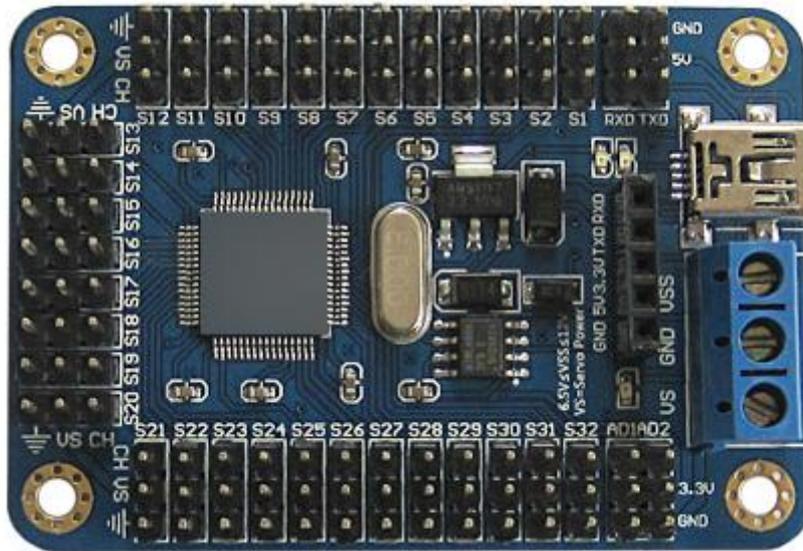


# 32-Channel Servo Controller Manual

Ver2011

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## Introduction

*32-bit high speed CPU, faster, more accurate and more stable.*

*Identify the baud rate automatically (9600, 19200, 38400, 57600, 115200, 12800).*

**Remarks:** *USB can power the chip. The USB port and the chip power supply is isolated, to prevent the reverse current flowing into USB.*

*Because the servo motor needs high current, to power the chip and the motor with the same supply is not recommendable. To many motors, working at the same time might reset the*

chip. However, to prevent this problem, the power supply can be shared indirectly as follows:

If the power supply voltage is 12V, it can be separated into two groups (2 lines into 4 lines), in which two lines can be regulated to the right voltage of the motor by regulators to power the motors and the other two lines can be connected with the power supply port of the chip on the board directly. (Because there is already a regulator on-board)

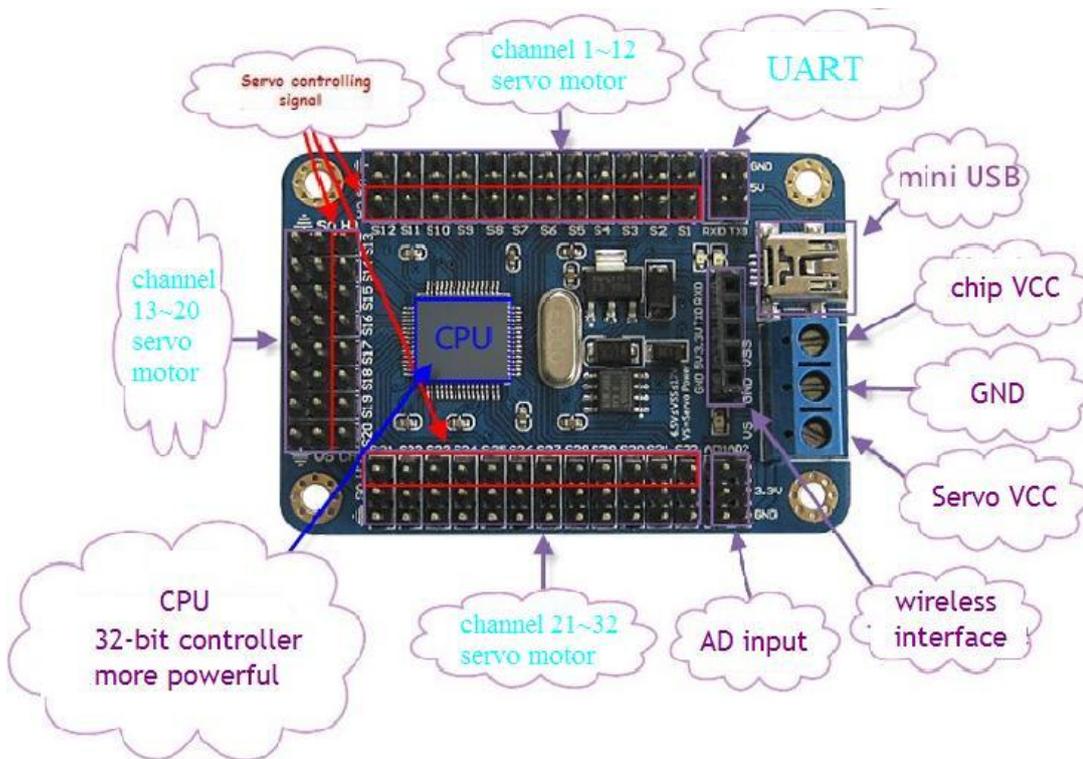
**Warning:**

32-Channel servo controller needs two power supplies, one for servo and the other for the chip. The chip can be powered via USB by the computer, but the servo can not be powered through the USB port because of the servo's high power cost. If you use USB to power the servo, it might burn out your computer and the servo control board. If you do not use USB to power the chip, you can use the VSS power supply port in the figure below, and the input voltage must be between 6.5V ~ 12V, please be sure!



The servo can be powered through the VS input power in the figure above, and the input voltage should be adjusted with the need of the motor, for the input is to power the servo directly. For example, if you use the TR213 servo, the input voltage should be adjusted to 4.8V-7.2V, the voltage over this range would burn your servo. In order to avoid unnecessary losses, please operate in strict accordance with the instructions!

**Interface**



## Instruction

### Servo moves

Format: # <ch> P <pw> ... # <ch> P <pw> T <time> \ n \ r

<ch> = Servo number, range 1~32 (decimal number)

<pw> = Pulse width (servo position), range: 500~2500. Unit: us (microseconds)

<time> = Time used to move to the position, effective for all servos.

\ n \ r = Binary number 0x0d, 0x0a (carriage return), the command terminator

Example:

# 8P600T1000 \ n \ r

Move NO.8 servo to pulse width 600us, using time 1000 microseconds

*# 11P2000 # 30P2500T1500 \ n \ r*

*Move NO.11 servo to pulse width 2000us, No. 30 servo to pulse width 2500us, using time 1500ms. Servo's speed depends on the steering location of the previous time. NO.11 and NO.30 servos arrived at the designated location at the same time.*

### ***Read the 2 analog input voltage***

Format: *#UPAD1\n\r* Read AD1 port voltage

*#UPAD2\n\r* Read AD2 port voltage

*Return 2-byte hexadecimal number (with precision 12bit 0V~3.3V)*

*Returned data range: 0000~03ff (decimal numbers 0~4096)*

### ***Action group instructions***

*Run Action Group*

Command format: *#<AG>G...#<AG>G<pw>C<Cycle> \ n \ r*

*<m>: action group number*

*<AG>=action group number, range 1~n(decimal number, n is the factual maximum number)*

*<Cycle>=loop times, range 1~999(decimal number)*

*\n\r =0x0D, 0x0A in hex, means the end of the command*

*Example:*

*#1GC99\n\r*

*Perform action group 1 and loop 99 times*

*#1G#2G#4G#2GC1\ n \ r*

*Perform action group in order as 1,2,4,2 and loop only once.(The action group in the instruction can repeat just as #2G in this example)*

*When the instruction is done, it will return #AGF for indication.*

### **Offline running**

Command format: *#ENABLE#<AG>...#<AG>C <Cycle> \ n \ r*

*Example:*

*#ENABLE#1GC5 \ n \ r*

*The servo controlling board will perform action group 1 and loop 5 times when powered on.*

*#DISABLE\ n \ r offline running failure*

***Servo control software***



32-Channel servo control software

### Port settings

Open the corresponding serial port connected with the servo controlling board and set the baud rate.

### Box (Each Box corresponds to one servo)



Drag the slider in the Box. If the servo control board and computer are properly connected, LED on the control board will blink and the servo will perform as the slider movement.

### Box manual setting

Click the **Edit mode** -> edit the Box. In this mode, you can drag the Box location, hidden \ Display Box.

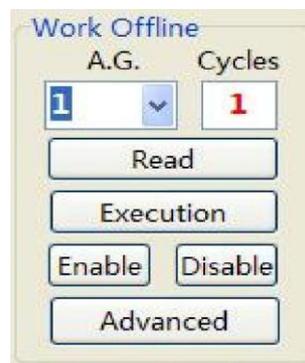
## Hide \ Display Box



Click the corresponding button to hide \ Display Box. Click the "Exit & Save" to save the Box location and display hidden information.

## Offline running

Controlling board manages data of movement in form of action group. Click the **Download** button, code displayed in the window will be downloaded to the servo control board. It will add 1 for each action group download.



The number of action groups can be read after downloading is finished. Through the down list you can select the action group you want to perform, the default loop times is 1 and you can change it, and then click **Execution**, and the servo will perform the relevant action. You can click **Enable** so that each time servo control board is powered on, it will perform the action group you set (Repeat). If you click **Disable**, the servo control board will not perform any actions, but waiting for the command.

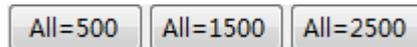
**Read:** this command is to read in the number of action groups saved in Flash



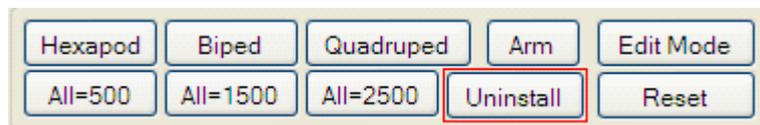
**Reset** command is to return to the default settings, display 32 Boxes, evenly distributed.

### All = XXX

All = XXX command is to drag the slider of all the Boxes to XXX.



### Clear



~~Please be cautious of this command!~~ This command is used to clear all the settings of this software.

### Erase Flash



~~Please be cautious of this command!~~ This command erases all the data stored in the Flash, including all the action groups. Executing this command would takes tens of seconds (do not take operation to the to software and controller board). While the software prompts "Erase completed", it means erasing successfully. If the servo controller powers down during the command executing, erasing will be interrupted. In this case, erasing is not completed, and

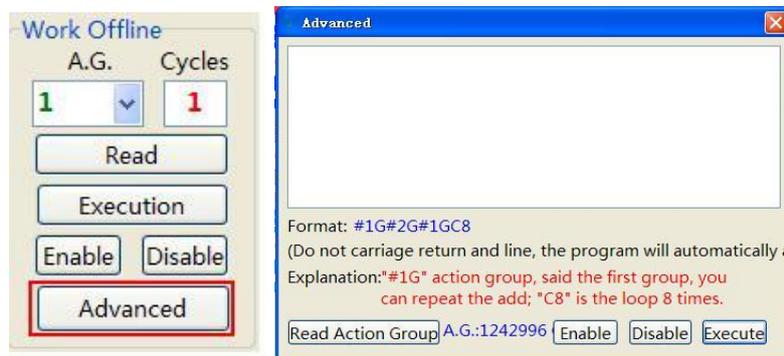
part of the Flash is erased. We recommend that you perform this command again until it prompts "Erase complete."

### Action group Advanced Setting

"Advanced" setting

"Advanced" setting is a more advanced way to implement the action group and offline-running, however you need to enter the command manually.

Click "advanced" button in the "Work offline" window and enter the advanced setting screen, as shown in the figure below.



Before you enter the command, we recommend you to click "Read Action Group" to get the largest group number of the controlling board. Because the action number entered by the user can not be larger than the actual maximum. If error occurs, the software will indicate.

Command format is as follows:

# 1G # 2G # 1GC8

You can only enter numbers, "G" and "C", and the symbol "#" and any other symbol is not right. The program will automatically add "enter" and "change the line" so you do not need to add that anymore. The action group can be repeated.

*This command is the continuous implementation of the first, the second and the first action group and it will loop 8 times.*

*After you enter the command, then click the "Execute", to check the result. (The "Execute" is the immediate implementation of the command input box)*

*You can also click on "Enable" to offline run the command. ("Enable" means to run the commands automatically when powered on.)*

*"Disable" is the command to disable offline running, that is, to delete the last command running offline.*

*Note: If the command you entered would run for a long time, such as # 1G # 2GC999.*

*Theoretically, this command is right, but it needs to execute 999 times, a very long time. In this case, you can connect the S1 to ground, and then power on the servo control board again, in this way the commands running last time will be disabled.*

### **Upgrade automatically**

*The servo control software will detect and upgrade automatically after 5 seconds you open the program, to ensure that you are using the latest software. We will fix some bugs from time to time, and increase some more user-friendly features.*

### **Reset the saved settings**

*The servo controlling software will create some files on your computer to keep the software data. If you no longer use the software, click "Options" at the right corner of the software, then click "Reset all settings", this action data saved in the user's computer will be deleted,*

*such as Box arrangement, COM port-related settings, language, etc., please be cautious to use this.*

### ***Disclaimer and Revisions***

*The information in this document may change without notice.*

#### *Revision History*

<b>Rev.</b>	<b>Date</b>	<b>Author</b>	<b>Description</b>
A	May. 26 <sup>th</sup> , 2011	Wilson Shen	Initial version