

Arduino Xmas Tree

Thank you for purchasing the Elektor Arduino Xmas Tree. In this document, we will show you what's inside the kit, some LED basics and a guide for building the Tree. If you are a beginning hobbyist please follow this manual.



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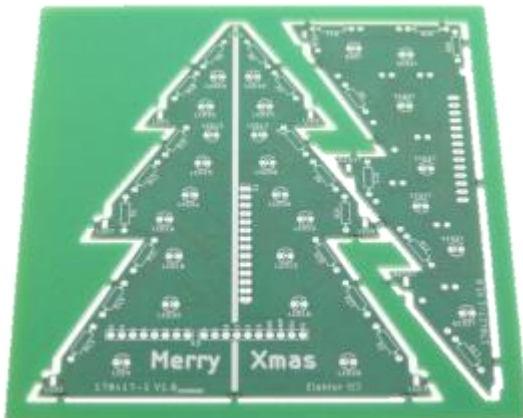
Content and Equipment

Before we start building, let us take a look at the content of the kit.

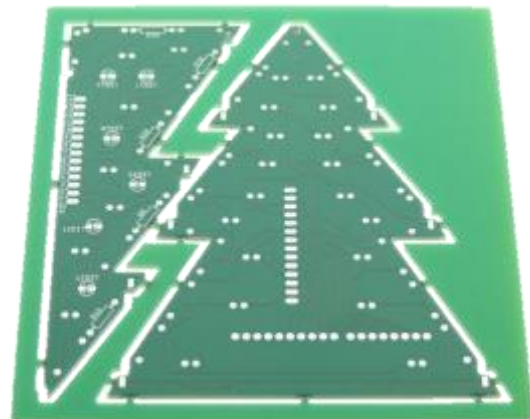
- 1x 170417-1 PCB
- 22x LED Red 3mm
- 18x LED Green 3mm
- 1x LED Yellow 5mm
- 2x Resistor 100 Ω
- 11 x Resistor 120 Ω
- 15x Resistor 220 Ω
- 40x Angled Pin Header

For building the kit we need some equipment.

- Soldering iron
- soldering tin
- Cutting tool
- Pliers



Frontside

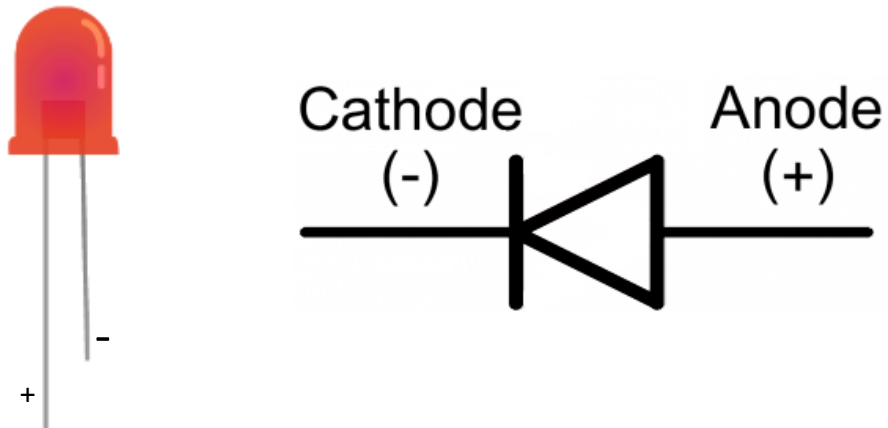


Backside

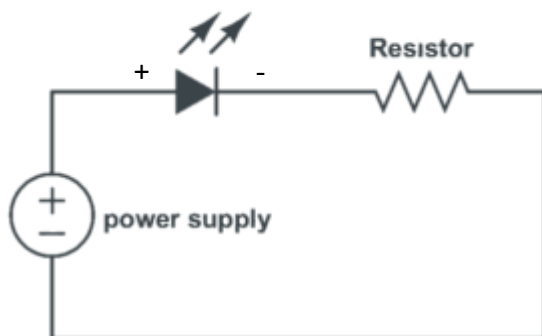
LED Basics

Here are some LED basics:

Each LED has a + and an – pin, in the picture's below you can see the difference in length of the pins and the symbol. As you can see is the long leg the Anode (+) and the short one the Cathode (-). When building, check the polarity of your LEDs. If it is reversed, they won't light up.



This schematic shows the set-up of a simple LED circuit.



Building the Xmas Tree

Step 1:

Start with breaking out the PCB.



Step 2:

Now solder the upright LED's. Be sure that the + pin of the LEDs is soldered at the front side of the PCB, while the - pin of the LED is soldered on the backside. After soldering, shorten the pins by cutting the exceeding length.

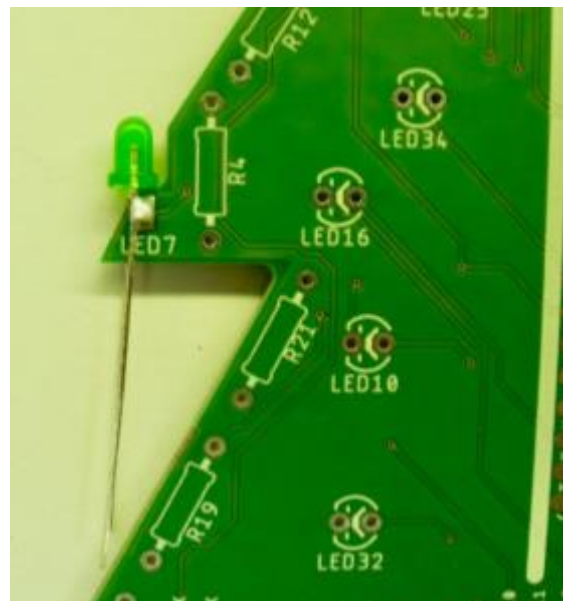
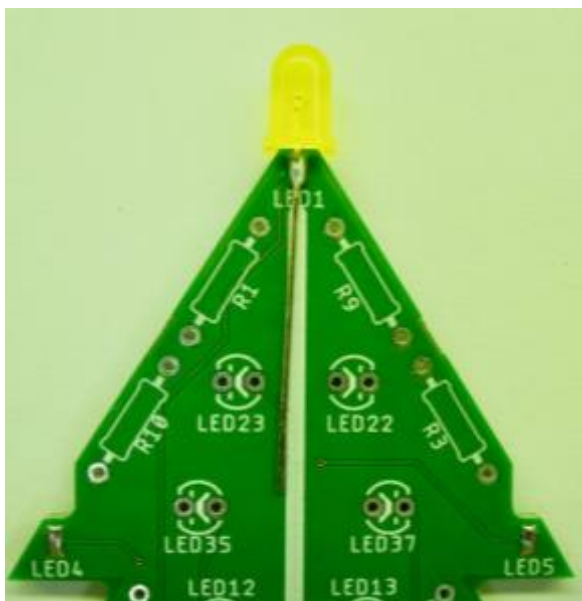
Three different colours are used:

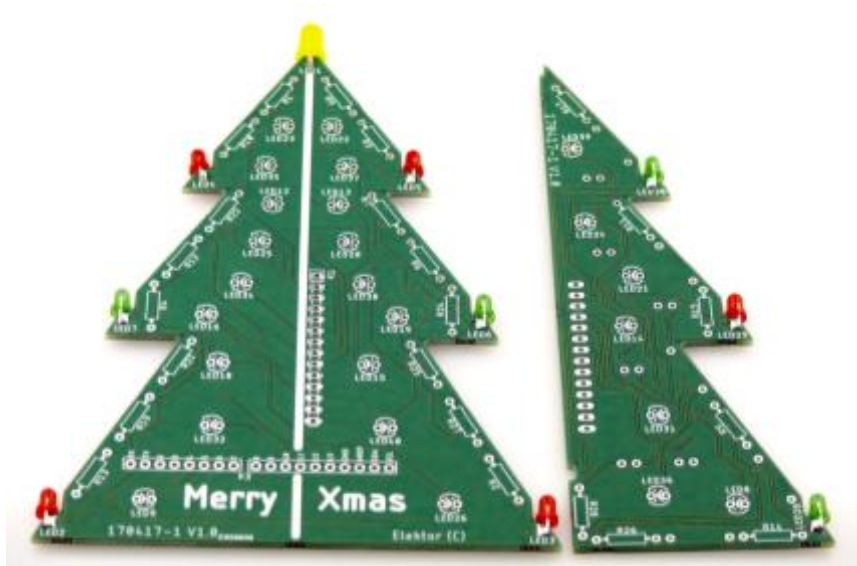
LED1 = Yellow

LED2,3,4,5,30= Red

LED6,7,28,29 = Green

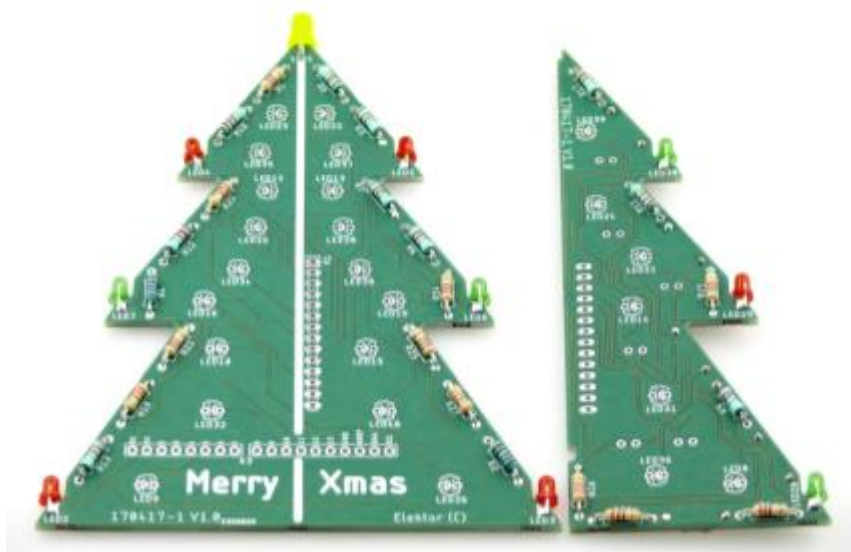
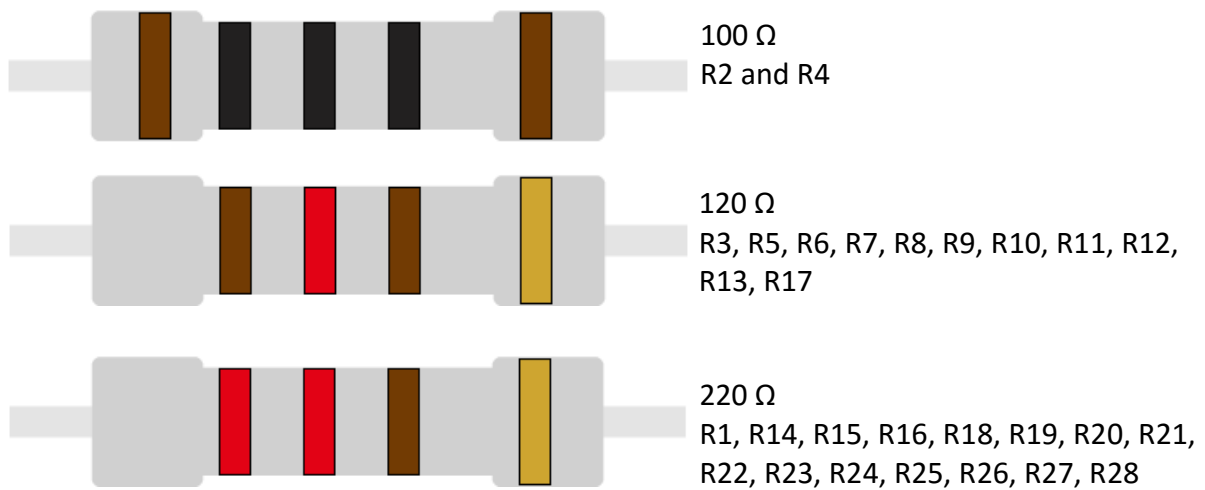
TIP: Before soldering the LEDs, put some solder on the copper pads on the front side of the PCB





Step 3:

Now solder the resistors. There are three different values.



Step 4:

Before soldering the LEDs, check their polarity. The picture below shows the correct position of a LED.



Red:

LED8, LED9, LED10, LED11, LED12, LED13, LED15, LED16, LED21, LED27, LED31, LED33, LED34, LED37, LED38, LED39, LED40

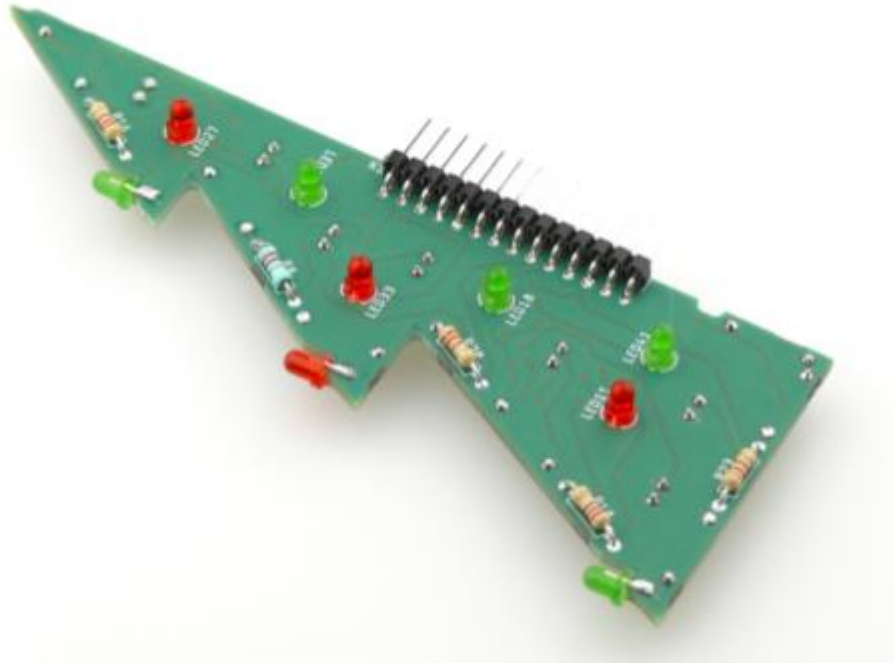
Green:

LED14, LED17, LED18, LED19, LED20, LED22, LED23, LED24, LED25, LED26, LED32, LED35, LED36, LED41



Step 5:

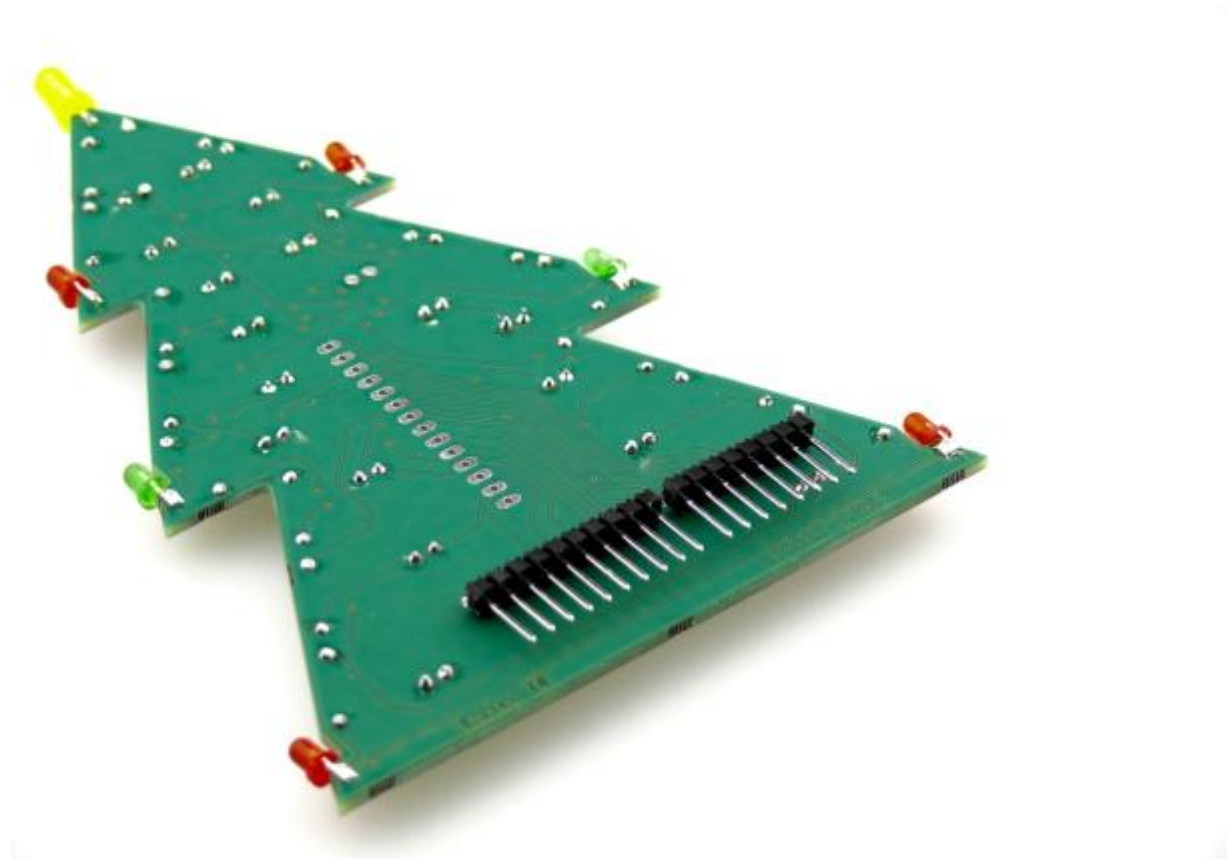
Solder K2 on the backside of the half PCB as showed on the picture.



Step 6:

Solder the Uno headers on the backside of the main PCB. Make sure you leave enough room to insert the Uno itself between the angled pins and the PCB.

Tip: Before soldering, insert the long pins of the angled headers on the Uno. Then insert the main PCB on the short pins of the angled headers. Now solder the outer 2 pins of each header. Remove the Uno and solder the remaining pins.



Step 7:

Now the PCBs come together. Place the half PCB on K1 of the main PCB and solder them. Before starting, check the perfect angle of the two PCBs. This is a precision job. After soldering the first pin, check the angle of the assembly again. Correct if necessary and proceed.



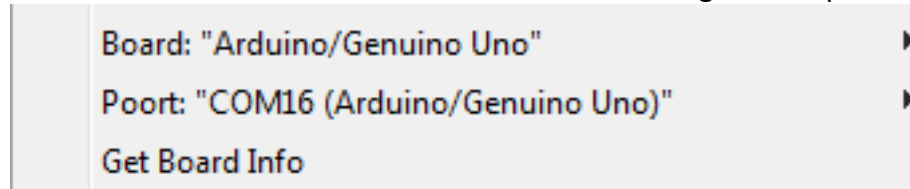
Step 8:

Connect the Arduino with your computer via the USB Cable. For programming the Uno, you need the Arduino IDE Software. Download the XmasTreeElektor Sketch from our LABS [website](#) and open it.

In case you don't have the Arduino Software, you can download it here:

<https://www.arduino.cc/en/Main/Software>

Make to select the Uno in the Arduino IDE with the right COM-port:



Upload the sketch.

To change the speed, you need to modify these parameters in the code.

```
55 delay(random(100, 500));  
56 }
```

`delay(random(1,2));`

- 1: Maximum speed: Lower this number for faster maximum blinking speed.
- 2: Minimum speed: Heighten this number for slower blinking speed.

Step 9:

Disconnect the Uno and insert the Christmas tree on the Uno. Then connect the power supply and enjoy your Xmas tree.

