POWERMANAGER®
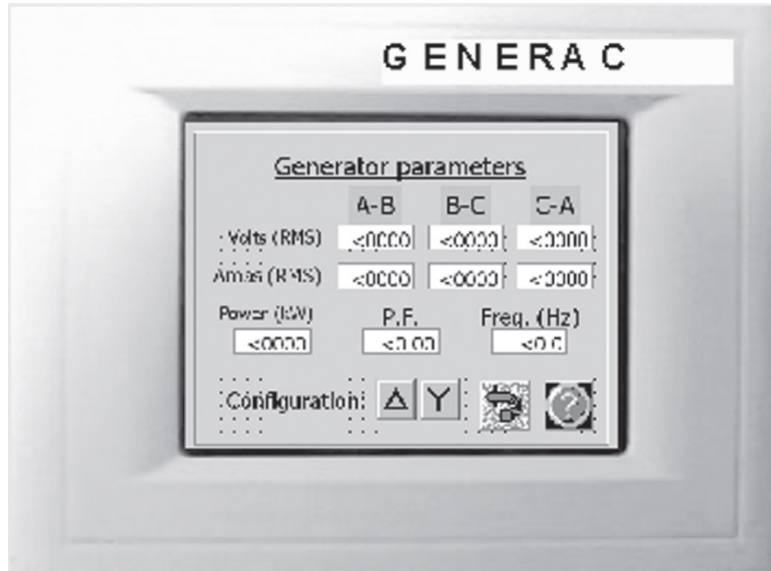# Digital Control Platform (PM-DCP)

Touch Screen Information Panel

Features

Totally Integrated Control

The Generac PowerManager® Digital Control Platform is a fully integrated and multipurpose family of controllers for Generac's single and Modular Power Systems (MPS).

The PowerManager® Digital Control Platform (PM-DCP) is configured as the PowerManager® Genset Controller (PM-GC) for stand-alone gensets, the PowerManager® Parallel Controller (PM-PC) for gensets in a Modular Power System configuration, and the PowerManager® System Controller (PM-SC) for the systematic control of the Modular Power Systems.

Standard Features as a Single Unit Control

PowerManager® Generator Control (PM-GC)
- Engine Protective Functions
- Digital Engine Governor Control
- Digital Voltage Regulator
- Touch Screen
- Multiple Programmable Outputs and Inputs
- PLC Logic and Programming
- Remote Display Capability
- Communication via Modbus or CANbus
- Alarm and Event Logging with Real Time Stamping
- Built-in Diagnostics
- Spare Analog and Digitial Inputs and Outputs
- Software Update via Remote Computer
- Built-in Modem and Dial-out Capability

Additional Standard Features as Parallel Control

PowerManager® Parallel Control (PM-PC)
- Paralleling Control (Synchronizing)
- Reverse Power
- Loss of Syncronization Between Gesets
- Load and VAR Sharing

Standard Features as System Control

PowerManager® System Control (PM-SC)
- Built-in PLC Logic Eliminates the Need for External Controllers Under Most Conditions
- Touch Screen for Local Control and Engine and Generator Information
- Remote Display and Programming via Laptop
- Internal Built-in Modem
- Communication Between Gensets via Standard Modbus Protocol
- Programmable I/O Channel Properties
- Alarm and Event Logging with Real Time Stamping
- Parameter Logging and Trending
- Built-in Diagnostics
- Selective Load Sharing
- Spare Analog and Digital Inputs and Outputs
- Software Updated via Remote Communication
- Dial-out Capability
- Separate Enclosure (24" x 30" x 9") NEMA 1

POWERMANAGER®
Digital Control Platform (PM-DCP)

Features - Continued

Voltage Regulation*
- Digital Control
- Three Phase Sensing
- Variable V/F Slope Settings and Adjustable Gains
- Negative Power Limit
- Soft Start Ramping
- Loss of Sensing Protection
- Components Encapsulated for Total Protection
- RMS Sensing
- Paralleling Function on PM-PC
- Fault Protection (I^2T Function) Optional
- High Voltage Limit
- Low Voltage Limit
- Maximum Power Limit
- ±0.5% Voltage Regulation
- ±0.1% Stability
- Adjustable via GenLink®

PLC (Built-in Programmable Logic Controller)
- Boolean Logic Programming (Ladder)
- 16 Timers
- 16 Counters
- Counter Reset
- Programmable in GenLink®
- Custom Configurable for Non-standard Options

Governor*
- Soft Start Ramping (Multiple Steps)
- Synchronizing Function on PM-PC Only
- Overshoot Limit and Control
- Fully Adjustable Gain (PID)

Connections**
- 28 - Digital Outputs (Open Collector 30V 200 mA)
- 4 - Analog Outputs (0 - 5 V)
- 24 - Digital Inputs Maximum
- 6 - Isolated Digital Inputs
- 17 - Analog Inputs Maximum

Qualification Testing
- Life Test in Environmental Chamber
- Temperature Rating -40° to +70°C
- Humidity 2% to 95%
- Vibration Tested and Protected
- Accelerated Testing MTBF >50,000 hours

Codes and Standards
- UL2200
- CSA
- NFPA 110 (Software Programmable for Level 1 and 2)
- NFPA 70
- IEC801 Radiated Emissions, Susceptibility and Surge Immunity

*Applies to PM-GC and PM-PC Only; Does Not Apply to PM-SC
** Actual Number May Vary Due to Configuration of Genset Options

Display (Touch Screen)
- Interactive RS485 Interface to CPU
- 30 Pages Available with 10 Items per Page
- Touch Screen Paramater Page Changes
- Amps per Phase - Generator
- Amps per Phase - Utility
- Line to Line and Line to Neutral Volts - Utility and Generator
- Frequency
- RPM
- Engine Coolant Temperature
- Engine Oil Pressure
- Engine Oil Temperature
- Battery Voltage
- Power Factor
- kW
- kVAr
- Shutdown Messages
- Diagnostics
- Maintenance Information
- Hourmeter

Ports
- 2 - RS485
- 2 - RS232
- 1 - RJ45 Modem
- CANbus

Engine Shutdown Messages (Touch Screen)*
- Low Oil Pressure
- Low Coolant Level
- High Coolant Temperature
- Sender Failure
- Oil Temperature
- Overspeed, Underspeed - User Definable (Within Limits)

Overcurrent and Short Circuit Protection
- Protection Against Phase to Phase and Phase to Neutral Short Circuits (IT Algorithm) Optional

Flexibility
- Standby Controller PM-GC
- Paralleling Controller PM-PC
- System Controller PM-SC
- Common Control Platform via GenLink® Software
- Same Hardware = Less Service Stock
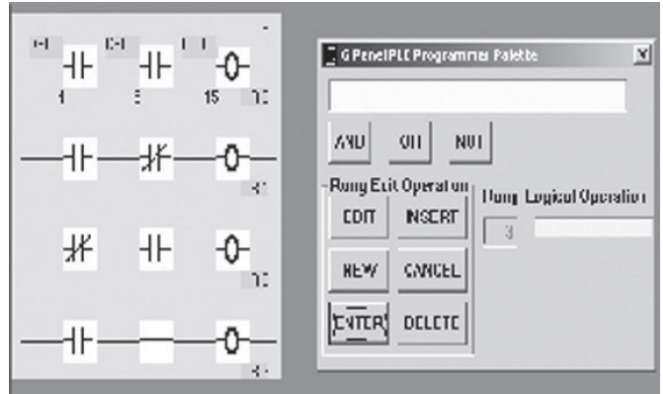
Control Panel and Touch Screen
- Auto/Manual/Off Keyswitch
- Alarm LED
- Not in Auto LED
- Alarm Acknowledge Button
- Audible Alarm
- Emergency Stop

POWERMANAGER®
Digital Control Platform (PM-DCP)

Typical Screens from Touch Screen Panel on Genset
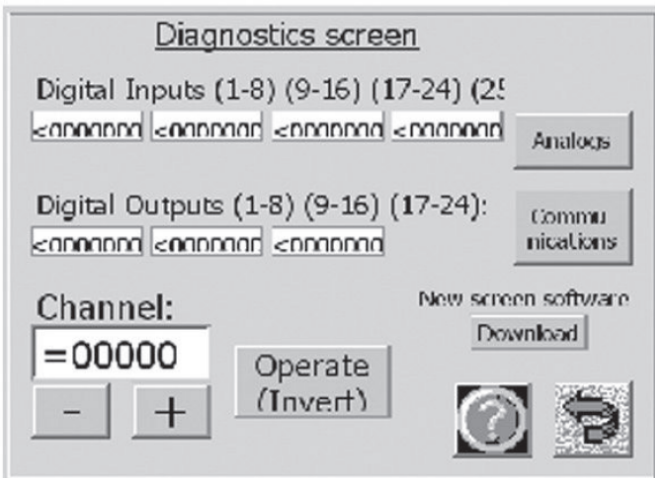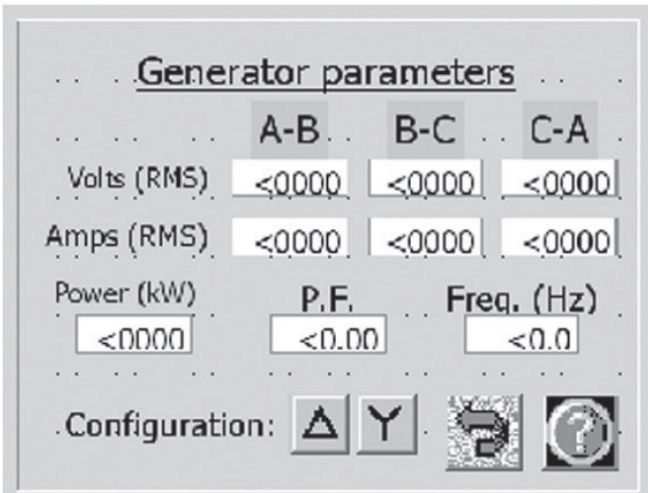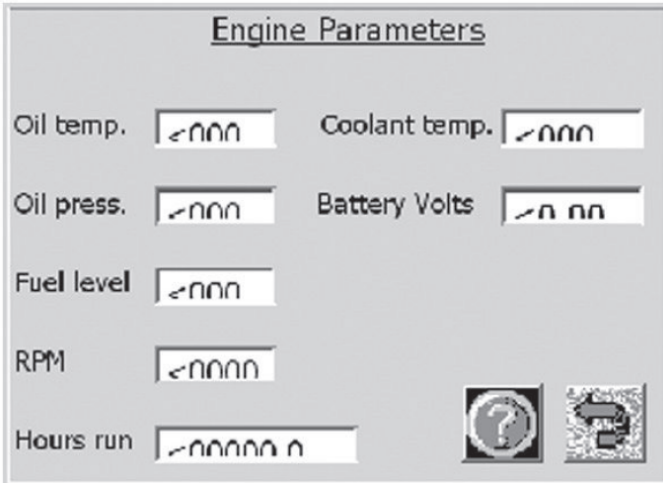

Typical Screens from GenLink® for PLC

Main Processor Assembly

- Factory Sealed in a Die Cast Aluminum Tamper Resistant Enclosure
- No Internal Adjustments or Controls
- Watertight Output and Input Connections
- 5 - 30 V Input Power
- Motorola 32-bit Processor
- Built-in Protection from Voltage Spikes
- Built-in Diagnostics
- 4 - 20 mA Sender Input
- -40° to +70°C Temperature Range
- Multi-layer Circuit Board Technology with Surface Mount Components
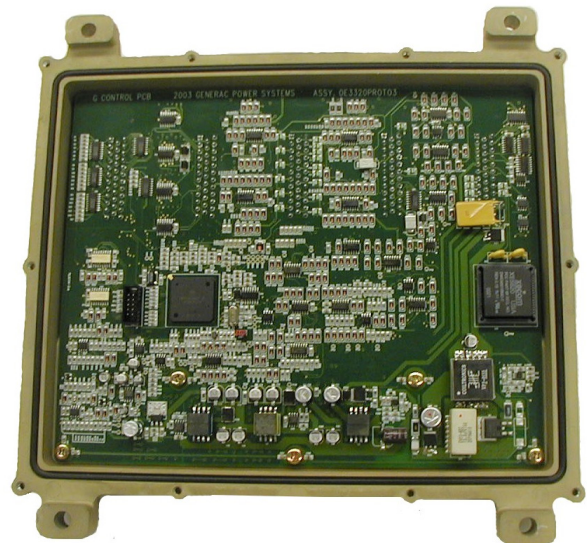
Shown with Cover Removed (Back Side)

POWERMANAGER®
Digital Control Platform (PM-DCP)

Key Components

- PM-GC — Single Units Only
- PM-PC — Paralleled Units
- PM-SC — Controller for Multiple Paralleled Units (MPS)

Operation Sequence for MPS, with Single or Multiple Transfer Switches

1. Utility fail or brownout occurs.
2. Transfer switch sends a signal via a two-wire start to the PM-SC.
3. The PM-SC then sends a signal to each generator telling it to begin the start sequence.
4. The Generator Controller on each genset will monitor power up frequency and voltage. When the first generator reaches rated frequency and voltage, the PM-PC will close the generator contactor to the bus. The bus is now live.
5. The PM-SC will monitor the rest of the generators and sequence them to the bus as they reach their rated parameters. The PM-PC monitors phase sequence, voltage and frequency, and then determines when the contactor closes, but the PM-SC provides an interrupt to sequence the gensets and prevent two generators from closing at the same time.
6. When the appropriate number of gensets assigned to each transfer switch are up and closed on the bus, the PM-SC then allows that transfer switch to switch to the Emergency position.
7. If one generator does not start, programmable load shed contacts will open or prevent a switch from closing, which will reduce the load, then allow selected transfer switches to transfer to the emergency poition with the available generators.
8. If emergency power is required within 10 seconds, a separate transfer switch for the critical loads is installed and powered from the main bus. As soon as the bus is live, the transfer switch will transfer and pick up the critical loads.
9. If a single genset is taken off line, the load shed contacts will drop a pre-programmed load and keep the remaining loads alive.
10. When Utility returns, the PM-SC will transfer the load back to the Utility side and then give disconnect commands to the generators and after a cool-down period will give a shutdown command to all generators.

Typical Arrangement - PowerManager®