

Total solder points: 159

Difficulty level:

beginner 1  2  3  4  5  advanced

High Q  
**velleman-kit** 

# 4 channel recorder / logger

## Hardware:

# K8047

- USB connected and powered.
- Four DC coupled input channels.
- Input resistance 1Mohm.
- Maximum samples per second : 100
- Four input ranges, 3V / 6V / 15V and 30V.
- Sensitivity 10mV.
- Accuracy  $\pm 3\%$  of full scale.
- Maximum input 30Vdc.
- Power and recording/diagnostic LED indication on unit.

## Software:

- Analogue trace or digital DVM readout.
- 4 simultaneous channels recording.
- Minimum / maximum sample hold function for DVM.
- From 1 sec to 1000 sec per division.
- Storage and recall of screens (full colour) or data.
- Automatic recording option for long time recordings.
- On screen markers for time and voltage.
- DLL included for own development.







**VELLEMAN Components NV**  
**Legen Heirweg 33**  
**9890 Gavere**  
**Belgium Europe**  
**[www.velleman.be](http://www.velleman.be)**  
**[www.velleman-kit.com](http://www.velleman-kit.com)**

### 1. Assembly (Skipping this can lead to troubles !)

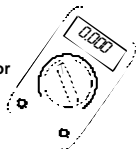
Ok, so we have your attention. These hints will help you to make this project successful. Read them carefully.

#### 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 rosin-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**



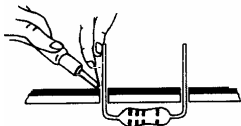
#### 1.2 Assembly Hints :

- ⇒ 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 checkboxes 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 :

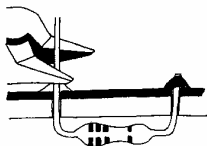
Mount the component against the PCB surface and carefully solder the leads



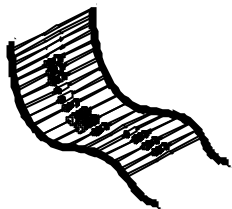
Make sure the solder joints are cone-shaped and shiny



Trim excess leads as close as possible to the solder joint



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



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

5%



\*K7= ( 5 - 7 - 2 - B )



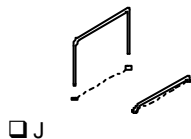
\*K7= ( 5 - 7 - 2 - B )

COLOR= 2...5



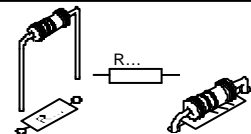
	I	P	E	SF	S	DK	N	D	GB	F	NL
C	CODICE	CODIGO	CODIGO	VÄRI	FÄRG	FARVE-	FARGE-	FARB	COLOUR	CODIFI-	KLEUR
O	COLORE	DE CORES	DE COL-	KOODI	SCHEMA	KODE	KODE	KODE	CODE	CATION	KODE
D			ORES							DES COU-	D
E										LEURS	E
0	Nero	Preto	Negro	Musta	Svart	Sort	Sort	Schwarz	Black	Noir	Zwart
1	Marrone	Castanho	Marrón	Ruskea	Brun	Brun	Brun	Braun	Brown	Brun	Bruin
2	Rosso	Encarnado Rojo		Punainen	Röd	Rød	Rød	Rot	Red	Rouge	Rood
3	Aranciato	Laranja	Naranja	Oranssi	Orange	Orange	Orange	Orange	Orange	Orange	Oranje
4	Giallo	Amarelo	Amarillo	Keitainen	Gul	Gul	Gul	Gelb	Yellow	Jaune	Geel
5	Verde	Verde	Verde	Vihreä	Grön	Grøn	Grønn	Grün	Green	Vert	Groen
6	Blu	Azul	Azul	Sininen	Blå	Blå	Blå	Blau	Blue	Bleu	Blauw
7	Viola	Violeta	Morado	Purppura	Lila	Violet	Violet	Violet	Purple	Violet	Paars
8	Grigio	Cinzeno	Gris	Harmaa	Grå	Grå	Grå	Grau	Grey	Gris	Grijs
9	Bianco	Branco	Blanco	Valkoinen	Vit	Hvid	Hvidt	Weiss	White	Blanc	Wit
A	Argento	Prateado	Plata	Hopea	Silver	Sølv	Sølv	Silber	Silver	Argent	Zilver
B	Oro	Dourado	Oro	Kulta	Guld	Guld	Guldi	Gold	Gold	Or	Goud

## 1. Jumper



J

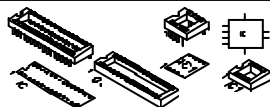
## 2. Resistors



- R1 : 1K5 (1-5-2-B)
- R2 : 3K (3-0-0-1-1)
- R3 : 6K8 (6-8-0-1-1)
- R4 : 27K (2-7-0-2-1)
- R5 : 91K (9-1-0-2-1)
- R6 : 1M (1-0-0-4-1)
- R7 : 91K (9-1-0-2-1)
- R8 : 1M (1-0-0-4-1)
- R9 : 27K (2-7-0-2-1)
- R10 : 470E (4-7-1-B)
- R11 : 6K8 (6-8-0-1-1)
- R12 : 27K (2-7-0-2-1)
- R13 : 27K (2-7-0-2-1)
- R14 : 91K (9-1-0-2-1)
- R15 : 91K (9-1-0-2-1)
- R16 : 1M (1-0-0-4-1)
- R17 : 1M (1-0-0-4-1)
- R18 : 1K5 (1-5-2-B)
- R19 : 27K (2-7-0-2-1)
- R20 : 6K8 (6-8-0-1-1)
- R21 : 3K (3-0-0-1-1)
- R22 : 3K (3-0-0-1-1)
- R23 : 1K5 (1-5-2-B)

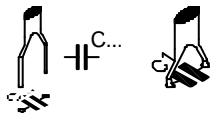
- R24 : 27K (2-7-0-2-1)
- R25 : 1K5 (1-5-2-B)
- R26 : 27K (2-7-0-2-1)
- R27 : 6K8 (6-8-0-1-1)
- R28 : 3K (3-0-0-1-1)
- R29 : 27K (2-7-0-2-1)
- R30 : 1K5 (1-5-2-B)
- R31 : 470E (4-7-1-B)
- R32 : 1K5 (1-5-2-B)

## 3. IC sockets. Watch the position of the notch!



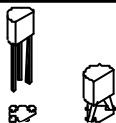
- IC1 : 28p
- IC2 : 14p

## 4. Ceramic Capacitors



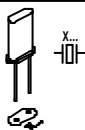
- C1 : 220nF (224, 0.22)
- C2 : 33pF (33)
- C3 : 33pF (33)
- C4 : 100nF (104, 0.1, u1)
- C6 : 100nF (104, 0.1, u1)
- C7 : 100nF (104, 0.1, u1)
- C8 : 100nF (104, 0.1, u1)
- C9 : 100nF (104, 0.1, u1)
- C10 : 100nF (104, 0.1, u1)
- C11 : 100nF (104, 0.1, u1)

### 5. Zenerdiode



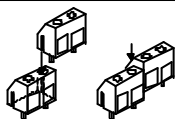
ZD1 : LM385Z

### 6. Quartz crystal



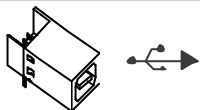
X1 : 6MHz

### 7. Screw connectors



J1 : 2P (CH1)  
 J2 : 2P (CH2)  
 J3 : 2P (CH3)  
 J4 : 2P (CH4)

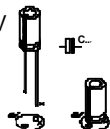
### 8. USB connector



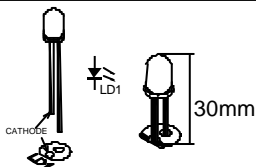
J5 : USB B90

### 9. Electrolytic capacitors. Check the polarity !

C5 : 4,7 $\mu$ F / 50V

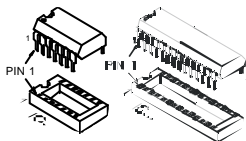


### 10. LED's. Watch the polarity!



LD1 : 3mm  
 'Red' => Recording  
 LD2 : 3mm  
 'Green' => Power ON

### 11. IC's. Watch the position of the notch!



IC1 : VK8047  
 Programmed PIC16C745-IP !  
 IC2 : TLV274IP

## 12. Software installation and test



**DO NOT CLOSE THE HOUSING YET**

**&**



**DO NOT ATTACH THE FRONT STICKER YET**

### A. Installation :

- Install the software. If the necessary software is not included or if you want to check for updates, you can always download it for free from our Velleman Website [www.velleman.be](http://www.velleman.be)
- An installation wizard will guide you through the installation procedure.
- By default the software is installed in the folder :  
'C:\Program Files\Velleman\Pc-Lab2000'



Fig 1.0



## B. Test :

- Hook-up a USB cable between a free port of your computer and the K8047 (see page 8.)
- Connect a 9V battery to one of the signal inputs (CH1, CH2, CH3 or CH4), respect the polarity (+ and -)!
- Start the PC-Lab2000 software and select the appropriate device (K8047).

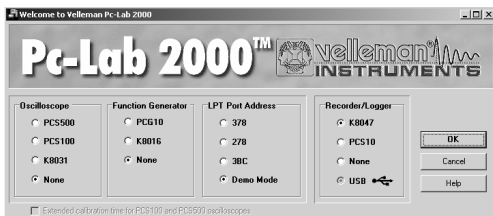

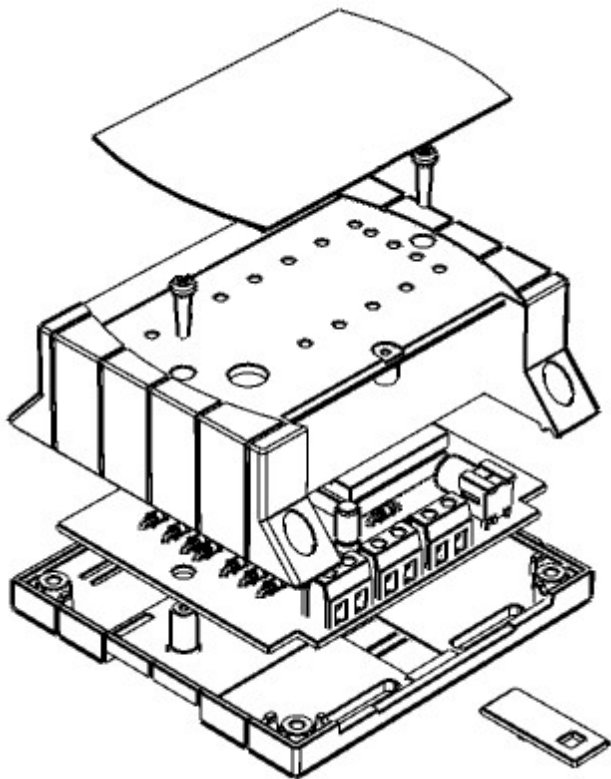


Fig 2.0

- Select 15 or 30V range.
- Press the run button.

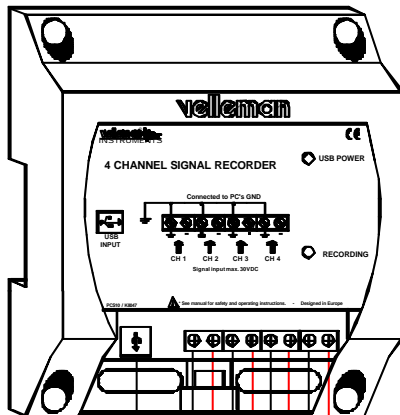
The unit is ready for use when a signal appears on the screen.

 Other information concerning this unit can be found on the CD.

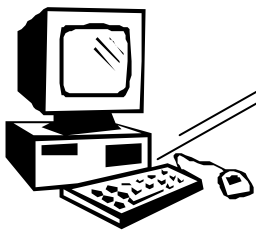
**13. Final assembly**

**You can close the housing and affix the front sticker after the final test.**

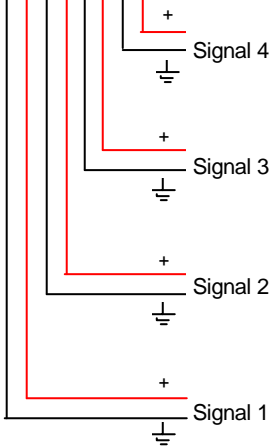
14. Connection



👉 Inspect the assembly once more

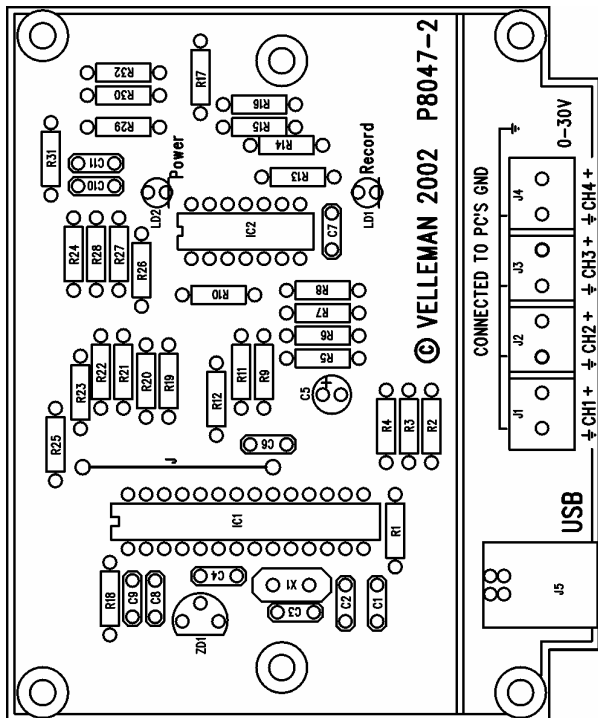


USB CABLE - A MALE TO B MALE



**PCB  
&  
DIAGRAM**

# 15. PCB layout.





Notes :

Modifications and typographical errors reserved  
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