Best performance in yacht management! Your NavyBus System

NAVYBUS®

NavyBUS



What is NavyBUS[®]?

NavyBus® was created in 2008. It was designed to become a **reference in boats electrical wiring applications.** Like KNX, home automation and building projects standard, the NavyBus® is an OPEN technology thereupon its specifications could be shared with other manufacturers. Currently, Navy-Bus® used by various manufacturers of equipment:

Directly : Navylec, Ocean Data systems,

Frigomar, Desalator, ... Indirectly at this time : Victron, Garmin, Engine manufacturers ...

All the partners, who work with NavyBus®, participate in a creation of a consortium the purpose of which is **global standardization** of NavyBus® technology.

Generally, NavyBus® is dedicated for boats from 20' to more than 140' long.

Why Multiplexing?

Logical evolution of electrical architecture:

Today, it is quite common to find pleasure-boats with several kilometers of electric cables. The total weight of all these wires might represent over several hundreds of kilos. Plurality of equipment operates point-to-point with their-own control switch, cut-out switch, or control panel.

The solution allowing **decreasing the costs**, to optimize the installation time, design, reliability and control, consist in connecting the different components through a **SAFE** local **MULTIPLEXED** network (wired or wireless).

Instead of using several cables, carrying single information by wire, the different components are connected together by only 2 wires (the multiplexed network). All the information are packed and transferred by this multiplexed network to keep a real time control of all the components.

With several OEMs' manufacturers, NAVYLEC® selected a technology named NavyBUS® for the nautical world. NavyBUS® is now as a standard that powers Energy, Control & Monitoring for the largest cruise ships (both sailing and engine boats). It also concerns the biggest yachts for racing, passengers ships and smaller crafts.

NAVYLEC® offers to your company, the best solutions for your new projects, on today and for tomorrow.



Why to choose NavyBUS?

For shipyard:

- SIGNIFICANT LABOR COST SAVINGS on installation, quality control & after sales actions
- REDUCTION of wires' weight end length
- EASY NETWORK CONFIGURATION
- FULL ETHERNET compatibility
- ROBUSTNESS (racing experiences)
- **RATIONALIZATION** of displays and control means (Ergonomic navigation station)
- MORE FUNCTIONS using RADIO SWITCHES & SENSORS
- COMPATIBILITY with the other MULTIPLEXED systems (NMEA 2000 & J1939)
- Data logger to understand how the boat is used & better manage warranty

For the owner and the passengers:

- INCREASING COMFORT of common and private areas by DOMOTIC : lighting, air conditioning and heating, ...
- **REDUCTION of noise NUISANCE:** for example smart startup of Genset...
- MODERN interface : switching and display
- Leisure interface : iPhone, IPad, and other tablet and smartphone

For the captain:

- INCREASE OF SYSTEMES RELIABILITY
- FULL YACHT MONITORING SYSTEM
- ALARM MONITORING SYSTEM
- EASY MAINTENANCE ACTIONS (software diagnostic & LEDs to show the burnt fuse)
- **CENTRALYZED FUNCTIONS** (Lighting, toilets, air conditioning, ...)
- **A STRONG WATERTIGHT TABLET** provide a copy of the MAIN DISPLAYS
- Innovating instrumentation to know at any time if the boat is not overflow.



NavyBUS[®] - main technical characteristics:

- NavyBUS® communication is a "FAULT TOLERANT" CAN BUS. This bus, which usually works with 2 wires, is able to keep the communication even if one of the wires is cut off, short-circuited to "battery +" or to "battery -" or if the wires are short-circuited between each other. This technology is one of the most proven, in difficult and unstable environments.
- NavyBUS® is also supported on ETHERNET and WIFI for complex architecture using large monitoring screens or wireless tablets. This Common Network completes the Fault Tolerant Bus used for the wiring of all the input/output modules and the small display units
- NavyBUS® integrates a remote intelligence with NO centralization: if a component breaks down or has been removed from the installation, all others components would continue to operate correctly.
- 4. NavyBUS® uses specifications which could be shared between other suppliers as an OPEN technology. Sharing these specifications will secure a long time life and an easier exchange of products for this technology.
- NavyBUS® is connected to the most other famous and complementary networks, such as NMEA2000 (nautical), J1939 (engine), ModBUS (others) ...
- 6. NavyBUS® offers low electrical consumption. NavyBUS® allows operation on 24 hours a day, 365 days a year even on a sailboat without a power generating set... The radio switches and the remote control devices have a 5-year autonomy (average of battery replacement calculated on a daily basis).

FAULT TOLERANT ETHERNET – WIFI – RADIO OPEN TECHNOLOGY NO INTELIGENCE CENTRALIZATION



- 7. Operating with a mix of wired and wireless technology, NavyBUS® enables the shipyard to totally remove some cables wherever it is possible: switches, sensors, ... NavyBUS® provides an encrypted frequency modulation and bi-directional radio transmission developed. This technology has been designed for the applications in special vehicles requiring lot of safety. The Navy-BUS® handheld remote control devices have a range over 300 m and they allow lot of new functions. Therefore, the NavyBUS® wireless switches remove all cables or holes on any walls. These radio switches could be installed in an unlimited number and they could be installed in the most sensible locations.
- Based on standardized and qualified software libraries for all on-board communication products, Navy-BUS® was created to be used in harsh environments requiring a high level of security. This technology was installed and proven enough for the last 10 years.
- NavyBUS® includes all the diagnosis and tele-coding features and services.
- 10. **NavyBus**® is generally dedicated for boats from 20' to more than 200' feet.

GATEWAY FOR NMEA2000 or J1939... HARSH ENVIRONMENTS OPERATING EASY SOFTWARE PROGRAMING BOAT 20' to 200' feet





Easy connection with NavyBUS!

Power Distribution BOX



Home automation

The NavyBus® equipments provide a high level of comfort and ambient atmosphere personalization,

never reached so far.

- Lighting with dimming function with all possibilities for logical combinations, general ambiance or **global switching** on, off...

- Shutter
- Sockets
- Fans, ...

Extended Systems :

The **NavyBus®** technology can be connected with any manufacturer in CAN BUS, using the nautical and engine standards (NMEA2000 & J1939).

These numerical information could be displayed in all screens or could be used in all automation processes or alarms calculation.

Communication Systems :

On board : In Ethernet mode, **NavyBus®** allows connection with all wireless devices using WIFI ports. The users will connect their smartphones and tablets, in order to access to some basics operating commands or information. At the shipyard, the boat builder could connect its working computer via its wireless port, in order to program the **NavyBus®** components.

Out board: with a GSM quad band module for web service. When the boat is on wireless GSM accessibility, **NavyBUS®** allows Diagnosis, Data logger, functional update...

Alarm :

All **NavyBus®** systems can be monitored and could generate alarms.

Automation embedded in the **NavyBus®** system allows the possibilities to create intelligent alarms.

Systems Management:

The **NavyBus®** equipments allow to measure and to monitor the:

- Electrical energy, Battery management with double shunts to split the production and the consumption currents.

- Special equipment to evaluate all current production and consumption,

- Diesel tanks,
- Waters tanks,
- Technical temperatures,
- Fridge temperature,
- Fluid pressure,

- Position of important components (valves, pumps, doors, mechanical equipment..)

- Etc...

All these measurements could be displayed in all screens and could be used in all automation processes or alarms calculation.

Automation :

The **NavyBus®** technology allows all combinations and some calculations with all status and measurements.

With the **NavyBus®** architecture, it's possible to create some complex automation processes without adding extra systems. The **NavyBus®** provides a greater understanding and a higher simplification of the systems.

Equipment using **NavyBus®** could be easily replaced and therefore the **NavyBus®** solution has a good adaptation to the permanent's boats changes.

Large HQ Monitoring (High Quality displays):

In the Ethernet mode, the **NavyBus®** communication could support the operation with large monitors or special outdoor monitors. They could display a very large numbers of data with a high level of security.

NAVYLEC® offers a vast range of **NavyBus**® switch displays, especially a touch screen using new technology of capacitive switches.

This innovate product replaces the traditional switch by a high quality touch screen. This display allows infinity of graphic possibilities.

NavyBUS[®], Various levels of integration



NavyBUS[®], on board integration:

- A NavyBus® installation is easier to understand than conventional systems: the distribution of power is naturally found as a "tree".
- Each "node" corresponds to a secondary distribution box that contains protections lines downstream circuits.
- The architecture of the cabling is minimized by the lack of all traditional cables for the switches connection. This optimization is greater as all lighting switch cables have been replaced by a full multi-frequency wireless in the NavyBUS® system.
- Quick start: the simplicity of the cabling allows a quick location if the potential cabling mistake. The cabling installation could be quickly checked, point to point
- Easy adding (in a few minutes) of any electrical equipment: Additional output, switch, display, ...
- The free Software configuration & boat programmation allows a quick and self-employment by the shipyard for the electrical architecture development.t



On board innovating wiring topology:

NavyBUS® uses a bus structure which allows a **"FREE" wiring topology** unlike J1939 or NMEA2000 networks that impose a line topology.





MIXED & STAR NETWORK



NavyBUS[®], Software Programmation



The free Software configuration & boat programming provide to the shipyard the possibilities of quick and self-employment for the electrical architecture development.

NavyBUS® Project: This Software is used by the electrical designers to:

- Design calculators architectures
- Defining the inputs and outputs
- Program interaction between NavyBUS®
- and NMEA2000 or J1939 equipments
- Etc...

- NavyBUS® Tool: this Software is used inside boats to:
- Set up the installation
- Program all NavyBUS® equipments
- Locate potential problems
- Read all parameters from all NavyBUS® equipments
- Etc...



