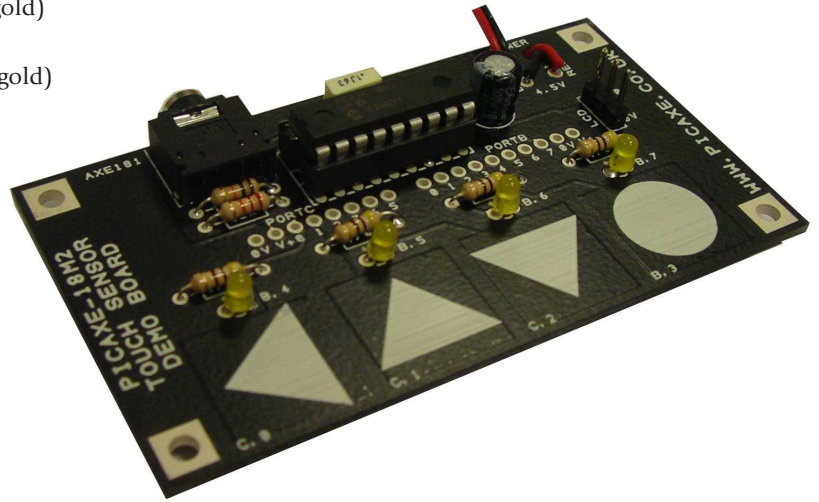


AXE181 TOUCH SENSOR DEMO BOARD

Contents:

- PCB Touch Sensor Demo Board PCB
- R1 10k resistor (brown black orange gold)
- R2 22k resistor (red red orange gold)
- R3-6 470 resistor (yellow violet brown gold)
- C1 100nF polyester capacitor
- C2 100uF electrolytic capacitor
- L1-4 3mm yellow LED
- H1 3 pin header
- CT1 stereo download socket
- BC Battery Clip
- BB 4.5V (3xAA) Battery Box
- IC1 18 pin IC socket
- IC1 PICAXE-18M2 microcontroller



Description:

The PICAXE-18M2 touch sensor demo board provides a system for testing the touch sensor features of the PICAXE-18M2 microcontroller. Four touch sensor pads on the PCB are connected to 4 touch sensor pins (C.0, C.1, C.2 and B.3) and 4 LEDs (B.4 - B.7) are also available.

Solder pads are provided for all i/o pins to allow further experimentation.

An optional 3 pin header (pin B.0) allows connection to an AXE033 Serial LCD or other device such as a servo and may also be used to send sensor indications to another board. If powering an AXE033 Serial LCD via this connector ensure the power jumper is inserted on the AXE033 Serial LCD to allow 4.5V operation.

Instructions:

1. Solder the components in place.

Note that the LEDs must have the long leg in the hole marked '+'. The capacitor C2 is also polarised and must be soldered the correct way around.

Note the battery clip can be threaded through the board prior to soldering to generate a stronger joint.

2. Insert the PICAXE-18M2, pin1 nearest the download socket. ONLY USE A 3V or 4.5V battery pack, not a 9V PP3 battery, as the power supply.
3. Use the PICAXE software of choice to develop a control program (see examples overleaf), and then download the program to the board by connecting the PICAXE USB download cable (part AXE027). The older AXE026 serial cable (or serial cable/USB adapter combination) is not recommended for this product as the AXE026 cable can affect the touch calibration readings.

Calibration (BASIC):

Before using the board it is necessary to determine the 'finger on' and 'finger off' values so that a suitable threshold value (half way between these values) can be selected. Note that different input pins will have different values, so each pin must be calibrated separately. In particular C.2 will have different readings to C.0 and C.1, this is normal behaviour due to the way the microcontroller is designed.

The following program will read the 4 touch sensor values and then display them on the computer screen for experimentation purposes. The reading will update every 500ms. (Note that the fourth touch pad is pin B.3, not pin C.3!)

```
main: touch16 C.0, w0    ; read sensor C.0 into word variable w0
      touch16 C.1, w1    ; read sensor C.1 into word variable w1
      touch16 C.2, w2    ; read sensor C.2 into word variable w2
      touch16 B.3, w3    ; read sensor B.3 into word variable w3
      debug              ; display
      pause 500         ; wait 0.5s
      goto main         ; loop
```

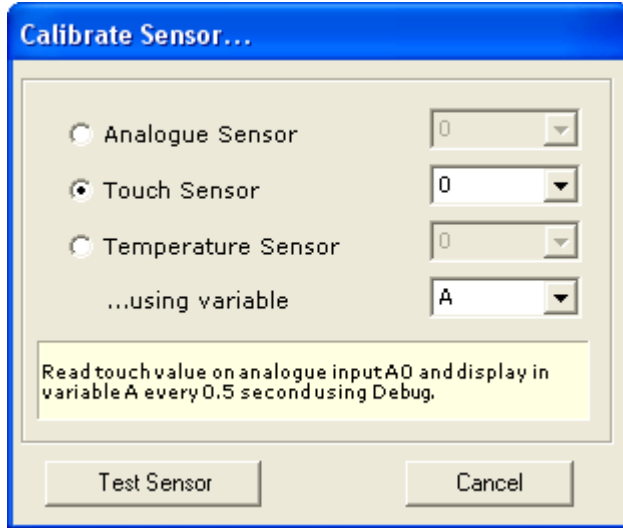
Example BASIC Program to Light LEDs:

In this example a threshold value of 5000 has been used on each input. These thresholds will need to be changed in your final program. Each LED should light when the corresponding touch sensor pad is touched.

```
main: touch16 C.0, w0    ; read sensor C.0 into word variable w0
      if w0 > 5000 then
          high B.4      ; LED on
      else
          low B.4       : LED off
      end if
      touch16 C.1, w1    ; read sensor C.1 into word variable w1
      if w1 > 5000 then
          high B.5      ; LED on
      else
          low B.5       : LED off
      end if
      touch16 C.2, w2    ; read sensor C.2 into word variable w2
      if w2 > 5000 then
          high B.6      ; LED on
      else
          low B.6       : LED off
      end if
      touch16 B.3, w3    ; read sensor B.3 into word variable w3
      if w3 > 5000 then
          high B.7      ; LED on
      else
          low B.7       : LED off
      end if
      ; debug           ; optional display the variable values
      goto main         ; loop
```

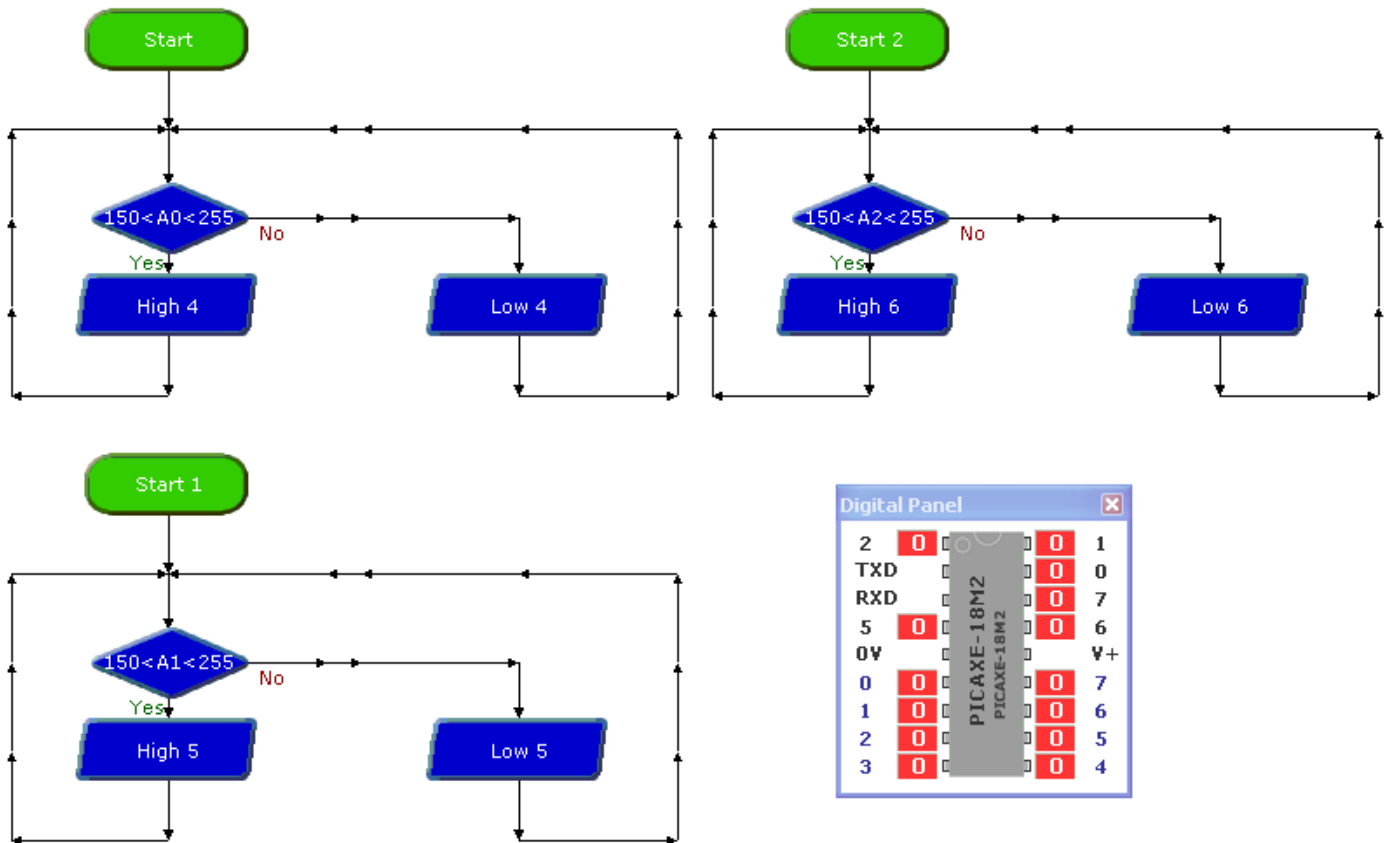
Calibration (Logicator):

To calibrate using the Logicator flowcharting software use the calibration wizard which is available from the PIC menu:



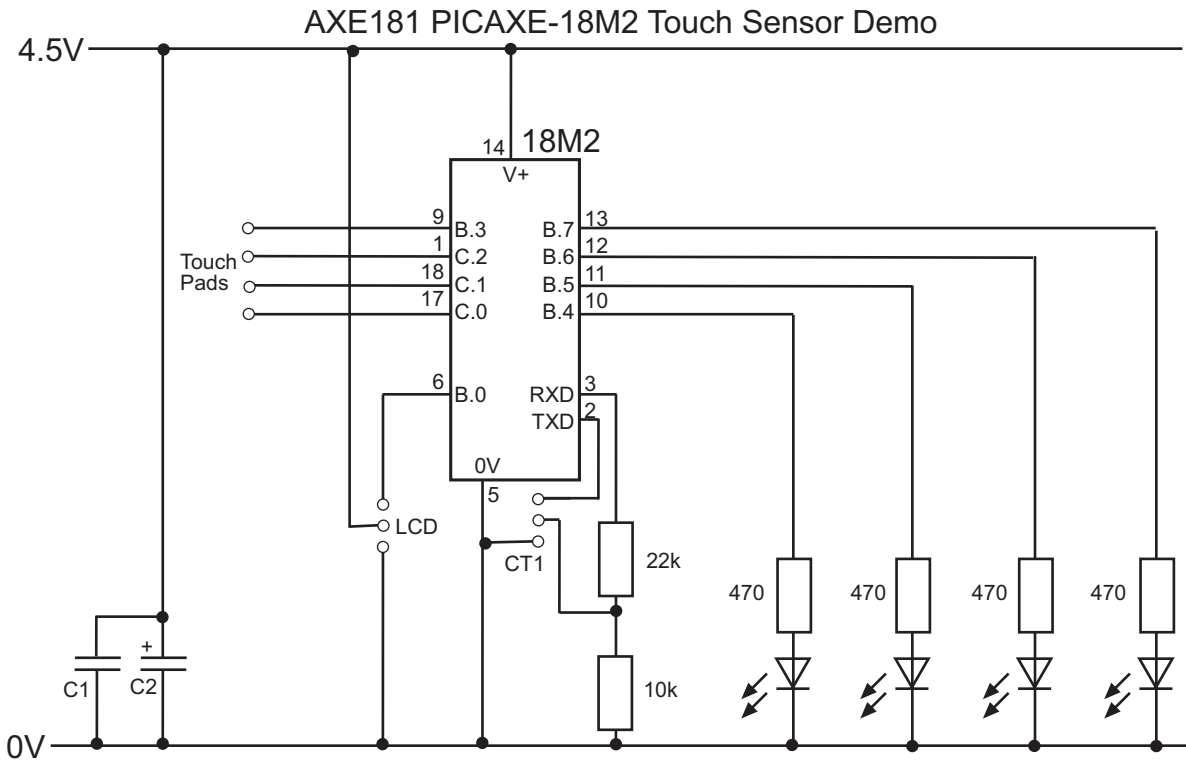
Example Logicator Flowchart

In this example a threshold value of 150 has been used on each input. These thresholds will need to be changed in your final flowchart. Each LED should light when the corresponding touch sensor pad is touched.



Circuit Diagram

Please note that the 4th input is pin B.3 not pin C.3
 (as C.3 does not have touch sensor capability)!



PICAXE-18M2

(DAC / Touch / ADC / Out / In) C.2	1	18	C.1 (In / Out / ADC / Touch)
(SRQ / Out) Serial Out / C.3	2	17	C.0 (In / Out / ADC / Touch)
(In) Serial In / C.4	3	16	C.7 (In / Out)
(In) C.5	4	15	C.6 (In / Out)
0V	5	14	+V
(SRI / Out / In) B.0	6	13	B.7 (In / Out / ADC / Touch)
(i2c sda / Touch / ADC / Out / In) B.1	7	12	B.6 (In / Out / ADC / Touch / pwm)
(hserin / Touch / ADC / Out / In) B.2	8	11	B.5 (In / Out / ADC / Touch / hserout)
(pwm / Touch / ADC / Out / In) B.3	9	10	B.4 (In / Out / ADC / Touch / i2c scl)