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› iCubeSmart 3D8P LED Cube DIY Electronic Kit, Soldering Practice Kit

iCubeSmart 3D8P-MULTI-JP

iCubeSmart 3D8P LED Cube DIY Kit Instruction Manual

Model: 3D8P-MULTI-JP

1. INTRODUCTION

The iCubeSmart 3D8P LED Cube is a do-it-yourself electronic kit designed for enthusiasts to assemble a stunning 3D LED display. This kit requires soldering and basic electronics knowledge. Once assembled, the cube can display a variety of pre-programmed dynamic animation effects, offering an engaging visual experience.

The main board is pre-tested and comes with over 20 built-in animation effects. Users will primarily focus on soldering the LED components and assembling the cube structure.

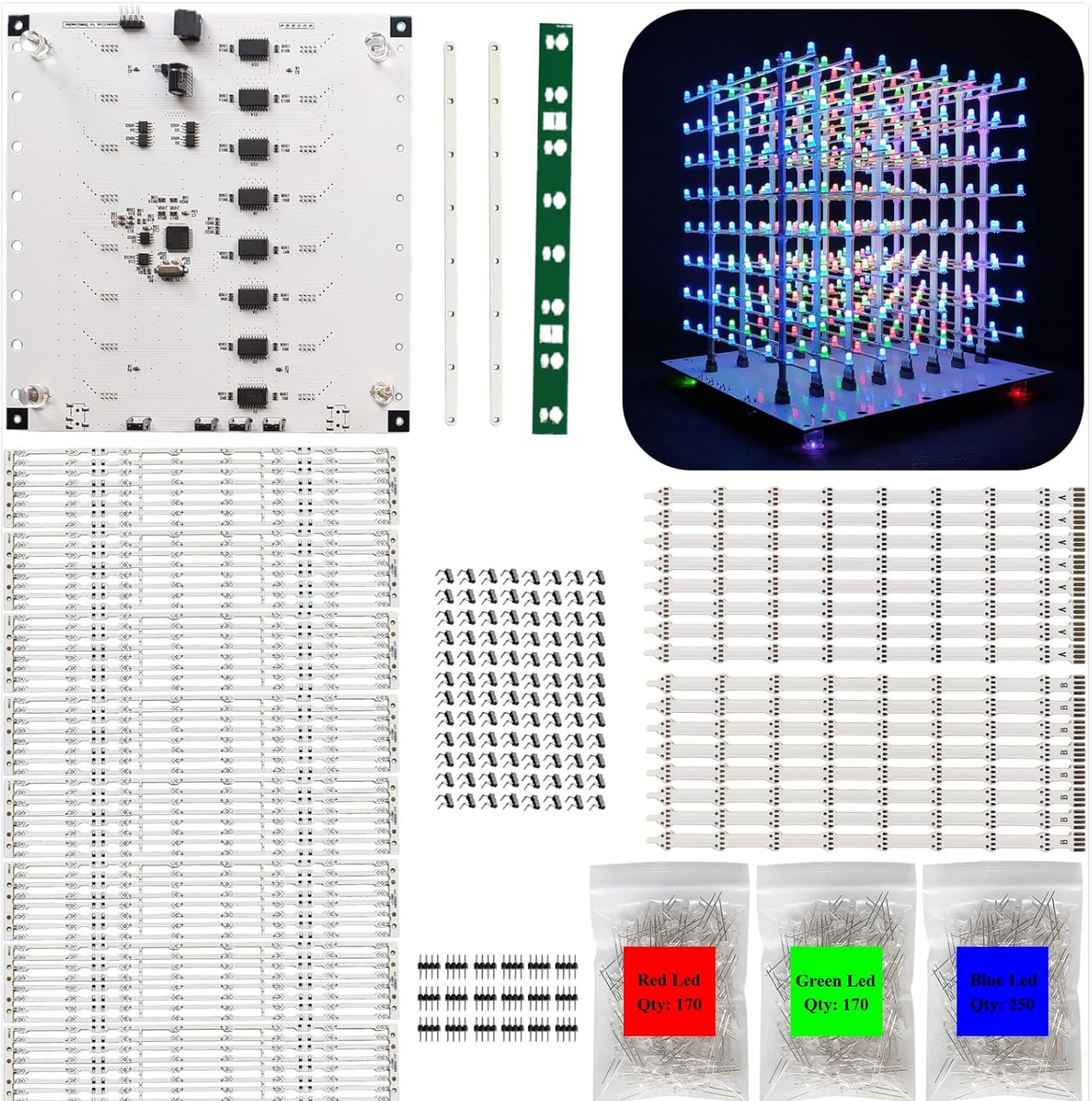


Image: Overview of the iCubeSmart 3D8P LED Cube kit, showing the main board, LED strips, individual LEDs, and the fully assembled cube displaying colorful patterns.

2. PACKAGE CONTENTS

Please verify that all the following components are included in your package before beginning assembly:

- 1 x Tested Main Board (pre-soldered)
- 64 x LED Lamp Bead PCBs
- 16 x Corresponding PCBs
- 128 x 2P Pin Headers
- 16 x 8P Pin Headers
- 1 x LED Soldering Bracket
- 2 x Lamp Anchor Brackets
- 250 x Blue LEDs (224 used, spares included)

- 170 x Green LEDs (144 used, spares included)
- 250 x Red LEDs (224 used, spares included)
- 1 x Program Downloader + DuPont Line
- 1 x Power Cord (USB)
- 1 x Instruction Manual (paper)

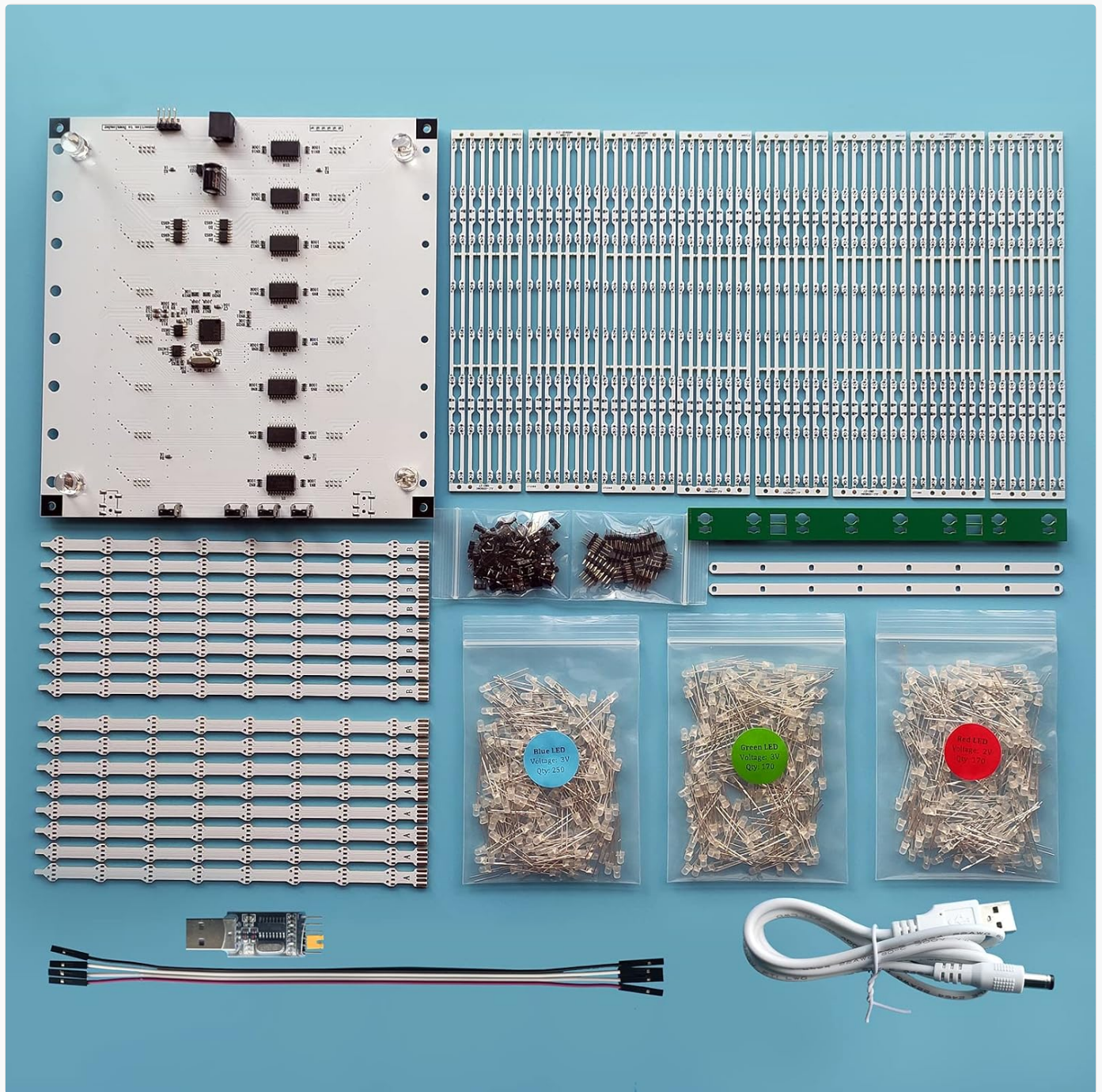


Image: All individual components of the iCubeSmart 3D8P LED Cube kit, including the main board, various PCBs, pin headers, and bags of red, green, and blue LEDs.



Image: A closer view of some of the smaller components, including different types of PCBs and bags of pin headers, essential for the cube's construction.

3. SPECIFICATIONS

Component	Specification
Microcontroller	STC12C5A60S2
Driver Chip	74HC573 + APM4953
LED Configuration	8x8x8 LED Matrix (144 Red, 144 Green, 224 Blue LEDs used)
Power Supply	5V USB
Finished Product Dimensions	18 cm (L) x 18.5 cm (W) x 19 cm (H)

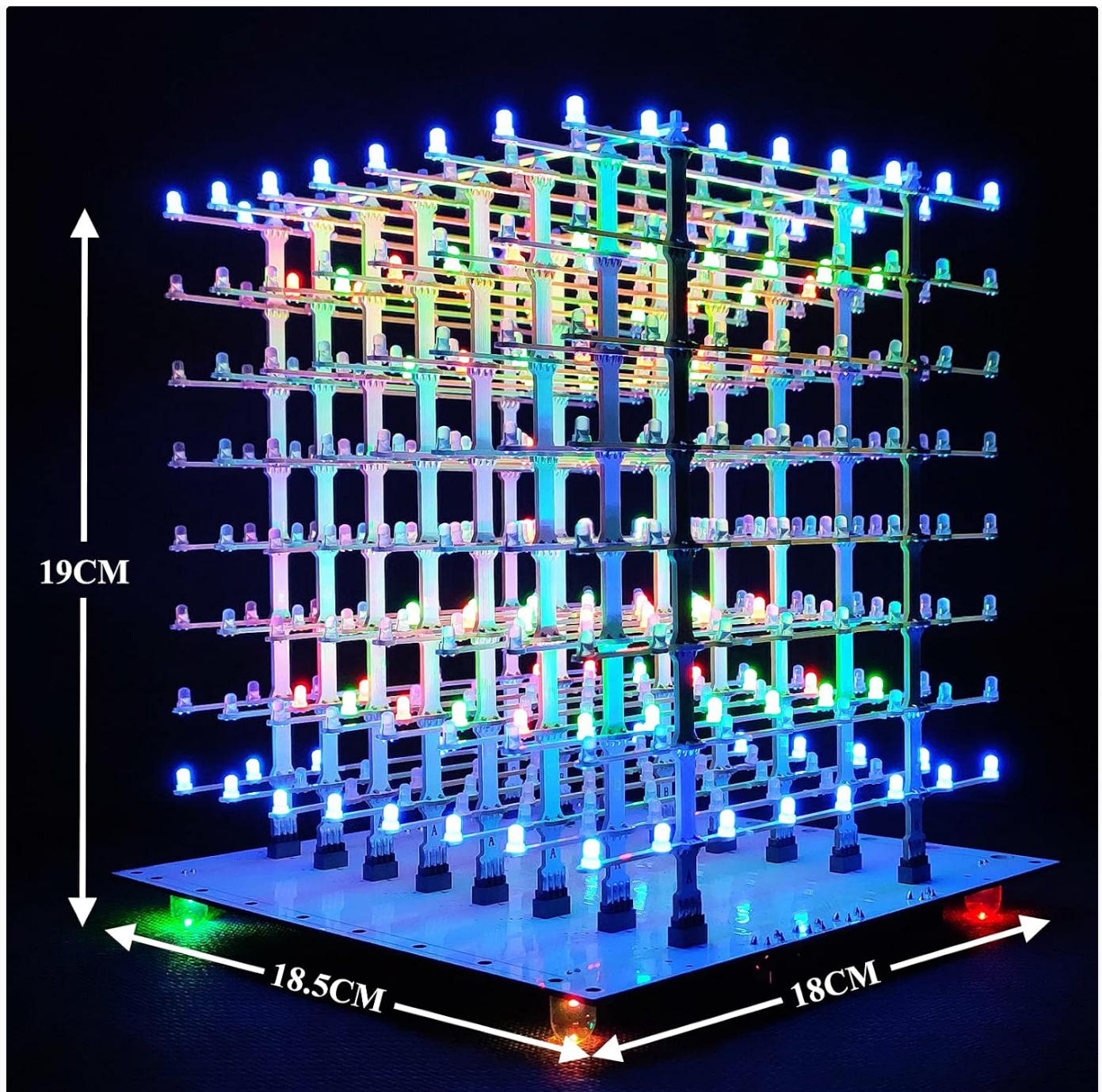


Image: Visual representation of the assembled LED cube with its dimensions clearly marked: 18 cm in length, 18.5 cm in width, and 19 cm in height.

4. ASSEMBLY INSTRUCTIONS (SETUP)

This kit requires users to perform soldering. It is essential to have basic electronics knowledge and soldering skills, along with necessary tools such as a soldering iron, solder wire, and other soldering accessories. The main board is pre-soldered and tested, so your primary task will be soldering the LEDs and PCB brackets.

General Soldering Tips:

- Ensure your soldering iron tip is clean and properly tinned.
- Apply heat to both the component lead and the PCB pad simultaneously.
- Apply a small amount of solder to the heated joint, allowing it to flow smoothly.
- Remove the solder and then the iron. A good solder joint should be shiny and cone-shaped.
- Avoid overheating components.

Assembly Steps Overview:

Refer to the detailed paper instruction manual included in your kit for comprehensive, step-by-step guidance. The following images provide a visual overview of key assembly stages:

DIY Manual for 3D8P Led Cube

Dear friends, thank you for choosing our electronic DIY suite! Please assemble it step by step as instructed below. During installation, if you have any question, or lose or damage any part, contact us directly!

E-mail address: icubeSmart@gmail.com

Before installation, please pay attention to such considerations as follows:

1. Never use battery or power supply to test LED directly. Otherwise, it will burn out directly because the voltage is 2V for the red LED.
2. During welding, ground the soldering iron as reliably as possible to avoid LED burnout due to leakage of the soldering iron.
3. If doubtful, please email us. Our professional technicians will answer your question about installation. We provide lifelong technical support services for DIY products.
4. There is a link to the Google disk available on the page for our product description. The data package includes the installation video, high-definition pictures and 3D software, etc. Moreover, you can also email us to get the latest electronic material.

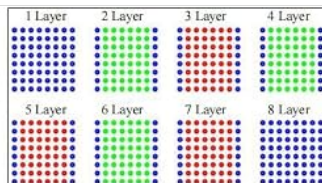
The suite contains such accessories as follows:

Welded and tested masterboard	x 1
LED lamp bead PCB	X64
Support PCB	X16
2P pin header	x 128
8P pin header + 8P socket	x 16
LED welding bracket (Green PCB)	x 1
Lamp anchor bracket	x 2
Usb Program downloader + DuPont line	x 1
USB-DC Cable	x 1
One Color Version: One color LED x580 (Used 512)	
Multi-Color Versions: Red LED x170 (only 144 used) Green LED x170 (only 144 used) Blue LED x250 (only 224 used)	

The LEDs are arranged as follows:

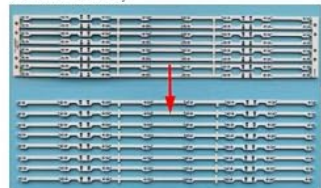
One color version: For a light cube all decorated with one color LED, the eight pieces of light strips are all one color, subject to no any sequential order.

Multi version: For a light cube decorated with red, green and blue LEDs, we suggest you weld 2 pieces of light strips with 64 blue LEDs, 3 pieces with 16 blue LEDs on both sides and 48 red LEDs in the middle, and 3 pieces with 16 blue LEDs on both sides and 48 green LEDs in the middle, as shown in the figure below. After welded, the light cube will have pure blue lights on four sides, which will have the text become much clearer when the lights are moving around.



The DIY installation is detailed as follows:

Step 1. As shown in the figure below, connect the LED lamp beads on the PCB board and divide the board into PCB strips, uses 64 PCB strips only in the LED cube and let others standby.



Step 2. Identify the LED installation site.

Each LED has two pins – anode (the longer pin) and cathode (the shorter pin); The longer LED pin corresponding to the symbol + on the PCB strip.



For the one color version, the 8 LEDs are identical in color, 8 LED lamp beads are welded onto the PCB board and weld 64 PCB strips.

For the multi version:
Part 1: As shown in the figure below, 6 red LEDs are used in the box, 2 blue LEDs are used on both sides, and weld 24 PCB strips.

Part 2: Use 6 green LEDs in the box, install 2 blue LEDs on both sides, and weld 24 PCB strips.

Part 3: Use 8 blue LEDs and weld 16 PCB strips.

In all, weld 64 PCB strips.



Step 3. Weld the LED lamp bead PCB.

As mentioned above, first identify the LED sites and number, then force 8 LEDs through the lamp bead PCB, and then put the lamp bead PCB as a whole into the 8 holes of the LED welding bracket, as shown in the figure below.

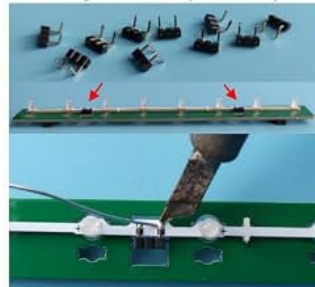
Then weld the LED.



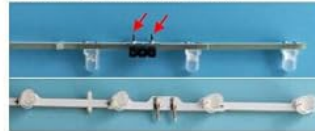
Cut off the excessive LED pins after welding.



As shown in the figure below, install the 2Pin header in the two holes on the lamp bead PCB, then place the PCB on the welding bracket and finally weld the two pins.



After welding, cut off the excessive pins on the back of the PCB, unplug the black caps on the 2P pin header and then this lamp bead PCB has been welded.



Step 4. According to the steps 2-3, the one color version has 64 lamp bead PCB strips welded.



Multi version has 6 blue lamp bead PCB strips welded as well as 24 PCB strips (6 red beads in the middle and 2 blue beads on both sides) and 24 PCB strips (6 green beads in the middle and 2 blue beads on both sides).

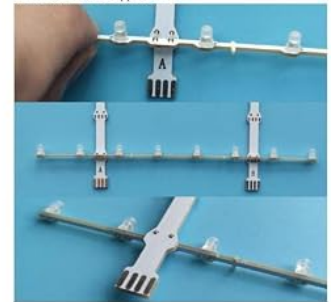


Step 5. Weld the support PCB.

There are two types of support PCBs, marked with A and B respectively on each side. As shown in the figure below, put the one marked with A on the left and B on the right.



Then insert the two pins on the lamp bead PCB into the two holes on the support PCB.



Insert 8 lamp bead PCB strips on the two supporting PCBs to form a complete LED light strip. Weld the two light strips with its 8 LEDs all blue, then weld the three light strips with its 8 LEDs all blue red and finally weld the three light strips with its 8 LEDs all blue green.



Weld the 4 joints where the lamp bead PCB is connected with the support PCB.



Weld the 16 joints where the lamp bead PCB is connected with the support PCB.



Then install the 8-pin header on the supporting PCB. Note: The metal pins are different in length on both sides of the black caps on the 8-pin header and the shorter side is installed on the PCB.



Later, weld both sides of the 8-pin header and the pins of the 2-pin header on the back of the PCB.



So far, a complete light strip has already been welded. After the 8 pieces of LED strips are welded, the whole 3d8p LED cube has come into being.

One color version: Weld 8 pieces of light strips with one color LEDs.



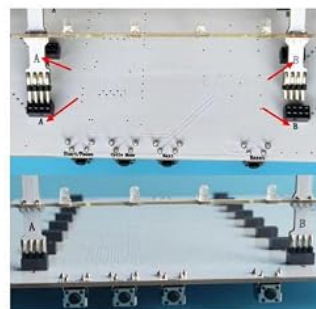
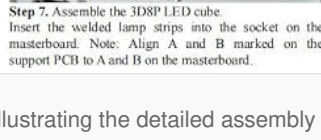
Multi version: Weld 2 pieces of light strips with 64 blue LEDs, 3 pieces with 16 blue LEDs on both sides and 48 red LEDs in the middle, and 3 pieces with 16 blue LEDs on both sides and 48 green LEDs in the middle.



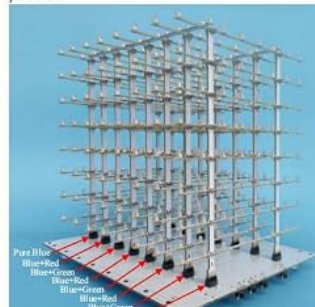
Step 6: Put 16 8P socket on the corresponding positions of the motherboard and solder them.



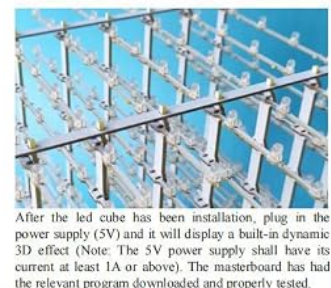
Step 7. Assemble the 3D8P LED cube. Insert the welded lamp strips into the socket on the motherboard. Note: Align A and B marked on the support PCB to A and B on the motherboard.



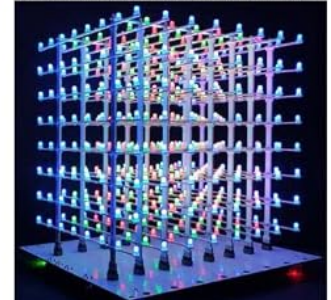
For a light cube with three colors combined, the first LED strip facing the arrow is pure blue, then blue green, blue red, blue green, blue red, blue green, blue red and pure blue.



Step 8. Insert all 8 LED light strips into the sockets on the motherboard and then install the two light anchor on the bracket in place.



After the led cube has been installation, plug in the power supply (5V) and it will display a built-in dynamic 3D effect (Note: The 5V power supply shall have its current at least 1A or above). The masterboard has had the relevant program downloaded and properly tested.



The Button functions are defined as follows:



1. Start / Pause: Start / Pause the dynamic effect
 2. Cycle Mode: Single dynamic / Full dynamic cycle
 3. Next: Next dynamic effect
 4. Reset: Reset to the first dynamic effect
- Now, that's all for installation. Please email us if you have any question during installation. If you are satisfied with our products, please give favorable comment on Amazon. We also have many other electronic DIY packages. If you like, search our brand name on Amazon and you can find them. Thank you very much!

Image: A comprehensive diagram illustrating the detailed assembly process, from soldering individual LEDs onto strips to connecting layers and mounting them onto the main board.

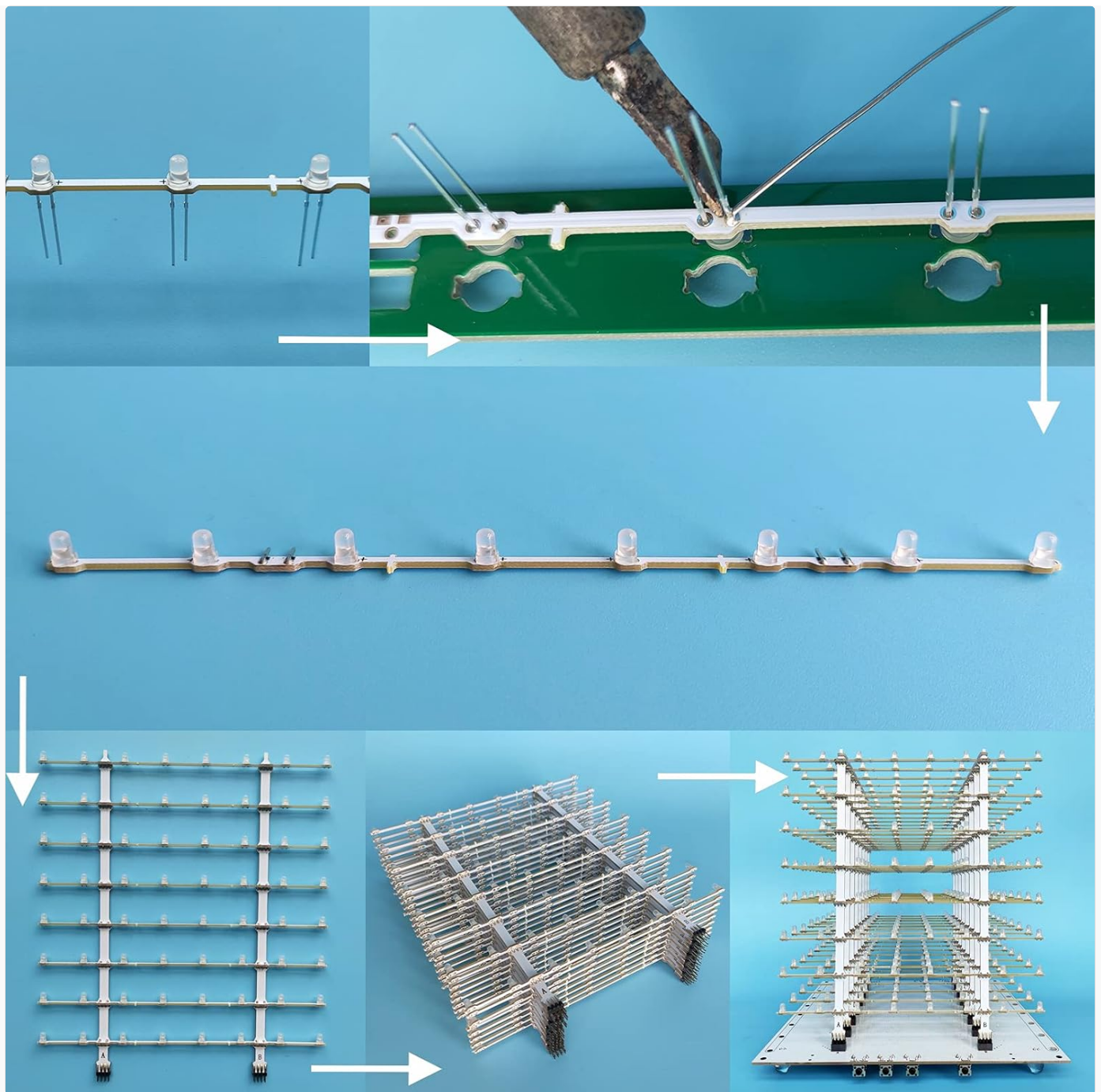


Image: A close-up view demonstrating the soldering process of LED components onto a PCB strip, highlighting the precision required for proper connections.

Key Steps:

1. **Prepare LED Strips:** Solder the individual LEDs onto the narrow PCB strips. Pay attention to LED polarity (long pin is positive, short pin is negative).
2. **Assemble Layers:** Connect the horizontal LED strips with the vertical PCB boards to form 8x8 LED layers.
3. **Create the Cube Structure:** Stack and solder the completed LED layers together to form the 3D cube.
4. **Mount to Main Board:** Carefully align and solder the completed LED cube structure onto the pre-tested main board.
5. **Final Connections:** Ensure all connections are secure and free of solder bridges.

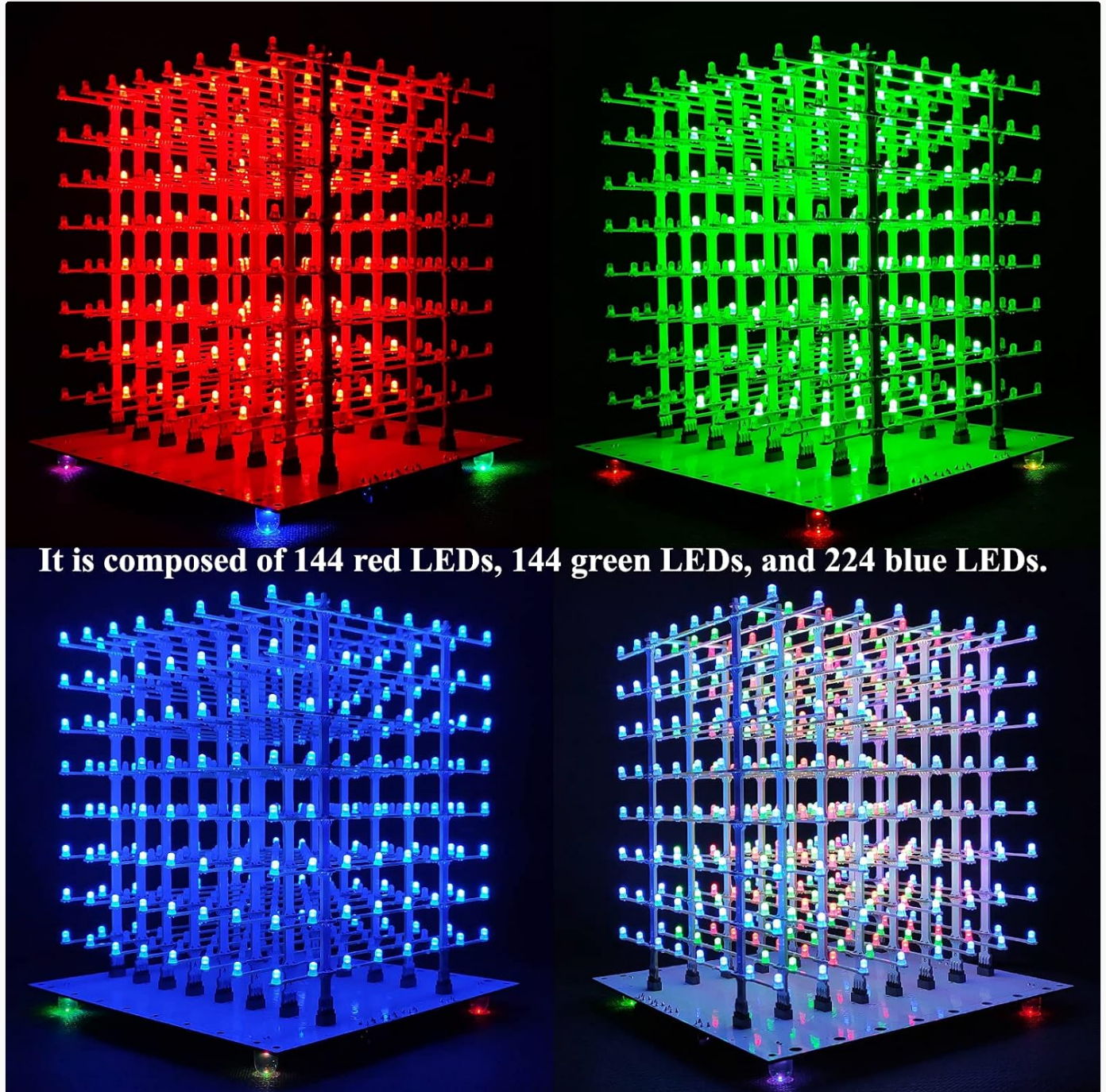
5. OPERATING INSTRUCTIONS

Once assembly is complete, connect the provided USB power cord to the main board and a 5V USB power source. The LED cube will automatically power on and begin displaying its pre-programmed animation effects.

Controlling Animation Effects:

The main board features four buttons to control the dynamic display effects:

- **Button 1 (Start/Pause):** Press to start or pause the current dynamic effect.
- **Button 2 (Cycle Mode):** Press to switch between single dynamic effect mode and continuous cycle mode.
- **Button 3 (Next Effect):** Press to advance to the next animation effect.
- **Button 4 (Reset):** Press to reset the cube to its initial state or default animation.

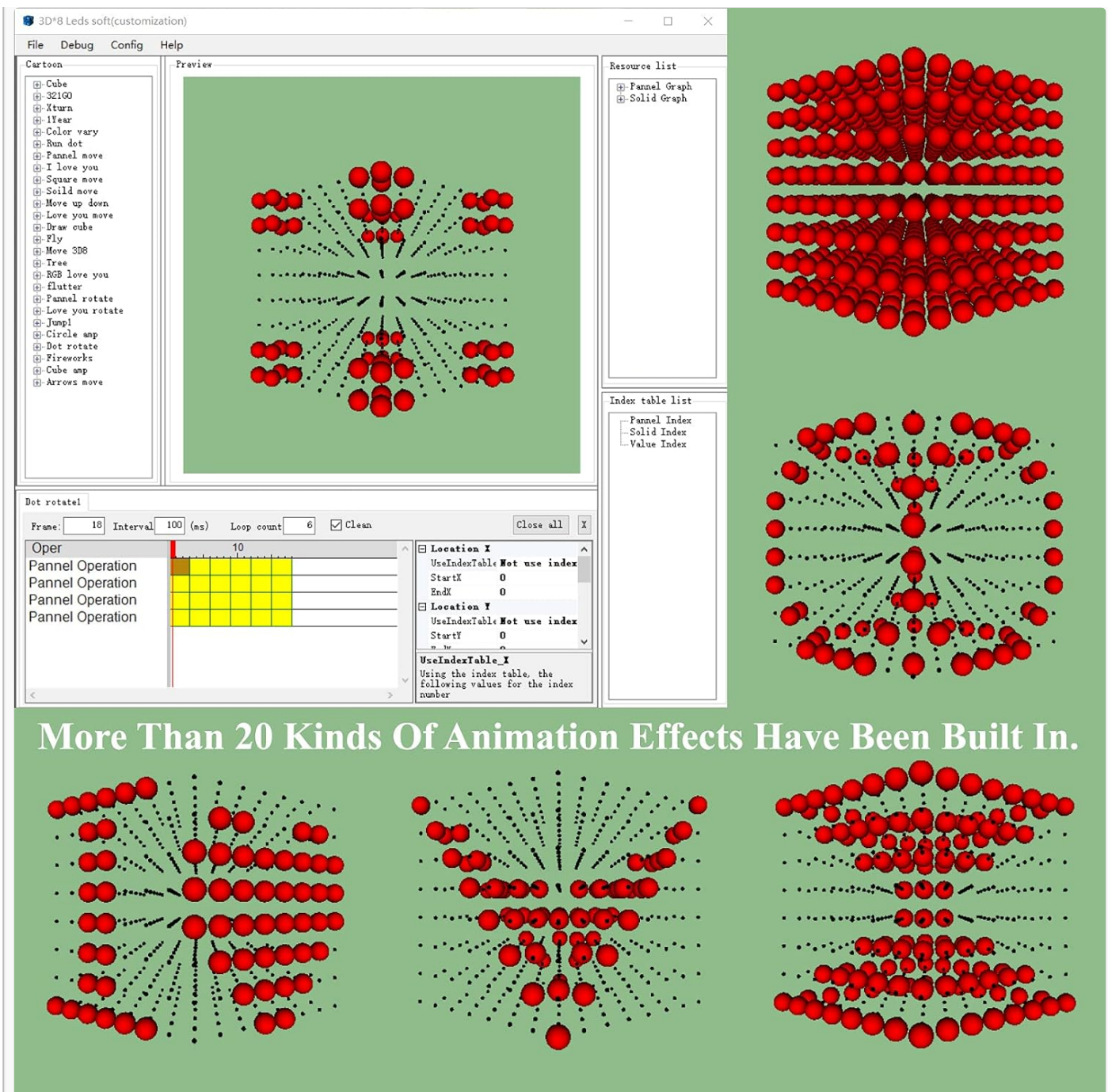


It is composed of 144 red LEDs, 144 green LEDs, and 224 blue LEDs.

Image: The iCubeSmart 3D8P LED Cube showcasing its ability to display vibrant patterns in single colors (red, green, blue) and a dynamic multi-color combination.

Customizing Animations:

The kit allows users to modify displayed text and dynamic effects. You can also change the displayed content for free. Dynamic display effects can be altered using 3D software, and C code is not required, making it very simple to customize.



More Than 20 Kinds Of Animation Effects Have Been Built In.

Image: Screenshot of the 3D software interface used to customize and program new animation effects for the LED cube, showing various patterns and control options.

6. MAINTENANCE

The iCubeSmart 3D8P LED Cube is designed for durability once assembled. To ensure its longevity and optimal performance, follow these simple maintenance guidelines:

- **Cleaning:** Gently wipe the cube with a soft, dry cloth to remove dust. Avoid using abrasive cleaners or excessive moisture, which could damage the electronic components.
- **Handling:** Handle the assembled cube with care. Avoid dropping it or applying excessive force, as this could damage the soldered connections or the LED structure.
- **Power Supply:** Always use a stable 5V USB power supply. Using an incorrect voltage or an unstable power source can damage the LEDs or the main board.
- **Storage:** When not in use, store the cube in a cool, dry place away from direct sunlight and extreme temperatures.
- **Spare Parts:** The kit includes spare LEDs. In case an LED fails after assembly, it can be replaced by carefully

desoldering the faulty LED and soldering a new one in its place.

7. TROUBLESHOOTING

If you encounter any issues with your iCubeSmart 3D8P LED Cube, please refer to the following common troubleshooting steps:

- **No Lights or Partial Lights:**

- Check the 5V USB power connection. Ensure it is securely plugged in and providing power.
- Inspect all soldered joints, especially for the affected LEDs or layers. Look for cold solder joints (dull, lumpy appearance) or solder bridges (solder connecting two points that should not be connected). Re-solder as necessary.
- Verify the polarity of the LEDs. If an LED is installed backward, it will not light up.
- Test individual LEDs if possible. Use a multimeter or a small battery (e.g., 3V coin cell) with appropriate current limiting resistor to check if the LED itself is functional. Replace any faulty LEDs using the provided spares.

- **Incorrect Animation or No Animation Change:**

- Ensure the control buttons on the main board are functioning correctly. Press them firmly.
- If you have attempted to re-program the cube, ensure the program downloader is correctly connected and the programming process was successful.

- **Cube Not Stable:**

- Check the structural integrity of the soldered layers. Ensure all connections are strong and the cube is not wobbly.
- Verify that the cube is securely mounted to the main board.

If you have followed these troubleshooting steps and are still experiencing issues, please contact our technical support team for assistance.

8. TECHNICAL SUPPORT & WARRANTY

iCubeSmart is committed to providing comprehensive technical support for our DIY products. We have professional technicians available to assist you with any issues you may encounter during the installation or operation of your LED cube.

If you have questions or require assistance, please feel free to send us a message. We offer lifetime technical support service for our DIY products.

For warranty information, please refer to the specific terms and conditions provided with your purchase or contact our customer service directly.

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

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After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question