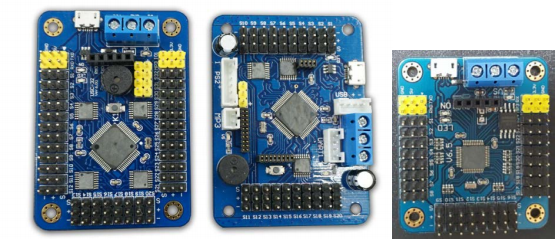
Servo control board instructions



This manual only applies to the three control boards pictured above.

The left one is a 32-circuit servo control board, and the center one is a 20-circuit servo control board for robots. The rightmost one is the latest 16-way servo control board.。

**1 ） Description of power supply**

The power supply part of this module is designed separately, the power supply of the control board and the power supply of the servo are powered separately, so that they do not interfere with each other. This will not interfere with each other.

For the module to control the servo properly, both power supplies must be supplied.

The power supply is connected to the blue terminal in the picture above (loosen the screws, put the wires in, and then tighten the screws). (loosen the screws, put the wires in, and then tighten the screws), there are markings on the side or back of the blue terminal for VS, GND, VSS, so be careful not to connect them wrongly.

a) Control board chip power supply VSS

Both VSS and GND in the USB interface and the blue terminal can supply power to the control board, and either of them is enough. (The power supply range of VSS is 6.5-12V)

b) Servo power VS

The power supply of the servo is determined by the servo used, you can consult the relevant parameters of the servo, if you do not understand, you can make

The VS input voltage is the voltage supplied to the servo, so it must be strictly matched to the servo's voltage parameters. So it is necessary to strictly match the servo's voltage parameters.

The servo power input connector is VS and GND in the blue terminal.

(GND is shared between the control board power supply and the servo power supply)

As long as the supply voltage meets the requirements, it is possible to power both VSS and VS with a single battery.

Voltage Parameters for Conventional Servos

MG995, MG996 supply voltage is 4.8-6.8V.

TR213, TR223, 1501MG supply voltage is 4.8-7V.

TR227 supply voltage 4.8-7.2V

For unknown servos, please supply 5V or 6V (95% of standard servos can be supplied with 5V).

If the supply voltage exceeds the range of the servo, it may cause the servo to burn out or the servo control board to be damaged. Please

users to be cautious and check the servo's related parameters.

Please see the penultimate page for other instructions on servo power supply.。

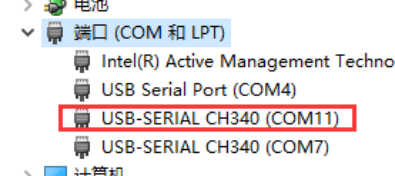
**2 ） Installation of drivers**

Driver download address ：<http://dl.torobot.com/down/CH341SER.EXE>

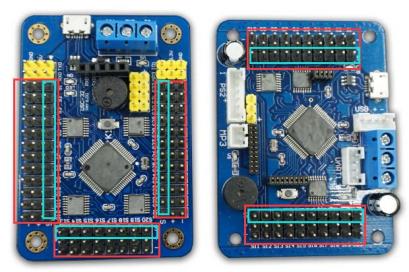
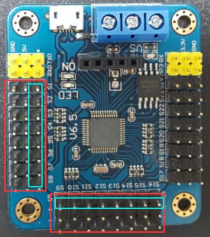
Download the driver and then install it, you can download the new driver first and then install it, if the computer device manager doesn't

If the computer device manager does not show the port number correctly, you can install the old driver to try.

The latest control board, install the latest driver, the device name displayed is as follows,USB-SERIAL CH340（ COM11 ）



**3 ） Connecting the Servo**



The red box in the picture is the area for connecting the servo, and the sky blue box is the signal line interface (pay attention to the direction when connecting the servo). When connecting the servo, pay attention to the white text markings next to the servo.)

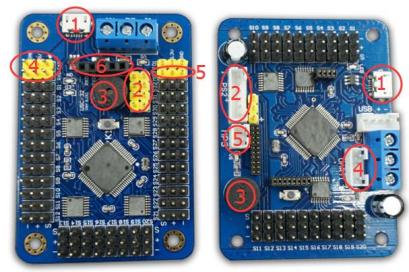
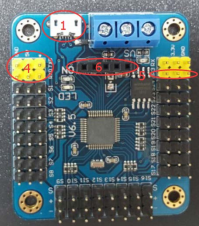
When connecting the servo, pay attention to the white text markings next to the servo, such as S1, S2..... represents the servo channel. The software on the computer is one-to-one correspondence.。

**4 ） Downloading and using software**

Download URL： <http://dl.torobot.com/down/ROBOIDE.exe>（Only applies to the servo control board in the picture above, does not support other versions of control boards）

**After you download the software, for the manual on the use part of the software, after you open the software, click on the top of the software Menu---Help---Help.**

**5 ） Other interface descriptions for the control board**



Red circle 1: USB cable connector, PC debugging connector

Red circle 2: PS2 joystick receiver port (please see PS2 manual for details)

Red circle 3: Buzzer, when the servo VS power supply is insufficient, it will alarm.

Red circle 4: Serial port 1, external microcontroller interface

Red circle 5: MP3 expansion interface

Red circle 6: Serial port 2, external microcontroller or external wireless module interface, (32 servo control board in the

6 and 4 are two independent serial ports.)

(6 and 4 are two independent serial ports in the 32-way servo control board)

**6 ） External microcontroller development, or self-developed host computer software**

The servo control board is an auxiliary device that can only accept commands, or execute pre-set commands, and cannot

It can't have the ability to think and can't be programmed, it can only be used as a driver board.

Communication protocol with external: serial communication (TTL level), baud rate 9600 (default 9600, can be

baud rate 9600 (default 9600, other baud rates can be set by PC software), no parity bit, 8 data bits, 1 stop bit.

The servo control board cannot accept any commands other than the stop command (#STOP\r\n ) during the execution of an action group command.

If you set the offline command, then it is also executing the action group, then the servo control board during this process cannot accept other commands either.

The specific orders are as follows: (to be refined)

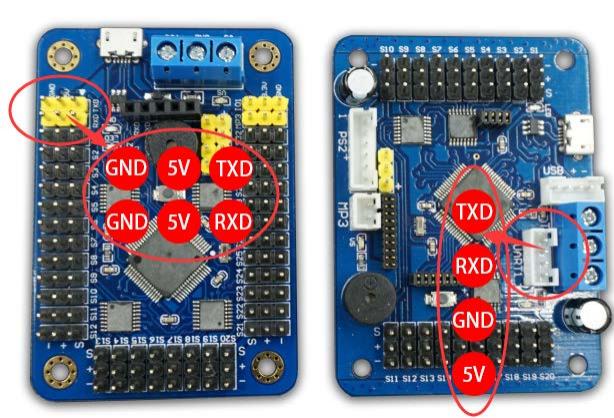
|  |  |  |
| --- | --- | --- |
| Name | Command | Clarification |
| Control Single Servo | #1P1500T100\r\n | Data 1 is the channel of the servo  Data 1500 is the servo position in the range of 500-2500  Data 100 is the execution time, indicating the speed speed, in the range of 100-9999 |
| Control Multiple Servos Servos | #1P600#2P900#8P2500T100\r\n | Data 1,2,8 are servo channels.  Data 600, 900, 2500 are the positions of the servos for each of the 3 channels.  Data 100 is the execution time, which is the speed of the 3 servos.  Regardless of the number of servos, there can only be one time, that is, there can only be one T. This command is executed simultaneously, that is, there can only be one T. The command is executed at the same time, that is, all the servos move together.  This command is executed simultaneously, i.e. all servos move together. |

|  |  |  |
| --- | --- | --- |
| Execution Single Action Group | #1GC2\r\n | Data 1 is the action group number  Data C2 is the number of cycles |
| Execute Multiple Actions Groups | #1G#3G#1GC2\r\n | Perform action group 1, then action group 3, then action group 1, then start over Repeat again.  (Execute Action Group 1, Execute Action Group 3, Execute Action Group 1, Execute Action Group 1, Execute Action Group 1, Execute Action Group 3, Execute Action Group 1) Execute Motion Group 1, Execute Motion Group 3, Execute Motion Group 1)  Data 1 and 3 are action group numbers  Data C2 is the number of cycles  A command can only have one cycle number |
| Execute Multiple Actions Groups | #1G#3G#1G#1G#1GC1\r\n | Execution Action Group 1, Execution Action Group 3, Execution Action Group 1, Execution Action Group 1, Execution Action Group 1, Execution Action Group 1, Execution Action Group 1  Data 1 and 3 are action group numbers  The last data C1 is the number of cycles  A command can only have one cycle number |
| Stop All Current Action | #STOP\r\n | Stop All Current Action |

The above commands all have one thing in common, they all have \r\n , this is the end of the command, must have. In addition, all commands do not contain spaces

**If you need to use the serial port debugging assistant to control the servo control board, then please read "How to use the serial port debugging assistant to send commands to the servo control board.pdf" carefully.**

**7 ） Connection to microcontroller**



The interface in the above figure is for connecting to the microcontroller.

To connect with the external microcontroller, you only need to connect RXD, TXD, GND, the 5V marked in the above figure is the input pin, it is not recommended to use it as a 5V output (it will be unstable or easy to burn the control board). The 5V marked in the above diagram is the input pin, and it is not recommended to use it as a 5V output (it will be unstable or easy to burn out the control board).

Servo control board ------- external microcontroller

RXD-----------------TXD

TXD-----------------RXD

GND----------------GND

**8 ） Summary of problems related to servo control boards**

>Buzzer for servo control board

The buzzer, only barks when the servo control board has just been started or when the servo is not powered or is underpowered. Because the servo needs a lot of current, if the servo power supply is not good, the moment the servo is turned on, the power supply voltage will be much lower. will be much lower, this time the buzzer will call, prompting the power supply is insufficient.

If you think the buzzer is very noisy, you can cancel it by the following way: open the PC software, upper menu, Settings, Settings, then remove the check mark in front of "Buzzer Low Voltage Alarm", if you find that there is no check mark, then check the check mark first, then remove the check mark, then remove the check mark. If you find it is not checked, then check the box first, and then remove the check.

**Notes：**Insufficient power supply will cause the servo to move randomly, or the servo is not controlled. (Common sense: insufficient power supply is not enough current, not enough voltage, the current is how much to take how much, even if you give 100A of current, he will take 1A, will not take more, it will control the amount of food, will only starve to death, will not hold up. Even if you give 100A of current, he will take 1A, not more, it will control the amount of food, it will only starve to death, will not hold up.)

Insufficient power supply checking method: you can use a multimeter to measure the voltage value of VS and GND on the blue terminal on the control board, and measure the instant voltage value of the servo movement, if the instant voltage will drop a lot below the normal power supply range of the servo, then it means that your power supply or battery is not working. If the instant voltage drops a lot below the normal power supply range of the servo, it means that your power supply or battery is not working.

>Can I set a delay between action groups or between each command?

First of all you need to understand that each command is followed by a time T, which means time, so by repeating the last command, isn't it understood as waiting? That's right, you are very smart, repeat the last command, the servo will not move, but the time is going, so you can understand this is a delay. (In a later update, a new command will be added for time delay. (In the later upgrade, there will be a new command for time delay)

>Setting the robot's initial action

When the servo control board is just turned on, the robot may move around, this may be caused by the servo power-on reset, or the output signal of the servo control board is unstable at the moment of power-on, the user can set up the offline action to set up an initial action group for the robot. First of all, download a simple action group (an initial state of the robot) from your computer, and then set the action group to be executed offline. After the action group is set, every time the control board turns on the power switch, the action will be executed, if you set the robot to stand, then the robot will stand first when the power switch is turned on.

>Some notes on servo power supplies

Normal use of servos requires a high power supply, a 13KG.CM torque metal servo requires almost zero current when unloaded, but when fully loaded the current may be as high as 3A. If a robot is installed with 10 such servos, a power supply capable of outputting 5A or so is required to ensure that each servo can work, and of course if each servo is to work at full load, then 5A is also required to ensure that each servo can work. Of course, if each servo has to work at full load, then 5A is not enough.

is not enough.