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> iCubeSmart 3D8P LED Cube DIY Electronic Kit Instruction Manual

iCubeSmart 3D8P-BLUE-JP

iCubeSmart 3D8P LED Cube DIY Electronic Kit

Instruction Manual

Model: 3D8P-BLUE-JP | Brand: iCubeSmart

1. PRODUCT OVERVIEW

The iCubeSmart 3D8P LED Cube is an innovative DIY electronic kit designed for enthusiasts to assemble their own 8x8x8 LED matrix cube. Unlike traditional LED pins, this kit utilizes narrow PCB strips for a cleaner matrix structure, preventing rust on LED lamp pins. The design facilitates easy maintenance, disassembly, and transport.

The mainboard comes pre-programmed with over 20 gorgeous animation effects. Users can also modify displayed text and dynamic effects using 3D software, without needing C code, making customization simple.

This kit requires user soldering. Basic electronic and soldering skills are necessary. Users must provide their own soldering iron, solder wire, and other soldering tools. The mainboard is pre-soldered and tested; users only need to solder the LED lights and PCB brackets.

2. PACKAGE CONTENTS

Upon receiving your product, please verify that all the following components are included in your kit:

- 1 x Pre-tested Mainboard
- 64 x LED Lamp Beads PCB
- 16 x Corresponding PCB
- 128 x 2P Pin Headers
- 16 x 8P Pin Headers
- 1 x LED Soldering Bracket
- 2 x Lamp Anchor Brackets
- 550 x Blue LEDs (512 used, 38 spare)
- 1 x Program Downloader + DuPont Line
- 1 x Power Cord
- 1 x Instruction Manual (Paper)



Figure 2.1: Complete kit contents including mainboard, PCBs, LEDs, and accessories.

3. SETUP AND ASSEMBLY

This section guides you through the assembly process of your iCubeSmart 3D8P LED Cube. Please follow the steps carefully to ensure proper functionality.

3.1. Preparing the LED Layers

1. **Solder LEDs to PCB Strips:** Use the provided LED soldering bracket to hold the LED lamp beads and PCB strips in place. Carefully solder each LED to its designated spot on the PCB strip. Ensure a strong, clean solder joint.
2. **Forming LED Layers:** Once all LEDs are soldered to the PCB strips, you will have 64 horizontal PCB strips. These will form the 8 layers of your cube.

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.

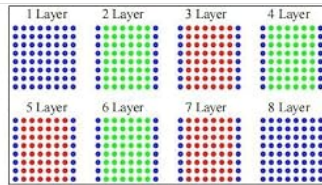
The suite contains such accessories as follows:

Welded and tested motherboard	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:

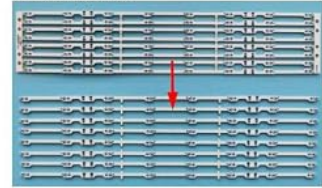
One color version: For a light cube all decorated with one color LED, the eight pieces of light strips are all one color, subject to no any sequential order.

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.



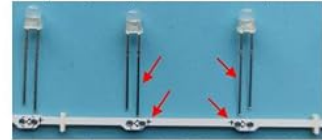
The DIY installation is detailed as follows:

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.

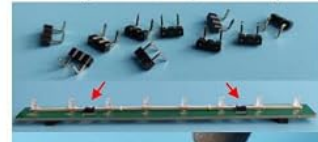
Then weld the LED.



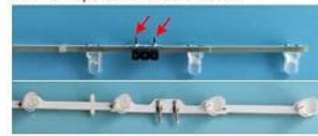
Cut off the excessive LED pins after welding.



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 16 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.

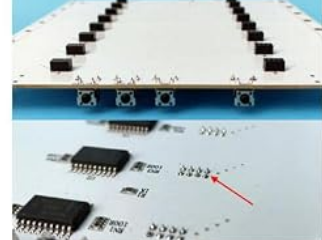
One color version: Weld 8 pieces of light strips with one color LEDs.



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.

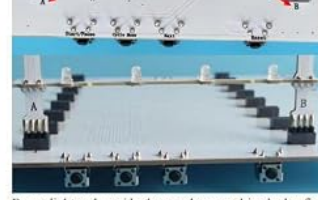


Step 6: Put 16 8P socket on the corresponding positions of the motherboard and solder them.

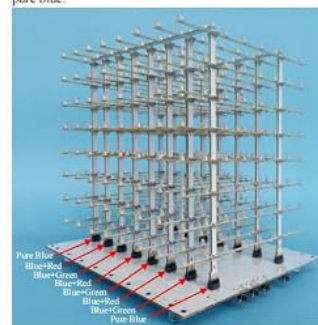


Step 7. Assemble the 3D8P LED cube.

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.



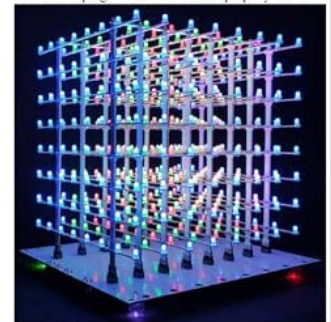
For a light cube with three colors combined, the first LED strip facing the arrow is pure blue, then blue green, blue red, blue green, blue red, blue green, blue red and pure blue.



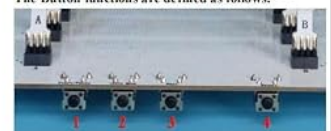
Step 8. Insert all 8 LED light strips into the sockets on the motherboard and then install the two light anchor on the bracket in place.



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 motherboard 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!

Figure 3.1: Step-by-step visual guide for soldering LEDs onto the PCB strips and assembling the cube layers.

3.2. Assembling the Cube Structure

3. **Connect Vertical PCBs:** Solder the 16 vertical PCB boards to connect the horizontal LED layers, forming the 8x8x8 cube structure.
4. **Attach Pin Headers:** Solder the 2P and 8P pin headers to the appropriate locations on the PCB strips and mainboard as indicated in the paper instruction manual.

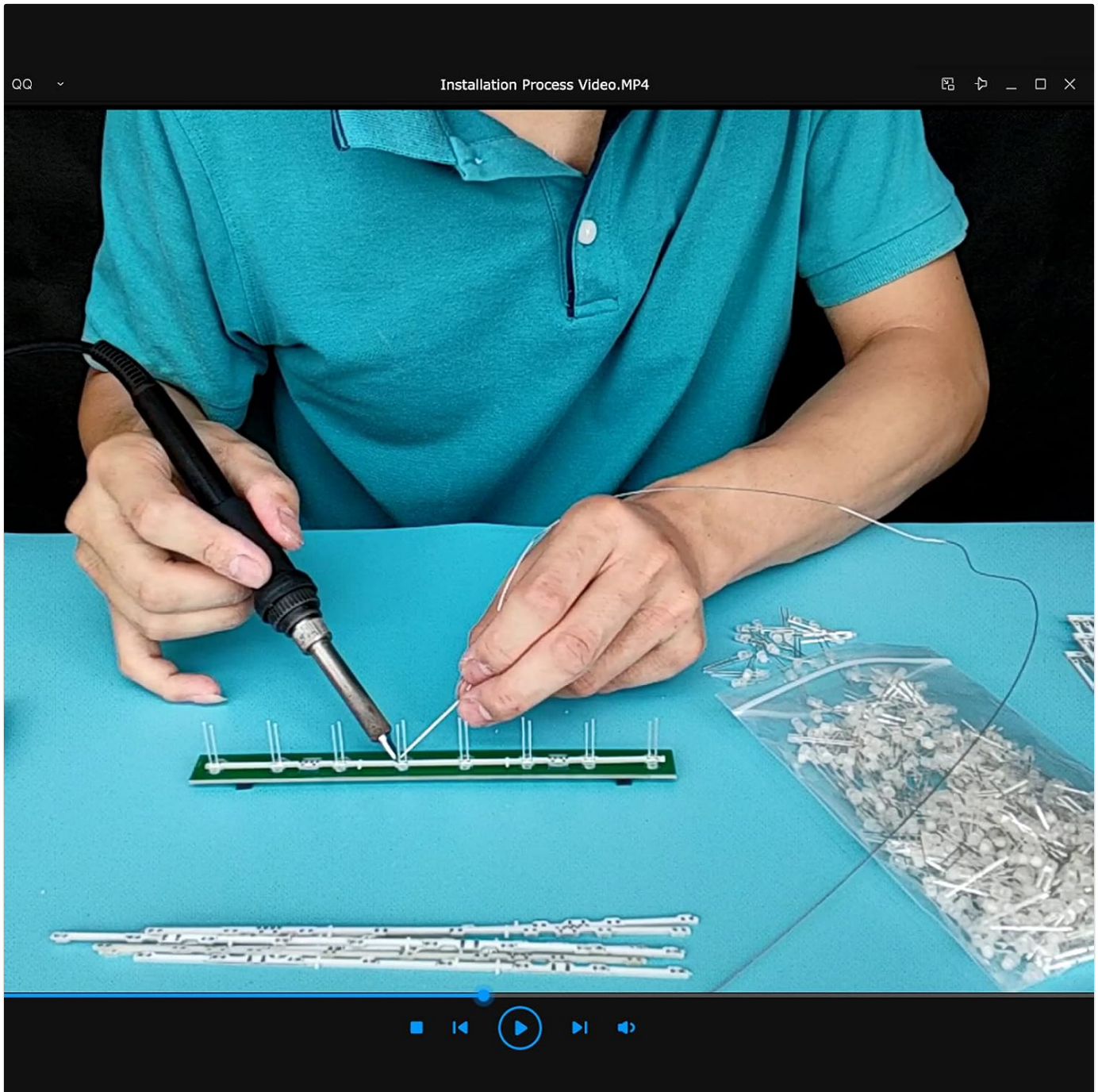


Figure 3.2: Illustration of the cube assembly process, showing how layers are connected.

3.3. Connecting to the Mainboard

5. **Mount the Cube:** Carefully insert the assembled LED cube structure onto the mainboard, aligning the pin headers with the corresponding sockets.
6. **Secure Connections:** Ensure all connections are firm. The mainboard is pre-tested, so focus on secure connections for the LED cube.

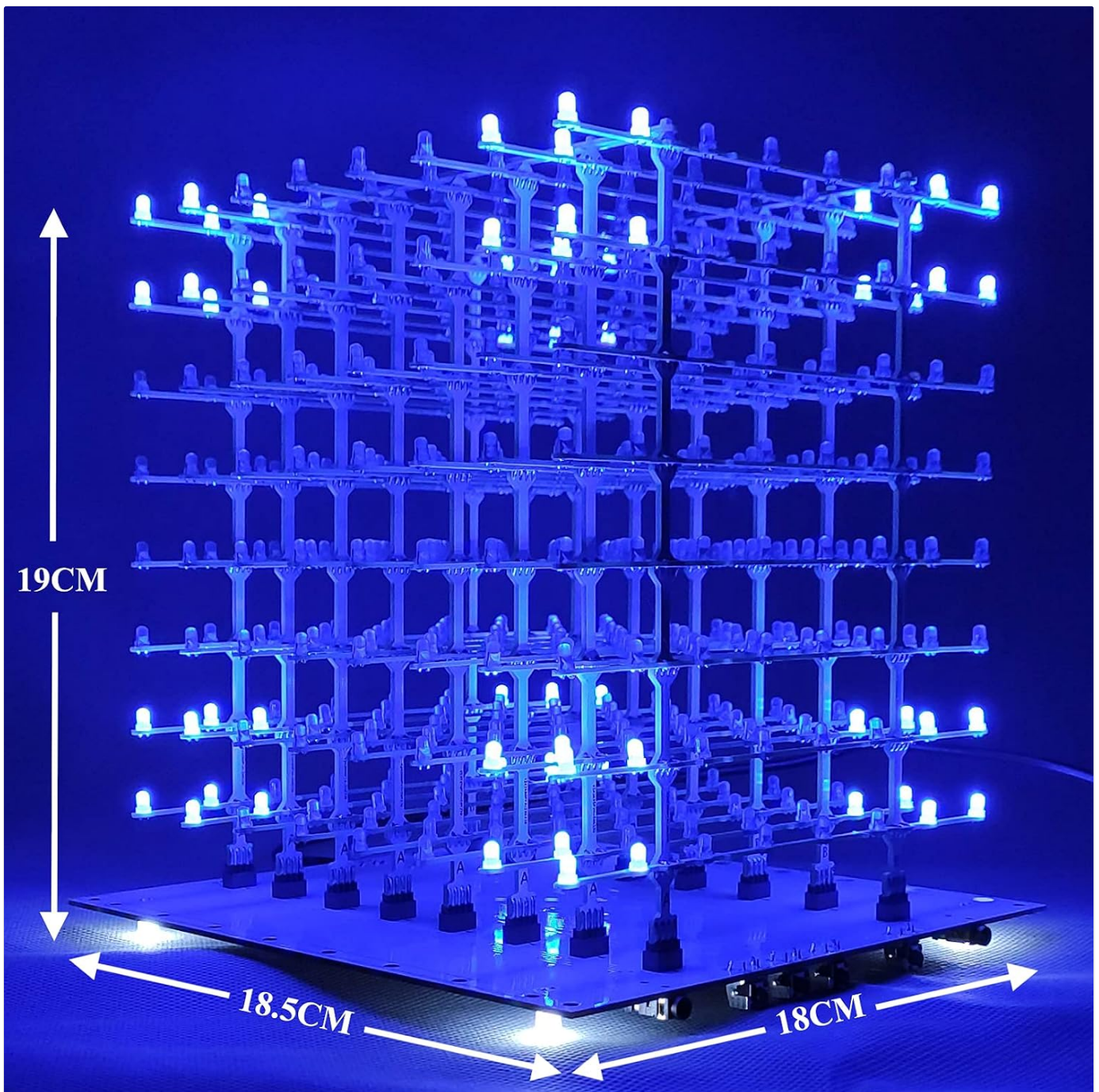


Figure 3.3: The completed iCubeSmart 3D8P LED Cube, ready for operation.

4. OPERATING INSTRUCTIONS

Once assembled, your iCubeSmart 3D8P LED Cube is ready to display various dynamic effects.

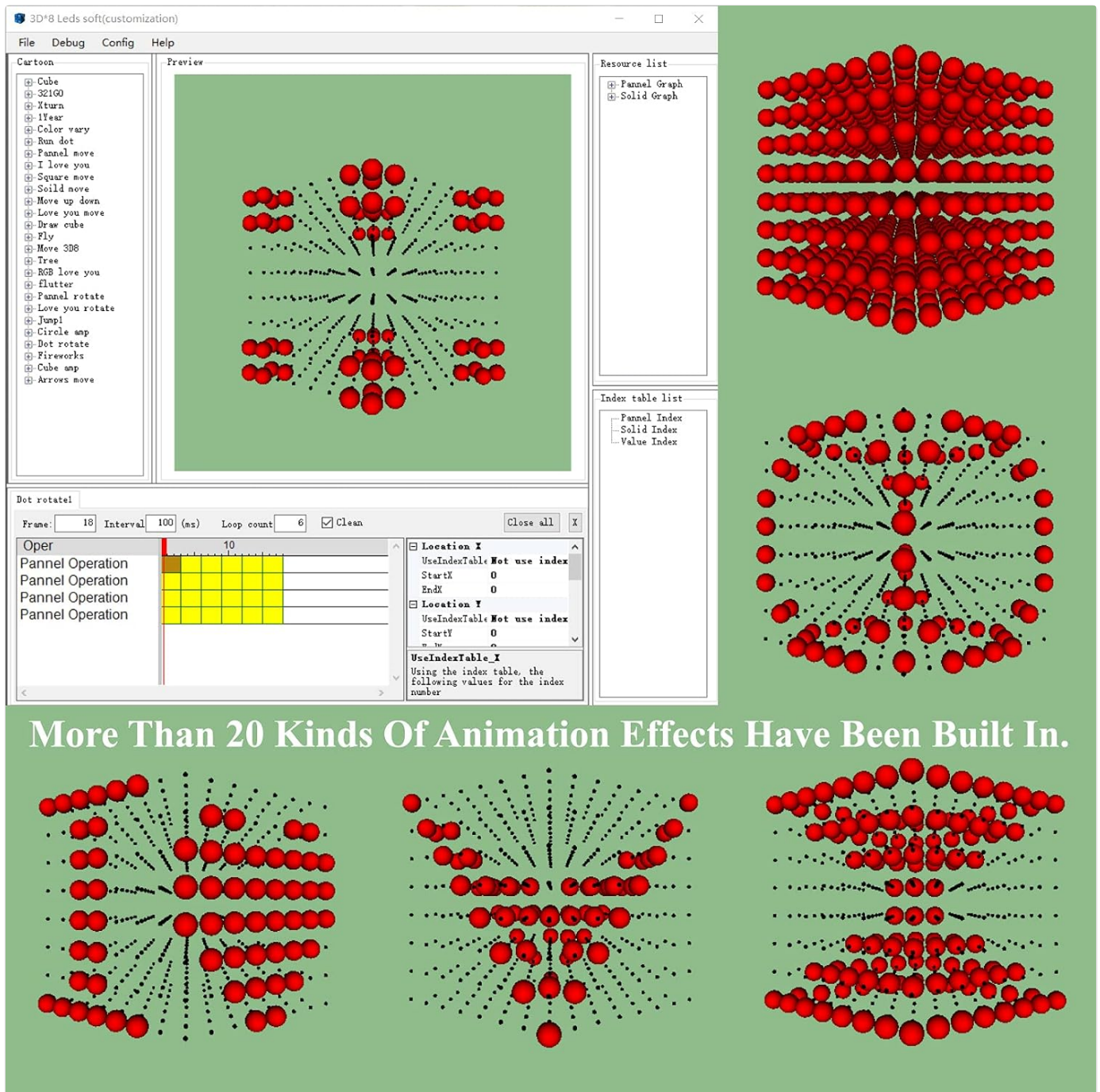
4.1. Powering On

Connect the provided power cord to the mainboard and a 5V USB power source. The cube will automatically power on and begin displaying its pre-programmed animation effects.

4.2. Changing Animation Effects

The mainboard features four buttons to control the dynamic display effects:

- **Button 1 (Start/Pause):** Press to start or pause the dynamic effect.
- **Button 2 (Cycle Mode):** Press to switch between single dynamic effect mode and full dynamic effect mode.
- **Button 3 (+):** Press to increase the speed or change to the next effect.
- **Button 4 (-):** Press to decrease the speed or change to the previous effect.



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

Figure 4.1: The 3D Leds software allows for customization of animation effects. The mainboard buttons provide direct control over pre-loaded effects.

5. MAINTENANCE

To ensure the longevity and optimal performance of your iCubeSmart LED Cube, follow these maintenance guidelines:

- **Cleaning:** Gently wipe the cube with a soft, dry cloth to remove dust. Avoid using liquid cleaners or abrasive materials.

- **Handling:** Handle the cube with care. Avoid dropping it or applying excessive force, as this can damage the delicate LED connections.
- **Storage:** When not in use, store the cube in a dry, cool place away from direct sunlight and extreme temperatures.

6. TROUBLESHOOTING

If you encounter any issues with your iCubeSmart LED Cube, please refer to the following common problems and solutions:

- **LEDs not lighting up:**
 - Check all solder joints for cold joints or bridges. Re-solder any problematic connections.
 - Ensure the LEDs are inserted with the correct polarity. The longer leg is typically the anode (+).
 - Verify that the power supply is providing stable 5V.
 - Inspect for any bent or broken LED pins. Spare LEDs are provided in the kit.
- **Cube not powering on:**
 - Ensure the power cord is securely connected to both the mainboard and the USB power source.
 - Try a different 5V USB power adapter and cable.
- **Animation effects not changing:**
 - Ensure the buttons on the mainboard are functioning correctly.
 - If you have attempted custom programming, ensure the firmware was uploaded correctly.
- **Missing parts during assembly:**
 - Double-check the package contents against the list in Section 2.
 - If a critical part is missing, please contact iCubeSmart technical support.

For further assistance, please refer to the technical support information in Section 8.

7. SPECIFICATIONS

Feature	Specification
Microcontroller	STC12C5A60S2
Driver Chip	74HC573 + APM4953
LED Type	3mm Blue LED
LED Quantity	512 (plus 38 spare)
Cube Dimensions (Finished)	18 x 18.5 x 19 cm
Power Supply	5V USB

Feature	Specification
Package Dimensions	21.3 x 19.3 x 4.7 cm
Package Weight	470 g

8. WARRANTY AND SUPPORT

iCubeSmart is committed to providing excellent customer service and technical support for our DIY products.

8.1. Technical Support

Our company employs professional technicians dedicated to providing technical support and assisting buyers with any issues encountered during the installation and operation of the product. If you have questions or require assistance, please send us a message.

We offer **lifetime technical support service** for all our DIY products.

8.2. Warranty Information

Please retain your proof of purchase for any warranty claims. Specific warranty details may vary; contact our support team for more information regarding product defects or missing components upon arrival.

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Details

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