

User Manual

Walk Through Metal Detector

ZK-D1090

Date: July 2025

Doc Version: 1.0

English

Thank you for choosing our product. Please read the instructions carefully before operation. Follow these instructions to ensure that the product is functioning properly. The images shown in this manual are for illustrative purposes only.



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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 the ZK-D1090 Walk-through Metal Detector.

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

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1 Overview

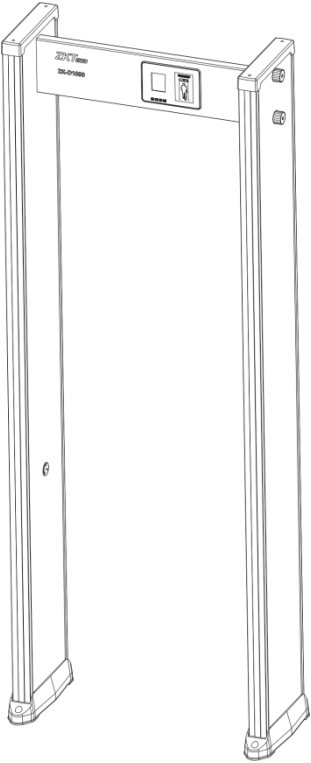
1.1 Introduction

ZK-D1090 metal-detector is a walk-through metal-detector that is used for security screening at access points in the prisons, courthouses, and train stations. Metal-detectors are highly sensitive to magnetic metals and have a high detection capability, with less ability to detect non-magnetic metals. They are used to detect the concealed metal weapons on a person's body. It offers high-speed detection capability. It can detect large metal objects like knives and guns. Its screening capacity is very large when compared to hand-held metal detectors.

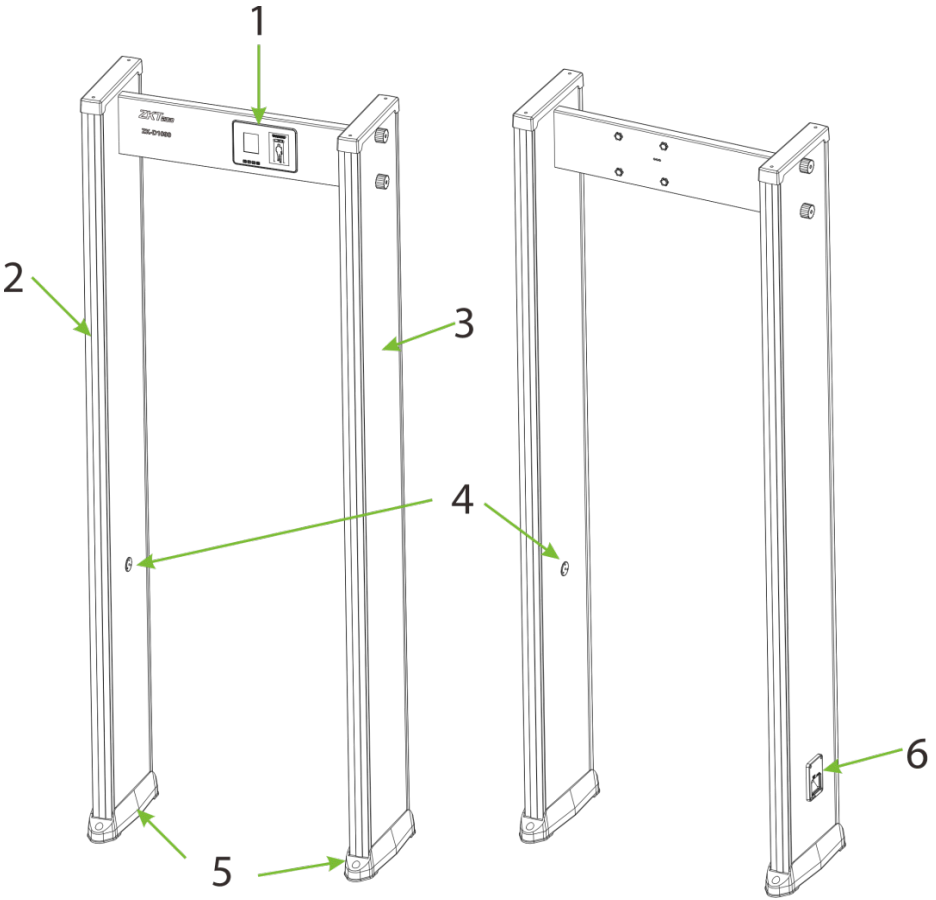
Feature

- Up to 9 detection zones and 500 sensitivity levels allow precise contraband detection.
- Accurate detection of a wide range of contrabands.
- Clear threat indication with synchronous sound alert and LED indicator.
- Displays the number of pedestrians passed and alarm count accurately.
- Automatic setting of sensitivity and channel.
- Simple installation and use.

1.2 Appearance



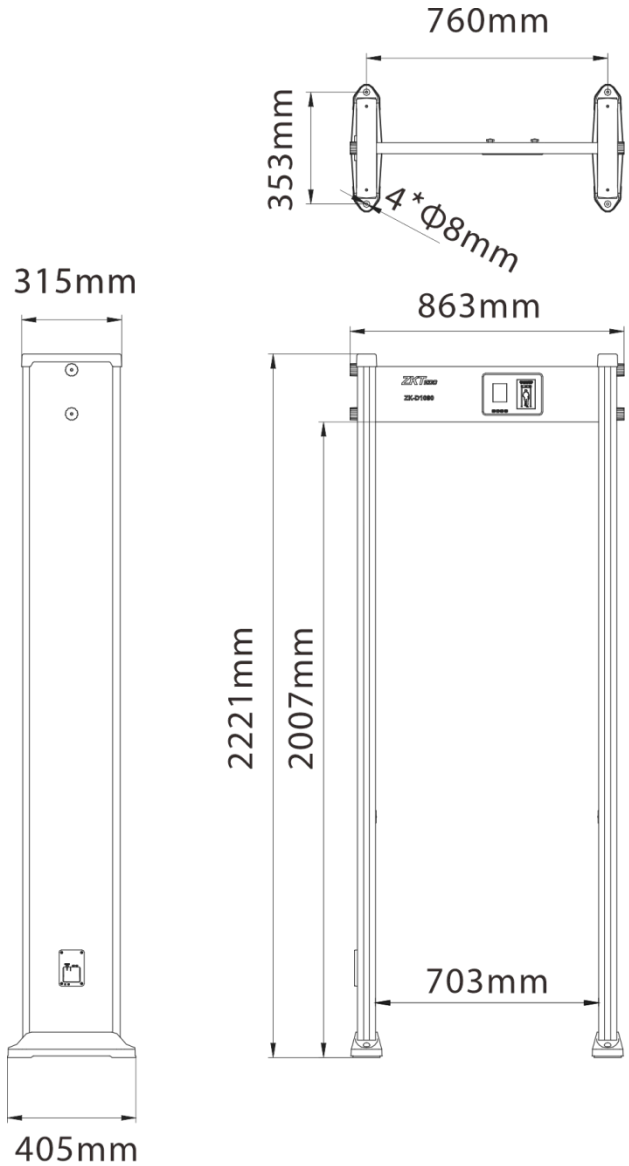
1.3 Components



1. Beam	2. LED Alarm Zones	3. Built-in Probe
4. Infrared Sensors	5. Foot Cover	6. Power-line Interface

2 Product Specifications

2.1 Dimensions



2.2 Technical Specifications

Display	2.8" TFT Color Screen
Physical Keypad	4 keys
Detection Zone	3/6/9 zones mode adjustable
Sensitivity Level	500
Channel	100
Smallest Metal Objects Detected	Coin-sized Metals 22.25*T1.85 mm (Steel-nickel Alloy)
Maximum Detection Distance	Vertical 20-2000mm
Detection Sound Alert	6 types of alarm tones (adjustable)
	0-6 levels of volume adjustable (Maximum volume 80 dB)
Detection Visual Indicator	2 sets of LEDs (red) are evenly distributed on the left and right door panels LED (Steady red= metal contraband detected)
Throughput	> 40 persons per minute
Self-diagnosis Program	Yes
Detection Mode	Automatic Detection Mode/ Infrared Detection Mode (default)
Number of IR Groups	1

Detected Contraband	Ferrous and non-ferrous metal weapons
Enclosure Material	Flame Retardant ABS Polymer, Medium Density Fiberboard, PVC
Power supply	AC100V to 240V (DC12V/3A)
Input Voltage	DC12V
Operating Current	0.8A
Operating Power	10W
Operating Time (Estimated)	24/7 operation capability (continuous operation)
Operating Frequency	5.7KHz ~ 9.6KHz
Operating temperature	-10°C ~ 45°C
Storage Temperature	-20°C ~ 55°C
Operating Humidity	<95% RH (non-condensing)
Application Environment	Indoor
Dimensions (L*W*H)	2221 * 859 * 405 (mm)
Lane Size (L*W*H)	2007 * 710 * 315 (mm)
Dimensions with Packaging (L*W*H)	2280 * 457 * 280 (mm)
Weight	Gross Weight: 34kg Net Weight: 30kg
Certifications	CE, FCC, ISO9001

3 Installation Setup

3.1 Safety Precautions

- Install the detector in a stable and smooth area. Make sure that the detector is installed firmly in the selected area.
- It can be used for both indoor and outdoor purposes. If used outdoor, cover it with a canopy to protect against rain.
- Before installation, make sure the left and right door panels are placed at the corresponding location. Avoid high temperatures and wet environments.
- Wait for 1 minute for the self-diagnosis of the detector when it starts. Do not touch the detector during a security check to avoid false alarm.
- Install the detector away from radio-frequency devices to avoid interference. Make sure that there is no large metal object or strong magnetic field around the detector for at least 2 meters.
- Do not hit the detector hardly, as it may cause false alarms.
- Do not disassemble the unit without the guidance of a professional technician.
- Each device has a warranty card, with which users can have their devices maintained or repaired free of charge within the warranty period.

3.2 Instructions to Pedestrians

- A line must be drawn at 50cm away from the detector. The pedestrians must pass through the detector one-by-one.
- Pedestrians should line up one-by-one to ensure the smooth operation of the detector.
- Pedestrians should walk at a normal speed. They must not intentionally form a crowd, rush, walk slowly, or crush the door panel.
- Before passing through the metal detector, the pedestrians must remove all the carried metal objects (such as keys, mobile phone, watch, coins, etc.),

and place it on the security chute or a table, and pick it up after the security check.

- If the detector alarms when someone passes through, that means there is/are some metal object(s) hidden in the body. The security guard can use a hand-held metal detector to accurately detect the hidden position according to the alarm zones.

3.3 Installation Site

The following section describes the requirements of the installation environment.

3.3.1 Stationary Metallic Items

The detector must be installed away at 50cm from the stationary metallic items such as aluminum alloy/stainless-steel windows, doors, etc. to prevent false alarms and affecting the sensitivity of the detector.

3.3.2 Portable Metallic Items

The portable metallic objects must be kept away at 2 meters from the detector to avoid false alarms.

3.3.3 Floor Vibration

The installation floor must be flat and fixed to avoid false alarm from the movement of the people walking through the detector.

3.3.4 Electromagnetic Radiation and Interference

Since the detector uses Bilateral receiver technology, the detector must be installed away at a distance of at least 1 meter from the sources of electromagnetic radiation or electromagnetic interference. The parameters that define the distance are determined by the installation environment and the parameters vary for different installation environments.

The sources of electromagnetic radiation and electromagnetic interference are given below:

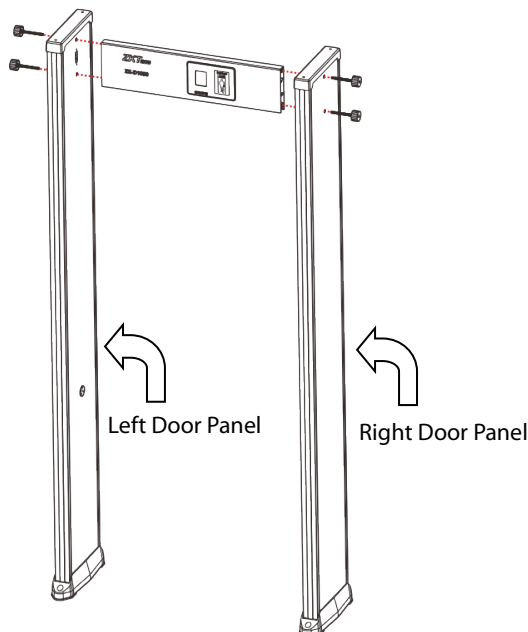
Electrical Control Box, Radiofrequency equipment, Interphone, High Power Motor, Power Transformer, Ac Power Lines, Thyristor Control Circuit (High Power Switching Power Supply, Inverter Welder), Engine, Motor, etc.

3.3.5 Parallel Installation

When two detectors are installed parallel to each other, the distance between two detectors must be greater than 50cm. When three detectors are installed parallel to each other, the distance between each detector must be greater than 80cm. They must operate at a different frequency to avoid interference. The distance varies according to the actual working environment, it is not recommended to mount three detectors in parallel, the frequency can be adjusted according to the environment.

3.4 Installation Steps

Make sure that the device is installed as per the following installation instructions. If you want to open the chassis, you should contact the agent for permission. Otherwise, you will bear any consequence resulting from your actions.



1. Open the Control unit and Door panel package.
2. Install the control unit and the door panels as shown in the above diagram. Connect the door panels to the control unit with bolts and nuts and tighten the screws.
3. Insert the probe-lines of the left and right door panels to the corresponding sockets on the mainboard.
4. Then lift the Walk-through metal detector vertically and place it in the required area.
5. Finally, plug in the power cable to start working.

4 Performance and Technical Features

Accurate Positioning: There are 9 overlapping detection zones with bilateral transmit and receive technology. The detection zones can accurately detect the objects with an intuitive display of the target location.

Adjustable Sensitivity: The detection zones have 500 sensitivity levels (0 to 500). You can preset the metal size, by excluding the false alarm of coins, keys, jewelry, belt buckle, etc.

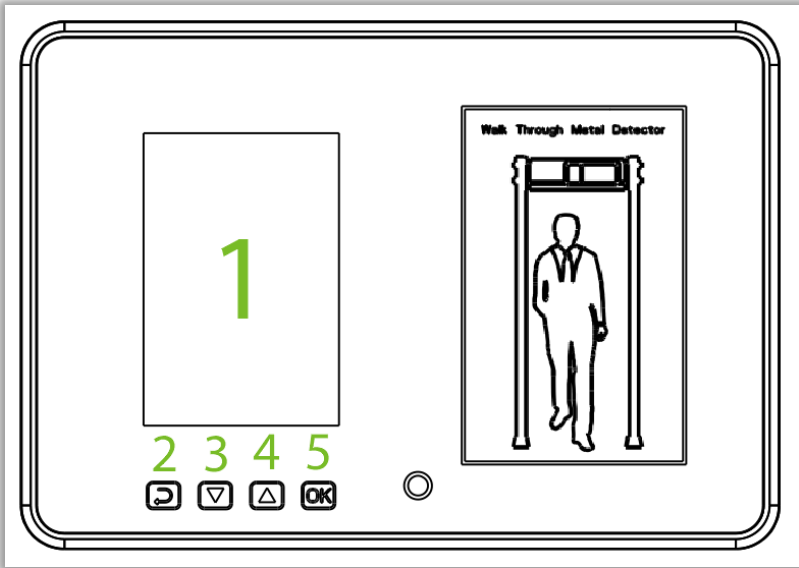
Digital Pulse Technology: Digital signal processing and filtering system in the detector has excellent anti-interference ability.

Count Statistics: The detector displays the number of pedestrians passed and Alarm count accurately.

Harmless: The detector is harmless to heart pacemakers, pregnant women, magnetic floppy disks, recording tapes, etc.

Easy to install: The detector has an integrated design and it can be effortlessly installed or disassembled in 15 minutes.

5 Control Panel



The components of the Control Panel are given below:

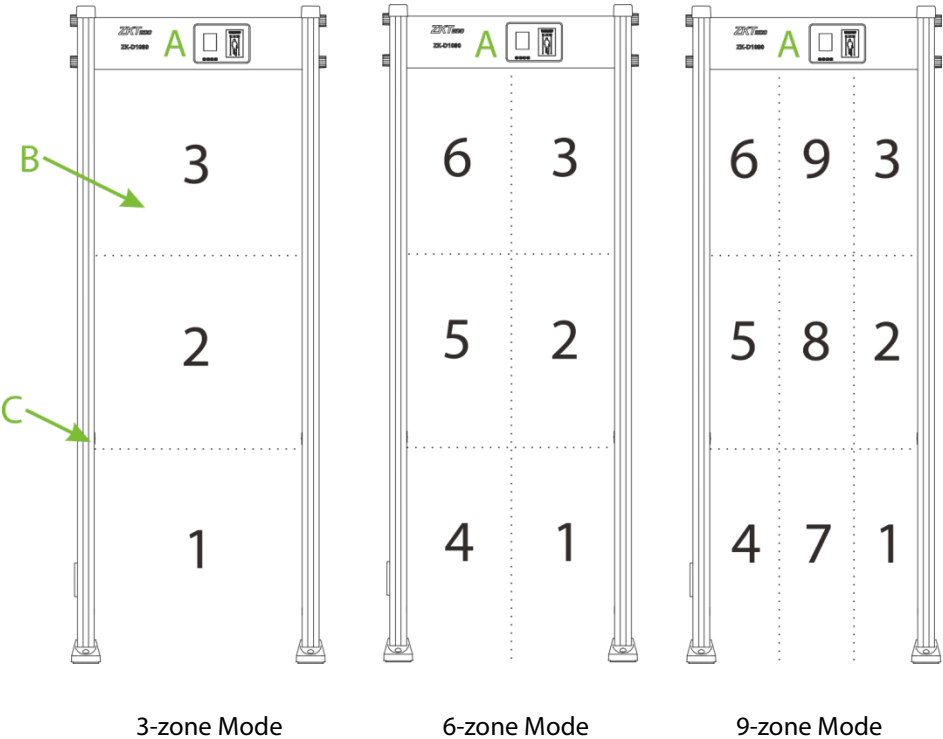
1. **LCD:** Displays the Pass count, Alarm count, Password settings, and other information.
2. **ESC:** Press to discard the settings and exit the menu.
3. ∇ : Adjustment (decrement) key to decrease the parameter values.
4. Δ : Adjustment (increment) key to increase the parameter values.
5. **OK:** Opens the Menu interface, saves the settings, and exits the menu.

6 Detection Zones

The detector can detect a wide range of threat objects/weapons composed of magnetic, non-magnetic metals and alloys.

Chassis Panel: The screen shows the number of people passing the detector and the number of alarms.

Alarm Zones:



There are two unique sets of precise positioning LEDs evenly distributed on the door panels. If the detected metal object reaches or exceeds the preset value, the red LED glows and an alarm will be triggered. If there are multiple alarm targets, the LED of each target location will glow with alarm.

Infrared Sensor

After connecting the power supply, the metal detector starts to work. When there is no person or object passes through the detector, the infrared sensors can effectively stop alarming to avoid false alarms. It also helps to maintain an accurate count of pedestrians and alarms.

6.1 Adjustment of Detection Zone's Sensitivity

1. The device must be in a stable position to achieve the best detection effect (refer [Installation Site](#)). To check whether the device is in a stable state, perform the following steps:
 - a) Power on the detector and check whether it is not shaking after one minute.
 - b) The device should not alarm when the testing person did not carry any metal items while walking through the detector.
2. You can exclude the small portable metal objects such as rings, key, belt buckle, shoes, and so on, by following the steps given below:
 - a) Choose a small metal as a sample. Increase the sensitivity, so that when the testing person carries the sample and pass through the detector, and it would alarm.
 - b) Decrease the sensitivity a little, carry the sample, and pass through the detector again. If it still alarms, once again reduce the sensitivity, until the device does not alarm when the sample is passed through.

Note: If you want to decrease the sensitivity in a certain zone, you must only adjust the sensitivity of the relative zone. After implementing the above adjustments, the metal smaller than the sample will not alarm, but the metal objects bigger than the sample can be detected accurately.

7 Operational Procedure

Connect the power supply to the detector. After 2 seconds of initialization, the following standby interface is displayed.

CH:57	Normal	14:16
PASS		
00454		
ALARM		
00436		

The standby interface displays the following content: Working Channel, Time, Pass count, and Alarm Count.

Press the **OK** button on the Control panel and enter the login password (default:**100000**) to enter the main menu.

Login
Password
* * * * * *

MENU
Sensitivity
Channel
Alarm
Application
RandomAlarm

Record System About
--

7.1 Sensitivity Adjustment

On the main menu, select **Sensitivity** to enter the Sensitivity interface.

Sensitivity
Manual Setting Auto Setting Sens Range

Select **Manual Setting** and press **OK** to set the sensitivity level of each detection zone. Press “▽” and “Δ” to select the detection zone and then press **OK** to confirm. Then press “▽” and “Δ” to change the sensitivity values. The larger the sensitivity value, the higher the sensitivity. Then press **OK** to save the settings.

Sensitivity
Overall: 186 ZoneALL : 469 Zone 6 : 469 Zone 5 : 469 Zone 4 : 469 Zone 3 : 469 Zone 2 : 469 Zone 1 : 469

Note: 7-9 are Virtual zones, which can't be shown in the zone setting as those zone settings are by default.

Select **Auto Setting** and press **OK** to set the sensitivity automatically. It will be set up in a few seconds.

Select **Sens Range** and then press **OK** to set the intensity of the sensitivity levels.

Press “**Δ**” and “**▽**” to select the sensitivity settings for all the zones. Press **OK** to save the settings.

Sens Range
High
Medium
Low

7.2 Channel Settings

In the main menu, select **Channel** to enter the Channel interface.

Channel
Manual Setting
Auto Setting

Select **Manual Setting** and then press **OK**. The channel range is from 1 to 100. The default value is 57. Press “**Δ**” and “**▽**” to set the value and then press **OK** to save the settings.

Channel
001——100

Select **Auto Setting** and press **OK** to set the channel automatically. It will be set up in a few seconds.

7.3 Alarm Settings

In the main menu, select **Alarm** to enter the Alarm interface.

Alarm
Buzzer Alarm Time Tone Volume

Select **Buzzer** and then press **OK** to confirm. Press “**Δ**” and “**▽**” to select whether to turn on or off the buzzer and press **OK** to save the settings.

Buzzer
OFF ON

Select **Alarm Time** and then press **OK** to confirm. The default alarm time is 1 second. Press “**▽**” and “**Δ**” to select the alarm time as per your requirements and press **OK** to save the settings.

Alarm
0.5s 1.0s 1.5s 2.0s ... 10.0s

Select **Tone** and then press **OK** to confirm. Press “**▽**” and “**Δ**” to select the tone and

press **OK** to save the settings.

Tone
1
2
3
4
5
6

Select **Volume** and then press **OK** to confirm. Press “▽” and “△” to set the alarm volume and press **OK** to save the settings.

Volume
1
2
3
4
5
6

7.4 Application Area

In the main menu, select **Application** and then press **OK** to confirm. Press “△” and “▽” to adjust the real-time application area. Press **OK** after setting the application area. (There are a total of 72 applications to choose from.)

Application
Airport
Customs
Port
Prison
Detention
Police Office
Train Station
...
Cartridge Industry

7.5 Random Alarm

In the main menu, select **RandomAlarm** to enter the random alarm setting interface.

Random
Setting
Tone

Select **Setting** and then press **OK** to confirm. Press “▽” and “△” to set the value and press **OK** to save the settings.

Under normal circumstances, the alarm is generated when the amount of metal signal reaches the set sensitivity threshold, while it can pass normally when it is less than the threshold. When a random alarm value is set, there will be a n% probability that a normal pass without alarm will be turned into an alarm, so that it can be checked and confirmed again manually.

Random Alarm
00——50%

Select **Tone** and then press **OK** to confirm. Press “▽” and “△” to select the tone and press **OK** to save the settings.

Tone
1
2
3
4
5
6

7.6 Record

In the main menu, select **Record** to enter the Record interface.

Record
Record Query Storage

Select **Record Query** and then press **OK** to confirm. Press “▽” and “△” to set the start time and end time and press **OK** to search the corresponding records.

Start Time
2025-06-19
00:00
End Time
2025-06-19
23:59

Record Query
Pass:783
ALARM:744
2025-06-19 09:29:09
2025-06-19 09:29:09
2025-06-19 09:50:51
2025-06-19 09:50:51
2025-06-19 09:51:13

Select **Storage** and then press **OK** to confirm. Press “▽” and “△” to select whether to save the data or not. You can also delete the pedestrian count and Alarm count. Press the **OK** to save the settings.

Storage
Save
Don't Save
Clear Pass (Clear Pedestrian Count)
Clear Alarm (Clear Alarm Count)

7.7 System

In the main menu, select **System** to enter the system setting interface.

System
Date & Time
Work Mode
Password
Restore

Select **Date & Time** and then press **OK** to confirm. Press “**Δ**” and “**∇**” to adjust the time then press **OK** to save the changes.

Date & Time
2025-06-19
15:26

Select **Work Mode** and then press **OK** to confirm. Press “**Δ**” and “**∇**” to select the zone mode then press **OK** to save the changes.

WorkMode
Zone 3
Zone 6
Zone 9

Select **Password** and then press **OK** to confirm. Press “**Δ**” and “**∇**” to set the password, and press **ESC** to clear the entered value. Press **OK** to save the settings.

Password
New Password
✖ ✖ ✖ ✖ ✖ ✖

Select **Restore** and then press **OK** to confirm. Press “**Δ**” and “**∇**” to choose whether to restore factory settings. Select "**Yes**" and press **OK** to restore the original factory settings. Select "**Cancel**" or press **ESC** to cancel the operation.

Restore
Cancel
Yes

7.8 About

Show firmware version number.

About
Ver: EN-09-N-1.0.0

7.9 Default Parameters

Parameter	Default Value
Sensitivity	Overall: 186 ZK-D1090: 469
Channel	57
Buzzer	ON
Alarm Time	1.0 s
Application Area	Train Station
Data Saving	Save
System Password	100000

Troubleshooting

What to do if the Sensor could not count?

- a) Check whether the probe cables are connected firmly with the door panels.
- b) Check whether there is any infrared interference beside the device, such as infrared surveillance system, infrared remote control, outdoor sunlight, etc.
- c) If both a and b are OK, replace the infrared sensor.

What to do if the detector gives a false alarm?

- a) If the device gives false alarms frequently after installation, perform the following steps:
 - Firstly, check the installation environment. Make sure there are no movable or stationary large metal objects around 1.5 meters from the detector. If there is any metal object, try to place the device away from the large metal objects.
 - Make sure that the installation location is stable and free from physical movements.
- b) If the false alarm is not caused by the environment, reduce the sensitivity level of all zones.
- c) Change the frequency.
- d) Change the installation location.

Packing List

The package consists of the following items:

No	Component	Quantity
1	Power Adapter	1 set
2	Power Cable	1 set
3	Hexagon Socket Set Screw	8 pcs
4	Inner Hexagon	1 pc
5	User Manual	1 pc
6	Beam	1 set
7	Panel	2 sets

Warranty Card

- 1. Please keep this card safe and produce the same during maintenance.
- 2. This card will be invalid without the signature or stamp of the designated dealer.
- 3. This card will be regarded as invalid if the details are not filled in three guarantees column and the acknowledgment of the receipt. Please confirm whether the data filled in the three guarantees column and acknowledgment of receipt is correct or not when purchasing it, and then hand it over to the dealer.
- 4. This card will not be issued again if it is lost.

Model Number	
ID	
Date of Acquisition	
User	
Post Code	
Address	
User's Phone Number	
Fax	

Date of Maintenance	Record of Maintenance	Technician

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