

TinkerKit - Starter

Code: K000002

The **Starter Kit** is a pack of different TinkerKit Modules, aimed to start designing interactive environments / prototype interfaces without using the breadboard or the soldering iron.

The **Starter Kit** consists in the Sensor Shield V.2, 8 different **Sensors** and 7 **Actuators**, some cables.

Part List

- [Sensor Shield V.2](#) x1
- [Button Module](#) x1
- [LDR Module](#) x1
- [Tilt Module](#) x1
- [Therm Module](#) x1
- [Rotary Potentiometer Module](#) x1
- [Linear Potentiometer Module](#) x1
- [Touch Sensor Module](#) x1
- [Joystick Module](#) x1
- [Relay Module](#) x1
- [5mm Green Led Module](#) x1
- [5mm Yellow Led Module](#) x1
- [5mm Red Led Module](#) x1
- [10mm Green Led Module](#) x1
- [10mm Yellow Led Module](#) x1
- [10mm Red Led Module](#) x1
- [20cm Cables](#) x4
- [50cm Cables](#) x2
- [100cm Cables](#) x1

Shield - TinkerKit Sensor Shield V.2

Code: T020010

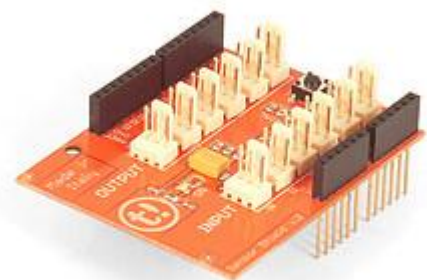
The **Sensor Shield v.2** allows you to hook up the TinkerKit **SENSORS** and **ACTUATORS** directly to the Arduino, without the use of the breadboard.

It has 12 standard TinkerKit 3pin connectors. The 6 labeled **I0** through **I5** 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 DuemilaNove board the pins are:

Pin 11	on the Arduino	is	O0	on the shield.
Pin 10	on the Arduino	is	O1	on the shield.
Pin 9	on the Arduino	is	O2	on the shield.
Pin 6	on the Arduino	is	O3	on the shield.
Pin 5	on the Arduino	is	O4	on the shield.
Pin 3	on the Arduino	is	O5	on the shield.

Module description: A green LED signals that the shield is correctly powered, a standard 6mm pushbutton allows you to RESET the board.



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. Note that on Arduino the I2C bus uses Analog Input 4 and 5, using the TWI connection precludes the use of those analog inputs.

The **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.

Note: If you're sending or receiving data to and from the computer this serial connector is not available.

Two mounting holes are provided in the same position found on the Arduino board. A third hole allows you to see the led connected to pin 13 of the Arduino.

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**.

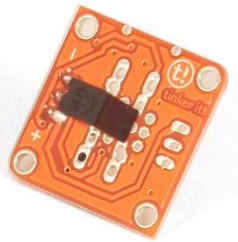


The **Tilt Sensor** can detect when it is at an angle.

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 tilted.

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 approaches 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**.



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.

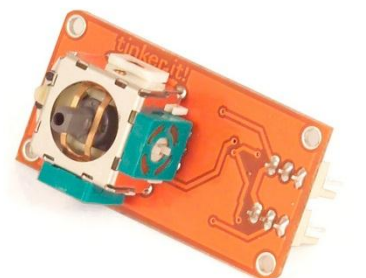
Module Description: on the back of the module you can find a signal amplifier, a capacitor, a [QT 100A single touch controller](#), a green LED that signals that the module is correctly powered and a yellow LED whose brightness depends on the values output by the module.

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 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.



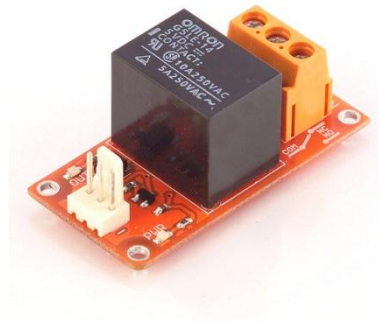
Module Description: This module features two 4k7 Ohm linear potentiometers, two standard TinkerKit 3pin connector, two signal amplifiers, a green LED that signals that the module is correctly powered and two yellow LED whose brightness depends on the values output by the module.

This module is a **SENSOR**. Its connectors are **OUTPUTs** which must be 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 will 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**.

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 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

