

30KG Serial Bus Servo, High precision and torque, with Programmable 360 Degrees Magnetic Encoder

 waveshare.com/st3215-servo.htm

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30KG Serial Bus Servo, High precision and torque, with Programmable 360 Degrees Magnetic Encoder, Two-way Feedback, Servo/Motor Mode Switchable

30KG Serial Bus Servo

360° High Torque Programmable Magnetic Encoder



Specifications

PRODUCT TYPE	ST3215 serial bus servo
TORQUE	30kg.cm@12V
ROTATION ANGLE	360° (0~4095)
POSITION SENSOR RESOLUTION	360° / 4096
MECHANISM LIMITED ANGLE	No Limit
OPERATING VOLTAGE	6 ~ 12.6 V
GEAR	high precision metal gear

NO-LOAD SPEED	0.222sec / 60° (45RPM)@12V
Encoder TYPE	360° Magnetic Encoder
ID RANGE	0 ~ 253
BAUDRATE	38400bps ~ 1Mbps (1Mbps by default)
FEEDBACK	Position, Load, Speed, Input Voltage
NO-LOAD CURRENT	180 mA
LOCKED-ROTOR CURRENT	2.7A
kt	11kg.cm/A

Application Examples

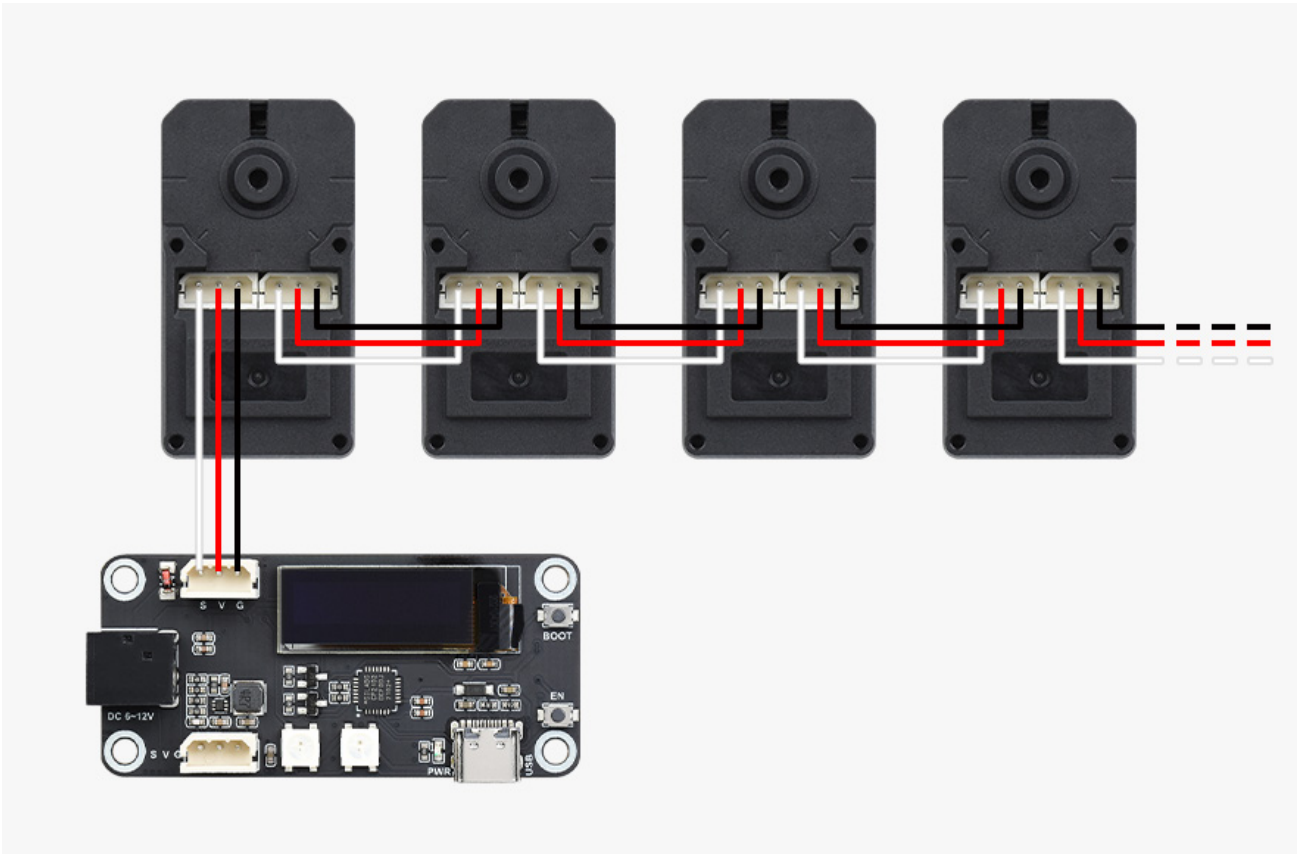
- Servos will provide various feedback like position, speed, torque lock, operating mode (servo mode, servo motor mode, etc.) for advanced projects requiring closed-loop automatic control.
- Ideal choice for building quadruped robots, hexapod walkers, robotic arms and other robotic projects requiring multiple servos. (This product provides the open source model of the quadruped robots as shown in the picture below.)



* images here are for reference ONLY

UART Serial Bus Control

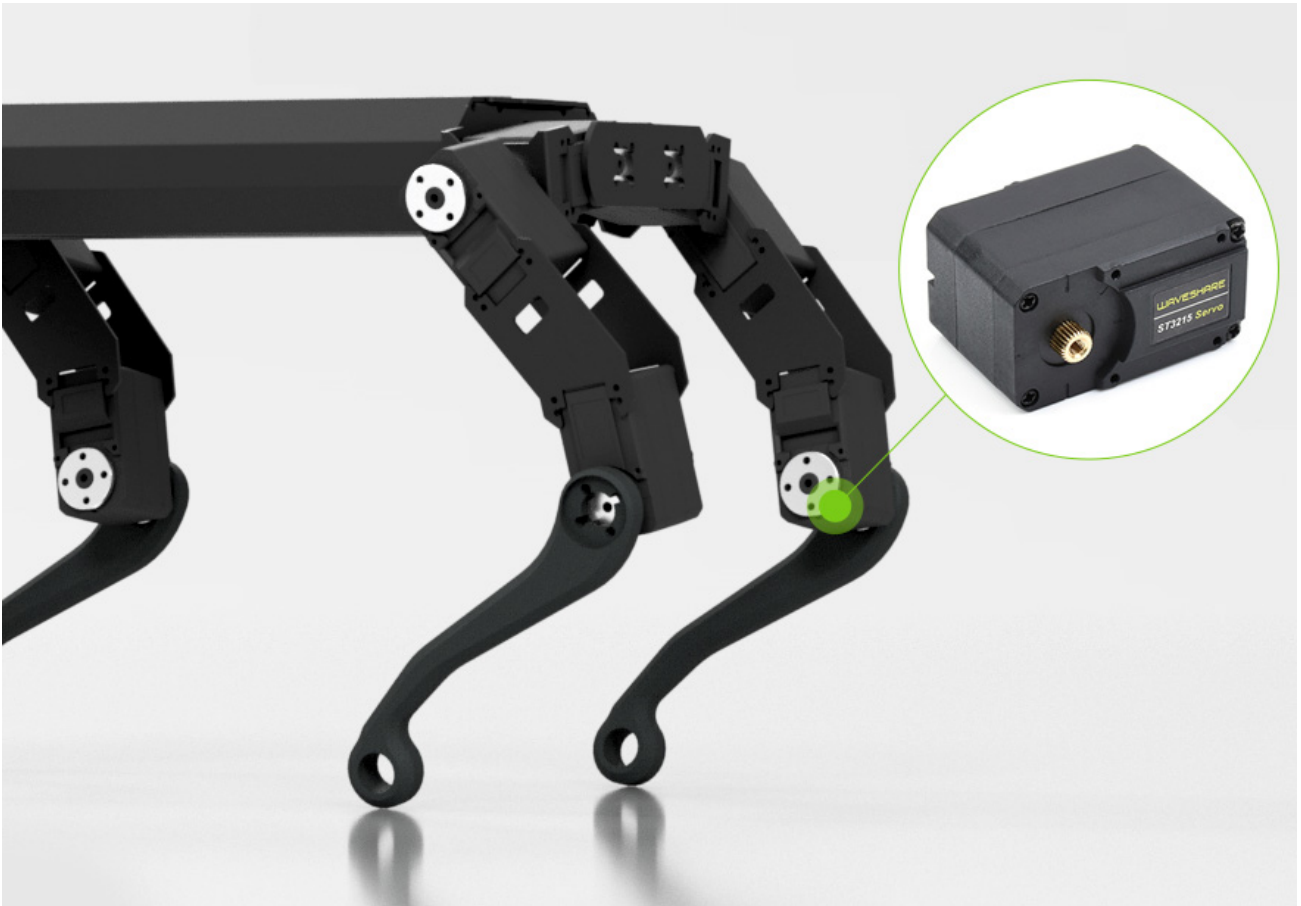
Allows controlling up to 253 serial bus servos at the same time



Note: though one channel UART is able to control up to 253 serial bus servos, due to the high power of the servos, it is necessary to consider whether the power supply solution is enough when using too many servos. For reference only, the servo driver board is NOT included

Large Torque

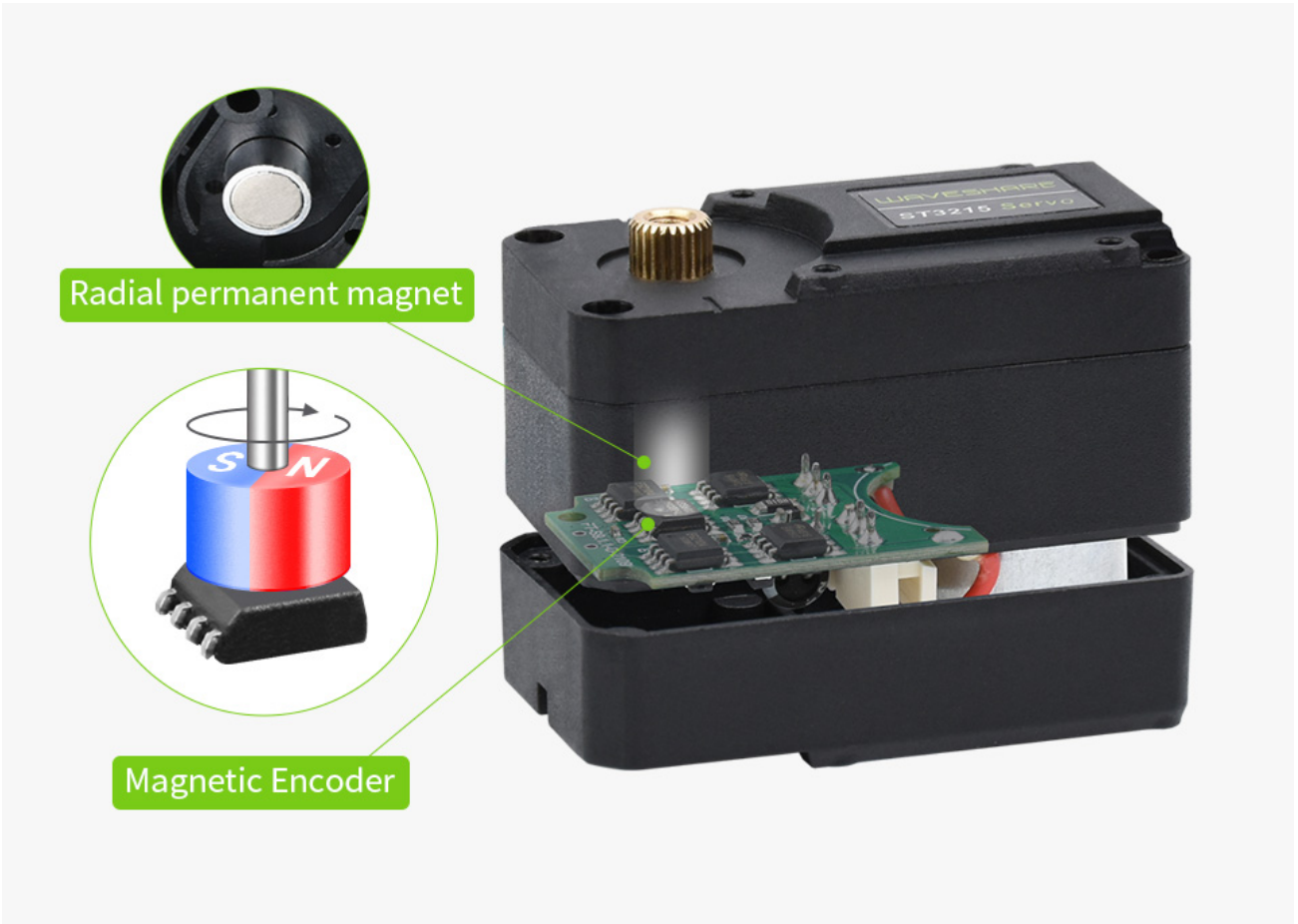
Up To 30kg.Cm Torque On 12V Voltage, Suitable For Building Quadruped Robots, Hexapod Walkers, Robotic Arms And Other Robotic Projects Requiring Multiple Servos



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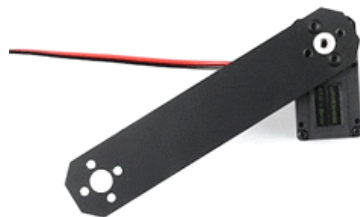
360° Magnetic Encoder
High Precision, Longer Lifetime

Adopts 12-bit high-precision magnetic encoding angle sensor. Compared with the potentiometer, the angle is enlarged to 360°, and the resolution is increased by 4 times. Since there is a gap and no friction between the magnetic encoder and the radial magnet, the lifetime of the servo is effectively extended.

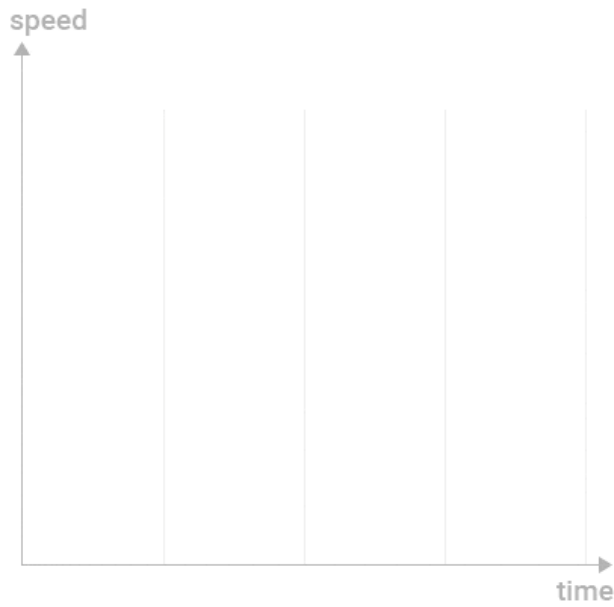


Acceleration Start-stop Function

The speed and acceleration values can be set, and the motion effect is softer



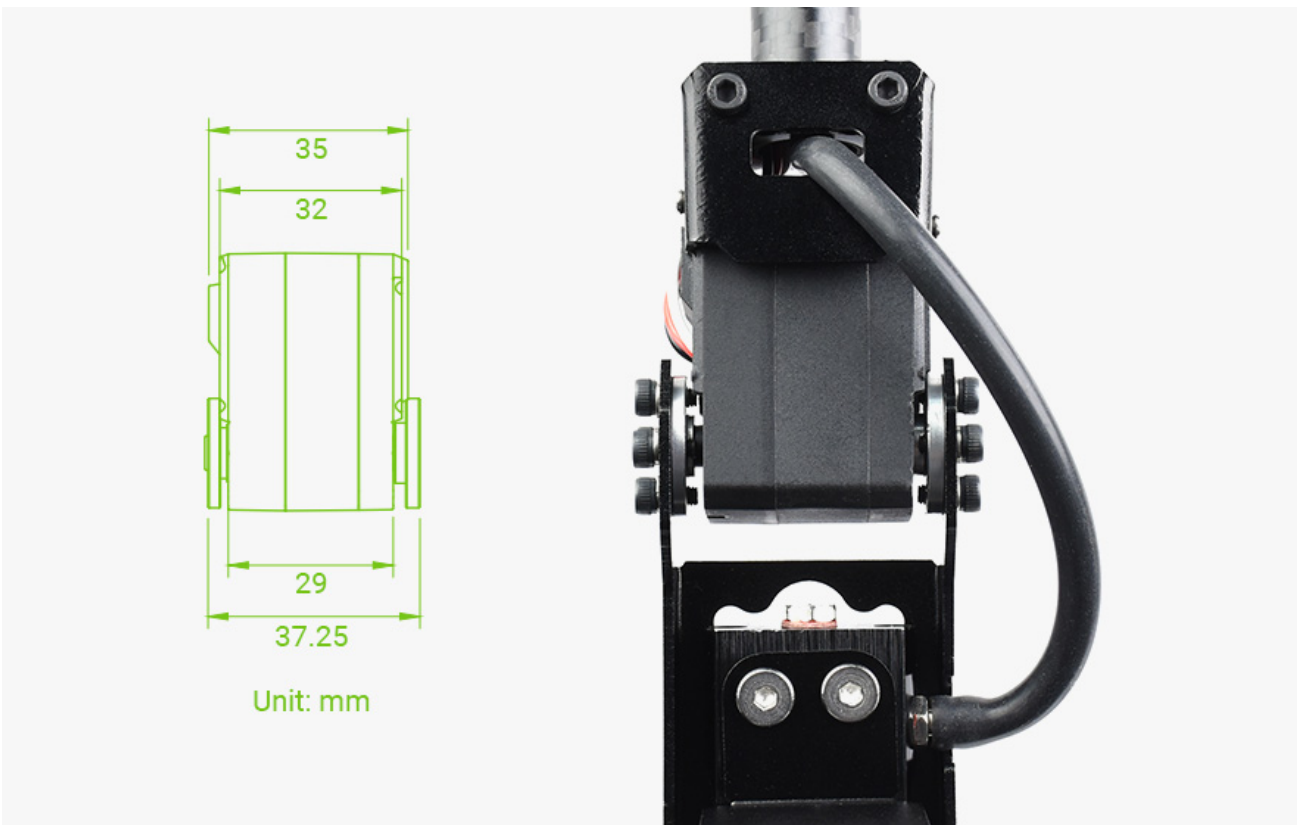
Actual Effect



Motion Effect Diagram

Compact Structure Design

The case adopts higher intensity engineering plastics, dual shaft and low profile design, shortening the plane spacing of the double-shaft servo wheel, and the overall structure is more compact, which can make the appearance of the product more beautiful.

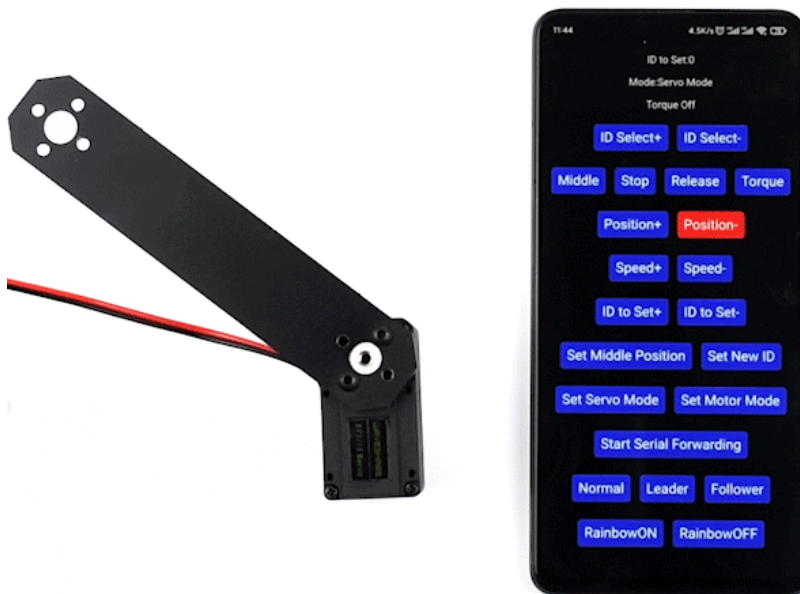


One Button to Calibrate the Middle Position

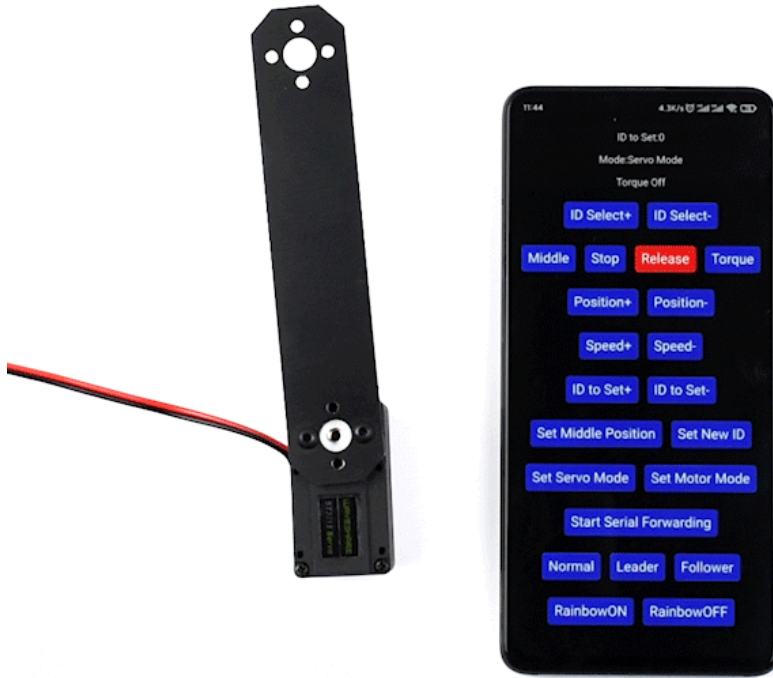
360° installation at any position, one button to set the current position as middle position. Easy to install



1. In the default program, a hotspot will be created automatically after the servo driver board is turned on. Use your mobile phone to connect to this hotspot, open the browser, and enter the IP address to enter the control interface.



2. Click Release to unlock, then turn the servo to the middle position where you need to set



3. Click Set Middle Position then confirm.



4. Turn the servo to any angle, then click Middle, and the servo will automatically return to the middle position initially set.

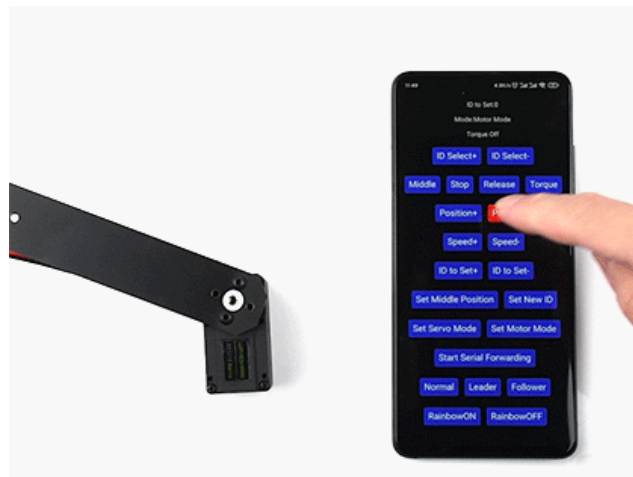
Two-Way Feedback

The Servos Will Provide Various Feedback Like Position, Load, Speed, And Input Voltage In Real Time

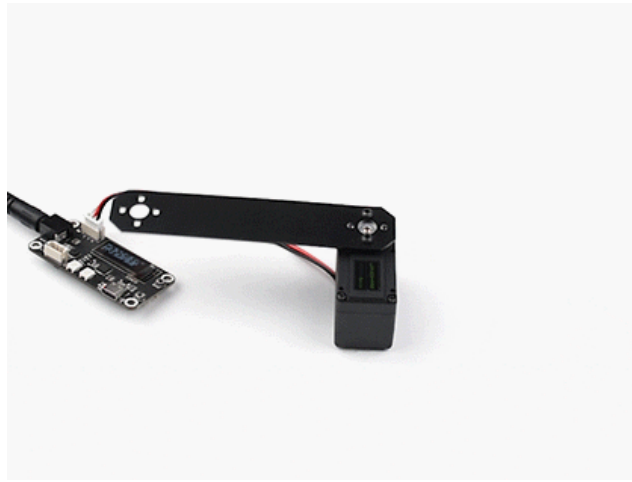


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Dual Modes: Servo Or Motor



precise rotation angle control on servo mode



continuous rotation on motor mode

* images here are for reference ONLY

Details Introduction



Nylon and fiberglass case

Improved heat-resistance, size stability, rigidity, and mechanical performance



High strength aluminum servo wheels

Using T6061 aluminum alloy, good corrosion-resistance



High precision copper and steel gears

Ingenious combination of the two, lower operating noise, better stability and mechanical performance

Open Source Control Program

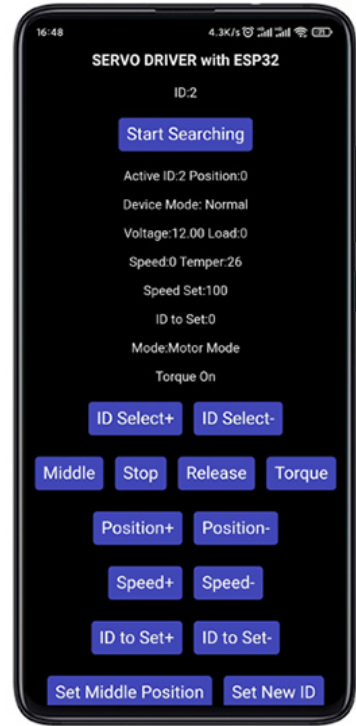
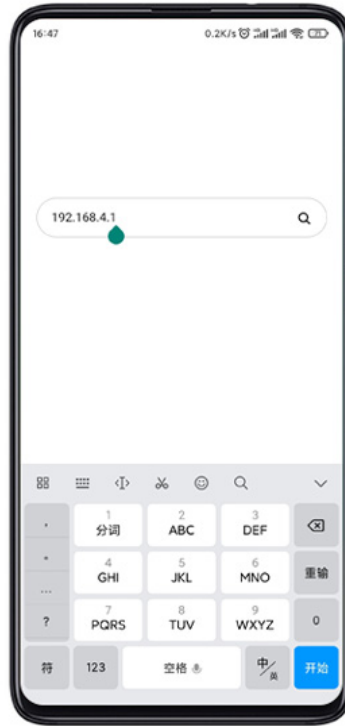
We provide the open-source web control demo of the servo driver board and a secondary development tutorial, which can be directly used for remote setting and remote control of the servo. At the same time, we also provide a 3D model for you to build your own project quickly



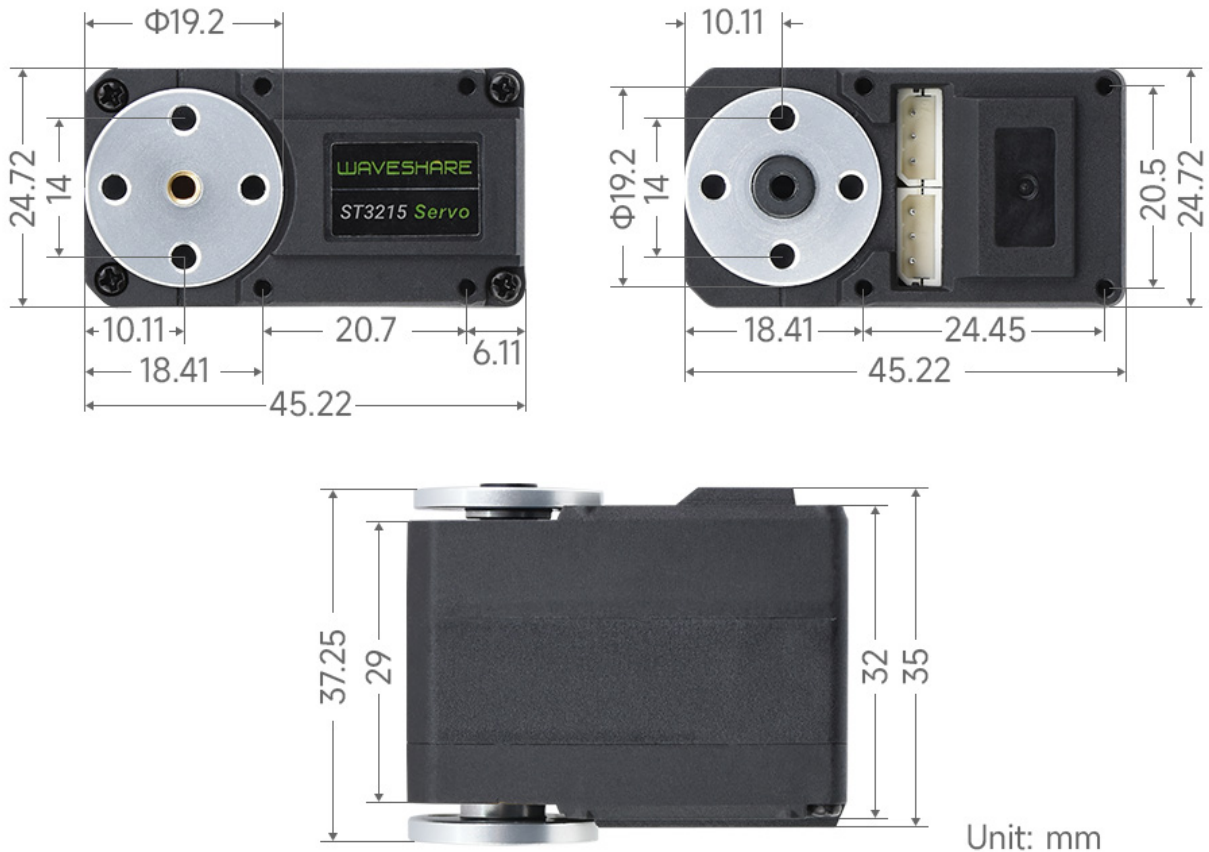
1 Connect to AP

2 Enter the IP address in the browser

3 Enter the control interface



Outline dimensions



Resources & Services



User Manual



Circuit Diagram



Example Code



Dev Resources

WIKI: www.waveshare.com/wiki/ST3215_Servo

* Resources for different product may vary, please check the wiki page to confirm the actually provided resources.

Product Selection

Product	Voltage	Control Method	Precision	NO-LOAD SPEED	Continuous Rotation	LOCKED-ROTOR TORQUE *	LOCKED-ROTOR CURRENT	Range	Feedback
WP90	4.8 ~ 7.4	PWM	≤2°	0.1sec/60°	-	2.3kg.cm	1.0A	180°	-
WP5320	4 ~ 8.4	PWM	≤5°	0.151sec/60°	-	20kg.cm	3A	180°	-
WP5335	4 ~ 8.4	PWM	≤1°	0.192sec/60°	-	35.5kg.cm	3.9A	180°	-
SC09	4.8 ~ 8.4	TTL	300°/1024	0.1sec/60°	√	2.3kg.cm	1.0A	300°	√

SC15	4.8 ~ 8.4	TTL	180° / 1024	0.16 sec / 60°	√	15kg.cm	1.5A	180°	√
ST3020	6 ~ 14.0	TTL	360° / 4096	0.167sec / 60°	√	25kg.cm	2.7A	360°	√
ST3215	6 ~ 12.6	TTL	360° / 4096	0.222 sec / 60°	√	30kg.cm	2.7A	360°	√
ST3025	6 ~ 12.6	TTL	360° / 4096	0.117sec / 60°	√	40kg.cm	4.4A	360°	√
ST3235	6 ~ 12.6	TTL	360° / 4096	0.222sec/60°	√	30kg.cm	2.7A	360°	√
CF35-12	9.0 ~ 12.6	TTL	360° / 4096	0.222sec/60°	√	35kg.cm	2.8A	360°	√
RSBL35- 24-HS	9.0 ~ 24.0	RS485	360° / 4096	0.087sec/60°	√	35kg.cm	1.8A	360°	√
RSBL45- 24	9.0 ~ 24.0	RS485	360° / 4096	0.142sec/60°	√	45kg.cm	2.3A	360°	√
RSBL85- 12	9.0 ~ 12.0	RS485	360° / 4096	0.167sec/60°	√	85kg.cm	7.9A	360°	√
RSBL85- 24	9.0 ~ 24.0	RS485	360° / 4096	0.154sec/60°	√	85kg.cm	5.6A	360°	√
RSBL120- 24	9.0 ~ 24.0	RS485	360° / 4096	0.2sec/60°	√	120kg.cm	4A	360°	√

* the Locked-rotor torque is measured at the typical voltage of each servo, please refer to the documentation in the wiki for more details