**Soldering station**

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# Introduction

The device that was build is a soldering station. The project came from the Elektor magazine from May/June 2021. The purpose of the device is that it should heat up a soldering iron to an temperature that is put in by the user with a rotary encoder with a push button. The temperature is shown on a seven segment four digit display. The reason behind this device is that it is a fairly simple project. The device itself is a verry useful item. Almost every person in the field needs one for his/her own projects. It shows us how we can design the PCB (Printed Circuit Bord) and what the difficulties are with every step in the process. The Application Note discuss several different point for instance: The materials that where used and the used methods, the results from all the testing, a part where these results are discussed and where the points are discussed that can use improvement,…

# Material and methods

The materials used consist of a few different type of components like: resistors, inductors, capacitators, semiconductors,… . The list of used components can be found in table 1. This table is the BOM(Bill Of Materials). The PCB is split into two different PCB’s who are connected to each other by a flat cable. But there is still one BOM.

Tabel 1: BOM

|  |  |  |  |
| --- | --- | --- | --- |
| Component | Component number | Ammount | Supplier |
| SOLDERINGIRON |  |  |  |
| Bridge\_Rectifier | B1, B2 | 2 | LCSC |
| 10µf | C1, C8, C13 | 3 | LCSC |
| 100µf | C2 | 1 | LCSC |
| 4700µf | C3 | 1 | LCSC |
| 10n | C4, C5, C6, C7 | 4 | LCSC |
| 100n | C9, C10, C11, C12, C14 | 5 | LCSC |
| Zener\_Diode | D1 | 1 | LCSC |
| 1N4007 | D2 | 1 | LCSC |
| 1N4148 | D3 | 1 | LCSC |
| OKI-78SR-5/1.5-W36-C | IC1 | 1 | MOUSER |
| Dual\_Opamp | IC2 | 1 | MOUSER |
| ATMEGA4809 | IC3 | 1 | MOUSER |
| 2060-452/998-404 | K1, K2, K3, K4 | 4 | CONRAD |
| 22-28-4033 | K5, K6, K11 | 3 | / |
| M22-2510205 | K7 | 1 | / |
| 61300411121 | K8 | 1 | / |
| TSW-103-07-G-D | K9 | 1 | / |
| 5x2 box pinheader | K10 | 1 | CONRAD |
| 61300511121 | K12 | 1 | / |
| Common\_Mode\_Choke | L1 | 1 | MOUSER |
| Choke | L2 | 1 | LCSC |
| 68K | R1 | 1 | LCSC |
| 10K | R2, R18, R19 | 3 | LCSC |
| 4K7 | R3, R5, R17, R20, R21, R22 | 6 | LCSC |
| 100 ohm | R4, R9, R13 | 3 | LCSC |
| 5K6 | R6, R8, R12, R14 | 4 | LCSC |
| 18K | R7, R10, R11 | 3 | LCSC |
| 1M | R15 | 1 | LCSC |
| 10M | R16 | 1 | LCSC |
| RELAY\_GENERAL\_PURPOSE | RE1 | 1 | MOUSER |
| Transistor\_NPN | T1, T2, T5 | 3 | LCSC |
| Transistor\_PNP | T3 | 1 | LCSC |
| MOSFET\_P | T4 | 1 | LCSC |
|  |  |  |  |
| DISPLAY |  |  |  |
| 10nf | C1, C2, C3 | 3 | LCSC |
| 100nf | C4 | 1 | LCSC |
| 100µf | C5 | 1 | LCSC |
| PEC11R-4220F-S0012 | ENC1 | 1 | MOUSER |
| TM1637 | IC1 | 1 | LCSC |
| 5x2 box pinheader | K1 | 1 | CONRAD |
| CA56-12SYKWA | LD1 | 1 | GOTRON |
| 10K | R1, R2, R3 | 3 | LCSC |

The total price for all the components is 91,26 euros. We dropped the price down by ordering with a group of twenty students. By ordering in group we manly dropped the price of the shipping.

The software is published by Elektor. They wrote the code for the whole soldering iron. The soldering iron converts the input voltage to a lower voltage. The user select the wanted temperature and starts to heat the soldering iron to the selected temperature. The microcontroller uses an OPAMP to measure the temperature of the soldering iron.

# Results

[Describe the end result you accomplished.

* Describe every aspect of your device. How does it function?
* Add an image of the electrical schematic, PCB design, finalized mechanical design, and finalized product

Write a well-structured text using subtitles and paragraphs.

**+/-500**]

## Subtitle 1

### Subtitle

### Subtitle

## Subtitle 2

### Subtitle

### Subtitle

# Discussion

[Reflect on and discuss your project.

* Which difficulties did you encounter during the design process and why? How did you solve these issues?
* Reflect on the process: did things go as expected? Would you choose the same approach if you had to do the project all over again? Are there issues that still need to be fixed? How come?

**+/-300 words**]

# Reference list

[Insert your reference list here.]