Quick-Start

Christmas tree V2 DIY kit

Areas of application
The kit serves the purpose of tinkering and experimenting in the areas of education, research and teaching. It is ideal for trainees, students and hobby electronics engineers to acquire and deepen basic knowledge of electrical engineering.

Required knowledge and skills
Users should have basic knowledge of electrical engineering and how to use tools such as soldering irons. Skills in reading circuit diagrams and manual dexterity are also necessary. A certain amount of experience in dealing with electrical components and their safe handling is required. The product is not suitable for impaired users.

Operating conditions
The electrical kit is intended for use in dry, dust-free interiors. The ambient temperature should be between 15°C and 25°C to ensure optimal function and safety. A relative humidity of 20% to 60% is ideal.

Environmental conditions
The kit should not be operated in damp or heavily polluted environments. Use in potentially explosive areas is prohibited.

Intended Use
The kit is intended exclusively for setting up and commissioning the intended electrical circuits. All steps in the instructions must be followed carefully and only those components included or specified in the kit may be used.

Improper foreseeable use
The kit may not be used to build devices that will be used permanently in the home or in industrial applications. Misuse of the components, for example to build devices not intended or for use in safety-critical applications, is prohibited. Use by children without supervision is not permitted

disposal
Do not discard with household waste! Your product is according to the European one Directive on waste electrical and electronic equipment to be disposed of in an environmentally friendly manner. The valuable raw materials contained therein can be recycled become. The application of this directive contributes to environmental and health protection. Use the collection point set up by your municipality to return and Recycling of old electrical and electronic devices. WEEE Reg. No.: DE 62624346

electrostatic discharge
The kit is sensitive to electrostatic discharge (ESD), which can damage or destroy the electronic components. Please note the following safety instructions to avoid ESD hazards: Attention: Electrostatic charges on your body can damage the kit. Note: Ground yourself by wearing an anti-static wrist strap connected to a grounded surface or by touching a grounded metal surface before handling components. Caution: Use anti-static mats and bags to protect components. Note: Place the components on an anti-static work mat and store in anti-static bags when not in use. Note: A clean and grounded workplace minimizes the risk of ESD. Action: Keep your workplace clean and free of materials that can generate electrostatic charges. Make sure all surfaces used are grounded.

safety instructions
Although the kit complies with the requirements of the RoHS Directive (2011/65/EU) and does not contain any hazardous substances in quantities above the permitted limits, chemical hazards may still exist due to soldering work. Attention: Solder and flux can be harmful to health! Note: Work in well-ventilated areas and avoid breathing fumes. Attention: Danger from cleaning solutions and chemicals! Note: Use only recommended cleaning products and wear protective gloves and goggles. Attention: Danger from solder containing lead! Note: Wash your hands thoroughly after work and avoid contact with food. Although the kit complies with the requirements of the RoHS Directive (2011/65/EU) and does not contain any hazardous substances in quantities above the permitted limits, chemical hazards may still exist due to soldering work. Attention: Solder and flux can be harmful to health! Note: Work in well-ventilated areas and avoid breathing fumes. Attention: Danger from cleaning solutions and chemicals! Note: Use only recommended cleaning products and wear protective gloves and goggles. Attention: Danger from solder containing lead! Note: Wash your hands thoroughly after work and avoid contact with food. The kit contains sensitive electronic components. Improper handling or excessive pressure can result in component damage or injury. Attention: Sharp edges on components and wires! Note: Use appropriate tools and, if necessary, wear protective gloves to avoid cuts. Attention: Small parts can be swallowed! Note: Keep the kit away from small children and pets and store

small parts safely. Attention: Risk of injury from resilient components! Note: Do not apply excessive pressure to components and assemble them carefully. The kit works with electrical voltages and currents that, if used improperly, can lead to electric shocks, short circuits or fires. Please note the following safety instructions: Attention: Electrical voltage can be dangerous! Note: Never work on live parts and check whether the device is disconnected from the mains. Attention: Danger of short circuit if soldered improperly! Note: Make sure that no uninsulated wires touch each other and check your soldering carefully. Note: Look for signs of electrical damage such as smoke, unusual odors, or discoloration. Action: If such signs occur, turn off the power immediately and inspect the circuit thoroughly for errors. Attention: Soldering irons reach high temperatures! Note: Avoid skin contact with the soldering tip to prevent burns. Attention: Components may be hot after soldering! Note: After soldering, allow components to cool sufficiently before touching them. Attention: Risk of fire due to improper handling of the soldering iron! Note: Always place the soldering iron on a heat-resistant surface and turn it off after use. Attention: Some components may heat up during operation Note: Do not touch any components during operation and then allow them to cool down sufficiently

Properties

Name of the model	Christmas Tree V2
Working voltage	DC 4.0V~5.5V
Power consumption	500 mA
Service type	DC005 5.5*2.1mm socket
Size of the mould	63*61*190mm
Working temperature	-40℃~85℃

Tools required:

Soldering iron
Solder wire
Wire cutters

Component list:

No.	Description of the	Quantity
1	PCB tree A	1
2	PCB tree B	1
3	PCB socket	1
4	PCB Round A	1
5	PCB Round B	1
6	R 100 Ohm	7
7	R 47K Ohm	9
8	R 30K Ohm	1
9	R 100K Ohm	1
10	5mm LED blue	18
11	3mm LED RGB flashing	37
12	CP 22uF 25V	9
13	Transistor S9014	6
14	Transistor S8050	1
15	Switches	1
16	LM358	1
17	Potentiometer 20K Ohm	1
18	IC socket for LM358	1
19	DC mains connection	1
20	Spacer hexagonal M3 25mm	4
21	Spacer hexagonal M3 10mm	4

22	Screw M3 8mm	2
23	Screw M3 10mm	3
24	Screw M3 6mm	12
25	Nut M3	4
26	USB-DC cable	1
27	Spring	2
28	Engine	1

Installation steps :

Before you start, please note the following instructions:

- Avoid prolonged contact (over 1.0 second) of the soldering iron with the components to prevent damage.
- Be sure to distinguish between the positive and negative sides of the components.
- Any short circuit must be strictly avoided during installation.
- Make sure that the LEDs are installed according to the specified rules to ensure proper lighting, as incorrect placement can result in some LEDs not lighting up.
- Ensure that all components are correctly aligned and fitted in the intended positions.

Step 1 :

Unpack the kit and compare the quantities with the parts list.
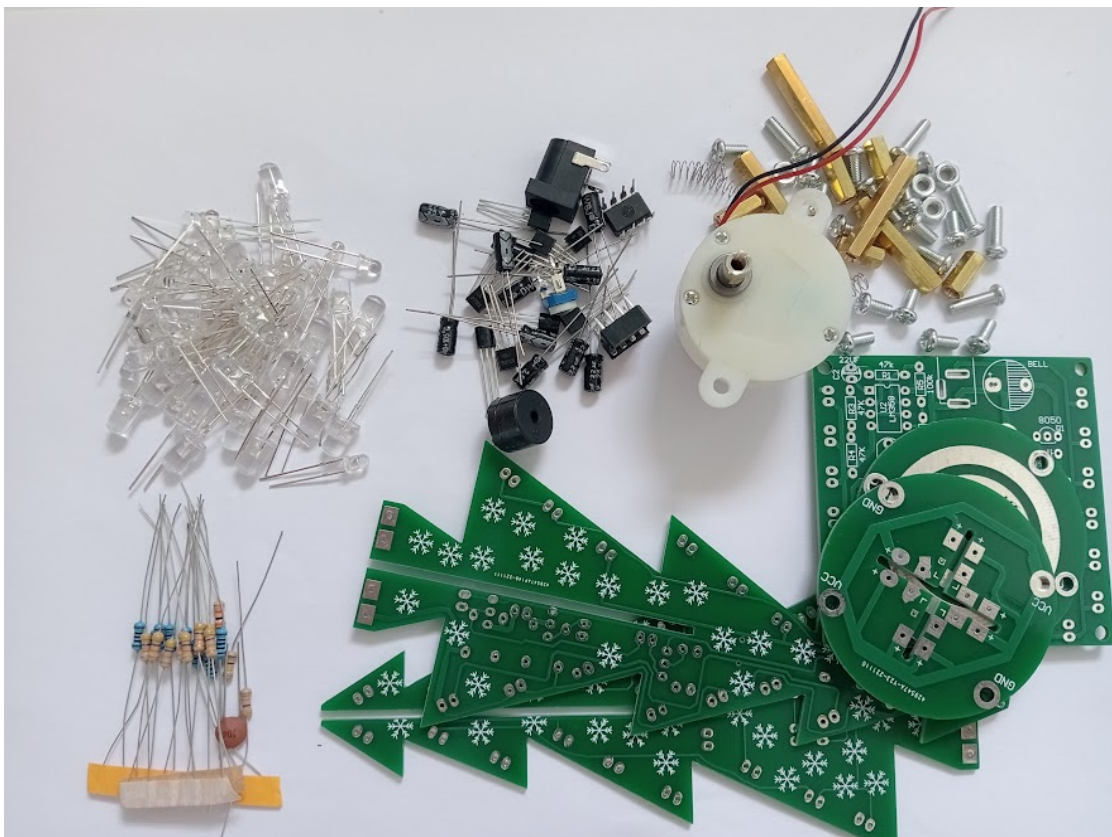
Step 2 :

Solder and install the resistors. You will need the resistors: 100K, 30K and 3x 47K Ohm. Please pay attention to the labelling on the circuit board.
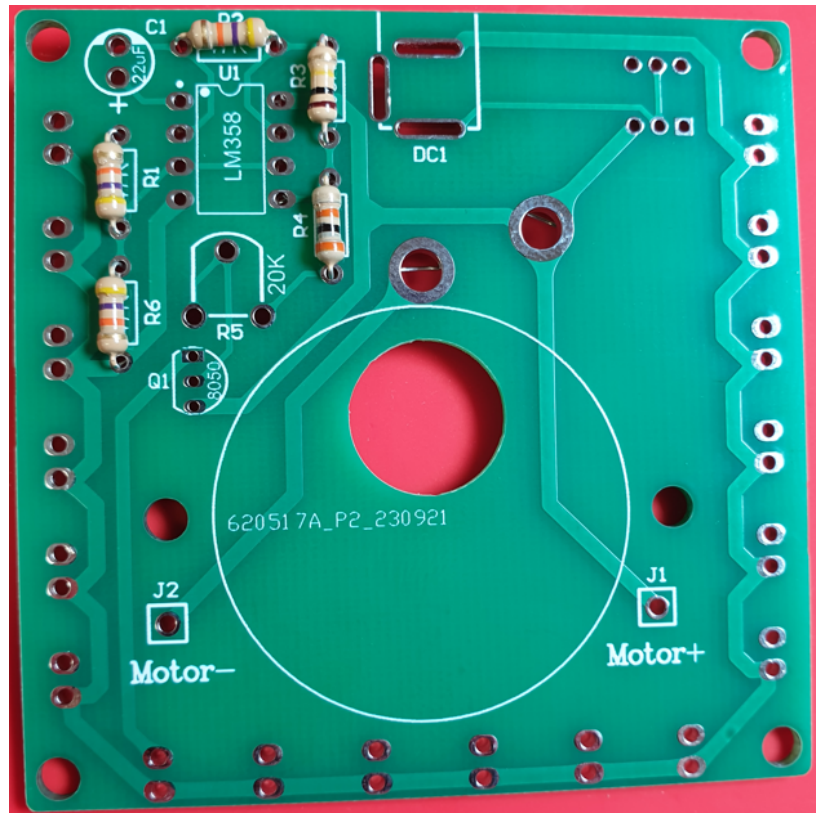
Step 3 :

Solder the IC socket, the S8050 transistor, the potentiometer, the capacitor (please pay attention to the polarity of the capacitor) and the DC power supply socket. Start with the smallest components, followed by the next largest. Now the LM358 can be plugged into the socket, paying attention to the point on the circuit board that indicates Pin 1.
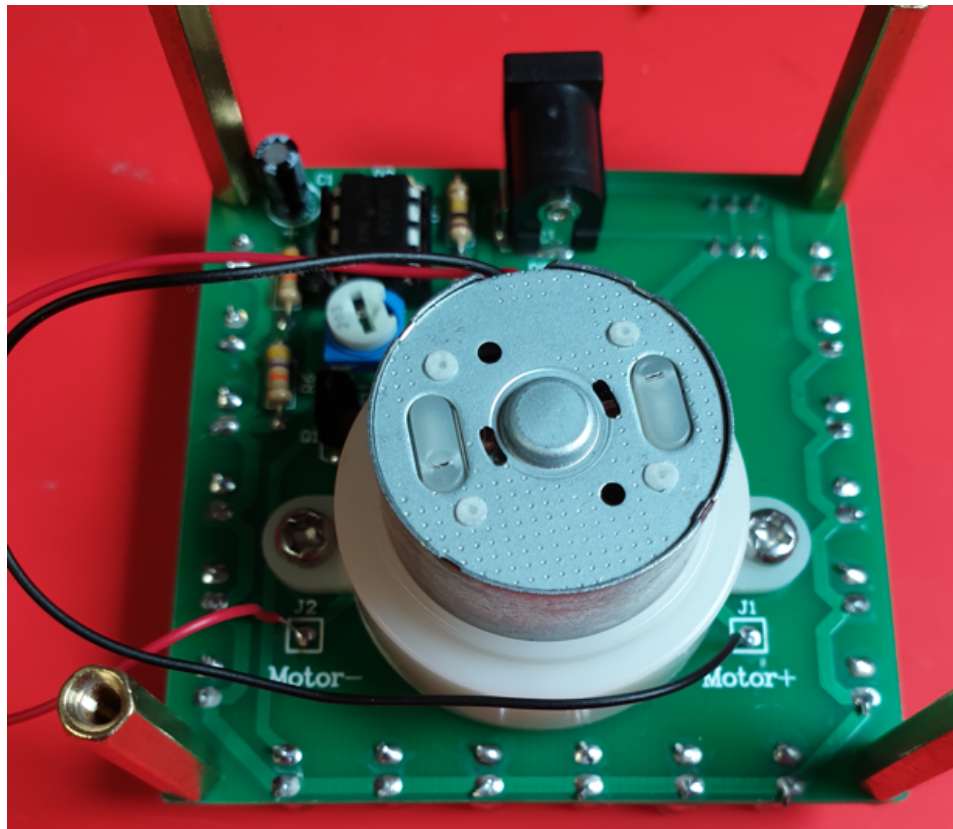

Positive

Negative
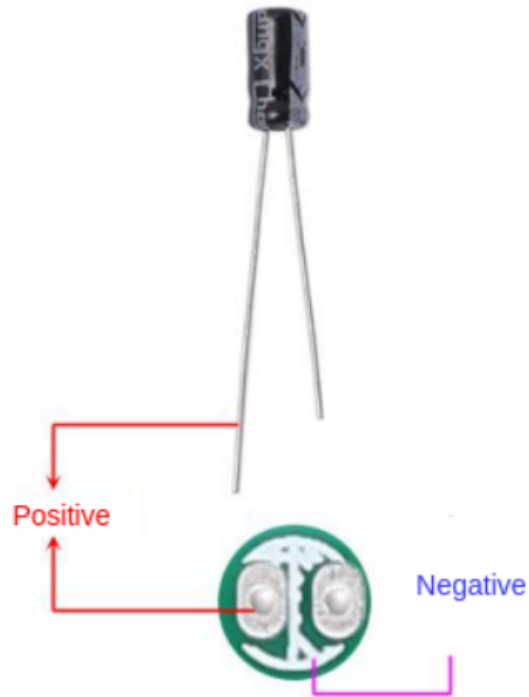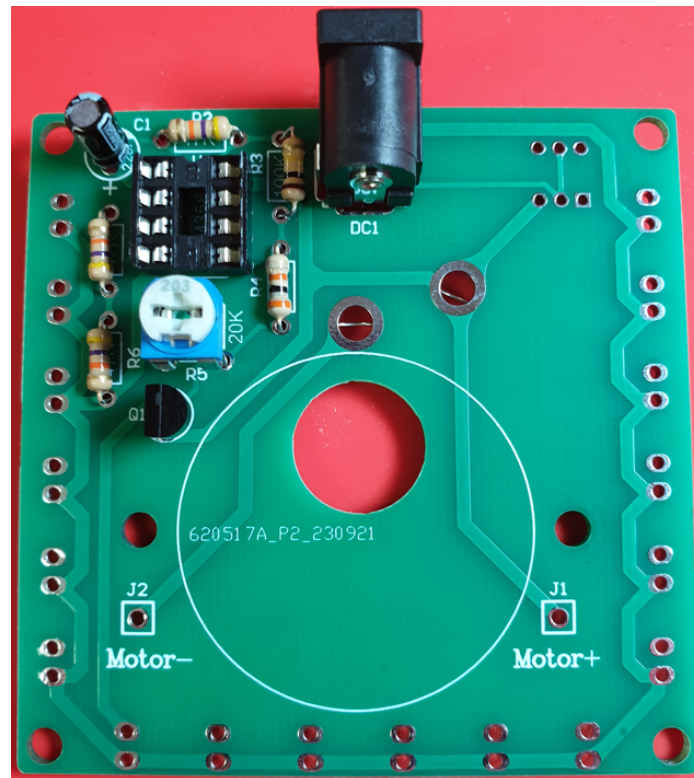
Step 4 :

Solder in the 5mm LEDs. Followed by the switch
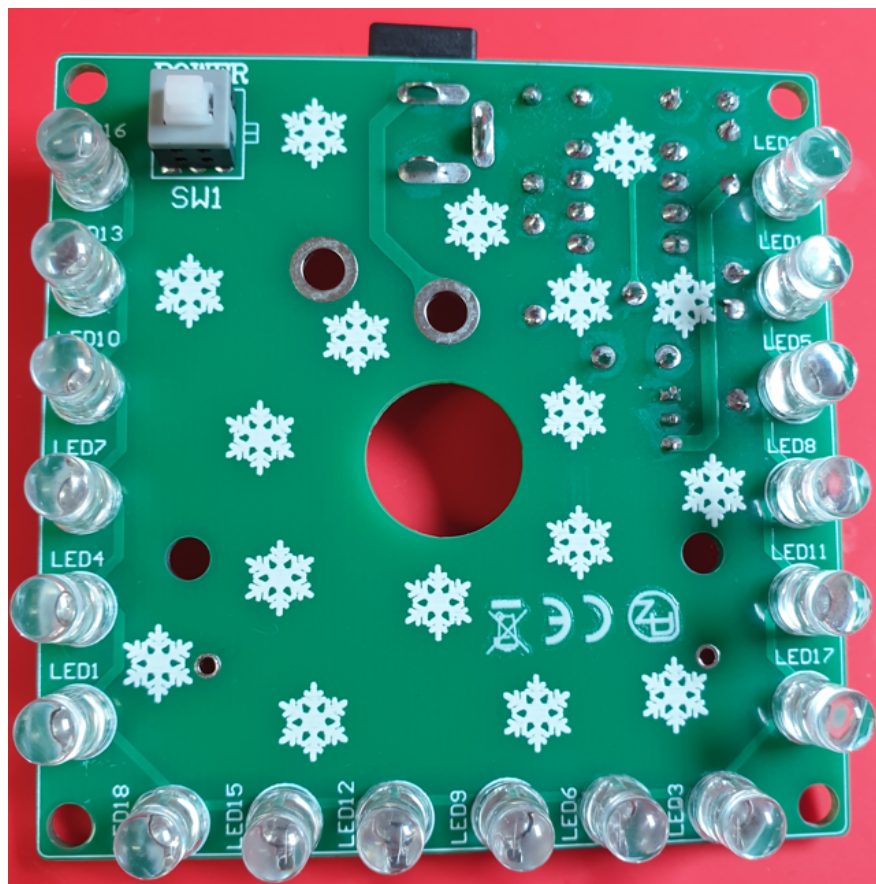
Step 5 :

Install the DC motor and fasten the motor with 2 M3+6mm screws and 2 M3 nuts. Solder the red cable to "Motor+" and the black cable to "Motor-". You can attach the long spacers at this point.

Note: If you swap the cables, the tree will rotate in the opposite direction.

Step 6:

Install the 10 mm screws. Insert the springs, these serve as sliding contacts.
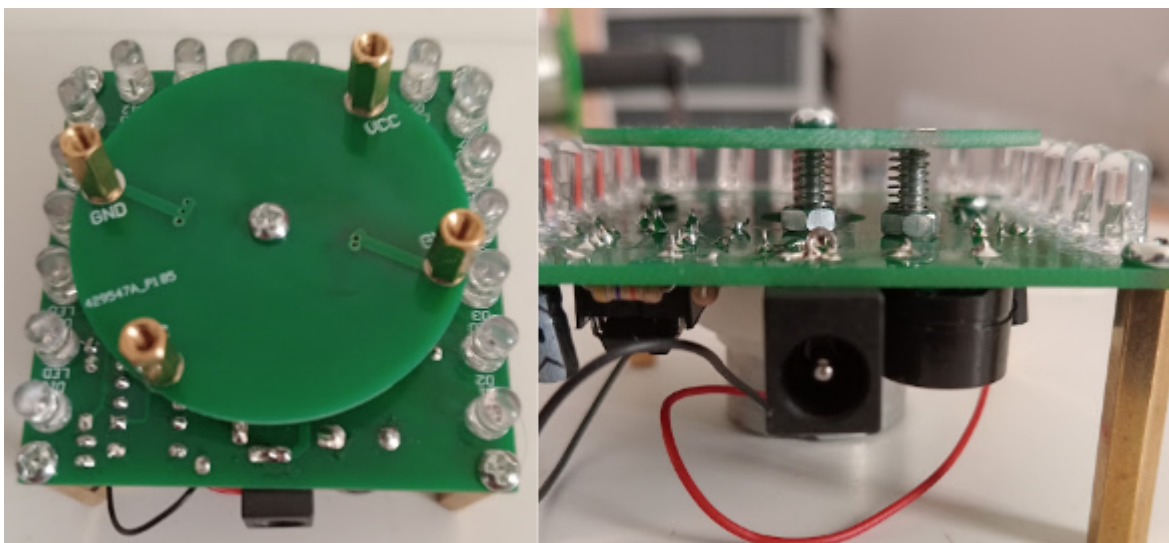
Step 7:

Install 4 pieces of M3+10mm copper pillar and 4 pieces of M3 6mm screw on the bottom round PCB which has two rings.

Step 8:

Fasten the lower circuit board to the motor shaft with an M3 screw (10 mm).
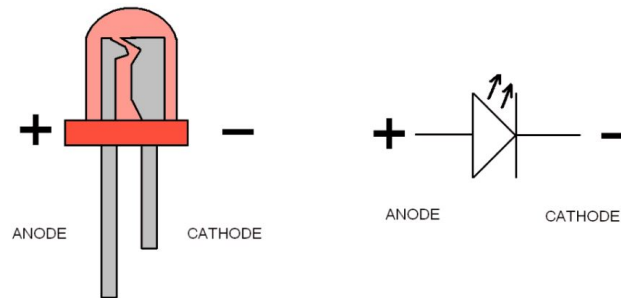
Step 9:

Now let's prepare the upper part:

Solder in the resistors, paying attention to the labelling on the circuit board.

Step 10:

Next up are the 3mm RGB LEDs. Pay attention to the LED marking, the longer pin is inserted into the positive pole pad.

Step 11 :

Next, solder in the 9014 transistors, followed by the capacitors. Please also pay attention to the labelling on the circuit board here

Step 12 :

Now solder the second tree board together using the same procedure.
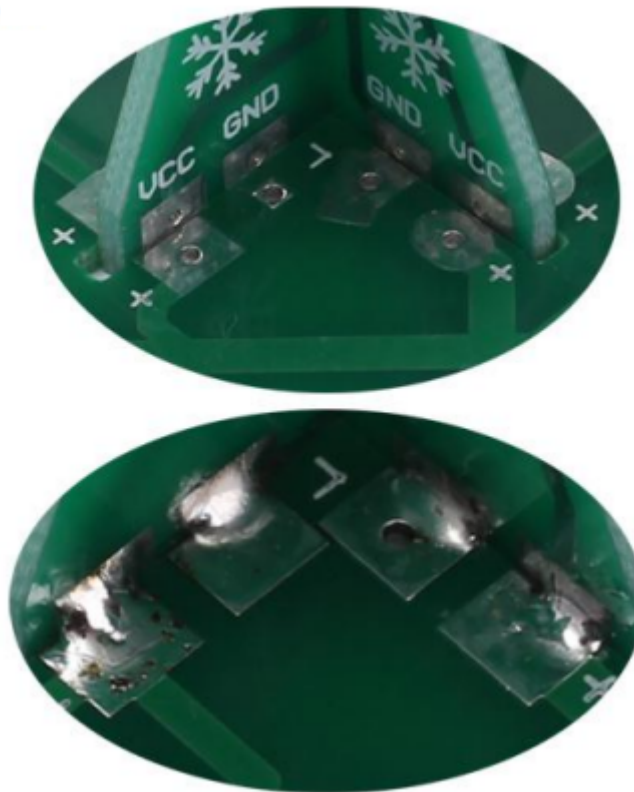
Step 13:

Plug the two circuit boards together as shown in the picture.

Step 14 :

Adjust the height and position together with the motherboard and make sure they fit correctly. 3 pieces are then attached by soldering 16 pads.

Step 15:

Attach the upper round PCB with the tree to the lower round PCB using 4 M3 6mm screws and make sure that VCC and GND match on both round PCBs.

Step 16 :

Connect the device via USB using the cable supplied and enjoy the effect.

You've done it, you can now use your module for your projects :)

Now it's time to learn and create the projects yourself. You can do this with the help of many example scripts and other instructions that you can find on the Internet.

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Have fun!

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