

MEGA-GUARDseries

GENERATOR CONTROL AND POWER MANAGEMENT



- Generator Control
- Power Management
- Generator Protection
- Engine Safety System
- Easy Operation Through Operator Panel For Each Generator
- Class Type Approved

**‘THE BEST ROUTE
TO SHIP
AUTOMATION!’**

MEGA-GUARD Generator Control and Power Management



Operator Panel
for one Generator Set

Automatic and Manual operation:

The Mega-Guard Power Management System executes all generator control and power management functions when Automatic mode is selected. The pushbuttons 'Start', 'Stop', 'Increase' and 'Decrease' are only active when Manual mode is selected. By pressing the 'Start' pushbutton, the Mega-Guard will execute a start sequence. When the engine is running and the 'Start' pushbutton is pressed again, the Mega-Guard will synchronize the generator set to the main busbar. By pressing the 'Stop' pushbutton, the Mega-Guard will unload the generator, open the circuit breaker and stop the generator set.

Features:

The Mega-Guard Power Management System is an advanced system for full automation of the power plant; including generator control, power management, generator protection and engine safety system. Each generator is equipped with its own independent and autonomous Mega-Guard system. This ensures the highest degree of reliability and availability.

The Mega-Guard is supplied as a complete product and no additional components are needed for automation of a low voltage switchboard up to 690VAC.

Voltage transformers and power transmitters are not needed as generator/busbar voltage and generator current (1A or 5A) are directly connected to the Mega-Guard Power Management System. Generator and engine safeties are included.

System lay-out:

For each generator the following components are supplied:

- **Operator Panel.**
The Operator Panel is flush panel mounted at the generator section of the switchboard. The panel is equipped with operation pushbuttons, a display (Power, Frequency, Voltage) and LED's for status and alarm indication.
- **Controller.**
The Controller consists of a Control Processor, I/O Module with 12DI/8DO and an I/O Module for Power Management. The three modules are mounted on a DIN rail and installed inside main switch board at each generator section. I/O signals from busbar, generator, breaker and engine are directly connected to the I/O Modules.



Power Plant Mimic Diagram
on Operator Workstation

Functions

Functions

The Mega-Guard Power Management System fulfills the following functions as a standard:

- manual and automatic load dependant start/stop
- automatic synchronizing
- frequency regulation
- power measurement (3 phase)
- symmetric/a-symmetric load sharing
- black-out monitoring/start
- stand-by selection
- generator monitoring of critical parameters such as: under-voltage, over-voltage, under-frequency, over-frequency and overload
- generator protection with circuit breaker trip in case of reverse power, short circuit and over-current
- engine shutdown on low lub. oil pressure, high cooling water temperature and overspeed

The engine safety system is implemented with its own logic on the I/O Module Power Management and is fully independent from other functions.

The Mega-Guard Power Management System fulfills the following functions with optional I/O Modules:

- consumer blocking
- preference tripping
- sea and harbor mode
- bus-tie breaker control
- automatic voltage regulation
- synchronization to shore
- I²t breaker protection

Fieldbus and Workstation:

The Control Processors from the different generators are connected to each other via the redundant Fieldbus network in order to realize common functions such as power management. The Fieldbus can also be extended to a Workstation providing remote control and monitoring functions via dedicated mimic diagrams.

Medium Voltage Switch Board:

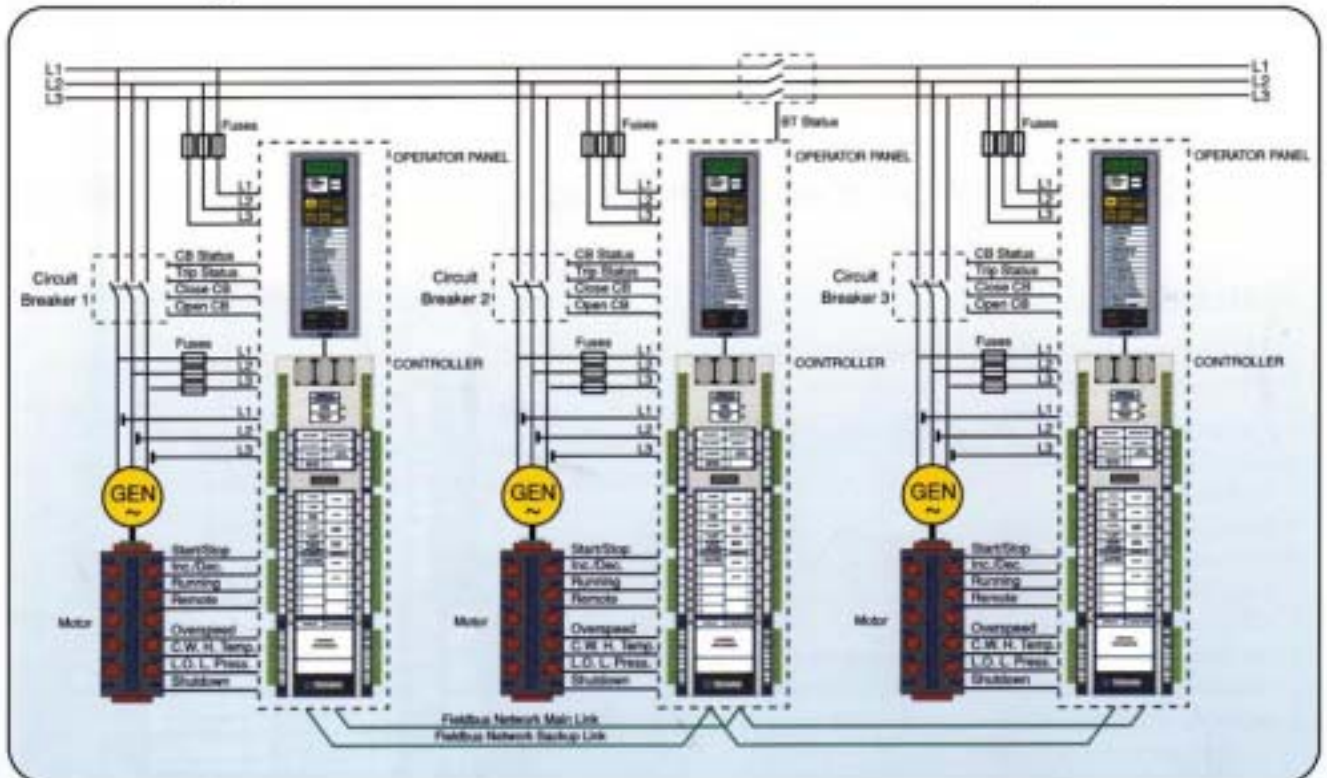
The Mega-Guard Power Management System can also be applied in automation of medium voltage switch boards (6.6kV). In this case a number of optional generator safety modules are supplied:

- generator differential protection
- negative phase sequence
- loss of excitation
- earth fault protection



- Controller consisting of:
- Control Processor
 - I/O Module 12DI/8DO
 - I/O Module Power Management

Block Diagram MEGA-GUARD Generator Control and Power Management system



Overview of the MEGA-GUARD Total Integrated Ship Automation System

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Integrated Navigation System

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Bridge Manoeuvring System

MEGA-GUARD



Machinery Control and Monitoring System

MEGA-GUARD



Cargo Control and Monitoring System

MEGA-GUARD



Generator Control and Power Management System



Ensuring Service, Maintaining Quality

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