

**TOSLON<sup>®</sup>**



**XR310**

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Owner's Manual



# Preface

As Yachting Electronic Co., Ltd is continuously improving this product, we retain the right to make changes to the product at any time which may not be reflected in this version of the manual. Please contact your dealer if you require any further assistance.

It is the owner's sole responsibility to install and use the instrument and transducers in a manner that will not cause accidents, personal injury or property damage. The user of this product is solely responsible for observing safe boating practices.

 **Warning:** disassembly and repair of this electronic unit should only be performed by authorized service personnel. Any modification of the serial number or attempt to repair the original equipment or accessories by authorized individuals will void the warranty.

We may find it necessary to change or end our policies, regulations and special offers at any time. We reserve the right to do so without notice. All features and specifications subject to change without notice.

# Special words

The following words were specially defined for XR310 using instruction:

CCS:	Cruise Control System
BCS:	Boat Control System box of XR310
L.BBOX:	left bait-box
R.BBOX:	right bait-box
CLS.BX:	close the bait-box
M.light:	main light
D.lights:	daytime running light
T.light:	tail light
Config:	configuration
Def.:	definition
SPD:	speed

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# Overview

XR310 is an autopilot system for R/C boat, which combined remote with advanced autopilot function.

## What's the advantage of XR310?



Press the joystick when giving joystick speed, to active CCS (Cruise Control System) mode.



Automatically decrease speed before boat arriving the target, much less noise for high speed boat.



Click the Joystick to select a point on map, and start autopilot.



Automatically return to HOME point after signal lost lasting 20s.

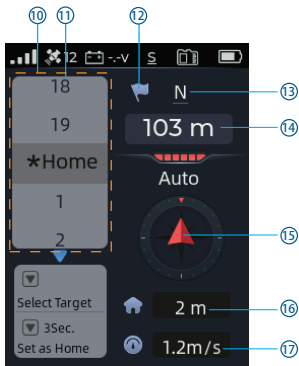
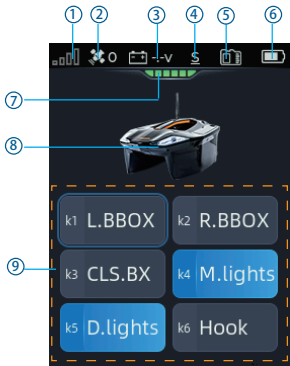


Can config to release bait-box, hook, light after boat arrive target.

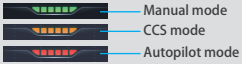


Can be fit to most bait boats on the market ( importing new boat setting from SD card is supported).

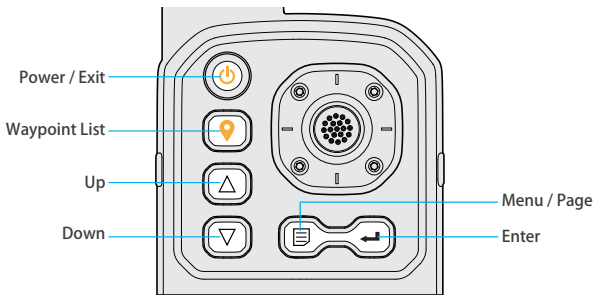
# What's on the display





① The strength of radio signal	⑩ Recently used waypoint list
② the number of satellites connected	⑪ Waypoint slot index <i>(will be marked with * when this slot was saved with position information)</i>
③ the Voltage of boat	⑫ Icon of Target
④ [S] Speedy Mode [D] Standard Mode	⑬ North Up mark or Target number
⑤ MicroSD card in	⑭ The distance from boat to target
⑥ Battery strength of handheld unit	⑮ heading direction of the boat <i>- in autopilot mode, it shows the heading with the reference of the line from the start point to target.</i> <i>-in manual mode, it shows the heading with north-up.</i>
⑦ the Mode of boat condition: 	⑯ The distance from boat to Home point
⑧ Icon of the selected boat type	⑰ Speed of the boat
⑨ SW Channels button	

# Keypad Instruction



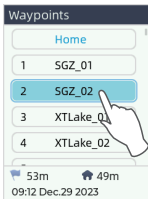
Power / Exit	<ul style="list-style-type: none"> <li>1) Power On / Off the unit.</li> <li>2) Exit the selection or Menu.</li> </ul>
Waypoint List	Used to quickly enter into waypoint list or go home by one-button pushing.
Up	<ul style="list-style-type: none"> <li>1) Move up menu or increase value of an option.</li> <li>2) Shortcut key for user defined function (please refer to page 32.)</li> </ul>
Down	<ul style="list-style-type: none"> <li>1) Move down menu or decrease value of an option.</li> <li>2) Shortcut to mark current position as Home point.</li> </ul>
Menu / Page	<ul style="list-style-type: none"> <li>1) Used to switch between main pages.</li> <li>2) Keep pressing 2s to open Menu settings.</li> <li>3) Exit the current menu and back to previous menu.</li> </ul>
Enter	<ul style="list-style-type: none"> <li>1) Finalizes menu selections; confirm a setting.</li> <li>2) ENTER key is also used to quickly save Home point.</li> </ul>

# Menu Selection and Confirmation

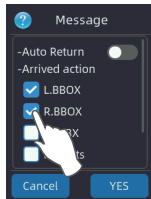
You can choose a menu or confirming an option with  $\triangle \nabla \leftarrow$  ( Up / Down and Enter key ).  
Additionally, you can also do it by sliding or clicking on the touch screen.



Sliding on the screen

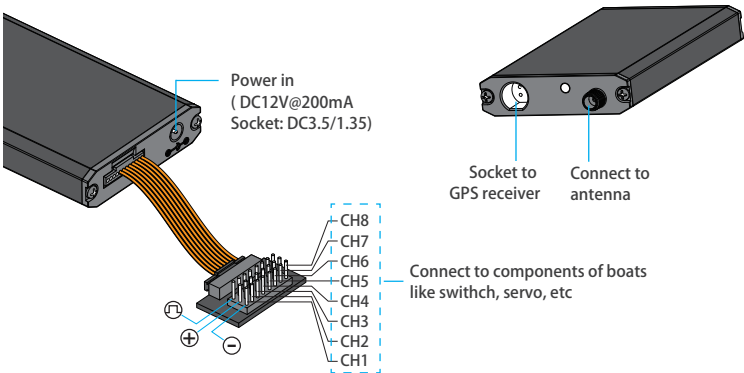


Click to confirm selection



Click to confirm an option

# Connection of BCS Box



The following figures instruct how to connect the BCS box of XR310 with your bait boat.

The system can control most 2 engines or 1 engine (with rudder) boat with proper settings.

1) for Xboat730, please connect CH1-CH6 to CCU of the boat.

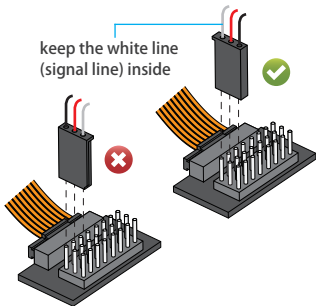
2) for other boats, please connect CH1-CH8 to the components like servo, switch, etc as requested by the boat.



**NOTE:**

1) please insert the connector correctly as shown in the right image, otherwise the boat will not work normally.

2) this connector doesn't supply power for external devices. If you devices (such as servo or lights) need taking power from the servo-cable, please connect external power source to this connector.



# Start Using

## Using CCS mode

To active CCS (Cruise Control System) mode, just press the joystick (as shown in the figure) when boat is running. Then the boat will keep running in a straight line under a certain speed.

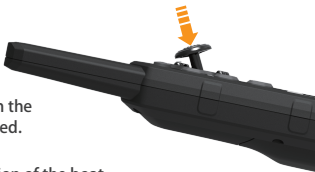


**NOTE:** under the CCS mode, you can steer the direction of the boat by controlling the joystick to left/right side without terminating the boat running.



**NOTE:** to terminate the CCS mode, just pull the Joystick down.

press to active CCS mode



Pull down to exit CCS mode



## Using Autopilot mode

### 1) Set HOME point



To set HOME point:

1) keep pressing the **Down** key for 2second. A message "Save as home?" appears.

2)Click **YES** to set current position as HOME point.

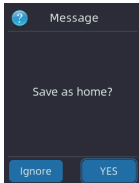


**NOTE:** after system was powered on, XR310 always take the 1st. position (where the GNSS received more than 6 satellites ) as the HOME position.

To avoid misoperation, please reset the HOME point before you start the autopilot mode.

### 2) Load a prestored waypoint to start the autopilot.

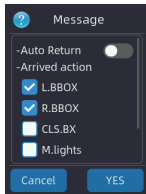
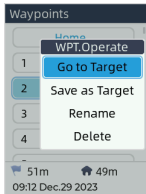
There are 2 ways to select a waypoint to active autopilot mode:





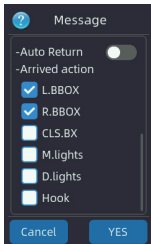
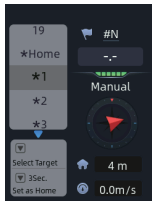
## 2.1) Load a waypoint from the waypoint list to start autopilot.

- Press **Waypoint List** key to enter into waypoint list.
- Use **Up/Down** key (or by sliding screen) to select a prestored waypoint, then press **Enter** to confirm.
- Click **“Go to target”** , a message appears to let you choose arrived action.
- Confirm the arrive actions, then click **YES**. The boat will start autopilot to the prestored waypoint.



## You could also load a prestored waypoint from the recently used waypoint list.

- Slid on the screen to select a waypoint with the index number.
- Click the index number (or press **Enter** key to confirm the selection), a message of arrived action appears.
- Choose and confirm the arrived action, then click **YES**. The boat start autopilot to the prestored waypoint.



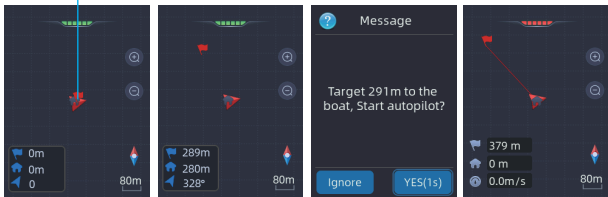
**NOTE:** what does arrive action means?

- Arrive Actions: to determin what the boat will do when it reach the target:
  - L.BBOX: open the left bait-box.
  - R.BBOX: open the right bunker box.
  - Hook: releas the hook.
- Auto Return: if enabled, the boat will return to HOME point automatically after it finish the actions.

## 2.2) Select point by touching screen

- Press **Menu/Page** key to switch to [Map] page, then press down the joystick vertically (when the joystick is at middle position), a red flag icon appeared.
- Move the red flag icon to a position by pushing the joystick, then press **Enter** key, a message appears to ask if start the autopilot?
- Click **YES** to start the autopilot.

Red flag icon

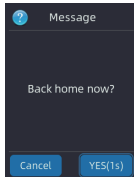


### 3) Return to HOME



How to return to HOME point quickly?

- Keep pressing the **[Waypoint List]** key for 2seconds a message appears to ask if back to HOME.
- Click **YES**, then boat will start back to HOME point automatically.



**NOTE:** to terminate the autopilot mode, just pull the Joystick down.

Pull down to exit autopilot mode

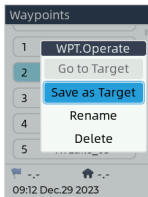


## How to save a waypoint?

When the boat reaches a certain point on the lake, where you need to save as a new waypoint, please do the following steps:

- Press **[Waypoint List]** Key to enter into waypoint list.
- Use **Up/Down** key (or by sliding screen) to select a blank slot, then press **Enter** key.
- Chose **“Save as target”** , then the current position will be saved as a waypoint with a default name.

To change the default name of waypoint, please just click it, then choose **“Rename”** to edit.

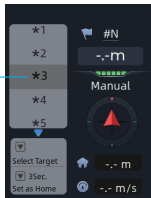


## Recently used waypoint list

XR310 generally shows 20 waypoints on the recently used waypoint list.

On the middle position, it always shows the waypoints that be selected lastly from the waypoint list menu.

No.3 waypoint was shown on the middle position



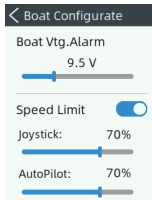
No.3 waypoint was selected

# Menu Setting

## Basic

### Boat Config

- Boat Vtg. Alarm: alarm appears when the input battery voltage of the boat is equal to or less than the setting.
- Speed Limit: enable to limit the max speed which the boat can reach.
  - Joystick: 70% means when control the boat by joystick, the max speed of the boat was limited to 70% of the real top speed.
  - AutoPilot: 70% means in the autopilot mode, the max speed of the boat was limited to 70% of the real top speed.



## Handheld Unit

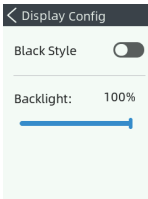
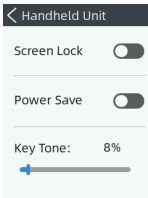
Used to set configuration of handheld unit.

- Screen Lock: enable to lock the screen while there is no any operation within 30s.
- Power Save: the backlight will be dimming to save power when there is no any operations in 30 sec.
- Key Tone: set the volume of Key Tone.

## Display Config

Used to set configuration of display.

- Black Style: to set the background style of display.
- Backlight: adjust the brightness of backlight.





## **Simulator**

Used to let you practicing using the device as if you were on the water.

## **Advanced**

Enable to enter into advanced setting.

# System

## Language

Select the display language for menus.

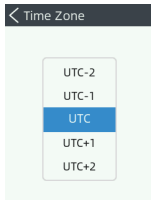
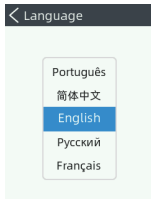
## Time Zone

Selects UTC time for using in different countries.

For example:

- Germany, France, Cetherland, Italy, Poland : UTC+1
- Bulgaria, Romania, Ukraine, Greece: UTC+2
- Russia: UTC+3

For your UTC time, please refer: <http://www.worldtimezone.com>



## Compass Cali.

Used to make the calibration of compass. After install the device to a new boat or move to an new enviroment, strongly recommend to re-calibarate the compass.

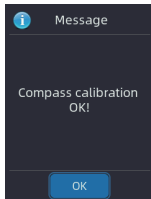
How to make compass calibration?

- Select **Compass Cali.** from menu list.
- A message appear to ask you rotate the boat.
- Rotate the boat as request, until a message "Compass calibration ok!" appears.

Now the compass calibration was finished.



**NOTE:** DO NOT calibrate the compass in a house or car!

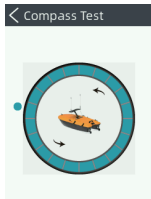
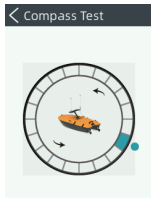


## Compass Test

Used to check if compass working normal or not.

How to make compass test?

- Select **Compsss Test** from Menu list, then press **Enter** key.
- A message appear to ask you rotate the boat.
- Plese rotate the boat clockwise & counterclockwise to see if the circular ring was full with green square. If yes, it means the compass working normal. Otherwise, pleases make the compass calibration again.



## Radio Bind

Used to bind the Handheld unit with BCS box.

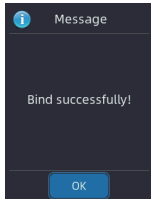
How to make the Radio Bind?

- Select **Radio Bind** from menu list, then press **Enter** to confirm the selection.
- A message appears to ask you restart the boat.
- Restart the boat, a message "Bind successfully" will appear in few seconds.

Now the handheld unit was successfully binded with the BCS box.

## System Info

Show system information of the device.



# Advanced Cfg

Under the **[Basic]** menu list, after enable the **[Advanced]** option, all advanced parameters menu will be shown.

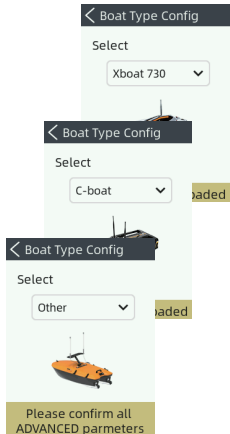


**Note:** **[Advanced]** options is recommended for boat factories or skilled engineers only.

## Boat Type config

Used to match the device with different bait boat.

- Xboat: match with Toslon Xboat730
- Cboat: match with Cboat
- Others: match with other bait boat



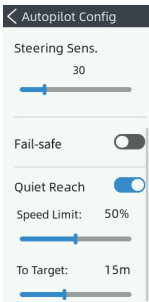


**Note:** before using the device, please select the correct boat type.

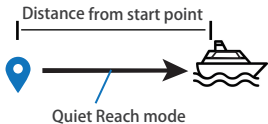
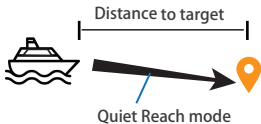
## Autopilot Config

Used to make configuration of the autopilot functions:

- **Steering Sens.:** Adjust the steering sensitivity of autopilot, normally higher speed, lower steering-sens.
- **Fail-safe:** if enable this option, boat will return back automatically after signal lossing last 20s.
- **Quiet Reach:** enable the option, the boat will automatically decrease the speed at the distance set in **[To Target]**, when it leave the start point or before approaching the target.
  - **Speed Limit:** to limit the speed when **[Quiet Reach]** mode was activated.



- To Target: to set the distance to active the **[Quiet Reach]** mode.



**Note:** **[Quiet Reach]** mode is only needed for high speed boat, or the boat which is noisy while running.

As default, when select boat type as XBOAT730, **[Quiet Reach]** option will be hidden.



## Receiver Config

Used to choose signal type and engine type for the boat.



**Note:** this menu appears only when you choose "Other" for the menu of **Boat Type Config**.

- Signal Type: choose signal type for the boat.
  - PWM: Enable to match the boat with PWM signal.
  - PPM: Enable to match the boat with PPM signal.
- Channels Reverse: is used to correct the running direction of motor (or rudder) after you found them did not run the correct direction as expected.

For example, if your boat are with 2 engines, and you found the engine suck in air (or the boat turning around on the water). When you want it to go straight, then you need to enable the channel reverse.

The screenshot shows the 'Receiver Config' menu with the following settings:

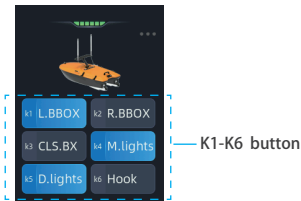
- Signal Type:** PWM (checked), PPM (unchecked)
- Channels Reverse:** CH1 (unchecked), CH3 (unchecked)
- Engine Type:** Single Engine (dropdown menu)
- Mixer:** Disabled (toggle switch)
- Rudder Angle:** 100% (slider bar)

- CH1: to correct the running direction of rudder (for boat with single engine).
- CH3: to correct the running direction of motor.
- Engine Type: select engine type for the boat.
  - Single Engine: boat with one engine and one rudder.
  - Dual Engines: boat with 2 engine.
  - Mixer: if the boat was built with standard commercial ESC & SERVO, normally you need enable the Mixer option.
  - Rudder Angle: to adjust the angle for the rudder.


## SW-Channel Def.

Used to define the function of K1-K6 button for using with other boat .

Different boat has different function. After you select "other boat" from **Boat Type** menu, then it' s necessary to define the function for the K1-K6 button on the main page.



- Selflock: when enable self-lock, the PWM signal will keep giving the certain pulse width, won't back to the middle point(1.5mS).

 Selflock enable: the button change color when being clicked.

 Selflock disable: the button does not change color when being clicked.

- Contact Channel: map the button to the channel of the receiver ( CH2, CH4~CH8).
  - On/Off: for the PWM signal, the middle point is 1.5mS, you can define a wider(plus) or narrower(minus) pulse width as on/off signal.



**NOTE:** for XBOAT730 and Cboat, the button of K1(L.BBOX ) and K2(R.BBOX) can not be selflock.

To open the left or right bait-box,  
click L.BBOX or R.BBOX button.



To close the bait-box, Click  
CLS.BX button



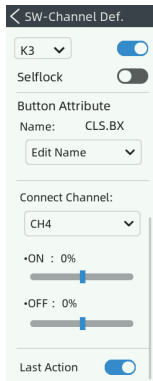
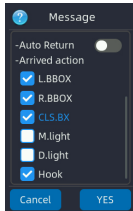
- Last Action: to define which one will be done at last in the [Arrive-actions] list.

For example:

1. K3 button (right image) was enabled [Last Action] option.
2. There are four actions in [Arrive-action] list were enabled.
3. CLS.BX is in blue color, means it's the last action.
4. After boat arrive the target, will do the following steps:
  - 4.1 Release left bait box
  - 4.2 Release right bait box
  - 4.3 Release hook
  - 4.4 Close both bait-box
  - 4.5 Return home (if [Auto Return] option was enabled )



**NOTE:** the button of [Last Action] will be marked in blue color in [Arrive action] list.



## How to make the SW-Channel Def.?

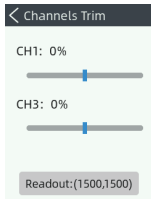
- Choose **SW-Channel Def.** from menu list, then press **Enter** key to confirm selection.
  - Select the Button (K1-K6) which you hope to define.
  - Select a name from the default setting for the button (or select **"user define"** to edit a new name )
  - Select a Channels (CH1-CH8)to match the button.
- Now the button was successfully defined.

## Channels Trim

Used to adjust the middle point of each servo, which is especially useful when this middle point cannot be mechanically fine adjusted.

CH1: to correct the running direction of rudder.

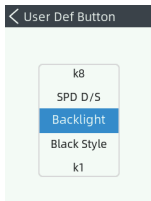
CH3: to correct the running direction of motor.



## User Def Button

Used to define shortcut function for the **Up** key.

For example, if you choose Backlight, then the **Up** key will be defined as a shortcut key to adjust backlight.



## Map Rotate

For XR310, there is no compass in handheld side, however the system can identify the facing direction of the operator after an autopilot mission started.

If enable [**Map Rotate**], system will use the operator facing direction instead of North-up.

## Set & Reset

Used to restore original factory setting.

# Packing List



1. Handheld
2. BCS box
3. GPS receiver
4. Sling
5. Power cable
6. Antenna
7. SMA radio cable
8. Channel Connector
9. Screws (4pcs)
10. Bracket of GPS receiver
11. Valcro



# Specifications

Handhelds	Screen Size	2.8" color TFT, 320*240 Pixels
	Touch Screen	capacitive touch screen
	SD card storage	Yes(8~32G)
	Waypoints Number	100
	Battery	2*14650 lithium battery (not included)
	Charger Port	USB type-c / DC5V 1A
	Battery life	8hr (with 1200mAH 14650 battery)
BCS-BOX (Boat Control System)	Signal Interface	PWM,PPM,Uart(optional)
	Channels of Receiver	8
	GNSS/Compass Port	RS232, 19200bps

BCS-BOX (Boat Control System)	Failing-safe	YES (automatically return to HOME point after signal lost lasting 20s)
	Power Input	DC 3.5/1.35mm DC6~16V/200mA
Others	GNSS	GPS, BeiDou, Galileo, GLONASS
	Radio frequency	2.4GHz FHSS
	Radio Power	20dBm (500m RC distance , Depends on usage environment)
	Compass at Boat Side	Yes
	Compass in Handhelds	No
	Case size	179*62*27mm
	Waterproof	IP3 waterproof(safe from vertical splashing)



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