ADK Sensor Kit

Code: K000006
The **ADK Kit** is a complete pack of different TinkerKit Modules, Arduino ADK and the Mega Sensor Shield to kickstart your Android Develpment Experience.

Part List

- Mega Sensor Shield V.2 x1
- Button Module x2
- LDR Module x1
- Tilt Module x1
- Therm Module x1
- Accelerometer Module x1
- Hall Sensor x1
- Rotary Potentiometer Module x1
- Linear Potentiometer Module x1
- Touch Sensor Module x2
- Joystick Sensor Module x2
- Relay Module x2
- Mosfet Module x1
- High Power Led Module x1
- 5 mm Blue Led Module x1
- 5 mm Green Led Module x1
- 5 mm Yellow Led Module x1
- 5 mm Red Led Module x1
- 10 mm Blue Led Module x1
- 10 mm Green Led Module x1
- 10 mm Yellow Led Module x1
- 10 mm Red Led Module x1
- 20 cm Cables x 6
- 50 cm Cables x 4
- 100 cm Cables x 2
- Arduino Mega ADK x 1

Shield - TinkerKit Mega Sensor Shield V.2

Code: T020040
The **Mega Sensor Shield v.2** allows you to hook up the TinkerKit **SENSORS** and **ACTUATORS** directly to the Arduino Mega or Mega 2560 or Mega ADK, without the use of the breadboard.

It has 22 standard TinkeKit 3pin connectors. The 10 labeled **I0** through **I9** are **Analog Inputs**. The ones labeled **O0** through **O5** are **Analog Outputs** connected to the PWM capable outputs of the Arduino Board (it is possible to change these to Digital Inputs, in which case they will report either HIGH or LOW, but nothing in between).

On a Standard Arduino Mega 2560 board the pins are:
Pin 11 on the Arduino Mega is O0 on the shield.
Pin 10 on the Arduino Mega is O1 on the shield.
Pin 9 on the Arduino Mega is O2 on the shield.
Pin 6 on the Arduino Mega is O3 on the shield.
Pin 5 on the Arduino Mega is O4 on the shield.
Pin 3 on the Arduino Mega is O5 on the shield.

The one labeled **IO** (**D13, D12, D8, D7, D4, D2**) are Input

/ Output pins capable of PWM, digitalRead and digitalWrite. They correspond to Digital 13, 12, 8, 7, 4, 2.

Module description: A green LED signals that the shield is correctly powered.

The **4pin TWI socket** allows communication to any device supporting the I2C protocol through the Wire library on Arduino. 5V and Ground are provided on the socket.

4 **4pin SERIAL socket** allows the board to communicate with other devices that support serial communication. 5V and Ground are provided on the socket for your convenience.

The **Pushbutton Module** is possibly the simplest sensor available. It detects when a person or an object presses on its circular cap.

Output:This module outputs 5v when the button is pressed and 0v when released. Pressing the button closes the circuit. When connected to an input on the Arduino using the TinkerKit Shield, you can expect a value of 1023 while the button is pressed and 0 when released.

Module Description: This module features a 12mm pushbutton , the standard TinkerKit 3pin connector, a green LED that signals that the module is correctly powered and a yellow LED that is lit only when the button is pressed.

This module is a **SENSOR**. The connector is an **OUTPUT** which must be connected to one of the **INPUT** connectors on the **TinkerKit Shield**

LDR (or **Light Dependant Resistor**, or **Photoresistor**) is a variable resistor. Light falling on the sensor decreases its resistance.

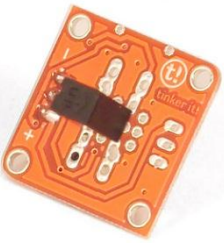
Output: This module outputs 5v when the sensor receives no light (the circuit is open) and 0v when exposed to bright light (the circuit is closed). When connected to an input on the Arduino using the TinkerKit Shield, you can expect to read values from 0 to 1023.

Module Description: This module features a Light Dependent Resistor, a signal amplifier, the standard TinkerKit 3pin connector, a green LED that signals that the module is correctly powered and a yellow LED whose brightness changes according to the amount of lightness.

This module is a **SENSOR**. The connector is an **OUTPUT** which must be connected to one of the **INPUT** connectors on the **TinkerKit Shield**.

The **Tilt Sensor** can detect when it is at an angle.

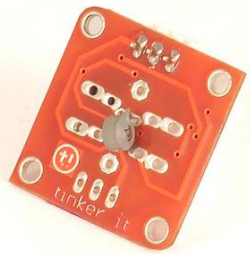
Output: This module contains two contacts and a small metal ball. When the sensor is in its upright position, the ball bridges the two contacts, completing the circuit. When the board is tilted, the ball moves, and the circuit opens. When upright, the module outputs 5V and when it is tilted, it outputs 0V. When connected to an input on the Arduino using the TinkerKit Shield, you can expect to read a value of 1023 when in its upright position and 0 when it is titled.



Module description: this module features a Tilt Sensor, a signal amplifier, the standard TinkerKit 3pin connector, a green LED that signals that the module is correctly powered and a yellow LED that lights up when a connection is made (the sensor is upright).

This module is a **SENSOR**. The connector is an **OUTPUT** which must be connected to one of the **INPUT** connectors on the TinkerKit Shield.

The **Thermistor** is a resistor whose resistance varies significantly (more than in standard resistors) with temperature.



Output: This module's output approches 5v as the temperature increases. As the temperature decreases, it approaches 0V. When connected to an input on the Arduino using the TinkerKit Shield, expect to read values between 0 and 1023

(NB: any changes in the values will be slow and may not vary a great deal).

Module Description: This module features a Thermistor, a signal amplifier, the standard TinkerKit 3pin connector, a green LED that signals that the module is correctly powered and a yellow LED whose brightness changes according to the temperature.

This module is a **SENSOR**. The connector is an **OUTPUT** which must be connected to one of the **INPUT** connectors on the **TinkerKit Shield**.

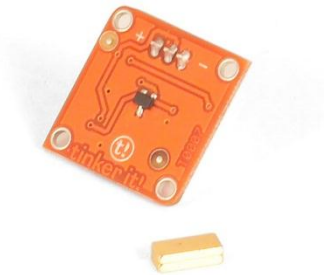
An **accelerometer** is a device that measures acceleration. It is very common in consumer electronics such as portable electronic devices and video game controllers to detect movement using accelerometers.

Output: This module outputs 0V to 5V on one of its two signal pins when its G-force is changed (e.g. is moved). The value is approximately 2.5V when there is 0G on the X or Y axis. When you connect this module to the input on an Arduino using the TinkerKit Shield, you can expect to read values between 0 to 1023 while moving the module.

Module description: On the back of the module you can find two signal amplifier and a green LED that signals that the module is correctly powered. The module is based on the LIS344AL by ST Microelectronics, and is a three-axis acceremoter. You can get data about the third axis (referred to as Z) by soldering a header to the thru-hole labeled "Z".

This module is a **SENSOR**. The connector is an **OUTPUT** which must be connected to one of the **INPUT** connectors on the **TinkerKit Shield**.

A **Hall sensor** creates a voltage related to the magnetic field around the sensor. This can be used to detect distance from a nearby magnet. Hall sensors can also be used to detect the magnetic field induced in a wire or coil.



Output: This module outputs 5v when a magnetic field (e.g. a human body) is close to the sensor, and roughly 0v when there is nothing nearby. When connected to an input on the Arduino using the TinkerKit Shield, you can see values between 0 (no presence) and 1023 (presence detected).

Module description: An Hall Sensor is mounted on a standard TinkerKit board; on the back of the module you can find a signal amplifier, a green LED that signals that the module is correctly powered and a yellow LED whose brightness depends on the values output by the module.

NB: There are exposed electrical contacts on the sensor surface - be careful to not touch the board with metallic objects, you may cause a short.

This module is a **SENSOR**. The connector is an **OUTPUT** which must be connected to one of the **INPUT** connectors on the **TinkerKit Shield**.

A **Potentiometer** is a commonly used variable resistor. Turning the knob, you vary the output voltage between 0 and 5V. This value is sent through the middle pin of the pot.

Output: This module outputs 5v when turned in one direction, and 0v when turned in the opposite way. When connected to an input on the Arduino using the TinkerKit Shield, you can expect to read values between 0 and 1023.

Module Description: This module features a 4k7 Ohm linear potentiometer, a signal amplifier, the standard TinkerKit 3pin connector, a green LED that signals that the module is correctly powered and a yellow LED whose brightness changes according to the position of the potentiometer.

This module is a **SENSOR**. The connector is an **OUTPUT** which must be connected to one of the **INPUT** connectors on the **TinkerKit Shield**.

A **Linear Potentiometer** is a commonly used variable resistor. It can often be found as a volume controller on radios and TVs. By moving the slider you can vary the output voltage between 0 and 5V. This value is sent through the middle pin of the pot.

Output: This module outputs 5v when the slider is at one end and 0v when moved in the opposite way. When connected to an input on the Arduino using the TinkerKit Shield, you can expect to read values going from 0 to 1023.

Module Description: this module features a 4k7 Ohm linear

potentiometer, a signal amplifier, the standard TinkerKit 3pin connector, a green LED that signals that the module is correctly powered and a yellow LED whose brightness changes according to the position of the potentiometer.

This module is a **SENSOR**. The connector is an **OUTPUT** which must be connected to one of the **INPUT** connectors on the **TinkerKit Shield**.

The **Touch Sensor** is sensitive to skin contact.

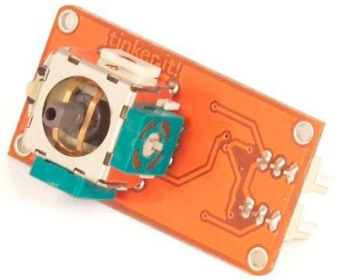
Output: This module normally outputs 0v, but when touched, sends 5v. When connected to an input on the Arduino using the TinkerKit Shield, you will see 0 when there is no touch, and 1023 when touched.

Module Description: on the back of the module you can find a signal amplifier, a capacitor, a QT 100A single touch controller, a green LED that signals that the module is correctly powered and a yellow LED whose brightness depends on the values output by the module.

Please note this device performs an auto calibration when it is turned on, so if someone is touching the switch surface when it is turned on it will not work. To reset, cycle power and make sure no one is touching it as you restart.

This module is a **SENSOR**. The connector is an **OUTPUT** which must be connected to one of the **INPUT** connectors on the **TinkerKit Shield**.

The **Joystick module** is similar to analog joysticks found in gamepads. It is made made by mounting two potentiometers at a 90 degrees angle. The potentiometers are connected to a short stick centered by springs.

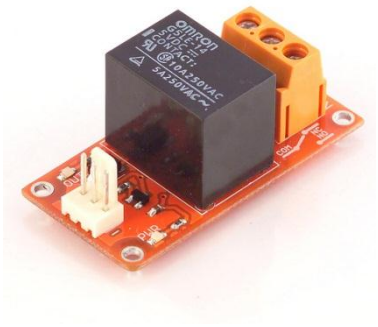


Output: This module will output roughly 2.5 volts from both outputs when in its resting position. Moving the stick will cause the outputs to change from 0v to 5v depending on its direction. If you connect this module to an Arduino through the Tinkerkit Shield, you can expect to read a value of roughly 512 in its resting position (expect small variations due to tiny imprecisions of the springs and mechanism) When you move the joystick you should see the values change from 0 to 1023 depending on its position.

Module Description: This module features two 4k7 Ohm linear potentiometers, two standard TinkerKit 3pin connector, two signal amplifiers, a green LED that signals that the module is correctly powered and two yellow LED whose brightness depends on the values output by the module.

This module is a **SENSOR**. Its connectors are **OUTPUTs** which must be be connected to two of the **INPUT** connectors on the TinkerKit Shield.

A **relay** is an **electrically operated switch** that allows you to turn on or off a circuit using voltage and/or current much higher than the Arduino could handle. There is no connection between the low voltage circuit operated by Arduino and the high power circuit. The relay protects each circuit from each other.



Warning: We don't recommend you operate circuits powered at more than 24V without the supervision of an expert.

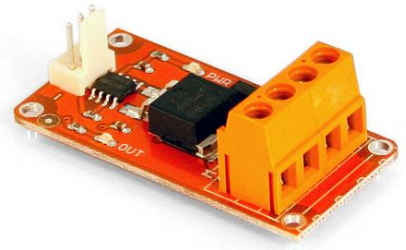
Input: The relay is a simple mechanical on/off switch. It activates when the input reaches 5v and turns off when the input is 0v. You can control it though the digitalWrite() function on Arduino.

The module provides three connections labeled **COM**, **NC** and **NO**. **NC** stands for "**NORMALLY CLOSED**". This means that when the relay has no signal (LOW or 0V from an Arduino), the connected circuit wil be active; conversely, if you apply 5V or pull the pin HIGH, it will turn the connected circuit off. **NO** stands for "**NORMALLY OPEN**", and functions in the opposite way; when you apply 5V the circuit turns on, and at 0V the circuit turns off. Relays can replace a manual switch. Remove the switch and connect its wires to**COM** and **NO**. When the relay is activated the circuit is closed and current can flow to the device you are controlling.

Module Description: this module features an 250v 10A mounted on a 2 module TinkerKit board, one standard TinkerKit 3pin connector, one transistor, a green LED that signals that the module is correctly powered and an yellow LED that indicates when the relay is active.

This module is an **ACTUATOR**. The connector is an **INPUT** which must be connected to one of the **OUTPUT** connectors on the **TinkerKit Shield**.

This module switches a high current load using a high power transistor. Unlike a mechanical relay, this is capable of high speed switching for use with PWM.

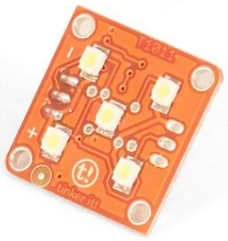


Input: This module lets you control devices operating at a maximun of 24VDC with an Arduino pin. To wire the module, connect the power supply for your device (max 24 V) to the V+ and GND terminals. Connect the device to M+ and M-. Be aware of your circuit's polarity, you could damage your components if it is not wired correctly.

Module Description: This module features an IRF520 power MOSFET transistor, a kick-back diode, a standard TinkerKit 3pin connector,a signal amplifier, a green LED that signals that the module is correctly powered and one yellow LED whose brightness depends on the input signal received by the module.

This module is a **ACTUATOR**. The connector is an INPUT that must be connected to an **OUTPUT** on the **TinkerKit Shield**.

The **Power LED** is an actuator. Five ultra-bright LEDs can be powered from an Arduino pin. **Input**: Arduino provides a maximum of 40 mA per pin, enough to light up the five LEDs using the DigitalWrite() and AnalogWrite() functions.



Module description: This module features Five **AWT801-S LEDs from Seoul Semi Conductor**, the standard TinkerKit 3pin connector and a green LED that signals that the module is correctly powered and a yellow LED that is lit only when the LED is lit. A resistor limits the voltage from the Arduino, protecting the lights.

This module is an **ACTUATOR**. The connector is an **INPUT** which must be connected to an **OUTPUT** connector on the **TinkerKit Shield**.

The **LED** is possibly the simplest actuator available. It's a low power light source available in many colors. It lights up when powered from an Arduino pin.

Input: Arduino provides a maximum of 40 mA per pin; this is enough to light up the LED through the **digitalWrite()** and **analogWrite()** functions.

Module description: This module features a 5mm Blue Light Emitting Diode, the standard TinkerKit 3pin connector and a green LED that signals that the module is correctly powered and a tiny yellow LED that shows the current brightness of the blue LED. A resistor provides the optimal amount of current when connected to an Arduino.

This module is an **ACTUATOR** therefore the connector is an INPUT that need to be connected to one of the **OUTPUT** connectors on the **TinkerKit Shield**.

The **LED** is possibly the simplest actuator available. It's a low power light source available in many colors. It lights up when powered from an Arduino pin.

Input: Arduino provides a maximum of 40 mA per pin; this is enough to light up the LED through the **digitalWrite()** and **analogWrite()** functions.

Module description: this module features a 5mm Green Light Emitting Diode, the standard TinkerKit 3pin connector and a green LED that signals that the module is correctly powered and a tiny yellow LED that shows the current brightness of the main green LED. A resistor provides the optimal amount of current when connected to an Arduino.

This module is an **ACTUATOR** therefore the connector is an INPUT that need to be connected to one of the **OUTPUT** connectors on the **TinkerKit Shield**.

The **LED** is possibly the simplest actuator available. It's a low power light source available in many colors. It lights up when powered from an Arduino pin.

Input: Arduino provides a maximum of 40 mA per pin; this is enough to light up the LED through the **digitalWrite()** and **analogWrite()** functions.

Module description: this module features a 5mm Yellow Light Emitting Diode, the standard TinkerKit 3pin connector and a green LED that signals that the module is correctly powered and a tiny yellow LED that shows the current brightness of the yellow LED. A resistor provides the optimal amount of current when connected to an Arduino.

This module is an **ACTUATOR** therefore the connector is an INPUT that need to be connected to one of the **OUTPUT** connectors on the **TinkerKit Shield**.

The **LED** is possibly the simplest actuator available. It's a low power light source available in many colors. It lights up when powered from an Arduino pin.

Input: Arduino provides a maximum of 40 mA per pin; this is enough to light up the LED through the **digitalWrite()** and **analogWrite()** functions.

Module description: This module features a 5mm Red Light Emitting Diode, the standard TinkerKit 3pin connector and a green LED that signals that the module is correctly powered and a tiny yellow LED that shows the current brightness of the red LED. A resistor provides the optimal amount of current when connected to an Arduino. This module is an **ACTUATOR** therefore the connector is an INPUT that need to be connected to one of the **OUTPUT** connectors on the **TinkerKit Shield**.

The **LED** is possibly the simplest actuator available. It's a low power light source available in many colors. It lights up when powered from an Arduino pin.

Input: Arduino provides a maximum of 40 mA per pin; this is enough to light up the LED through the **digitalWrite()** and **analogWrite()** functions.

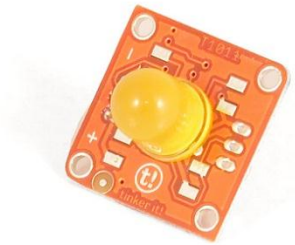
Module description: this module features a 10mm Green Light Emitting Diode, the standard TinkerKit 3pin connector and a green LED that signals that the module is correctly powered and a tiny yellow LED that shows the current brightness of the large green LED. A resistor provides the optimal amount of current when connected to an Arduino. This module is an **ACTUATOR** therefore the connector is an INPUT that need to be connected to one of the **OUTPUT** connectors on the **TinkerKit Shield**.

The **LED** is possibly the simplest actuator available. It's a low power light source available in many colors. It lights up when powered from an Arduino pin.

Input: Arduino provides a maximum of 40 mA per pin; this is enough to light up the LED through the **digitalWrite()** and **analogWrite()** functions.

Module description: this module features a 10mm Blue Light Emitting Diode, the standard TinkerKit 3pin connector and a green LED that signals that the module is correctly powered and a tiny yellow LED that shows the current brightness of the blue LED. A resistor provides the optimal amount of current when connected to an Arduino. This module is an **ACTUATOR** therefore the connector is an INPUT that need to be connected to one of the **OUTPUT** connectors on the **TinkerKit Shield**.

The **LED** is possibly the simplest actuator available. It's a low power light source available in many colors. It lights up when powered from an Arduino pin.



Input: Arduino provides a maximum of 40 mA per pin; this is enough to light up the LED through the **digitalWrite()** and **analogWrite()** functions.

Module description: this module features a 10mm Yellow Light Emitting Diode, the standard TinkerKit 3pin connector and a green LED that signals that the module is correctly powered and a tiny yellow LED that shows the current brightness of the yellow LED. A resistor provides the optimal amount of current when connected to an Arduino.

This module is an **ACTUATOR** therefore the connector is an INPUT that need to be connected to one of the **OUTPUT** connectors on the **TinkerKit Shield**.

The **LED** is possibly the simplest actuator available. It's a low power light source available in many colors. It lights up when powered from an Arduino pin.

Input: Arduino provides a maximum of 40 mA per pin; this is enough to light up the LED through the **digitalWrite()** and **analogWrite()** functions.

Module description: This module features a 10mm Red Light Emitting Diode, the standard TinkerKit 3pin connector and a green LED that signals that the module is correctly powered and a tiny yellow LED that shows the current brightness of the red LED. A resistor provides the optimal amount of current when connected to an Arduino.

This module is an **ACTUATOR** therefore the connector is an INPUT that need to be connected to one of the **OUTPUT** connectors on the **TinkerKit Shield**.

20 cm long wires for the TinkerKit with a 3 pin jumper on both sides

50 cm long wires for the TinkerKit with a 3 pin jumper on both sides.

100 cm long wires for the TinkerKit with a 3 pin jumper on both sides

Arduino ADK Rev3

Code: A000069
The Arduino ADK R3 is a microcontroller board based on the ATmega2560 (datasheet). It has a USB host interface to connect with Android based phones.

It is compatible with Android's Accessory Development Kit examples. It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.

The ADK is based on the Mega 2560. Plus it has an USB Host circuit that enable this board to communicate with USB Devices, and give them

power supply.

Additional features coming with the R3 version are:

- ATmega16U2 instead 8U2 as USB-to-Serial converter.
- 1.0 pinout: added SDA and SCL pins for TWI communication placed near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adapt to the voltage provided from the board and the second one is a not connected pin, that is reserved for future purposes.
- stronger RESET circuit.