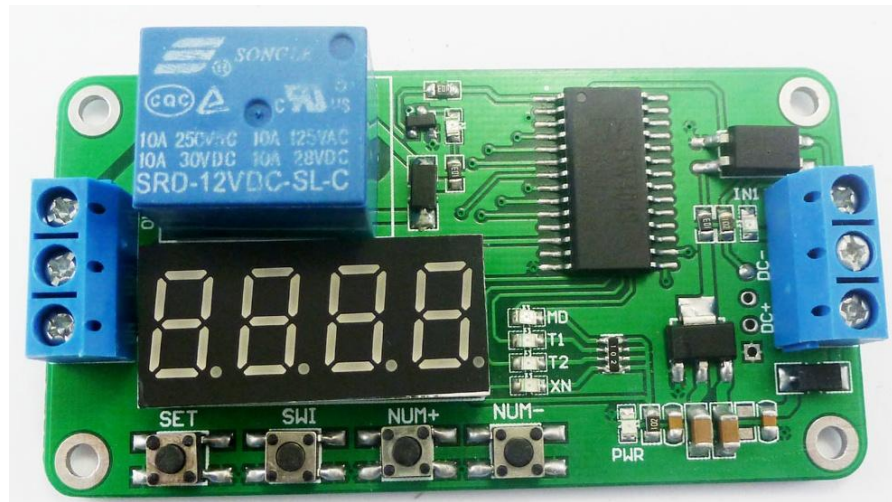


# Timer Relay Module (CE030) User Manual

The multifunctional relay control module (CE030), designed for the customers of different needs, micro-controller as the main control unit, preset 18 kinds of functions, and can be based on user needs, customize and add other specific functions.

The module using of high-quality power relay module, high-power and high-voltage transistor, red signal lights, double-sided PCB board, stable performance, can be widely used in a variety of power control occasions.



## I. Module Function

The user can select one of the following 18 kinds of function according to keys and display, can set and save the parameters of the 18 kinds of function, also can view the current function parameters, time parameter sets the minimum 0.1 second adjustable, more expertise.

Gentle remind: Function 1-8 start automatically after power on; function 9-18 start required a low level Pulse signal trigger, and the low level duration  $\geq 20\text{ms}$ ; function 9 is self-locking mode; function 10 is a level control mode.

### [Function 1]:

Timing Pull-in: after power on, when arrived the setting time T1, the relay pull-in, and the T1 can be adjustable between 0.1 second -270 hours, give CH1 interface a low pulse signal (low level duration  $\geq 20\text{ms}$ ), repeat the above function.

### [Function 2]:

Timing Disconnect: after power on the relay pull-in, when arrived the setting time T1, the relay disconnect, and the T1 can be adjustable between 0.1 second -270 hours, give IN1 interface a low pulse signal (low level duration  $\geq 20\text{ms}$ ), repeat the above function.

### [Function 3]:

Timing Pull-in Then Disconnect: after power on, the relay don't pull-in, when arrived the setting time T1 relay pull-in; when arrived the setting time T2 relay

disconnect, and the T1 and T2 can be adjustable between 0.1 second -270 hours, give IN1 interface a low pulse signal(low level duration  $\geq 20\text{ms}$ ),repeat the above function.

**[Function 4]:**

Timing Disconnect Then Pull-in : after power on, the relay immediately pull-in, when arrived the setting time T1 relay disconnect; when arrived the setting time T2 relay pull-in, and the T1 and T2 can be adjustable between 0.1 second -270 hours, give IN1 interface a low pulse signal(low level duration  $\geq 20\text{ms}$ ),repeat the above function.

**[Function 5]:**

Unlimited Cycle Timing Mode A: after power on, the relay don't pull-in, when arrived the setting time T1 relay pull-in; when arrived the setting time T2 relay disconnect, then repeat the above status, and the T1 and T2 can be adjustable between 0.1 second -270 hours, give IN1 interface a low pulse signal (low level duration  $\geq 20\text{ms}$ ), repeat the above function.

**[Function 6]:**

Unlimited Cycle Timing Mode B: after power on, the relay immediately pull-in, when arrived the setting time T1 relay disconnect; when arrived the setting time T2 relay pull-in, then repeat the above status, and the T1 and T2 can be adjustable between 0.1 second -270 hours, give IN1 interface a low pulse signal (low level duration  $\geq 20\text{ms}$ ),repeat the above function.

**[Function 7]:**

Limited Cycle Timing Mode A: after power on, the relay don't pull-in, when arrived the setting time T1 relay pull-in; when arrived the setting time T2 relay disconnect, then repeat the above status "NX" times, the T1 and T2 can be adjustable between 0.1 second -9999 seconds, the cycle times "NX" can be adjustable between 1-9999, give IN1 interface a low pulse signal (low level duration  $\geq 20\text{ms}$ ),repeat the above function.

**[Function 8]:**

Limited Cycle Timing Mode B: after power on, the relay immediately pull-in, when arrived the setting time T1 relay disconnect; when arrived the setting time T2 relay pull-in, then repeat the above status "NX" times, the T1 and T2 can be adjustable between 0.1 second -9999 seconds, the cycle times "NX" can be adjustable between 1-9999, give IN1 interface a low pulse signal (low level duration  $\geq 20\text{ms}$ ),repeat the above function.

**[Function 9]:**

Self-locking Mode: give IN1 interface a low pulse signal, the relay pull-in, again give a low pulse signal, the relay disconnect.

**[Function 10]:**

Trigger Mode: contain delay off function, the relay does not operate after power on ,give IN1 interface a low pulse signal, the relay pull-in immediately, when the low pulse signal disappeared, the relay still pull-in, when arrived the setting time T1 relay disconnect, the T1 can be adjustable between 0 second-270 hours. Remark: in this function, if T1 is 0 second, give IN1 connector a low pulse signal,

the relay pull-in, when the low pulse signal disappeared, the relay immediately disconnect.

**[Function 11]:**

Trigger timing mode A : the relay does not operate after power on ,give IN1 connector a low pulse signal, when arrived the timing time T1,the relay pull-in ,T1 can be adjustable between 0.1 second -270 hours, give IN1 interface a low pulse signal again, repeat the above function one time.

**[Function 12]:**

Trigger timing mode B: the relay does not operate after power on ,give IN1 interface a low pulse signal, the relay pull-in , when arrived the timing time T1, the relay disconnect,T1 can be adjustable between 0.1 second -270 hours, give IN1 interface a low pulse signal again, repeat the above function one time.

**[Function 13]:**

Trigger timing mode C : the relay does not operate after power on ,give IN1 interface a low pulse signal, when arrived the timing time T1,the relay pull-in ,when arrived the timing time T2,the relay disconnect, timing time T1 and T2 can be adjustable between 0.1 second -270 hours, give IN1 interface a low pulse signal again, repeat the above function one time.

**[Function 14]:**

Trigger timing mode D: the relay does not operate after power on ,give IN1 interface a low pulse signal, the relay pull-in immediately , when arrived the timing time T1, the relay disconnect, when arrived the timing time T2,the relay pull-in, timing time T1 and T2 can be adjustable between 0.1 second -270 hours, give IN1 interface a low pulse signal again, repeat the above function one time.

**[Function 15]:**

Unlimited Cycle Timing Mode A: the relay does not operate after power on ,give IN1 connector a low pulse signal, when arrived the timing time T1,the relay pull-in , when arrived the timing time T2,the relay disconnect, then repeat the above status, T1 and T2 can be adjustable between 0.1 second -270 hours, give IN1 interface a low pulse signal again ,repeat the above function.

**[Function 16]:**

Unlimited Cycle Timing Mode B: the relay does not operate after power on ,give IN1 interface a low pulse signal, the relay pull-in immediately, when arrived the timing time T1,the relay disconnect, when arrived the timing time T2,the relay pull-in, then repeat the above status , T1 and T2 can be adjustable between 0.1 second -270 hours, give IN1 interface a low pulse signal again ,repeat the above function.

**[Function 17]:**

Limited Cycle Timing Mode A: the relay does not operate after power on ,give IN1 interface a low pulse signal, when arrived the timing time T1,the relay pull-in , when arrived the timing time T2,the relay disconnect, then repeat the above status "NX" times, the T1 and T2 can be adjustable between 0.1 second -9999 seconds, the cycle times "NX" can be adjustable between 1-9999,give IN1 interface a low pulse signal again ,repeat the above function.

**[Function 18]:**



Keys include long press and short press, and in different modes with different functions, the following is to introduce under three mode key's different functions.

**[Operating mode]:**

1. When turned on, the digital display current timing countdown, when time to zero, that displays the current function number, such as: “ -- 0 1 ” means the function 1
2. Short press [SET] enter into the power saver, the display goes out, but the program to work normally, press again to restore the display;
3. Long press [SET] enter into [Parameter setting mode];
4. Long press [SWI] enter into [Parameter view mode];
5. Long press [NUM+] into 10 seconds automatic power saving mode, the digital tube will blink twice, which means that the setting is successful. After entering the power saving mode, if no operation of any button within 10 seconds, the digital display will turn off, but the program running, you can short press [SET] to restore the display temporarily, you can also long press [NUM+] again to exit the automatic power saving mode, the digital tube will blink three times to indicate the setting is successful.
6. Long press [NUM-] timing reset and stop, again short press [NUM-] to restore timing, after into reset state, LED lights are no longer flashing.

**[Parameter view mode]:**

When turned on, long press [SWI] enter into parameter view mode, under parameter view mode, can view the parameter of the current function, the parameter LED indicator will flash to display.

1. Short press the key [SET], cutover the parameters, can choose one from [MOD]、[T1]、[T2] or [NX], the LED indicator of the selected parameter will flash, the digital tube display the parameters that have been set. Such as: when [T1] light, the digital tube display the content of [ T1].
2. Long press the key [SWI], enter into [Operating mode];

**[Parameter setting mode]:**

When turned on, long press [SET] enter into parameter setting mode, under this mode, you can set various parameters, for example, you can select working mode, also can set the delay time etc.

1. Short press the key [SET], cutover the parameters, can choose one from [MOD]、[T1]、[T2] or [NX], the LED indicator of the selected parameter will long light, the digital tube display the parameters that have been set. Such as: if users need to adjust the working mode, should press the [SET] to make LED indicators point to [MOD].
2. Short press the key [SWI], cutover the selected digital tube, the relevant digital tube will flash display.
3. Short press the key [NUM+], the selected digital tube numerical +1, add 9 stop;
4. Short press the key [NUM-], the selected digital tube numerical -1, reduced to 0 to stop;
5. Long press the key [SWI], when setting [T1] or [T2] parameter, Long press [SWI] will appear decimal point (Stepping 0.1 seconds), Long press [SWI] again decimal point disappear (Stepping 1 seconds).

6. Long press the key [SET], save the parameters, and enter into [Operating mode].

### For Examples:

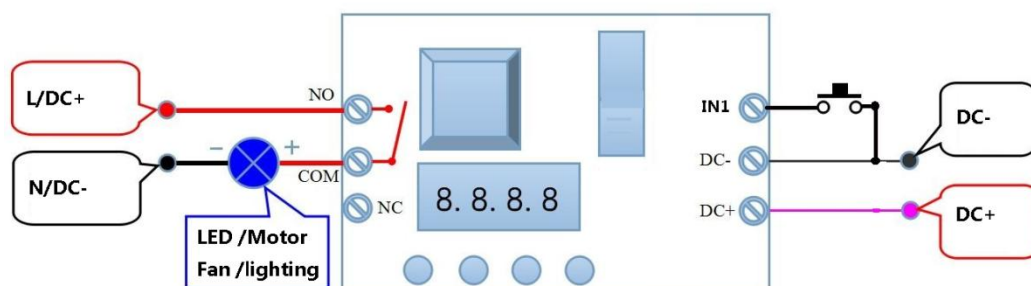
Example 1. Control a lamp, automatically to run an hour, then turn off. This application can select the function 2 or function 12, set the parameters: MOD=" - - 12", T1="3 6 0 0", T1="xxxx", NX="0 1 x x" (x can be any value, no need), at the same time, the input interface IN1 as the user switch, below is the set-up process:

- 1> long press [SET] enter into [Parameter setting mode];
- 2> short press [SET], then [MOD] indicator light, press [NUM+] or [NUM-], adjust the digital tube display " - - 12";
- 3> short press [SET], T1 light, set T1="3 6 0 0", T2 no need, X10="0 1 0 1";
- 4> long press [SET], save settings, and exit [Parameter setting mode], the function starts running immediately.

Example 2. When power on, the machine is running 1 hour, stop for 10 minutes, 5 cycles, the machine turns off.

This application can select the function 8, set the parameters: MOD=" - - 0 8", T1="3 6 0 0", T2="0 6 0 0", NX="0 0 0 5".

## III. Wiring Reference



**Gentle remind:** If user load and CE030 module use a seam DC power supply, it is possible because of the power supply capacity is insufficient or wiring connections unfit, the module appears unstable phenomenon occasionally, please use the following (even if no found the problem, it should follow the recommendations):

1. **Separate wiring:** the positive DC power supply should draw two lines, one link CE030 of DC + interface for modules, one link NO interface for load use, so the negative power supply should also be dealt with like this.
2. **Replace the output current power:** If it is the motors and other inductive or

capacitive load, the capacity of DC power should choose bigger, such as the use of motor 1A, 3-5A power to choose more reasonable, because the motor starting current is 3-7 times of the rated current, if the power supply capacity is too small, it will result in the voltage dropped instantly and caused CE030 module reset.

**3. Shunt capacitor:** If the above two measures fail to achieve the desired effect, please shunt an electrolytic capacitors of 470uf/35V or above capacity between the DC-/DC +.

### III. Electrical parameters

1. Operating Voltage: 12V/(+/-10%)  
5V version can be customized
2. Working Current:  
12V / less than 70mA (when the relay is not operating less than 40mA, turn off the display less than 12mA)
3. Working Temperature: -20°C—60°C (Limit range-30°C—70°C)
4. Load Capacity:  
the module normally open interface maximum load capacity: DC 0-30V/10A, AC 0-250V/10A  
the module normally closed interface maximum load capacity: DC 0-28V/10A, AC 0-125V/10A

#### Restrictions:

1. relay life is loaded with action 100,000 times, and therefore more suitable for use in low frequency and high current pull control of the situation, is not suitable for repeated use in the fast-action situations;.
2. Note consider relay port load margin, purely resistive load more than doubled to left margin, ordinary inductive or capacitive loads must be at least three times more margin.

### IV. Module Interface

**Module Voltage/Signal Input:** There have three interfaces, all interfaces have terminal, user easy to use.

1. **DC+:** DC power positive;
2. **DC-:** DC power negative;
3. **IN1:** Input signal interface. (0-1.5V low voltage to be invalid; 3V-18V high voltage to be valid; 1.5V-3V voltage is unpredictable, you should avoid this voltage range)

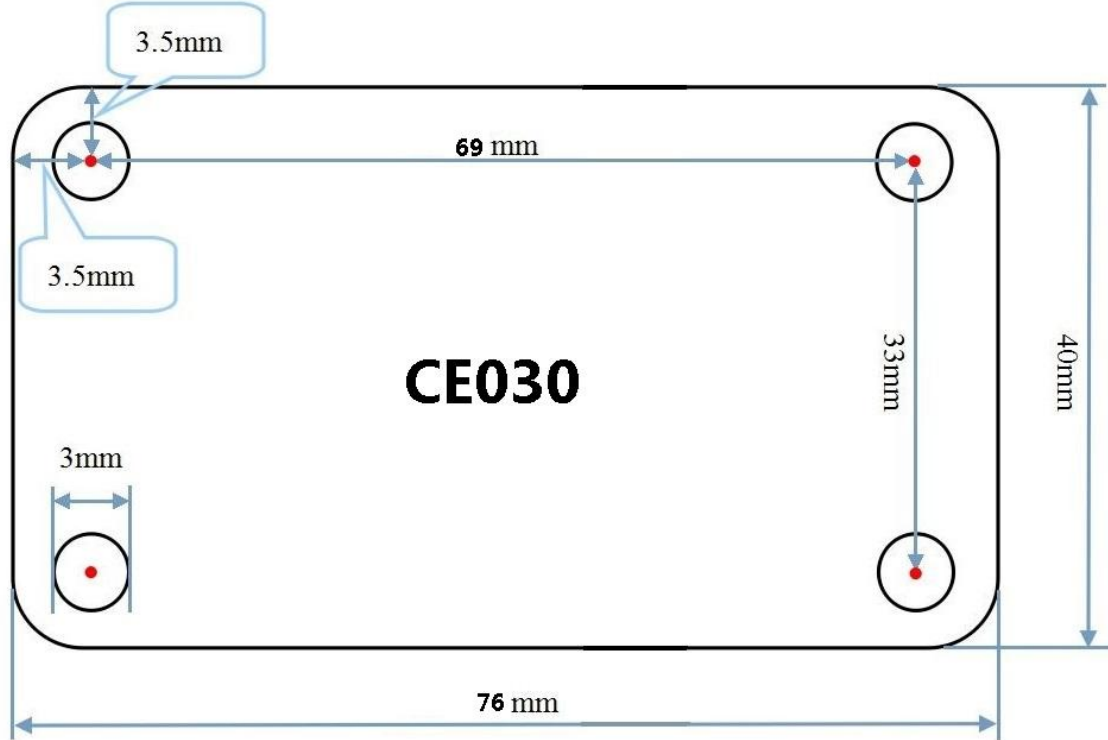
**Module Output:** There have three interfaces, all interfaces have terminal.

1. **NO :** Normally open interface, the relay becomes vacant before, after pull-in short with the COM;

- 2. **COM:** Common interface;
- 3. **NC :** Normally closed interface, short with COM before, become vacant after pull-in.

## V. Module Size

- 1. Dimensions: 76mm \* 40mm \* 20mm (L \* W \* H) ;
- 2. Screw Size: 4\* $\phi$ 3.0mm.
- 3. Screw holes center distance: 69mm \* 33mm



3D View

