Access Control

Single Door
Standalone Card Reader

User Manual

Ver. 1.0

Contents

1. INTRODUCTION

The S2-EM is a compact, waterproof stand-alone programmable access control system that provides proximity entry for up to 2000 users. It uses Atmel microcontroller assures maximum performance in any environment, and the low-power circuit makes its service life prolonged.
The product unique feature is simple in design, easy operation, and high reliability.
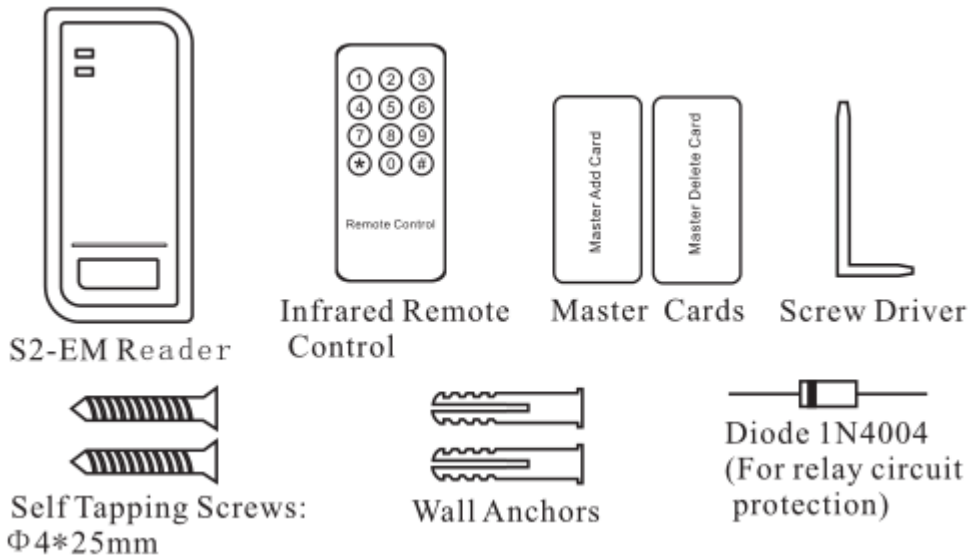
1.1 Features

- Waterproof, conform to IP66
- Read 125KHz EM card
- One programmable relay operation
- Pulse mode, Latch mode
- Remote infrared programmer
- 2000 users
- Card block (batch) enrollment
- Two-color LED status display
- Built in light dependent resistor (LDR) for anti-tamper
- Buzzer for audible or silent mode
- Low temperature resistance (-40℃)

2. Specifications

User Capacity	**2000**
Card	EM card
Operating Voltage	**9~18V DC**
Idle Current	＜40mA
Proximity Card Reader	**EM**
Radio Technology	125KHz Proximity Card
Read Range	3-10cm
Wiring Connections	Relay Output, Exit Button
Relay	**One (NO, NC, Common)**
Adjustable Relay Output Time	1-99 Seconds (5 seconds default)
Lock Output Load	2 Amp Maximum
Environment	**Meets IP66**
Operating Temperature	-40℃ ~60℃
Operating Humidity	20%RH-98%RH

Physical	ABS Shell
Colour	Black
Dimensions	L103* W48 * H20 (mm)
Unit Weight	100g
Shipping Weight	150g

2.1 Carton Inventory

S2-EM Reader

Infrared Remote Control

Master Cards

Screw Driver

Self Tapping Screws: Φ4*25mm

Wall Anchors

Diode 1N4004 (For relay circuit protection)

3. INSTALLATION

- Remove the back cover from the unit
- Drill 2 holes (A,C) on the wall for the screws and one hole for the cable
- Knock the supplied rubber bungs to the screw holes(A,C)
- Fix the back cover firmly on the wall with 4 flat head screws
- Thread the cable through the cable hole(B)
- Attach the unit to the back cover
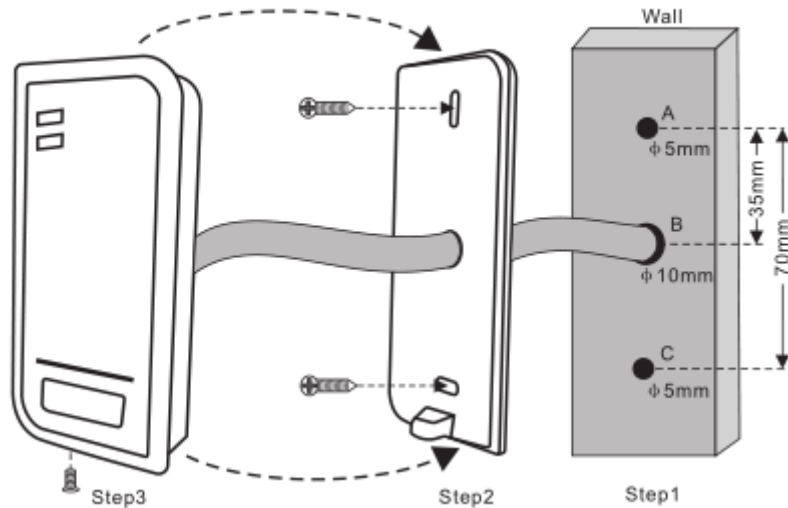
3.1 Wiring

Colour	Function	Notes
Red	Power +	9~18 Votes DC Regulated Power Input
Black	GND	Ground
White	NO	Normally Open Relay Output
Brown	COM	Common Connection for Relay Output
Green	NC	Normally closed Relay Output
Yellow	OPEN	Request to Exit input(REX)

3.2 Sound and LED Status Indicators

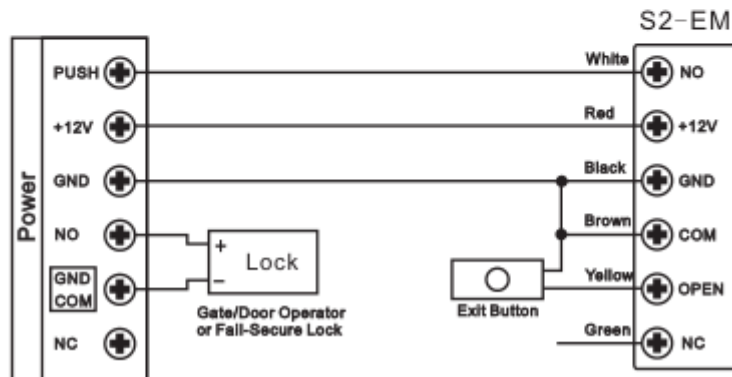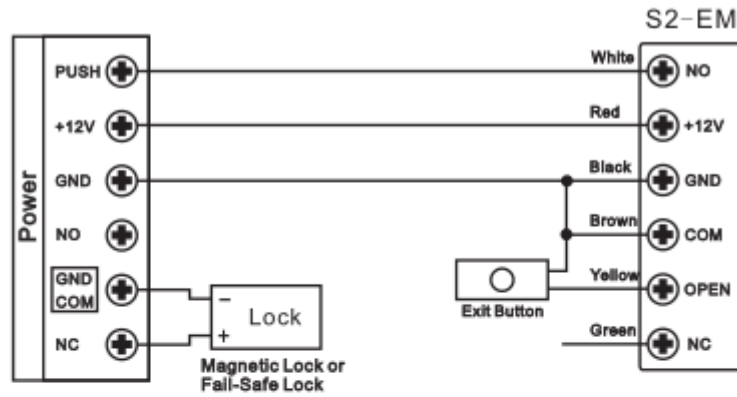| Operation Status	LED	Buzzer
Stand by	Solid Red	-
Enter into programming mode	Pulsing Red	One beep
Operation error	-	Three beeps
Exit from the programming mode	Solid Red	One beep
Open lock	Solid Green	One beep
Alarm	Pulsing Red quickly	Beeps
Invalid Card	Pulsing Red	Three beeps

4. Connection Diagram

Common power supply:
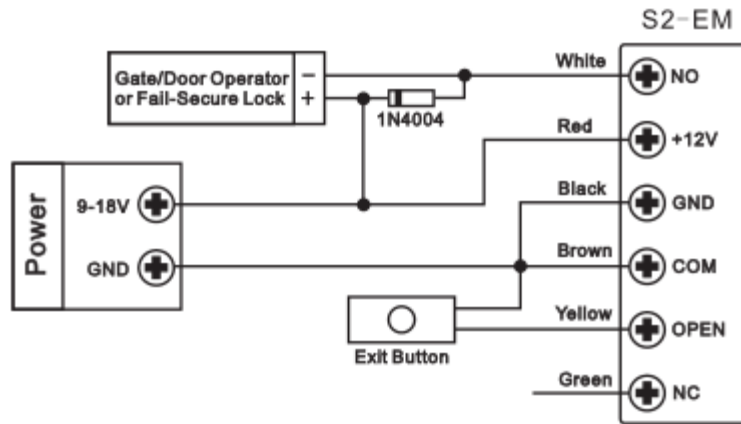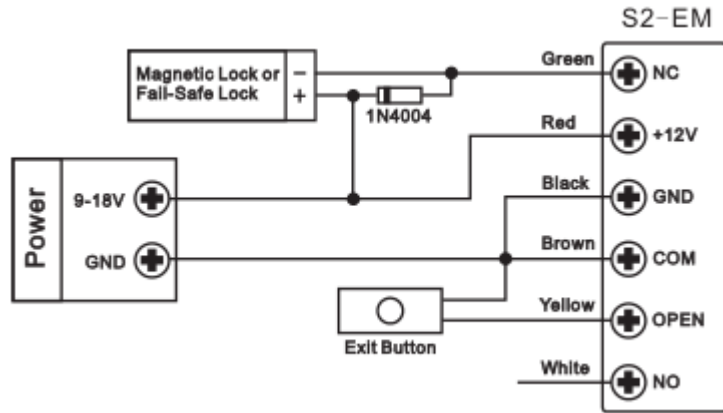
Attention: Install a 1N4004 or equivalent diode is needed when use a common power supply, or the reader might be damaged. (1N4004 is included in the packing)

Access Control Power Supply:

Magnetic Lock or Fail-Safe Lock

Gate/Door Operator or Fail-Secure Lock

5. Master Cards Usage

Using Master Cards is the easiest way to add or delete cards / PIN users.

Add a User	1. **(Read Master Add Card)** 2. **(Read User Card)** *Repeat Step 2 for additional user cards* 3. **(Read Master Add Card)** to stop adding. ***Note:*** *Same User Card cannot add more than once.*
Delete a User	1. **(Read Master Delete Card)** 2. **(Read User Card)** *Repeat Step 2 for additional user cards* 3. **(Read Master Delete Card)** to stop deleting.

6. Programming

Programming will vary depending on access configuration. Follow the instructions according to your access configuration.

General Programming Information

- **Remote Control**: Please use the Infrared Remote Control to program the Reader.
- **User ID number**:Assign a user ID to the access card in order to track it. The user ID number can be any number from 1~2000.

  IMPORTANT: User IDs do not have to be proceeded with any leading zeros. Recording of User ID is crical. Modifications to the user require the User ID be available.
- **Proximity Card**: Any 125KHz industry standard EM Proximity card or Tag.

6.1 Basic Configuration

6.1.1 Enter and Exit Program mode

Programming Step	Keystroke Combination
Enter Program Mode	* **(Master Code) #** *(Factory default is 123456)*
Exit Program Mode	*

6.1.2 Set Master Code

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Update Master Code	**0 (New Master Code) # (Repeat New Master Code) #** *(Master code is any 6 digits)*
3. Exit Program Mode	*

6.2 Add User Cards

Programming Steps	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
Add Card User	
2. Add Card: Using Auto ID (S2-EM reader will automatically assign the next available User ID number to Card)	**1 (Read Card) #** The cards can be added continuously. *For example: 1 (Read Card1)(Read Card2)...#* ***Note:*** *After read card, Card link to an available User ID number.*
OR 2. Add Card: Using User ID (Manager set a specific User ID to Card, same User ID can be assigned to different cards, but this is a bad practice)	**1 (User ID) # (Read Card) #** *(User ID is any number from 1-2000)* The cards can be added continuously. *For example: 1 (User ID)#(Read Card1)#1(User ID)#(Read*

OR 2. Add Card: by Card Number	*Card2)...#* *(**Note**: each User ID should begin with 1)* **1 (Input 10 digits Card number) #** You can input card number continuously. *For example: 1 (Input 10 digits Card number) # (Input 10 digits Card number) #….#* *(Input data including leading zeros)* ***Note:*** *After input EM Card number, you can use EM Card to open door.* For example: ● EM card's hexadecimal code is 0500C8538E, take the last 8 hexadecimal 00C8538E (8H) convert it to 13128590 (10D),input 0013128590 (must including leading zeros) as 10 digits Card number. ● EM card's hexadecimal code is 0500C849CB, take the last 8 hexadecimal 00C849CB (8H) convert it to 13126091 (10D),input 0013126091 (must including leading zeros) as 10 digits Card number.
OR 2. Add Card: Block (Batch) Enrollment (Allows manager to add up to 2000 cards to the Reader in a single step.) Takes 3 minutes to program.	**1 (User ID number) # (Card quantity) #(The first card number) #** Cards' ID number must be consecutive; Card quantity is the number of cards to be enrolled.
3. Exit	*

6.3 Delete Users

Programming Steps	Keystroke Combination
1. Enter Program Mode	***(Master Code) #**
Delete Card	
2. Delete Card - By Card	**2 (Read Card) #** The cards can be deleted continuously. *For example: 2(Read Card)(Read Card)….#*
OR 2. Delete Card - By User ID (if two cards have the same User ID, the first one added will be deleted, but others cards with same User ID still valid, and can only be deleted using Delete by Card method)	**2 (User ID) #** The cards can be deleted continuously. *For example: 2(User ID)#(User ID)#….#* *After deleting User ID, the associated card will be deleted, too.*
OR 2. Delete Card - By Card number	**2 (10 digits Card number) #** You can input card number continuously. *For example: 2 (Input 10 digits Card number) # (Input 10 digits Card number) #….#* ***Note:***

	When you add EM card, its 10 digits card number will be saved to reader; so after you delete 10 digits card number, the card cannot use to open door again.
Delete All Users	
2. Delete All User	**2 (Master Code) #** ***Note:*** *All configuration data is retained.*
3. Exit	*

6.4 Set Relay Configuration

The relay configuration sets the behavior of the output relay on activation.

Programming Steps	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Pulse Mode (factory default) **OR** 2. Latch Mode	**3 (1-99) #** The relay time is 1-99 seconds. *(1 is one second)* *(Default is 5 seconds)* **3 0 #** Sets the relay to ON/OFF Latch mode. (If door closed, after read valid card, door will open and remain in open state; only read valid card again – not necessary the same card, the door will close)
3. Exit	*

6.5 Set Strike-out Alarm

The strike-our alarm will engage after 10 failed cards attempts (factory setting is OFF). It can be set to deny access for 10 minutes after engaging or disengage only after entering a valid card or Master code.

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Strike-Out OFF **OR** 2. Strike-Out ON (silence) **OR** 2. Strike-Out ON (with Alarm)	**4 0 #** (factory default) **4 1 # (**Access will be denied for 10 minutes) (No way to back to normal) **4 2 # 5**

Set alarm time	**(0 ~ 3) #**, *(0 ~ 3 minutes, 0 means no alarm)* Read valid User card or Master card to silence.
3. Exit	*

6.6 Set Audible and Visual Response

Programming Step	Keystroke Combination	
1. Enter Program Mode	* **(Master Code) #**	
2. Control LED **OR** 2. Control Sounds	OFF = **6 1 #** OFF = **6 3 #** (read card silence)	ON = **6 2 #** ON = **6 4 #** (Factory defaults are ON)
3. Exit	*	

7. Others
7.1 Users Operation

Open the door: Read valid user card.

Remove Alarm: Read valid user card or Master card

7.2 Reset to Factory Default & Add Master Cards

Power off access device, press the Exit Button (see connection diagram), hold it and power on, after two beeps, release the Exit button and the green LED turns on to solid green, then read any two 125kHz EM card, the LED will turn into solid red, means reset to factory default successfully. Of the two cards reading, the 1st one is Master Add Card, the 2nd one is the Master Delete Card.

After two Master Cards made, should use them to add / delete User cards to make sure everything is all right.

Remarks:

① If no Master Cards added, must press the Exit Button for at least 10 seconds before release.

② Reset to factory default, the user's information (cars added before) will still be retained.

③ Using same ID to assign to cards (Add Card: using User ID), the buzzer will beep 3 times to

warn you, but if you insist on using the same User ID, reader will allow you to do so. But this is a very bad practice that should be avoid, because when times comes that you delete the Card by User ID, only the first one added will be deleted, others will remain valid and cannot be deleted using that User ID. The others with the same User ID can only be deleted using Delete Card by Card method after wards.

S2-EM Simplified Instruction	
Function description	**Operation**
Enter the programming mode	*** (123456) #** *then you can do the programming.* *(123456 is the factory default master code)*
Change the master code	**0 (new code) # (repeat the new code) #** *(master code: 6 digits)*
Add card user	**1 (Read Card) #** (can add Cards continuously)
Delete card user	**2 (Read Card) #** (can delete Cards continuously)
Exit from the programming mode	*

How to open the door	
Card User	Read card