Fingerprint & RFID Access Control

User Manual

INTRODUCTION

Device is a waterproof metal case standalone fingerprint access control with integrated card reader. The card reader is of two versions optional: 125KHz EM card, or 125KHz HID&EM cards.

IP66waterproof makes it very suitable for outdoor use; with the slim design, it is an ideal choice to install on door frame.

Device supports up to 1000 fingerprint users and 2000 card users, with Wiegand 26~44bits output, it can also work as a slave reader to connect to a 3rd party controller.

Device equips with an infrared remote control and master cards for easy operation, and supports fingerprint access, card access and multi users access; with external alarm, door contact, exit button.

Main Features:

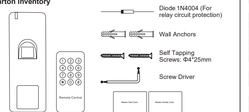
- Waterproof, conforms to IP66
- Metal case, anti-vandal
- One programming relay output
- 1000 fingerprint users, 2000 card users
- Card type:
  EM version: 125KHz EM card
  HID & EM version: 125KHz HID & EM cards
- Wiegand 26~44 bits output
- Standalone or Pass-through operation
- Multi cards / fingerprints access
- Support setting Authorizing Users
- 2 devices support interlock for 2 doors
- Latch Mode to hold door or gate open
- Anti-tamper alarm
- Multi-color LED status display
- Integrated alarm & buzzer output

Specifications:

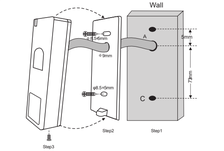
User Capacity Fingerprint Card	**3,000** 1000 2000
Operating Voltage Idle Current Active Current	**12VDC±10%** ≤45mA ≤ 150mA
Proximity Card Reader Radio Technology Read Range	**EM or HID & EM** 125KHz ≥2cm

Fingerprint Reader Resolution Identification Time FAR FRR	**Optical Fingerprint Module** 500DPI ≤1S ≤0.001% ≤0.1%
Wiring Connections	**Relay Output, Exit Button, DOTL, Alarm, Wiegand Output**
Relay Adjustable Relay Output Time Adjustable Alarm Output Time Lock Output Load Alarm Output Load	**One (NO, NC, Common)** 0-99 Seconds (default: 5 seconds) 0-3 Minutes (default: 1 minute) 2 Amp Maximum 5 Amp Maximum
Wiegand Interface	**Wiegand 26~44 bits output** (default: 26bits)
Environment Operating Temperature Operating Humidity	**Meets IP66** -30℃~60℃ (-22℉~140℉) - Default -40℃~60℃ (-40℉~140℉) - Optional 20%RH-90%RH
Physical Surface Finish Dimensions Unit Weight Shipping Weight	**Zinc-alloy Enclosure** Powder Coat L128 × W48 × D26 (mm) 385g 465g

Carton Inventory



INSTALLATION



Wiring

Wire Color	Function	Notes
Basic Stand Alone Wiring		
Red	12V DC	12V DC Regulated Power Input
Black	GND	Ground
Blue	Relay NO	Normally Open Relay Output (Install diode provided)
Purple	Relay Common	Common Connection for Relay Output
Orange	Relay NC	Normally Closed Relay Output (Install diode provided)
Yellow	OPEN	Request to Exit (REX) Input
Pass -through Wiring (Wiegand Reader)		
Green	Data 0	Wiegand Output (Pass-through) Data 0
White	Data 1	Wiegand Output (Pass -through) Data 1
Advanced Input and Output Features		
Grey	Alarm Output	Negative contact for Alarm
Brown	Contact Input	Door/Gate Contact Input (Normally Closed)

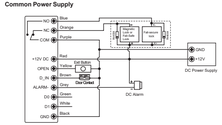
Sound and Light Indication

Operation Status	LED	Finger Sensor Light	Buzzer
Stand by	Red light bright	Off	
Enter into programming mode	Red light shines	Off	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	Off	One beep
Alarm	Red light Shines quickly	Off	Beeps

Connection Diagram

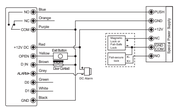
Lock 1: Fail-Safe Lock or Door/Gate Operator
Lock 2: Fail-Secure Lock or Magnetic Lock

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



Pass-through: Please check No.4 Pass-through Operation

PROGRAMMING

GENERAL PROGRAMMING INFORMATION

> **User ID Number:** Assign a user ID number in order to keep track of the users of access fingerprints or cards. The user ID number can be any number from 1~3000. 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 or card be available.

Remark: User ID 997 and 998 are for Authorized Fingerprints.
User ID 999 and1000 are for Master Add Fingerprint and Master Delete Fingerprint.
User ID 2999 and 3000 are for Authorized Cards.

> **Proximity Card**
EM version: Any 125KHz industry standard 26 bits EM card.
HID & EM Card version: Any 125KHz industry standard 26 bits HID & EM cards.

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) #**
3. Exit Program Mode	*

(Factory default is 123456)

(Master code is any 6 digits)

Add Fingerprint Users by Auto ID
(Allows device to assign Fingerprint to next available User ID, ID number is 1~1000)

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Add Fingerprint	**1 (Fingerprint) (Repeat Fingerprint)** Fingerprints can be added continuously
3. Exit	*

Add Fingerprint Users by Specific ID
(Allows Master to define a specific ID to the fingerprint, ID number is 1~1000)

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Add Fin gerprint	**1 (User ID) # (Fingerprint) (Repeat Fingerprint)** Fingerprints can be added continuously
3. Exit	*

Add Card Users by Auto ID
(Allows device to assign Card to next available User ID ID number is 1~3000)

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Add Card : by Reading Card **OR** 2. Add Card : by Card Number	**1 (Read Card)** Cards can be added continuously **1 (User ID) # (Input 8/10 Digits Card Number) #**
3. Exit	*

Add Card Users by Specific ID
(Allows Master to define a specific ID to the Card, ID number is 1001~3000)

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Add Card : by Reading Card **OR** 2. Add Card : by Card Number **OR** 2. Add Card: by Block Enrolment	**1 (User ID) # (Read Card)** Cards can be added continuously **1 (User ID) # (Input 8/10 Digits Card Number) #** **9 (User ID) # (Card Quantity) # (Input 8/10 Digits Card Number of the First Card) #**
3. Exit	*

Simplified Instruction

Function Description	Operation
Enter the Programming Mode	* - **123456- #** *then you can do the programming* *(123456 is the default factory master code)*
Change the Master Code	**0 - New code - # - Repeat the New Code - #** *(code: 6digits)*
Add Fingerprint User	**1 - Fingerprint - Repeat Fingerprint- #** *(can add fingerprints continuously)*
Add Card User	**1 - Read Card - #** *(can add cards continuously)*
Delete User	**2 - Fingerprint - #** **2 - Read Card - #** **2 - User ID - #** *(can delete users continuously)*
Exit from the Programming Mode	*
How to release the door	
Fingerprint User	Input Fingerprint
Card User	Read Card

How Authorized Cards / Fingerprints Work?
In standby mode, read the Authorized Card or input the Authorized Fingerprint once, the red LED of evice blinks 4 times, then all the valid users are unable to open the door, and the buzzer sounds 3 short beeps (the exit button inside can still open the door); read the Authorized Card or input the Authorized Fingerprint again, the Green LED of device blinks 4 times, then Device returns to normal use.

Delete Users

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Delete Fingerprint: by Fingerprint **OR**	**2 (Input Fingerprint)** Fingerprints can be deleted continuously
2. Delete Card: by Reading Card **OR**	**2 (Read Card)** Cards can be deleted continuously
2. Delete Card: by Card Number **OR**	**2 (Input 8/10 Digits Card Number) #**
2. Delete Card or Fingerprint: by ID Number **OR**	**2 (User ID) #**
2. Delete ALL Users	**2 (Master Code) #**
3. Exit	*

Master Cards Usage

Using Master Cards to add and delete users	
Add Card or Fingerprint User	1. Read Master Add Card 2. Read User Card / Input Fingerprint Twice (Repeat Step 2 for additional users) 3. Read Master Add Card Again
Delete Card or Fingerprint User	1. Read Master Delete Card 2. Read User Card / Input Fingerprint Once (Repeat Step 2 for additional users) 3. Read Master Delete Card Again

Remark: can also use Master Fingerprints to add and delete users, the operations are the same with Master Cards.

Set Relay Configuration
The relay configuration sets the behavior of the output relay on activation.

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Pulse Mode **OR** 2. Latch Mode	**3 (1-99) #** *(Factory default)* The relay time is 1-99 seconds (1 is 100Sm)*(Factory default: 5 seconds)* **30 #** Sets the relay to ON/OFF latch mode
3. Exit	*

Set Access Mode
For Multi Cards/ Fingerprints access mode, the interval time of reading cards/inputting fingerprints can not exceed 10 seconds, or else, the device will exit to standby automatically. In each access, the same card or fingerprint can not be used repeatedly, or else, the device will exit to stand by automatically.

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Card Access ONLY **OR** 2. Card or Fingerprint Access **OR** 2. Fingerprint Access ONLY **OR** 2. Multi Cards / Fingerprints Access	**4 0 #** **4 2 #** *(Factory default)* **4 3 #** **4 4 (2~9) #**
3.Exit	*

Set Alarm

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Di sable Alarm **OR** 2. Enable Alarm	**5 0 #** **5 (1~3) #** *(Factory default: 1 minute)*
3. Exit	*

Set Strike-out Alarm
The strike-out alarm will engage after 10 failed Card/Fingerprint attempts, factory default is OFF, it can be set to deny access for 10 minutes or enable alarm after engaging.

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Strike-out OFF **OR** 2. Strike-out ON **OR** 2. Strike-out ON	**5 4 #** *(factory default)* **5 5 #** Access will be denied for 10minutes **5 6 #** Enable alarm, need enter Valid Card or Fingerprint to silence
3. Exit	*

Set Door Open Detection
Door Open Too Long (DOTL) Detection
When use with an optional magnetic contact or built-in magnetic contact of the lock, if the door is opened normally, but not closed after 1 minute, the inside buzzer will beep automatically to remind people to close the door. The beep can be stopped by closing the door, master users or valid users, or else, it will continue to beep the same time with the alarm time set.

Door Forced Open Detection
When use with an optional magnetic contact or built-in magnetic contact of the lock, if the door is opened by force, the inside buzzer and external alarm (if there is) will both operate, they can be stopped by master users or valid users, or else, it will continue to sound the same time with the alarm time set.

Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Disable Door Open Detection **OR** 2. Enable Door Open Detection	**6 0 #** *(factory default)* **6 1 #**
3. Exit	*

Users Operation & Reset to Factory Default

> **Open the door** Read valid user card or input valid fingerprint
> **Open the door in Multi cards / Fingerprints Mode**Read valid multi cards or fingerprints within 10 seconds.
> **Remove Alarm:**Read valid user card or input valid fingerprint, or read master cards, master fingerprints or input Master Code #
> **To reset to factory default & Add Master Cards**Power off, press the Exit Button, hold it and power on; there will be two beeps, release the button, the LED light turns into Orange, then read any two 125KHz EM cards or HID cards within 10 seconds, the LED will turn into 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.

Remarks:
> If no Master Cards added, must press the Exit Button for at least 10 seconds before release.
> Reset to factory default, the user's information is still retained.

Set Device ID (Only apply for Fingerprint Users)

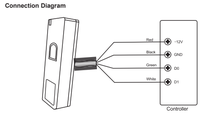
Programming Step	Keystroke Comb ination
1. Enter Program Mode	* **(Master Code) #**
2. Set Device ID	**7 (0~255) #** *(factory default: 0)*
3. Exit	*

If use device as a Wiegand reader, can set its Device ID for recognition.When input the valid fingerprint, it will output a virtual card number as the way of Wiegand 26 output.For example, if set the Device ID as 255, and the Fingerprint User ID is 3, then it will output the virtual card number as 255,00003 (only apply for Wiegand 26bits input controller).

PASS-THROUGH OPERATION

SF1 can work as a Wiegand output reader to the controller. Below the operations for adding fingerprint users:
1) Add fingerprint (refer to Page 06)
2) Operate the controller to enter into adding card users, then read this added fingerprint on device, this fingerprint's corresponding User ID will generate a virtual card number and send to the controller, the controller save this number, and then the fingerprint added successfully.

Connection Diagram



Set Wiegand Output Format
Please set the Wiegand output format of Reader according to the Wiegand input format of the Controller.

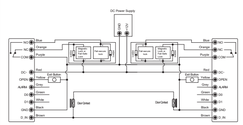
Programming Step	Keystroke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Set Wiegand output bits Or Disable Wiegand output	**8 (26~44) #** *(factory default: 26bits)* **8 0 #**
3. Exit	*

ADVANCED APPLICATION

Interlock
The SF1 supports the Interlock function. It is of two devices for two doors, and mainly used for banks, prisons, and other places where a higher level security is required

Connection Diagram
Remarks: The Door Contact must be installed and connected as the diagram.

Connection Diagram



Let's name the two same devices as "A "and "B" for two doors "1" and "2"

Step 1:
Enroll the users to the two SF1 (refer to Page 06)

Step 2:
Set both of the two readers (A and B) to Interlock function

Programming Step	Keystro ke Combination
1. Enter Program Mode	* **(Master Code) #**
2. Interlock -OFF **OR** 2. Interlock -ON	**6 2 #** *(factory default)* **6 3 #**
3. Exit	*

The interlock operation is finished,
When and only door 2 is closed, the user can read the valid card or input valid fingerprint on Reader A, door 1 will open; then when and only door 1 closed, read valid card or input valid fingerprint on Reader B, door 2 will open.