

ZHD500X Handheld Box Manual

Version 1.0

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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.

Content

| | |
|--|----|
| ZHD500X Handheld Box Manual | 1 |
| Chapter I Production Introduction | 4 |
| 1.1 ZHD500X | 5 |
| 1.1.1 Operation Method | 5 |
| 1.1.2 Shell Structure | 5 |
| 1.2 Hardware Introduction | 6 |
| 1.2.1 Emergency Stop | 6 |
| 1.2.2 Selector Switch (3 positions)..... | 7 |
| 1.2.3 Enable Switch | 7 |
| 1.2.4 Handwheel | 8 |
| 1.2.5 Display Screen | 8 |
| 1.2.6 Touch Pad..... | 8 |
| 1.2.7 Keys and LED..... | 9 |
| 1.3 Use Process | 11 |
| 1.3.1 Power on | 11 |
| 1.3.2 Configuration Page..... | 11 |
| 1.3.3 Touch Correction..... | 11 |
| 1.3.4 Connect to Controller..... | 12 |
| 1.3.5 Buzzer Settings | 12 |
| 1.3.6 Simulator..... | 12 |
| Chapter II Wiring Description..... | 13 |
| 2.1 Power Supply Interface | 13 |
| 2.2 U Disk Interface | 14 |
| 2.3 Cable | 14 |
| 2.4 Common Problems..... | 14 |
| Chapter III Size Description | 15 |

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 or above.

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

The ZHD500X supports a touch screen, which can be used in conjunction with buttons and touch, and a stylus can be used to facilitate operations 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 (it needs to evaluate the equipment)
4. Pat pasting button
5. Rotation encoder
6. Indicator light
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.



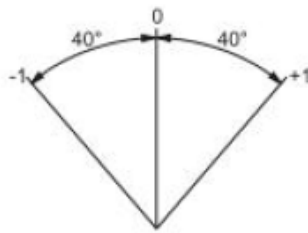
Stop button on teach pendant can't replace emergency stop button on machine.



Please check stop button before use, it is not damaged, which means it can be used normally.

1.2.2 Selector Switch (3 positions)

- ◆ The selector 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)



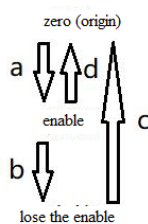
Selector switch rotation angle

1.2.3 Enable Switch

→ There are 3 positions of enable switch:

| Switch Position | Function | Switch Motion | Switch Contact |
|-----------------|-----------------|---------------|----------------|
| 1 | Origin position | No | Close |
| 2 | Enable | Press | Open |
| 3 | Lose enable | Full press | Close |

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




key operation

| 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 |

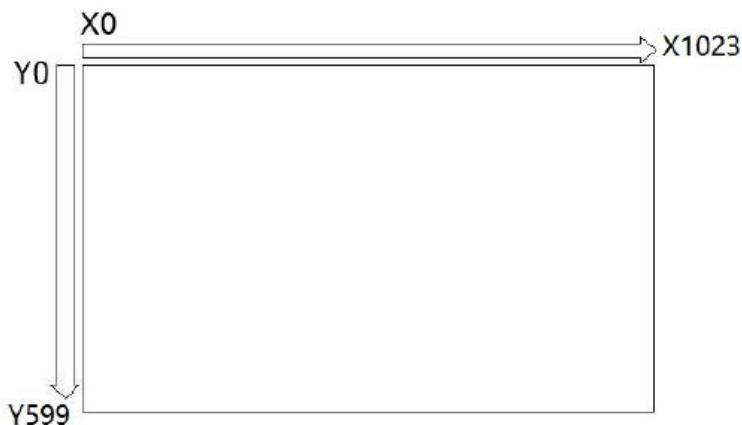
1.2.4 Handwheel

- ◆ 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 | Normally |
| | 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 five network cable. The crystal head can be powered on by inserting the POE power supply device.



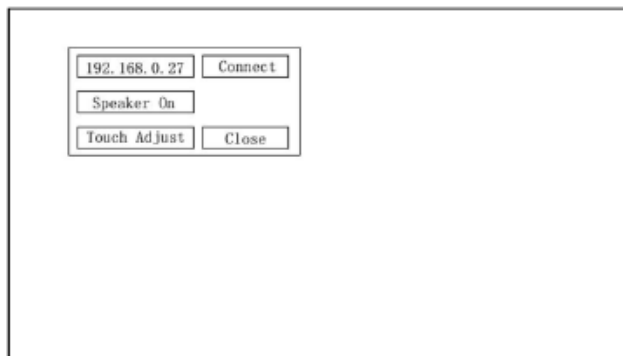
This product must be powered and communicated with a 48V~52V Poe power supply device.



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

1.3.2 Configuration Page

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, button the key 12(F2), and continue to buttoning key 11(F1) (don't loosen grip).

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.

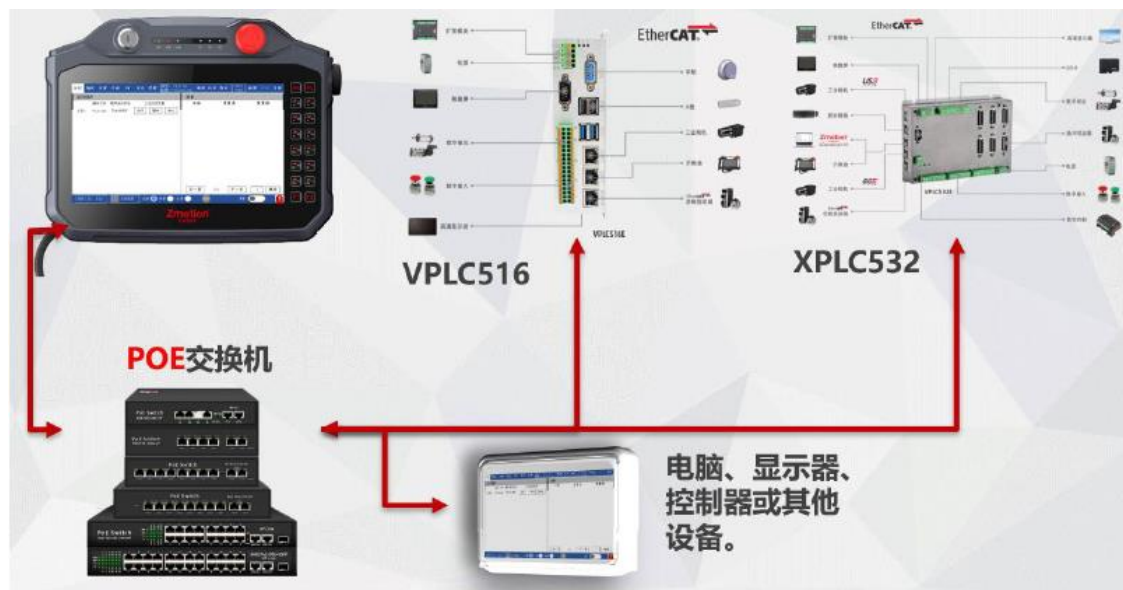
1.3.5 Buzzer Settings

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 communicate with teach pendant directly. (It doesn't have development function at present)



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

