

Components

- 65 Jumper wire
- Stepper motor
- Servo motor SG90
- LCD1602 with I2C adapter
- Joystick module
- Membrane contact module (membrane keypad)
- 5V relay
- F-M Dupont wire
- DHT11 sensor module
- 9V battery connector
- Diode rectifier 1N4007
- Small button
- Thermistor
- Transistor PN2222
- RGB LED
- LED red 5pcs
- LED yellow 5pcs.
- LED blue 5pcs.
- Uno R3 with cable
- Prototype shielding
- 830-pin breadboard
- IR remote control
- Breadboard power supply
- Resistors 100pcs
- ULN2003 stepper motor driver board
- Ultrasonic sensor
- Water level detector
- Fan wheel and 3V DC motor
- 4-digit 7-segment display
- 1-digit 7-segment display
- IR receiver module
- Sound sensor module
- L293D Motor driver IC
- 74HC595
- Toggle switch
- Active buzzer
- Passive buzzer
- Photo resistor 2pcs.
- LED green 5pcs.

HD44780 16x02 Blaues Display



Contents:

1. Basic Specifications
2. Absolute Maximum Ratings
3. Electrical Characteristic
4. Pinout
5. Connection Diagrams
6. Precautions

I. Basic specifications

- Module dimensions: 80 mm x 36 mm x 12.5 mm
- View area: 12 mm x 56 mm
- Resolution: 16 Characters x 2 Lines
- Backlight: ED, White
- View Angle: 180 degrees
- Modes: Parallel (8bit and 4bit)
- Operating Voltage: 3.3V and 5V
- Operating temperature: from -10°C to +60°C
- Storage temperature: from -30°C to +80°C

2. Absolute Maximum Ratings

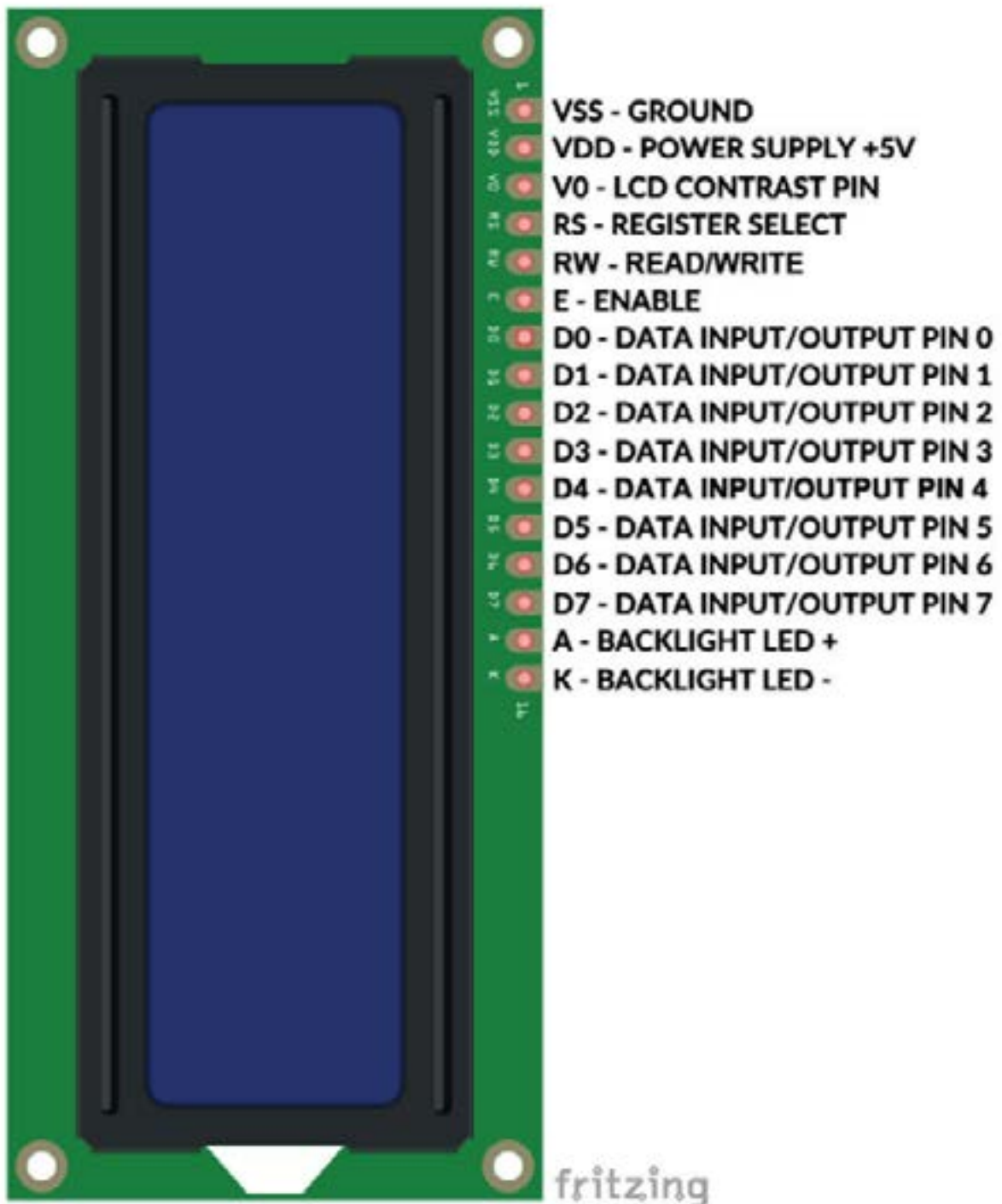
Item	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage for Logic	VDD-VSS	-0.3	-	+7	V
Power Supply for LCD	VLCD	VDD-15	-	VDD+0.3	V
Input Voltage	VIN	-0.3	-	VDD+0.3	V
Supply Current for Backlight	ILED	-	-	25	mA

3. Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply for LCM	VDD-VSS	-	4.8	5.0	5.2	V
			3.0	3.3	3.6	V
Input Voltage	VIL	L Level	-0.2	-	1	V
	VIH	H Level	VDD-1.0	-	VDD	V
LCD Driving Voltage	VDD-VO	-	4.5	4.8	5.1	V
Supply Current for LCM	IDD	VDD = 5V	-	-	1500	µA
		VDD = 3.3V	-	-	1250	
Supply Current for Backlight	ILED	-	-	15	-	mA

4. Pinout

Connect the HD44780 16x02 LCD Display with the Atmega328p as shown on the following connection diagram:



The VO pin uses analog voltage to set up the screen contrast level. Hardware contrast adjustment can be done by using voltage divider or potentiometer.

The anode pin A and cathode pin K are positive and negative terminals that are used to control the backlight of the screen.

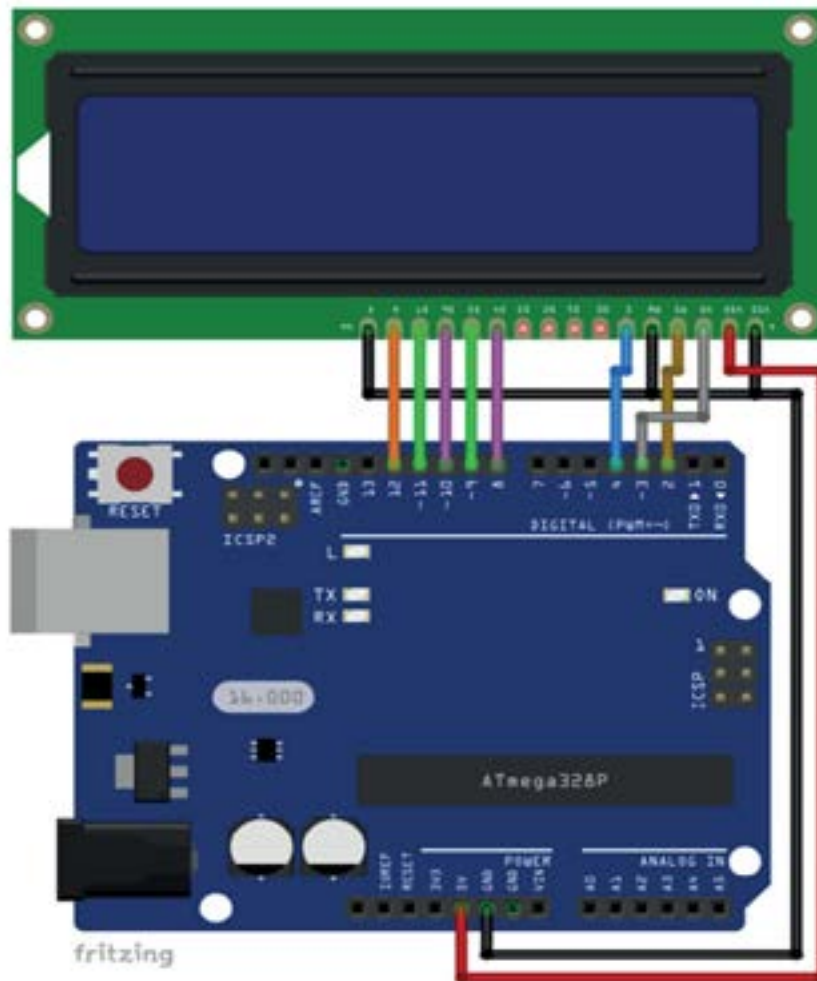
The RW pin, or Read/Write pin, is used to set the data direction, to read data from displaydriver chip or to write data into the screen driver chip.

The RS pin is Register Select pin which is used to shift between command or data registers of the driver chip.

The E pin, or Enable pin, is used to enable/disable communication between the main microcontroller and the driver chip of the screen.

5. Connection Diagrams

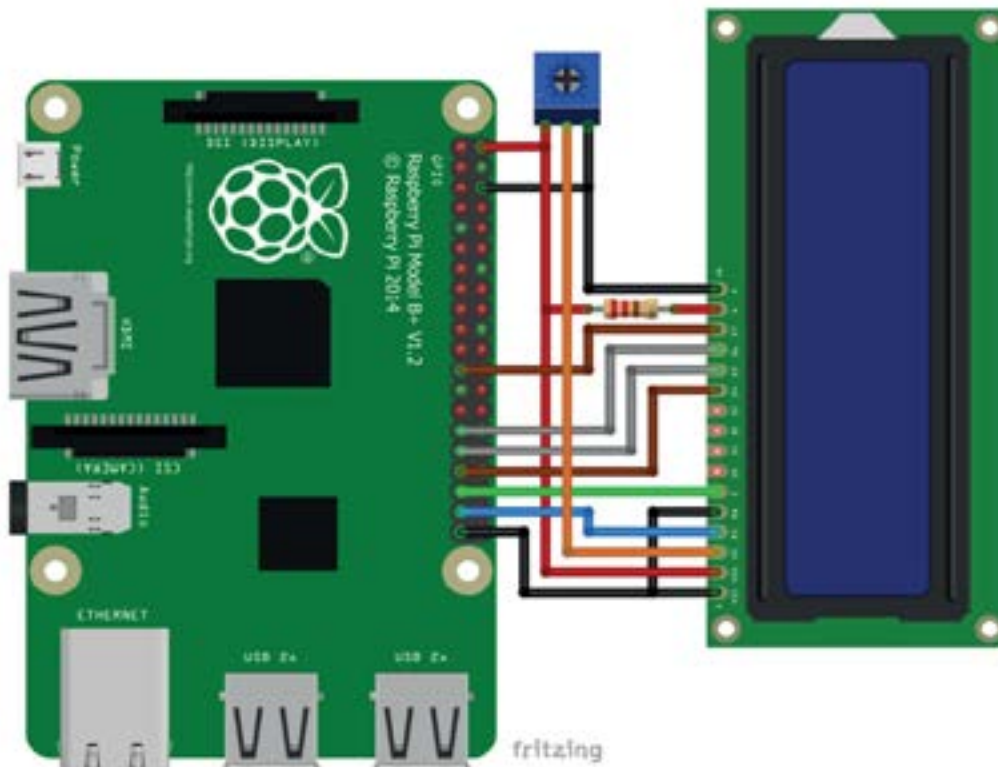
Connect the HD44780 16x02 LCD Display with the Atmega328p as shown on the following connection diagram:



Screen pin	Mc pin	Wire color
VSS	GND	Black wire
VDD	5V	Red wire
V0	D3	Gray wire
RS	D2	Ochre wire
RW	GND	Black wire
E	D4	Blue wire
D4	D8	Purple wire
D5	D9	Green wire
D6	D10	Purple wire
D7	D11	Green wire
K	GND	Black wire
A	D12	Orange wire

6. Precautions

Connect the HD44780 16x02 LCD Display with the Raspberry Pi as shown on the following connection diagram:



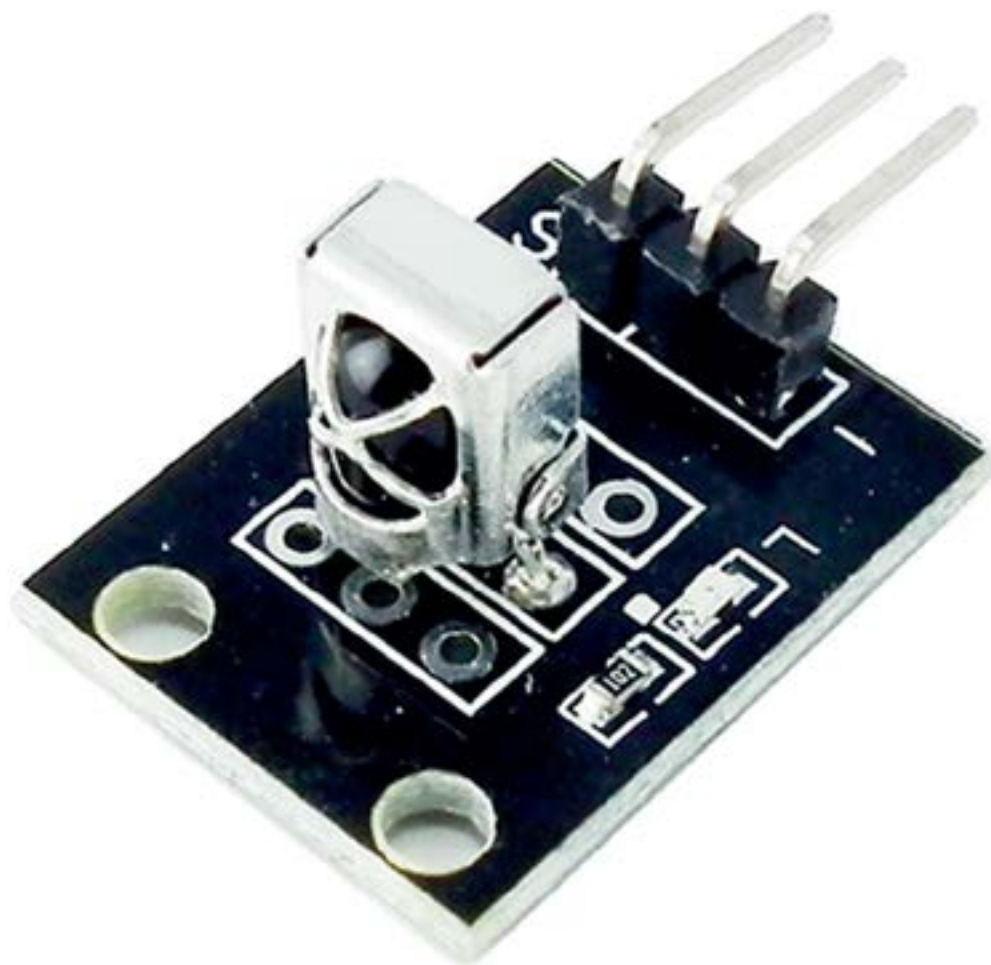
Screen pin	Raspberry Pi pin	Physical pin	Wire color
VSS	GND	6	Black wire
VDD	5V	2	Red wire
RS	GPIO26	37	Blue wire
RW	GND	39	Black wire
E	GPIO19	35	Green wire
D4	GPIO13	33	Brown wire
D5	GPIO6	31	Gray wire
D6	GPIO5	29	Gray wire
D7	GPIO11	23	Brown wire
K	GND	6	Red wire
A	5V, via 220Ω resistor	2	Orange wire
V0	potentiometer center pin		

Potentiometer			
GND	Right pin	6	Black wire
5V	Left pin	2	Red wire

- This device is susceptible to Electro-Static Discharge (ESD) damage. Observe Anti-Static precautions
- Do not apply excessive force to display surface or the adjoining areas since this may cause the color tone to vary.
- The polarizer covering display surface of the LCD module is soft and easily scratched. Handle
- this polarizer carefully.
- If display surface becomes contaminated, breathe on the surface and gently wipe it with a
- soft dry cloth. If it is heavily contaminated, moisten cloth with Isopropyl or alcohol.
- Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the Water.
- Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets,
- moisture condensation or a current flow in a high-humidity environment.
- Install LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the cable or the backlight cable.
- Do not attempt to disassemble or process LCD module.
- NC terminal should be open. Do not connect anything.
- If the logic circuit power is off, do not apply the input signals.
- To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
- Be sure to ground the body when handling LCD modules.
- Tools required for assembling, such as soldering irons, must be properly
- grounded.
- To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions
- The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.
- Identify and, at all times, observe absolute maximum ratings for both logic and LC drivers.
- Prevent the application of reverse polarity to VDD and VSS, however briefly.
- Use a clean power source free from transients. Power-up conditions are occasionally jolting and may exceed the maximum ratings of these LCD modules.

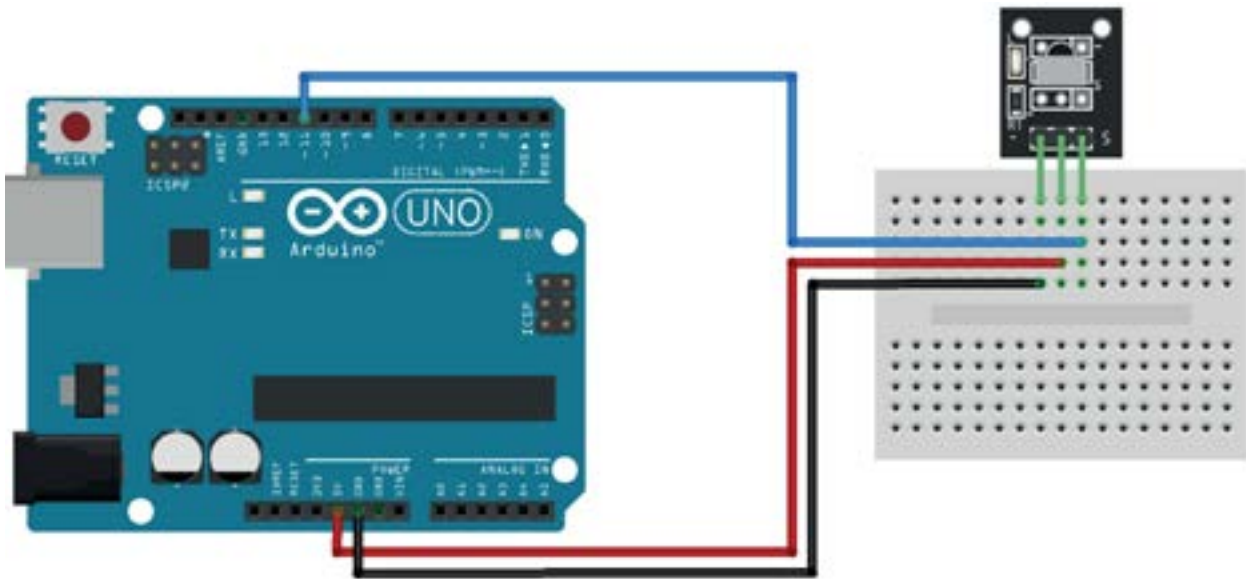
- The VDD power of LCD module should also supply the power to all devices that may access
- the display. Do not allow the data bus to be driven when the logic supply to the module is
- turned off.
- Operate this LCD module within the limits of the modules temperature specifications.
- Surface of the LCD panel should not be touched or scratched. The display front surface is an easily scratched, plastic polarizer.
- Always employ anti-static procedure while handling LCD module.
- Do not store in direct sunlight.
- If leakage of the liquid crystal material should occur, avoid contact with this material, particularly ingestion. If the body or clothing becomes contaminated by the liquid crystal material, wash thoroughly with water and soap.
- When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.
- Keep LCD modules in bags (avoid high temperature / high humidity and low temperatures below 0°C.
- Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may
- also be generated if the module is subject to a low temperature.
- To minimize the performance degradation of the LCD modules resulting from destruction
- caused by static electricity etc., exercise care to avoid holding the following sections when
- handling the modules.
- Exposed area of the printed circuit board.
- Terminal electrode sections.
- Please keep the temperature within specified range for use and storage. Polarization degradation, bubble generation or polarizer peel-off may occur with high temperature and high
- humidity.
- Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil
- lead (glass, tweezers, etc.).

KY-022 IR-Empfänger Modul



Contents:

1. Specifications
2. Schematic
3. Example code



3. Example code

The following Arduino sketch uses the IRremote library to receive and process infra-red signals.

Use the KY-005 IR transmitter module to serially send data to this module.

```

1  #include <IRremote.h>
2
3  int RECV_PIN = 11; // define input pin on Arduino
4  IRrecv irrecv(RECV_PIN);
5  decode_results results; // decode_results class is defined in IRremote.h
6
7  void setup() {
8      Serial.begin(9600);
9      irrecv.enableIRIn(); // Start the receiver
10 }
11
12 void loop() {
13     if (irrecv.decode(&results)) {
14         Serial.println(results.value, HEX);
15         irrecv.resume(); // Receive the next value
16     }
17     delay (100); // small delay to prevent reading errors
18 }

```

I. Specifications

Arduino IR receiver module KY-022, reacts to 38kHz infrared light. This module consists of a 1838 IR receiver, a 1kQ resistor and a LED. It works together with the KY-005 IR transmitter module. Compatible with popular electronic platforms like Arduino, Raspberry Pi and ESP8266.

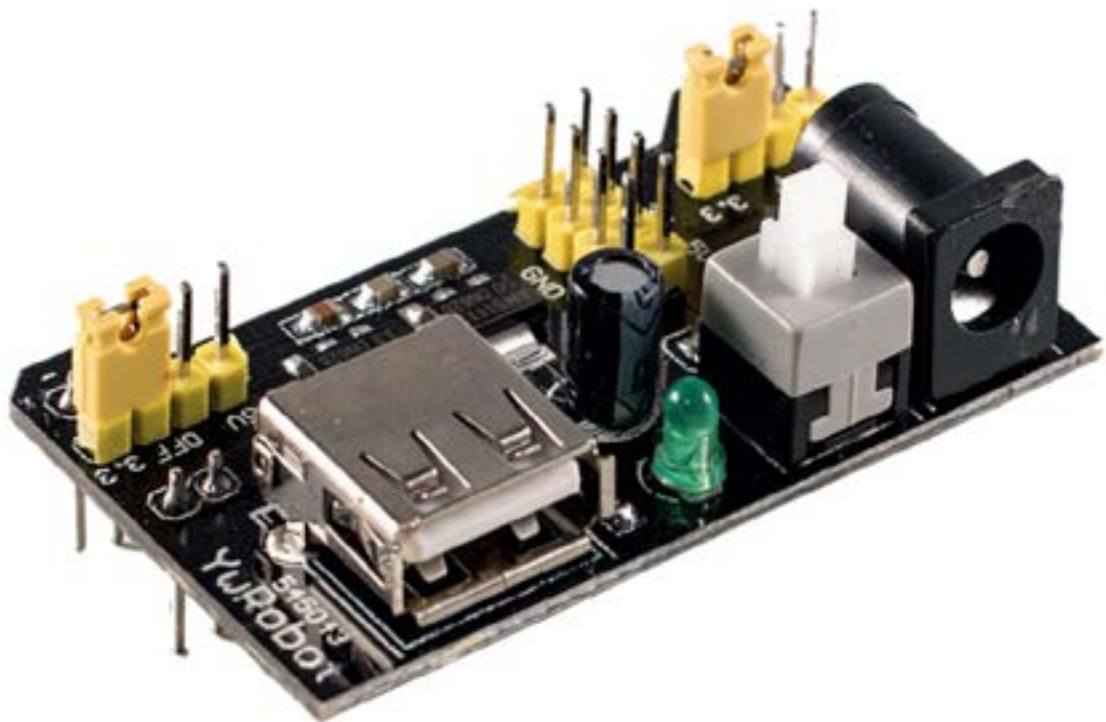
Operating Voltage	2.7 to 5.5V
Operating Current	0.4 to 1.5mA
Reception Distance	18m
Reception Angle	±45°
Carrier Frequency	38KHz
Low Level Voltage	0.4V
High Level Voltage	4.5V
Ambient Light Filter	up to 500LUX

2. Schematic

Connect the Power line (middle) and ground (-) to +5 and GND respectively. Connect signal (S) to pin 11 on the Arduino. Line un IR receiver and transmitter.

KY-012	Arduino
S	Pin 11
middle	+5V
-	GND

MBIO2 Netzteil Adapter



Contents:

- 1.Product Specification
- 2.Settings up output voltage
- 3.Important note

I. Product Specifications

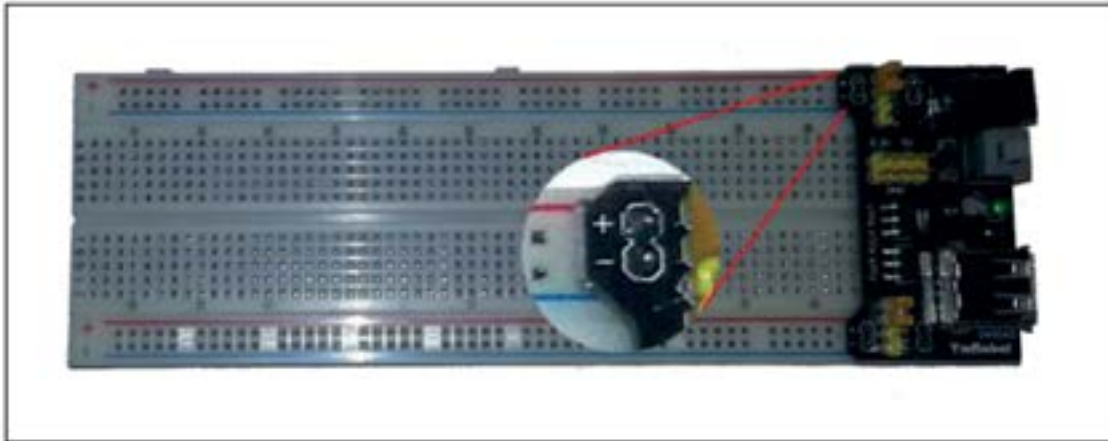
Locking On/Off Switch

- LED Power Indicator
- Input voltage: 6.5-12v (DC) via 5.5mm x 2.1 mm plug
- Output voltage: 3.3V/5v
- Maximum output current: 700 mA
- Independent control rail output. 0v, 3.3v, 5v to breadboard
- Output header pins for convenient external use
- Size: 2.1 in x 1.4 in
- USB device connector onboard for power output to external device

2. Setting up voltage



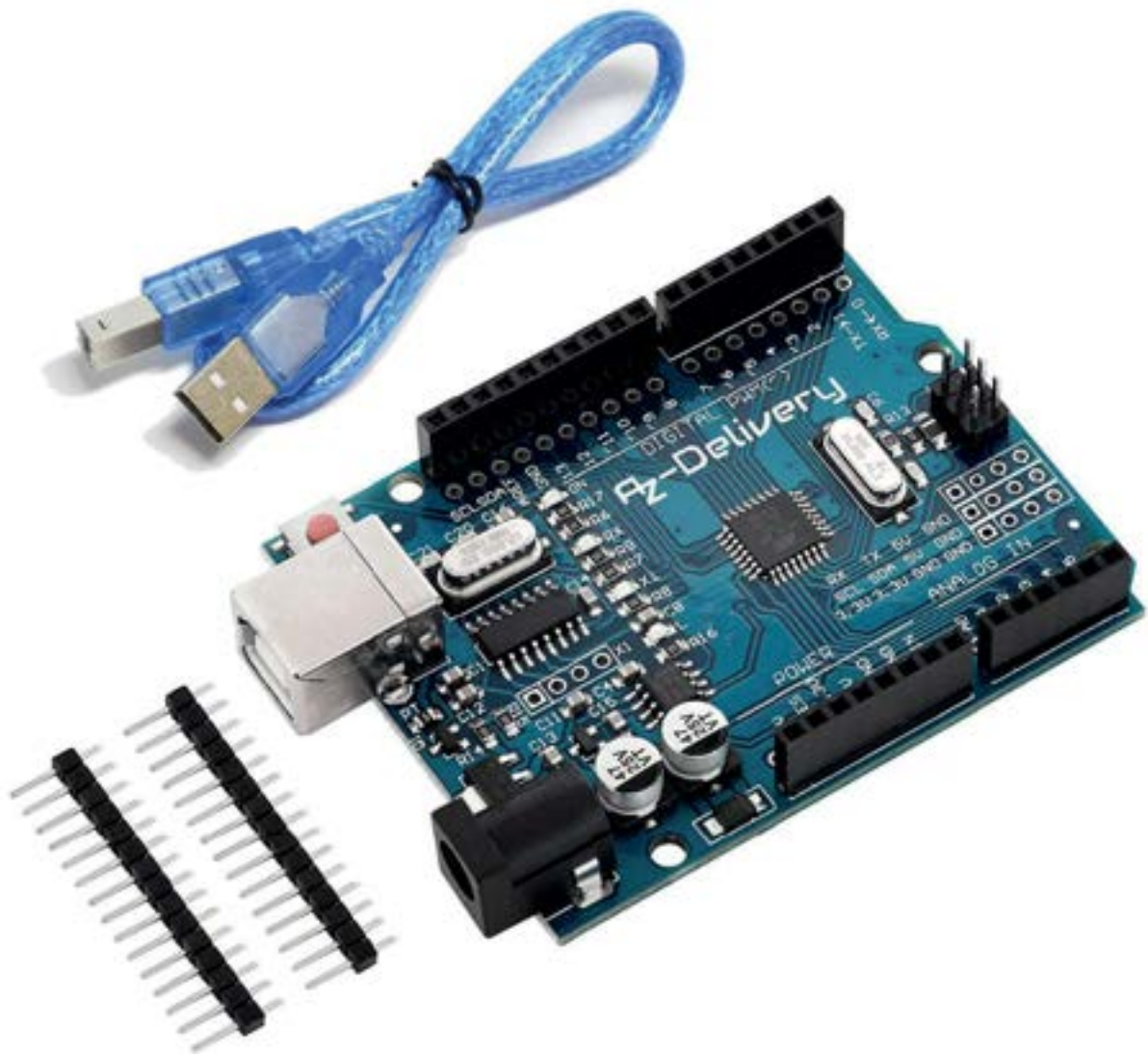
The left and right voltage output can be configured independently. To select the output voltage, move jumper to the corresponding pins. Note: power indicator LED and the breadboard power rails will not power on if both jumpers are in the "OFF" position.



Make sure that you align the module correctly on the breadboard. The negative pin(-) on module lines up with the blue line(-) on breadboard and that the positive pin(+) lines up with the red line(+). Failure to do so could result in you accidentally reversing the power to your project.

USB connector is for powering external devices (output only). Do not attempt to use it to power the MB102.

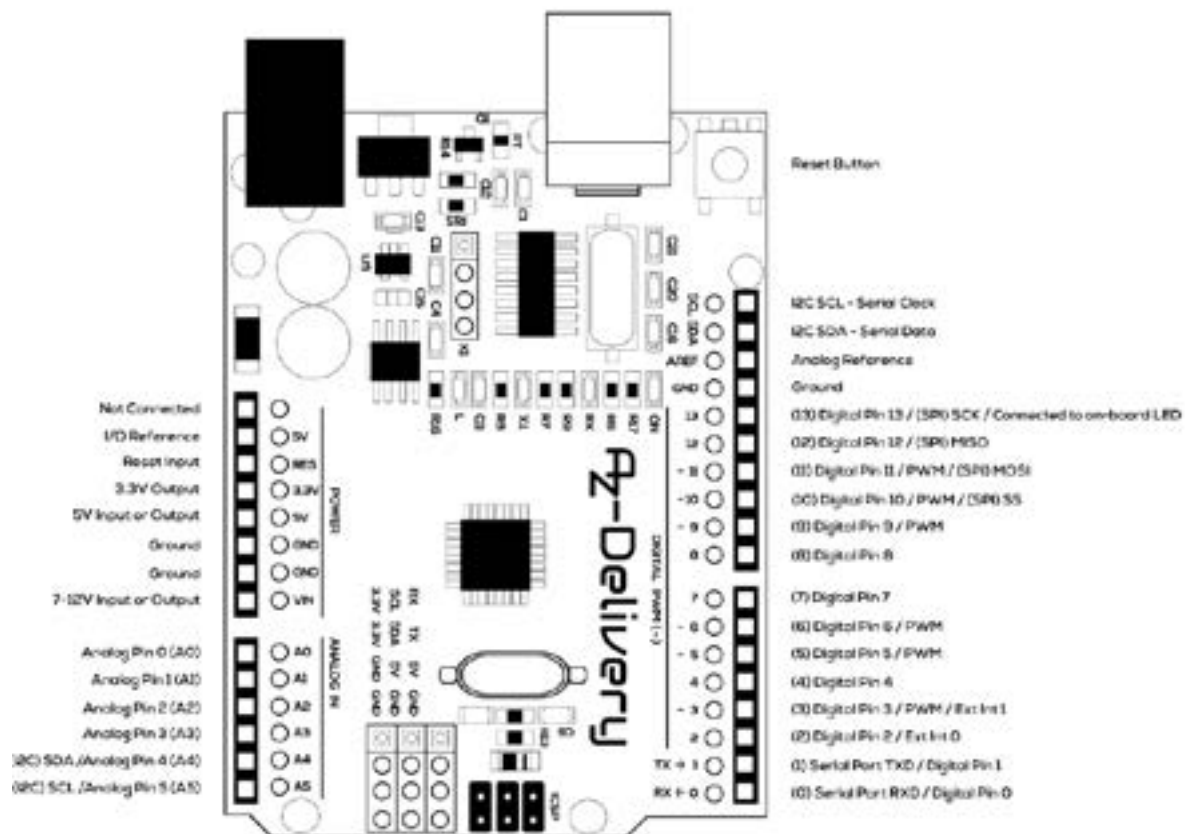
Mikrocontroller Board mit ATMega328



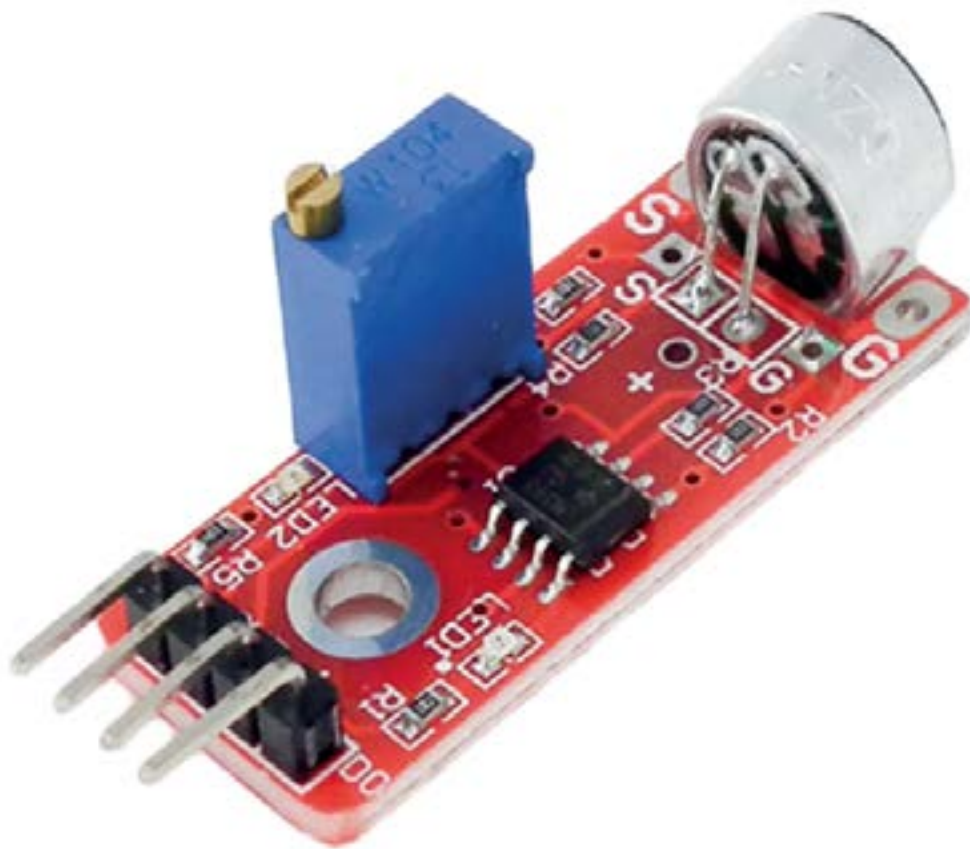
I. Specifications

Operating Voltage	5V
Input Voltage	7V-12V
Microcontroller	ATMega328P
Digital I/O Pins	14 (6 provide PWM output)
PWM Digital I/O Pins	6
Analog Input Pins	6
DC Current per I/O Pin	20mA
DC Current per 3.3V Pin	50mA
Flash Memory	32kB (0.5kB used by bootloader)
SRAM	2kB (ATMega328P)
EEPROM	1kB (ATMega328P)
Clock Speed	16MHz
Dimensions	70mm x 50mm x 13mm

2. Microcontroller Board Pinout



Mikrofon Modul groß



I. Introduction

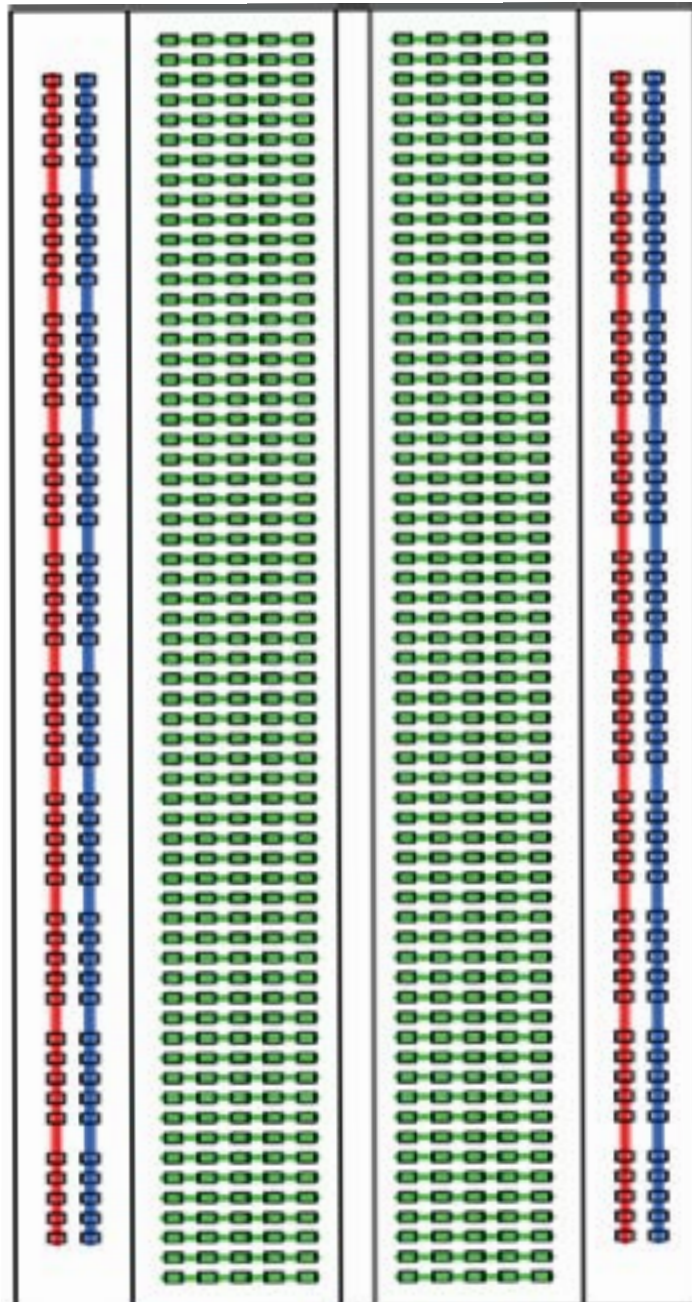
It's a high sensitivity sound detection module, which has two output signal pin. one digital pin(DO), When it detect some sound up to certain threshold, it can output High or Low level. One analog pin(AO), it can real-time output voltage signal of the microphone.

- Specification
- Voltage: 5V/3.3V
- Electret microphone (It's different from module4)
- There is a mounting screw hole 3mm
- The use 5V DC power supply
- With analog output
- There are threshold level output flip
- High sensitive microphone and high sensitivity.
- A power indicator light
- The comparator output is light
- Weight: 4g
- Frequency Response range: 50 Hzrv 20 kHz
- Impedance: 2.2 KOhm
- Sensitivity: 48-66dB
- Polar pattern: Universal
- Operating temperature: -40 to 85 degrees celsius
- Operating humidity: 30-90%
- Storage temperature: -5 to 30 degrees celsius
- Storage humidity: 20—75%
- Product size: 44*15*10mm

2. Pinout

Pin	Description
A0	Analog signal output pin
G	Ground
+	Power(5V/3.3V)
D0	Digital signal output pin

Breadboard internal connections



HC-SR04 Ultraschall Modul Pinout

