

# Navylec & NavyBus

## Summary

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# 1 Introduction

## 1.1 Introduction

**Navylec® and NavyBus®** are the nautical brand of the company Anncy Electronique located in the French region of Geneva, which has been a leading specialist for over 30 years in automotive and aeronautics on-board electronic systems, and has revolutionized electrical installations in pleasure boats.

Multiplexing consists of a “tree-shaped” wiring system of the electric distribution that places the switching elements as close as possible to the consumers. Traditional switches are replaced by sturdy electronic devices that receive orders via a data bus (described in a later stage...).

**NavyBus** : is the name of an OPEN technology able to be used by different manufacturers of equipment’s.

Directly: Navylec, Ocean Data systems, Dessalator at this time, other in 2013...

Indirectly: Victron, Garmin, Webasto (ready 04.2013),



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### **Logical evolution of electrical architecture:**

Today, it is not strange to see pleasure boats with several kilometers of wires or electric cables that might amount to several hundreds of kilos on the scales. Most equipment work point-to-point with their control, switch, cut-out switch, or control panel. To confront the problems regarding cost, rationalization of exposure time, design, reliability and control, the solution is to connect the different elements through a local network. Instead of using several cables, each of them carrying only one piece of information, the different elements are connected by only 2 cables that take it in turns to carry the various information used. This technical connection is called multiplexing, and it is applied in the marine environment by Navylec®, brand name of Anncy Electronique, which provides its know-how in architecture in this domain and its recognized experience in the automotive and aeronautics world. You can be sure that, in order to study and carry out projects using such systems, the solution that we will offer you will be, technologically speaking, the most suitable and successful.

**NavyBus®** is adapted since 20’ to above 120’ boats

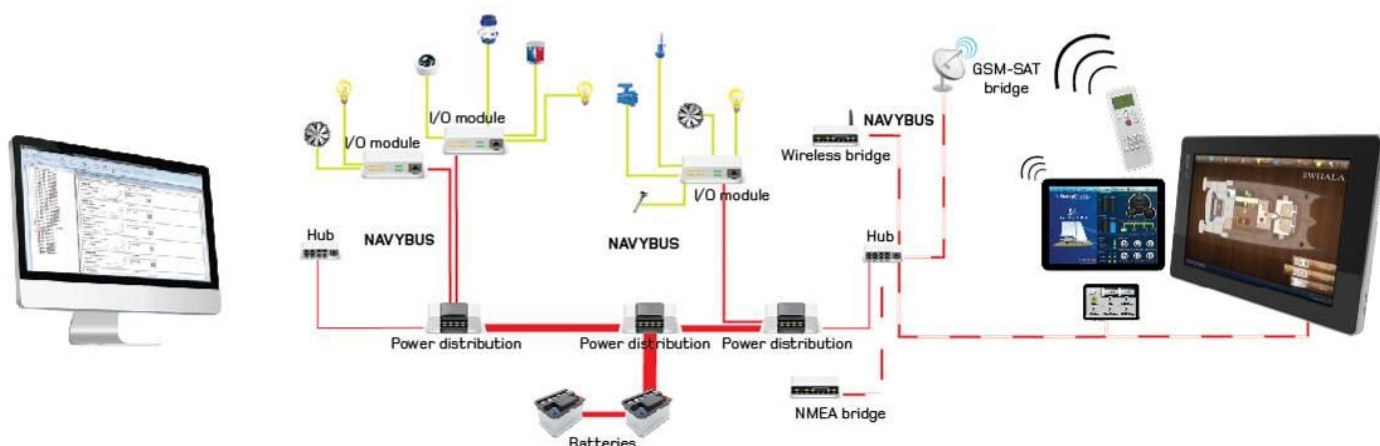
## 1.2 Main characteristics

1. **"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 with each other. This technology is one of the most tested in difficult and unstable environments.
2. **NavyBus®** is also supported on **ETHERNET** and **WIFI** for complex architecture of large Monitoring screens or wireless tablets. Is Common Network complete the Fault Tolerant Bus use for the wiring of all input/output module and small display units
3. **NavyBus® implements remote intelligence with no centralization:** if a component should break down or be removed from the installation, all others would continue to work normally.
4. **NavyBus®** uses specifications which enable it to be shared between **other suppliers** and guarantee **the durability and interchangeability** for life.
5. A unique device enables **NavyBus® to use up very little energy** and be in operation 24 hours a day, 365 days a year even on a sailboat without a power generating set... The radio switches and remote controls have a 5-year average autonomy used on a daily basis.
6. **Using a mixture of wired and wireless technology** enables you to totally suppress cables wherever possible: switches, sensors, etc. **Navylec®** uses a radio transmission in frequency modulation encrypted and bi-directional developed by Anncy Electronique within the applications of special vehicles. This energy saving technology caters **for future environmental standards** and guarantees the uniqueness of every installation. **Navylec®** handheld remote controls have a range over 300 m and they allow for new functions. Therefore, **NavyBus®** remote switches do not need any cables or holes on any walls to be fixed to. They can be installed in unlimited number and always in the most sensible locations.
7. **Using standardized and qualified software libraries** in all on-bard communication products

### 1.3 General presentation

#### NavyBus multiplexing architecture:

- Reduced installation costs
- Reduced weight
- Increased your boat functionality
- Increased reliability



#### Fast configuration

Program all your electrical systems and graphics display.  
Build and start easily your boats...

#### Bus system

- High Security Fault Tolerant CAN Bus
- Free topology bus architecture
- ETHERNET and WIFI extension Embedded
- Worldwide wireless for switches and remote
- NMEA2000, J1939 or special protocol connectable
- Open Solution for other manufacturer

#### Total control

##### **Systems**

- Battery monitoring
- Tanks levels
- Pumps control
- Navigation instruments
- Charger / Inverter monitoring

##### **Domotic**

- Lighting
- Blind control
- Airconditioning
- Tablet control

##### **Automation**

- Ventilation, pump, WC, valves, electrical, winches, security systems

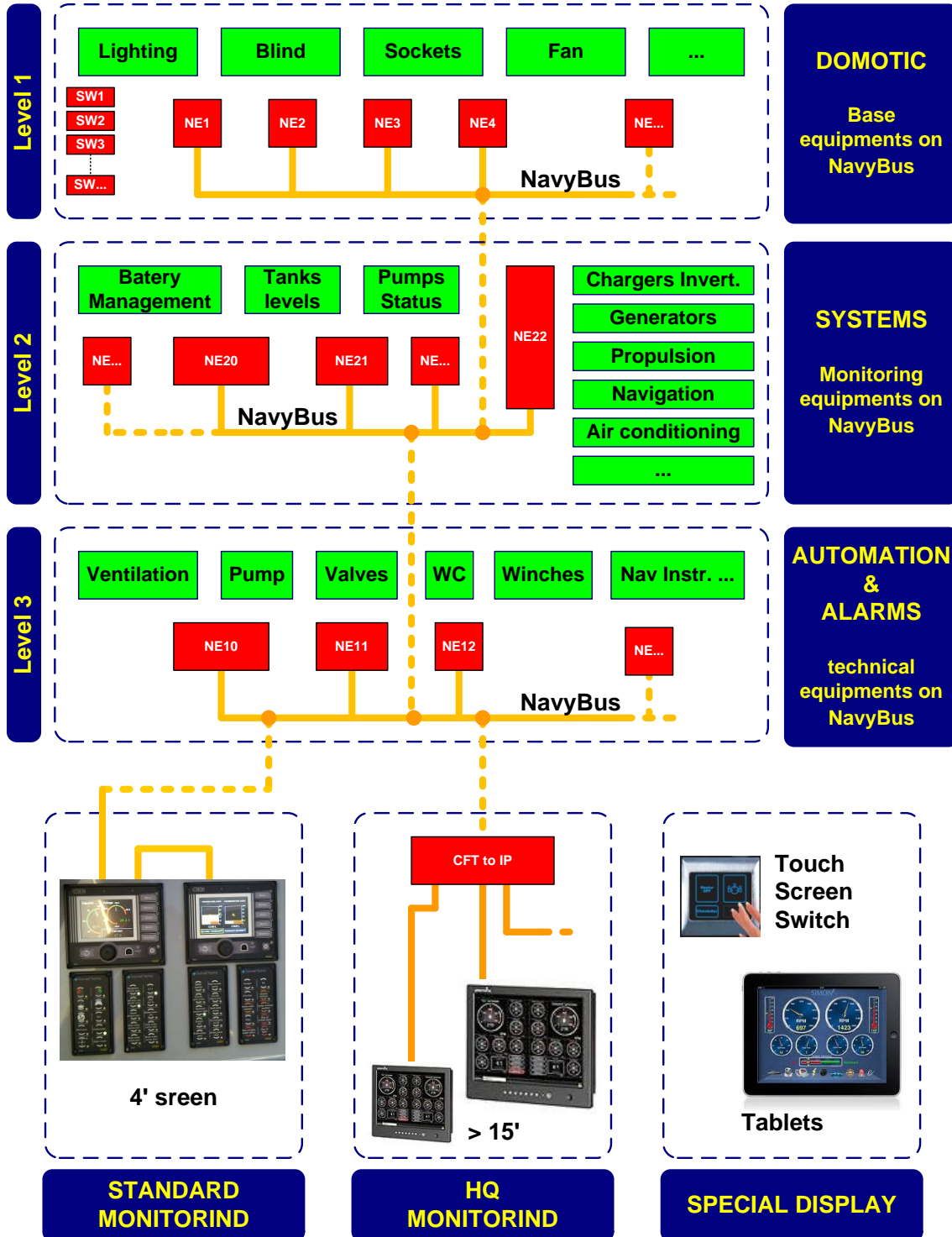
##### **Alarms**

- Monitoring Management

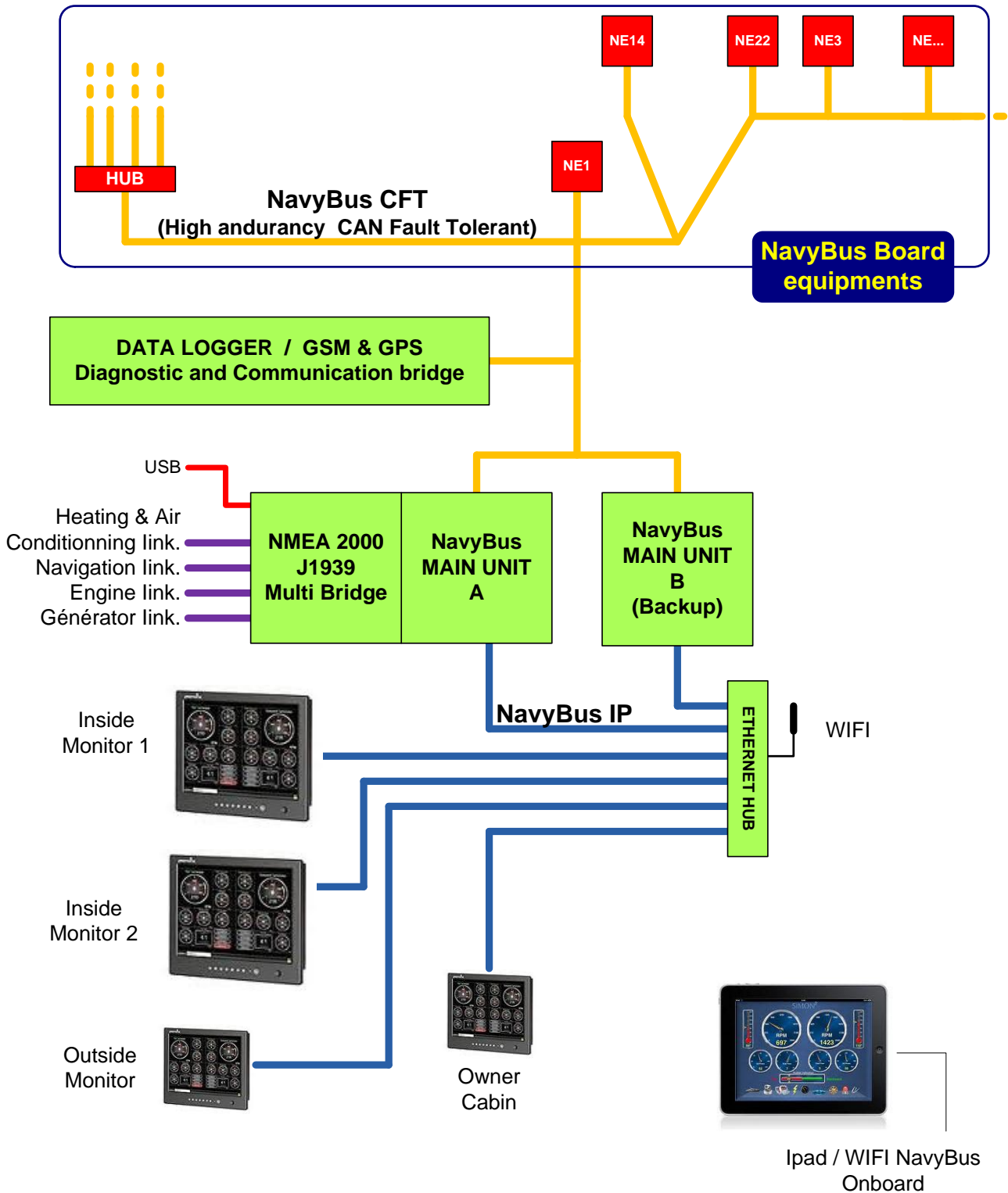
NavyBus architecture is use now in several situation types of boats.  
For itch, uses NavyBus Multiplexing architecture since 20' to above 120' boats:

## 2 NavyBus Architecture

### 2.1 Various level of realizations



## 2.2 Example of complete realization



## 2.3 Description of Level of realization:

### 1. Base Package : Domotic

The Navylec NavyBus equipment's provide a high level of atmosphere never reached so far.

- Diming function,
- All possibility of logical combinations, general ambiance or switch off...
- Compatible with all LED light
- Automatic voltage protection
- Important reduces of volume and weight.

### 2. Base Systems Management :

The Navylec NavyBus equipment's permit to measure and monitored for :

- Electrical energy, Battery management with double shunt to dissociate production and consumption currents.
- Special equipment to evaluate all current production and consummation,
- Diesel tanks,
- Waters tanks,
- Technical temperatures,
- Fridge temperature,
- Fluid pressure,
- Position of important elements (valves, pumps, doors, mechanical equipment..)
- Etc.

All this measurements are accessible by all screens or can be used in all automation.

### 3. Extended Systems :

NavyBus technology is ready to be connected to other manufacturer.

In 2013, GARMIN and WEBASTO will be connected on Navylec Gateway, like Victron at this time. Most used protocols are NMEA2000 and J1939.

Navylec is able to develop link with any manufacturer in CAN BUS (NMEA2000 and J1939). It's just necessary to have data base of this manufacturer.

This numerical entire links are accessible by all screens or can be used in all automation.

#### **4. Communication Systems :**

On board: The NavyBus technology runs at this time in WIFI to permit tablets android application.

Out board: Navylec propose a GSM quad band module for web service when boat is on wireless GSM accessibility:

- Diagnostics,
- Upgrade
- Data logger for important value
- Other on demand

#### **5. Automation**

NavyBus technology permits all combination with all status and measurements. With

NavyBus architecture, it's possible to realize complexes automation without adding additional systems. It thus provides a greater understanding and simplification of systems.

Equipment using NavyBus can change very facility and therefore adapt to permanent's boats changes.

#### **6. Alarm :**

All systems can be monitored and generate alarms.

Automation embedded in NavyBus allows possibilities to created intelligent alarms.

#### **7. Large HQ Monitoring:**

NavyBus technology use Ethernet support communication for the uses of large monitors or special outside monitors. NavyBus technology permits to monitor a very important of data with high level of security.

#### **8. Special Switch display:**

Navylec propose a large range of NavyBus switch display, especially a capacitive switch touch screen.

This innovate product replace traditional switch by high quality touchscreen and permit an infinity graphics possibilities.



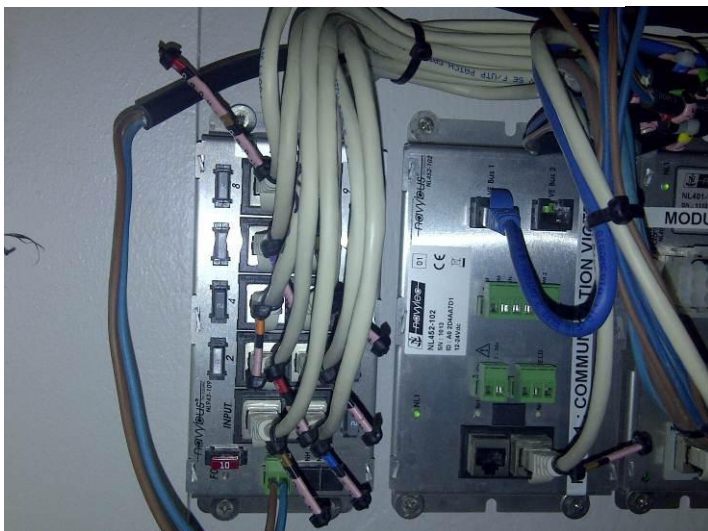
## 2.4 Example of installation:

Chart table (2xNL490-010 + 4x NL105-122)



- 👉 High quality graphics, easy understanding
- 👉 Save place for other equipment
- 👉 Reduce wiring in & to chart table
- 👉 No limit for evolutions

Hub NL943-109 + Victron-NavyBus gateway



NL402-038 Multi I/O module



Chart Table and wireless 4 buttons switch on VIMAR MECHANICAL



Navylec Power distribution example



Output and wireless module



Large and HQ or outside monitors



NL456-G15 NL456-G15



NL456-A3S  
NL456-A6E