

Total solder points: 117

Difficulty level: *beginner* 1  2  3  4  5  *advanced*

## "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:

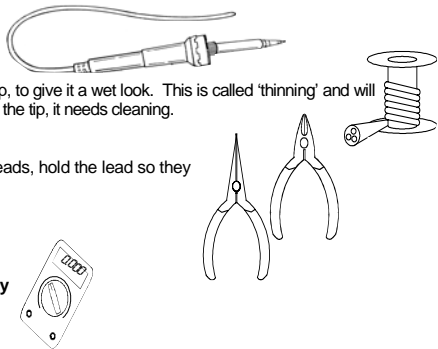
- relay output NO/NC: 3A / 24VDC max.
- power supply: 12VDC / 100mA max.
- Dimensions:
  - front: 85 x 85mm / 3,35 x 3,35"
  - mounting depth: 45mm / 1,77"

### 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**

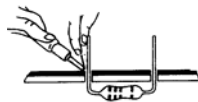
#### 1.2 Assembly Hints :

- ⇒ 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.
- ⇒ 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

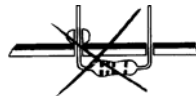
\* Typographical inaccuracies excluded. Always look for possible last minute manual updates, indicated as 'NOTE' on a separate leaflet.

### 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

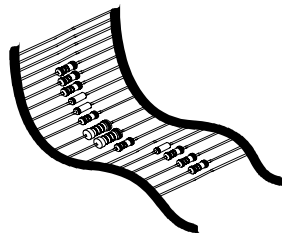


3- Trim excess leads as close as possible to the solder joint

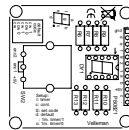
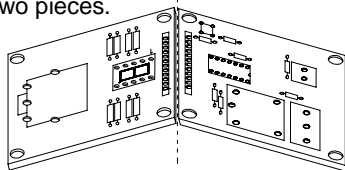


**REMOVE THEM FROM THE TAPE ONE AT A TIME !**

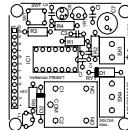
**AXIAL COMPONENTS ARE TAPED IN THE  
CORRECT MOUNTING SEQUENCE !**



Break the PCB into two pieces.



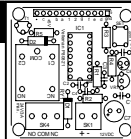
Display PCB



Main PCB

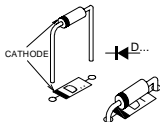
## (1) Main PCB

Mount at first the components on the main PCB

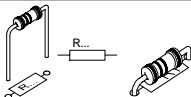


### 1. Diodes. Watch the polarity!

- D1 : 1N4007
- D2 : 1N4007

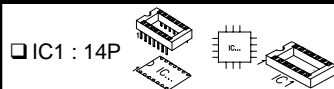


### 2. Resistors



- 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)

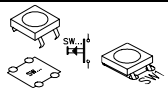
### 3. IC socket, Watch the position of the notch!



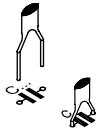
- IC1 : 14P

**4. Push button**

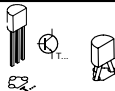
SW1 : SET

**5. Capacitors**

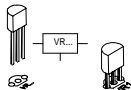
- C1 : 100nF (104)
- C2 : 100nF (104)
- C3 : 100nF (104)
- C4 : 100nF (104)
- C5 : 100nF (104)

**6. Transistor**

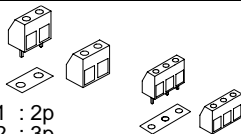
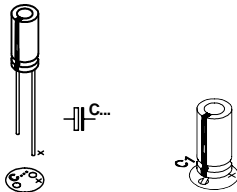
T1 : BC547

**7. Voltage regulator**

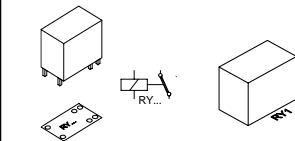
VR1 : UA78L05

**8. Terminal blocks**

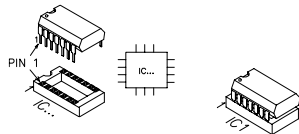
- SK1 : 2p
- SK2 : 3p

**9. Electrolytic Capacitors.  
Watch the polarity !**

- C6 : 10 $\mu$ F/50V
- C7 : 470 $\mu$ F/25V

**10. Relay**

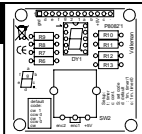
RY1 : VR15M121C

**11. IC, watch the position of  
the notch!**

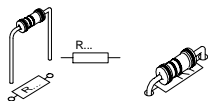
IC1 : VK8082  
(programmed PIC16F630-I/P)

## (2) DISPLAY

Mount the components on the display PCB

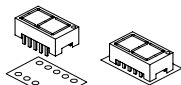


### 1. Resistors



- 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)

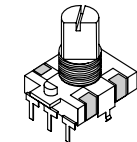
### 2. Display



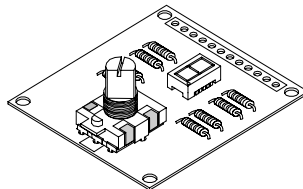
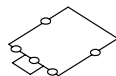
☞ Pay attention to the position of the decimal point.

- DY1

### 3. Digital potentiometer

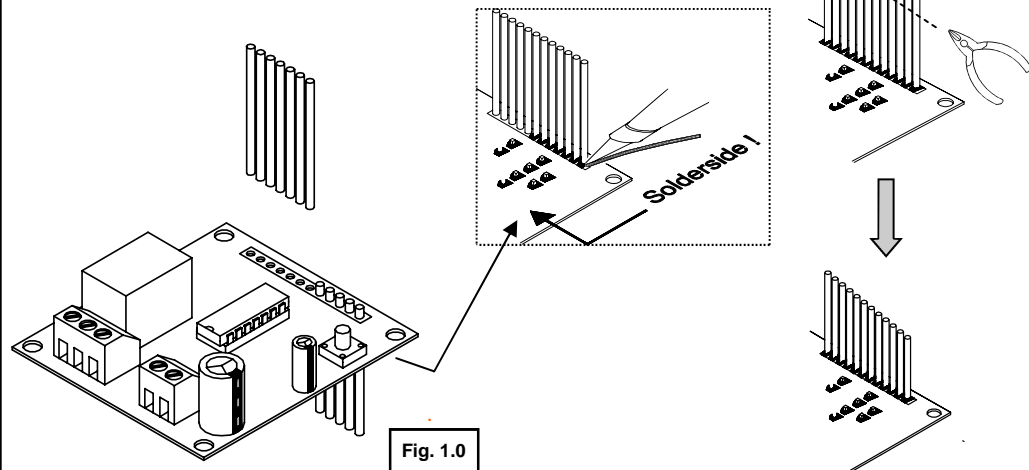


- SW2 : Rotary encoder



### (3) ASSEMBLY

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





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

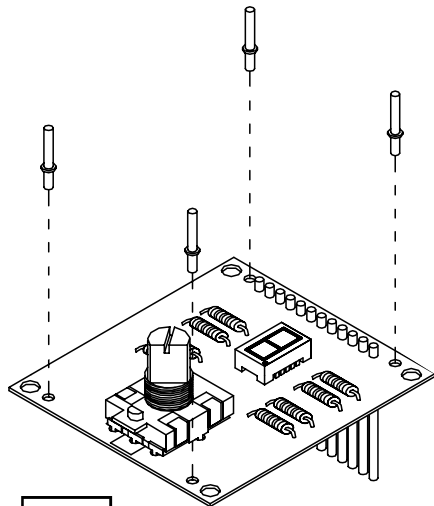


Fig. 2.0

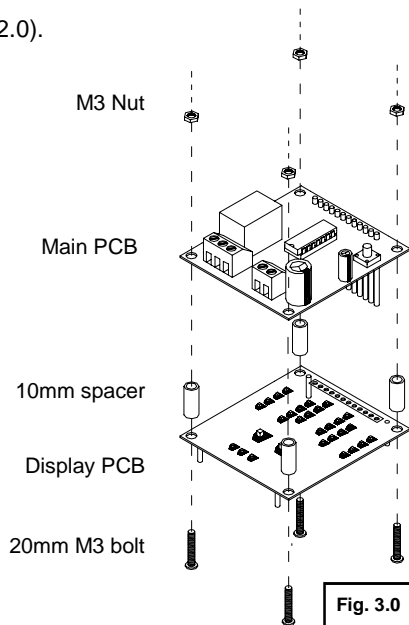
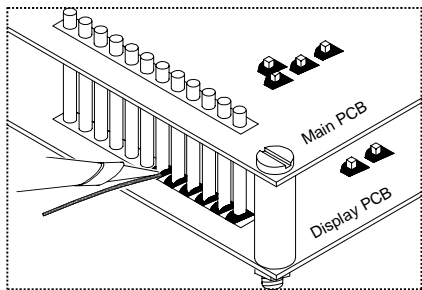


Fig. 3.0



☞ **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)

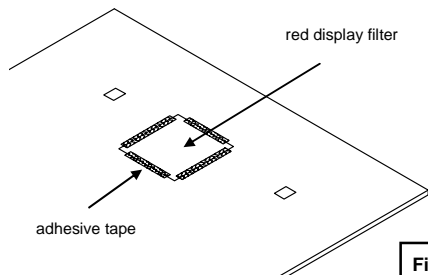
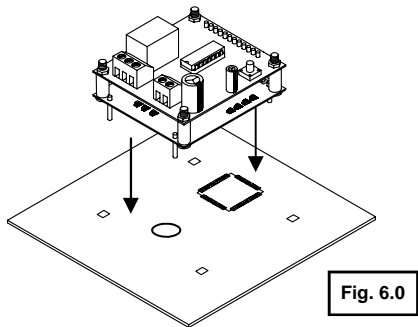
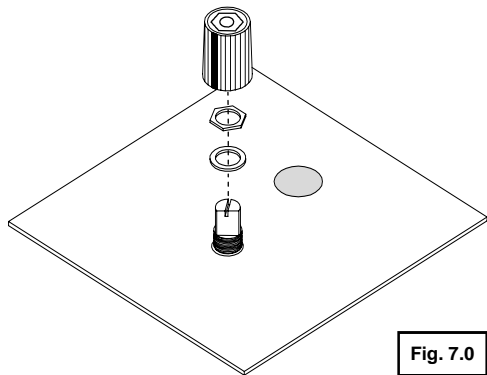


Fig. 5.0

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



- Fasten the potentiometer
- Slide the black plastic knob on the axle and fasten the unit (fig 7.0)



- Carefully solder the 4 PCB pins to the front panel.

☞ **Watch the position of the display!**

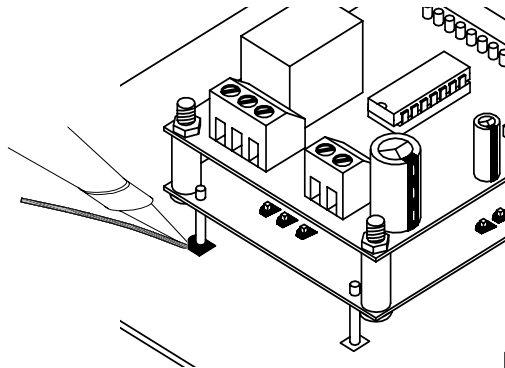
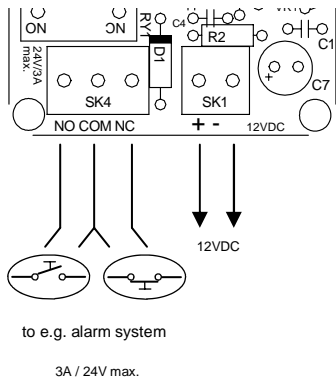


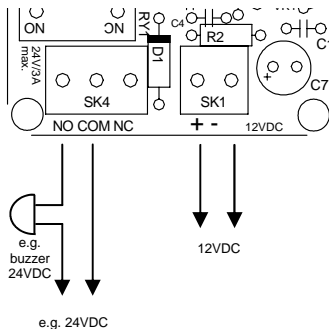
Fig. 8.0

**(4) CONNECTION DIAGRAM & EXAMPLE**

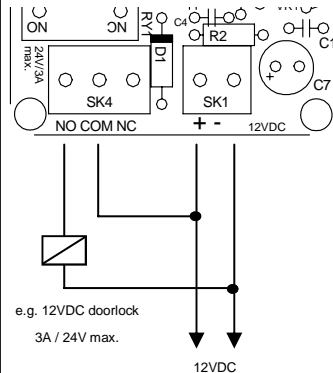
To e.g. alarm system



To e.g. buzzer 24VDC



To e.g. 12VDC door lock



## (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

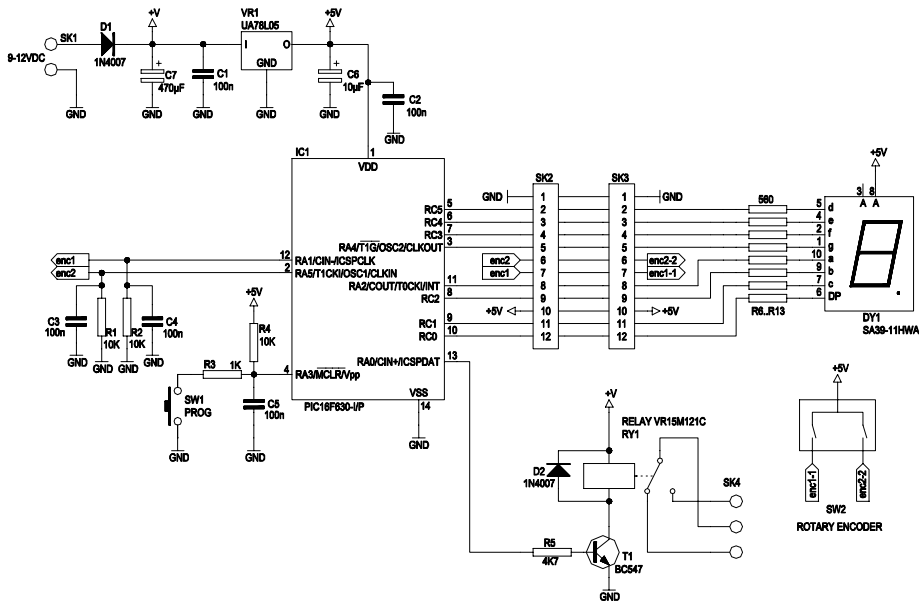


- ✓ **'I'** Relay turns on at power up  
You have 1 min to enter your code (Display shows an animation)
- ✓ Compose your code  
If the correct code is not entered within one minute, the relay will turn off and 'A' (alarm) will flash.
- ✓ Release the menu button to select this mode
- ✓ Decimal point will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

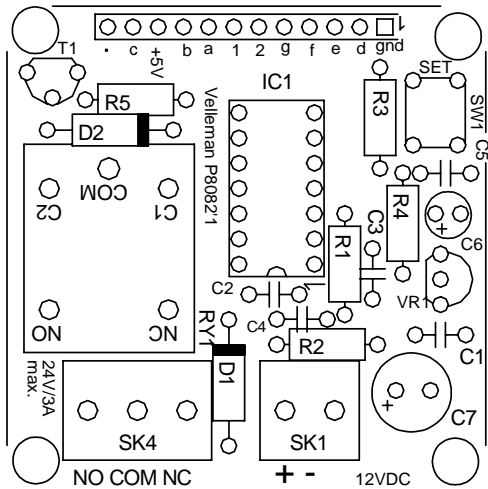
- ✓ **'o'** Relay is off at power up.  
You have 1 min to enter your code. (Display shows an animation)
- ✓ Compose your code  
If the correct code is not entered within one minute, the relay will turn **on** and 'A' (alarm) will flash.
- ✓ Release the menu button to select this mode.
- ✓ Decimal point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

 **Remark:** The modes 'I' 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.

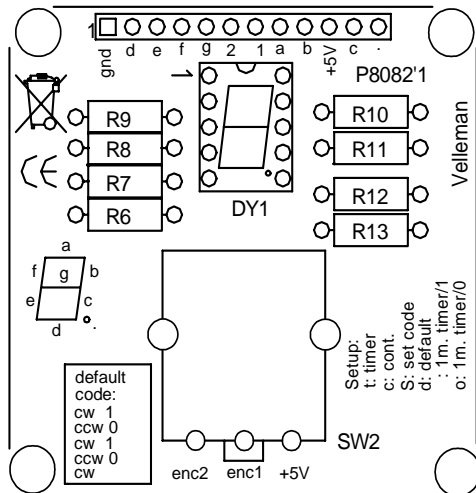
## (6) Schematic diagram.



(7) MAIN PCB



DISPLAY PCB





Modifications and typographical errors reserved  
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H8082IP'1 - 2006 (rev 1.0)

