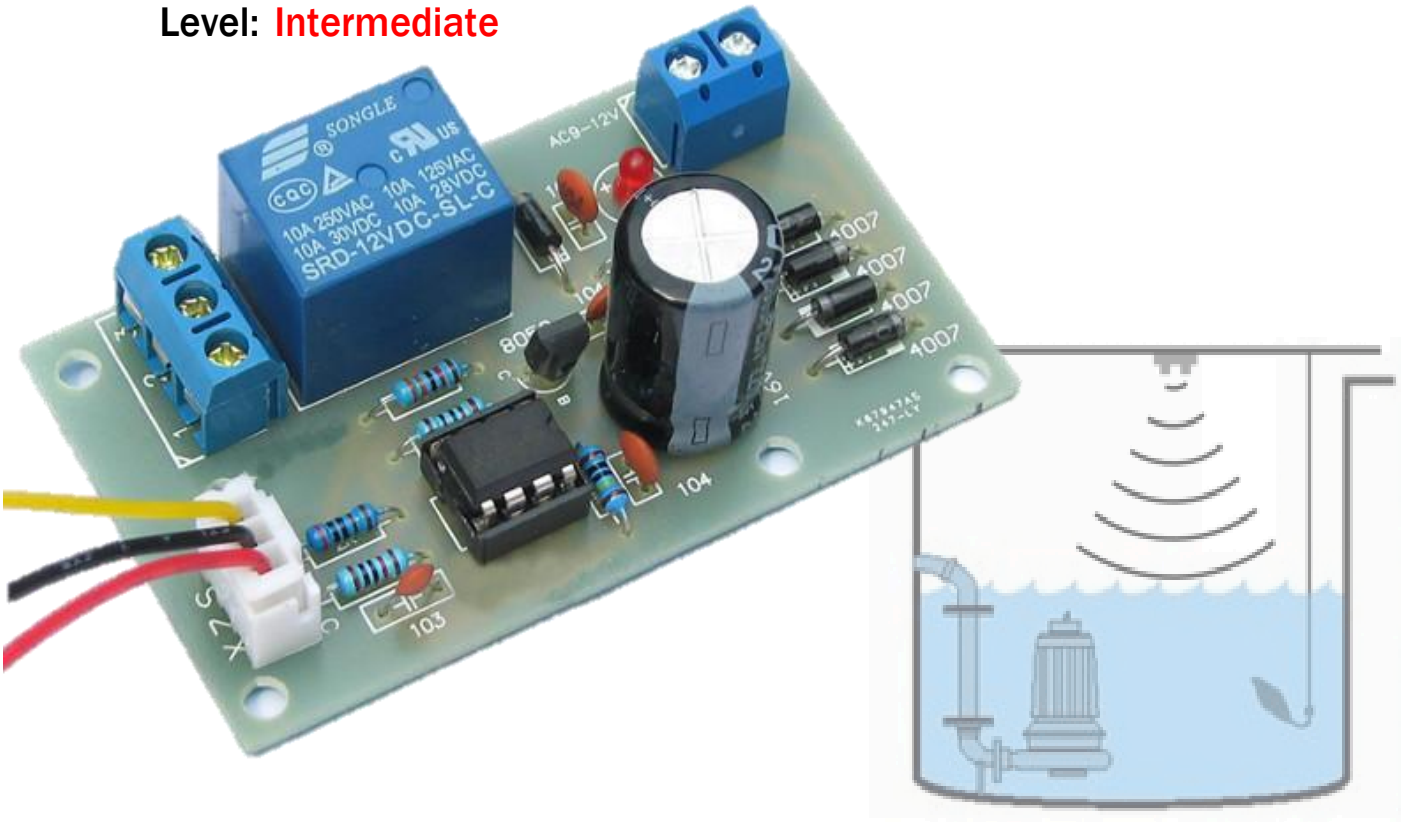
Water Depth Controller D.I.Y Kit

“ for automated water depth sensing and electronic switching circuit to power on or off your external devices ”

Part Number: AK-335

Level: Intermediate



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Description:

This kit contains the required components to build yourself a water depth controller. This module is based around the 555-timer circuit and SRD-12V relay.

While being a simple soldering project for beginners, this kit can be used in a variety of small personal, educational or enterprise applications such as:

Automated drainage system

Automated tank fluid level control

Automated water flood detection system

This is a D.I.Y. kit that requires soldering through-hole components on the main single-sided printed circuit board. Users with minimal soldering tools and intermediate skills can easily assemble this module. The assembly process should take anywhere between 10 to 20 minutes.

Specification:

Module

- Required Input Voltage: 12VDC or 12VAC (using a step-down transformer)
- Current: ≈ 40mA
- PCB Dimensions: 66 x 38 x 2mm (3"x 1 ½")

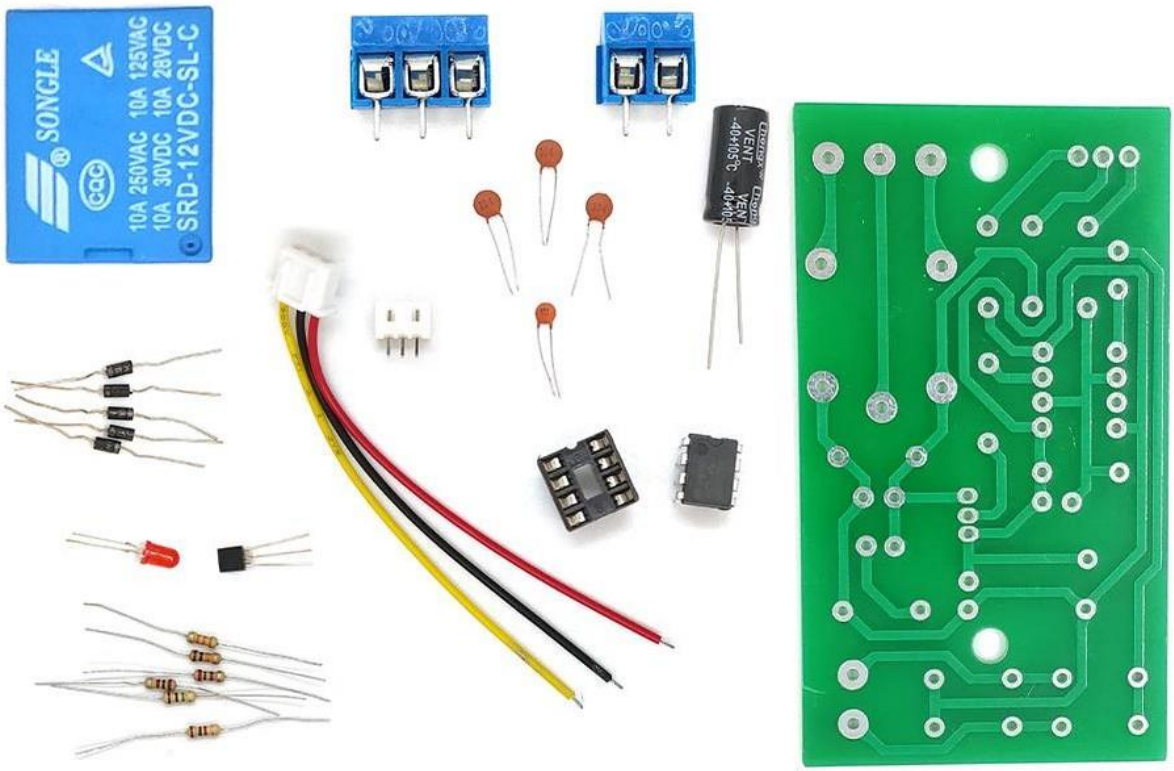
Relay

- Absolute Maximum Input Voltage: 30VDC or 250 VAC
- Absolute Maximum Input Current: 10A

Bill of Materials:

This package includes 26 pieces which are listed below along with their labels and quantity.

Component	Label	Value / Type / Label	Quantity
Resistors	R1, R6	2KΩ / (Red, Black, Red, Gold)	2
	R5	1KΩ / (Brown Black, Red, Gold)	1
	R3	10KΩ / (Brown, Black, Orange, Gold)	1
	R4	1MΩ / (Brown, Black, Green, Gold)	1
	R2	33KΩ / (Orange, Orange, Orange, Gold)	1
Rectifier Diode	D1, D2, D3, D4, D5	1N4007	5
Light Emitting Diode	LED	5mm Red LED	1
Ceramic Capacitor	C1, C3, C4	104 (100nF)	3
	C2	103 (10nF)	1
Electrolytic Capacitor	C5	2200µF Polarized	1
Transistors	Q1	S8050 Epitaxial Silicon NPN	1
IC Chips and Sockets	NE555	NE555p 555 Timer IC	1
	—	8-pin (DIP-8) IC Socket	1
PCB and Module	—	Water Depth Module (White PCB)	1
Relay	JS1	SRD-12VDC-SL-C	1
Connector and Header	—	2 Pin Screw Terminal	1
	—	3 Pin Screw Terminal	1
	ABC	3 Pin XH Connector and Socket	1



Assembly:

1) In order to assemble the module, you need the following tools:

Must Have

Temperature Adjustable Soldering Iron
A variety of soldering tips
Brass wool
Wet sponge

60/40 or 63/37, Tin-Lead Solder

Flush Cutters

Needle Nose Plier or Tweezers

Wire Stripper

Lint Free Cloth

*It is recommended to have some isopropyl alcohol and a fine soldering brush handy to clean off the excess flux on the circuit board when the soldering is done.

Recommended

Isopropyl Alcohol

Soldering Brush

Rosin Flux Pen or Paste

ATTENTION DO NOT USE RUBBING ALCOHOL, IT WILL DAMAGE THE COMPONENTS.

2) Open the package and verify the components. (refer to section 4. Bill of Materials on page 3)
3) Lay down all the components on your workbench and proceed to the next step.
4) Prepare your soldering tools.
    a) Use an appropriate tip for the application. Also, make sure the soldering tip is clean. Gently use a brass wool or a brush to clean the tip when needed. Another way of cleaning the soldering tip is to use a wet sponge.

b) The soldering iron temperature depends on the type of solder used. If you are using a typical 60/40 lead solder, depending on the thickness the temperature should be set anywhere between 370 to 500 °F (187 to 260 °C). If you are using a lead-free solder, increase above temperatures by 40 to 70 °F (5 to 20 °C).
ATTENTION HIGHER TEMPERATURES WILL DAMAGE THE COMPONENTS ALONG WITH THE CIRCUIT BOARD.
*ATTENTION*DO NOT TOUCH THE SOLDERING IRON WHEN IT IS HOT.

c) It is recommended that you clean the board with a fine brush, isopropyl alcohol and lint-free cloth to get rid of any pre-existing residue, glue or dirt. This way the solder will create a better joint with the copper surface.

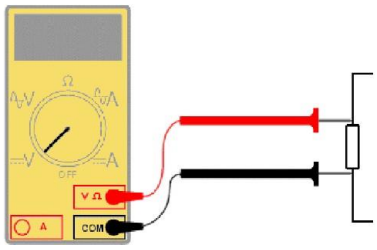
d) Have your flush cutter, needle nose plier or tweezers handy.

e) Having a roll of paper tape helps you to keep the components in place when soldering on the bottom side of the board.

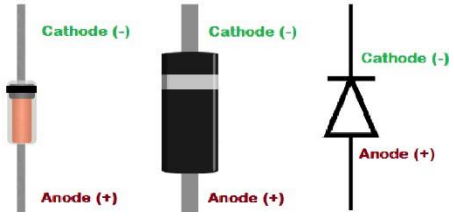
f) Have a rosin flux pen or paste handy. Adding flux to the pads before soldering the components makes the wetting process easier by letting the melted solder to flow better on the pad and create a better joint.
ATTENTION SOLDERING SHOULD BE DONE IN A VENTILATED AREA. BREATHING SOLDER FUMES WILL HARM YOU.

g) Always cut the excess leads with a flush cutter once a component is soldered on the PCB. At least 1mm of the lead should stick out from the solder joints.

Optional
Use a digital multimeter to measure the resistor values



Pay attention to the polarity of the diodes.



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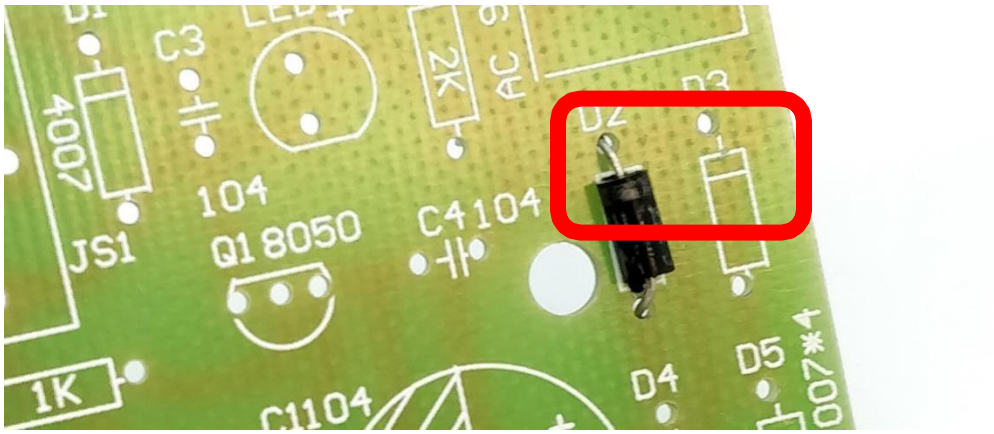
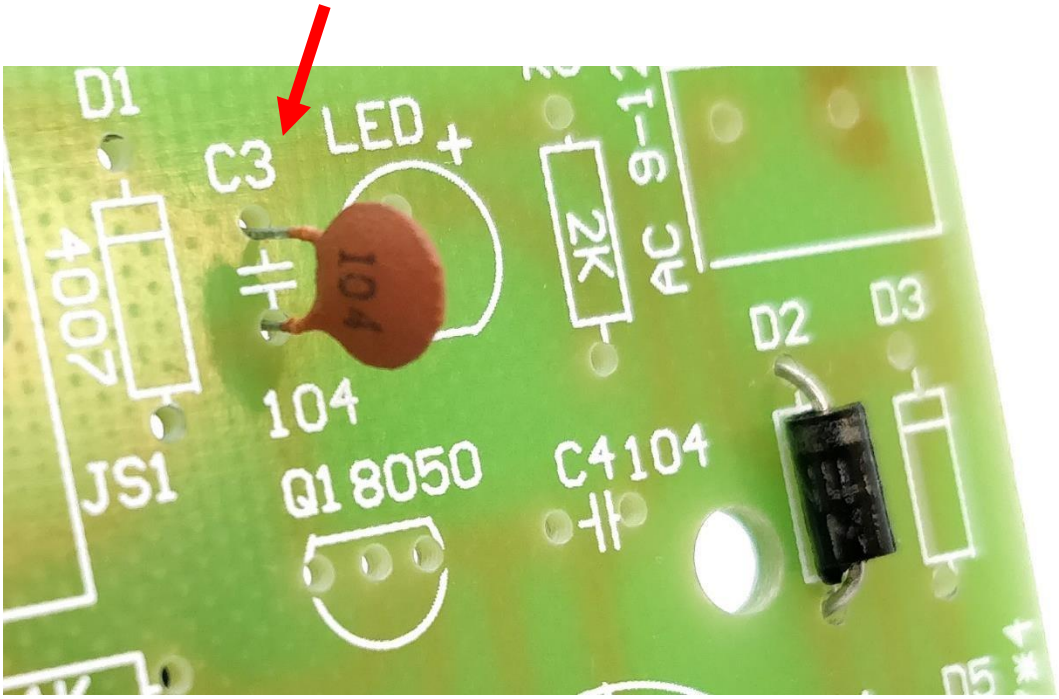
Insert the diode as indicated on the silkscreen. Ensure the white band position matches with the board, solder the leads on the bottom side of the board.



You can solder these components one by one or all at once depending on your level of comfort and skills.

Insert the ceramic capacitors and solder it on the bottom side of the board.



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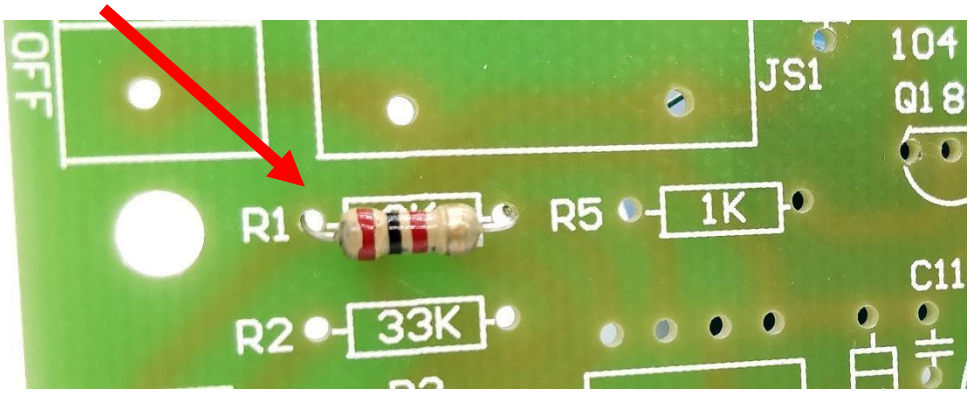
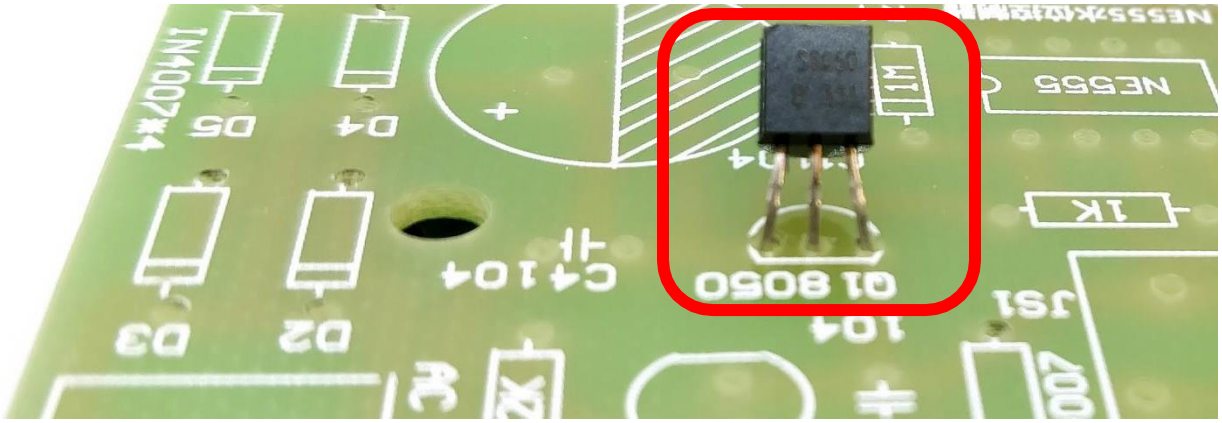
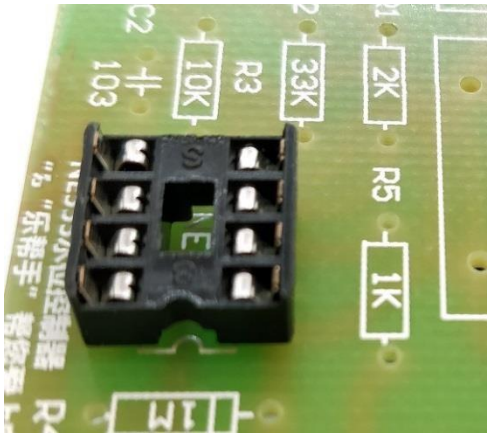
Insert the resistors and solder it on the bottom side of the board.

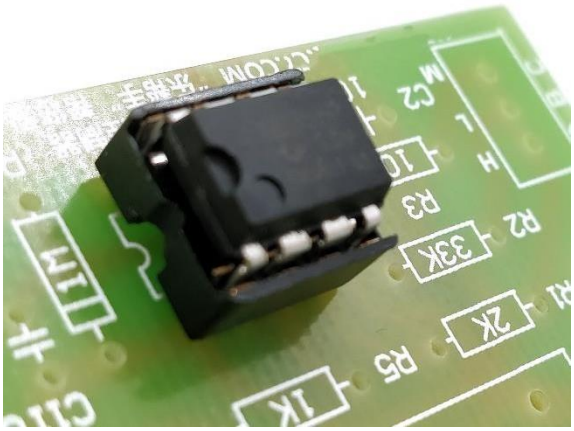


Insert the transistor and solder it on the bottom side of the board.



Insert the 8-pin DIP socket, ensure the notch aligns with the marking on the board as shown and solder it on the bottom side of the board.





After soldering you can insert the IC into the socket, please ensure the notch align correctly!

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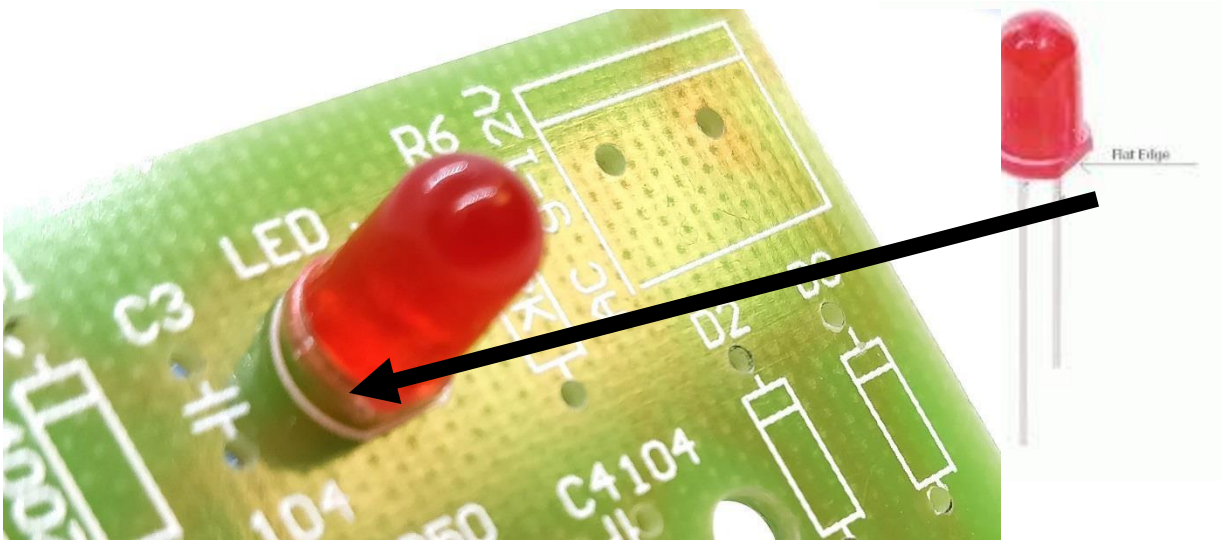
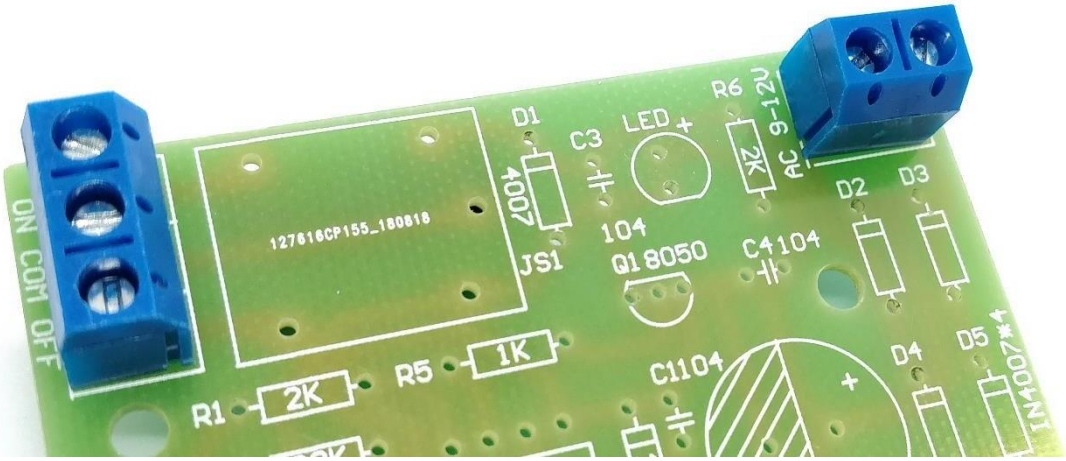
Insert the led, ensure the flat side (cathode) of the led aligns with the marking on the board and solder it on the bottom side of the board.



Insert the terminal blocks and solder on the bottom side of the board.



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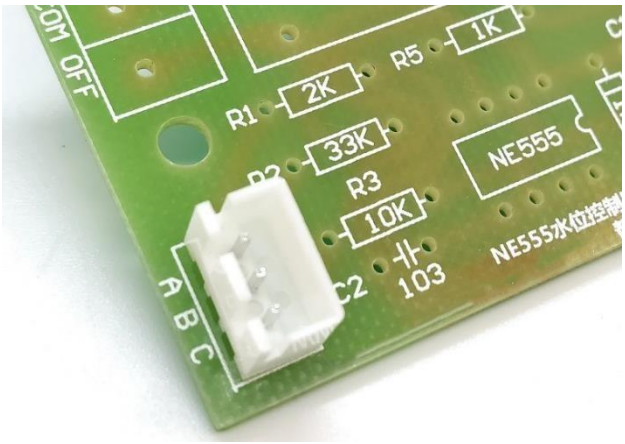
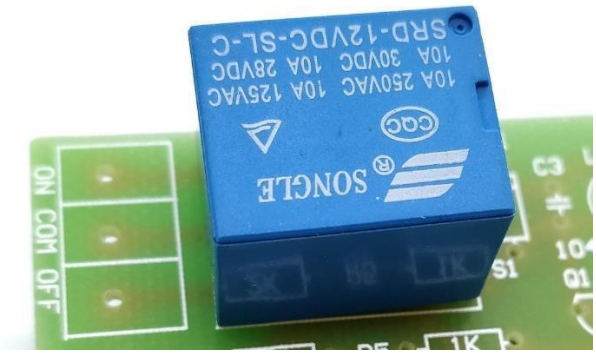
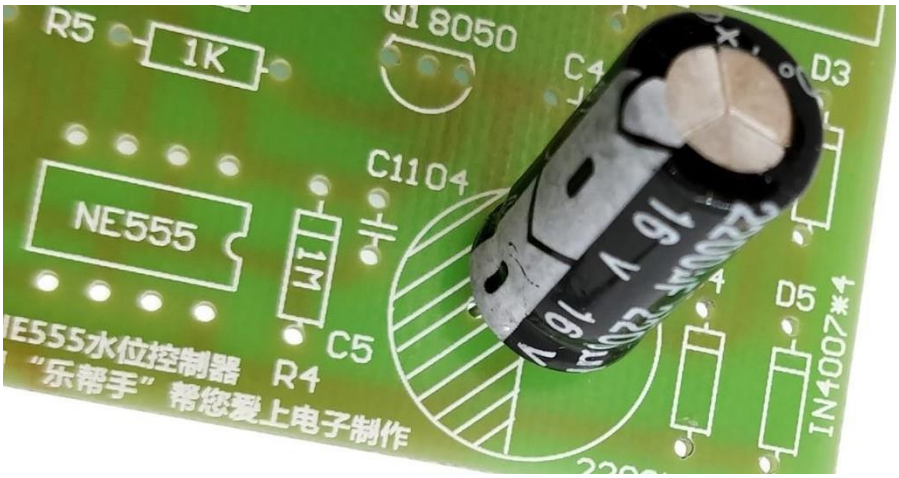
Insert the 3 pin JST-XH socket and solder on the bottom side of the board.



Insert the relay and solder on the bottom side of the board.



Insert the polarized capacitor as shown in the photo with the white band matching the shaded white region on the bottom side of the board.



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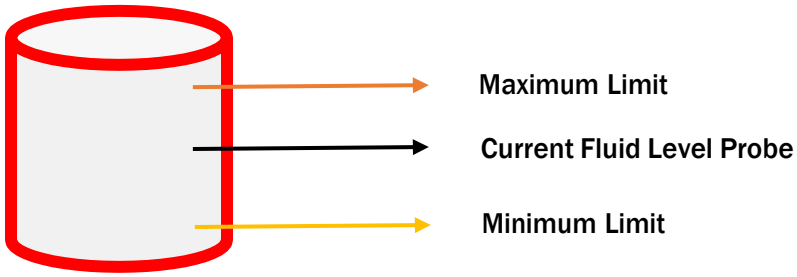
Implementation:

The three probes are designed to be affixed into any water chamber or room that you wish to install this device.



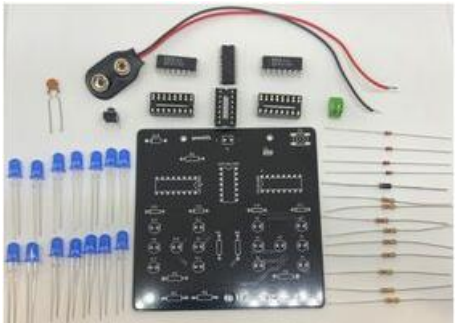
You may simply use the given stripped JST-XH by allowing the wire in the tank to be exposed to any non-corrosive fluid or solder an extension cable with an exposed medium such as copper or tinned wires to send signal back.

While the current fluid level probe is below the maximum limit, the relay will be in the “ON” state. When the current fluid level probe has reached the maximum limit probe the relay will switch to the “OFF” state.

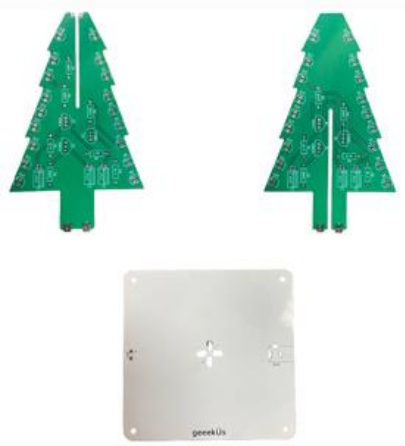
The system will only resume to “ON” state when the current fluid level probe reaches the minimum limit.

Related D.I.Y Kits:

GK-EK-DICE Dice DYI Solder Kit



The particular game that can be played is Craps which heavily relies on rolling dice, making this kit perfect for such a game! This DICE Kit also comes with a manual that covers the basic rules of the game, soldering tips, and the PCB's circuitry schematic.



GK-EK-51 Christmas Tree DYI LED RGB Kit

This soldering kit is great for polishing soldering skills. Assemble the 3D Christmas tree and give the room some Christmas spirit for the holidays!

GK-EK-180 DIY LED Flashing Wheel of Fortune

This DIY LED Flashing Wheel of Fortune soldering kit is a great way for anyone looking to get a taste of what it is like to experience the rewarding task of soldering. The board demonstrates a fairly simple 555 timer logic circuit that you can assemble in less than 30 minutes by following the provided manual.

- Check out more awesome projects at www.abra-electronics.com -