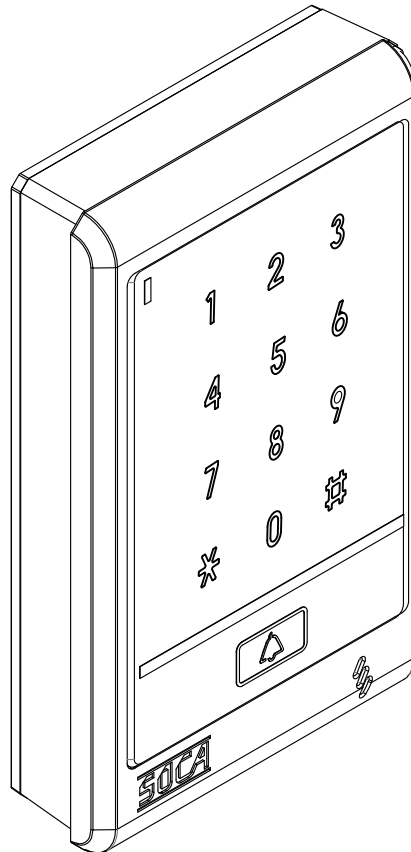


# ST-520AM

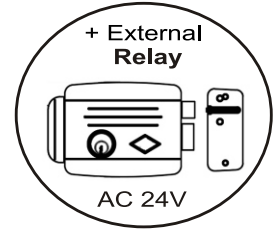
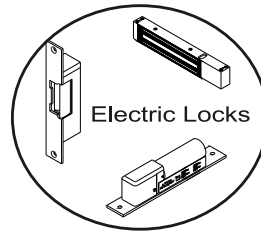
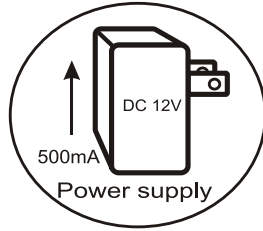
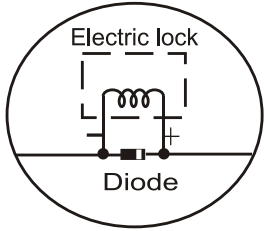
## Waterproof Proximity Access Control System Operation and Installation Manual



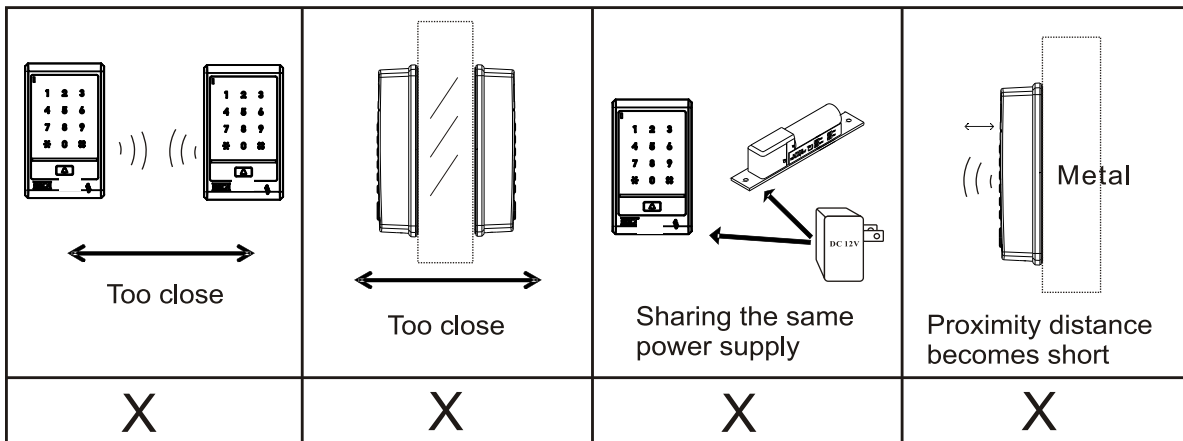
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# ATTENTION

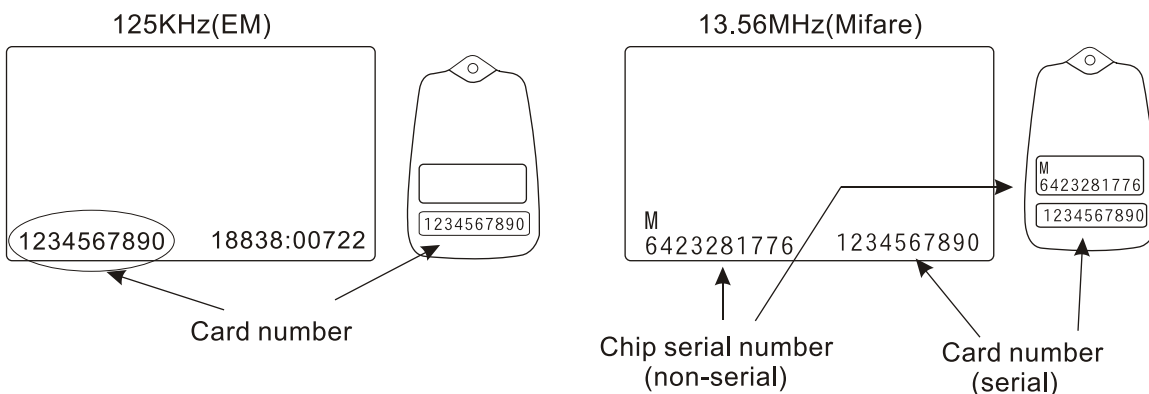


1. Power Supply requirement : DC 12V 500mA and above.
2. Door opening or alarm connector output : Maximum load of 1A@12VDC.  
 ※ Connect with external RELAY to control higher voltage or current .
3. Electric Lock : Fail-safe or fail-secure type (refer to P16).  
 ※ PLEASE NOTE : In order to protect the proximity unit, please connect one Diode between two power supply connectors of electric lock to absorb surge.
4. Avoid installing the unit at the following environment : (A) Machines with the same frequency as the proximity unit around the neighborhood. (B) In the area of a base station with radio or wireless transmission. (C) On metal wall (proximity distance will be shorten).
5. It is suggested to separate the power supply of electric lock and proximity unit in order to stabilize the power supply.
6. It is waterproof design and its surface is completely waterproof.



## Card number in the back of the card.

Example of the card : The last 8-digit number of 1234567890 is 34567890.



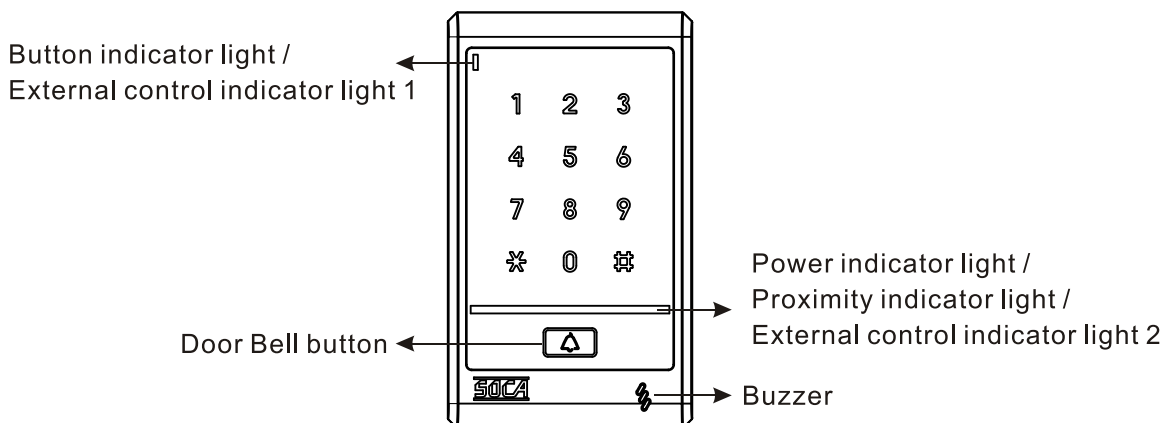
# Special Features

- Waterproof design. Tight structure design of silicone washer. Durable and strong weather resistance.
- Any unauthorized break-in or entering will activate the alarm.
- Standalone proximity, single card number entering or batch entering to enter. Cards are distributed before use.
- Anti-tamper design and alarm will activate when the unit is tampered or move with force.
- Add or delete specific card.
- Door opening time can be set between 01-99 seconds. Setting 99 seconds as normal output to use for anti-theft unit.
- Four sets of door opening modes:
  - (1) Enter 4-digit password, mode number is 1.
  - (2) Proximity card door opening, mode number is 2.
  - (3) Proximity card and 4-digit password (total of 8 sets of door open password), mode number is 3.
  - (4) Proximity card or 4-digit password, mode number is 4.
- System password (default system password is 4567) is required to enter system setting modes to set any system setting functions. Enter \* # before system password and then # to enter system setting modes (for example , \* #4567 #).
- All proximity cards or key tags have to be registered before use.
- 8 sets of different door opening password to integrate with proximity card.
- Maximum capacity of 2000 cards.(MX format as 1600 cards)
- ST-520AM reads 8-digit card number .
- With special memory, data are kept for permanent even power cut occurred.
- Use of PC material to enhance toughness of its cover. Cream white / white or deep gray to select.
- Maximum proximity of 5cm (13.56MHz) ; the distance is varied according to the type of card.
- Use of PC material to enhance toughness of its cover.
- Power supply: DC 12V. Power consumption:80mA (Standby),110mA(Active).
- Operating temperature 0~60℃ ; humidity 85% Rh max.
- Dimensions : 136(L) × 85(W) × 24(H) (mm).
- Backup system password available if user has lost or forgotten the system password

# Front Panel and Types of Cards

## FRONT PANEL

- Power Indicator Light : Standby (Red), proximity correct (Green).
- Proximity Indicator Light : Correct (Green).
- External Control Light : Control by white wire .
  - ※ Bright Red (position 1), purple (position 2), please refer to Function 24.
- Button Indicator Light : Same as external control light, it is flashing when doorbell button is pressed.
- Doorbell button : The pattern is flashing when it is touched.



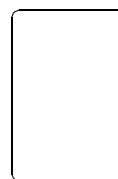
## Model Series

- ST-520AM : 13.56MHz Mifare format
- ST-520AMX : 13.56MHz Mifare SOCA V.3 format
- ※ MX format as anti-copy type with multiple anti-copy system. Please do not attempt to duplicate or use non-original proximity card or ring Proximity card may be locked permanently and cannot be used if the above attempts happen. It is suggested to delete the proximity card number if the unit displays the proximity card is being locked which shows duplicated card.

## Types of Proximity Card

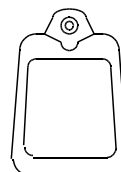
### | SC-10 |

Thin card , thickness of 0.8 mm, ISO standard card dimensions.  
It can be printed directly from card printer.  
Read range : Mifare 13.56MHz:3~7cm.



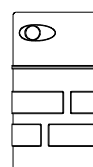
### | SC-30 |

Key tag, dimensions: 51L X 7.8H X 32W (mm).  
Ultrasonic connection, waterproof, shock proof.  
Read range : Mifare 13.56MHz:1.5~4 cm.



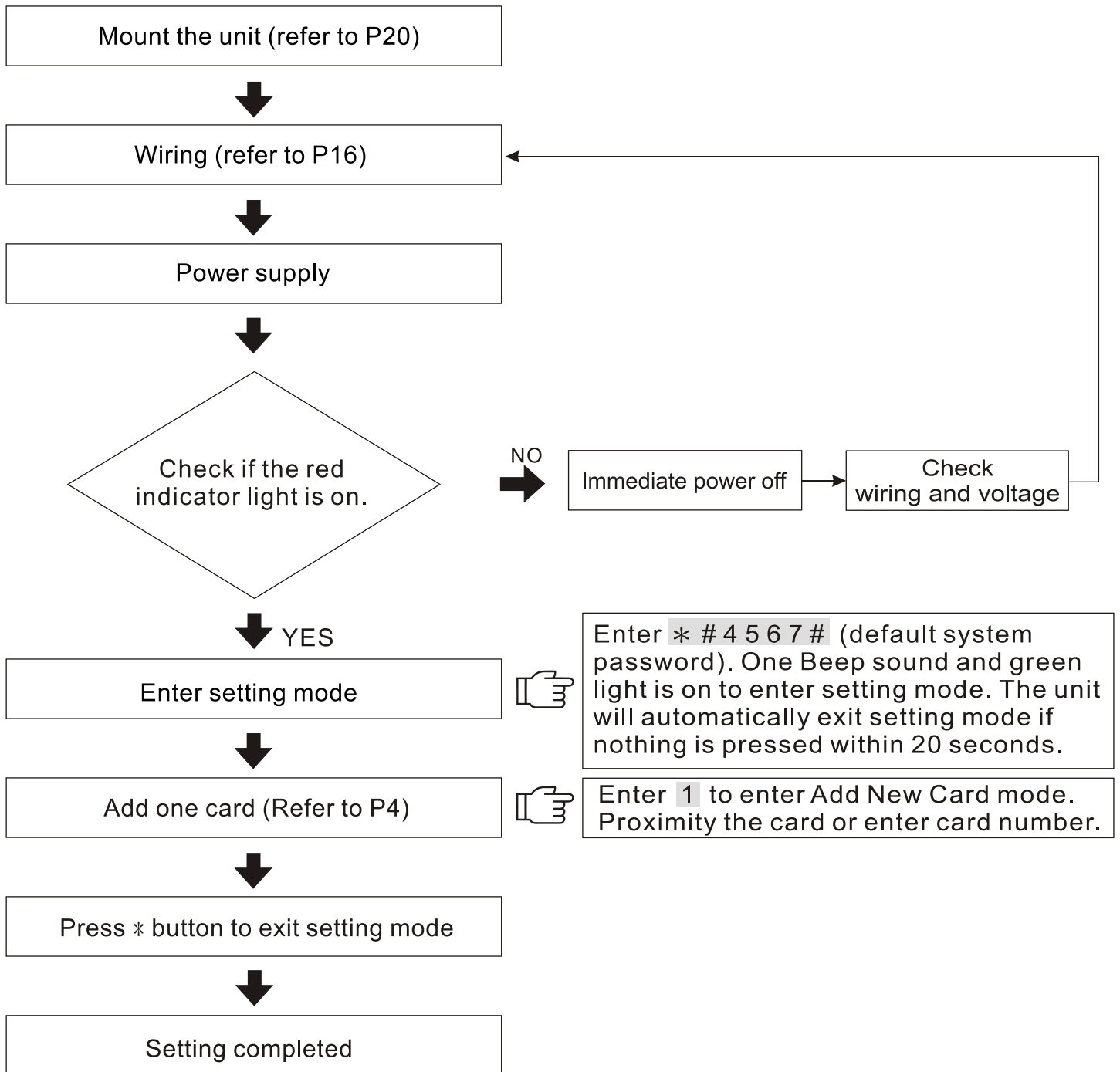
### | SC-50 |

Key tag, dimensions: 46L X 25W X 7H (mm).  
Ultrasonic connection, waterproof, shock- proof.  
Read range : Mifare 13.56MHz:1.5~4cm



★ The above read range stated is for reference and it is varied according to the different environment it is used.

# Installation Procedures



※ For other detailed function operations, please refer to the following pages.

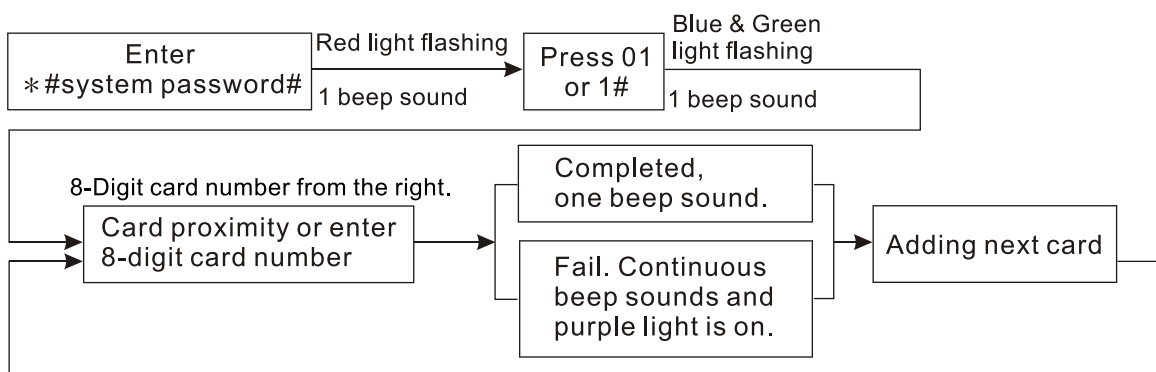
# Setting Modes and Functions

System password (Default system password is 4567) is required to enter system setting modes. After entering System Setting Mode, beep sound after proximity and red light is flashing. If there isn't any action or entering within 20 seconds, the system will automatically escape from the setting mode.

## ATTENTION !!

- ★ Default light : Standby light as red light and door open light as green light.
- ★ Function keys :
  - # key : Confirm setting.
  - \* key : Clear entering or back to previous setting. Press \* key (one beep sound) 1~2 times until standby light (default setting as red light ) appears to complete mode setting.
- ★ Continuous beep sounds and purple light is on to indicate wrong operation while operating. Please refer to the indicator light guide to operate again.
- ★ Two Registration Modes :
  1. Automatic selection :  
It is easy to operate when cards have compatible card numbers for management.
  2. Manual selection :  
When cards do not have compatible card numbers. Entering card memory address manually and user is able to delete from the site selected.
  3. Default registration mode as selection. Please adjust the mode before registration.  
Both modes are not available to set and use simultaneously. Please refer to Function 12 if user wants to change the mode after setting.

### Function 1 Add new card : To register users card number.

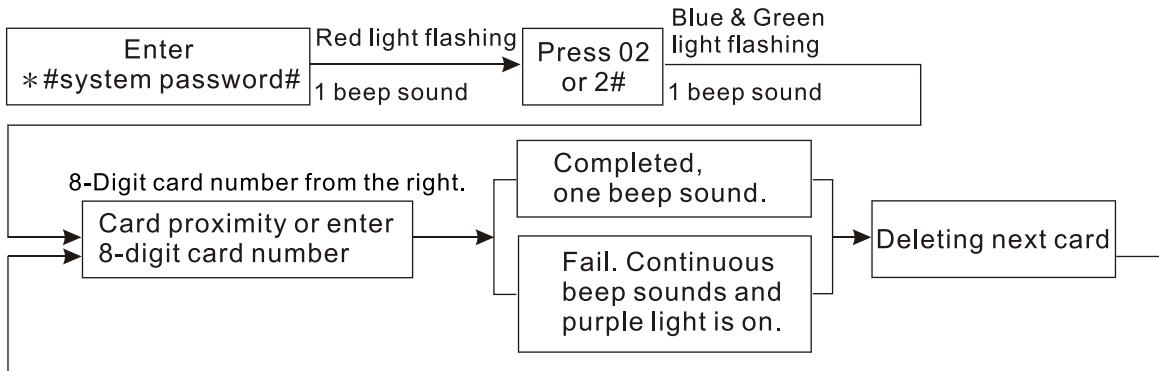


※ **Default setting as Automatic Address Selection.**  
**Please refer to P15. for Manual Selection Setting.**

※ Continuous beep sounds and purple light is on when adding new card is failed ( maximum number of card is reached or repeated card number occurred).

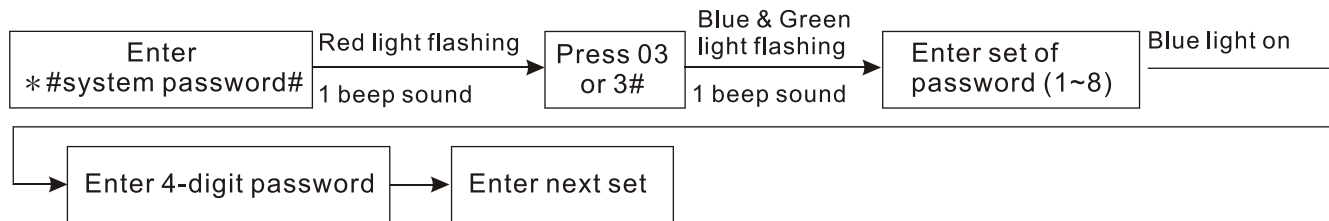
**Function 2 Delete card :**

Deletion of user's card (such as loss of card). Card number is the 8-digit number indicated on the proximity card.



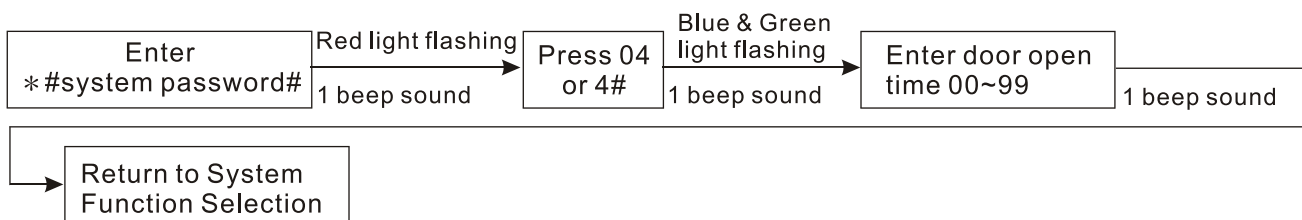
※ **Default setting as Automatic Address Selection.**  
**Please refer to P15. for Manual Selection Setting.**

**Function 3 Change of 8 sets of user's password :**



**Function 4 Door open time setting :**

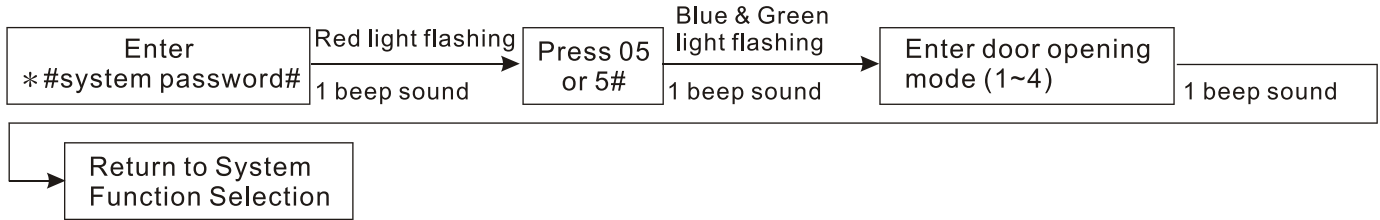
Setting door open time from 01-99 seconds. All time setting shall be in 2-digit such as enter 01 for 01second. Setting 99 seconds as toggle state (**suitable for security system**) and 00 second as single punch (**suitable for automatic door**). Default time is 3 seconds.



### Function 5 Door opening modes :

There are 4 sets of door-opening modes. Users could only set one of the door-opening modes for access control. Default door opening mode is proximity card door-opening.

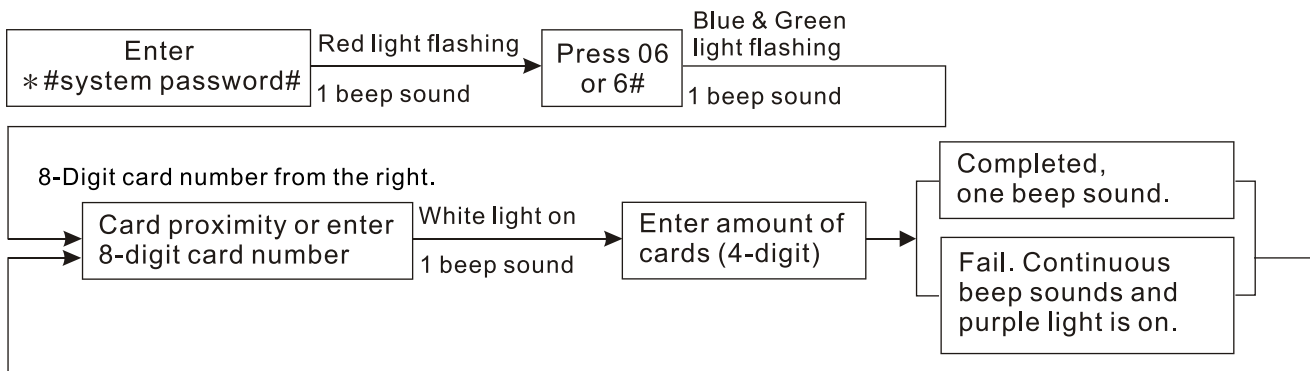
- (1) Enter password, mode number is 1. (※ please refer to Function 82)
- (2) Proximity card. Door opens when the card is sensed, mode number is 2.
- (3) Proximity card and enter 4-digit password, mode number is 3.
- (4) Proximity card or enter password, mode number is 4.



NOTE : Under " Random Startup Code" function, user has to press the random number shown on the keyboard when it is touched during standby mode. After that, user is able to enter 4-digit door open password after the beep sound.

### Function 6 Batch registration :

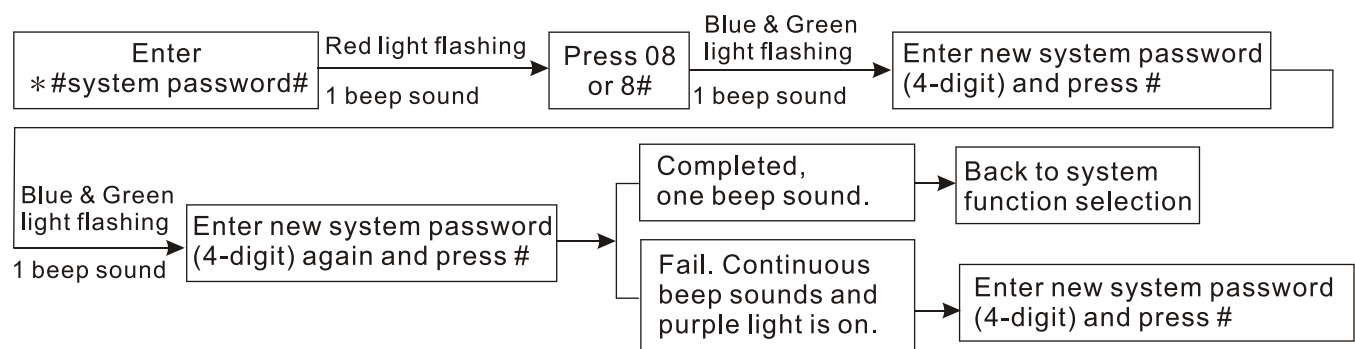
Registering multiple cards and cards in series. Enter 8-digit card number, then enter amount of cards in 4-digit manner(must be in full 4 digits, such as 100pcs, enter 0100).



※ Continuous beep sounds and purple light is on when adding new card is failed.  
(Maximum number of card is reached or repeated card number occurred).

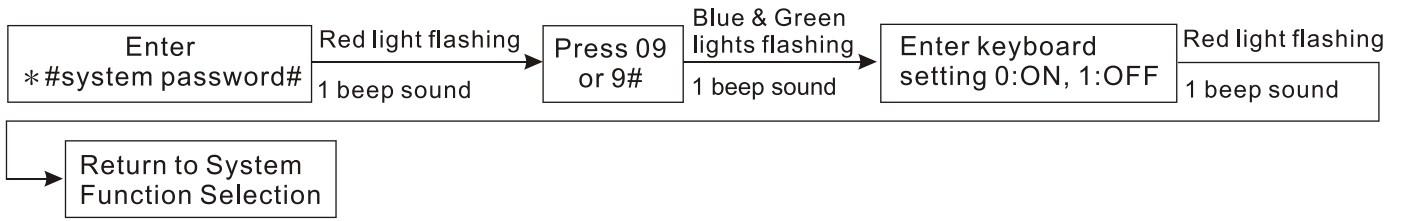
### Function 8 Change system password :

Default system password is 4567. Please remember the default system password or else user is unable to enter system setting mode.



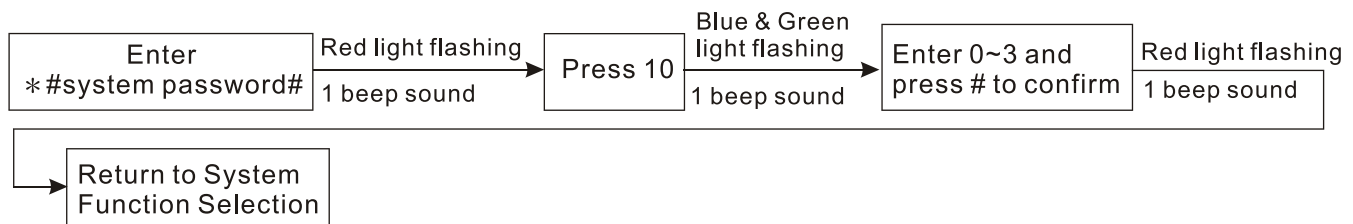
### Function 9 Random Startup Code Setting :

User has to press the random number shown on the keyboard when it is touched during standby mode. A beep sound after pressing the number to enter keyboard input function to increase password input's complexity. Default value as OFF, 0 as ON, 1 as OFF.



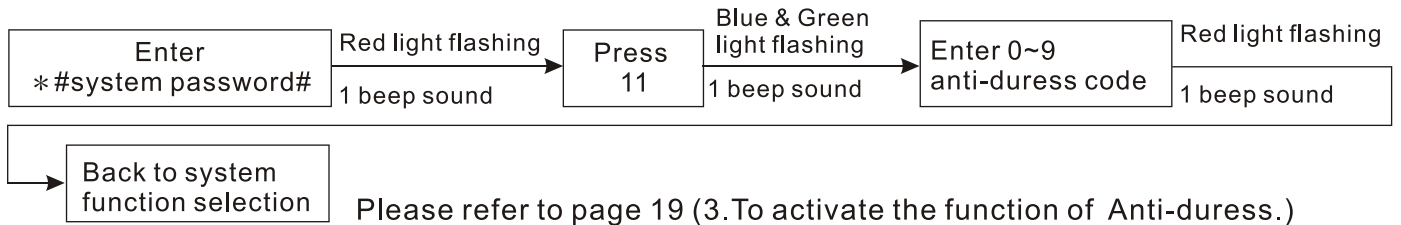
### Function 10 Buzzer volume setting :

0 as Sound off, 1 as Minimum, 2 as Medium (Default), 3 as Maximum.



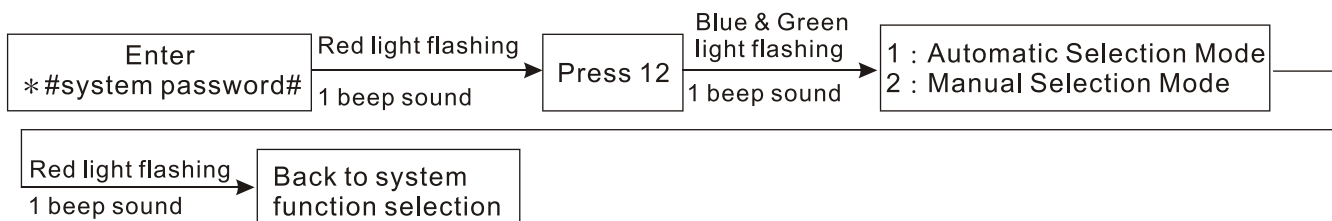
※ Enter digit 0 to set buzzer volume as off. User does not need to press # key as to return to system function selection.

### Function 11 Anti-duress Code Setting : Default value as 0.



### Function 12 Adding new card mode setting :

1 as Automatic Selection Mode(default value). 2 as Manual Selection Mode.



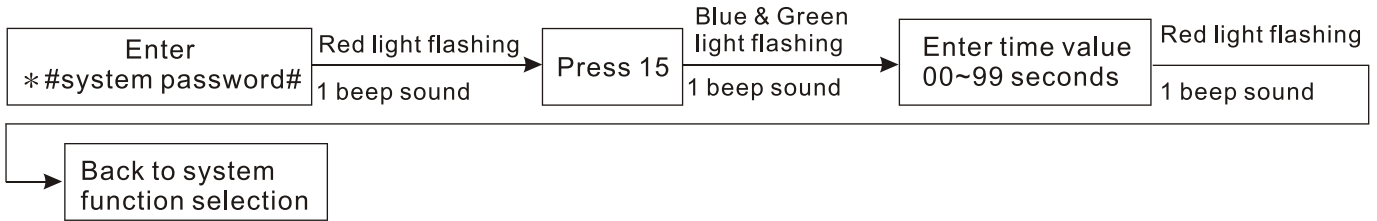
※ It is unable to change the mode when the reader has already registered cards.

User has to delete all the cards before changing the mode.

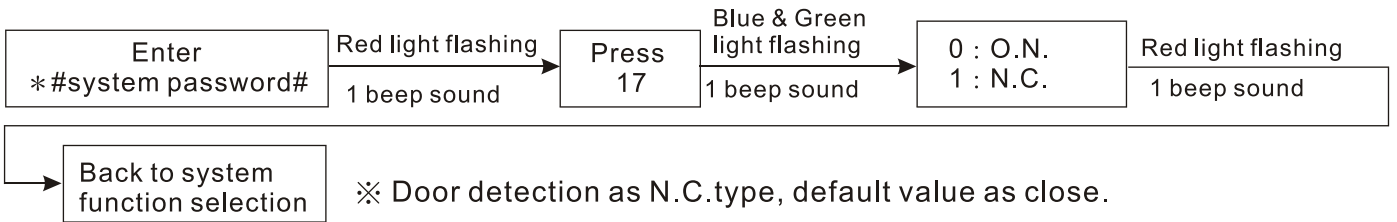
※ Bluetooth version and MX format do not support this function.

### Function 15 Door detection time setting :

Time entering within 99 seconds. Default value as 5 seconds.

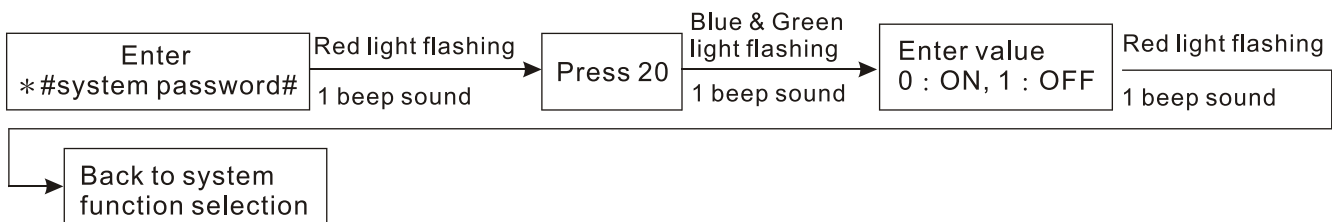


### Function 17 Types of door detection : 0 as O.N., 1 as N.C., Default value as N.O.

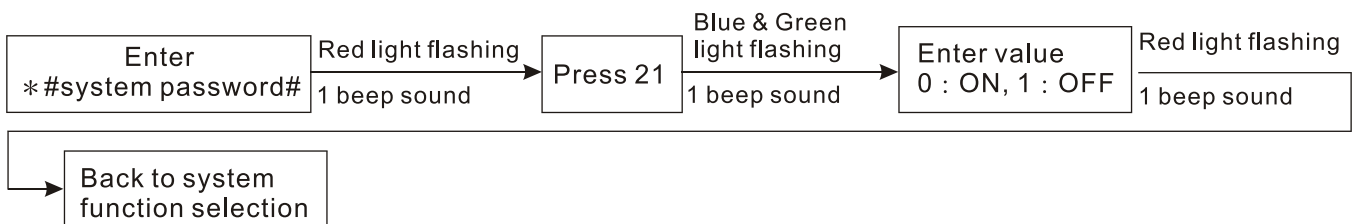


### Function 20 Alarm buzzer setting :

0 as ON, 1 as OFF. Default value as OFF. Buzzer rings once every 2 seconds once the alarm is activated when the setting is ON.

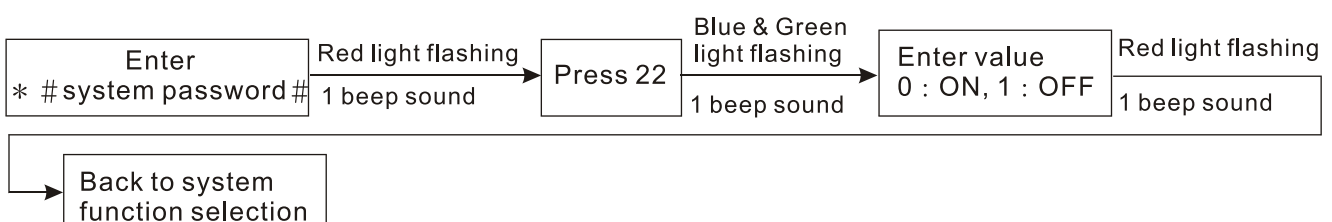


### Function 21 Anti-duress setting : 0 as ON, 1 as OFF, default value as OFF.



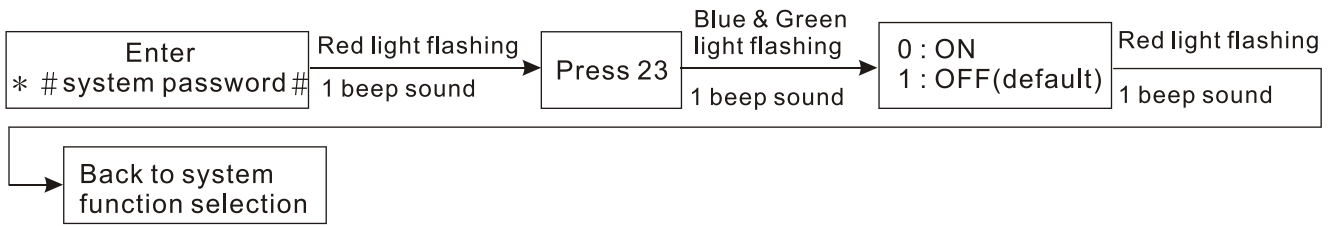
### Function 22 Password error alarm setting :

0 as ON, 1 as OFF, default value as OFF. Siren is on and keyboard entering is locked for 20 seconds when wrong system password or password is entered for 3 times.



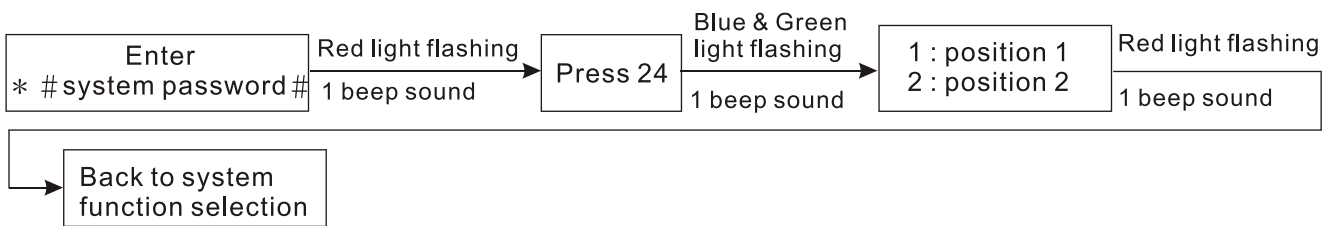
### Function 23 Anti-tailgating mode :

When the function is on, door lock will lock automatically when the door is closed.  
(Default value as close)

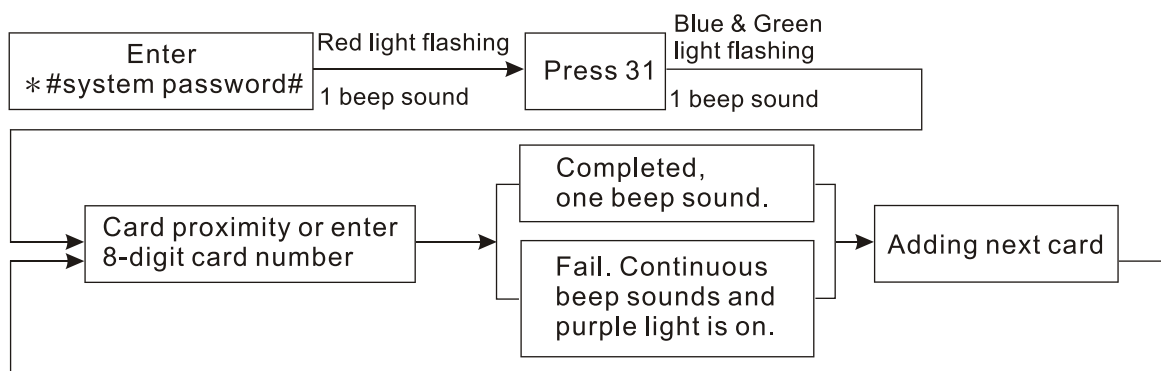


### Function 24 External control indicator light position selection :

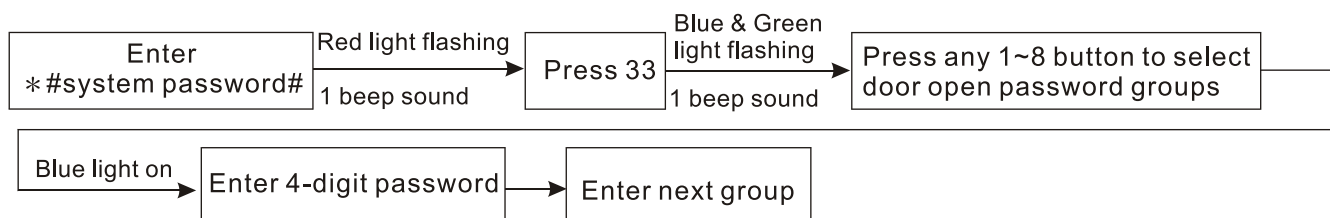
This function is available to select turn on specific position of the indicator light.  
Please refer to P3 (introduction of the panel). Default value as 1(position1).



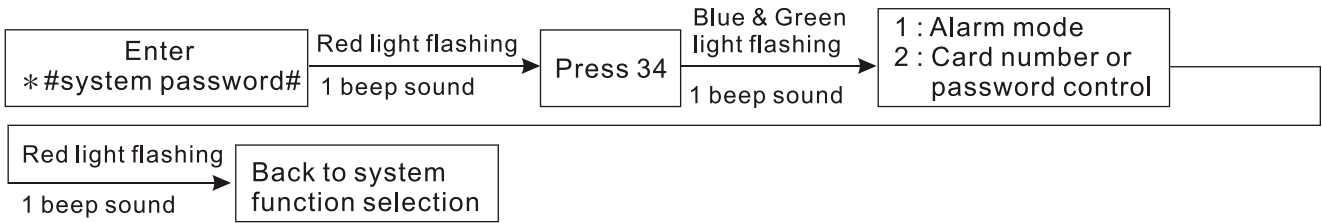
### Function 31 Add new card of output 2 :



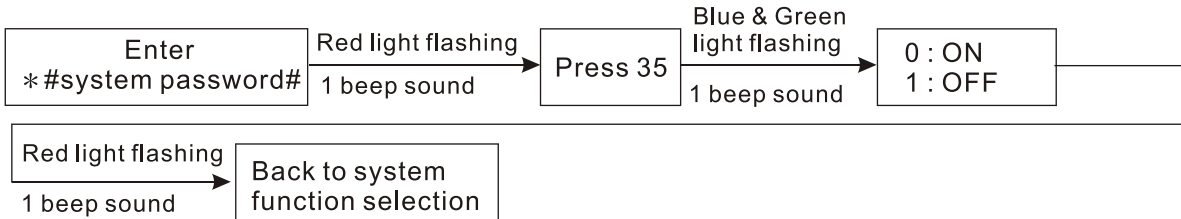
### Function 33 Add new password of output 2 :



**Function 34** Output 2 mode : Default value as alarm mode.

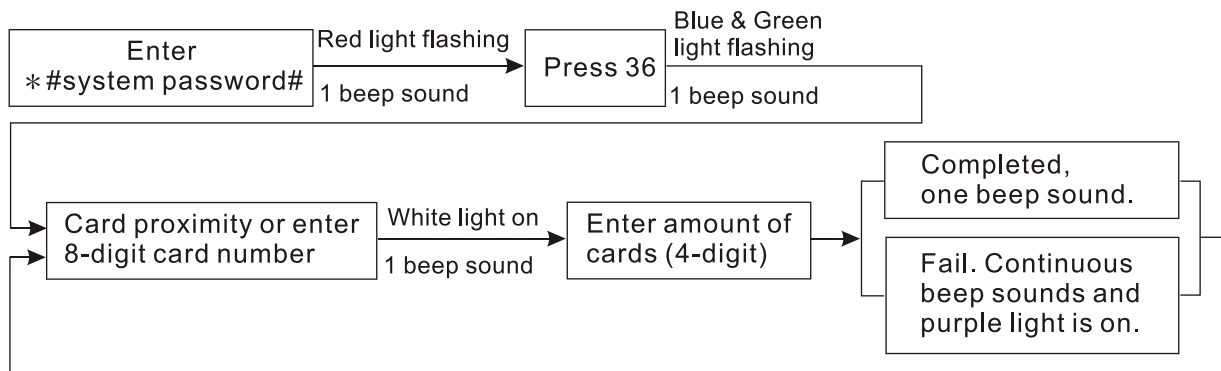


**Function 35** Security function : Default value as OFF.



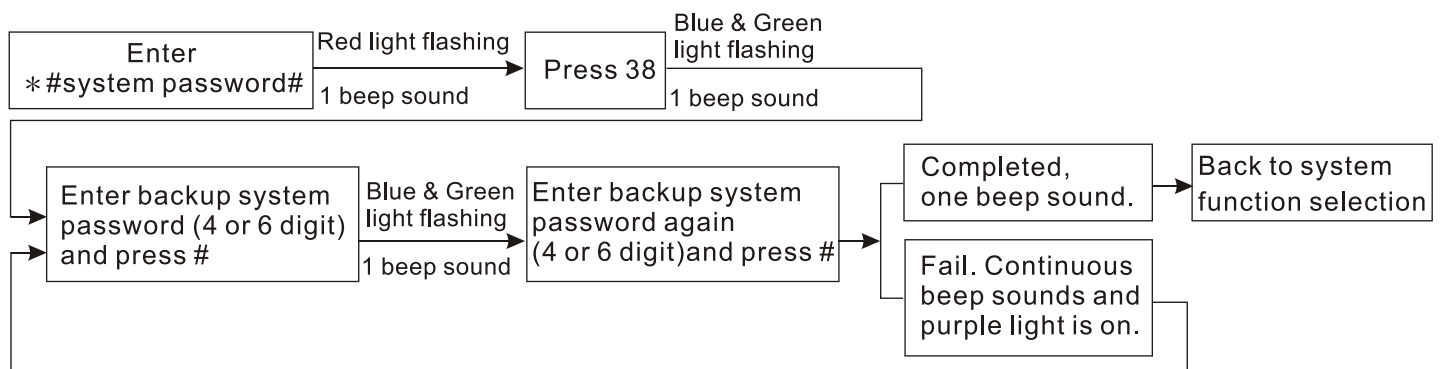
※ As white wire (indicator light control point) and GND are short circuit, the reader enters security mode when the function is on. Therefore, it is unable to control door open point.

**Function 36** Batch registration output 2 card :



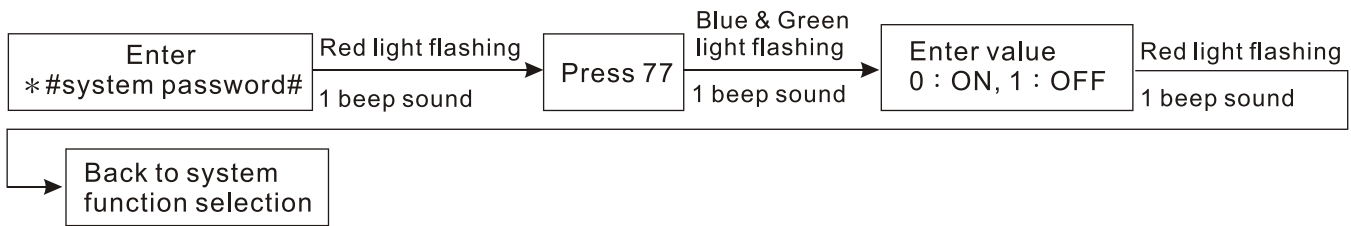
**Function 38** Change backup system password :

Provide second set of system password for backup use.



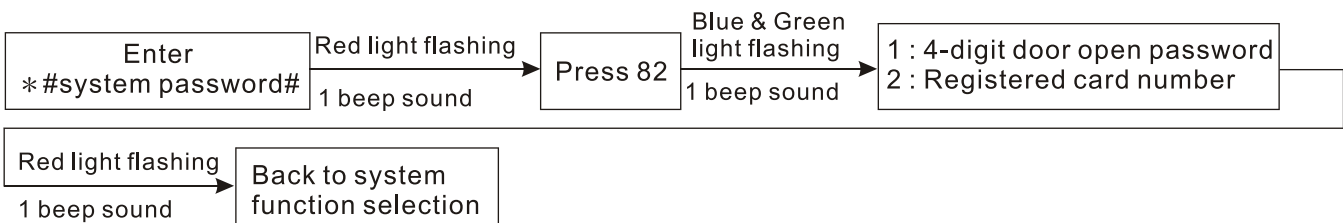
### Function 77 Automatic registration mode :

Cards will be automatically registered for the first time as long as they meet the proximity format. Door will be open after registration. This function is for alternating new and old cards as to solve. Unification of registering all cards. User must turn the function off manually once all the cards are collected and registered. 0 as ON, 1 as OFF, default value as OFF.



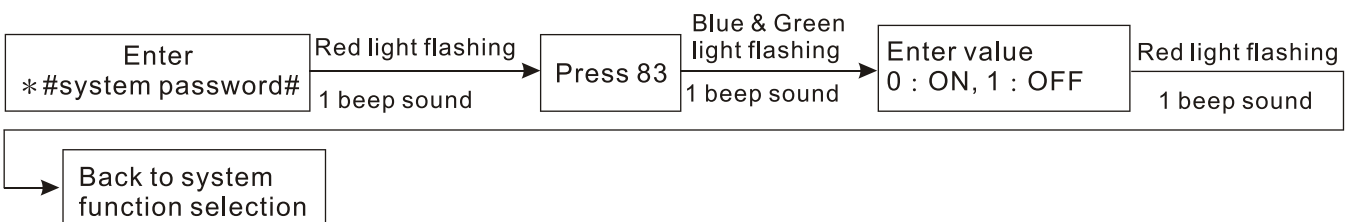
### Function 82 Password use mode : Default value as 1 (4-digit door open password).

Door open after proximity when cards meet the proximity format when the function is set ON. It applies for temporary access regardless of any valid or invalid cards. 0 as ON, 1 as OFF, default value as OFF.



### Function 83 Access control mode :

Door open after proximity when cards meet the proximity format when the function is set ON. It applies for temporary access regardless of any valid or invalid cards. 0 as ON, 1 as OFF, default value as OFF.



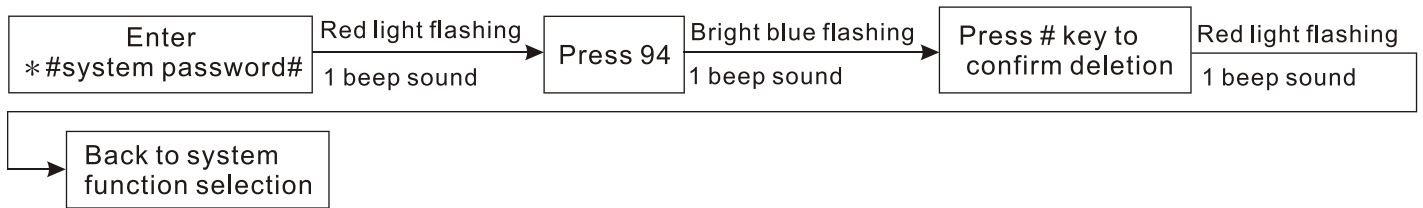
### Function 93 Deletion of 8 sets of user's password :

Please note that this function will delete all the 8 sets of user's password and cannot be retrieved.



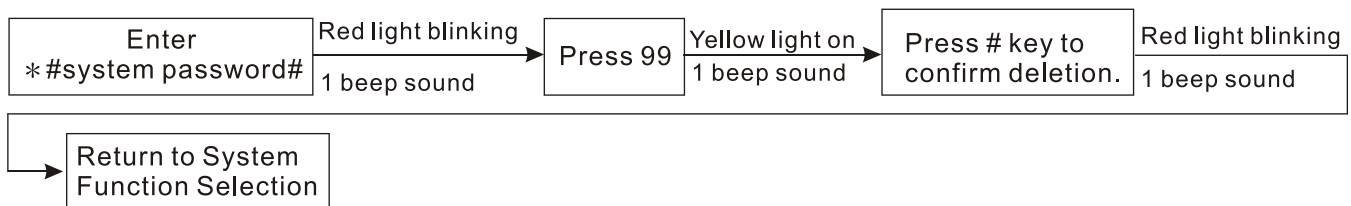
## Function 94 Reset system parameters :

Reset all parameters as default values for checking.

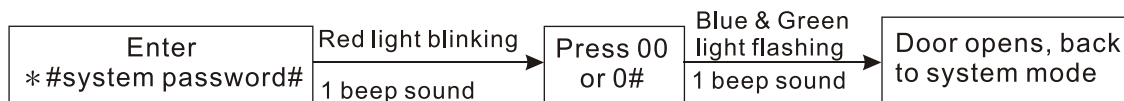


**NOTE :** This function only resets parameters ( lights/ open door mode / seconds and etc) as default values. Other important data such as door open password, system password, registration data will not be changed.

## Function 99 Delete all cards :

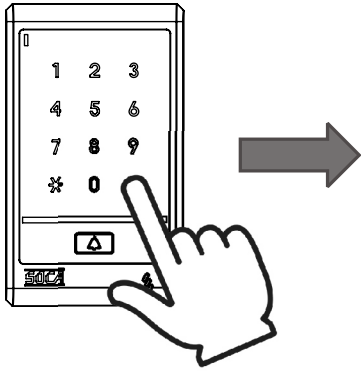



## Function 00 System door open :



# Output Contact Control Methods

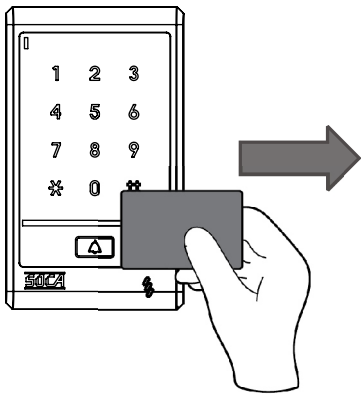
## Enter password method

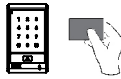



Enter 4-digit password	Trigger contact
Password authority = 1	Door open
Password authority = 2	Output 2
Password authority = 1 & 2	 Select contact for output

※ Please refer to Function 82 for password mode.  
 Please refer to Function 3 or 33 for password authority.

## Proximity card method



Proximity	Trigger contact
Card authority = 1	Door open
Card authority = 2	Output 2
Card authority = 1 & 2	 <b>Door open</b> Remove card after one beep.  Output 2 Hold on to the card until second beep sound.

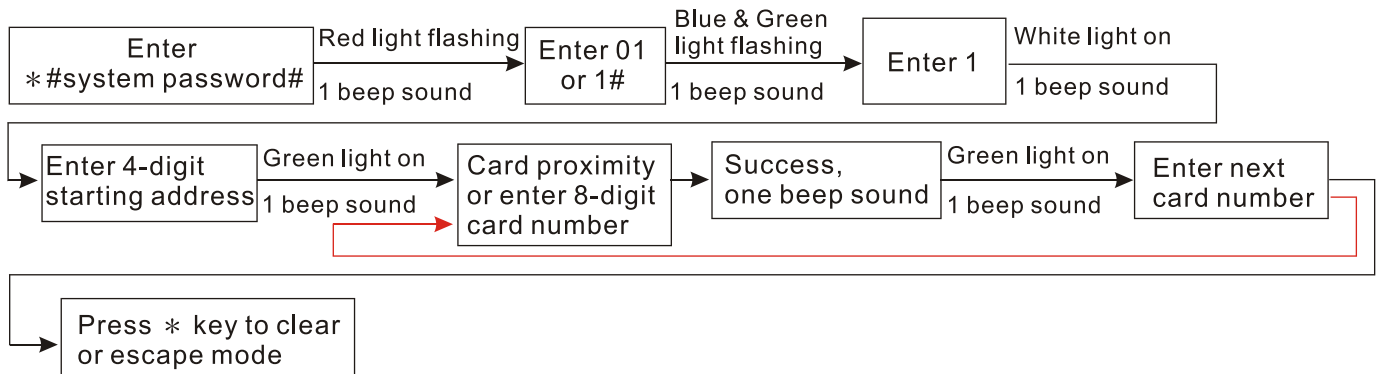
※ Please refer to Function 01 or 31 for password mode.  
 Please refer to Function 06 or 36 for password authority.

# Manual Address Selection

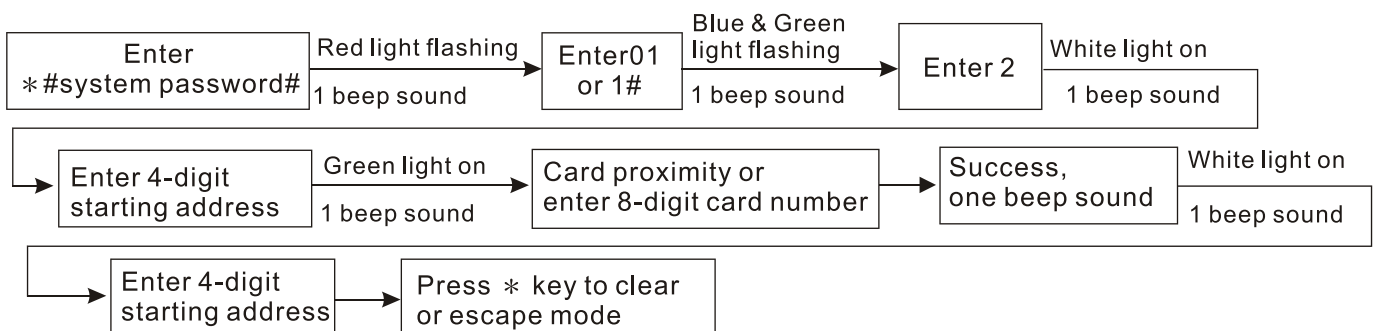
- ※ User must record the card's address, in case unable to delete the card in the future.
- ※ Not support MX format and bluetooth version.
- ※ Please confirm the Function 12.

**Function 1** Add one card : To register users card number.

- ① Batch Registration : Enter starting position and addresses are automatically added.  
(User must calculate and record addresses)

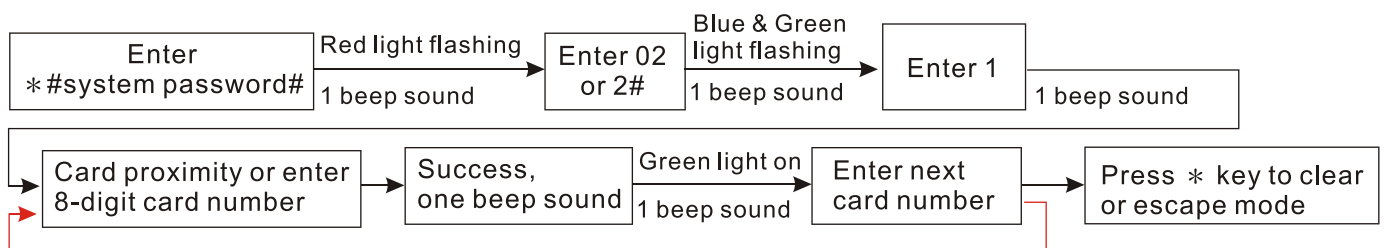


- ② Single Registration : Manually set each card's position among 0001~2000 addresses.

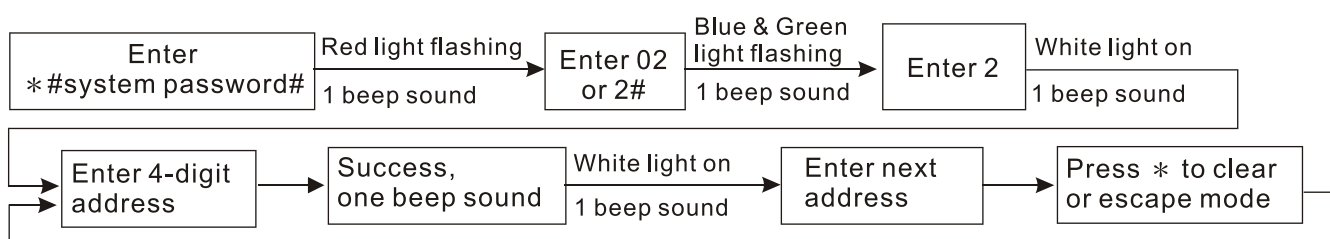


**Function 2** Delete card : Deletion of user's card (such as loss of card).

- ① Single Deletion (Card number) :

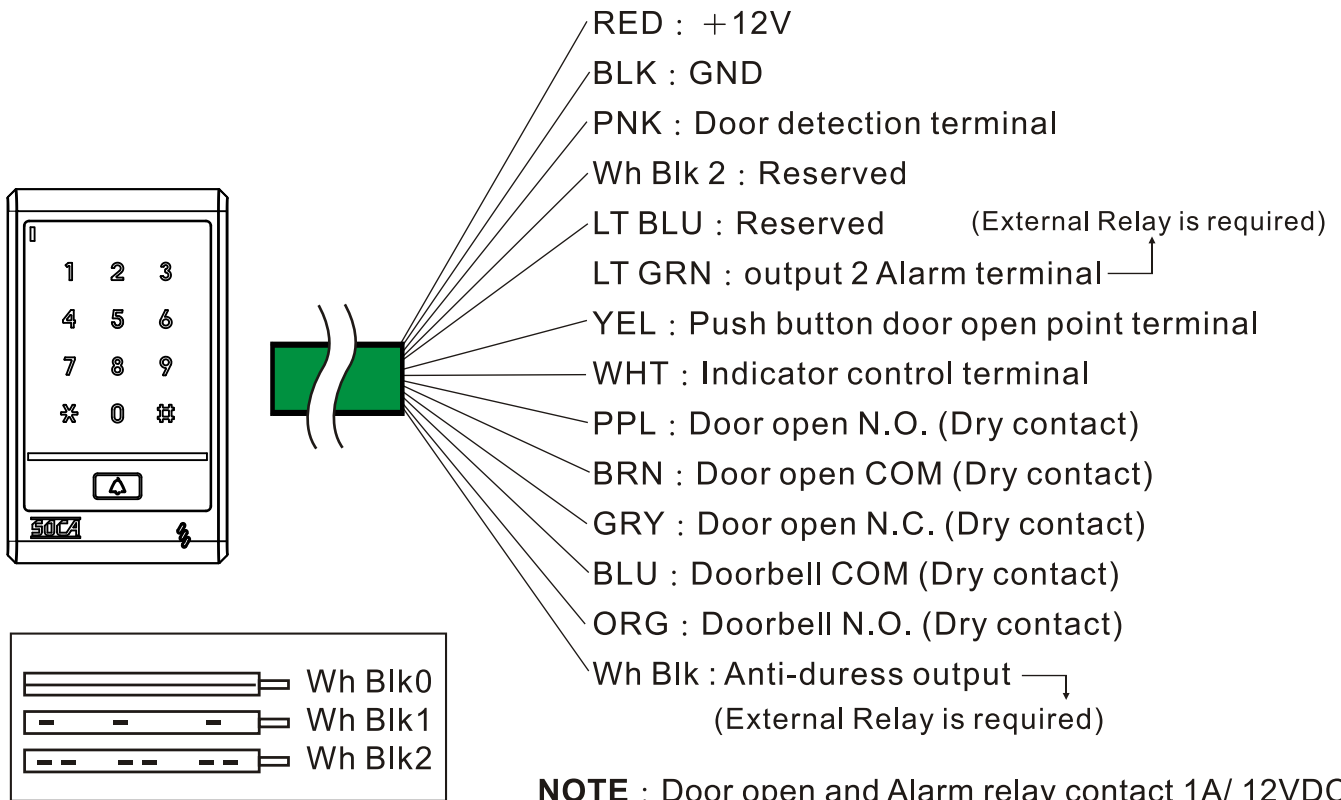


- ② Single Deletion (address) :



# Wiring

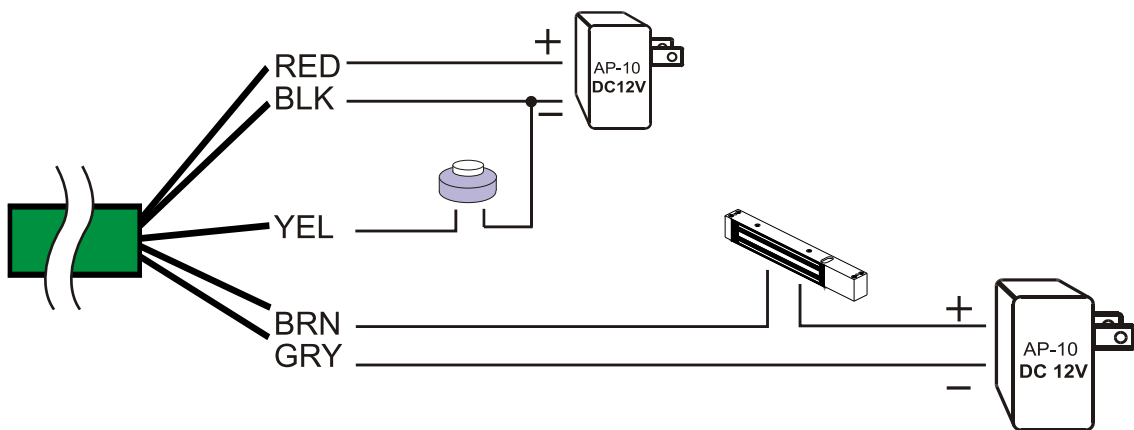
## 1. Reader connections



## 2. Reader's External RELAY and Electric Lock's Wiring

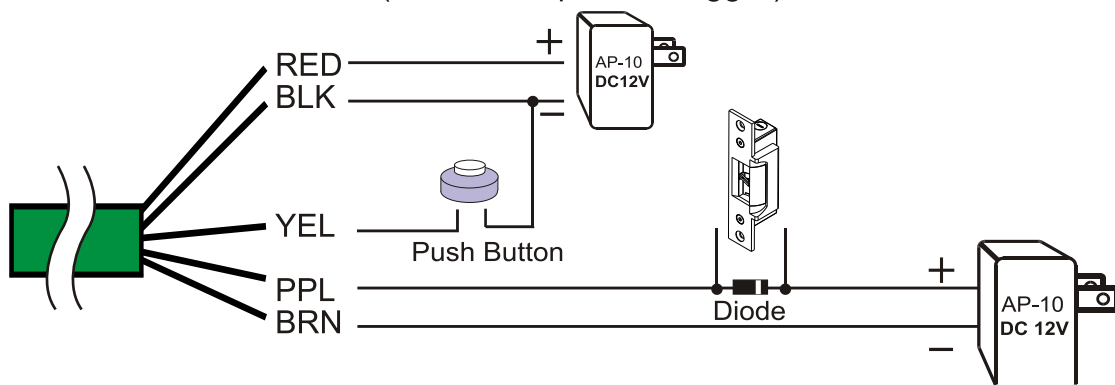
Different wiring for different electric lock. There are two types of wiring as below :

A. "N.C." Connector : Suitable for Fail-safe electric lock such as electromagnetic lock.

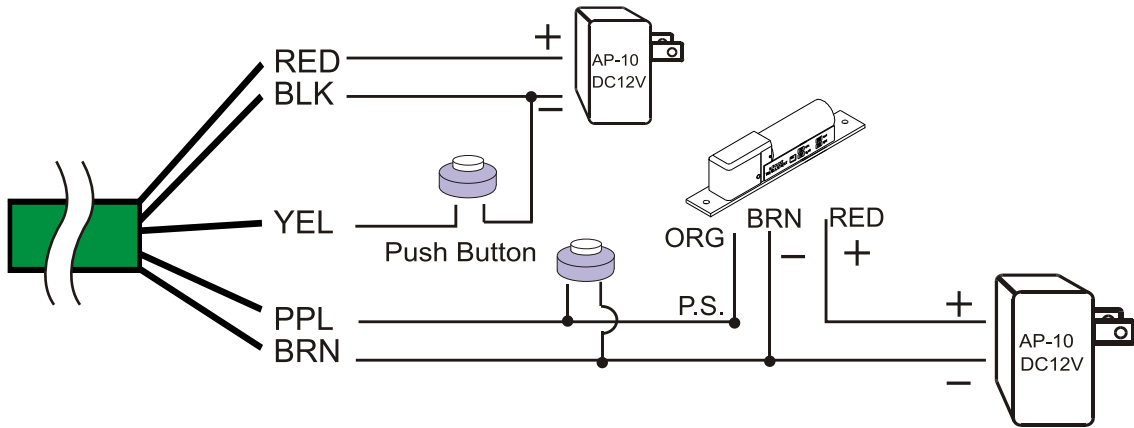


B. "N.O."connector : Suitable for Fail-secure electric lock or any electric lock that requires N.O Connector.

【Example】 Fail-secure strike lock (use of N.O point to trigger).



**【Example】** Microcontroller Fail-safe electric lock (use of N.O point to trigger).



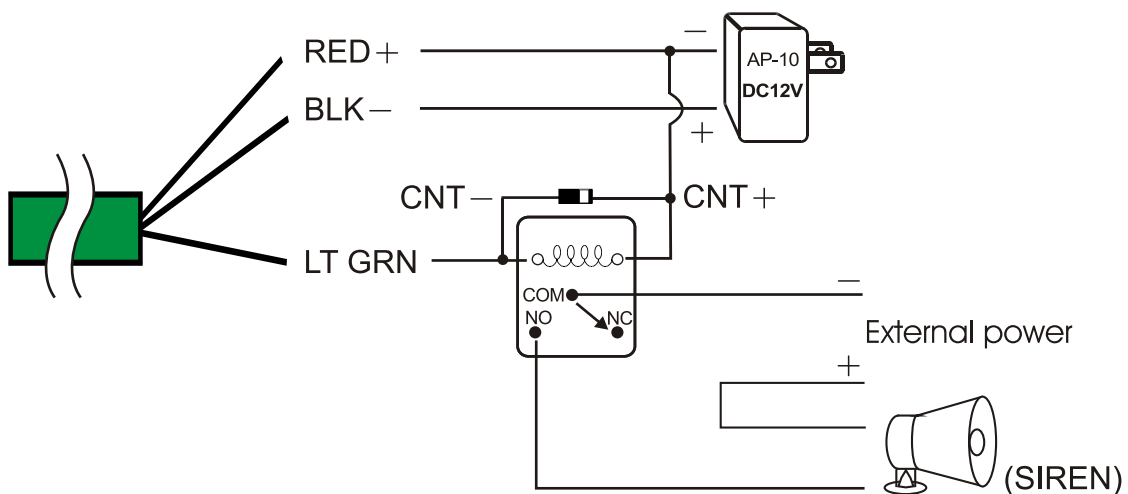
RED : +12V  
 BLK : GND  
 YEL : Door open button contact  
 PPL : Door open N.O.( Dry contact)  
 BRN : Door open COM (Dry contact)  
 GRY : Door open N.C.( Dry contact)

**3. Door Bell Wiring**

Doorbell output as dry contact with maximum load 1A@12VDC.

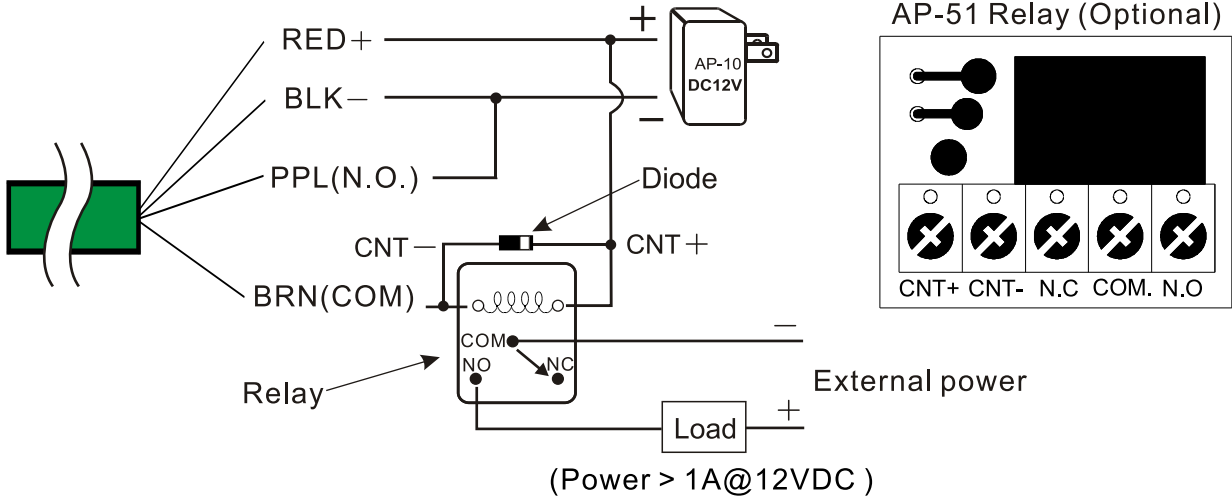
DC12V Wiring	Doorbell voltage > DC12V Wiring (Connect with Relay is necessary)

**4. Output 2 Alarm Wiring**



## 5. Door Open External RELAY

### External Relay Control

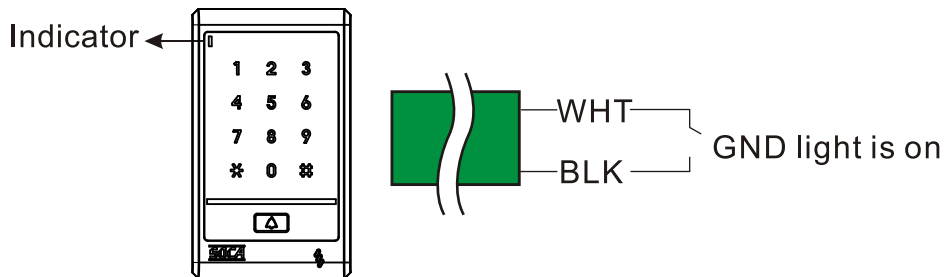


#### PLEASE NOTE :

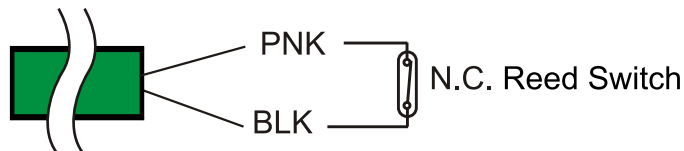
- (1) Maximum load of Door Open Relay as 1A@12VDC. It is required to connect with as external Relay for higher voltage or power to control to avoid internal parts being burned (optional Relay module board for convenient wiring).
- (2) Please connect with one diodes for external Relay to absorb surge.  
(please be aware of its directionality)

## 6. Indicator Light Control Contact Wiring

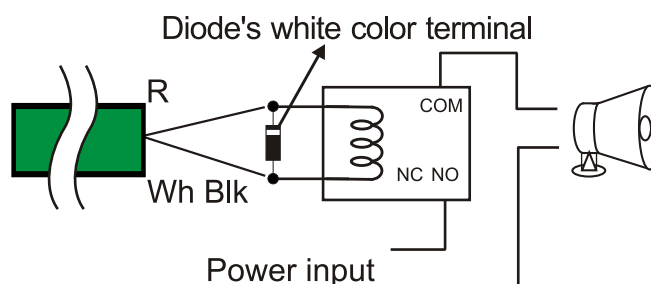
External indicator light control as dry contact. GND short circuit, indicator light is on.



## 7. Door Detection Wiring



## 8. Anti-duress Wiring



## Precautions

1. Please make sure the voltage and the polarity of the current to avoid causing damage to the unit.
2. Do not share electric current with electric lock and reader to avoid interference.
3. Do not simply conduct any fixing or modification of the unit without our personnel.
4. Warranty period for the reader is 1 year.

## Troubleshooting

1. Card sensed but the door lock doesn't work.

**Solution :**

- (1) Please check if the power supply of the reader and the electric lock is on.  
Please check if the panel's POWER light (Red indicator light) is on.
- (2) Please check if the panel's OK light (Green indicator light) is on. If it is on,  
please check if the electric lock's power supply and connecting points are correct.
- (3) Continuous proximity. Please remove the card from the reader and try again.
- (4) Please check whether the door opening mode is correct.

2. Unable to enter into setting mode when system password is entered.

**Solution :**

- (1) Incomplete system password is entered. \* # XXXX # represents complete system password or press "\*" button and then enter valid system password (\* # XXXX #).
- (2) Wiring problem that caused key buttons are unable to enter correct data when they are pressed.  
Please check if all wires are placed behind the space of the display panel to avoid all wires pressing against the PC board which may cause short circuit or interference.

3. To activate the function of Anti-duress.

**Solution :**

Door opening mode has to be changed as one of the following modes in order to set anti-duress :

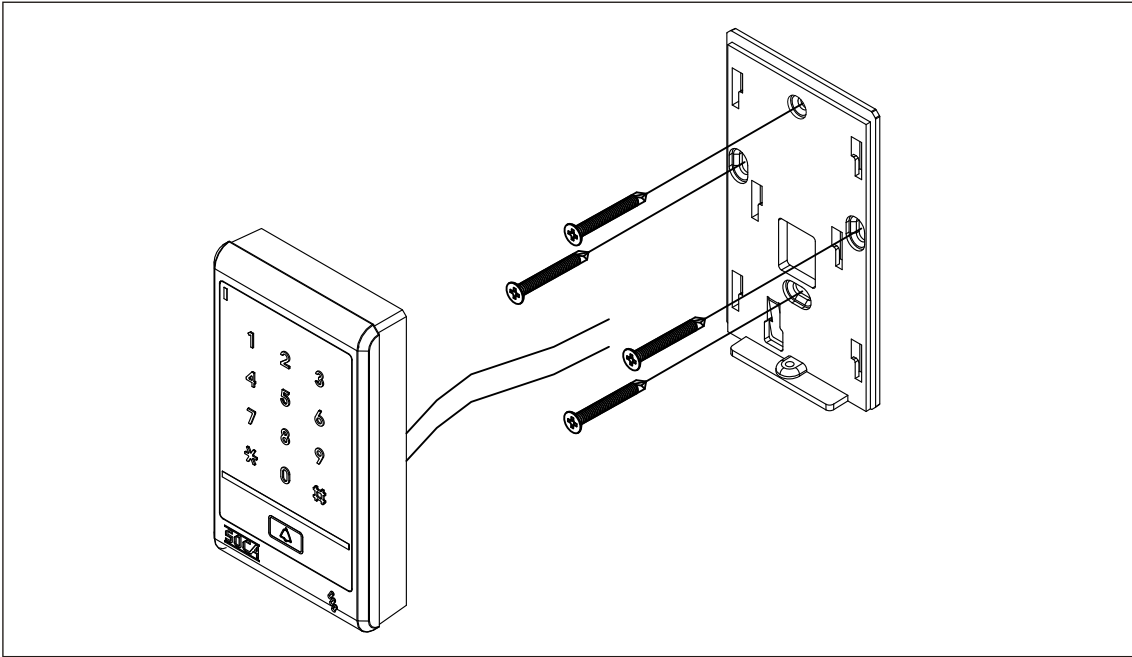
- Ⓐ Enter 4-digit password mode 1; or Ⓑ Proximity card and enter 4-digit password mode 3; or  
Ⓒ Proximity card or enter 4-digit password mode 4.

Enter \* # Anti-duress number & 4-digit password # to activate the function when door opening mode is set (please refer to Function 5 of setting modes And Functions for door opening mode).

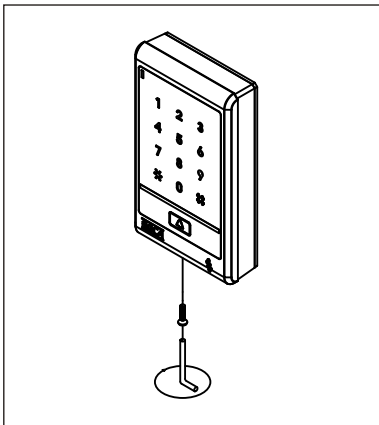
4. Terminate anti-tamper or anti-duress output.

**Solution :** Enter into system setting mode or open the door.

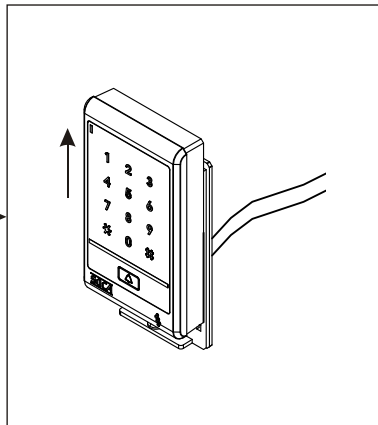
# Installation of The Unit



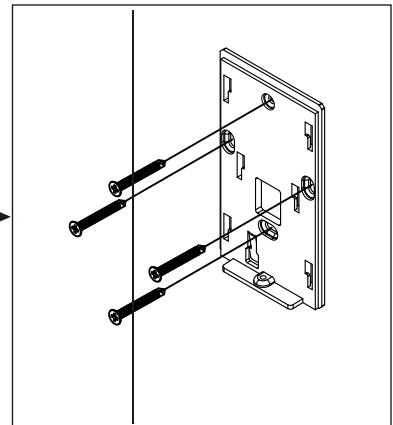
## Step1



Use attached screwdriver to unscrew the screws.

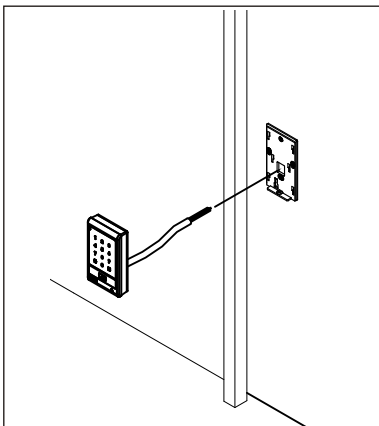


Separate the panel base from the unit.

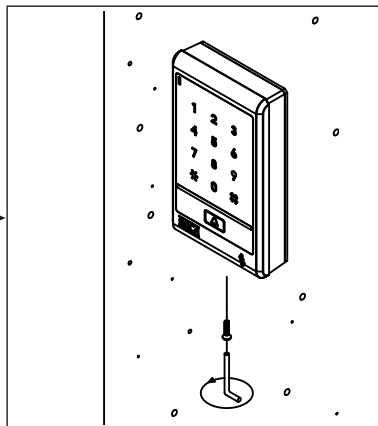


Screw the panel base rubber cushion tight on the wall.

## Step4



Insert the wires in the back of the reader into the hole of the base cover. Place both reader and base cover back together.



Use attached screwdriver to tighten the screws.