# SCDA-324R
# SCDA-211R
# SCDA-221R
# Safety relay module

新产品

## Product overview

◆The SCDA-324R series safety relays integrate multiple safety inputs and outputs for today's increasingly complex safety control system requirements, and can be expanded and cascaded by simple AND or logic operations.

◆The module includes the following functions: four dual-channel safe inputs, with logic, or logic, one dual-channel instantaneous safe output, and one dual-channel delay shutdown safe output (semiconductor transistor output). By operating with logic and OR, multiple safety relays can be expanded.

◆4 dual-channel safety inputs: can be configured as 4 dual-channel safety sensor inputs, or two of them can be configured as dual-channel safety switch or emergency stop inputs.

◆ 2 dual-channel safety outputs: 1 instantaneous dual-channel safety output, 1 delay-off dual-channel safety output, delay time set by button.

◆ Logic input: 1 with logic input, 1 channel or logic input, logic operation input signal and safety relay input signal in SCDA-324R for logic operation, according to the operation result control output, logic operation can be set by the key to turn off the corresponding function.

◆ Reset: The safety relay can be set to automatic reset and manual reset function through different wiring methods.

◆ Auxiliary output: The safety relay has 4 auxiliary outputs for safety output indication or failure indication of the operation of the entire system.

◆ SCDA-324R series safety relays include SCDA-324R and SCDA-211R and SCDA-221R three types of safety relays, of which SCDA-211R and SCDA-221R are subsets of SCDA-324R safety relays. The SCDA-211R implements a single dual-channel safety input and a single dual-channel safety output with two cascaded outputs, and the SCDA-211R can be connected to the SCDA-324R as a basic control unit for expansion and cascading.

## Features

- Complies with ISO13849-1Cat4 category, safety class PLe.
- Multiple safety inputs, a total of 4 dual safety inputs
- Multiple safety outputs, a total of 2 dual safety outputs, of which 1 dual channel can be configured as a delay shutdown output, and the delay time can be set
- Multiple auxiliary outputs, each channel safety output has indication, and fault indication can also be realized
- Support logic operation, can realize logical and, logic or, multiple sets of SCDA-324R cascade use or with SCDA-211R and other safety relays can be easily expanded
- Automatic reset and manual reset through port configuration, no need to use different models of products
- Transistor safety output, convenient access to safety PLC
- Buttons and OLED display facilitate user parameter setting

# SCDA-324R SCDA-211R SCDA-221R
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## Technical parameters

| | |
|---|---|
| **Security level** | |
| Standard | ISO 13849-1 |
| Security classification | ISO 13849-1 PLe/Cat.4 |
| **Electrical parameters** | |
| Power supply | 24V DC±15% |
| Power consumption (without load) | 2W |
| Response time（ON→OFF） | 15ms |
| Response time（OFF→ON） | ＞50ms |
| Overvoltage category | II |
| Turn-off delay accuracy | ±5% |
| Turn-off delay time | 0，0.1S~300S（0.1SPositive integer multiples） |
| Input high | ＞10V |
| Input low | ＜4.3V |
| OSSD1,OSSD2;<br>OSSD3,OSSD4;<br>Safe output current | 500mA |
| Safe output conduction voltage drop | ＜3V(Safe output, auxiliary output) |
| Safe output turns off leakage current | ＜100μA(Safe output, auxiliary output) |
| Output mode | Transistor output |
| Auxiliary output mode | Transistor output |
| Output current | Max 150mA |
| **Environmental and physical characteristics** | |
| Protection | IP40/IP20 |
| Operating temperature | -5…+55℃ |
| Vibration resistance | 10…55Hz,0.35mm |
| Impact resistance | 10G,16ms,100次冲击 |
| Installation | 35mmDIN导轨 |
| Weight (g) | 150g |
| Maximum conductor specifications | 0.2…4mm$^2$ |

※Affected by product configuration and manufacturing process, the actual product size, weight may be different, please refer to the actual product

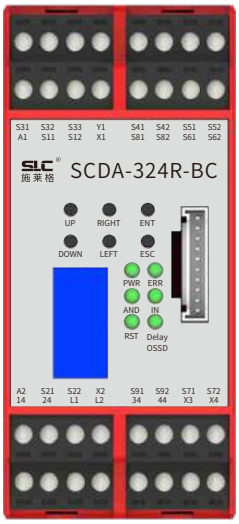
## Selection guide

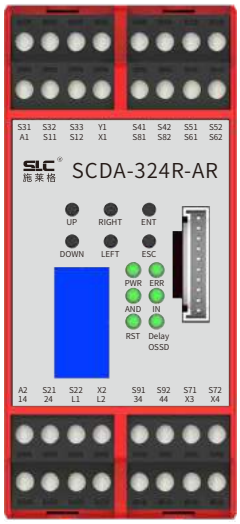
SCDA − 3 2 4 RP

- SCDA: Safety relay series
- 3: 2:Single function; 3:multifunction
- 2: 1:One dual output; 2:Two dual output
- 4: 1:1 dual channel input; 2:2 dual channel input; 4:4 dual channel input
- RP: RP:PNP output; RN:NPN output; RR:Relay output

| Model | Function description |
|---|---|
| SCDA-211RP | PNP type safety output with two cascade outputs, single dual channel safety input, single dual channel safety output safety relay |
| SCDA-221RP | PNP type safety output, single dual channel safety input, two channel dual channel safety output safety relay |
| SCDA-324RP-BC | Basic functions, only 4 dual-channel safety inputs, two dual-channel PNP type safety outputs |
| SCDA-324RP-AR | Full-featured with 4 dual-channel safety inputs, as well as logic functions (logic AND and logic OR), two dual-channel PNP-type safety outputs |

## SCDA-324R Panel definition and description



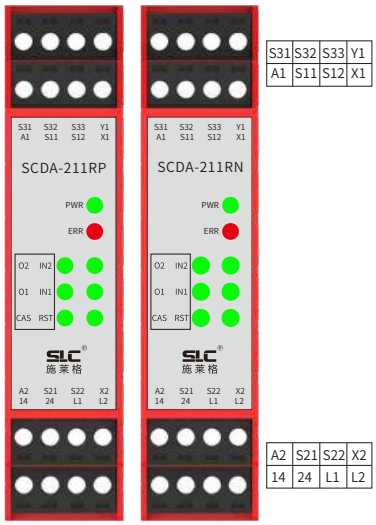




| S31 | S32 | S33 | Y1 | S41 | S42 | S51 | S52 |
|---|---|---|---|---|---|---|---|
| A1 | S11 | S12 | X1 | S81 | S82 | S61 | S62 |

| A2 | S21 | S22 | X2 | S91 | S92 | S71 | S72 |
|---|---|---|---|---|---|---|---|
| 14 | 24 | L1 | L2 | 34 | 44 | X3 | X4 |

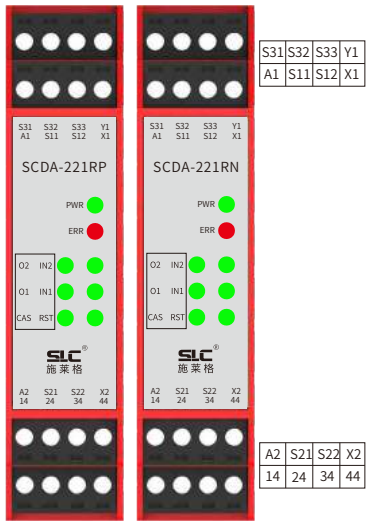
| Signal | instructions |
|---|---|
| UP | Up botton |
| DOWN | Dotton Botton |
| LEFT | Left Botton |
| RIGHT | Right Botton |
| ENT | Confirm botton |
| ESC | Canncel botton |
| PWR | Power LED |
| ERR | Error LED |
| AND | Logic with LEDs |
| IN | Input LED |
| RST | Reset the LED |
| Delay OSSD | OSSD LED |

## SCDA-211R and SCDA-221R panel definitions and descriptions




| S31 | S32 | S33 | Y1 |
|---|---|---|---|
| A1 | S11 | S12 | X1 |

| A2 | S21 | S22 | X2 |
|---|---|---|---|
| 14 | 24 | L1 | L2 |



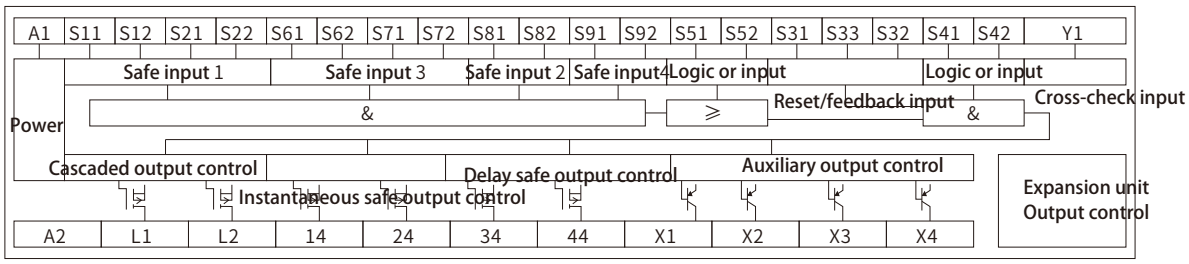

| S31 | S32 | S33 | Y1 |
|---|---|---|---|
| A1 | S11 | S12 | X1 |

| A2 | S21 | S22 | X2 |
|---|---|---|---|
| 14 | 24 | 34 | 44 |

| Signal | instructions |
|---|---|
| PWR | Power LED |
| ERR | Error LED |
| O1 | OSSD1 LED |
| O2 | OSSD2 LED |
| In1 | Enter 1 LED |
| In2 | Enter 2 LED |
| CAS | Cascade fault LEDs |
| RST | Reset the LED |

## Internal join diagrams and logic diagrams

### SCDA-324R Internal join logic diagrams



# SCDA-324R SCDA-211R SCDA-221R
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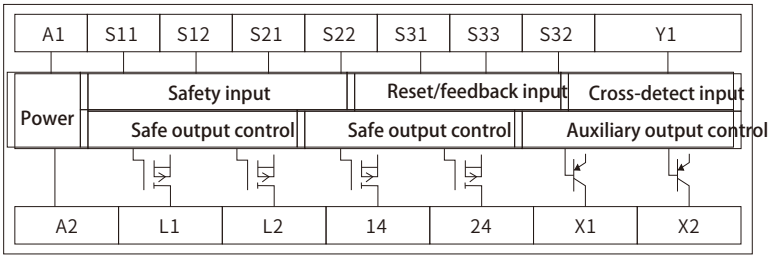
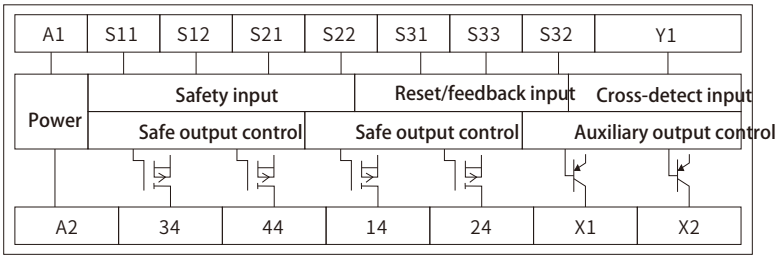
## SCDA-211R Internal join diagrams




## SCDA-221R Internal join diagrams




## Interface definition

| Signal name | Interface identification | Signal description | Signal direction |
|---|---|---|---|
| Power | A1 | Power , +24V | |
| | A2 | Power , 0V | |
| Safety input channel 1 | S11,S21 | CH1 safety switch is connected, two signal outputs are applied | O |
| | S12,S22 | CH1Two signal inputsd | I |
| Safety input channel 3 | S61,S71 | CH3 safety switch is connected, two signal outputs are applied | O |
| | S62,S72 | CH3 Two signal inputs | I |
| Safety input channel 2 | S81,S82 | CH2 Two signal inputs | I |
| Safety input channel 4 | S91,S92 | CH4 Two signal inputs | I |
| Feedback, reset | S31 | Reset signal inputs | O |
| | S32 | 31 and S32 for manual reset,S33 need connect 24V | I |
| | S33 | S32connect 24V, If S31 and S33 are directly shorted, it will be auto reset; If OSSD output feedback is connected to this path, it is used for feedback signal input | |
| Cross-faults Detect input | Y1 | Safety input signal pulse detection enable signal, when floating, both safety input channel 1 and safe input channel 3 will detect input pulse; When Y1 is connected to 24V, safe input channel 1 and safe input channel 3 do not detect input pulses | I |
| Logic or input | S41,S42 | Logic or input | I |
| Logic or input | S51,S52 | Logic or input | I |
| Instantaneous safety output | 14,24 | Two channel Instantaneous safety output | O |
| Delayed safety output | 34,44 | Two delay shutdown outputs, the time is set by the button(SCDA-324R) | O |
| | | Two channel Instantaneous safety output(SCDA-221R) | O |
| Cascade signals | L1,L2 | Two cascaded output signals | O |
| Auxiliary output | X1 | Indicates 14, 24 output status (anti-logic) | O |
| | X2 | Indicates a system failure | O |
| | X3 | Indicates 34, 44 output status (anti-logic) | O |
| | X4 | Indicates S41, S42 (logical AND) status | O |

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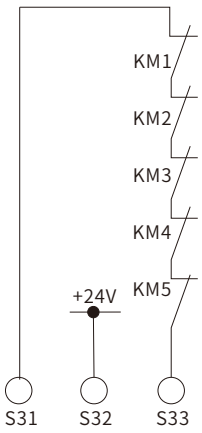
## SCDA-324R Safety relay function configuration

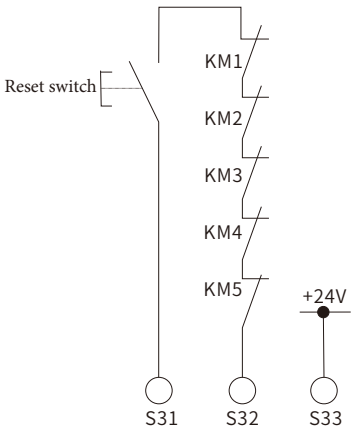
### Auto-reset/manual reset configuration

Set the reset mode using auto-reset/manual reset input terminals S31, S32, and S33. Automatic reset mode is selected when terminal S32 is shorted to 24V, and manual reset mode is selected when terminal S33 is shorted to 24V.

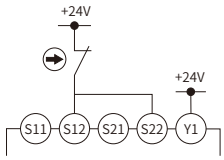
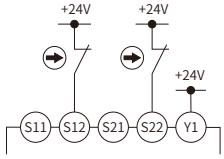
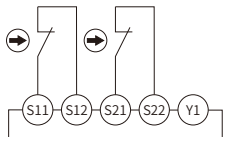
Auto reset mode




Manual reset mode

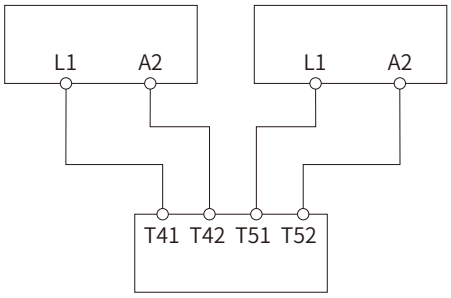



### Cross-fault detection configuration

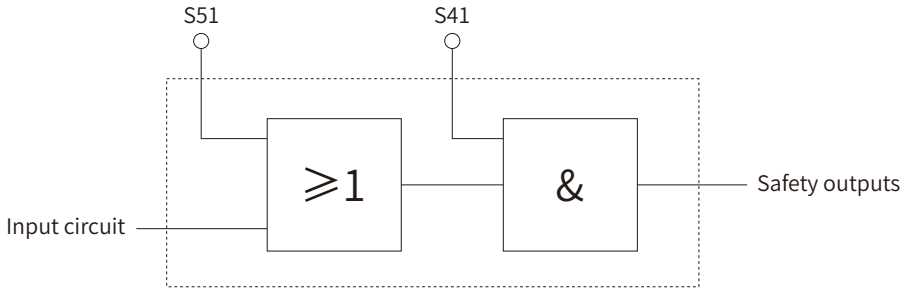
| Cross-fault detection | connection | |
|---|---|---|
| OFF | Use secure input channel 1 | Equivalent to safety level 2  |
| | | Equivalent to safety level 3  |
| | Use secure input channel 2 | |
| ON | | Equivalent to safety level 4  |

## Logical operation configuration

Logical operations include logic AND and logical or operations, S41, S42 are logic and input, S51, S52 are logic or input.
Logic and Logic can be enabled and turned off via the HMI. When safety relays are used alone without cascading and extended functions, it is necessary to turn off the logic AND and logic OR.
When a safety relay has a logic AND and logic or signal input, for the function to work properly, the logic AND and logic OR must be activated. For specific settings, see Menu Settings.




The four dual-channel input signals first and cascaded input or proceed or operation, and then and cascaded input and proceed and operation, as shown in the figure below. Note: When using or logic operations, the corresponding 4-channel dual-channel input signal can be bypassed by other settings, and special attention should be paid to the fact that after the safety relay is bypassed, its corresponding input no longer has the detection function.




## Menu settings

Safety relays can be set and display the relevant device parameters via keys and OLEDs on request. At present, the main parameters that can be set are: "logic and" function on/off setting, "logic or" function on/off setting, delay time setting of delay off output, password setting, password password is required when entering the setting interface to prevent unauthorized personnel from changing the settings.

## Output delay off-time setting

The delay shutdown time is set through the man-machine interface, when the delay time is set to 0, the delay shutdown output and the instantaneous output are synchronized, and the shutdown delay can be set from a minimum of 0.1s to a maximum of 300s, and a step of 0.1s is set, and the specific setting of the parameter delay shutdown time setting content.

警告

- Modifying settings changes the state of the system, can be dangerous, and requires authorized personnel to operate
- After successful setting, the relay will turn off the output, restart, and the new setting function can take effect, so the operation must be ensured during the setting process
- During the setting process, please ensure that the relay power supply is stable, and abnormal power failure may cause configuration errors

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### Normal working interface

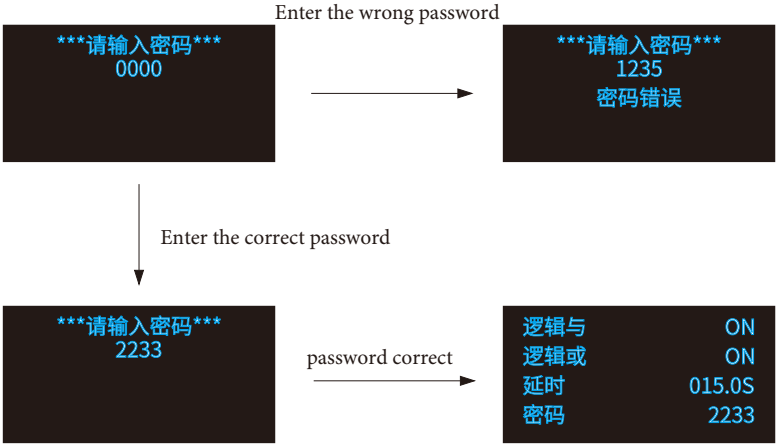
After the system is successfully initialized, enter the normal working interface, the interface displays the current system input configuration information, and press the "LEFT" key to enter the password input interface set by the function

Press the "LEFT" key to enter the password input interface


### Password interface

You need to enter the correct password to enter the main interface of function settings, the default password is 2233. Type "UP", "DOWN" keys to adjust numbers, type "LEFT", "RIGHT" keys to adjust the position of numbers, "password error" will be prompted when the password is entered incorrectly, and after the password is entered correctly, it will enter the main interface of settings.

Enter the wrong password

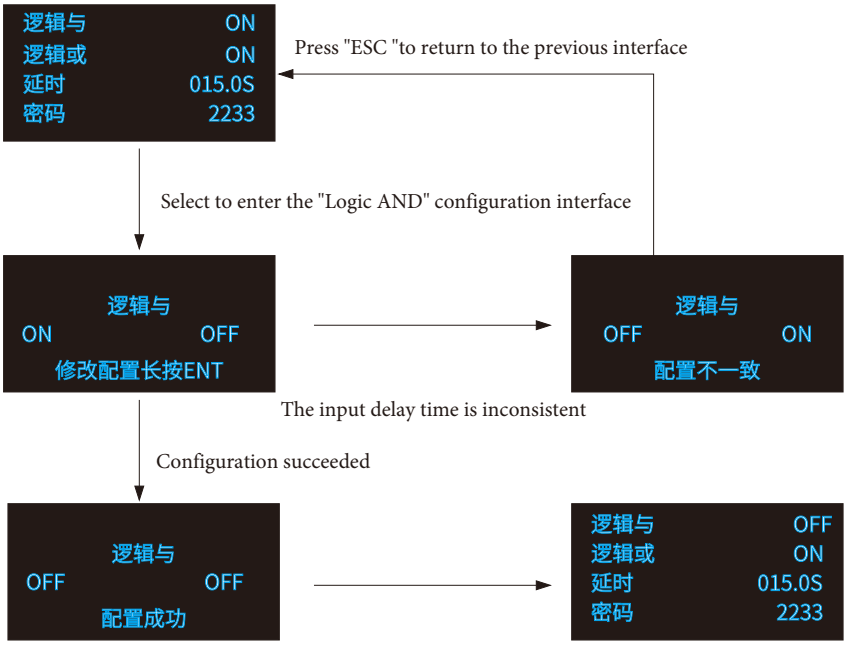



### Setting options interface

There are four options in the setting options interface, namely "logical and" configuration, "logical or" configuration, output shutdown delay configuration, and password configuration. Type the "UP" and "DOWN" keys to select the function options that need to be set, and type the "ENT" key to enter the corresponding function setting interface.

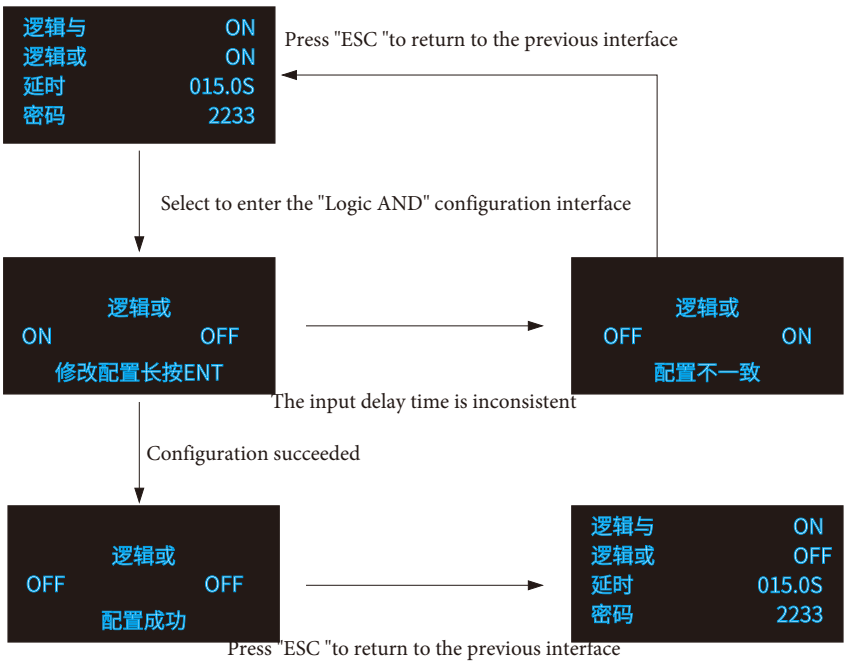
## Logical OR setting

After selecting to enter the "Logical AND" setting interface, two-step verification is required during setup, 'ON' means that the "Logical AND" function is turned on, and 'OFF' means that the "Logical AND" function is turned off. SCDA-324R-AR factory default setting is ON, type "UP", "DOWN" keys to enable or disable this function, type "LEFT", "RIGHT" keys to select the configuration location. After configuration, after pressing the "ENT" key, the consistency of the left and right configurations will be verified first, if the left and right configurations are inconsistent, it will prompt "configuration inconsistency", if the left and right configurations are consistent, the configuration can be successful, OLED will prompt "configuration successful" or "configuration failure", "logical and" configuration example as shown in the figure below.




## Logical OR setting

After selecting to enter the "Logical OR" setting interface, two-step verification is required during setup, "ON" means that the "Logical OR" function is turned on, and "OFF" means that the "Logical OR" function is turned off. The SCDA-324R-AR is factory set to OFF by default. Type the "UP" and "DOWN" keys to enable or disable the function, and type the "LEFT" and "RIGHT" keys to select the configuration location. After configuration, after pressing the "ENT" key, the consistency of the left and right configurations will be verified first, if the left and right configurations are inconsistent, it will prompt "configuration inconsistency", if the left and right configurations are consistent, the configuration can be successful, OLED will prompt "configuration success" or "configuration failure", "logical or" configuration example as shown in the figure below.



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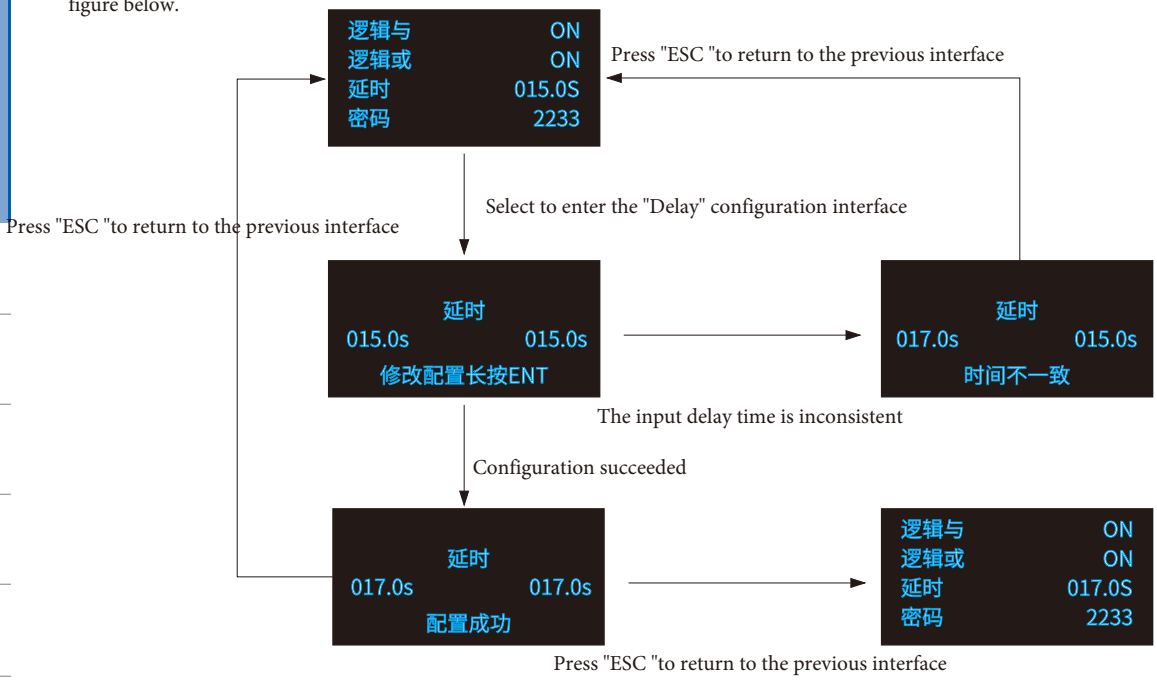
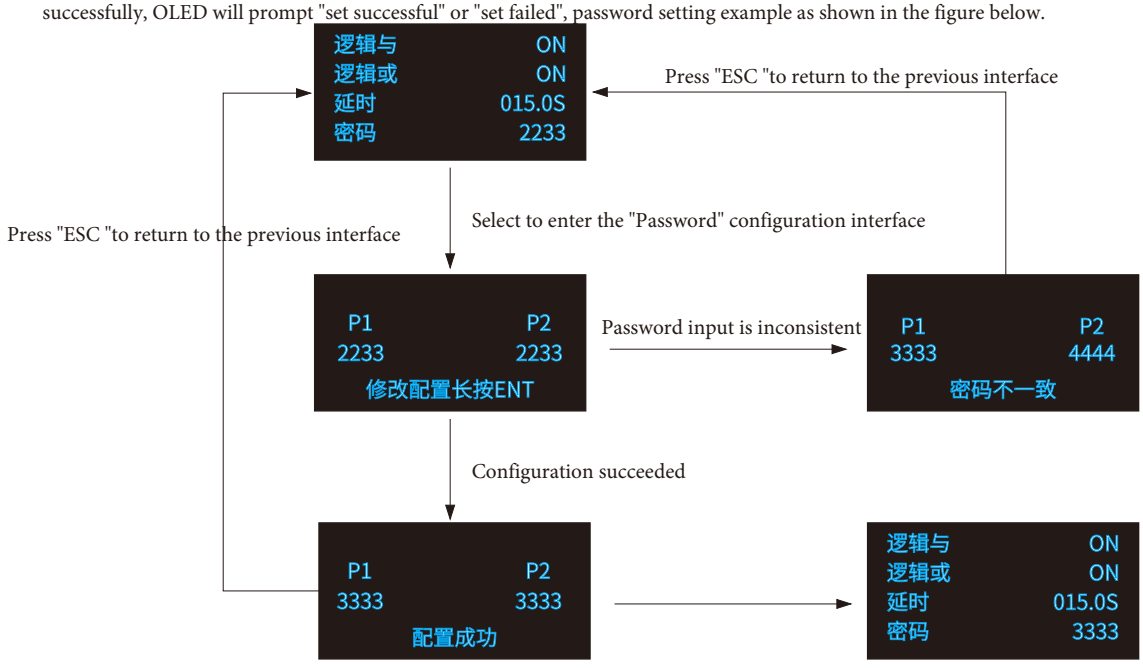
### Output shutdown delay time setting

After entering the "Delay" setting interface, the current output delay time is displayed, and two-step verification is required when setting, and the time number is adjusted through the "UP" and "DOWN" keys, and the number position is adjusted through the "LEFT" and "RIGHT" keys. After pressing the "ENT" key, first verify the consistency of the left and right input numbers, if the input numbers are inconsistent, it will prompt "configuration inconsistency", if the input numbers are consistent, the configuration can be successful, OLED will prompt "configuration successful" or "configuration failed", SCDA-324R-AR factory default setting is 10s, delay setting example as shown in the figure below.



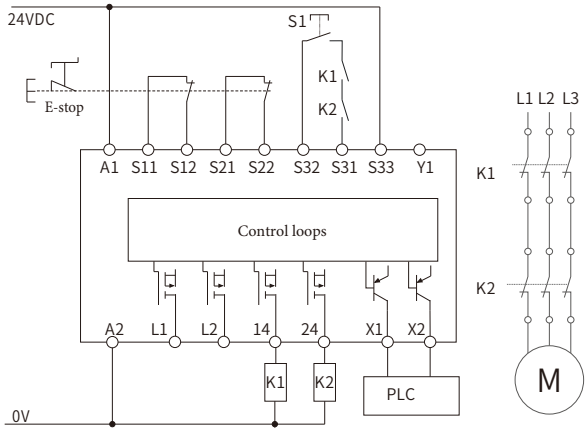

### Password settings

After entering the "Password" setting interface, the current password is displayed, and two-factor authentication is required when setting, and the password number is adjusted through the "UP" and "DOWN" keys, and the password number position is adjusted through the "LEFT" and "RIGHT" keys. After pressing the "ENT" key, the consistency of the left and right passwords will be verified first, if the left and right passwords are inconsistent, it will prompt "configuration inconsistency", if the input numbers are consistent (cannot be "0000"), in order to configure successfully, OLED will prompt "set successful" or "set failed", password setting example as shown in the figure below.

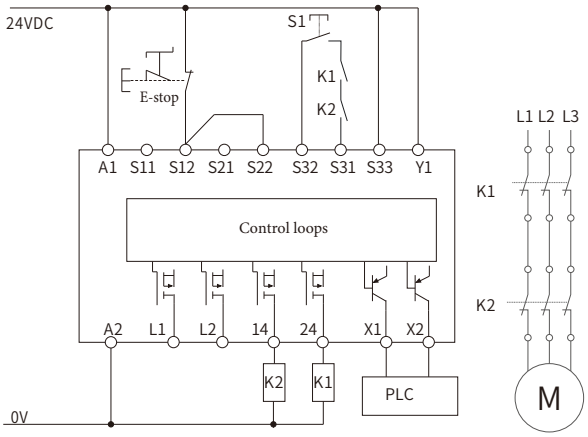


## Description of wiring diagrams for typical applications

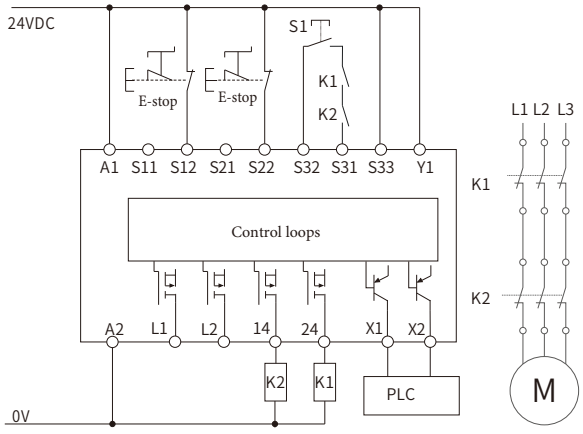
### The SCDA-211RP is connected to a dual-channel emergency stop with manual reset with output monitoring




### SCDA-211RP single-channel emergency stop with manual reset with output monitoring




### The SCDA-211RP is connected to a two-lane emergency stop (without input cross-fault detection) and a manual reset with output monitoring



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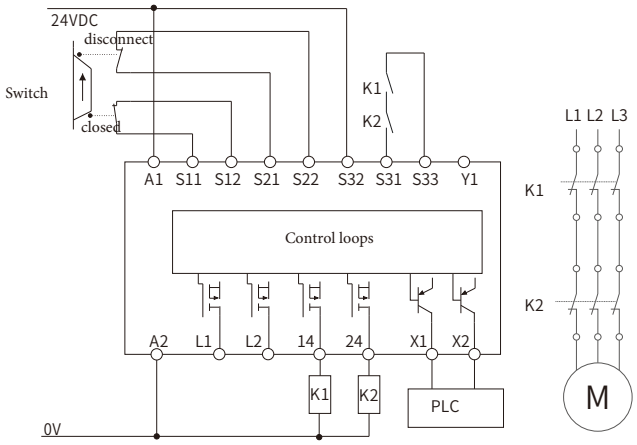
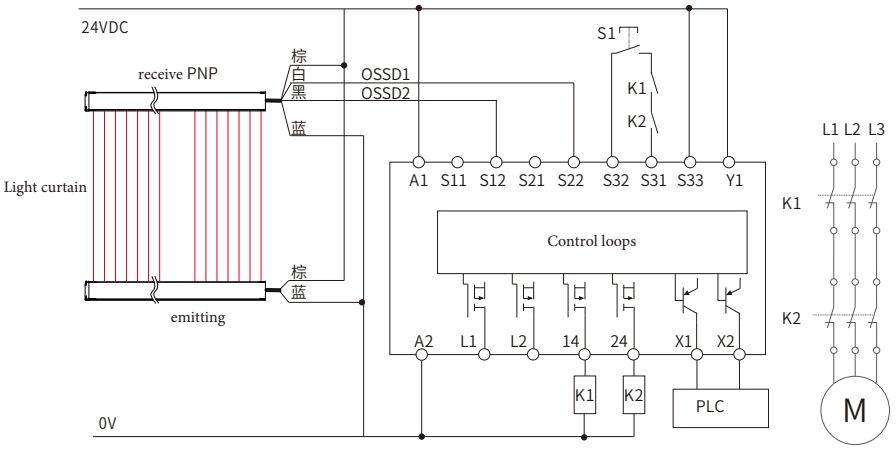
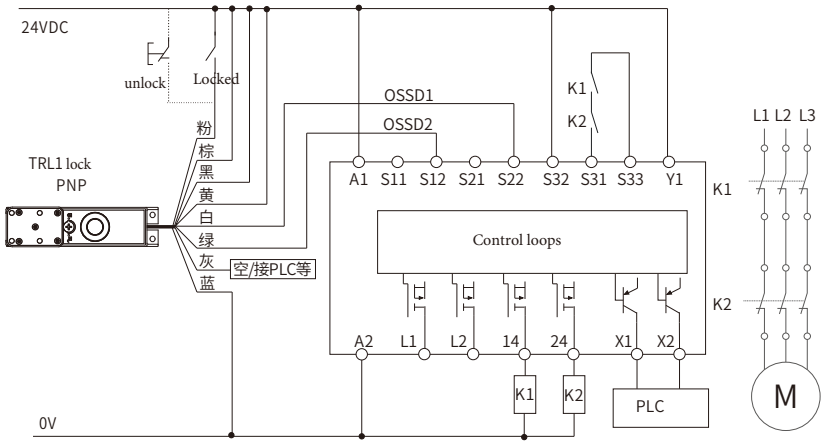
### The SCDA-211RP is connected to a dual-channel safety machine with automatic reset with output monitoring



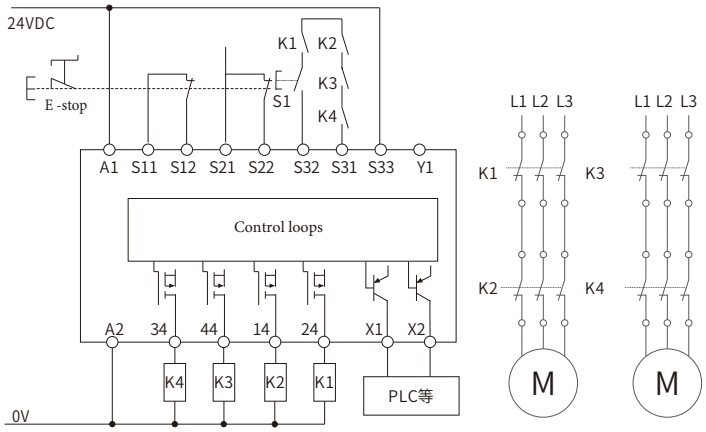

### The SCDA-211RP is connected to a Type4 safety light barrier with manual reset with output monitoring



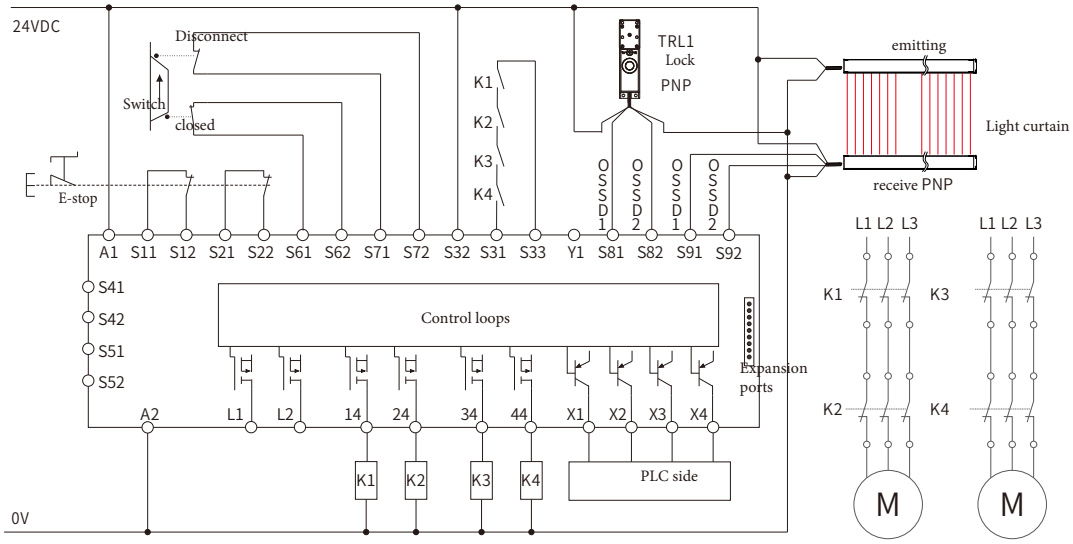

### The SCDA-211RP is connected to an RFID security protection lock and automatic reset with output monitoring



The SCDA-211RP is connected to a two-lane emergency stop, drives two motors, and has a manual reset with output monitoring




SCDA-324RP is connected to dual-channel emergency stop, dual-channel safety dam, dual-channel safety light grid and dual-channel safety protection lock, automatic reset, input signal cross-fault detection, output monitoring



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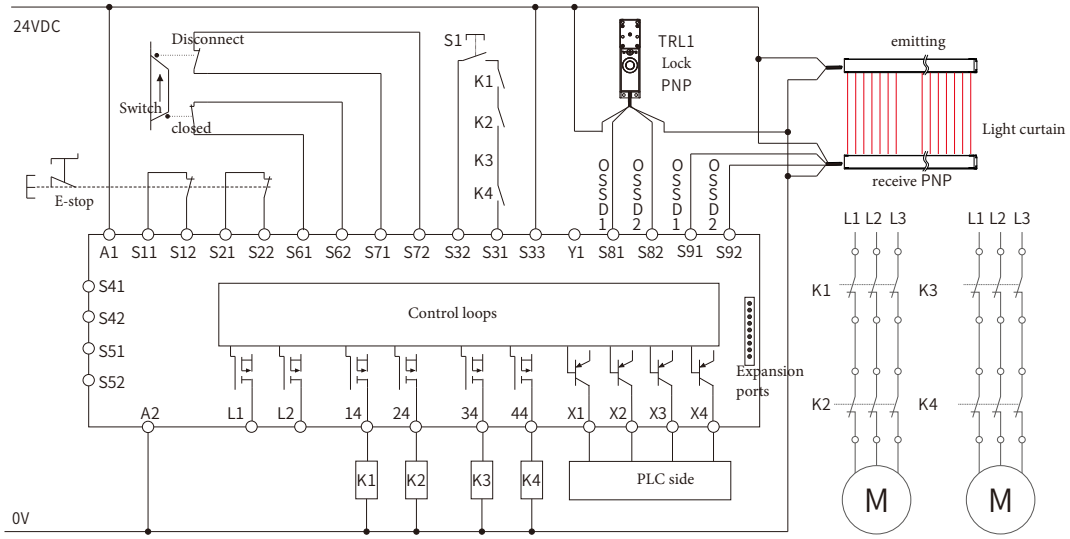
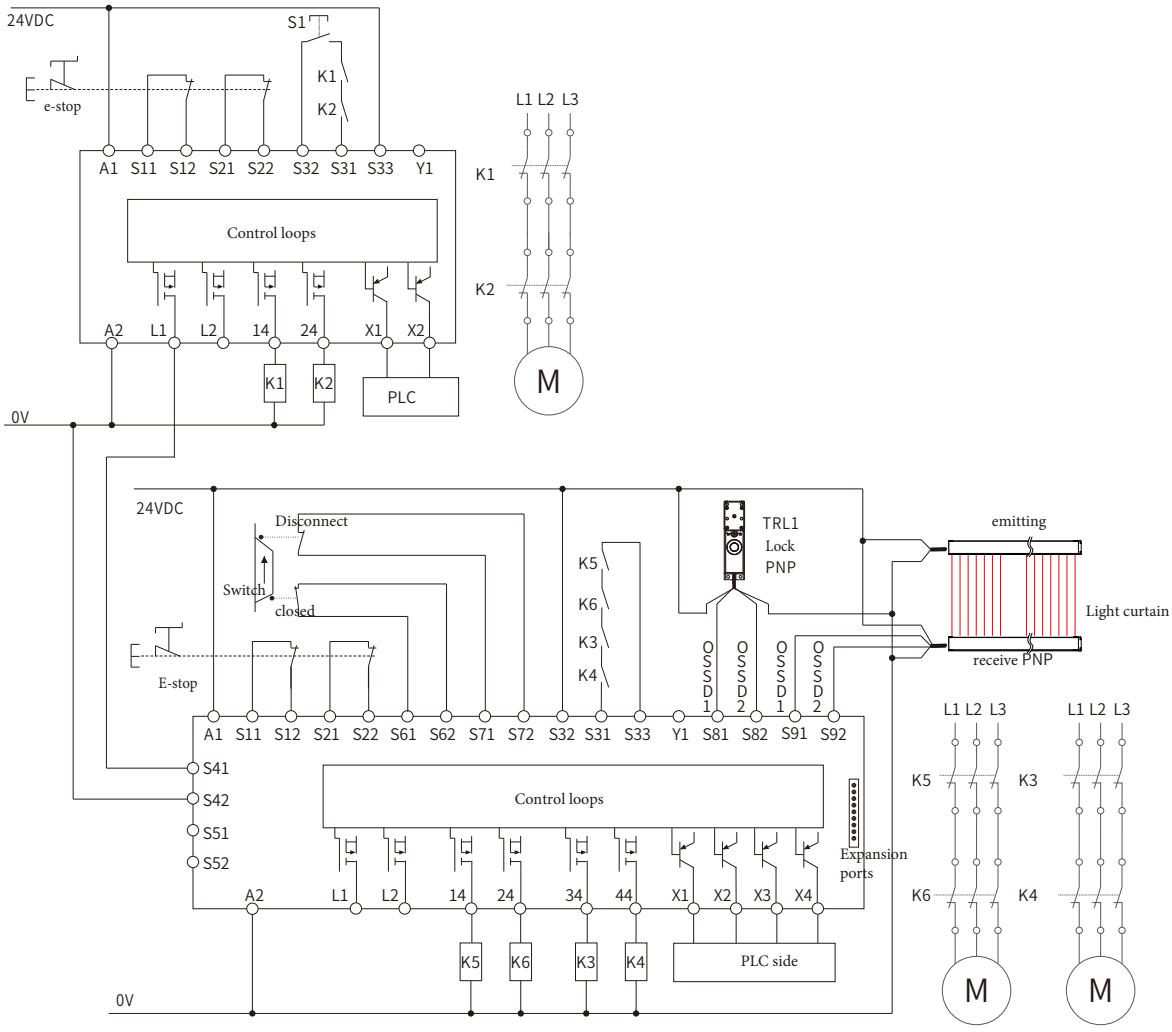
SCDA-324RP is connected to dual-channel emergency stop, dual-channel safety dam, dual-channel safety light grid and dual-channel safety protection lock, manual reset, input signal cross-fault detection, output monitoring




SCDA324RP and SCDA-211RP cascade and logic operations



## The SCDA-211RP is cascaded with two sets of SCDA-324RP