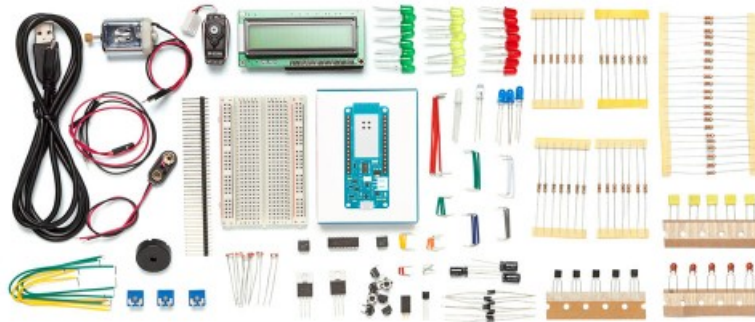




ARDUINO MKR IOT BUNDLE

Code: GKX00006

The MKR IoT Bundle is a great way to get started with the **Internet of Things!** The MKR IoT Bundle includes the components you need to make **5 IoT projects** following the step-by-step online tutorials on the [Arduino Project Hub online platform](#)



The **MKR IoT Bundle** walks you through the basics of using the Arduino MKR1000 for IoT applications. You'll learn through building 5 creative experiments thanks to the step by step online tutorials available on the [Arduino Project Hub platform](#). The MKR IoT bundle includes a selection of the most common and useful electronic components to build 5 IoT experiments.



The kit is based around the MKR1000—a powerful board that combines the functionality of the Zero and the Wi-Fi Shield—and enables Makers to add connectivity to their designs with minimal prior networking experience.

Each bundle includes:

- 1 Arduino [MKR1000 board](#), with header soldered.
- 1 micro USB cable,
- 1 400-point breadboard,
- 70 solid-core jumper wires,
- 1 9V battery snap,
- 1 stranded jumper wire
- 1 stranded jumper wire,
- 6 phototransistors,
- 3 potentiometers (10 kilohm),
- 10 pushbuttons,
- 1 temperature sensor (TMP36),
- 1 tilt sensor,
- 1 alphanumeric LCD (16 x 2 characters),
- 1 bright white,
- 34 LEDs (1 bright white, 1 RGB, 8 red, 8 green, 8 yellow, 3 blue),
- 1 small DC motor (6/9V),
- 1 small servo motor,
- 1 piezo capsule (PKM17EPP-4001-B0),
- 1 H-bridge motor driver (L293D),
- 1 octocouplers (4NE5),
- 2 MOSFET transistors (IRF520),
- 5 capacitors (100uF),
- 5 diodes (1N4007),
- 3 transparent gels (R,G,B)
- 1 male pin strip (40 x 1),
- 20 resistors (220 ohm),



- 5 resistors (560 ohm),
- 5 resistors (1 kilohm),
- 5 resistors (4.7 kilohm),
- 20 resistors (10 kilohm),
- 5 resistors (1 megohm),
- 5 resistors (10 megohm)

Please note, don't connect 9V to the board, as it will be damaged.
You can use the 9v Battery strip to supply an external component.



Arduino MKR1000 has been designed to offer a practical and cost effective solution for makers seeking to add Wi-Fi connectivity to their projects with minimal previous experience in networking. It is based on the Atmel [ATSAMW25](#) SoC (System on Chip), that is part of the SmartConnect family of Atmel Wireless devices, specifically designed for IoT projects and devices.

The ATSAMW25 is composed of three main blocks:

- SAMD21 Cortex-M0+ 32bit low power ARM MCU
- WINC1500 low power 2.4GHz IEEE® 802.11 b/g/n Wi-Fi
- ECC508 CryptoAuthentication



The ATSAMW25 includes also a single 1x1 stream PCB Antenna.

The design includes a Li-Po charging circuit that allows the Arduino/Genuino MKR1000 to run on battery power or external 5V, charging the Li-Po battery while running on external power. Switching from one source to the other is done automatically. A good 32 bit computational power similar to [the Zero board](#), the usual rich set of I/O interfaces, low power Wi-Fi with a Cryptochip for secure communication, and the ease of use of the Arduino Software (IDE) for code development and programming.

All these features make this board the preferred choice for the emerging IoT battery-powered projects in a compact form factor.

The USB port can be used to supply power (5V) to the board. The Arduino MKR1000 is able to run with or without the Li-Po battery connected and has limited power consumption.

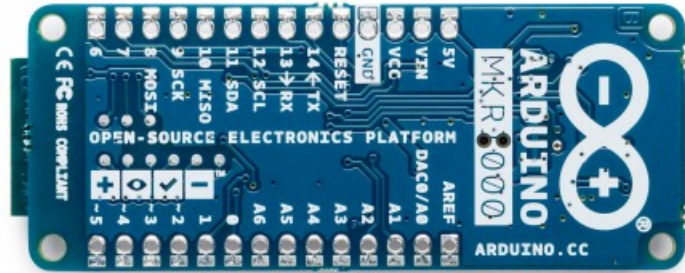
The MKR1000 Wifi module supports certificate SHA-256.

Warning: Unlike most Arduino & Genuino boards, the MKR1000 runs at 3.3V. The maximum voltage that the I/O pins can tolerate is 3.3V. Applying voltages higher than 3.3V to any I/O pin could damage the board. While output to 5V digital devices is possible, bidirectional communication with 5V devices needs proper level shifting.



TECH SPECS

Microcontroller	SAMD21 Cortex-M0+ 32bit low power ARM MCU
Board Power Supply (USB/VIN)	5V
Supported Battery(*)	Li-Po single cell, 3.7V, 700mAh minimum
Circuit Operating Voltage	3.3V
Digital I/O Pins	8
PWM Pins	12 (0, 1, 2, 3, 4, 5, 6, 7, 8, 10, A3 - or 18 -, A4 -or 19)
UART	1
SPI	1
I2C	1
Analog Input Pins	7 (ADC 8/10/12 bit)
Analog Output Pins	1 (DAC 10 bit)
External Interrupts	8 (0, 1, 4, 5, 6, 7, 8, A1 -or 16-, A2 - or 17)
DC Current per I/O Pin	7 mA
Flash Memory	256 KB
SRAM	32 KB
EEPROM	no
Clock Speed	32.768 kHz (RTC), 48 MHz
LED_BUILTIN	6
Full-Speed USB Device and embedded Host	
LED_BUILTIN	6
Length	61.5 mm
Width	25 mm
Weight	32 gr.



OSH: Schematics

The MKR1000 is open-source hardware! You can build your own board using the following files:

[EAGLE FILES IN .ZIP](#) [SCHEMATICS IN .PDF](#) [FRITZING IN .FZPZ](#)

Pinout

[Download the pinout](#) in PNG format

Li-Po batteries, Pins and board LEDs

Battery capacity

Li-Po batteries are charged up to 4,2V with a current that is usually half of the nominal capacity (C/2). For Arduino / Genuino MKR1000 we use a specialized chip that has a preset charging current of 350mAh. This means that the MINIMUM capacity of the Li-Po battery should be 700 mAh. Smaller cells will be damaged by this current and may overheat, develop internal gasses and explode, setting on fire the surroundings. We strongly recommend that you select a Li-Po battery of at least 700mAh capacity. A bigger cell will take more time to charge, but won't be harmed or overheated. The chip is programmed with 4 hours of charging time, then it goes into automatic sleep mode. This will limit the amount of charge to max 1400 mAh per charging round.

Battery connector

If you want to connect a battery to your MKR1000 be sure to search one with female 2 pin JST PHR2 Type connector. Polarity : looking at the board connector pins, polarity is Left = Positive, Right = GNDDownload here the [Connector datasheet](#). On the MKR1000, connector is a Male 2pin JST PH Type. **Vin** This pin can be used to power the board with a regulated 5V source. If the power is fed through this pin, the USB power



source is disconnected. This is the only way you can supply 5v (range is 5V to maximum 6V) to the board not using USB. This pin is an INPUT.

5V

This pin outputs 5V from the the board when powered from the USB connector or from the VIN pin of the board. It is unregulated and the voltage is taken directly from the inputs. When powered from battery it supplies around 3.7 V. As an OUTPUT, it should not be used as an input pin to power the board.

VCC

This pin outputs 3.3V through the on-board voltage regulator. This voltage is the same regardless the power source used (USB, Vin and Battery).

LED ON

This LED is connected to the 5V input from either USB or VIN. It is not connected to the battery power. This means that it lits up when power is from USB or VIN, but stays off when the board is running on battery power. This maximizes the usage of the energy stored in the battery. It is therefore normal to have the board properly running on battery power without the LED ON being lit.

CHARGE LED

The CHARGE LED on the board is driven by the charger chip that monitors the current drawn by the Li-Po battery while charging. Usually it will lit up when the board gets 5V from VIN or USB and the chip starts charging the Li-Po battery connected to the JST connector. There are several occasions where this LED will start to blink at a frequency of about 2Hz. This flashing is caused by the following conditions maintained for a long time (from 20 to 70 minutes):- No battery is connected to JST connector.- Overdischarged/damaged battery is connected. It can't be recharged.- A fully charged battery is put through another unnecessary charging cycle. This is done disconnecting and reconnecting either VIN or the battery itself while VIN is connected.

Onboard LED

On MKR1000 the onboard LED is connected to **D6** and not D13 as on the other boards. Blink example or other sketchthes that uses pin 13 for onboard LED may need to be changed to work properly.

(*) Note : DO NOT CONNECT to the male JST connector present on the board anything else than a Li-Po battery whose characteristics are compliant with those indicated above. Please DO NOT POWER VIN with more than 5V.

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