

Albatross Control System v1.4

Introduction to Albatross Control System

PRELIMINARY
Rev.PA1

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1 General

1.1 Purpose

The purpose of this document is to provide an overview of the Albatross appliance and introduce several general concepts on the architecture and connections of the Albatross control system, as well as the capabilities of the Visualization client and Install Tool software.

1.2 Revision history

Revision	Date	Commentary/Changes
PA1	2007-02-13	First version

Table 1 Revision history

2 An introduction to the Albatross Control System

The Albatross digital control system encompasses a series of products destined to represent data from your ship based on the NMEA 2000 standard, which guarantees its compatibility with products from all major manufacturers..



Fig 1: Raymarine Display



Fig 2: Lowrance Display



Fig 3: Simrad Display

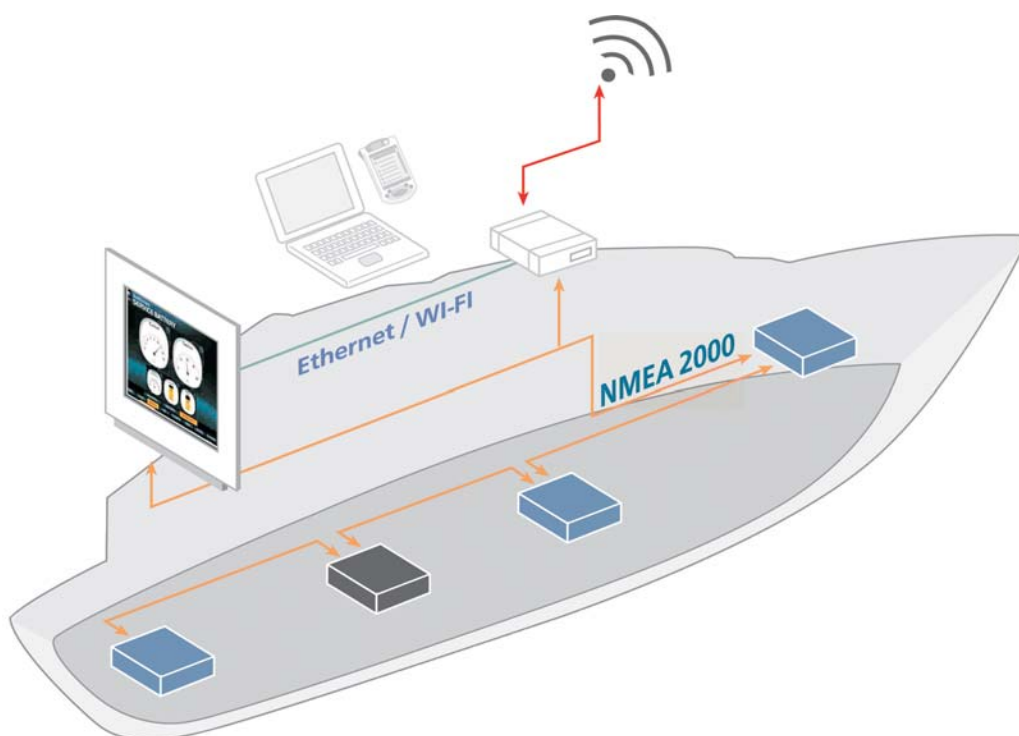




Fig 4: Displays and input devices



The product is shipped with a Standard configuration. To ensure its proper functioning on your slip, you'll have to calibrate each sensor before.

DO NOT USE this product until you have gone through the whole calibration process detailed in this manual.

2.1 System overview

Some typical Albatross systems such as those depicted in the following figures include the majority of components available in the Albatross system.

The Albatross Control System uses a Wide range of compatible sensors, interfaces and devices, thus encompassing onboard digital control, remote security and ship position and monitoring services in a single tool.

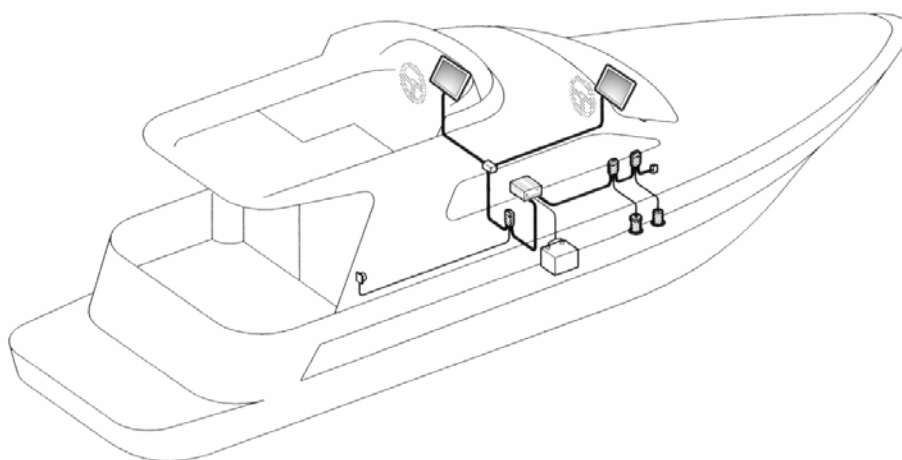


Fig 5: Example representation of an Albatross NMEA2000 installation on a motor yacht

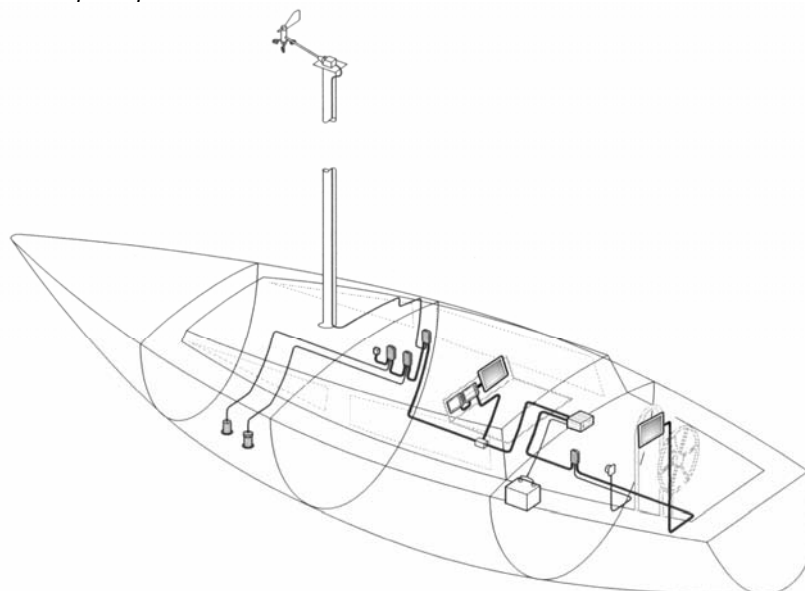


Fig 6: Example representation of an Albatross NMEA 2000 installation on a sailing boat

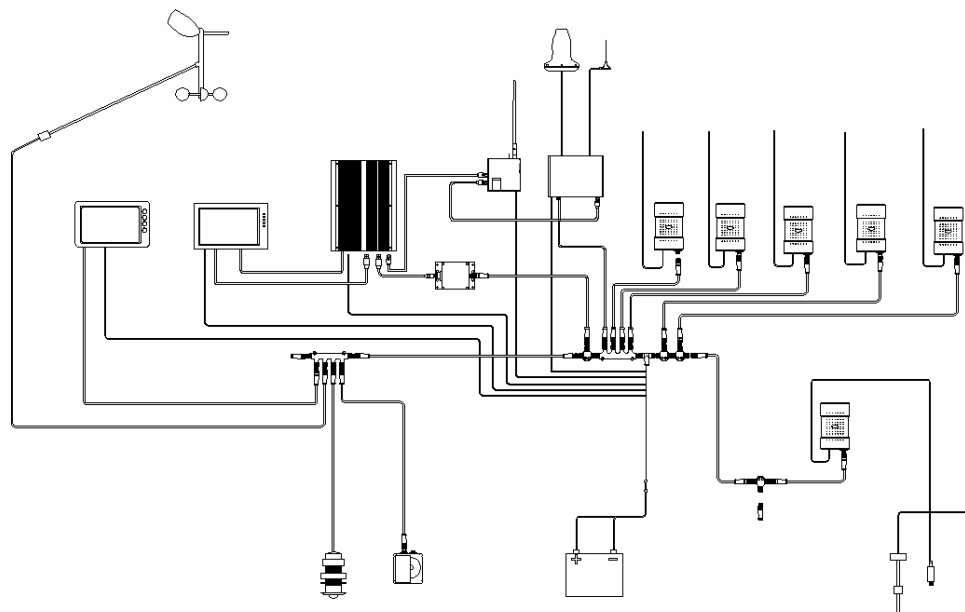


Fig 7 Sample connection diagram of complete Albatross Control system NMEA 2000 installation

2.1.1

System data buses

Albatross Control System® is an integrated ship monitoring and control system based on the NMEA 2000® standard. For this type of bus, sensors are connected through a single cable delivering both information and the necessary energy feed for the sensors to work.

Once information is digitalized and processed by the Data Processing Unit, it can be distributed anywhere in the ship through an Ethernet bus

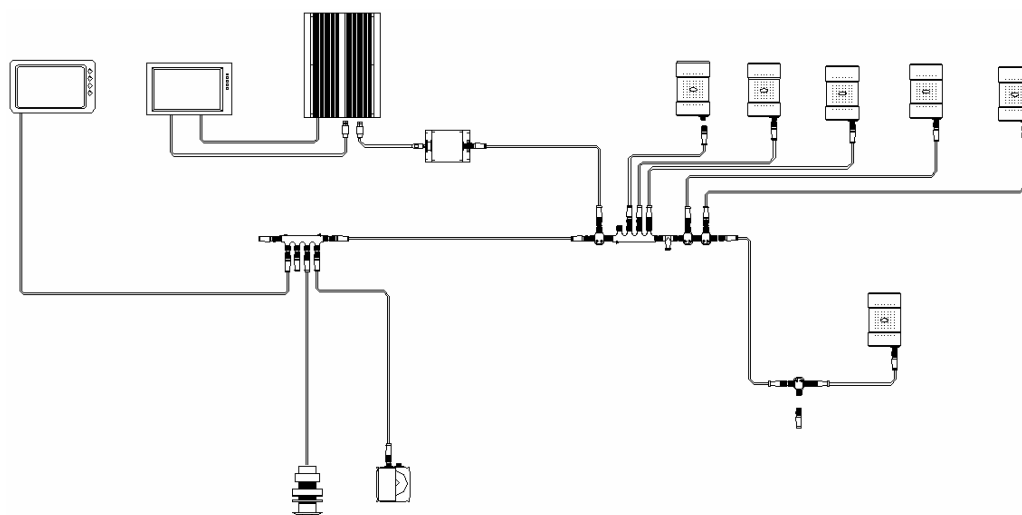


Fig 8: Representation of an Albatross NMEA2000 installation with a NMEA 2000-compatible display; an Alba-CPU connected to a tactile screen, 6 Albatross NMEA 2000 interfaces and 2 NMEA2000 active sensors

2.1.2 Data processing unit

The **Alba-CPU** is an onboard computer in charge of processing all monitoring information from the NMEA 2000®. Network, and launching the Albatross control software in optimum operational conditions.

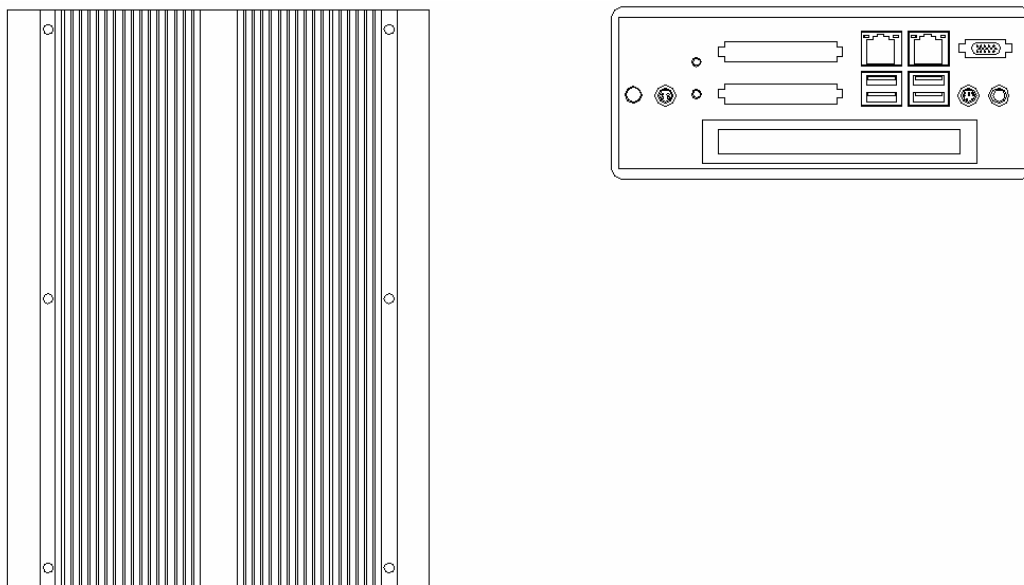


Fig 9: Several views of the Alba-CPU

This can be substituted by an onboard (desktop or laptop) computer if one is already installed. This computer will need to have the Albatross OnBoard software installed.

2.1.3 Albatross OnBoard control software

The control software comprises the Central Monitoring Element (ECM), which interprets all incoming information from sensors and modules, and appropriately storing it in a database, and the Visualization Client (CV) application that shows data from several parts of the ship as the user chooses. This information can be shown in several visualization devices such as laptop computers, PDA's, latest generation mobile phones or other personal computers onboard that are connected to the network.

Among the most outstanding features of the system, we could point out:



Fig 10: NMEA parameter monitoring

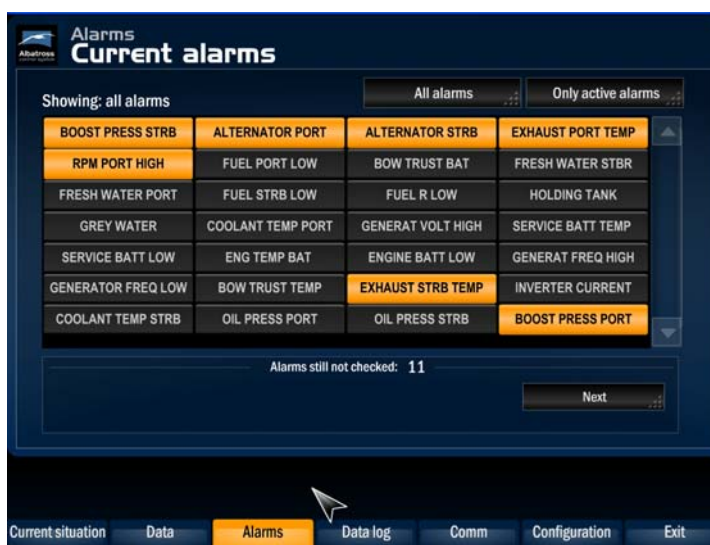
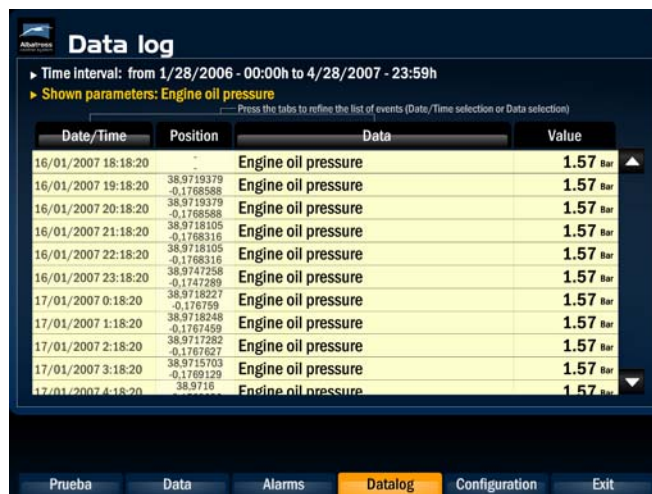


Fig 11: Alarms



Data log

Time Interval: from 1/28/2006 - 00:00h to 4/28/2007 - 23:59h

Shown parameters: Engine oil pressure

Press the tabs to refine the list of events (Date/Time selection or Data selection)

Date/Time	Position	Data	Value
16/01/2007 18:18:20	-	Engine oil pressure	1.57 bar
16/01/2007 19:18:20	38.9719379 -0.1768588	Engine oil pressure	1.57 bar
16/01/2007 20:18:20	38.9719379 -0.1768588	Engine oil pressure	1.57 bar
16/01/2007 21:18:20	38.9718105 -0.1768316	Engine oil pressure	1.57 bar
16/01/2007 22:18:20	38.9718105 -0.1768316	Engine oil pressure	1.57 bar
16/01/2007 23:18:20	38.9747258 -0.1747289	Engine oil pressure	1.57 bar
17/01/2007 0:18:20	38.9719227 -0.176759	Engine oil pressure	1.57 bar
17/01/2007 1:18:20	38.9718248 -0.1767459	Engine oil pressure	1.57 bar
17/01/2007 2:18:20	38.9717282 -0.1767627	Engine oil pressure	1.57 bar
17/01/2007 3:18:20	38.9715703 -0.1769129	Engine oil pressure	1.57 bar
17/01/2007 4:18:20	38.9716	Engine oil pressure	1.57 bar

Prueba Data Alarms **Datalog** Configuration Exit

Fig 12: Data history

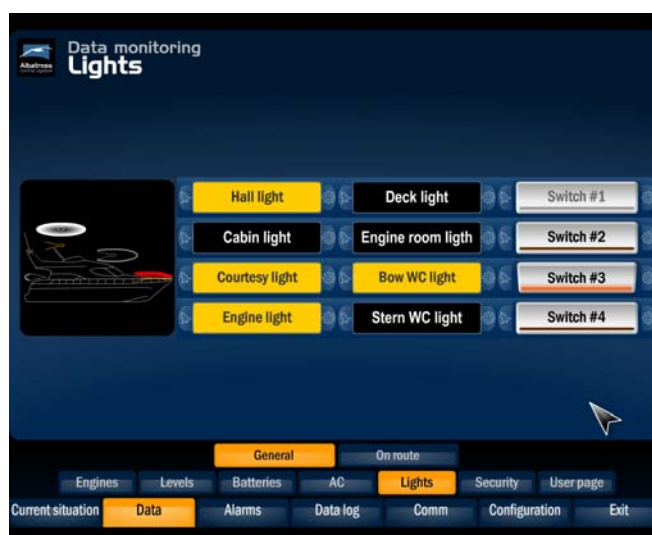


Fig 13: Remote activation

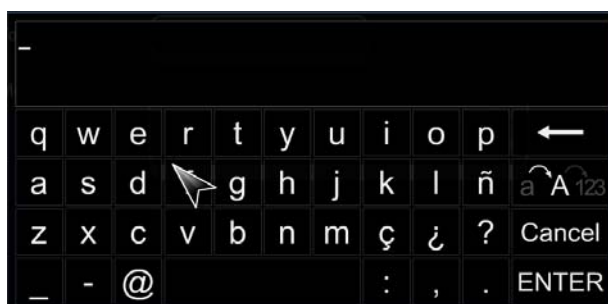


Fig 14: Communication terminal



Fig 15: Customisable looks

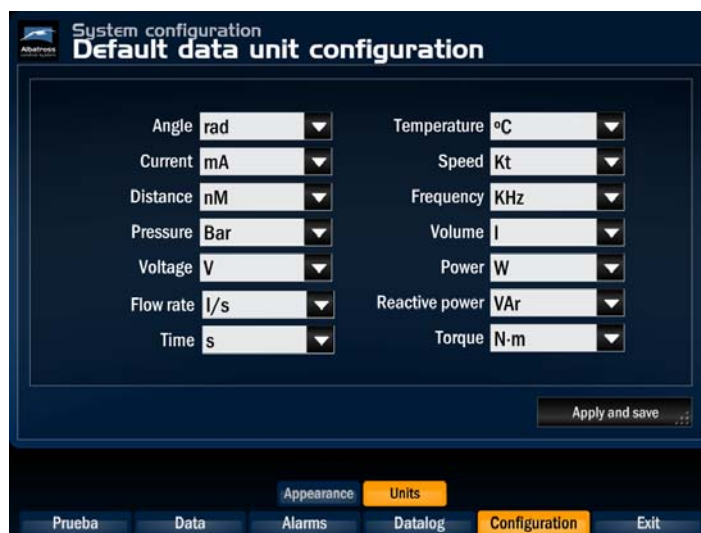


Fig 16: Unit configuration

2.1.4 Digital devices

The Albatross system offers visualization of the diverse parameters monitored through several NMEA 2000® compatible (Raymarine E and C series, Lowrance and Simrad).

Example of a connection diagram to a Raymarine unit

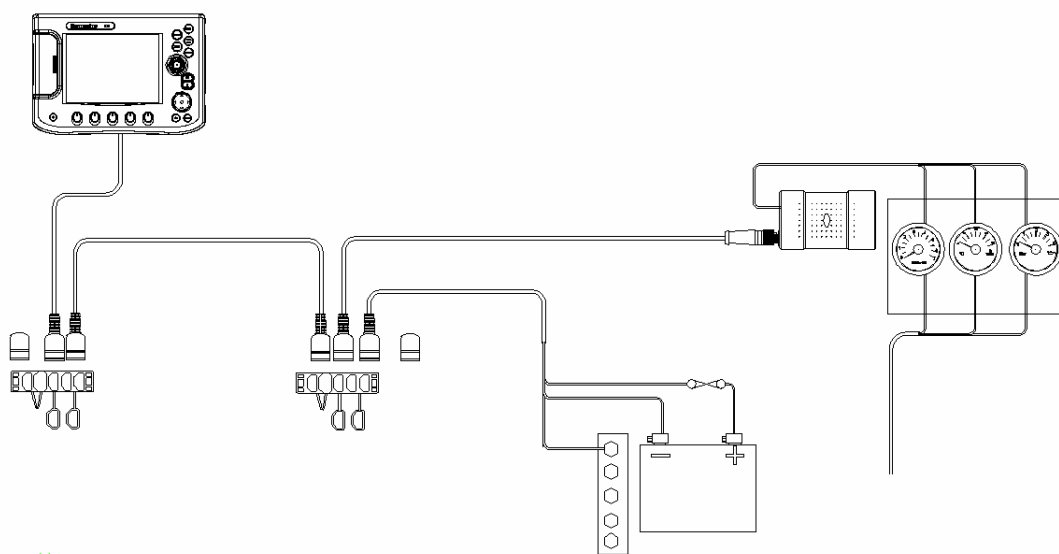


Fig 17: Example of connection diagram to a Raymarine display

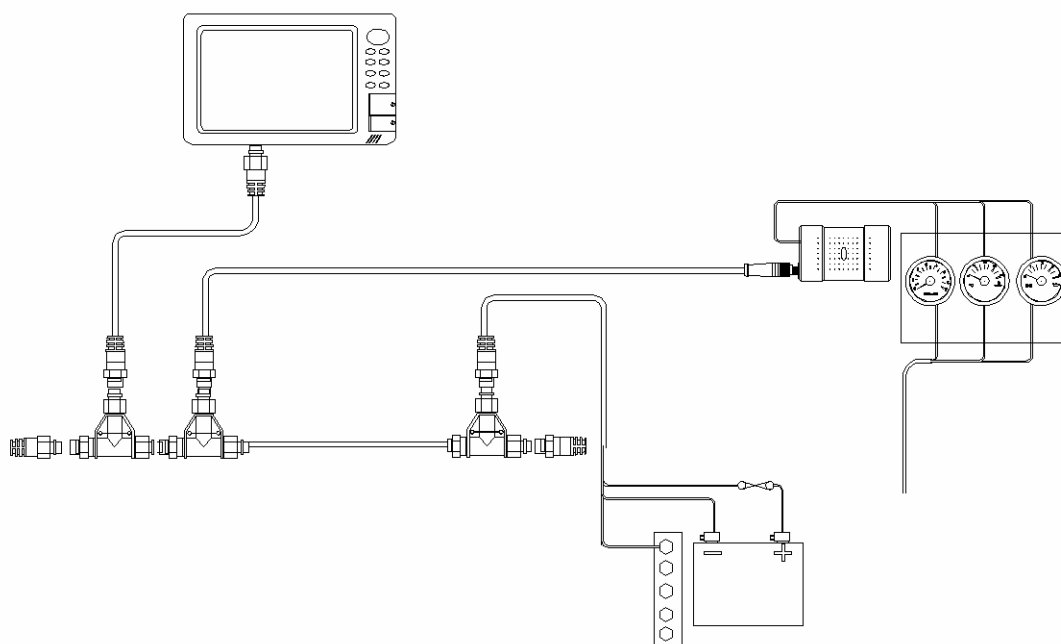


Fig 18: Example of a connection diagram to a Lowrance display

2.1.5 System data input

The data inputs comprise all hardware components that allow the user to control the ship (modules and sensors). These components can be:

- **NMEA 2000® Interfaces:** Albatross Modules transform analogue data from the sensors into the digital NMEA 2000® format. They allow the user to monitor any device onboard through digital on/off displays, resistive, pulse or capacitive sensors.

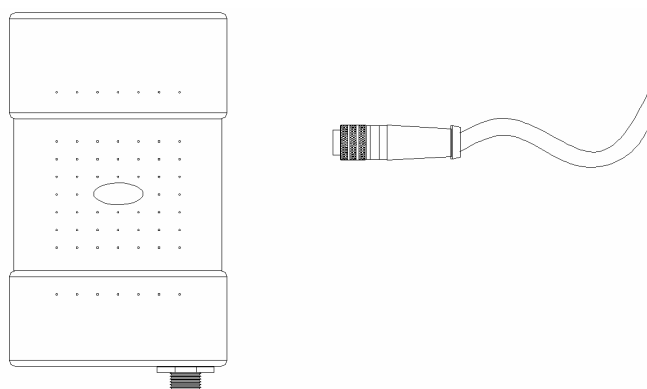


Fig 19: Albatross NMEA2000 interface and NMEA2000 Micro-C type connector

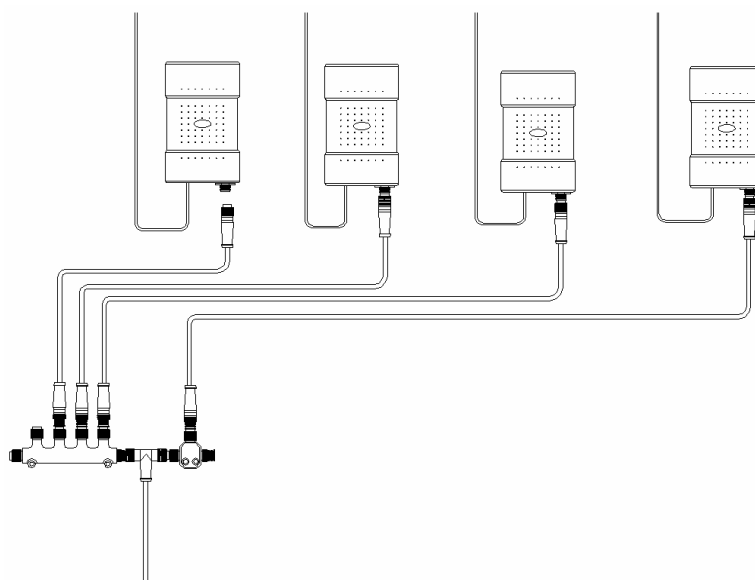


Fig 20: Connection diagram of several Albatross NMEA2000 interfaces using a NMEA2000 multitap bus

- **Active NMEA sensors:** These sensors are called active because they integrate the necessary electronics to connect directly to the bus and emit digital data in NMEA 2000® format. This makes them a single piece to be installed directly on the data bus.

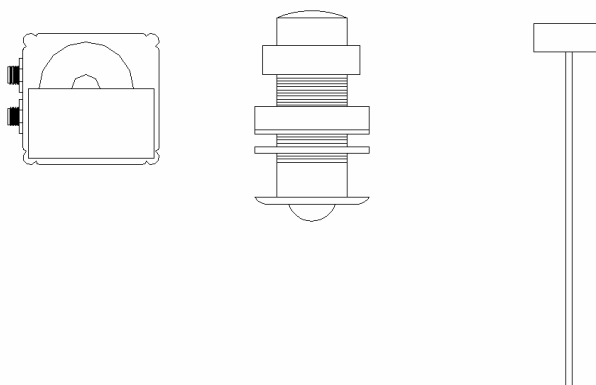


Fig 21: Several NMEA2000 active sensors (Girocompás, speed transducer/water temperature and tank level sensor)

- **Alba-USB.** This is a crucial element for the functioning of the Albatross control and monitoring software. It can also be used to bridge USB equipment using NMEA 0183 such as onboard computers using navigation software on the NMEA 2000.

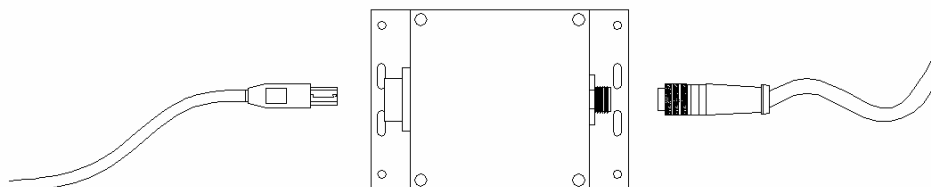
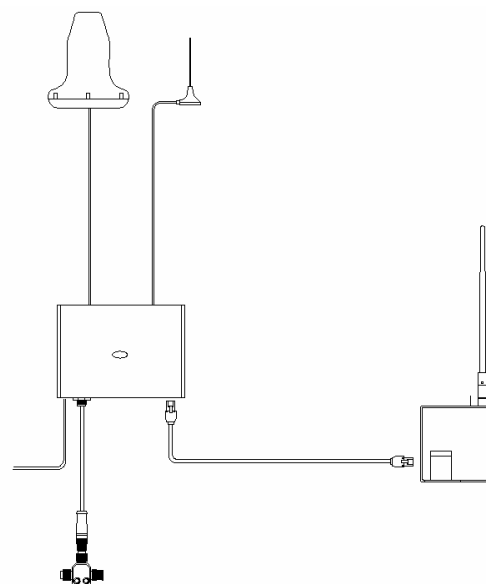


Fig 22: Alba-USB interface diagram, showing USB and NMEA2000 (Micro-C)

2.1.6 Communication

All monitored parameters on the ship can be transmitted outside it through several media, allowing the user to interact and control the system from home or office just by connecting to the Internet. For transmitting data outside, you'll need:

- The **Alba-Com** communication module: stores all information related to slip safety, monitoring and follow-up.
- Communication channel: **Inmarsat D+, Inmarsat C, GSM, GPRS**. All of them can be integrated with the Alba-Com module to transmit monitoring data to mainland or the ships' remote control.



If you wish to be able to send SMS or e-mails, you'll also need the communication-licensed Albatross Onboard Software.



Fig 14: Communication terminal

2.1.7 Data history

Data history is stored on a great capacity database, where all monitored ship information allows you to review the values for diverse ship parameters in the past.

If your ship has a NMEA2000 compatible GPS system, the Albatross system can cross- compare parameter data and ship location at the moment, showing both simultaneously.



The screenshot shows the 'Data log' window of the Albatross control system. It displays a table of engine oil pressure data over time, with columns for Date/Time, Position, Data, and Value. The data shows a constant pressure of 1.57 Bar from January 16, 2007, to January 17, 2007. The interface includes a time interval selector, a parameter filter, and a bottom navigation bar with buttons for 'Prueba', 'Data', 'Alarms', 'Datalog', 'Configuration', and 'Exit'.

Date/Time	Position	Data	Value
16/01/2007 18:18:20	-	Engine oil pressure	1.57 Bar
16/01/2007 19:18:20	38,9719379 -0,1768588	Engine oil pressure	1.57 Bar
16/01/2007 20:18:20	38,9719379 -0,1768588	Engine oil pressure	1.57 Bar
16/01/2007 21:18:20	38,9718105 -0,1768316	Engine oil pressure	1.57 Bar
16/01/2007 22:18:20	38,9718105 -0,1768316	Engine oil pressure	1.57 Bar
16/01/2007 23:18:20	38,9747258 -0,1747289	Engine oil pressure	1.57 Bar
17/01/2007 0:18:20	38,9718227 -0,176759	Engine oil pressure	1.57 Bar
17/01/2007 1:18:20	38,9718248 -0,1767459	Engine oil pressure	1.57 Bar
17/01/2007 2:18:20	38,9717282 -0,1767627	Engine oil pressure	1.57 Bar
17/01/2007 3:18:20	38,9715703 -0,1769129	Engine oil pressure	1.57 Bar
17/01/2007 4:18:20	38,9716	Engine oil pressure	1.57 Bar

Fig 12: Data history

Alarms

Both Albatross On Board and Albatross Online can have alarms set to show onscreen or sent to a mobile phone or e-mail address when given values are reached or exceeded. For example:

- Being noticed whenever bilge level goes beyond a given value, and being able to activate the auxiliary pump.
- If battery temperature exceeds 70°, for example, we could deactivate the charger to keep batteries from burning.
- If motor exhaust temperature exceeds a given number of degrees we can be noticed through SMS or e-mail.
- We could also be noticed by a siren or an SMS if the presence of people onboard is detected.
- Turbo temperature could also be monitored to avoid damaging the motor.
- Knowing motor RPM in rented ships. We could configure an alarm to send an SMS or e-mail telling us if the motor in a ship we've rented goes beyond a given RPM value.
- We can detect a drop in current flow from port (220V) and receive notifications via mobile phone or e-mail.

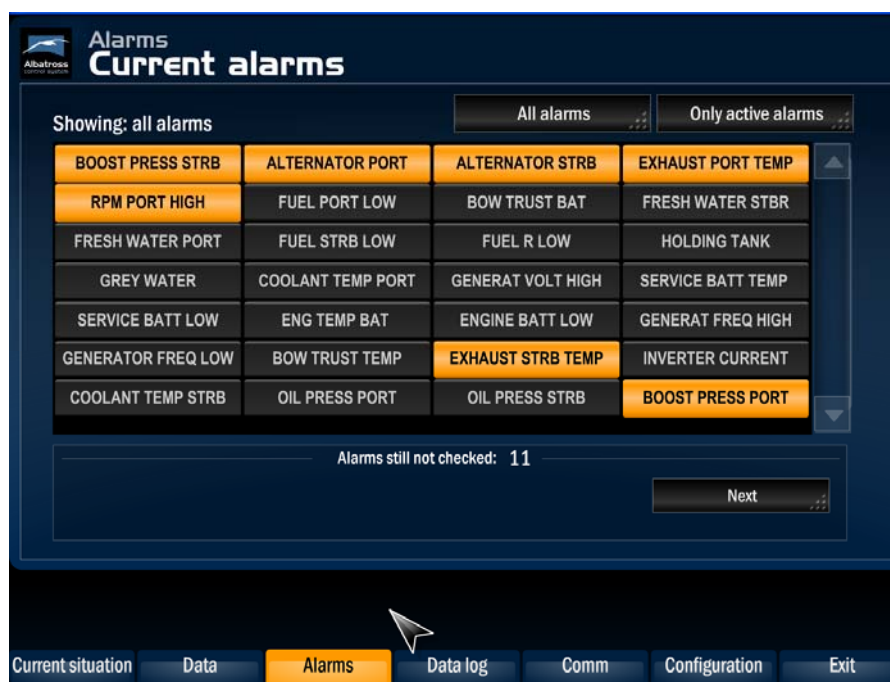


Fig 11: Alarms

2.2 Configuration and calibration requirements

To ensure a correct functioning of all elements, Albatross modules need to be calibrated before using the system for the first time.

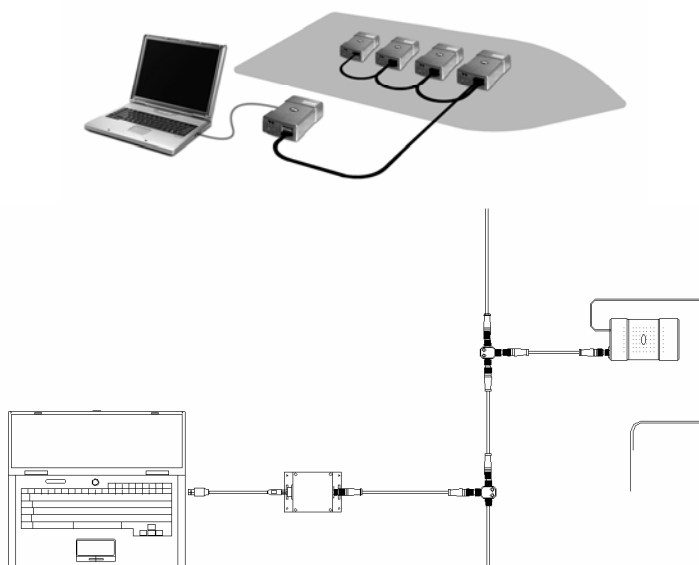


Fig 23: Albatross system configuration through the configuration application on a laptop computer

A configuration of the monitoring application (Visualization Client) is also necessary to adjust data screens to the elements present in your ship.

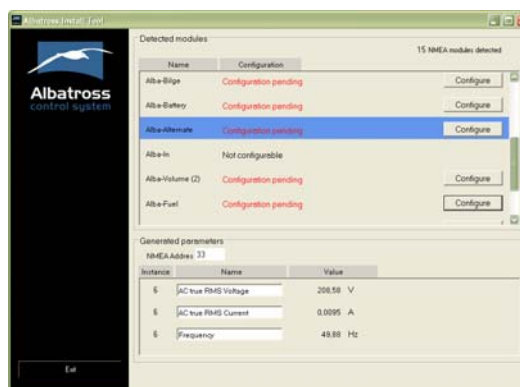


Fig 24: InstallTool Configuration Application

Do not use the Albatross system before all configuration and calibration procedures have been carried out satisfactorily.

2.3 System upgrades

The Albatross Control System allows the user to easily add new features and functions by loading software and license upgrades .

Licence	Allows	PGNs NMEA2000
Basic license	The Basic license is necessary for the correct functioning of the albatross OnBoard application. It includes the necessary PGNs for the representation of Basic parameters.	ECM Module PGN126992 (System Time) PGN129029 (GNSS Position Data) PGN129045 (User Datum Settings) PGN129291 (Set & Drift, Rapid update) PGN130306 (Wind Data) PGN130576 (Small Craft status)
Motors	Support for monitoring motor parameters	PGN127488 (Engine Parameters Rapad Update) PGN127489 (Engine Parameters Dynamic) PGN130840 PGN127493 (Transmission parameters, dynamic) PGN127497 (Trip parameters, Engine) PGN127498 (Engine parameters, static) PGN130839 (Temperature proprietary, Alba-Propeller)
Levels	Support for monitoring tank levels	PGN130839 (Proprietary Temperature) PGN130841 (Proprietary Pressure) PGN127505 (Fluid level) DF86 Volume, large PGN127501 (Switch bank status)
Batteries	Support for the monitoring of battery state	PGN127508 (Battery Status) PGN127506 (DC detailed status) PGN127507 (Charger status)

AC	Support for monitoring shore power connections and inverters	PGN130837 (Altern proprietary) PGN127503 (AC input status) PGN127504 (AC output status) PGN127509 (Inverter status) PGN127511 (Inverter configuration status)
Navigation lights	Support for the monitoring of navigation lights state (connected, disconnected or failure)	PGN127501
Navigation	Support for the monitoring of vessel position, speed, route and attitude	PGN128267 (Water Depth) PGN128259 (Speed) PGN128275 (Distance Log) PGN129026 (COG, SOG, Rapid Update) PGN130310 (Environmental Parameters) PGN127237 (Heading/Track Control) PGN127245 (Rudder) PGN127250 (Vessel Heading) PGN127251 (Rate of Turn) PGN127257 (Attitude) PGN127258 (Magnetic variation) PGN127539 (GNSS DOPs) PGN129025 (Position, rapid update) PGN130311 (Environmental parameters) PGN130312 (Environmental parameters) PGN130577 (Direction Data) PGN130578 (Vessel Speed Components)
Data history	Support to check data history	
Digital Switch Control	Support for remote activation through Alba-OUT modules	PGN127501 Bin Switch Bank Control PGN127502 Bin Switch Bank Control

To acquire or upgrade your Albatross licenses, please contact us on the telephone:

902 010 759 (Spain)
+34 96 287 99 44 (Outside Spain)

Or through the webpage:

<http://www.emminet.com>