

MYCOMKITS.COM's "MK-300B Push / Toggle Operation! Multifunctional Touch Sensor Kit with Relay which also works Water Level Sensor" is a touch sensor kit which recognizes having touched the pad by detecting change of electric capacity.

Now, the touch switch of various forms, such as a resistance detection system and an electric capacity detection system, is used as a switch of many pieces of equipment. This MK-300B touch sensor kit uses "the capacitive sensing module (CPS)" which detects the state of a touchpad by detecting change of the electric capacity built in microcontroller IC of the microchip company, it is the kit which enabled it to use a touch pad as a push-button switch (momentary operation) or a toggle switch (alternate operation). If the lighting of AC100V, alarm, equipment, etc. are attached to a relay output since the large-sized relay is carried, you can turn on it touching it and turn it off touch it again, or 10 seconds after touching it, the system can turn it off automatically.

FEATURES:

- Three operational mode:
push-button switch mode (one pad use)
toggle switch modes 1 (one pad use. Turn on and off by one pad)
Toggle switch mode 2 (two pads use it for ON/OFF)
- Since a touchpad is non-contact, you can put a pad into a plastic case and turn ON and OFF from outside.
- Since change of electric capacity is detected and turn on and off, it can detect a water level.

SPECIFICATIONS & FEATURES:

Supply Voltage	DC +12V
Consumption Current	About 50mA (driving relay), about 5mA (idle)
Relay output contact current	Max 10A (AC100V//AC240V/DC30V at resistive load) Max 03A (AC100V//AC240V/DC30V at inductive load)

ON time adjustment of a relay (effective only at the time of push button switch mode) From about 1 second to about 50 seconds -- You can adjust time to continue making a relay to ON. You can adjust in the range for about 1 to about 50 seconds (at the end of the right) , in the pre - set potentiometer (R1) on the board. **Cautions: It is effective only at the push button switch mode.**

Number of pads for touch sensors: 2 pcs. However, the number of pads which you use by operational mode changes. Folding a printed circuit board, you can separate it and use it as the pad.

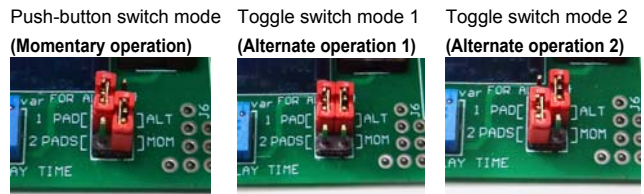
How to change operational mode You can determine the operational mode (three modes) which inserts a short pin in pin header of J4. Extracting a short pin with tweezers etc. and insert it between the pins corresponding to the operational mode to wish (refer to photograph) **Notes: Microcontroller IC detects and determines the mode only at their turning on. When you do not change operational mode, please do not mount J4 connector, but short-circuit the terminal which you wish to have directly.**

Push-button switch mode (momentary operation):
While pushing the touchpad 1, the relay is turning on. After your finger leaving from the pad, the relay will turn off after ON time setting time. You do not use the pad 2. **Notes: The relay may be turned off depending on environment even if you are keeping to touch the pad.**

Toggle switch mode 1(alternate operation):
If the touchpad 1 is touched, the relay is turned ON. The relay will be turned off if it is touched once again You do not use the pad 2.

Toggle switch mode 2(alternate operation):
If the touchpad 1 is touched, the relay is turned ON. The relay will be turned off if the pad2 is touched

**MK-300B Push / Toggle Operation!
Multifunctional Touch Sensor Kit with Relay**



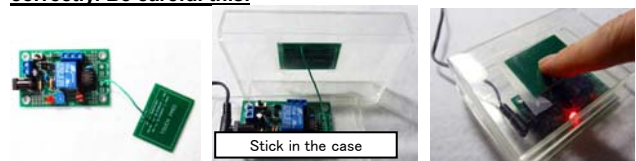
Relay output: There are three terminals as a relay output, and while the relay is not driving, a COM terminal (common) and NC terminal (normally Close) are electrically connected and the relay is driving, a COM terminal (common) and NO terminal (normally opening) are electrically connected. For example, when using alarm etc. ,you connect the power supply and alarms to the COM terminal and NO terminal.

Visual Indicator LED on a board lights up during a relay driving.

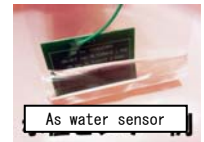
How to use:
Power supply connection: You connect DC power supply of +12V to DC jack connector (J1) or a terminal block (screw-type terminal J2) at either.

Relay output connection: Refer to the above-mentioned specification for the concrete adjustment way.
ON time adjustment of a relay: Refer to the above-mentioned specification for the concrete adjustment way.
How to change operational mode Notes: Microcontroller IC detects and determines the mode only at their turning on. When you do not change operational mode, please do not mount J4 connector, but short-circuit the terminal which you wish to have directly. Refer to the above-mentioned specification for the concrete adjustment way.

Power on: Slide the slide switch S1 to ON.
Mounting of a touchpad: In the push button mode and the toggle mode 1, since the pad 2 is not used, it is not necessary to solder the pad 2. You mount a touchpad so that the component side (side with white printing) of a touchpad can be touched fundamentally. You can mount it on the back of a plastic case In that case, please stick and attach the soldering face of a pad (side without white printing. The metal plate which detects a touch is stuck) in a case (refer to photograph). **Important: When you mount a pad, please solder an electric wire to the side opposite to the side to be used. If metal things, such as a speaker and an aluminum board, are near the back of a pad, it will not operate correctly. Be careful this.**



Use as a water-level sensor: Please set to push button mode (momentary operation), put the pad 1 into a plastic bag (about 0.05 mm in thickness), and let stick as much as possible and use it. **Notes: Please do not pour water on a pad directly. Since it is not waterproofing, it breaks (it rusts)**

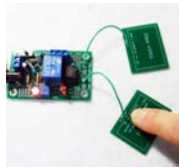


Assembly:
Important: Separate the touchpad 1 and the touchpad 2 from a printed circuit board fundamentally, then use them (even if it does not separate, you can use them) (refer to photograph) The printed circuit board is trenched at V type by both sides. You can easily separable if you push equally and folded in the both sides of V slot on the edge of any board or desk. You separate the pad 2 and then separate the pad 1. Please separate before mounting parts.



Important: A component side (side with white printing) or a soldering face is also OK for soldering of the electric wire to a touchpad. Please choose by your favorite mounting way.
Check to see if all of the parts in the parts list are included before assembly. Refer to the fabrication side (color) of the product page during fabrication.

It is generally easiest to solder the lowest height components first - the resistors, and diode. Next, start soldering the taller parts (in order of the 0.1uF capacitor, polar capacitor, LED, terminal blocks and relay). Note the poles of polar parts when soldering them. Align the cathode (flat part or shorter lead) of the LED with the flat line of the PCB legend and solder them together.



At last, cut to the length which expects an attached vinyl electric wire, and solder to the touchpads 1 and 2 (refer to photograph). **Note: Since the electric wire itself works as a touch sensor although it can be extensible, an electric wire is greatly influenced by environment.** When you extend it, please carry out with a trial repeatedly.

Refer to the "Convenient notes for electrical work" on the website for details, on how to attach components, how to view PCB silk printings, how to interpret resistance values, and so on.

What To Do If It Does Not Work

Poor soldering is the most likely reason. Check all solder joints carefully under a good light. Check that all components are in their correct position on the PCB.

Explanation of a circuit and a program (C compiler by CCS):

6 pin(RA1) and 7 pin(RA0) of microcontroller IC are set as the touch sensor input terminal. When you touch the pad according to operational mode, microcontroller IC detects it, then 3 pin (RA4) is set to high level (about 5V), it drives the transistor Q1, and the transistor drive relay RLY1. Operational mode is determined using the voltage of 4 (RA3) and a 2 (RA5) pin changing by the position of the jumper pin inserted in the pin header J4. Since the pull-up of No. 4 (RA3) and the No. 2 (RA5) pin is carried out inside the microcontroller, you set each pin to 5V or 0V with a jumper pin. With the voltage of the potentiometer R1 connected to the 5 pin (RA2), it calculates the ON time of a relay as time proportional to the voltage. It is programmed so that ON time will become by 1 second at 0V and will be 50 seconds at 5V in general.

In push button mode (momentary), if the touchpad 1 is pushed, the value of the timer 1 will change and function touchpad_getc() will return "0." Next, the relay is turned ON and the value of the internal timer 1 is recorded simultaneously, and it maintains with ON of a relay until the value changes. In the mode which uses one pad in toggle mode (alternate), if the touchpad 1 is touched, the value of timer1 will change, and function touchpad_getc() returns "0" and turns ON a relay simultaneously. Since the value of the timer 1 will change and function touchpad_getc() will return "0" again if the touchpad 1 is touched, it turns OFF a relay. In the mode which uses two pads in toggle mode (alternate), the procedure which turns ON a relay is the same as one pad using. The touchpad 2 is used in order to turn OFF a relay. Since the value of the timer 1 will change and function touchpad_getc() will return "1" if the touchpad 2 is touched, it turns OFF a relay. or details, please download the "program file" (text) of a product page, and refer to it.

CONTACT DETAILS

Access the following MYCOMKITS.com website below for related detailed documents.

<http://www.mycomkits.com>

Contact us at the email address below if you have any questions.

support@mycomkits.com

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Parts List-MK-300B

Resistors (5%, 1/4W)

- 2.2kΩ (red, red, red) R2 1
- 1kΩ (brown, black, red) or 1.2k (brown, brown, brown,) R3 1

Capacitor

- 0.1uF(104) capacitor C1, 2 2
- 10uF polar C3 1

Semiconductors

- 12F1822 PIC microcontroller IC U1 1
- 78L05 regulator IC U2 1
- 1N4007 diode D1, 2, 3 3
- BC548 (or equivalent) transistor Q1 1
- LED (red) D4 1

Other

- IC socket (8 pin) for U1 1
- 10KΩ pre-set potentiometer R1 1
- Relay (SRD-12V or equivalent) RLY1 1
- DC jack connector J1 1
- Slide switch S1 1
- Terminal block (bipolar screw terminal) J2 1
- Terminal block (3 poles screw terminal) J3 1
- Pin header (6 pin double, or 2-3 pin single) 1
- Jumper pin socket 2
- Vinyl electric wire for pad connection (about 15 cm) 1
- MK-300B PCB(K321) 1
- (main: around 69x43mm, pad: around 33 x 43mm)

