

VMA203

LCD & KEYPAD SHIELD FOR ARDUINO® - LCD1602



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®

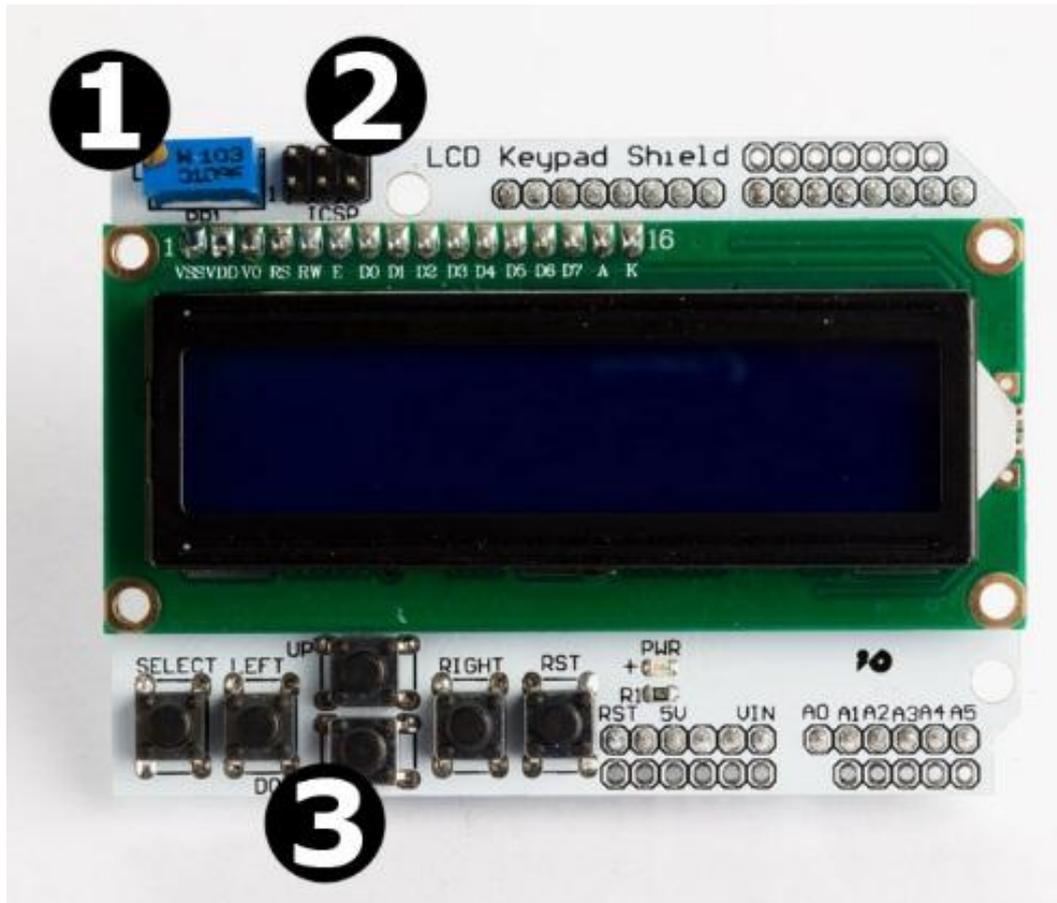
Arduino® is an open-source prototyping platform based in easy-to-use hardware and software. Arduino® boards are able to read inputs – light-on sensor, a finger on a button or a Twitter message – and turn it into an output – activating of a motor, turning on an LED, publishing something online. You can 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

VMA203

The 16x2 LCD and keypad shield for Arduino® Uno, Mega, Diecimila, Duemilanove and Freeduino boards.



1	LCD contrast potentiometer
2	ICSP

3	control keys (connect to analogue input 0)
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dimensions 80 x 58 x 20 mm

6. Pin Layout

Analogue 0	UP, DOWN, RIGHT, LEFT, SELECT
Digital 4	DB4
Digital 5	DB5
Digital 6	DB6
Digital 7	DB7
Digital 8	RS
Digital 9	E
Digital 10	Backlight

7. Example

```
//Sample using LiquidCrystal library
#include <LiquidCrystal.h>

/*****

This program will test the LCD panel and the buttons

*****/

// select the pins used on the LCD panel
LiquidCrystal lcd(8, 9, 4, 5, 6, 7);

// define some values used by the panel and buttons
int lcd_key = 0;
int adc_key_in = 0;
#define btnRIGHT 0
#define btnUP 1
#define btnDOWN 2
#define btnLEFT 3
#define btnSELECT 4
#define btnNONE 5

// read the buttons
int read_LCD_buttons()
{
  adc_key_in = analogRead(0); // read the value from the sensor
  // my buttons when read are centered at these valies: 0, 144, 329, 504, 741
  // we add approx 50 to those values and check to see if we are close
  if (adc_key_in > 1000) return btnNONE; // We make this the 1st option for speed reasons since it will be
  the most likely result
  // For V1.1 us this threshold
  if (adc_key_in < 50) return btnRIGHT;
  if (adc_key_in < 250) return btnUP;
  if (adc_key_in < 450) return btnDOWN;
  if (adc_key_in < 650) return btnLEFT;
  if (adc_key_in < 850) return btnSELECT;

  // For V1.0 comment the other threshold and use the one below:
  /*
  if (adc_key_in < 50) return btnRIGHT;
```

```

if (adc_key_in < 195) return btnUP;
if (adc_key_in < 380) return btnDOWN;
if (adc_key_in < 555) return btnLEFT;
if (adc_key_in < 790) return btnSELECT;
*/

return btnNONE; // when all others fail, return this...
}

void setup()
{
  lcd.begin(16, 2);          // start the library
  lcd.setCursor(0,0);
  lcd.print("Velleman VMA203"); // print a simple message
}

void loop()
{
  lcd.setCursor(9,1);      // move cursor to second line "1" and 9 spaces over
  lcd.print(millis()/1000); // display seconds elapsed since power-up

  lcd.setCursor(0,1);      // move to the beginning of the second line
  lcd_key = read_LCD_buttons(); // read the buttons

  switch (lcd_key)        // depending on which button was pushed, we perform an action
  {
    case btnRIGHT:
      {
        lcd.print("RIGHT ");
        break;
      }
    case btnLEFT:
      {
        // if You need the word "LEFT " shown on the display than use lcd.print("LEFT ") instead of
        lcd.print(adc_key_in) and lcd.print(" v");
        // the following 2 lines will print the actual threshold voltage present at analog input 0 ; As these buttons
        are part of a voltage divider, pressing each button creates a different threshold voltage

        lcd.print(adc_key_in); // shows the actual threshold voltage at analog input 0
        lcd.print(" v"); // ends with v(olt)
        break;
      }
    case btnUP:
      {
        lcd.print("UP  ");
        break;
      }
    case btnDOWN:
      {
        lcd.print("DOWN ");
        break;
      }
  }
}

```

```
case btnSELECT:
{
  lcd.print("SELECT");
  break;
}
case btnNONE:
{
  lcd.print("TEST ");
  break;
}
}

}
```

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).