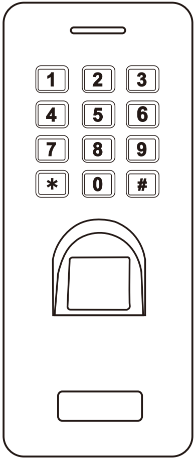
S4A Industrial Co.,Limited

SF2 - Waterproof
Fingerprint & RFID Access Control



User Manual

INTRODUCTION

The device is a waterproof metal case standalone fingerprint access control with keypad. IP66 waterproof makes it very suitable for outdoor use.

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

The device supports fingerprint access, PIN access and multi users access; with external alarm, door contact, exit button.

Main Features:

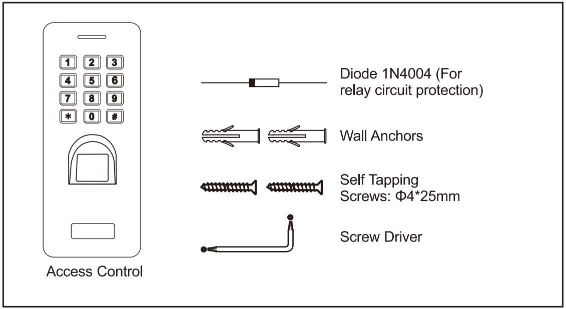
- Waterproof, conforms to IP66
- Metal case, anti-vandal
- One programming relay output
- 1000 fingerprint users, 2000 PIN users
- Wiegand 26~44 bits output
- Standalone or Pass-through operation
- Multi PINs/ fingerprints access
- Support setting Authorized Users
- 2 devices support interlock for 2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

Specifications:

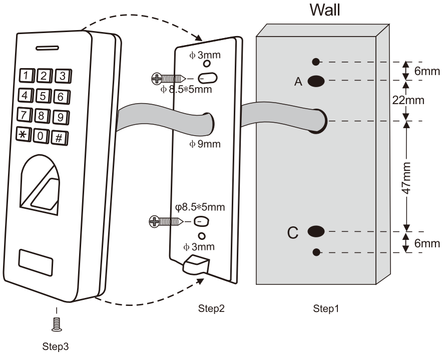
User Capacity Fingerprint PIN	**3,000** 1,000 2,000
Operating Voltage Idle Current Active Current	**12V DC±10%** ⩽45mA ⩽150mA
Fingerprint Reader Resolution Identification Time FAR FRR	**Optical Fingerprint Module** 500DPI ⩽1S ⩽0.01% ⩽0.1%
PIN Length	**4~6 digits**

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°C~60°C (-22°F~140°F) - Default -40°C~60°C (-40°F~140°F) - Optional 20%RH-90%RH
Physical Surface Finish Dimensions Unit Weight Shipping Weight	**Zinc-alloy Enclosure** Powder Coat L137 × W58 × D26 (mm) 400g 500g

Carton Inventory


1
2
3
4
5
6
7
8
9
*
0
#
Access Control
Diode 1N4004 (For relay circuit protection)
Wall Anchors
Self Tapping Screws: Φ4*25mm
Screw Driver

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)

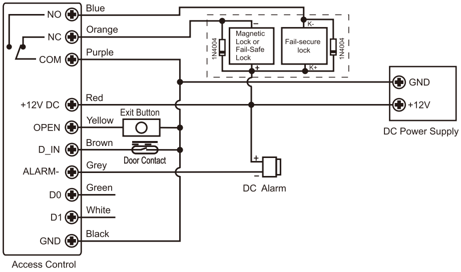
Sound and Light Indication

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

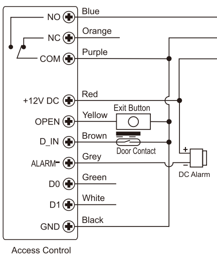
Lock 1: Fail-Safe Lock or Door/Gate Operator
Lock 2: Fail-Secure Lock or Magnetic Lock

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 PINs. The user ID number is 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 PIN be available.

Remark: User ID 999 and 1000 are for Authorized fingerprint users
User ID 2999 and 3000 are for Authorized PIN users.

> **PIN:** Any 4~6 digits number

Set Master Code

Programming Step	Keystroke Combination
1. Enter Program Mode	*** (Master Code) #** *(Factory default is 123456)*
2. Update Master Code	**0 (New Master Code) # (Repeat New Master Code) #** *(Master code is any 6 digits)*
3. Exit Program Mode	*

Add Fingerprint Users by Auto ID

(Allows the 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 Fingerprint	**1 (User ID) # (Fingerprint) (Repeat Fingerprint)** Fingerprints can be added continuously
3. Exit	*

Add PIN Users by Specific ID

(Allows Master to define a specific ID to the PIN, ID number is 1001~3000)

Programming Step	Keystroke Combination
1. Enter Program Mode	*** (Master Code) #**
2. Add PIN : by user ID	**1 (User ID) # (PIN) #** PIN can be any 4~6 digits
3. Exit	*

Tips for PIN Security :
For higher security we allow you to hide your correct PIN within other numbers up to a max of 10 digits.

Example PIN 1234
You could use **(001234)** or **(001234)
("*" can be any numbers from 0~9)

When the PIN is less than 6 digits, preceed with leading zeros to make it 6 digits.

How Authorized PINs / Fingerprints Work?

In standby mode, input the Authorized PIN # or the Authorized Fingerprint once, the LED shines RED 4 times and one long beep will be heard, then all the valid users entered cannot open the door and 3 short beeps will be heard (the push button inside can release the door);input the Authorized PIN # or the Authorized Fingerprint again, the LED shines GREEN 4 times and one long beep will be heard, then all the valid users can release the door normally.

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 PIN or Fingerprint : by user ID **OR**	**2 (User ID) #**
2. Delete ALL Users	**2 (Master Code) #**
3. Exit	*

Master Fingerprints Usage (Please refer to Page 10 “To reset to factory default & Add Master Fingerprints” to Add Master Fingerprints)

Using Master Fingerprints to add and delete fingerprint users (not suitable for PIN users)	
Add Fingerprint User	1. Input (Master Add Fingerprint) 2. Input Fingerprint Twice (Repeat Step 2 for additional users) 3. Input (Master Add Fingerprint) Again
Delete Fingerprint User	1. Input Master Delete Fingerprint 2. Input Fingerprint Once (Repeat Step 2 for additional users) 3. Input (Master Delete Fingerprint) Again

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**	**3 (1-99) #** *(Factory default)* The relay time is 1-99 seconds (1 is 100ms) *(Factory default: 5 seconds)*
2. Latch Mode	**30 #** Sets the relay to ON/OFF latch mode
3. Exit	*

Set Access Mode

For Multi PINs / Fingerprints access mode, the interval time of inputting PIN/Fingerprints can not exceed 5 seconds, or else, the device will exit to standby automatically;
In each access, the same PIN or fingerprint can not be used repeatedly, or else, the device will exit to standby automatically.

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

Set Alarm

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

Set Strike-out Alarm

The strike-out alarm will engage after 10 failed PIN/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(Alarm)	**5 4 #** *(factory default)* **5 5 #** Access will be denied for 10 minutes **5 6 #** Enter Master Code# or Valid PIN # 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	*

Set Buzzer

Programming Step	Keystroke Combination
1. Enter Program Mode	*** (Master Code) #**
2. Disable Buzzer **OR** 2. Enable Buzzer	**6 4 #** **6 5 #** *(Factory Default)*
3. Exit	*

Users Operation & Reset to Factory Default

> **Open the door**: Input valid PIN user or input valid fingerprint

> **Open the door in Multi PINs / Fingerprints Mode:** Input valid multi PINs or fingerprints within 5 seconds.

> **Remove Alarm:** Input valid user PIN or input valid fingerprint, or input master fingerprints or input Master Code #

> **To reset to factory default & Add Master Fingerprints:** 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, which means entered into Add Master Fingerprints mode, the first fingerprint (input for twice) entered is Master Add Fingerprint and the second fingerprint (input for twice) entered is Master Delete Fingerprint in 30 seconds, then the LED light turns into RED, means reset to factory default successfully.

Remarks:
>If no Master Fingerprints added, must press the Exit Button for at least 30 seconds before release.
> Reset to factory default, the user's information is still retained.

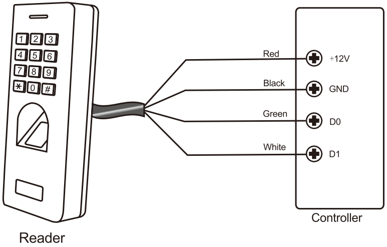
PASS-THROUGH OPERATION

The device can work as a Wiegand output reader to the controller. Below the operations for adding fingerprint users:

1.Add fingerprint on the reader (refer to Page 06)

2.Operate the controller to enter into adding Card users, then read this added fingerprint on the reader, this fingerprint's corresponding User ID will generate a virtual Cardn umber 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 4bits PIN output format 8bits PIN output format 10bits PIN output format (Virtual card number)	**8 (26~44) #** *(factory default: 26 bits)* **8 0 #** **8 4 #** *(factory default: 4 bits)* **8 8 #** **8 10 #**
3. Exit	*

Set Device ID

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 the device as a Wiegand reader, can set its Device ID for recognition. When input the valid fingerprint or PIN, it will output virtual card number as the way of Wiegand 26 output.

Note: when needs to set a Device ID, it will need to set Wiegand output format as 26 bits and PIN output format as 10 bits virtual card number format.

Transmission Format

1. Fingerprint Transmission Format

Device ID + User ID

Example:
Device ID: 255
User ID: 3
The output will be 255, 00003

2. Keypad Transmission Format

The reader will transmit the PIN data when it receives the last key (#) after PIN code

Example:
Device ID: 255
PIN code: 5555（4 digits PIN)
Press 5555 #, then the output format will be: 255,05555

When PIN is 5 digits or 6 digits, there's no Device ID output,only PIN data output after the last key (#) pressed.

For example:

PIN code: 55555（5 digits PIN)
Press 55555 #, the output format will be: 000,55555

PIN code: 555555（6 digits PIN)
Press 555555 #, the output format will be 005,55555

Note: Fingerprint must be valid fingerprint, or there is no output; PIN can be either valid or invalid, there’s output

ADVANCED APPLICATION

Interlock

The device 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

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Example:
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PIN code: 5555（4 digits PIN)
Press 5555 #, then the output format will be: 255,05555

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For example:

PIN code: 55555（5 digits PIN)
Press 55555 #, the output format will be: 000,55555

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Press 555555 #, the output format will be 005,55555

Note: Fingerprint must be valid fingerprint, or there is no output; PIN can be either valid or invalid, there’s output

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