velleman-kit HIGH-Q

"Safe" - style code lock

K8082

Novelty code lock.

Features:

- ☑ codelock with rotary encoder and 7-segment display
- ☑ 4-digit code
- ☑ several operating modes
- ☑ adjustable pulse duration
- ☑ application examples: open a door, gate, fence…
- ☑ arm / disarm your alarm system
- ☑ prevent unauthorized use (mode 3) of car, entertainment systems, computers, machinery…

Specifications:

- relay output NO/NC: 3A / 24VDC max.
- power supply: 12VDC / 100mA max.
- Dimensions:
  - front: 85 x 85mm / 3,35 x 3,35"
  - mounting depht: 45mm / 1,77"

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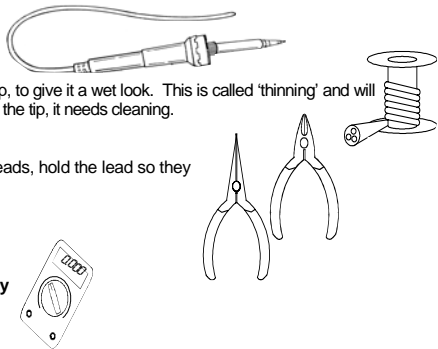
**For some projects, a basic multi-meter is required, or might be handy**

1.2 Assembly Hints :

$\Rightarrow$ Make sure the skill level matches your experience, to avoid disappointments.
$\Rightarrow$ Follow the instructions carefully. Read and understand the entire step before you perform each operation.
$\Rightarrow$ Perform the assembly in the correct order as stated in this manual
$\Rightarrow$ Position all parts on the PCB (Printed Circuit Board) as shown on the drawings.
$\Rightarrow$ Values on the circuit diagram are subject to changes.
$\Rightarrow$ Values in this assembly guide are correct*
$\Rightarrow$ Use the check-boxes to mark your progress.
$\Rightarrow$ 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.
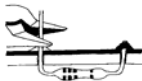
3

1.3 Soldering Hints :

1- Mount the component against the PCB surface and carefully solder the leads
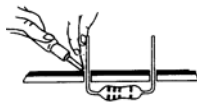
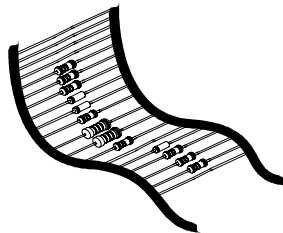**2-** Make sure the solder joints are cone-shaped and shiny

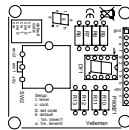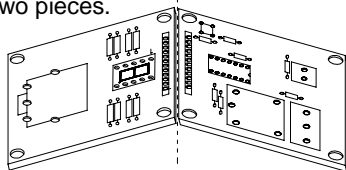**3-** Trim excess leads as close as possible to the solder joint

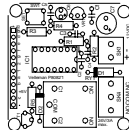**REMOVE THEM FROM THE TAPE ONE AT A TIME !**

AXIAL COMPONENTS ARE TAPED IN THE CORRECT MOUNTING SEQUENCE !
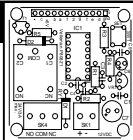
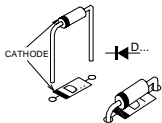Break the PCB into two pieces.

Display PCB   Main PCB

(1) Main PCB

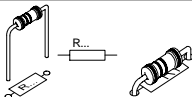Mount at first the components on the main PCB

1. Diodes. Watch the polarity!
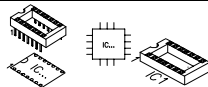
❑ D1 : 1N4007
❑ D2 : 1N4007

CATHODE

2. Resistors

❑ R1 : 10K (1 - 0 - 3 - B)
❑ R2 : 10K (1 - 0 - 3 - B)
❑ R3 : 1K (1 - 0 - 2 - B)
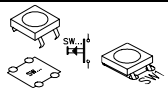❑ R4 : 10K (1 - 0 - 3 - B)
❑ R5 : 4K7 (4 - 7 - 2 - B)

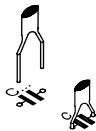### 3. IC socket, Watch the position of the notch!
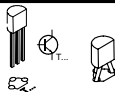
❑ IC1 : 14P
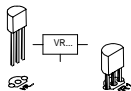
4. Push button

❑ SW1 : SET

5. Capacitors

❑ C1 : 100nF (104)
❑ C2 : 100nF (104)
❑ C3 : 100nF (104)
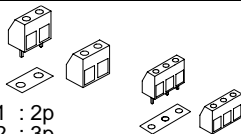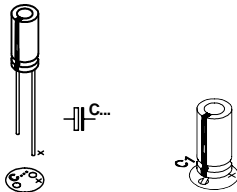❑ C4 : 100nF (104)
❑ C5 : 100nF (104)
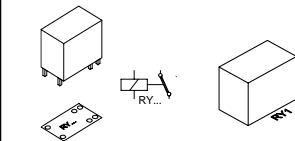
6. Transistor

❑ T1 : BC547

7. Voltage regulator
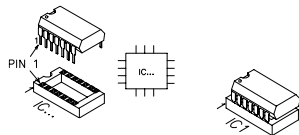
❑ VR1 : UA78L05

8. Terminal blocks

❑ SK1 : 2p
❑ SK2 : 3p

9. Electrolytic Capacitors. Watch the polarity !

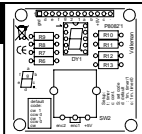❑ C6 : 10µF/50V
❑ C7 : 470µF/25V

10. Relay

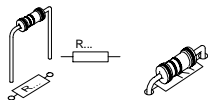❑ RY1 : VR15M121C

11. IC, watch the position of the notch!

PIN 1

❑ IC1 : VK8082
(programmed PIC16F630-I/P)

(2) DISPLAY

Mount the components on the display PCB

1. Resistors

R...
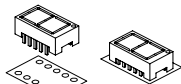
- ☐ R6 : 560 (5 - 6 - 1 - B)
- ☐ R7 : 560 (5 - 6 - 1 - B)
- ☐ R8 : 560 (5 - 6 - 1 - B)
- ☐ R9 : 560 (5 - 6 - 1 - B)
- ☐ R10 : 560 (5 - 6 - 1 - B)
- ☐ R11 : 560 (5 - 6 - 1 - B)
- ☐ R12 : 560 (5 - 6 - 1 - B)
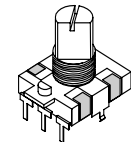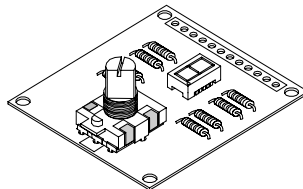- ☐ R13 : 560 (5 - 6 - 1 - B)

2. Display

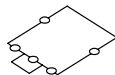Pay attention to the position of the decimal point.

☐ DY1

3. Digital potentiometer

☐ SW2 : Rotary encoder

(3) ASSEMBLY

• Mount the jump wires onto the main PCB according to figure 1.0.

Solderside !

Fig. 1.0
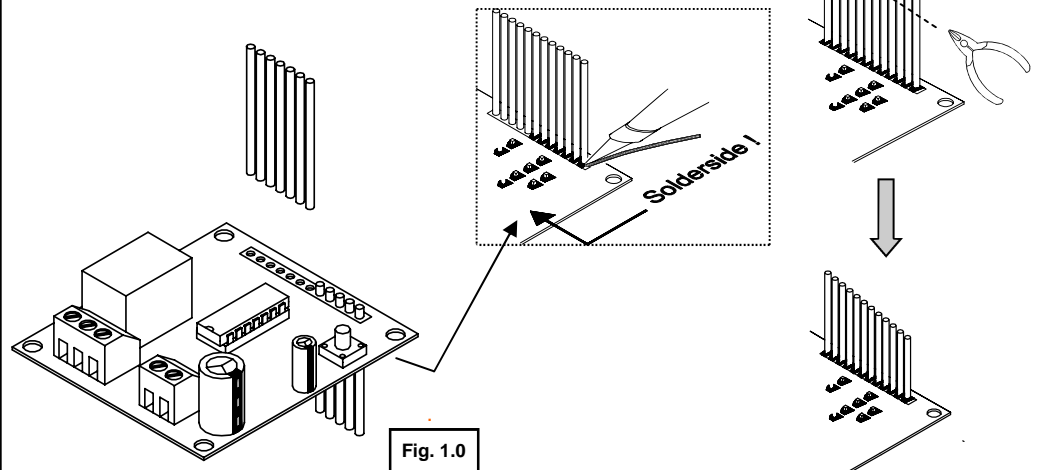
- Mount 4 print tabs onto the display print (see figure 2.0).
- Assemble the unit together (fig. 3.0)

Fig. 2.0

M3 Nut

Main PCB
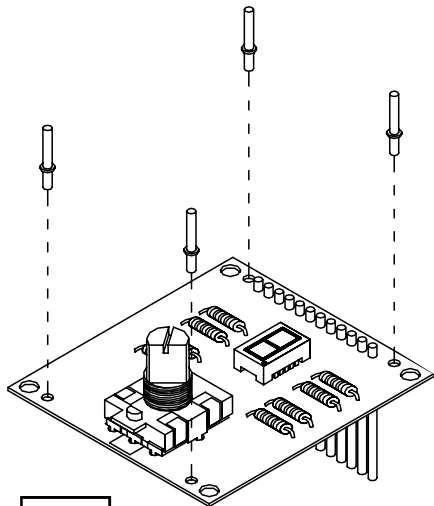
10mm spacer

Display PCB

20mm M3 bolt

Fig. 3.0

velleman®
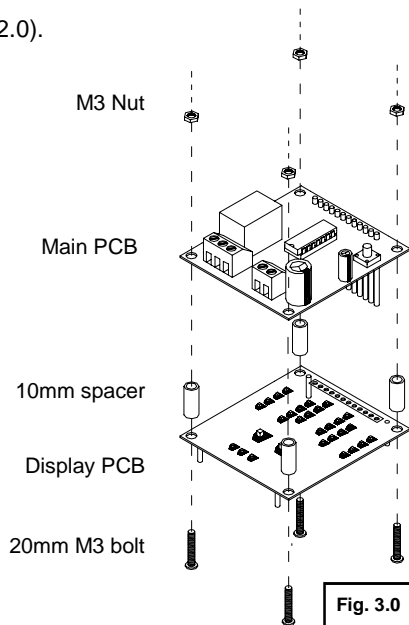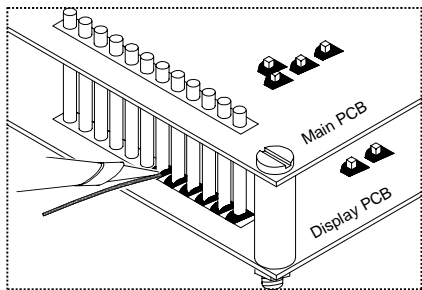
☞ **Make sure to connect all jumper wires with the display print and solder them (see figure 4.0).**

Fig. 4.0

- Mount the red display filter onto the front panel (backside)
- Fix the red display filter using a piece of transparent adhesive tape (four sides) (fig. 5.0)

red display filter

adhesive tape
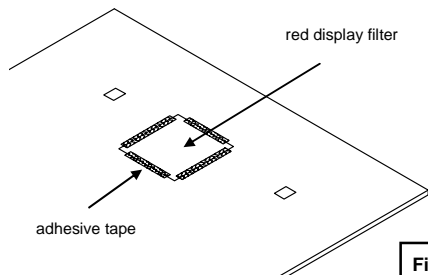
Fig. 5.0

• Place the unit onto the front panel (fig. 6.0)

Fig. 6.0
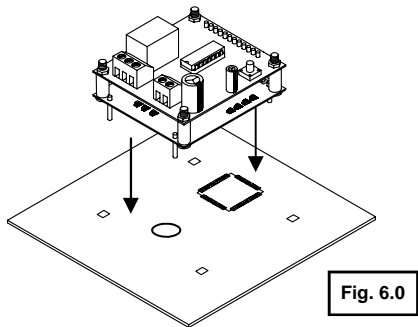
• Fasten the potentiometer
• Slide the black plastic knob on the axe and fasten the unit (fig 7.0)

Fig. 7.0
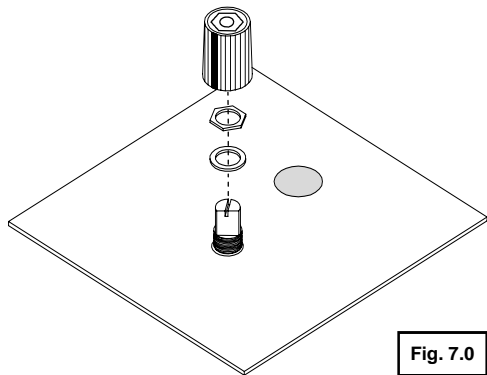
• Carefully solder the 4 PCB pins to the front panel.

☝ Watch the position of the display!

Fig. 8.0

(4) CONNECTION DIAGRAM & EXAMPLE

To e.g. alarm system

To e.g. buzzer 24VDC

To e.g. 12VDC door lock

to e.g. alarm system

3A / 24V max.

e.g. buzzer 24VDC

e.g. 24VDC

e.g. 12VDC doorlock

3A / 24V max.
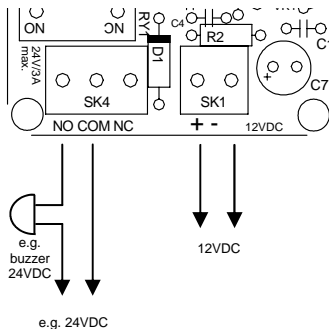
12VDC
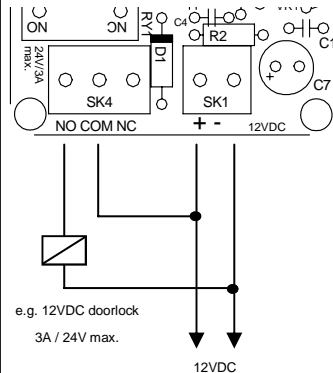
(5) ENTER YOUR CODE

At first turn-on, the unit responds to factory code *(1 - 0 - 1 - 0)* only.

To compose the code:

1) turn clockwise to 1
2) turn counter clockwise to 0
3) turn clockwise to 1
4) turn counter clockwise to 0
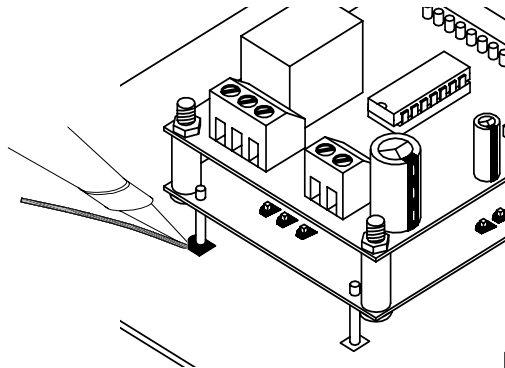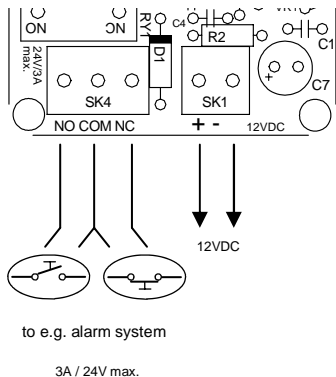5) turn clockwise

✍ **if you make a mistake, restart from 1**

The relay turns on and the 'lock open'-symbol is displayed.
To turn off the relay, turn knob in any direction

✍ **Remark:** When the unit remains idle for a while and the relay is off, then the display will show an animation.
✍ The status of the relay is always shown by the decimal point (dp ON = relay ON)

(6) MENU OPTIONS

Remark: you can only access the menu when the output relay is off

• Hold the button to enter the setup menu
• The display shows **'-'**. If button is released at this time, no settings will be altered.
• The decimal dot will flash 3 times, to confirm you left the menu.
• If the unit was set to 'timer mode', the display will flash the current set time.

Turn knob in any direction to select a menu item, while still holding the button.

't'   **timer mode : The output relay generates a timed pulse between 0.5 and 9s**

To set timer mode:

- ⅄ Release button.
- ⅄ Set required time (0..9s, 0 = 0.5s)
- ⅄ Hold button
- ⅄ Select 't'
- ⅄ Release button
- ⅄ Display will flash selected time to confirm selection.

'c' **continuous mode : The output relay remains activated until the knob is turned.**

To set continuous mode:

- ⋎ Release button
- ⋎ Decimal point will flash 3 times to confirm selection

's' **Set mode : Allows you to compose a 4-digit code of your choice.**

To select 'set' mode:

- ⋎ Release the menu button
- ⋎ Compose your custom 4-digit code (change direction after each digit and last digit).
- ⋎ The decimal point will flash 3 times to indicate that your code has been stored.

☞ **Remark:** If the unit remains idle for a while, the unit will return to normal operation and the code will not be changed

'd' **default. Return to the factory code (1010)**
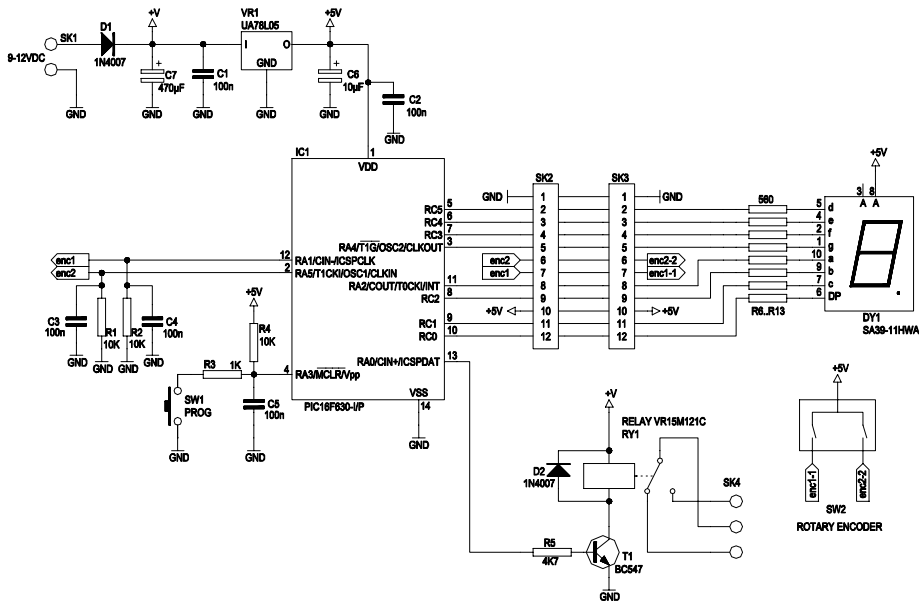
To set 'default' mode:

- ⋎ Release the menu button
- ⋎ Decimal point will flash 3 times to confirm selection

'l'
- ⋎ Relay turns on at power up
  You have 1 min to enter your code (Display shows an animation)
- ⋎ Compose your code
  If the correct code is not entered within one minute, the relay will turn off and
  'A' (alarm) will flash.
- ⋎ Release the menu button to select this mode
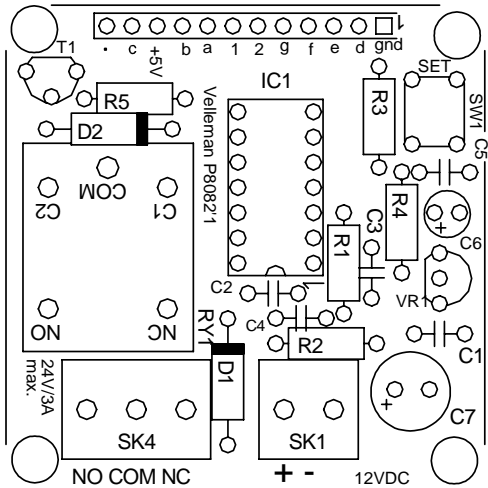- ⋎ Decimal point will flash 3 times to confirm selection

'o'
- ⋎ Relay is off at power up.
  You have 1 min to enter your code. (Display shows an animation)
- ⋎ Compose your code
  If the correct code is not entered within one minute, the relay will turn *on* and
  'A' (alarm) will flash.
- ⋎ Release the menu button to select this mode.
- ⋎ Decimal point will flash 3 times to confirm selection

☞ **Remark:** The modes 'l' and 'o' can only be changed during the first minute after power up. Otherwise, the unit will go into alarm-mode and access to the menu will be prohibited. In that case, briefly interrupt the power supply to restart the unit.
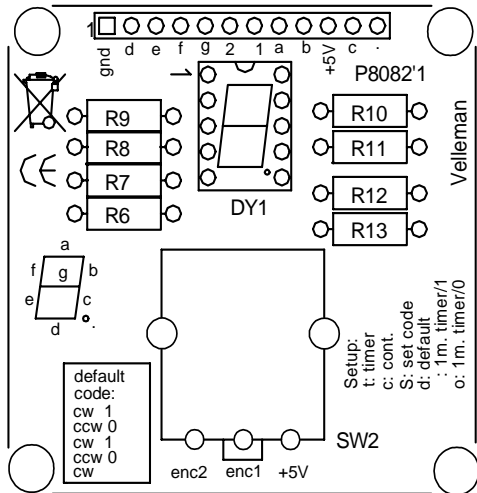
(6) Schematic diagram.

(7) MAIN PCB

DISPLAY PCB

VELLEMAN Components NV
Legen Heirweg 33
9890 Gavere
Belgium Europe
www.velleman.be
www.velleman-kit.com