FUTURE KIT

HIGH QUALITY ELECTRONIC KITS

DIGITAL COUNTER 4 DIGIT CODE 936

LEVEL 3

This circuit is the digital counter. It can be set the counter to count up or count down and fix numeric for set restart the circuit automatically.

Technical specifications:

- Power supply : 12VDC.   - consumption : 76mA max.
- Count maximum : 0-9,999
- Can be set the circuit for count up or count down.
- Can be set the preset digit for setting reset digit and restart counting automatically.
- Can be add the other board for adding digit.
- PCB dimensions : 2.70 x 3.14 inches.

How to works:

At the heart of the circuit is the mircocontroller IC2 which IC2 is programming form factory completely. Port PD0, PD3, PD4, PD6 and PB0-PB7 are driving 7'segment. PB5 is used for setting the counting format (normal and preset). PB6 is setting the count up or count down. Switch S1 to S6 are used for control the operation of circuit and setting of displaying. CK/IN point is used to connect the count signal or clock signal. CARRY and OUT point are used to add the other board for add the digit.

PCB assembly:

Shown in Figure 3 is the assembled PCB. Starting with the lowest height components first, taking care not to short any tracks or touch the edge connector with solder. Some tracks run under components, and care should be taken not to short out these tracks. If the pins will not enter the holes with ease, use a small drill to slightly enlarge the opening. All components with axial leads should be carefully bent to fit the position on the PCB and then soldered into place. Make sure that the electrolytic capacitors are inserted the correct way around. Some components are particularly sensitive to heat (ie: Transistors, IC's, diodes etc.) extra care must be taken to only apply the iron for as little time as possible, using a pair of pliers to grip the leads will help conduct heat away. Trim components leads with wire cutters to prevent excess lengths causing a short circuit. Now check that you really did mount them all the right way round!

How to use switch:

- Switch SW1 is used for change the thousand digit of each 1 step.
- Switch SW2 is used for change the hundred digit of each 1 step. If push and hold this switch 2 seconds, the display will show the time of send voltage at output point. But if push and hold this switch 5 seconds, the circuit will save the time to be showing at display now (at display showing "1" = 0.5 second).
- Switch SW3 is used for change the ten digit of each 1 step. If push and hold this switch 2 seconds, the circuit will save the numeric to be showing at display now for use the first numeric is showing when connect the power supply.
- Switch SW4 is used for change the first digit of each 1 step. If push and hold this switch 2 seconds, the display will be reset to "0000".
- Switch SW5, if push and hold this switch 1 seconds, the display will show the reset numeric for restart counting. But if push and hold this switch 3 seconds, the circuit will save the reset numeric to be showing at display now.
- Switch SW6 is used for change the digit of each 1 step.

NOTE

When you connect the power supply after assembly the component is complete, you have to push and hold switch SW4 untill the display to be display "0000" for reset the numeric before using.

How to set the time of send voltage at output point (in PRESET mode):

1.Setting the time by switch SW1 to SW4 (1 step = 0.5 second).

2.Push and hold switch SW2 approx. 5 seconds for save the time at the display to be showing "SAVE". At that mean the timer is complete.

3.If you want to see this time, you can push and hold switch SW2 approx. 2 seconds.

How to set the first numeric when connect the power supply:

1.Setting the numeric by switch SW1 to SW4.

2.Push and hold switch SW3 untill the display to be showing "SAVE" for save the numeric. At that mean the timer is complete.

How to set the reset numeric (in PRESET mode):

1.Setting the numeric by switch SW1 to SW4.

2.Push and hold switch SW5 approx. 5 second for save the numeric at the display to be showing "SAVE". At that mean the timer is complete.

3.If you want to see this numeric, you can push and hold switch SW2 approx. 1 seconds.

Testing:

Connect the power supply 12VDC to the circuit. Jumping "J1" jumper to "PRE" point and "J2" jumper to "UP" point. Set the circuit following below:

1.Push SW1, 7'segment will increase the thousand digit 1 step following your pushing. Set this digit to "0".

2.Push SW2, 7'segment will increase the hundred digit 1 step following your pushing. Set this digit to "0".

3.Push SW3, 7'segment will increase the ten digit 1 step following your pushing. Set this digit to "9".

4.Push SW4, 7'segment will increase the first digit 1 step following your pushing. Set this digit to "5".

5.In this time, 7'segment is showing "0095". Push SW5, at 7'segment will be showing "0100" ("0100" in this function is preset count).

6.Push SW6 until the circuit is counting to "100", the circuit will send the voltage out to "OUT" point and LED will be lighted on. And then push SW6 again, the circuit will reset the display digit to "0001" for the new counting again.

Connection:

- CK/IN point is used for connect the counting signal from sensor or other equipment.
- OUT 12V and CARRY point are connected to second board for add digit.
- OUT point will send the voltage 5VDC when the circuit is counting to preset of counting with this voltage can be apply to trig the other equipment.

Figure 1. Installing the componants

RESISTOR R ......Ω

ELECTROLYTIC CAPACITOR C .....μF Watch the polarity!

LED A ⊳⊢ K

TRANSISTOR
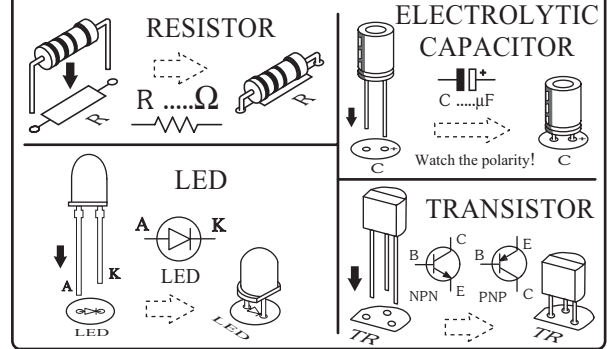
Troubleshooting:

The most problem like the fault soldering. Check all the soldering joint suspicious. If you discover the short track or the short soldering joint, re-solder at that point and check other the soldering joint. Check the position of all component on the PCB. See that there are no components missing or inserted in the wrong places. Make sure that all the polarised components have been soldered the right way round.
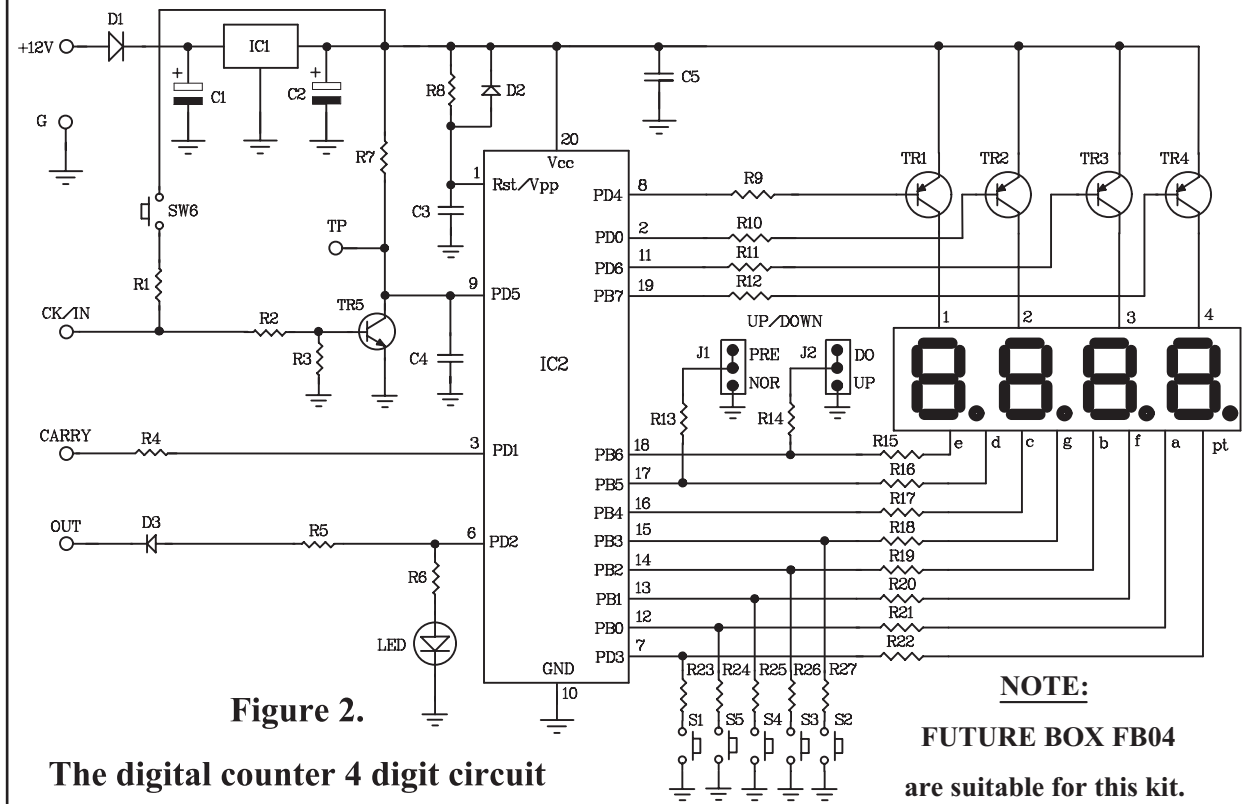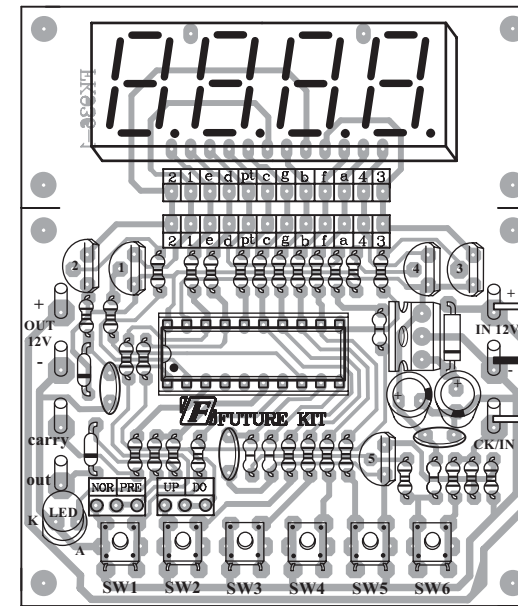

Figure 2.
The digital counter 4 digit circuit

NOTE:

FUTURE BOX FB04 are suitable for this kit.

Figure 3. Connections

FK936-1

FK936-2

+ POWER SUPPLY 12V -

COUNT SIGNAL

J1 is used for setting the counting format.

NOR PRE   **normal counting**

NOR PRE   **preset counting and restart counting automatically**

J2 is used for setting count up or count down.

UP DO   **count up**   UP DO   **count down**

Connection for add the board.

Board 2 ... Board 1