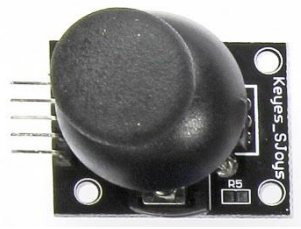
Elektor's Arduino 37 in 1 Sensor kit
(Part No. 150001-91)

The Elektor set for the Arduino system consists of 37 individual modules which can be used to carry out many interesting experiments using the Arduino Uno system. All of the modules are supplied packed in a practical organizer storage box. A short description of each module is given below. The actual appearance of the modules supplied may be subject to change but this will not affect their functionality.

Joystick

An analog 2-axis joystick with 2x 10K ohm pots and push button function. Connector pin descriptions are printed on the PCB. A push-on operating knob is included with the module.



Relay

A relay module suitable for direct connection to an Arduino board. The module requires 5 V power supply. The input control signal is identified with an 'S'. The relay has one change-over contact. It is capable of switching resistive loads up to 10 A at 250 VAC and up to 10 A at 30 V maximum. Don't forget to provide interference suppression for the switched load!

Big Sound

A microphone module featuring a high-sensitivity large-format electret capsule. Output 'DO' (active high) is switched when the sound level exceeds a preset level. A pot allows adjustment of the level. The analog output signal is available at the 'AO' pin.

Small Sound

A microphone module with a small electret capsule. Output 'DO' (active high) is switched when the sound level exceeds a preset level. A pot allows adjustment of the level. The analog output signal is available at the 'AO' pin. Except for the smaller size of the capsule and its lower sensitivity the module is identical to the 'Big Sound' module.

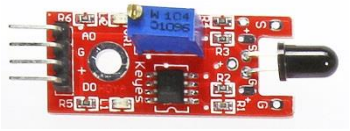
Tracking

IR light reflection switch, useful for obstacle avoidance or line following on models that move around the floor. An obstacle in front of the sender/receiver diodes will cause the 'out' pin to be pulled low (active low). A pot allows adjustment of the circuit's sensitivity. The detection distance can be up to approximately 1 cm.

Avoid

IR-reflection sensor, useful for obstacle avoidance applications. When an obstacle is in front of the IR sender/receiver the 'Out' pin is switched low (active low). The circuit sensitivity can be adjusted with a pot. The obstacle detection distance can be adjusted up to approximately 7cm. An enable (EN) jumper can be fitted for continuous operation. Removal of the EN jumper allows an external logic signal (at the EN pin) to switch the detector on and off (low = active, high = off).

Flame



A sensor module to detect flames. The spectral sensitivity of the sensor is optimized to detect emissions from naked flames. The output signal 'DO' is pulled high (active high) when a flame is detected. The switching threshold is adjustable via a preset pot. An analog output signal from the sensor is available at pin 'AO'.

- Typical spectral sensitivity: 720-1100nm
- Typical detection angle: 60°

Linear Hall Sensor

Linear Hall Sensor module to detect the presence of a magnetic field near the sensor. Variables such as field strength, polarity and position of the magnet relative to the sensor will affect point at which the 'DO' output switches to a high level (i.e. active high). The circuit sensitivity can be adjusted with a pot. An analog output signal from the sensor is available at pin 'AO'.

Touch

Touch sensitive switch. Touching the sensor pin produces an output at the 'DO' pin. The output is not a clean signal but includes 50 Hz mains induced signals ('mains hum'). The output signal is 'active high' and the circuit sensitivity can be adjusted with a pot. An analog output signal from the sensor is available at pin 'AO'.

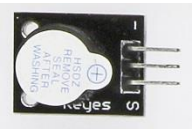
Digital Temp

Temperature sensing module using an NTC thermistor. The output signal at 'DO' switches high when the preset (adjustable) temperature is reached. An analog output signal from the sensor is available at pin 'AO'

Buzzer

Electronic buzzer for 5 V operation. *Ensure correct polarity!!*
Positive supply to the '-' pin and ground to the 'S' pin!
Data: Typical operating frequency 4000Hz at 80dB min, 5V DC at 5mA typical
TMB12A05 or equivalent.

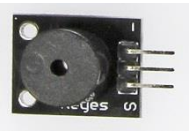
Tip to avoid mix up: The buzzer housing is slightly taller than the loudspeaker housing and has a label showing the + pin ident.



Passive Buzzer

Mini loudspeaker module ca. 16 Ohm Impedance, (maximum continuous current through the speaker coil is approximately 25 mA.) Don't mix this one up with the buzzer module! The outer two pins connect to the speaker. Polarity is unimportant.

Tip to avoid mix up: The loudspeaker housing is not as tall as the buzzer housing.

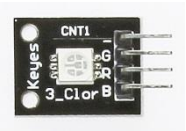


RGB LED

RGB-LED with clear lens and built-in 150 ohm series resistor for 5 V operation. The PCB printing is incorrect, it shows the blue and red connections switched. The LED has a common cathode (the '-' Pin).

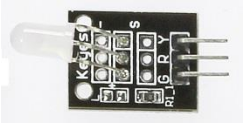
SMD RGB

RGB-LED with an SMD housing and no series resistor. The PCB printing is incorrect, it shows the green and red connections switched. The LED has a common cathode (the '-' pin). A suitable resistor value would be 220 ohms.



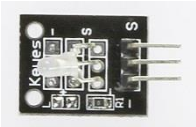
Two-Color 5mm

The 5mm LED has a common cathode connected to the '-' pin on the PCB. The centre pin connects to the red anode and the 'S' pin connects to the green anode. No series resistor is included in the circuit. A suitable value for low voltage operation would be 220 ohms.



Two Color 3mm

The 3mm bi-color LED has a common cathode (- pin), connected with the '-' pin on the PCB. The centre pin activates the red light and the 'S' pin the green light. No series resistor is included in the circuit. A suitable value for low voltage operation would be 220 ohms.

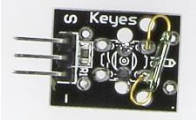


Reed Switch

This reed switch offers an analog as well as a digital interface. The 'G' pen is connected to GND, the '+' pen to 5V DC, the 'AO' pen offers the analog output while the 'DO' offers the digital output. A potentiometer is used as a pull up resistor.

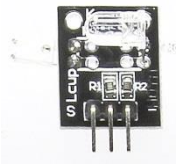
Mini Reed

The reed switch is connected between the two outer pins on the PCB. Without a magnetic field the contacts remain open.
A built-in 10 K ohm resistor is connected between the centre pin and the 'S' pin.
It can be used as a pull up or pull down resistor.



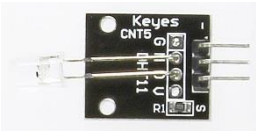
Heartbeat

This module consists of an IR-LED and a photo transistor which can be used to read a pulse when a fingertip is positioned between the LED and photo transistor.
The module requires additional external circuitry. A 330 ohm series resistor for the LED is included. The 5 V supply connects to the centre pin, ground to the '-' pin. The photo transistor signal is available on the 'S' pin which has a built-in pullup resistor.



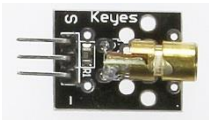
7 color flash

Clear 5mm LED for direct operation from 5V. The LED color automatically cycles through a seven-color sequence. The 5 V supply connects to the 'S' pin and ground on the centre pin.



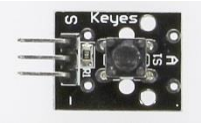
Laser emitter

Red Laser module for direct connection to a 5 V supply. Connect the 5 V supply to the 'S' pin and ground to the '-' pin. Transmission wavelength: 650nm



PCB mounted push Button

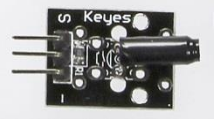
A built-in 10 K ohm resistor is connected between the centre pin and the 'S' pin and can be used as a pull up or pull down resistor. The push button connects the two outer pins.



The Button.h library (available from Arduino) is suitable for use with this.

Shock, a rolling-ball type tilt switch.

A built-in 10 K ohm resistor is connected between the centre pin and the 'S' pin and can be used as a pull up or pull down resistor. The switch contacts connect to the two outer pins.

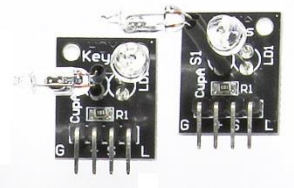


Rotary encoder

Rotary encoder useful for making an electronic pot etc. Connection idents are printed on the PCB.

2x Light Cup

This module incorporates a mercury tilt switch and clear red LED. 'G' is the common connection to the LED cathode and one terminal of the switch. 'S' is the other switch contact and 'L' connects to the LED anode (a series resister is required for the LED, 220 ohms for example). The '+' pin connects to a 10 K ohm pullup resistor connected to 'S' of the switch.

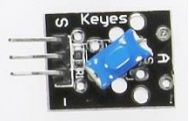


Tilt Switch

Mercury tilt switch which makes or breaks depending on its attitude.

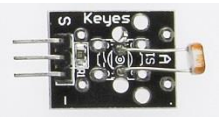
Rolling ball tilt switch

A built-in 10 K Ohm resistor connected between the middle and 'S' pin is available for pull up or pull down use. The switch contacts connect to the two outer pins. Load switching max: 12VDC 50mA



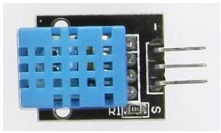
Photoresistor

LDR (Light Dependant Resistor). Dark resistance >20M Ohm, light <80 Ohm. The two outer pins connect to the LDR. A fixed 10 K ohm resistor connected between the middle pin and the 'S' pin is included on the module. This simplifies the building of a measurement bridge circuit.



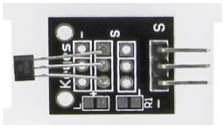
Temp and Humidity

A module with a temperature/humidity sensor type DHT11, Temperature range : 0 - 50°C (+/-2°C), Rel. humidity: 20-95% (+/-5%), Supply voltage: 3 to 5.5V. With a built-in 10 K ohm pullup resistor. Library: DHT.h



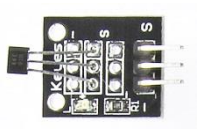
Analog Hall

The Hall-Sensor-Switch (bipolar) module features a 44E311, 3144EUA-S or 3144LUA-S sensor together with an LED and resistor. The LED switches on when a magnetic field is detected. The ground pin is marked '-', centre pin is +5 V supply (Vs) and the output signal is on the 'S' pin.



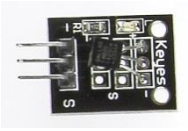
Hall Magnetic

A Hall sensor module with analog output signal. The ground pin is marked '-', centre pin is +5 V supply (Vs) and the output signal is on the 'S' pin.



Temp

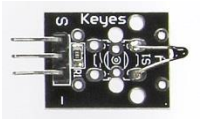
A module with a digital 'One Wire' temperature sensor (DS18B20). A 4.7K ohm pullup resistor is included for the bus signal. Additional sensors can be added to the bus and individually addressed. Only one pullup resistor should be connected to the bus, irrespective of the number of sensors connected.



- Temperature range: -55 to +125°C
- Typical accuracy: 0.5°C
- Resolution: 9-12Bit, depending on the program

Analog Temp

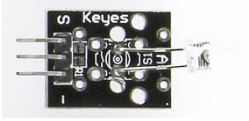
NTC Temperature sensor module. The sensor resistance is approximately 10 k ohm at room temperature. The NTC sensor is connected between the two outer pins. A fixed 10 K ohm resistor connected between the middle pin and the 'S' pin is included on the module. This simplifies the building of a measurement bridge circuit.



- Temperature range: -55°C to +125°C
- Accuracy: +/- 0.5°C

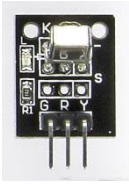
IR Emission

The IR-LED can be used to build a light barrier or an IR remote control signal transmitter.



IR Receiver

Infrared sensor type 1838 for use with 38KHz IR signals.

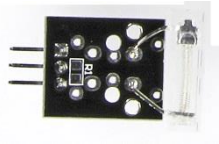


- Supply voltage: 2.7 to 5.5 V
- Frequency: 37.9 KHz
- Receiver range: 18m (typical)
- Receiving angle: 90°

Library: https://github.com/shirriff/Arduino-IRremote

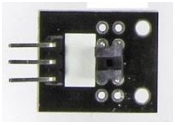
Tap Module

Vibration sensor module. The momentary switch contacts are connected between the two outer pins.

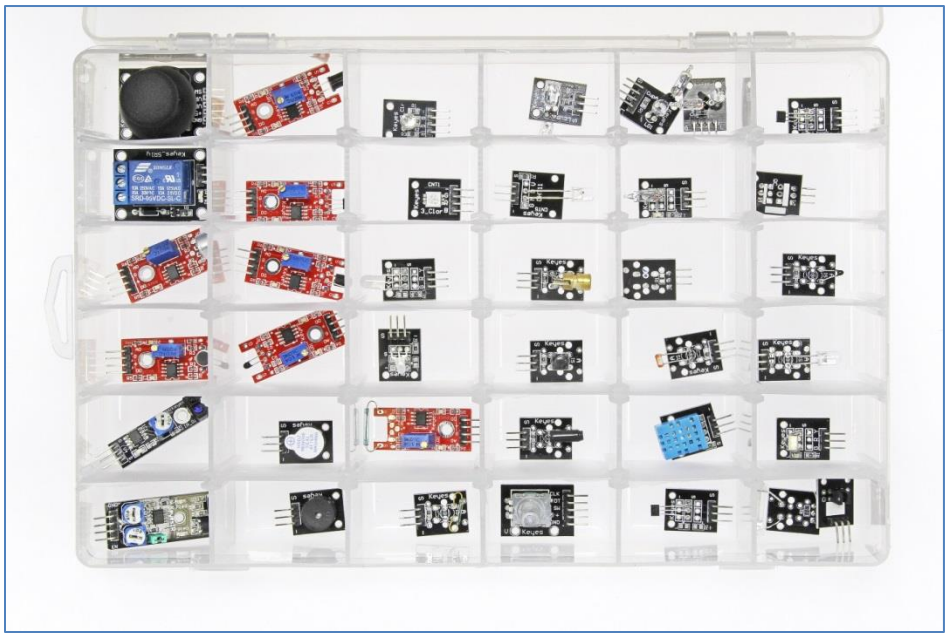


Light blocking

Slotted light barrier. The middle pin connects to + 5 V supply and the pin marked '-' connects to ground. The output signal (with a 10 K ohm pullup to +5 V) is available on the pin on the right.



A view showing all the modules in the complete set



NB: All information regarding the sensors is subject to change! In some cases the modules may be fitted with fewer components.
Be sure to contact Elektor Support (support@elektor.com) for advice and support on any issues.