MYW868B/CP

WIRELESS
YACHT
CONTROL
SYSTEM

Operating Instructions

ASTEL
MARINE

CONTENTS

PREFACE

The MYW868B/CP is a RF microprocessor based yacht remote control system specially designed for yacht engines, bow thrusters and anchor windlass controlling. The high quality foil keyboard and relays together with a special software protocol enable high reliability yacht controlling. The transmitter is built in an ergonomic and waterproof casing which enables simple management and bearing.
This remote control system comes in three versions. Version MYW868B/CP-3 controls the vessel's engines and anchor windlass; version MYW868B/CP-4 controls the vessel's engines, anchor windlass and bow thruster; and version MYW868B/CP-5, in addition to engine and bow thruster control, also features stern thruster control.

FEATURES

- Port Engine Control
- Starboard Engine Control
- Anchor Windlass Control
- Bowthruster Control
- Sternthruster Control
- Transmit LED Indicator
- Low Battery LED Indicator
- ABS Casing With IP65 Protection
- Low-Power Consumption
- Simple Connecting

PRECAUTIONS

- The remote control system has to be installed and used in accordance with the instructions of this manual only.
- The power supply has to be disconnected before installation.
- Avoid using the remote control system under the presence of appliances generating strong magnetic fields like mobile phones, radar, wheather station, etc.
- If the remote control system is used with gas engines the system components must be located away from areas with danger of explosion.
- Do turn power off immediately and refer servicing to qualified service personnel if the remote control system does not operate normally following the operating instructions.

DESCRIPTION

The Wireless Yacht Control System MYW868B/CP is composed of transmitter and receiver units. The transmitter - 'Remote Controller' – is fitted in ergonomic plastic casing and is managed by operator. The receiver is installed in a suitable place and it has all necessary electronics for connection to the motor boat control systems.

MYW868B/CP has many systems to achieve safe and high reliability:

- ***Frequency and output power***:

MYW868B/CP is designed for ISM/SRD frequency band 1f – 868.000 to 868.600 MHz, and works at frequency 868.2772 Mhz. The fact that output power is limited and this frequency band is limited to the SRD – short radio devices, the possibility of disturbance from other equipment is very small. Also the output power of MYW868B/CP is limited in a way that enough distance is achieved and at the same time the disturbance from other MYW868B/CP is limited to the minimum. Also there is no disturbance from other equipment, working on different frequencies (GSM, etc).

- ***TDM - Time Domain Multiplexing:***

The time domain multiplexing is used because all the MYW868B/CP are transmitt in the same frequency. This mean that each transmitter transmitt in selected time frame only for selected time interval. In the next time interval the next transmitter transmitt, etc. With this method many of the MYW868B/CP can communicate on the same frequency as is defined in ISM/SRD band 1f directive.

- ***RGT - Random Generated Transmission:***

High reliability of the TDM method can be achieved only in condition that transmission is non-periodic. This can be achieved with random transmission time interval. This is partial naturally because the key pressing of users is randomly.
In the MYW868B/CP a special mechanism is added which helps to define random transmissions time interval. A special *RBG- random bit generator* is used for this purpose. The RBG has a relatively white spectrum – which guaranty high level of random transmissions.

- ***High reliability data transmission:***

MYW868B/CP has built-in very high reliability system for data transmission between transmitter and receiver. The data is synchronous, FSK modulated and Manchester coded.
The MYW868B/CP has many systems for error correction and recognition. The error correction and recognition can be detected with parity checking, checksum checking and double data transmission checking.

a. *Double data transmission* – all the data transmitted is doubled. Each data is transmitted in two different records.

b. *Parity checking* – each of data byte has parity bit, a basic protection is achieved with this checking

c. *Checksum checking* – last transmitted byte is checksum byte, which is sum of all previous sent bytes.

- ***AIDR - Advanced Intelligent Data Recognition:***

MYW868B/CP has built-in highly advanced and intelligent algorithm for data management. The algorithm can detect and recognize the correct data received and make intelligent decision.
The receiver is checking the incoming data and with the help of systems for error correction and recognition the decision is made.

The receiver can receive data with errors or the receiver can miss the complete data packet. The decision depends on current status - *moving boat* (when at least one key is pressed or switch moved) or *stopped boat* (when no key is pressed or no switch is moved)

Moving boat decision:
The receiver is able to correct or cancel all wrong data packets.
After the fifth consecutive error in data packet **the boat is stopped** (this means that all the controls of any motor from the side of MYW868B/CP are stopped) and the sound signal and LED signal announce that there is problem with the communication.
If the complete data packets are missed in the time interval of 0.5s **the boat is stopped** (this means that all the controls of any motor from the side of MYW868B/CP are stopped) and the sound signal and LED signal announce that there is problem with the communication.

Stopped boat decision:
The receiver is able to correct or cancel all wrong data packets.
After the fifth consecutive error in data packet sound signal and LED signal announce that there is problem with the communication.
If the complete data packets are missed in the time interval of 3s the sound signal and LED signal announce that there is problem with the communication.

- ***Transmitter/receiver addressing:***

In the MYW868B/CP the 16 bit-addressing mode is used. The address of the transmitter and receiver is factory defined. Defined is together with the serial number. Each MYW868B/CP has its own address. In this way the maximum protection against unique addressing is achieved

- ***Electronics reliability:***

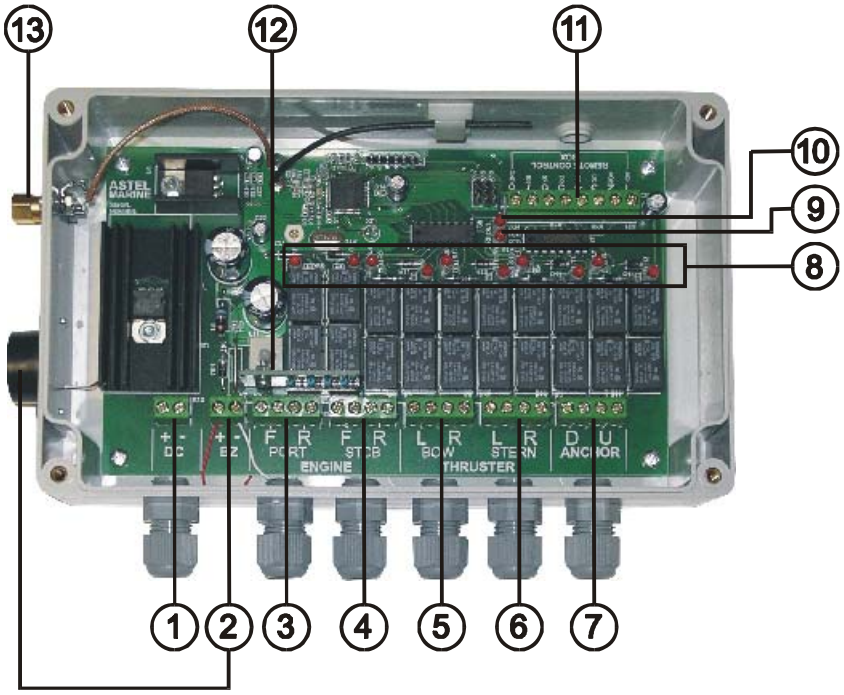
a. *Keys - transmitter, relays – receiver*:
MYW868B/CP is made of highest quality components on the market. The keys on the transmitter – RemoteController – are high quality sealed foil keys. The built-in foil keys are 100 % waterproof and moister protected.
The relay is the key component in the receiver. The high quality fully sealed relays were selected.
Double protection is done in the relay part. These means that for each control path two serially independent connected relays are used. The reliability is doubled in this way.

b. *Low voltage functionality, immunity*
The power supply voltage is 12-24VDC. But the receiver needs only 7-8 VDC for normal operation. The low power supply voltage was achieved with the use of low voltage relay – 5VDC and the receiver part power supply of only 3.3VDC. The importance of low power supply is important when the accumulator voltage drops below 12VDC because of high current users (bow thruster, anchor motor,etc) so that receiver can work without any problems.
The power supply part is protected by many filters which guaranty high reliability also in bad conditions.

c. *Low bat indication:*
RemoteController/transmitter has built-in logic for low battery indication. In the case that battery voltage is below than level of reliable functionality the RemoteController has built in LED indicator which indicate the low battery level.

CONTROLS AND CONNECTORS

MYW868B Basic Unit (Receiver)



(1) DC
Terminal block to connect DC power supply 12V to 24V.

(2) BZ
Terminal block to connect optional external buzzer. Standard buzzer is mounted on the casing and already connected.

(3) PORT ENGINE
Terminal block to connect control wires of port engine command.

(4) STBD ENGINE
Terminal block to connect control wires of starboard engine command.

(5) BOW THRUSTER (*)
Terminal block to connect control wires of bow thruster.

(6) STERN THRUSTER (**)
Terminal block to connect control wires of stern thruster.

(7) ANCHOR
Terminal block to connect control wires of anchor windlass.

(8) Relay LEDs
LEDs to show which relays are activated. For every pressed keys or switch one double relay is activated and LED lights.

(9) Receive LED
LED to show the signal interruption. If the received signal is not correct the LED starts to light and buzzer is activated.

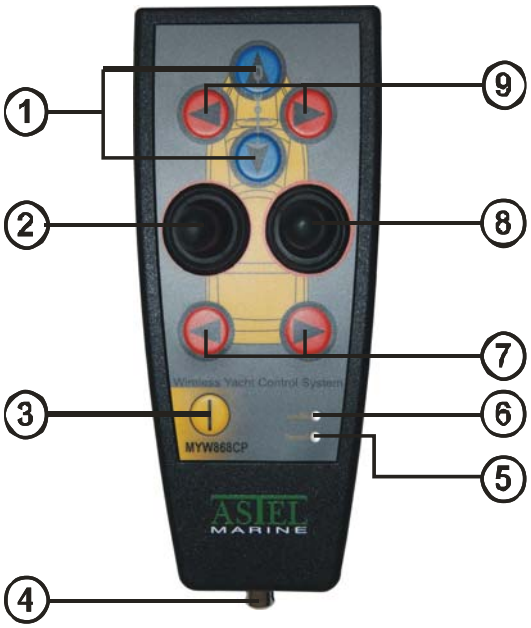
(10) Power on/communication LED
LED to show the internal communication. If the system work normally the LED blinks.

(11) REMOTE CONTROL BOX
Terminal block to connect control wires of Additinal Control Unit MYW868BE. (optionally)

(12) Resistors Adapter
The connector with spacer support to insert different Resistors Adapters to control engines with potentiometer type control heads.

(13) Antenna connector
SMA male connector to connect the antenna. (included)

MYW868CP Remote Controller (Transmitter)



(1) Anchor windlass control – up/down
By pressing the control keys the anchor windlass is activated to move anchor up and down.

(2) Port engine control – forward/reverse
By pressing the port control switch the system will command Ahead or Astern with Idle RPM.

(3) Power on/off key
By pressing this key for 3 seconds the transmitter is switched on. The green LED starts to blink. By pressing this key another time for 3 seconds the transmitter is switched off. The green and red LEDs light for a second.
Also if no one key or switch is activated the transmitter is switched off automatically after 15 minutes

(4) Strap lug
The strap is attached by passing the narrow end of the strap through the strap lug and then by passing the other end through the loop.

(5) Transmitt LED
The green LED indicate the transmission mode. When one or more keys or switches are pressed the LED starts to blink quickly.

(6) Low Bat LED
The red LED indicate that the battery voltage is too low for operation. The battery have to be replaced as soon as possible.

(7) Stern-thruster control – left/right (**)
By pressing the control keys the stern-thruster will be activated to move the boat left or right.

(8) Stbd engine control – forward/reverse
By pressing the starboard control switch the system will command Ahead or Astern with Idle RPM.

(9) Bow-thruster control – left/right (*)
By pressing the control keys the bow-thruster will be activated to move the boat left or right.

(*) – only for models MYW868B/CP-4 and MYW868B/CP-5
(**) – only for model MYW868B/CP-5

INSTALLATION

The system consists of the following components:

- MYW868B basic unit
- MYW868CP remote controller
- Resistor adapters pack
- Antenna
- 2 x CR2 battery
- Strap
- Wall-mount bracket with screws

All the diagrams in this manual show the installation of the remote control system to the motor boat of a complete twin engine propulsion system with built-in anchor windlass, bow and stern thrusters.

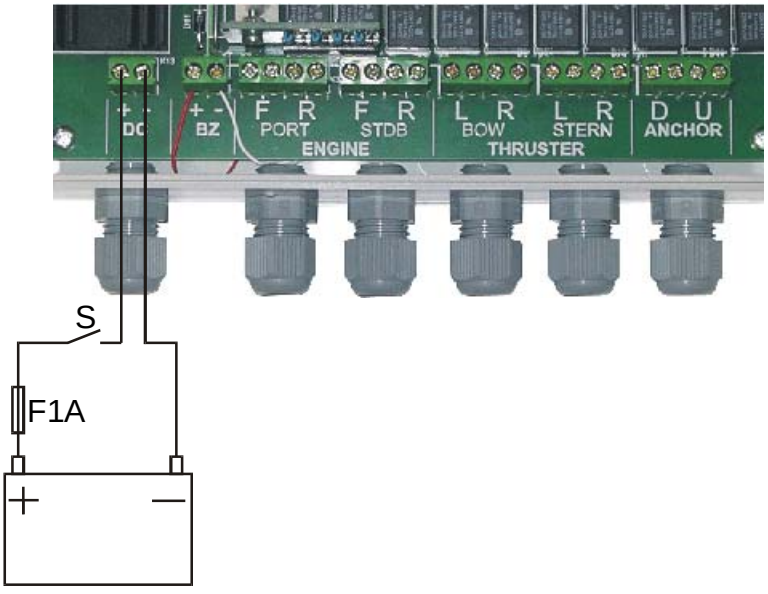
MYW868B Basic Unit (Receiver)

The MYW868B basic unit have to be installed near the control board. Avoid the installation in engine room, extremely hot places and near appliances generating strong magnetic fields.
The installation have to be realize by a qualified personel. Use only the cables with wires from 0.75mm^2 to 1.5mm^2, not more than 1.5 m long. The wiring kit is also available. (not included)

Note:

- ***The main DC power supply has to be switched off before installation.***

Power supply connection
The power supply have to be connected through the switch (not included) and protected with a fuse (not included) to the DC terminal block connector with right polarity. The power supply voltage have to be from 12 - 24VDC.



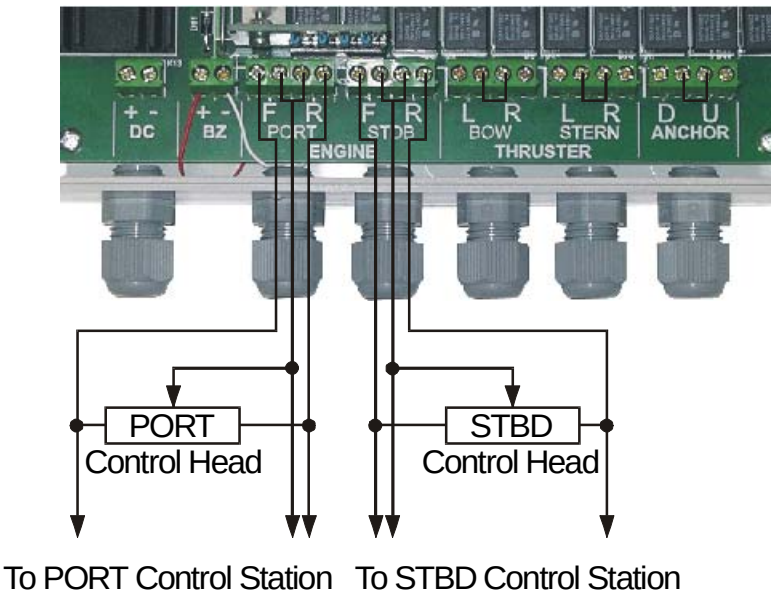
External buzzer connection
The external buzzer (not included) can be connected directly to the BZ terminal block or through the relay in case of high power consumption. The standard buzzer is also included and already connected.

Port and Starboard Engine connection (Appendix)
The MYW868B/CP remote control system is designed to control different engines with electronic commands specially with potentiometer type control heads. By the help of Resistor Adapters Pack many different electronic commands can be connected.

a) Check all the Resistors Adapters and find the correct type. The type of electronic command is printed on every Resistors Adapter.
The potentiometer type electronic commands for which the special Resistor Adapter is not included there is also the universal type of Resistor Adapter with trimmer potentiometers to adjust the correct control voltage. (see “Adjusting the control voltage”)

b) Insert the selected Resistor Adapter into the connector and spacer support.

c) Connect the 3-wire cable in parallel with the port control head wires and another 3-wire cable in parallel with the starboard control head wires. Other end of cables push through the cable bushings and connect to the terminal block connector marked with F (forward) and R (reverse) PORT and STBD ENGINE.
The two contacts in the middle of terminal block are factory bridged and the unit is prepared to connect the potentiometer type, 3-wires control heads.
In case of special control heads the bridges can be removed. (Please contact your dealer for more information.)



ADJUSTING THE CONTROL VOLTAGE

Note:

- ***The control voltage adjustment have to be done after the complete system installation is finished.***

If the vessel is equipped with the engine's electronic commands for which the Resistors Adapter is not included the following adjustments can be achieved:

a) Insert the Resistor Adapter with trimmer potentiometers into the connector and spacer support.

b) Connect the 3-wire cable in parallel with the port control head wires and another 3-wire cable in parallel with the starboard control head wires. Other end of cables push through the cable bushings and connect to terminal block connector marked with F (forward) and R (reverse) PORT and STBD ENGINE.

c) Switch-on the main DC power supply and apply the DC power to the control heads.

Note:

- ***Only switch-on the power supply to the control heads but not start the engines.***

d) Move the Port control lever to Ahead detent and measure the voltage between F (forward) contacts on the PORT ENGINE terminal block connector.

e) Move the Port control lever to Neutral detent and position the Port switch on the MYW868CP remote controller to forward gear.
Measure the voltage between the F (forward) contacts on the PORT ENGINE terminal block connector. By the help of trimmer TP1 on the Resistor Adapter adjust the same voltage as measured with the lever on Ahead detent position. The voltage can be adjusted 2 – 5 % different then measured to secure the throttle lever to Idle or few percent higher RPM.

f) Move the Port control lever to Astern detent and measure the voltage between R (reverse) contacts on the PORT ENGINE terminal block connector.

g) Move the Port control lever to neutral detent and position the Port switch on the MYW868CP remote controller to reverse gear.
Measure the voltage between the R (reverse) contact on the PORT ENGINE terminal block connector. By the help of trimmer TP2 on the Resistor Adapter adjust the same voltage as measured with the lever on Astern detent position. The voltage can be adjusted 2 – 5 % different then measured to secure the throttle lever to Idle or few percent higher RPM.

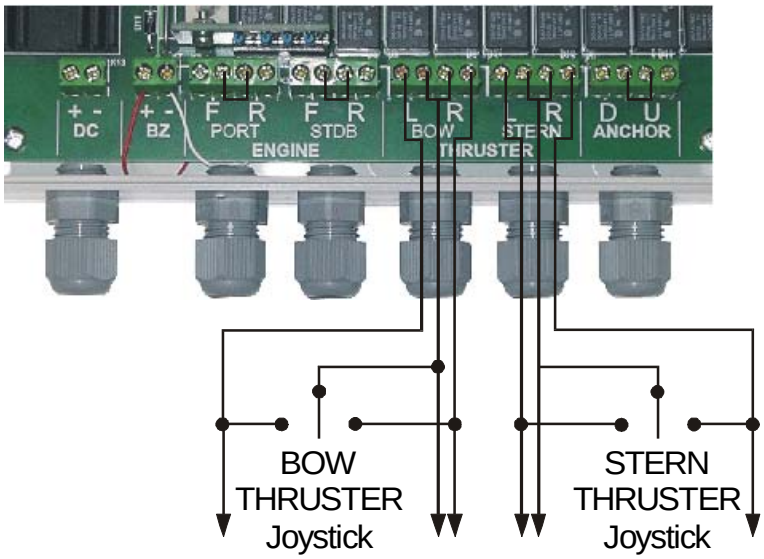
h) The same adjustment have to be done for Starboard engine commands but with adjusting the trimmer TP3 for F (forward) and TP4 for R (reverse) gear.

Bow and Stern Thruster connection

The MYW868B/CP remote control system is also designed to control the vessels with equipped Bow and Stern thrusters. The control wires have to be connected in paralell with Joysticks wires.

a) Connect the 3-wire cables in parallel with the Joysticks wires. Other end of cables push through the cable bushings and connect to the terminal block connectors marked with L (left) and R (right) BOW and STERN THRUSTER.
The two contacts in the middle of terminal blocks are factory bridged and the unit is prepared to connect the 3-wires joystick control Bow and Stern thrusters.

In case of special Bow and Stern thrusters control the bridges can be removed. (Please contact your dealer for more information.)



To BOW THRUSTER Control To STERN THRUSTER Control

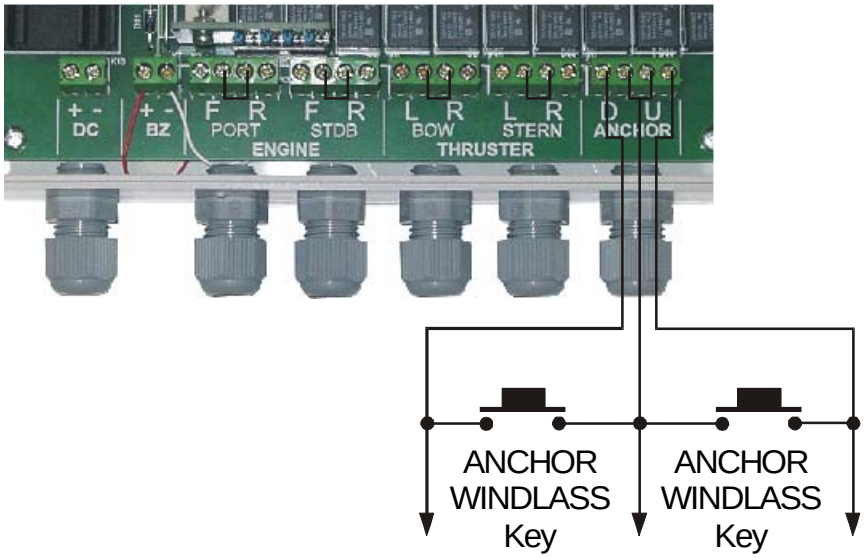
Anchor Windlass connection

The MYW868B/CP remote control system is also designed to control the vessels with equipped anchor windlass. The control wires have to be connected in paralell with anchor windlass control Switch wires.

a) Connect the 3-wire cables in parallel with the switch wires. Other end of cables push through the cable bushings and connect to the terminal block connectors marked with D (down) and U (up) ANCHOR windlass.

The two contacts in the middle of terminal blocks are factory bridged and the unit is prepared to connect the 3-wires anchor windlass control switch.

In case of special anchor windlass control the bridge can be removed. (Please contact your dealer for more information.)



To ANCHOR WINDLASS Control

Remote Control Box connection
If the yacht is fitted with a fly-bridge an optional control unit, MYW868BE, can also be supplied for secondary engine commands. (Please contact your dealer for more information.)

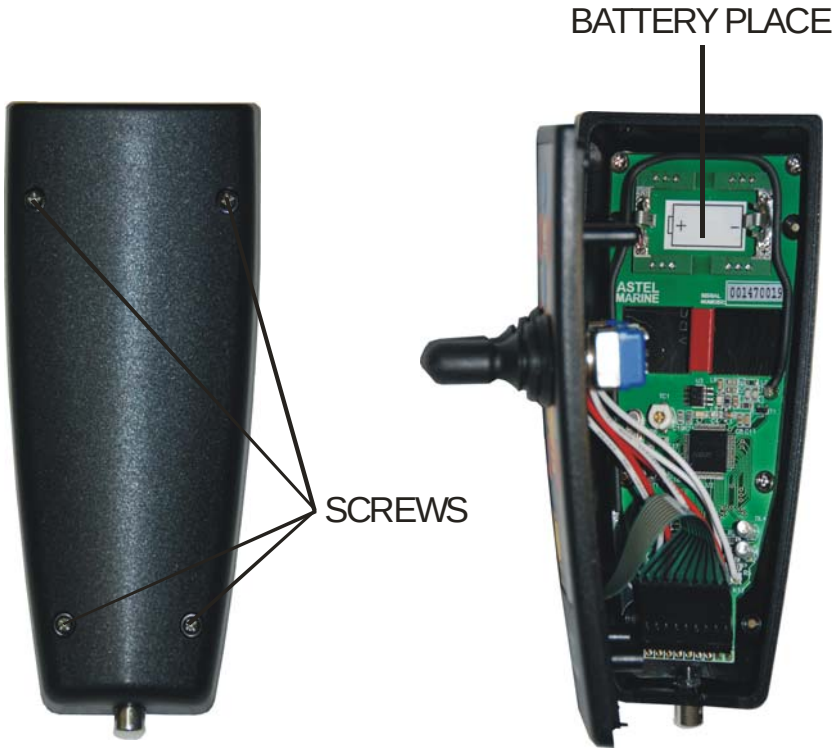
Antenna connection
The MYW868B basic unit is designed with an internal antenna. But if the unit is installed near metallic parts or the receiver casing is covered with a metal cover or with another equipment with metal casing the additional antenna can be connected to the antenna connector. But first the connector cap have to be removed.
If the unit is installed in the place closed for RF waves an external antenna (not included) can be connected to the antenna connector.

MYW868CP Remote Controller (Transmitter)

The MYW868CP is a RF wireless remote controller which is built in an ergonomic and waterproof casing. By the help of the wall-mount bracket can find a place very close to vessel's control head when is not in use.

a) Attach the strap by passing the narrow end of the strap through the strap lug and then pass the other end through the loop.

b) To insert the battery remove the screws on the bottom of the casing with screw-driver. Then open the casing and insert the CR 2 battery with the right polarity as printed on the board.
Close the cover and tighten the screws.



Note:

- ***When inserting the battery pay attention to the flat cable and connector. They have to be put inside the casing very carefully.***

TECHNICAL SPECIFICATIONS

Number of channels	6, 8 or 10
Transmission code	40 bit
Frequency	868 MHz

Transmitter

RF output power	max. 10 mW
Power requirement	3V lithium battery CR2
Operating temperature	0°C - +50°C
Casing	ABS, IP65 protection
Dimensions (L x W x H)	150 x 60 x 34 mm
Weight (incl. battery)	0.2 kg

Receiver

Power requirement	12 – 24VDC
Consumption	max. 300 mA DC
Operating temperature	0°C - +50°C
Casing	ABS, IP65 protection
Dimensions (L x W x H)	200 x 120 x 55 mm
Weight	0.5 kg

OPTIONAL ACCESSORIES

- Additional Remote Controller MYW868CP
- Additional Basic Control Unit MYW868B
- Additional Control Unit MYW868BE

Design and specifications subject to change without notice.

WARRANTY

1. The equipment manufactured by ASTEL d.o.o. is warranted to be free from defects in workmaship and materials under normal use and service.
2. This Warranty is in effect for of two years from the date of purchase by the user. Proof of purchase must be included, to establish that it is inside the warranty period.
3. This Warranty is transferrable and covers the product for the specified time period.
4. In case any part od the equipment proves to be defective, other than those parts excluded in paragraph 5 below, the owner should do the following:
   (a) prepare a detailed written statement of the nature and circumstances of the defect, to the best of the Owner's knowledge, including the date of purchase, the place of purchase, the name and adress of the installer, and the Purchaser's name, adress and telephone number;
   (b) the Owner should return the defective part or unit along with the statement referenced in the preceding paragraph to the warrantor, ASTEL d.o.o., or an authorized distributor, postage/shipping prepaid and at the expense of the Purchaser;
   (c) if upon the Warrantor's or authorized distributor's examination, the defect is determined to result from defective material or workmanship, the equipment will be repaired or replaced at the Warrantor's option without charge, and returned to the Purchaser at the Warrantor's expense;
   (d) no refund of the purchase price will be granted to the Purchaser, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so. Prior to refund of the purchase price, Purchaser must submit a statement in writing from a professional boating equipment supplier that the installation instructions of the Operating Instructions manual have been complied with and that the defect remains;
   (e) warranty service shall be performed only by the Warrantor, or an authorized distributor, and any attempt to remedy the defect by anyone else shall render this warranty void.
5. There shall be no warranty for defects or damages coused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment spacially designed as waterproof.
6. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives for injury to any person or persons, or damage to property, loss of income or profit, or any other consequential or resulting damage or cost which may be claimed to have been incurred through the use or sale of the equipment, including any possible failure or malfunction of the equipment, or part thereof.
7. The Warrantor assumes no liability for incidental or consequential damages of any kind including damages arising from collision with other vessels or objects.

DECLARATION OF CONFORMITY

according to IEC Guide 22 and EN 45014

Manufacturer's Name:	ASTEL, Podjetje za projektiranje, proizvodnjo in trgovino, d.o.o.
Manufacturer's Address:	Dutovlje 138 6221 Dutovlje Slovenija

declares that the products

Item, Product Name and Model Number:	1.Wireless Yacht Control System MYW868B/CP

conform to the following Product Specifications:

Radio Spectrum:	EN 300 220-1:1997
EMC:	ETS 300 683: 1997
Electrical Safety:	EN 60945: 2003

Supplementary Information:

The products herewith comply with the requirements of the following Directives and carry the CE-marking accordingly:

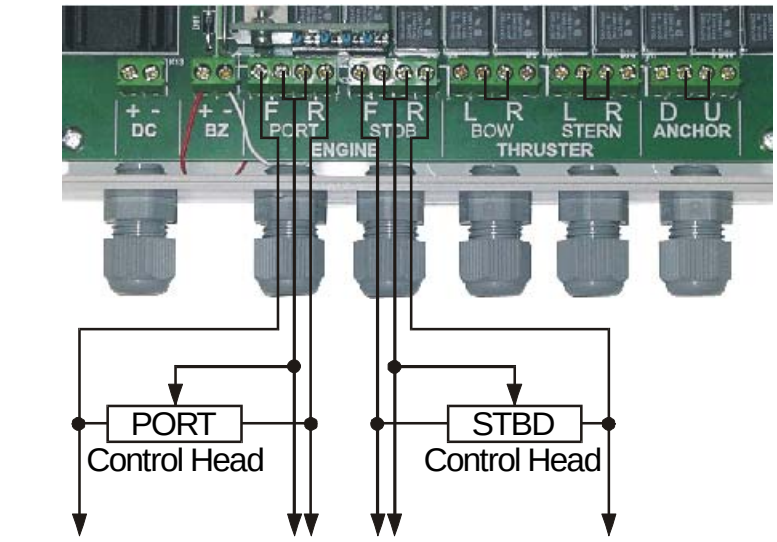
- the R&TTE Directive 1999/5/EC

ASTEL d.o.o.
Dutovlje 138
6221 Dutovlje
Slovenija

10th November, 2009

APPENDIX 1

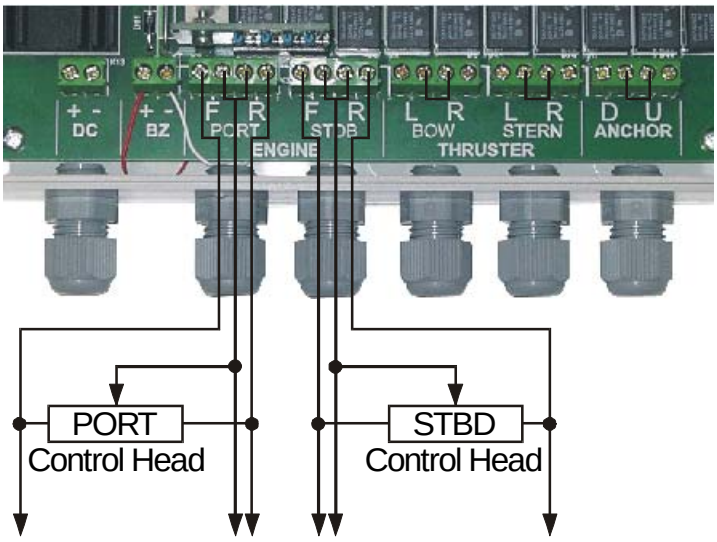
Connecting to "VOLVO PENTA (EDC)" control head



CONNECTOR		DESCRIPTION	WIRE'S COLOR
PORT ENGINE	F	FORWARD	Green / Black
	F+R (bridged)	COMMON	Green / Orange
	R	REVERSE	Green / Yellow
STARBOARD ENGINE	F	FORWARD	Green / Yellow
	F+R (bridged)	COMMON	Green / Orange
	R	REVERSE	Green / Black

APPENDIX 2

Connecting to "MATHERS-MICROCOMMANDER" control head



CONNECTOR		DESCRIPTION	WIRE'S COLOR
PORT ENGINE	F	FORWARD	Blue (5)
	F+R (bridged)	COMMON	Green (6)
	R	REVERSE	Yellow (7)
STARBOARD ENGINE	F	FORWARD	Blue (7)
	F+R (bridged)	COMMON	Green (6)
	R	REVERSE	Yellow (5)

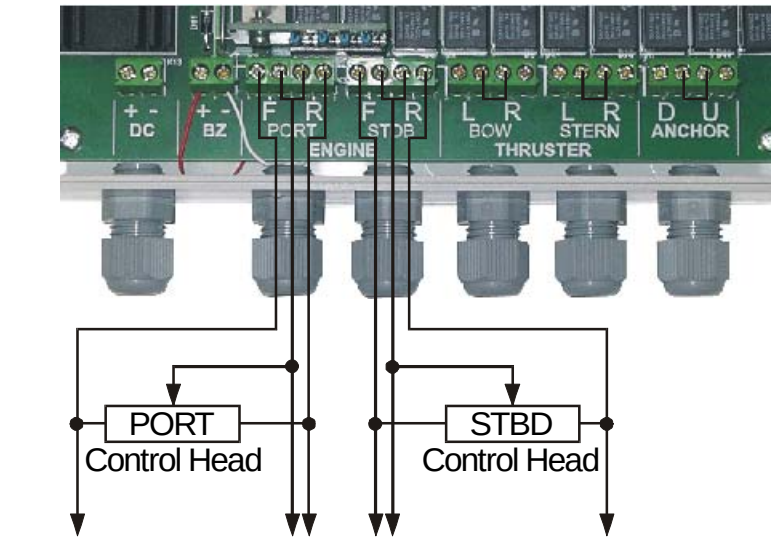
APPENDIX 3

Connecting to "REXROTH" control unit

CONNECTOR		DESCRIPTION	WIRE'S COLOR
PORT ENGINE	F	FORWARD	Brown
	F+R (bridged)	COMMON	Yellow – Green
	R	REVERSE	Blue
STARBOARD ENGINE	F	FORWARD	Brown
	F+R (bridged)	COMMON	Yellow – Green
	R	REVERSE	Blue
REMOTE CONTROL BOX	3 – DC		Pink
	4 – PF		White
	5 – PR		Brown
	6 – SF		Yellow
	7 – SR		Green
	8 – GND		Blue

APPENDIX 4

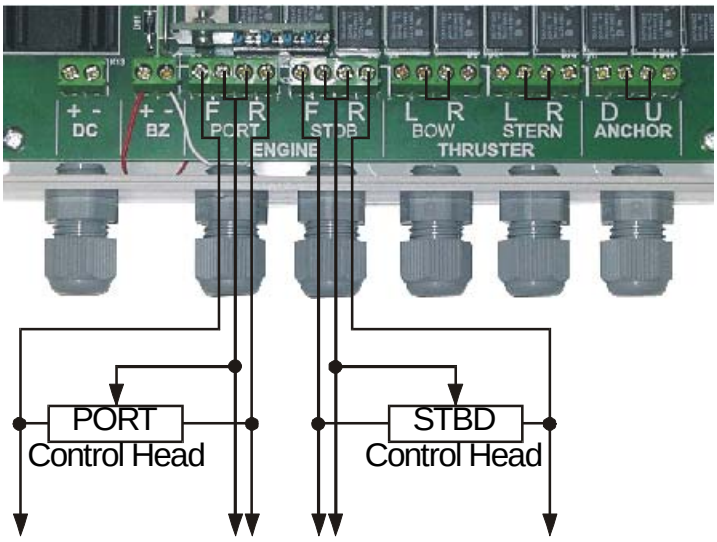
Connecting to "VOLVO PENTA (EVC)" control head – without Neutral Switch



CONNECTOR		DESCRIPTION	WIRE'S COLOR
PORT ENGINE	F	FORWARD	Red / Yellow
	F+R (bridged)	COMMON	Red / Green
	R	REVERSE	Red / Blue
STARBOARD ENGINE	F	FORWARD	Red / Yellow
	F+R (bridged)	COMMON	Red / Green
	R	REVERSE	Red / Blue

APPENDIX 5

Connecting to "VOLVO PENTA (EVC)" control head – with Neutral Switch



CONNECTOR - MYW868B		DESCRIPTION	WIRE'S COLOR
PORT ENGINE	F	FORWARD	Red / Yellow
	F+R (bridged)	COMMON	Red / Green
	R	REVERSE	Red / Blue
STARBOARD ENGINE	F	FORWARD	Red / Yellow
	F+R (bridged)	COMMON	Red / Green
	R	REVERSE	Red / Blue

Connecting the Neutral Switch wire to Additional Control Unit MYW868BE:

CONNECTOR – MYW868BE		DESCRIPTION
PORT ENGINE	K3 – left pin	Cut the Black / Blue wire and connect one side to K3 and other side to K8
	K8 – right pin	
STARBOARD ENGINE	K4 – left pin	Cut the Black / Blue wire and connect one side to K4 and other side to K7
	K7 – right pin	

Connecting the Additional Control Unit MYW868BE to Basic Control Unit MYW868B with 6-wire multi-core cable:

CONNECTOR – MYW868BE	CONNECTOR – MYW868B
1 – DC	3 – DC
2 – PF	4 – PF
3 – PR	5 – PR
4 – SF	6 – SF
5 – SR	7 – SR
6 – GND	8 – GND

ASTEL d.o.o., Dutovlje 138, 6221 Dutovlje, Slovenia
Tel: +386 5 7310771, +386 5 7310772
Fax:+386 5 7310789
E-mail: info@astel-marine.com
Web: www.astel-marine.com