

K8101

ILLUSTRATED ASSEMBLY MANUAL H8101IP'1

USB MESSAGE BOARD



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projects



Add another screen to your computer that shows the information you want! Even if your main screen is off.

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News

NEW HK193 LED CUBE

CubeXimator software available for download here!!

Posted on 04-06-12

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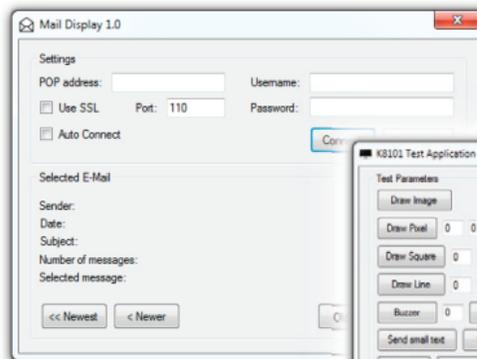
Board index All times are UTC

	Forum	Topics	Posts	Last post
General				
8	Forum rules, suggestions & forum Read this if you are a general user. Moderation: Velleman Support	2	2	Wed Dec 05, 2012 12:04 pm vulleman
2	Forum Administration Velleman 3-Phase Forum Discussions Moderation: Velleman Support	3	4	Thu Nov 03, 2011 1:22 pm VFL445
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	Vellus Home Automation General section for our new vellus home automation system (diamond) Moderation: Velleman Support	404	2072	Tue Sep 11, 2012 5:13 pm Dreves
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2	Microcontroller Programmer / Engineering Projects Here you can discuss PIC programming, assembly etc. Moderation: Velleman Support	463	1749	Thu Sep 13, 2012 6:27 pm Berteloo
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2	Router Projects Research related articles, from light drivers to remote control Moderation: Velleman Support	636	2283	Fri Sep 14, 2012 11:00 pm VFL417

Add another screen to your computer that shows the information you want! Even if your main screen is off.

Features

- 4 downloadable example programs with source code supplied
 - Twitter Display: displays the incoming feeds
 - Mail Display: shows incoming mail subjects
 - Drive Display: shows info of your HDD
 - Eyes Display: mouse movement and click animation
- DLL supplied to easily code your own applications (VB.net - C#)
- 1 Button with 2 programmable functions (short & long press)
- Equipped with a buzzer that can be configured through software
- A test program (with source code) can also be downloaded to test all functions of the kit (button, backlight, buzzer, LCD draw routines)
- Available commands:
 - Send images to the display (.BMP 128x64)
 - Draw or erase pixels
 - Draw or erase a square
 - Draw or erase a line
 - Activate the buzzer by sending a beep amount (0-255)
 - Activate the backlight by sending an "ON-time" (0-254 sec / 255 = always on)
 - Send small or big text
 - Change the contrast
 - Invert the display
 - Clear everything but the background image
 - Clear everything
 - Do something on a short button press
 - Do something on a long button press

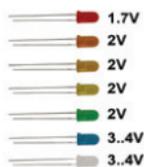


For software, visit www.vellemanprojects.eu

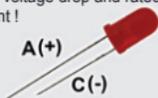
Specifications

- LED - Backlight (white)
- LCD resolution: 128 x 64 pixels
- USB powered
- Max. power consumption: 35 mA
- dimensions: 77.5 x 60.5 x 38 mm (3.05" x 2.4" x 1.5")

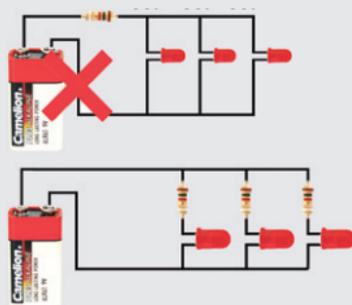
Leds and how to use them



Leds feature a specific voltage drop, depending on type and colour. Check the datasheet for exact voltage drop and rated current !



Never connect leds in parallel



How to Calculate the series resistor:

Example: operate a red led (1.7V) on a 9Vdc source.

Required led current for full brightness: 5mA (this can be found in the datasheet of the led)

$$\frac{\text{Supply voltage (V) - led voltage (V)}}{\text{required current (A)}} = \text{series resistance (ohms)}$$

$$\rightarrow \frac{9V - 1.7V}{0.005A} = 1460 \text{ ohm}$$

closest value :
use a 1k5 resistor

Required resistor power handling=
voltage over resistor x current passed trough resistor

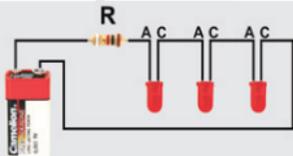
$$\rightarrow (9V - 1.7V) \times 0.005A = 0.036W$$

a standard 1/4W resistor
will do the job

LEDs in series:

Example: 3 x red led (1.7V) on 9V battery

Required led current for full brightness: 5mA
(this can be found in the datasheet of the led)



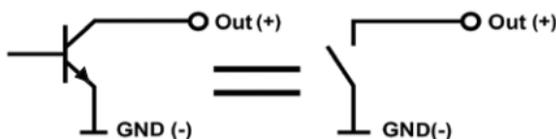
$$\frac{\text{Supply voltage (V) - (number of leds x led voltage (V))}}{\text{required current (A)}} = \text{series resistance (ohms)}$$

$$\rightarrow \frac{9V - (3 \times 1.7V)}{0.005A} = 780 \text{ ohm}$$

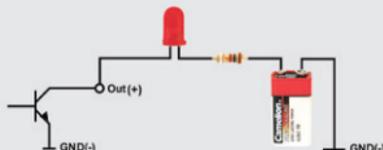
use an
820 ohm resistor

open collector outputs

An open collector output can be compared to a switch which switches to ground when operated



Example: How to switch an LED by means of an open collector output



assembly hints

1. Assembly (Skipping this can lead to troubles !)

Ok, so we have your attention. These hints will help you to make this project successful. Read them carefully.



1.1 Make sure you have the right tools:

- A good quality soldering iron (25-40W) with a small tip.
- Wipe it often on a wet sponge or cloth, to keep it clean; then apply solder to the tip, to give it a wet look. This is called 'thinning' and will protect the tip, and enables you to make good connections. When solder rolls off the tip, it needs cleaning.
- Thin raisin-core solder. Do not use any flux or grease.
- A diagonal cutter to trim excess wires. To avoid injury when cutting excess leads, hold the lead so they cannot fly towards the eyes.
- Needle nose pliers, for bending leads, or to hold components in place.
- Small blade and Phillips screwdrivers. A basic range is fine.



☞ For some projects, a basic multi-meter is required, or might be handy



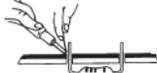
1.2 Assembly Hints :

- Make sure the skill level matches your experience, to avoid disappointments.
- Follow the instructions carefully. Read and understand the entire step before you perform each operation.
- Perform the assembly in the correct order as stated in this manual
- Position all parts on the PCB (Printed Circuit Board) as shown on the drawings.
- Values on the circuit diagram are subject to changes, the values in this assembly guide are correct*
- Use the check-boxes to mark your progress.
- Please read the included information on safety and customer service

* Typographical inaccuracies excluded. Always look for possible last minute manual updates, indicated as 'NOTE' on a separate leaflet.

1.3 Soldering Hints :

1. Mount the component against the PCB surface and carefully solder the leads

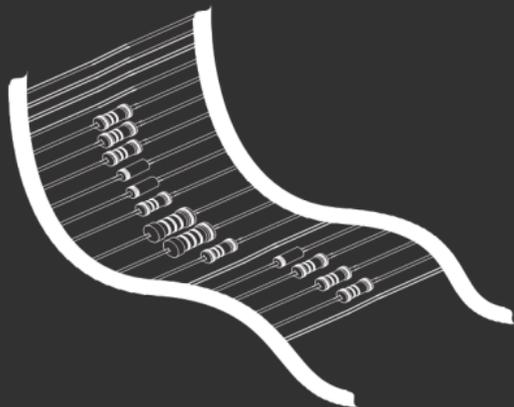


2. Make sure the solder joints are cone-shaped and shiny



3. Trim excess leads as close as possible to the solder joint



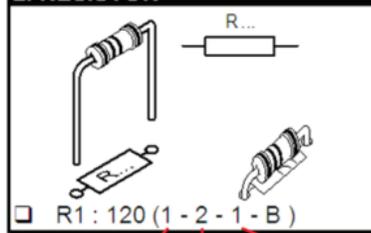


REMOVE THEM FROM THE TAPE ONE AT A TIME !

Included in
this kit



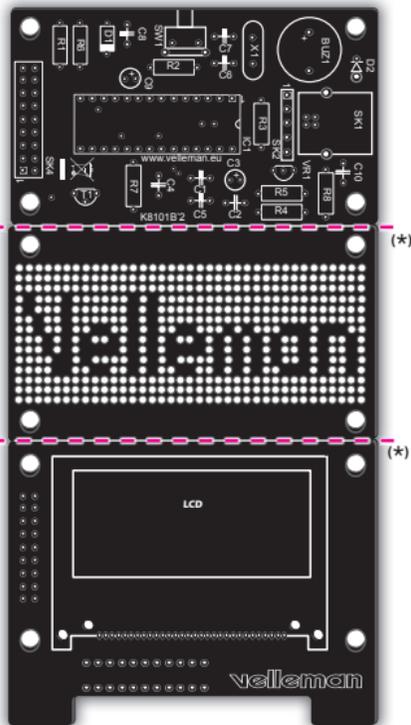
2. RESISTOR



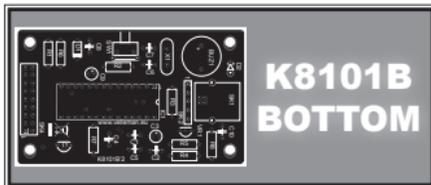
COLOUR	COLOUR NAME	1ST DIGIT/ STRIPE	2ND DIGIT/ STRIPE	3RD DIGIT/ STRIPE	MULTIPLIER STRIPE	TOLE 4TH!
Black	BLACK	0	0	0	x1	1%
Brown	BROWN	1	1	1	x10	
Red	RED	2	2	2	x100	
Orange	ORANGE	3	3	3	x1.000	
Yellow	YELLOW	4	4	4	x10.000	
Green	GREEN	5	5	5	x100.000	
Blue	BLUE	6	6	6	x1.000.000	

DO NOT BLINDLY FOLLOW THE ORDER OF THE COMPONENTS ONTO THE TAPE. ALWAYS CHECK THEIR VALUE ON THE PARTS LIST!

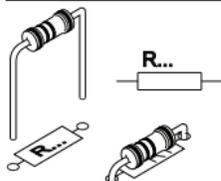
I. CONSTRUCTION



(*) Break the three circuit boards from each other.



1 Resistors



- R1 : 15Ω (1 - 5 - 0 - B)
- R2 : 10KΩ (1 - 0 - 3 - B)
- R3 : 10Ω (1 - 0 - 0 - B)
- R4 : 680 (6 - 8 - 0 - 0 - 1)*
- R5 : 1K (1 - 0 - 0 - 0 - 1)*
- R6 : 10KΩ (1 - 0 - 3 - B)
- R7 : 10KΩ (1 - 0 - 3 - B)
- R8 : 4K7 (4 - 7 - 2 - B)

2 Diodes



- D1 : 1N4148

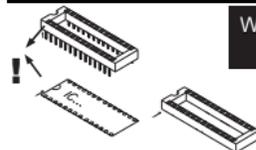
* metalfilm resistor !

3 Ceramic Capacitors

- C1 : 100nF (104)
- C2 : 100nF (104)
- C4 : 100nF (104)
- C5 : 100nF (104)
- C8 : 100nF (104)



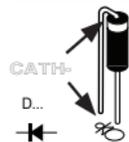
4 IC socket



Watch the position of the notch!

- IC1: 28p

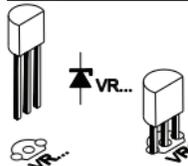
5 Vertical diodes



Watch the polarity!

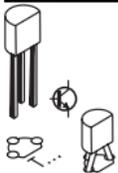
- D2 : 1N4148

6 Voltage regulator



- VR1 : LM317LZ

7 Transistor



□ T1 : BC547B

8 Ceramic Capacitors

- C6 : 22pF (22)
- C7 : 22pF (22)
- C10 : 10nF (103)

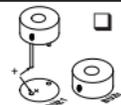


9 Push button



□ SW1

10 Buzzer



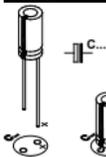
□ BUZ1

11 USB connector



□ SK1

12 Electrolytic capacitors



Watch the polarity!

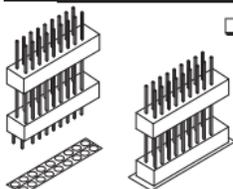
- C3 : 4,7μF
- C9 : 10μF

13 Quartz crystal



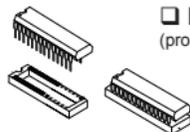
□ X1 : 12MHz

14 Male header



□ SK4 : 18p

15 IC

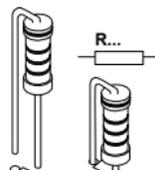


□ IC1 : VK8101
(programmed PIC18F27J53-ISP)

Watch the position of the notch!

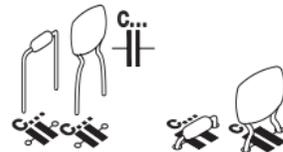


1 Resistors



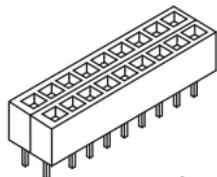
□ R9: 1MΩ (1-0-5-9)

2 Ceramic Capacitors

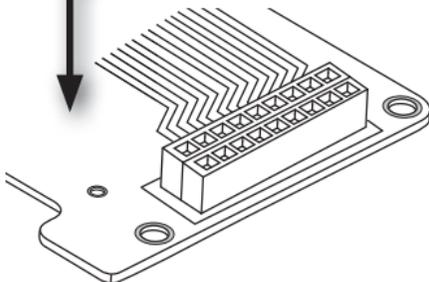


□ C11...C20 : 1μF (105)

3 Female header



SOLDERSIDE

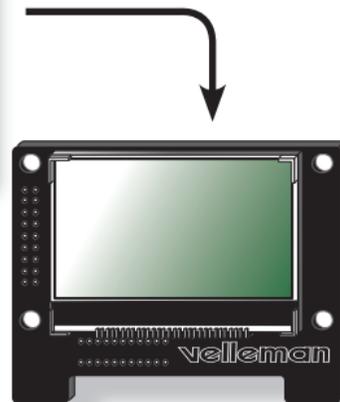
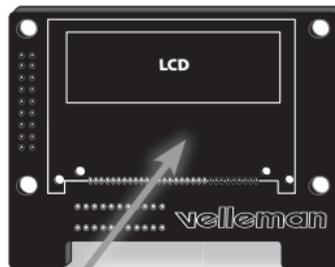


□ SK3: 18p



**K8101T
Topside !**

1 LCD

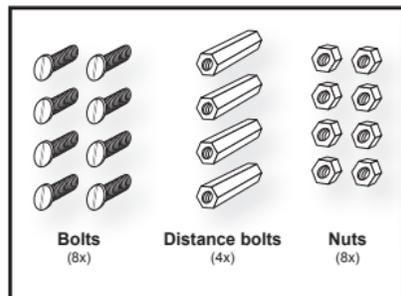


Solder on backside !



**Be careful when soldering the LCD connections.
Overheating will damage the LCD screen.**

II. ASSEMBLY



Metal distance bolt
(20mm M3)



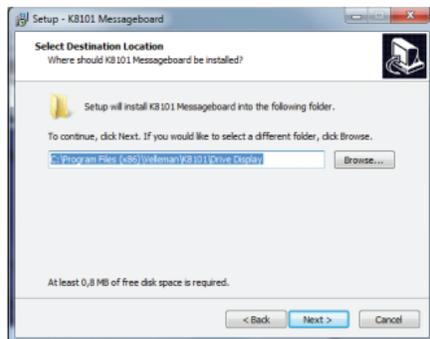
III. SOFTWARE INSTALLATION

After assembly of the circuit, it is now time to install the software.



For software, visit www.vellemanprojects.eu

Step 1: Download the software on our website or via the QR-code.



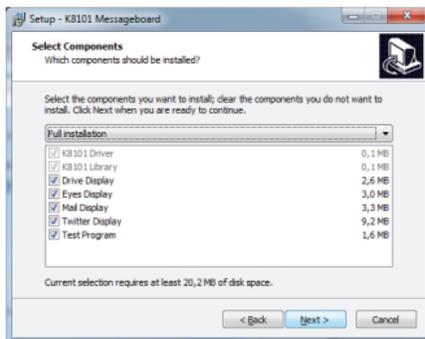
Step 4: Select the destination on your PC



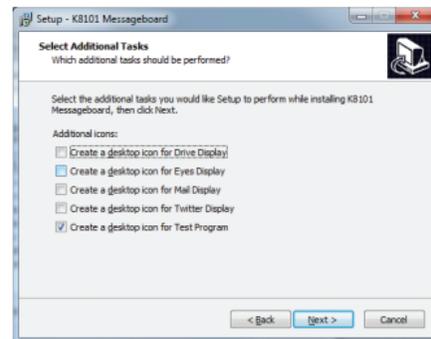
Step 2: open the file en select the software.



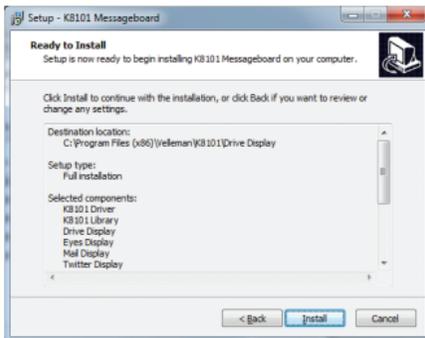
Step 3: Select "next" to begin the installation procedure.



Step 5: Select the type of installation, we recommend the full installation



Step 6: Select additional tasks you would like to be performed.



Step 7: Select "install" for installing the software.



Step 8 : Click "finish" to exit setup.

IV. DRIVER INSTALLATION

Connect the USB connector of the K8101 to your PC using an USB cable.

With the first connection, you should install the USB driver onto the PC first. You can download the manual for installing the driver on our website or via the QR-code.



For software, visit www.vellemanprojects.eu

V. PROGRAMS



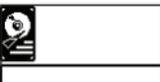
Eyes - display : mouse movement and click animation.
Source can be found on: "c:\...\k8101\Eyes Display\source"



Mail - display : shows incoming mail subjects.
Source can be found on: "c:\...\k8101\Mail Display\source"



Test program : create your own text or bitmap images on the screen.
Source can be found on: "c:\...\k8101\Test Display\source"

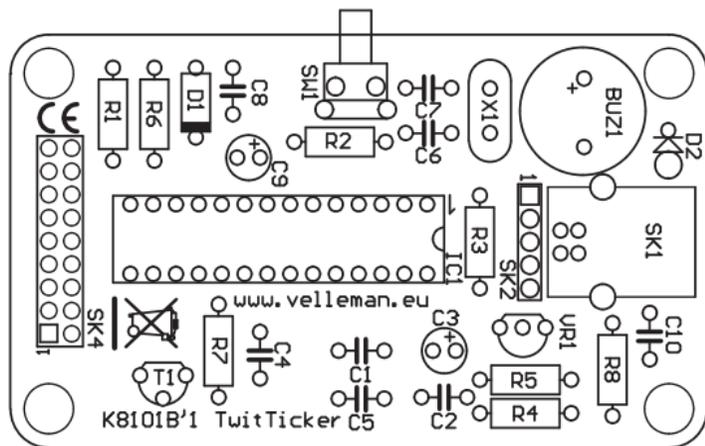
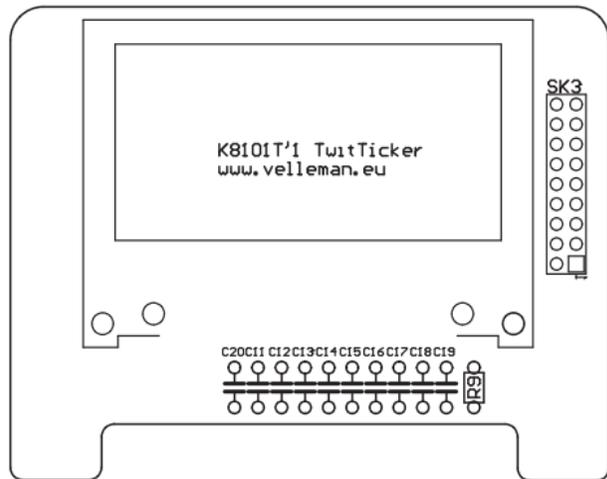


Drive - display : shows info of your HDD.
Source can be found on: "c:\...\k8101\Drive Display\source"



Twitter - display : displays the incoming feeds mail.
Source can be found on: "c:\...\k8101\Twitter Display\source"

DLL for programming your own software can be found on: "c:\...\k8101\k8101 Library"







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