PRAXIS
AUTOMATION TECHNOLOGY

Energy Management System

Energy Management System

Features

The Mega-Guard Energy Management System (EMS) is the brain of a total Mega-Guard electric propulsion solution. The EMS allows for automatic electric energy source selection both in full electric, serial hybrid and parallel hybrid propulsion configurations. Mega-Guard EMS controls the maximum power which flows to the electric propulsion motors as well in order to avoid overload situations of the Electric Energy Storage and/or the DC bus Generators. In addition the Mega-Guard EMS controls the charging of the Electric Energy Storage either by the DC bus Generators or by shore power.
The Mega-Guard EMS is connected through a redundant Ethernet network to the following Mega-Guard electric propulsion products:

EMS Operator Panel

- Propulsion Control System
- High Power Inverter for following applications:
  - Electric Propulsion Motor drive from DC bus
  - Electric Steerable POD drive from DC bus
  - DC bus Generator drive to DC bus
  - AC grid generation from DC bus
  - Shore power to DC bus conversion
  - DC/DC conversion
  - Electric Fin Stabilizer from DC bus
- Electric Energy Storage with built-in BMS

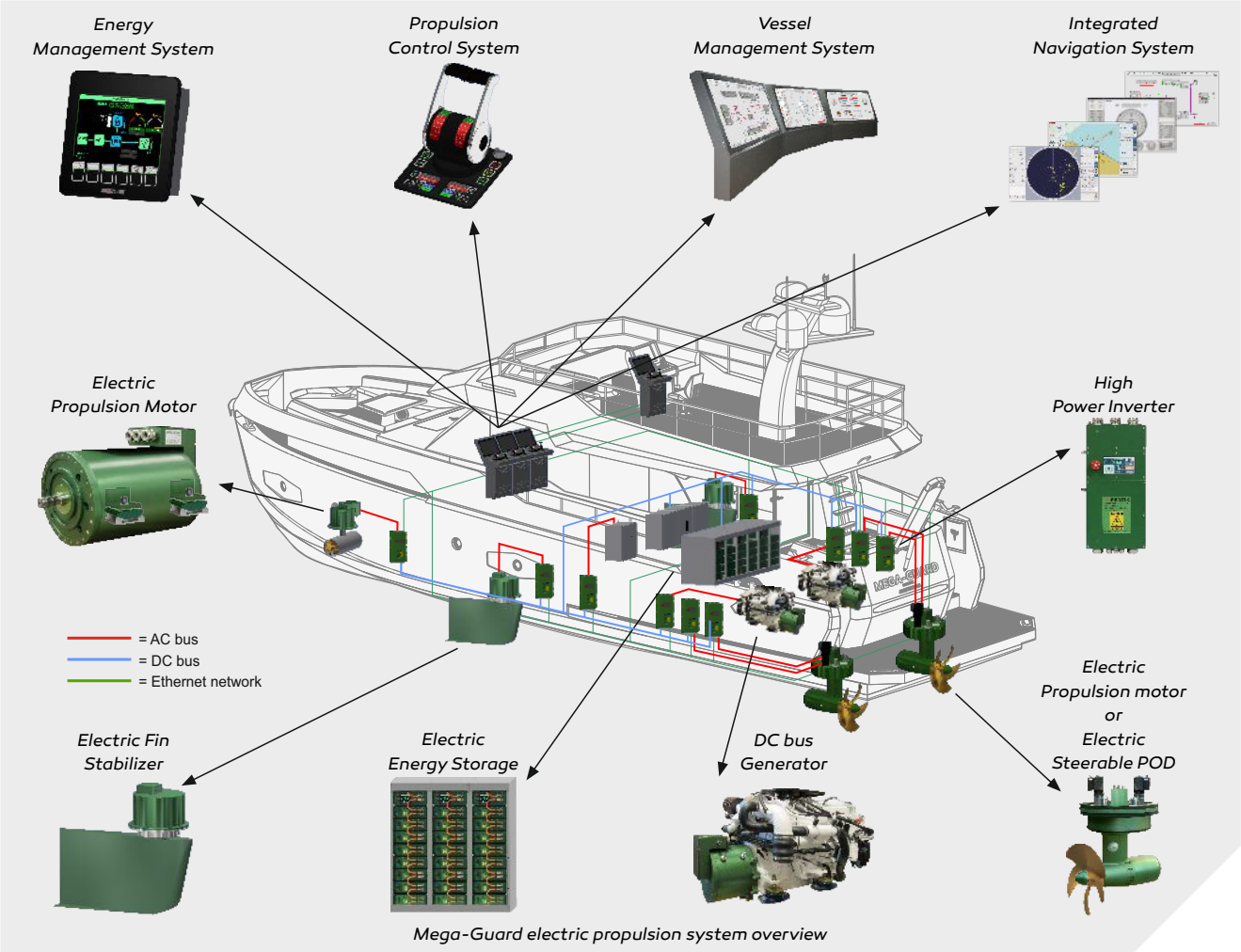
Mega-Guard EMS can be extended with the following independent Mega-Guard **automation and navigation** products:

- Vessel Management System
- Power Management System
- Fire Alarm System
- CCTV Video Distribution
- Ship Performance Monitor
- Fleet Management System
- Integrated Navigation System
- Heading Control System
- Propulsion Control System
- Dynamic Positioning System
- BNWAS Watch Alarm System
- Navigation Light Control
- Wiper Control System

Mega-Guard EMS for a ship with two main thrusters consists of two EMS Operator Panels with built-in controller for flush mounting in bridge console

System lay-out and operation

Portside and starboard side propulsion have each their own independent Mega-Guard EMS. The EMS Operator Panel is equipped with a 5.7" touchscreen and a built-in controller. All data regarding consumers and producers are displayed on the EMS Operator Panel. Mode selection pushbuttons are available as well on the EMS Operator Panel. The EMS Operator Panel contains a project specific control strategy in order to control the consumers and producers. Communication in between all Mega-Guard electric propulsion systems is through the redundant Ethernet network. As all Mega-Guard products are built-up from the same technology, a transparent and trouble free control strategy can be implemented in standard IEC61131 language. The EMS Operator Panel is available in two versions: with a metal front for commercial ships and with a highly esthetic glass front for mega yachts.



Mega-Guard electric propulsion system overview

Propulsion Control System

The Propulsion Control System (PCS) fully automates remote control from the bridge of the Electric Propulsion Motors. In case of parallel hybrid applications, the combustion propulsion engine is controlled as well and automatic change over from electric propulsion motor (low power) to combustion propulsion engine (high power) is fully supported. The PCS provides steering functions as well with the application of Electric Steerable POD. PCS operator modes are adapted for every application.

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Vessel Management System

Power Management System

Fire Alarm System

CCTV Video Distribution

Ship Performance Monitor

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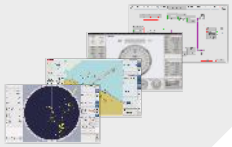
Integrated Navigation System



Heading Control System

Propulsion Control System

Dynamic Positioning System

BNWAS Watch Alarm System

Navigation Light Control

Wiper Control System

Energy Management System

Electric Propulsion Motor

Electric Steerable POD

High Power Inverter

DC bus Generator

Electric Energy Storage

Electric Fin Stabilizer

Ship automation, navigation and electric propulsion

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