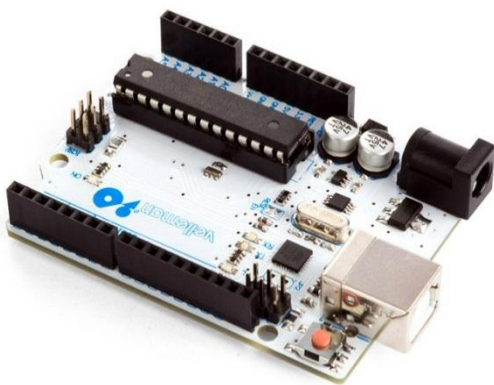
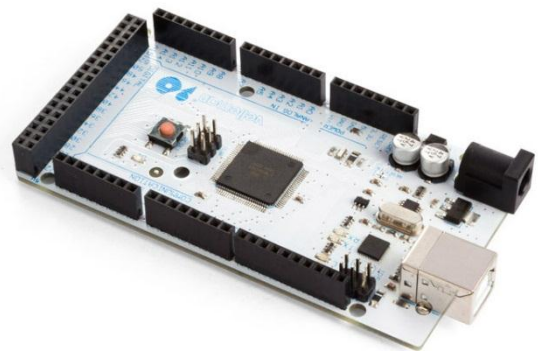


MAKEVMA100/MAKEVMA101/ MAKEVMA102/MAKEVMA103

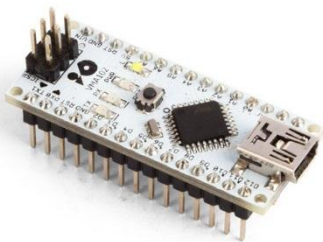
DEVELOPMENT BOARD



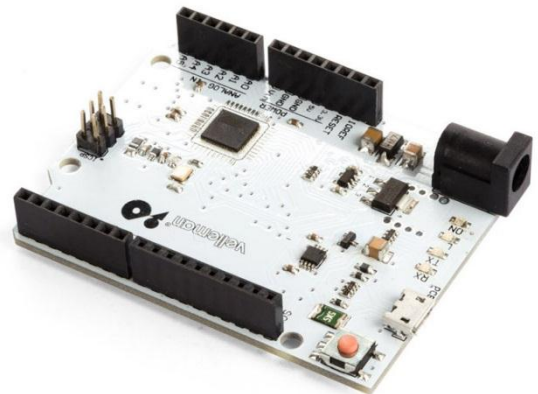
MAKEVMA100



MAKEVMA101



MAKEVMA102



MAKEVMA103



USER MANUAL

1. Introduction

To all residents of the European Union

Important environmental information about this product



This symbol on the device or the package indicates that disposal of the device after its lifecycle could harm the environment. Do not dispose of the unit (or batteries) as unsorted municipal waste; it should be taken to a specialized company for recycling. This device should be returned to your distributor or to a local recycling service. Respect the local environmental rules.

If in doubt, contact your local waste disposal authorities.

Please read the manual thoroughly before bringing this device into service. If the device was damaged in transit, do not install or use it and contact your dealer.

2. Safety Instructions



- This device can be used by children aged from 8 years and above, and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning the use of the device in a safe way and understand the hazards involved. Children shall not play with the device. Cleaning and user maintenance shall not be made by children without supervision.



- Indoor use only.
Keep away from rain, moisture, splashing and dripping liquids.

3. General Guidelines



- Familiarise yourself with the functions of the device before actually using it.
- All modifications of the device are forbidden for safety reasons. Damage caused by user modifications to the device is not covered by the warranty.
- Only use the device for its intended purpose. Using the device in an unauthorised way will void the warranty.
- Damage caused by disregard of certain guidelines in this manual is not covered by the warranty and the dealer will not accept responsibility for any ensuing defects or problems.
- The dealers cannot be held responsible for any damage (extraordinary, incidental or indirect) – of any nature (financial, physical...) arising from the possession, use or failure of this product.
- Due to constant product improvements, the actual product appearance might differ from the shown images.
- Product images are for illustrative purposes only.
- Do not switch the device on immediately after it has been exposed to changes in temperature. Protect the device against damage by leaving it switched off until it has reached room temperature.
- Keep this manual for future reference.

4. What is Arduino®

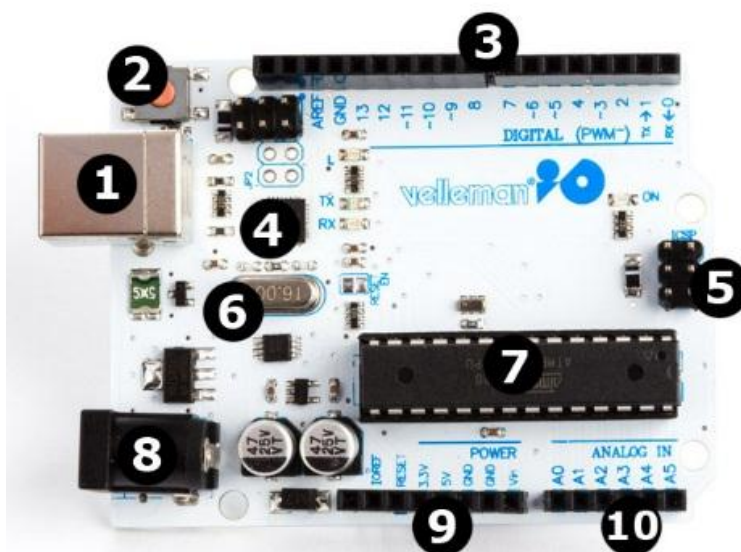
Arduino® is an open-source prototyping platform based in easy-to-use hardware and software. Arduino® boards are able to read inputs – light-on sensor, a finger on a button or a Twitter message – and turn it into an output – activating of a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so, you use the Arduino programming language (based on Wiring) and the Arduino® software IDE (based on Processing).

Surf to www.arduino.cc and www.arduino.org for more information.

5. Overview

MAKEVMA100

The MAKEVMA100 (Arduino® Uno compatible) is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analogue inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller. Connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.



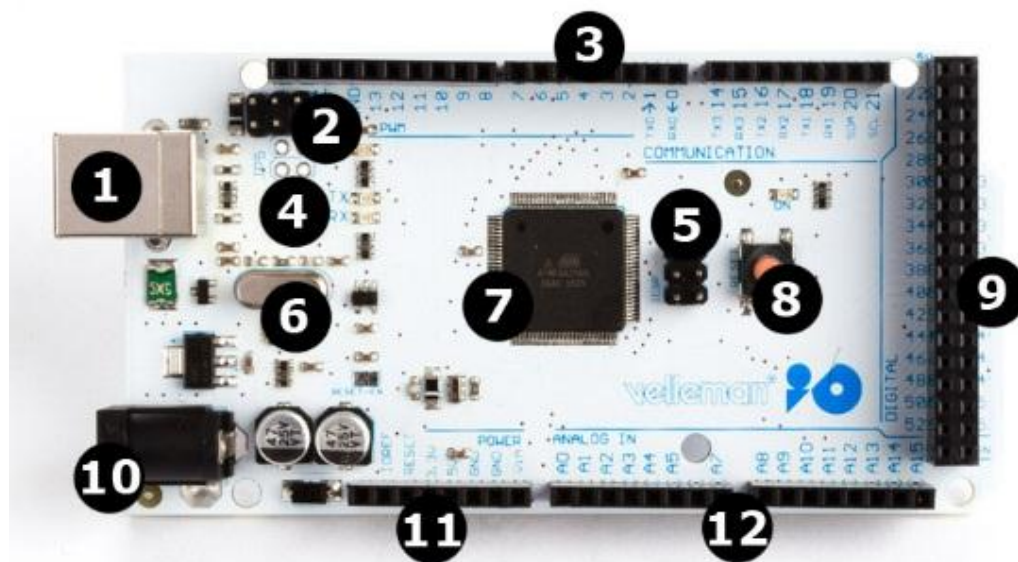
1	USB interface
2	reset button
3	digital I/O
4	Atmel mega16U2
5	ICSP

6	16 MHz clock
7	Atmel mega328p (DIL)
8	7-12 VDC power input
9	power and ground pins
10	analogue input pins

microcontroller	ATmega328
operating voltage.....	5 VDC
input voltage (recommended)	7-12 VDC
input voltage (limits).....	6-20 VDC
digital I/O pins	14 (of which 6 provide PWM output)
analogue input pins.....	6
DC current per I/O pin.....	40 mA
DC current for 3.3 V pin.....	50 mA
flash memory	32 kB (ATmega328) of which 0.5 kB used by bootloader
SRAM	2 kB (ATmega328)
EEPROM.....	1 kB (ATmega328)
clock speed	16 MHz
dimensions	
length	68.6 mm
width	53.4 mm
weight	25 g

MAKEVMA101

The MAKEVMA101 (Arduino® compatible) Mega 2560 is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 15 can be used as PWM outputs), 16 analogue inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller. Connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. The Mega is compatible with most shields designed for the Arduino® Duemilanove or Diecimila.



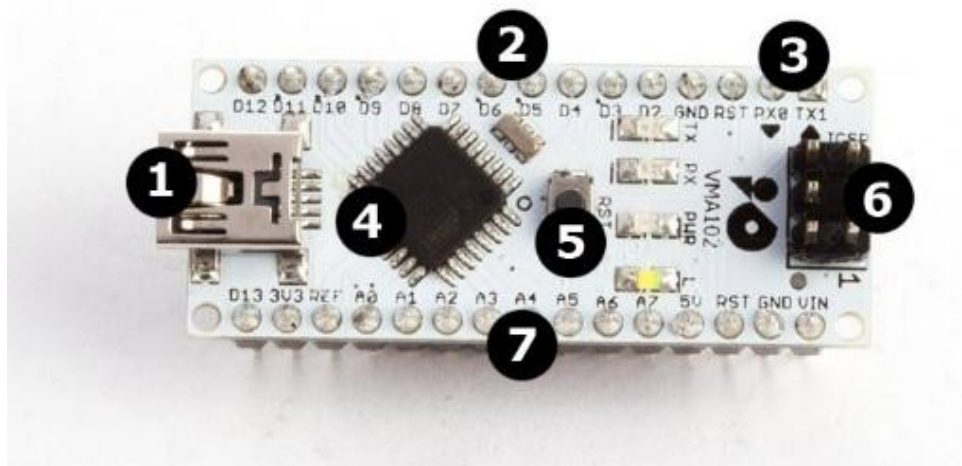
1	USB interface
2	ICSP for 16U2
3	digital I/O
4	Atmel mega16U2
5	ICSP for mega2560
6	16 MHz clock

7	Atmel mega2560
8	reset button
9	digital I/O
10	7-12 VDC power input
11	power and ground pins
12	analogue input pins

microcontroller	ATmega2560
operating voltage.....	5 VDC
input voltage (recommended)	7-12 VDC
input voltage (limits).....	6-20 VDC
digital I/O pins	54 (of which 15 provide PWM output)
analogue input pins.....	16
DC current per I/O pin.....	40 mA
DC current for 3.3 V pin.....	50 mA
flash memory	256 kB of which 8 kB used by bootloader
SRAM	8 kB
EEPROM.....	4 kB
clock speed	16 MHz
dimensions	
length	112 mm
width	55 mm
weight	62 g

MAKEVMA102

The MAKEVMA102 (Arduino® compatible Nano 3.0) is a small, complete, and breadboard-friendly board based on the ATmega328 (Arduino Nano 3.x) or ATmega168 (Arduino Nano 2.x). It has more or less the same functionality of the Arduino® Duemilanove, but in a different package. It lacks only a DC power jack, and works with a mini-B USB cable instead of a standard one.



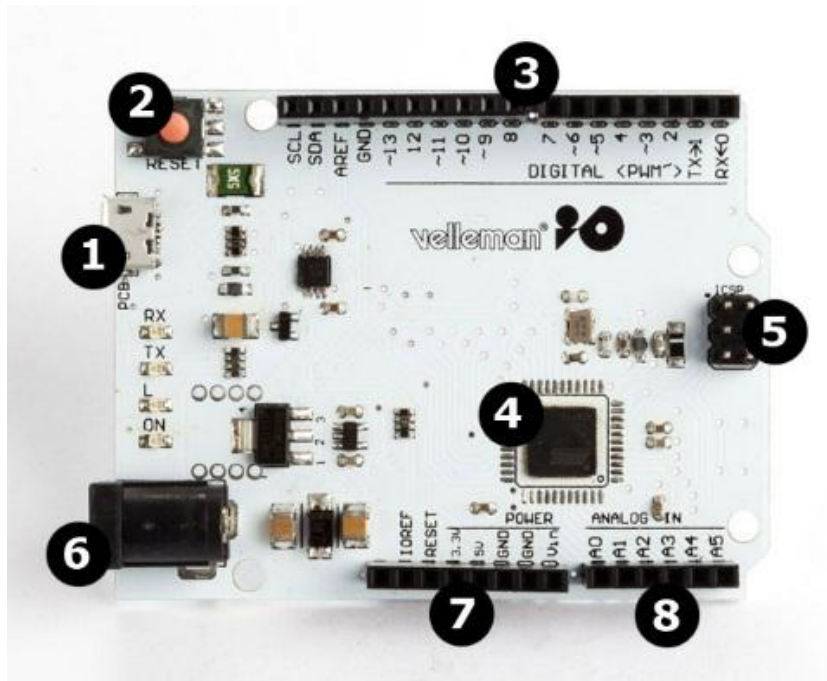
1	mini USB interface
2	digital I/O
3	serial communication pins
4	Atmel mega328p

5	reset button
6	ICSP
7	analogue input pins

microcontroller	Atmel ATmega168 or ATmega328
operating voltage.....	5 VDC
input voltage (recommended)	7-12 VDC
input voltage (limits).....	6-20 VDC
digital I/O pins	14 (of which 6 provide PWM output)
analogue input pins.....	8
DC current per I/O pin.....	40 mA
flash memory	16 kB (ATmega168) or 32 kB (ATmega328)
SRAM	1 kB (ATmega168) or 2 kB (ATmega328)
EEPROM.....	512 bytes (ATmega168) or 1 kB (ATmega328)
clock speed	16 MHz
dimensions	
length	45 mm
width	18 mm
weight	5 g

MAKEVMA103

The MAKEVMA103 (Arduino® compatible Leonardo) is a microcontroller board based on the ATmega32u4. It has 20 digital input/output pins (of which 7 can be used as PWM outputs and 12 as analogue inputs), a 16 MHz crystal oscillator, a micro USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller. Connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.



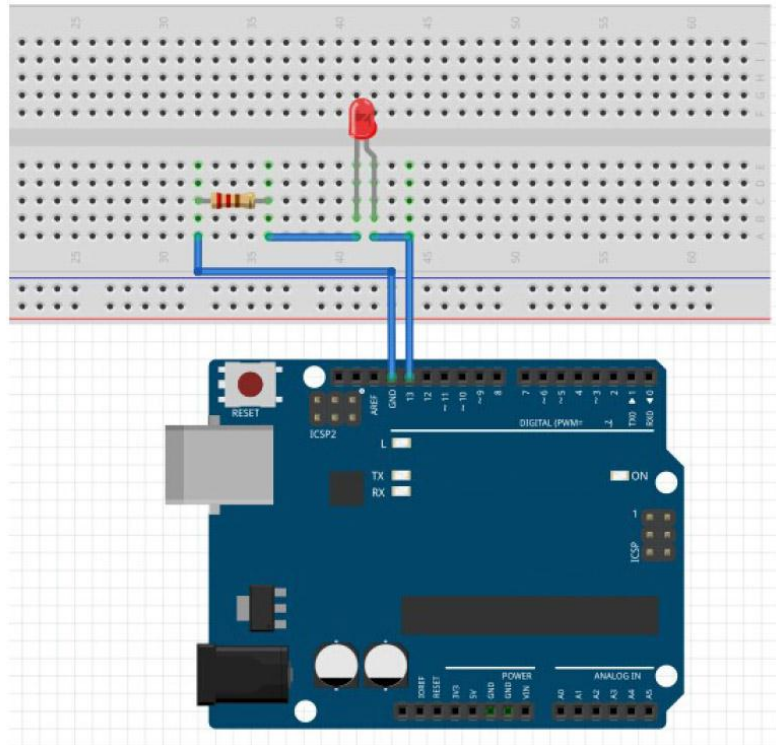
1	USB interface
2	reset button
3	digital I/O
4	Atmel mega32U4

5	ICSP
6	7-12 VDC power input
7	power and ground pins
8	analogue input pins

microcontroller	ATmega32u4
operating voltage.....	5 VDC
input voltage (recommended)	7-12 VDC
input voltage (limits).....	6-20 VDC
digital I/O pins	20
analogue input pins.....	12
DC current per I/O pin.....	40 mA
DC current for 3.3 V pin.....	50 mA
flash memory	32 kB (ATmega32u4) of which 4 kB used by bootloader
SRAM	2.5 kB (ATmega32u4)
EEPROM.....	1 kB (ATmega32u4)
clock speed	16 MHz
dimensions	
length	68.6 mm
width	53.3 mm
weight	20 g

6. How to Use

In the example below, we use the MAKEVMA100 to make an LED blink.

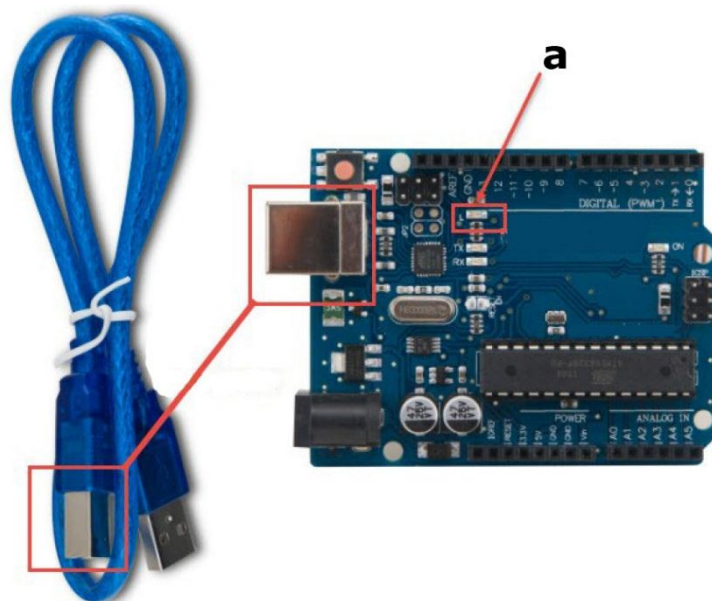


Connection.

First, download the latest Arduino® Integrated Development Environment (IDE) from the Arduino® page.

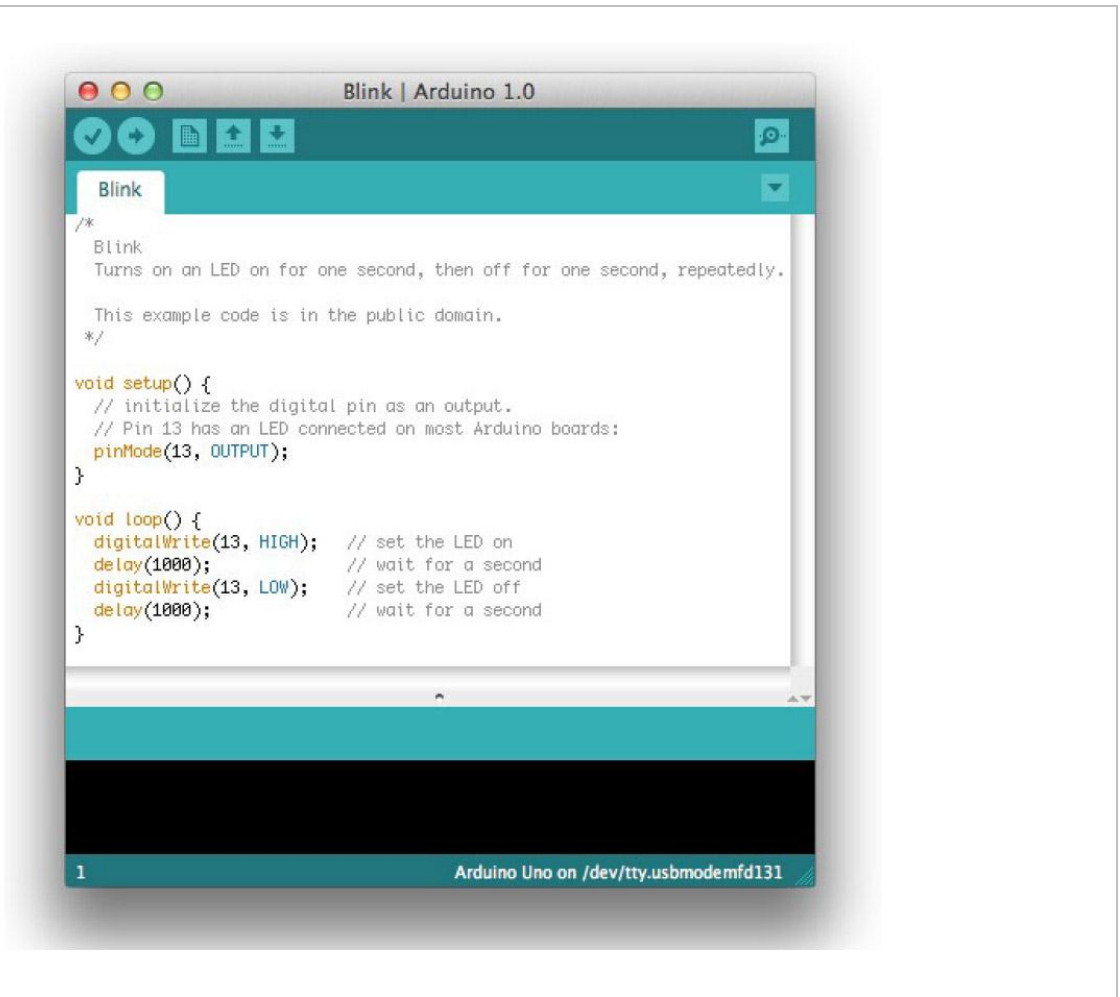
<https://www.arduino.cc/en/Main/Software>

Install the software and use a USB cable to connect your MAKEVMA board to your computer.

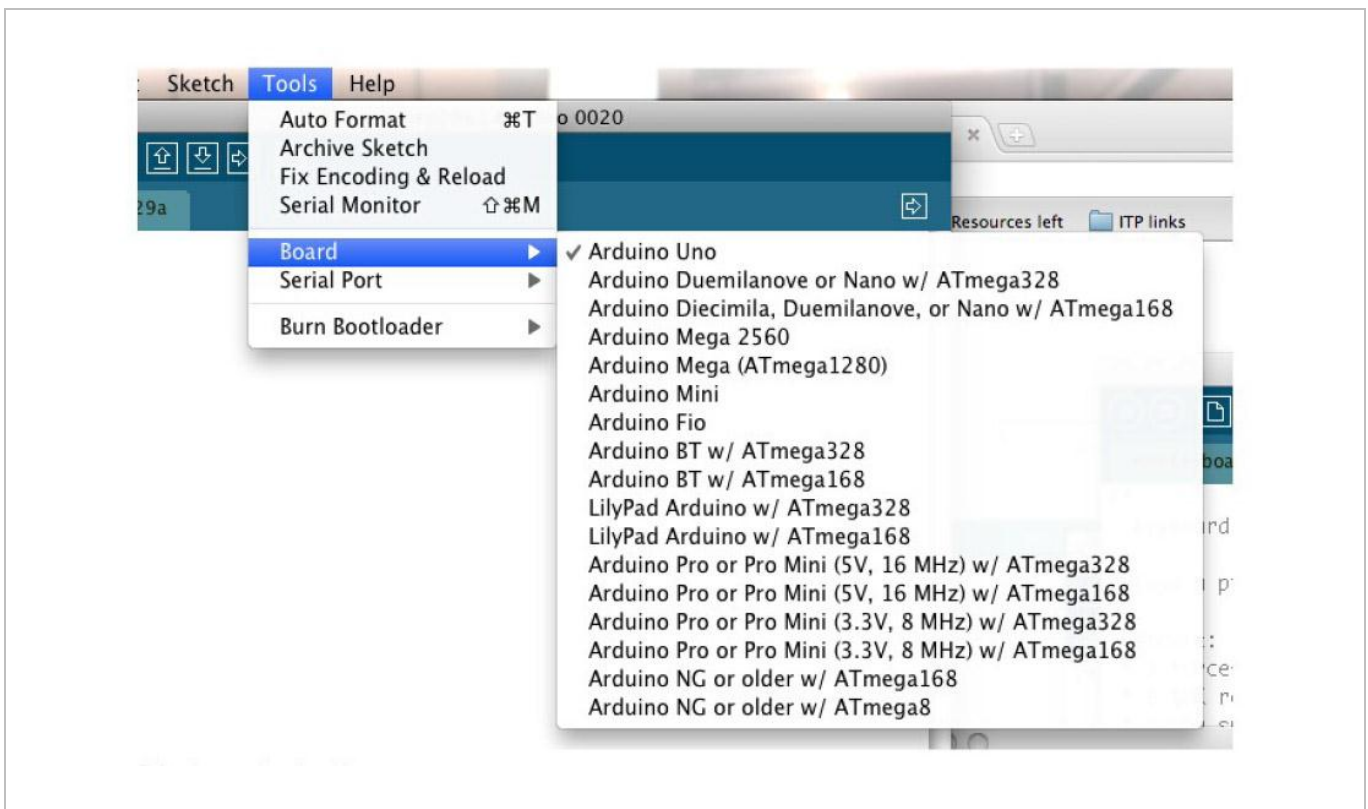


a. LED13 will blink.

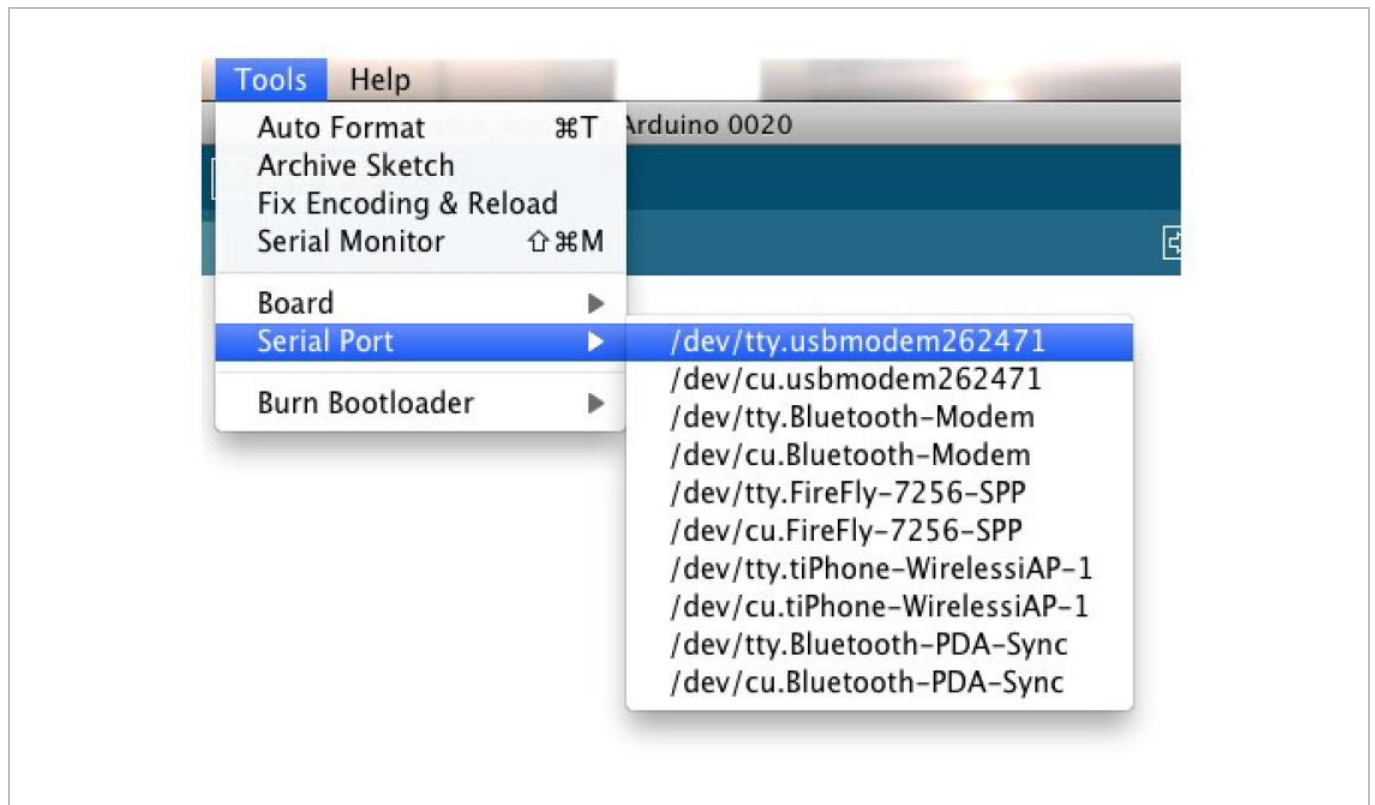
Next, launch the Arduino® application and click File > Examples > 01. Basics > Blink.



You will need to select the used board. To do so, click Tools > Board.



Select the serial device of the Arduino board. To do so, click Tools > Serial Port.



The LED should now be blinking.

© **COPYRIGHT NOTICE**

All worldwide rights reserved. No part of this manual may be copied, reproduced, translated or reduced to any electronic medium or otherwise without the prior written consent of the copyright holder.