User Manual

KR900 Series

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English

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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 **KR900 Series**.

All figures displayed are for illustration purposes only. Figures in this manual may not be exactly consistent with the actual products.
Features and parameters with ★ are not available in all devices.

Document Conventions

Conventions used in this manual are listed below:

GUI Conventions

For Device	
Convention	**Description**
< >	Button or key names for devices. For example, press <OK>.
[ ]	Window names, menu items, data table, and field names are inside square brackets. For example, pop up the [New User] window.
/	Multi-level menus are separated by forwarding slashes. For example, [File/Create/Folder].

Symbols

Convention	Description
	This represents a note that needs to pay more attention to.
	The general information which helps in performing the operations faster.
	The information which is significant.
	Care taken to avoid danger or mistakes.
	The statement or event that warns of something or that serves as a cautionary example.

Table of Contents

1   Overview

KR900 series is a high-security RFID reader, that supports 125kHz and 13.56MHz cards. This series features tamper-proof alarm functionality and offer two communication modes: Wiegand only or Wiegand & RS485. The RS485 communication protocol supports ZK-RS485, making it compatible with ZKTeco access control standalone devices and controllers. Also, Wiegand communication protocols also enable integration with third-party access control devices.

Available in six models, each reader offers distinct features including optional physical keypads and flexible authentication methods. All models support ID cards at 125kHz and IC cards at 13.56MHz, with a verification speed under 0.3 seconds and recognition distance of up to 4cm. They also feature a tamper switch, indicators, and an audio buzzer.

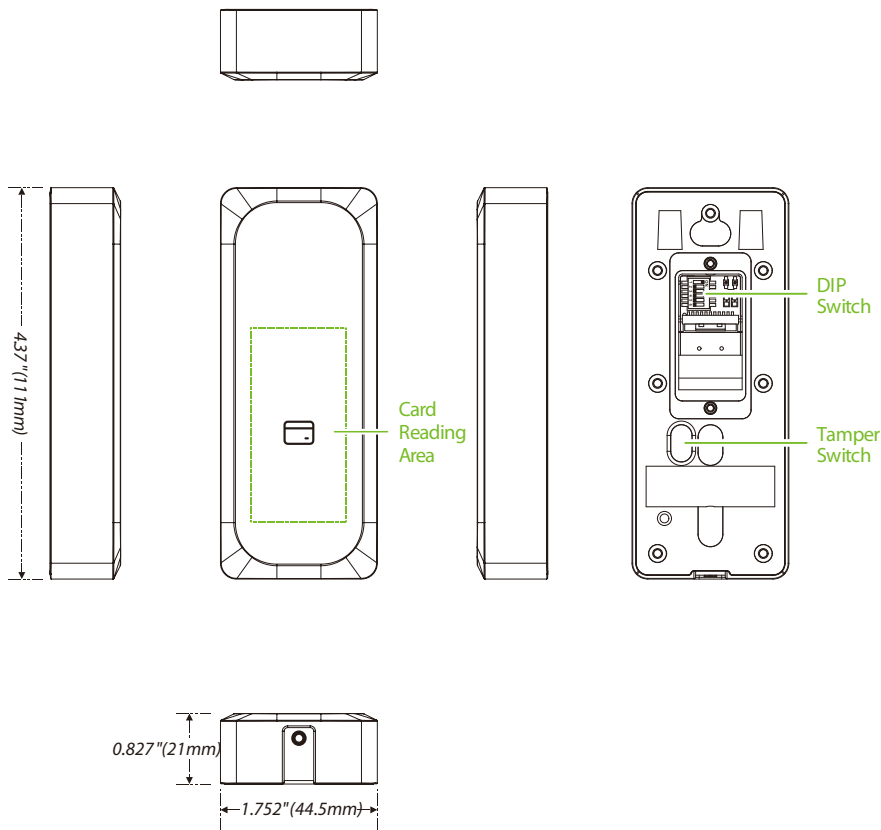**The KR900 series installation is compatible with:**
- Mullion mount (KR901, KR902).
- Single gang and European gang box (KR901S, KR902S with back box).
- Asian gang box (KR903, KR904).
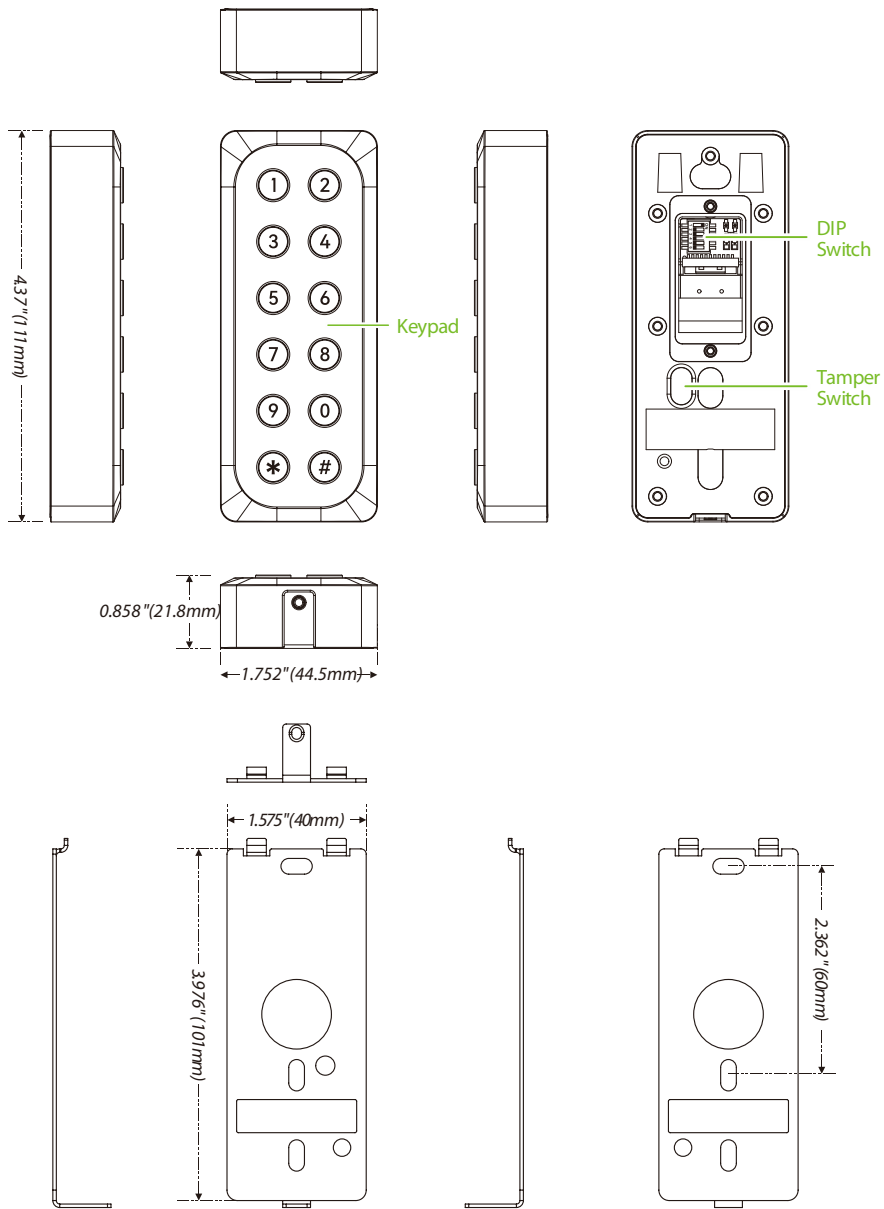- Flat surface mount (all models).

1.1 Features

- Support multi-frequency 125kHz ID card and 13.56MHz IC card, including DESFire EV1 / EV2 / EV3 and NTAG.
- Two communication options: Wiegand only or Wiegand + RS485 (ZK-RS485).
- Tamper detection and alarm.
- Multiple authentication methods: card or card with PIN code.
- Achieved IP65 protection rating with dustproof and waterproof.
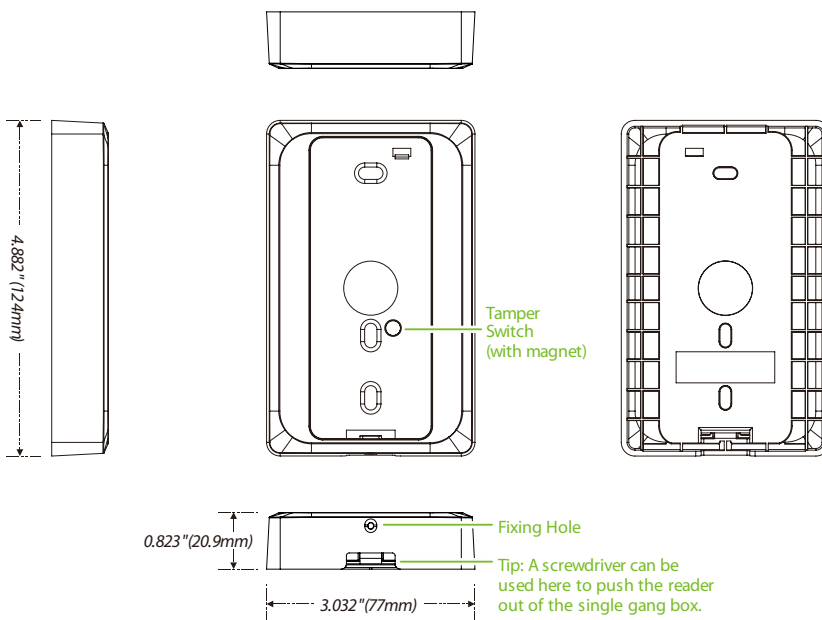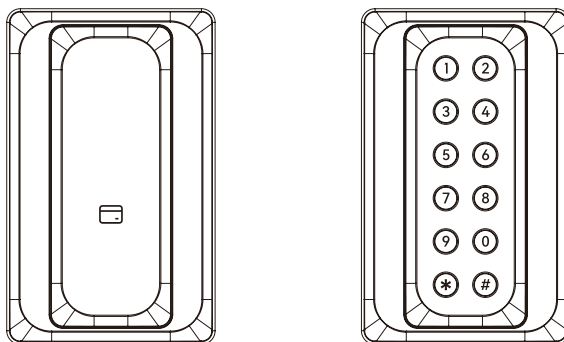
1.2 Appearance

KR901

- Card Reading Area
- DIP Switch
- Tamper Switch

4.37"(111mm)

0.827"(21mm)

1.752"(44.5mm)

KR902

Keypad

DIP Switch

Tamper Switch

4.37"(111mm)

0.858"(21.8mm)

1.752"(44.5mm)

1.575"(40mm)

3.976"(101mm)

2.362"(60mm)

Single Gang Box Compatible (Wall-Mounted)

4.882"(124mm)

Tamper
Switch
(with magnet)

0.823"(20.9mm)

Fixing Hole

Tip: A screwdriver can be
used here to push the reader
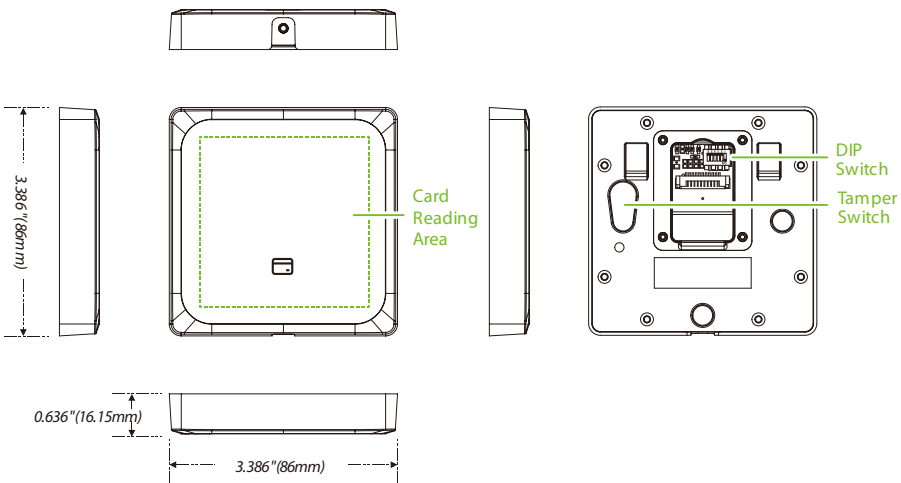out of the single gang box.

3.032"(77mm)

The result after installation is shown below:

Note:*This single gang box is only compatible with KR901 and KR902.*

KR903

3.386"(86mm)
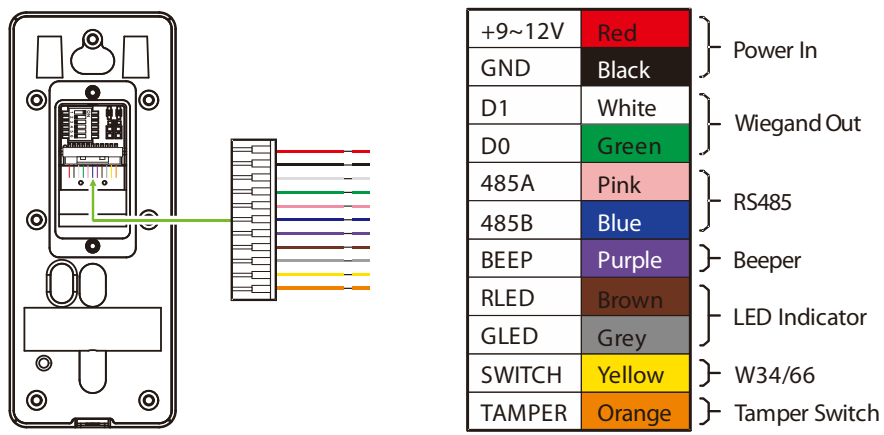
Card Reading Area

DIP Switch

Tamper Switch

0.636"(16.15mm)

3.386"(86mm)

KR904

3.386"(86mm)

Keypad

DIP Switch

Tamper Switch

0.636"(16.15mm)

3.386"(86mm)

P a g e |11

3.15"(80mm)

2.953"(75mm)

Suitable for Asian gang box mounting

2.362"(60mm)

2.362"(60mm)
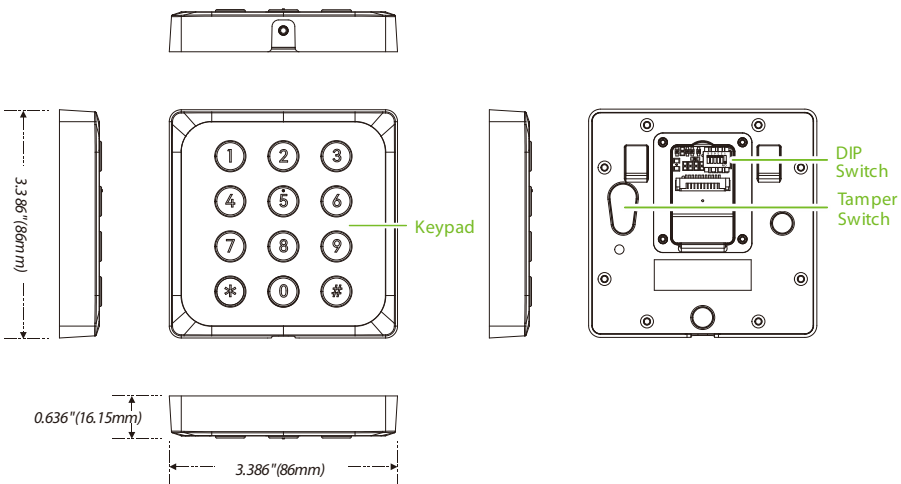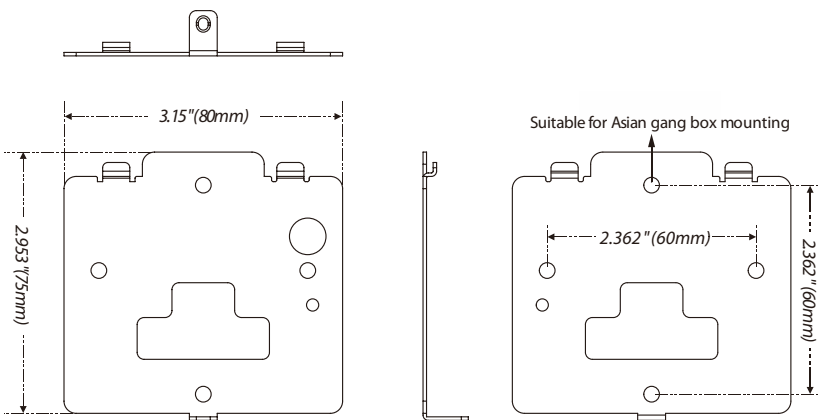
1.3 Technical Specifications

Model	KR901	KR901S	KR902	KR902S	KR903	KR904
Hardware	Physical Keypad: N/A RFID Module: ID & IC Tamper Switch: Support	Physical Keypad: N/A RFID Module: ID & IC Tamper Switch: Support	Physical Keypad: 12keys RFID Module: ID & IC Tamper Switch: Support	Physical Keypad: 12keys RFID Module: ID & IC Tamper Switch: Support	Physical Keypad: N/A RFID Module: ID & IC Tamper Switch: Support	Physical Keypad: 12keys RFID Module: ID & IC Tamper Switch: Support
Authentication Method	Card	Card	Card / Password	Card / Password	Card	Card / Password
Card Type	ID Card@125kHz & IC Card@13.56MHz (Standard)					
Verification Speed	＜0.3s @ Card					
Recognition Distance	＜4cm @ Card					
Communication	Wiegand output only (W34 / 66) Or RS485 (ZK-RS485) & Wiegand output (W34 / 66) Note: Support Wiegand format switching (Default: W34)					

Visual Indicator	LED Indicators Power On:Blue = Standby Status: Green = Verification successful Red = Verification failed					
Audio Indicator	Buzzer					
Tamper Switch	Support					
Operating Environment	Indoor/Outdoor					
Power Supply	9V~12V DC					
Operating Temperature	-20°C to 60°C					
Operating Humidity	10%-90% RH (Non-condensing)					
Dimensions (L*W*H)	111*44.5*21mm	124*77*20.9mm	111*44.5*21.8mm	124*77*20.9mm	86*86*16.15mm	86*86*16.15mm
Gross Weight	0.16Kg	0.19Kg	0.16Kg	0.19Kg	0.17Kg	0.17Kg
Net Weight	0.13Kg	0.16Kg	0.13Kg	0.16Kg	0.14Kg	0.14Kg
Installation	Compatible with mullion mount or flat surface mounting	Wall-mount (Compatible with Single gang box / European gang box) or flat surface mounting	Compatible with mullion mount or any flat surface mounting	Wall-mount (Compatible with Single gang box / European gang box) or flat surface mounting	Wall-mount (Compatible with Asian gang box) or flat surface mounting	Wall-mount (Compatible with Asian gang box) or flat surface mounting
Housing Material	ABS Plastic					
Ingress Protection Rating	IP65 (water & dust proof)					
Certifications	ISO9001,ISO14001,CE,FCC,RoHS					
Factory ID	AC03-KR91H-01	AC03-KR91H-01	AC03-KR92H-01	AC03-KR92H-01	AC03-KR93H-01	AC03-KR94H-01

2 Terminal Description

+9~12V	Red	} Power In
GND	Black	
D1	White	} Wiegand Out
D0	Green	
485A	Pink	} RS485
485B	Blue	
BEEP	Purple	} Beeper
RLED	Brown	} LED Indicator
GLED	Grey	
SWITCH	Yellow	} W34/66
TAMPER	Orange	} Tamper Switch

Name	Interface	Colour	Description
Power In	+9~12V	Red	+9~12V DC Input ***Note:*** *Minimum AC adapter:* **12V, 0.5A**, *Recommended AC adapter:* **12V, 1A**.
	GND	Black	
Wiegand Out	D1	White	Wiegand Output1
	D0	Green	Wiegand Output0
RS485	485A	Pink	RS-485 Communication Interface
	485B	Blue	
Beeper	BEEP	Purple	Beep Input

Name	Interface	Colour	Description
LED Indicator	RLED	Brown	Red LED Input
	GLED	Grey	Green LED Input
W34/66	SWITCH	Yellow	Used to switch the Wiegand format. The default ungrounded is W34. Grounded to W66.
TAMPER	TAMPER	Orange	Used for the tampering alarm function. *Note:* *RS485 tamper alarm, compatible with the latest controllers* ***C3 Plus, inBio Pro Plus****, and* ***EC16*** *elevator control, Wiegand tamper alarm compatible with* ***EC16****.* ***Cancel Alarm:*** *The tamper alarm is deactivated after a magnet is placed for 5 seconds.*

3   Installation Set-up

The device supports a variety of installation methods, the user can be freely selected according to the actual needs.

3.1 Install On The Wall Via The Backplate

1.   Drill holes in the wall at suitable locations according to the holes in the backplate.
2.   Fix the backplate on the wall with the wall mounting screws.
3.   Pass the cable through the wiring hole, and then snap the device onto the backplate from top to bottom.
4.   *Fasten the device to the backplate with a security screw.*
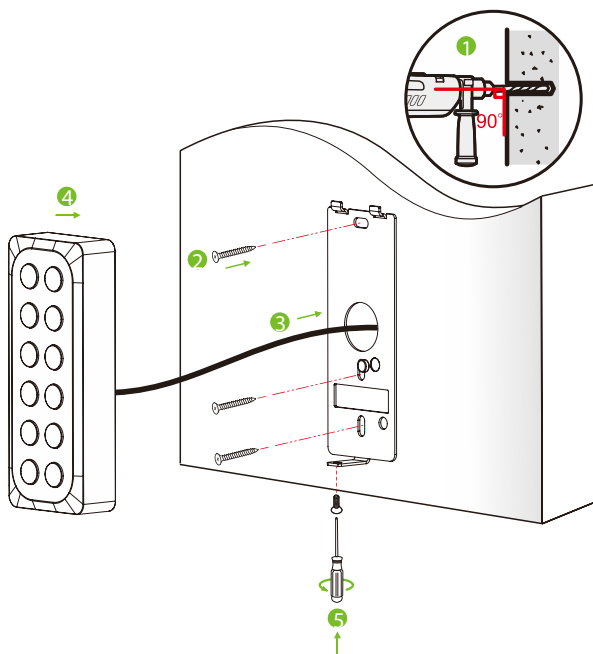
Note:

- *The installation method of KR901, KR903, and KR904 are the same as that of KR902. Only KR902 is used as an example, and will not be repeated here again.*

3.2 Install On The Wall Via Single Gang Box Compatible (Wall-Mounted)

1. Drill holes in the wall at suitable locations according to the holes in the single gang box.
2. Fix the single gang box on the wall with the wall mounting screws.
3. Pass the cable through the wiring hole and push the device into the single gang box.
4. Fasten the device to the single gang box with a security screw.
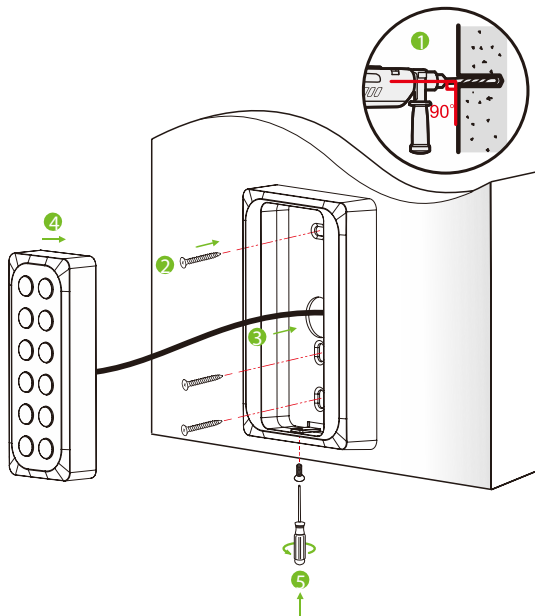
Note: *This installation is for KR901 and KR902 only.*

4   Communication Methods

The KR900 series can communicate with the control panel via either RS-485 or Wiegand.

4.1 Wiegand Mode

Connect the reader to the controller via Wiegand as follows and then connect the +12V power supply. The controller shown in the diagram is only partially wired. The Wiegand wiring reference is shown below:

1. Wiegand format is W34 (default):   2. Wiegand format is W66:
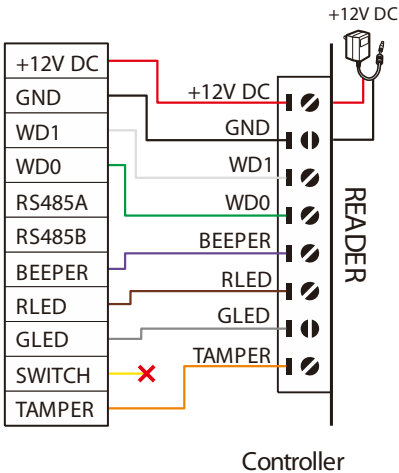
Controller   Controller
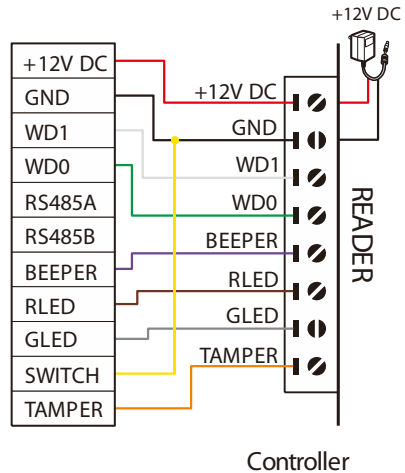
Notes:

- *The default Wiegand format is W34. It can be switched to W66 when supporting IC cards.*

- *The format can be switched via the terminal SWITCH. By default, it is W34 when SWITCH is not grounded, and it becomes W66 when SWITCH is grounded.*

- *Controller models that support reader connection via Wiegand are: C3 Plus, inBio Pro Plus and EC16 Elevator Controller.*

- *The Wiegand tamper alarm is only compatible with the latest EC16 controller. Other models, such as the C3 Plus and InBio Pro Plus, do not support this function.*
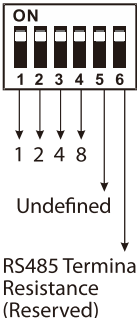
4.2 RS-485 Mode
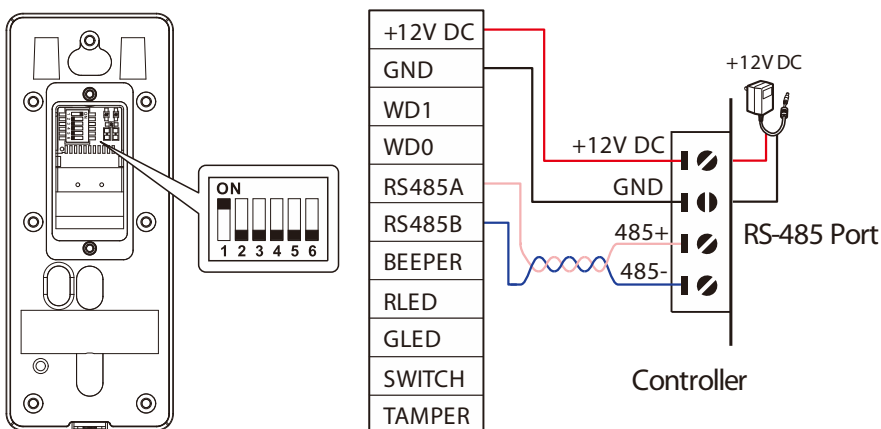
Notes:

- *The RS-485 address of each reader is set via the DIP switch before power is applied.*

- *Each controller supports up to **16** readers.*

- *Each reader requires a separate power supply.*

- *RS485 communication supports the following two protocols:*
  Encrypted and unencrypted versions of the ZK485 protocol.

- *Controller models that support reader connection via RS-485 are: C3 Plus, inBio Pro Plus and EC16 Elevator Controller.*

4.2.1 DIP Switch Setting

Description	RS485 Address	DIP Switch	RS485 Address	DIP Switch	RS485 Address	DIP Switch
	1		6		11	
	2		7		12	
	3		8		13	
	4		9		14	
	5		10		15	

ON
1 2 3 4 5 6

1 2 4 8

Undefined

RS485 Terminal Resistance (Reserved)

4.2.2 Status Indicator & Buzzer

After the RS485 (ZK485) communication is successfully connected, the status of the status indicator and buzzer are shown in the table below.

Working Status	Description
Standby Mode	Breathing blue light, with one breath cycle every 2 seconds.
Card Detected	The buzzer beeps once briefly, and the blue light turns on.
Received the verification result	• **Successful verification:** the buzzer beeps once and the indicator light (green) lights up. • **Failed verification:** buzzer beeps twice, indicator

	light (red) lights up briefly twice.
	• **Authentication mode error:** red light, two quick beeps and one long beep.
	• **No authority:** the buzzer short beep four times, the indicator (red) short light four times.
	• **Combination of validation to continue validation:** indicator (red) short three times.
	• **Combination verification is not completed:** buzzer short beep four times (timeout time is 10s), indicator (red) short light four times.
	• **Verification timeout:** the buzzer sounds three times (timeout is 8s), and the indicator (red) lights up three times.
Standby status light when RS485 is not connected	Breathing blue light, with one breath cycle every 4 seconds. *Note: The RS485 protocol standby status lamp is determined by the master.*
When the tamper alarm is triggered	The buzzer sounds long, the standby status light remains unchanged. *Note: The tamper alarm will be canceled and the beeping will stop after the tamper button (magnet) is held in place for **5** seconds.*

Note:

Under Wiegand mode or RS485 protocol, the verification result status indicator is determined by the master controller.

5   Verification Methods

5.1 Card Verification

Applicable models: KR901, KR903

ID Card Verification:

- Supports reading card numbers by swiping ID cards.

IC Card Verification:

- Supports 4-byte cards: IC (MIFARE Ultralight, MIFARE Classic, MIFARE Classic EV1).
  Note: *When connected to the controller side (e.g., C3 Plus Series or InBio Pro Plus Series): RS485 communication and Wiegand 34-bit output the card number in decimal format, which is the reverse hexadecimal order of the 4-byte card.*

- Supports 7-byte cards: IC (MIFARE DESFire EV1/EV2/EV3) -- Outputs the full-byte UID card number.
  Note: *When connected to the controller side (e.g., C3 Plus Series or InBio Pro Plus Series): RS485 communication and Wiegand 66-bit output the full 7-byte card number in decimal format in the correct order. Wiegand 34-bit outputs the card number in decimal format, which is the reverse hexadecimal order of bytes 4, 5, 6, and 7.*

5.2 Password Verification

Applicable models: KR902, KR904

The ***** key is the delete key. The **#** key is the confirmation key.
The reader supports 1~8 digit password verification.

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