

Kniwwelino Extension Cards







© Luxembourg Institute of Science and Technology, 2019

This document has been created by LIST in within the scope of the Kniw2School project financed by the FNR (Luxembourg National Research Fund).

This document is licensed under a <u>Creative Commons Attribution 4.0 International License</u>. Kniwwelino and the Kniwwelino lion are registered trademarks of the Luxembourg Institute of Science and Technology.



Kniwwelino Board

The board is the brain of your project. It interprets your program and transfers the instructions to the concerned components.

Kniwwelino Board

Kniwwelino on start:

Contains the blocks which are only executed once, at the start of Kniwwelino (for instance the variables initialisation).



Contains the blocks which are executed repeatedly, as long as Kniwwelino is powered.







External push button

To trigger an event: you can press and hold the button or click it (press and release). In this case the circuit is closed.

External push button

Is used in the same way as buttons A and B on the Kniwwelino board.

external button on	pin	D5 🔻	was click	ed
	\checkmark	D5		
		D6		
		D7		

Detects if an external button connected to a specified pin (D5, D6 or D7) was clicked (pressed and released).

external button on pin D5 🔪 is pressed

Detects if an external button connected to a specified pin (D5, D6 or D7) is currently pressed.









External LED

Lights when as soon as current flows: you can give a feedback (for instance that you got a message) or just for decoration.

External LED

set external LED on pin D0 🔻) to	on 🔪
	1	on
		blink
		flash
		off

Switches on an external LED connected to the specified pin (D0, D5, D6 or D7). You can also set an effect.

Kniwwelino repeat forever:

set external LED on pin DO 🔹 to blink 🔹







Buzzer

Plays a musical note or a tone.

Buzzer

Play Note C C 4 C of duration 1/ 4 on Pin D5

Plays a musical note or a pause with the given duration on the buzzer connected to D5, D6 or D7.



Plays a tone on the buzzer connected to the specified pin.

Turn tone off on pin D5 💌

Stops the tone being played on the buzzer connected to the specified pin.



Can be used to assign a variable to a note/tone in order to play a it later in the code.









A servo is a motor able to turn to a predefined position. This position is an angle between 0° and 180°. It allows you, for instance, to build a mechanical arm.

Micro Servo motor SG90

set servo angle on pin D5 🔨 to 🄰 90 🛛 degrees

Changes the position of the servo motor connected to the specified pin (D5, D6 or D7). It rotates the motor and stops on the angle of 90°.

read servo angle on pin D5 🔹

Reads the angular position of the servo motor connected to the specified pin.









RGB LED Strip

*** Neopixel LED Strip with size 10 on pin D5 🔹

Specifies the number of LEDs that you want to connect and the pin you want to use. This block is absolutely necessary if you want to use the RGB LED strip.

#1: set strip to effect: (BLINK [1]

Changes the effect on the LED strip: e.g. blink, rainbow, fireworks, ...



Changes the colour of all the LEDs on the strip.

👬 set pixel 🚺 0 to color: 🚺

Changes the colour of an individual LED on the strip.

set effect speed to 200

Changes the speed of the effect.

set brightness to 200

Changes the brightness of the LEDs.



♀LED

5 RGB LEDs on a strip. You can switch them on

individually and change their colour and effect.







DC Motor

Uses magnets to transform electricity into mechanical motion. When current flows, the motor rotates continuously.

DC Motor

set pin D0 🔹 to digital value (HIGH 🔹

To switch on or off the motor connected to D0, D5, D6 or D7:

- HIGH = current flows and motor rotates at maximum speed, or
- LOW = no current and motor stops rotating

set pin D5 T to analog value (100)

To switch on and set the rotation speed of a motor connected to D5, D6 or D7. Can be set between 0 (no rotation) and 255 (maximum speed).









Temperature Sensor DS18B20

Measures the temperature in C°.

Temperature Sensor DS18B20

DS18B20 read temperature [°C] on Pin D5 T

Reads the temperature in C° on a sensor connected to D5, D6 or D7.











Ultrasonic Distance Sensor HC-SR04

Like a bat, it detects the distance of nearby objects or persons. It sends an ultrasonic pulse and measures the time difference when receiving it back. Then it calculates the distance.

Ultrasonic Distance Sensor HC-SR04

HC-SR04 read distance [cm] on Pin D5 v

Reads the distance to the next nearby object in cm using the distance sensor connected to the specified pin (D5, D6 or D7)









Potentiometer

Rotating the knob changes the output voltage of the circuit. You can use it to input a value between 0 and 1023.

Potentiometer

read analog pin A0 🔻

Reads the output voltage of a potentiometer connected to A0. Returns a value between 0 and 1023.









Light Sensor LDR

Detects the luminosity of the surounding light and maps it to a value between 0 and 1023.

Light Sensor LDR

read analog pin 🗚 🔻

Reads the luminosity level using the sensor connected to A0. Returns a value between 0 (dark) and 1023 (bright).









Touch button

Detects if you put your finger on it. Can be used to trigger an event.

Touch button

read analog pin A0 🔻

Reads the output voltage of the current flowing through the sensor connected to A0. Returns a value between 0 (no current) and 1023 (full current).









Hall effect Sensor A3144

Detects the presence of magnets.

Hall Effect Sensor A3144

read digital pin D0 🗴

Detects if a magnet is close to a hall sensor connected to the specified pin (D0, D5, D6 or D7). The result is LOW when a magnet is detected and HIGH when no magnet is detected.





