

K8025

ILLUSTRATED ASSEMBLY MANUAL H8025IP'1

VIDEO PATTERN GENERATOR



velleman®
projects



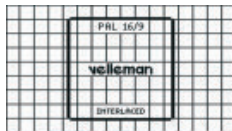
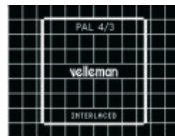
Check the picture quality of your monitor or TV, ideal for adjustment or troubleshooting.

Features

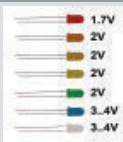
- pocket video generator and fixed audio sine wave
- black and white + gray scale video patterns
- check the picture quality of your monitor or TV
- use for picture adjustment or troubleshooting
- video selections:
 - A PAL or NTSC
 - A interlaced or progressive (non-interlaced)
 - A 12 different patterns included: purity patterns (black, white, gray), grayscale (staircase), square grids, 100% contrast half screens
 - A 4/3 and 16/9 patterns

Specifications

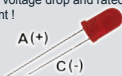
- supply: 3V, CR2032 battery (not included)
- consumption: 12mA (grid signal@75ohm)
- audio output: 1kHz sine wave / 0.7Vrms (10k load)
- video output: 0.8Vpp @ 75 ohm load (staircase signal)
- auto power off: 10 minutes



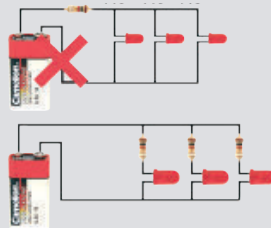
Leds and how to use them



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)

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



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

closest value :
use a 1k5 resistor

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



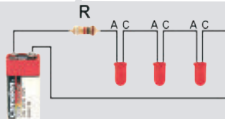
$$(9V - 1.7V) \times 0.005A = 0.036W$$

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)



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

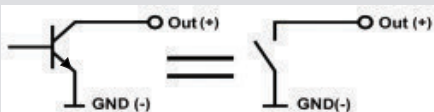


$$\frac{9V - (3 \times 1.7V)}{0.005A} = 780 \text{ ohm}$$

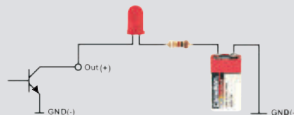
use an
820 ohm resistor

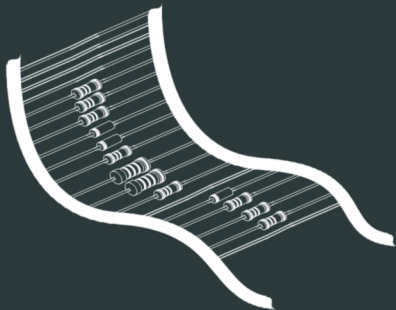
open collector outputs

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

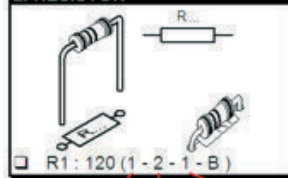




REMOVE THEM FROM THE TAPE ONE AT A TIME !



2. RESISTOR



COLOUR	COLOUR NAME	1ST DIGIT/ STRIPE	2ND DIGIT/ STRIPE	3RD DIGIT/ STRIPE	MULTIPLIER STRIPE	TOLERANCE
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!

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



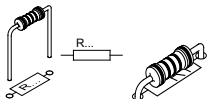
2. Make sure the solder joints are cone-shaped and shiny



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

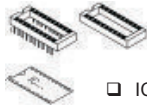


1 Resistors



- ☐ R1 ... R3 : 68K (6 - 8 - 3 - B)
- ☐ R4 ... R7 : 680 (6 - 8 - 1 - B)
- ☐ R8 : 330 (3 - 3 - 1 - B)
- ☐ R9, R10 : 180 (1 - 8 - 1 - B)
- ☐ R11 : 560 (5 - 6 - 1 - B)
- ☐ R12 : 1K (1 - 0 - 2 - B)
- ☐ R13 : 120 (1 - 2 - 1 - B)

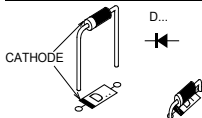
2 IC-socket



Watch the position
of the notch!

- ☐ IC1 : 14p

3 Diode (Check polarity!)



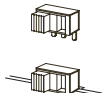
- ☐ D1: 1N4007

4 Ceramic Capacitor



- ☐ C1, C2 : 27pF (27)
- ☐ C3 : 1nF (102)
- ☐ C4, C5 : 220nF (224)

5 Switch



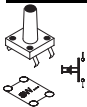
- ☐ SW1 : power on/off

6 Battery holder



- ☐ E1 : 3V (# part. CR2032)

7 Push button



- ☐ SW2 : Pattern

8 Electrolytic capacitor

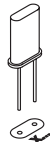


Watch the
polarity!



- ☐ C6, C7 : 10µF

9 Quartz crystal

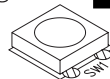


- ☐ X1 : 4MHz

10 Push button

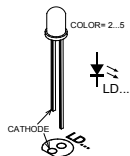


**Mount &
solder on
solderside !**



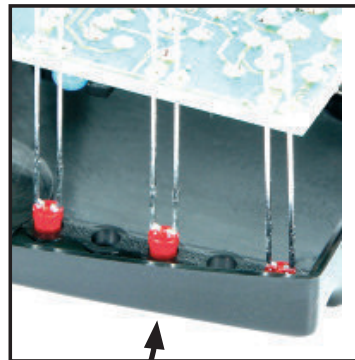
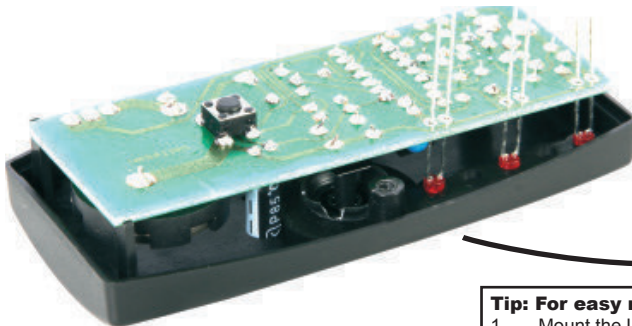
- ☐ SW3 : int / prog

11 LEDs



Watch the polarity!

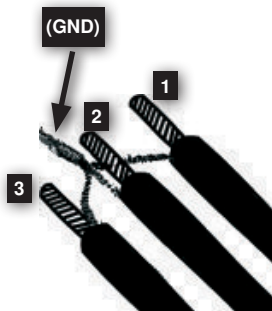
- ☐ LD1 : Interlace
- ☐ LD2 : NTSC
- ☐ LD3 : PAL

**Tip: For easy mounting at the correct height**

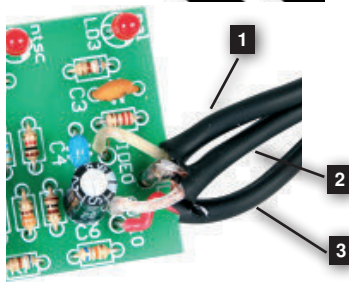
1. Mount the LEDs on the PCB
2. place the PCB with the leds on the front panel on flat surface.
3. Solder the connections.

12 RCA plug male cable

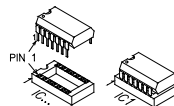
- Solder the signal wires of the RCA cable (1,2 &3) to the pcb.
- Solder the shielding cable of the RCA cable together en solder to the GND on the PCB.



- 1** Video
- 2, 3** Audio



13 IC

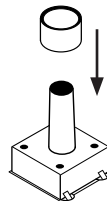


Watch the position
of the notch!

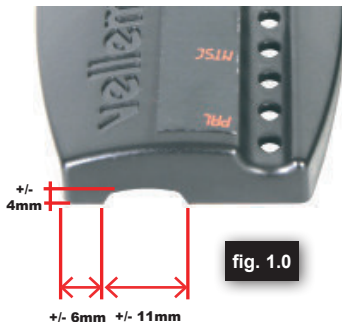
□ IC1: VK8025 (programmed PIC16F1825-I/P)

14 CAP

Mount the black cap on the push button



14 Assembly



1. First make an opening of +/- 4mm height in the upper part of the housing. The RCA will run trough. (fig.1.0)
2. Then remove a part of the lip in the lower part of the housing. (fig.2.0)
3. Drill a $\varnothing$ 10mm hole in the housing according to figure 3.0 if you want to let push button SW2 come trough (fig.3.0)



Do not use the enclosed red button!

4. Insert 1x CR2032 battery into the battery holder. Mind the polarity!
5. Mount all parts and close the housing by means of the enclosed screws.

Beware: do not forget to feed the RCA cable trough the hole in the housing.

6. Now stick the enclosed stickers to the housing;

15 Use

Select pattern:

Select between 12 different patterns.



On/Off power switch



Setup:

Select between interlaced or progressive video. Keep the button pressed to select between PAL and NTSC.



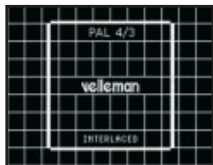
Interlaced video: This technique uses two fields to create a frame. One field contains all the odd lines in the image, the other contains all the even lines of the image. Only CRT displays and plasma displays are capable of displaying interlaced signals.

Progressive video: is a way of displaying, storing, or transmitting moving images in which all the lines of each frame are drawn in sequence. Progressive scan is used for most computer monitors, all LCD computer monitors, and most HDTVs.

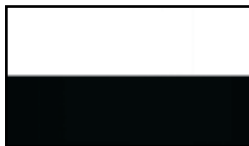
PAL: Phase Alternating Line is an analogue television colour encoding system. It refers to the 625-line/50 Hz (576i) television system in general.

NTSC: National Television System Committee, is the analog television. offers very slightly smoother motion than PAL. NTSC receivers have a tint control to perform colour correction manually. If this is not adjusted correctly, the colours may be faulty. The PAL standard automatically cancels hue errors by phase reversal, so a tint control is unnecessary.

Patterns:



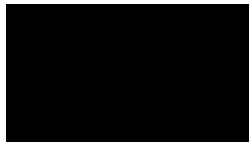
PAL, NTSC : 4/3 square grid *



100% contrast half screens **



PAL, NTSC : 16/9 square grid *



Grayscale (staircase) **

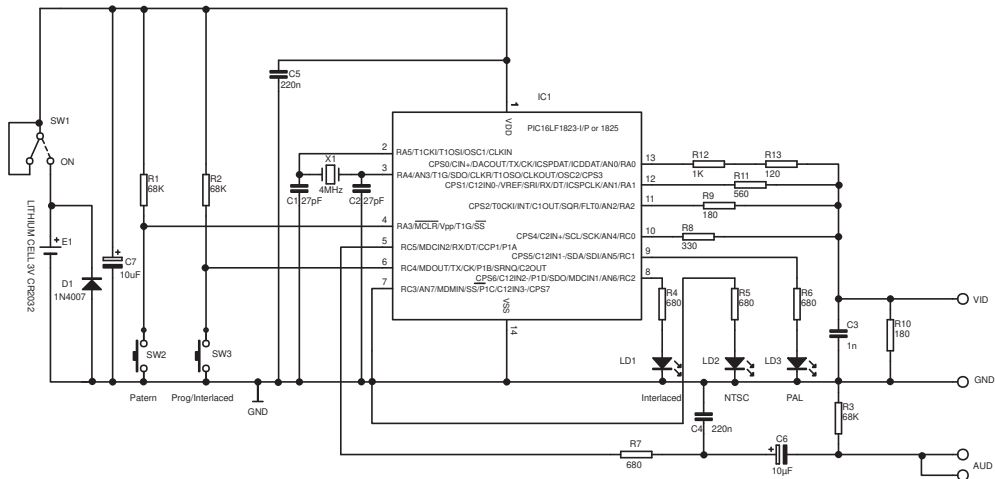


Purity patterns (black, grey, white)

* available also in grey and white pattern

** reverse pattern selectable







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