LCD1602 Digital Electronic Clock DIY Kit

1.Introduction:

It is a LCD1602 Display Electronic Clock DIY Kit. It allows you to display the current date, time, temperature, alarm, and even switch between 12H/24H display modes in real time. The display brightness can be adjusted manually with a screwdriver or automatically with a photosensitive sensor to fit different environments. It is easy to use, has a beautiful design, and is perfect for home or office use.

It is a fun DIY electronic product that allows you to better understand the circuit and learn how to solder.

2.Feature:

1>.LCD Display:Display date, time, week, and temperature in Celsius degree simultaneously on an LCD display.

2>.Automatic Brightness Adjustment: Built-in photosensitive sensor which can automatically adjust the brightness of the display screen. Users can also set 01-10 levels of fixed brightness. You can adjust the contrast of the display screen through the potentiometer on the back to change the display effect.

3>.12H/24H display mode: Set the time display format at 12 or 24 hour system and display P or A at 12H display mode.

4>.Alarm Clock: Set alarms with on/off feature, and enjoy the convenience of never missing an important event. Press S1/Left button to stop the alarm clock or automatically stop after 60 seconds.

5>.Voice Hourly Report: Get a buzzer alarm prompt ‘di di di’ once an hour when enabled.

6>.Power-down memory: Time and settings are remembered even when powered down thanks to the built-in CR1220 battery.

7>.DIY Hand Soldering, This DIY kit comes with various components that need to be installed by hand, helping to improve soldering skills and increase interest in electronics. Great for electronics hobbyists, beginners, school and home education.

3.Parameter:

1>.Item name: LCD1602 Display Electronic Clock DIY Kit

2>.Work voltage:DC 5V

3>.Work Temperature:-20℃~85℃

4>.Work Humidity:0%~95%RH

5>.Size(Installed):90*51*32mm

4.Set Method:

1>.It displays date, time, week, and temperature in Celsius degree by default. Note:

2>.S1/Left button is SET button and be used to enter set mode and switch set parameters. One underline will flash at set parameter in set mode.

3>.S2/Middle button is ADD button and be used to increase parameter value.

4>.S3/Right button is EXIT button and be used to save parameter value and exit.

4>.Set Year: Short press S1/Left button for the 1st time and then press S2/Middle button to set value for current year. Note:The parameter value can only be increased, and returns 00 when it reaches 99. Press S3/Right button can save and exit.

5>.Set Month: Short press S1/Left button for the 2nd time and then press S2/Middle button to set value for current month. Press S3/Right button can save and exit(same in the following steps).

6>.Set Day: Short press S1/Left button for the 3rd time and then press S2/Middle button to set value for current day. Week will automatically match and no need to reset.

7>.Set Hour: Short press S1/Left button for the 4th time and then press S2/Middle button to set value for current hour.

8>.Set Minute: Short press S1/Left button for the 5th time and then press S2/Middle button to set value for current minute.

9>.Set Second: Short press S1/Left button for the 6th time and then press S2/Middle button to set value for current second.

10>.Set Alarm(set_alarm_time) Hour: Short press S1/Left button for the 7th time and then press S2/Middle button to set value for alarm hour.

11>.Set Alarm(set_alarm_time) Minute: Short press S1/Left button for the 8th time and then press S2/Middle button to set value for alarm minute.

12>.ON/OFF Alarm(set_alarm_time): Short press S1/Left button for the 9th time and then press

S2/Middle button to turn ON or OFF alarm. It will display ‘alarm_ON’ or ‘alarm_OFF’.

13>.Set Hourly Report(on_time_alarm) Start Hour: Short press S1/Left button for the 10th time and then press S2/Middle button to set value for Hourly Report Start hour.Such as 07:21 means Hourly Report from 7:00 to 21:00.

14>.Set Hourly Report(on_time_alarm) Stop Hour: Short press S1/Left button for the 11th time and then press S2/Middle to set value for Hourly Report Stop Hour. Such as 07:21 means Hourly Report from 7:00 to 21:00.

15>.ON/OFF Hourly Report(on_time_alarm): Short press S1/Left button for the 12th time and then press S2/Middle button to turn ON or OFF Hourly Report. It will display ‘alarm_ON’ or ‘alarm_OFF’.

16>.Set Screen Brightness: Short press S1/Left button for the 13th time and then press S2/Middle button to set brightness value. Its set range is 01 to 10. The brightest level is 10.

17>.Set 12/24H mode: Short press S1/Left button for the 14th time and then press S2/Middle button to select 12 or 24 hour system.

18>.Save and Exit: Short press S1/Left button for the 15th time to save parameters and return to normal display status.

5.Note:

1>.Garbled characters are displayed when the power is turned on for the first time, and the settings need to be completed before they can be displayed correctly.

2>.The week value will automatically match and display based on the set date.

3>.Temperature values cannot be modified and calibrated.

4>.CR1220 is only used to power the clock chip to ensure accurate time.

5>.Press S1/Left button to stop the alarm clock.

6>.The alarm clock can automatically stop after 60 seconds.

6.Component listing:

NO.	Component Name	PCB Marker	Parameter	QTY
1	Metal Film Resistor	R1-R3	10Kohm	3
2	Thermal Sensor	R4	DO-35	1
3	Photosensitive Sensor	R5		1
4	Potentiometer	R17	10Kohm	1
5	Black Button	S1-S3		3
6	RC1220 Battery	BT1	3V	1
7	RC1220 Battery Socket	BT1	SMD	1
8	Electrolytic Capacitor	C1	100uF	1
9	Ceramic Capacitor	C5	0.1uF 104	1
10	Ceramic Capacitor	C6,C7	22pF	2
11	Active Buzzer	LS1	5V	1
12	DC-005 Power Socket	JK1		1
13	Crystal Oscillator	Y1	32768Hz	1
14	Female Pin	U3	16Pin	1
15	Male Pin	U3	16Pin	1
16	LCD1602 Display Screen	U3		1
17	STC15W408AS	U2	DIP-20	1
18	IC Socket	U2	DIP-20	1
19	DS1302 Clock IC	U1	DIP-8	1
20	IC Socket	U1	DIP-8	1
21	USB Power Wire			1
22	Acrylic Plate			6
23	M3*6mm Screw			12
24	M3*30mm Screw			4
25	M3*11mm Copper Pillar			4
26	PCB		80*36mm	1
Note:Users can complete the installation according to the PCB silk screen and component list.				

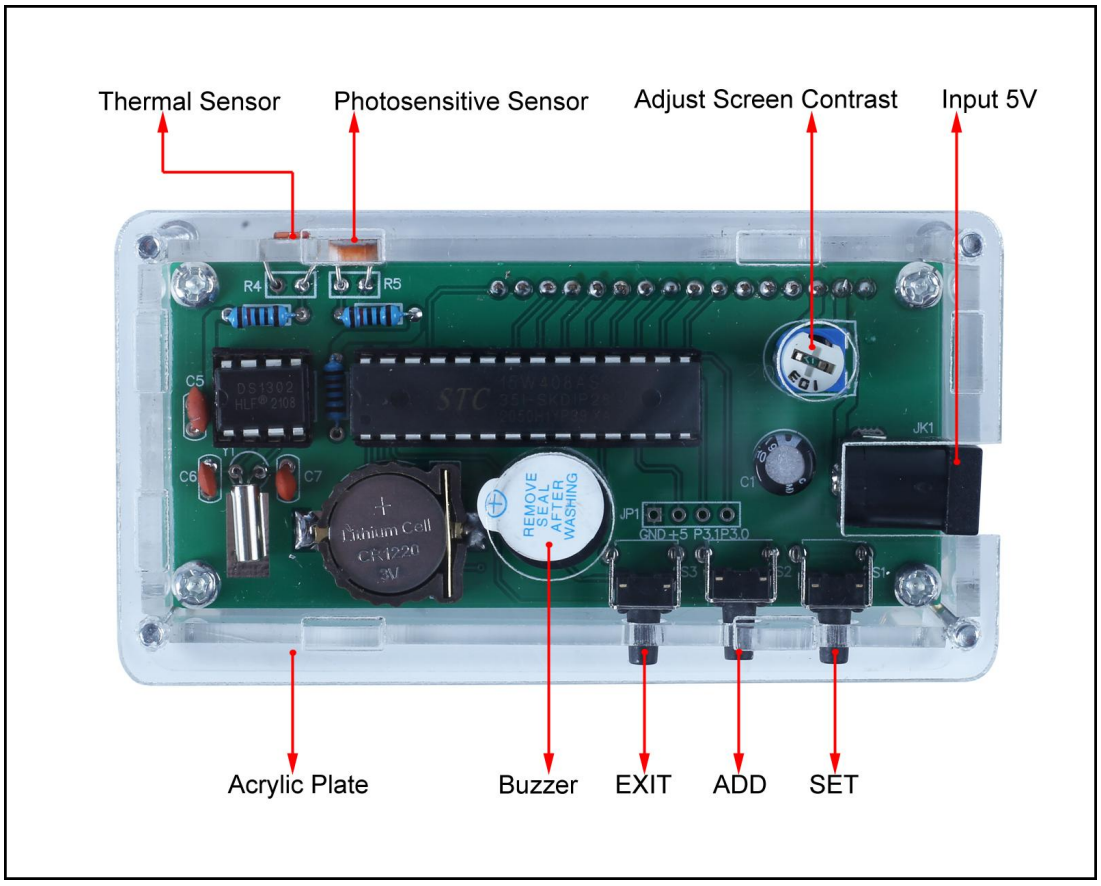
7.Application:

1>.Practical at home
2>.Indoor display
3>.Simple appearance, easy office
4>.Wall decoration

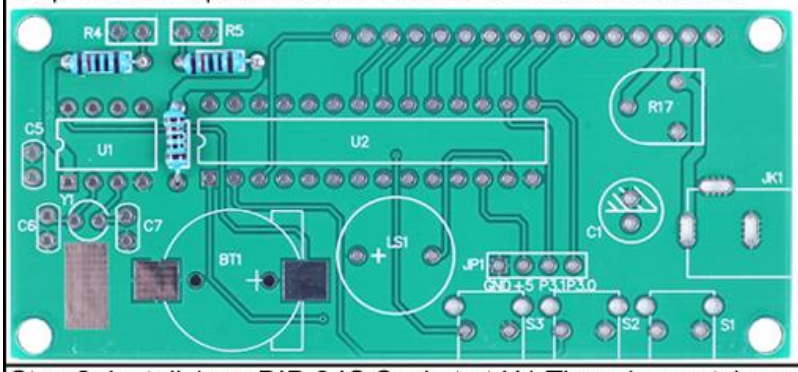
8.Installation Tips:

1>.Users must first prepare their soldering tools.
2>.Please be patient while the installation is completed.
3>.This package is a DIY kit which requires the user to finish the installation.
4>.The soldering iron should not stay in contact with the components for too long (no more than 1.0 second) or it could damage them.
5>.Take care to pay attention to the polarity of the components.
6>.It is strictly prohibited to make any short circuits.
7>.Complex components should be installed first.
8>.Ensure that all components are in the right direction and in the right place.
9>.Please wear anti-static gloves or anti-static wristbands when installing electronic components.
10>.It is strongly recommended to read the installation manual before beginning the installation!!!

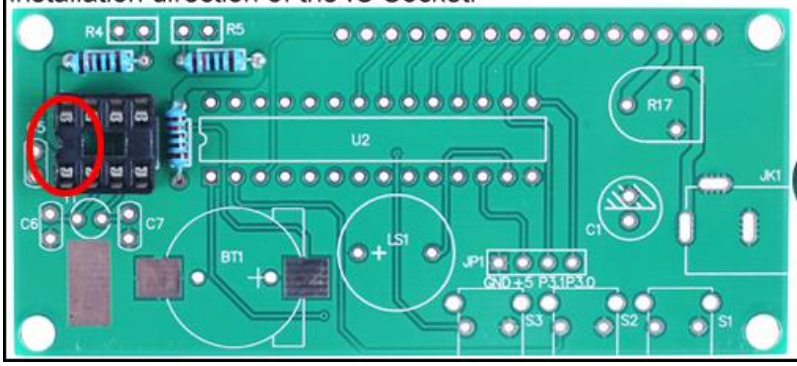
9.Installation Steps(Please be patient install!!!):



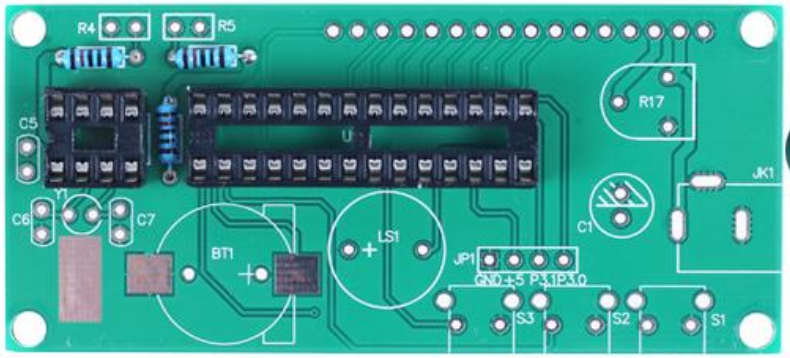
Step 1: Install 3pcs 10Kohm Metal Film Resistor at R1-R3.

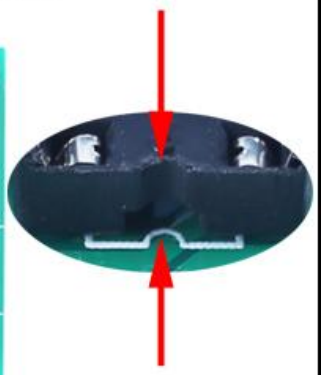


Step 2: Install 1pcs DIP-8 IC Socket at U1.There is a notch on one end of IC Socket and there is a curved silk screen printing on the PCB where the IC Socket can be placed. These two marks correspond to each other and are used to indicate the installation direction of the IC Socket.

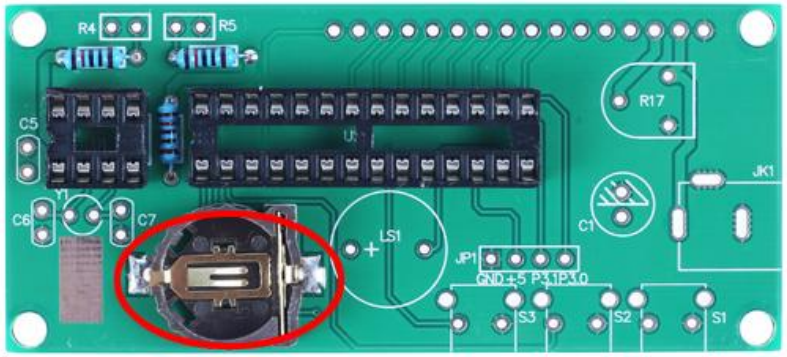


Step 3: Install 1pcs DIP-20 IC Socket at U2 by the same methods.

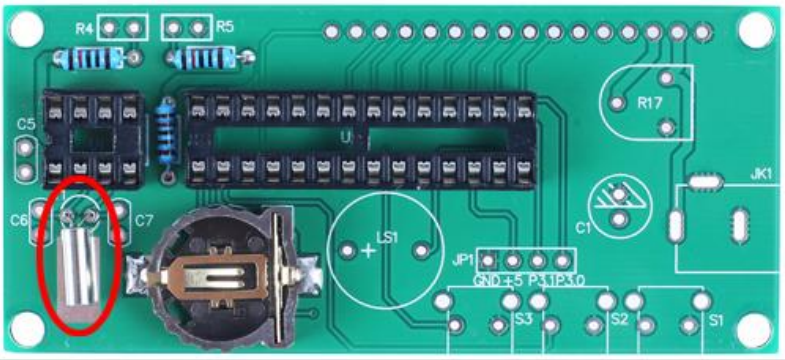




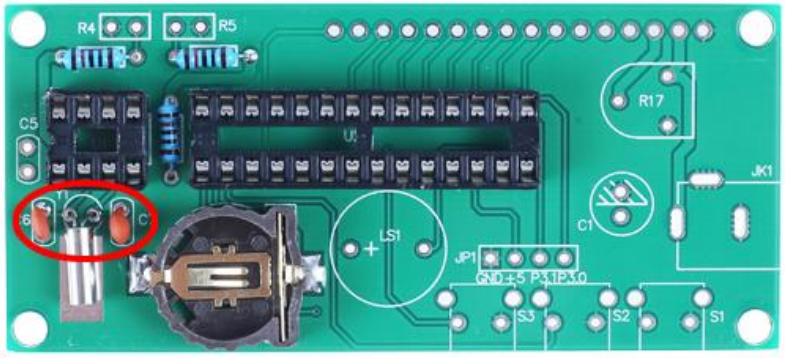
Step 4: Install 1pcs SMD RC1220 Battery Socket at BT1.



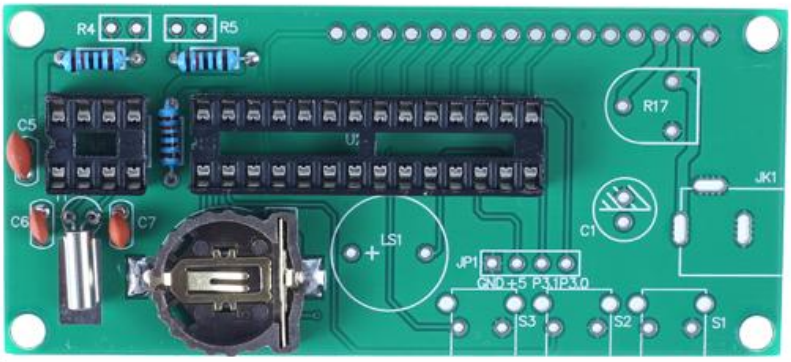
Step 5: Install 1pcs 32768Hz Crystal Oscillator at Y1.
Note: it needs to be placed horizontally.



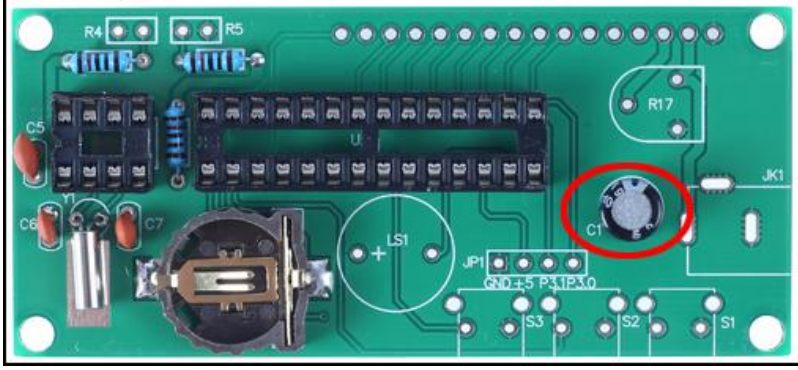
Step 6: Install 2pcs 22pF Ceramic Capacitor at C6,C7.



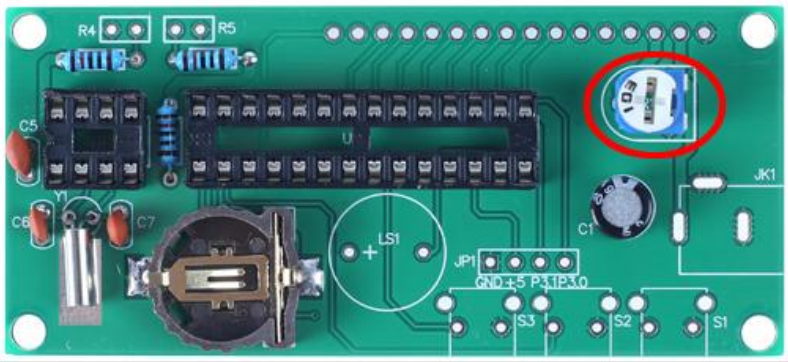
Step 7: Install 1pcs 0.1uF 104 Ceramic Capacitor at C5.



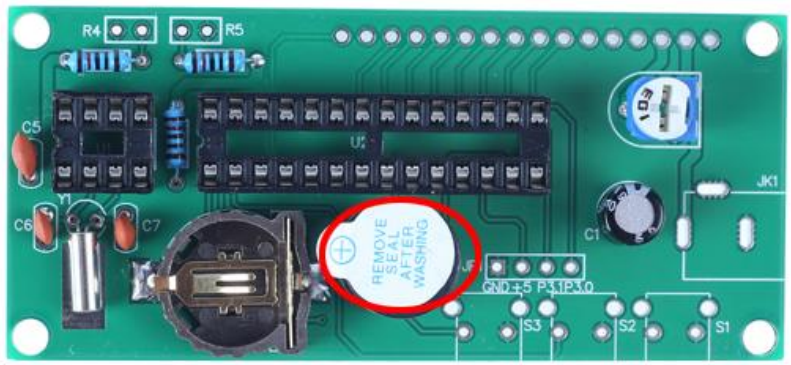
Step 8: Install 1pcs 100uF Electrolytic Capacitor at C1. There is a white mark on the PCB silk screen printing where the cathode should be inserted. The shorter lead is the cathode pole.



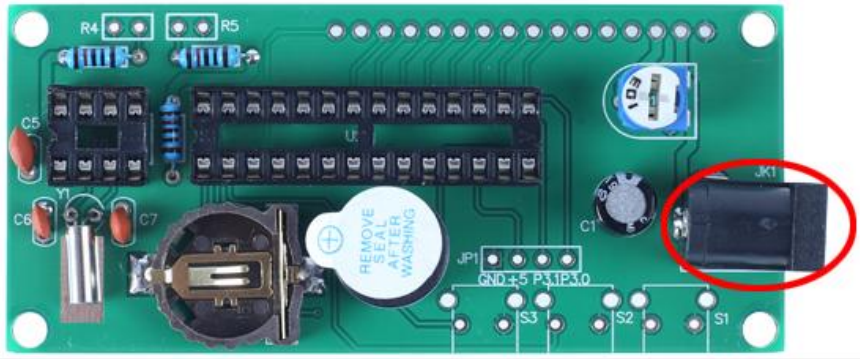
Step 9: Install 1pcs 10Kohm Potentiometer at R17.



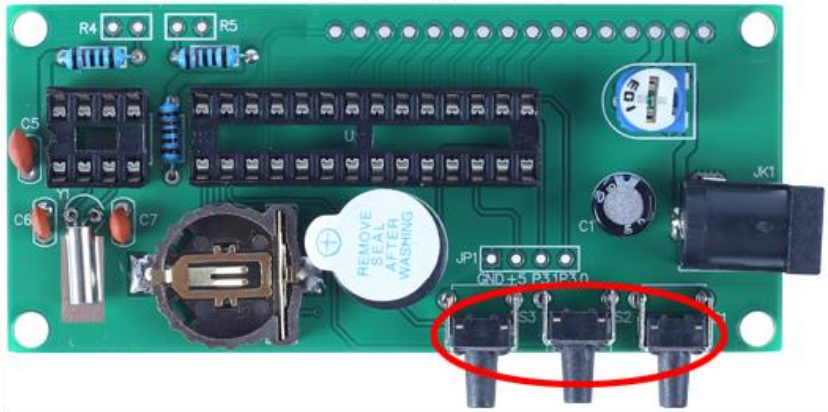
Step 10: Install 1pcs Active buzzer at LS1. Pay attention to the installation direction.



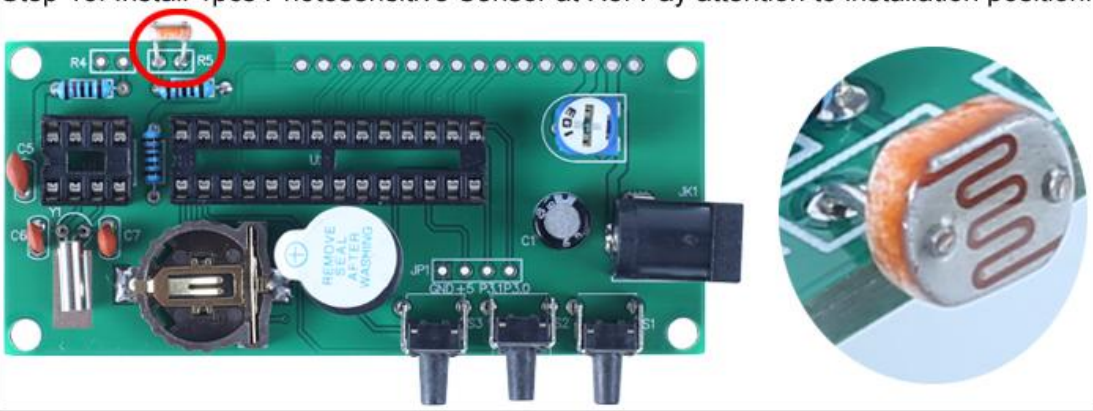
Step 11: Install 1pcs DC-005 Power Socket at JK1.



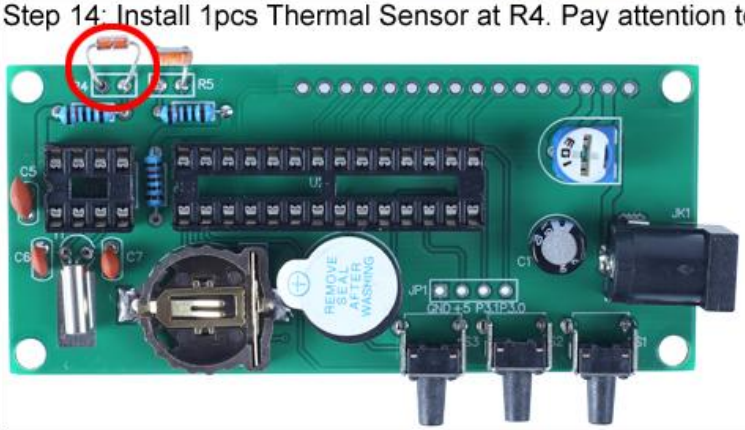
Step 12: Install 3pcs Black Button at S1-S3.



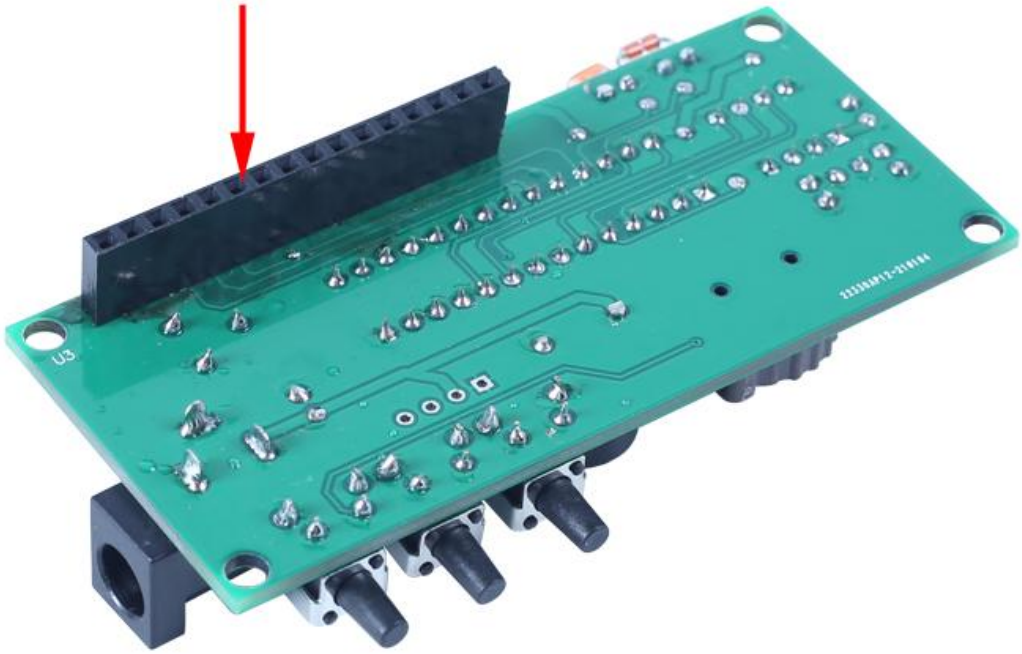
Step 13: Install 1pcs Photosensitive Sensor at R5. Pay attention to installation position.



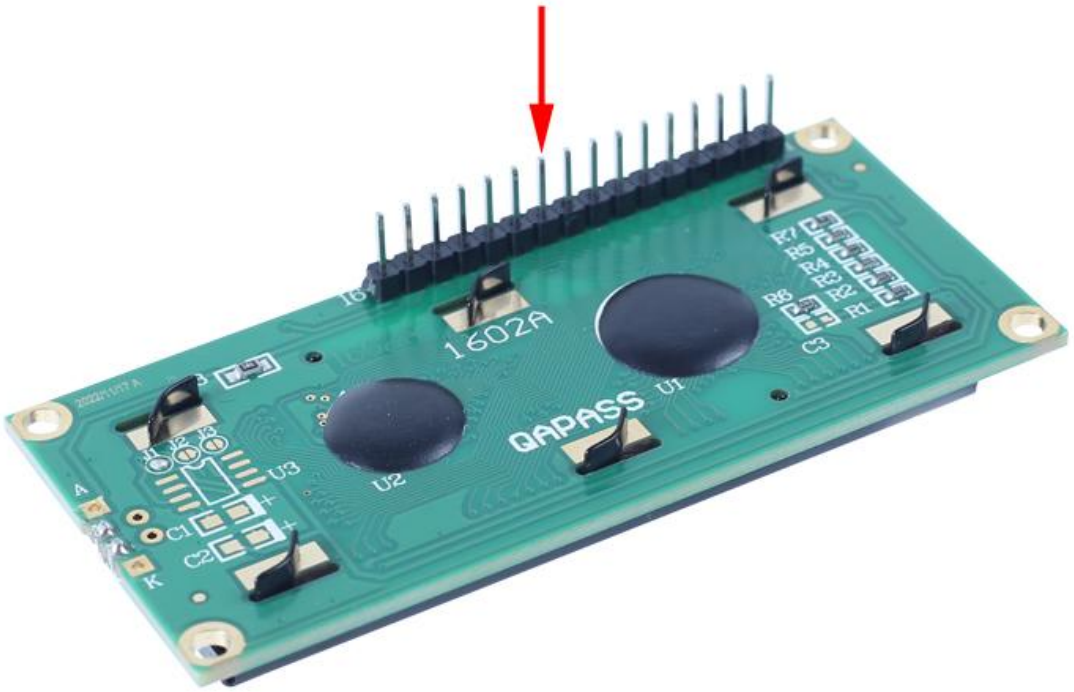
Step 14: Install 1pcs Thermal Sensor at R4. Pay attention to its installation position.



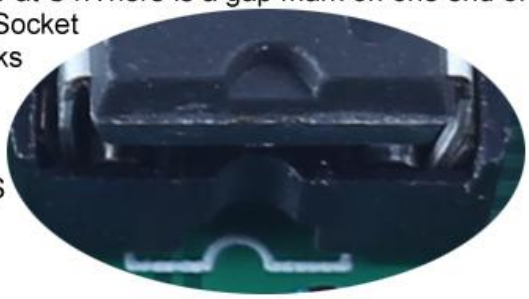
Step 15: Install 1pcs 16pin Female Pin at U3 on PCB another side.



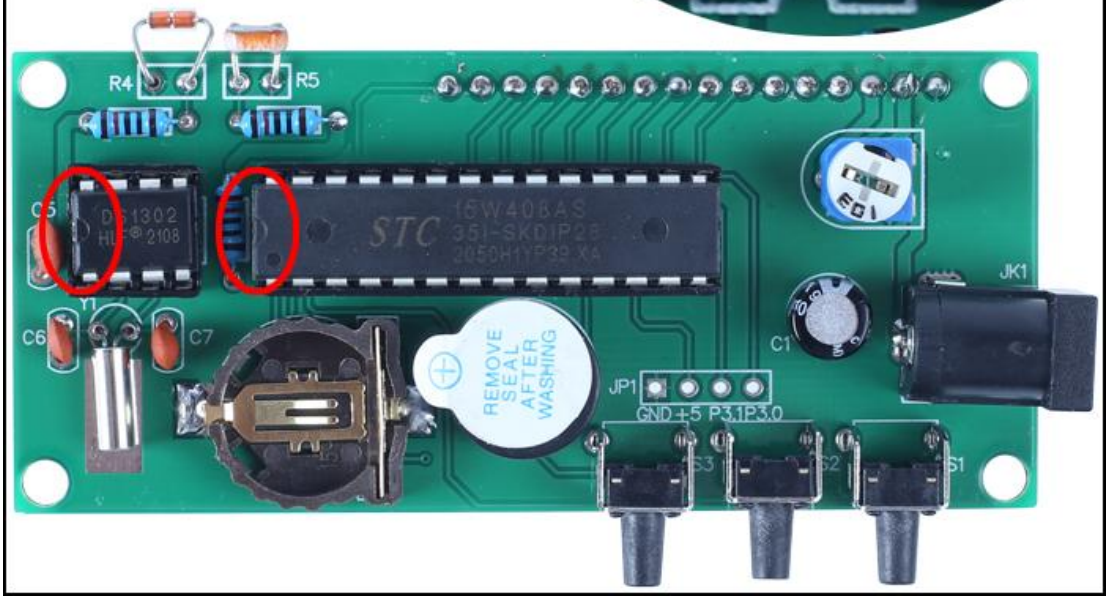
Step 16: Install 1pcs 16pin Male Pin on LCD1602 Display Screen.



Step 17: Install 1pcs DIP-8 DS1302 Clock IC at U1.There is a gap mark on one end of IC and there is a gap mark on the DIP-8 IC Socket where the IC can be placed. These two marks correspond to each other and are used to indicate the direction.

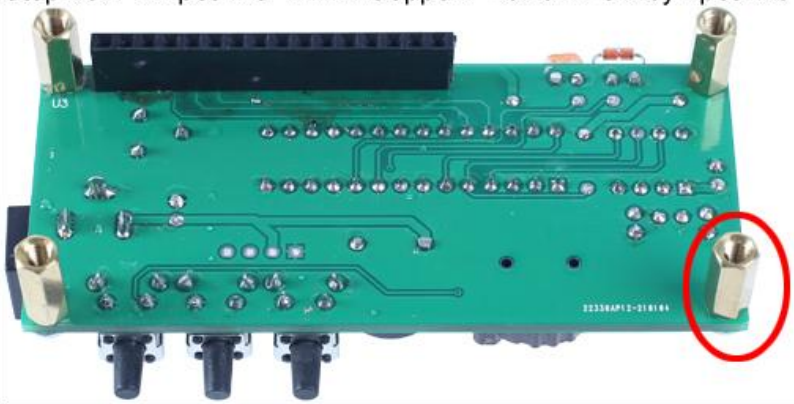


Step 18: Install 1pcs DIP-20 STC15W408AS at U2 by the same methods.



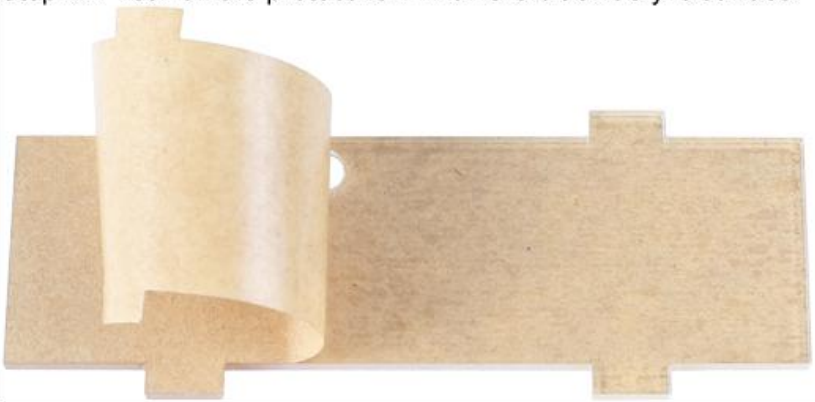
Step 19: Install 1pcs CR1220 Battery at BT1 Socket.Pay attention to negative pole.

Step 20: Fix 4pcs M3*11mm Copper Pillar on PCB by 4pcs M3*6mm Screw.

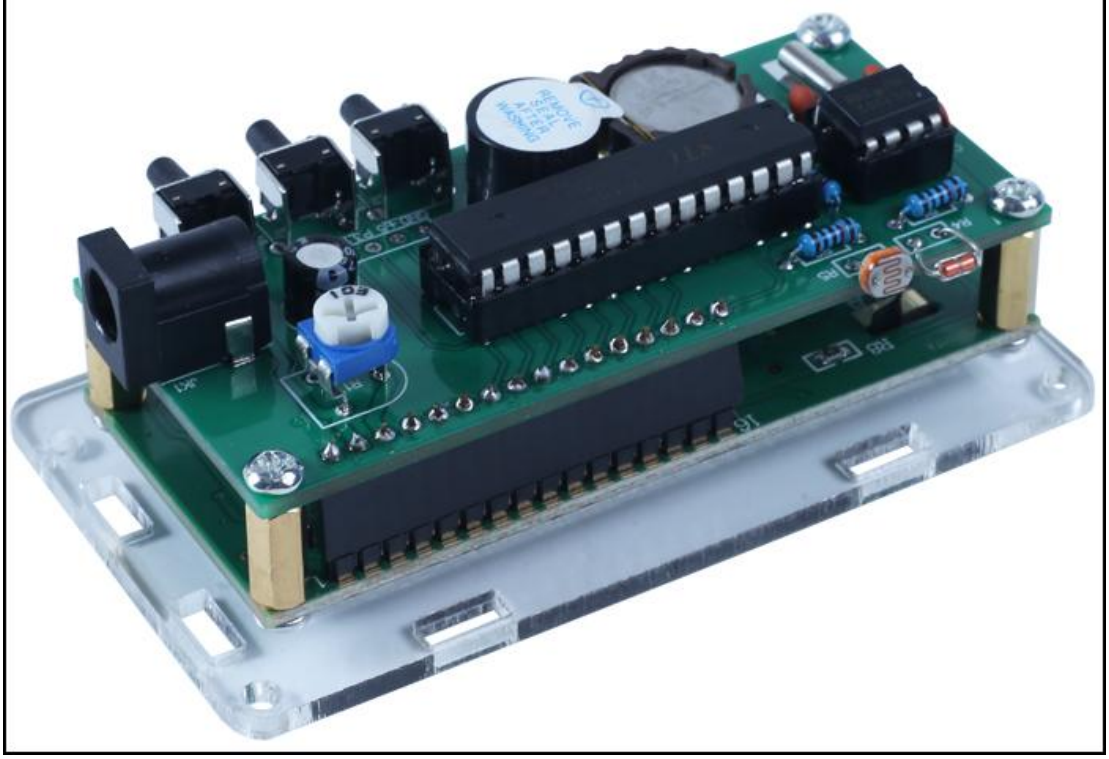


Step 21: Insert and fix LCD1602 Display Screen by 4pcs M3*6mm Screw.

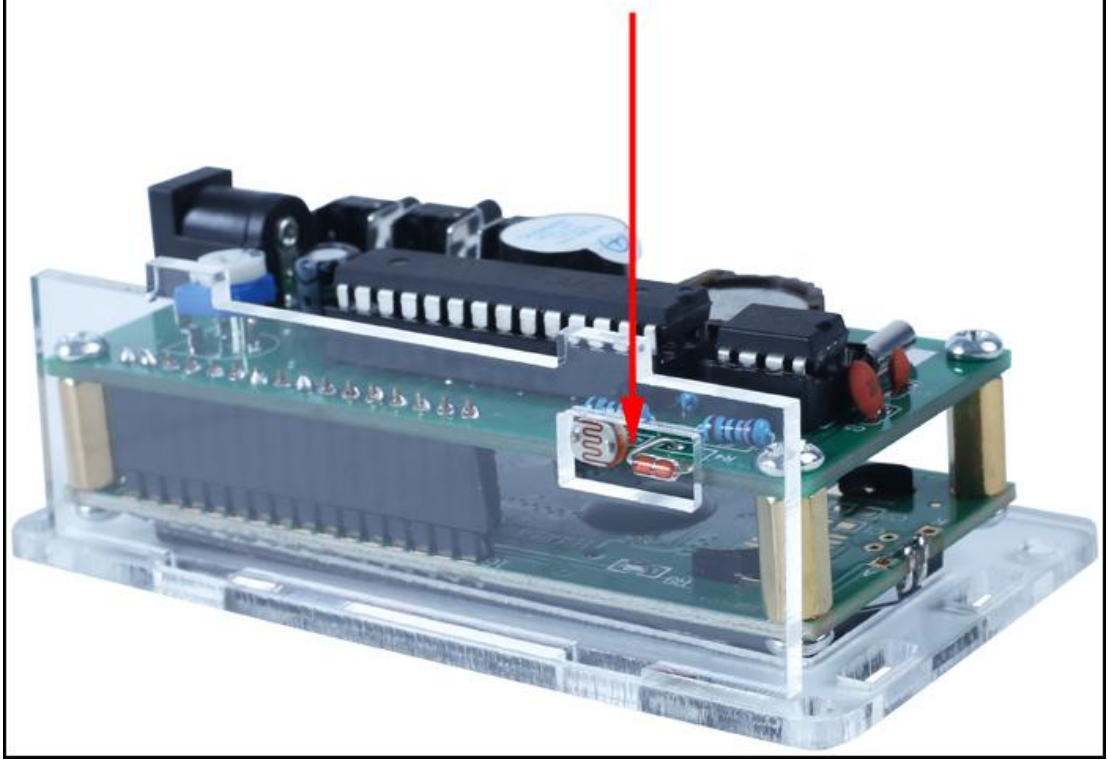
Step 22: Tear off the protective film on the black acrylic surface.



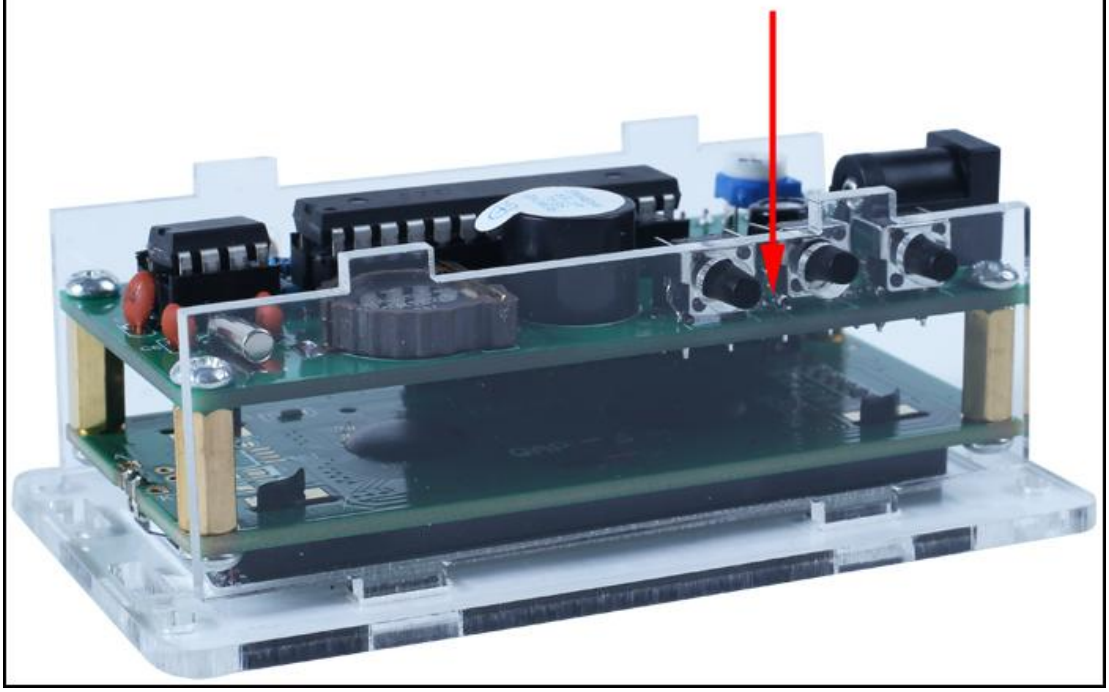
Step 23: Place Acrylic TOP Plate on LCD1602.



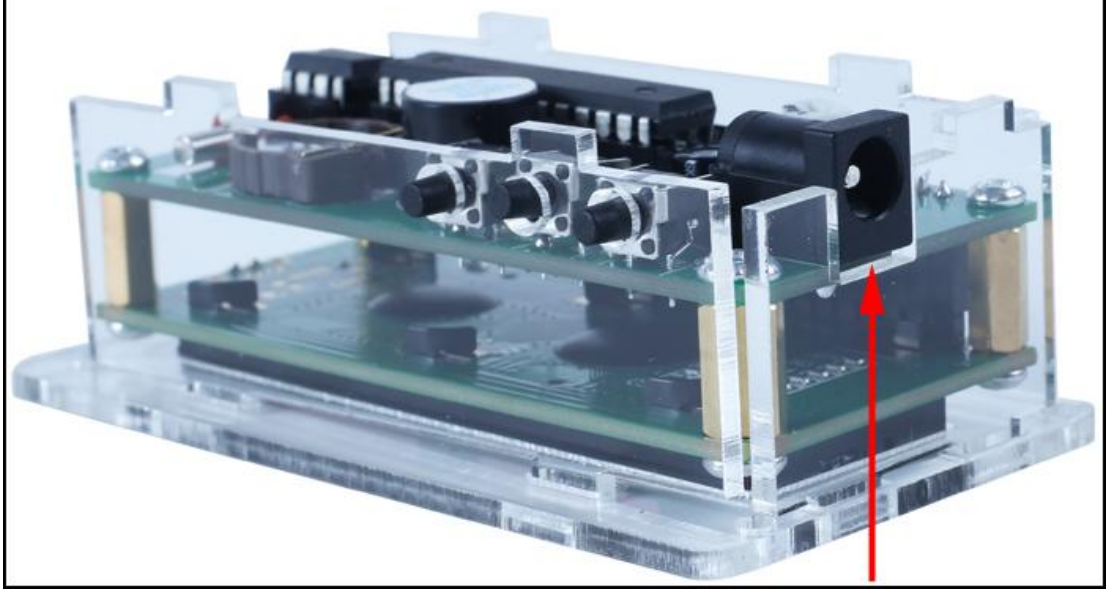
Step 24: Place Acrylic Sensor Plate. Pay attention to the sensing hole of the sensors.



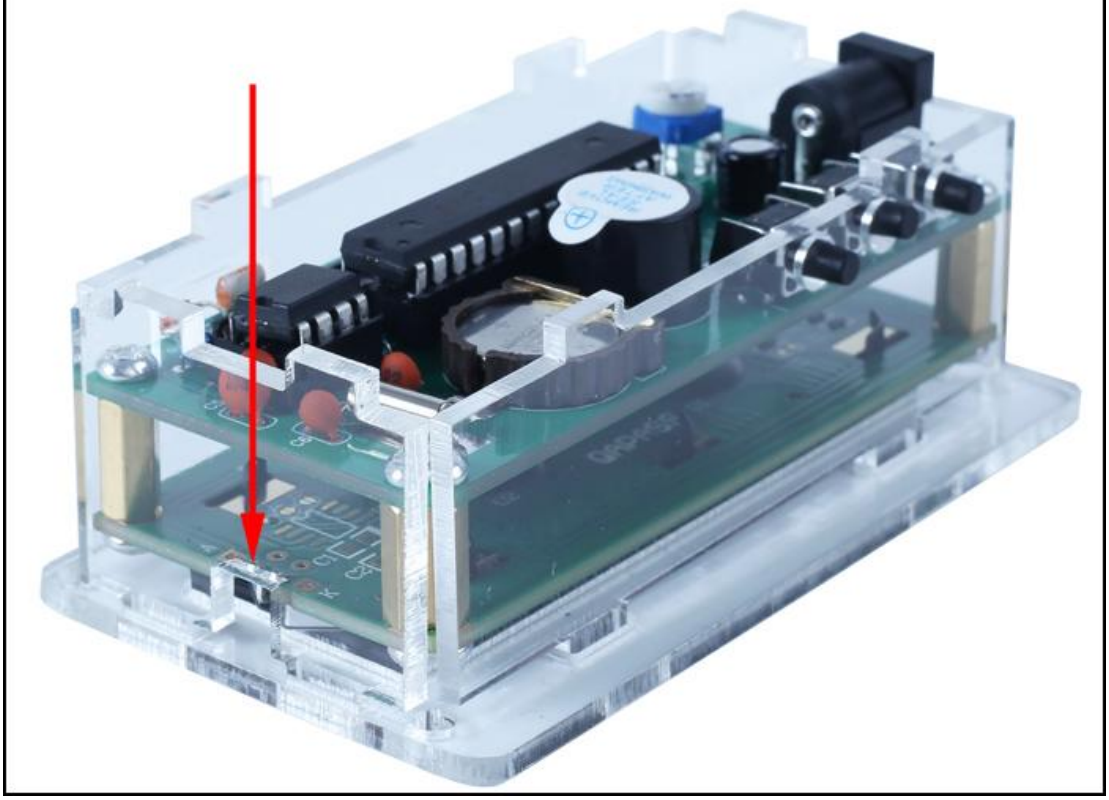
Step 25: Place Acrylic Button Plate. Pay attention to the mounting hole of the buttons.



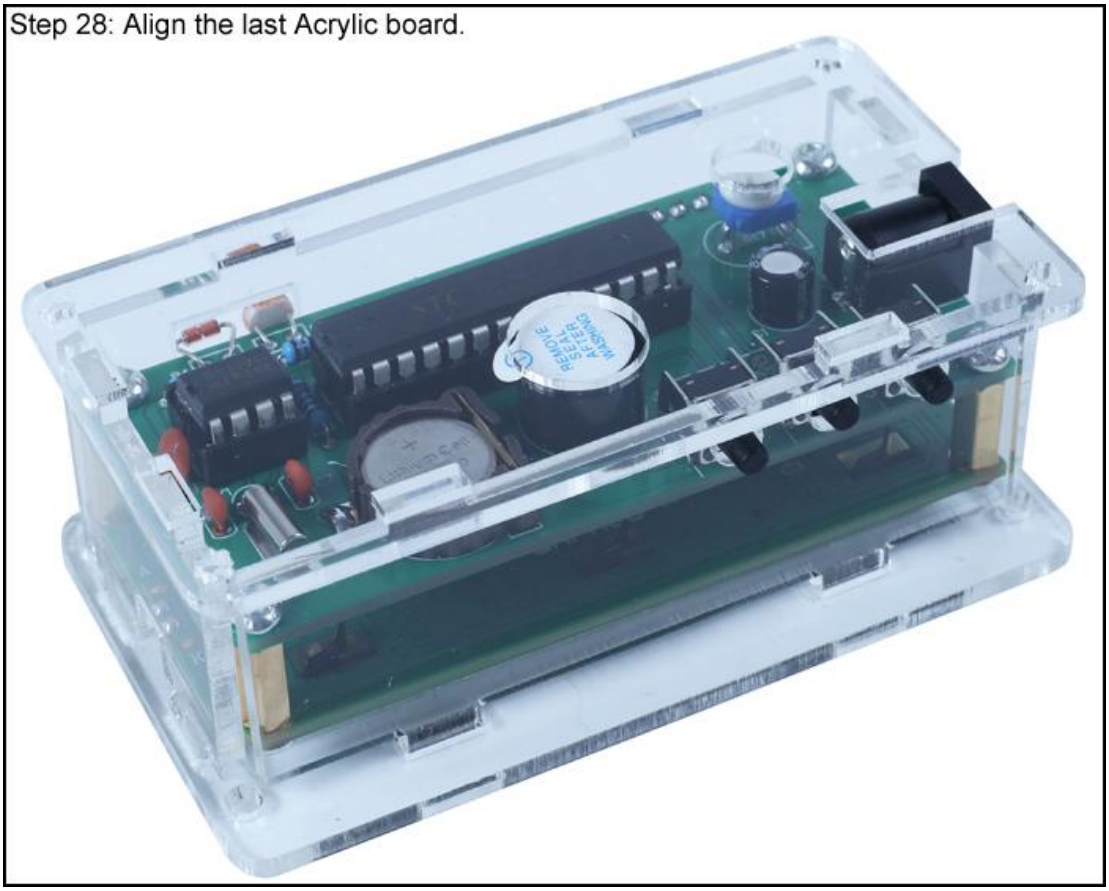
Step 26: Place Acrylic Power Plate. Pay attention to the mounting hole of the power socket.



Step 27: Place Acrylic last side Plate. Pay attention to the mounting hole.



Step 28: Align the last Acrylic board.



Step 29: Fix four 4 mounting holes by 4pcs M3*30mm Screw to fix all acrylic plates.