

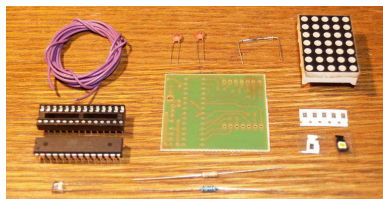
# Reactive Light with 5x7-Dot LED Display Assembling and Instruction Manual

## Assembling



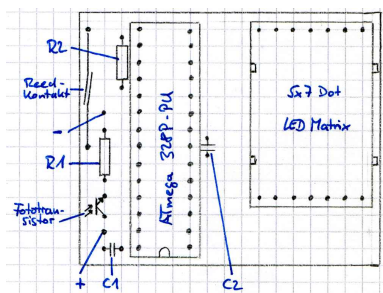
For assembling these tools are needed:

- soldering iron with a fine soldering tip
- tin-solder
- side cutter
- spiry forceps

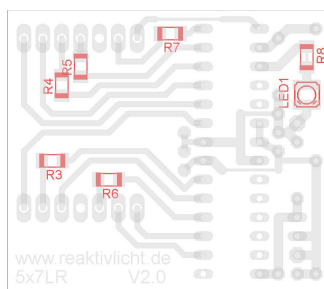


These are the elements you find in the kit:

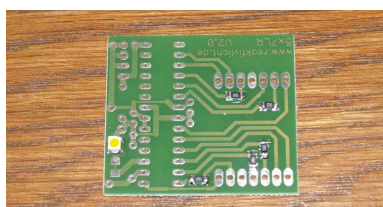
- about 20 cm cable
- one phototransistor
- one reed contact
- one microcontroller
- one socket for the microcontroller
- two resistors (THT)
- five resistors (SMD)
- two capacitors
- one LED (SMD)
- one circuit board
- one 5x7-Dot LED display



This is the plan for assembling the device. It shows the circuit board from the top (green side without copper lines).

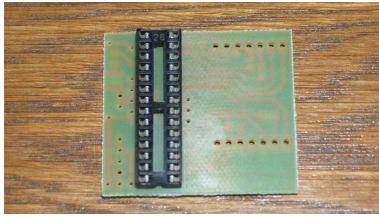


This is the plan for assembling the bottom side of the device (green side with copper lines).

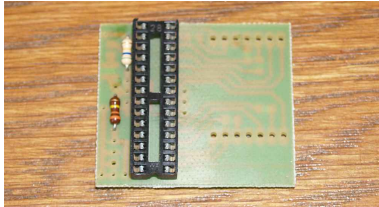


Place the circuit board as shown on the photo.  
Solder the resistors R3 – R7 with the value 56 Ω (labe: 560). The resistor R8 is not populated.  
Solder the LED in a way that the skewed corner points to the upper right.  
For soldering a SMD element first tin one of the pads. Afterwards take the element with forceps and solter it to the tinned pad. Then solder the other pad.

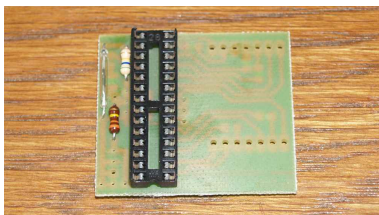
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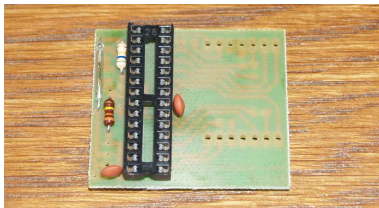
Flip the circuit board.  
Then stick the socket to its place. Consider that the notch is downward. Solder all pins.



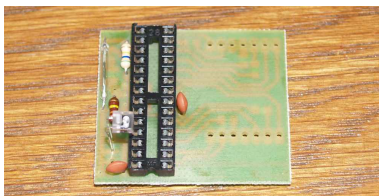
Add the resistors.  
The lower resistor is 330 k $\Omega$  (orange orange yellow gold).  
The upper one is 270 k $\Omega$  (red violett yellow gold), 390 k $\Omega$  (orange white yellow gold) or 560 k $\Omega$  (green blue yellow gold).



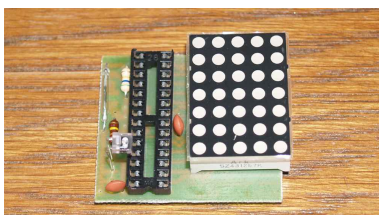
Add the reed contact.  
Be careful when bending the connecting wire. The glass pipe is fragile. If you need to bend them, please use fine nippers to hold the element next to the glass pipe. Beyond the nippers the wire can be bent riskless.



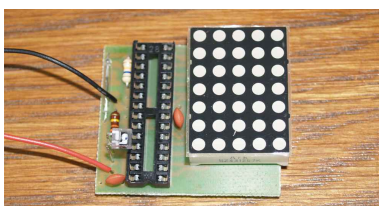
Add the capacitors.  
The value is 100nF. They are orange lens-shaped elements.



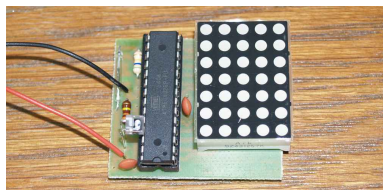
Add the phototransistor. It is a transparent element.  
Bend it into the direction if the IC in a way that the point-shaped bump shows upward.



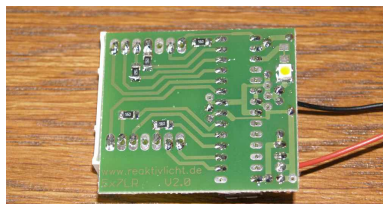
Add the LED display.  
Make sure the nibs are on the right side and the notches on the left.



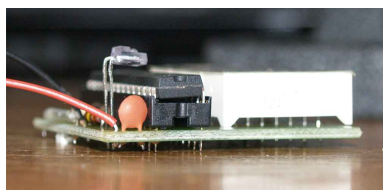
Add the cables for the power supply.



Insert the microcontroller into the socket.  
The colored mark, the notch or the small round mark has to be above the notch of the socket.



Control all soldering points.  
Make sure no connections exist except the ones of the circuit board.



The finished device.

## Startup

Connect the device to the power supply. Put a finger onto the microcontroller. If it becomes hot, disconnect the device and check if the microcontroller is placed well and the power supply is connected in the right way.

After connected the device shows one time the stored number sequence. If no sequence is stored, a single LED of the display lights up.

At daylight the device is inactive. To reactivate it, go to a dark place and wait for about 10 seconds.

Use a torch light to trigger the device. Light the photoconductive cell for a short time. The device will show the stored sequence. If you light the photoconductive cell for a long time (about 2 minutes), the device becomes inactive, because it interprets the constant lighting as daylight.

## Teaching s sequence

1. Download the software for teaching a sequence from [http://www.reaktivlicht.de/atmel.html#5x7LR\\_Teachmodus](http://www.reaktivlicht.de/atmel.html#5x7LR_Teachmodus). For running the software you need an installed Java runtime on the computer.
2. Start the software.
3. Connect the reactive light to a power supply and place it in front of the big colored field of the software in a way that the phototransistor points to the monitor. The room has to be dark. Lamps and incoming daylight can handicap the teaching process.
4. Enter the desired character sequence into the textfield. All characters of a German keyboard except stresses are allowed. Then press „Start“.
5. Close the reed contact of the reactive light with a magnet until the LED on the backside lights shortly. Then remove the magnet. The teaching process can be aborted by again closing the reed contact. Wait until the LED blinks and then stay lightened.
 

1x blinking, then static on:	Calibration succeeded
2x blinking, then static on:	Calibration failed
3x blinking, then static on:	Calibration aborted
6. Press „Continue“.
7. Close the reed contact with a magnet until the LED lights shortly. The teaching can be aborted by closing the reed contact again.
8. Press „Continue“.
9. Wait until the LED lights shortly.
 

The colored field of the software does not change anymore:	Einlernvorgang erfolgreich abgeschlossen
The colored field of the software is still changing:	Einlernvorgang fehlgeschlagen
3x blinking:	Einlernvorgang wurde abgebrochen

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## Reasons for failed teaching

- Inside of the room it has to be dark. Lamps and daylight can handicap the teaching process.
- If necessary repeat the teaching process.