



# WingX Origin Barrier

## User Manual



# Foreword

## General

This manual introduces the installation, functions and operations of the WingX Origin boom barrier (hereinafter referred to as the "barrier"). Read carefully before using the Barrier, and keep the manual safe for future reference.

## Safety Instructions

The following signal words might appear in the manual.

Signal Words	Meaning
 <b>DANGER</b>	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
 <b>CAUTION</b>	Indicates a potential risk which, if not avoided, could result in property damage, data loss, reductions in performance, or unpredictable results.
 <b>TIPS</b>	Provides methods to help you solve a problem or save time.
 <b>NOTE</b>	Provides additional information as a supplement to the text.

## Revision History

Version	Revision Content	Release Time
V1.0.0	First release.	April 2025

## Privacy Protection Notice

As the device user or data controller, you might collect the personal data of others such as their face, audio, fingerprints, and license plate number. You need to be in compliance with your local privacy protection laws and regulations to protect the legitimate rights and interests of other people by implementing measures which include but are not limited to: Providing clear and visible identification to inform people of the existence of the surveillance area and provide required contact information.

## About the Manual

- The manual is for reference only. Slight differences might be found between the manual and the product.
- We are not liable for losses incurred due to operating the product in ways that are not in compliance with the manual.
- The manual will be updated according to the latest laws and regulations of related jurisdictions. For detailed information, see the paper user's manual, use our CD-ROM, scan the QR code or

visit our official website. The manual is for reference only. Slight differences might be found between the electronic version and the paper version.

- All designs and software are subject to change without prior written notice. Product updates might result in some differences appearing between the actual product and the manual. Please contact customer service for the latest program and supplementary documentation.
- There might be errors in the print or deviations in the description of the functions, operations and technical data. If there is any doubt or dispute, we reserve the right of final explanation.
- Upgrade the reader software or try other mainstream reader software if the manual (in PDF format) cannot be opened.
- All trademarks, registered trademarks and company names in the manual are properties of their respective owners.
- Please visit our website, contact the supplier or customer service if any problems occur while using the Camera.
- If there is any uncertainty or controversy, we reserve the right of final explanation.

# Important Safeguards and Warnings

This section introduces content covering the proper handling of the device, hazard prevention, and prevention of property damage. Read carefully before using the device, and comply with the guidelines when using it.

## Transportation Requirements



- Pack the device with packaging provided by its manufacturer or packaging of the same quality before transporting it.
- Transport the device under allowed humidity and temperature conditions.

## Storage Requirements



Store the device under allowed humidity and temperature conditions.

## Installation Requirements



- Strictly comply with the local electrical safety code and standards. Make sure the ambient voltage is stable and meets the power supply requirements of the device.
- Do not connect the device to two or more kinds of power supplies, to avoid damage to the device.
- Do not perform any operations while powered. Disconnect all power sources before wiring, installation, or disassembly.
- Use the accessories suggested by the manufacturer. Installation and maintenance must be performed by qualified professionals.



- Put the device in a well-ventilated place, and do not block its ventilation.
- Use an adapter or cabinet power supply provided by the manufacturer.
- A safety circuit breaker is designed on the connector of the Device to cut the power of the Device. Make sure the breaker can be easily operated during installation.

## Operation Requirements



- Do not operate the Barrier in wind conditions of Force 6 or higher, including typhoons. It is recommended to remove the barrier arm.
- Do not use the product in environments with strong electromagnetic interference, such as near large motor equipment or around radio transmission towers. If interference occurs, try adjusting

the product's position or contact the manufacturer to replace with components of a different frequency band.

- Use the device under allowed humidity and temperature conditions.
- Use the device within the power supply requirements specified for the equipment.
- Make sure that the power supply is correct before use.
- Ensure that the device is properly grounded before connecting the power.
- Do not touch exposed terminals or components after the device is powered on to prevent electric shock.
- Do not vibrate, squeeze or immerse the device in liquid during transportation, storage or installation.
- When the barrier is in operation, do not place any objects on the barrier arm and do not stand under the barrier arm to prevent injury from being struck.
- We recommend you use the device with a lightning protection device for stronger protection against lightning. For outdoor scenarios, strictly comply with the lightning protection regulations.

## Maintenance Requirements



- The power supply for the Barrier should be connected according to the *User's Manual*. The control board in the terminal box will have non-safe voltages when powered on. Do not plug or unplug RS-232, RS-485, or other cables while the system is powered. Additionally, do not touch any components while the Barrier is in operation.
- When the Barrier is in motion, do not open the cabinet door or cover to prevent accidental personal injury.
- The internal wiring of the device is completed at the factory. Under normal circumstances, do not make any changes.

## Low-Power Short-Range Device Declaration



- The device complies with the technical requirements for Class H general low-power devices, and is intended for radar applications. It uses an integrated antenna. For control, switching, and other information, refer to the User's Manual.
- Do not alter the usage scenarios or conditions, expand the transmission frequency range, or increase the transmission power (including the installation of additional RF power amplifiers). Do not modify the transmission antenna.
- The device must be able to withstand interference from industrial, scientific, and medical (ISM) applications and other legitimate radio stations.
- The device must not cause harmful interference to other legitimate radio stations and cannot claim protection from such interference.
- If the device causes harmful interference to other legitimate radio stations, use must be immediately stopped, and measures must be taken to eliminate the interference before resuming use.
- Comply with electromagnetic protection regulations and relevant industry standards when using the device in aircraft, radio astronomical observatories, meteorological radar stations, satellite earth stations (including control, ranging, reception, and navigation stations), and other defense and civilian radio stations, as well as in airport electromagnetic protection zones.
- Use of model remote controllers is prohibited within a 5000-meter radius of the center point of airport runways.

- The temperature and voltage conditions for the low-power section are the same as those for the device.

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# 1 Device Overview

## 1.1 Device Introduction

The barrier is an access control device used to manage vehicle entrance and exit on roadways. It can be controlled by various methods, such as parking management systems, ANPR (Automatic Number Plate Recognition) cameras, remote controls or buttons.

Due to its characteristics, the barrier is widely used in entrance and exit scenarios of parking lots, hotels, schools, residential areas and enterprises.

## 1.2 Features

- Made from 1.5 mm thick high-quality cold-rolled steel, the casing is treated with phosphating and powder coating to enhance corrosion resistance.
- Equipped with a 24 VDC permanent magnet synchronous motor and a springless design for stable operation.
- Supports automatic arm length adaptation, adjusting parameters upon each power-up.
- Supports quick left-right-oriented change.
- Supports automatic arm raising in case of power failure.
- Supports speed adjustment of arm raising and lowering.
- Supports adjustment of limit opening/closing positions.
- Supports external radar, loop detectors, and IR anti-drop functionality, with an integrated 12 V 1 A power supply for external radar power.
- Supports rebound on obstruction. The arm will automatically rebound if it encounters an obstacle during lowering.
- Supports remote control for opening and closing the Barrier, with a maximum range of 50 meters (in open conditions).
- Supports one-touch always-open mode; holding the open button for 4 seconds enters always-open mode, and pressing the close button exits it.
- Supports counting mode. The Barrier will automatically close after the number of vehicles passing matches the number of open signals.
- Supports delayed closing, with adjustable delay time and closing speed.

## 2 Device Structure

### 2.1 Device Appearance

Figure 2-1 Telescopic straight arm barrier (right-oriented and telescopic arm)

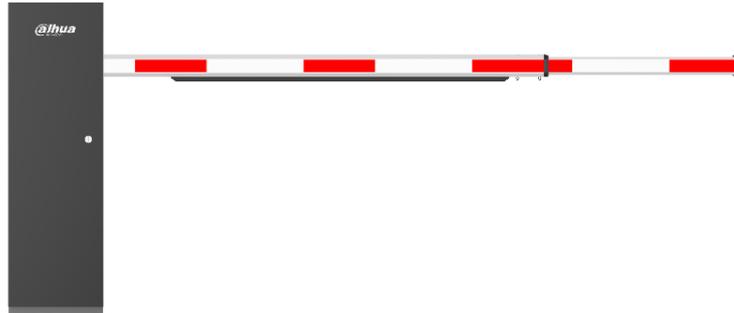


Figure 2-2 Telescopic straight arm barrier (right-oriented and straight arm)

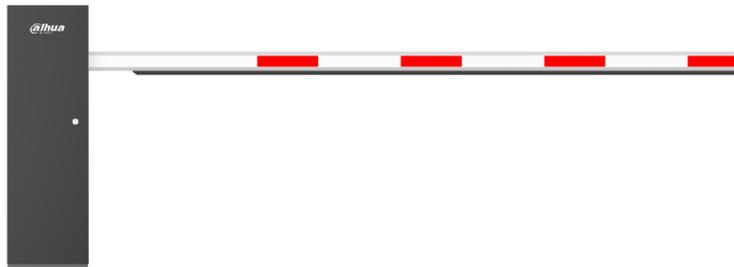
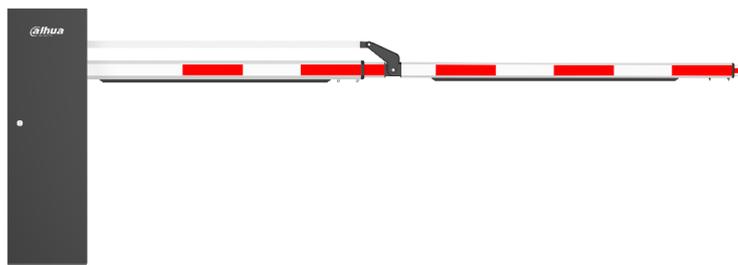


Figure 2-3 Folding arm barrier (right-oriented)



## 2.2 Structure

Figure 2-4 Structure

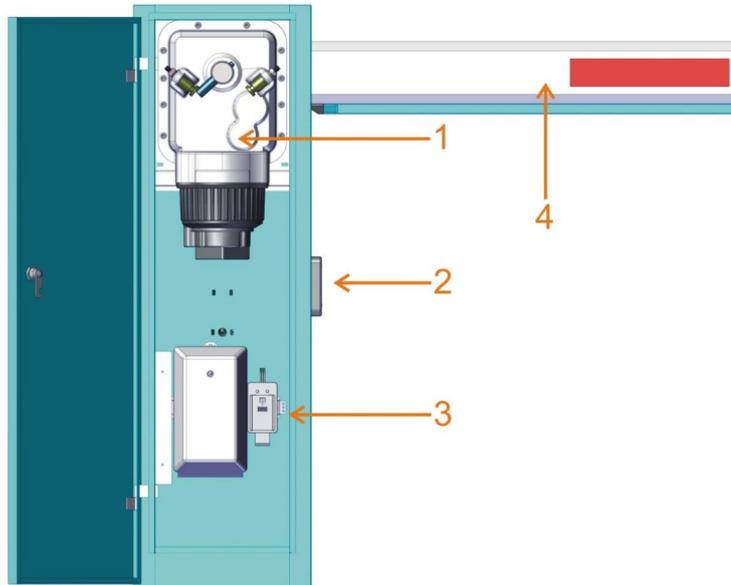


Table 2-1 Overall structure description

No.	Name	Description
1	Mechanism assembly	The main component of the transmission mechanism.
2	Anti-smash radar	Detects the presence of vehicles to prevent smashing and to automatically close the gate after a vehicle passes.
3	Controller assembly	Includes the controller, power supply, and electronic clutch control unit.
4	Barrier arm	Can be replaced with different styles of barrier arms as needed.

Figure 2-5 Mechanism structure

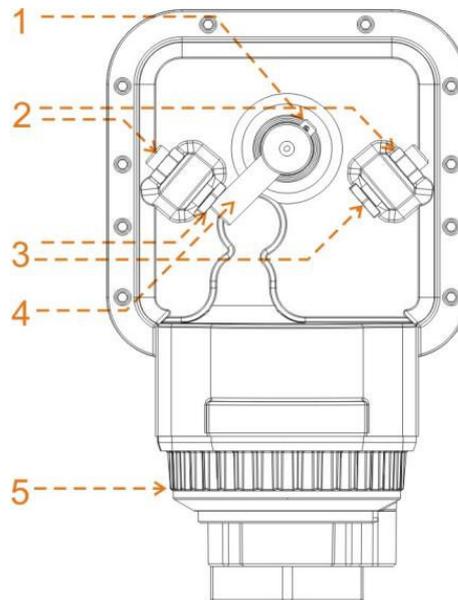


Table 2-2 Mechanism structure

No.	Name	Description
1	Cotter pin	Used to secure the limit pressure rod.
2	Locking nut	Used to lock the mechanical limit adjustment bolt.
3	Mechanical limit adjustment bolt	Used to adjust the mechanical limit positions for the open and close directions separately.
4	Limit pressure rod	Forms a rigid connection with the rod clamp, used for mechanical limiting.
5	Motor	Source of power.

## 3 Device Installation

This section introduces basic requirements for selecting and constructing the foundation. For details on installing the barrier, see the construction guide.

### 3.1 Installation Requirements

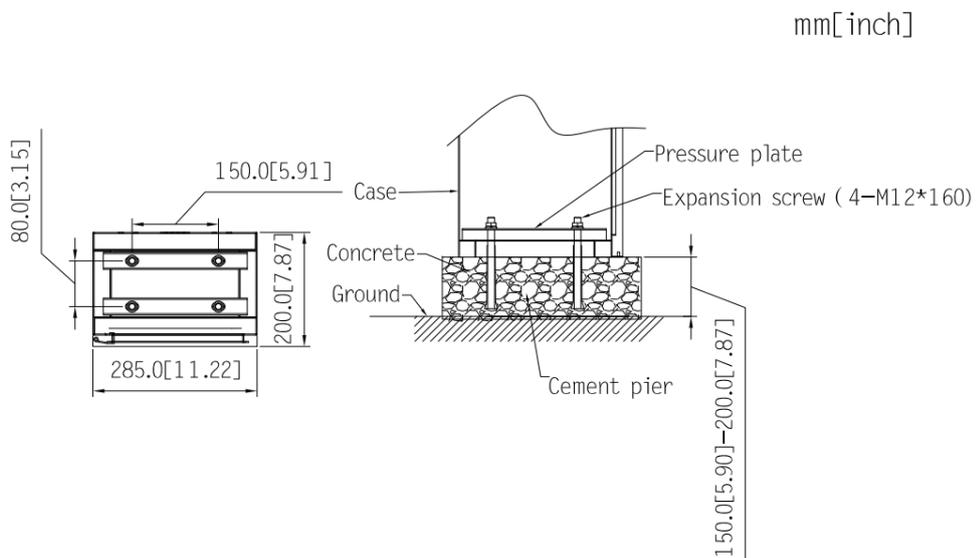
- The location should be prominent, with the barrier arm facing outward (towards the intersection), and the bottom of the Barrier should be flush with the road surface.
- The installation location must provide sufficient space for the barrier arm to swing.
- Construct the foundation according to the site conditions. If the ground is already concrete, use the provided expansion bolts to secure the casing directly. For non-concrete surfaces, a cast-in-place foundation is required, with a height of 150 mm to 200 mm above the ground. Heights outside this range can significantly affect radar detection accuracy.
- Pre-bury the cables, with the conduit extending 50 mm above the ground to prevent water from entering and causing a short circuit.
- Before installation, select the location and device type according to the installation guide.

### 3.2 Installing the Casing

#### Procedure

- Step 1    Unpack the packing box and remove the accessories.
- Step 2    Mark the installation position of the barrier and use a screwdriver to outline the 4 expansion bolt holes on the ground. The installation position should meet the requirements shown in the following figure to facilitate installing the pressure plate and fixing the casing.
- Step 3    Drill the expansion bolt holes with a drill bit, with a diameter of  $\Phi 16$  mm and a depth of 110 mm to 120 mm. Insert the expansion bolts, ensuring that the bolts protrude from the ground by at least 100 mm. Adjust the horizontal and vertical positions of the casing and tighten the nuts.

Figure 3-1 Installation diagram



### 3.3 Install the Barrier Arm

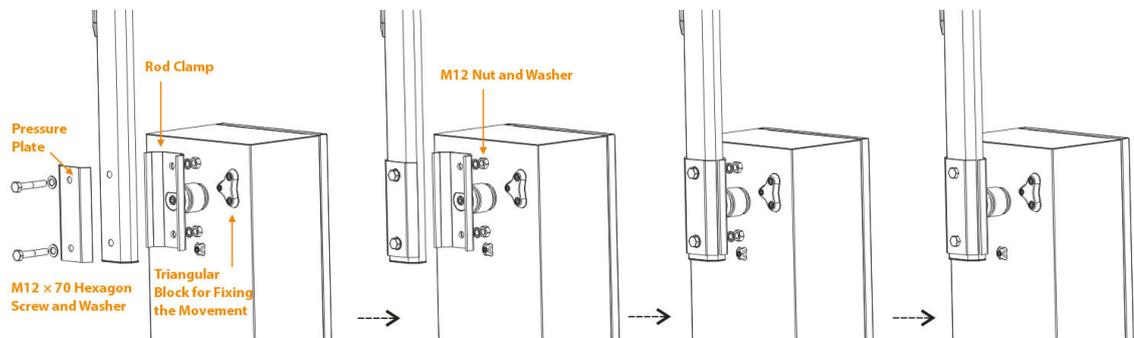


The installation diagram is for reference only. Refer to the actual device for details.

#### 3.3.1 Installing the Straight Arm

- Step 1** Use 2 M12 × 70 hexagon screws and washers to pass through the fixing holes of the pressure plate and the arm.
- Step 2** Hold the pressure plate, and raise the arm vertically next to the rod clamp.
- Step 3** Sequentially install the flat washer, spring washer, and M12 nut onto the bolt.
- Step 4** Secure the bolt with an open-end wrench.

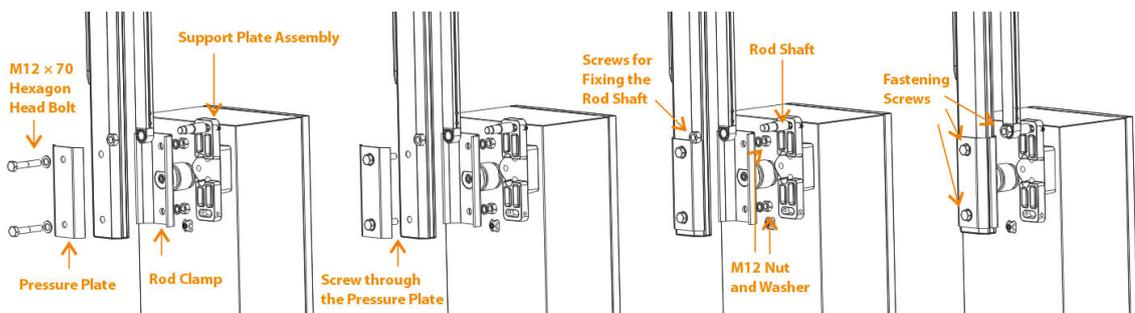
Figure 3-2 Install the straight arm



#### 3.3.2 Installing the Folding Arm

- Step 1** Use the support plate assembly to replace the triangular block to secure the mechanism, and install the arm shaft onto the support plate assembly, fastening it with screws.
- Step 2** Use 2 M12 × 70 hexagon head bolts to pass through the fixing holes of the pressure plate and the arm.
- Step 3** Hold the pressure plate, and raise the arm vertically next to the rod clamp.
- Step 4** Sequentially install the flat washer, spring washer, and M12 nut onto the bolt, and secure the bolt with an open-end wrench.
- Step 5** Fit the arm end bearing onto the arm shaft, and secure it with a nut.

Figure 3-3 Install the folding arm



### 3.4 Electrical Wiring



The internal wiring of the device is completed by default when the device is delivered. The device can work after connecting it to the power supply and protective ground wire.

Figure 3-4 Interface diagram of the junction box

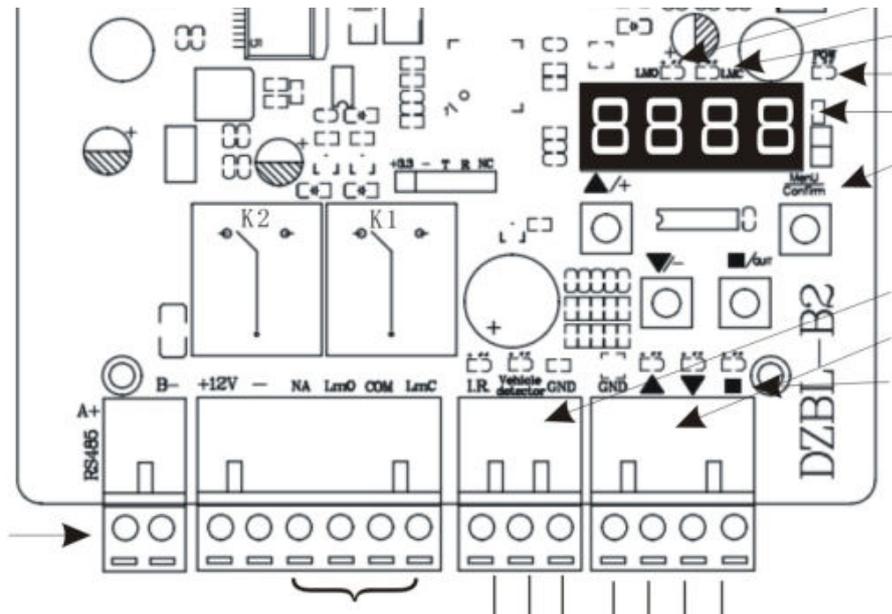


Table 3-1 Description of junction box interface

Interface	Description
RS-485-A/RS-485-B	RS_485 communication interface.
+12/-	12 VDC power supply output.
LmO/COM	Barrier opening signal (when the barrier arm is opened to vertical position, COM and LmO are closed).
LmC/COM	Barrier closed signal (when the barrier arm is closed to horizontal position, COM and LmC are closed).
I.R./GND	IR anti-smashing signal input (when the barrier is closing, the barrier will open when the IR anti-smashing signal is input).
V.D./GND	Radar anti-smashing signal input (when the barrier is closing, the barrier will open when the radar anti-smashing signal is input).
GND/▲	Opening signal input.
GND/▼	Barrier signal input.
GND/■	Stop signal input.

# 4 Extended Function Commissioning

## 4.1 Controller Interface Description

Figure 4-1 Controller electrical wiring diagram

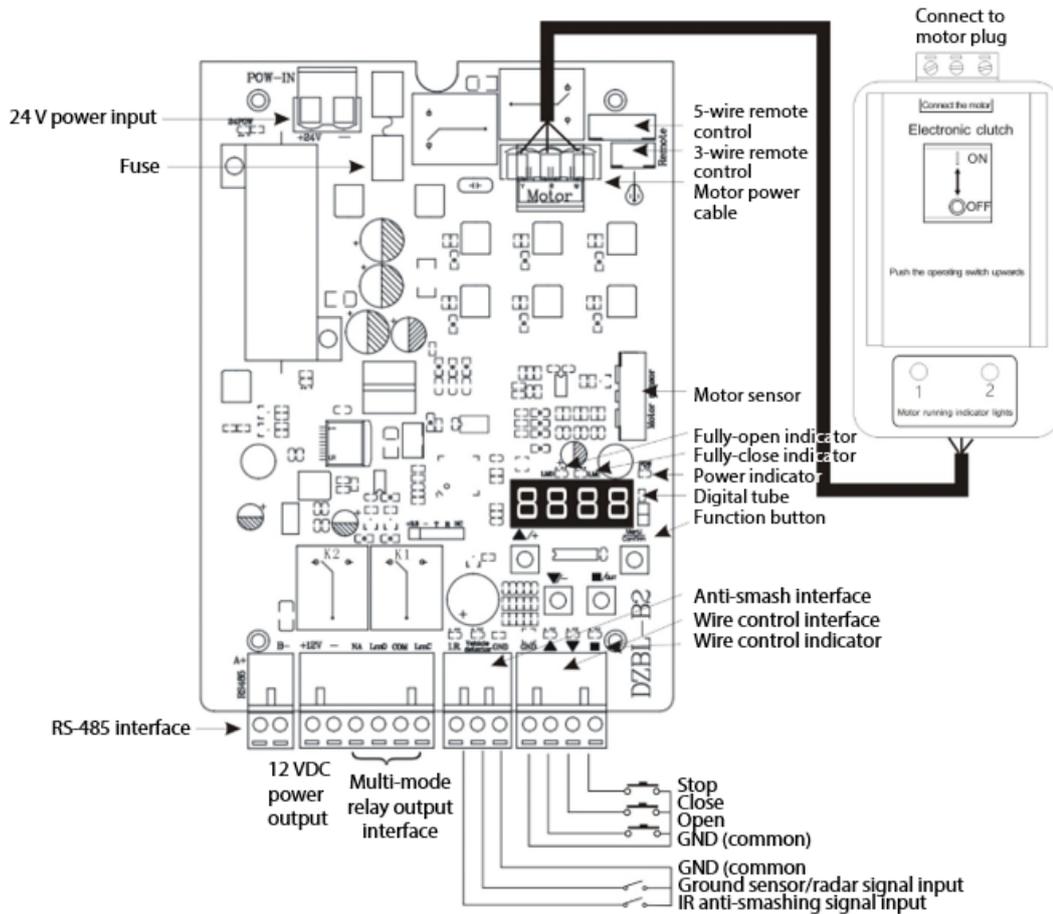


Table 4-1 Controller interface description

Interface/Indicator/ Button	Description
Wire control interface	<ul style="list-style-type: none"> <li>Connects to the parking system and an external key switch to control the barrier.</li> <li>Open the barrier: Short-circuit <b>Open the barrier▲</b> and <b>GND</b>.</li> <li>Barrier: Short-circuit <b>Close the barrier▼</b> and <b>GND</b>.</li> <li>Stop: Short circuit <b>Stop■</b> and <b>GND</b>.</li> </ul>

Interface/Indicator/ Button	Description
Anti-smash interface	<ul style="list-style-type: none"> <li>● IR anti-smashing: During the closing process, the barrier will respond to opening when <b>IR</b> and <b>GND</b> are short-circuited. After it is fully opened, the barrier will automatically close after <b>IR</b> and <b>GND</b> are disconnected (you can also set the barrier not to close via the H-27 option); in the fully opened status, there will be no response when <b>IR</b> and <b>GND</b> are short-circuited.</li> <li>● Anti-smashing with ground sensor: During the closing process, the barrier will respond to opening when <b>ground sensor</b> and <b>GND</b> are short-circuited. After it is fully opened, the barrier will automatically close after the <b>ground sensor</b> and <b>GND</b> are disconnected. In the fully opened status, the <b>ground sensor</b> and <b>GND</b> are short-circuited, and the barrier will automatically close after they are disconnected.</li> </ul>
Multi-mode relay output interface	<p>The output of the relay can meet different application requirements by setting the output mode. Refer to item H-16 of the advanced settings for details. The default limit signal output is as follows:</p> <ul style="list-style-type: none"> <li>● When the barrier is fully opened, COM and LmO are closed.</li> <li>● When the barrier is fully closed, COM and LmC are closed.</li> <li>● When the barrier arm is raising or falling, or stops, COM is disconnected from LmC and LmO.</li> </ul>
12 VDC power output	<p>Provides 1 A current output, which can provide power for radar or small light strips.</p>
Indicator	<p>Indicates barrier running status.</p>
Function button	<p>The 4 buttons have 2 working status: normal working status and menu setting status.</p> <ul style="list-style-type: none"> <li>● In normal working status:                         <ul style="list-style-type: none"> <li>◇ ▲/+ is for opening the barrier.</li> <li>◇ ▼/- is for closing the barrier.</li> </ul> </li> </ul> <p style="text-align: center;"><u>Menu</u></p> <ul style="list-style-type: none"> <li>◇ ■/QUIT is for stopping the barrier, and <b>Confirm</b> has no function when pressed shortly under normal working conditions, and when you press and hold it for 2 seconds, it goes to the menu setting status.</li> </ul> <ul style="list-style-type: none"> <li>● In the menu setting status:                         <ul style="list-style-type: none"> <li>◇ ▲/+ and ▼/- are used to adjust menu items or parameters.</li> <li>◇ ■/QUIT is used to cancel the configured value, or exit the menu setting status.</li> </ul> </li> </ul> <p style="text-align: center;"><u>Menu</u></p> <ul style="list-style-type: none"> <li>◇ <b>Confirm</b> is used to enter the next level menu or save the settings.</li> </ul>
Digital tube	<p>Displays information such as the working status, parameters, menu items, and more of the barrier. If no button is pressed, it will enter low power mode after 60 seconds, and the brightness of the digital tube will dim to reduce power consumption. Normal brightness will be restored when a button is pressed.</p>

Interface/Indicator/ Button	Description
Electronic clutch switch	When there is a power outage, turn the switch to $\bigcirc$ to unlock the motor, and you can raise the arm to open the barrier. After raising it, turn the switch to <b>1</b> to lock the motor to prevent the arm from falling. When the barrier is raised and lowered in the power-on status, the motor running indicators 1 and 2 will flash.

## 4.2 Meaning of Information Displayed on Digital Tube

Table 4-2 Description of information

Information	Description
ldLE	The motor sensor is not plugged in or malfunctions, which might be caused by loosen wiring.
STOP	The barrier is fully closed or has stopped.
STOP.	The resistance is great when the barrier is close to the horizontal position.
Lock	Barrier locked, entering the fleet mode.
uPxx	The number of barrier opening memories when the counting function is turned on. xx is the number of times (displayed only when the counting function is turned on).
dExx	Automatically delay closing time. xx represents countdown time (only displayed when delay function is turned on).
Adxx	Software version. xx represents the version number, the larger the value, the higher the version. It is displayed first when power is turned on.
Loxx	When automatic opening of the barrier due to low voltage is set, it will be displayed after the opening is triggered. xx represents the setting value of H-47.
uLxx	Displays the voltage of the current power interface, xx is the voltage value. The built-in 24 V power supply voltage is displayed when the barrier is powered on.
cL.xx	The barrier is being closed or fully closed. xx indicates the source of the barrier closing signal: 2 remote control; 4 ground sensor/radar; 7 wire control closing/main board closing button; 10 delayed automatic closing; 12 IR barrier closing; 15 automatic search for position when the barrier is powered on; 16 RS-485.
oP.xx	The barrier is opening or fully opened. xx indicates the source of the barrier opening signal: 1 remote control; 3 ground sensor/radar; 6 wire control opening/main board opening button; 12 IR anti-smashing; 15 automatic search for position when the barrier is powered on; 16 RS-485.

## 4.3 Controller Parameter Settings

### Menu

Press and hold **Confirm** for 2 seconds to enter the normal menu setting status, and the digital tube will display **F-XX**. Select the menu item by pressing or pressing and holding  $\blacktriangle$ /+ and  $\blacktriangledown$ /- . A

press will add or subtract one, and a press and holding will add or subtract continuously. When **F-**

Menu

**XX** displayed on the digital tube is the parameter that needs to be set, press **Confirm** again to enter the setting of the specified item, and press **■/QUIT** to return to the previous level or exit the

Menu

setting. After completing the setting of the specified parameters, you must press **Confirm** to confirm before it takes effect. Pressing **■/QUIT** will not make the currently defined parameters take effect.

Table 4-3 Command list

Menu	Function	Default	Range	Notes
F-00	Opening speed	40	15-100	The larger the value, the faster the barrier opens.
F-01	Closing speed			The larger the value, the faster the barrier closes.
F-02	Deceleration position of barrier opening	60	10-80	The angle at which the barrier starts to decelerate. Unit: degree.
F-03	Deceleration position of barrier closing	40		
F-04	Low speed operation angle of barrier opening	90	15-90	Starting angle of the last low-speed zone when opening the barrier.
F-05	Low speed operation angle of barrier closing	0	0-75	Starting angle of the last low-speed zone when closing the barrier.
F-06	The speed that barrier opening ends	8	1-50	Barrier opening speed.
F-07	The speed that barrier closing ends	4		Barrier closing speed.
F-08	Horizontal position adjustment	15	1-600+	Fine-tune the horizontal position of the barrier arm. This device is <50.
F-09	Vertical position adjustment	6		Fine-tune the vertical position of the barrier arm. This device is <950.
F-10	Automatic delay closing time	0	0-255	Automatic barrier closing time when no vehicle passes. Unit: seconds.
F-11	Reserved function		0-20	—
F-12				
F-13	Power-on self-learning speed	25	10-80	Find upper and lower limits at this speed.
F-14	Reserved function	0	0	—

Menu	Function	Default	Range	Notes
F-15	Resistance rebound sensitivity	10	1-40	The smaller the value, the more sensitive it is when encountering resistance. The recommended value for this device is $\leq 2$ .

Table 4-4 Explanation of commands

Menu	Function	Description
F-02	Deceleration position of barrier opening	Used to set the position where deceleration starts during the barrier opening process. The fully closed position is $0^\circ$ , and the fully open position is $90^\circ$ . This parameter indicates that deceleration starts when the barrier arm is opened to this angle. Reduce this value if the barrier arm jitters a lot when the barrier is fully opened.
F-03	Deceleration position of barrier closing	Used to set the position where deceleration starts during the barrier closing process. The fully closed position is $0^\circ$ , and the fully opened position is $90^\circ$ . This parameter indicates that deceleration starts when the barrier arm falls to this angle. Increase this value if the barrier arm jitters a lot when the barrier is fully closed.
F-04	Low speed operation angle of barrier opening	Set a low-speed zone during the barrier opening process. When the barrier opening angle reaches the angle defined by F-04, it will run at the F-06 speed until the barrier is fully opened. If the value is 90, it means that the function is invalid. Reduce the value appropriately if the barrier arm jitters a lot when the barrier is fully opened.
F-05	Low speed operation angle of barrier closing	Set a low-speed zone during the barrier closing process. When the barrier is closed to this angle, it will run at the F-07 speed until it is fully closed. If the value is 0, it means that the function is invalid. Increase the value appropriately if the barrier arm jitters a lot when the barrier is fully closed.
F-06	The speed that barrier opening ends	The lowest speed for the barrier to fully open. The barrier will be opened at this speed. If this parameter is set too high, the barrier arm will jitter when the barrier is fully opened.
F-07	The speed that barrier closing ends	The minimum speed for the barrier to fully close. The barrier will be closed at this speed. If this parameter is set too high, the barrier arm will jitter when the barrier is closed.
F-08	Horizontal position adjustment	If the barrier arm is not horizontal when the barrier closed, this parameter can be used for fine-tuning. See the figure at right side for the adjustment method.

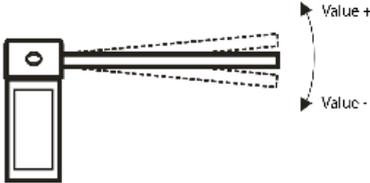
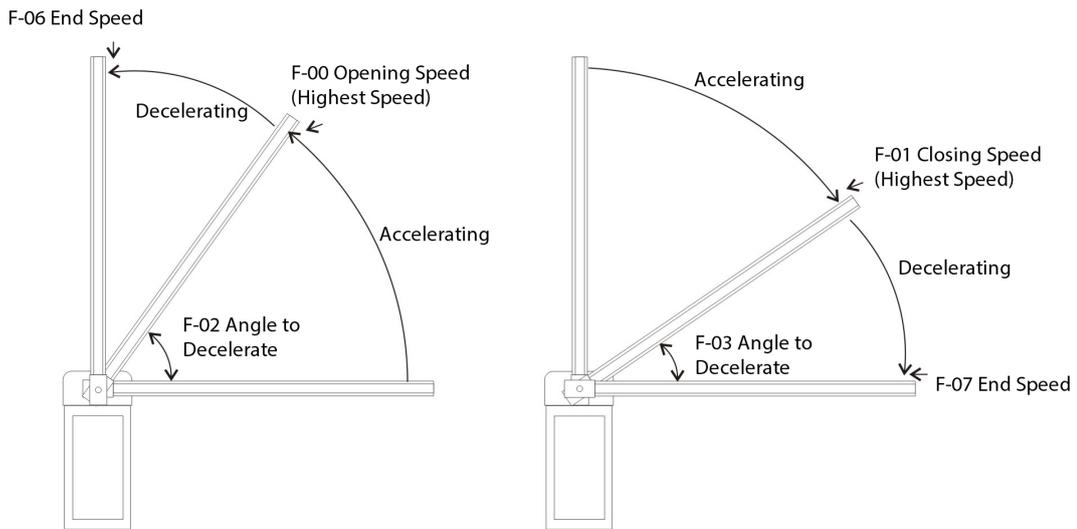
Menu	Function	Description
F-09	Vertical position adjustment	<p>If the barrier arm is not vertical when the barrier is fully opened, this parameter can be used for fine-tuning. See the following figure for the adjustment method.</p> 
F-10	Automatic delay closing time	<p>After the barrier is fully opened, if no vehicle passes within the defined time, it will automatically close. If there is a barrier opening signal during the countdown, the countdown will be restarted. If a barrier closing signal is given, the barrier will be closed immediately. If a stop signal is given, the delay will be paused. Setting it to 0 means turning off this function.</p> 
F-13	Power-on self-learning speed	<p>Set the speed for searching for the mechanical limit stop reference point in the closing direction for the first time when the power is turned on. After entering the setting, set the rebound speed of the arm to return it to the horizontal closed position after finding the stop reference point. The digital tube displays <b>1-XX</b>, and XX represents the rebound speed. You can adjust the speed by pressing ▲ and ▼. The larger the value, the faster the rebound speed. You can select the Default. After setting the rebound speed, press ≡, and the digital tube displays <b>2-XX</b>. Here XX represents the speed for searching for the mechanical limit stop reference point in the closing direction. You can also adjust the speed by pressing ▲ and ▼. The larger the value, the faster the search speed. You can select the Default. After the setting is complete, press ≡ to save the settings. If you press ■ during the setting process, the defined parameters will be invalid.</p>
F-15	Resistance rebound sensitivity	<p>When the barrier meets with resistance, and stops for more than the defined time, the barrier will rebound and open, and the digital tube will display Er.ob. The smaller the value, the higher the sensitivity, and vice versa. The recommended value for the device is <math>\leq 2</math>.</p>

Figure 4-2 Parameters related to opening/closing the barrier



The left figure shows barrier opening, and the right figure shows barrier closing.

How to enter the **Advanced Menu** : Press and hold  $\equiv$  +  $\blacksquare$  for 2 seconds. After entering the **Advanced Menu**, the digital tube will display **H-XX**.



The advanced menu is for professionals only. General users must use it with care. Do not arbitrarily change the menus not listed in the table, because it might cause abnormal operation of the barrier.

Table 4-5 Part of the advanced menu commands

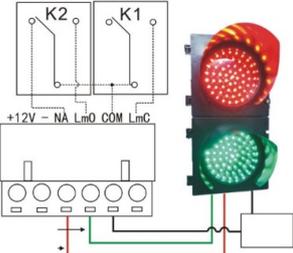
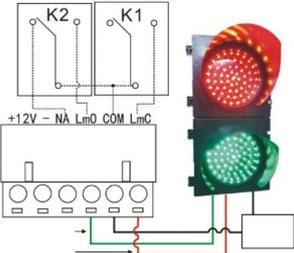
Menu	Function	Default	Range	Notes
H-03	Automatic barrier closing after a delay when a vehicle passes	0	0-255	After the vehicle passes, the barrier arm will automatically fall after a delay. Unit: seconds.
H-05	Motor type and rotation direction	3	0-3	3 for right-oriented, and 2 for left-oriented.
H-07	Counting function	0	0-10	One barrier arm for one vehicle by default.
H-08	Automatic aging test and automatic closing of the switch upon power on	0	0-6	0 is normal operation, 1-5 is the automatic aging test time interval, and 6 is the automatic full closing of the barrier after being powered on.
H-12	Import parameters of different arm types of this movement	0	0-23	The correct usage range of this device is 14-19.

Menu	Function	Default	Range	Notes
H-16	Relay output mode	6	0-9	Applied for different relay applications.
H-27	IR interface anti-smashing mode	1	0-1	<ul style="list-style-type: none"> <li>0- The closing process triggers the IR interface to automatically open the barrier and keep it open.</li> <li>1- The closing process triggers the IR interface to automatically open the barrier, and the barrier will automatically close after the signal disappears (default).</li> </ul>
H-30	Turn off ground sensing angle	10	0-45	Turn off ground sensing after closing the barrier to the defined angle.
H-31	The way of entering the fleet mode by remote control	0	0-4	Select the way of the remote control to enter the fleet mode.
H-38	Ground sensor signal sound	1	0-1	<ul style="list-style-type: none"> <li>0-No sound when ground sensor signal exists.</li> <li>1-There is sound when ground sensor signal exists.</li> </ul>
H-40	Effective time of ground sensing signal	5	1-20	The ground sensing signal is considered valid only if it lasts for more than the defined time.
H-45	Speed of automatic delayed closing	40	15-100	When the F-10 or H-03 value is >0, the closing speed is determined by this value.
H-46	Low voltage automatic opening action time	0	0-50	Unit: 0.1 seconds. 0 means off.
H-47	Low voltage automatic opening threshold	21	15-22	Action voltage. Unit: volt.

Table 4-6 Explanation of advanced menu commands

Menu	Function	Description
H-03	Automatic barrier closing after a delay when a vehicle passes	Range: 0–255 (0 by default). Unit: 1 second. Different from F-10, this delay means that the countdown will not start until the vehicle passes through the ground sensor. If there is a barrier opening signal during the countdown, the countdown will be restarted, and the barrier closing will be executed immediately if a barrier closing signal is given. The delay will pause if a stop signal is given. Setting it to 0 means turning off this function, and the barrier will be closed immediately after the vehicle passes.

Menu	Function	Description
H-05	Motor type and rotation direction	Range: 0–3. This movement only uses 2 and 3 (3 for right-oriented and 2 for left-oriented).
H-07	Counting function	<ul style="list-style-type: none"> <li>● 1: Intelligent counting. When there is no vehicle in the ground sensing/radar area, no matter how many times the barrier opening signal is given, the barrier will automatically close after the vehicle passes. When there is a vehicle in the ground sensing/radar area, if the barrier opening signal is given multiple times, the count remains at 2, and the barrier will automatically close after 2 vehicles pass.</li> <li>● 2–10: The barrier will be closed only when the number of barrier openings and ground sensor relay closings are consistent. The value indicates the maximum number of barrier openings of continuous memory.</li> </ul>
H-08	Automatic aging test and automatic closing of the barrier after being powered on	<ul style="list-style-type: none"> <li>● 0: Normal operation.</li> <li>● 1–5: Automatic aging test time interval. Unit: seconds. Aging test will continue after the barrier is powered off and restarts.</li> <li>● 6: Automatically search for limit position and close the barrier in place after the barrier is powered on.</li> </ul>
H-12	Import parameters of different arm types for this movement	<ul style="list-style-type: none"> <li>● Right-oriented.</li> <li>● Left-oriented.</li> </ul>

Menu	Function	Description
H-16	Relay output mode	<ul style="list-style-type: none"> <li>● 0 Passage light mode. Drives the traffic light board to indicate whether passage is allowed or not allowed. When the barrier is fully opened, COM and LmO are connected, and COM and LmC are disconnected. When the barrier is fully closed, COM and LmO are disconnected, and COM and LmC are connected.</li> <li>● 1 Arm raising alarm mode: When the barrier is fully opened, the relay K2 will be used as an alarm signal output. When the barrier is fully closed, if the arm is manually raised beyond a certain angle, COM and LmO will be connected for 15 seconds as an alarm output. At this time, an external alarm can be connected for alarms.</li> <li>● 2 Ground sensing mode: In this mode, the fully-closing relay K1 is used for signal output, which can be used as a signal for radar ground sensing and other signals that need to detect the opening and closing status of the barrier. When the barrier is opened, COM and LmC are connected, and when it is closed, COM and LmC are disconnected.</li> <li>● 3 Traffic light mode 1. In this mode, the fully-opening position relay K2 is used for traffic light control. When it is fully opened, COM and NA are connected, and when it is fully closed, COM and LmO are connected (that is, the green light turns on immediately when the barrier is raised, and the red light turns on immediately when the barrier is lowered). The wiring diagram is shown in the left of the following figure.</li> </ul> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <ul style="list-style-type: none"> <li>● 4 Traffic light mode 2. When the barrier is fully opened, COM and LmO are connected, and COM and LmC are disconnected. When the barrier just starts to close, COM and LmO are disconnected, and COM and LmC are connected (that is, the green light is on after the barrier is fully opened, and the red light is on during the process of lowering the barrier arm and when the barrier is fully closed). The wiring diagram is shown on the right of the figure above.</li> <li>● 5 Pulse mode. After the barrier is fully closed, COM and LmC are connected for 1 second. It can be used to prevent vehicles from following behind, or as an opening signal for another barrier. During the opening process or in the fully-opened status, COM and LmO are connected to indicate the operation status.</li> <li>● 6 Limit signal output mode. When the barrier is fully opened, COM and LmO are connected, and when the barrier is fully closed, COM and LmC are connected. During the opening and closing processes, and when the barrier stop, COM is disconnected to both LmO and LmC. It can be used for the system to monitor the barrier status.</li> <li>● 7 Pulse mode + remote control opening signal output. After the barrier is fully closed, COM and LmC are connected for 1 second (same as mode 5). When there is a remote control opening signal, COM and LmO are connected for 1.5 seconds, which can be used to read the remote control opening signal.</li> <li>● 8 Synchronous output for opening and closing of the barrier:</li> </ul>

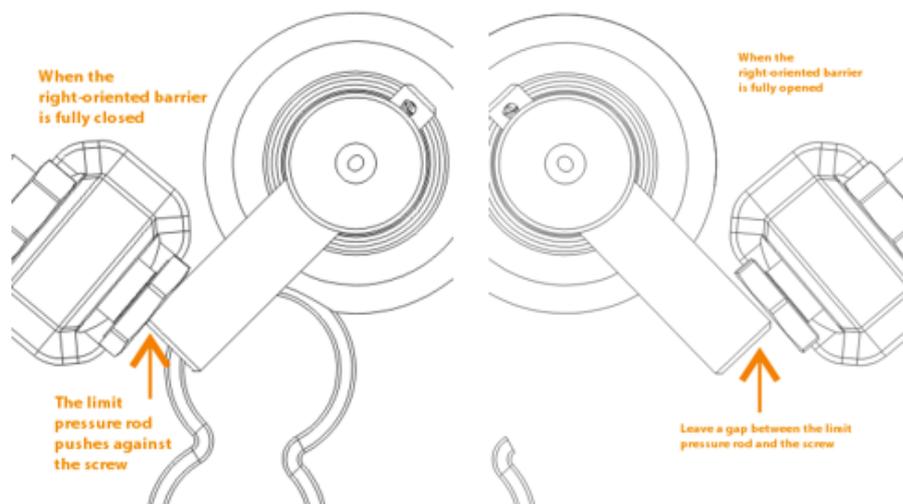
Menu	Function	Description
H-27	IR interface anti-smashing mode	<ul style="list-style-type: none"> <li>● 0: During the closing process, the IR interface is triggered to automatically open the barrier. After the barrier is fully opened, the IR signal disappears but the barrier remains open.</li> <li>● 1: During the closing process, the IR interface is triggered to automatically open the barrier. After the barrier is fully opened, when there is no other external signal, the barrier will automatically close after the IR signal disappears (note: triggering the IR interface in the fully-opened status will not automatically close the barrier).</li> </ul>
H-30	Turn off ground sensing angle	<p>Range: 0–45 (10 by default). Unit: degree.</p> <p>This solves the problem of the ground sensor mistakenly detecting a vehicle when the barrier is closing. You can set the barrier to not detect the ground sensor after it is closed to a specified angle. 0 means that the ground sensor signal is always detected during the closing process.</p>
H-31	The way of entering the fleet mode by remote control	<p>After entering the fleet mode, the digital tube on the main board displays the character "Lock." The barrier will not close automatically when the vehicle passes through the ground sensing area. It needs to be closed by remote control or external closing signal. After closing, the fleet mode will be automatically canceled.</p> <p>Range: 0–1 (0 by default).</p> <p>0. In the fully-opened status, press and hold the "Open" button on the remote control for 4 seconds to enter the fleet mode.</p> <ol style="list-style-type: none"> <li>1. Press Open on the remote control to enter fleet mode directly.</li> <li>2. In the fully-opened status, press Stop on the remote control to enter the fleet mode.</li> <li>3. The remote control never enters the fleet mode.</li> <li>4. Reserved function.</li> </ol>
H-38	Ground sensing signal sound	<p>In the fully-opened status, when the ground sensing signal is valid, the buzzer will beep. When it is set to 0, it will not beep when there is a ground sensing signal; when it is set to 1, it will beep when there is a ground sensing signal. It is 1 by default.</p>
H-40	Effective time of ground sensing signal	<p>Range: 1–20 (5 by default). Unit: 0.02 seconds.</p> <p>During the barrier opening process, or in the fully-opened status, to filter out false triggering signals of short-term ground sensing, the ground sensing signal must last for more than the defined time, and the barrier will automatically close only when the ground sensing signal disappears (that is, the vehicle passes over the ground sensing coil).</p>

Menu	Function	Description
H-45	Speed of automatic delayed closing	Range 15–100 (40 by default). When the F-10 or H-03 is set greater than 0, after the countdown reaches 0, the barrier will automatically close at the speed of this value. The smaller the value, the slower the speed, and vice versa. When the speed value is too small, and the barrier meets with resistance and rebounds, the value can be appropriately increased.
H-46	Low voltage automatic opening trigger time	Used for automatic barrier opening when the power is off. It works with H-47 to realize that when the power supply voltage is lower than the defined voltage, and this situation continues for the time defined by H-46, the barrier will automatically open. After the barrier is fully opened, the digital tube will display loxx (xx represents the H-47 value). This function requires a supercapacitor backup power module. If H-46 is set to 0, this function is turned off.
H-47	Low voltage automatic opening threshold	Works with H-46, which is used to set the action voltage for barrier opening in case of power off. When the power supply voltage is lower than this value, and exceeds the time defined by H-46, the power-off opening is initiated.

## 4.4 Quick Commissioning Guide

For environments without eaves, you can quickly follow the method below for quick commissioning of the barrier:

Figure 4-3 Right-oriented barrier in fully-closed and fully-opened statuses



### Barrier Commissioning

Properly adjust the limit adjustment screw, so that when the barrier is fully closed, the arm can push against the limit pressure rod. See the left image in Figure 4-4. When the barrier is fully opened, the arm does not have to push against the limit pressure rod. See the right image in Figure 4-4.

Press and hold and **■/QUIT** together on the controller for 2 seconds to enter the Advanced Menu, go to H-12, and then select the corresponding speed according to the arm length:

H-12=14 right-oriented straight arm  $\leq 3.5$  meters.

H-12=15 left-oriented straight arm  $\leq 3.5$  meters.

H-12=16 right-oriented straight arm  $\leq 4$  meters.

H-12=17 left-oriented straight arm  $\leq 4$  meters.

H-12=18 right-oriented straight arm  $\leq 4.5$  meters.

H-12=19 left-oriented straight arm  $\leq 4.5$  meters.

After selection, press to confirm (it will automatically modify the parameters in F-00 to F-09, F-13, F-15 and H-05.H-33 will be automatically changed to 2), and then press **■/QUIT** to exit. Control the rise and fall of the barrier through remote control, and observe whether the rise and fall is smooth. If the operation is not smooth, adjust the parameters according to the situations described below:

- There is jitter when the barrier is fully opened: Reduce F-02, and then consider reducing F-06.
- When the barrier is fully opened, the arm is not vertical (leaning forward): Increase F-09 until the barrier is fully opened and the arm is vertical (pay attention to the position of the limit pressure rod and the limit adjustment bolt).
- When the barrier is fully opened, the arm is not vertical (tilted backward): Reduce F-09 until the barrier is fully opened and the arm is vertical.
- After the barrier is fully opened, the indicator does not light up: Reduce F-09, and then use the remote control to raise the arm until the indicator lights up normally.
- The barrier jitters when it is closed: Increase F-03 and decrease F-07.
- The barrier is fully closed, but the arm is not level (drooping): Power off the controller when the arm is raised, adjust counterclockwise the mechanical limit adjustment bolt in the closing direction to extend it a little, so that the bolt can push against the limit pressure rod in the horizontal position of the arm, then power on the controller again, control the rise and fall of the arm, and observe whether the arm is level.
- The barrier is fully closed, but the arm is not level (warped): If the limit pressure rod has not push against the limit adjustment bolt in the closing direction, you can reduce F-08; if it pushes against it, power off the controller when the arm is raised, adjust clockwise the mechanical limit adjustment bolt in the closing direction, so that the bolt can push against the limit pressure rod in the horizontal position of the arm, then power on the controller again, control the rise and fall of the arm, and observe whether the arm is level.



The mechanical limit stop point in the closing direction is the reference point for calculating the opening stroke angle of the arm. After adjusting the closing limit adjustment bolt, the controller must be powered off and restarted (if it is connected to a supercapacitor backup power supply, the power plug can be unplugged), so that the controller can calculate the opening stroke angle according to the new reference point. This adjustment will affect the verticality of the arm when the barrier is fully opened. You can adjust the value of F-09 appropriately to keep the arm vertical when the barrier is fully opened.

## Commissioning Method when Using the Barrier in an Environment with Eaves Blocking the View

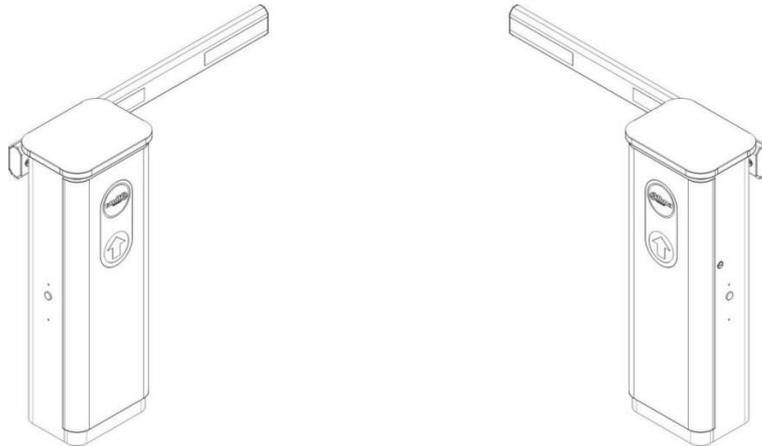
After setting H-12 according to the above instructions, reduce the value of F-09 (half of the original value is  $45^\circ$  for starting the barrier arm) until it does not touch the eaves.

## 4.5 Changing Barrier Direction

### 4.5.1 Barrier Direction

The left figure shows the right-oriented barrier, and the right figure shows the left-oriented barrier.

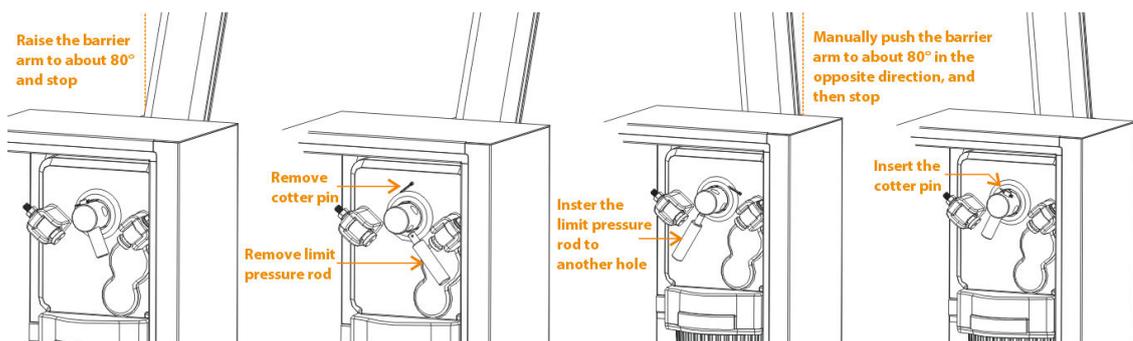
Figure 4-4 Barrier direction



## 4.5.2 Changing the Barrier Direction

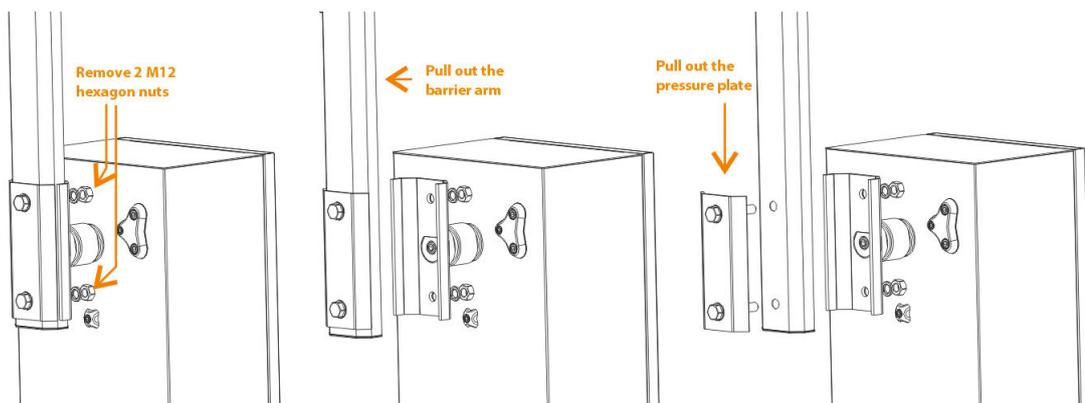
Here uses the right-oriented straight arm barrier as an example. The steps to change it to a left-oriented barrier are as follows.

Figure 4-5 Change the limit pressure rod position



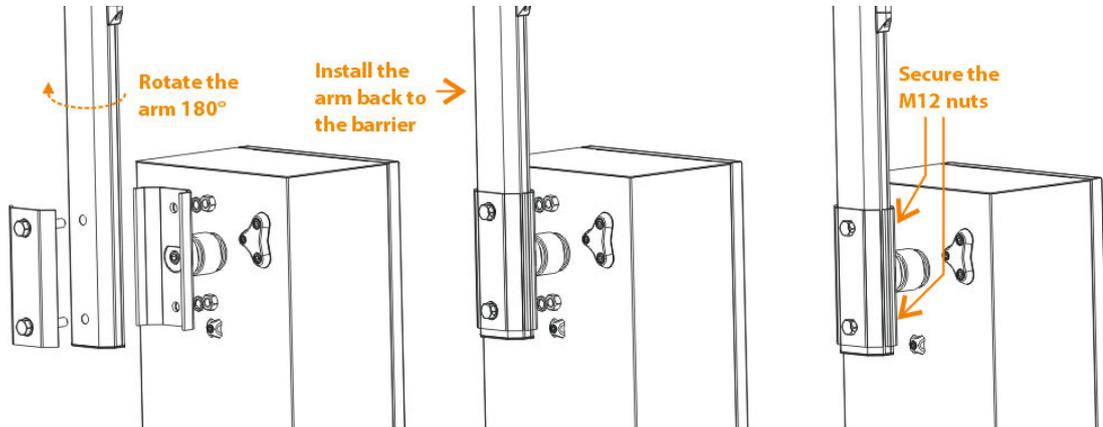
- Step 1** Raise the barrier arm to about 80° and stop, to facilitate removing the limit pressure rod.
- Step 2** Remove the cotter pin and limit pressure rod respectively.
- Step 3** Turn the electronic clutch switch to the **0** position (pull down), manually push the barrier arm to about 80° in the opposite direction, turn the electronic clutch switch back to the **1** position (pull up), and insert the limit pressure rod into another fixed hole.
- Step 4** Insert the cotter pin back into the hole at the top of the limit pressure rod.

Figure 4-6 Change the barrier direction (1)



- Step 5 Use an open-end wrench to remove the 2 M12 hexagon nuts that secure the pressure plate.
- Step 6 Pull the pressure plate and arm out of the chuck.
- Step 7 Pull out the pressure plate.

Figure 4-7 Change the barrier direction (2)



- Step 8 Rotate the barrier arm 180°, so that the rubber strip faces the other direction.
- Step 9 Put the pressure plate together with the screws through the barrier arm, and install it back on the chuck.
- Step 10 Secure the 2 M12 nuts.
- Step 11 In the Advanced Menu of the controller, select right-oriented barrier **3** or left-oriented barrier **2** in the H-05 option.

### 4.5.3 Adding Remote Control

- Step 1 Unplug the remote control receiver (or turn off the power of the barrier).
- Step 2 Press and hold the Open button on the remote control, then plug in the remote control receiver (or power on the barrier).
- Step 3 When the indicator (the indicator inside the receiver) flashes slowly, it goes to the pairing status. Release the Open button, and then press and hold the Stop button for 3 seconds. The indicator will stay on, which indicates successful pairing. After it stays on and then flashes slowly, you can proceed with pairing the second remote control.
- Step 4 Press and hold the Stop button on the second remote control for 3 seconds. The indicator will stay on, indicating that the second remote control has been successfully paired. You can continue pairing in this way. After 1 minute without any pairing operation, it will automatically exit the pairing status and enter normal operation (or press and hold the Open button of the paired remote control for 3 seconds to exit the pairing status). It supports up to 40 remote controls. Any number exceeding the limit will overwrite the first paired remote control.

### 4.5.4 Removing Remote Control

#### Procedure

- Step 1 Unplug the remote control receiver (or power off the barrier).
- Step 2 Press and hold the Close button on the paired remote control, and then plug in the remote control receiver (or power on the barrier).

- Step 3 When the indicator flashes quickly, it goes to the unpairing status. Release the Close button, and then press and hold the Stop button for 5 seconds. The indicator will stay on, which indicates that all remote controls have been unpaired, and it will automatically switch to normal working mode after 6 seconds of unpairing.

## 5 Device Maintenance

### Regular Maintenance

The barrier should be maintained every 3 months, and the maintenance items are as follows:

- Check whether the fasteners, such as the locking nut of the limit adjustment bolt, are loose or falling off, and tighten them in time.
- Inject lubricating oil into each movable connection accessory to maintain good lubrication condition.
- Professionals check the wearing parts and replace the worn parts in time.
- Check whether the fastening bolts of each transmission mechanism are loose, and whether the bearings make any abnormal noise during the process of raising and lowering the arm.
- Check whether each transmission part is loose and causes interference in operation. If there is any problem, adjust it back to its original position.
- Check whether there is any abnormal noise when the motor is running. If there is any abnormal noise, contact our after-sales service, and we will handle it for you in time.
- Check whether the wiring is loose, and whether the grounding is reliable.

### Maintenance Methods

- In case of power outage, turn off the power first, and then adjust the barrier arm to the vertical position.
- If the locking nut of the limit adjustment bolt is found to be loose, tighten it again with an open-end wrench.
- After power failure, wait for the controller indicator to go out, turn off the electronic clutch switch, manually push and pull the arm, and check whether the handle chuck is loose or falling. If so, use an Allen wrench to tighten the chuck fixing screws again.
- When the power is off, gently pull the connector harness with screws, and if any of the harness is found to be loose, tighten it immediately.

## 6 Common Faults and Troubleshooting

### 6.1 Error Code List

When the controller detects an anomaly, the type of error will be indicated through the error code. Details are as follows:

Table 6-1 Error code

Error Code	Reason of Error
Er.ob	Return or stop when meeting with resistance.
Er.ou	The barrier stops in the opening process when meeting with resistance, and the 24 V power supply voltage is lower than 18 V. The switching power supply is insufficient, or the arm exceeds the specified length.
Er. 7	Alarm in case of raising the arm manually.
Er.11	Operation timeout prompt. If the opening or closing time exceeds 30 seconds, the device will automatically shut down and display the code.
uLxx flashes	xx is the voltage of the voltage interface. When xx is less than 15 or greater than 30, it indicates that the voltage is abnormal and a flashing prompt will appear.
Er.L0	When the power is turned on, it is detected that there is a wire control stop signal input. You can unplug the wire control terminal to check whether it is caused by external devices.
Er.L1	When powered on, it is detected that there is a wire control closing signal input. You can unplug the wire control terminal to check whether it is caused by external device.
Er.L2	When powered on, it is detected that there is a wire control opening signal input. You can unplug the wire control terminal to check whether it is caused by external devices.
Er.L3	When powered on, it is detected that there is a ground sensing signal input. You can unplug the wire control terminal to check whether it is caused by external devices.
Er.L4	When powered on, it is detected that there is a radio signal input. You can unplug the wire control terminal to check whether it is caused by external devices.
Er.L5	When powered on, it is detected that there is a 5P remote control stop signal input. You can unplug the 5P remote control receiver to check the situation.
Er.L6	When powered on, it is detected that there is a 5P remote control barrier closing signal input. You can unplug the 5P remote control receiver to check the situation.
Er.L7	When powered on, it is detected that there is a 5P remote control barrier opening signal input. You can unplug the 5P remote control receiver to check the situation.
Er.13	The braking voltage is too high. If the problem recurs after power off and then power on, replace the main board.

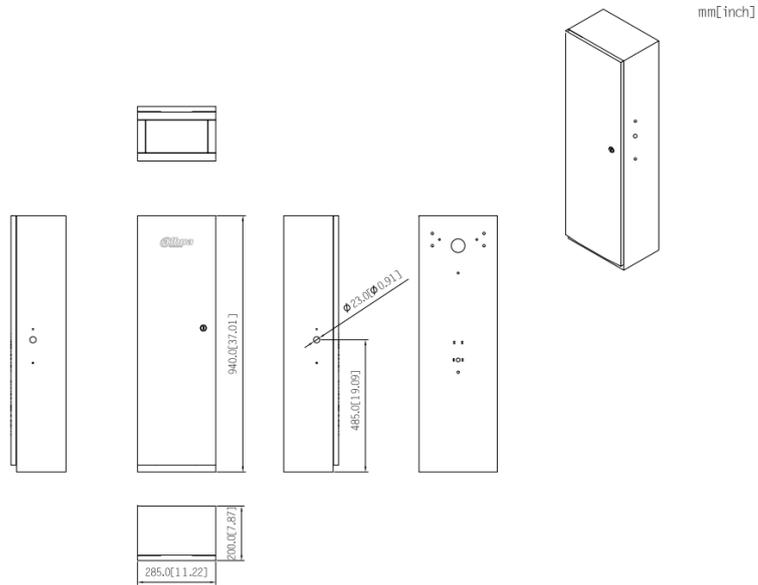
## 6.2 Common Faults

No.	Fault	Solution
1	When powering on the device, press the Open or Close button on the remote control, the barrier arm does not work.	<ul style="list-style-type: none"> <li>● Check whether the controller power indicator is on. If not, check whether the fuse is intact.</li> <li>● Check whether the remote control is paired or the battery is low.</li> <li>● There is co-frequency interference nearby. Press the control buttons on the control panel to see if it is normal.</li> <li>● The external protection circuit fails or is in protection status. Check whether the radar indicator and ground sensing indicator are on.</li> </ul>
2	The speed of first barrier closing after power-on is too fast.	Check whether the value of F-13 is too large. You can reduce the 2-XX value of F-13.
3	The controller displays IDLE.	<ul style="list-style-type: none"> <li>● Check whether the motor sensor plug is not plugged in. Plug it in properly.</li> <li>● Check whether the motor sensor malfunctions. If yes, replace the sensor assembly on the plastic part at the bottom of the motor.</li> </ul>
4	The controller is reset when the barrier is running.	<ul style="list-style-type: none"> <li>● During operation, use a multi-meter to measure whether the 24 V voltage output by the switching power supply is normal.</li> <li>● Check whether the barrier controller malfunctions. If yes, replace the controller.</li> </ul>
5	The arm rebound automatically during the closing process.	<ul style="list-style-type: none"> <li>● Check whether a short arm is lowering too slowly. If yes, increase the value of F-01 or decrease the value of F-03.</li> <li>● Check whether the ground sensor or radar has any false signals, and check whether the ground sensor or radar signal indicator flashes falsely.</li> </ul>
6	When fully opened, the barrier jitters a lot.	<ul style="list-style-type: none"> <li>● Check whether the opening speed is too high. If yes, reduce F-06.</li> <li>● Check whether the barrier opening deceleration angle is too large. If yes, reduce F-06 and F-02 at the same time.</li> <li>● Check whether the barrier opening speed is too fast. If yes, reduce F-00.</li> </ul>
7	When fully closed, the barrier jitters a lot.	<ul style="list-style-type: none"> <li>● Check whether the closing speed is too high. If yes, reduce F-07.</li> <li>● Check whether the barrier closing deceleration angle is too large. If yes, reduce F-07 and F-03 at the same time.</li> <li>● Check whether the barrier closing speed is too fast. If yes, reduce F-01.</li> </ul>

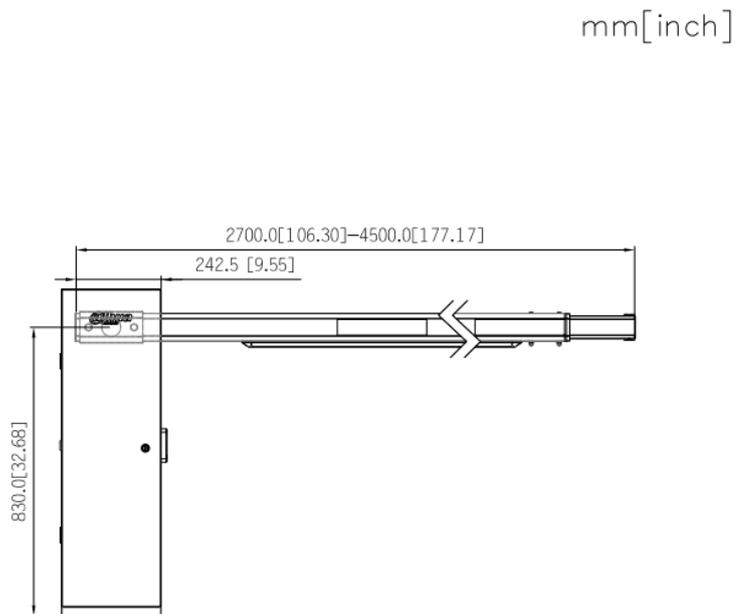
No.	Fault	Solution
8	The remote control distance is short.	<ul style="list-style-type: none"><li>• Check whether the battery voltage of the remote control is too low. If yes, replace the battery.</li><li>• Check whether there are high-voltage wires or serious electromagnetic interference near the barrier. If yes, replace the remote control with a high-power one.</li></ul>
9	Remote control learning failed.	If the remote control does not match the receiver, contact the manufacturer or confirm whether it is the original remote control.
10	The barrier arm is not vertical after the barrier is fully opened.	Check whether the vertical position value of the barrier controller is set properly. If not, adjust the value of F-09 of the barrier controller.
11	The barrier arm is not level after the barrier is fully closed.	Check whether the position of the limit adjustment screw and the limit pressure rod is unreasonable, or the horizontal position value is improperly set. If yes, adjust the position of the limit adjustment screw and the limit pressure rod, and then adjust the value of F-08.

# Appendix 1 Device Dimensions

Appendix Figure 1-1 Barrier casing dimensions

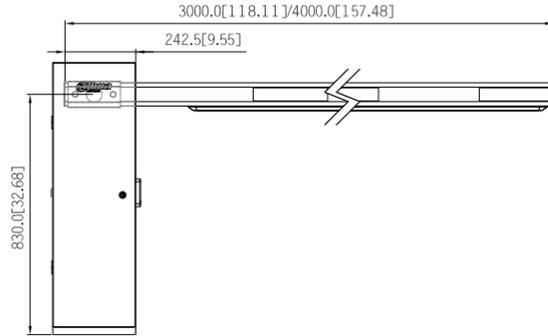


Appendix Figure 1-2 Dimensions of telescopic straight arm barrier (with telescopic straight arm)



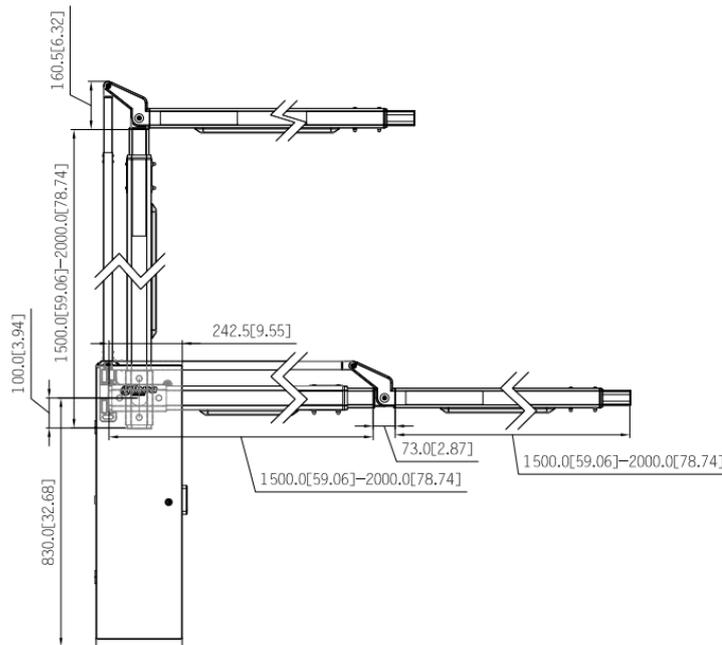
Appendix Figure 1-3 Dimensions of straight arm barrier (with straight arm)

mm[inch]



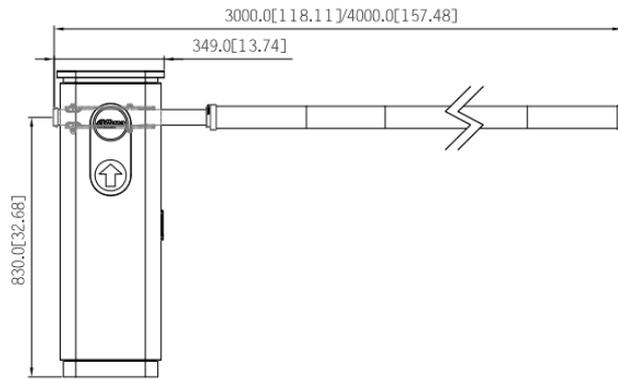
Appendix Figure 1-4 Dimensions of folding arm barrier

mm[inch]



Appendix Figure 1-5 Dimensions of round arm barrier

mm[inch]



## Appendix 2 Security Commitment and Recommendation

Dahua Vision Technology Co., Ltd. (hereinafter referred to as "Dahua") attaches great importance to cybersecurity and privacy protection, and continues to invest special funds to comprehensively improve the security awareness and capabilities of Dahua employees and provide adequate security for products. Dahua has established a professional security team to provide full life cycle security empowerment and control for product design, development, testing, production, delivery and maintenance. While adhering to the principle of minimizing data collection, minimizing services, prohibiting backdoor implantation, and removing unnecessary and insecure services (such as Telnet), Dahua products continue to introduce innovative security technologies, and strive to improve the product security assurance capabilities, providing global users with security alarm and 24/7 security incident response services to better protect users' security rights and interests. At the same time, Dahua encourages users, partners, suppliers, government agencies, industry organizations and independent researchers to report any potential risks or vulnerabilities discovered on Dahua devices to Dahua PSIRT, for specific reporting methods, please refer to the cyber security section of Dahua official website.

Product security requires not only the continuous attention and efforts of manufacturers in R&D, production, and delivery, but also the active participation of users that can help improve the environment and methods of product usage, so as to better ensure the security of products after they are put into use. For this reason, we recommend that users safely use the device, including but not limited to:

### Account Management

#### 1. Use complex passwords

Please refer to the following suggestions to set passwords:

- The length should not be less than 8 characters;
- Include at least two types of characters: upper and lower case letters, numbers and symbols;
- Do not contain the account name or the account name in reverse order;
- Do not use continuous characters, such as 123, abc, etc.;
- Do not use repeating characters, such as 111, aaa, etc.

#### 2. Change passwords periodically

It is recommended to periodically change the device password to reduce the risk of being guessed or cracked.

#### 3. Allocate accounts and permissions appropriately

Appropriately add users based on service and management requirements and assign minimum permission sets to users.

#### 4. Enable account lockout function

The account lockout function is enabled by default. You are advised to keep it enabled to protect account security. After multiple failed password attempts, the corresponding account and source IP address will be locked.

#### 5. Set and update password reset information in a timely manner

Dahua device supports password reset function. To reduce the risk of this function being used by threat actors, if there is any change in the information, please modify it in time. When setting security questions, it is recommended not to use easily guessed answers.

## Service Configuration

### 1. Enable HTTPS

It is recommended that you enable HTTPS to access Web services through secure channels.

### 2. Encrypted transmission of audio and video

If your audio and video data contents are very important or sensitive, we recommend you to use encrypted transmission function in order to reduce the risk of your audio and video data being eavesdropped during transmission.

### 3. Turn off non-essential services and use safe mode

If not needed, it is recommended to turn off some services such as SSH, SNMP, SMTP, UPnP, AP hotspot etc., to reduce the attack surfaces.

If necessary, it is highly recommended to choose safe modes, including but not limited to the following services:

- SNMP: Choose SNMP v3, and set up strong encryption and authentication passwords.
- SMTP: Choose TLS to access mailbox server.
- FTP: Choose SFTP, and set up complex passwords.
- AP hotspot: Choose WPA2-PSK encryption mode, and set up complex passwords.

### 4. Change HTTP and other default service ports

It is recommended that you change the default port of HTTP and other services to any port between 1024 and 65535 to reduce the risk of being guessed by threat actors.

## Network Configuration

### 1. Enable Allowlist

It is recommended that you turn on the allowlist function, and only allow IP in the allowlist to access the device. Therefore, please be sure to add your computer IP address and supporting device IP address to the allowlist.

### 2. MAC address binding

It is recommended that you bind the IP address of the gateway to the MAC address on the device to reduce the risk of ARP spoofing.

### 3. Build a secure network environment

In order to better ensure the security of devices and reduce potential cyber risks, the following are recommended:

- Disable the port mapping function of the router to avoid direct access to the intranet devices from external network;
- According to the actual network needs, partition the network: if there is no communication demand between the two subnets, it is recommended to use VLAN, gateway and other methods to partition the network to achieve network isolation;
- Establish 802.1x access authentication system to reduce the risk of illegal terminal access to the private network.

## Security Auditing

### 1. Check online users

It is recommended to check online users regularly to identify illegal users.

### 2. Check device log

By viewing logs, you can learn about the IP addresses that attempt to log in to the device and key operations of the logged users.

3. **Configure network log**

Due to the limited storage capacity of devices, the stored log is limited. If you need to save the log for a long time, it is recommended to enable the network log function to ensure that the critical logs are synchronized to the network log server for tracing.

## Software Security

1. **Update firmware in time**

According to the industry standard operating specifications, the firmware of devices needs to be updated to the latest version in time in order to ensure that the device has the latest functions and security. If the device is connected to the public network, it is recommended to enable the online upgrade automatic detection function, so as to obtain the firmware update information released by the manufacturer in a timely manner.

2. **Update client software in time**

We recommend you to download and use the latest client software.

## Physical Protection

It is recommended that you carry out physical protection for devices (especially storage devices), such as placing the device in a dedicated machine room and cabinet, and having access control and key management in place to prevent unauthorized personnel from damaging hardware and other peripheral equipment (e.g. USB flash disk, serial port).

ENABLING A SMARTER SOCIETY AND BETTER LIVING

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