

SKU:DFR1036 (<https://www.dfrobot.com/product-2752.html>)

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INTRODUCTION

DAC series modules are a range of products that can be controlled through I2C or PWM signals to generate voltage or current output signals. They possess the capability to produce a variety of analog voltage or current signals, including 0-5V, 0-10V, 0-2.5V, 0-VCC, and 0-25mA.



An analog quantity refers to the continuous variation of voltage magnitude (or current magnitude) within a specific range. Due to its stability, long transmission distance, and ease of use, it has found widespread application in the field of industrial automation control, including:

- Motor speed control
- Sound intensity control
- Temperature regulation
- Adjustment of light brightness
- Valve angle modulation

etc.

This series of DAC products not only offers a variety of output signal ranges, but also provides three selectable resolutions: 8-bit, 12-bit, and 15-bit. It allows for the choice of either single-channel or dual-channel configurations, and multiple modules can be cascaded to form a multi-channel output. When coupled with Arduino controllers, Raspberry Pi, STM32, and similar controllers, it finds application in various automation control scenarios, including:

- Laboratory testing equipment
- Automatic motor speed control
- Indoor and outdoor lighting control
- Automated volume adjustment

- Backlight control for displays
- etc.

The following table presents the functional parameters of each DAC product for reference in the selection process.

0-2.5V/VCC Product									
SKU	Name	Chip modle	Functional Diagram	Number of Channels	Output	Input	Resolution	Linearity error	Product Features
DFR1034	2-channel I2C to 0-2.5V/0-VCC	GP8503		2	0-2.5V/VCC	I2C	12bit	0.10%	2 channels, expandable up to 8 modules through cascading.
DFR1037	2-channel PWM to 0-2.5V/0-VCC	GP8501		2	0-2.5V/VCC	PWM	8bit	0.10%	2 channels, PWM input, versatile compatibility.
DFR1035	1-channel I2C to 0-2.5V/0-VCC	GP8512		1	0-2.5V/VCC	I2C	15bit	0.01%	High resolution and precision.
0-5V/10V Product									
SKU	Name	Chip modle	Functional Diagram	Number of Channels	Output	Input	Resolution	Linearity error	Product Features
DFR0971	2-channel I2C to 0-5V/0-10V	GP8403		2	0-5V/10V	I2C	12bit	0.10%	2 channels, expandable up to 8 modules through cascading.
DFR1073	2-channel 15bit I2C to 0-5V/0-10V	GP8413		2	0-5V/10V	I2C	15bit	0.01%	2 channels, offering high resolution and precision, expandable up to 8 modules through cascading.
DFR1071	1-channel 15bit I2C to 0-5V/0-10V	GP8211S		1	0-5V/10V	I2C	15bit	0.01%	High resolution and precision.
DFR1036	1-channel PWM to 0-5V/0-10V	GP8101S		1	0-5V/10V	PWM	8bit	0.10%	PWM input, versatile compatibility.
4-20mA Product									
SKU	Name	Chip modle	Functional Diagram	Number of Channels	Output	Input	Resolution	Linearity error	Product Features
DFR0972	1-channel I2C转4-20mA	GP8302		1	0-20mA	I2C	12bit	0.10%	More stable current signal.

DFR1036 GP8101S （1-Channel PWM to 0-5V/10V DAC Module）

FUNCTIONS

This is a 1-channel DAC module with PWM communication, a resolution of 8-bit, and 0.1% output voltage linearity error, capable of generating analog voltage outputs of 0-10V or 0-5V. The 0-10V or 0-5V voltage output is a standard driving method. It can be widely used in automation control scenarios such as lighting adjustment, frequency converters, valve regulation, and pump control,etc. This product can drive a variety of 0-10V or 0-5V controlled devices available in the market through Arduino programming.

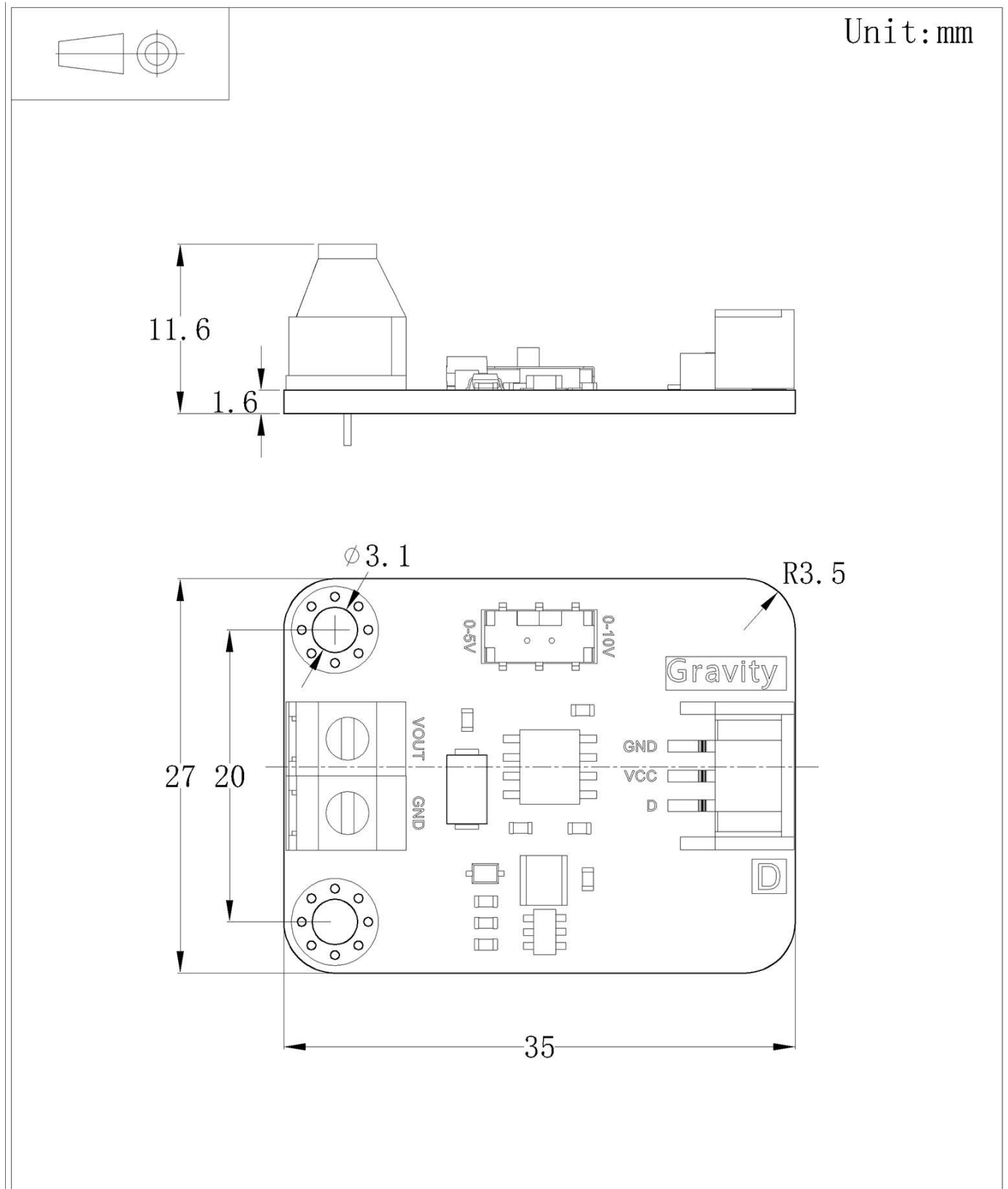
PWM signal drive allows the module to be controlled by MCU digital ports, providing a simple and convenient usage.

FEATURES

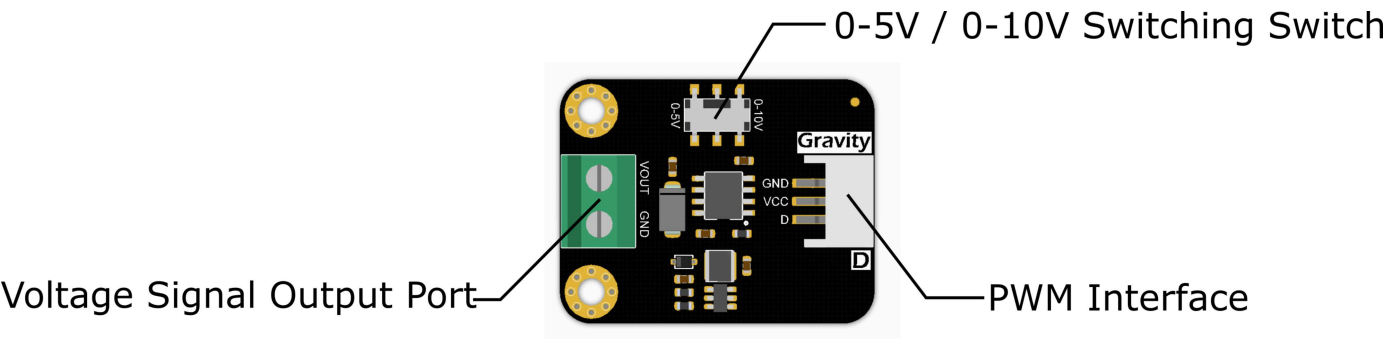
- Support 3.3V-5V power supply.
- Output voltage linearity error of 0.1%.

- Two channels of voltage output, either 0-5V or 0-10V, enabling connection and control of standard analog voltage devices.
- Gravity interface, PWM communication, Arduino control, suitable for program automation control.
- PWM signals can be utilized to drive the module, enabling it to be controlled simply by the digital port of the MCU.

DIMENSION



FUNCTIONAL DIAGRAM



Name	Description	Remarks
PWM Interface	VCC	Positive terminal of the power supply (3.3V-5V)
	GND	Negative terminal of the power supply
	D	PWM Input Port
0-5V/0-10V Switching Switch	0-10V	Switch output voltage to 0V-10V
	0-5V	Switch output voltage to 0V-5V
Voltage Signal Output Port	VOUT	Positive terminal of output voltage signal
	GND	Negative terminal of the output voltage signal

SPECIFICATIONS

- Chip Type: GP8101S
- Operating Voltage: 3.3V-5V
- Output Voltage: 0-5V or 0-10V
- Number of Channels: 1 channel
- Communication Method: PWM
- Resolution: 8-bit
- Value Range: 0 - 255 corresponding to 0-5V or 0-10V
- Output voltage linearity error: 0.1%

In this example, we will Demonstrate the variation of output voltage for the same input signal in two different states.

Input signal value range: 0-255

- In the state of 0-5V: Input value of 176, resulting in an output voltage of 3.45V.
- In the state of 0-10V: Input value of 176, resulting in an output voltage of 6.90V.

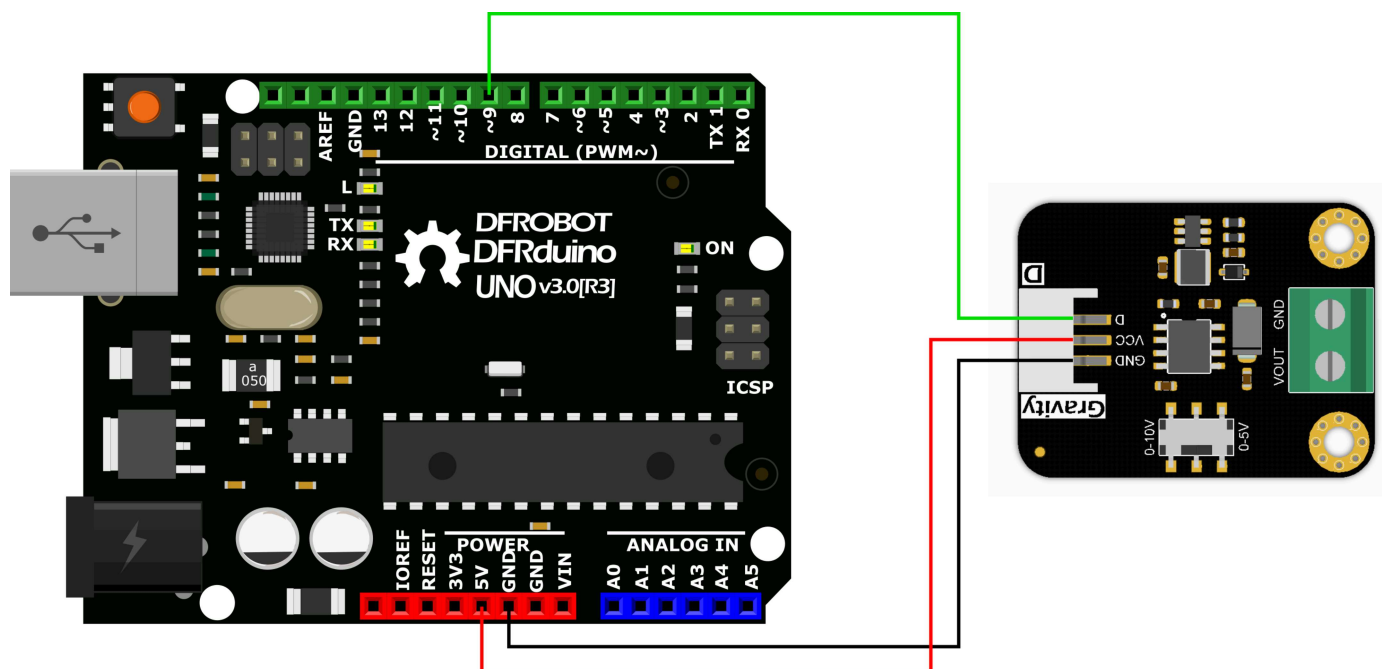
SOFTWARE REQUIREMENTS

- Download Arduino IDE: Click to download Arduino IDE (<https://www.arduino.cc/en/Main/Software>)
- Download Arduino libraries: Click to download https://github.com/DFRobot/DFRobot_GP8XXX (https://github.com/DFRobot/DFRobot_GP8XXX)

Click the link to view: How to install the library?;
(<http://www.dfrobot.com.cn/community/forum.php?mod=viewthread&tid=1854&page=1&extra=#pid6955>)

Note: All modules in this series utilize the same library.

HARDWARE CONNECTION



SAMPLE CODE

```
#include <DFRobot_GP8XXX.h>

//Output IO Port
int pwmPin = 9;
DFRobot_GP8101S GP8101S(pwmPin);
void setup() {

    GP8101S.begin();

    /**
     * @brief. Set the output DAC value.
     * @param data pwm
     * @n. Optional parameters (0-255) correspond to voltage ranges of (0-5V) or (0-10V), and
     */
    GP8101S.setDACOutVoltage(176);//Output voltage of 3.45V under the 0-5V state and 6.90V under the 0-10V state
}

void loop() {

}
```

RESULT

After downloading the program, the voltmeter was used to measure the actual output voltage of 3.45V under the 0-5V state and 6.90V under the 0-10V state.

More Documents

DFR1036 Documents:

DFR1036-Schematics.pdf

(<https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/d3feb7b39ca373c639b41113891acf21.pdf>)

DFR1036_Dimensions.pdf

(<https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/64665c3536d543091142d6337a6d3807.pdf>)

DFR1036_3D File.rar

(<https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/94a0c691e9a36f3dd2dd0f1e8df6d6>)

(<https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/54a0c091e3aa013dd2dd01fe0d10d070.rar>)

DFR1036_2D_CAD File.rar

(<https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/e8ddfee4051b92233e3366bfa637cdde.rar>)

DFR1036_GP8101S Datasheet.pdf

(<https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/b86e46b39945acb8bcfe6429bef0df15.pdf>)

FAQ

For any questions, advice or cool ideas to share, please visit the **DFRobot Forum**

(<https://www.dfrobot.com/forum/>).