

Lesson 2 Bus Servo Learning

1. Bus Servo Introduction

The bus servo is a derivative of the digital servo. Asynchronous serial communication implementing control through sending and receiving command packages, a form of closed-loop control, can distinguish the bus servo from the traditional PWM digital servo. Based on this features, bus servos can be cascaded, which makes the project have clean wiring and reduce the the serial port occupation.

Because of this, the connection among the bus servos, which is the same as giving a name to person, is required to set ID for all the servos. Otherwise, the servos are hard to be distinguished. Under this circumstance, you can send commands to the bus servo while communicating: ID1 servo rotate 30 degrees; ID2 servo rotate 40 degrees...

The bus servo uses a high-precision potentiometer. Compared with PWM servo control, it not only has ability to feedback information such as position, temperature and voltage. Its excellent accuracy and linearity make robot run more stable and greatly extend the service life of the servo.

In addition, you must adjust the servo to the middle position before installing it.

The “middle position” refers to the initial position of the servo. Servo will rotate clockwise or counterclockwise staring from this point, “zero point”. Therefore, servo needs to be adjust to initial position before installing on servo horn.

This is because when the servo is rotating, the rotating part drives the potentiometer, and the software assumes that this middle position is “zero point”. Otherwise, the potentiometer may enter “blind spot” and cause the entire assembly to fail to operate properly, which may result in the robot not being able to reach the specified angle or the corresponding action group being inconsistent.

Regarding all the servos of xArm ESP32, the corresponding ID and middle position have been set for user before delivery, so you don't need to set it by yourself. If the future debugging for the servo is required, please view in folder “4.Advanced Lesson-> 5.Bus Servo Communication Protocol”.

2. Servo Introduction

The distribution of servos used in xArm ESP32 as the figure shown below:



Servo ID	Model	position	Installation Note	Note
No.1	Specific servo gripper	Hand	Servo wires have been connected	-
No.2	LX-15D	Wrist	You just need to install the driving servo horn manually and do not need to install the auxiliary servo horn	Set the limited angle to 240° .
No.3		arm	Both driving and auxiliary servos have been installed.	-
No.4				
No.5				
No.6	LX-225			
No.6	LX-15D	Button	Both driving and auxiliary servos have been installed.	Set the limited angle to 320° .

Attachment: servo parameters

	Specification	Parameter
	Size:	44.02 x 22.92 x 35.12mm
	Gear material:	Alloy
	Plug-in model:	PH2.0- 3P
	Working voltage:	6-8.4V
	Torque:	15kg.cm 6V 17kg.cm 7.4V
	Rotation angle:	0°-240°
	Rotation speed:	0.23sec/60° 7.4V
	Control method:	UART serial command
	Communication baud rate:	115200
	Parameter feedback:	Provide temperature, voltage, position feedback.
	Indicator:	RGB light
	Save:	Servo settings are automatically saved when power off