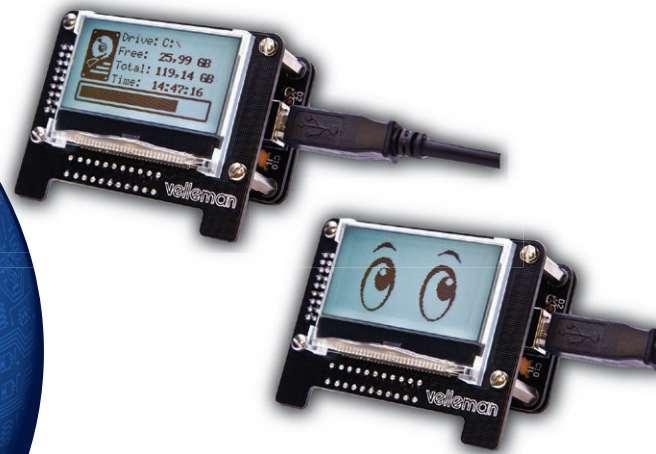
K8101

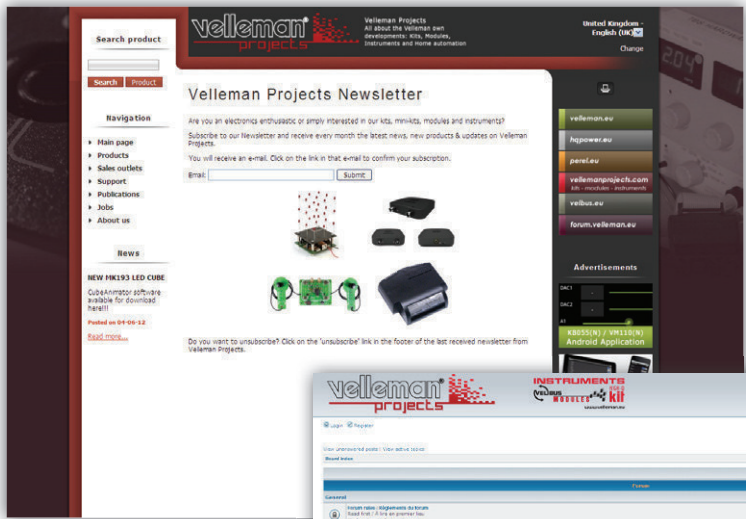
ILLUSTRATED ASSEMBLY MANUAL H8101IP'1

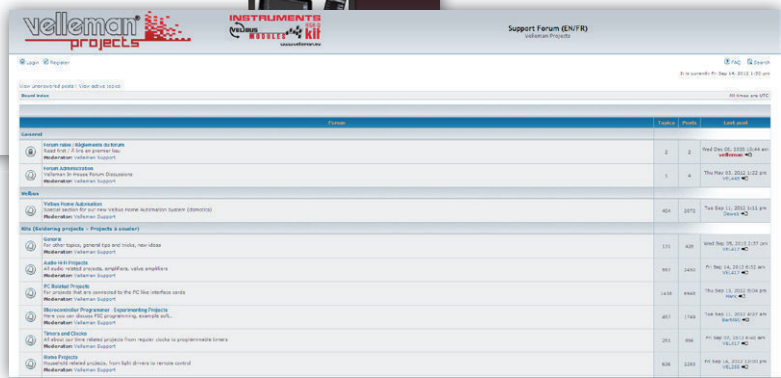
USB MESSAGE BOARD



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

velleman projects





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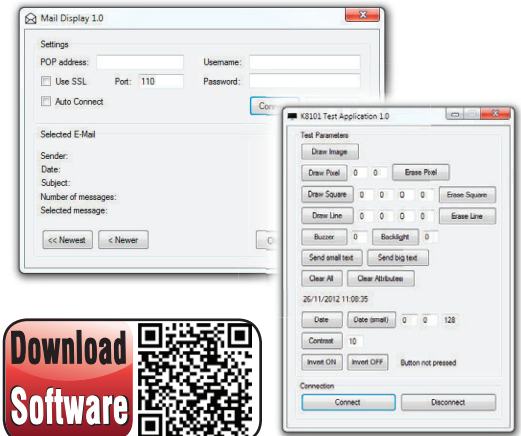
Add another screen to your computer that shows the information you want! Even if your main screen is off.

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



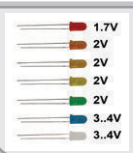
Download Software

For software, visit www.vellemanprojects.eu

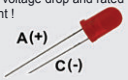
Specifications

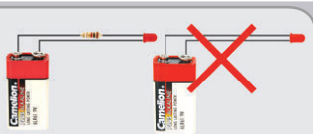
- LED - Backlight (white)
- LCD resolution: 128 x 64 pixels
- USB powered
- Max. power consumption: 35 mA
- dimensions: 77.5 x 60.5 x 38 mm (3.05” x 2.4” x 1.5”)

Leds and how to use them

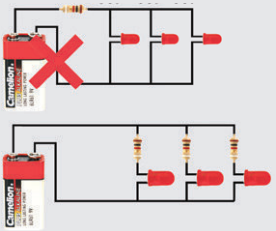


Leds feature a specific voltage drop, depending on type and colour. Check the datasheet for exact voltage drop and rated current !





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)

Supply voltage (V) - led voltage (V) / required current (A) = series resistance (ohms)

→ 9V - 1.7V / 0.005A = 1460 ohm

closest value : use a 1k5 resistor

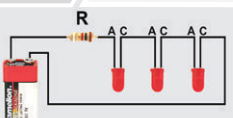
Required resistor power handling= voltage over resistor x current passed trough resistor

→ (9V - 1.7V) x 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)



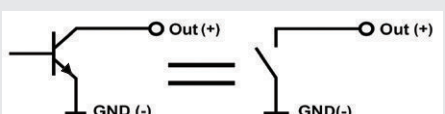
Supply voltage (V) - (number of leds x led voltage (V)) / required current (A) = series resistance (ohms)

→ 9V - (3 x1.7V) / 0.005A = 780 ohm

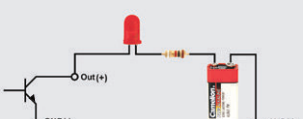
use an 820 ohm resistor

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 :

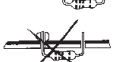
- Make sure the skill level matches your experience, to avoid disappointments.
- Follow the instructions carefully. Read and understand the entire step before you perform each operation.
- Perform the assembly in the correct order as stated in this manual
- Position all parts on the PCB (Printed Circuit 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.

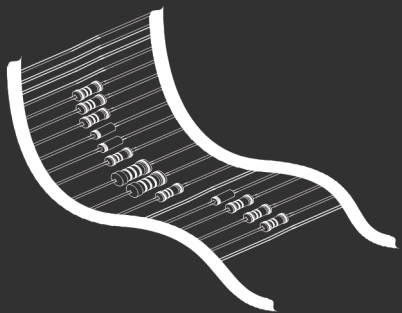
1.3 Soldering Hints :

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

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

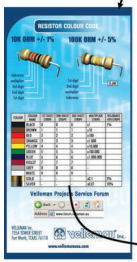


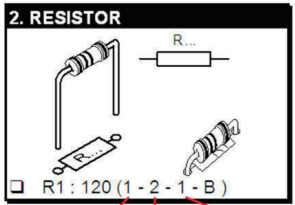
3. Trim excess leads as close as possible to the solder joint



REMOVE THEM FROM THE TAPE ONE AT A TIME !

Included in this kit

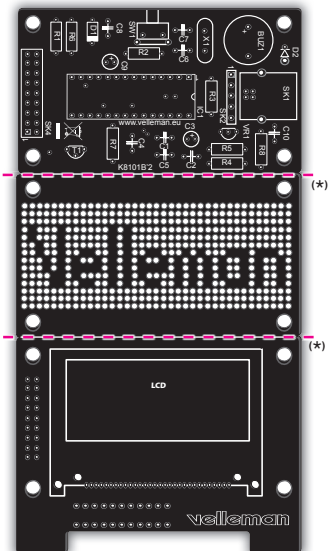




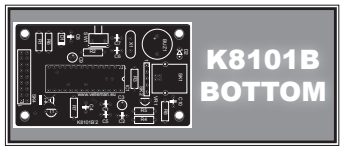
COLOUR	COLOUR NAME	1ST DIGIT/ STRIPE	2ND DIGIT/ STRIPE	3RD DIGIT/ STRIPE	MULTIPLIER STRIPE	TOLE 4TH
	BLACK	0	0	0	x1	1%
	BROWN	1	1	1	x10	
	RED	2	2	2	x100	
	ORANGE	3	3	3	x1.000	
	YELLOW	4	4	4	x10.000	
	GREEN	5	5	5	x100.000	
	BLUE	6	6	6	x1.000.000	

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

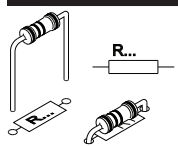
I. CONSTRUCTION



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

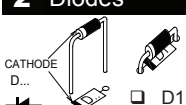


1 Resistors



❑ 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

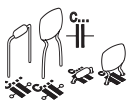


Watch the polarity!

❑ D1 : 1N4148

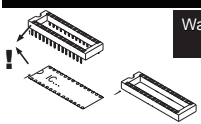
* metalfilm resistor !

3 Ceramic Capacitors



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

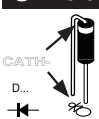
4 IC socket



Watch the popsition of the notch!

❑ IC1: 28p

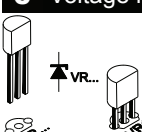
5 Vertical diodes



Watch the polarity!

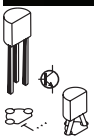
❑ D2 : 1N4148

6 Voltage regulator



❑ VR1 : LM317LZ

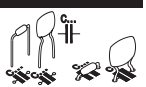
7 Transistor



❑ T1 : BC547B

8 Ceramic Capacitors

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



9 Push button

❑ SW1

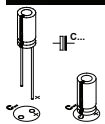
10 Buzzer

❑ BUZ1

11 USB connector

❑ SK1

12 Electrolytic capacitors



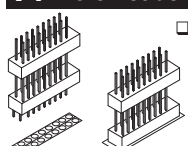
Watch the polarity!

❑ C3 : 4,7µF
❑ C9 : 10µF

13 Quartz crystal

❑ X1 : 12MHz

14 Male header

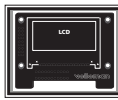


❑ SK4 : 18p

15 IC

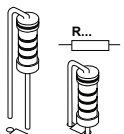
❑ IC1 :VK8101
(programmed PIC18F27J53-ISP)

Watch the position of the notch!



K8101T Solderside !

1 Resistors

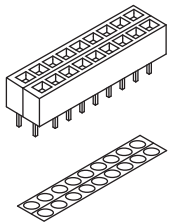


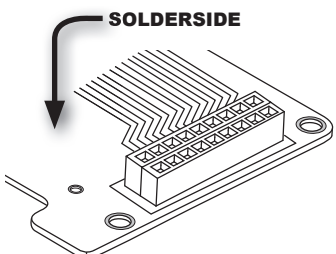
❑ R9: 1MΩ (1 - 0 - 5 - 9)

2 Ceramic Capacitors

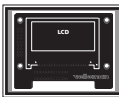
❑ C11...C20 : 1µF (105)

3 Female header



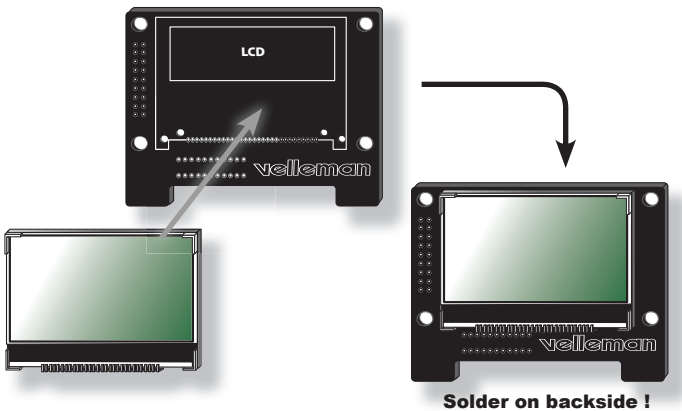


❑ SK3: 18p



K8101T
Topside !

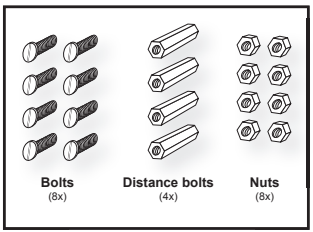
1 LCD



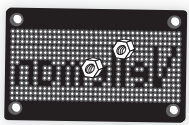
Solder on backside !

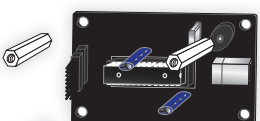
Be careful when soldering the LCD connections.
Overheating will damage the LCD screen.

II. ASSEMBLY


Bolts
(8x)
Distance bolts
(4x)
Nuts
(8x)


M3 bolt


M3 nut


K8101B


Metal distance bolt
(20mm M3)

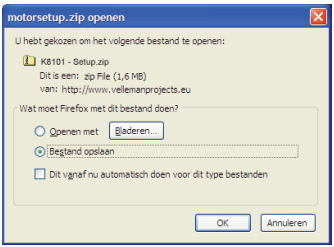

velleman
K8101T


M3 bolt

III. SOFTWARE INSTALLATION

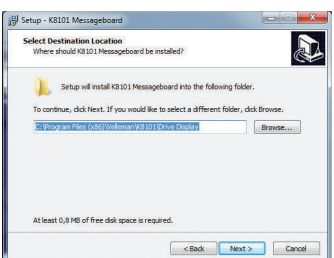
After assembly of the circuit, it is now time to install the software.

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

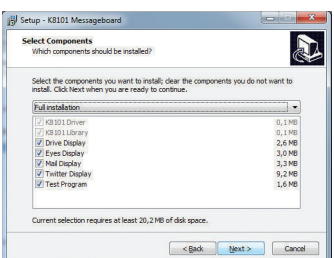


Step 2: open the file en select the software.

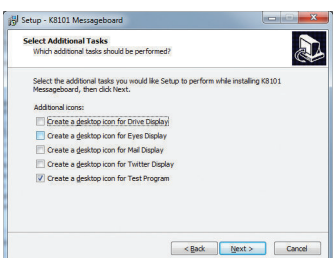
Step 3: Select “next” to begin the installation procedure.



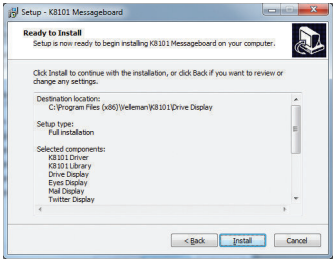
Step 4: Select the destination on your PC



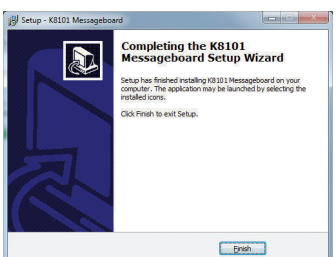
Step 5: Select the type of installation, we recommend the full installation



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.

Download Software

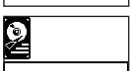
For software, visit www.vellemanprojects.eu

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”*

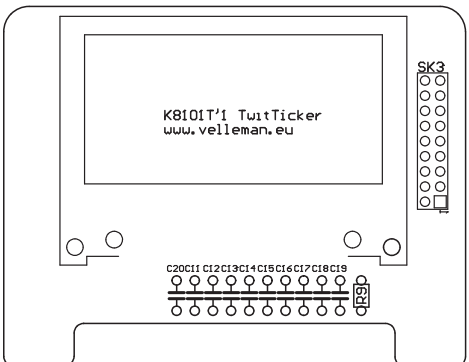
Test program : create your won text or bitmap images on the screen.
Source can be found on: *“c:\...\k8101\Test Display\source”*

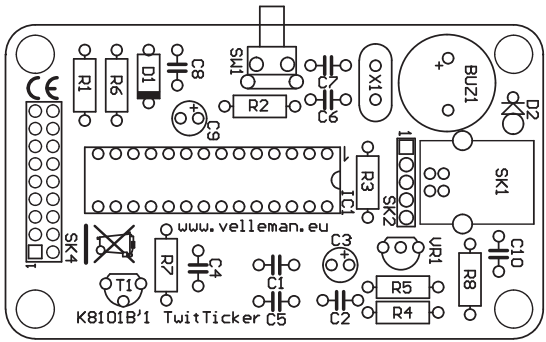


Drive - display : shows info of your HDD.
Source can be found on: *“c:\...\k8101\Drive Display\source”*

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\”*


K8101T'1 TwitTicker
www.velleman.eu
SK3
C20 C11 C12 C13 C14 C15 C16 C17 C18 C19
R9


R1
R6
D1
C8
C9
SW1
R2
C7
C6
OX1
BUZ1
D2
SK1
IC1
R3
SK2
SK4
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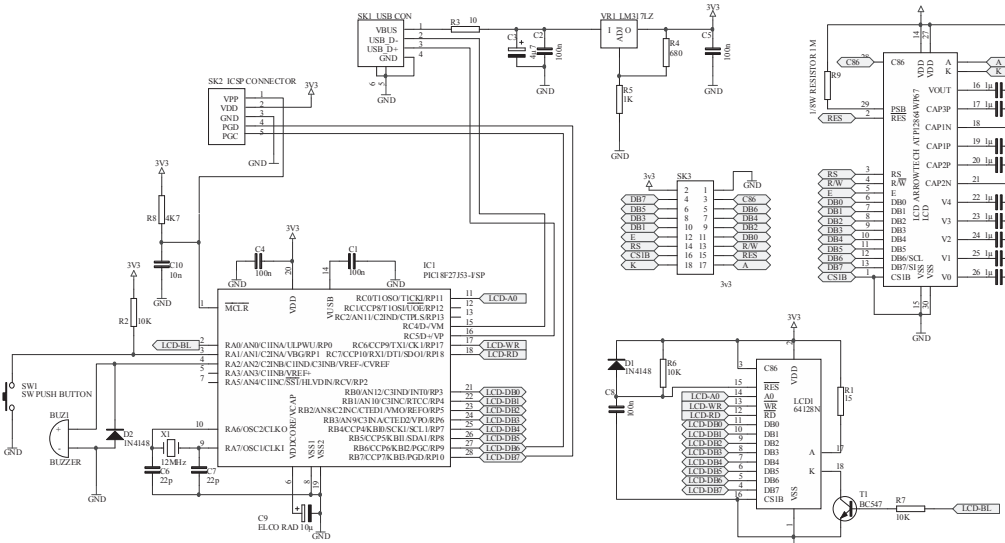
R7
C4
C3
VR1
C10
T1
C1
C5
C2
R5
R4
R8
K8101B'1 TwitTicker


SK1 USB CON
VBUS
USB_D-
USB_D+
GND
R3 10
C3
C2
100n
VR1 LM317LZ
I ADJ O
R4 680
C5 100n
R5 1K
SK2 ICSP CONNECTOR
VPP
VDD
GND
PGD
PGC
3V3
GND
R8 4K7
C10 10n
R2 10K
C4 100n
C1 100n
IC1
PIC18F2753-I/SP
MCLR
VDD
VUSB
RC0/T1OSO/T1CKI/RP11
RC1/CCP8/T1OSI/UOE/RP12
RC2/AN11/C2IND/CTPL/SRP13
RC4/D-/VM
RC5/D+/VP
RC6/CCP9/TX1/CK1/RP17
RC7/CCP10/RX1/DT1/SDO1/RP18
RA0/AN0/C1INA/ULPWU/RP0
RA1/AN1/C2INA/VBG/RP1
RA2/AN2/C2INB/C1IND/C3INB/VREF-/CVREF
RA3/AN3/C1INB/VREF+
RA5/AN4/C1INC/SS1/HLVDIN/RCV/RP2
RB0/AN12/C3IND/INT0/RP3
RB1/AN10/C3INC/RTCC/RP4
RB2/AN8/C2INC/CTED1/NMO/REFO/RP5
RB3/AN9/C3INA/CTED2/VPO/RP6
RB4/CCP4/KBI0/SCK1/SCL1/RP7
RB5/CCP5/KBI1/SDA1/RP8
RB6/CCP6/KBI2/PGC/RP9
RB7/CCP7/KBI3/PGD/RP10
LCD-BL
LCD-A0
LCD-WR
LCD-RD
LCD-DB0
LCD-DB1
LCD-DB2
LCD-DB3
LCD-DB4
LCD-DB5
LCD-DB6
LCD-DB7
SW1
SW PUSH BUTTON
BUZ1
BUZZER
D2
1N4148
X1
12MHz
C6
22p
C7
22p
OSCO/CLKO
OSCI/CLKI
VDD
VSS
C9
ELCO RAD 10u
SK3
DB7
DB5
DB3
DB1
E
RS
CS1B
K
DB6
DB4
DB2
DB0
R/W
RES
A
C86
R9
18W RESISTOR 1M
PSB
RES
LCD ARROWTECH ATP12864W/W7
VDD
K
VOUT
CAP3P
CAP1N
CAP1P
CAP2P
CAP2N
R/W
E
DB0
DB1
DB2
DB3
DB4
DB5
DB6/SCL
DB7/SI
VSS
V4
V3
V2
V1
V0
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
1µ
D1
1N4148
R6
10K
C8
100n
LCD1
64128N
RES
A0
WR
RD
DB0
DB1
DB2
DB3
DB4
DB5
DB6
DB7
CS1B
R1
15
T1
BC547
R7
10K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