Micro Device S.r.l.

Installator's guide.

Preliminary Version

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ATTENTION:
BEFORE INSTALLING YACHT CONTROLLER SYSTEM READ CAREFULLY THE PRESENT 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 RELATIVE 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 PROPETRY COMING THROUGH NEGLIGENCE IN FOLLOWING THE ASSEMBLING INSTRUCTION OR COMING FROM INSTALLATIONS MADE BY NOT QUALIFIED ENGINEERS.

MICRO DEVICE S.R.L. FURTHERMORE DOES NOT TAKE ANY LIABILITY FOR POSSIBLE DAMAGES TO PEOPLE OR TO PROPERTY COMING FROM DIFFERENT OR IMPROPER USES OF THE EQUIPMENT.

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 use 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

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1. Introduction

Yacht Controller, developed by Micro Device S.r.l., is an electronic remote control wireless, able to control a boat in his essential parts.
From the first prototype, going back to 1998, "Yacht Controller" has undergone a continuous evolution. Various types of electronic components have been tested and some essential parts for the safety, like the switches of the transmitter or the relays of the receiver, satisfy the most rigid military norms.
The system uses some microprocessors programmed directly in laboratory by Micro Device S.r.l.; therefore interferences with the gangways or anchors radio controls available on any market which instead use standard electronic components, are impossible. The range of action of Yacht Controller is limited to a few tens of meters and the transmission protocol, codified and owner, makes whichever interference between the same or different systems working in the same zone, impossible.

Severe tests led on various types of boats, have brought to light the resistance and the reliability of Yacht Controller in marine environment. Moreover, before being commercialised, Yacht Controller, has been subordinate in factory to numerous qualitative tests in order to guarantee a perfect operation.
With Yacht Controller is possible to manage easily, using simple switches, the bow thruster, the right engine, the left engine, the stern thruster or the eventual winch.
"Yacht Controller" is safe because, linking up in parallel with the existing commands, it leaves however full control to them to allow, in case of need, a prompt resumption of the manual control. In fact, if the dialogue between the transmitter and the receiver had to stop for any reason, an acoustic signal will inform the user about the necessity of manually taking the control of the boat again.

IMPORTANT:
Further information concerning the complete system, regarding the transmitter and the correspondent receiver, are available in the user's manual.

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1.1. Composition of the kit

The kit of installation of Yacht Controller system includes:

1. A receiver, held in a grey polycarbonate container with a transparent cover.
2. A transmitter, very similar to a remote control.
3. A connector, to connect to the receiver, complete of cables of the length of 1,5 meters.
4. A kit of connectors for quick installations.
5. An adapter kit to use to 24 V.
6. A watertight switch for the ignition.
7. The installator's guide and the user's guide.

1.2. General transmitter features

The transmission unit, similar to a remote control, is supplied with switches (two, three or four according to the models) for the radio transmission of the commands.
The model enabled with the command of the winch presents on the superior cover the two command buttons up/down.

Every transmitter owns a sole and different code programmed in factory, chosen among 65.000 combinations.

Electronics is held in a grey ABS container which combines functionality with an IP65 protection degree (resisting to the water sprinklings but not dipable). The container is composed of two parts gathered between them without screws through two covers. Removing the lower cover it is possible to enter into the box containing the batteries.
The unity is equipped with two luminous LED: - a red LED indicates the condition of battery near the discharge limits. - a yellow LED indicates the transmission of control signals towards the receiver. It shows also the transmission of commands when the switches are pressed.

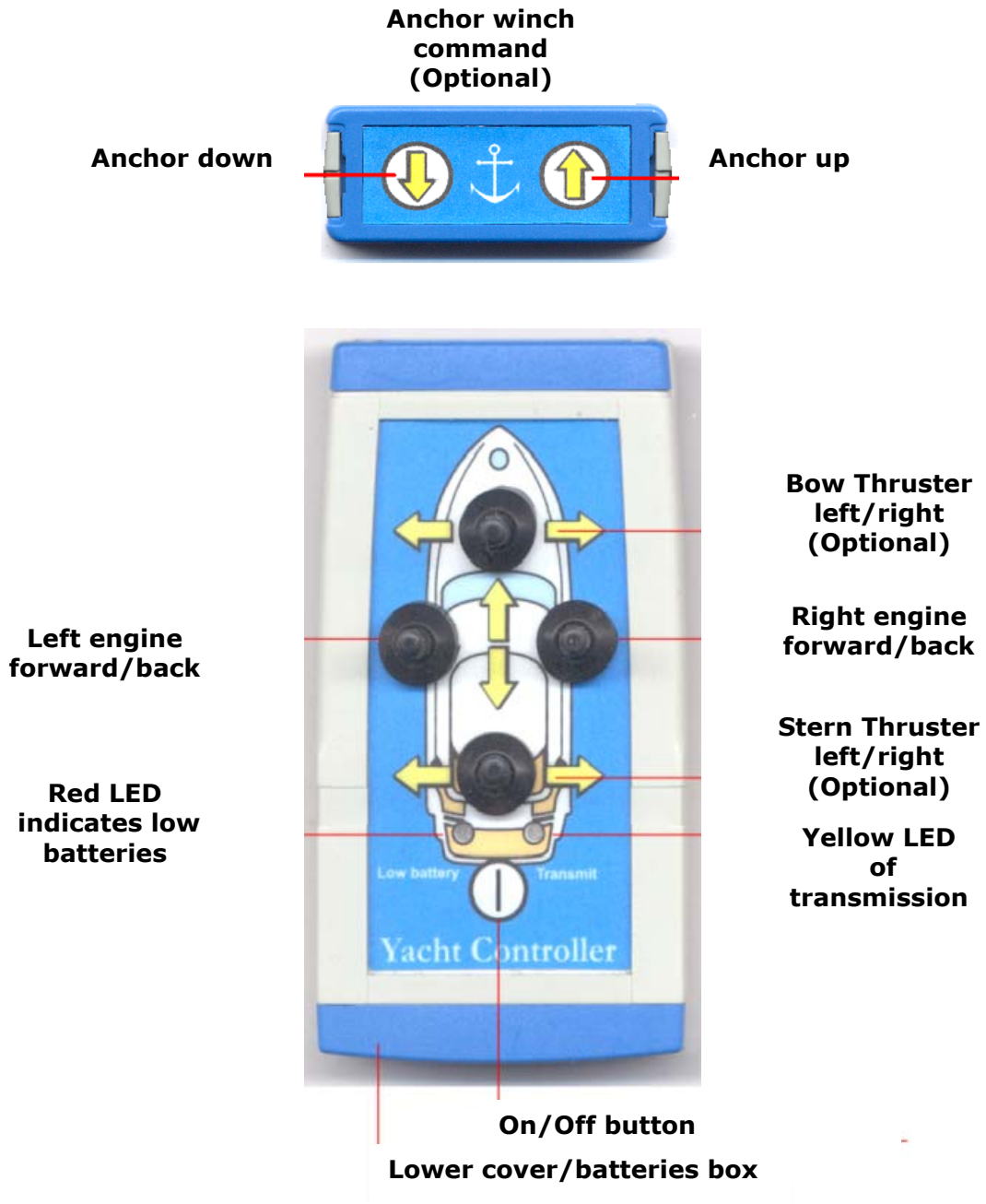

Figure 1: Description of the transmitter

1.3. General receiver features

The receiving unity acquires the transmission of the radio control and commands the relays connected to the operations of the boat.

The command of the relays takes place with the activation of the respective switches on the transmitter. The relay will remain closed till the corresponding switch on the transmitter will stay active and up when the radio connection between transmitter and receiver will be present.

The transmitter, in fact, cyclically, sends the receiver, the state of the switches so as to command the relative outputs. In the case in which the receiver does not receive the periodic transmission from the transmitter, it will automatically deactivate the output relay. That allows to deactivate the loads connected if they are outside the control of the transmitting unity.

Thanks to the adoption of a procedure of self-learning of the code of the transmitter, instructing the receiver to receive commands from more than one transmitter, is possible (even if not simultaneously). In fact the receiver is able to identify univocally and memorize the code of an any transmitter.

It is not possible to carry out contemporary transmissions from several transmitters to activate the same receiver. In fact, the periodic transmissions of the two transmitters would be affected themselves, causing interferences and contrasting the activation commands of the relay.

The receiver is held in a grey polycarbonate container with a transparent cover.
The ignition of the receiver takes place through the switch which will have to be placed, by the installer, near the helm station.

A luminous red LED indicator signals the ignition of the equipment. When the transmitter is switched OFF, the red LED is NOT flashing. On the contrary, in presence of a correct receiving from the transmitter, the LED lightens for a fraction of second.

Moreover the receiver is equipped of an acoustic signal which signals the lack of the radio connection with the transmitter and the forced opening of the command relays of operations.

The operation exits of the unity are planned for being able to command sea engines supplied with electronic control switchboard.
The equipment is supplied with luminous LED indicators which signal the activation of the corresponding operation exits. Such indicators are placed in correspondence of the respective relays.

Inside the circuit there is also a connector which concurs to adapt the internal tension in case of use on boats with batteries to 24 V.

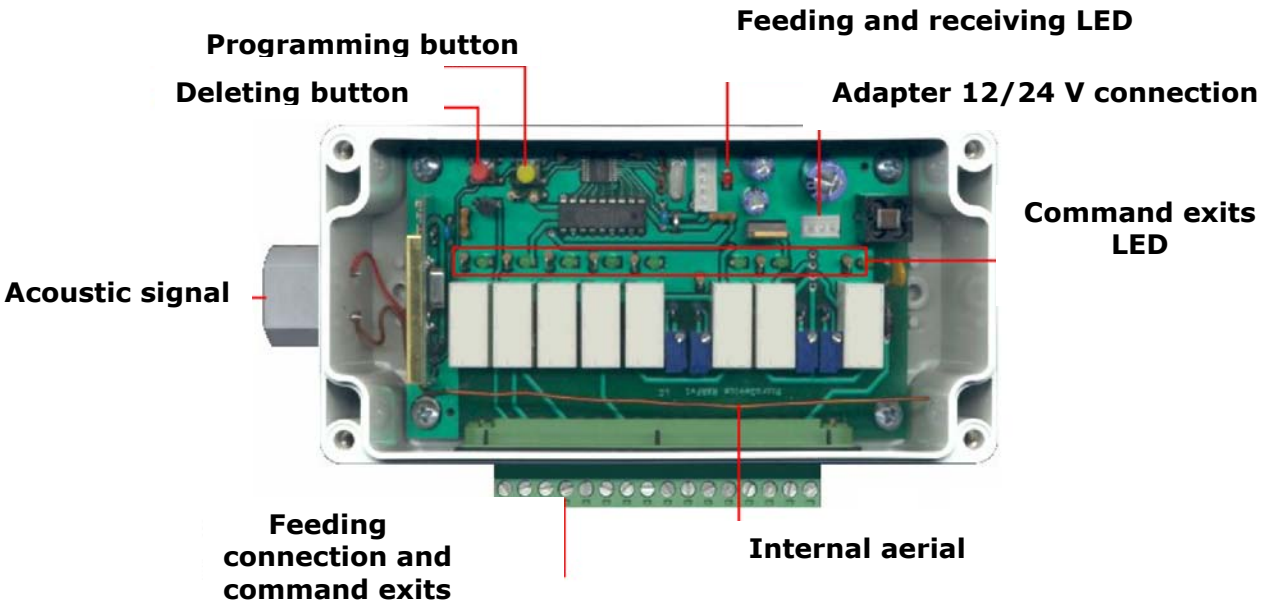

Figure 2: Description of the receiver

2. Installation and connection

2.1. Installation environment

The receiver MUST be installed far 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 is absolutely forbidden installing the receiver inside the engines room as such environment is subject to disturbs and important thermal jolts.

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

DO NOT INSTALL the receiver inside a metal structure as the metal walls prevent the correct passage of the radio signals. In this case, ask Micro Device S.r.l., to let you have the model of the receiver equipped with the external aerial.

2.2. Installation of the receiver

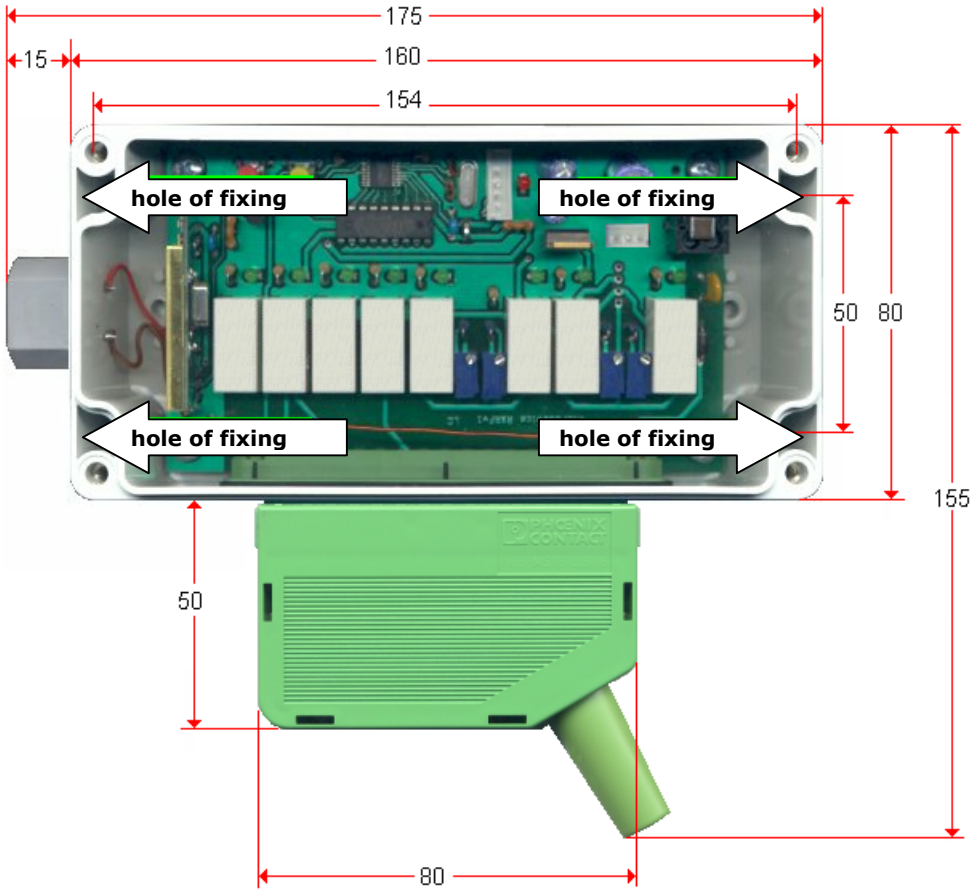

Figure 3: Dimensions of the receiver

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

Normally the receiver must be installed around the chosen command station, which could be in the hall or on the fly according to the habits of the customer.

If the space in proximity of the station is insufficient, it is possible to install in the easier access place, keeping present that the acoustic signal issued by the receiver will have to be perfectly hearable from the command station; if it was not like that, it will be possible to use an external acoustic signal to be installed around the command station.

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

2.2.1 Connections scheme

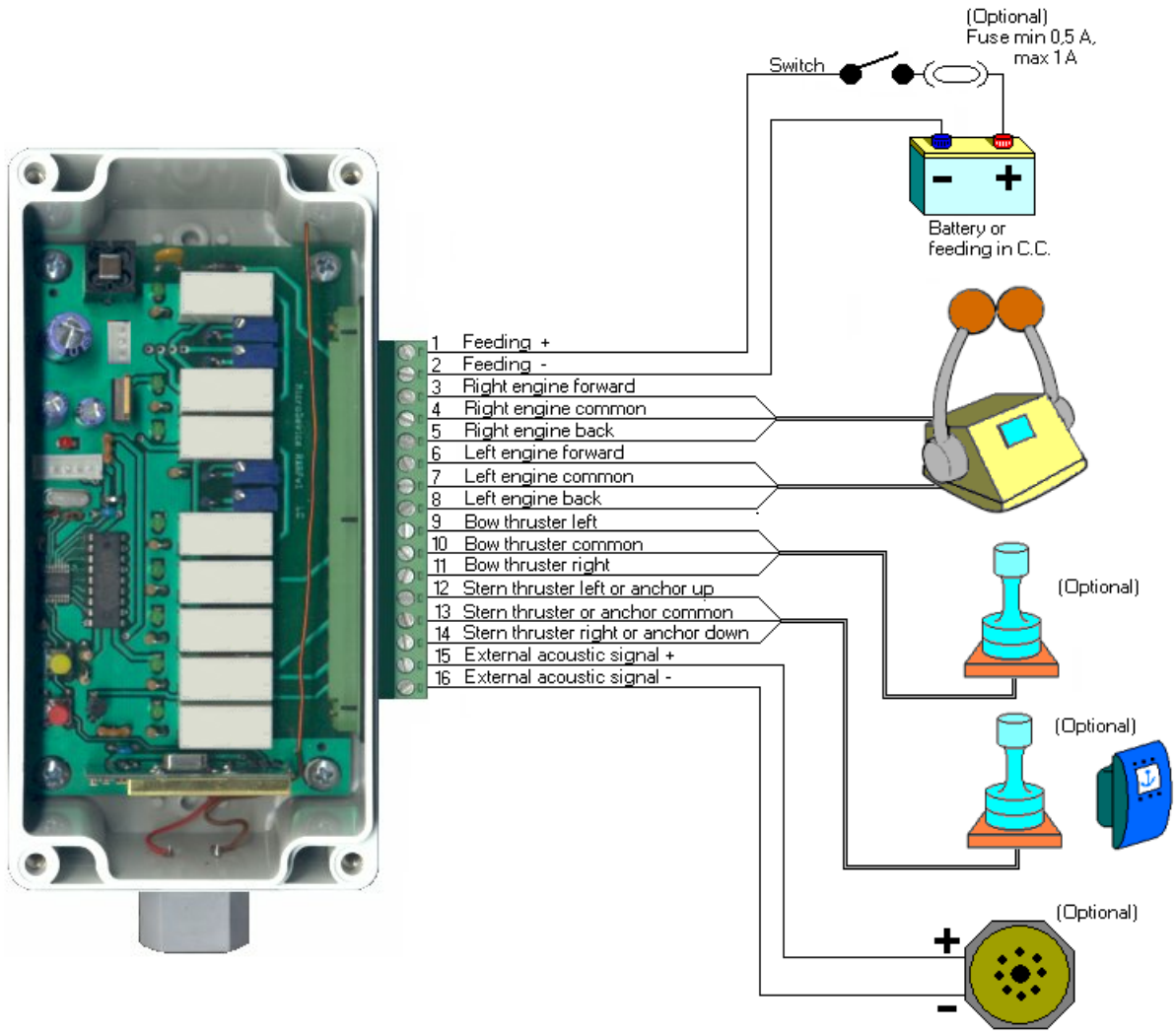

Figure 4: Connection scheme of the receiver

2.2.2 Connection of the feeding wires

Determine the command station interested in the installation and the space suitable to contain the receiver.

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WARNING:
Before connecting or disconnecting the electric cables of the receiver, check that the feeding is not present and that the command station interested to 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 feeding of the receiver and verify carefully the polarity and the correct value of tension.

WARNING:
If the boat is equipped with 24V batteries, identify on the receiver the adaptation connector (see figure 2), take away from the connector the adapter for 12V batteries and replace it with that one for 24V batteries supplied in the kit.

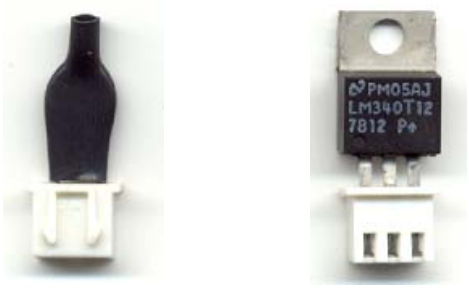

Figure 5: Adaptors for 12 V batteries (on the left) and 24 V batteries (on the right).

It is opportune that the feeding supplied to the receiver is activated by the key of enabling of the chosen command station, as to feed the receiver only in case of effective use.

Always mount a switch for the ignition/switching-off of the receiver in a point easily accessible, placed around of the chosen command station. In lack of switches already available on the bridge, use the one provided in the kit. Make sure that the used switch is to watertight estate.

Even if not necessary, as the equipment is supplied with a internal self-restorable fuse, is a good rule to insert a fuse (min 0,5 A, max 1 A) on the line of feeding of the device.

2.2.3 Connection of the engine wires

For installing the engine command exits it is necessary to identify the cables that from the control levers go to the electronic switchboard and to connect in parallel to them the cables coming out from the receiver (see figure 4).

In order to make the wiring easier, Micro Device S.r.l. has arranged a series of connectors that use cables whose colours recall those used for the main control switchboards. In the appendix you can find a series of tables which indicate the colours used by the most common brands of switchboards and the corresponding colour used for the cable.

As Constructors some times modify the colour of the cables. To obtain further technical information or in case of problems in the identification of the cables, contact Micro Device S.r.l. before beginning the installation.

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

Proceed to the link of the cables using the connectors supplied in the kit.
Using these connectors it is possible to connect between them, in a simple and in a fast way, the cables coming from Yacht Controller to the link cables between the switchboard and the control levers without cutting the cable coming from the switchboard.

Once identified the cable to which connecting the command wire coming from the connector of connection, insert it in the passing groove of the connector, paying attention to slip it completely. Then insert the cable of Yacht Controller up to the end in the blind hole of the connector and crush, with the use of flat pliers, the superior coloured part of the connector so that the metal part can link between them the cables and establish a safe connection.

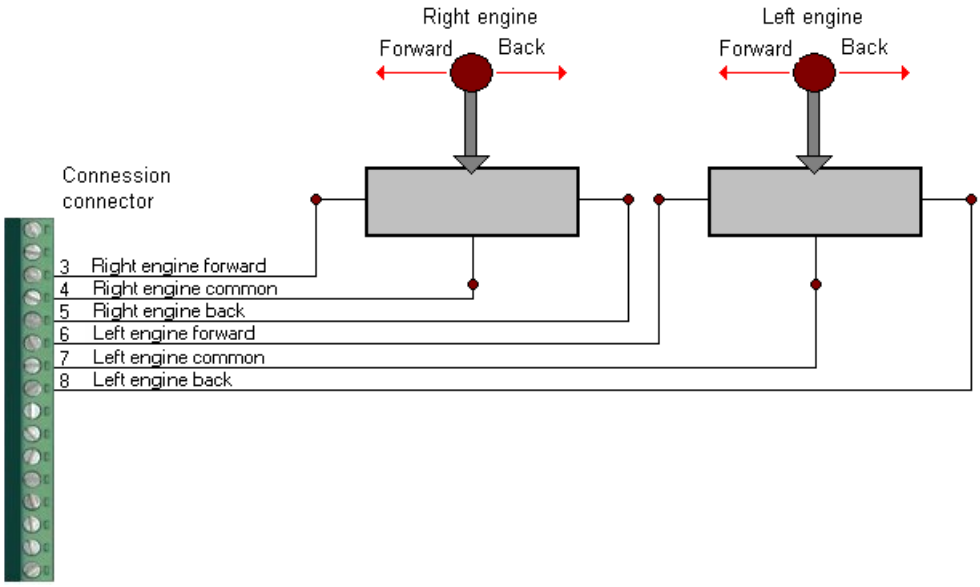

Figure 7: Connection scheme of the control levers

2.2.4 Connection of the bow thruster (optional) wires

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

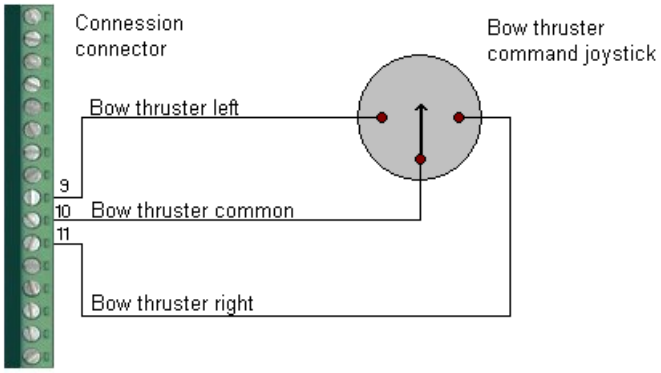

Figure 8: Connection of the bow thruster

WARNING:
Do not connect the command exits of the receiver directly to the engines of the propeller, but always connect them to the command joystick.

2.2.5 Connection of the stern thruster (optional) wires

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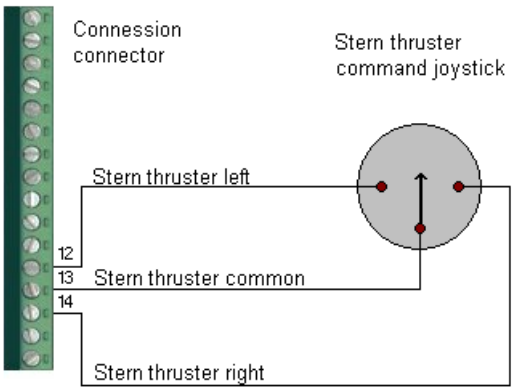

Figure 9: Connection of the stern thruster

WARNING:
Do not connect the command exits of the receiver directly to the engines of the propeller, but always connect them to the command joystick.

2.2.6 Connection of the winch (optional) wires

In alternative to the command of the stern thruster, it is possible to use Yacht Controller for the command of the anchor winch.

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

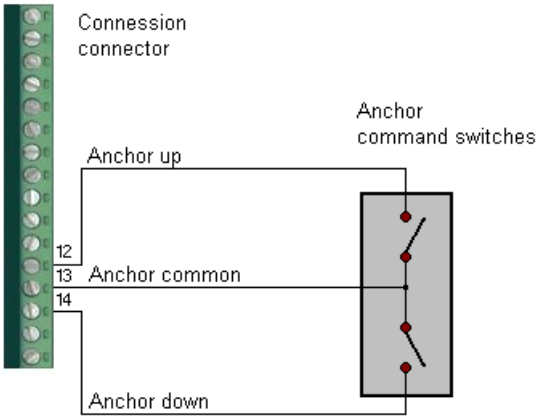

Figure 10: Connection scheme of the anchor winch.

WARNING:
Do not connect the command exits of the receiver directly to the anchor winch, but always connect them to the command switch.

2.2.7 External acoustic signal (optional)

In case the device is placed in a position that prevents to hear the acoustic signal, it is possible to add an external acoustic signal, connecting it with two cables as from the installation scheme. (see figure 4).

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

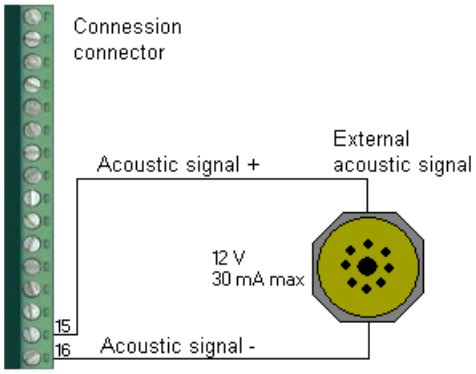

Figure 11: Connection scheme of the external acoustic signal.

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

WARNING:
External acoustic signals requiring a current greater than 30 mA must be connected through an outside relay of 12V, max 30 mA (see figure 11). For further indications, contact Micro Device S.r.l..

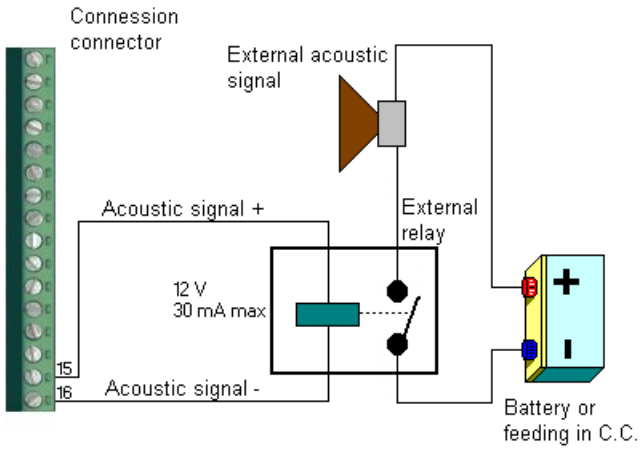

Figure 12: Connection scheme of the external acoustic signal with relay.

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3. Functionality test

IMPORTANT:
If installed correctly, Yacht controller, does not need calibrations.

Once connected and checked the wires, it is possible to proceed with the functionality test.
First of all, activate Yacht Controller, following step by step the procedure described here:

- Activate Yacht Controller system with the suitable switch (installed on the boat) of ignition/switching-off of the receiver. After about two second the acoustic signal of the device will emit the acoustic signal of showing attention indicating that the receiver is active but it has not established yet the radio connection with the transmitter.
- Turn the transmitter ON, keeping pressed the button by more than three second (security time to child test). The confirmation of the ignition is given by the activation of the transmission LED.

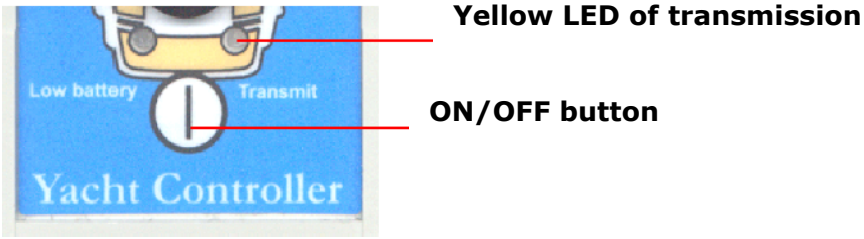

Figure 12: Transmitter ON/OFF button.

WARNING:
Since this moment the system is operating. Pay the maximum attention, as the involuntary pressure of one of the switches would cause the activation of the relative command exit.

- At this point, if the operation has had positive result, the acoustic signal of the receiver stops and the system is completely operating. Now it will be possible to control the engines and eventually the propellers, simply pressing the switches of the transmitter.

- If the acoustic signal does not stop and the transmitter has the yellow transmission LED lightening, check the paragraph "operation problems".

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

Verify the correct directional operation of the bow thruster and of the stern thruster (if present) with short commands right/left, or of the anchor winch with short commands up/down.
If inversions are discovered in the commands, check the paragraph "Functionality problems".

It is anyway possible to test the correct operativity of the commands of the engines, following step by step the following instructions:

- Ignite the engines following your usual procedure.
- Enable the station of command of the boat which the unity of receiving of Yacht Controller is connected to.
- In order to verify the correct directional command and the identification of the engines, with the boat moored and provided with shock-absorbers of mooring, lengthen the warps of stern of at least 1-2 meters and give short command of activation of the right/left engines and forward/back.
- 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 security**.**

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

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

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 1.3.2).

3.1.1 Programming the receiver

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

1. Feed the receiver keeping pressed the yellow programming button (see figure 2).
2. After about 4 seconds the red LED of the receiver will light up and the acoustic signal will start ringing, signalling the passage in the procedure of programming of the receiver memory.
3. Release the programming button. If to this point the red LED starts lightening and the acoustic signal rings, the memory of the receiver is saturates, that means that five codes have already been memorized. To be able to insert the code of a new transmitter, the memory of the receiver will have to be deleted before inserting the code of the new transmitter.
4. Switch on the transmitter that you want to tune and activate the combination of switches necessary for the acquisition of the code by 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 succedeed, the red LED will light in a continuous way and the acoustic signal will ring for 4 seconds. Vice versa the lighten of the LED and the activation of the acoustic signal indicates that the inserted code is already present in the receiver memory.

Once acquired the code of a transmitter and after the signalling of happened memorization, the receiver does not accept other codes any more. In order to finish the procedure, turn the device OFF. To the next re-ignition of the device, the transmitter will be qualified to command the boat.

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

3.1.2 Cancellation of the receiver memory

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

The procedure to delete the memory of the receiver is the following:

1. Ignite the receiver by pressing the red deleting button (see figure 2).

2. After about 4 second the luminous red indicator of the receiver will start lightening while the acoustic signal will emit a short acoustic signal.

3. Keep pressed the deleting button for other 4 seconds, up to the next acoustic signal and up to the continuous ignition of the luminous indicator for 4 seconds, which signals the cancellation of the memory. If the button is released while the luminous indicator still lightens, the cancellation sequence is cancelled.

4. Turning the device OFF is necessary to go out of the cancellation procedure.

IMPORTANT:
Before the next use, execute the procedure of programming of the receiver to enable a transmitter.

4. Functionality problems

This section describes a series of problems and malfunctions which could happen during the installation, with the possible cause and, where possible, the contromisure to solve the problem. If solving the problem by yourself is impossible, please ask Micro Device's Customer Service.

Problem	Possible causes	Remedy
The receiver is not ignited.	Tension does not arrive to the receiver.	Check that the receiver is fed correctly. Verify in the order: - The presence of the tension of the batteries. - The eventual presence of interrupted fuses. - The functionality of the ignition switch.
The transmitter is not ignited.	The transmitter is not fed correctly.	Verify in the order: - That the batteries and the cover are inserted respecting the polarity indicated on the back of the transmitter. - The batteries charge.
The acoustic signal of the receiver always stays active.	None of the codes enabled on the receiver corresponds to that one of the transmitter.	Refer to the paragraph containing the programming description.
The acoustic signal of the receiver emits some discontinuous signals.	The radio transmission is disturbed by radio-frequency sources near the devices (mobile telephones or other radio-frequency equipment)	- 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.	- go nearer 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 commands of the right/left engines are reversed.	Wrong identification of the wires of the two engines.	On the connector of the command exits, reverse the wires 3, 4, 5 with the wires 6, 7, 8.
The commands ahead/back of the right engine are reversed.	Wrong link of the wires of the engine.	On the connector of the command exits, reverse the wires 3 and 5.
The commands ahead/back of the left engine are reversed.	Wrong link of the wires of the engine.	On the connector of the command exits, reverse the wires 6 and 8.
The right/left commands of the bow thruster are reversed.	Wrong identification of the wires of the joystick of the bow thruster.	On the connector of the command exits, reverse the wires 9 and 11.
The right/left commands of the stern thruster are reversed.	Wrong identification of the wires of the joystick of the stern thruster.	On the connector of the command exits, reverse the wires 12 and 14.
The commands up/down of the anchor winch are reversed.	Wrong identification of the wires of the joystick of the winch.	On the connector of the command exits, reverse the wires 12 and 14.

If you verify problems which are not contemplated in this table, contact the retailer or directly Micro Device's Customer Service.

5. Technical specifications

5.1. Transmitter

Feeding:	2 alkaline 1,5 batteries AAA (LR03) type
Absorption:	30mA in transmission
Cover:	In ABS with protection degree IP65.
Number of channels:	4, 6, or 8 according to the models.
Transmission code:	digital 16 bit
Dimensions (LxAxP)	55 x 98 x 40 mm
Weigh:	with batteries in, 60 g
Power of transmission:	<5mW ERP (range 50-100 m max)
Transmission frequency	916.5 MHz
Operating temperature:	from 0°C to +50°C
Optional:	Bow thruster switch. Stern thruster switch or anchor winch switch.

5.2. Receiver

Feeding:	12 VDC o 24 VDC ± 5 % max
Absorption:	max 2W
Container:	In polycarbonate with protection degree IP65.
Dimensions (LxAxP)	connector included, 175 x 155 x 56 mm
Weigh:	connector included, 320 g
Range of the contacts of the exits:	up to 2A, 30Vdc / 0.6A , 115Vac
Frequency of carrying:	916.5 MHz
Operating temperature:	from 0°C to +50°C
External acoustic signal exit:	up to 30 mA, 12 VDC ± 5 %
Optional:	Bow thruster switch. Stern thruster switch or anchor winch switch.

6. Warranty

Each Yacht Controller system is guaranteed for 24 months, as from the date of sale to the first user.

The warranty on the Micro Device S.r.l equipment is effective for all the possible faults of manufacture, material and for all the breakdowns not imputable to the customer. Regarding the installation and the eventual maintenance operations, these are of competence and responsibility of the installer.

All breakdowns imputable to the customer or due to force majeure, natural events and all the faults caused by improper use of the equipment, are not covered by the warranty.

Warranty is valid at the following conditions only:

- Installation must be made by a qualified installer.
- Electronic parts must be integral, not disassembled, tampered or modified.
- Warranty decays in case of equipment damaged by water.
- Defective equipment must be sent back in original package complete of all the accessories.
- Package must be sent back by the engineer that has installed your Yacht Controller with a brief description of the problem.
- Package must show on the cover, near the address of the sender, the Number of Authorization to the Re-entry "NAR" given by Micro Device's Customer Service, tel. +39 02 6131001.
- Transport is however and always at senders charge.
- All the parcels in assigned port and/or without NAR will be rejected.
- The Manufacturer Company responsibility is limited to the substitution or repair of the equipment which, to its unquestionable judgment, presented a manufacture defect.
- The constructor and the retailer are exonerated by every responsibility or obligation for any accident and/or damage to the people and/or to the property that can take place for and during the use of the equipments, even if for causes or dependencies of defect of the same ones.

The repair or replacement of the equipment, during the warranty period, does not have the effect to extend the warranty itself.
These conditions do not mean to cancel the effects of laws or regulations to protection of the consumer.

Yacht Controller can be subjected to modifications without notice: if differences or ambiguities were found, please consult the retailer.

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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 the electronics control: _____ **Engines:** _____

Receiver matriculation number: _____ **Transmitter matriculation number:** _____

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Colour of the right engine wires

Boat	Radio Command

Colour of the right engine wires

Boat	Radio Command

Colour of the bow thruster wires

Boat	Radio Command	
		left/up
		Common
		Right/Down

Colour of the stern thruster/winch wires

Boat	Radio Command

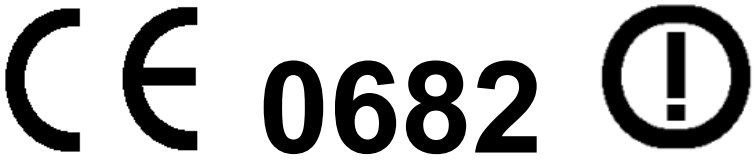
Installation: _____ Fly ☐ ☐ Hall
Feeding: _____ 12 V ☐ ☐ 24 V
Right engine: reversed wires: _____ Yes ☐ ☐ No
Left engine: reversed wires: _____ Yes ☐ ☐ No
Bow Thruster: reversed wires: _____ Yes ☐ ☐ No
Stern Thruster: reversed wires: _____ Yes ☐ ☐ No
Check range: _____ 30 ☐ ☐ More:
Notes: _____

_____

_____

Date of the test Engineer Signature

7. CE Mark



YACHT CONTROLLER IS A SYSTEM IN COMPLIANCE WITH THE FOLLOWING CE NORMS:

- DIRECTIVE 1999/05/CE
- DIRECTIVE ELETTROMAGNETIC COMPATIBILITY 89/336/CEE
- EN 60945 FOR TRANSMITTERS IN NAUTICAL ENVIROMENT
- EN 61 000-4-3 ELETTROMAGNETIC COMPATIBILITY (EMC)
- EN 61 000-4-2 IMMUNITY TO THE ELECTROMAGNETIC DISCHARGES (ESD)

IMPORTANT REMARKS
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Micro Device s.r.l Via Bellini, 31/33 20095 Cusano Milanino (MI) Italy
Tel. +39 02 6131001 r.a. Fax. +39 02 66400086 E-mail mdevice@tin.it

Conformity Declaration

The Constructor:

Micro Device S.r.l.

Via Bellini, 31/33 20095 Cusano Milanino (MI)

declares that the product:

Yacht Controller

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

Cusano Milanino, 8/5/2003

The General Manager

Giuseppe Brianza

Appendix

The receiver is supplied with an exit connector assembled with cables of the length of about a meter. The colours have been chosen to make easier the connection with several electronic switchboards.
Below is provided a table of the correspondences between the colour of the cables and the activation exits for the managed electronic switchboards.

MICROCOMMANDER SYSTEM				
Pin	Description	Colour of the exit connection	Colour of the wires on the boat	Foreseen colour(1)
1	Feeding +	White/Red		
2	Feeding -	White/Black		
3	Right engine ahead	Blue		Blue
4	Right engine common	Green		Green
5	Right engine back	Yellow		Yellow
6	Left engine ahead	Yellow		Yellow
7	Left engine **common**	Green		Green
8	Left engine back	Blue		Blue
9	Bow thruster left	Grey/Blue		
10	Bow thruster common	Grey		
11	Bow thruster right	Grey/Black		
12	Stern thruster left or anchor winch up	Yellow/Black		
13	Stern thruster common or Anchor	Yellow/Green		
14	Stern thruster right or anchor winch down	Yellow/Red		
15	N.C. (eventual acoustic signal +)			
16	N.C. (eventual acoustic signal -)			

1) It depends on the regulation of the sense of working of the actuator of the reverser selected on the electronic switchboard.

VOLVO EDC SYSTEM				
Pin	Description	Colour of the exit connection	Colour of the wires on the boat	Foreseen colour(1)
1	Feeding +	White/Red		
2	Feeding -	White/Black		
3	Right engine ahead	Yellow		Green\Yellow
4	Right engine common	Orange		Green\Orange
5	Right engine back	Black		Green\Black
6	Left engine ahead	Black		Green\Black
7	Left engine common	Orange		Green\Orange
8	Left engine back	Yellow		Green\Yellow
9	Bow thruster left	Grey/Blue		
10	Bow thruster common	Grey		
11	Bow thruster right	Grey/Black		
12	Stern thruster left or anchor winch up	Yellow/Black		
13	Stern thruster common or Anchor	Yellow/Green		
14	Stern thruster right or anchor winch down	Yellow/Red		
15	N.C. (eventual acoustic signal +)			
16	N.C. (eventual acoustic signal -)			

MORSE KE4, KE5, KE6 SYSTEM				
Pin	Description	Colour of the exit connection	Colour of the wires on the boat	Foreseen colour(1)
1	Feeding +	White/Red		
2	Feeding -	White/Black		
3	Right engine ahead	Red		Red
4	Right engine common	Pink		Pink
5	Right engine back	Orange		Orange
6	Left engine ahead	Orange		Orange
7	Left engine common	Pink		Pink
8	Left engine back	Red		Red
9	Bow thruster left	Grey/Blue		
10	Bow thruster common	Grey		
11	Bow thruster right	Grey/Black		
12	Stern thruster left or anchor winch up	Yellow/Black		
13	Stern thruster common or Anchor	Yellow/Green		
14	Stern thruster right or anchor winch down	Yellow/Red		
15	N.C. (eventual acoustic signal +)			
16	N.C. (eventual acoustic signal -)			

1) It depends on the regulation of the sense of working of the actuator of the reverser selected on the electronic switchboard.

TELEFLEX EC SYSTEM				
Pin	Description	Colour of the exit connection	Colour of the wires on the boat	Foreseen colour(1)
1	Feeding +	White/Red		
2	Feeding -	White/Black		
3	Right engine ahead	Green		Green
4	Right engine common	Brown		Brown
5	Right engine back	White		White
6	Left engine ahead	Green		Green
7	Left engine common	Brown		Brown
8	Left engine back	White		White
9	Bow thruster left	Grey/Blue		
10	Bow thruster common	Grey		
11	Bow thruster right	Grey/Black		
12	Stern thruster left or anchor winch up	Yellow/Black		
13	Stern thruster common or Anchor	Yellow/Green		
14	Stern thruster right or anchor winch down	Yellow/Red		
15	N.C. (eventual acoustic signal +)			
16	N.C. (eventual acoustic signal -)			

1) It depends on the regulation of the sense of working of the actuator of the reverser selected on the electronic switchboard.