Micro Device S.r.l.

Installer's guide

Dual Band Model

Version 1.2

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ATTENTION:
BEFORE INSTALLING THE YACHT CONTROLLER DUAL BAND SYSTEM, READ CAREFULLY THIS MANUAL AND PROCEED TO THE INSTALLATION FOLLOWING PUNCTUALLY THE INSTRUCTIONS. NOT FOLLOWING THE INSTRUCTIONS CAN COMPROMISE THE VALIDITY OF THE WARRANTY CONDITIONS.

IN CASE OF DOUBTS ASK DIRECTLY THE RETAILER OR MICRO DEVICE'S CUSTOMER SERVICE.

THIS KIT AND THE RELATED INSTRUCTIONS OF ASSEMBLAGE HAVE BEEN REALIZED FOR INSTALLERS ENDOWED WITH A QUALIFIED AND SPECIALIZED TRAINING. THE ASSEMBLAGE INSTRUCTIONS HAVE BEEN WRITTEN UP EXCLUSIVELY FOR PROFESSIONAL USE AND THEY ARE NOT SUITABLE FOR UNPROFESSIONAL USE.

MICRO DEVICE S.R.L. DOES NOT TAKE ANY LIABILITY FOR POSSIBLE DAMAGES TO PEOPLE OR PROPERTY COMING THROUGH NEGLIGENCE IN FOLLOWING THE ASSEMBLING INSTRUCTIONS OR COMING FROM INSTALLATIONS MADE BY NOT QUALIFIED TECHNICIANS.

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Safety Precautions

This manual contains indications, specified by symbols, which can determine damages or accidents if NOT observed.

IMPORTANT:	Used to draw your attention to important information regarding the right way to install Yacht Controller.
WARNING:	Not observing exactly what specified in this section can cause product malfunction or breakdown.
DANGER:	Not observing exactly what specified in this section can cause damages to people and/or damages to property.

The information contained in this manual can be modified without notice: if you find differences or ambiguity, please ask the reseller.

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Summary

1. Introduction

Yacht Controller Dual Band, developed by Micro Device S.r.l., is an electronic wireless remote control, able to easitly control the right and left engines, the bow and the stern thrusters and the anchor winch.

The first prototype, was developed in 1998, and since then “Yacht Controller” has undergone a continuous evolution: in 2003 has been launched the first model, replaced in 2007 by the Evolution (EVO) version.

To increase even more the operational safety, in May 2010 has been launched the Dual Band version that exploits two different bands of transmission of the commands and that satisfies the most rigid naval norms in its components.

Yacht Controller Dual Band is safe because it uses microprocessors programmed directly in Micro Device S.r.l’s laboratory so interferences with passerelas, gangways or anchor radio controls which may be available and in use on the market that, on the contrary use standard electronic components, are impossible.
The range of control of Yacht Controller’s Transmitter is limited to about ten meters and the transmission protocol, makes interference between the same or different systems working in the same area, impossible.

Severe tests made on various types of vessels, have proven the resistance and the reliability of Yacht Controller Dual Band in the marine environment.
Moreover, before its launch on the Market, Yacht Controller Dual Band, has been subjected to many laboratory tests in order to further ensure proper operation.

IMPORTANT:
Further information concerning the use of the system, are available in the users manual.

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1.1. Composition of the standard kit

The kit of installation of Yacht Controller Dual Band system includes:

Figure 1: Standard installation Kit

1. A receiver
2. A transmitter
3. Connections cables to connect the receiver based on the purchased controls options.
4. A kit of connectors for a quick installation.
5. A watertight switch for the ignition with a sticky label
6. The installer's guide and the user's guide

IMPORTANT:
Some "Yacht Controller Dual Band" models have additional components. To install these components, refer to their manuals enclosed to them.

1.2. General transmitter features

On the Yacht Controller Dual Band transmitter there are levers and buttons to control the boat functions as described in figure 2.

It is normal that the levers and the buttons of the transmitter correspondent to options not purchased do not work because the receiver is configured just with the electronic boards requested.
It is possible anyway to order and install afterwards the options not purchased at the beginning. (see paragraph "Expansion of the system").

Each transmitter has an unique code programmed in Factory that is different from the others and selected among over 65.000 combinations.

The electronics of the transmitter is contained in a silver colored ABS box that combines ergonomics and functionality with a protection degree IP68. Removing the cover on the back of the transmitter, it is possible to access to the batteries for their replacement.

The unit has three bright led indicators:
- The red led placed in the lower part on the left, points out the condition of the battery next to the limits of discharge.
- Two yellow led, one for each band, placed in the lower part on the right, points out the transmission of the control signals toward the receiver.

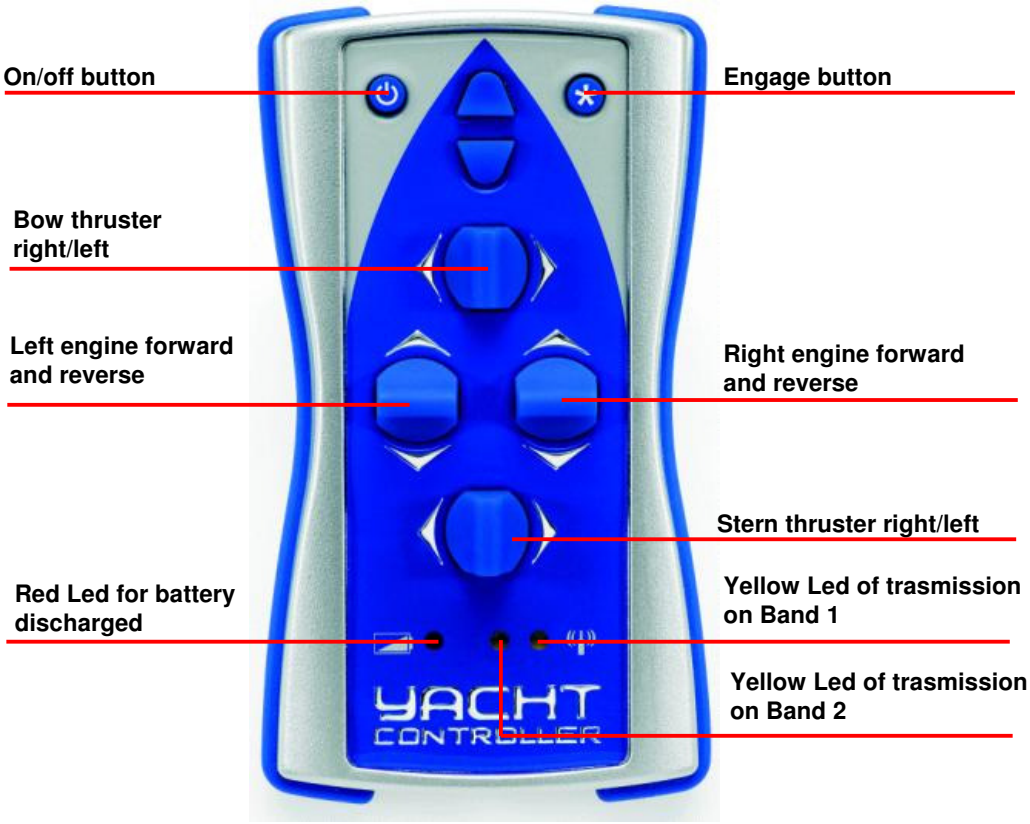


Figure 1: Description of the transmitter

1.3. General features of the Receiver

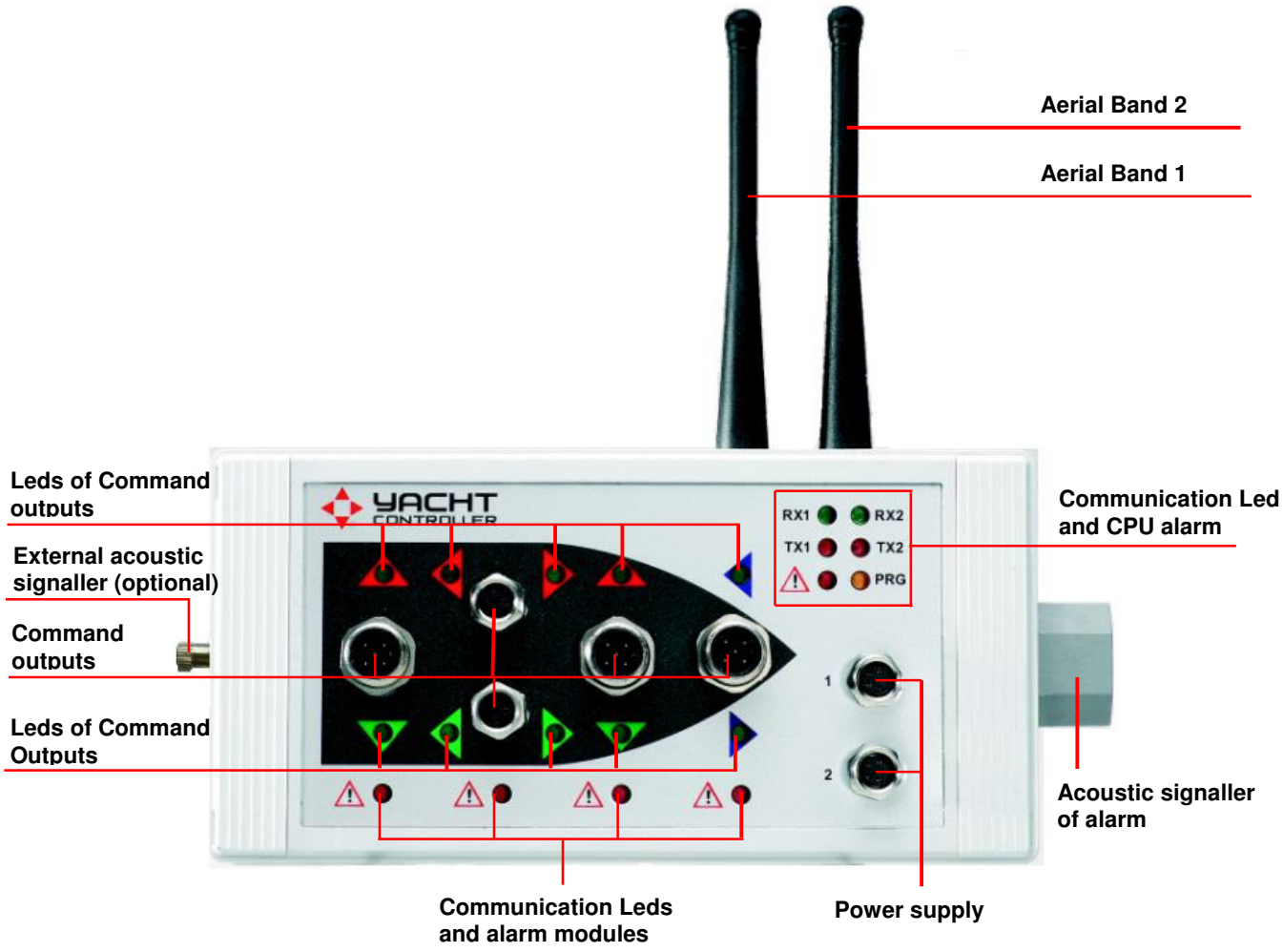
The receiver acquires the commands of the transmitter and activates the functions of the boat accordingly.

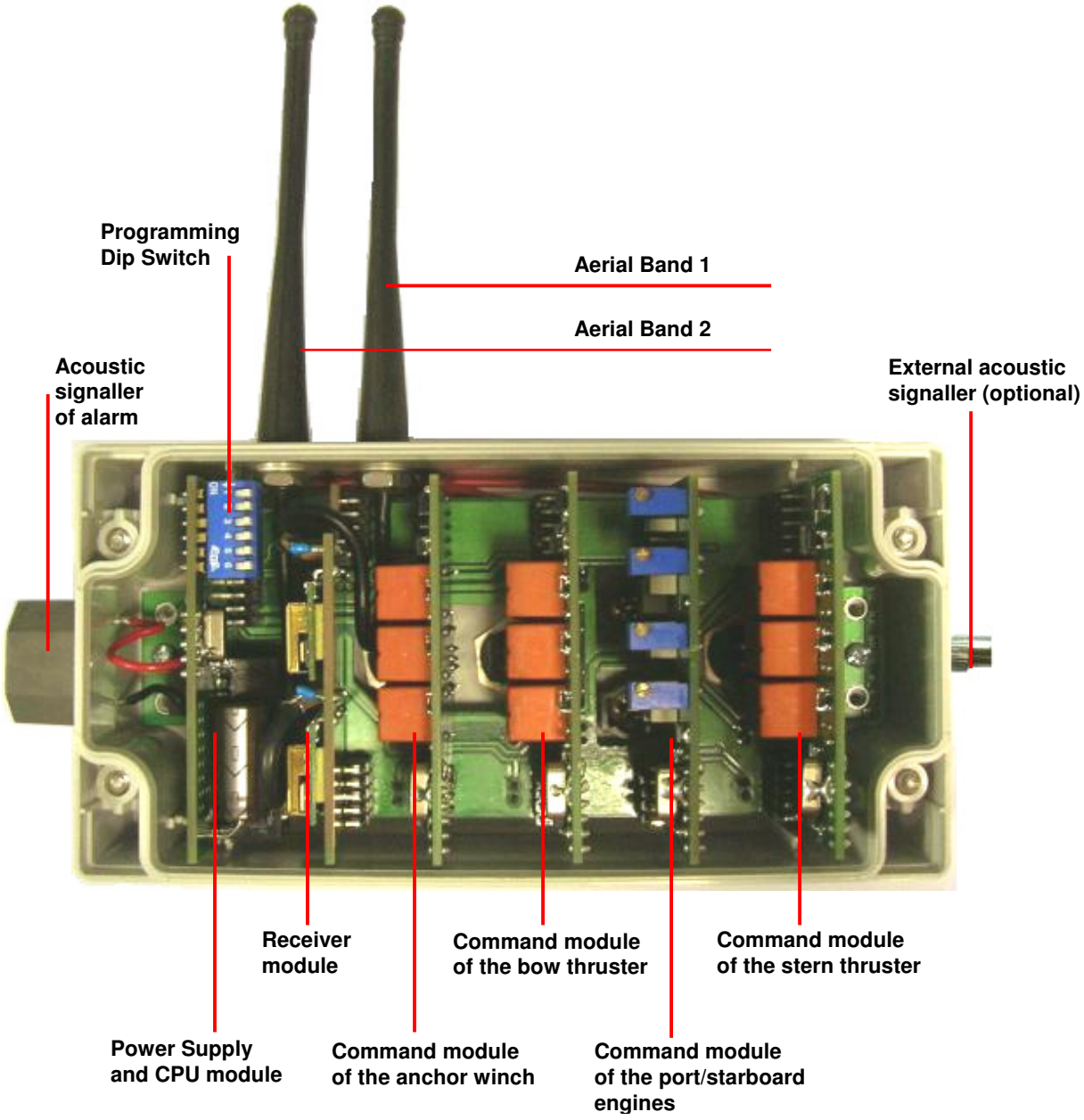
The command of the outputs occours with the activation of the switches on the transmitter. The output will stay active until the correspondent switch remains pressed and until there is the connection between transmitter and receiver.
The transmitter, in fact, cyclically sends the state of the switches to the receiver. In lack of dialogue with the transmitter, for safety reasons, the receiver automatically deactives the outputs and contemporarily activates the acoustic alarm.

Thanks to the adoption of a procedure of self-learning, the receiver is able to identify unequivocally and memorize the code of more than one transmitter. In this way it is possible to enable the receiver so that it can accept the commands of different transmitters.
It is not possible anyway to carry out contemporary transmissions from several transmitters to activate the same receiver. In fact, the periodic transmissions of the transmitters would affect themselves, causing interferences and contrasting the activation commands of the outputs.

The receiver can be switched ON by a switch placed near the helm station.

The receiver contains a various number of boards, that depends on the configuration choosen, each of which commands an ouptut.
Each board is endowed with green leds that show the state of the command ouptputs and a red led that signals the condition of it (alarm or normal operation).


Aerial Band 2
Aerial Band 1
Leds of Command outputs
External acoustic signaller (optional)
Command outputs
Leds of Command Outputs
YACHT
CONTROLLER
RX1
RX2
TX1
TX2
PRG
1
2
Communication Led and CPU alarm
Acoustic signaller of alarm
Communication Leds and alarm modules
Power supply


Programming
Dip Switch
Aerial Band 1
Aerial Band 2
Acoustic
signaller
of alarm
External acoustic
signaller (optional)
Receiver
module
Command module
of the bow thruster
Command module
of the stern thruster
Power Supply
and CPU module
Command module
of the anchor winch
Command module
of the port/starboard
engines

2. Installation and connection

2.1. Installation environment

The receiver MUST be installed far away from devices (i.e. electric engines or electric lines of power) which can produce an electromagnetic field that can disturb the radio signal issued by the transmitter.
Therefore it is absolutely forbidden to install the receiver inside the engines room as such environment is subjected to environmental troubles and remarkable change in temperatures.

The receiver must be installed NOT LESS than a meter of distance from the compass.

DO NOT INSTALL the receiver inside or on the back of a metallic structure (bulkheads or instrumentation) because the metal parts prevent the correct passage of the radio signals. If it is not possible to do otherwise, ask the Retailer, to let you have the model of the receiver equipped with the external aerials.

2.2. Installation of the receiver

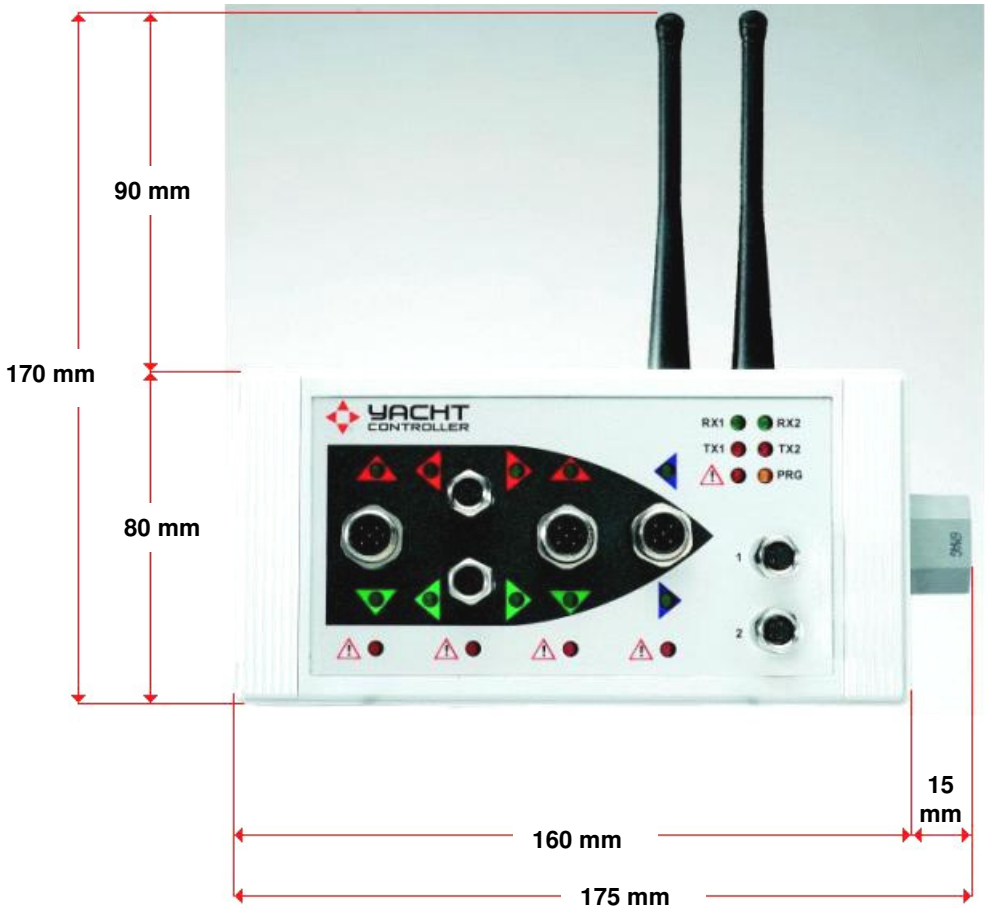


Figure 5: Dimensions of the receiver

Normally the receiver must be installed nearby the chosen helm station, which could be in the salon or on the fly according to the habits of the customer.

WARNING:
it is compulsory to install the receiver with the aerials upward.

If the space nearby of the helm station is insufficient, it is possible to install it in the easier access place, paying anyway attention that the acoustic signal issued by the receiver will have to be perfectly hearable from the helm station; if it was not like that, ask the Retailer the version of the receiver provided with the external acoustic signaller.

WARNING:
The length of cables supplied with the connector is approximately 1,5 meters. The extension of these cables can compromise the behaviour of the device with respect to the EMC rules.

During the installation, the FORM supplied with the manual, must be filled in every part. In case of need, this will allow the Customer Service, to determine the countermeasures to be undertaken to solve possible problems.

IMPORTANT:
Once completed the installation, the receiver could not be accessibile from the user of the transmitter.

2.2.1 Connection scheme

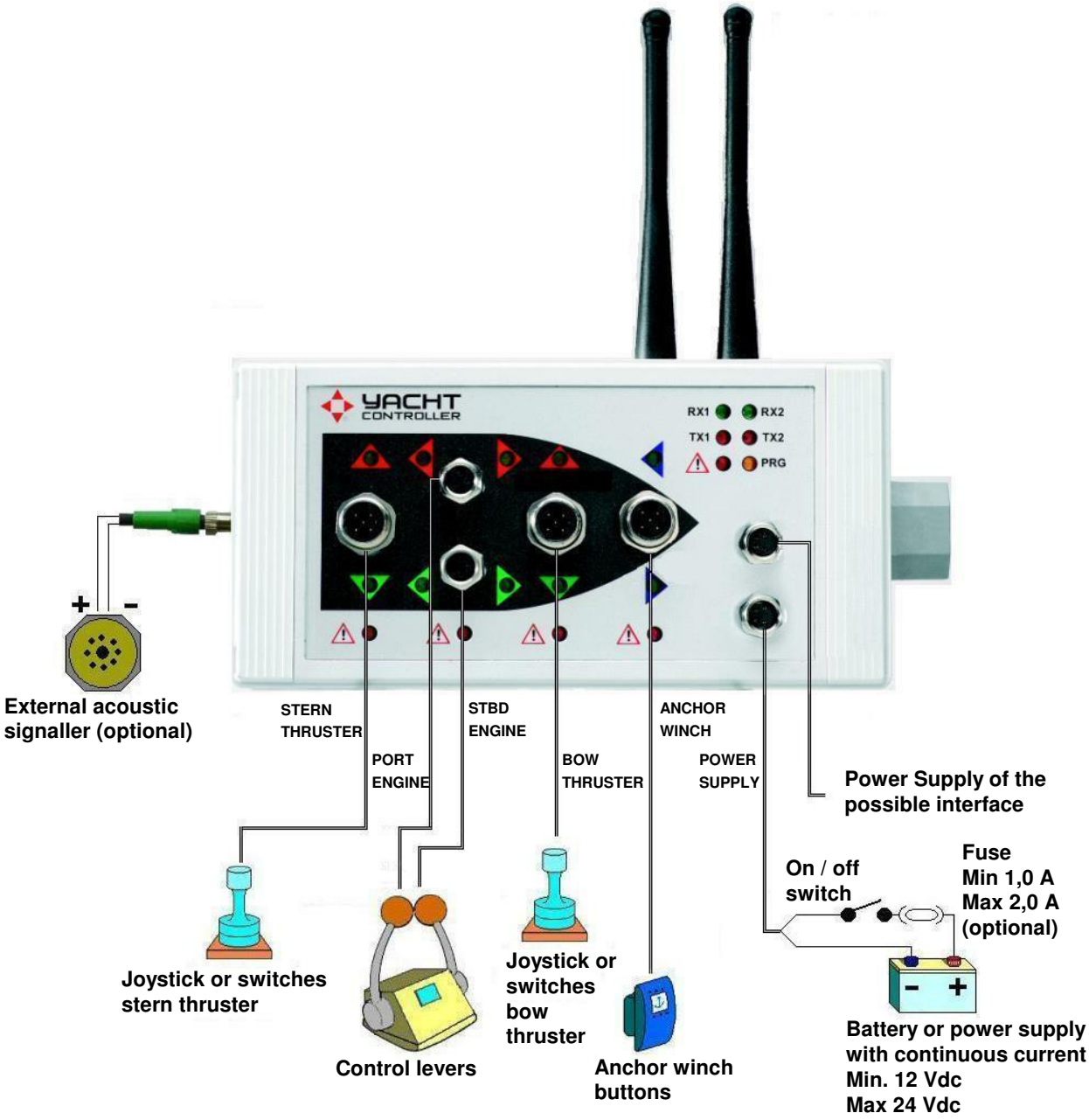


Figure 6: Connection scheme of the receiver

2.2.2 Connection of the power supply wires

Choose the helm station for the installation and the space suitable to contain the receiver.

WARNING:
Before connecting or disconnecting the electric cables of the receiver, check that the power supply is not present and that the helm station interested in the connections is not active.
In all the connections pay attention to the correct identification of the cables (common, right and left commands, etc.) and to their correct connection.

- Identify the wires connected with the battery tension needed for the power supply of the receiver and verify carefully the polarity and the correct value of tension. (Min. 12 Vdc, Max 24 Vdc).

- It is opportune that the power supply given to the receiver is activated by the key of enabling the chosen helm station, as to supply the receiver only in case of effective use.

- Even if it is not necessary, as the equipment is supplied with a internal self-restorable fuse, is a good rule to insert a fuse (min 1 A, max 2 A) on the line of power supply of the device.

- Always install the ON/OFF switch of the receiver in a point easily accessible, nearby the chosen helm station. In lack of switches already available on the bridge, use the one supplied in the kit. Be sure that the used switch is watertight.

ONLY FOR INSTALLATIONS WITH BOSCH REXROTH INTERFACE
It's recommended the installation of main switch of Yacht Controller Dual Band next to Bosch Rexroth interface.

- Connect the battery's positive wire to the switch.
- Connect the blue/red wire of the cable "POWER SUPPLY" to the other pole of the switch and the brown/black wire to the negative one.
- Connect the cable "Power SUPPLY" to the connector 2 of the Yacht Controller Dual Band receiver.

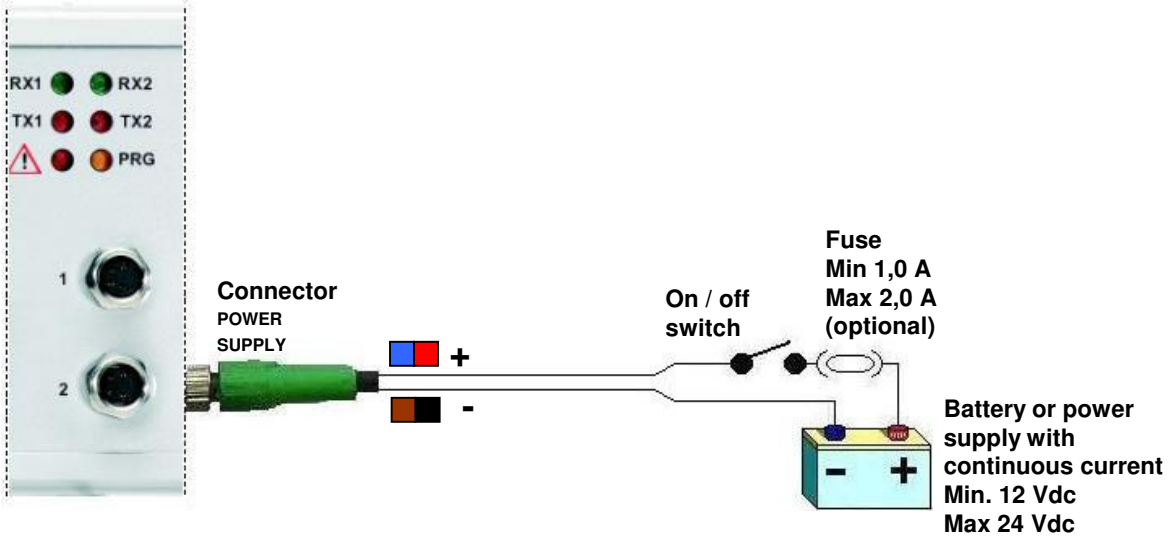


Figure 7: Connection scheme of the power supply wires

2.2.3 Connection of the command wires of the engines

WARNING:
The installation of Yacht Controller Dual Band with some types of control head needs particular instructions, given as attached to the manual. Before proceeding with the installation therefore, verify the possible presence of enclosures.

Identify the cables that from the control head go to the electronic control unit of the engines and connect in parallel to them the cables coming from the receiver (see figure 6).

The enclosed document shows the colors used by your specific electronic control unit and the relatives colors used for the related cables.

As the Manufacturers sometime modify the colors of the cables, to get further technical information or in case of difficulty in the identification of the cables, contact Micro Device before starting the installation.

Pay a lot of attention to the correct identification of the group of command cables of each engine (right and left).

Cable the blue, black and brown wires of the connectors PORT ENGINE and STARBOARD ENGINE to the correspondent ones coming from the control head, as illustrated in figure.
Use for this reason the blue connectors supplied in the kit, that allow to make the necessary connections in a simple and a fast way without having to cut the cable coming from the control unit.

Once identified the cable to which you have to connect the command wire coming from the connector of connection, insert it in the passing slot of the blue connector, paying attention to insert it completely. Insert then the cable of the "Yacht Controller Dual Band" up to its end in the blind hole of the blue connector and, using a flat plier, crush the colored superior part of the connector so that the metallic part is able to join among them the cables and to establish a safe connection.

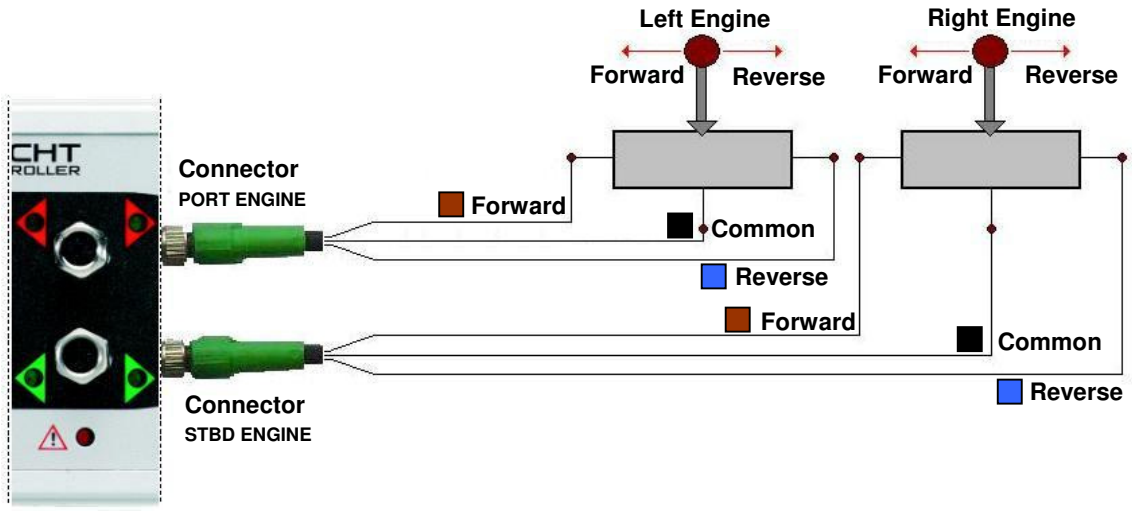


Figure 8: Scheme of connection of the control head

2.2.4 Connection of the command wires of the bow thruster (optional)

Identify the cables coming from the joystick of command of the bow thruster and connect them in parallel to the correspondents cables of the receiver.

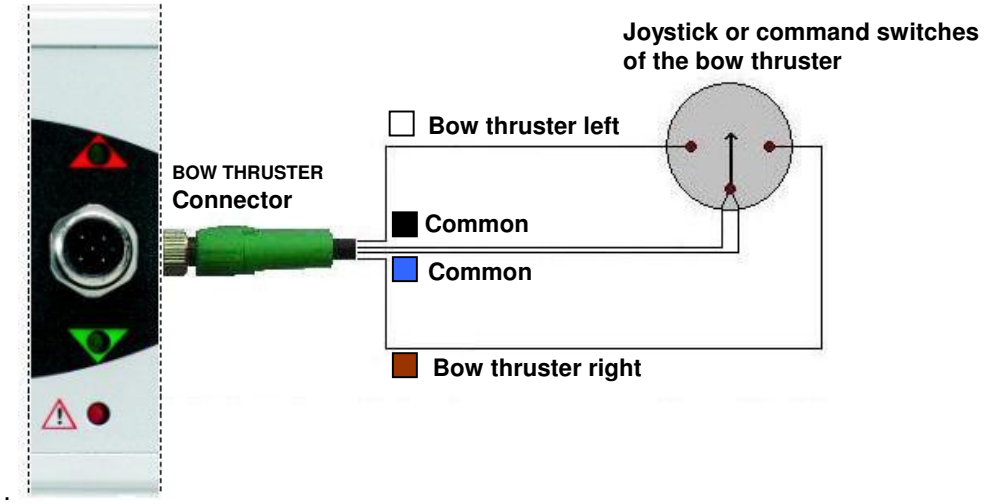


Figure 9: Connection scheme of of the bow thruster

WARNING:
Do not connect the command outputs of the receiver directly to the engines of the propeller, but always connect them to the command joystick.
Verify that the necessary current doesn't overcome the 3 Adc to avoid breakups of the outputs of the receiver.

2.2.5 Connection of the command wires of the stern thruster (optional)

Identify the cables coming from the command joystick of the stern thruster and connect them in parallel to the corresponding cables of the receiver.

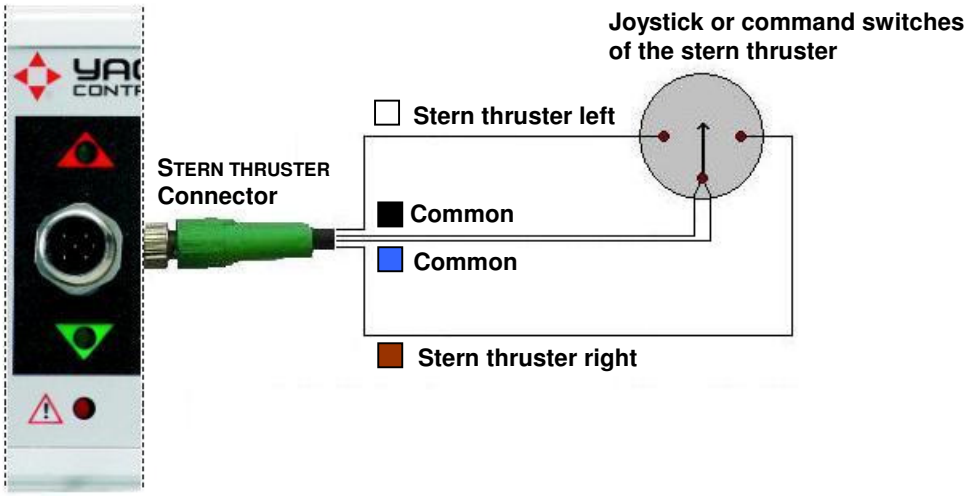


Figure 10: Connection scheme of the stern thruster.

WARNING:
Do not connect the command outputs of the receiver directly to the engines of the propeller, but always connect them to the command joystick.
Verify that the necessary current doesn't overcome the 3 Adc to avoid breakups of the outputs of the receiver.

2.2.6 Connection of the command wires of the anchor winch (optional)

Identify the cables coming from the switch of command of the anchor winch and connect them in parallel to the cables of the receiver

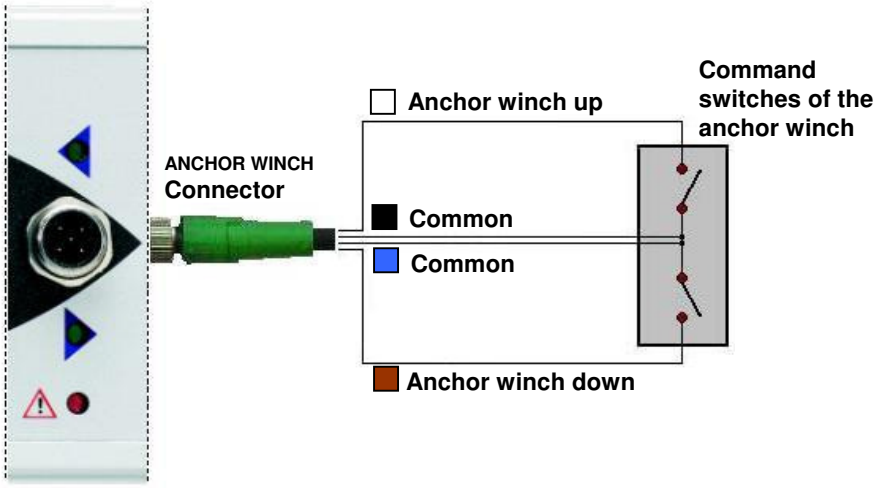


Figure 11: Connection scheme of the anchor winch.

WARNING:
Do not connect the command outputs of the receiver directly to the anchor winch, but always connect them to the command switch.
Verify that the necessary current doesn't overcome the 3 Adc to avoid breakups of the outputs of the receiver.

2.2.7 External acoustic signaller (optional)

In case the device is placed in a position that prevents to perfectly hear the internal acoustic signaller, it is possible to add an external acoustic signal, connecting it with two cables as shown in the installation scheme. (see figure 12).

The external acoustic signaller will have to be a ceramic resounder signaller with internal oscillating circuit working at 12 VDC and have a maximum absorption of 30 mA.

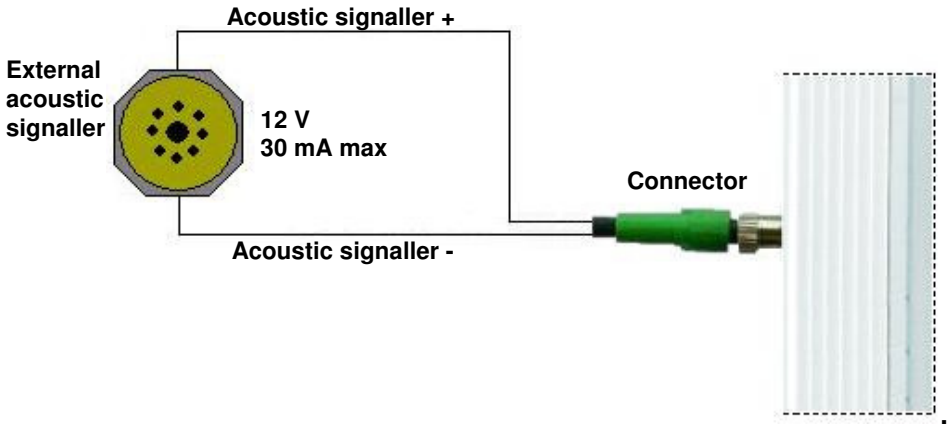


Figure 12: Connection scheme of the external acoustic signaller.

IMPORTANT:
Pay attention to the polarity of the acoustic signaller during the connection operations.

WARNING:
External acoustic signallers requiring a current higher than 30 mA must be connected through an external relay of 12V, max 30 mA (see figure 13). For further informations, contact Micro Device S.r.l..

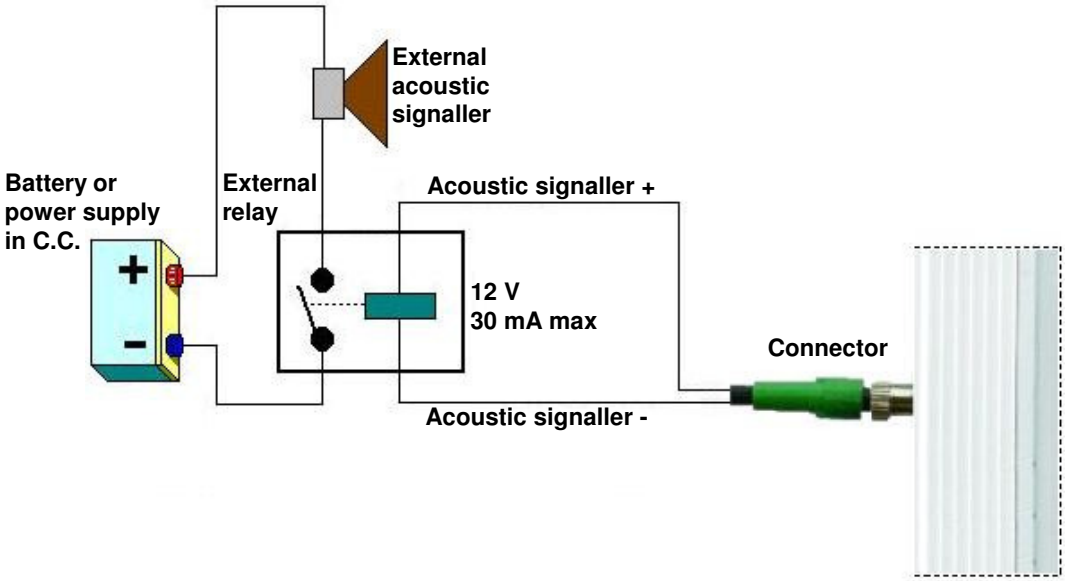


Figure 13: Connection scheme of the external acoustic signaller with relay.

3. Functional test

IMPORTANT:
If installed correctly, Yacht Controller Dual Band, does not need trims.

Once connected and checked the wires, it is possible to proceed with the functional test.

First of all, activate Yacht Controller transmitter, following step by step the procedure described here below:

- Activate the receiver using the ON/OFF switch (installed on the boat). The activation is signalled by the lighting of the six leds of communication and alarm CPU (see figure 3) for a second.
  After about three seconds the acoustic signaller of the device will start to emit the acoustic signal of danger indicating that the receiver is operating but it has not established yet the radio connection with the transmitter.

- Once the receiver is switched ON the red leds of alarm associated to each of the command modules begin to flash, signalling the correct operation of the system. In case of error or malfunction, instead, the red led of the module in alarm will remain turned ON fixed.

- Turn the transmitter ON, keeping pressed the button more than three seconds (security time to child test). It is moreover possible to switch ON the transmitter immediately pressing contemporarily the ON/OFF button and the engage button. The confirmation of the ignition is given by the fixed activation of the yellow communication LED.

Figure 14: ON/OFF button of the transmitter.

- If the operation has had positive result, the acoustic signal of the receiver stops and starts the signal of the engagement. This signal caracterized by a bit about every two seconds means that there is the radio connection between the transmitter and the receiver and that the system, not yet operating, is waiting for the engagement.

- During this waiting period for the engagement the levers and the buttons are not active yet.

- In a way to have Yacht Controller Dual Band operating, it is necessary to press twice the engage button within no more than 5 seconds between the first pressure and the second. When the transmitter is waiting for the second pressure, the yellow leds of communication flash in synchronous way.

- At this point, if the operation has had positive result, the acoustic signal of the receiver stops and the system is completely operating. The two yellow leds of the transmitter flash, signalling the transmission to the receiver on the two bands. Now it is possible to control the engines and in case, the bow and the stern thrusters and the anchor winch, simply pressing the switches of the transmitter.

- Each activation of the outputs is signalled by the lighting of the correspondent green leds associated to each command modules on the receiver. The red leds of each module, if flashing, they signal the correct operation of it.

WARNING:
From now on the system is operating. Pay the maximum attention, as the involuntary pressure of one of the switches or buttons would cause the activation of the related command output.

- When the transmitter is OFF, the red led of alarm of the receiver is fixed and the acoustic signal is activated. Contrarily, in presence of a correct receipt from the transmitter, the red led of alarm goes OFF, while the green leds of receipt RX1 and RX2 flash.

- The acoustic signal of the receiver has four states of operation as illustrated in the following scheme.

Type of acoustic signal	State of the receiver	State of the outputs
Continuous	Lack of reception from the transmitter.	Deactivated
Beep every two secs	Correct reception from the transmitter but waiting for the engagement.	Deactivated
Absent	Correct reception from the transmitter with engagement	Enabled
A continuos beep of 5 secs followed by a variable number of beeps	Receiver on alarm (see chapter troubleshooting).	Deactivated the output of the function in alarm, activated the others.

IMPORTANT:
The transmitter automatically goes OFF after approximately 4 minutes from the last pressure of a whichever switch or button.

Verify the correct directional operation of the bow thruster and of the stern thruster (if installed) with short commands right/left, or of the anchor winch with short commands up/down.

If inversions are found in the commands, check the paragraph "Troubleshooting".

Following step by step the instructions here below it is possible to test the correct operativity of the commands of the engines:

- Ignite the engines following your usual procedure.
- Enable the helm station of the boat to which the Yacht Controller Dual Band receiver is connected to.

DANGER:
TO USE THE SYSTEM “YACHT CONTROLLER DUAL BAND” IT IS NECESSARY TO HAVE THE CONTROL HEAD IN NEUTRAL POSITION

- In order to verify the correct directional command and the identification of the engines, with the boat moored and equipped with mooring shock-absorbers, lengthen the lines of stern of at least 1-2 meters and give short commands of activation of the engines forward and reverse.

- In the case the boat is not equipped of mooring shocks-absorber, unmooring in the traditional way and execute the engines command test in a place wide enough to make the manoeuvres in total security

DANGER:
DURING THE ENGINES COMMAND TEST, PAY THE MAXIMUM ATTENTION TO AVOID DAMAGES TO THE BOAT (TEAR TO THE MOORING BUOY OR COLLISION AGAINST THE QUAY).

If inversions are discovered in the commands, check the paragraph "Troubleshooting".

3.1. Programming instructions

The receiver in the kit is already arranged to receive the commands from the associated transmitter

WARNING:
The programming procedure described here **must be used only** to qualify the receiver for receiving commands from a further transmitter or in case of replacement of the original transmitter**.**

In case of replacement of the original transmitter, before executing the programming procedure, remember to delete the receiver memory (see paragraph 3.1.2).

3.1.1 Programming the receiver

In order to work, the receiver, must know which transmitter it can operate with. The procedure to insert the code of the transmitter in the memory of the receiver is the following:

1. With the receiver switched ON, remove the back part of the equipment to access to the electronic.
2. Identify the Dip Switch 1 on the power supply module and CPU (see figure 4) and to position it on "ON" (see figure 15).

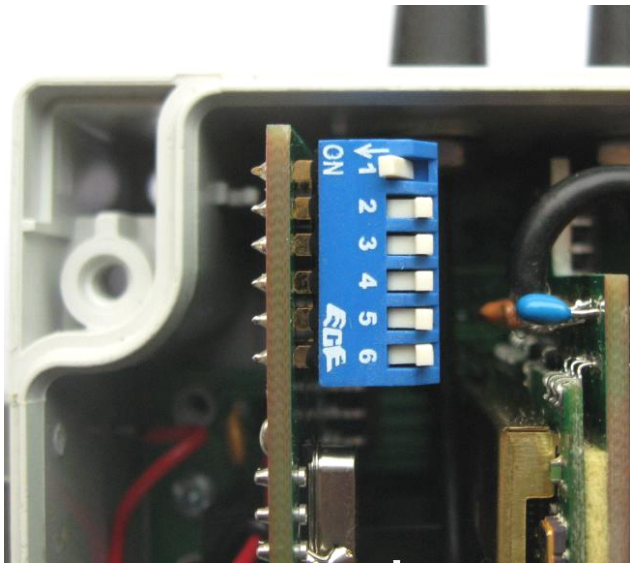


Figure 15: Programming Dip Switch.

3. The receiver will emit four beeps in sequence while the red led of alarm will flash. Moreover the yellow led showing the passage to the programming procedure of the memory of the receiver , will go ON.
4. If the memory of the receiver is saturated, because two codes have been already memorized, the acoustic signaller will emit ten beeps while the red led of alarm will remain turned on fixed. To be able to insert the code of a new transmitter it will be necessary first to cancel the memory of the receiver.

5. Turn ON the transmitter that you want to tune in and activate the necessary combination of switches to acquire the code from the receiver. The combination foresees the contemporary activation of two switches: right engine forward and left engine forward.

At this point, if the memorization has had success, the red led and the acoustic signaller are activated for a second. Vice versa, if the inserted code is already present in the memory of the receiver, the acoustic signal wil emit eight beeps while the red led of alarm will be activated.

Once acquired the code of a transmitter and after the signaling of happened memorization of it, the receiver doesn't accept other codes. To finish the procedure, it is enough to put the Dip Switch 2, OFF.

For safety reasons, during the procedure of insertion of the code, the receiver is not qualified for activating the output relay.

3.1.2 Cancellation of the receiver memory

Sometimes deleting the memory of the receiver is needed. For example, in the case in which the transmitter has been broken or lost, or if the memory of the receiver is full and you want to change the list of the transmitters.

The procedure for the cancellation of the memory of the receiver is the following:

1. With the receiver ON, remove the back part of the equipment to access to the electronics.
2. Identify the Dip Switch 6 on the power supply module and CPU (see figure 4) and position it "ON" (see figure 16).

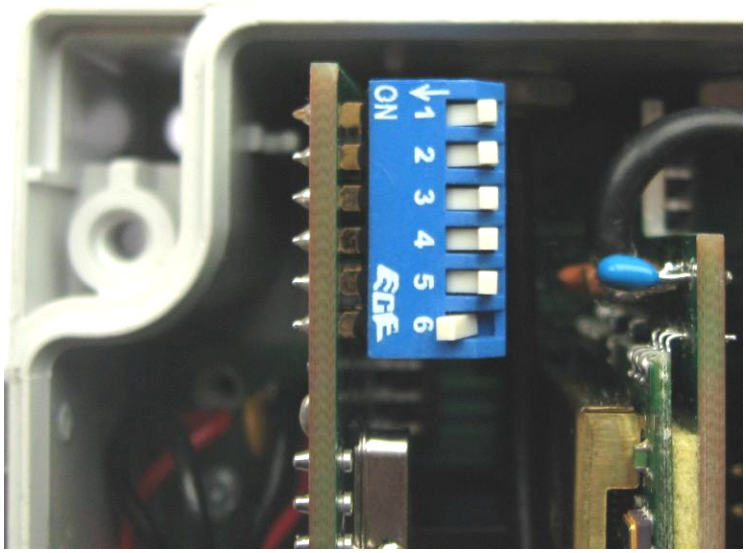


Figure 16: Dip Switch for deleting.

3. The receiver will emit a beep of the duration of four seconds while the red led of alarm and the yellow led of programming will be activated.
4. To finish the procedure of cancellation, it is enough to move the Dip Switch 6 OFF.

IMPORTANT:
Before the following use, it is necessary to program the receiver to enable a transmitter.

4. Expansion of the system

The system Yacht Controller Dual Band allows in any moment to modify the orignal configuration.

The options not initially purchased, in fact, can be ordered in a second time and installed simply inserting in the special lodgings, additional boards.

After having updated the configuration of the system, the new board module immediately becomes operational.

Here below how to proceed with the change of the configuration of the system Yacht Controller Dual Band.

- Take off the power supply from the receiver and remove all the cables placed on the front part of the equipment.
- Remove the back cover to access the electronics of the receiver.
- Find the position in which you have to insert the module. On the panel you can find easily the holes of the not installed modules. They, in fact, look closed and are marked by the symbol of the device to command (in the below example, the anchor winch).

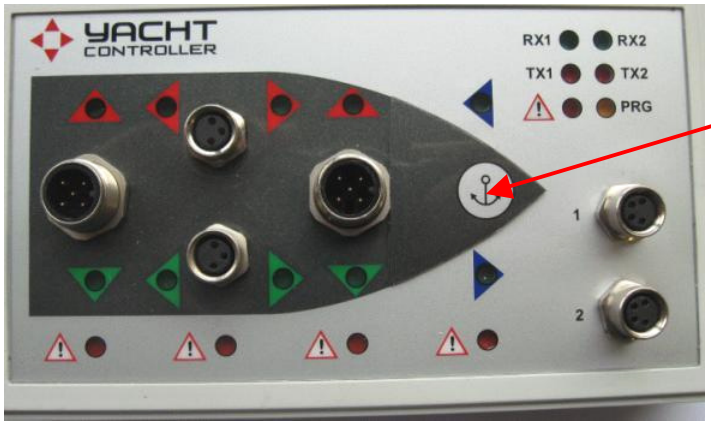


Figure 17

- Cut out with a cutter the contour of the hole related to the module to insert.

Figure 18

- Remove the nut of fixing from the connector of the board. Insert, then, the board in its lodging, paying attention that the male connectors on the inferior edge, perfectly enter the female connectors of the base.

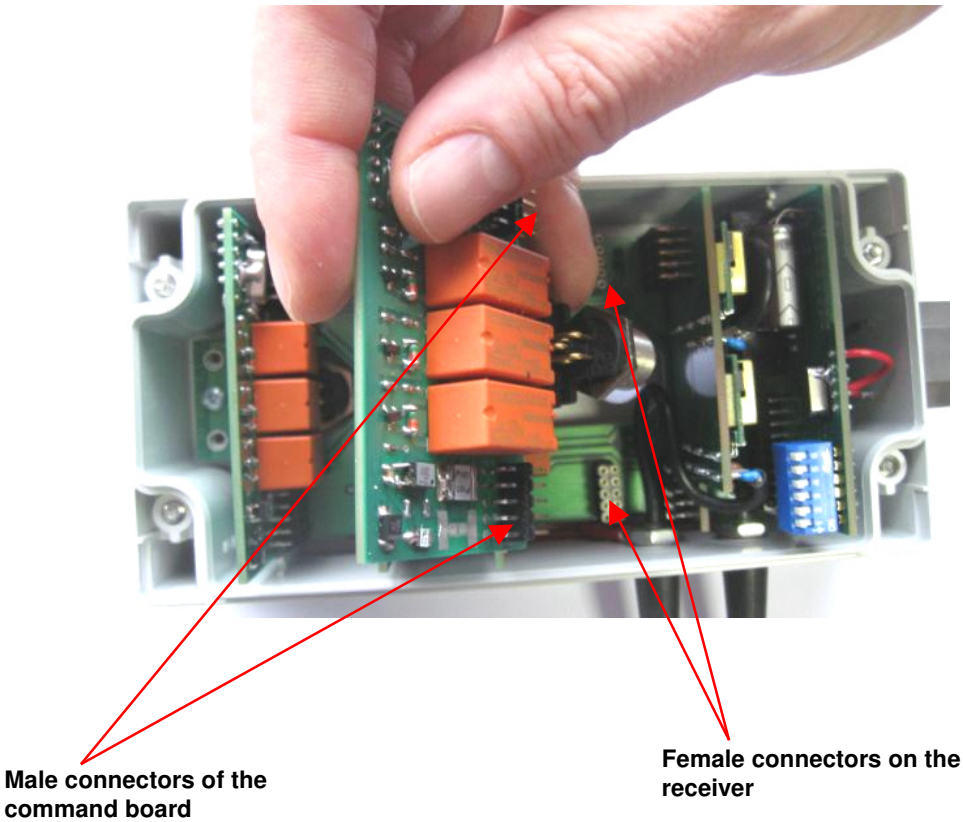


Figure 19

- Press the board just inserted to perfectly fit the female connectors of the base.

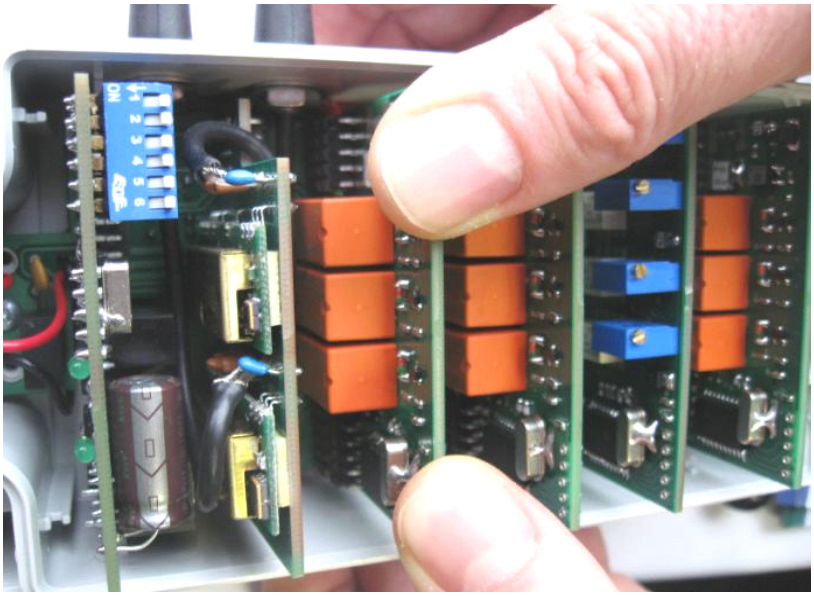


Figure 20

- Screw the nut of fixing to the connector of the board just inserted.

Figure 21

- Connect again the cables of connection.

- Proceed to the installation of the new module as described in the paragraph of the chapter "Installation and connection" of the this manual.

- Turn the receiver ON. At this point the acoustic signaller will signal an error of configuration emitting 6 beeps.

- To configure the receiver, put the Dip Switch 2 to ON, on the module of power supply and CPU. The acoustic signaller will emit a series of beeps that mean the memorization of the new configuration.

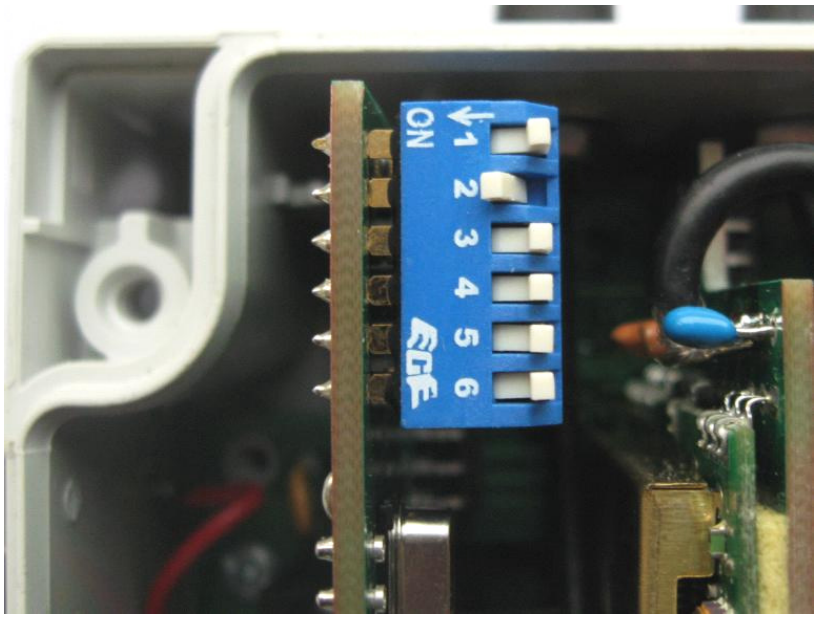


Figure 22

- When the acoustic signaller stop to emit, put the Dip Switch 2 OFF.
- At this point the procedure has been finished.

5. Troubleshooting

This section describes some problems and malfunctions that could happen during the installation, with the probable cause and - where possible - the countermeasures to be undertaken for their solution.

Problem	Possible causes	Remedy
The receivers does not turn ON.	There is no tension to the receiver.	Check if the receiver has its power supply. Check in the order: - The tension on the battery. - The possible presence of interrupted fuses. - The operativity of the ON/OFF switch. - The cable's polarity.
The transmitter does not turn ON.	There is not power supply on the transmitter.	Verify in the order: - That the batteries and the cover are inserted with the right polarity showed on the back of the transmitter. - The charge of the batteries.
The acoustic signaller of the receiver is always ON.	None of the enabled codes in the receiver correspond to the one of the transmitter.	Refer to the pragraph "programming procedures".
	Lack of reception from the transmitter.	- The transmitter is OFF - Possible presence of disturbs on both bands.
The acoustic signal of the receiver emits some discontinuous signals.	The radio transmission is disturbed by radio-frequency sources near the devices.	- remove, if possible, the source of disturbance. - if the functionality of the system is compromised, take the manual control again at the helm station.
	The distance between the receiver and the transmitter has exceeded the range of the transmitter.	- go near the receiver to reduce the distance between the two devices. - the range of action of the transmitter depends on the charge of the batteries. Check the charge.

Problem	Possible causes	Remedy
The acoustic signaller emits a continuous beep of 5 secs follow by a variable number of beeps.	The receiver is in alarm.	The type of alarm is identified by the number of beeps emitted: 1 beep: error of the command board of the output of the engines. Contact the reseller. 2 beeps: error of the command board of the outputs of the bow thruster. Contact the reseller. 3 beeps: error of the command board of the outputs of the stern thruster. Contact the reseller. 4 beeps: error of the command board of the outputs of the anchor winch. Contact the reseller. 5 beeps: error on the serial interface for engines. Contact the reseller. 6 beeps: wrong configuration. Contact the reseller. 7 beep: low battery tension. Verify the position of the battery and its connection with the receiver. 8 beeps: low tension of the CPU module. Contact the reseller. Contact the reseller for other possible signalings of alarm.
The engine commands are inverted.	Wrong identification of the connectors of the two engines.	Invert the two cables on the connectors of the engines (PORT ENGINE and STBD ENGINE).
Commands of the right engine forward and reverse are inverted.	Wrong connection of the wires of the engine.	Invert the connection on the wires coming from the control head.
Commands of the left engine forward and reverse are inverted.	Wrong connection of the wires of the engine.	Invert the connection on the wires coming from the control head.
Commands of the bow thruster right and left are inverted.	Wrong identifications of the wires of the joystick of the bow thruster.	Invert the connection on the wires coming from the joystick.

Problem	Possible causes	Remedy
Commands of the stern thruster right and left are inverted.	Wrong identifications of the wires of the joystick of the stern thruster.	Invert the connection on the wires coming from the joystick.
Commands up and down of the anchor winch are inverted.	Wrong identifications of the wires of the anchor winch.	Invert the connection on the wires coming from the anchor winch.

WARNING:
In case of alarm the beeps emitted by the acoustic signaller point out the module responsible of the malfunction (see previous section).
Once identified the module, looking at the behavior of the corresponding red led of communication and alarm, it is possible to diagnose the type of malfunction.
If the led remains always turned ON or always turned OFF, there is an error of the module, which can be broken or missing.
Instead, a continuous lighting of five seconds, followed by a variable number of flashes, points out - according to the number of flashes - one of the following condition of error:

- One flash: the time-out of communication with the CPU has been overcome.
- Two flashes: the output has high current flow.

If problems not described here above are found, contact the retailer or directly Micro Device's Technical Support.

6. Technical Characteristics

6.1. Transmitter

Power Supply:	3 batteries 1,5V di tipo AAA (LR03)
Absorption:	max 40mA in trasmission
Box:	In ABS with protection degree IP68.
Number of Channels:	max 10
Transmission Code:	digital at 16 bit
Dimensions (LxHxW)	70 x 123 x 43 mm
Weight:	145 g batteries included
Frequencies:	433.92 MHz and 868.3 MHz
Power of transmission:	<5mW ERP on band 868.3 MHz
	<10mW ERP on band 433.92 MHz
	(range 30-50 m max)
Operational Temperature:	from 0°C to +50°C

6.2. Receiver

Power Supply:	12 VDC o 24 VDC ± 5 % max
Absorption:	max 4W
Box:	In polycarbonate with protection degree IP65.
Dimensions (LxHxW)	175x170x130 mm with conncetors and aerials included
Weight:	680 g with connectors included
Capacity of the outputs contacts.	up to 3A, 30Vdc / 0.6A , 115Vac
Frequencies:	433.92 MHz and 868.3 MHz
Operational Temperature:	from 0°C to +50°C
External signaller output:	up to 30 mA, 12 VDC ± 5 %
Optional:	Control for Bow Thruster
	Control for Stern Thruster
	Control for Anchor Winch.

7. Warranty

Each Yacht Controller Dual Band system is warranted for 24 months, as from the date of sale to the first user . The warranty on the Micro Device S.r.l.'s devices is for all the possible defects of material and breakdowns not caused by the customer.
Regarding the installation and the possible maintenance operations, these are responsibility of the installer. This warranty explicitly does not include faults due to maintenance, improper installation and customer misuse.

The warranty is given on the following conditions: the equipment is effective for all the possible faults of manufacture, material and for breakdowns not caused by the customer. All breakdowns imputable to the customer or due to force majeure, natural events and all faults caused by improper use of the equipment, are not covered by the Manufacturer's warranty.

Manufacturer's Warranty is valid in accordance with following conditions:

- Installation must be made by a certified installer.
- Electronic Components must be integral, not disassembled, tampered or modified in any manner.
- Warranty excludes equipment damaged by water.
- Defective equipment must be returned properly packaged to avoid shipping damage and complete of all the accessories.
- Package must include a brief description of the problem.
- Package must clearly show, near the address of the sender, the Number of Authorization to the Re-entry "NAR" given by Micro Device S.r.l. Phone. +39.026131001.
- Return transportation charges are at the expense of the Sender
- All the packages sent without "NAR" or at the manufacturer's expense, will be refused.
- The Manufacturer's responsibility is limited to the substitution or repair of equipment which, in its sole judgment, has a manufacture defect.
- Purchaser agrees that the manufacturer and and seller's liability for any accident and/or damage to property and/or personal injury which occurs during the use of this equipment is solely limited to the purchase price of this equipment regardless of the incident or circumstances.
- The repair or replacement of equipment, during the warranty period, does not have the effect of extending the original warranty period.
- These conditions do not intend to void the effects of laws or rules for protection of the customer.
- "Yacht Controller Dual Band" can be subjected to changes without warning: if differences or ambiguity were found, ask the retailer.

Micro Device srl Via Bellini, 31/33 20095 Cusano Milanino (MI)
Tel. +39.02.6131001 r.a. Fax. +39.02.66400086 Email mdevice@tin.it

Test and recording form

Send by fax to Micro Device S.r.l., +39-02-66400086, to activate the warranty.

Customer: _____ **Telephone:** _____

Boat: _____ **Name:** _____

Type of Control Head: _____ **Engines:** _____

Receiver serial number: _____ **Transmitter serial number:** _____

Installation: _____	Fly	☐	☐ Salon
Power supply: _____	12 V	☐	☐ 24 V
Right engine: reversed wires: _____	Yes	☐	☐ No
Left engine: reversed wires: _____	Yes	☐	☐ No
Bow thruster: reversed wires: _____	Yes	☐	☐ No
Stern thruster: reversed wires: _____	Yes	☐	☐ No
Check range: _____	30	☐	☐ Over

Notes:

Colour of the right engine wires

Boat	Radio Command

Colour of the left engine wires

Boat	Radio Command

Colour of the bow thruster wires

Boat	Radio Command	
		Left
		Common
		Right

Colour of the stern thruster

Boat	Radio Command

Colour of the anchor winch wires

Boat	Radio Command	
		Up
		Common
		Down

Date of the test: _____

Engineer signature: _____

8. FCC - CE Mark

CE 0051

YACHT CONTROLLER DUAL BAND IS A SYSTEM IN COMPLIANCE WITH THE FOLLOWING CE DIRECTIVES:

DIRECTIVE R&TTE

- EN 300 220-1 V2.1.1
- EN 301 489-1 (V1.8.1) + EN 301 489-3 (V1.4.1)
- EN 60950-1 (2006)

ELECTROMAGNETIC COMPATIBILITY DIRECTIVE

- EN 60945 (2002)

FCC ID: R86TX001YCDB

YACHT CONTROLLER DUAL BAND IS A SYSTEM IN COMPLIANCE WITH THE FCC DIRECTIVE.

Position of the FCC mark on the receiver (above) and on the transmitter (right)

Verification according to § 15.19 (a) (3):

This device complies with Part 15 of the Rules.

Operation is subject to the following two conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received, including interference that may cause undesired operation.

Micro Device srl Via Bellini, 31/33 20095 Cusano Milanino (MI)
Tel. +39.02.6131001 r.a. Fax. +39.02.66400086 Email mdevice@tin.it

YACHT CONTROLLER DUAL AND IS A SYSTEM IN COMPLIANCE WITH CE DIRECTIVES FOR TRANSMITTERS IN NAUTICAL ENVIRONMENTS AND THE DIRICTIVES FOR ELECTOMAGNETIC COMPATIBILITY AND IMMUNITY TO ELECTOMAGNETIC DISCHARGES

Conformity Declaration

The manufacturer:

Micro Device S.r.l.

Declares that the product:

Yacht Controller

Is in compliance with the qualifications and with the pertinent dispositions established from the Directive 1999/5/CE.

This device complies with Part 15 of the Rules.

Operation is subject to the following two conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received, including interference that may cause undesired operation.

FCC ID: R86TX001YCDB

Cusano Milanino, 11 May 2010

The Legal Representative

Giuseppe Brianza