User Manual

SBT3000 Series

Date: April 2024

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English

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For further details, please visit our Company's website www.zkteco.com.

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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, Doors, 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 **SBT3000 Series**.

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

- The speed gate is advanced pedestrian access equipment designed for speed, stability, safety, and aesthetics. It is suitable for office buildings, commercial spaces, and high-end venues.
- Speed gate shell is made of high-quality 304 stainless steel and frame structure, parts after anti-corrosion treatment, durable.
- The speed pass door motor is driven by a high-end servo motor with a precision planetary reducer, distinguishing it from the typical DC motors found in the market. This setup offers superior performance in terms of speed, stability, safety, and other aspects.
- The speed gate utilizes high-quality infrared technology known for its precision and strong resistance to interference, making it adaptable to various challenging environments. It employs multiple logic judgments for enhanced accuracy.
- The speed gate incorporates the latest driver featuring RS232/RS485 communication protocols and offers multiple mode switching capabilities. It includes safeguards such as over-current, over-voltage, and over-temperature protection for added safety.

1.2 Features

- Offers various pass modes, single / two-way free pass, verification pass, prohibit pass free with, normal working mode and aging test mode switching.
- Fast and accurate, the minimum opening time can reach 0.6s to 1s, switch in place accurately.
- Long service life, measured switch more than 15 million times.

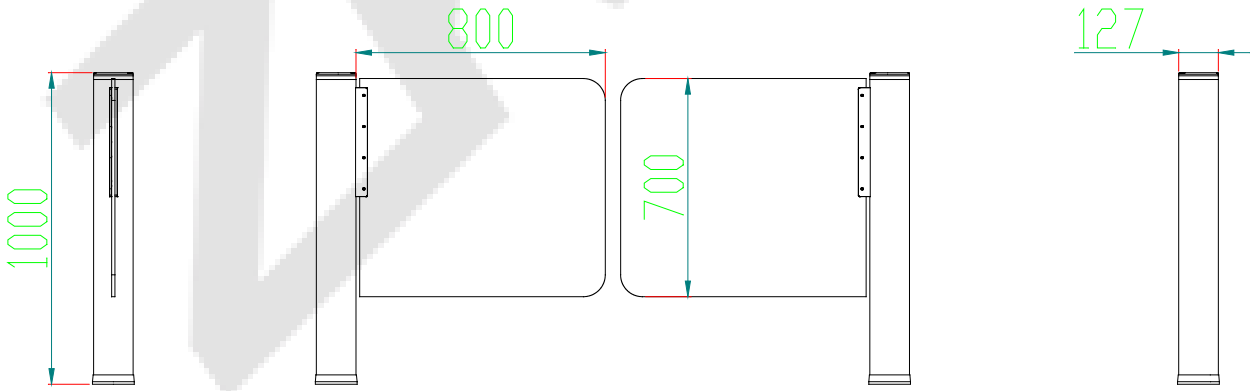
  Equipped with intrusion alarm, tailing alarm, reverse passage alarm, long time stay alarm and other tips.
- Allows manually push open when power is off and close automatically when power is on.
- Anti-violence gate, forced to push open resistance rebound, can also be equipped with a brake, push open lock, can be automatically reset.
- Self-protection function, to prevent forced entry, excessive current and other special circumstances, damage to the product, crash, etc.
- One-key control of gate enable/disable status.
- With fire linkage, receiving a fire signal can open the gate in an emergency, and alarm prompts.
- Compatible with various peripheral verification equipment, including face, ID, fingerprint, card, ESD equipment, code scanning and other verification methods.
- Offers switching between normally open/normally closed functions to suite different places.
- Features memory function to allow passage for multiple individuals after continuous card swipin.

- Provides a development interface for system integration.

1.3 Product Specifications

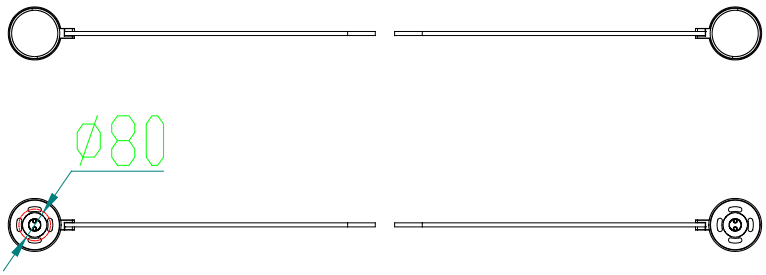
Name	Parameters
Drive Motor	High-end brushless servo motor.
Channel Width	550 to 900mm (Swing arm standard exposed 300mm).
Passing Speed	45 persons/minute.
Gate Material	Standard acrylic, optional tempered glass.
Opening Speed	0.6s to 1s.
Chassis Material	304 stainless steel.
Communication Interface	RS485, RS232.
Environment	Indoor, outdoor (canopy), temperature: -20°C to 70°C; humidity: RH ≤ 90% non-condensation.
Power Input	AC220V to 240V, 50/60Hz.
Input Interface	Switching signal or DC12V level signal.
Running Times	Above 15 million.

2 Product Dimensions

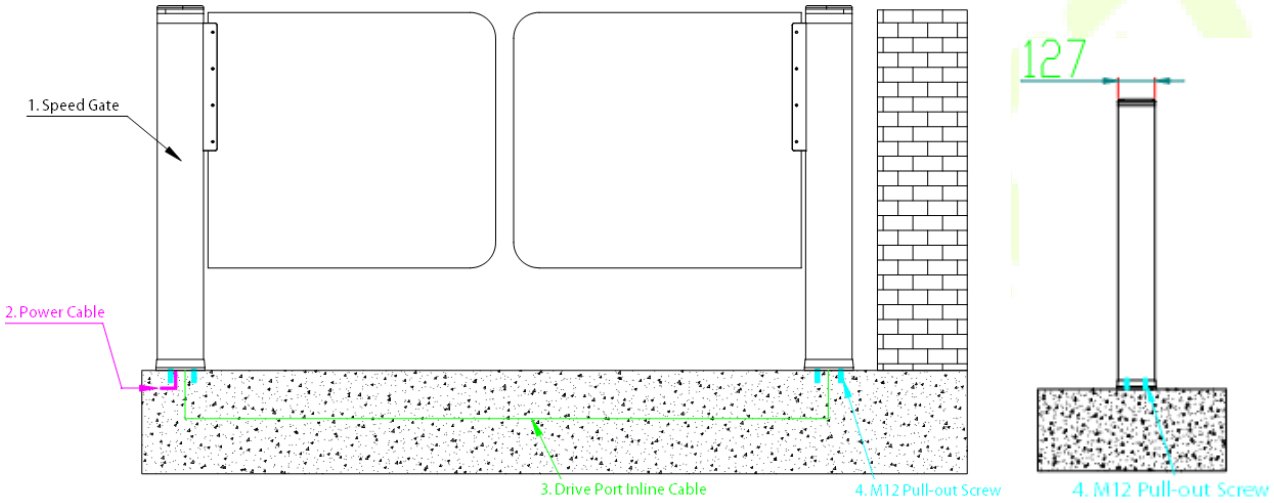


3 Installation

Bottom Mounting Holes:

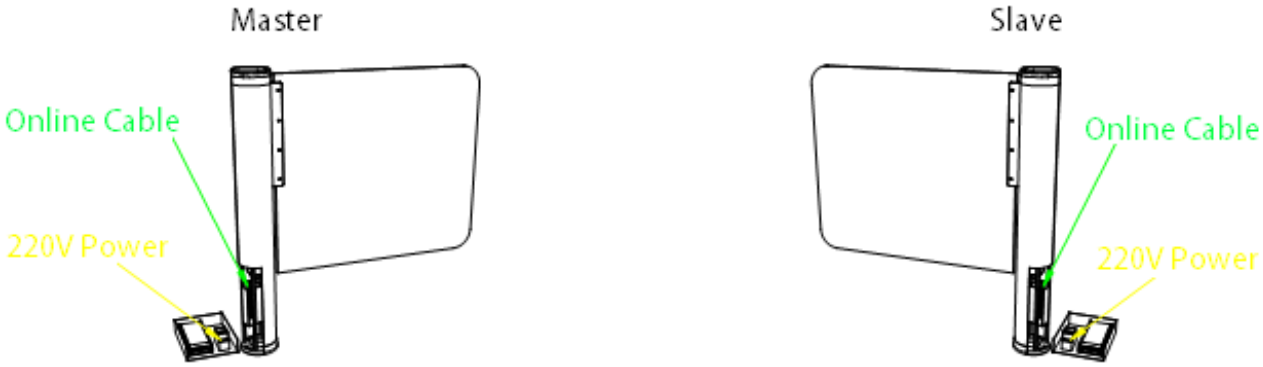


Bottom Cable Routing Holes:



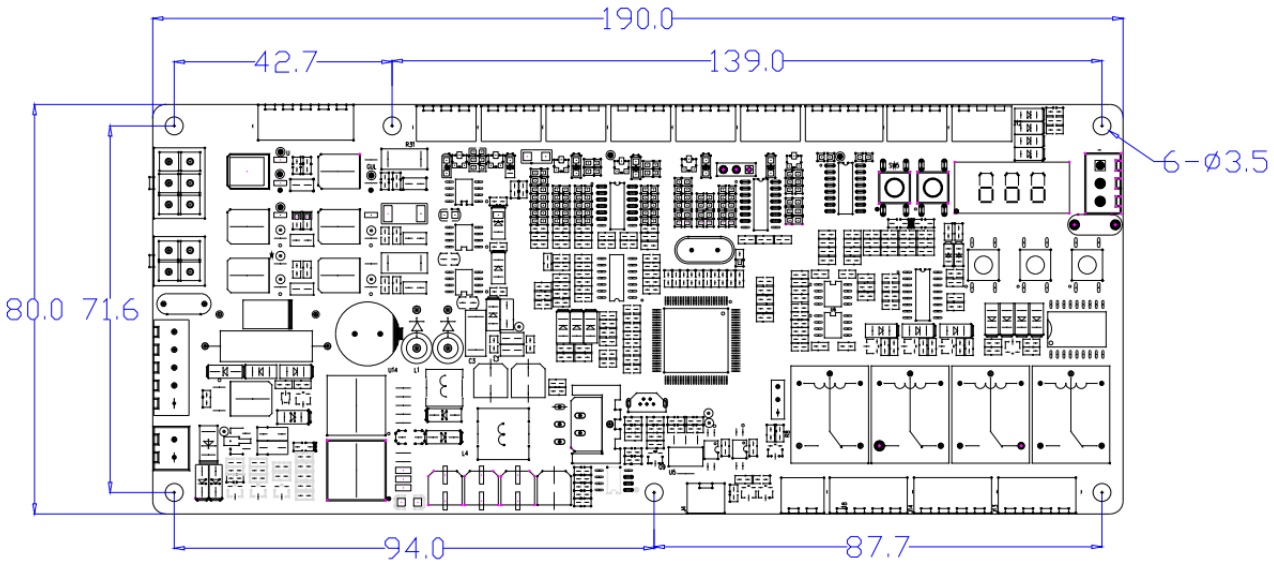
4 Wiring

Schematic diagram location of the gate's main and auxiliary machine online cables.

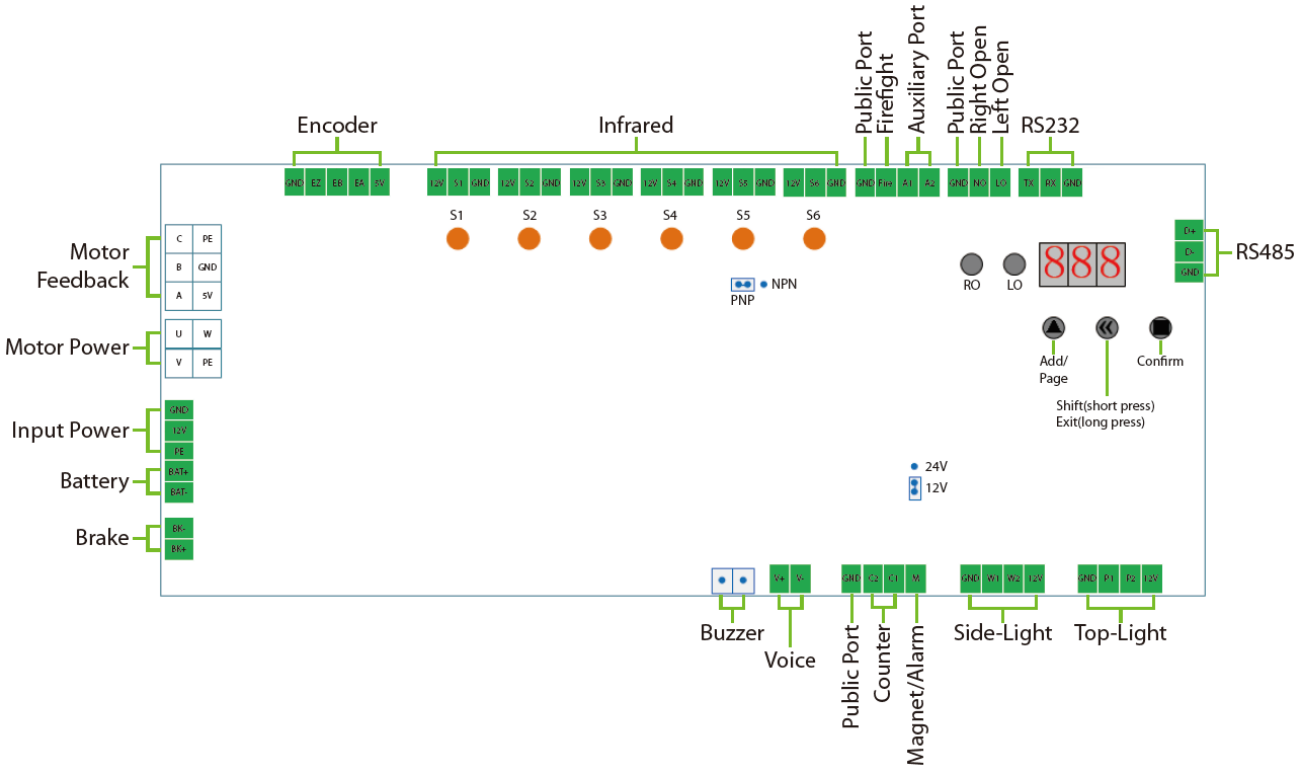


5 Interface Description

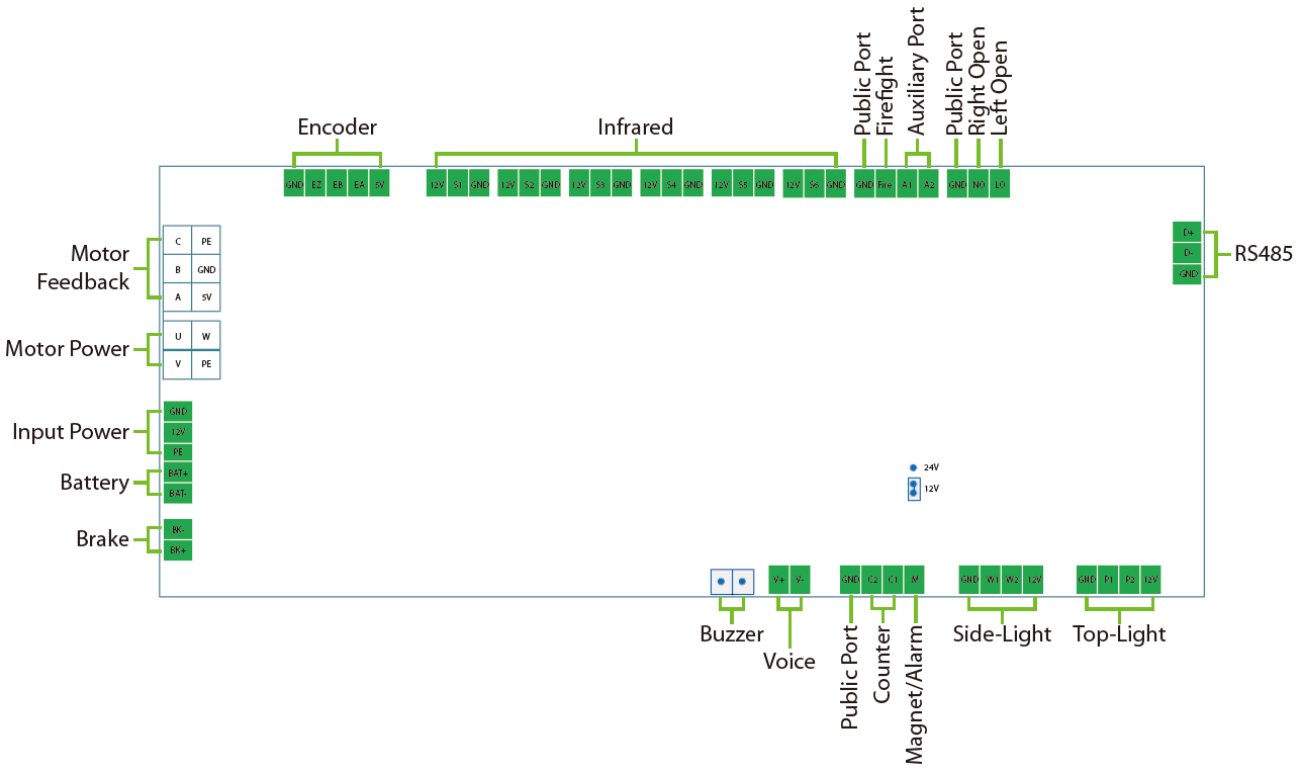
5.1 Installation Diagram



5.2 Main Board Ports



5.3 Secondary Board Ports

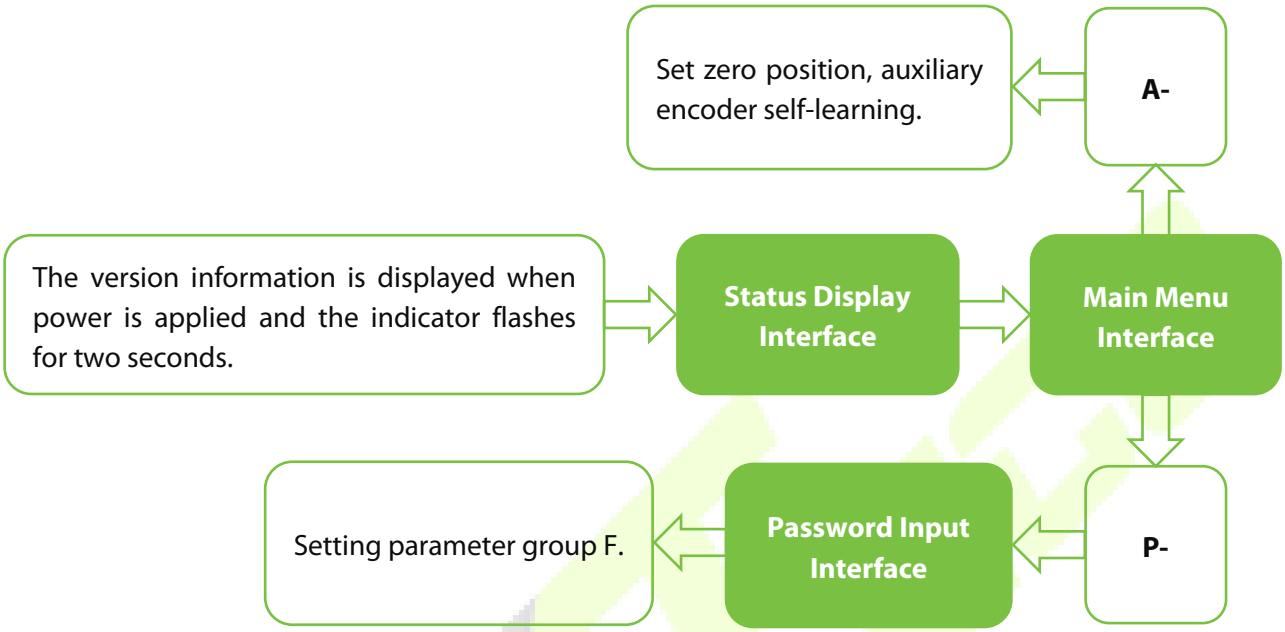


5.4 Port Function Introduction

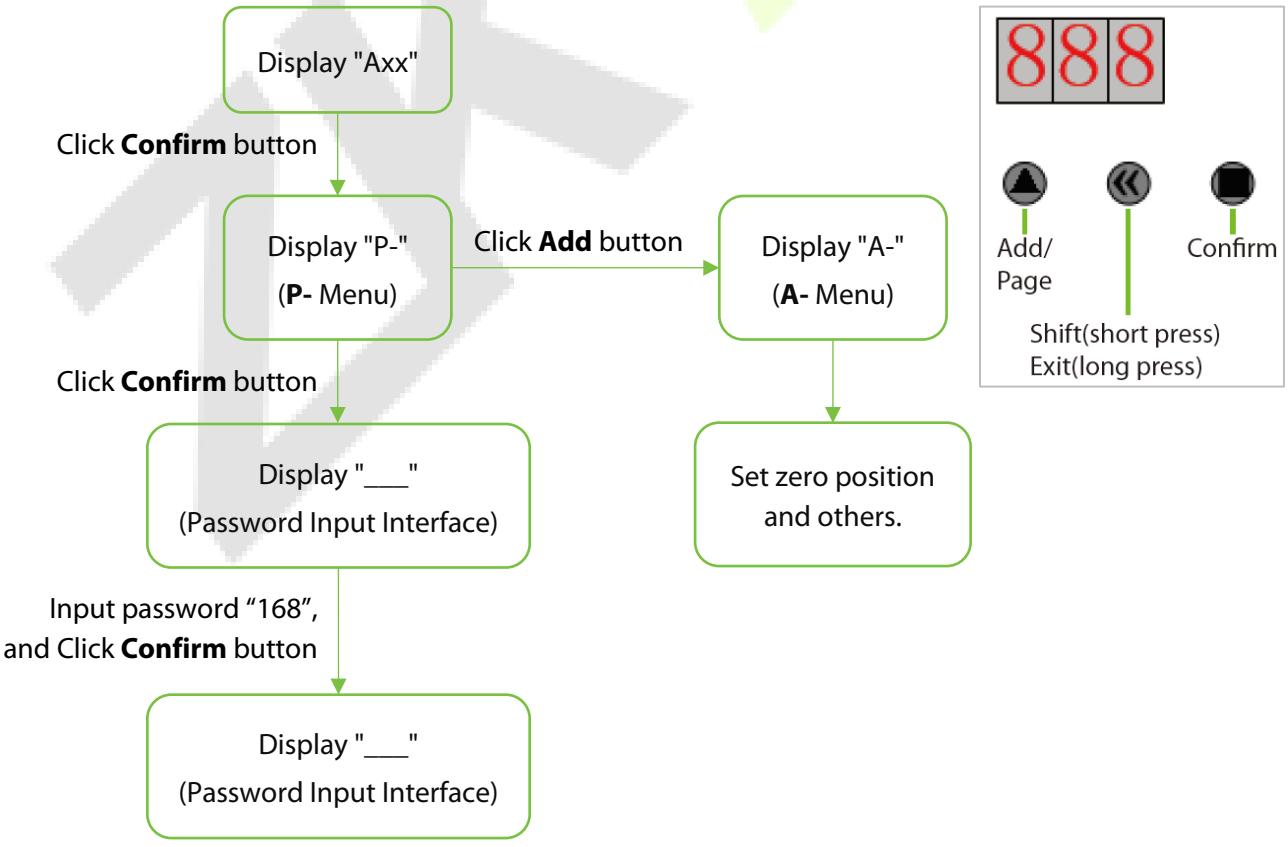
Input Power Supply	External 24V external switching power supply, and dual power supply independent connection method is recommended to be more than 150W on one side; Single power supply parallel connection method is recommended to be more than 300W.
Battery	External 12V 1.3Ah battery or supercapacitor, no need to open the gate without power-down function.
Auxiliary Encoder	For external auxiliary incremental encoder.
Auxiliary Port (NPN Type)	A1: Swing / Flap Barrier Turnstile limit switch, Tripod Turnstile zero switch; A2: Swing / Flap Barrier Turnstile limit switch.
Counter	C1 is the counting output for the entrance passing direction; C2 is the counting output for the exit passing direction.
Solenoid/Alarm	Swing / Flap Barrier Turnstile: alarm signal output; Tripod Turnstile: solenoid output (12V/24V optional).
Synchronization and Communication	RS485: master-slave synchronous communication; RS232: communication with the host computer.

6 Device Settings

6.1 Key Operation



6.2 Key Function Description



6.3 Menu Display

A- Menu	
Code	**Function**
SE0	Set zero position.
IdE	Auxiliary encoder parameter recognition.

6.4 Example of Operation

6.4.1 Auxiliary Encoder Parameter Identification A-IdE

Step 1. Exit to the main menu and find "A-" in the setup parameter menu, then click **Confirm** button on the right to confirm and enter the sub-menu.

Step 2. Click **Add** button to find "IdE", and then click **Confirm** button, the digital tube blinks to show "19", when status 19 appears, the state of 19 manually swings the door plate maximum stroke, tripod turnstile can be manually swung more than one turn for the motor reduction ratio identification.

Step 3. If the report recognizes the lack of phase (E05), check whether the auxiliary encoder is properly connected or whether manual swinging over the door is required, In case of report the recognition of the reverse (E06), please adjust the AB phase. Upon recognizing the completion of state 00, re-power is required at this time.

6.4.2 Setting Zero Point

Step 1. Exit to the main menu, and find the setting parameter menu entry "A-", and then click **Confirm** button to enter the sub-menu, and click **Add** button to find the "SE0". "SE0"; or enter "000" in the password input screen.

Step 2. Click **Confirm** button again to confirm, the door panel will enter the deactivation state, then swing the door panel to the set position.

Step 3. After 5 seconds, the gate will be reset automatically.

7 Quick Debug Wizard

Step	Operation	Description	Remarks
1	Set the Master and Slave	Set F00 Master 000, Slave 001.	Default A and B boards can skip this step, dual A boards need to be set.
2	Set the Master-Slave Rotation Direction	Set F01 Motor rotation direction 0/1.	In the A board F01 parameters into, change to 1-0 or 0-1.
3	Set the Gate Type	Set F33 Selection 0. Swing barrier turnstile double door. 1. Swing barrier turnstile single door. 2. Flap barrier turnstile / sliding gate double door. 3. Flap barrier turnstile / sliding gate single door.	The swing barrier turnstile is set to 0, Flap barrier turnstile / sliding gate is set to 2. After the completion of the settings needs to be re-powered.
4	Set the Motor Reduction Ratio	Set the F49 parameter according to the actual reduction ratio (external reduction ratio multiplied by motor reduction ratio).	Setting is required for structures where the movement structure comes with its own reduction ratio.
5	Set the Infrared Type	Set the IR, PNP / NPN Jumper Cap. Set the F37, 0-PNP / 1-NPN Type.	Default value 0-PNP. Generally jumper caps and parameters need to be changed.
6	Set the Number of Infrared Pairs	Set F17, select 3 pairs, 4 pairs or 6 pairs.	Default value 1 to 6 IR pairs (set according to the number of IR interfaces connected to the A-board).
7	Set the Zero Point	A-SE0, set door zero position.	Zero point setting required for swing barrier turnstile only.
8	Set the Switching Position	Set F14, F15 parameters.	F14 is a reverse open/close gate.
9	Set the Switching Speed	Set F03 motor speed percentage, or set F65 to modify the door type blocking parameter	
10	Auxiliary Encoder Recognition	A-IdE, parameter identification of the auxiliary encoder.	This operation is not required if no auxiliary encoder is installed.

8 Parameter Table

8.1 Password Operations

Password	Function	Password	Function
168	Parameter debugging privileges.	111	Query IR status.
618	Gate reset.	321	Restore default parameters (master-slave).

8.2 Parameter Settings

No.	Address	Name	Default	Range	Remarks
F00	05 01	Master-Slave Setting	0	0 to 1	0 means Master, 1 means Slave.
F01	00 0D	Motor Rotation Direction	0-0	0 to 1	0-0 (Master-Slave), 0 means reverse, 1 means forward.
F02	04 08	Auxiliary Sensor Setting	0	0 to 3	0. No auxiliary sensors (zero switch self-recognition). 1. Incremental encoder (swing barrier turnstile, flap barrier turnstile, tripod turnstile). 2. Zero position switch (swing barrier turnstile, tripod turnstile A1). 3. 2 limit switches (A1+A2). 4. No auxiliary sensors, zero switch A2 for security gate signals.
F03	09 00	Switching Gate Speed (%)	60	1 to 100	Percentage of rated motor speed.
F04	09 01	Acceleration	20	1 to 200	The larger the value, the faster the acceleration.
F05	09 06	Running Blocking Current	1.0	0 to 900	0 means no blocking judgment, the smaller the value, the higher the anti-pinch sensitivity.
F06	09 08	Zeroing Turn Blocking Current	2.5	1 to 100	Increase appropriately when finding zero abnormality.
F07	09 09	Velocity Ring Ratio	120	1 to 999	Increase when the door is heavy.

No.	Address	Name	Default	Range	Remarks
F08	09 0B	Position Ring Ratio	45	1 to 999	Decrease when overshooting in place
F09	08 1D	Forced Push Judgment Angle	2.5	1 to 90.0	The larger the setting value, the larger the push-open angle.
F10	08 09	Zeroing Speed	10	1 to 80	Percentage of rated motor speed
F11	08 25	Blocking Mode Selection	1	1 to 2	1 means rebound an angle, 2 means speed, torque reduction
F12	08 18	Push Mode Selection	1	0 to 1	0 means no clutch locking, 1 means locking clutch.
F13	08 10	Emergency Stop Mode	1	0 to 1	0 means non-locking clutch, 1 means locking clutch.
F14	0A 19	Close Position Indentation Angle	5.0	1 to 90.0	The smaller the setting value, the greater the angle of opening and closing the gate.
F15	0A 1A	Opening Position Indentation Angle	5.0	1 to 90.0	The smaller the setting value, the larger the opening angle (corresponding to swing barrier turnstile: positive opening angle; flap barrier turnstile: opening angle).
F16	0F 00	Gate Mode	1	0 to 10	0. Aging mode. 1. Bidirectional swipe. 2. Bidirectional free. 3. Bidirectional prohibition. 4. Inward swipe + outward free. 5. Inward swipe & outward prohibited. 6. Inward free & outward card swipe. 7. Inward free & outward prohibited. 8. Inward Prohibition & Outward Freedom. 9. Inward prohibited & outward card swipe. 10. Test mode (no pass logic).
F17	0F 01	Infrared Logarithmic	1	0 to 2	0. 3 pairs of infrared. 1. 6 pairs of red. 2. 4 pairs of infrared.
F18	0F 02	Continuous Swipe	0	0 to 1	0 means invalid. 1 means valid.

No.	Address	Name	Default	Range	Remarks
F19	0F 03	Gate Standby	0	0 to 1	0. Normally closed. 1. Normally open.
F20	0F 04	Maximum Passing Time	10	1to 65	Automatic closing of the door after the timeout. (Unit: second)
F21	0F 05	Swipe Card in The Passageway	1	0 to 1	0. Not allowed. 1. Allowed. (When the card is allowed to be swiped in the channel, the first infrared in the inward and outward directions will not report trespassing.)
F22	0F 06	Whether to Close the Door Against Traffic	1	0 to 3	0. Not close the door. 1. Close the door. 2. Anti-trespassing does not close the door, after the passage is completed switch to standby. 3. Anti-trespassing closes the door, anti-trespassing is cancelled after switching to standby.
F23	0F 07	Voice Volume	15	0 to 15	
F24	0F 08	Tailgating Detection Delay Time	30	0 to 999	Unit: 10ms.
F25	0F 09	Whether to Lock the Brake When the Door Is Closed	0	0 to 1	0. No lock. 1. Locked.
F26	0F 0A	Whether To Lock the Brake for Trespassing	0	0 to 1	0. No lock. 1. Locked.
F27	0F 0B	Infrared Filtering Time	1	0 to 500	Unit: 10ms.
F28	0F 0C	Allow Delay Time for Opposite Direction after Card Swipe	500	0 to 600	Unit: 10ms.
F29	0F 0D	Fire Alarm Door Opening Direction	1	0 to 1	0. Outward door opening. 1. Inward door opening.
F30	0F 0E	Gate Opening Delay Time After Card Swipe	0	0 to 500	Unit: 10ms.
F31	0F 0F	Delay Time to Close Gate After Passing	0	0 to 500	Unit: 10ms.

No.	Address	Name	Default	Range	Remarks
F32	0F 10	Maximum Delay Time in the Channel	10	0 to 999	Unit: second.
F33	0F 12	Controller Door Type (Need to Re-Power on After Modification)	0	0	0. Swing barrier turnstile double gate. 1. Swing barrier turnstile single gate. 2. Flap barrier turnstile double gate. 3. Flap barrier turnstile single gate. 4. Tripod turnstile.
F34	0F 14	Trigger Anti-Pinch Delay	32	0 to 999	Unit: 1ms.
F35	0F 15	Exit Anti-Trap Delay	250	0 to 999	Unit: 1ms.
F36	0F 16	Gate Control Commands	0	0 to 32	1. Forward open. 2. Reverse open. 16. Forward normally open. 32. Reverse normally open (decimal unit).
F37	0F 17	Infrared Type	0	0 to 1	0. PNP normally open. 1. NPN normally open.
F38	0F 18	Open The Door with or without Beeping Prompt	0	0 to 1	0. No. 1. Yes.
F39	0F 19	Chinese and English Voice	0	0 to 1	0. Chinese. 1. English.
F40	0F 1A	Entrance Voice Setting (Welcome)	0	0 to 79	Check the **Voice Content Table** for specific definitions.
F41	0F 1B	Exit Voice Setting (Have a nice trip)	6	0 to 79	
F42	0F 1C	Tailgating Voice Setting (Don't follow)	3	0 to 79	
F43	0F 1D	Reverse Voice Setting (Unauthorized access from opposite direction)	2	0 to 79	
F44	0F 1E	Stay Voice Setting (Please pass through quickly)	4	0 to 79	
F45	0F 28	Gate Breaking Voice (Break-in, please pass after verification)	1	0 to 79	

No.	Address	Name	Default	Range	Remarks
F46	0F 29	RGB Lamp Output Enable	2	0 to 2	0. Deactivated (pass light, welcome light valid). 1. Bidirectional RGB light logic. 2. Standard RGB light logic.
F47	05 04	Baud Rate Setting (RS232)	5	0 to 5	4800 / 9600 / 19200 / 38400 / 57600 / 115200.
F48	08 14	Blocking Bounce Angle	20.0	0 to 99.9	The higher the setting value, the higher the bounce angle.
F49	08 00	Deceleration Ratio	25	1 to 999	Actual reduction ratio setting.
F50	0F 2A	Counter Port Output Mode	2	0 to 1	0. Default counter output. 1. Output as passing light. 2. Output as welcome light.
F51	05 0D	Synchronization Interface Setting	0	0 to1	0. RS485. 1. RS232.
F52	09 03	Tripod Turnstile Closing Speed	60	1 to 100	Percentage of rated motor speed (data conversion).
F53	09 0C	Tripod Turnstile Blocking Current	3.0	0 to 300	Tripod turnstile blocking current (0.1A).
F54	08 0B	Pre-Opening Angle of Tripod Turnstile	15.0	1 to 90.0	Tripod turnstile pre-opening angle setting.
F55	08 22	Tripod Turnstile Push Rod Strength	20	10 to 300	Tripod turnstile push rod strength setting.
F56	0A 0C	Tripod Turnstile Zeroing Swing Times	3	0 to 9	The number of times the tripod turnstile zeroes the swing (positive 60°, negative 60°, positive 120° as a time).
F57	0C 0C	Auxiliary Encoder Linkage Coefficient	251	1 to 999	That is, one position of the auxiliary encoder corresponds to how many positions of the main encoder (instead of the auxiliary encoder resolution and deceleration ratio settings).
F58	06 07	Maximum Deviation Angle of Position Following	100	0 to 900	Used for double closed-loop zeroing, set to 0 to invalidate this function.

No.	Address	Name	Default	Range	Remarks
F59	00 0E	Double Closed-Loop Structure Dead Zone Setting	20	1 to 200	Structural dead zone refers to structural clearance problems, such as motor jitter can be increased by increasing this parameter to filter out the jitter.
F60	0F 2F	Door Closing Process Triggers Anti-Pinch Infrared Selection	1	0 to 1	0. No door open (emergency stop). 1. Open door.
F61	04 06	Motor Model Selection	4	1 to 5	1. MBS59R-60S-2020. 2. MBS80F-60A-3018. 3. MBS57R-60A-2026. 4. MBS70F-40A-1825-V3. 5. MBS70ZF-40A-1836-V1. (In idle mode, modify the parameters of the motor model will only take effect, after modification, you have to switch the mode to gate mode and re-power on.) Select 1 or 3, you may need to modify F02 at the same time.
F62	0F 30	Security Check Signal Effective Time Setting	5	0 to 65	Unit: 1s.
F63	0F 34	Forward Compensation Value of Tripod Turnstile/Full-Height Gate	0	0 to 90	Angular Unit: 0.1 degree. Prevents the reduction ratio from deviating from the whole position, and compensates for the deviation.
F64	0F 35	Tripod Turnstile /Full-Height Gate Reverse Compensation Value	0	0 to 90	Angular Unit: 0.1 degree. Prevents the reduction ratio from deviating from the whole position, and compensates for the deviation.
F65	08 0E	Door Panel Selection (Height 1000)	0	0 to 7	0. Acrylic 300. 1. Tempered glass 300. 2. Acrylic 400. 3. Tempered glass 400. 4. Acrylic 500. 5. Tempered glass 500. 6. Acrylic 600. 7. Tempered glass 600.

No.	Address	Name	Default	Range	Remarks
F66	0F 33	Setting The Buzzer Duration	10	0 to 500	Unit: 100ms.
F67	01 15	Offset Zero Position	0	0 to 900	Unit: 0.1 degree.
F68	08 03	Zeroing Method	2	2 to 4	0. Rotating plug to zero. 1. Switching signal to find zero. 2. Bilateral turn blocking zeroing. 3. Flap barrier turnstile zeroing method. 4. Both sides of the turn blocking zeroing, you can calculate the position of the zero point.
F69	0B 0C	Reverse Opening Compensation Angle	0	0 to 450	Unit: 0.1 degree.
F70	0F 34	Whether Or Not to Shield the Un-swiped Card Break-In Alarm	0	0 to 1	0. No shielding. 1. Shielded. *Only in 3-pair IR mode, when not connected to 1 group of 3 groups of infrared used.
F71	04 09	Motor Feedback Type	0	0 or 7	0. Default brushless servo. 7. Default incremental encoder. *When 7, the auxiliary encoder function is disabled and only incremental can be adapted, F4-08 is fixed to 0

8.3 Voice Content Table

By setting the parameter F39 (Chinese and English voice), the Chinese and English voices can be switched.

F40 to F45 allows you to set the voice content as desired.

Code	Chinese	Code	English
0	欢迎光临	80	Welcome
1	非法闯入请验证后通过	81	Do not enter, authorized personnel only
2	反向进入请退出等候	82	Unauthorized access from opposite direction
3	尾随通行请注意	83	Don't follow
4	尽快通行请勿逗留	84	Please pass through quickly

Code	Chinese	Code	English
5	逆行通过请注意	85	Passing from opposite direction
6	一路平安	86	Have a nice trip
7	自检过程异常	87	Initialization failure
8	主从机通讯异常	88	Communication error
9	主机通讯异常请注意	89	Master communication error
10	从机通讯异常请注意	90	Secondary communication error
11	消防报警，请迅速撤离	91	Fire warning, please evacuate immediately
12	主机	92	Master controller
13	从机	93	Secondary controller
14	欢迎再次光临	94	Welcome again
15	欢迎回家	95	Welcome home
16	多谢惠顾，请走好	96	Thank you for your patronage
17	您已进入监管区域	97	You are under surveillance
18	进入施工现场，请戴好安全帽	98	Construction area! Hard hats must be worn
19	当前仅限一人通行	99	Only one passenger allowed at one time
20	请验证后通过	100	Authorized personnel only
21	通道关闭	101	Closed off
22	请在黄线外刷卡或验票	102	Please authorize outside the line
23	"DING"	103	--
24	"DI DI"	104	--
25	请出厅	105	--
26	请通行	106	Please go through
27	系统初始化	107	System startup
28	系统启动完成	108	System startup complete
29	验证失败	109	Verification failure
30	请小心通行	110	Please be careful

9 Status Display

9.1.1 Gate Status

When powering on the digital tube display for the gate status information, and when exiting the menu display, no key operation for 30 seconds to return to the display.

For example: "A08" means the Main gate is in place; "S08" means the Secondary gate is in place.

Code	Status	Code	Status
A00	Motor Deactivating	A10	Stopping the Machine Forcibly Pushed
A01	Finding Zero Point	A12	Emergency Stopping in Progress
A02	Forward Door Opening	A13	Master-Slave Wait Timeout
A03	Reverse Door Opening	A14	Counter-Axis Running Block
A04	Forward Door Closing	A15	Counter-Axis Stopping Block
A05	Reverse Door Closing	A17	Zero Point Recognition
A06	Forward Door Opening in Place	A18	Drive Alarm
A07	Reverse Door Open	A21	Power Down and Open
A08	Closed Door in Place	A22	Power Down and Open Complete
A09	Running Block	A23	Reset

9.1.2 Alarm Processing

Note: Secondary alarms will have a dot display for differentiation and have a higher priority than the host, e.g., the main alarms the loss of power-up Hall: **E01**, and the secondary displays **E.01**.

Code	Alarm Information	Solution
P01	Positive Gate Alarm	Access Alarm.
P02	Stall Alarm	
P03	Reverse Trespassing Alarm	
P04	Tailgating Alarm	
P06	Reverse Break-In Alarm	
P05	Master-Slave Communication Alarm	Check Master-Slave connection.
E01	Power-On Hall Loss	Check encoder cable or replace motor.
E02	EEPROM Error	Drive hardware failure or abnormal software version.
E03	Motor Blocking	Check for stuck motor loads or abnormal motors.

Code	Alarm Information	Solution
		F05 running blocking current is too small, increase appropriately, and do not exceed the rated current of the motor.
E10	V-Phase Current Calibration Error	Drive hardware failure.
E11	U-Phase Current Calibration Error	
E12	Undervoltage	Bus voltage is too low, check the input power supply.
E13	Overvoltage	Bus voltage is too high, check the input power supply.
E16	Overcurrent	Drive bus overcurrent, and check motor wiring.
E18	Failure To Find Zero	1. Check the transmission structure for the slipping phenomenon. 2. F61 The motor model is set incorrectly, change to the correct motor model; 3. F49 Deceleration ratio parameter setting error. 4. F05 running blocking current size mismatch, adjust larger or smaller appropriately.

10 Serial Communication Protocol

The controller (RJ-WS2021AB Universal Brushless Controller A Series Channel Controller) uses RS232 serial communication port and adopts the Modbus communication protocol format. Through serial communication, it can exchange data with the channel controller, such as sending door opening commands, reading the passage status of the channel, and setting relevant parameter values.

Serial Port Type	RS232/RS485
Baud Rate	115200
Parity Bit	None
Stop Bit	1

1	2	3	4	5	6	7	8
ID	CMD	ADDR_H	ADDR_L	DATA_H	DATA_L	CRC_L	CRC_H
Target ID	Command Keyword	Function Code Address High Bit	Function Code Address Low Bit	Data High Bit	Data Low Bit	CRC Checksum High Bit	CRC Checksum Low Bit

Target ID:

0x01 for main, 0x02 for secondary.

Command Keyword:

0x03 for read function code command, 0x06 for write function code command.

Function Code Address:

Function code parameter F12-00, i.e. 0x0C 0x00.

Data:

Function code value 01, i.e. 0x00 0x01.

CRC Checksum:

CRC16 check value, CRC_L CRC_H.

10.1 Door opening instruction

The high data bit indicates the number of times the card is swiped, of which 00 and 01 are single swipes.

The low data bit is the direction of door opening, 01 represents inward authorization to open the door, 02 represents outward authorization to open the door.

Single Authorized Door Opening Command:

Demand	Send	Receive
Inward Door Opening	01 06 0F 16 00 01 AA DA	09 08 00 01 00 01 71 43
Outward Door Opening	01 06 0F 16 00 02 EA DB	09 08 00 02 00 01 81 43
Closing Command	01 06 0F 16 00 40 6A EA	

Multiple Authorization of Door Opening Commands:

Demand	Send	Receive
6 Consecutive Passes Inward Door Opening	01 06 0F 16 06 01 A9 7A	09 08 00 01 00 06 CRC_L CRC_H
12 Consecutive Passes Outward Door Opening	01 06 0F 16 0C 02 EF DB	09 08 00 02 00 0C CRC_L CRC_H

When the memory swipe function is invalid (F18=0), a multiple swipe command is equivalent to a single pass swipe command.

When the memory swipe function is valid (F18=1), the function code value **01 01** is equivalent to **00 01**, both are single pass swipe commands.

Normally Open Mode Command:

F15-22=16 means forward normally open mode, F15-22=32 means reverse normally open mode, and F15-22=0 means cancel normally open mode.

Demand	Send	Receive
Forward Normally Open Mode	01 06 0F 16 00 10 6A D6	01 06 0F 16 00 10 6A D6
Reverse Normally Open Mode	01 06 0F 16 00 20 6A C2	01 06 0F 16 00 20 6A C2
Cancel Normally Open Mode	01 06 0F 16 00 00 6B 1A	01 06 0F 16 00 00 6B 1A

10.2 Automatic Return to Pass Completion Status

For remaining passable times, swipe the card 1 time, the number of times plus 1, pass through the completion of 1 time, the remaining number of times minus 1.

It is used to judge the current passage status of the gate:

When the display is **0**, it means that all passes are completed;

When **FF FF** is displayed, it means the passage timeout;

When the display is **00 XX**, it means the remaining **00 xx** passable times.

When the normal passage of pedestrians is completed or passage timeout, the controller will automatically return to the passage status and return format:

ID	Return Type	Direction of travel: 0x01 inbound, 0x02 outbound	Remaining xx passes available	CRC16 Checksum
09	04	00 0x	XX XX	CRC_L CRC_H

For A Single Swipe:

Actual Access Status	Corresponding value	Return Command
Card swiped but not yet entered the passageway	**00 01:** 1 pass remaining.	No return.
Forward passage completed, normal closing	**00 00:** Passage completed.	**09 04 00 01 00 00 CRC_L CRC_H**
Outward passage is completed, close the door normally	**00 00:** Passage completed.	**09 04 00 02 00 00 CRC_L CRC_H**
No access to the passageway passage timeout, the passageway is closed	**FF FF:** Passage timeout.	**09 04 00 01 FF FF CRC_L CRC_H**

For Swiping Multiple Times:

Example: When the memory swipe function is turned on and the positive direction is swiped 3 times in a row:

Actual Access Status	Corresponding value	Return Command
1st person through, gate stays open.	**00 02:** 2 pass remaining.	**09 04 00 01 00 02 CRC_L CRC_H**
2nd person passes, gate stays open.	**00 01:** 1 pass remaining.	**09 04 00 01 00 01 CRC_L CRC_H**
3rd person (i.e. last person) passes through. Passage is complete and the gate closes normally.	**00 00:** Passage completed.	**09 04 00 01 00 00 CRC_L CRC_H**
If someone does not enter the passageway in time, the passage time out and the gate closes.	**FF FF:** Passage timeout.	**09 04 00 01 FF FF CRC_L CRC_H**

10.3 Passage Alarm Inquiry

Command	Send	Receive
Passage Alarm Inquiry	**01 03 0F 1F 00 01 B6 D8**	**01 03 02 x1 x2 CRC_L CRC_H**
The returned x1 x2 is the data value of this function code, and the data values correspond as follows: 0. No alarm. 1. Positive unswiped card gate breaking. 2. Stall alarm. 3. Reverse alarm. 4. Tailgating alarm. 5. Master-Slave communication abnormality. 6. Reverse card not swiped to break into the gate.		

Passage Alarm Active Return:

Actual Access Status	Return Command
After Swiping the Card, The Normal Passage is Completed	No return.
Positive Card Not Swiped to Break Through the Gate	**09 05 00 00 00 01 0D 42**
Stall Alarm	**09 05 00 00 00 02 4D 43**
Reverse Alarm	**09 05 00 00 00 03 8C 83**
Tailgating Alarm	**09 05 00 00 00 04 CD 41**
Master-Slave Communication Abnormality	**09 05 00 00 00 05 0C 81**
Reverse Unwritten Card Breach Alarm	**09 05 00 00 00 06 4C 80**

10.4 Number of Passes Inquiry

Command	Send	Receive
Read Entrance Statistics	**01 03 0F 24 00 02 87 14**	**01 03 04 X1 X2 X3 X4 CRC_L CRC_H**
Read Exit Statistics	**01 03 0F 26 00 02 26 D4**	**01 03 04 X1 X2 X3 X4 CRC_L CRC_H**
Empty Count	**01 06 0F 13 00 01 BA DB**	Original data return.

X1 X2 is the high level of headcount data, **X3 X4** is the low level of headcount data.

- **Entrance Headcount** = Entrance Headcount High * 65536 + Entrance Headcount Low.
- **Exit Count** = Exit Count High * 65536 + Exit Count Low.
- **Empty Headcount:** Empty both entrance and exit headcount.

10.5 Passage Status Inquiry

Command	Send	Receive
Passage Status Inquiry	**01 03 0F 20 00 01 86 D4**	**01 03 02 x1 x2 CRC_L CRC_H**

The returned x1 x2 is the data value of this function code, and the data values correspond as follows:

0. System initialization state.
1. Idle state.
2. Aging state.
3. Fire door opening status.
4. Inward swipe card access status.
5. Outward swipe card status.
6. Set zero state.
7. Inward free pass status.
8. Outward free passage status.
9. Power down and open status.
10. System normally open state.

Appendix

Corresponding reference parameters for different door panels:

Door Material	Acrylic 300	Tempered Glass 300	Acrylic 400	Tempered Glass 400	Acrylic 500	Tempered Glass 500	Acrylic 600	Tempered Glass 600
Door Opening and Closing Speed (F03)	1200 (60%)	900 (45%)	900 (45%)	800 (40%)	800 (40%)	500 (25%)	700 (35%)	450 (22%)
Acceleration and Deceleration (F04)	20	15	15	10	12	10	10	5
Speed Ring (F07)	120	180	130	180	200	220	220	320
Position Ring (F08)	45	45	38	28	26	16	20	14

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