LAMPIRAN

Source code

```
#include <Adafruit_Sensor.h>

#include <Adafruit_ADXL345_U.h>

#include <Wire.h>

#include <Servo.h>

#define buzzer 12 // buzzer pin

#define relay 11 // relay pin

#define Register_ID 0

#define Register_2D 0x2D

#define Register_X0 0x32

#define Register_X1 0x33

#define Register_Y0 0x34

#define Register_Y1 0x35

#define Register_Z0 0x36

#define Register_Z1 0x37

int ADXAddress = 0x53;  //I2C address

int reading = 0;

int val = 0;

int X0,X1,X_out;

int Y0,Y1,Y_out;

int Z1,Z0,Z_out;

double Xg,Yg,Zg;
```

```
long start;

int buz=0;

float datax,datay,dataz;

Adafruit_ADXL345_Unified accel = Adafruit_ADXL345_Unified(12345);

Servo myservo;

Servo myservo2;

int pos = 0;

//bagian x

#define samplesx 50

#define maxBuzX 2

#define minBuzX -2

#define maxValX 6 // Batas Maksimum

#define minValX -6 // Batas Minimum

#define buzTime 1000

#define relayTime 1000

//bagian y

#define samplesy 50

#define maxBuzY 2

#define minBuzY -2

#define maxValY 6 // Batas Maksimum

#define minValY -6 // Batas Minimum

#define buzTime 1000
```

```
#define relayTime 1000
void setup()
{
  Serial.begin(9600);
  delay(100);
  Wire.begin();
  delay(100);
  Wire.beginTransmission(ADXAddress);
  Wire.write(Register_2D);
  Wire.write(8);
  Wire.endTransmission();
  Serial.println("EarthQuake Detector ");
  delay(1000);
  Serial.println("Device Ready");
  delay(1000);
  Serial.println(" X Y Z ");
  myservo.attach(9);
  myservo2.attach(4);
  pinMode(buzzer, OUTPUT);
  pinMode (relay, OUTPUT);
  buz=0;
  digitalWrite(buzzer, buz);
```

```
  digitalWrite(relay, HIGH);
}
void loop()
{
for (pos = 0; pos <= 40; pos += 4) { // goes from 0 degrees to 180 degrees
    // in steps of 1 degree
    myservo.write(pos);              // tell servo to go to position in variable 'pos'
    delay(99);                       // waits 15 ms for the servo to reach the position
  }
  for (pos = 40; pos >= 0; pos -= 4) { // goes from 0 degrees to 180 degrees
    // in steps of 1 degree
    myservo.write(pos);              // tell servo to go to position in variable 'pos'
    delay(99);                       // waits 15 ms for the servo to reach the position
  }
  Wire.beginTransmission(ADXAddress);
  Wire.write(Register_X0);
  Wire.write(Register_X1);
  Wire.endTransmission();
  Wire.requestFrom(ADXAddress,2);
  if(Wire.available()<=2);
  {
    X0 = Wire.read();
```

```
  X1 = Wire.read();
  X1 = X1<<8;
  X_out = X0+X1;
}
Wire.beginTransmission(ADXAddress);
Wire.write(Register_Y0);
Wire.write(Register_Y1);
Wire.endTransmission();
Wire.requestFrom(ADXAddress,2);
if(Wire.available()<=2);
{
  Y0 = Wire.read();
  Y1 = Wire.read();
  Y1 = Y1<<8;
  Y_out = Y0+Y1;
}
Wire.beginTransmission(ADXAddress);
Wire.write(Register_Z0);
Wire.write(Register_Z1);
Wire.endTransmission();
Wire.requestFrom(ADXAddress,2);
if(Wire.available()<=2);
```

```
  {
    Z0 = Wire.read();
    Z1 = Wire.read();
    Z1 = Z1<<8;
    Z_out = Z0+Z1;
  }
if(X_out < minBuzX || X_out > maxBuzX)
{
if(buz == 0)
start=millis(); // timer start
buz=1;
// buzzer / led flag activated
}
if(Y_out < minBuzY || Y_out > maxBuzY)

{
if(buz == 0)
start=millis(); // timer start
buz=1;
// buzzer / led flag activated
}
else if (buz == 1) // buzzer flag activated then alerting earthquake
```

```
{
Serial.println("Earthquake Alert ");
if(millis()>= start+buzTime)
buz=0;
}
digitalWrite(buzzer, buz); // buzzer on and off command
//RELAY
if(X_out < minValX || X_out > maxValX)
{
 digitalWrite(relay, LOW);
 myservo2.write(90);
 delay (7000);
}
if(Y_out < minValY || Y_out > maxValY)
{
 digitalWrite(relay, LOW);
 myservo2.write(90);
 delay (7000);
}else // buzzer flag activated then alerting earthquake
{
digitalWrite(relay, HIGH);
myservo2.write(0);
```

```
}
 digitalWrite(relay, HIGH); // buzzer on and off command
myservo2.write(0);
  Xg = X_out;
  Yg = Y_out;
  Zg = Z_out;
  Serial.print("X=");
  Serial.print(Xg);
  Serial.print("\tY=");
  Serial.print(Yg);
  Serial.print("\tZ=");
  Serial.println(Zg);
  delay(1000);
}
```

Data sheet sensor

Sensor ADXL345

FEATURES

Ultra low power: 25 to 130 µA at VS = 2.5 V (typ) Power consumption scales automatically with bandwidth User selectable fixed 10-bit resolution or 4mg/LSB scale

factor in all *g*-ranges, up to 13-bit resolution at ±16 *g*

32 level output data FIFO minimizes host processor load Built in motion detection functions

- Tap/Double Tap detection
- Activity/Inactivity monitoring
- Free-Fall detection

Supply and I/O voltage range: 1.8 V to 3.6 V SPI (3 and 4 wire) and I^2C digital interfaces

Flexible interrupt modes – Any interrupt mappable to either interrupt pin

Measurement ranges selectable via serial command Bandwidth selectable via serial command

Wide temperature range (-40 to +85°C) 10,000 *g* shock survival

Pb free/RoHS compliant

Small and thin: 3 × 5 × 1 mm LGA package

APPLICATIONS

Handsets

Gaming and pointing devices Personal navigation devices HDD protection

Fitness equipment Digital cameras

GENERAL DESCRIPTION

The ADXL345 is a small, thin, low power, three-axis accelerometer with high

resolution (13-bit) measurement up to
±16 *g*. Digital output data is formatted as 16-bit twos complement and is accessible through either a SPI (3- or 4- wire) or I^2C digital interface.

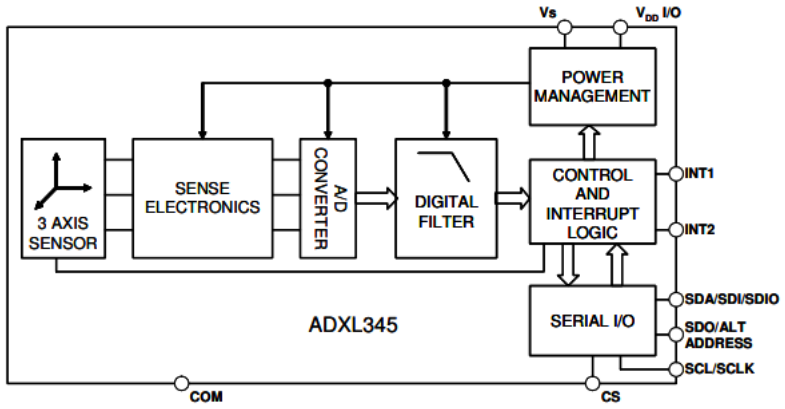
The ADXL345 is well suited for mobile device applications. It measures the static acceleration of gravity in tilt-sensing applications, as well as dynamic acceleration resulting from motion or shock. Its high resolution (4m*g*/LSB) enables resolution of inclination changes of as little as 0.25°.

Several special sensing functions are provided. Activity and inactivity sensing detect the presence or lack of motion and if the acceleration on any axis exceeds a user-set level. Tap sensing detects single and double taps. Free-Fall sensing detects if the device is falling. These functions can be mapped to interrupt output pins. An integrated 32 level FIFO can be used to store data to minimize host processor intervention.

Low power modes enable intelligent motion-based power management with threshold sensing and active acceleration measurement at extremely low power dissipation.

The ADXL345 is supplied in a small, thin 3 mm × 5 mm × 1 mm, 14-lead, plastic package.

FUNCTIONAL BLOCK DIAGRAM



Gambar. ADXL345 Simplified Block Diagram

SPECIFICATIONS

TA = 25°C, VS = 2.5 V, VDD I/O = 1.8 V, Acceleration = 0 g, unless otherwise noted.

Table 1. Specifications1

Parameter	Conditions	Min	Typ	Max	Unit
SENSOR INPUT	Each axis				
Measurement Range	User Selectable		±2, 4, 8, 16		*g*
Nonlinearity	Percentage of full scale		±0.5		%
Inter-Axis Alignment Error			±0.1		Degrees
Cross-Axis Sensitivity[2]			±1		%
OUTPUT RESOLUTION	Each axis				
All g-ranges	10-bit mode		10		Bits
±2 *g* range	Full-Resolution		10		Bits
±4 *g* range	Full-Resolution		11		Bits
±8 *g* range	Full-Resolution		12		Bits
±16 *g* range	Full-Resolution		13		Bits
SENSITIVITY	Each axis				
Sensitivity at XOUT, YOUT, ZOUT Scale Factor at XOUT, YOUT, ZOUT Sensitivity at XOUT, YOUT, ZOUT Scale Factor at XOUT, YOUT, ZOUT Sensitivity at XOUT, YOUT, ZOUT Scale Factor at XOUT, YOUT, ZOUT Sensitivity at XOUT, YOUT, ZOUT Scale Factor at XOUT, YOUT, ZOUT	VS = 2.5 V, ±2 *g* 10-bit or Full-Resolution VS = 2.5 V, ±2 *g* 10-bit or Full-Resolution VS = 2.5 V, ±4 *g* 10-bit mode VS = 2.5 V, ±4 *g* 10-bit mode VS = 2.5 V, ±8 *g* 10-bit mode VS = 2.5 V, ±8 *g* 10-bit mode VS = 2.5 V, ±16 *g* 10-bit mode VS = 2.5 V, ±16 *g* 10-bit mode	232 3.5 116 7.0 58 14.0 29 28.1	256 3.9 128 7.8 64 15.6 32 31.2	286 4.3 143 8.6 71 17.2 36 34.3	LSB/*g* mg/LSB LSB/*g* mg/LSB LSB/*g* mg/LSB LSB/*g* mg/LSB
Sensitivity Change due to Temperature			±0.02		%/°C
0 *g* BIAS LEVEL	Each axis				
0 *g* Output (XOUT, YOUT, ZOUT)	VS = 2.5 V, TA = 25°C	-150	0	+150	m*g*
0 *g* Offset vs. Temperature			<±1		mg/°C
NOISE PERFORMANCE					
Noise (x-, y-axes)	Data Rate = 100 Hz, ±2 *g* 10-bit or Full-Res.		<1		LSB RMS
Noise (z-axis)	Data Rate = 100 Hz, ±2 *g* 10-bit or Full-Res.		<1.5		LSB RMS
OUTPUT DATA RATE / BANDWIDTH	User Selectable				
Measurement Rate[3]		0.1		3200	Hz
SELF TEST					
Output		+0.31		+1.02	*g*
Change X		-0.31		-1.02	*g*
Output		+0.46		+1.64	*g*
Change Y					
Output					
Change Z					
POWER SUPPLY					
Operating Voltage Range (VS)		2.0	2.5	3.6	V
Interface Voltage Range (VDD I/O)		1.7	1.8	VS	V
Supply Current	Data Rate > 100 Hz		130	150	µA
Supply Current	Data Rate < 10 Hz		25		µA
Standby Mode Leakage Current			0.1	2	µA
Turn-On Time[4]	Data Rate = 3200 Hz		1.4		ms
TEMPERATURE					
Operating Temperature Range		−40		85	°C
WEIGHT					
Device Weight			20		mgrams

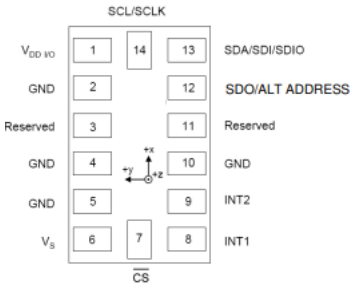
ABSOLUTE MAXIMUM RATINGS

Table 2. Absolute Maximum Ratings

Parameter	Rating
Acceleration (Any Axis, Unpowered)	10,000 *g*
Acceleration (Any Axis, Powered)	10,000 *g*
V_S	−0.3 V to 3.6 V
$V_{DD\ I/O}$	−0.3 V to 3.6
All Other Pins	−0.3 V to 3.6
Output Short-Circuit Duration (Any Pin to Ground)	Indefinite
Temperature Range (Powered)	−40°C to +105°C
Temperature Range (Storage)	−40°C to +105°C

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

PIN CONFIGURATION AND DESCRIPTIONS



Gambar Pin Configuration (Top View)

Pin No.	Mnemonic	Description
1	$V_{DD\ I/O}$	Digital Interface Supply Voltage
2	GND	Must be connected to ground
3	Reserved	Reserved, must be connected to V_S or left open
4	GND	Must be connected to ground
5	GND	Must be connected to ground
6	V_S	Supply Voltage
7	$\overline{CS}$	Chip Select
8	INT1	Interrupt 1 Output
9	INT2	Interrupt 2 Output
10	GND	Must be connected to ground
11	Reserved	Reserved, must be connected to GND or left open

12	SDO/ALT ADDRESS	Serial Data Out, Alternate I^2C Address Select
13	SDA/SDI/SDIO	Serial Data (I^2C), Serial Data In (SPI 4-Wire), Serial Data In/Out (SPI 3-Wire)
14	SCL/SCLK	Serial Communications Clock

FUNCTIONAL DESCRIPTION

DEVICE OPERATION

The ADXL345 is a complete three-axis acceleration measurement system with a selectable measurement range of either ±2 *g*, ±4 *g*, ±8 *g*, *or* ±16 *g*. It measures both dynamic acceleration resulting from motion or shock and static acceleration, such as gravity, which allows it to be used as a tilt sensor. The sensor is a polysilicon surface-micromachined structure built on top of a silicon wafer. Polysilicon springs suspend the structure over the surface of the wafer and provide a resistance against acceleration forces. Deflection of the structure is measured using differential capacitors that consist of independent fixed plates and plates attached to the moving mass. Acceleration deflects the beam and unbalances the differential capacitor, resulting in a sensor output whose amplitude is proportional to acceleration. Phase-sensitive demodulation is used to determine the magnitude and polarity of the acceleration.

POWER SEQUENCING

Power may be applied to V_S or $V_{DD\ I/O}$ in any sequence without damaging the ADXL345. All possible power on states are summarized in Table 4. The interface voltage level is set with the interface supply voltage $V_{DD\ I/O}$, which must be present to ensure that the ADXL345 does not create a conflict on the communications bus. For single-supply operation, $V_{DD\ I/O}$ can be the same as the main supply, V_S. Conversely, in a dual-supply application, $V_{DD\ I/O}$ can differ from V_S to accommodate the desired interface voltage. Once V_S is applied, the device enters standby state, where power consumption is minimized and the device waits for $V_{DD\ I/O}$ to be applied and a command to enter measurement state (setting the MEASURE bit in the POWER_CTL register). Clearing the MEASURE bit returns the device to standby state.

Table 4. Power Sequencing

Condition	V_S	$V_{DD\ I/O}$	Description
Power Off	Off	Off	Completely off, potential for communications bus conflict.
Bus Enabled	Off	On	No functions available, but will not create conflict on communications bus.

Standby or Measurement	On	On	At power up the device is in Standby mode awaiting a command to enter measurement mode and all sensor functions are off. Once instructed to enter Measurement mode, all sensor functions are available.

POWER SAVING

Power Modes

The ADXL345 automatically modulates its power consumption proportionally with its output data rate as shown in

Table 5. Ifadditional power savings is desired, a lower power mode is available. In this mode, the internal sampling rate is reduced allowing for power savings in the 12.5 to 400Hz data rate range at the expense of slightly greater noise. To enter lower power mode, set the LOW_POWER bit(D4) in the **BW_RATE** register.

Table 5. Current Consumption versus Data Rate

Output Data Rate (Hz)	Bandwidth (Hz)	Rate Code	I_{DD} (μA)
3200	1600	1111	130
1600	800	1110	80
800	400	1101	130
400	200	1100	130
200	100	1011	130
100	50	1010	130
50	25	1001	80
25	12.5	1000	55
12.5	6.25	0111	37
6.25	3.125	0110	25
3.125	1.563	0101	25
1.563	0.782	0100	25
0.782	0.39	0011	25
0.39	0.195	0010	25
0.195	0.098	0001	25
0.098	0.048	0000	25

The current consumption in Low Power Mode is shown in Table 6. Cases where there is no advantage to using Low Power Mode are shaded.

Table 6. Current Consumption versus Data Rate in Low Power Mod

Output Data Rate	Bandwidth (Hz)	Rate Code	I_{DD} (μA)
3200	1600	1111	130
1600	800	1110	80
800	400	1101	130
400	200	1100	80
200	100	1011	55
100	50	1010	37
50	25	1001	30
25	12.5	1000	25
12.5	6.25	0111	25
6.25	3.125	0110	25
3.125	1.563	0101	25
1.563	0.782	0100	25
0.782	0.39	0011	25
0.39	0.195	0010	25
0.195	0.098	0001	25
0.098	0.048	0000	25

Auto Sleep Mode

Additional power can be saved by having the ADXL345 automatically switch to sleep mode during periods of inactivity. To enable this feature set the **THRESH_INACT** register to an acceleration value that signifies no activity (this value will depend on the application), set **TIME_INACT** to an appropriate inactivity time period (again, this will depend on the application), and set the AUTO_SLEEP bit and the LINK bit in the **POWER_CTL** register. Current consumption at the sub- 8Hz data rates used in this mode is typically 25 μA.

Standby Mode

For even lower power operation Standby Mode can be used. In Standby Mode current consumption is reduced to 2μA (typical). In this mode no measurements are made and communication with the ADXL345 is limited to single-byte read or writes.
Standby Mode is entered by clearing the MEASURE bit (D3) in the **POWER_CTL** register. Placing the device into Standby Mode will preserve the contents of the FIFO.

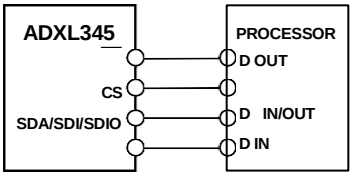
SERIAL COMMUNICATIONS

I^2C and SPI digital communications are available. In both cases, the ADXL345 operates as a slave. I^2C mode is enabled if the CS pin is tied high to $V_{DD\ I/O}$. In SPI mode, the CS pin is controlled by the bus master. In both SPI and I^2C modes of

operation, data transmitted from the ADXL345 to the master device should be ignored during writes to the ADXL345.

SPI

For SPI, either 3-wire or 4-wire configuration is possible, as shown in the connection diagrams in Figure 3 and Figure 4. Clearing the SPI bit in the **DATA_FORMAT** register selects 4-wire mode while setting the SPI bit selects 3-wire mode. The maximum SPI clock speed is 5 MHz, with 12 pF maximum loading and the timing scheme follows CPOL = 1, CPHA = 1.



Gambar Wire SPI connection

Data Sheet Aktuator

Arduoino uno

Description The Arduino UNO R3 is the perfect board to get familiar with electronics and coding. This versatile development board is equipped with the well-known ATmega328P and the ATMega 16U2 Processor. This board will give you a great first experience within the world of Arduino. Target areas: Maker, introduction, industries

Features

ATMega328P Processor

Memory

AVR CPU at up to 16 MHz32KB Flash

2KB SRAM

1KB EEPROM

Security

Power On Reset (POR) Brown Out Detection (BOD)

Peripherals

2x 8-bit Timer/Counter with a dedicated period register and compare channels

1x 16-bit Timer/Counter with a dedicated period register, input capture and compare channels 1x USART with fractional baud rate generator and start-of-frame detection

1x controller/peripheral Serial Peripheral Interface (SPI)

1x Dual mode controller/peripheral I2C

1x Analog Comparator (AC) with a scalable reference input Watchdog Timer with separate on-chip oscillator

Six PWM channels

Interrupt and wake-up on pin change

ATMega16U2 Processor

8-bit AVR® RISC-based microcontroller

Memory

16 KB ISP Flash 512B EEPROM

512B SRAM

debugWIRE interface for on-chip debugging and programming

Power 2.7-5.5 volts

Application Examples

The UNO board is the flagship product of Arduino. Regardless if you are new to the world of electronics or will use the UNO as a tool for education purposes or industry-related tasks, the UNO is likely to meet your needs.

First entry to electronics: If this is your first project within coding and electronics, get started with our most used and documented board; Arduino UNO. It is equipped with the well-known ATmega328P processor, 14 digital input/output pins, 6 analog inputs, USB connections, ICSP header and reset button. This board includes everything you will need for a great first experience with Arduino.

Industry-standard development board: Using the Arduino UNO R3 board in industries, there are a range of companies using the UNO board as the brain for their PLC's.

Education purposes: Although the UNO R3 board has been with us for about ten years, it is still widely used for various education purposes and

scientific projects. The board's high standard and top quality performance makes it a great resource to capture real time from sensors and to trigger complex laboratory equipment to mention a few examples.

Related Products

Starter Kit Arduino UNO R4 Minima Arduino UNO R4 WiFi Tinkerkit Braccio Robot

Recommended Operating Conditions

Symbol	Description	Min	Max
	Conservative thermal limits for the whole board:	-40 °C (-40°F)	85 °C (185°F)

> **NOTE:** In extreme temperatures, EEPROM, voltage regulator, and the crystal oscillator, might not work as expected.

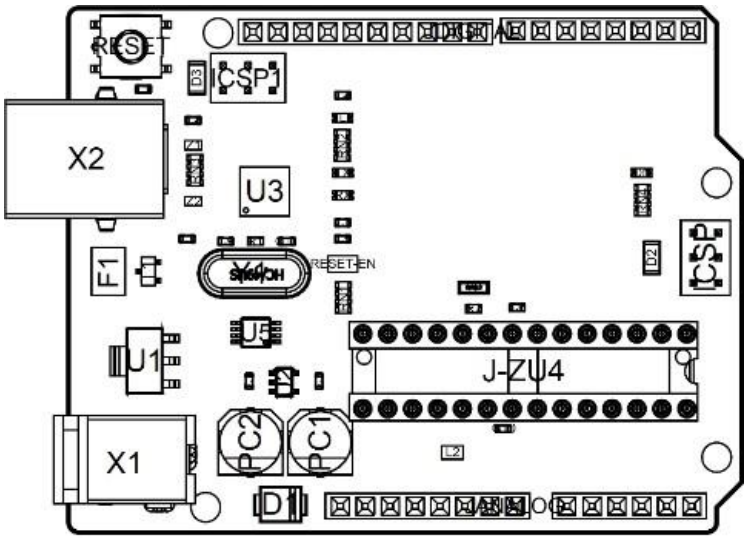
Power Consumption

Symbol	Description	Min	Typ	Max	Unit
VINMax	Maximum input voltage from VIN pad	6	-	20	V
VUSBMax	Maximum input voltage from USB connector		-	5.5	V
PMax	Maximum Power Consumption	-	-	xx	mA

Functional Overview

Board Topology

Top view



Board topology

Ref.	Description	Ref.	Description
X1	Power jack 2.1x5.5mm	U1	SPX1117M3-L-5 Regulator
X2	USB B Connector	U3	ATMEGA16U2 Module
PC1	EEE-1EA470WP 25V SMD Capacitor	U5	LMV358LIST-A.9 IC
PC2	EEE-1EA470WP 25V SMD Capacitor	F1	Chip Capacitor, High Density
D1	CGRA4007-G Rectifier	ICSP	Pin header connector (through hole 6)
J-ZU4	ATMEGA328P Module	ICSP1	Pin header connector (through hole 6)
Y1	ECS-160-20-4X-DU Oscillator		

Processor

The Main Processor is a ATmega328P running at up to 20 MHz. Most of its pins are connected to the externalheaders, however some are reserved for internal communication with the USB Bridge coprocessor.

Board Operation

Getting Started - IDE

If you want to program your Arduino UNO R3 while offline you need to install the Arduino Desktop IDE [1] To connect the Arduino UNO to your computer, you'll need a USB-B cable. This also provides power to the board, asindicated by the LED.

Getting Started - Arduino Web Editor

All Arduino boards, including this one, work out-of-the-box on the Arduino Web Editor [2], by just installing a simpleplugin.

The Arduino Web Editor is hosted online, therefore it will always be up-to-date with the latest features and support for all boards. Follow **[3]** to start coding on the browser and upload your sketches onto your board.

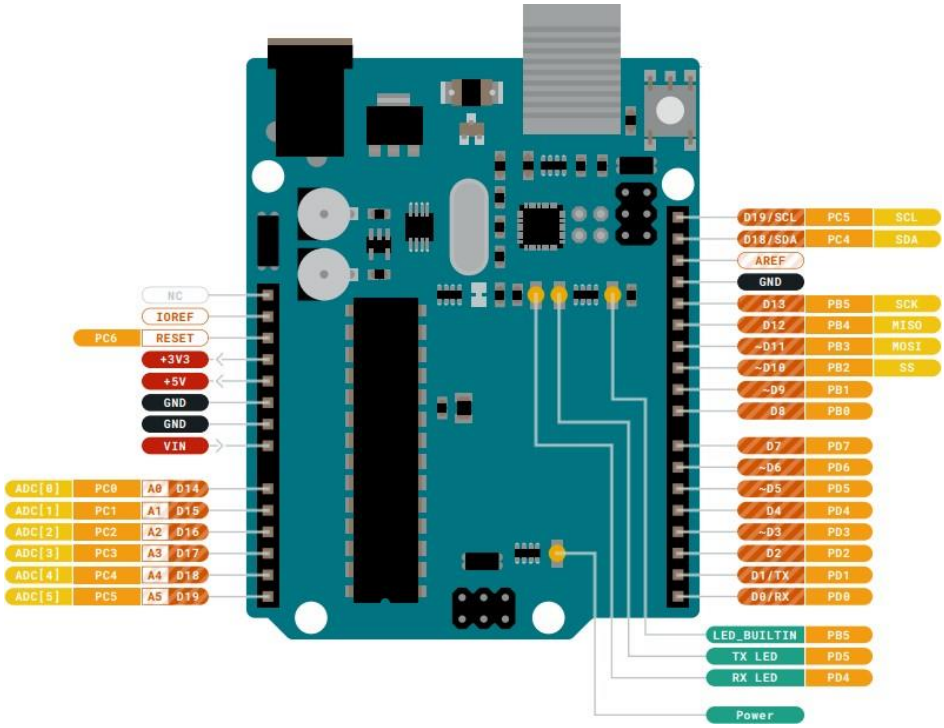
Sample Sketches

Sample sketches for the Arduino UNO R3 can be found either in the "Examples" menu in the Arduino IDE or in the "Documentation" section of the Arduino website [4]

Online Resources

Now that you have gone through the basics of what you can do with the board you can explore the endless possibilities it provides by checking exciting projects on Arduino Project Hub **[5]**, the Arduino Library Reference **[6]** and the online Arduino store **[7]** where you will be able to complement your board with sensors, actuators and more.

Connector pinouts



Pinout

JANALOG

Pin	Function	Type	Description
1	NC	NC	Not connected
2	IOREF	IOREF	Reference for digital logic V - connected to 5V
3	Reset	Reset	Reset
4	+3V3	Power	+3V3 Power Rail
5	+5V	Power	+5V Power Rail
6	GND	Power	Ground
7	GND	Power	Ground
8	VIN	Power	Voltage Input
9	A0	Analog/GPIO	Analog input 0 /GPIO
10	A1	Analog/GPIO	Analog input 1 /GPIO
11	A2	Analog/GPIO	Analog input 2 /GPIO
12	A3	Analog/GPIO	Analog input 3 /GPIO
13	A4/SDA	Analog input/I2C	Analog input 4/I2C Data line
14	A5/SCL	Analog input/I2C	Analog input 5/I2C Clock line

JDIGITAL

Pin	Function	Type	Description
1	D0	Digital/GPIO	Digital pin 0/GPIO
2	D1	Digital/GPIO	Digital pin 1/GPIO
3	D2	Digital/GPIO	Digital pin 2/GPIO
4	D3	Digital/GPIO	Digital pin 3/GPIO
5	D4	Digital/GPIO	Digital pin 4/GPIO
6	D5	Digital/GPIO	Digital pin 5/GPIO
7	D6	Digital/GPIO	Digital pin 6/GPIO
8	D7	Digital/GPIO	Digital pin 7/GPIO
9	D8	Digital/GPIO	Digital pin 8/GPIO
10	D9	Digital/GPIO	Digital pin 9/GPIO
11	SS	Digital	SPI Chip Select
12	MOSI	Digital	SPI1 Main Out Secondary In
13	MISO	Digital	SPI Main In Secondary Out
14	SCK	Digital	SPI serial clock output
15	GND	Power	Ground
16	AREF	Digital	Analog reference voltage
17	A4/SD4	Digital	Analog input 4/I2C Data line (duplicated)
18	A5/SD5	Digital	Analog input 5/I2C Clock line (duplicated)

Buzzer

Features

Black in colour

With internal drive circuit

Sealed structure

Wave solderable and washable

Housing material: Noryl

Applications

Computer and peripherals

Communications equipment

Portable equipment

Automobile electronics

POS system

Electronic cash register

Specifications:

Rated Voltage : 6V DC

Operating Voltage : 4 to 8V DC

Rated Current* : ≤30mA

Sound Output at 10cm* : ≥85dB

Resonant Frequency : 2300 ±300Hz

Tone : Continuous

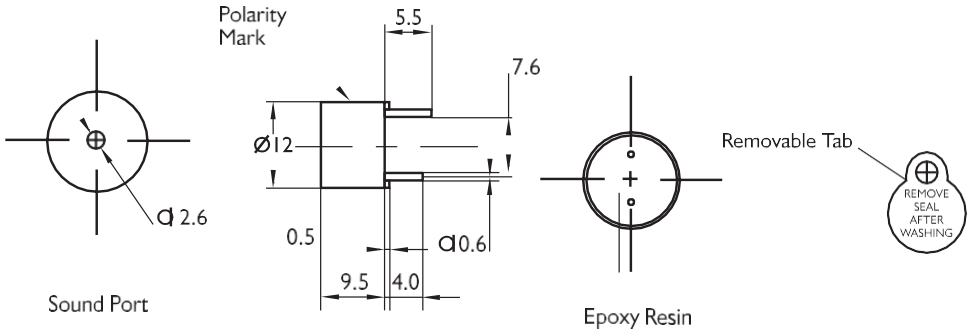
Operating Temperature : -25°C to +80°C

Storage Temperature : -30°C to +85°C

Weight: 2g

*Value applying at rated voltage (DC)

Diagram



Dimensions : Millimetres Tolerance : ±0.5mm

Relay

Part Number Table

Description	Part Number
Buzzer, Electromech, 6V DC	ABI-009-RC

RELAY MODULES

RELAY WORKING IDEA

Relays consist of three pins normaly open pin , normaly closed pin, common pin and coil. When coil powerd on magntic field is generated the contacts connected to each other.

Relay modules 1-channel features

• Contact current 10A and 250V AC or 30V DC.

• Each channel has indication LED.

• Coil voltage 12V per channel.

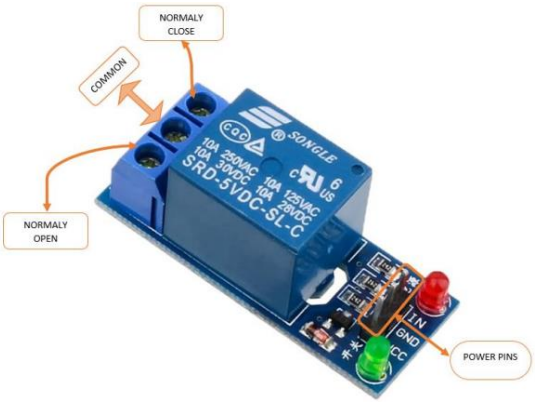
• Kit operating voltage 5-12 V

• Input signal 3-5 V for each channel.

• Three pins for normally open and closed for each channel.

How to connect relay module with Arduino

As shown in relay working idea it depends on magnetic field generated from the coil so there is power isolation between the coil and the switching pins so coils can be easily powered from Arduino by connecting VCC and GND bins from Arduino kit to the relay module kit after that we choose Arduino output pins depending on the number of relays needed in project designed and set these pins to output and make it out high (5 V) to control the coil that allow controlling of switching process.



Solenoid doorlock

DESCRIPTION

Solenoids are basically electromagnets: they are made of a big coil of copper wire with an armature (a slug of metal) in the middle. When the coil is energized, the slug is pulled into the center of the coil. This makes the solenoid able to pull from one end. This solenoid in particular is nice and strong, and has a slug with a slanted cut and a good mounting bracket. It's basically an electronic lock, designed for a basic cabinet or safe or door. Normally the lock is active so you can't open the door because the solenoid slug is in the way. It does not use any power in this state. When 9-12VDC is applied, the slug pulls in so it doesn't stick out anymore and the door can be opened. The solenoids come with the slanted slug as shown above, but you can open it with the two Phillips-head screws and turn it around so its rotated 90, 180 or 270 degrees so that it matches the door you want to use it with. To drive a solenoid you will a power transistor and a diode, check this diagram for how to wire it to an Arduino or other microcontroller. You will need a fairly good power supply to drive a solenoid, as a lot of current will rush into the solenoid to charge up the electro-magnet, about 500mA, so don't try to power it with a 9V

Power suplay

Features

Universal AC input / Full range

- Withstand 300VAC surge input for 5 second
- Protections: Short circuit / Overload / Over voltage
- Cooling by free air convection
- Miniature size and 1U low profile
- Compliance to IEC/EN 60335-1(PD3) and IEC/EN61558-1, 2-16 for household appliances
- Operating altitude up to 5000 meters (Note.7)
- Withstand 5G vibration test
- LED indicator for power on
- No load power consumption<0.3W
- Over voltage category III
- 100% full load burn-in test
- High operating temperature up to 70℃
- High efficiency, long life and high reliability
- 3 years warranty

Applications

- Industrial automation machinery
- Industrial control system
- Mechanical and electrical equipment

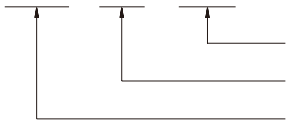
- Electronic instruments, equipments or apparatus
- Household appliances

Description

LRS-100 series is a 100W single-output enclosed type power supply with 30mm of low profile design. Adopting the full range 85~264VAC input, the entire series provides an output voltage line of 3.3V, 5V, 12V, 15V, 24V, 36V and 48V.

In addition to the high efficiency up to 91%, the design of metallic mesh case enhances the heat dissipation of LRS-100 that the whole series operates from -30℃ through 70℃ under air convection without a fan. Delivering an extremely low no load power consumption (less than 0.3W), it allows the end system to easily meet the worldwide energy requirement. LRS-100 has the complete protection functions and 5G anti-vibration capability; it is complied with the international safety regulations such as TUV EN2368-1, EN60335-1, EN61558-1/-2-16, UL62368-1 and GB4943. LRS-100 series serves as a high price-to-performance power supply solution for various industrial applications

LRS - 100 3.3



Output voltage Rated wattage Series name

SPECIFICATION

MODEL		LRS-100-3.3	LRS-100-5	LRS-100-12	LRS-100-15	LRS-100-24	LRS-100-36	LRS-100-48
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V	36V	48V
	RATED CURRENT	20A	18A	8.5A	7A	4.5A	2.8A	2.3A
	CURRENT RANGE	0 ~ 20A	0 ~ 18A	0 ~ 8.5A	0 ~ 7A	0 ~ 4.5A	0 ~ 2.8A	0 ~ 2.3A
	RATED POWER	66W	90W	102W	105W	108W	100.8W	110.4W
	RIPPLE & NOISE (max.) Note.2	100mVp-p	100mVp-p	120mVp-p	120mVp-p	150mVp-p	200mVp-p	200mVp-p
	VOLTAGE ADJ. RANGE	2.97 ~ 3.6V	4.5 ~ 5.5V	10.2 ~ 13.8V	13.5 ~ 18V	21.6 ~ 28.8V	32.4 ~ 39.6V	43.2 ~ 52.8V
	VOLTAGE TOLERANCE Note.3	±3.0%	±2.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION Note.4	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION Note.5	±2.0%	±1.0%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	500ms, 30ms/230VAC 500ms,30ms/115VAC at full load						
	HOLD UP TIME (Typ.)	55ms/230VAC 10ms/115VAC at full load						
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 373VDC (Withstand 300VAC surge for 5sec. Without damage)						
	FREQUENCY RANGE	47 ~ 63Hz						
	EFFICIENCY (Typ.)	84.5%	86%	88%	88.5%	90%	90.5%	91%
	AC CURRENT (Typ.)	1.9A/115VAC 1.2A/230VAC						
	INRUSH CURRENT (Typ.)	COLD START 50A/230VAC						
	LEAKAGE CURRENT	<0.75mA / 240VAC						
PROTECTION	OVER LOAD	110 ~ 150% rated output power						
		Protection type : Hiccup mode, recovers automatically after fault condition is removed						
	OVER VOLTAGE	3.8 ~ 4.45V	5.75 ~ 6.75V	13.8 ~ 16.2V	18.75 ~ 21.75V	28.8 ~ 33.6V	41.4 ~ 48.6V	55.2 ~ 64.8V
		Protection type : Shut down o/p voltage, re-power on to recover						
ENVIRONMENT	WORKING TEMP.	-30 ~ +70℃ (Refer to "Derating Curve")						
	WORKING HUMIDITY	20 ~ 90% RH non-condensing						
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH non-condensing						
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)						
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes						
	OVER VOLTAGE CATEGORY	Ⅲ; Compliance to EN61558, EN50178, EN60664-1, EN62477-1; altitude up to 2000 meters						
SAFETY & EMC (Note 8)	SAFETY STANDARDS	UL 62368-1, TUV EN62368-1, EN60335-1, EN61558-1/−2−16, CCC GB4943.1, BSMI CNS14336-1, EAC TP TC 004, AS/NZS62368.1(by CB),KC K60950-1(for LRS-100-12/24 only) approved						
	WITHSTAND VOLTAGE	I/P-O/P:4KVAC I/P-FG:2KVAC O/P-FG:1.25KVAC						
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH						
	EMC EMISSION	Compliance to EN55032 (CISPR32) Class B, EN55014, EN61000-3-2,-3, GB/T 9254, BSMI CNS13438, EAC TP TC 020, KC KN32,KN35(for LRS-100-12/24 only)						
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN61000-6-2 (EN50082-2), heavy industry level, criteria A, EAC TP TC 020, KC KN32,KN35(for LRS-100-12/24 only)						
OTHERS	MTBF	720.6K hrs min. MIL-HDBK-217F (25℃)						
	DIMENSION	129*97*30mm (L*W*H)						
	PACKING	0.34Kg ; 40pcs/14.6Kg/0.92CUFT						

NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. Line regulation is measured from low line to high line at rated load. 5. Load regulation is measured from 0% to 100% rated load. 6. Length of set up time is measured at cold first start. Turning ON/OFF the power supply very quickly may lead to increase of the set uptime. 7. The ambient temperature derating of 5℃/1000m is needed for operating altitude greater than 2000m(6500ft). 8. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed bymounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meetsEMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on http://www.meanwell.com) ※ Product Liability Disclaimer： For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx