

MARINE AND PORTS

Onboard Microgrid

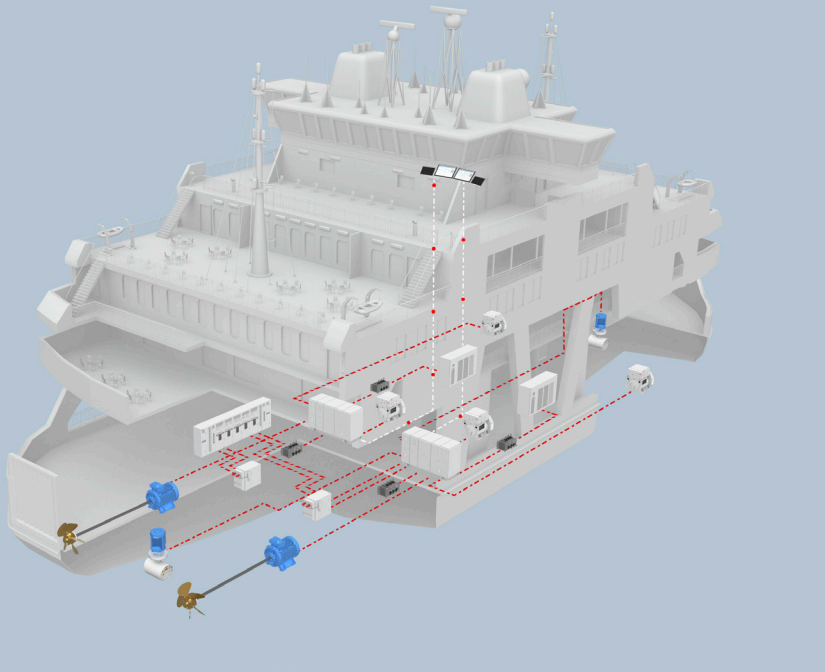
Overcome your power distribution challenges



Onboard Microgrid is a new, pre-engineered power distribution solution that supports hybrid power setups so vessels can operate more efficiently and comply with environmental regulations. The compact, ready-made solution contains all the control, power and energy management systems vessels need for more sustainable operations.

01 Onboard Microgrid is an ideal solution for operators seeking to reduce both their environmental impact and costs.

Features	Benefits
Connection to multiple energy sources, including generator in-comer, battery storage, shore connection, propulsion, other drives, and future support for fuel cells	Versatile hybrid solution adaptable to varying customer needs; more efficient operation helps comply with regulations
Compact size	Small footprint leaves more room for payload; no separate electrical room required
Standardized architecture	Shortened installation time, no advanced competency required, fewer resources needed
Configurable control software for all the above	Improved control, power and energy management
Support for up to five converters from AC to DC power distribution	Allows connected assets to operate at variable power consumption, leading to increased efficiency, reduced costs, and less consumption overall
Water-cooled	Ideal engine room conditions
Robust design/construction	Sturdier construction than standard marine boards and drives; long-lasting and upgradable
ABB knowledge and expertise	Trusted, reliable technology and support
Support for one or two multi-drive units	Higher power or redundancy to support varying load demands depending on customer need



Heart of the system

ABB Onboard Microgrid is built around the OMD880LC multi-drive unit, designed for marine power generation and propulsion drive applications.

The drive houses up to five converter modules and one AC module for AC network supply, all connected to an internal DC bus, so each power source and consumer can be controlled and optimized independently.

Electric power generation options

Supports connection of multiple hybrid power sources:

- Synchronous generator (PM or brushless excitation) with diesel / gas engine
- Shaft generator - PTO/PTI
- Battery energy storage
- Fuel cell (forthcoming)
- Shore connection

Hybrid Energy System (HES) modules are configured as inverter, supply unit or DC/DC-converter depending on power source. An external choke unit is added when necessary.

Propulsion drive options

The electric propulsion drive may be configured as a single drive using a standard motor with single 3-phase winding. The motor may be of asynchronous or permanent magnet type.

Achieve higher power or redundancy by installing two HES modules to run either a single motor with two winding systems, or two motors coupled to the same shaft directly or through a reduction gear.

AC-power generation

A dedicated module for AC network supply connects to a distribution switchboard through a transformer and filter unit. This ensures proper suppression of harmonics and electromagnetic interference to a safe level in accordance with IEC 60533 requirements for general distribution zone.

The converter can also supply sufficient short circuit current to ensure selective protection in the AC distribution system.

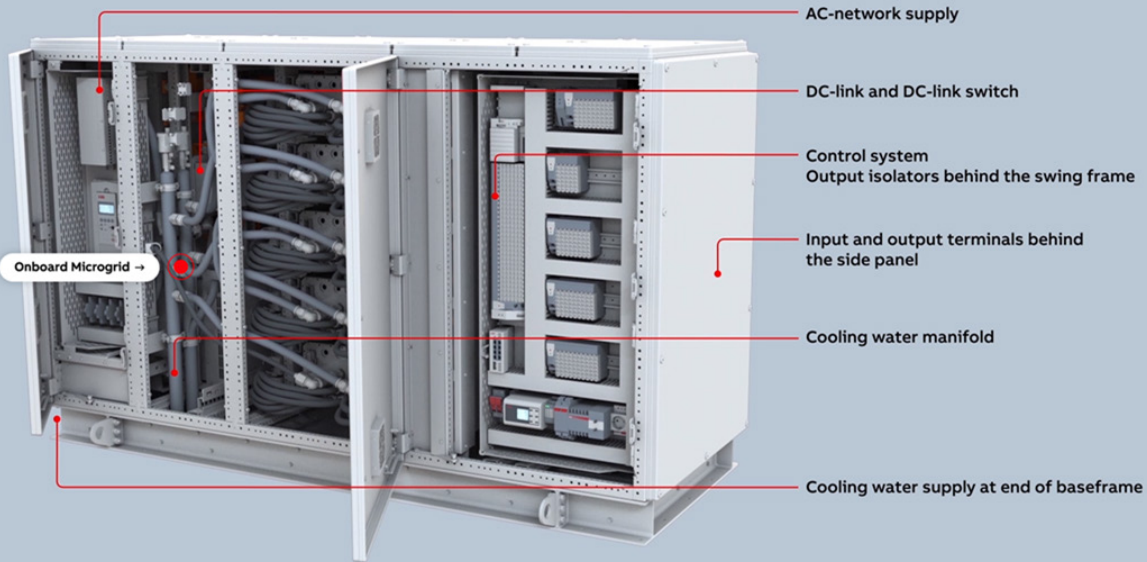
Integrated power management and propulsion control system

Built-in control system hardware and software configured according to customer need:

- Propulsion control
- Power and energy management system (PEMS) supporting engine, electric, hybrid and shore modes
- Energy storage control system
- Graphical user interface and propulsion essential control panel at one or two bridge control positions
- Interface to engines, rotating machines, battery management, shore connection, AC network and propulsion remote control system.
- Modbus TCP interface to automation / alarm system

Fit for the future

ABB Onboard Microgrid allows reconfiguration of the number and types of power sources, consumers and power levels. Alternative energy sources are becoming increasingly important and, as vessels age, the ability to upgrade and alter power sources will be a significant benefit for operators seeking to extend the life of their fleet while reducing costs.



Technical Specifications

Degree of protection	IP54
Ambient design conditions	Air 0°C - 50°C, Water 10 °C. - 45°C, no condensation
Overall dimensions	Height 1294mm, Depth 827mm, Length 2154mm
Service space	Front 600 mm, above 200 mm, behind 20 mm, sides 200 mm
Weight	OMD880LC unit: 900 - 1200 kg (excluding transformer, filter parts, motor(s) and power source(s))
Cooling	Liquid cooled, connects to external dedicated closed-loop cooling circuit
Basic configuration	Off-grid converter and distribution transformer with LCL filtering, DC-link 750VDC, propulsion motor interface, power source interface(1pc)
Optional configurations	Three configurable HES module slots for use as power source, 2nd propulsion system, consumer
External active parts	<ul style="list-style-type: none"> - Propulsion drive braking resistor (1 pc/OMD880LC – when needed) - Battery inductance (1pc / battery), - Power source filtering (1pc/source - when needed) - Distribution transformer (1 per OMD880LC)

Technical Specifications Continued

Voltage 500VAC, 750VDC (230-500VAC)

Ratings - DC-link 1360A, Transfer DC-link 400A
- 5 pcs HES module branches 100-650kW
- Electrical network supply 500VAC 330kVA 600 A for 3s

HES module sizes and current ratings	Generator AAC	Motor AAC	Shore AAC	Battery ADC
S	318	350	350	383
M	545	600	600	600
L	800	800	800	900

Control hardware platform ABB (B&R) X20-system

Control system interfaces - capitalize interface to engines, generators, motors, shore connection, battery management system and remote-control system
- Modbus TCP to automation system (statuses, measurements, alarms)
- Internal ethernet control network

Human Machine Interface - 1 or 2 graphical operator panels and hardwired propulsion essentials panels
- Local start / stop control for AC and DC power generation

Power generation modes in the integrated PEMS	Engine Engines only	Electric Battery only	Hybrid Battery & engines with selectable priority	Shore Battery charging
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