ST-120EA / MA

Waterproof Proximity Access Control System Operation And Installation Manual
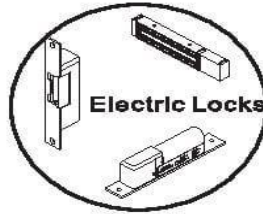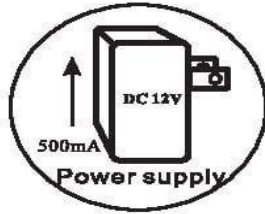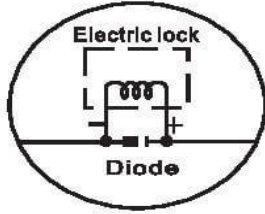
VER 10.10.06

CONTENTS

Attention:

Electric lock / Diode

DC 12V / 500mA / Power supply
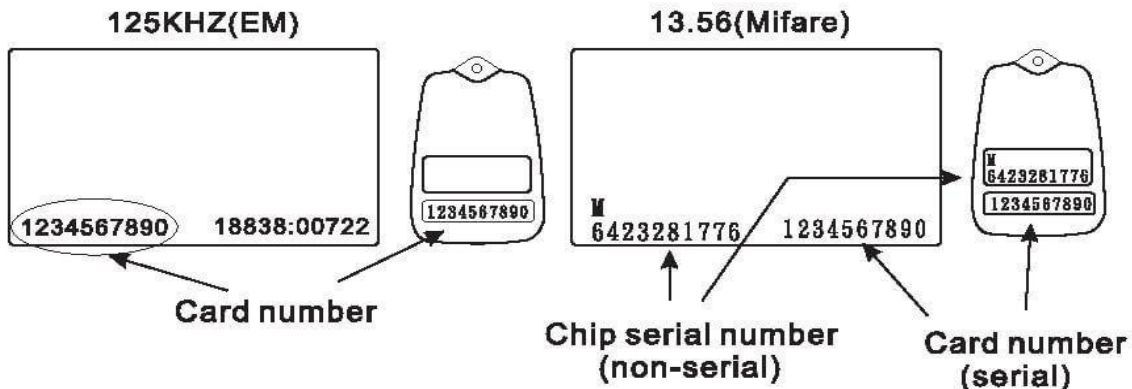
Electric Locks

+ External Relay / AC 24V

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 p12).
   ※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 stabalize the power supply.
6. It is IP54 waterproof and its surface is completely waterproof. Please apply waterproof
   silicone on its base if it is mounted on rough surface to make sure its base is waterproof.

Too close	Too close	Sharing the same power supply	Proximity distance becomes short
X	X	X	X

*Card number in the back of the card.

125KHZ(EM)

1234567890   18838:00722   1234567890

Card number

13.56(Mifare)

M 6423281776   1234567890

M 6423281776   1234567890

Chip serial number (non-serial)

Card number (serial)

Example of the card:

The last 6-digit number of 1234567890 is 567890.

Special Features

1. Panel's red LED indicator, POWER light and luminous buttons are on with one beep sound when it is installed and power is on.

2. 4 types of door opening modes:
   (1) Enter 4-digit door opening password, mode number is 1.
   (2) Proximity card door access, mode number is 2.
   (3) Proximity card and 4-digit door opening password (8 sets of 4-digit door opening passwords), mode number is 3.
   (4) Proximity card or 4-digit door opening password, identification code is 4.

3. When entering into the system setting mode, 4-digit system password should be entered in order to enter into system setting modes. Default system password is 4567. In order to enter into the system to set up mode, press *# first then enter password and press # again when completed.(Example: *# 4 5 6 7 #).

4. All proximity card or proximity key tag must be registered before use.

5. Proximity card or proximity key tag has 8-digit card number(only the last six digits are used).

6. 8 sets of door opening passwords.

7. Maximum storage capacity of 1,000 cards.

8. Data memory feature in case of power failure.

9. Waferproof proximity reader with stainless steel panel and luminous buttons which glow.

10. Super slim design. Special sealed upper case design with no screws visible.

11. Use of PC to enhance toughness of its cover. Creamy-white or deep gray to select.

12. ST-120EA reads 6-digit card number from the right.
    ST-120MA reads 8-digit card number from the right.

13. Power supply: DC 12V. Power consumption:80mA (Standby),110mA(Active).

Front Panel And Types Of Proximity Card

FRONT PANEL

◎Power Indicator Light: Standby (Red) ヽ Proximity Indicator Light (Green).

◎External Indicator Light: Operation.

◎Luminous keypad:Standby (Red)

　　　　　10 entry keys (buttons),2 function keys:"#"&"＊".

　　　　　#: Confirmation key.(ENTER).

　　　　　＊: Clear or Escape key.(CLR/ESC)

External Indicator Light　　　Power Indicator Light

Keypad(0-9ヽ ＊ #)
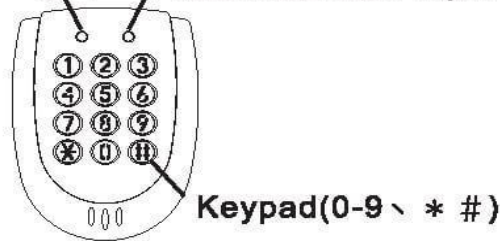
Serial numbers

　　　　　ST-120EA 　:125KHz EM-Marin format

　　　　　ST-120MA 　:13.56MHz Mifare format

　　　　　ST-120MAF:13.56MHz Mifare encryption format

Types of proximity card
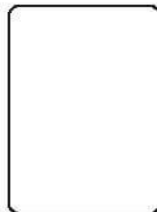
SC-10:Thin card , thickness of 0.8 mm, ISO standard card dimensions. Read range of 10 cm. It can be printed directly from card printer.
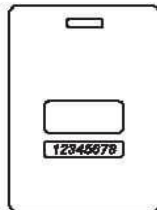
SC-20 : Thick card , thickness of 1.8 mm, ISO standard card dimensions. Read range10 of cm. It can be printed directly from card printer.

SC-30 : Key tag, read range of 6cm. Dimensions: 50L X 7.5H X 32W (mm). Ultrasonic connection, waterproof, and shockproof.

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

Installation Procedures

```
          ┌─────────────────────────┐
          │      Refer to P15       │
          │ (Mounting of reader unit)│
          └───────────┬─────────────┘
                      │
                      ▼
          ┌─────────────────────────┐          ┌──────────────────────────┐
          │  Wiring: Please refer to │◀─────────│ Ensure the power adapter's│
          │ installation guide on    │          │ voltage and polarity are  │
          │ page 11.                 │          │ fitted correctly.         │
          └───────────┬─────────────┘          └─────────────▲────────────┘
                      │                                       │
                      ▼                                       │
          ┌─────────────────────────┐                        │
          │ Power supply to the reader│            NO         │
          └───────────┬─────────────┘                        │
                      │                                       │
                      ▼                          ┌────────────┴────────────┐
          ┌─────────────────────────┐   ──────▶ │ If not, turn off the power│
          │ Check if the reader's red │          │ supply immediately.      │
          │ indicator light is on and │          └──────────────────────────┘
          │ one beep sound            │
          └───────────┬─────────────┘
                      │
                      ▼
          ┌───────────────────────────────────┐
          │ Enter setting mode password of     │◀──┐
          │ * #4567#.                          │   │
          │ One beep sound and green light is  │   │
          │ flashing to indicate entering into │   │
          │ setting mode.                      │   │
          └───────────┬───────────────────────┘   │
                      │                            │
                      ▼                            │
          ┌───────────────────────────────────┐   │
          │ Enter 1(register the proximity     │   │
          │ card)or 6 (batch registration).    │───┘
          │ Then, register all the user's      │
          │ proximity cards and key tags.      │
          │ When completed, press *to escape   │
          │ from the setting mode.             │
          └───────────┬───────────────────────┘
                      │
                      ▼
          ┌─────────────────────────┐
          │   Setting completed     │
          └─────────────────────────┘
```
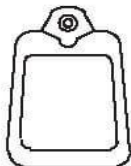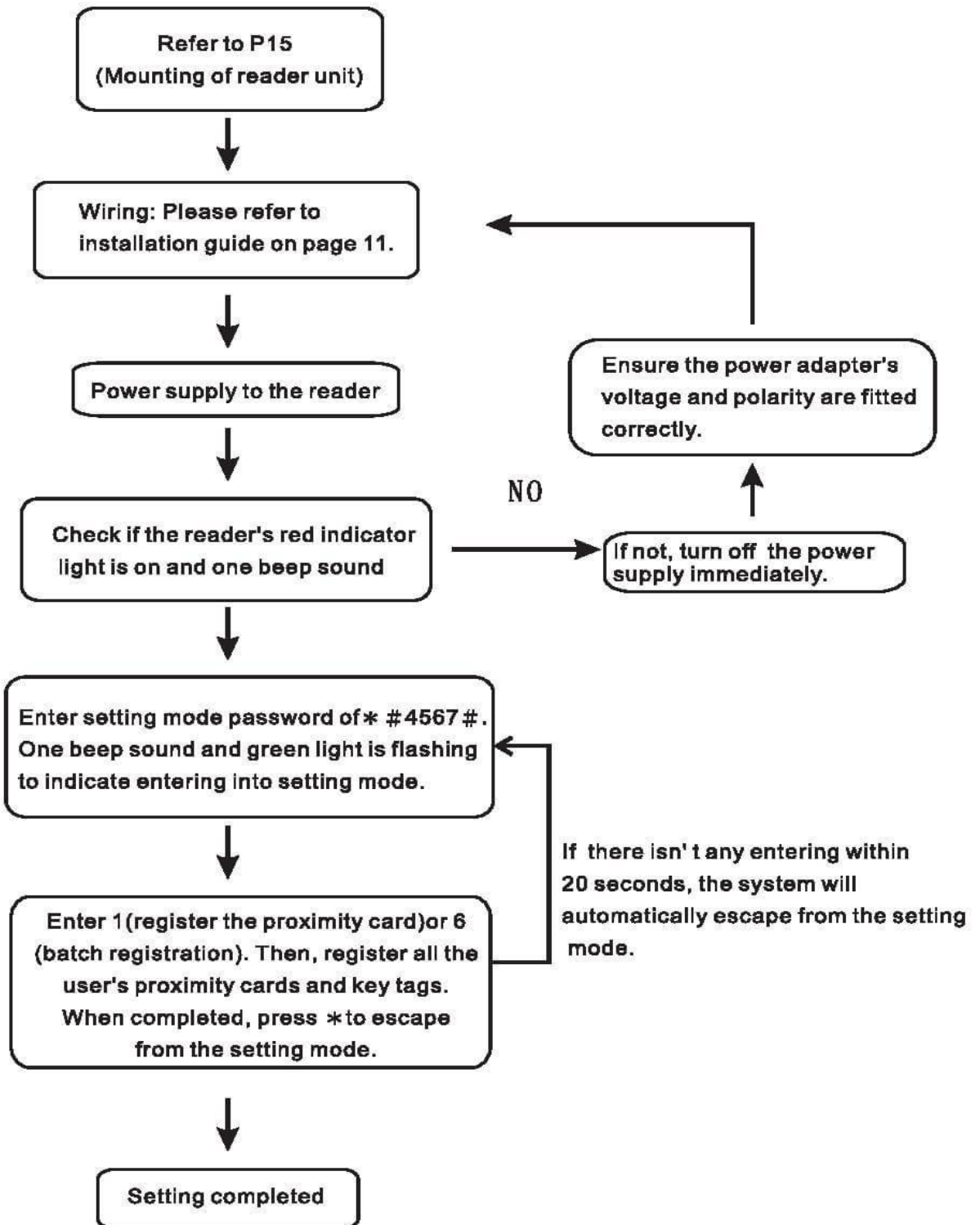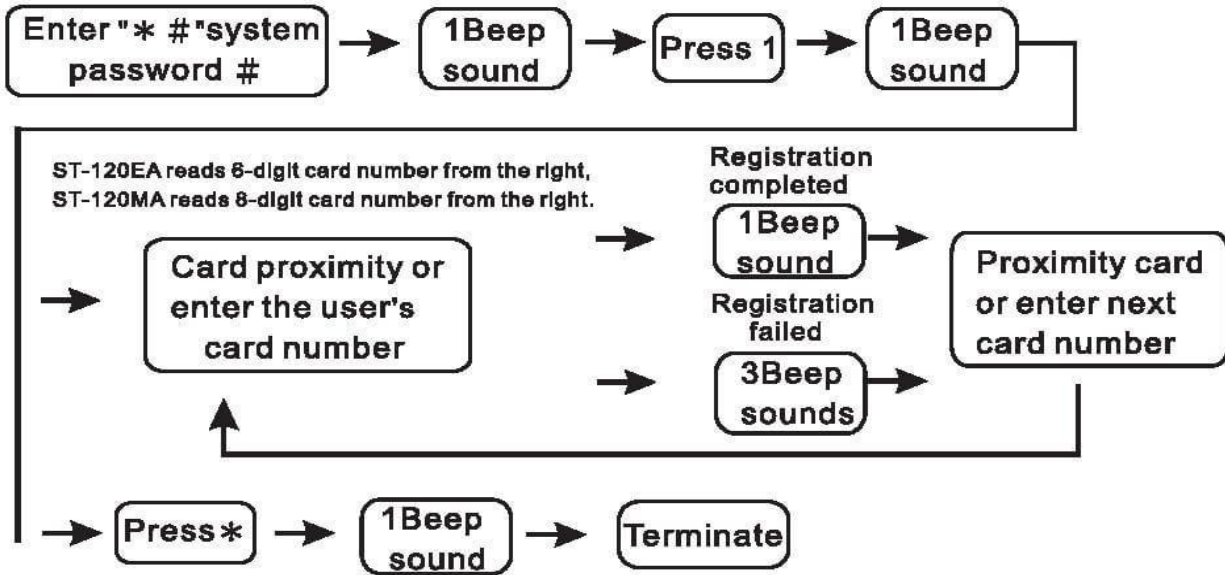
If there isn't any entering within 20 seconds, the system will automatically escape from the setting mode.
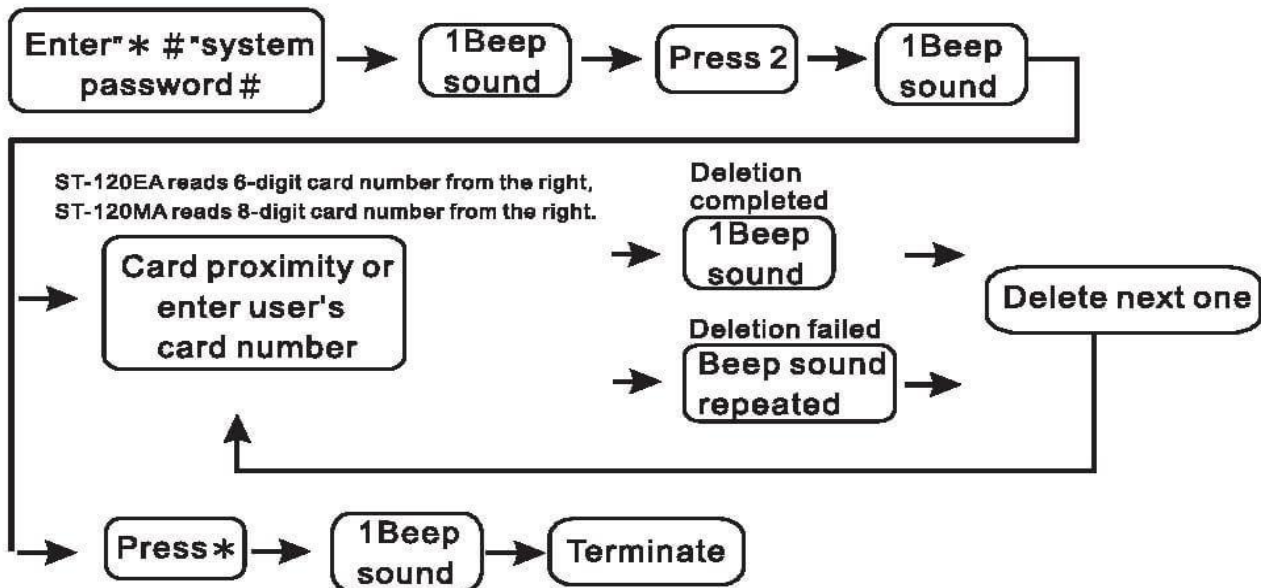
Setting Modes And Functions

System password (default system password is 4567)is required to enter system setting modes. The reader will then send a beep sound to indicate entering system setting modes. If there isn't any action or entering within 20 seconds, the system will automatically escape from the setting mode.

1.Add one card:To register user card and utilize proximity to register.

Enter "* #"system password # → 1Beep sound → Press 1 → 1Beep sound

ST-120EA reads 6-digit card number from the right,
ST-120MA reads 8-digit card number from the right.

Card proximity or enter the user's card number → Registration completed 1Beep sound → Proximity card or enter next card number

Registration failed 3Beep sounds →

Press * → 1Beep sound → Terminate

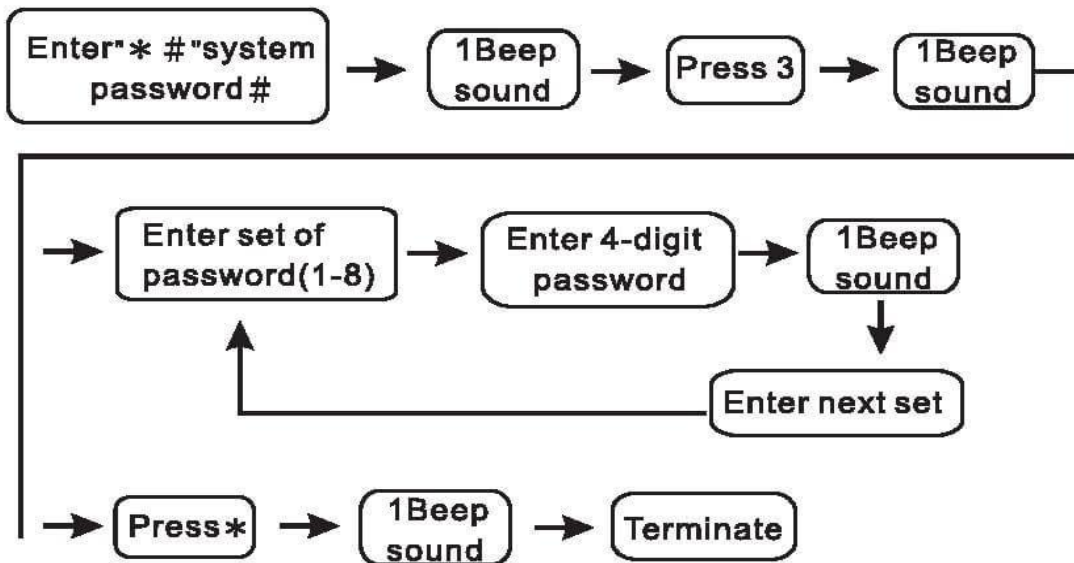If * is being pressed during the procedures, the card registration will be terminated.

2.Delete card:Deletion of user's card (such as loss of card). Card number is the last 6-digit number indicated on the proximity card.

Enter "* #"system password # → 1Beep sound → Press 2 → 1Beep sound

ST-120EA reads 6-digit card number from the right,
ST-120MA reads 8-digit card number from the right.

Card proximity or enter user's card number → Deletion completed 1Beep sound → Delete next one

Deletion failed Beep sound repeated →

Press * → 1Beep sound → Terminate

If * key is pressed during the above procedures:
(1)Deletion card function will terminate when no card number is entered.
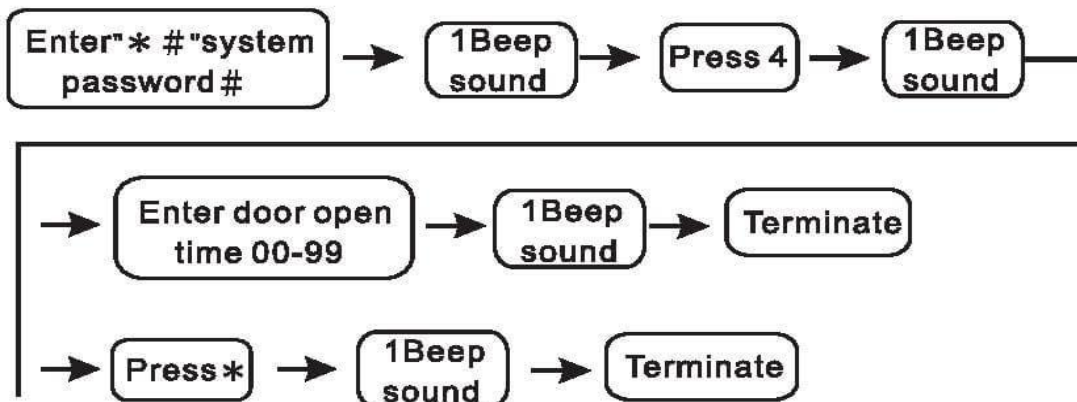(2)Re-enter 6-digit card number when card number is already entered.

3. Change of 8 sets of user's password

```
┌─────────────────┐     ┌──────────┐     ┌─────────┐     ┌──────────┐
│ Enter"*#"system │ ──▶ │ 1Beep    │ ──▶ │ Press 3 │ ──▶ │ 1Beep    │
│ password #      │     │ sound    │     │         │     │ sound    │
└─────────────────┘     └──────────┘     └─────────┘     └──────────┘
                                                                │
┌─────────────────┐     ┌──────────────┐     ┌──────────┐       │
│ Enter set of    │ ──▶ │ Enter 4-digit│ ──▶ │ 1Beep    │ ◀─────┘
│ password(1-8)   │     │ password     │     │ sound    │
└─────────────────┘     └──────────────┘     └──────────┘
         ▲                                        │
         │                                        ▼
         │                              ┌──────────────────┐
         └──────────────────────────────│ Enter next set   │
                                        └──────────────────┘
┌─────────┐     ┌──────────┐     ┌────────────┐
│ Press * │ ──▶ │ 1Beep    │ ──▶ │ Terminate  │
│         │     │ sound    │     │            │
└─────────┘     └──────────┘     └────────────┘
```

If * key is pressed during the above procedures:
(1) Re-enter the set of password when number of set of password is not entered.
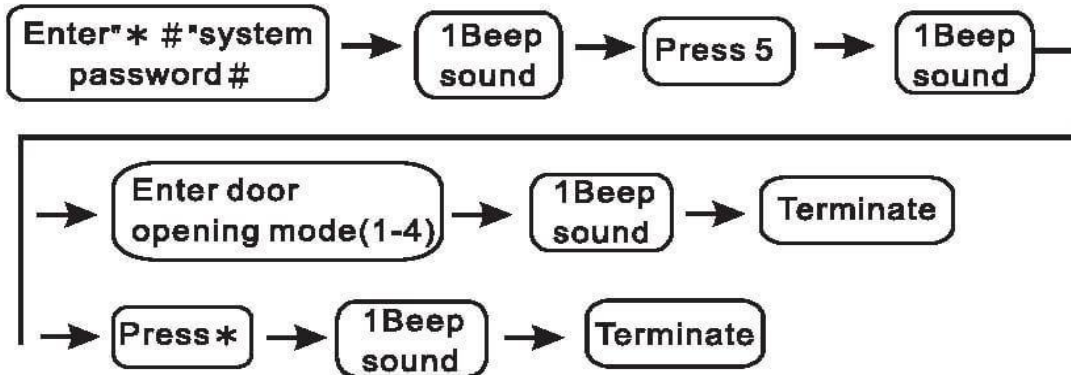(2) Re-enter 4-digit password when number of set of password is entered.

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 01 second. Setting 99 seconds as normal state (suitable for security system) and 00 second as single punch (suitable for automatic door).

```
┌─────────────────┐     ┌──────────┐     ┌─────────┐     ┌──────────┐
│ Enter"*#"system │ ──▶ │ 1Beep    │ ──▶ │ Press 4 │ ──▶ │ 1Beep    │
│ password #      │     │ sound    │     │         │     │ sound    │
└─────────────────┘     └──────────┘     └─────────┘     └──────────┘
                                                                │
┌─────────────────┐     ┌──────────┐     ┌────────────┐         │
│ Enter door open │ ──▶ │ 1Beep    │ ──▶ │ Terminate  │ ◀───────┘
│ time 00-99      │     │ sound    │     │            │
└─────────────────┘     └──────────┘     └────────────┘

┌─────────┐     ┌──────────┐     ┌────────────┐
│ Press * │ ──▶ │ 1Beep    │ ──▶ │ Terminate  │
│         │     │ sound    │     │            │
└─────────┘     └──────────┘     └────────────┘
```
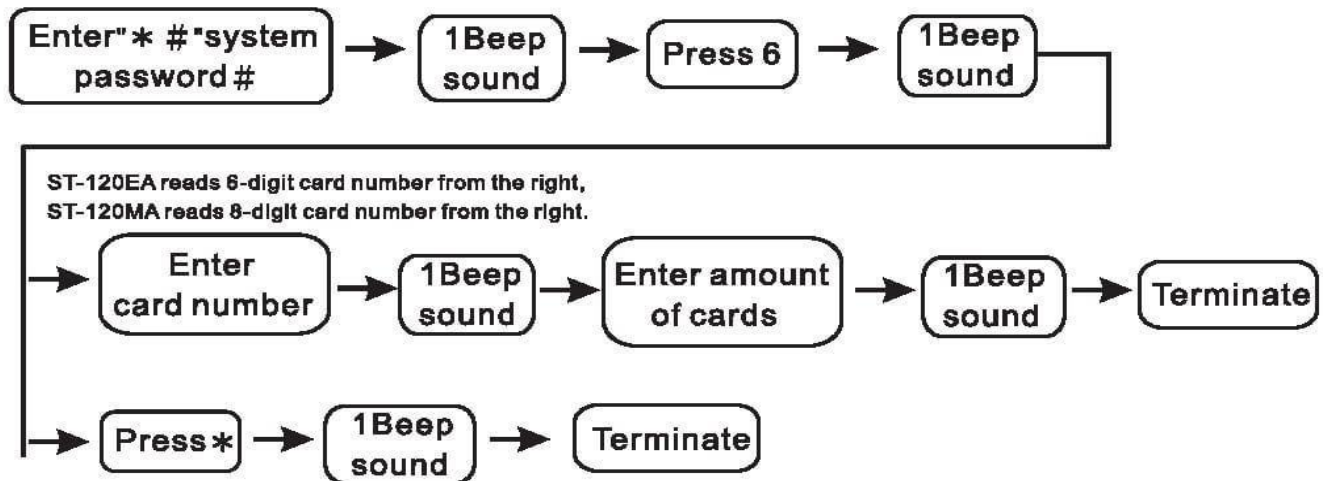
5. Setting identification modes

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 4-digit password (There are 8 sets of door opening password), mode number is 1.

(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 4-digit password, mode number is 4.

Enter "* #" system password # → 1Beep sound → Press 5 → 1Beep sound

→ Enter door opening mode(1-4) → 1Beep sound → Terminate

→ Press * → 1Beep sound → Terminate

6. Batch registration: Registering multiple cards and cards in series. Enter 6-digit card number, then enter amount of cards in 4-digit manner(must be in full 4 digits, such as 100pcs, enter 0100).

Enter "* #" system password # → 1Beep sound → Press 6 → 1Beep sound

ST-120EA reads 6-digit card number from the right,
ST-120MA reads 8-digit card number from the right.

→ Enter card number → 1Beep sound → Enter amount of cards → 1Beep sound → Terminate

→ Press * → 1Beep sound → Terminate

If * key is pressed during entering card number:

(1) Terminate Batch Registration function when nothing is entered.

(2) Re-enter card number again when card is entered.

If * key is pressed during entering amount of cards:

(1) Re-enter card number again when amount fo cards is not entered.

(2) Re-enter 4-digit amount of cards again when amount of cards is entered
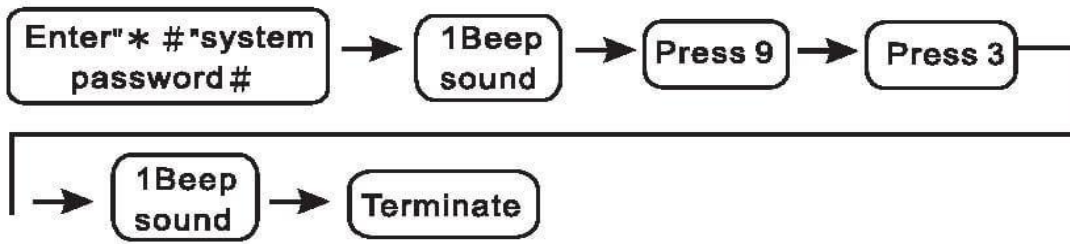
7.Anti-duress output setting:0:ON 1:OFF

```
┌──────────────────────┐     ┌──────────┐     ┌──────────┐     ┌──────────┐
│ Enter"* #"system     │ ──► │ 1Beep    │ ──► │ Press 7  │ ──► │ 1Beep    │
│ password #           │     │ sound    │     │          │     │ sound    │
└──────────────────────┘     └──────────┘     └──────────┘     └──────────┘

   ┌──────────────────────┐     ┌──────────┐     ┌──────────────┐
──►│ Enter Anti-duress    │ ──► │ 1Beep    │ ──► │ Terminate    │
   │ Mode 0 or 1          │     │ sound    │     │              │
   └──────────────────────┘     └──────────┘     └──────────────┘

   ┌──────────┐     ┌──────────┐     ┌──────────────┐
──►│ Press *  │ ──► │ 1Beep    │ ──► │ Terminate    │
   │          │     │ sound    │     │              │
   └──────────┘     └──────────┘     └──────────────┘
```
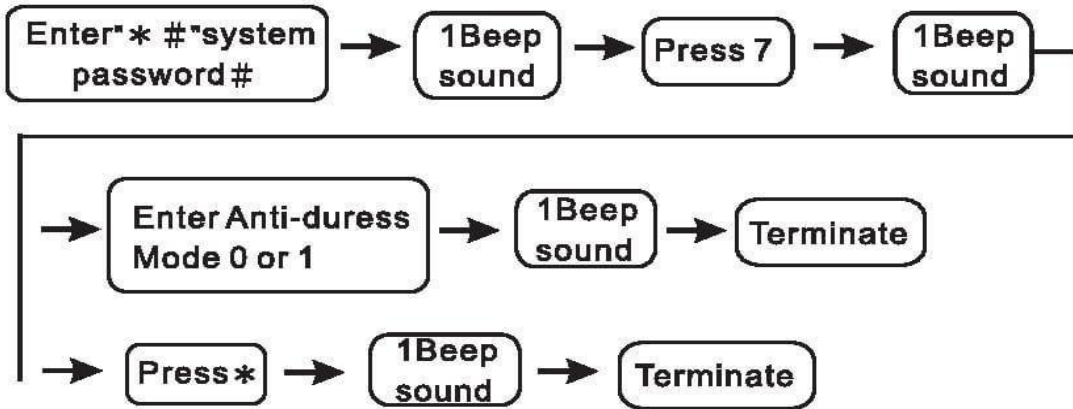
8.Change system password : Default system password is 4567. Please remember the default system password or else user is unable to enter system setting mode.

```
┌──────────────────────┐     ┌──────────┐     ┌──────────┐     ┌──────────┐
│ Enter"* #"system     │ ──► │ 1Beep    │ ──► │ Press 8  │ ──► │ 1Beep    │
│ password #           │     │ sound    │     │          │     │ sound    │
└──────────────────────┘     └──────────┘     └──────────┘     └──────────┘

   ┌──────────────┐     ┌──────────┐     ┌──────────┐     ┌──────────────────┐
──►│ Enter new    │ ──► │ Press #  │ ──► │ 1Beep    │ ──► │ Confirm the      │
   │ 4-digit system│    │          │     │ sound    │     │ new password     │
   │ password     │     └──────────┘     └──────────┘     └──────────────────┘
   └──────────────┘

   ┌──────────┐     ┌──────────┐     ┌──────────────┐
──►│ Press #  │ ──► │ 2Beep    │ ──► │ Terminate    │
   │          │     │ sounds   │     │              │
   └──────────┘     └──────────┘     └──────────────┘

   ┌──────────┐     ┌──────────────┐     ┌──────────────┐     ┌──────────────┐
──►│ Press #  │ ──► │ Unmatched    │ ──► │ Beep sound   │ ──► │ Terminate    │
   │          │     │ password     │     │ repeat       │     │              │
   └──────────┘     └──────────────┘     └──────────────┘     └──────────────┘
```
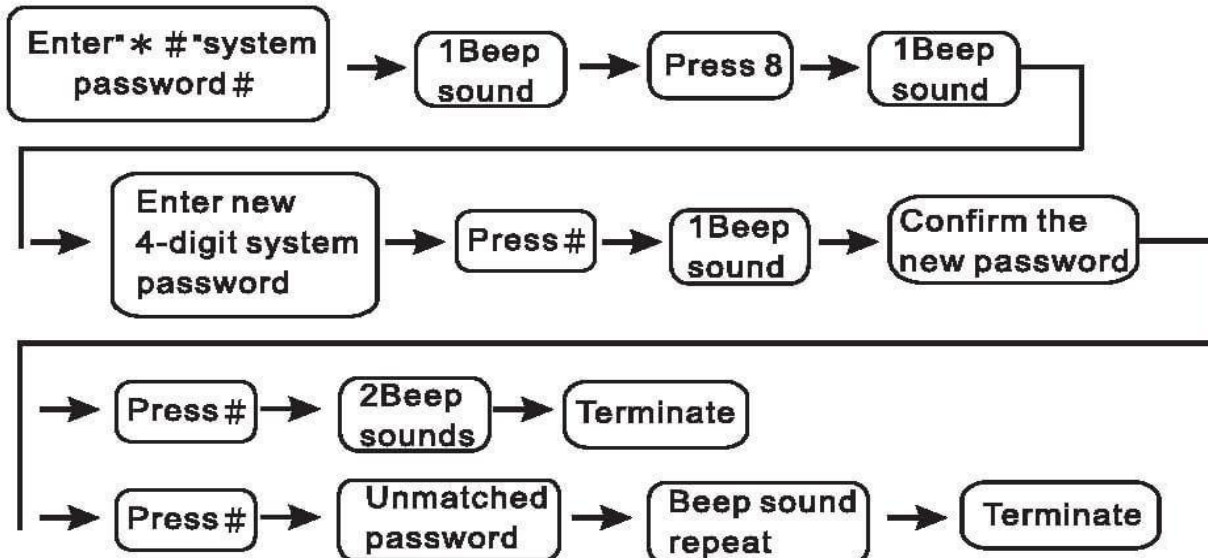
Press * key when no number is entered during the procedures will terminate Change System Password function.
Re-enter the new password again when * key is pressed during confirmation of the password.

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

Enter"＊#"system password# → 1Beep sound → Press 9 → Press 3

→ 1Beep sound → Terminate

10.Delete all cards

Enter"＊#"system password# → 1Beep sound → Press 9 → Press 9

→ 2Beep sounds → Terminate
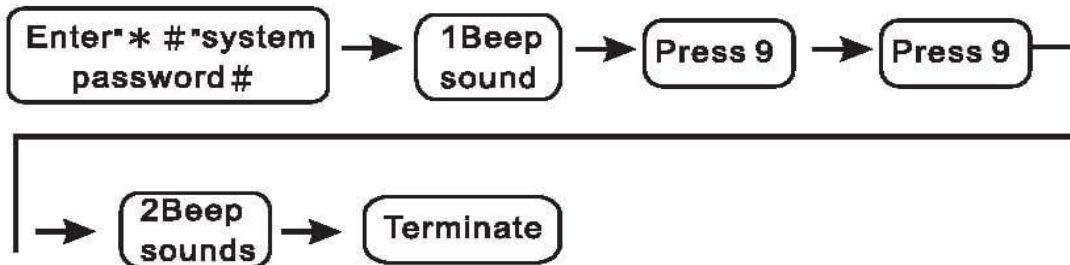
11.Use of system password to open door

Enter"＊#"system password# → 1Beep sound → Press 0 → Press 0

→ Door open (Green light) → Terminate
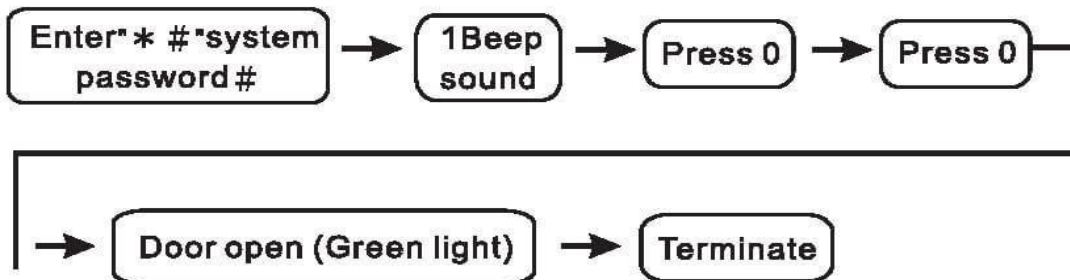
12.Reader alarm setting:0 as ON (Enable),1 as OFF (Disable).
        (The function is not available for ST-120MA and ST-120MAF).

Enter"＊#"system password# → 1Beep sound → Press 0 → Press 3 → 1Beep sound

→ Enter 0-ON 1-OFF → 1Beep sound → Terminate
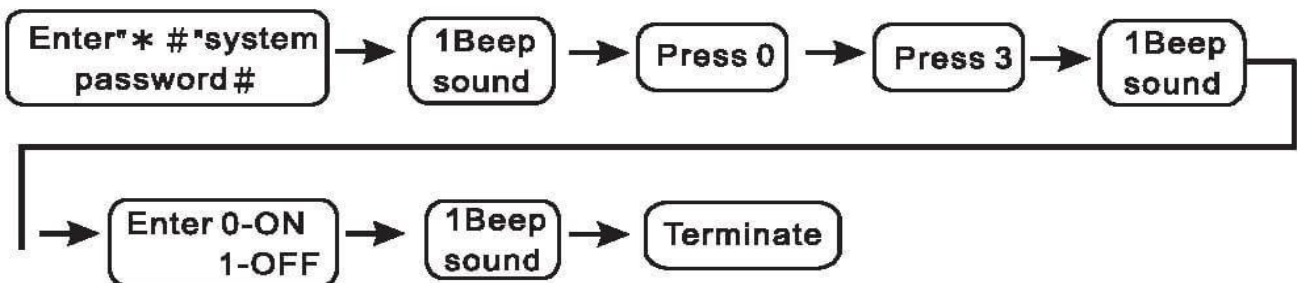
Note: Reader alarm as Toggle mode.

13. Incorrect password alarm setting:0 as ON(Enable),1 as OFF(Disable),default value as 1.
(The function is not available for ST-120MA and ST-120MAF).

Enter"＊#"system password# → 1Beep sound → Press 0 → Press 4 → 1Beep sound →

→ Enter 0-ON 1-OFF → 1Beep sound → Terminate
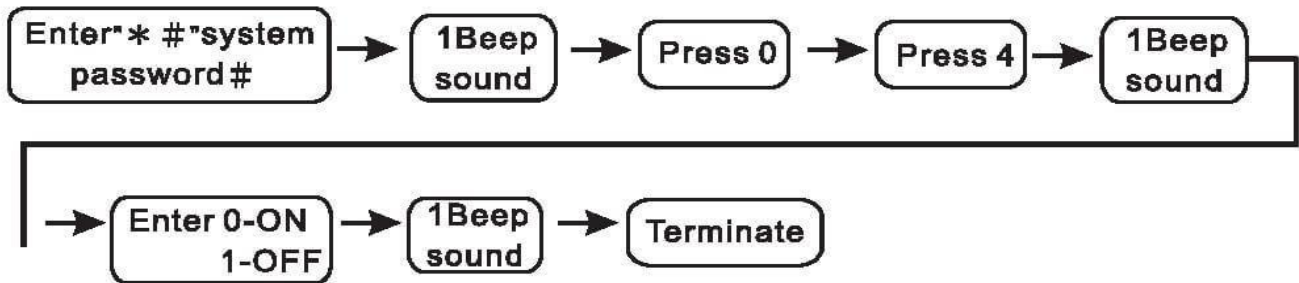
3 consecutive of incorrect password or system password enterings will activate alarm and temperoraily disable for 20 seconds.

14. Door detection time setting:Time entering within 30 seconds. Default value as 5 seconds.
(The function is not available for ST-120MA and ST-120MAF).

Enter"＊#"system password# → 1Beep sound → Press 0 → Press 6 → 1Beep sound →

→ Enter time value 00~30 seconds → 1Beep sound → Terminate

→ Press＊ → 1Beep sound → Terminate
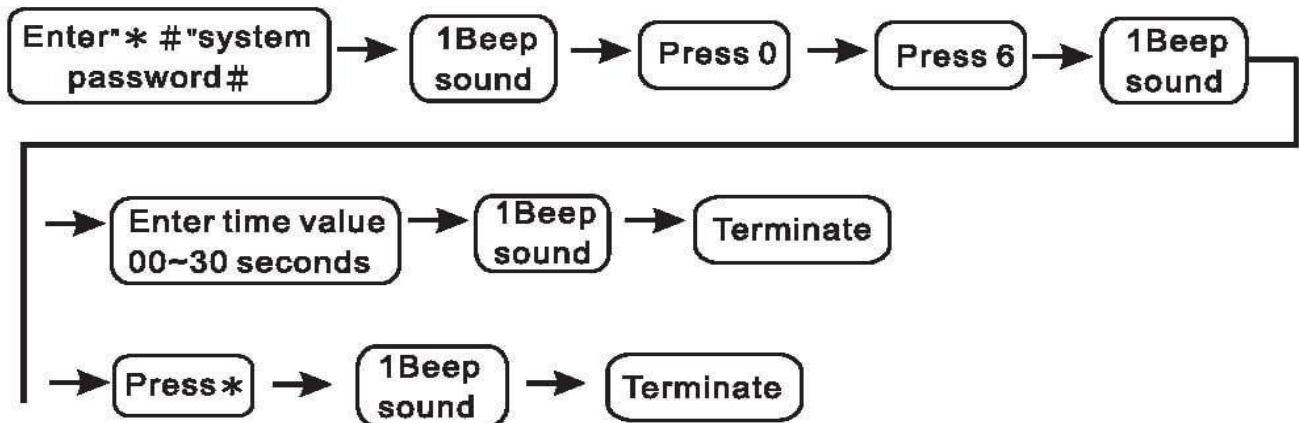
15. Types of door detection:0 as N.O. type, 1 as N.C. type, default value as N.O. Type.
(The function is not available for ST-120MA and ST-120MAF).

Enter"＊#"system password# → 1Beep sound → Press 0 → Press 7 → 1Beep sound →

→ Enter 0-N.O. 1-N.C. → 1Beep sound → Terminate
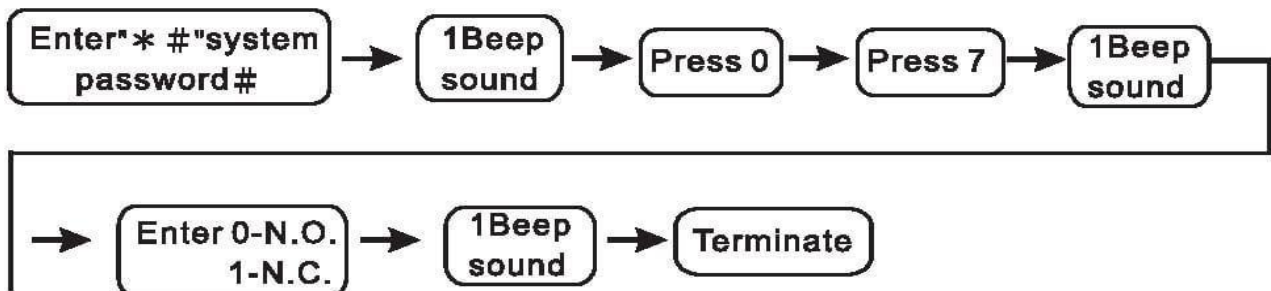
P.S Door detection must be installed if it is set as N.C.

10

16.Add anti-duress function
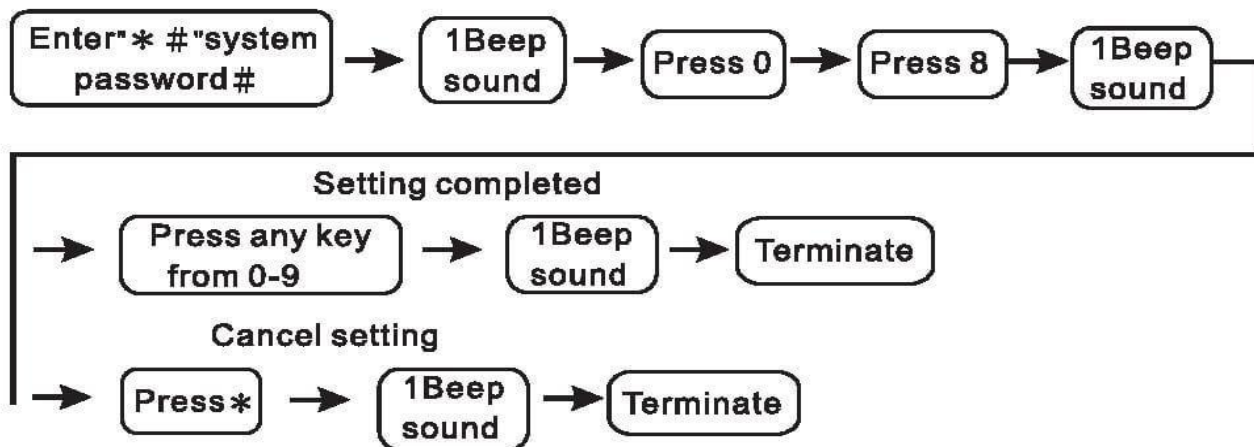
Installation Of Proximity Reader

1.Reader and Wiring

AP-55

Door control REALY. Dry contact N.0
Door control REALY. Dry contact COM
Door control REALY. Dry contact N.C
Exit push button
Alarm output RELAY. Dry contact N.O
Alarm output RELAY. Dry contact COM
Alarm output RELAY. Dry contact N.C

GND
+12VDC
W: Wiring of orange LED
Blu: Reserved
O: Door detection
G: Reserved
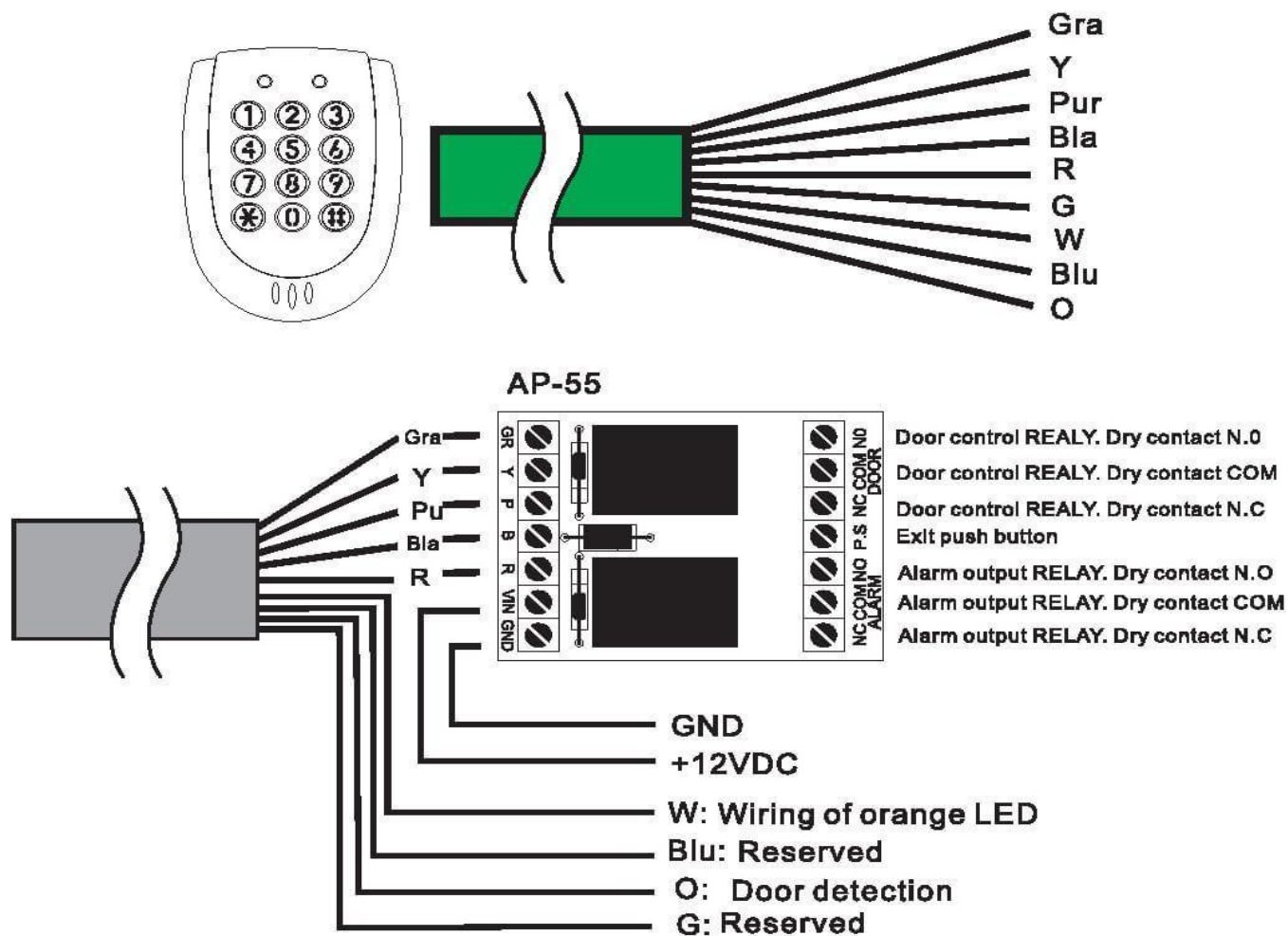
P.S. Door open and Alarm relay contact 1A/30VDC or 3A/24VDC.

11

2.Reader's external RELAY and Electric lock's wirings:

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

A. "N.O" connector (please use JUMPER to adjust)
 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).
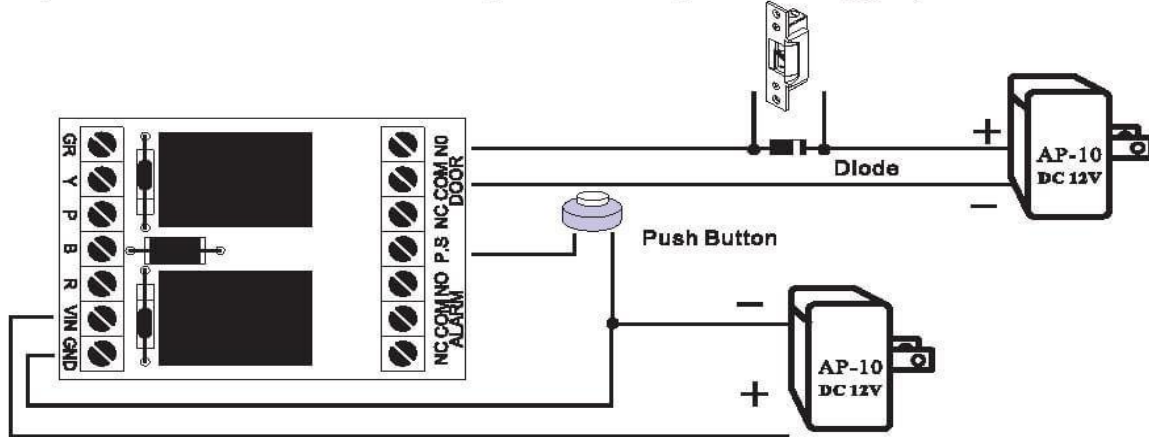
Connect SOCA electric lock with N.O. points. Connect its power to 12V.
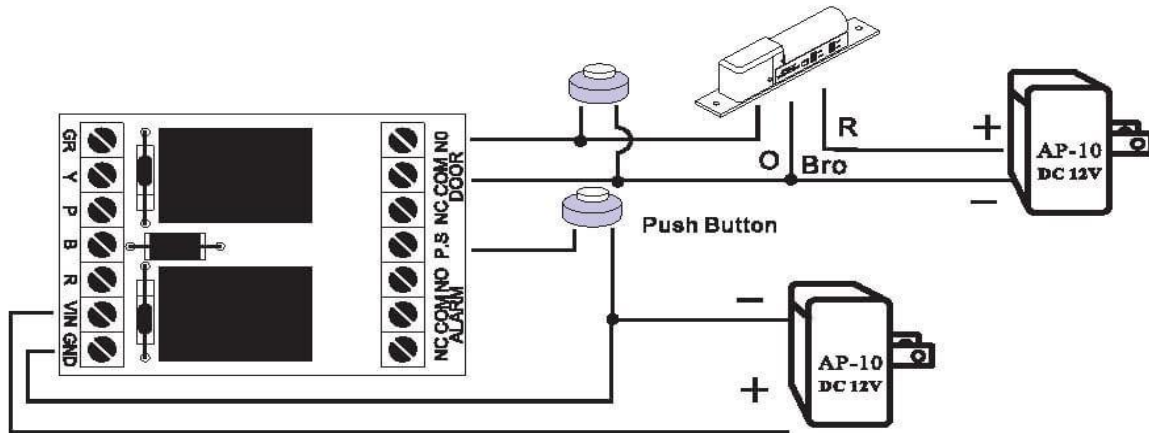
B. "N.C" Connector (please use JUMPER to adjust)
 Suitable for: Fail-safe electric lock such as electromagnetic lock.
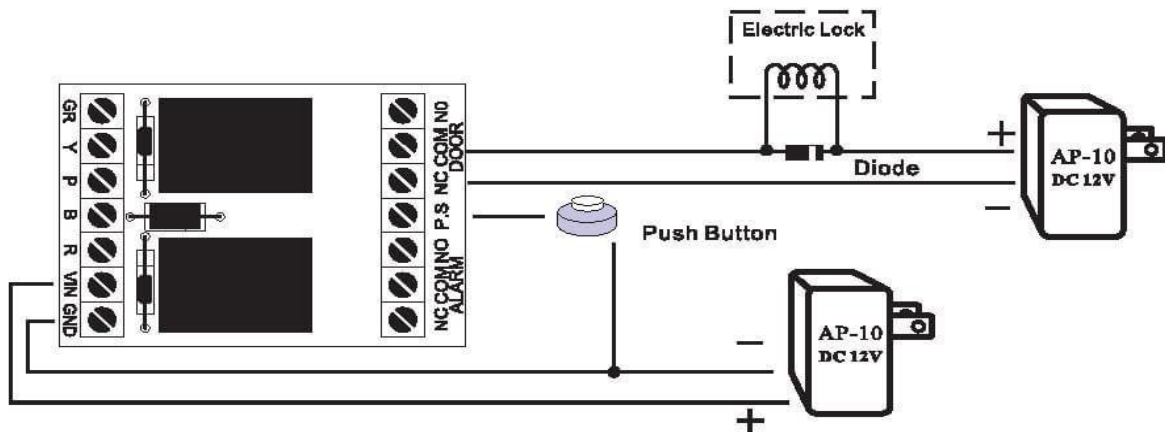
3 · Door detection wiring

N.O or N.C Reed Switch
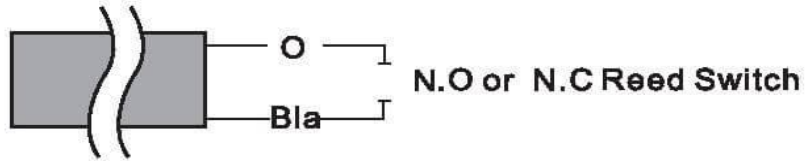
4 · Wiring of orange LED indicator

Connect to ground
to turn it on

5 · Alarm wiring

DC12V
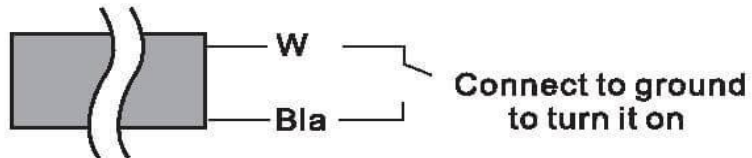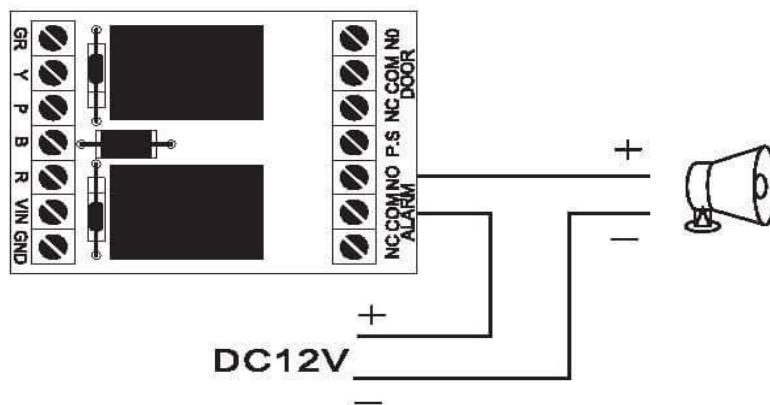
6 · Door Open point with external RELAY
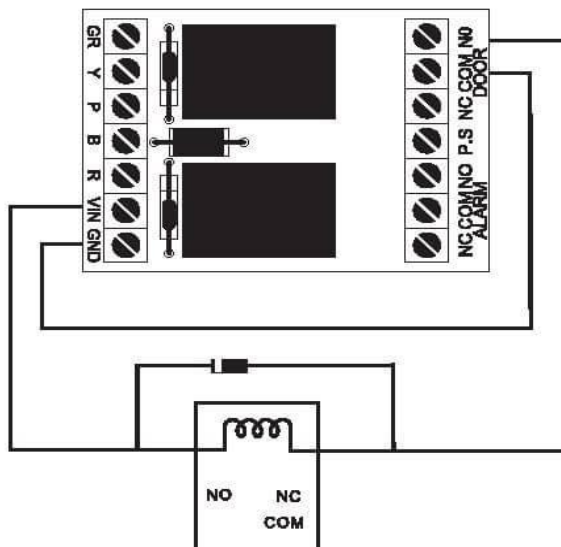
Precautions

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 various functions of setting mode when system password is entered.
   Solution:(1) Incomplete system password.
   ∗ # XXXX # represents complete system password or press "∗"button and then enter valid system password (∗ # XXXX #).
   (2) Wiring problem that caused key buttons 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. Setting Anti-duress.
   Solution:Door opening mode has to be changed as one of the following modes in order to set anti-duress:
   (a).Enter 4-digit password(mode1);or
   (b).Proximity card and enter 4-digit password (mode3);or
   (c).Prxomity card or enter 4-digit password (mode4).
   Enter" ∗ #Anti-duress 4-digit password # "to activate the function when door opening mode is set (please refer to item 5 of setting modes for door opening mode).
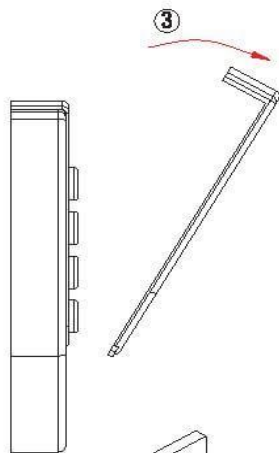
4. Terminate anti-tamper or anti-duress output.
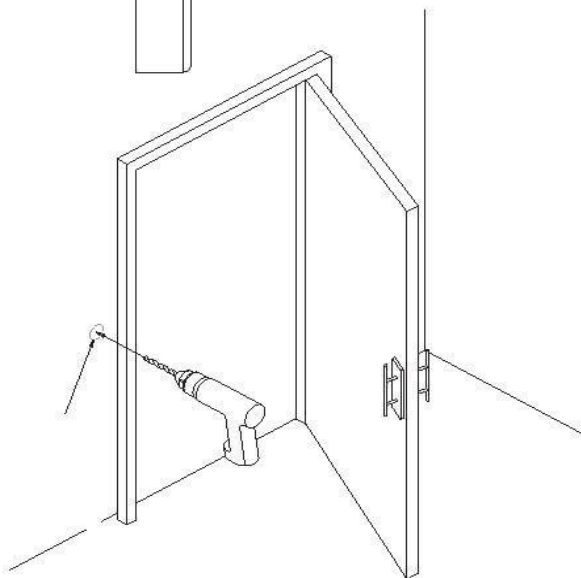   Solution:Enter into system setting mode or open the door.
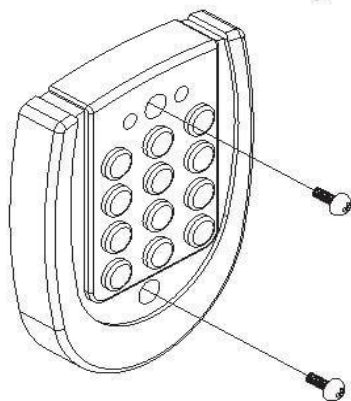
Installation Of The Unit
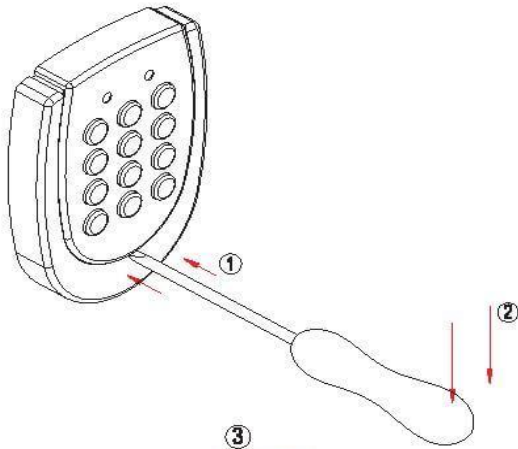
(1) Use a screwdriver towards the bottom of the reader's keypad case.
(2) Push the screwdriver slightly downward.

(3)Pull the upper case up to release.

∗ Select an appropriate location to install the reader and drill a hole through the indoors. Insert the reader's wires in the hole (indoors).

∗Please select an appropriate position to fit the unit. Use a pen to penetrate the screws' holes to mark two drilling holes (top and bottom). Use two screws to tighten the unit to the position drilled.
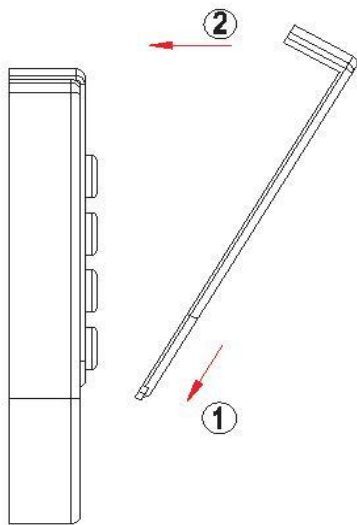
(1)Mount the unit cover at 45 degree direction as shown here and slot it to the mount holes.
(2) Push the cover toward the unit tight to make sure it is mounted tight to the unit.
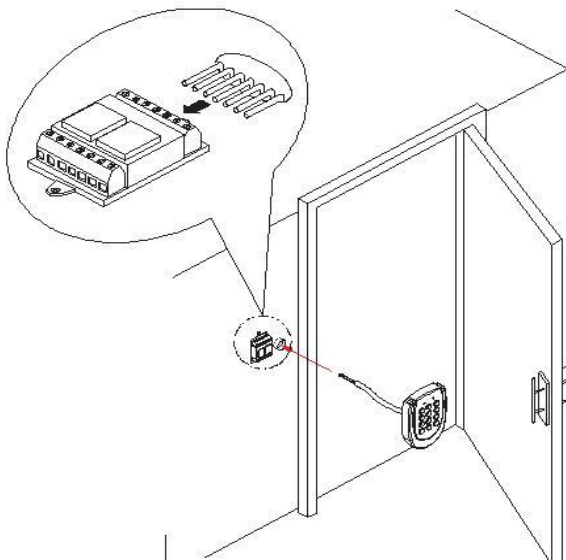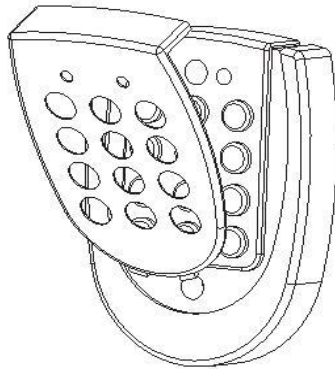
* Put the connector to go through the hole drilled.
  Connect the connector with the relay module.

Outdoor
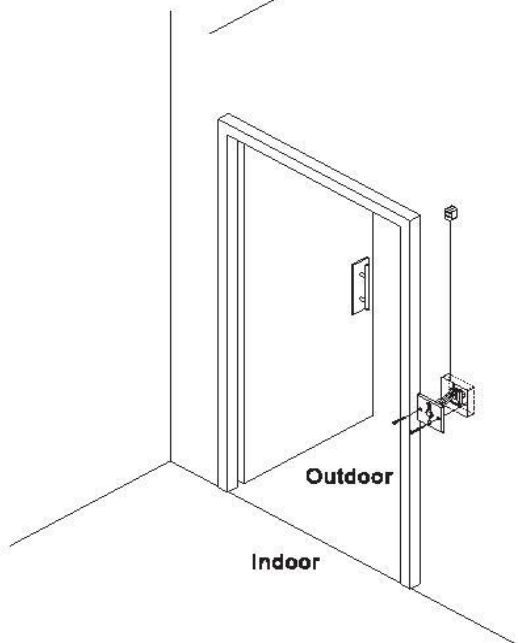
Indoor

* Finally connect it with the push button door bell.
  Use an adapter to supply current or DC12V to complete the installation.