

# DSS-M15S 270° 15KG DF Metal Servo with Analog Feedback SKU SER0044

(<https://www.dfrobot.com/product-1709.html>)

## Introduction

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DSS-M15S servos have been well received by customers in these years. It has extremely wide angle control range, huge load capacity and excellent quality. This DSS-M15S with analog feedback has broken its internal potentiometer signal. This is an analog signal with 0~3.3V feedback. You can connect it to MCU to realize close-loop feedback control.

DSS-M15S 270° Metal servo with feedback is compatible with Arduino Servo library. You can drive it with Arduino Board and read the angle value from analog side.

## Specification

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- Electronic specifications
  - Operating voltage: 4.8-7.2V
- 6V test environment
  - Operating speed (no load): 0.18 sec/60 degrees
  - Resting current: 80mA
  - Locking torque: 13.5KG\*cm

- Stall current: 1.8A
- Standby current: 4mA
- 7V test environment
  - Operating speed (no load): 0.16sec/60 degrees
  - Resting current: 100mA
  - Locking torque: 15KG\*cm
  - Stall current: 2A
  - Standby current: 5mA
- Mechanical specifications
  - Gear material: metal gear
  - Operating angle: 270 degrees
  - Wiring gauge: 28PVC
  - Data line length: 320mm
  - Gear bracket spline: 25T/5.80
  - Gear ratio: 310:1
  - Size: 54.5\*20\*47.5mm
- Control specifications
  - Feedback signal: 0-3.3V
  - Control signal: RC PWM
  - Pulse range: 500-2500 us
  - Median signal value: 1500us
  - Clockwise rotation: <1500us
  - Control frequency: 50-330Hz (Arduion compatible)

## Servo Overview

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Num	Label	Description
1	GND	GND

2	VCC	4.8~7.2V
3	INPUT	PPM Signal
4	OUTPUT	Analog feedback

## Relationship between Angle & Analog value

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Formula: **Actual angle = Analog value degree \*0.47-33.4**

## Before Usage

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There will be some error between each servos. If you want to use the servos with scenes that require precise control, you can calibrate them separately. A quick three-point calibration method is provided here:

- 1. Drive the servo to 90 degrees (1500us), record the actual angle as reference angle A, and record the corresponding feedback analog value a;
- 2. Drive the servo to 0 degrees (500us), record the actual angle as reference angle B, and record the corresponding feedback analog value B;
- 3. Drive the servo to 270 degrees (2500c), record the actual angle as reference angle C, and record the corresponding feedback analog value C

The following formula gives the relationship between Analog value & Angle:

The following formula gives the relationship between Analog value & Angle.

- Actual angle = m \* Analog value n
- $m = \frac{(A-B)/(a-b) - (C-A)/(c-a)}{2}$
- $n = \frac{(Ab-Ba)/(b-a) - (Bc-Cb)/(c-b)}{2}$

If you doesn't need such accurate value, you can use  $m=0.47;n=-33.4$  directly.

## Tutorial

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### Requirements

- **Hardware**
  - DFRduino UNO R3 (<https://www.dfrobot.com/product-838.html>) (or similar) x 1
  - SER0044 DSS-M15S 270° Metal Servo
  - M-M/F-M/F-F Jumper wires
- **Software**
  - Arduino IDE, Click to Download Arduino IDE from Arduino® (<https://www.arduino.cc/en/Main/Software>)

### Connection Diagram

### Sample Code

```
void setup()
{
  Serial.begin(9600); //Set Baud Rate to 9600 bps
}

void loop()
{
  uint16_t val;
  double dat;
  val=analogRead(A0); //Connect Analog pin to A0
  dat = (double) val * 0.47-33.4;
  Serial.print("Position:"); //Display the position on Serial monitor
  Serial.print(dat);
  Serial.println("Degree");
  delay(100);
}
```

## Expected Results

Arduino will drive the servo with D9 pin, and receive the Analog feedback from A0 port.

## FAQ

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For any questions, advice or cool ideas to share, please visit the **DFRobot Forum** (<https://www.dfrobot.com/forum/>).

## Dimension

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## More Documents

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Get **DSS-M15S 270° 15KG DF Metal Servo with Analog Feedback** (<https://www.dfrobot.com/product-1709.html>) from DFRobot Store or **DFRobot Distributor**. (<https://www.dfrobot.com/index.php?route=information/distributorslogo>)

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