEC Low Voltage Directive
 - EN 50178 LVD Standard
- ISO3046, ISO8528
- IEC529, IEC60034-5, IEC61131-3
- MIL STND 461

STANDARD FEATURES

CONTROLS

- Auto/Start/Stop
- Engine Cool-Down timer
- Emergency Stop
- Engine Cycle Cranking
- Lamp Test
- Generator Voltage
- Engine Speed/Generator Frequency

DIGITAL (LCD) INDICATION

- Generator AC Voltage – 3 phase (L-L & L-N)
- Generator AC Current (per phase & average)
- Generator Power kW (total & per phase)
- Generator kVAR (total & per phase)
- Generator kVAR-hr (total)
- Generator % of rated power (total) (kW, kVA, kVAR)
- Generator kVA (total & per phase)
- Generator kW-hr (total)
- Generator Power Factor (PF) (average & per phase)
- Generator Frequency
- Engine RPM
- Battery Voltage
- Engine Hours
- Engine Successful Start Counter
- Engine Oil Pressure
- Engine Coolant Temperature
- Engine Crank Attempt Counter
- Service Maintenance Interval (Engine Operating Hours or Calendar Days)
- Real Time Clock
- Twenty (20) Event Fault Log

Notes:

1. Temperature indications are viewable in either $^{\circ}\text{C}$ or $^{\circ}\text{F}$ (operator selectable)
2. Pressure indications are viewable in psi, kPa, or bar
3. Fuel Consumption viewable in US/Imperial gal/hr or Liters/hr

STANDARD FEATURES (CONT'D)

WARNING/SHUTDOWN INDICATION

- Overcrank
- Low Coolant Temperature Warning
- High Coolant Temperature Warning/Shutdown
- Low Oil Pressure Warning/Shutdown
- Overspeed
- Control Switch Not In Auto
- High/Low Battery Voltage
- Emergency Stop Activated

Notes:

- Warning condition activates common alarm output signal and common flashing yellow indicating lamp.
- Shutdown condition activates common shutdown output signal and common flashing red indicating lamp.
- Warning/Shutdown conditions result in text message in EMCP 3 display event log.

DIGITAL INPUTS (8 TOTAL)

- Emergency Stop
- Remote Start
- 6 Programmable

Digital inputs can be programmed for various alarm, shutdown, and status conditions including:

- Low Fuel Level
- High Fuel Level
- Fuel Leak Detected
- High Exhaust Temperature
- Air Damper Closed
- Circuit Breaker Open/Closed
- Low Engine Oil Level
- Low Coolant Level
- Low Starting Air Pressure
- Low/High Ambient Air Temperature
- Spare Fault #1-6.

Inputs can be programmed for either high or low activation using programmable Normally Open or Normally Closed contacts.

Note: The number of programmable Digital Inputs may vary based on specific package configuration. Refer to Engine Installation Guide for specific engine application.

PROTECTIVE RELAYING

- Generator Over/Under Voltage
- Generator Over/Under Frequency
- Generator Overcurrent

RELAY OUTPUTS (8 TOTAL)

- Starter Motor
- Fuel Control
- 6 Programmable

Relay outputs can be programmed for various operating conditions including: Air shut-off, or pre-lube, Common Alarm, Common Shutdown, Common Warning, Engine Running, Crank Alert, & Idle/Rated.

Relays are rated for 2A @ 30 VDC and consist of 6 Form A (Normally Open) contacts. Two of the programmable outputs are Form C (Normally Open & Normally Closed) contacts.

Note: These are only rated for DC.

Note: The number of programmable Relay Outputs may vary based on specific package configuration. Refer to Engine Installation Guide for specific engine application.

DISCRETE OUTPUTS

- 1 Programmable

Discrete output can be programmed for various operating conditions including: Air shut-off, pre-lube, Common Alarm, Common Shutdown, Common Warning, Engine Running, Crank Alert, & Idle/Rated.

Discrete output can sink up to 300mA and is suitable for driving relay coils or incandescent lamps.

SENSOR INPUTS

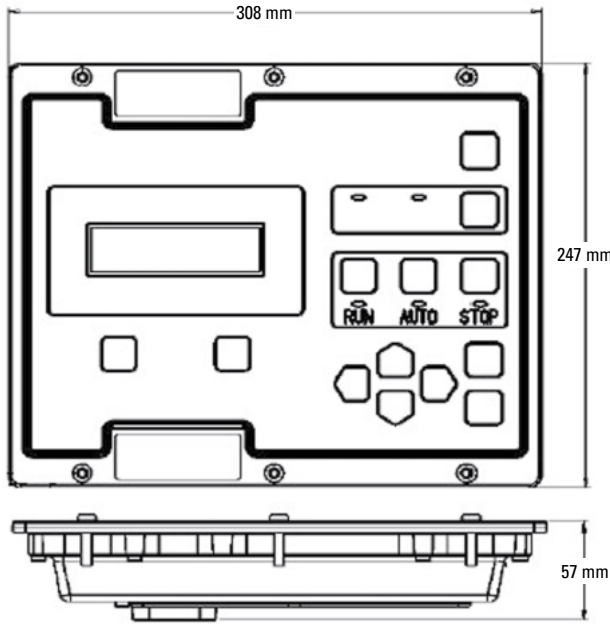
- Engine Speed (Magnetic Pick-up)
- Engine Oil Pressure (0-2 k Ω resistive sender, 1 or 2-wire) – MUI Engines only
- Engine Coolant Temperature (0-2 k Ω resistive sender, 1 or 2-wire) – MUI Engines only
- Configurable Input (0-2 k Ω resistive sender) (for engine oil temperature, etc)

AVAILABLE LOCAL DISPLAY LANGUAGES

• Arabic	• Italian
• Czech	• Latvian
• Danish	• Lithuanian
• Dutch	• Norwegian
• Estonian	• Polish
• Finnish	• Portuguese
• French	• Russian
• German	• Spanish
• Greek	• Slovak
• Hungarian	• Slovene
• Icelandic	• Swedish
	• Turkish

Note: Displays contain 2 languages (English and Local)

EMCP 3.2 GENSET CONTROLLER

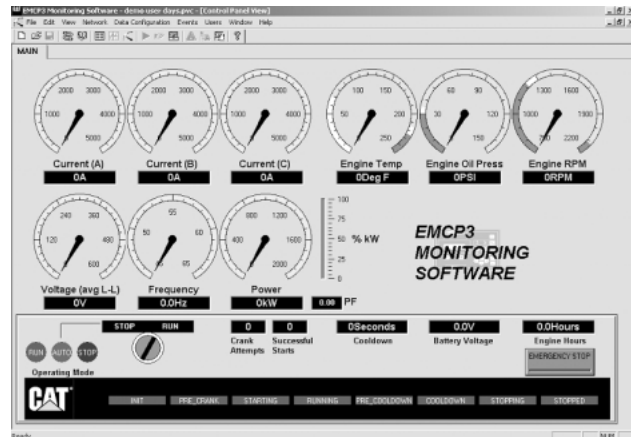


OPTIONS



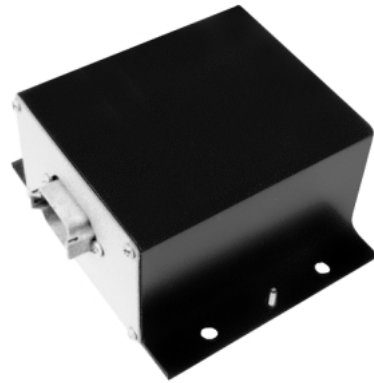
ANNUNCIATOR

The EMCP 3 Annunciator serves to display Genset system alarm conditions and status indications. The Annunciator has been designed for use on the EMCP 3 Communication Network and may be used in either Local (package mounted) or Remote (up to 800 feet) application. A maximum of three (3) Annunciators may be used with a single EMCP 3.2.



REMOTE MONITORING SOFTWARE

The EMCP 3 Remote Monitoring Software Package is a PC based program which allows the user to monitor and control a generator set, and is capable of running on a Windows based operating system. The Remote Monitoring software allows the user to configure data monitoring and data acquisition processes for monitoring, graphing, and logging of genset data.



DISCRETE INPUT/OUTPUT MODULE

The Discrete Input/Output (DI/O) module serves to provide expandable Input and Output capability of the EMCP 3 and is capable of reading 12 discrete inputs and setting 8 relay outputs. The DI/O Module has been designed for use on the EMCP 3 Communication Network and may be used in either Local (package mounted) or Remote (up to 800 feet) application. A maximum of four (4) DI/O Modules may be used with a single EMCP 3.2.