User Manual

MK2-V & MK2-H

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English

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The product will be updated from time to time without prior notice. The latest operation procedures and relevant documents are available on http://www.zkteco.com

If there is any issue related to the product, please contact us.

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About the Company

ZKTeco is one of the world's largest manufacturer of RFID and Biometric (Fingerprint, Facial, Finger-vein) readers. Product offerings include Access Control readers and panels, Near & Far-range Facial Recognition Cameras, Elevator/floor access controllers, Turnstiles, License Plate Recognition (LPR) gate controllers and Consumer products including battery-operated fingerprint and face-reader Door Locks. Our security solutions are multi-lingual and localized in over 18 different languages. At the ZKTeco state-of-the-art 700,000 square foot ISO9001-certified manufacturing facility, we control manufacturing, product design, component assembly, and logistics/shipping, all under one roof.

The founders of ZKTeco have been determined for independent research and development of biometric verification procedures and the productization of biometric verification SDK, which was initially widely applied in PC security and identity authentication fields. With the continuous enhancement of the development and plenty of market applications, the team has gradually constructed an identity authentication ecosystem and smart security ecosystem, which are based on biometric verification techniques. With years of experience in the industrialization of biometric verifications, ZKTeco was officially established in 2007 and now has been one of the globally leading enterprises in the biometric verification industry owning various patents and being selected as the National High-tech Enterprise for 6 consecutive years. Its products are protected by intellectual property rights.

About the Manual

This manual introduces the operations of MK2-V & MK2-H product.

All figures displayed are for illustration purposes only. Figures in this manual may not be exactly consistent with the actual products.

Table of Contents

1 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 can be made with Bluetooth version or with WIFI version.

1.1 Features

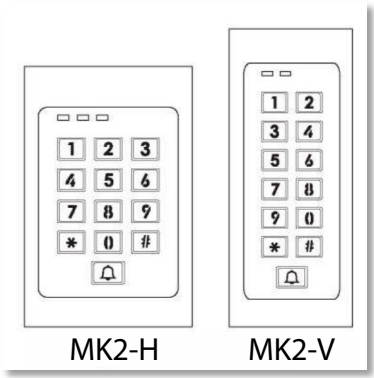
- Metal case, anti-vandal
- Waterproof, conforms to IP66
- PIN length: 4~6 digits
- EM card, Mifare card optional
- EM card: Wiegand 26~44 bits input & output
- Mifare card: Wiegand 26~44bits, 56bits, 58bits input & output
- Can be used as Wiegand reader with LED & buzzer output
- Card block enrollment
- Tri-color LED status display
- Integrated alarm & buzzer output
- Pulse mode, Toggle mode
- User data can be transferred
- 2 devices can be interlocked for 2 doors
- Built-in light dependent resistor (LDR) for anti tamper
- Backlit keypad, can set automatic OFF after 20 seconds

1.2 Specifications

Model	MK2-H / MK2-V
Display	N/A
Authentication Method	Card / PIN Code (Physical Keypad)
User Capacity	10,000 (1:N) (Standard)
Card Capacity	10,000(1:N)(Standard)
Max. User Password Length	4 to 6 Digits
Communication	Wiegand Input*1 &Wiegand Output*1 Electric Lock*1, Door Sensor*1, Exit Button*1,Doorbell*1,Alarm*1

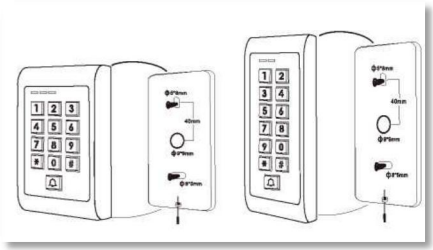
Standard Functions	Access Control, Buzzer, Multiple Verification Methods. LED status indicators: Green: Verification successful(1 Beep) Solid Red: Verification Failed (3 Beeps) Orange:Confiquration Solid Red: Standyby Rapid Red Flash: Alarm (Audible alert) Operation Error: 3 Beeps
Optional Functions	N/A
Power Supply	DC 12V 0.15A
Operating Temperature	-40℃ to 60℃
Operating Humidity	10% to 90% RH (Non-condensing)
Dimensions	MK2-H: 117mm * 70mm * 22mm (L*W*H) MK2-V: 132mm * 55mm * 25mm (L*W*H)
Gross Weight	MK2-H: 0.361Kg MK2-V: 0.333Kg
Net Weight	MK2-H: 0.302Kg MK2-V: 0.283Kg
Supported Software	N/A
Installation	Wall-mount
Housing Material	Zinc Alloy
Ingress Protection Rating	IP66 (waterproof and dustproof)
Certifcations	ISO14001, ISO9001, CE, ROHS

1.3 Carton Inventory



2 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



2.1 Wiring

Wire Color	Function	Notes
Basic Standalone Wiring		
Red	DC+	12V DC Power Input
Black	GND	Negative Pole of DC Power Input
Blue & Black	Relay NO	Normally Open Relay Output (install diode provided)
White & Black	Relay Common	Common Connection for Relay Output
Green & Black	Relay NC	Normally Closed Relay Output (Install diode provided)
Yellow	OPEN	Request to Exit(REX) Input
Pass-Through Wiring (Wiegand)		Reader or Controller)
Green	DataO	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)
WIFI Version with Doorbell		
Brown & Black	Doorbell A	Contact for Doorbell
Yellow & Black	Doorbell B	Contact for Doorbell

2.2 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/ Red and Green light bright (only for the device with 3 LEDs)	One beep
Operation error	Red light shines	Three beeps
Exit from the Programming mode	Red light bright	One beep
Open lock	Green light bright	One beep
Alarm	Red light Shines quickly	Beeps
WIFI Version with Doorbell		
Brown & Black	Doorbell A	Contact for Doorbell
Yellow & Black	Doorbell B	Contact for Doorbell

Note: 3 LEDs device with WiFi version—The orange light indicates successful WiFi connection and will remain on as long as the device remains online.

2.3 Basic Configuration

2.3.1 Enter and Exit Progarm Mode

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

2.3.2 Set Master Mode

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

2.3.3 Set the Working Mode

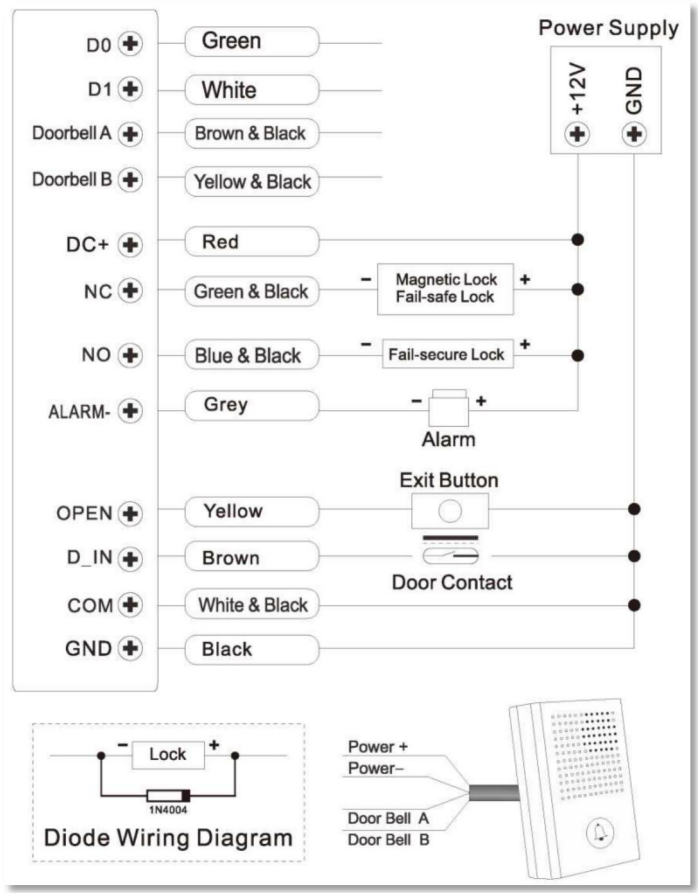
Notes: The device has 3 working modes: Standalone Mode, Controller Mode, Wiegand Reader Mode, choose the mode you use. (Factory default is Standalone Mode / Controller Mode)

Programming Step	Keystroke Combination
1. Enter Program Mode	*** (MasterCode)#**
2. Standalone/ControllerMode **OR** 2. Wiegand Reader Mode	7 7# **(Factory default)** 78#
3. Exit	*

3 STANDALONE MODE

The device can work as Standalone Access Control for single door. (Factory default mode) — **77#**

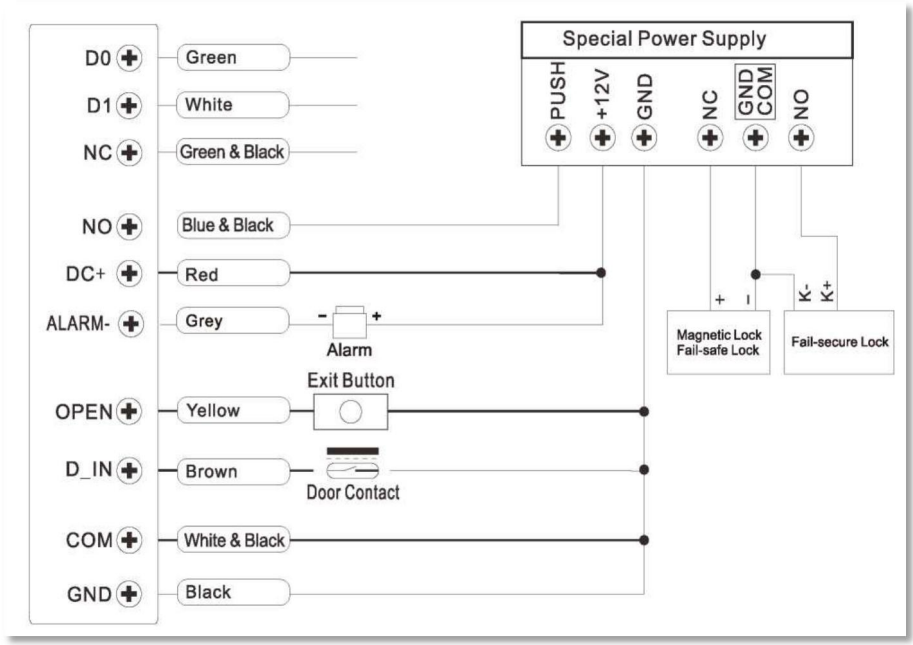
3.1 Connection Diagram Common Power Supply



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)

3.2 Access Control Power Supply



3.3 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 card / PIN in order to track it.
- **User ID number:**
  The Common Card / PIN User ID: 1-9988

Panic User ID: 9989-9990 Visitor User ID: 9991-10000

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: EM card / Mifare card
- **PIN:** Can be any 4~6 digits.

3.4 Add Common Users

(PIN / Card user ID: 1-9988; PIN length: 4~6 digits)

Programming Step	**Keystroke Combination**
1. Enter Program Mode	**ie (Master Code) #**
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) **OR** 2. Add Card: Block Enrollment (Allows Master to add up to 200 cards to the Reader in a single step) Takes 2 minutes to program.	**1 (Read Card)/(Input 8/10/17 Digits Card Number)#** The cards can be added continuously. **1 (User ID) # (Read Card) / (Input 8/10/17 Digits Card Number) #** **1 (User ID) # (Card Quantity) # (The First Card 8/10/17Digits Number) #** Cards' number must be consecutive; Card quantity = number of cards to be enrolled.

Add PIN User	
2. Select Specific ID (Allows manager to define a specific User ID to associate the PIN to)	**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 **(123434) ** or ** (123434)
("*" can be any numbers from 0~9)

3.5 Add Panic Users (Valid for Card/ PIN Users)

(User ID number is 9989,9990 PIN length: 4~6 digits)

Programming Step	**Keystroke Combination**
1. Enter Program Mode	**-k (MasterCode)#**
2. Add Card **OR** 2. Add PIN	**1 (User ID) # (Read Card / Input 8/10 /17Digits Card number)#** **1 (User ID)# (PIN)#**
3. Exit	*

3.6 Add Visitor Users

(User ID number is 9991-10000 PIN length: 4~6 digits)
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 8/10/17 Digits Card Number) #** **1 (UserID)#(0~9)#(PIN)#** **(0~9 means times of usage, 0=10 times)**
3. Exit	*

3.7 Change PIN Users(PIN length: 4~6 digits)

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)#**

3.8 Delete Users

Programming Step	Keystroke Combination
1. Enter Program Mode	**•k (MasterCode)#**
2. Delete User- By **OR** 2. Delete User - By ID number **OR** 2. Delete User - By Card number **OR** 2. Delete ALL Users	 **2(Read Card)#** The users can be deleted continuously **2 (User ID)#** **2 (input** 8/10/17 **Digits Card Number) #** **2 (Master Code)#**
3. Exit	*

3.9 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)30# Sets the relay to ON/OFF Toggle mode

3. Exit	*

3.10 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 Card Access **OR** 2 PIN Access **OR** 2 Multi User Access **OR** 2 Card or PIN Access	**40#** **41#** 4 3 **(2~9)** #(Only after 2~9 valid users, the door be opened) 4 3# (factory default)
3. Exit	*

3.11 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 card/ PIN or Master code/ card.

Programming Step	Keystroke Combination
1. Enter Program Mode	**ie (Master Code) #**
2. Strike-Out OFF **OR** **2. Strike-Out ON** **OR** 2. Strike-Out ON (Alarm) **Set Alarm Time**	**60#** (factorydefault) **61#** Access will be denied for 10 minutes (Exit button is still workable) **62#** 5 (0 ~ 3) # (factory default is 1 minute) Enter Master Code # or Master Card or valid user/ card / PIN to silence
3. Exit	*

3.12 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	*** (MasterCode)#**
2. Disable Door Open Detection **OR** 2. Enable Door Open Detection **Set Alarm Time**	6 3# (factory default) 64# 5 (0 ~ 3) # (factory default is 1 minute)
3. Exit	*

The function of **Set Alarm Time** also apply for anti-tamper alarm

3.13 Set Audible and Visual Response

Programming Step	Keystroke Combination
1. Enter Program Mode	*** (MasterCode)#**
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	70# 71# (factory default) **72#** 7 3# (factory default) **74#** **75#** 76# (factory default) Automatic OFF after 20 seconds, it will go ON by pressing any key (this key isn't taken into consideration)

3. Exit	*

3.14 Master Card Usage

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

3.15 Users Operation & Reset to Factory Default

- **Open the door:** Read valid user card or input valid user PIN #
- **Remove Alarm:** Enter Master Code # or Master Card or valid user 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/ 13.56MHz Mifare card, the LED will turn into red, means reset to factory default successfully. Of the card reading, it is the Master Card.

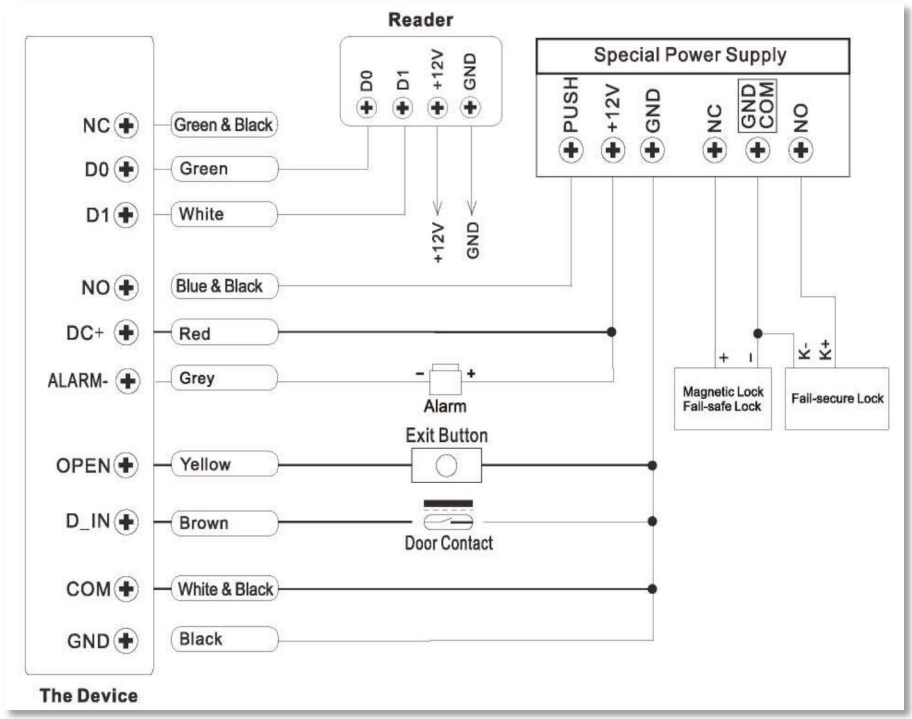
Remarks:

® 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.

4 CONTROLLER MODE

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

4.1 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)

4.2 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	**ie (Master Code) #**
2. Wiegand Input Bit	**For EM Card: 8 (26-44)#** (factory default is 26bits) **For Mifare Card: 8 0 (26-44, 56,58) #** (factory default is 34bits)
3. Disable Parity Bit Enable Parity Bit	**80#** **81#** (factory default)
4. Exit	*

Note: For connecting Wiegand readers with 32,40,56 bits output, need disable parity bits.

4.3 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/Mifare card reader: users can be added / deleted on either the device or external reader.
  -If HID 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: -k (Master Code) #
2 1 (Press Fingerprint A once on SF1) # (ID auto allocated) **OR** 2 1 (User ID) # (Press Fingerprint Aon SF1) # (Select specific ID)	
3	Exit: *

4.4 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	**ie (MasterCode)#**
2. PIN input bits	8 **(4 or 8 or 10)** # (factory default is 4 bits)
3. Exit	*

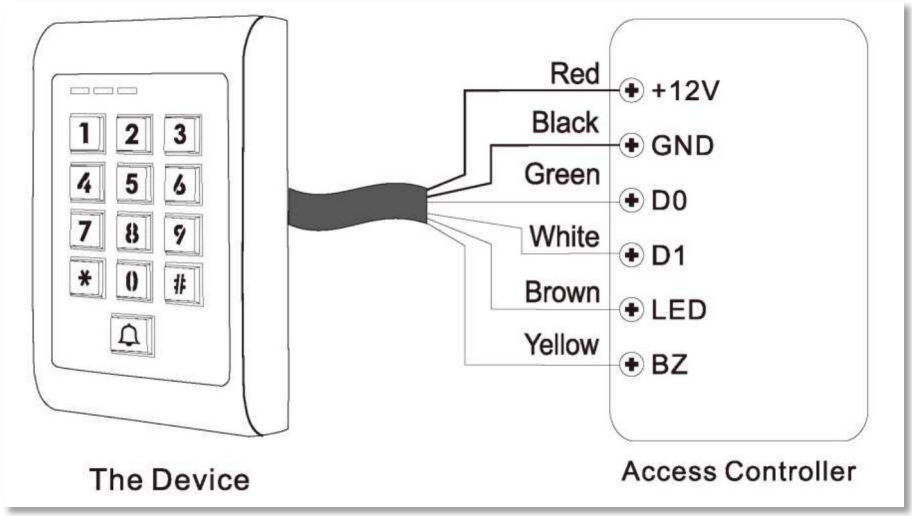
Remarks: 4 means 4 bits, 8 means 8 bits, 10 means 10 digits virtual number.

- **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.

5 WIEGAND READER MODE

The device can work as Standard Wiegand Reader, connected to the third party Controller — 78#

5.1 Connection Diagram



Notes:

- When set into Wiegand Reader mode, nearly all settings in Controller Mode will become invalid, and Brown & Yellow wires will be redefined as below:
- -Brown wire: Green LED light control
  -Yellow wire: Buzzer control

If you need to connect Brown/Yellow wires:

When the input voltage for LED is low, the LED will turn into Green; and when the input voltage for Buzzer is low, it will sound.

5.2 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	*** (MasterCode)#**
2. Wiegand output bits PIN output bits	**For EM Card: 8 (26-44)#** (factory default is 26bits) **For Mifare Card: 8 0 (26-44, 56, 58) #** (factory default is 34bits) 8 **(4 or 8 or 10) #** (factory default is 4 bits)
3. Disable Parity Bit Enable Parity Bit	**80#** **81#** (factory default)
4. Exit	

Note: For connecting Wiegand controller with 32,40,56 bits input, need disable parity bits.

6 ADVANCED APPLICATION

6.1 Collection Card Mode

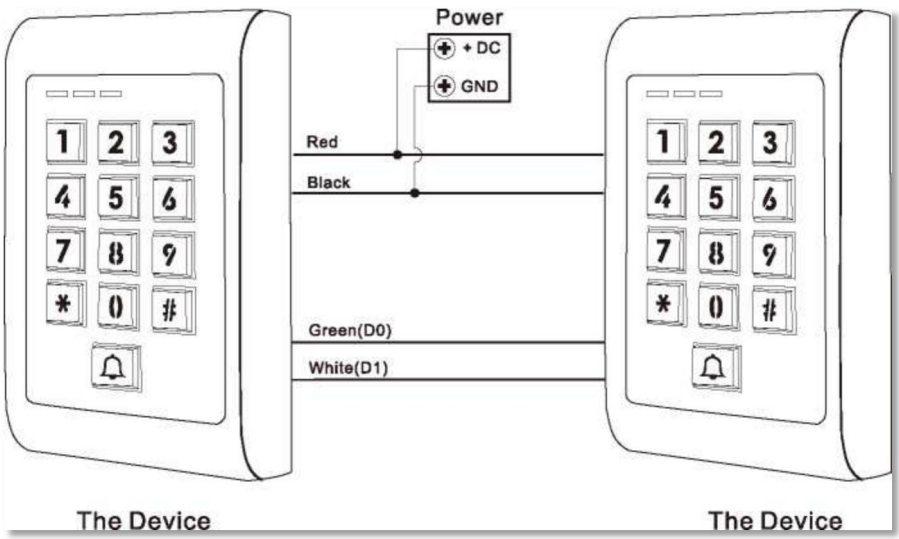
After this mode is turned on, all cards can open the lock. At the same time, the card is added to the device.

Programming Step	Keystroke Combination
1. Enter Program Mode	**ie (MasterCode)#**
2. Collection Card Mode OFF **OR** 2. Collection Card Mode ON	**9 2# (factorydefault) 93#**

3. Exit	*

6.2 User Information Transfer

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).



Remarks:

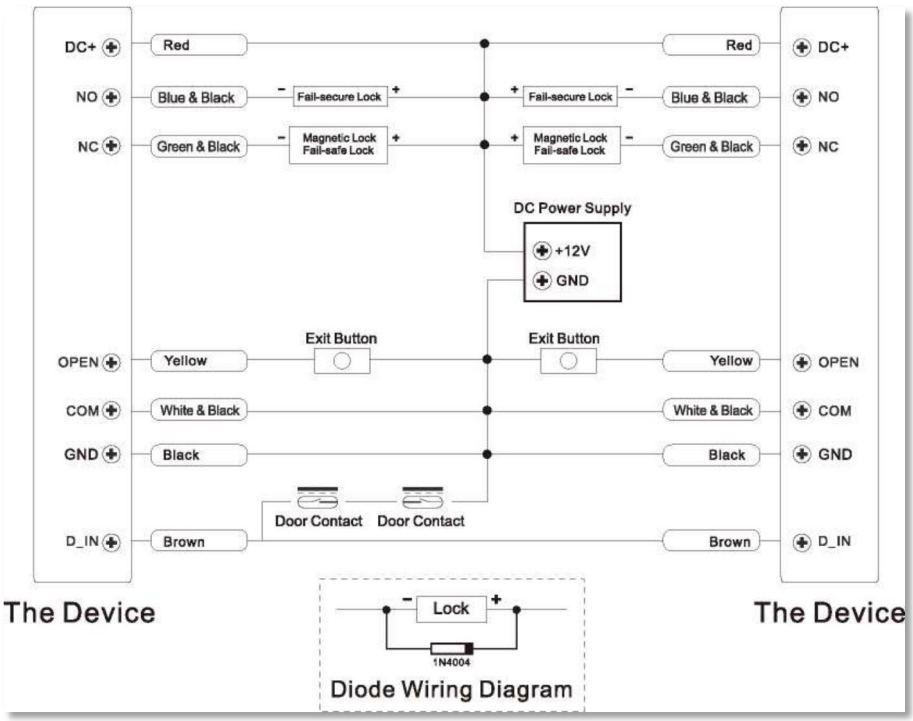
- The Master units and Accept units must be same series devices.
- The Master Code of the Master Unit and the Accept Unit must be set to the same.
- Program the transfer operation on Master Unit only.
- If the Accept Unit is already with the users enrolled, it will be covered after transferring.
- For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

6.3 Set Transferring on Master Unit:

Programming Step	Keystroke Combination
1. Enter the programming mode	**ic (MasterCode)#**
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	*

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.



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

Let’s name the two Devices as “A “and “B” for two doors “1” and “2”

Step 1:

Enroll the users on Device A, then transfer the users' information to Device B by "User Information Transfer" funciton.

Step 2:

Set both of the two Devices (A and B) to Interlock function

Programming Step	**Keystroke Combination**
1. Enter Program Mode	*** (MasterCode)#**
2. Disable Interlock **OR** 2. Enable Interlock	**9 0# (factorydefault) 91#**

3. Exit	*****

If enable interlock, when and only door 2 is closed, the user can read the valid fingerprint/card or input PIN on Reader A, door 1 will open; then when and only door 1 closed,read valid fingerprint/card or input PIN on Reader B, door 2 will open.

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 PIN User	**1 (User ID)-PIN-#** (The PIN is any 4~6 digits)
Delete User	**2-Read Card-# 2-User ID-#**
Exit from the Programming Mode	*
How to release the door	
Card User	Read Card
PIN User	Input PIN#

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