

ESK-310 Experimental Board

The ESK-310 Multi-function Experimental Board consists of fifteen individual circuit modules, providing a convenient platform to learn the development skill of Holtek microcontrollers. It can be used with a Holtek 8-bit MCU or 32-bit MCU starter kit to start the introductory learning and evaluation for various microcontroller applications such as home appliance, measurement, control, and healthcare.

Features

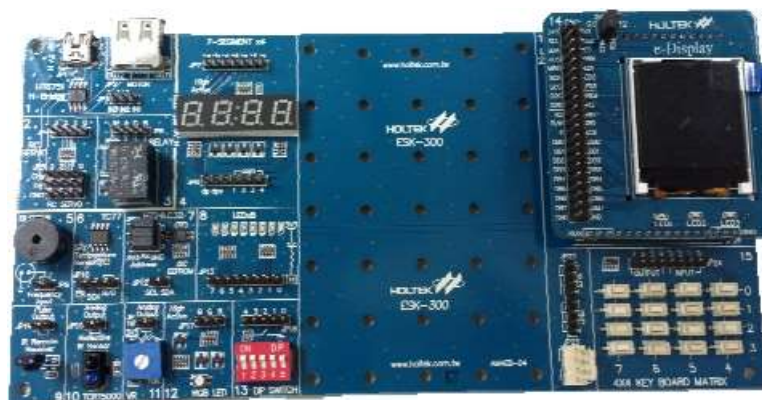
- ❖ Provide fifteen circuit modules for the convenience of learning or teaching.

HT6751 H-Bridge	Buzzer	VR
RC Servo	TC77	RGB LED
Relay	HT24LC32 EEPROM	DIP Switch
7-Segment x 4	LED x 8	Color TFT LCD
Reflective IR Sensor	IR Remote Receiver	4 x 4 Keypad

- ❖ Used with a Holtek 8-bit MCU or 32-bit MCU starter kit to control and interact with each circuit module.
- ❖ Holtek also provides the integrated development environment HT-IDE3000, featuring the function of real-time emulation, memory/register access, breakpoint, trace, and so on. The HT-IDE3000 provides a convenient and efficient environment for developing and debugging the application program.

System Requirement

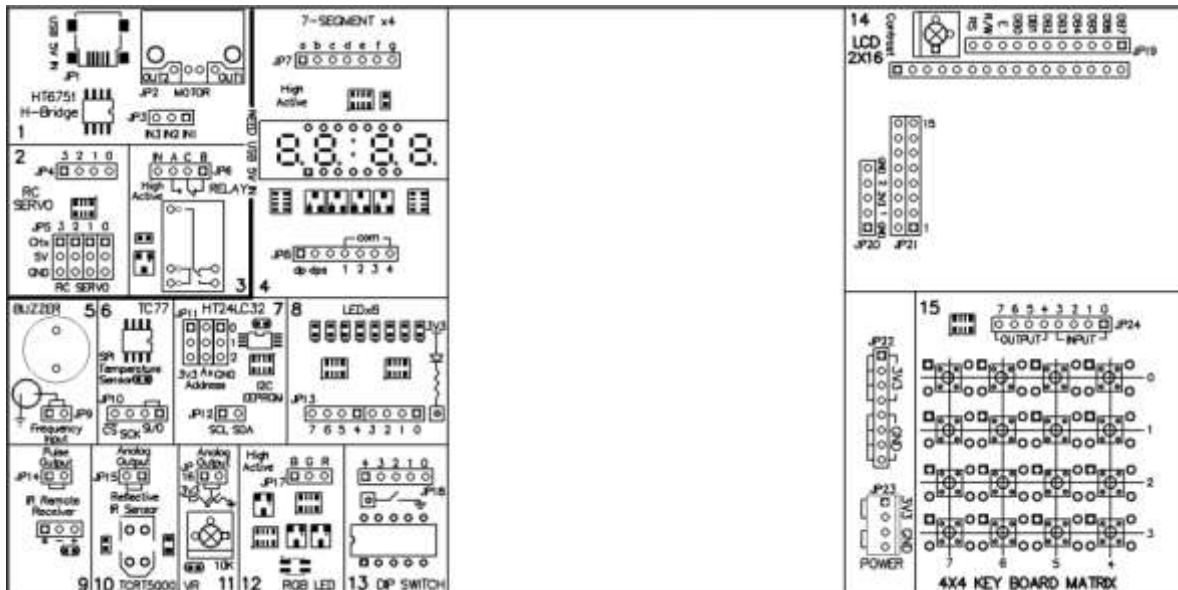
- ❖ Operating System: Window based
- ❖ Development Environment:
8-bit MCU: HT-IDE3000
32-bit MCU: Keil uVision, IAR EWARM



Function Description

The ESK-310 multi-function experiment board contains 15 practice units. Not only the component circuits used in the basic course, but also LED, Keypad, seven-segment display, and advanced light sensor, temperature sensor, EEPROM and other circuits are suitable for school microcontroller courses.

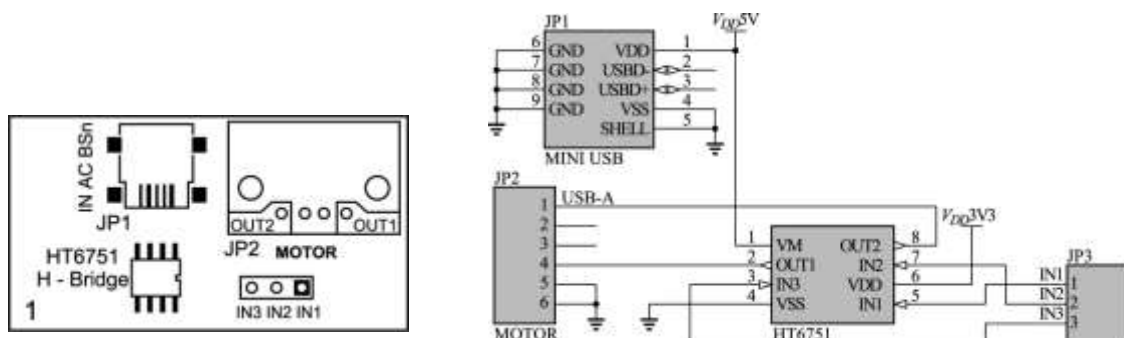
The layout diagram is as follows:



The circuit description of each block is as follows:

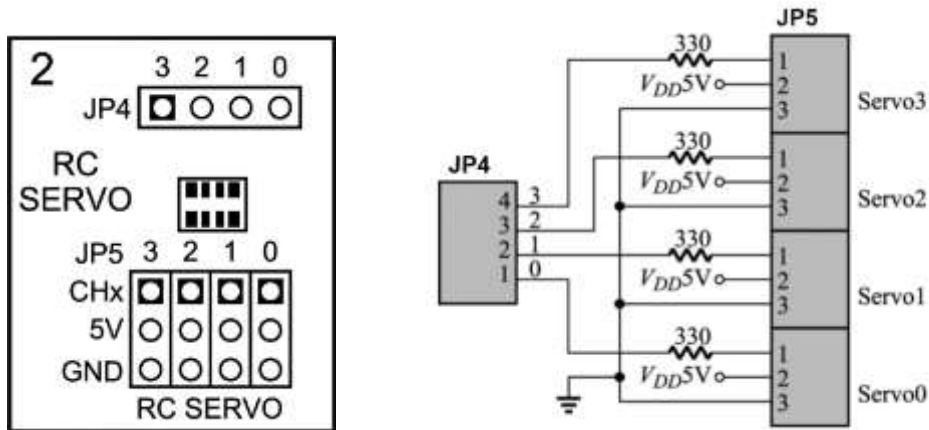
1. DC motor driver circuit

The power (+5V) is provided by mini USB (JP1), and the DC motor (fan) which should be connected to USB-A (JP2) is driven by the H-bridge driver IC (HT6751B).



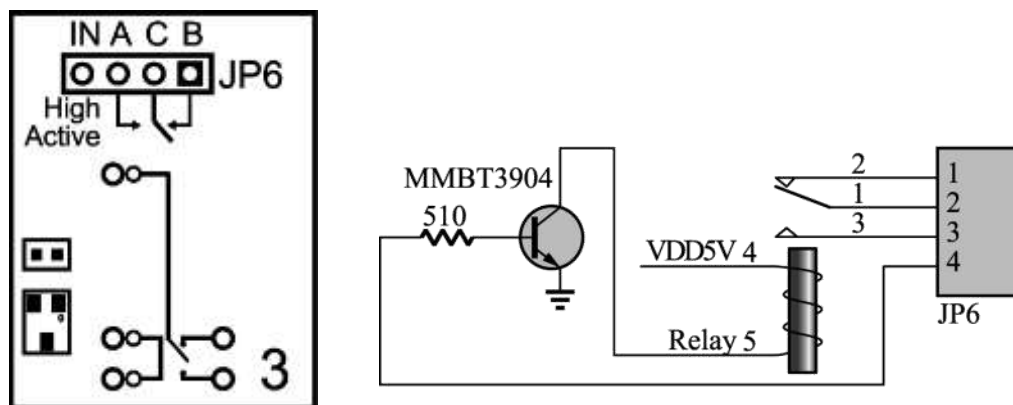
2. Servo motor circuit (RC Servo)

RC servo operation can be controlled by a PWM signal, the PWM signal can come from an MCU. Connect PWM signals to JP4 pins, and connect up to four RC Servos to JP5 (Servo0 - Servo3). The mini USB connector JP1 is used for power supply (+5V).



3. Relay circuit

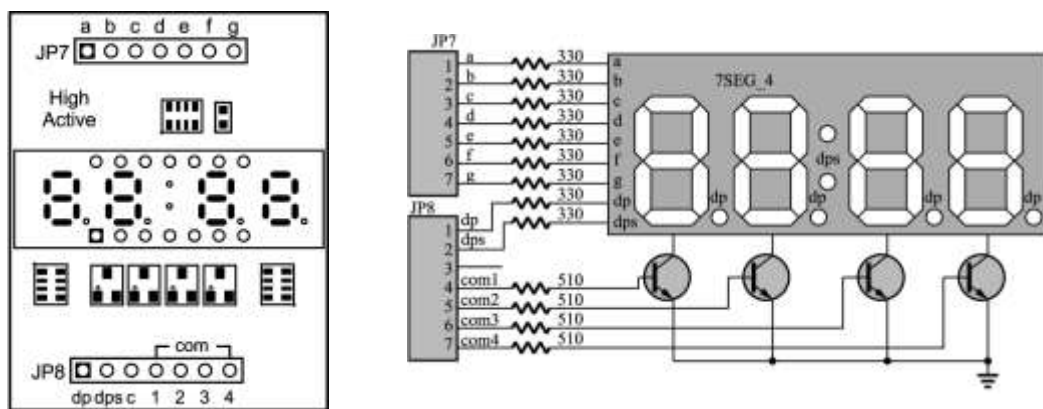
The relay will switch when the IN pin of JP6 is connected to high, C(1) is the common terminal, A(3) is NO (normally open), and B(2) is the NC (normally closed) pin.



4. Seven segment display

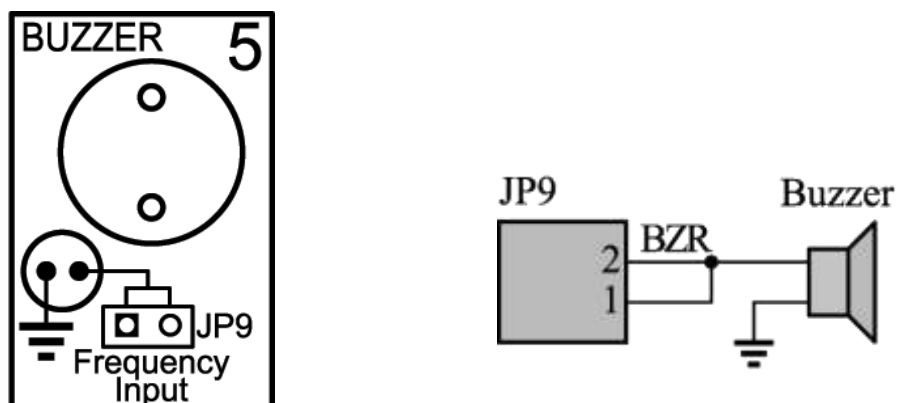
This circuit is a common cathode 4-digit seven-segment display. The com1 - com4 of JP8 select the digit to be displayed, set com1 - com4 high to display the correspond digit.

- Single digit display: for example, if only the rightmost digit is to be displayed, set com4 to high, and then set the JP7 pin high to light the correspond segment of the digit.
- Four-digit multiplex display: JP7 are the data lines, and the com1 - com4 of JP8 are the scanning lines. Four digits can be seen at the same time due to visual retention.



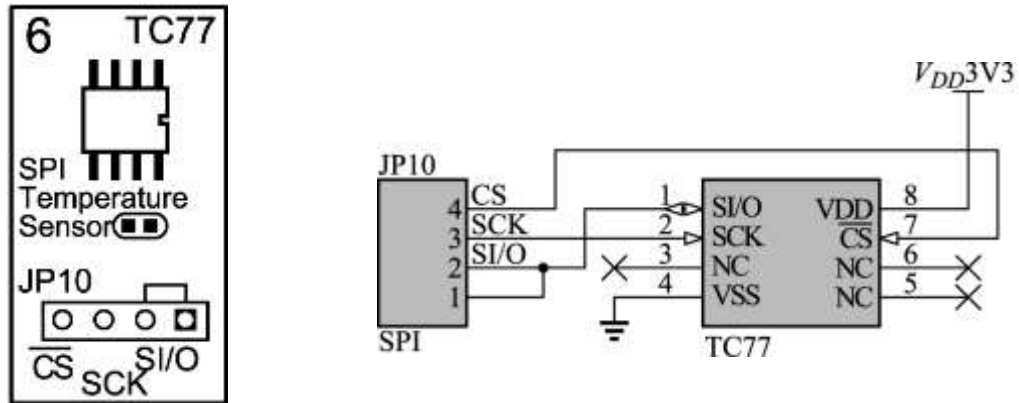
5. Buzzer

Input a waveform at JP9 to make a sound. The experimental board uses an active buzzer.



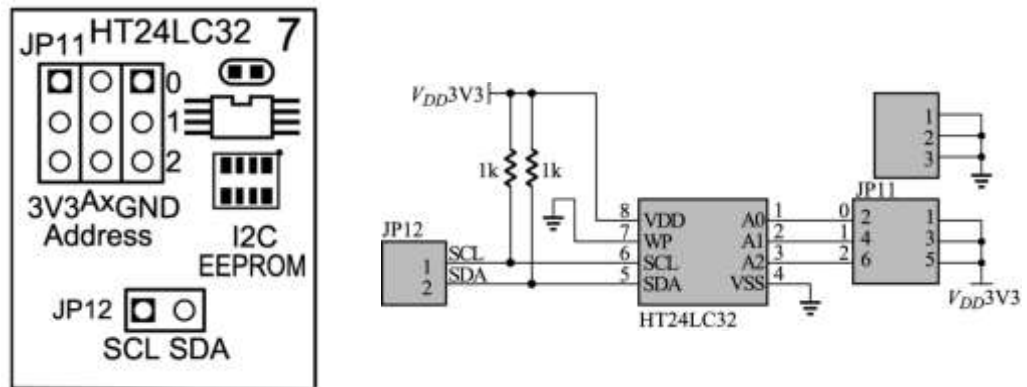
6. TC77 temperature sensing circuit

The temperature value of TC77 can be read via SPI interface. Connect the SPI interface pins of an MCU to JP10 to read data from TC77; the effective bit of TC77 is 13 bits, and the temperature resolution is 0.0625°C. Refer to the TC77 datasheet.



7. EEPROM circuit

Most MCUs integrate the I²C interface. Connect the I²C interface pins of an MCU to JP12 to access the EEPROM HT24LC32.



8. LED circuit

JP13 controls the ON and OFF of the LED; this LED circuit is a common anode circuit, therefore set JP13 pin to low to light up the correspond LED. The LED circuit uses 3.3V as the power, be sure to supply 3.3V on JP22

