

PTR4-SP Controller User Manual

Thank you for using this product of our company. The PTR4-SP controller can be set 99 groups time (steps), each step the relay switch state can be set switch "ON/OFF" (closed or opened) , use external input voltage signal or switch it can achieve many functions. The controller can be used to control four solenoid valve - linkage, sequence control as PLC, etc.

In case of any printing or translation error, we apologize for the inconvenience.

1. Features:

- 1) Industrial LCD displays, set by buttons, easy to use, has reset function.
- 2) High-performance microcontrollers, industrial-grade reliability, high process stability, low power, reverse power protection function, and surge current shock.
- 3) Four relays, each group of relays has common and normally opened, normally closed contacts, 4 sets of conversion;
- 4) 99 groups time, each timer range: 0.1 seconds ~ 9999 minutes adjustable, the total number of Loops is adjustable from 0 to 9999 ("0" means run loops all the time) ;
- 5) Each step can be set to cyclic jump to run forward 0-999 times, 20 layer nesting loops support (figure 2);
- 6) The external input high level and low level signals, achieve trigger function, wait input to run, jump to another step ,stop running functions;
- 7) User can set the password, to prevent others to change the setting parameters;
- 8) Shell size 115*90*40mm. All settings can be saved.

Timing Range : 0.1seconds ~ 9999 minutes can be set, cycles 0 ~ 9999 times

Operating power: DC6~40V

Relay parameters:

Four set of conversion (normally opened and normally closed)

Contact load: 10A/277V AC or 10A/30V DC Contact resistance: $\leq 100\text{m}\Omega$ (1A 6VDC)

Mechanical durability: 10 millions

Electricity durability: > 100,000 (10A-250VAC)

Operating Temperature: -40 ~ 85°C



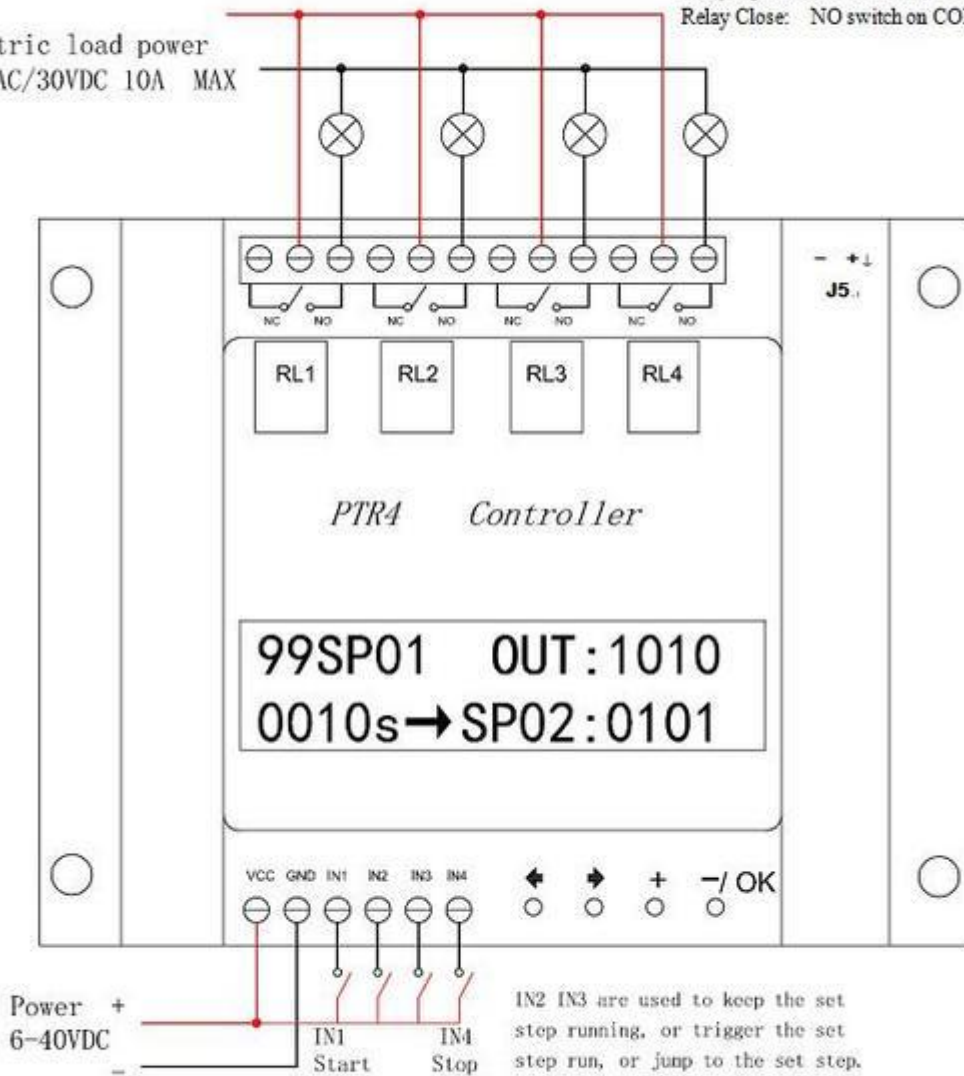
Attention:



Use this product to control the high-voltage electrical equipment must operate by electrical professionals, high voltage danger!

Electric load power
277VAC/30VDC 10A MAX

Relay Opened: NC switch on COM.
Relay Close: NO switch on COM.



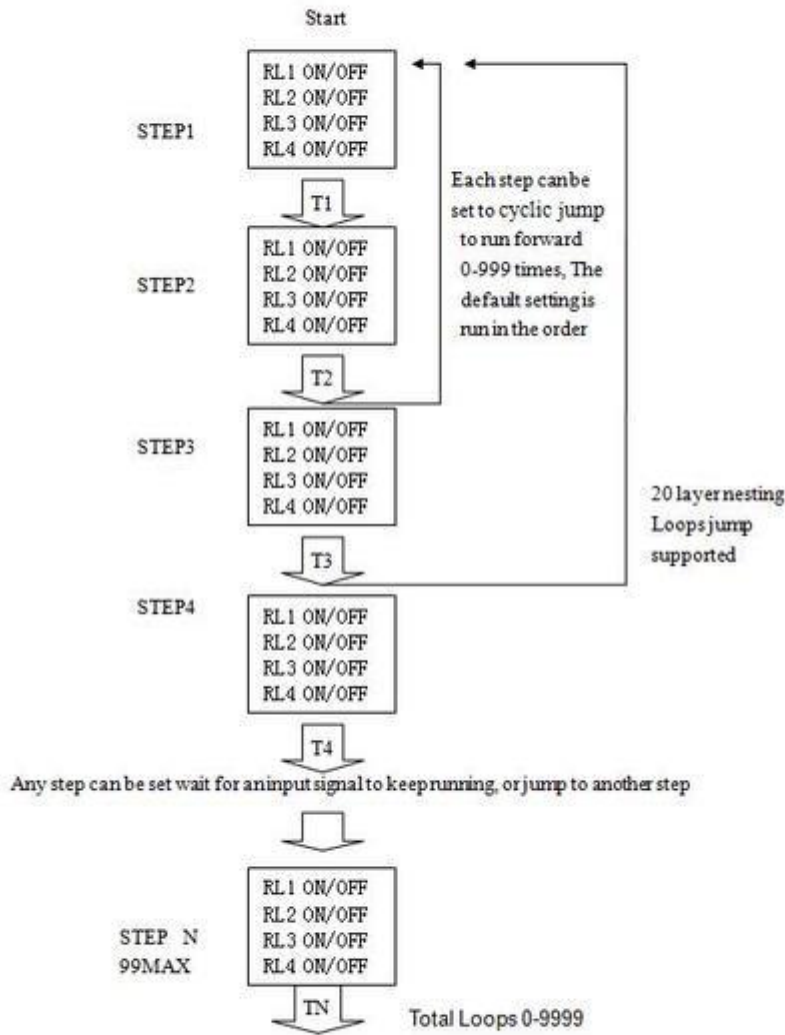
IN2 IN3 are used to keep the set step running, or trigger the set step run, or jump to the set step.

Voltage DC 3-40V (high level), or DC0-3V (low level) can be used as an input signal

Figure 1

2. Run Settings:

Controller's running diagram as figure 2. RL1234 means relay 1234, "ON/OFF" means closed or opened of relay's status, the user can set 99 steps programming maximum.



At the end of the limited total cycle, the J5 port will output a high level (3.3V,50ms) as a trigger for the other controller, as shown in Figure 1.

Figure 2 Controller's running diagram

Connect to power, LCD displays shows the word "PTR4-SP", system ready to run. There is timer run interface as follow figure 3.

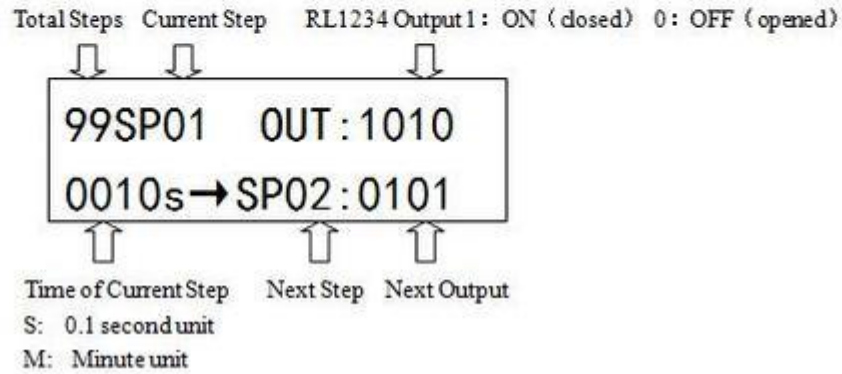


Figure 3 Timer run interface

Short press "+" key, user can switch show timer run interface or loops times interface.

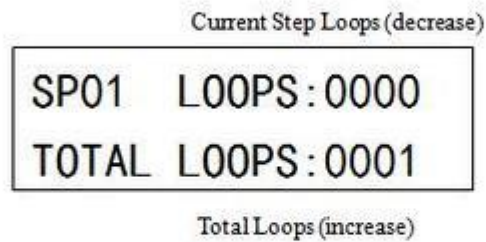
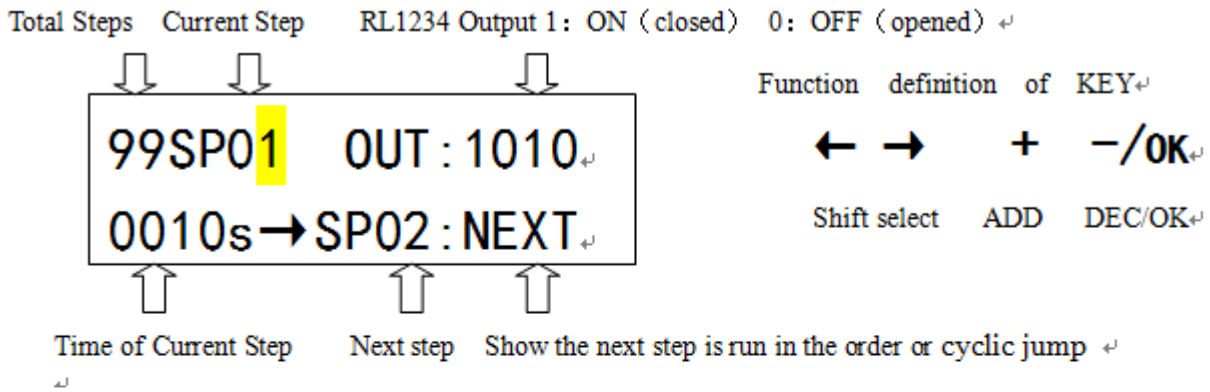


Figure 4 Loops times interface

Current Step loops: If you set the nested cyclic jump, the system have other loops that are executing, the interface shows the number of loops being executed at the current step.



Follow figure shows total steps 5, the step4 RL1234 all ON 1.0 seconds then jump to step2 for 3 loops↵

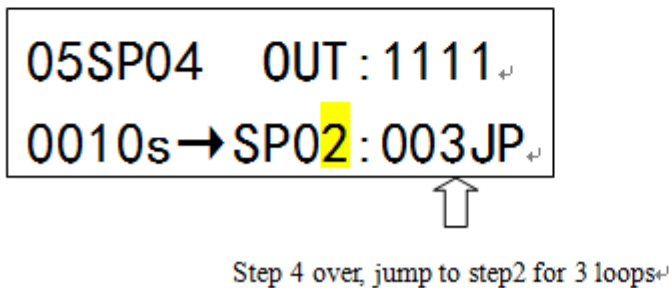


Figure 5 Timer relay programming interface

When system enter timer run interface, short press the “←or→”key, the cursor will be flashing and left or right shift to each value to be set, short press “+” or “-/ok”key , the user can set the total operation number of steps (99 max), the current step output (4 relay closed or opened), timer of current step (0.1 seconds to 9999 minutes, the default unit “s” means 0.1 seconds, “M” means minutes, the next step (default next step is current step add 1, the program run in the order, the last group character display “NEXT”, run up to the total number of the current step as a total loop. If the next step is set smaller than the current step’s numerical , the program will cyclic jump run forward for loops, the last group of words to show the times of loops, the maximum 999 loops can be set, the number of times more than 0 , the loops can be jump effectively.

Use cyclic jump function may easily repeated a combination of steps, such as a load need repeat switch 10 times(set cyclic jump loops 10), otherwise there are 20 steps will take up the program. When the step of cyclic jump program run at the end, system will continue to run the next step.

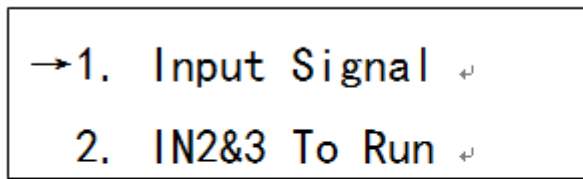
When the cursor is shifted to the current step, short press "+ -" key, can increase or decrease the number of steps, to view and set each step of the corresponding output status and timer, cyclic jump settings. When the cursor moves to the interface of the left or right away, the cursor stop flashing, the time relay parameters (programming) will be saved, the system waiting to start, user can press "-/OK" key to start the time relay operation, or use an external input signal to start running. When time relay running, short press "-/OK" key can suspend timer (relay hold), long press "-/OK" key will reset time relay(relay opened).

Note:

1. If one step set delay time is 0, system will not perform this step, because current step will jump to the next step in a flash.
2. when one step-X run to the end (already run once), this step has been set cyclic jump forward N times, this step will actually run the N+1 times, if later step will cyclic jump to the front step Y times, nested loops, that step-X will be executed (N+1) *Y times actual in a total loop.

Caution: cyclic jump with wrong setting will lead to unexpected results.

4. System Setting:



1. **Input Level** ←
2. **IN2&3 To Run** ←
3. **Total Loops** ←
4. **Start Mode** ←
5. **Set Password** ←
6. **Display Time** ←

Figure 5 System setting interface

When LCD shows timer run interface (no cursor flash), long press "←or→" key for three seconds, displays shows the system setting menu, displays shows two line of main menu scrolling, a total of 7, press "←or→" key user can select menu options up or down ,then short press "-/OK "key, system will enter the corresponding sub menu option to set parameters, in sub menu ,press "←or→" key to shift cursor where the number to be set , short press " + "or" - " may adjust the number, when cursor to " OK ", press "-/OK "key to save the settings and return to the main menu. Enter the menu for 1 minute without any operation, or select "7.Back" will return to the timer run interface.

4.1 Input Signal (four input signal type)

Enter the sub menu, display "1234:0000 OK ", "0000" correspond to the set value of the IN1234 input signal channel, the displays shows meanings when adjust the value of the corresponding signal.

IN1 input signal only used to control the time relay start.

0- High Trigger Run Trigger start by low level to high level (rising edge, PNP sensor)

1- Low Trigger Run Trigger start by high level to low level (falling edge, NPN sensor)

2- High Keep Run High level maintenance running, low level timing pause, relay opened(OFF) , PNP sensor

3- High Run Low Rst High level maintenance running, low reset to first step waiting to start(PNP sensor)

4- High Rst & Trig A rising edge trigger to reset to first step and start (PNP sensor)

5- Low Rst & Trig A falling edge trigger to reset to first step and start (NPN sensor)

Note: Some NPN sensor is open drain output signal, make a falling edge signal need the external pull-up resistor (10-47K) connect to high level.

IN2 and IN3 input signal are used to maintain the set target step running or jump to the set target step (see Section 4.2).

0-High Trigger Run:

When the system run to the target step, waiting for the low level to high level trigger to run (rising edge).

1- Low Trigger Run:

When the system run to the target step, waiting for the high level to low level trigger to run (falling edge) .

2- High Keep Run:

When the system run to the target step, waiting for high level to keep running, low level make timer pause and relays opened (OFF) .

3- High Trigger Jump

Any step at run time, a low level to high level will trigger (rising edge) step jump to the set target step.

4- Low Trigger Jump

Any step at run time, a high level to low level will trigger (falling edge) step jump to the set target step.

IN4 input signal is only used to control stop

0- High Stop Rst

Rising edge trigger time relay stop and reset

1- Low Stop Rst

Falling edge trigger time relay stop and reset

4.2 IN2 &3 To Run : Set IN2 IN3 input corresponding target step

Enter the sub menu, displays shows "IN2 to SP98 OK", user can set two input channel "IN2 IN3" corresponding target step (step number 02 -99 steps can be adjusted, there cannot be larger than maximum steps has been set), such as "IN2 to SP03", that is step 03 according to the IN2 channel (4.1 Input level settings) to control run, if the IN2 level is set to " 0-High Trigger Run", the timer will stop and relays opened when run to target step, once IN2 input a trigger signal , timer continue running; if the IN2 level is set to "2- High Keep Run", "IN2" need high level input to keep running, otherwise the timing will pause, relays will opened ,if the IN2 level is set to "3- High Trigger Jump", while any step running, "IN2" input rising edge that the time relay will jump to step 03 immediately.

4.3 Total Loops : Total number of cycles

This sub menu display "Loops:0001", means the total cycle will be executed 1 loop, set to "0000" means infinite loop, 9999 times max adjustable.

4.4 Start Mode: Startup mode

0: "IN1" valid signal input to start, 1: start automatic after power on

4.5 Set Password: Password settings

Enter the sub menu, displays shows "Disable NEW:**** OK", user can set "Disable" to "Enable" to enable the password function, with the "NEW:0000" , user can set 4 bit number of current password, the cursor to OK, short press OK to save, default is 0000". When the user changes the password, set the parameters of time relay and programming of system, need to enter password to unlock, if you forget your password, you can press "←" and "→" when power on to reset all settings.

4.6 Display Time

0-9 minutes to adjust. Set to 0 means backlight on all the time.

4.7 Back: return time relay run interface

5. Reset Settings

Press "←" and "→" key and power on, LCD shows "Step Timer Reset", the time relay settings will be cleared, Press "+" and "-/OK" key and power on, LCD shows "Settings Reset", the system settings will be cleared.

6. Time relay setting (programming) example:

Set 6 step: "IN1" input high level trigger , RL1 ON and RL234 OFF for 2 seconds, then RL2 ON and RL134 OFF for 5 minutes, then RL3 ON RL124 OFF for 10 seconds, then jump to step1 for 2 loops, then RL4 ON RL123 OFF for 1 minutes, and then waiting for "IN2" input a high level signal to keep running, then R1234 all ON 1second, then all relays OFF, as follow.