

EMCP II+ ELECTRONIC MODULAR CONTROL PANEL

The Caterpillar Electronic Modular Control Panel (EMCP II+) places full-featured power metering, protective relaying, simultaneous engine and generator parameter viewing, and expanded AC metering at your fingertips. Engine and generator control, diagnostics, and operating information is accessible via the control panel keypads or a remote, personal computer. The advanced microprocessor-based EMCP II+ combined with the Caterpillar Customer Communication Module (CCM) and Relay Driver Module (RDM) give you the flexibility to remotely manage the specific needs of your total system.

FEATURES

UL 508A

- UL 508A Listed

RELIABLE, DURABLE, AND ACCURATE

- Environmentally sealed, die-cast aluminum housing isolates and protects electrical components against failure caused by moisture and dirt contamination.
- Rigorous vibration testing ensures panel dependability.
- Maintains metering accuracy from -40°C (-40°F) to 70°C (158°F)
- Electrical noise immunity of 100 volts/meter
- True RMS sensing ensures AC metering accuracy is 0.5% for AC volts, amps, and power parameters.
- The digital, 32 bit microprocessor-based system eliminates the need for a number of switches, meters, transducers, relays, and sensing units. That means less wiring and fewer opportunities for mechanical failures.

ADVANCED FEATURES THAT SUPPORT YOUR BUSINESS NEEDS

- Full-featured power metering, accessible with one keypad touch, allows you to view generator set kW, kVA, kVAR, kW hours, kVAR hours, percent rated power, and power factor.
- Customer programmable protective relaying, available as alarm and shutdown, protects against undervoltage, overvoltage, underfrequency, overfrequency, overcurrent, and reverse power.

- Load demand relay opens and closes based on generator kW output, programmable to activate at an adjustable setpoint.
- Simultaneous viewing of engine and generator parameters with toggle between auto parameter scrolling and individual parameter display.
- Simultaneous viewing of all AC L-L voltages, all AC L-N voltages, or all AC line currents.
- Expanded remote customer communication module supported by an open RS-232C architecture — easily interfaces with existing plant systems and equipment.

KEYPAD PROGRAMMABILITY

- User-friendly, convenient, customer programmability directs the customer to logical parameter groups — AC metering, protective relaying, engine monitoring — for quick keypad access.
- Programmable, spare control relay with remote control capability provides additional flexibility for customer control function.
- 10 LED alarms, five programmable for customer inputs, provide more information at a glance.

REGULATORY APPROVALS

- U.S. sourced control panels meet CSA requirements.
- Larne sourced control panels meet CE requirements.

LEHX9590-05

STANDARD/OPTIONAL FEATURES

EMCP II+	
STANDARD FEATURES	
Digital (LCD) Indication	AC voltage — 3 phase (L-L & L-N) AC amps (3 phase & total) kW (total & per phase) kVA (total) kVAR (total) kWhr (total) kVARhr (total) PF (average total & per phase) Percent of rated (total) Frequency DC voltage Coolant temperature Oil pressure rpm Hours run System diagnostic L/R exhaust manifold temperature (3500 only) Oil temperature (except 3300/3406)
Controls	Auto start/stop Purge cycle (gas packages only) Staged shutdown (gas packages only) Emergency stop Lamp test Cycle crank Voltage control Cooldown timer Phase selector switch Load demand relay Spare relay — programmable
Enclosure	NEMA 12, IP44 Vandal door (Not available on 3406, 3456)
Indicating Lights with Shutdown	Low oil pressure High coolant temperature Overspeed Overcrank Emergency stop High inlet air temp (gas TA engines only) Detonation sensitive timing (gas LE engines only) Fault shutdown Fault alarms 3 spare lights/4 spare inputs, customer programmable (shutdown or alarm) to spare alarm or fault LEDs
Protective Relaying	Programmable relays: Over/undervoltage Reverse power relay Over/underfrequency Overcurrent
OPTIONAL FEATURES	
Protective Devices	Low coolant level (standard on some packages)
Miscellaneous Controls	Electronic governor: Isochronous speed control Load share Alarm modules — local (with horn and silence switch) Frequency control Common alarm/shutdown volt free contact Generator running volt free contact Ether starting aid (not available on gas packages) Remote annunciator modules Computer communications data link Panel lights

PROTECTIVE RELAYING

Setpoint programming provides the flexibility to custom configure protective relays in a manner which best suits a customer's application. The customer determines the response type and timing of protective relay functions:

- Alarm enable/disable
- Alarm threshold level
- Alarm time delay
- Shutdown enable/disable
- Shutdown threshold level
- Shutdown time delay

Setpoints are factory set for optimum performance and generator protection. Setpoint values may be viewed with the engine running or stopped.

EXPANDED SYSTEM FLEXIBILITY

ALARMS AND ANNUNCIATORS

EMCP II+ control panel includes two slots for optional alarm or synchronizing modules. Each alarm module contains a block of eight LEDs. Customers select from the following:

- NFPA99/110 alarm modules
- Custom alarm module
- Manual synchronizing module

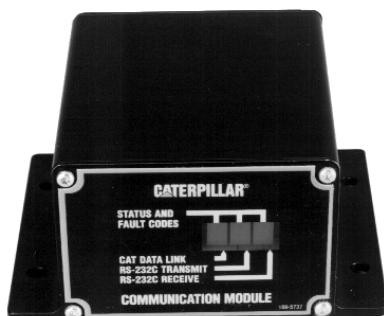


CUSTOMER INTERFACE MODULE

The Customer Interface Module (CIM) is a relay board that provides nine contacts for custom remote annunciation.

REMOTE COMMUNICATION

The Caterpillar Customer Communication Module (CCM) provides a means to remotely monitor and control single or multiple packaged generator sets at a common site. By accessing the CCM from a personal computer or other RS-232C device, each unit can be remotely started and stopped, and all engine and generator parameters can be monitored on a "real time" basis. Published, open architecture enables you to connect the CCM to an existing plant information system.



The combined power of the EMCP II+ and CCM now enable you to control the packaged generator set and ancillary equipment. Text editable software enables you to control the EMCP II+ spare relay and the Relay Driver Module (RDM).

RELAY DRIVER MODULE (RDM)

The Caterpillar RDM expands the number of relays available to the customer. One RDM contains nine relay outputs which can be directly connected to ancillary equipment such as lamps, fuel tank controls, or other devices such as louvers. The RDM requires the use of the CCM.



SYSTEM SOFTWARE

CCM PC is a user-friendly, IBM compatible, windows-based program.

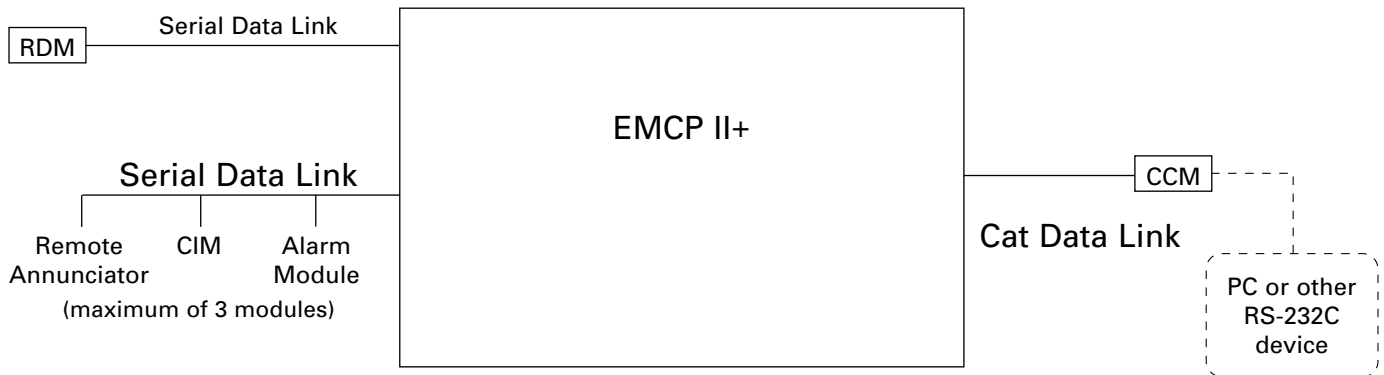
CCM PC interfaces with the CCM and EMCP II+. Remote control ability, parameter status display, diagnostic viewing/clearing options, and parameter logging are among its standard tools. An on-line help system provides fingertip access to software questions and instructions. Integrated file management facility allows you to copy, move, delete, view, print, and rename documents and files from within CCM PC without the use of DOS file names or the Windows File Manager.

CCM PC, used in conjunction with relay driver module, enables you to individually label and control each RDM relay.

EMCP II+ SPECIFICATIONS

- EMI Immunity
 - IEC 801-2, IEC 801-3, IEC 801-4, EN 5082-2
- Enclosure
 - NEMA 12, IP44
- Humidity
 - 0 to 100% relative humidity
- Impervious to:
 - salt spray, fuel, oil and oil additives, coolant, spray cleaners, chlorinated solvents, hydrogen sulfide and methane gas, and dust
- Input and output protection
 - all inputs and outputs are protected against short circuits to (+/-) battery
- Input voltage range (24 VDC nominal)
 - 14 to 45 VDC
- Power requirements
 - 10 watts (with generator set in standby mode — no alarms)
- Reverse polarity protected
- Shock, withstands 20 g
- Temperature range
 - Operating: -40° C to 70° C (-40° F to 158° F)
 - Storage: -55° C to 85° C (-67° F to 185° F)
- Vibration
 - withstands 2.0 g @ 18 to 500 Hz

EMCP II+ SYSTEM HIERARCHY DRAWING



www.CAT-ElectricPower.com

U.S./European sourced

LEHX9590-05 (7-03)
Supersedes LEHX9590-04

Materials and specifications are subject to change without notice.
The International System of Units (SI) is used in this publication.

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