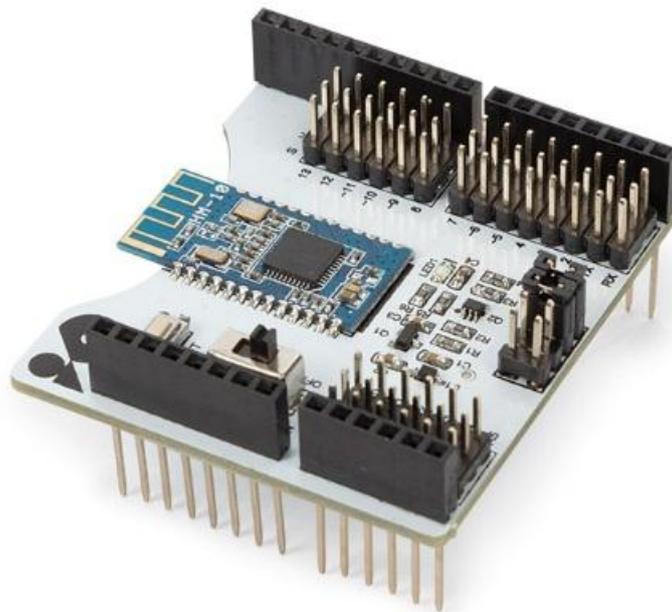


# velleman<sup>®</sup>

## VMA338

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HM-10 WIRELESS SHIELD FOR ARDUINO<sup>®</sup> UNO



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](http://www.arduino.cc) and [www.arduino.org](http://www.arduino.org) for more information.

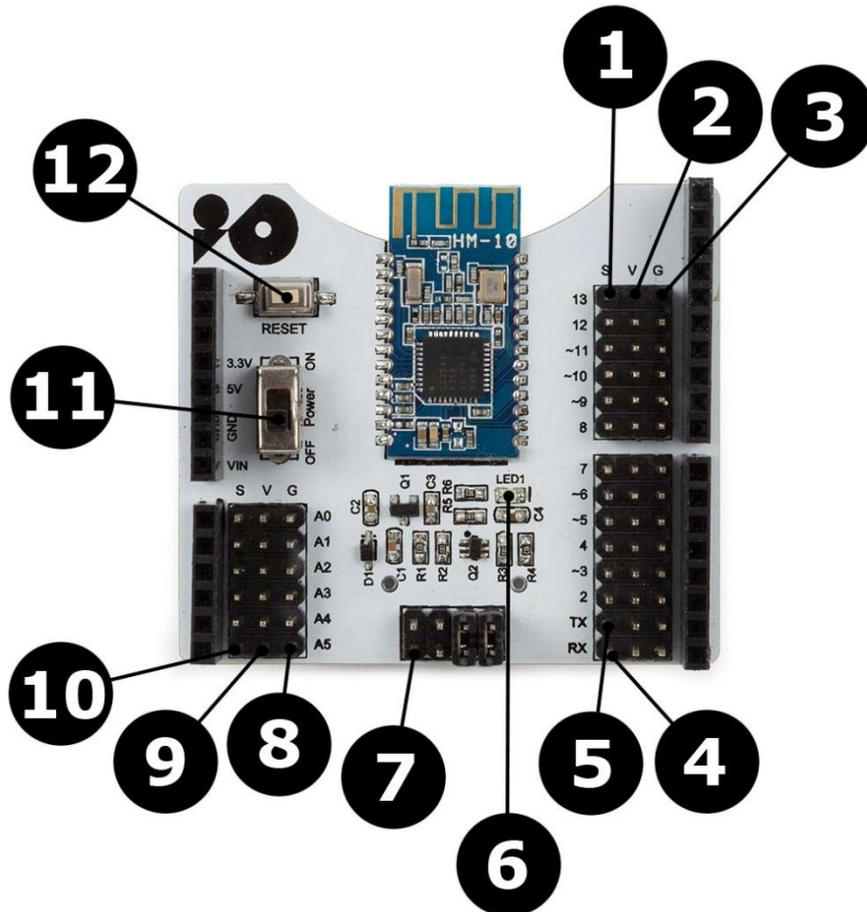
## 5. Overview

The VMA338 uses an HM-10 module with Texas Instruments® CC2541 Bluetooth v4.0 BLE chip, fully compatible with VMA100 UNO. This shield has extended all the digital and analogue pins out into 3PIN, making it easy to connect to sensors using 3PIN wire.

A switch is provided to switch on/off the HM-10 BLE 4.0 module, and 2 jumpers allow to select D0 and D1 or D2 and D3 as serial communication port.

pin header spacing .....	2.54 mm
Bluetooth® chip .....	Texas Instruments® CC2541
USB protocol .....	USB V2.0
working frequency .....	2.4 GHz ISM band
modulation method .....	GFSK (Gaussian Frequency Shift Keying)
transmission power .....	-23 dBm, -6 dBm, 0 dBm, 6 dBm, can be modified by AT command
sensitivity .....	=-84 dBm @ 0.1% BER
transmission rate .....	asynchronous 6K bytes
security .....	authentication and encryption
supporting service .....	central & peripheral UUID FFE0, FFE1
power consumption .....	400-800 µA during standby, 8.5 mA during transmission
power supply shield .....	5 VDC
power supply HM10 .....	3.3 VDC
working temperature .....	-5 to +65 °C
dimensions .....	54 x 48 x 23 mm
weight .....	19 g

## 6. Description



<b>1</b>	D2-D13
<b>2</b>	5 V
<b>3</b>	GND
<b>4</b>	RX (D0)
<b>5</b>	TX (D1)
<b>6</b>	Bluetooth® LED
<b>7</b>	Bluetooth® communication pin settings, default D0 D1; another RX TX pin to set the serial port, RX to D3, TX to D2
<b>8</b>	GND
<b>9</b>	5 V
<b>10</b>	A0-A5
<b>11</b>	Bluetooth® on-off switch
<b>12</b>	reset button

## 7. Example

In this example, we use one VMA338 mounted on the VMA100 (UNO) and a recent Android Smartphone to communicate with.

Please be aware that BLE (Bluetooth® Low Energy) is NOT backward-compatible with the older “Classic” Bluetooth®. For more information please see [https://en.wikipedia.org/wiki/Bluetooth\\_Low\\_Energy](https://en.wikipedia.org/wiki/Bluetooth_Low_Energy).

Carefully mount the VMA338 onto the VMA100 (UNO), copy-paste the code below into the Arduino® IDE (or download the VMA338\_test.zip file from our website).

```
int val;
int ledpin=13;
void setup()
{
  Serial.begin(9600);
  pinMode(ledpin,OUTPUT);
} void loop()
{ val=Serial.read();
  if(val=='a')
  {
    digitalWrite(ledpin,HIGH);
    delay(250);
    digitalWrite(ledpin,LOW);
    delay(250);
    Serial.println("Velleman VMA338 Bluetooth 4.0 Shield");
  }
}
```

Remove the two RX/TX jumpers from the VMA338 or switch off the HM-10 module (you have to send the code to the VMA100, not to the VMA338), and compile–upload the code.

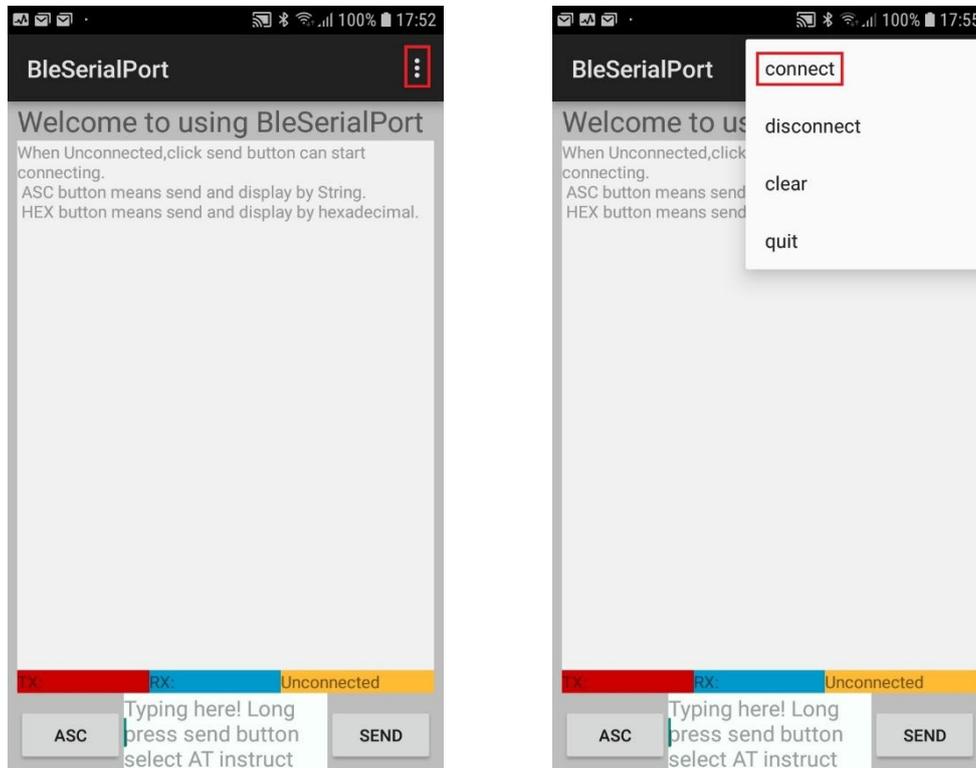
Once the upload finished, you can put back the two jumpers or switch on the HM-10.

Now, it is time to prepare the smartphone where we need a Bluetooth® terminal to talk and listen to the VMA338. As mentioned before, BLE 4.0 is NOT compatible with classic Bluetooth® so many of the available Bluetooth® terminal apps will NOT work.

Download the app [BleSerialPort.zip](#) or [BleSerialPort.apk](#) from our website.

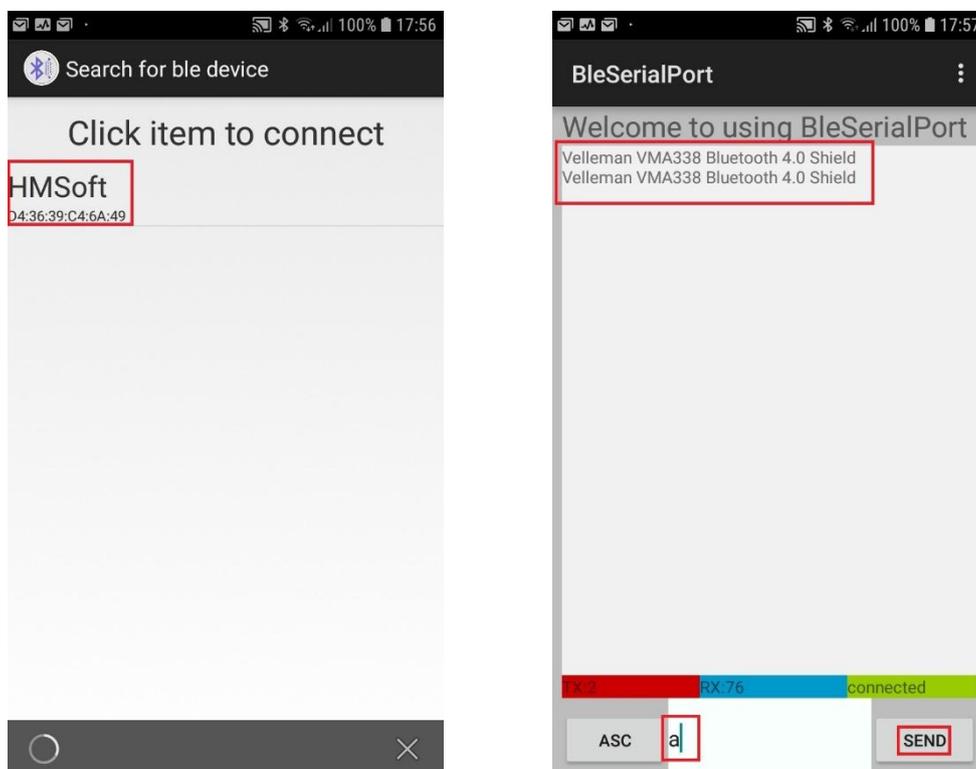
Install the BleSerialPort app and open it.

You will see a screen like this. Tap on the three dots and select “connect”.



Make sure the Bluetooth® function is switched on and your phone is BLE compatible. You should now see the VMA338 under the name HMSoft. Connect to it.

Type "a" and send it to the VMA338. The VMA338 will answer with "Velleman VMA338 [...]". At the same time, the LED connected to D13 on the VMA100 (UNO) will switch on for a few seconds.



An interesting link about the HM-10 and BLE: <http://www.martyncurrey.com/hm-10-bluetooth-4ble-modules/>.

## 8. More Information

Please refer to the VMA338 product page on [www.velleman.eu](http://www.velleman.eu) for more information.

For more information about the CC2541 Bluetooth® chip, please go to <http://www.ti.com/product/CC2541/technicaldocuments>.

RED Declaration of Conformity

Hereby, Velleman NV declares that the radio equipment type VMA338 is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:  
[www.velleman.eu](http://www.velleman.eu).

**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](http://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).**