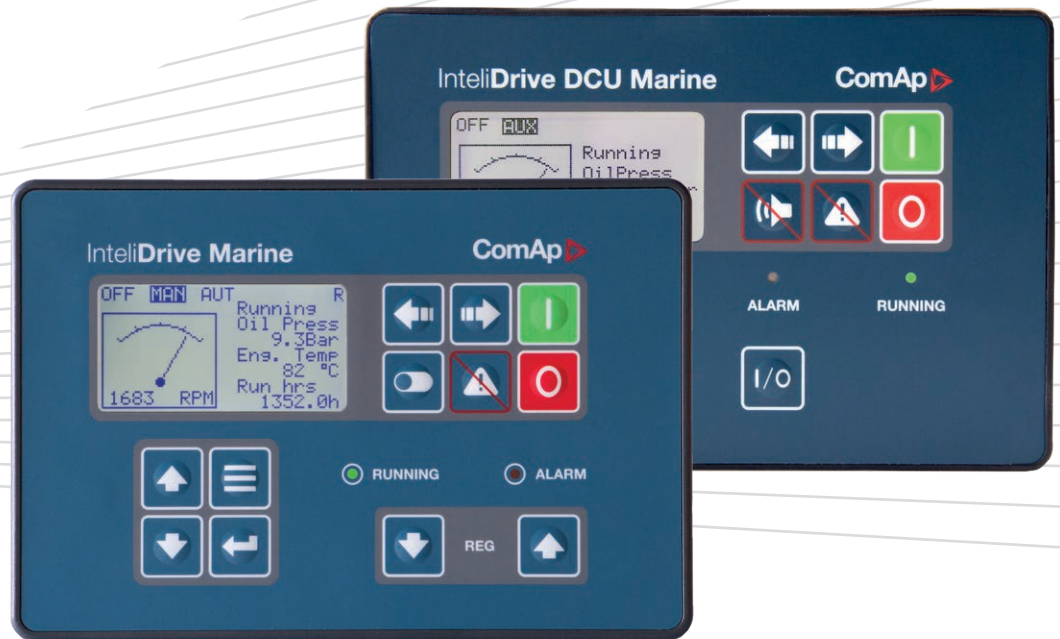


**Power, efficiency
and safety
on the water
That's smart
control**



Engine Management System



ComAp Engine Management System is comprehensive control, monitoring and protection solution for any type of marine engine. ComAp EMS controllers provides high level of performance and flexibility with extensive communication capabilities. ComAp has developed two

main controllers as InteliDrive Marine and InteliDrive DCU Marine with different range of capabilities, from simple non-certified to complex certified marine engine application, auxiliary or propulsion either on vessel or in harbour.

What ComAp offers

1 Quality



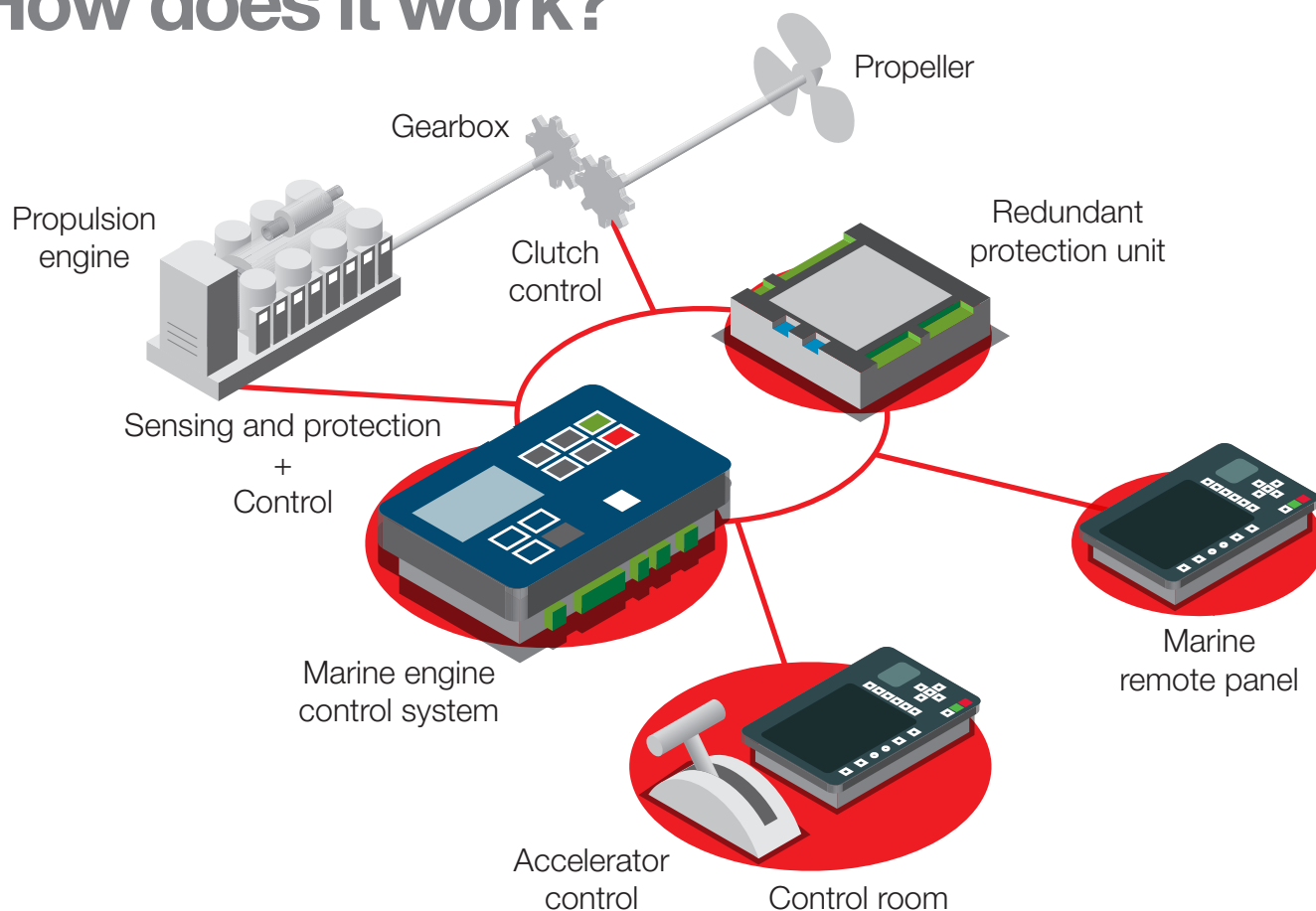
2 Integrated solution



- > Marine certified Hardware and Software
- > Years of reliable use all over the world
- > Full communication support of electronic engines
- > InteliDrive Marine is dedicated for non certified or simple CCS certified applications

- > Load sharing for effective balancing method of loading engines
- > Integrated clutch control
- > Customized scada and remote displays
- > Less wiring and components

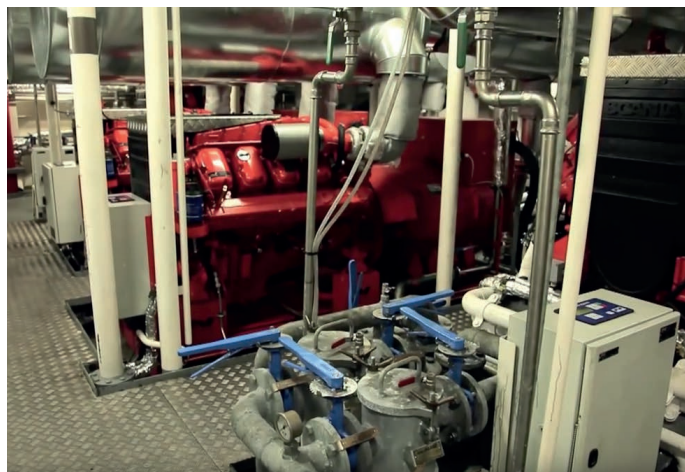
How does it work?



 Denmark

Faaborg III

Nordhavn, one of the largest marine gen-set builders in Scandinavia, installed two new engines and gen-sets equipped with ComAp controllers and displays on the ferry Faaborg III. All five onboard engines are fitted with IntelliDrive DCU Marine controllers which communicate with the ferry's SCADA system provided by Emerson. The IntelliDrive DCU Marine controllers operate in three application modes (Propulsion, Auxiliary and Emergency) allowing the controllers to control, monitor and protect every engine and also to integrate fully into the ferry's power management and monitoring systems.



Watch the project video!
youtube.com/ComApControlSystem



Power Management System



ComAp's Power Management System provides fully automatic operation of the generators including load dependent start/stop, power band control, running hours' equalization, automatic synchronization and load-sharing. ComAp's Power Management System offers a reliable, continuous and effective solution for power generation which can be also used for variable speed generators or shaft generators.

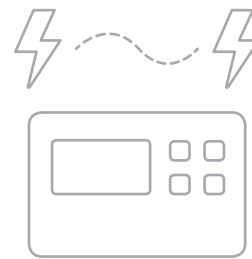
The complex power generation controllers, IntelliGen or IntelliSys can be complemented by the IntelliMains controller for automatic synchronization of the ships generators and shore connection while docking in the port or any bus tie breaker control, protection and synchronization.

What ComAp offers

1 Excellent flexibility



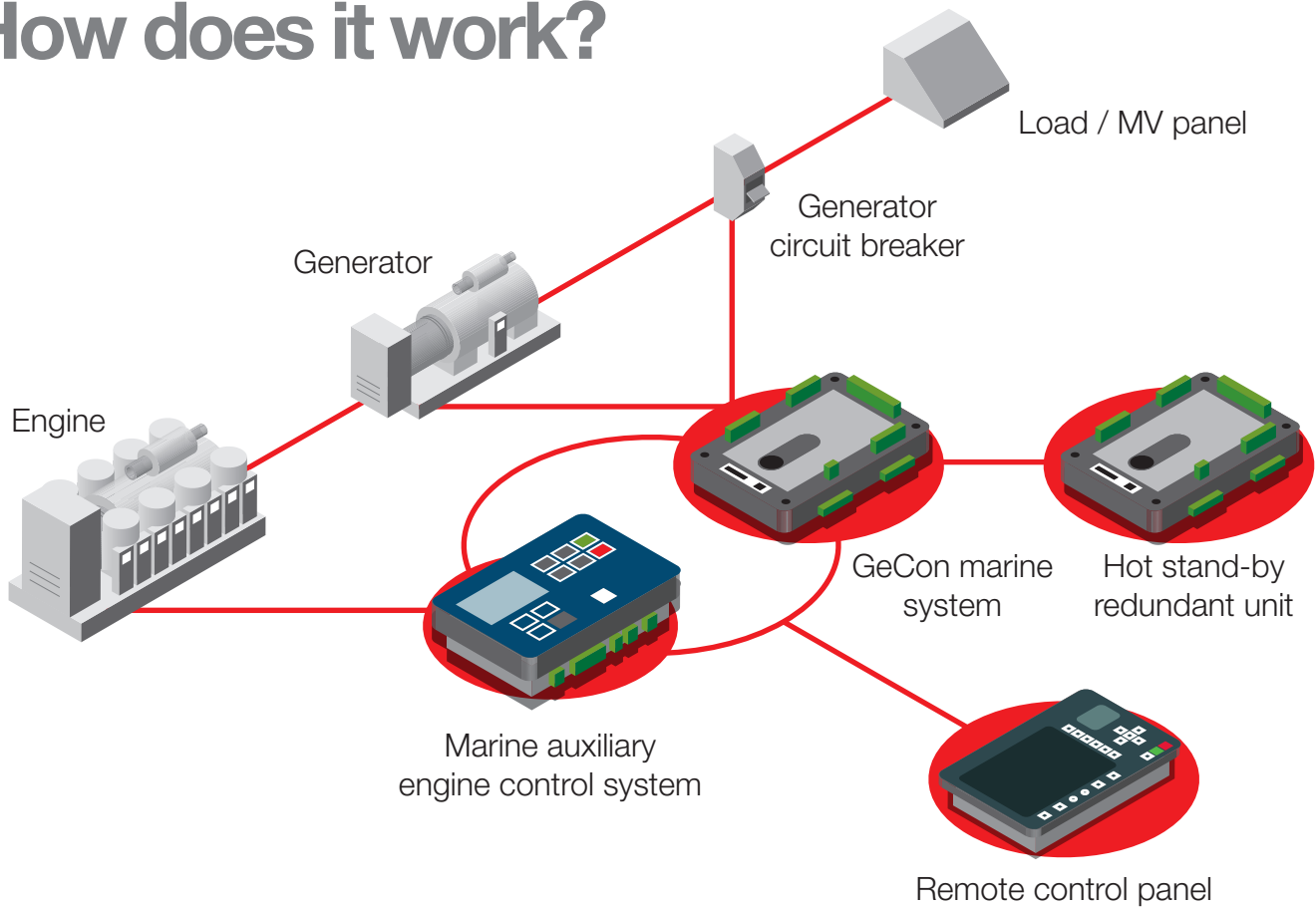
2 Advanced technical features



- > Manage outputs from generators from different manufacturers and with different power outputs
- > Built-in PLC functions remove the need for an external PLC controller
- > Cooperation with 3rd party engine controllers
- > Gen-set performance log for easy problem tracing in every control unit

- > Redundancy of CAN bus line with optional I-CR-R module
- > ComAp PMS minimizes the number of running generators a customer needs to use
- > 'Hot Stand-By' controller for uninterrupted generator control in case of failure of the primary controller
- > Isochronous generator control for stabilize the power factor for lower fuel consumption and more efficient energy production
- > Limitation of heavy loads and load shedding

How does it work?



Estonia **Kihnu Virve**

Estonia consists of a mainland and 2,222 islands, and many of these islands are inhabited, but also quite isolated. Ferries are used extensively to provide connection for the island communities and deliver better services for the people living on the islands. The Kihnu Virve ferry mainly services a route around Vormsi Island – the fourth largest island in Estonia, currently home to 240 people.

The ferry Kihnu Virve is powered by MTU engines, but also has Volvo and Rolls Royce engines to power the auxiliary systems. These generators are all controlled by ComAp's IntelliDrive DCU Marine and IntelliMains^{NT} controllers, with the IntelliVision 17Touch on the ship's bridge to provide control and systems information.

Monitoring, control and supervision of the system is provided over several remote displays and ComAp's SCADA system is used in combination with a ComAp IntelliVision 17Touch display. A combination of IntelliDrive DCU Marine, IntelliGen^{NT} and IntelliMains^{NT} controllers provide complex power management, protection, shore control connection and engine control. The customer appreciates the high flexibility and simplicity of system integration and especially the high reliability of ComAp controllers.



Watch the project video!
youtube.com/ComApControlSystem



Alarm Management System



ComAp's Alarm Management System provides large capacity for integration of third party systems as fuel pumps, air conditioning, preheating, firefighting systems and signalization. Built-in PLC logic fulfills customer requirements

for complex systems, allowing collection and analysis of external signals and displays them on our HMI colour screens or through the industrial protocol as Modbus on third party displays.

What ComAp offers

1 Integrated solution



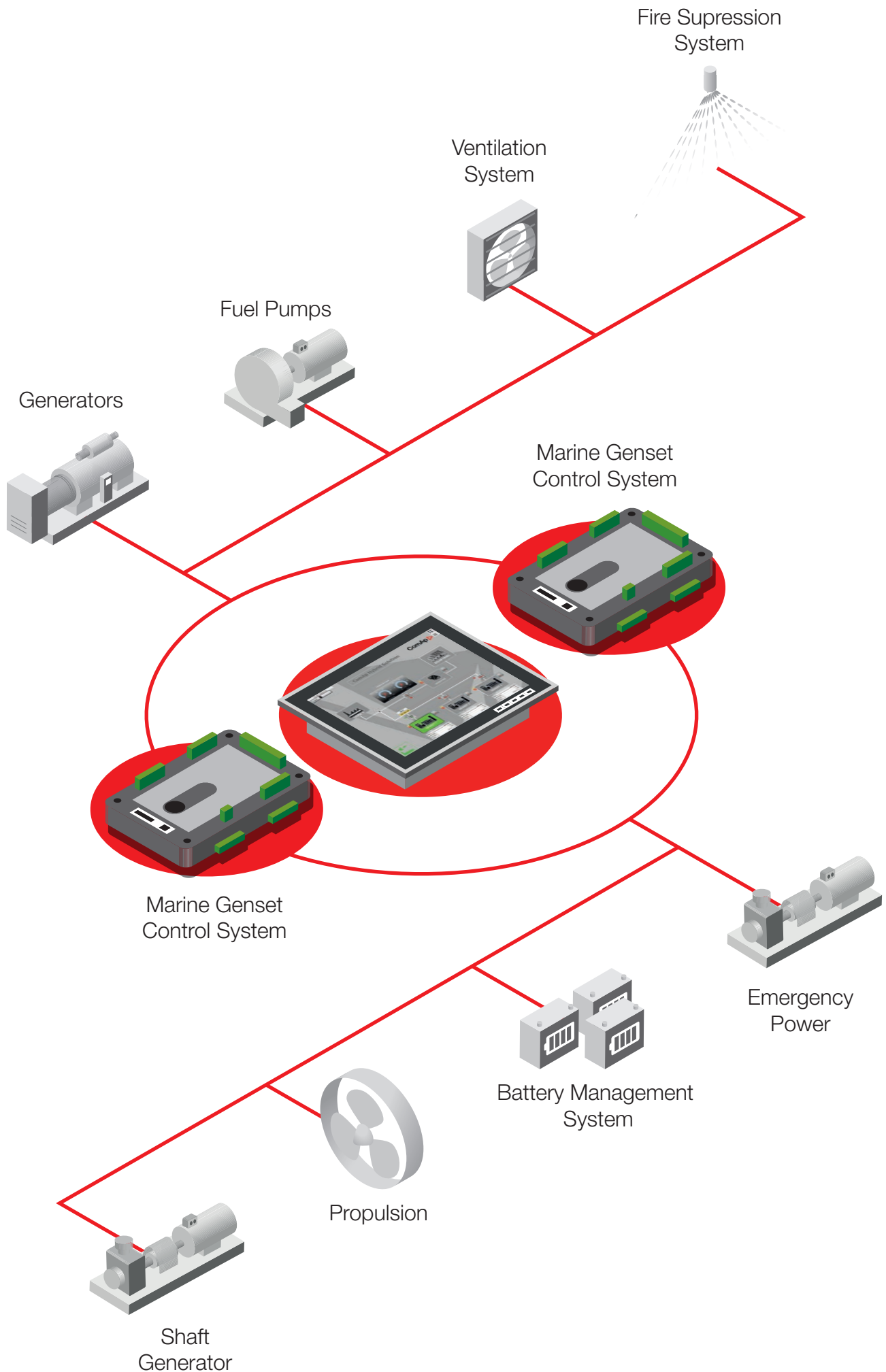
- > SCADA tools for complete overlook of the alarm signals
- > Screen Editor enabling users to customise their need for application
- > Full integration of 3rd party systems

2 Flexibility and complexity



- > 3rd party management system communication via Modbus
- > Built-in PLC for handling of complex applications
- > Variable extension modules for additional inputs/outputs

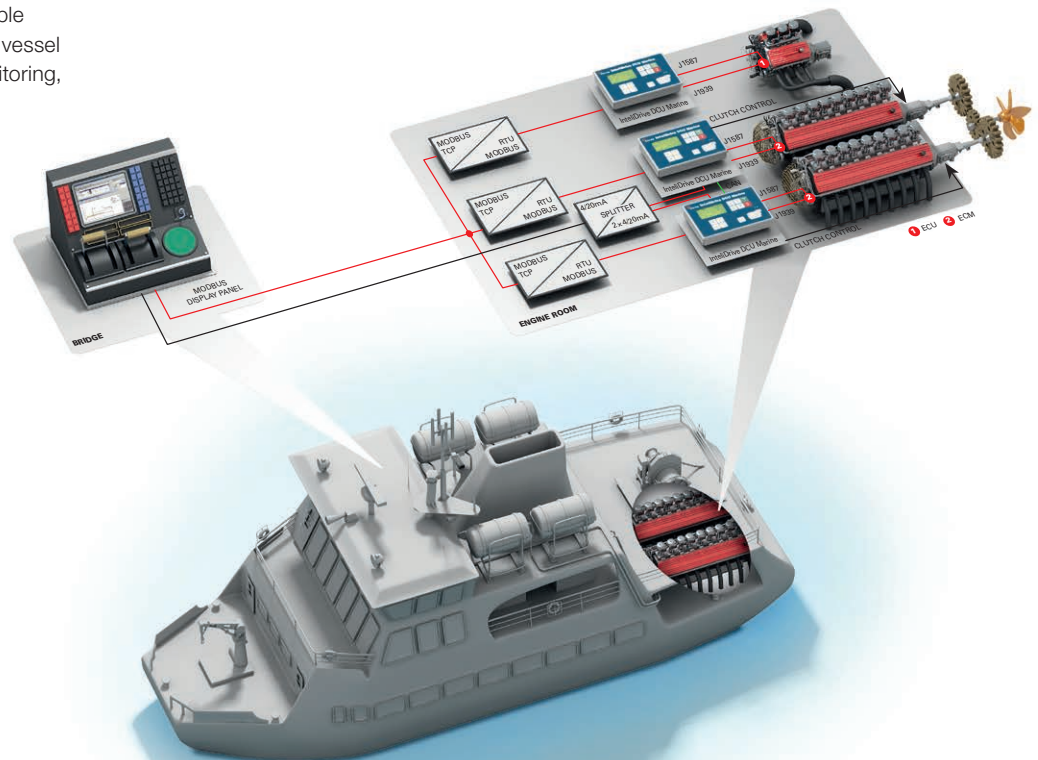
How does it work?



Applications

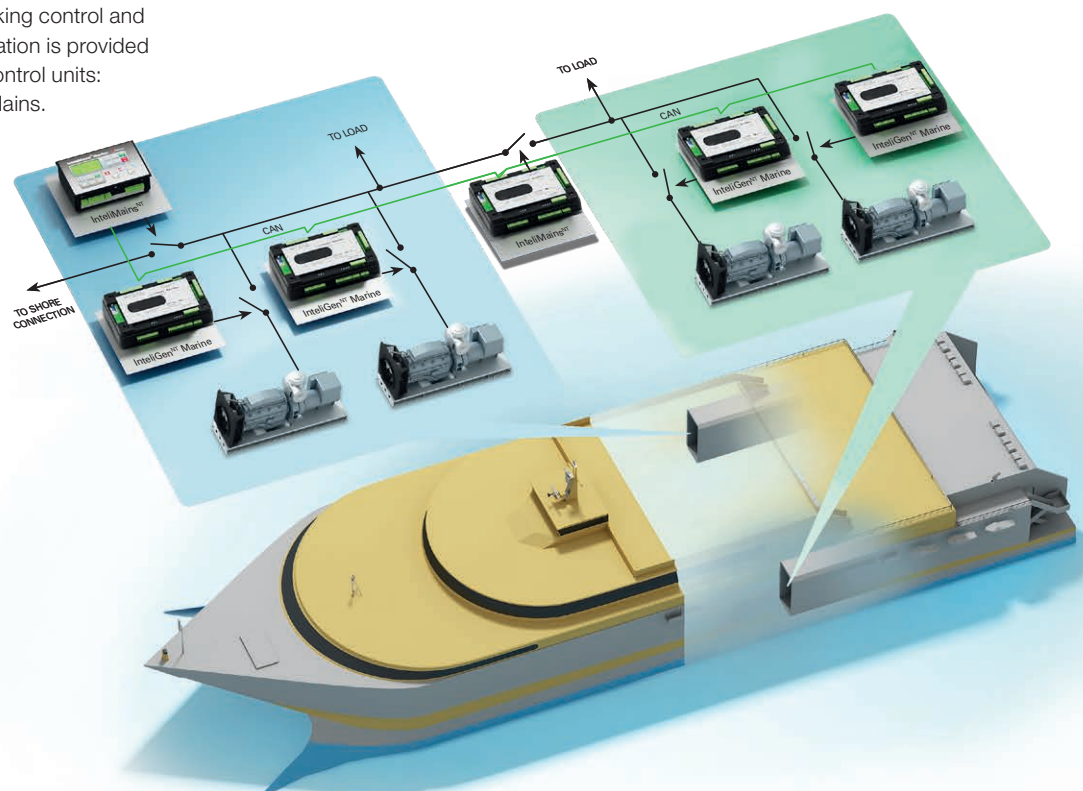
Propulsion

InteliDrive DCU Marine provides reliable control of propulsion system for your vessel with sophisticated load sharing, monitoring, protection and data logging system.



Power management system

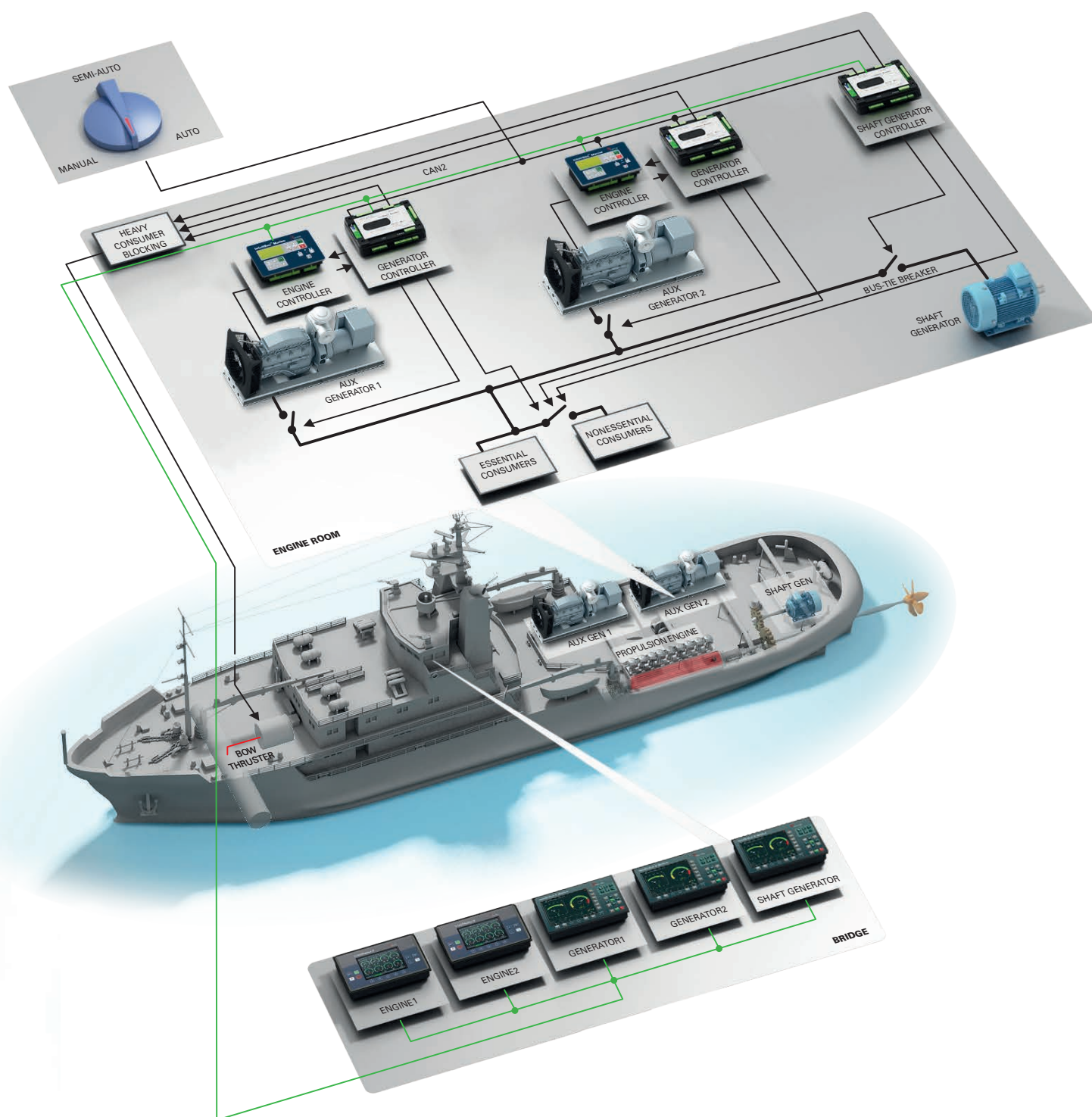
ComAp's Power Management System (PMS) offers reliable, continuous and efficient power supply for your vessel. Advanced generator, shaft generator, emergency generator control, power management, isochronous synchronization, bus-tie breaking control and effective power factor stabilization is provided by ComAp Marine certified control units: InteliGen, InteliSys and InteliMains.



Auxiliary and Generator

ComAp's IntelliDrive DCU Marine and IntelliGen^{NT} BaseBox, in combination with our powerful remote displays allow a complete power control system for any type of vessel.

Allowing control of both propulsion engines and auxiliary power generation engines, ComAp gives you reliable control, monitoring, protection and data logging with the capability to control other external devices.



References



Norway

Northern Corona

Northern Corona is a supply vessel owned by Trico Shipping AS operating in Norway and was recently upgraded with a new generator synchronizing and load sharing system supplied by Industrimarín.

They have also specified and installed the GeCon controller system for several customers' vessels for onboard generator applications as they provide a higher level of flexibility, as Bjarte explains:

"We are continually amazed at the level of flexibility this controller offers us."

Bjarte Steen, Director

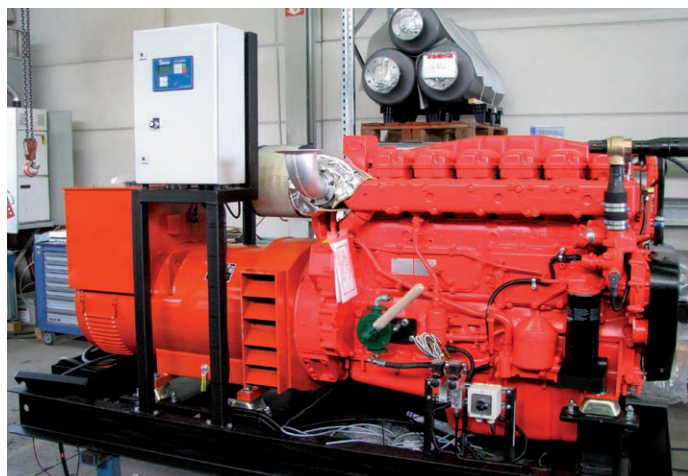


Netherlands

Sandfirden

"At Sandfirden, we use around 250 DCU/RPU panels each year for marine based gen-set applications and about 175 DCU without RPU on gen-sets used for inland waterway duties. The new integrated DCU panels have made a significant improvement, as we no longer require huge control boxes fitted with separate PLC and relays.

Now, at the heart of our control solution is the single ComAp DCU unit providing direct communication with the J1939 in combination with the built-in PLC – particularly important to us as 90 % of our gen-sets are electronic Scania and Sisu engines.



Ecuador

LAE 27 de Febrero and Corbeta BAE Esmeraldas

The Ecuadorian Guardacostas vessels LAE 27 de Febrero and Corbeta BAE Esmeraldas both use ComAp systems for either generator management or engine control and monitoring. The LAE 27 de Febrero features three IntelliDrive DCU Marine controllers to manage three Detroit diesel engines with system accessories including I-RD-CAN for the bridge and IGL-RA15 for the control station in the engine room. BAE Esmeraldas uses three IntelliGen^{NT} Marine units linked to IG-Displays and a LCD touch screen computer to provide automatic parallel control and synchronization of three 250 kW MTU powered Magnamax generators.



Turkey

Tarpan

The tug and supply vessel Tarpan, made by Gelibolu Shipyard, operates in the Caspian Sea.

The ship has three Cummins KTA-50 acting as the main engines connected by gearbox to variable pitch propellers with port and starboard engines driving powerful fire pumps. Engines and gearboxes are controlled and protected by three IntelliDrive DCU Marine controllers with remote control provided by I-RD-CAN remote displays on the Engine room and Aft bridge and by IntelliVision remote display units on the Fore bridge.

Extensive use of built-in PLC functions together with flexible input/output and communication structure of IntelliDrive DCU Marine has ensured a compact and economical control system.





Finland

Meriaura Ltd

Meriaura Ltd, the owner of MV Aura, is a Finnish shipping company specialising in demanding cargo projects and transporting industrial bulk and raw materials. For its work in support of renewable energy projects MV Aura is part of its fleet of Cable laying vessels covering both deep water and shallow water cable laying and trenching capabilities.

The ships' systems has been fitted with a dynamic positioning system and two additional bow thrusters, two new diesel engines, deck cranes and also accommodation block with capability of housing up to 36 people. This modern and environmentally friendly vessel is designed to operate globally and can be utilised for various tasks including transport of demanding project cargo such as offshore wind farm structures. As its area of deployment includes the Baltic Sea area, the vessel is also capable of operating as an Icebreaker giving it year round capability to perform its duties. This wide scope of capability is further enhanced into an environmental protection role; MV Aura is also capable of operating in oil spill response activities. The main engines of the vessel can use environmentally friendly bio oil as fuel.

Many ComAp products were used in this installation.

- > IntelliGen^{NTC} BaseBox with IGS-PTM and one IntelliVision 8 Marine on each gen-set
- > IntelliMains^{NT} for controlling all the breakers
- > IntelliVision 17 Touch for SCADA use and monitoring
- > InternetBridge-NT for remote monitoring in the engine control room.



Malaysia

Uzma Marsya Oil Rig

This off-shore oil rig is located off the coast of Malaysia. The rig is fitted with 5 gen-sets providing a power supply to the rig. The system is divided into three groups. First group, two 1.2MW Waukesha gas gen-sets together with second group, two marine 1.2MW Cummins diesel gen-sets generates power for the rig. Additional 1.2MW emergency Cummins diesel gen-set (third group), serve for back up of the power. Groups are connected together through the tie breaker.

Due to the safety and security, ComAp gen-set controller provides control, synchronization and protections of each of the gen-sets on the site. ComAp extension modules provides measurement of various temperatures and analog values that are important for safe operation of the gas gen-sets. Controllers are equipped with local HMI, as the customer can see all available values at engine site. The switchboard (close to captain's bridge) is also equipped with remote control panel. Due this, customer can control gen-sets in case of any switchboard operation.

Together with control of tie breaker, ComAp system manages entire power management, group synchronization, site protection, remote monitoring or control of entire system from one central ComAp SCADA system, located at the captain's bridge. The operator can see all available site data. Can start/stop gen-set, synchronized gen-sets or groups and change the configuration if required.



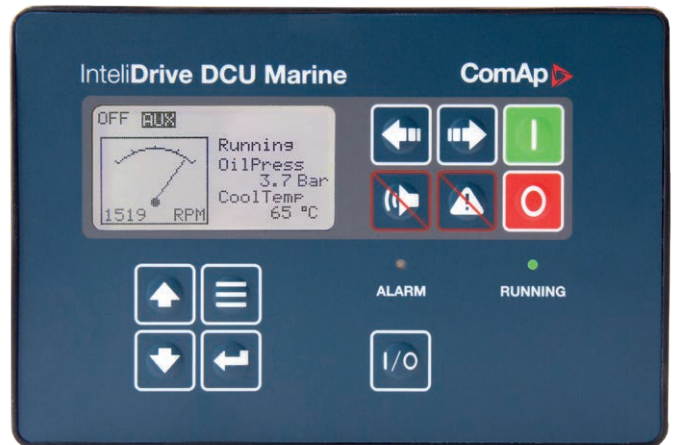
**Efficient and
reliable control
of your vessel
That's smart
control**



Key products

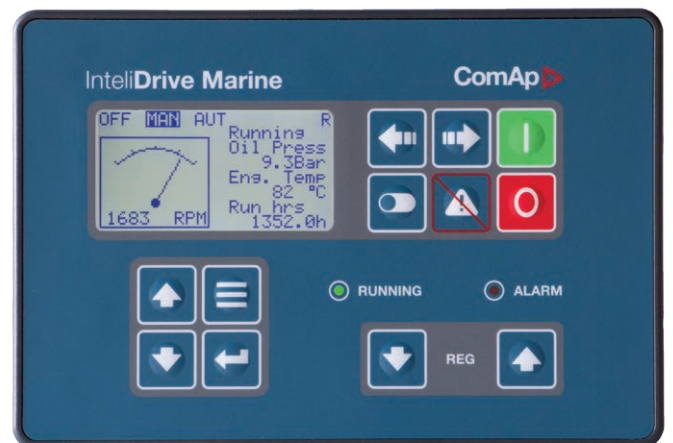
InteliDrive DCU Marine

- > Modular IACS certified engine controller for marine applications
- > Control, monitoring and protection for any type of marine engines
- > Dedicated Emergency, Auxiliary, Harbour and Propulsion engines application
- > Single speed application for generators and variable speed application for propulsion, pumps, compressors
- > Support of wide range of EFI (ECU) engines with Tier 4F support
- > Support of multi CANbus devices
- > Connection to engine via primary J1939 and backup J1587 buses or Cummins Modbus
- > Remote monitoring via Modbus, Ethernet and AirGate
- > Configurable Modbus RTU and Modbus TCP
- > RS232, RS485, Ethernet communication support
- > WebSupervisor support for remote supervising and monitoring
- > Redundant architecture: Main unit + Backup module
- > Backup ID-RPU module with broken wire protections
- > Speed/load control via J1939 or J1587 buses
- > Symmetrical load sharing for propulsion engines with J1939 (via CAN bus)
- > Power management controller cooperation over CAN bus (IG/IS-NTC-BB)
- > Integrated clutch control
- > 14 binary inputs, 14 binary outputs, 8 analog inputs
- > Marine certified extension modules for expandable number of Input/Outputs
- > 80x AIN, 32x AOUT, 112x BIN, 112x BOUT
- > Load sharing for propulsion engines, Integrated clutch control for propulsion engines
- > Switching between primary and secondary battery
- > Internal configurable PLC with large set of functions
- > PLC lock capability to keep your know-how safe
- > Event driven History record up to 4000
- > > Customizable colour HMIs, including InteliVision 12T OEM support
- > > Obsolete I-RD-CAN Marine remote display is replaced by ComAp HMIs InteliVision



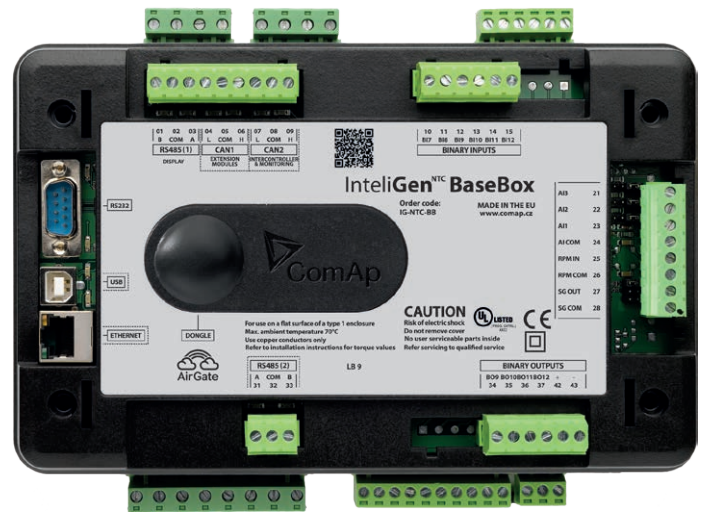
InteliDrive Marine

- > Engine controller for marine Tier4 Final propulsion applications
- > Control, monitoring and protection for any type of marine engine
- > Support of EFI (ECU) engines via CAN/J1939 or Cummins Modbus
- > Redundant architecture by using backup redundant protection unit Inteli RPU
- > Support of two independent power supplies via I-RPU module
- > 7 configurable binary inputs, 7 configurable binary outputs
- > 9 configurable analogue inputs (3 resistive, 3 current 0-20mA, 3 voltage 0-10V)
- > Option for additional inputs/outputs
- > Selectable protections warning/cooling down/shutdown
- > 3 level of controller setting / operation password protection
- > Ethernet, USB, GSM / GPRS, RS485 or RS232 / Modem / Modbus communication
- > Automatic SMS on alarm
- > On-line control and monitoring over web pages (embedded web server)
- > Real time clock and event history log
- > Toggle button with additional features adjustments
- > Up/Down speed regulation buttons on the front facia
- > 2 languages (user changeable), Chinese language support
- > Front panel sealed to IP65



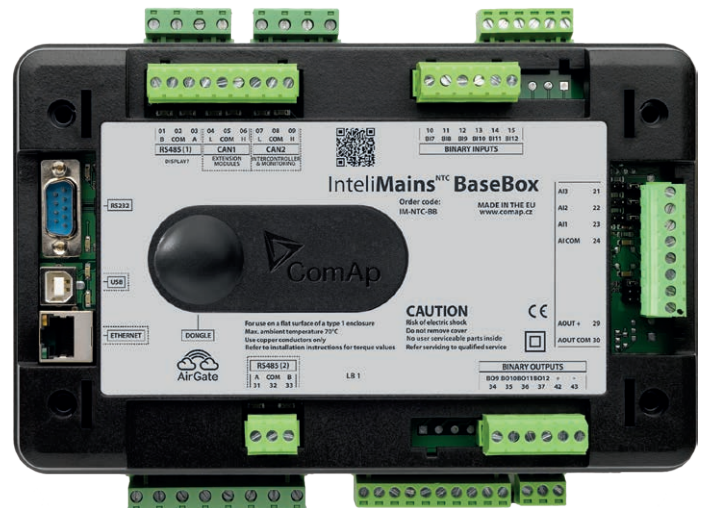
InteliGen^{NTC} BaseBox

- > Gen-set controller for both single and multiple gensets operating in standby or paralleling modes
- > Support of engines with ECU (Electronic Control Unit)
- > Complete integrated gen-set solution and signal sharing via CAN bus – minimum external components needed
- > Many communication options – easy remote supervising and servicing
 - AirGate support, Ethernet connection (RJ45), USB 2.0 slave interface, 1x RS232 / 2x RS485 interface with Modbus protocol support; Analog / GSM / ISDN / CDMA modem communication support; SMS messages; ECU Modbus interface; secondary RS485 converter is isolated
- > Automatic synchronizing and power control (via speed governor or ECU)
- > AMF function, Baseload, Import / Export, Peak shaving, Voltage and PF control (AVR)
- > Generator measurement: U, I, Hz, kW, kVAR, kVA, PF, kWh, kVAh
- > Mains measurement: U, I, Hz, kW, kVAR, PF
- > Selectable measurement ranges for AC voltages and currents – 120 / 277 V, 0–1 / 0–5 A
- > Inputs and outputs configurable for various customer needs
- > Bipolar binary outputs - possibility to use BO as High or Low side switch
- > Controller redundancy
- > Event-based history (up to 1000 records) with customer-selectable list of stored values; RTC; statistic values
- > Integrated PLC programmable functions
- > Integrated fixed and configurable protections
- > DIN-Rail mount
- > Customized firmware solution e.g. GeCon for alternator control only and cooperation with engine controller



InteliMains^{NTC} BaseBox

- > Breaker supervision controller base unit
- > Many different power control modes available
 - System Baseload with limited export or minimal import
 - Import/Export power control of gen-set group
 - Temperature of the system by power control
 - Dynamic changes of required system power via analog input
- > Reverse synchronization of the loaded gen-set group to mains
- > Forward synchronization of Mains to gen-set group
- > Coupling of several synchronized mains to a common bus
- > Allows to build complex applications with more mains incomers, bus-tie breakers, load management etc.
- > AMF function, Peak shaving
- > Mains measurement: U, I, Hz, kW, kVAR, kVA, PF, kWh, kVAh
- > Bus measurement: U, Hz (kW, kVAR, PF - via CAN from gen-set group)
- > Selectable measurement ranges for AC voltages and currents – 120 / 277 V, 0–1 / 0–5 A
- > Inputs and outputs configurable for various customer needs
 - 12 Binary Inputs
 - 12 Binary Outputs
 - 3 Analog Inputs
 - 1 Analog Output
- > Bipolar binary outputs - possibility to use BO as High or Low side switch
- > Many communication options – easy remote supervising and servicing
 - 1x RS232 / 1x RS485 interface with Modbus protocol support
 - Analog / GSM / ISDN / CDMA modem communication support
 - SMS messages
 - RS485 converter is isolated (one RS485 Display-dedicated port)
 - AirGate support
 - Ethernet connection (RJ45)
 - USB 2.0 slave interface



- > Controller redundancy
- > Event-based history (up to 1000 records) with customer-selectable list of stored values
- > RTC
- > Statistic values
- > Integrated PLC programmable functions
- > Integrated fixed and configurable protections
- > DIN-Rail mount of the controller
- > Customized firmware solution

InteliVision 5 CAN Backlit

- > Marine approved color display unit for either IntelliDrive DCU, IntelliGen^{NT} or IntelliSys^{NT} controllers
- > Plug and Play operation (auto configuration based on controller application)
- > Direct connection to the controller (converters are not needed)
- > Simpler, faster and more comfortable control for the user
- > More information in less time
- > 5,7" Colour TFT Display
- > Same cut out as standard ComAp controllers, e.g. IntelliDrive DCU
- > Same language support as the master controller including graphic languages
- > Active buttons – fast access to important data
- > Galvanically separated CAN interface
- > Binary output for horn/buzzer control
- > Sealed to IP65
- > 8-pins Harness connection on rear side
- > Drag & Drop customer screen configuration
- > Backlit buttons
- > Analog input to control display backlit intensity



InteliVision 8 Marine

- > Marine approved color display unit for either IntelliGen^{NT} / IntelliSys^{NT} or IntelliDrive controllers
- > 8" colour TFT display with resolution of 800x600 pixels
- > Controlled by active buttons
- > Comes with new TRENDS monitoring screen
- > Windows CE operating system
- > Same language support as IntelliGen^{NT} / IntelliSys^{NT} and IntelliDrive DCU
- > Screen configuration by customer – export to XML format with subsequent manual screen modification and import back to the controller (as IS-Display)
- > Customizable initial screen logo and content of controller help
- > This display gives complete access to all control and monitoring functions of IntelliGen^{NT} / IntelliSys^{NT} and IntelliDrive DCU
- > Intended for connection to ONE controller: IntelliGen^{NT} / IntelliSys^{NT} or IntelliDrive DCU
- > The same dimensions as IS-Display / IntelliSys^{NT} (including cut out dimensions)



InteliVision 12Touch OEM

- > InteliVision 12Touch, industrial operator panel equipped with 12,1" colour, multi-touch screen
- > 12,1" color, multi-touch screen, TFT display unit with resolution of 1280 x 800 pixels
- > Touch based Graphical User Interface, support for multi-touch gestures
- > Plug & Play operation (auto configuration based on controller application)
- > Complete access to all control and monitoring functions
- > Fast and intuitive navigation
- > Extended trends monitoring screen
- > Compatible with ScreenEditor software
- > USB flash disk file storage (export/import trends, history, archive of controller and InteliVision 12Touch firmware and others to USB stick)
- > User's pictures import
- > Adaptive and colour alarm list
- > Large History screen
- > Adjustable setpoints help
- > Multilanguage support
- > Communication connection via RS-485
- > Integrated easy to use mounting system



Product overview



IntelDrive DCU Marine

- > Modular certified engine controller and protection unit for any type of marine engine application with support of Tier 4F emission standard



IntelDrive Marine

- > Modular engine controller and protection unit for any type of marine single engine application with support of Tier 4F emission standard



IntelVision 5 CAN Backlit

- > Marine approved 5,7" colour display unit with CAN bus interface and backlit buttons



IntelVision 8 Marine

- > Marine approved 8" colour detachable display unit



IntelVision 12Touch OEM

- > 12" industrial grade touch Plug & Play display



IntelGen^{NTC} BaseBox

- > High-end marine certified gen-set controller for single or multiple generating sets operating in standby or parallel modes



IntelSys^{NTC} BaseBox

- > Premium marine certified gen-set controller for single or multiple generating sets operating in standby or parallel modes



IntelMains^{NTC} BaseBox

- > Controller for mains application (shore connection) or bus tie breaker application



Intel IO8/8

- > Binary inputs/outputs and analog outputs module



Intel AIN8

- > 8 analog input channels and 1 rpm/impulse input module



InternetBridge-NT

- > Communication module with cellular/ethernet connection



ID-RPU

- > Redundant protection unit

ComAp®
The heart of smart control



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