Picture shown may not reflect actual configuration

EMCP 4.3 GENERATOR SET CONTROLLER

The Cat® EMCP 4.3 offers fully featured power metering, protective relaying and engine and generator control and monitoring. Engine and generator controls, diagnostics, and operating information is accessible via the control panel keypads; diagnostics from the EMCP 4 optional modules can be viewed and reset through the EMCP 4.3.

Features

- Advanced engine monitoring is available on systems with an ADEM™ controller.
- Integration with the CDVR and IVR provides enhanced system performance.
- 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. Up to 40 diagnostic events are stored in the non-volatile memory.
- Real-time clock also allows for the creation of a status event log. This log holds the last 500 control events such as ECS Position, Remote Initiate, Load Shed, etc.
- A 480 x 320-pixel, 5.5-inch, white backlit graphical display denotes text alarm/event descriptions, set points, engine and generator monitoring, and is visible in all lighting conditions.
- Textual display with support for 17 languages, including character languages such as Arabic, Chinese, and Japanese.

Features

- Ability to view and reset diagnostics on EMCP 4 optional modules via the control panel removes the need for a separate service tool for troubleshooting.
- Set points and software stored in non-volatile memory, preventing loss during a power outage.
- Five levels of security allow for configurable operator privileges
- Programmable security levels for groups of set points.
- Programmable kW relays (3)
- Programmable weekly exerciser timer
- Dealer configurable resistive maps
- Default overview screen
- Load histogram
- Automatic transfer/ Auto mains failure (AMF) functionality
- Programmable logic functionality
- Selectable units
  - Temperature: °C or °F
  - Pressure: psi, kPa, bar
  - Fuel Consumption: Liter/hr or Gal/hr (U.S. or U.K.)

Full range of attachments

- Wide range of system expansion attachments, designed specifically to work with the EMCP 4.
- Flexible packaging options for easy and cost effective installation.

Worldwide product support

- Cat dealers provide extensive pre and post-sale support.
- Cat dealers have over 1,600 dealer branch stores operating in 200 countries

Standard Features

Generator Monitoring
- Voltage (L-L, L-N)
- Current (Phase)
- Average Volt, Amp, Frequency
- kW, kVAr, kVA (Average, Phase, %)
- Power Factor (Average, Phase)
- kW-hr, kVAr-hr (total)
- Excitation voltage and current (with CDVR)
- Desired Voltage, Excitation Command, Operating Mode (with IVR)
- Generator stator and bearing temp (with optional module)
- kW load histogram

Generator Protection
- Over/Under voltage (27/59)
- Over/Under frequency (81 O/U)
- Generator phase sequence (47G)
- Over current (timed & inverse) (50/51)
- Over current (thermal damage curve) (51)
- Reverse Power (kW) (32)
- Reverse Reactive Power (kVAr) (32RV)
- Current Balance (46)

Engine Monitoring
- Coolant temperature
- Oil pressure
- Engine speed (RPM)
- Battery voltage
- Run hours
- Crank attempt and successful start counter
- Enhanced engine monitoring (with electronic engines)

Engine Protection
- Control switch not in auto (alarm)
- High coolant temp (alarm and shutdown)
- Low coolant temp (alarm)
- Low coolant level (alarm)
- High engine oil temp (alarm and shutdown)
- Low, high, and weak battery voltage
- Overspeed
- Overcrank

Language Support
Arabic, Chinese, Danish, Dutch, English, Finnish, French, German, Greek, Italian, Japanese, Polish, Portuguese, Russian, Spanish, Swedish, Turkish

Control
- Run / Auto / Stop control
- Speed and voltage adjust
- Local and remote emergency stop
- Remote start/stop
- Cycle crank

Inputs & Outputs
- Two dedicated digital inputs
- Three analogue inputs
- Twelve programmable digital inputs
- Sixteen programmable digital outputs

Communications
- Primary and accessory CAN data links
- RS-485 annunciator data link
- Modbus TCP (10BT Ethernet)
- Modbus RTU (RS-485 Half duplex)
- Webserver

Environmental
- Control module operating temperature: -40°C to 70°C
- Display operating temperature: -20°C to 70°C
- Humidity: 100% condensing 30°C to 60°C
- Storage temperature: -40°C to 85°C
- Vibration: Random profile, 24-1000 Hz, 6.0G rms

Standards
- UL Recognized
- 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
- IEC529, IEC60034-5, IEC61131-3
- MIL STND 461

Enhanced Control Features

Advanced overcurrent protection
The EMCP 4.3 provides advanced overcurrent protection of the generator set system via programmable Definite Time and Inverse Time curves.

For the Inverse time curve the following four selections are available:
- Normally Inverse
- Very Inverse
- Extremely Inverse
- Thermal Damage Curve - the Thermal Damage curve may be more closely aligned to
- specific generators.

Integrated programmable logic controller (PLC)
This feature set of the EMCP 4.3 allows the user to create custom logic functions in similar fashion to that of the capability of a PLC controller. These logic functions allow for increased capability of the EMCP 4.3 through interaction and control of internal signals within the control software as well as the programmable inputs/outputs of the device.

Programmable kW relay
The EMCP 4.3 includes three programmable kW relay outputs configured based on the % kW of the generator set. The configurable set points of the kW relay include: trigger condition, percentage threshold, hysteresis percentage and trip activation & deactivation delay time. These output functions may also be used to trigger events, recordable within the event log and included in the remote monitoring of the generator set.

Arc Flash Maintenance mode
The EMCP 4.3 Programmable Arc Flash Energy Reducing Maintenance Mode feature provides a method to reduce clearing time via two functions that work together to meet the 2017 edition of NFPA 70, Section 240.87 (Arc Energy Reduction).
- A means to accept an energy-reducing maintenance switch and provide means to connect a local status indicator.
- An instantaneous overcurrent setting that can be set below the available arcing current.

Programmable cycle timer
The programmable cycle timer (PCT) feature allows for programming of seven independent times, when tasks (called PCT outputs), will be activated or deactivated automatically during the week. This is useful for exercising generator sets, or cases where two or more generators are required to automatically share the duty of supplying a load throughout the week. Using the PCT, each generator set can be programmed to start and stop at pre-set times. The PCT can handle a seven-day sequence with seven independent starts happening one or more times each week. Each of the seven timers has the following set points: activation day of the week, activation start time, active time and includes two (2) independent activation outputs.

Real (kW) load histogram
The EMCP 4.3 is equipped with a real (kW) load histogram. This feature keeps track of the amount of time the generator percent kW is within certain predefined ranges. The four ranges include:
- Time spent below 30% load
- Time spent greater than or equal to 90% load and less than 100% load
- Time spent greater than or equal to 100% load and less than 110% load
- Time spent greater than or equal to 110% load.

Webserver
The EMCP 4.3 controller includes an embedded web server. The embedded web server allows the operator to view basic event status, engine overview, and generator overview over an Ethernet connection to a local and/or remote viewing station.

Optional Modules

RS-485 annunciator

The EMCP 4 RS-485 Annunciator serves to display generator set system alarm conditions and status indications. The annunciator has been designed for use on the long-distance annunciator datalink and is used for remote (up to 4000 feet) applications.

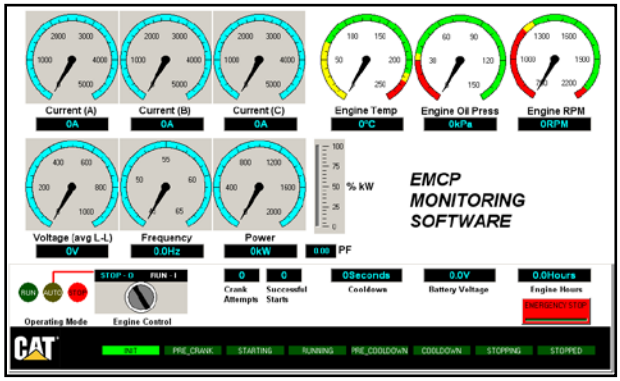
Digital input/output module

The Digital input/output (DI/O) module serves to provide expandable Input and Output event capability of the EMCP 4 and can read 12 digital inputs and setting 8 relay outputs. The DI/O module has been designed for use on the accessory communication network and may be used in either local (package mounted) or remote (up to 800 feet) application.

Remote HMI

The EMCP 4 Remote HMI serves to display generator set system alarm conditions and status indications through an interactive graphical interface. Featuring an 8” color LCD touch screen that may be mounted remotely using 1m harness with terminal block. A maximum of 1 display may be used with a single EMCP 4.3.

Remote monitoring software



The EMCP remote monitoring software package is a PC based program which allows the user to monitor and control a generator set, and can run 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 generator set data.

Optional Modules (continued)

RTD module

The RTD module serves to provide expandable generator temperature monitoring capability of the EMCP 4 and can read up to eight type 2-wire, 3-wire and 4-wire RTD inputs. The RTD module has been designed for use on the accessory communication network and may be used in either local (package mounted) or remote (up to 800 feet) application. A maximum of one RTD Module may be used with a single EMCP 4.3.

Thermocouple module

The thermocouple module serves to provide expandable engine and generator temperature monitoring capability of the EMCP 4 and can read up to twenty type J or K thermocouple inputs. The thermocouple module has been designed for use on the primary communication network for engine information and the accessory communication Network for generator information. It may be used in either local (package mounted) or remote (up to 800 feet) application. A maximum of one thermocouple modules may be used with a single EMCP 4.3 on each datalink.

Materials and specifications are subject to change without notice.
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