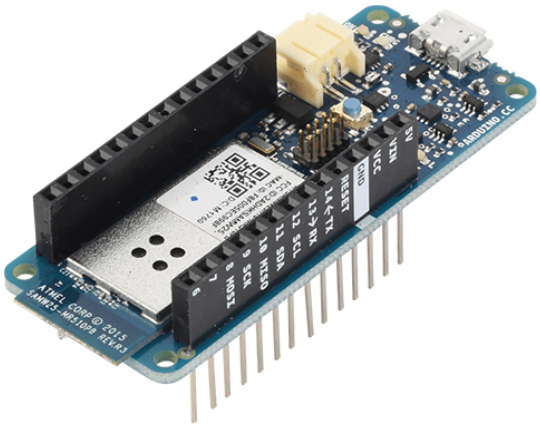
Arduino & Genuino Microcontroller Board
Model:MKR1000
User Manual

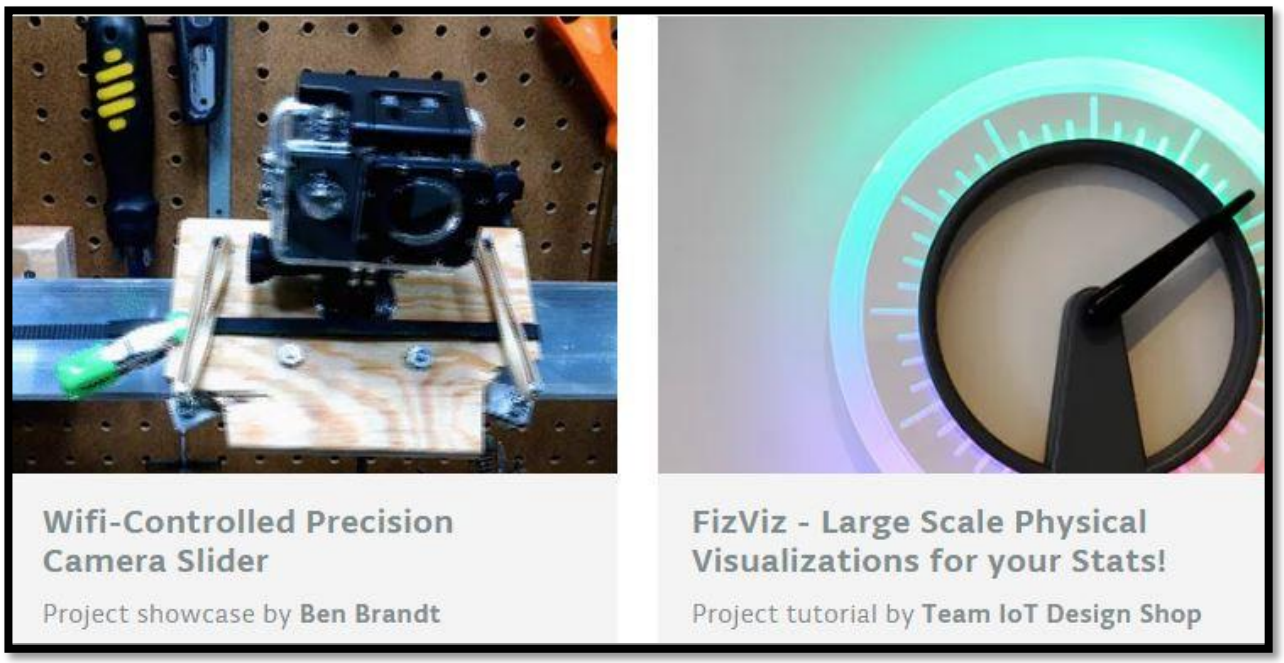


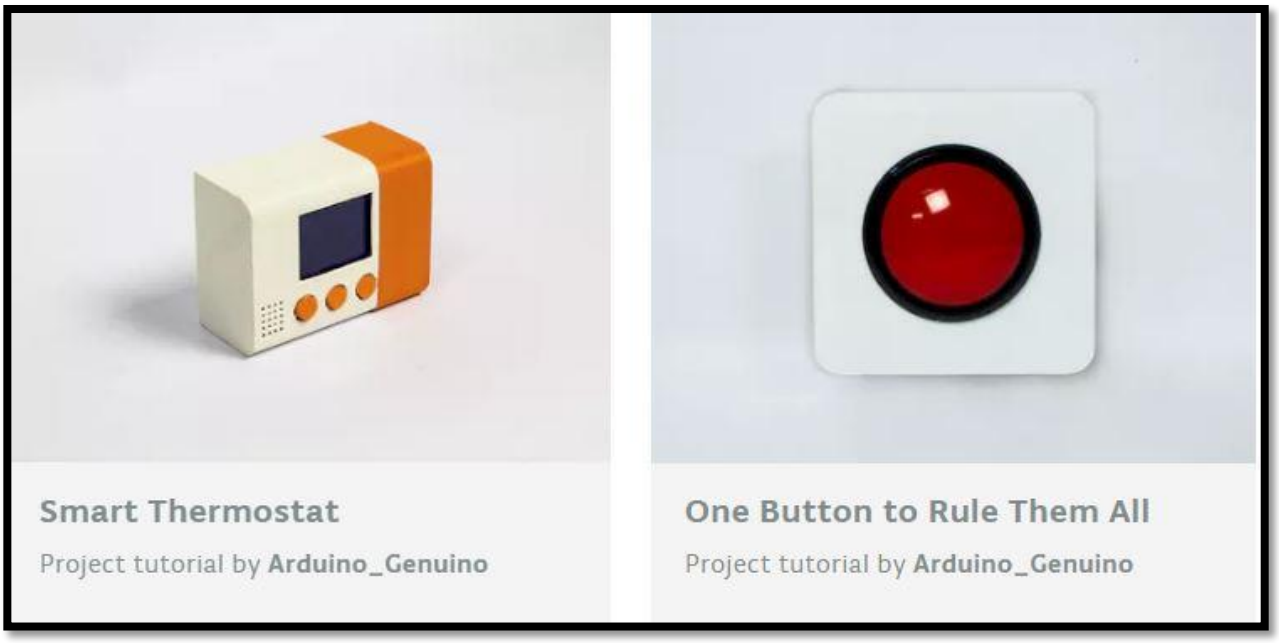
Getting Started

You can find in the Getting Started section all the information you need to configure your board, use the Arduino Software (IDE), and start tinker with coding and electronics. Full details and examples on how to use the WiFi interface are available in the WiFi101 Library reference page

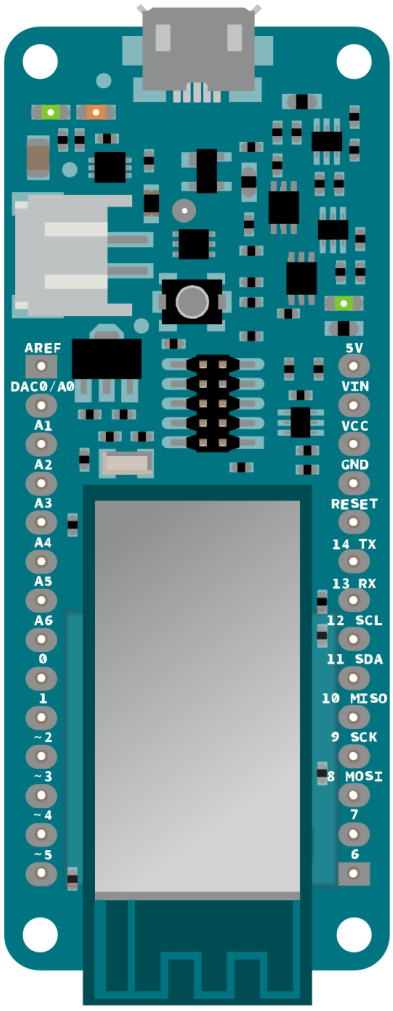
Get inspired

Discover some Arduino MKR1000 & Genuino MKR1000 projects featured from Arduino Project Hub, our tutorial platform:




Smart Thermostat
Project tutorial by Arduino_Genuino
One Button to Rule Them All
Project tutorial by Arduino_Genuino

Pinout:


AREF
DAC0/A0
A1
A2
A3
A4
A5
A6
0
1
~2
~3
~4
~5
5V
VIN
VCC
GND
RESET
14 TX
13 RX
12 SCL
11 SDA
10 MISO
9 SCK
8 MOSI
7
6

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 = GND

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 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

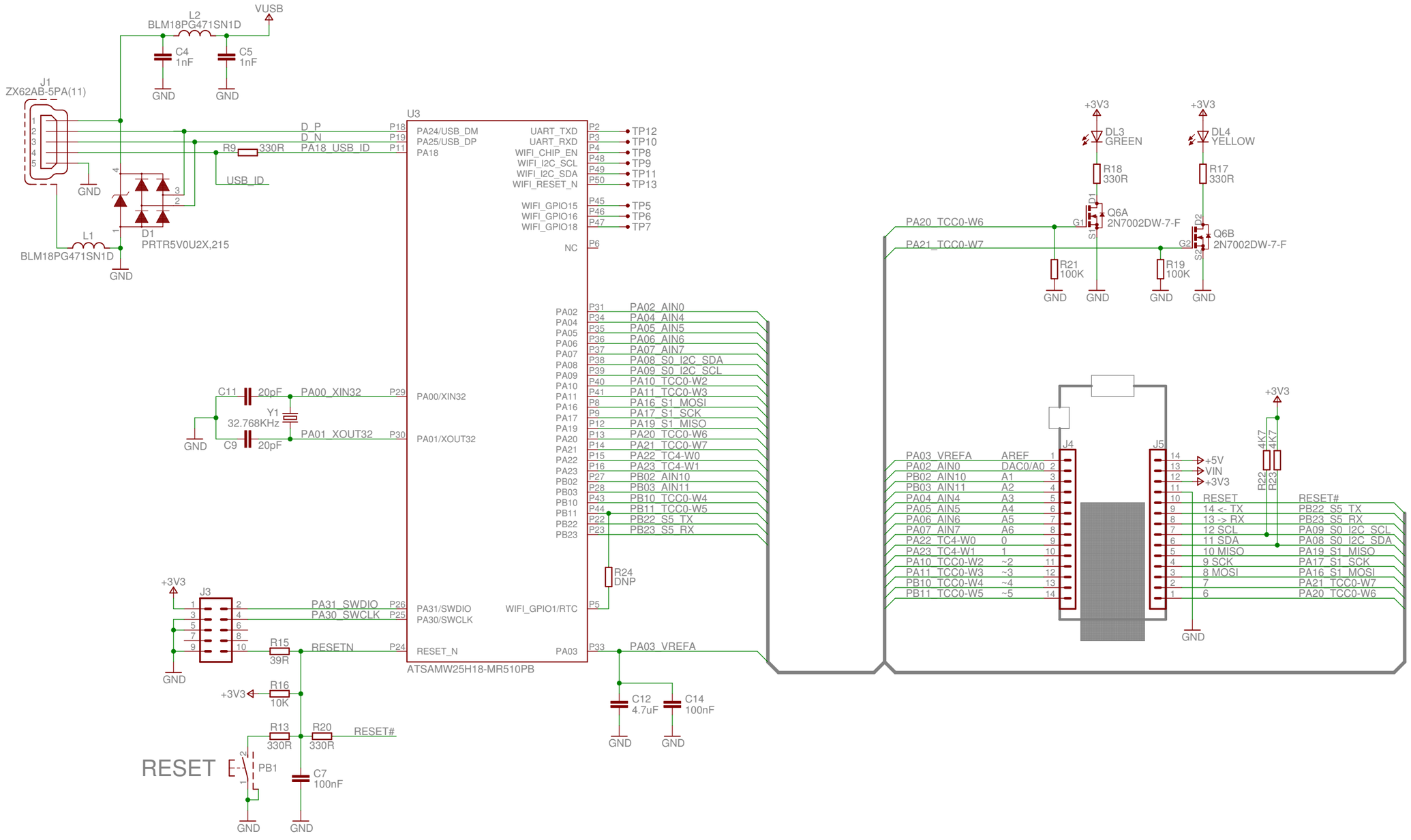
The CHARGE LED on the board is driven by the charger chip that monitors the current drawn by the Li-Po battery while charging. Usually it will lit up when the board gets 5V from VIN or USB and the chip starts charging the Li-Po battery connected to the JST connector. There are several occasions where 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.
- Over discharged/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 sketches 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.


L2
BLM18PG471SN1D
VUSB
C4
1nF
C5
1nF
GND
GND
J1
ZX62AB-5PA(11)
D_P
D_N
R9
330R
PA18_USB_ID
USB_ID
GND
L1
BLM18PG471SN1D
D1
PRTR5V0U2X,215
GND
U3
PA24/USB_DM
PA25/USB_DP
PA18
P18
P19
P11
UART_TXD
UART_RXD
WIFI_CHIP_EN
WIFI_I2C_SCL
WIFI_I2C_SDA
WIFI_RESET_N
WIFI_GPIO15
WIFI_GPIO16
WIFI_GPIO18
NC
TP12
TP10
TP8
TP9
TP11
TP13
TP5
TP6
TP7
C11
20pF
PA00_XIN32
Y1
32.768KHz
PA01_XOUT32
C9
20pF
PA00/XIN32
PA01/XOUT32
PA02_AIN0
PA04_AIN4
PA05_AIN5
PA06_AIN6
PA07_AIN7
PA08_S0_I2C_SDA
PA09_S0_I2C_SCL
PA10_TCC0-W2
PA11_TCC0-W3
PA16_S1_MOSI
PA17_S1_SCK
PA19_S1_MISO
PA20_TCC0-W6
PA21_TCC0-W7
PA22_TC4-W0
PA23_TC4-W1
PB02_AIN10
PB03_AIN11
PB10_TCC0-W4
PB11_TCC0-W5
PA22_S5_TX
PA23_S5_RX
R24
DNP
+3V3
J3
PA31_SWDIO
PA30_SWCLK
PA31/SWDIO
PA30/SWCLK
WIFI_GPIO1/RTC
R15
39R
RESETN
RESET_N
PA03
PA03_VREFA
ATSAMW25H18-MR510PB
R16
10K
C12
4.7uF
C14
100nF
R13
330R
R20
330R
RESET#
RESET
PB1
C7
100nF
+3V3
DL3
GREEN
DL4
YELLOW
R18
330R
R17
330R
PA20_TCC0-W6
PA21_TCC0-W7
Q6A
2N7002DW-7-F
Q6B
2N7002DW-7-F
R21
100K
R19
100K
J4
J5
PA03_VREFA
PA02_AIN0
PB02_AIN10
PB03_AIN11
PA04_AIN4
PA05_AIN5
PA06_AIN6
PA07_AIN7
PA22_TC4-W0
PA23_TC4-W1
PA10_TCC0-W2
PA11_TCC0-W3
PB10_TCC0-W4
PB11_TCC0-W5
AREF
DAC0/A0
+5V
VIN
+3V3
RESET
14 <- TX
13 -> RX
12 SCL
11 SDA
10 MISO
9 SCK
8 MOSI
7
6
RESET#
PB22_S5_TX
PB23_S5_RX
PA09_S0_I2C_SCL
PA08_S0_I2C_SDA
PA19_S1_MISO
PA17_S1_SCK
PA16_S1_MOSI
PA21_TCC0-W7
PA20_TCC0-W6
4K7
4K7
R22
R23