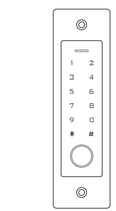
Embedded FingerKey & Reader



User Manual

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INTRODUCTION

The device is a single door multifunction standalone access controller or a Wiegand output reader. It uses Atmel MCU assuring stable performance. The operation is very user-friendly, and low-power circuit makes it long service life.

The device supports 1,000 users, all user data can be transferred from one to another (except fingerprint users). It supports multi access modes in card access, PIN access, fingerprint access, card + PIN access, or multi cards /PINs/ fingerprints access. It has extra features including block enrollment, Wiegand input & output interface...etc.

Features

> Capacitive fingerprint sensor, Touch key
> Metal case, anti-vandal, embedded design
> Waterproof, conforms to IP66
> One relay, 1,000 users (990 common + 10 visitor)
> PIN length: 4~6 digits
> Card type: 125KHz EM Card
> Can be used as Wiegand reader with buzzer output
> Card block enrollment
> Tri-color LED status display
> Pulse mode, Toggle mode
> User data can be transferred (except fingerprint users)
> Backlit keypad, can set automatic OFF after 20 seconds

Specifications

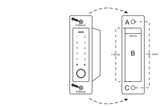
User Capacity Common User Visitor User	**1000** 990(100 Fingerprint + 890 Card/PIN Users) 10
Operating Voltage Working Current Idle Current	**12~18V DC** <150mA <60mA
Proximity Card Reader Radio Technology Read Range	**EM** 125KHz 2~6 cm
PIN Length	**4~6 digits**
Wiring Connections	**Relay Output, Exit Button, Wiegand Input, Wiegand Output**

Relay Adjustable Relay Output Time Lock Output Load	**One (NO, NC, Common)** 0~99 Seconds (5 seconds default) 2 Amp Maximum
Wiegand Interface PIN Output	**Wiegand 26~44 bits input & output** (Factory Default: Wiegand 26bits) **4 bits, 8 bits(ASCII), 10 digits Virtual Number** (Factory Default: 4 bits)
Environment Operating Temperature Operating Humidity	**Meets IP66** -30°C ~ 60°C (-22°F ~ 140°F) 0%RH~98%RH
Physical Colour Dimensions Unit Weight Shipping Weight	**Stainless Steel** Silver & Black L165 x W48 x D17.5(mm) 138g 198g

Carton Inventory

INSTALLATION

- Drill 2 holes(A,C) on the wall for the screws and one hole for the device
- Knock the supplied rubber bungs to the screw holes(A,C)
- Thread the cable through the hole(B)
- Attach the unit to the hole(B)
- Fix the unit firmly on the wall with 2 flat head screws
- Cover the screws by Screw Cover Stickers



Wiring

Wire Color	Function	Notes
Basic Standalone Wiring		
Red	DC +	12~18V DC Power Input
Black	GND	Negative Pole of DC Power Input
Blue	Relay NO	Normally Open Relay Output (install diode provided)
Brown	Relay Common	Common Connection for Relay Output
Grey	Relay NC	Normally Closed Relay Output (install diode provided)
Yellow	OPEN	Request to Exit(REX) Input
Pass-Through Wiring (Wiegand Reader or Controller)		
Green	Data 0	Wiegand Output (Pass-through) Data 0
White	Data 1	Wiegand Output (Pass-through) Data 1

Sound and Light Indication

Operation Status	LED	Buzzer
Stand by	Red light bright	---
Enter into programming mode	Red light shines	One beep
In the programming mode	Orange light bright	One beep
Operation error	---	Three beeps
Exit from the Programming mode	Red light bright	One beep
Open lock	Green light bright	Beep
Alarm	Red light Shines quickly	Beeps

Basic Configure

Enter and Exit Program Mode

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

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	*

Set the Working Mode

Notes: The device has 3 working modes: Standalone Mode, Controller Mode, Wiegand Reader Mode, choose the mode you use. (Factory default is Standalone Mode / Controller Mode)

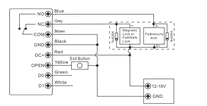
Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
2. Standalone/Controller Mode OR Mode	7 7 # (Factory default)
2. Wiegand Reader Mode	7 8 #
3. Exit	*

STANDALONE MODE

The device can work as Standalone Access Control for single door. (Factory default mode) — 7 7 #

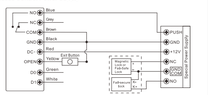
Connection Diagram

Common Power Supply



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

Access Control Power Supply



Programming

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

Notes:

> **User ID number**: Assign a user ID to the access fingerprint/ card/ PIN in order to track it.

The Common User ID:

- Fingerprint user ID: 0 ~ 98
- PIN/ Card user ID: 100 ~ 989
- Master Fingerprint User ID: 99
- Visitor User ID: 990~999

IMPORTANT: User IDs do not have to be proceeded with any leading zeros. Recording of User ID is critical. Modifications to the user require the User ID be available.

> Proximity Card:
Proximity Card: 125KHz EM card

> PIN: Can be any 4~6 digits except 8888 which is reserved.

Add Common Users

(Fingerprint user ID: 0 ~ 98, PIN/ Card user ID: 100 ~ 989; PIN length: 4~6 digits except 8888)

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
Add Fingerprint User	
2. Using Auto ID (Allows the device to assign Fingerprint to next available User ID number) **OR** 2. Select Specified ID (Allows Master to define a specific User ID to associate the fingerprint to)	**1 (Fingerprint) (Repeat Fingerprint) (Repeat Fingerprint again)** Fingerprints can be added continuously. **1 (User ID) # (Fingerprint) (Repeat Fingerprint) (Repeat Fingerprint again)** Fingerprints can be added continuously.
3. Exit	*

Add Card User	
2. Using Auto ID (Allows the device to assign Card to next available User ID number) **OR** 2. Select Specific ID (Allows Master to define a specific User ID to associate the card to)	**1 (Read Card) / (Input 8/10 Digits Card Number) #** The cards can be added continuously. **1 (User ID) # (Read Card) / (Input 8/10 Digits Card Number) #**
OR 2. Add Card: Block Enrollment (Allows Master to add up to 890 cards to the Reader in a single step) Takes 2 minutes to program.	**1 (User ID) # (Card Quantity) # (The First Card 8/10 Digits Number) #** Cards' number must be consecutive; Card quantity + number of cards to be enrolled.
Add PIN User	
2. Using Auto ID (Allows the device to assign PIN to next available User ID number) **OR** 2. Select Specific ID (Allows manager to define a specific User ID to associate the PIN to)	**1 (PIN) #** The PINs can be added continuously **1 (User ID) # (PIN) #**
3. Exit	*

Tips for PIN Security (Only valid for 6 digits PIN):

For higher security we allow you to hide your correct PIN with other numbers up to a max of 10 digits.

Example PIN: 123434
You could use "1(123434) **" or "1(123434) (***) can be any numbers from 0~9)

Add Master Fingerprint (By Specified ID: 99)

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
1. Add Master Fingerprint	**1 (99) # (Fingerprint) (Repeat Fingerprint) (Repeat Fingerprint again)**
3. Exit	*

Simplified Instruction	
Function Description	**Operation**
Enter the Programming Mode	* + Master Code + # then you can do the programming (123456 is the factory default master code)
Change the Master Code	0 + New Code + # + Repeat the New Code + # (code: 6 digits)
Add Card User	1 + Read Card + # (can add cards continuously)
Add Fingerprint User	1+Fingerprint- Repeat Fingerprint- Repeat Fingerprint Again+ #
Add PIN User	1 + PIN + # (The PIN is any 4~6 digits except 8888 which is reserved)
Delete User	2- Fingerprint+ # 2-Read Card+ # 2-PIN+ #
Exit from the Programming Mode	*
How to release the door	
Fingerprint User	Input Fingerprint
Card User	Read Card
PIN User	Input PIN #

Add Visitor Users (Valid for Card/ PIN Users)

(User ID number is 990~999, PIN length: 4~6 digits except 8888)
There are 10 groups Visitor PIN/card available, the users can be specified up to 10 times of usage, after a certain number of times, i.e. 5 times, the PIN/card become invalid automatically.

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
2. Add Card **OR** 2. Add PIN	**1 (User ID) # (0~9) # (Read Card) / (Input 8/10 Digits Card Number) #** **1 (User ID) # (0~9) # (PIN) #** (0~9 means times of usage, 0=10 times)
3. Exit	*

Change PIN Users(PIN length: 4~6 digits except 8888)

Programming Step	Keystroke Combination
Note: Below is done outside programming mode, users can undertake this themselves	
Change PIN	* (User ID) # (Old PIN) # (New PIN) # (Repeat New PIN) #
Change PIN of Card + PIN access mode (There will auto allocate PIN (8888) to cards when adding)	* (Read Card) (Old PIN) # (New PIN) # (Repeat New PIN) #

Delete Users

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
2. Delete User - By Fingerprint/ Card/ PIN **OR** 2. Delete User - By ID number **OR** 2. Delete User - By Card number **OR** 2. Delete ALL Users	2 (Input Fingerprint)/ (Read Card)/ (Input PIN) # The users can be deleted continuously. 2 (User ID) # 2 (Input 8/10 Digits Card Number) # 2 (Master Code) #
3. Exit	*

Set Relay Configuration

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

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
2. Pulse Mode **OR** 2. Toggle Mode	3 (1~99) # (factory default) The relay time is 1~99 seconds. (Default is 5 seconds) 3 0 # Sets the relay to ON/OFF Toggle mode
3. Exit	*

Set Access Mode

For Multi user access mode, the interval time of reading can not exceed 5 seconds, or else, the device will exit to standby automatically.

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
2. Fingerprint Access **OR** 2. Card Access **OR** 2. PIN Access **OR** 2. Card + PIN Access 2. Multi User Access **OR** 2. Fingerprint or Card or PIN Access	4 0 # 4 1 # 4 2 # 4 3 # 4 3 (2~9) # (Only after 2~9 valid users, the door be opened) 4 4 # (factory default)
3. Exit	*

Set Strike-out Alarm

The strike-out alarm will engage after 10 failed entry attempts (Factory is OFF). It can be set to deny access for 10 minutes after engaging or disengage only after entering a valid Fingerprint/ card/ PIN or Master code/ fingerprint/ card.

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
2. Strike-Out OFF **OR** 2. Strike-Out ON **OR** 2. Strike-Out ON (Alarm) **Set Alarm Time**	6 0 # (factory default) 6 1 # Access will be denied for 10 minutes (Exit button is still workable) 6 2 # 5 (0 ~ 3) # (factory default is 1 minute) Enter Master Code # or Master Fingerprint / Card or valid user fingerprint / card / PIN to silence
3. Exit	*

Set Audible and Visual Response

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
2. Disable Sound Enable Sound **OR** 2. LED Always OFF LED Always ON **OR** 2. Keypad Backlit Always OFF Keypad Backlit Always ON Keypad Backlit Automatic OFF	7 0 # 7 1 # (factory default) 7 2 # 7 3 # (factory default) 7 4 # 7 5 # 7 6 # (factory default) Automatic OFF after 20 seconds, it will go ON by pressing any key (this key isn't taken into consideration)
3. Exit	*

Users Operation & Reset to Factory Default

> **Open the door**: Read valid user fingerprint or user card or input valid user PIN #

> **Remove Alarm:** Enter Master Code # or Master Fingerprint/ Card or valid user fingerprint/ card / PIN

> **To reset to factory default & Add Master Card:** Power off, press the Exit Button, hold it and power on, there will be two beeps, then release the exit button, the LED light turns into yellow, then **read any** 125KHz EM card, the LED will turn into red, means reset to factory default successfully. Of the card reading, it is the Master Card.

Remarks:
① If no Master Card added, must press the Exit Button for at least 5 seconds before release.(this will make the previous registered Master Card invalid)
② Reset to factory default, the user's information is still retained.

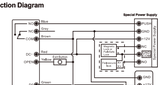
Master Fingerprint/ Card Usage (Master Card is not default accessory in the box, please add it by yourself if needed)

Using Master Fingerprint/ card to add and delete users	
Add Fingerprint/ Card/ PIN Users	1. Input (**Master Fingerprint / Card**) 2. Input (**Fingerprint three times**) or (**Card**) or (**PIN #**) Repeat step 2 for additional users 3. Input (**Master Fingerprint / Card**) again
Delete Fingerprint/ Card/ PIN Users	1. Input (**Master Fingerprint/ Card Twice within 5s**) 2. Input (**Fingerprint**) or (**Card**) or (**PIN #**) Repeat step 2 for additional users 3. Input (**Master Fingerprint/ Card**) again

CONTROLLER MODE

The device can work as Controller, connected with the external Wiegand reader. (Factory default mode) — 7 7 #

Connection Diagram



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)

Set Wiegand Input Formats

Please set the Wiegand input formats according to the Wiegand output format of the external Reader.

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
2. Wiegand Input Bit **OR**	8 (26~ 44) # (factory default is 26bits)
3. Disable Parity Bit Enable Parity Bit	8 0 # 8 1 # (factory default)
4. Exit	*

Note: For connecting Wiegand readers with 32, 40 bits output, need disable parity bits.

Programming

> Basic Programming is the same as Standalone Mode

> There are some exceptions for your attention:
The device Connected with External Card Reader
- If EM card reader: users can be added/deleted on either the device or external reader.
- If HID or Mifare card reader : users can only be added/deleted on external reader.

The device Connected with Fingerprint Reader

For example:
Connect SF1 as the fingerprint reader to the device.
Step 1: Add the Fingerprint (A) on SF1 (Please refer to SF1 manual)
Step 2: Add the same Fingerprint(A) on the device:

1	Enter Program Mode: * (Master Code) #
2 **OR** 2	1 (Press Fingerprint A once on SF1) # (ID auto allocated) 1 (User ID) # (Press Fingerprint A on SF1) # (Select specific ID)
3	Exit: *

The device Connected with Keypad Reader

The keypad reader can be 4 Bits, 8 Bits (ASCII), or 10 Bits output format. Choose the below operation according to the PIN output format of your reader.

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
2. PIN input bits	8 (4 or 8 or 10) # (factory default is 4 bits)
3. Exit	*

Remarks: 4 means 4 bits, 8 means 8 bits, 10 means 10 digits virtual number.

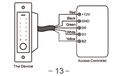
> Add PIN Users:
To add PIN users, after enter into programming mode on the device, PIN(s) can be input added on either the device or the external Keypad Reader.

> Delete PIN Users: the same way as add users.

WIEGAND READER MODE

The device can work as Standard Wiegand Reader, connected to the third party Controller — 7 8 #

Connection Diagram



Notes:
> When set into Wiegand Reader mode, nearly all settings in Controller Mode will become invalid, and Yellow wire will be redefined as below:
- Yellow wire: Buzzer control
> If you need to connect Yellow wire:
When the input voltage for Buzzer is low, it will sound.

Set Wiegand Output Formats

Please set the Wiegand output formats of Reader according to the Wiegand input formats of the Controller.

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
2. Wiegand output bits	8 (26~ 44) # (factory default is 26bits)
PIN output bits	8 (4 or 8 or 10) # (factory default is 4 bits)
3. Disable Parity Bit Enable Parity Bit	8 0 # 8 1 # (factory default)
4. Exit	*

Note: For connecting Wiegand controller with 32, 40 bits input, need disable parity bits.

ADVANCED APPLICATION

Collection Card Mode

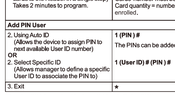
After this mode is turned on, all cards can open the lock. At the same time, the card is added to the device.

Programming Step	Keystroke Combination
1. Enter Program Mode	* (Master Code) #
2. Collection Card Mode OFF **OR** 2. Collection Card Mode ON	9 2 # (factory default) 9 3 #
3. Exit	*

User Information Transfer (Valid for Card / PIN Users)

The device supports the User Information Transfer function, and the enrolled user (cards, PINs) can be transferred from one (let's name it Master Unit) to another (let's name it Accept Unit).

Connection Diagram:



Remarks:
> The Master units and Accept units must be same series devices.
> The Master Code of the Master Unit and the Accept Unit must be set to the same.
> Program the transfer operation on Master Unit only.
> If the Accept Unit is already with the users enrolled, it will be covered after transferring.
> For full 900 users enrolled, the transfer takes about 30 seconds.

Set Transferring on Master Unit:

Programming Step	Keystroke Combination
1. Enter the programming mode	* (Master Code) #
2. Set transferring	9 8 #

Within 30 seconds, Green LED shines, after one beep, the LED will turn into Red, which means the users' information has been transferred successfully.

3. Exit	*