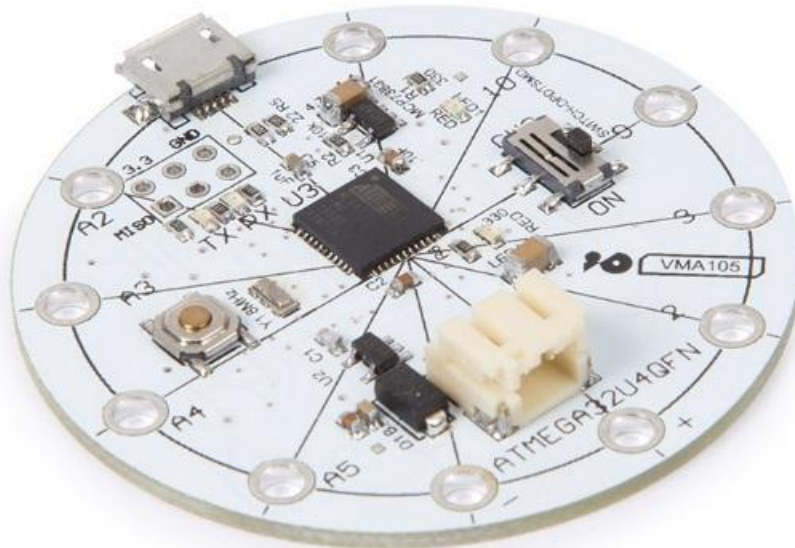


VMA105

ATMEGA32U4 WEARABLE DEVELOPMENT BOARD



USER MANUAL



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.

Thank you for choosing Velleman®! 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



- Refer to the Velleman® Service and Quality Warranty on the last pages of this manual.
- 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.
- Nor Velleman nv nor its dealers can 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

VMA105

This wearable development board can be used on textiles as well as sensors, actuators and similarly mounted power supplies.

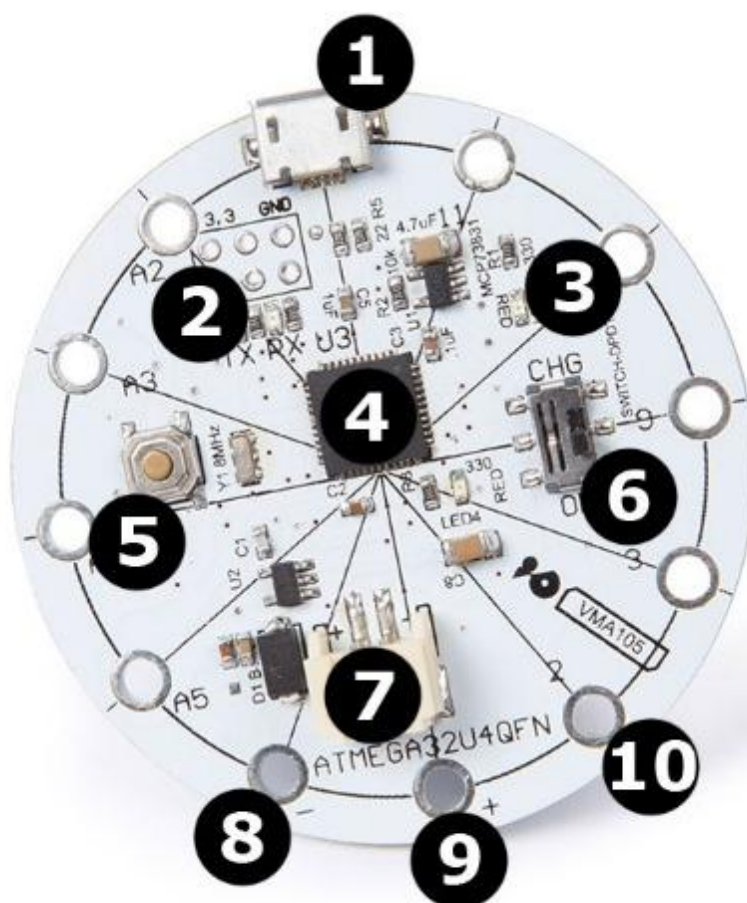
microcontroller: ATmega32U4
 operating voltage: 2.7 to 5.5 V DC
 input voltage: 2.7 to 5.5 V DC
 digital I/O pins: 9
 PWM channels: 4
 analogue input channels: 4
 DC current per I/O pin: 40 mA
 flash memory: 32 kB (of which 4 kB used by bootloader)
 SRAM: 2.5 kB
 EEPROM: 1 kB
 clock speed: 8 MHz
 dimensions: diameter 50 mm

6. Important Remark

The VMA105 module requires a power supply of 3.3 V. However, as the VMA105 contains a 3.3 V regulator it can be connected by using the 5 V micro USB.

The I/O pins of the VMA105 communicate **with 3.3 V only as they do not tolerate 5 V**. If interfacing with 5 V I/O pins is needed, we recommend using our VMA410 level shifter.

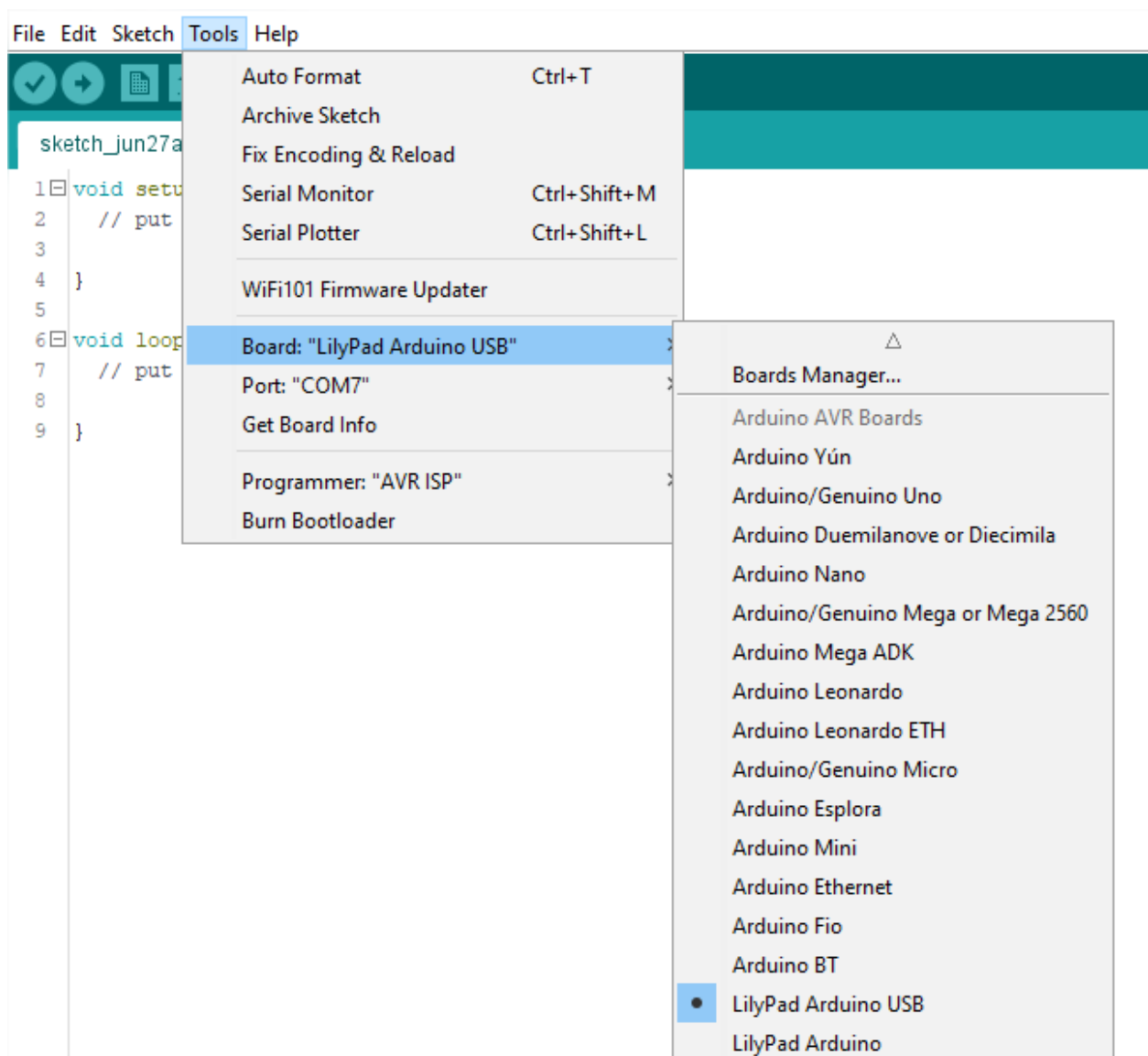
7. Pin Layout



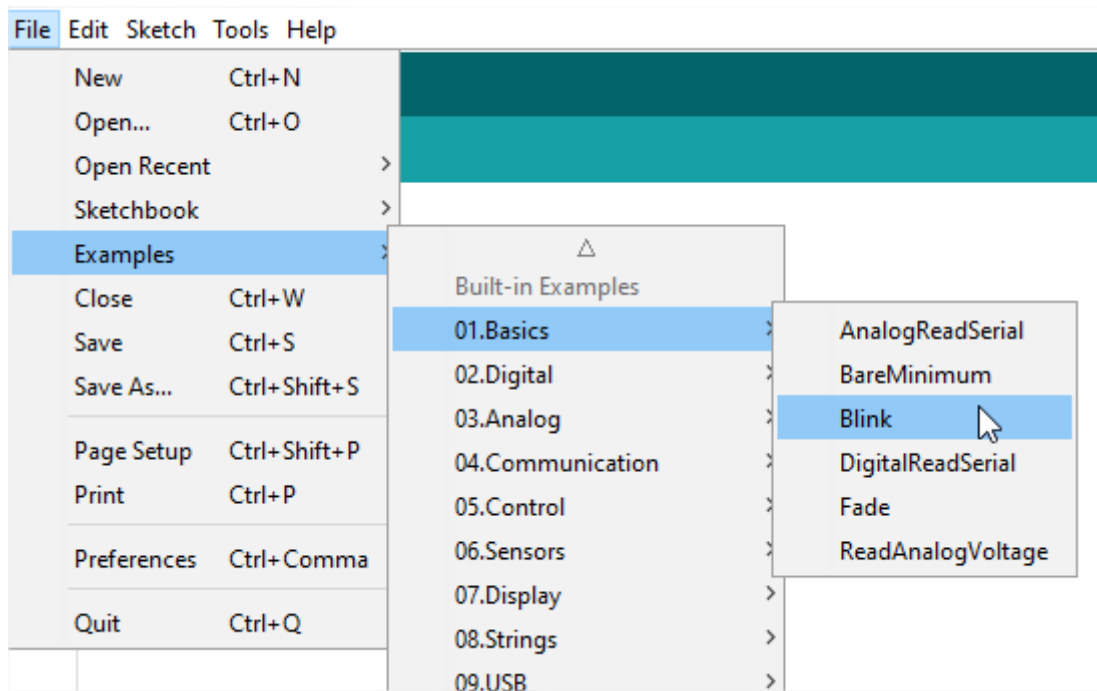
1	micro USB port
2	transmitting/receiving LEDs
3	charging LED
4	ATMega32U4 chip
5	reset button
6	on-off-charge switch
7	JST LiPo battery connection (3.3 V)
8	ground pin (-)
9	3.3 V pin (+)
10	general purpose input and output (GPIO) pins

8. Installation

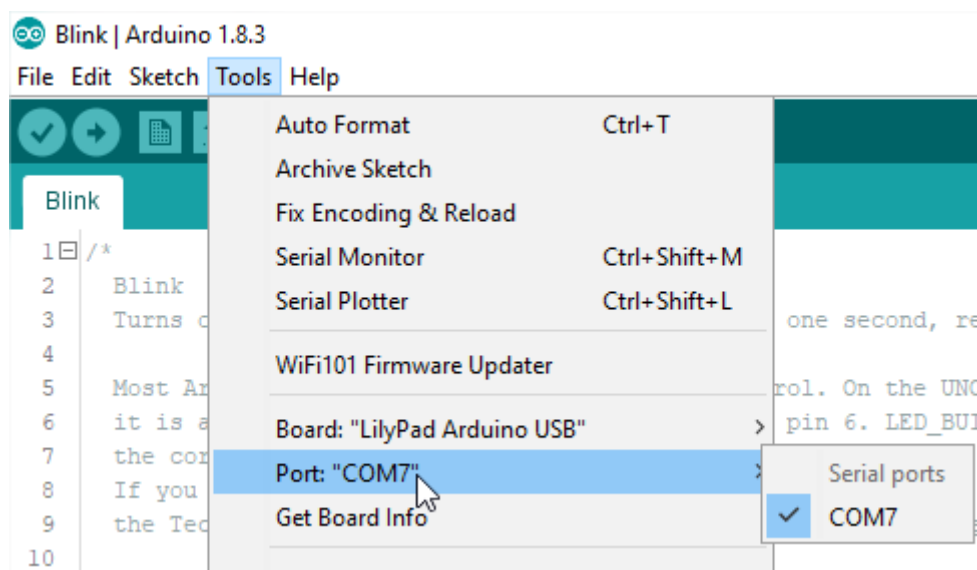
1. Download and install the latest Arduino® IDE (<https://www.arduino.cc/en/Main/Software>).
2. Start the Arduino® IDE and open Tools → Boards Manager.
3. Select LilyPad Arduino USB.



4. Now go to File → Examples → 01.Basics → Blink.



5. Connect your VMA105 via micro USB and select the communications port of your computer.



6. Compile and send the code to your VMA105, and enjoy the flashing LED.

9. Example

/* **CODE BEGIN**

Blink

Turns on an LED on for one second, then off for one second, repeatedly.

Most Arduinos have an on-board LED you can control. On the UNO, MEGA and ZERO it is attached to digital pin 13, on MKR1000 on pin 6. LED_BUILTIN is set to the correct LED pin independent of which board is used.

If you want to know what pin the on-board LED is connected to on your Arduino model, check

the Technical Specs of your board at <https://www.arduino.cc/en/Main/Products>

This example code is in the public domain.

modified 8 May 2014
by Scott Fitzgerald

modified 2 Sep 2016
by Arturo Guadalupi

modified 8 Sep 2016
by Colby Newman

```

*/

// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(LED_BUILTIN, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(LED_BUILTIN, HIGH); // turn the LED on (HIGH is the voltage level)
  delay(1000); // wait for a second
  digitalWrite(LED_BUILTIN, LOW); // turn the LED off by making the voltage LOW
  delay(1000); // wait for a second
}

```

10. More Information

Please refer to the VMA105 product page on www.velleman.eu or click this link <http://www.instructables.com/lesson/Introducing-the-Microcontroller-Arduino/> for more information.

All registered trademarks and trade names are properties of their respective owners and are used only for the clarification of the compatibility of our products with the products of the different manufacturers.

Use this device with original accessories only. Velleman nv cannot be held responsible in the event of damage or injury resulting from (incorrect) use of this device. For more info concerning this product and the latest version of this manual, please visit our website www.velleman.eu. The information in this manual is subject to change without prior notice.

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Velleman® Service and Quality Warranty

Since its foundation in 1972, Velleman® acquired extensive experience in the electronics world and currently distributes its products in over 85 countries.

All our products fulfil strict quality requirements and legal stipulations in the EU. In order to ensure the quality, our products regularly go through an extra quality check, both by an internal quality department and by specialized external organisations. If, all precautionary measures notwithstanding, problems should occur, please make appeal to our warranty (see guarantee conditions).

General Warranty Conditions Concerning Consumer Products (for EU):

- All consumer products are subject to a 24-month warranty on production flaws and defective material as from the original date of purchase.
- Velleman® can decide to replace an article with an equivalent article, or to refund the retail value totally or partially when the complaint is valid and a free repair or replacement of the article is impossible, or if the expenses are out of proportion.

You will be delivered a replacing article or a refund at the value of 100% of the purchase price in case of a flaw occurred in the first year after the date of purchase and delivery, or a replacing article at 50% of the purchase price or a refund at the value of 50% of the retail value in case of a flaw occurred in the second year after the date of purchase and delivery.

• Not covered by warranty:

- all direct or indirect damage caused after delivery to the article (e.g. by oxidation, shocks, falls, dust, dirt, humidity...), and by the article, as well as its contents (e.g. data loss), compensation for loss of profits;
- consumable goods, parts or accessories that are subject to an aging process during normal use, such as batteries (rechargeable, non-rechargeable, built-in or replaceable), lamps, rubber parts, drive belts... (unlimited list);
- flaws resulting from fire, water damage, lightning, accident, natural disaster, etc....;
- flaws caused deliberately, negligently or resulting from improper handling, negligent maintenance, abusive use or use contrary to the manufacturer's instructions;
- damage caused by a commercial, professional or collective use of the article (the warranty validity will be reduced to six (6) months when the article is used professionally);
- damage resulting from an inappropriate packing and shipping of the article;
- all damage caused by modification, repair or alteration performed by a third party without written permission by Velleman®.
- Articles to be repaired must be delivered to your Velleman® dealer, solidly packed (preferably in the original packaging), and be completed with the original receipt of purchase and a clear flaw description.
- Hint: In order to save on cost and time, please reread the manual and check if the flaw is caused by obvious causes prior to presenting the article for repair. Note that returning a non-defective article can also involve handling costs.
- Repairs occurring after warranty expiration are subject to shipping costs.
- The above conditions are without prejudice to all commercial warranties.

The above enumeration is subject to modification according to the article (see article's manual).