

# **ZHD500X Handheld Box Manual**

Version 1.0

## Copyright statement

# Zmotion®

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ZMC controller software involved in details as well as the introduction and routines of each instruction, please refer to ZBASIC software manual.

Information contained in this manual is only for reference. Due to improvements in design and functions and other aspects, Zmotion Technology reserves the final interpretation! Subject to change without notice!



**Pay attention to safety when debug the machine! Be sure to design effective safety devices in the machine, and add the error handling procedures in software. Zmotion has no obligation or responsibility for the loss.**

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# Chapter I Production Introduction

ZHD500X is a touch screen teaching box with network display. The teaching box must be used in conjunction with a controller that supports ZHMI functions. The software development of the controller requires ZDevelop3.10 / RTSys or above.

The teaching box has a USB port, a TFT display screen with a resolution of 1024\*600, and there are 16 buttons, an emergency stop switch, a key selection switch, and a handwheel that can be pressed.

The ZHD500X supports a touch screen, which can be used with buttons and touch, and a stylus can be used also in some scenarios.



## 1.1 ZHD500X

The teaching box is a wired device, which means it needs to be connected to the control device with a network cable. (Please see page 10, wiring reference).



### 1.1.1 Operation Method

- Hold the rear handle with your right hand and operate with your left hand.
- Use both hands to hold the buttons on both sides.
- Place it on the platform to operate.
- Wall-mounted operation.

### 1.1.2 Shell Structure

- Anti-vibration and aseismic structure.
- The surface is resistant to impact, water, detergents (alcohol and surfactants), oil, cutting oil (drilling oil), lubricating oil and lubricants.
- The IP65 protection level, which means the USB dust plug should be installed correctly.

## 1.2 Hardware Introduction



There are peripherals of ZHD500X:

1. Emergency stop
2. Selection switch (3 positions)
3. Enable button (please whether you need or not, it is optional order)
4. Pat pasting button
5. Rotate encoder
6. Indicator Led
7. 10.1inch TFT display screen
8. Touch screen
9. Stylus

### 1.2.1 Emergency Stop

The stop button is internally coded, which cannot be directly connected to the machine. This button is pressed, a corresponding key value will be sent. (See page 7, physical key coding table).



**The stop button can't replace other safety equipment.**



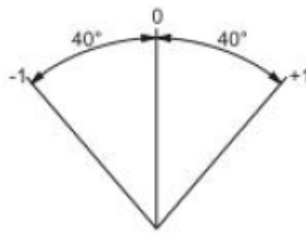
**Stop button on teach pendant can't replace emergency stop button on machine.**



**Please check stop button before use, make sure it can be used normally.**

### 1.2.2 Selector Switch (3 positions)

- ◆ The selection switch has three positions, each with a click.
- ◆ The key can be pulled out in any of these 3 positions.
- ◆ Each location has its corresponding key value. (See page 7, Physical Button Code Table)



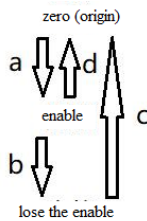
Selection switch rotation angle

### 1.2.3 Enable Switch

→ There are 3 positions of enable switch:

Switch Position	Function	Switch Motion	Switch Contact
1	Origin position	No	OFF
2	Enable	Press	ON
3	Disable	Full press	OFF

- ◆ Each position of the enable switch has a corresponding physical key value. (See page 7, Physical Button Code Table)
- ◆ If we fully press and release the enable switch, the switch skips the "enable" position and returns to the "zero" position.



Motion	Contact Status
a: press	close → open
b: full press	open → close
c: full press and release	close → close
d: press and release	open → close

key operation

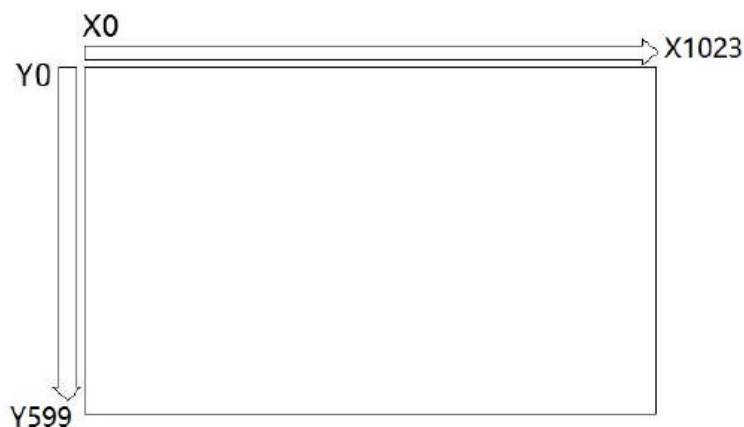
## 1.2.4 Handwheel

- ◆ The encoder on the right side of the teaching box is the handwheel, which supports forward rotation, reverse rotation and pressing down.
- ◆ One circle sends 20 pulses.
- ◆ It can be used as a button and it has a key value (see page 7, Physical Button Coding Table).

**!** The handwheel cap is easily damaged. If the teach pendant falls on the floor accidentally, pay attention to check the handwheel cap.

## 1.2.5 Display Screen

The dot matrix of the display screen is 1024\*600. The origin's coordinate is in the upper left corner.



## 1.2.6 Touch Pad

The touchpad is a resistive touchpad that can be operated with a finger press or a stylus.

- !** Do not hit the touchpad with sharp hard objects.
- !** In the case of inconvenient finger operation, try to avoid using metal tools, such as screwdrivers, wrenches, etc. Please use the stylus that comes with the box.



### 1.2.7 Keys and LED

The code of the keys is composed of rows and columns. When the key is pressed, the teaching box automatically sends the physical key to the controller, then the controller program can detect the physical key. If you need to use the virtual key, you need to use the key conversion table in the configuration. Zdevelop3.10 has a standard ZHD500X key conversion table.



surface film



Do not open the film without permission, it is easy to cause poor sealing and damage to the keys.

→ Attachment: Standard Physical Key Coding:

Selector Switch	Median position = 0	Selector switch
	Left position = 1	
	Right position = 2	
Emergency Stop Button	Press = 5	Emergency stop
Enable Switch	Enable & Lose able = 6 & 7	Enable switch
Handwheel	Press = 8	Encoder
Pad Pasting Button	Start = 3	Start
	Stop = 4	Stop

	key_X+ = 24	Axis shift key
	key_X- = 25	Axis shift key
	key_Y+ = 34	Axis shift key
	key_Y- = 35	Axis shift key
	key_Z+ = 44	Axis shift key
	key_Z- = 45	Axis shift key
	key_U+ = 54	Axis shift key
	key_U- = 55	Axis shift key
	key_A+ = 64	Axis shift key
	key_A- = 65	Axis shift key
	key_B+ = 74	Axis shift key
	key_B- = 75	Axis shift key
	key_f1 = 11	Function key 1
	key_f2 = 12	Function key 2
Led Light	Reserved	S1
	Reserved	S2
	Reserved	S3
	Run abnormally	Abnormally
	Run normally	Running
	No problem on power	Power supply

## 1.3 Use Process

### 1.3.1 Power on

The teaching box is powered through the network port, and the network cable is the super category 5 cable. The crystal head can be powered on by inserting the POE power supply device.



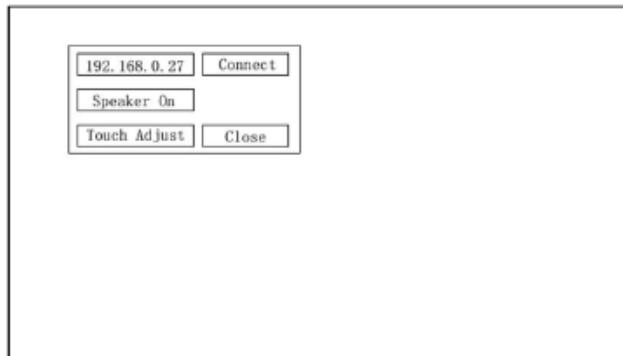
This product must be powered and communicated with a 48V~52V Poe power supply device.



Try to use a stable Poe power supply device with a speed of 100M and above.

### 1.3.2 Setting

The setting window can be popped up by continuously clicking on the upper left, upper right, lower left, lower right, upper left, upper right, lower left, and lower right.



### 1.3.3 Touch Correction

- Method 1: By clicking Touch Adjust on setting page to enter touch correction page.
- Method 2: After connecting with controller, trigger correction through controller TOUCH\_ADJUST instruction.
- Method 3: Not to connect with controller, press the key 12(F2), and continue to pressing key 11(F1) without releasing F2.

### **1.3.4 Connect to Controller**

Clicking the IP address in the settings window, it will research and show the next IP address. Select the IP address of the controller to be connected, and click “Connect” on the right to connect to the specified controller.

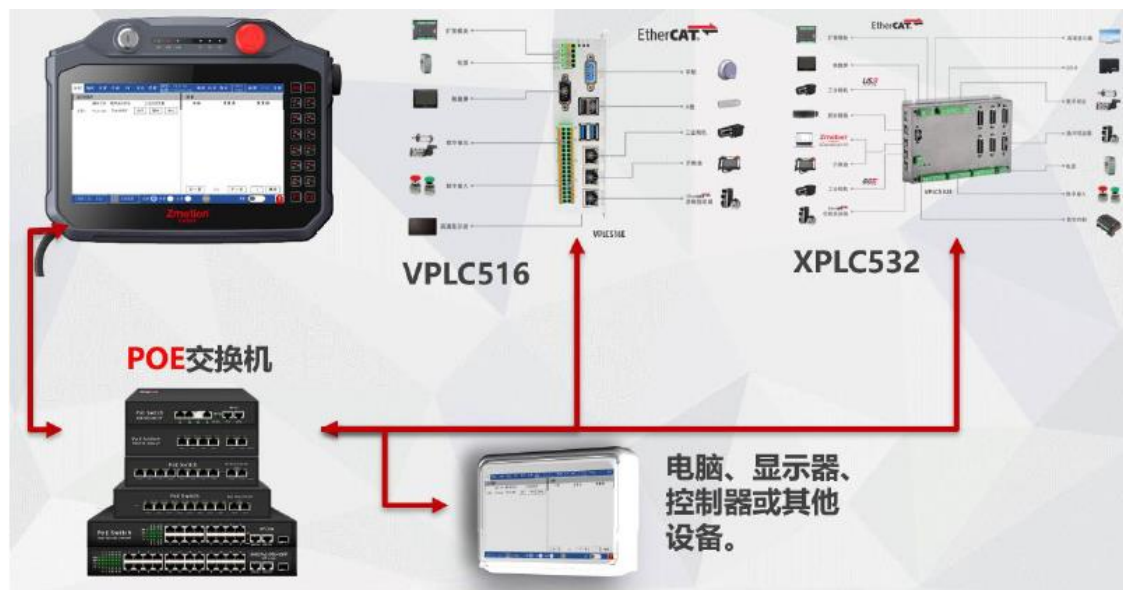
### **1.3.5 Buzzer Settings**

The buzzer is turned on by default, and every time the screen is effectively clicked, the buzzer will remind you with a "di" sound. Users can click “Speaker On” of the setting interface to turn it on or off.

### **1.3.6 Simulator**

Use [zdevelop3.10](#) to simulate this teach pendant.

## Chapter II Wiring Description



Connection Structure

### 2.1 Power Supply Interface

The teaching box is powered through the network port, the network cable is a standard network cable, and the crystal head is plugged into the POE power supply device to power on.



## 2.2 U Disk Interface

U Disk communicates with teach pendant directly, but this function is not valid now.



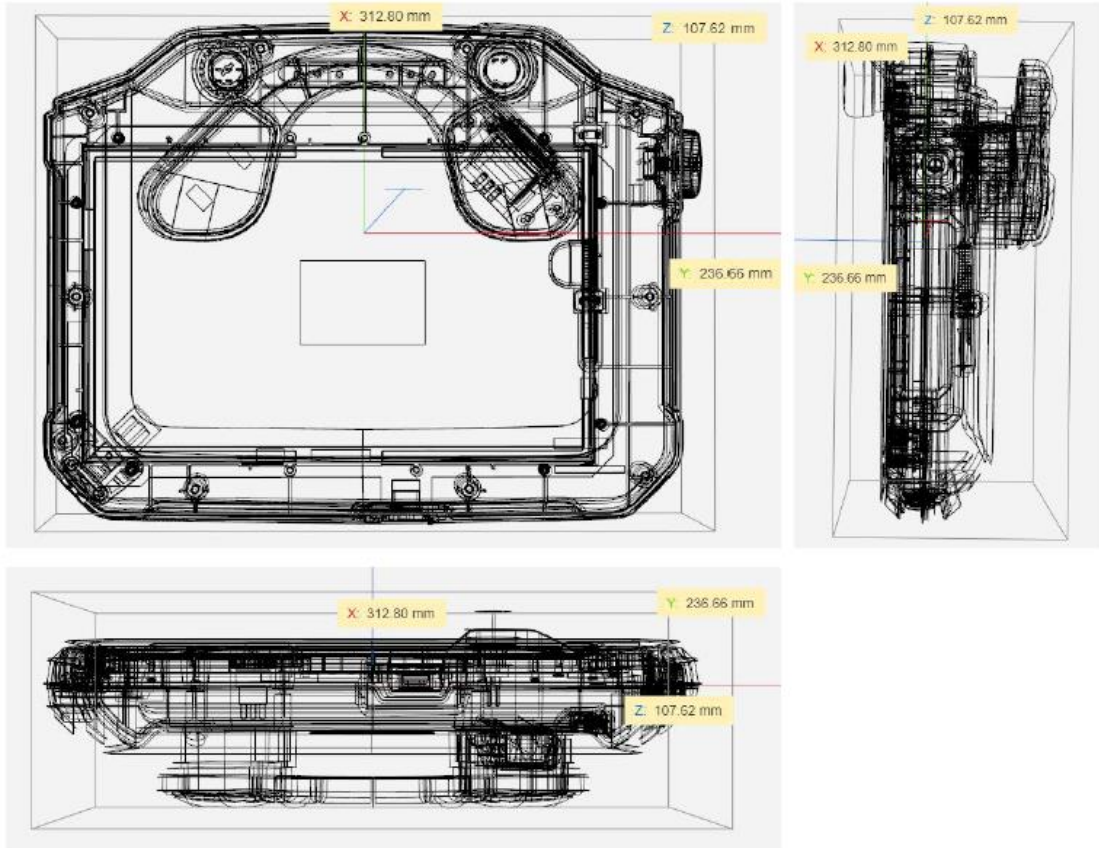
## 2.3 Cable

Use super five shielded network cable and flexible network cable, which is easy to drag and replace.

## 2.4 Common Problems

- Can't be Communicated: check the cable, and check POE equipment.
- Power doesn't light: check POE equipment whether it is power on or it is damaged or not.

# Chapter III Size Description



## Chapter IV Order Information

Model	Specification
ZHD500X-0L30	3-meter connecting cable, without robot enable button
ZHD500X-0L50	5-meter connecting cable, without robot enable button
ZHD500X-1L30	3-meter connecting cable, with robot enable button
ZHD500X-1L50	5-meter connecting cable, with robot enable button