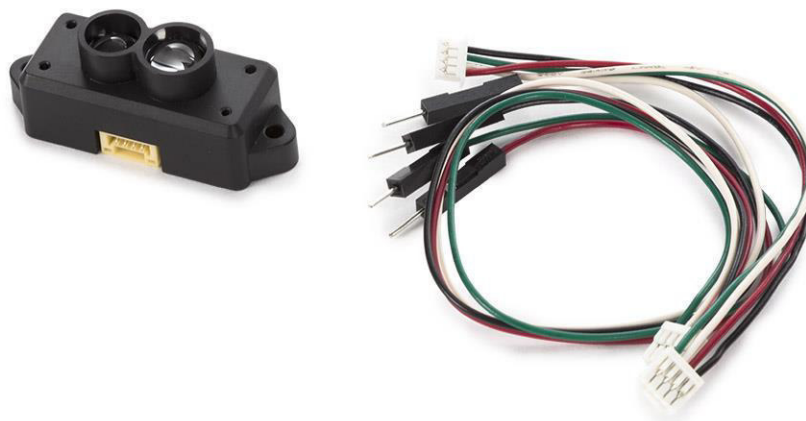


VMA349



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



Read and understand this manual and all safety signs before using this appliance.



Indoor use only.

- 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.

3. General Guidelines

- Refer to the Velleman® Service and Quality Warranty on the last pages of this manual.
- 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.
- 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.

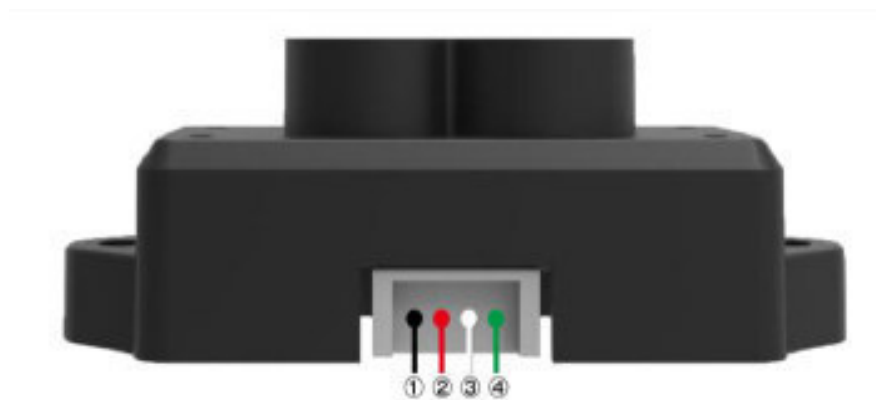
5. Overview

General

This product is based on ToF (Time of Flight) principle and integrates unique optical and electrical designs, so as to achieve stable, precise, high sensitivity and high-speed distance detection.

ToF's operating principle is as follows: a modulated near-infrared light is sent from the sensor and reflected by an object; the distance to the object to be shot can be converted with the sensor by calculating the time difference or phase difference between the light sending and the light reflection, so as to produce the depth information.

6. Connection



Warning! The RXD and TXD are using 3.3 VDC instead of 5 VDC!

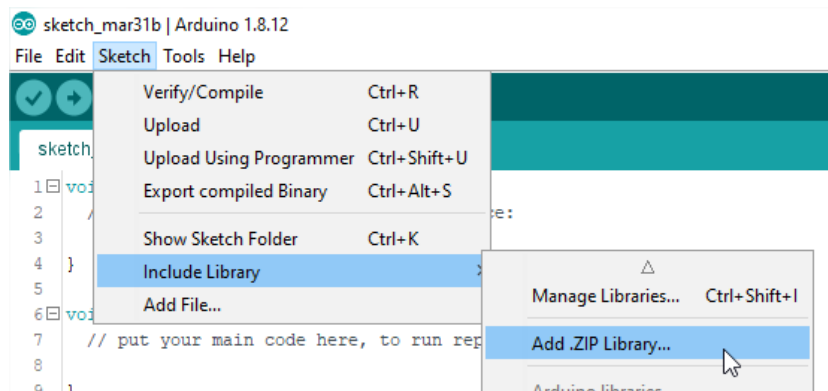
The connection of the VMA349 to the UNO VMA100 requires a level shifter (VMA410)!

Connection table if using a VMA410 and VMA100

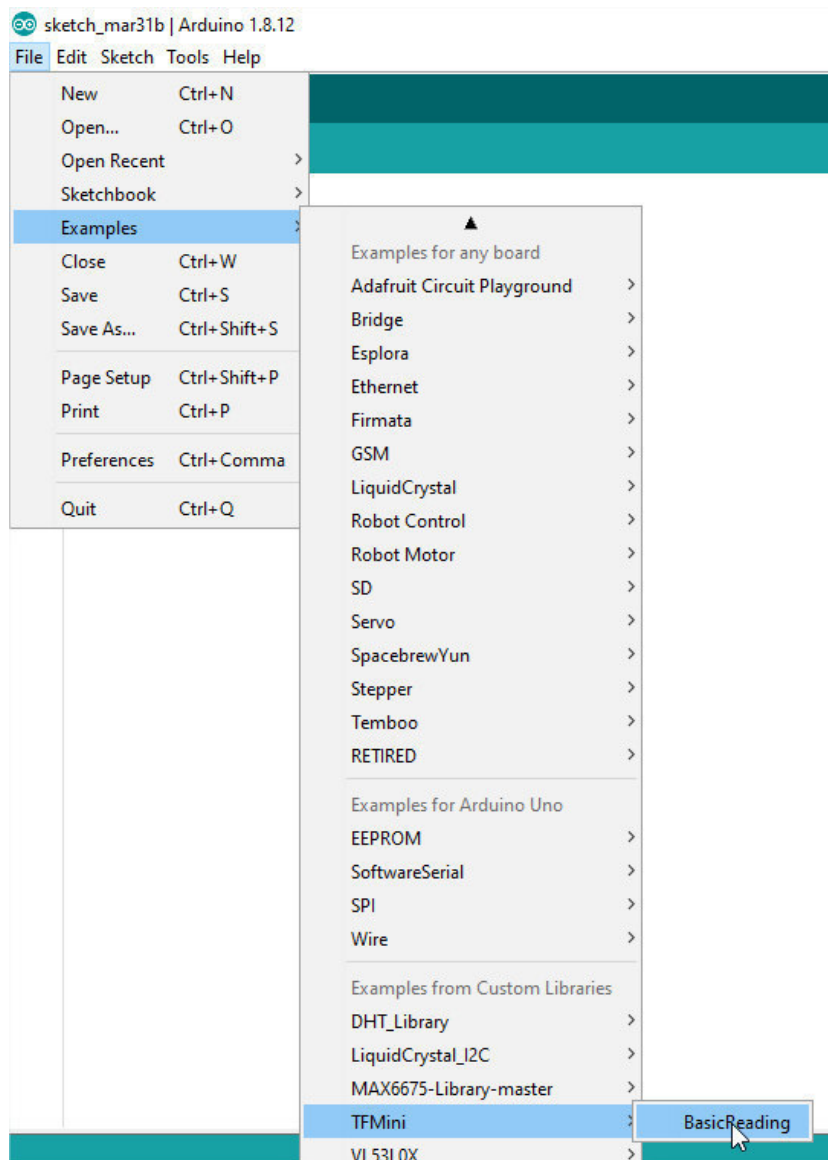
VMA349	VMA410	VMA100	Used VMA100 pins in example below
GND (black)	GND	GND	GND
+5V (red)	HV	5V	5V
RXD (white)	RX0		
TXD (green)	TXI		
	LV	3.3V	3.3V
	RXI	TX	D11 UNO TX (TFMini RX)
	TX0	RX	D10 UNO RX (TFMini TX)

7. Test Example

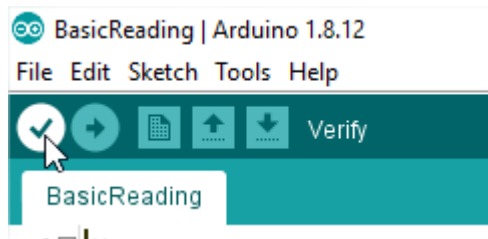
1. Connect the VMA349 to the VMA410 and VMA100 as in the table above.
2. Download the tfmini-master.zip file from our website.
3. Open the Arduino® IDE and load the tfmini-master.zip library.



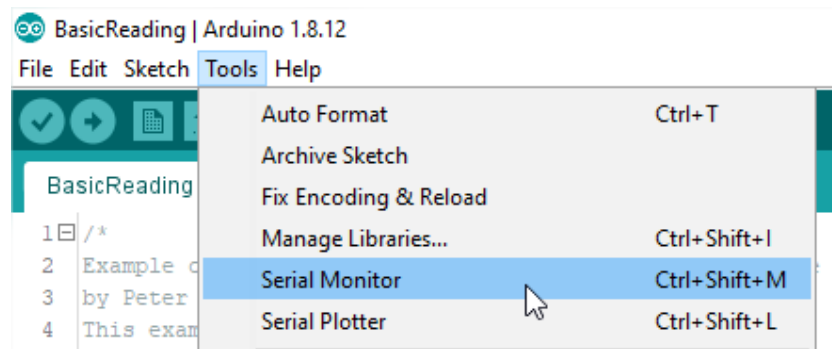
4. Once the library is loaded, open the BasicReading sketch which is included in the library.



5. Compile and upload the sketch to the VMA100/UNO.



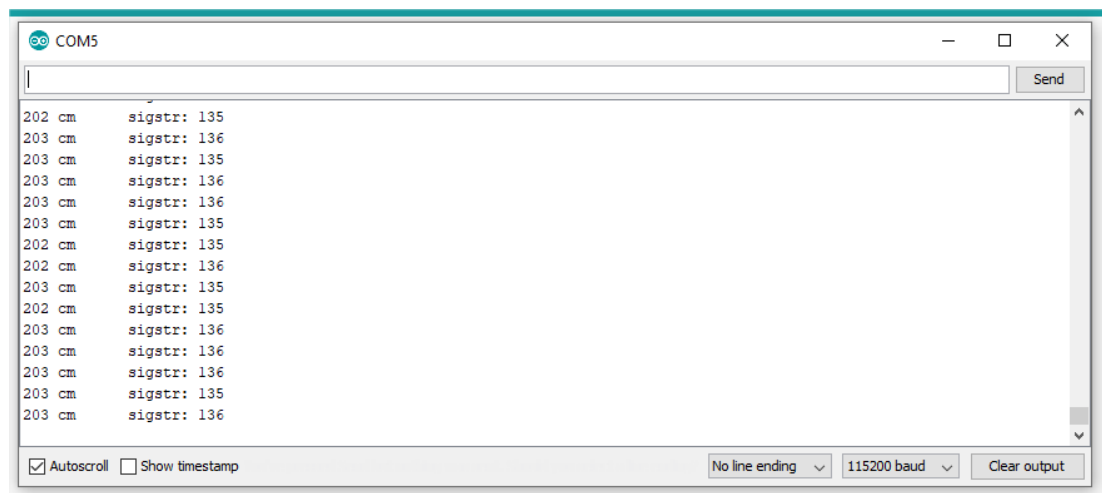
6. To see the result of the sketch, open the serial monitor.



The result should be like this, distance from VMA439 to object: 203 cm, signal strength 136.

Be sure the baud rate is at 115200 baud! As this baud rate is quite high, try to use short RX/TX wires, otherwise glitches can appear and cause wrong readings.

TIP: use the VMA349 in combination with the VMA434 laser module. It makes it easier to find the location where the VMA349 takes the distance.



8. Sample Sketch

/*

Example code for Benewake TFMMini time-of-flight distance sensor.

by Peter Jansen (December 11/2017)

This example code is in the public domain.

This example communicates to the TFMMini using a SoftwareSerial port at 115200, while communicating the distance results through the default Arduino hardware serial debug port.

SoftwareSerial for some boards can be unreliable at high speeds (such as 115200). The driver includes some limited error detection and automatic retries, that means it can generally work with SoftwareSerial on (for example) an UNO without the end-user noticing many communications glitches, as long as a constant refresh rate is not required.

The (UNO) circuit:

* Uno RX is digital pin 10 (connect to TX of TF Mini)

* Uno TX is digital pin 11 (connect to RX of TF Mini)

THIS SOFTWARE IS PROVIDED "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR(S) BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

*/

```
#include <SoftwareSerial.h>
```

```
#include "TFMini.h"
```

```
// Setup software serial port
```

```
SoftwareSerial mySerial(10, 11);    // Uno RX (TFMINI TX), Uno TX (TFMINI RX)
```

```
TFMini tfmini;
```

```
void setup() {
```

```
    // Step 1: Initialize hardware serial port (serial debug port)
```

```
    Serial.begin(115200);
```

```
    // wait for serial port to connect. Needed for native USB port only
```

```
    while (!Serial);
```

```
    Serial.println ("Initializing...");
```

```
    // Step 2: Initialize the data rate for the SoftwareSerial port
```

```
    mySerial.begin(TFMINI_BAUDRATE);
```



```

// Step 3: Initialize the TF Mini sensor
tfmini.begin(&mySerial);
}

void loop() {
  // Take one TF Mini distance measurement
  uint16_t dist = tfmini.getDistance();
  uint16_t strength = tfmini.getRecentSignalStrength();

  // Display the measurement
  Serial.print(dist);
  Serial.print(" cm    sigstr: ");
  Serial.println(strength);

  // Wait some short time before taking the next measurement
  delay(25);
}

```

9. Technical Specifications

operating range	0.3-12 m
maximum operating range at 10% reflectivity	5 m
average power consumption.....	0.6 W
applicable voltage range	5 V
minimum resolution ratio	1 cm
frequency	100 Hz
accuracy.....	1 % (< 6 m), 2 % (6-12 m)
distance detection unit	cm
wavelength	850 nm
communication interface.....	UART 115200
LED peak current.....	800 mA
serial port TTL voltage level	3.3 V
dimensions	42 × 15 × 16 mm (1.65 × 0.6 × 0.62")
operating temperature	-20 to +60 °C
weight.....	4.7 g

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.

© COPYRIGHT NOTICE

The copyright to this manual is owned by Velleman nv. 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.



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).

