

ROTECH



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USER MANUAL

Sentinel Z18 Flap Barrier

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Summary

The Sentinel Z18 flap barrier is designed to control pedestrians entering or exiting restricted areas. The high speed flaps ensure a rapid throughput of pedestrians and multiple sensors provide safe and secure access. The mechanism is enclosed in a 304 stainless steel case.

1. Technical Parameter

Model: Sentinel Z18

Housing Material: Stainless steel

Dimension: 1400*280*950 mm

Channel Width: 500~550 mm

Configuration: Single direction/ bi-direction, single/double flap available.

Working Conditions: Indoor, Outdoor

Working Temperature: $-30^{\circ}\text{C} \sim +70^{\circ}\text{C}$

Relative Humidity: $\leq 95\%$

Voltage: AC 220V $\pm 10\%$ 50Hz

Input Interface: 12V signal level or 12V pulsing signal with pulse width $> 100\text{ms}$

Driving Current: $> 200\text{mA}$, support multiple signal input

Pass Speed: 40 persons/min

Communication Interface: RS485

Communication Distance: 1200M

MCBF: 3,000,000 times

2. Function and features

- 2.1 The Sentinel Z18 is compatible with all types of access control systems.
- 2.2 Multiple sensors prevent tailgating and offer excellent safety for pedestrians.
- 2.3 LED gate direction indicator displays green arrow indicating that access is allowed and a red cross when access is blocked.
- 2.4 The flap gate can be opened by multiple inputs, RFID, Bar Code, or push buttons are all acceptable.
- 2.5 Indication that the flap gate has accepted the input can also be by an audible signal.
- 2.6 The flaps will open automatically during power failure and reset after power is restored (this is an optional feature).

- 2.7 Counting function. Flap closes after passing N pedestrians continuously by swiping card N times correspondingly (N<=16) (this is an optional feature).
- 2.8 Reversed passing alarm function, barrier will alarm if pedestrian pass from opposite direction after reading the card. (This is an optional feature).

3. Configuration and installation

3.1 Configuration

Each flap barrier is normally equipped with one or two reader controllers to open or close the flap.

If no card readers are used the gate can be controlled by a computerized access control system or a simple push button.

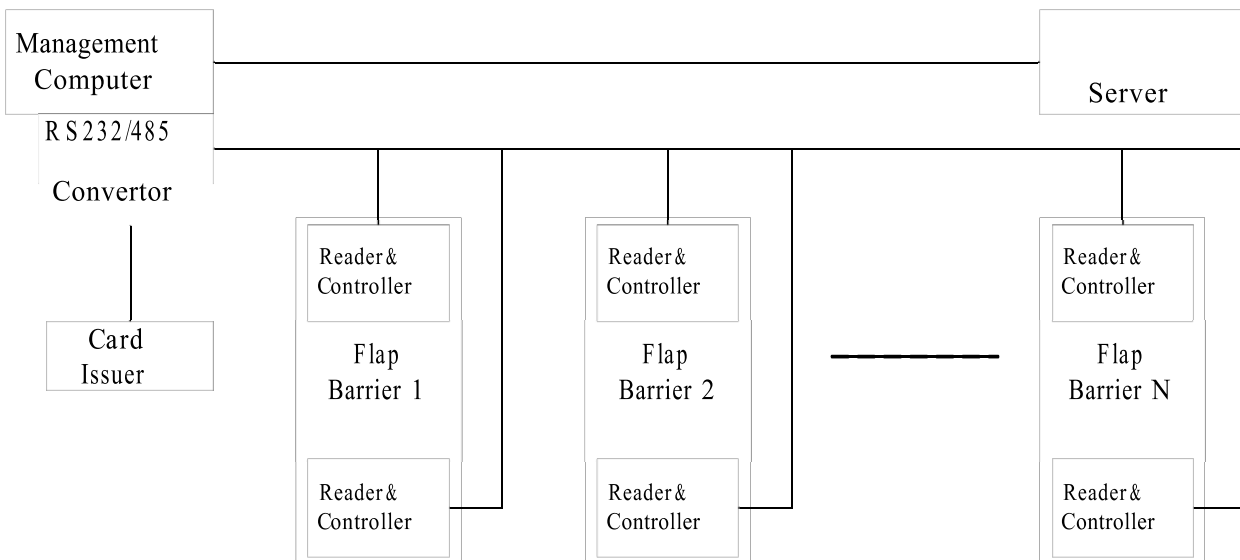


Figure 3-1 Entrance control system topological diagram 1

As shown in figure 3-1 above, each flap barrier is equipped with one or two readers & controller. If you need to monitor the status of the flap barrier in real time, you will need an access control software.

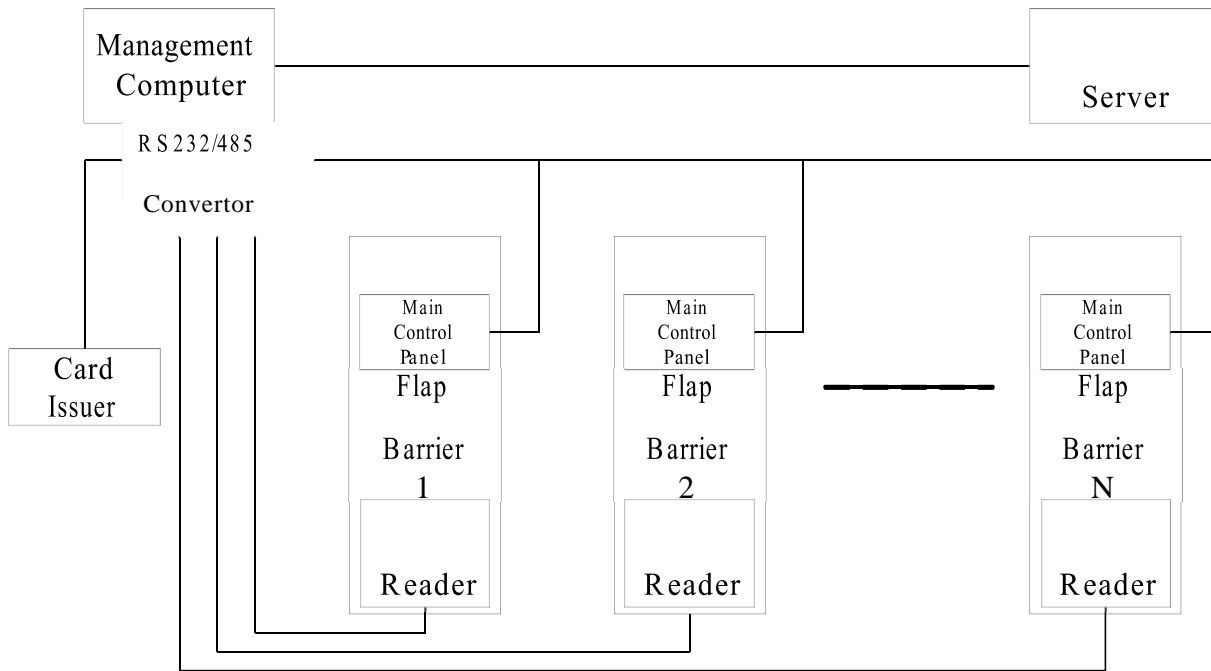


Figure 3-2 Entrance control system topological diagram 2

For big systems (for example ticket system for an exhibition), these can be configured with more than one computer for ticketing. In this case, the system should be configured with professional data base server. In order to keep the operational speed of the system, the computer cannot manage more than 8 tripod turnstiles, please refer to the above drawing, $N \leq 8$. If the total number of the tripod turnstiles exceeds 8 pieces, it's necessary to increase the number of the computers.

As shown in figure 3-2, each flap barrier is equipped with one reader, so as to respond to the intelligent cards, and to monitor the real time status and extract data by management software, to control the open/close of flap barrier. Multiple serial RS232/485 converters should be used to connect several flap barriers.

3.2 Installation and wiring

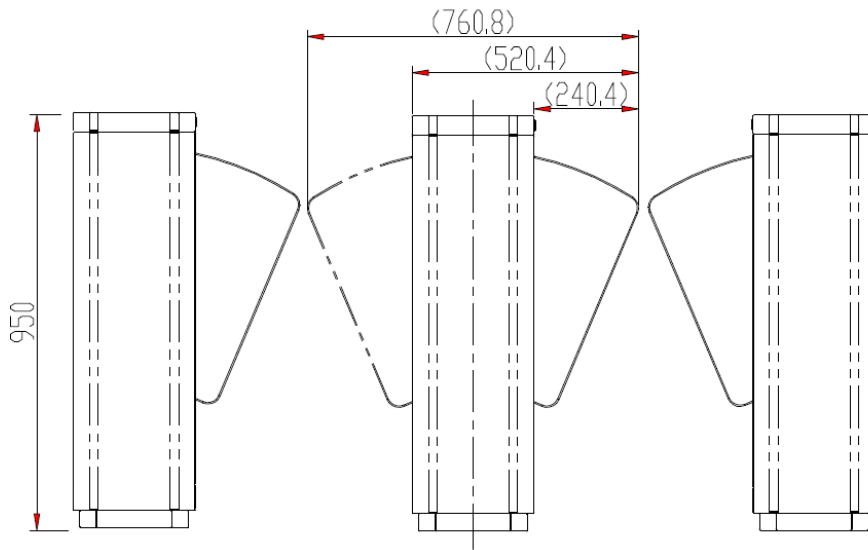


Figure 3-3 Flap barrier sketch map

Flap barrier can be a “single flap” or “double flap” barrier, as shown in figure 3-3 above, single lane flap barrier comprises two “single flap” barriers, one unit is the primary unit, the other is secondary unit. Dual lane flap barrier comprises two “single flap” barriers and one “double flap” barriers.

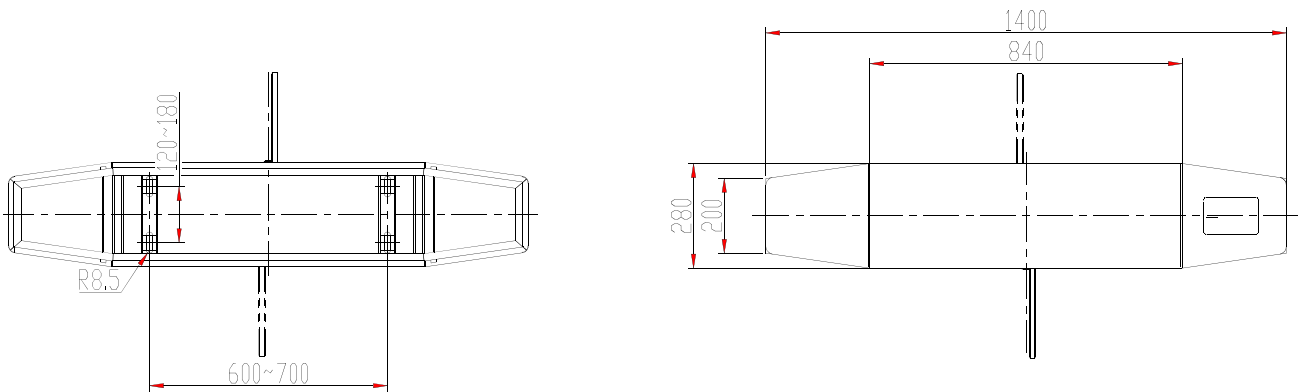


Figure 3-4 Flap barrier physical dimensions (Model -Z18)

The installation of the power and signal conduits must be sited so as not to interfere with the flap gate hold down bars.

If the flap barrier is controlled manually, please use one RVVP6*0.5 controlling cable to connect with the control button in administration office.

3.3 Electrical Connection

All wiring must installed by a qualified electrician in accordance with AS 3000 2007

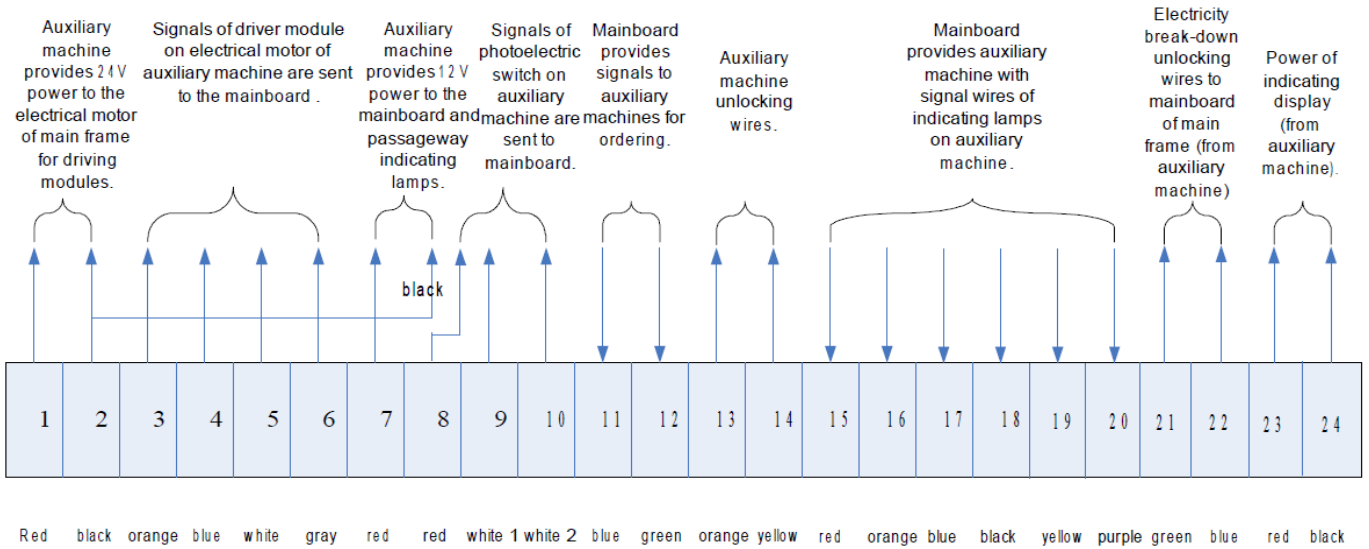
We have two different external wiring standards, 24P and 20P. The first one is for the flap barrier equipped with capacitor (with function of opening flap automatically during power interruption), the other one is for that without capacitor (no function of opening flap automatically during power interruption).

Figures 3-5 and 3-6 below are the wiring diagram of 24P and 20P, just connect the wiring terminal between primary unit and secondary one according to the diagram.

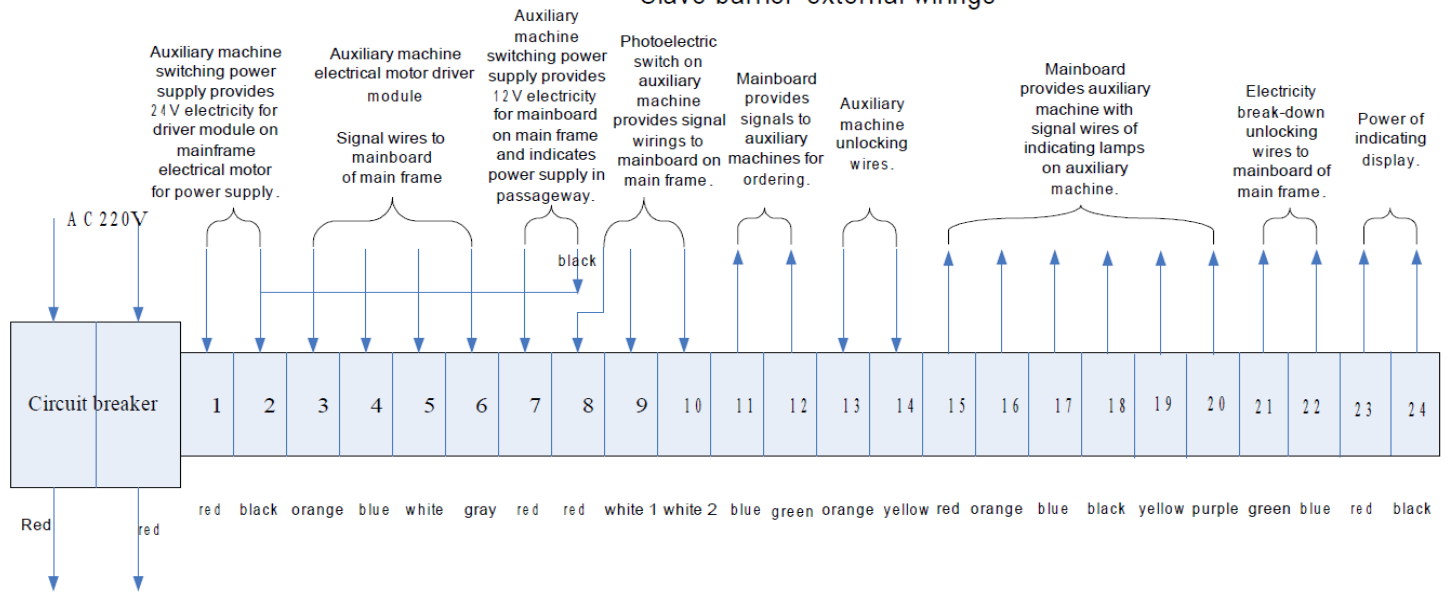
Note:

If the barrier gate requires two-tone color background LED lamp, another signal control wire should be added for wiring (the wire is for the color control of the lamp, which is used for terminal interconnection between primary and secondary unit).

Master barrier external wirings



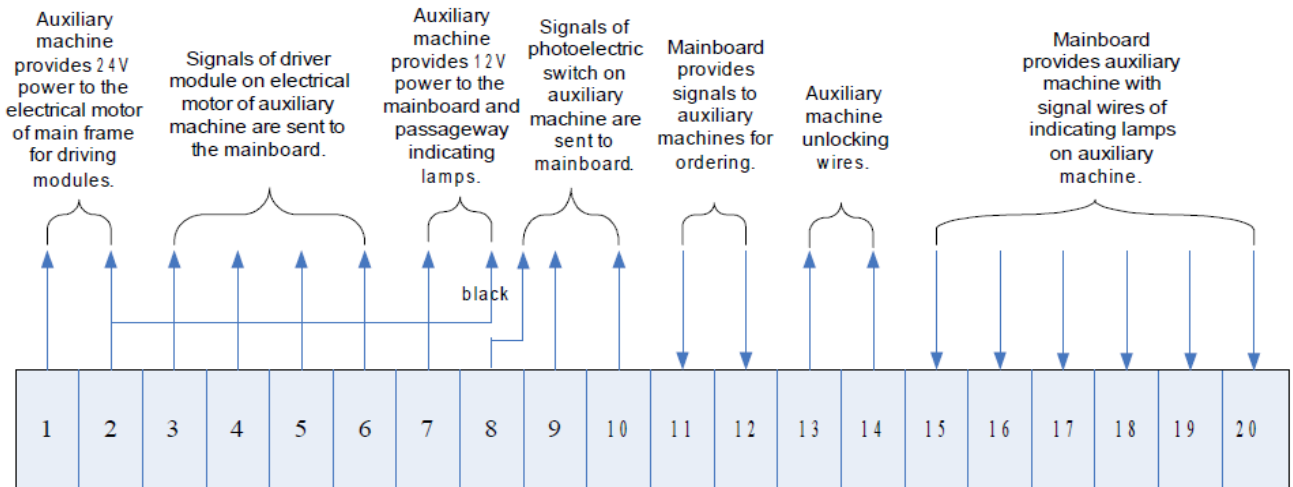
Slave barrier external wirings



Note: signal cables of the photoelectric switch are in red and white. White 1 means open completely (inner) and white 2 means close completely (outer).

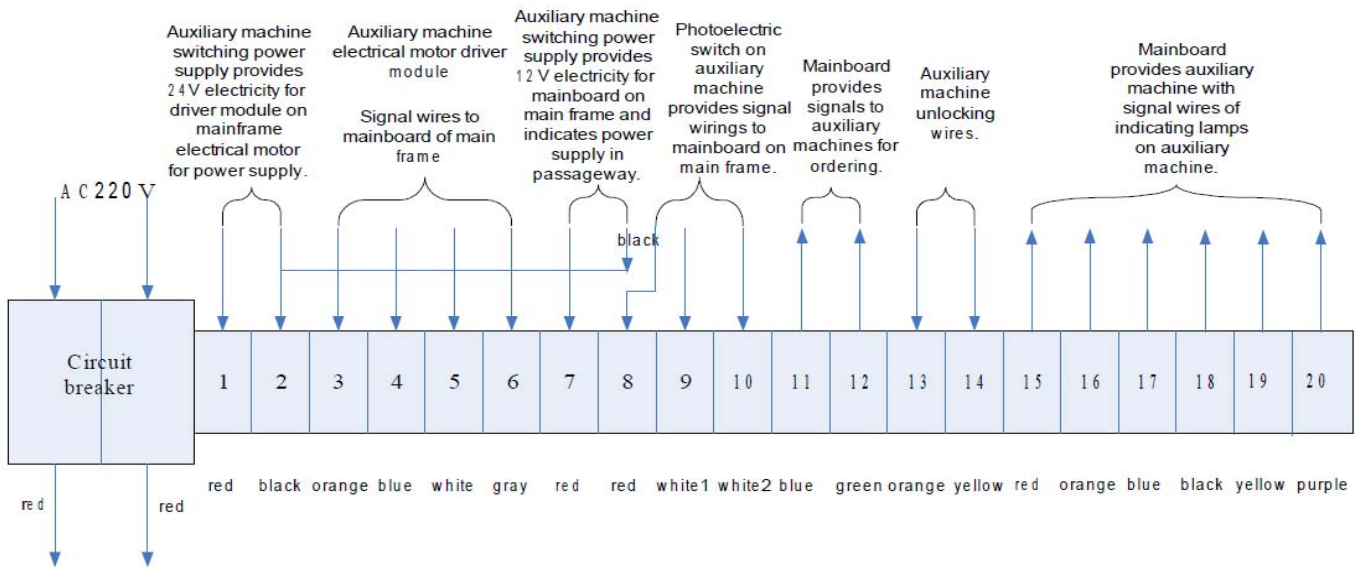
Figure 3-5 External connecting terminals (24P mode)

Master barrier external wirings



Red black orange blue white gray red red white 1 White 2 blue green orange yellow red orange blue black yellow purple

Slave barrier external wirings



Note: signal wires of the photoelectric switch are in red and white. White 1 means open completely (inner) and white 2 means close completely (outer).

Figure 3-6 External wire connection terminals (20P mode)

Notes:

There are three things to note when using other equipment instead of the card readers offered by our company:

when the opening gate input is level signal (voltage signal), voltage end of external open signals is connected with terminal "OP1+" and the earth end is connected with terminal "OP1-".

Secondly, when the opening gate input is dry contact signal (relay signal), one needs to connect terminal "OP1+" with terminal "+12V", contact point 1 of external open signal with terminal "OP1-" and contact point 2 of external open signal with terminal "GND".

Thirdly, when the opening gate input is bi-direction photo sensor, one needs to connect terminal "OP1+" with terminal "+12V", signal wirings of infrared connection with terminal "OP1-", GND of infrared connection terminal "GND" and "+12V" power cord of infrared correlation with terminal "+12V".

3.4 Debug specification

1. The button on the main controller is the button for manually opening and closing the gate. We can adjust position of retractable panels by pressing this button while debugging (no need to connect external card readers temporarily).
2. We can adjust position of photoelectric limit switch if the retractable panels are not in the correct position
3. Site definition and specification of photo sensor:

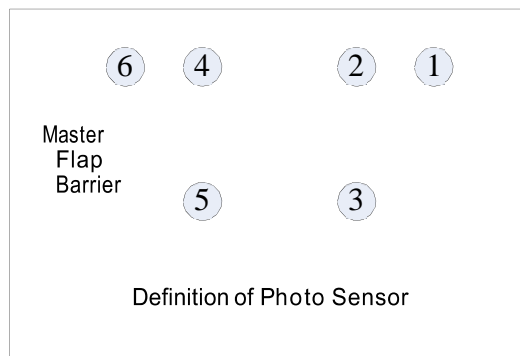


Figure 3-7 Diagram of photo sensors

As shown above, six pairs of photo sensors are distributed. With right-hand , photo sensors 1 and 6 indicate reading card and photo sensors 2, 3, 4 and 5 are for anti-pinch and closing gates.

photo sensor 1: Detection for entry

photo sensors 2-5: Detection for passing status photo sensor 6:

Detection for exit

The figure illustrates connection condition of photo sensors and corresponding connecting terminals. photo sensor 1, photo sensor 2, photo sensor 3, photo sensor 4, photo sensor 5 and photo sensor 6 are connected with corresponding IO1,IO2,IO3,IO4,IO5,IO6 on main controller. The above wiring is ready in factory.

4. System specification

4.1 System principle

The main controller serves as core of the overall system. Its input circuit consists of electric power source, external detection photo sensors, external connected card readers and limit detection switch and the output is an output interface circuit consisting of electrical motor driving module, alarms (optional), external connected display (optional), indicator (optional), counters (optional) and voice systems (optional).

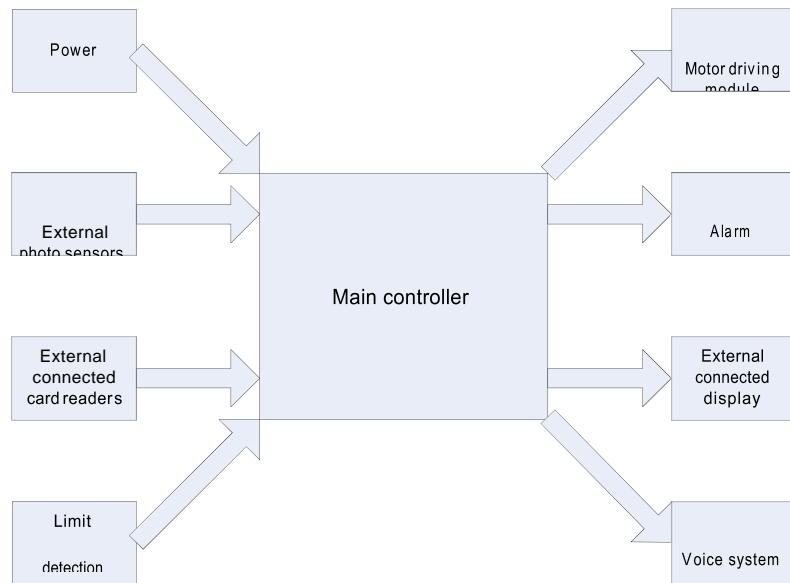


Figure 4-1 System diagram

4.2 Master control base pin position and relative definition

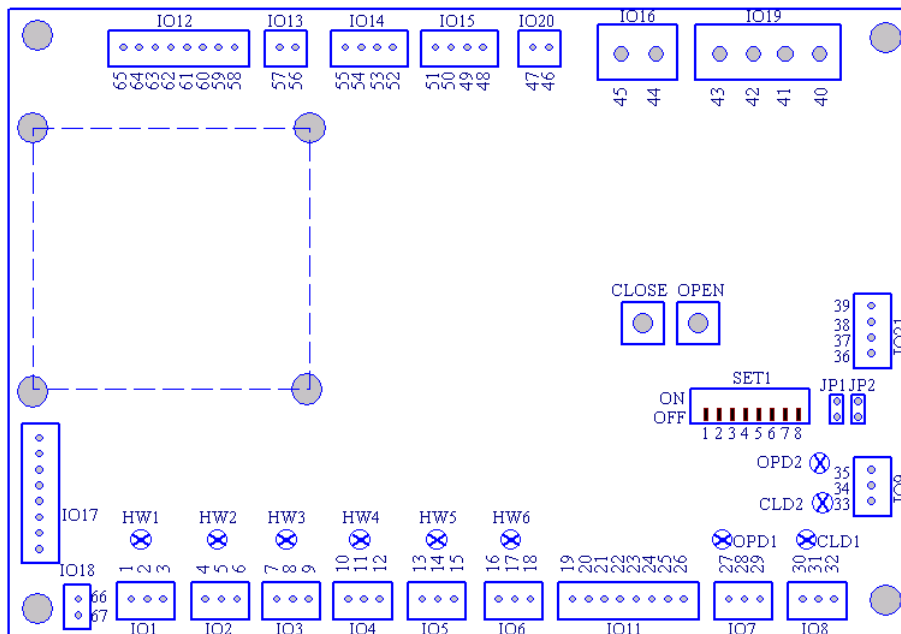


Figure 5-2 Main controller structure

Main controller base pin position specification:

IO1 Infrared 1 receiver interface (1: +12V output; 2: signal wiring input HW1; 3: ground wire GND);

IO2 Infrared 2 receiver interface (4: +12V output; 5: signal wiring input HW2; 6: ground wire GND);

IO3 Infrared 3 receiver interface (7:+12V output; 8: signal wiring input HW3; 9: ground wire GND);

IO4 Infrared 4 receiver interface (10:+12V output; 11: signal wiring input HW4; 12: ground wire GND);

IO5 Infrared 5 receiver interface (13: +12V output; 14: signal wiring input HW5; 15: ground wire GND);

IO6 Infrared 6 receiver interface (16: +12V output; 17: signal wiring input HW6; 18: ground wire GND);

The above 6 interfaces are all for infrared equipment and are connected with infrared photo sensors in accordance with actual demands.

IO7 Master barrier opening limit interface (27: +12V output; 28: signal wiring input OPD1 ; 29 : ground wire GND);

IO8 Master barrier closing limit interface (30:+12V output; 31 : signal wiring input CLD1;32:ground wire GND);

IO9 Slave barrier opening and closing limit interface (33: common wire COM; 34: signal wiring OPD2;35:signal wiring CLD2);

Note:

Common wire is +12V of photo-electric detection switch; power of the two photo-electric switches is supplied with slave barrier.

The above three interfaces are signal detection interfaces for detecting position of retractable panels open and close . Normally, wiring of master barrier is ready before leaving factory and we only need to connect limit switch circuit of slave barrier with main controller on main cabinet at site.

IO11 External signal input interface

(19, 20) OP1+, OP1- forward direction gate-opening signal input. (21, 22) OP2+, OP2- negative direction gate-opening signal input.

(23, 24) EOP+, EOP- forced gate-opening signal input; (used for external connected buttons only).

(25, 26) ECL+, ECL- forced gate-closing signal input; (used for external connected buttons only).

IO12 Output control indicator, counter interface (wired after leaving factory)

(58,59) FCNT-, FCNT+ negative direction counter control output signal. (60,61) ZCNT-, ZCNT+ forward direction counter control output signal. (62,63) FLED-, FLED+ negative direction indicator control output signal. (64,65) ZLED-, ZLED+ forward direction indicator control output signal.

IO13 Alarm signal output (57: earth GND; 56: alarm signal +12V ALM)

IO14 Control module interface on master barrier electrical motor (52:EGND;53:BR1; 54:FR1;55:+5A)

EGND connects with the "thin black" wire of control module on master barrier. BR1 connects with the "thin white" wire of control module on master barrier. FR1 connects with the "thin blue" wire of control module on master barrier.

+5A connects with the "thin red" wire of control module on master barrier.

IO15 Interface of electrical motor on slave barrier (48:SGND;49:BR2;50:FR2;51:+5B) SGND connects with the "thin black" wire of control module on slave barrier.

BR2 connects with the "thick white" wire of control module on slave barrier. FR2 connects with the "thick blue" wire of control module on slave barrier.

+5B connects with the "thick red" wire of control module on slave barrier.

IO16 Main controller mains input (44:AC2;45:AC1 are in 12 V without negative directions). IO17 Voice interface (used with voice module of our company instead of external wirings).

IO19 Main cabinet display interface(40:AC1 ; 41:SA ; 42 : SB ; 43 : AC2). It is optional and will be configured in accordance with clients' demands. If required, it will be wired before leaving factory. AC1 and AC2 are 12V power which may provide electricity for display. SA and SB are main controller auxiliary communication (for communicating with display).

IO20 Guard wire (pressure electric wave), not available commonly

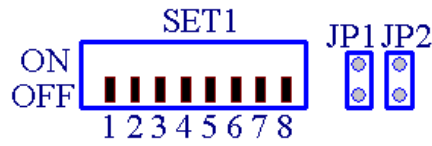
IO21 Communication interface (36:main communication MA; 37:main communication MB;39:power detection input DETECT;40:+12V)

HW1 to HW 6 are six pairs of photo sensor indicators. Corresponding indicators turns off if photo sensors were in aligning; corresponding indicator turns on if photo sensors were stopped; corresponding indicators turns off if not using terminals and defaults in aligning.

OPD1, CLD1, OPD2, CLD2 are limit indicators on master and slave barriers. Specifications are as following:

| OPD1 | CLD1 | Condition of electrical motor 1 | OPD2 | CLD2 | Condition of electrical motor 2 |
|------|------|---------------------------------|------|------|---------------------------------|
| ON | OFF | Open completely | ON | OFF | Open completely |
| OFF | ON | Close completely | OFF | ON | Close completely |
| ON | ON | Limit fault | ON | ON | Limit fault |
| OFF | OFF | Moving | OFF | OFF | Moving |

DIP-switch specification



| DIP NO. / Condition | 1 | 2 | 3 | 4 |
|---------------------|----------------------------|---------------------------------------|--------------------------|--|
| ON | Counting function active | wrong direction access alarm disabled | Anti-tailgating disabled | Enter with goodbye, exit with welcome voice prompt |
| OFF | Counting function disabled | wrong direction access alarm active | Anti-tailgating active | Enter with welcome, exit with goodbye voice prompt |

| DIP NO. / Condition | 5 | 6 | 7 | 8 |
|---------------------|---------------------|-----------------------------|-------------------------|----------|
| ON | Aging test active | Entrance free open active | Exit free open active | Reserved |
| OFF | Aging test disabled | Entrance free open disabled | Exit free open disabled | Reserved |

JP1, JP2 are correlated time lagging closing equipment (OFF for open and ON for close). Specifications are as following:

| | 4S | 8S | 12S | 16S |
|-----|-----|-----|-----|-----|
| JP1 | OFF | ON | OFF | ON |
| JP2 | OFF | OFF | ON | ON |

4.3 Specifications on other components

Infrared (photo sensor): the one with three wires at the bottom is the photo sensor on the master barrier; the one with two wires is the photo sensor on slave barrier. When power is connected, the indicator light of photo sensor on slave barrier is in green and the one on master barrier will be red if it is not aligned and off if it is correctly aligned. Photo sensor on master barrier is connected with IO1-IO6 on main controller. Photo sensor on slave barrier only needs to be electrified instead of being connected with main controller.

External connected card readers require a 12V pulse signal with 12V level signal or impulse width above 200ms. It is connected with IO11 on main controller.

Photoelectric limit detection equipment: Is installed near the electrical motor and provides signals to main controller when the switch of electrical motor is in position. Master barrier wirings are connected with IO07 and IO08 on main controller in the factory. Slave barrier wirings are connected with IO09 and needs to be installed on site.

Electrical motor driving module: Driving module on master barrier electrical motor is connected with main controller and the one on the slave barrier electrical motor is installed within slave barrier cabinet. Driving module on master barrier electrical motor is connected with IO014 on main controller and is connected in the factory; driving module on slave barrier electrical motor is connected with IO15 on main controller and needs to be installed on site.

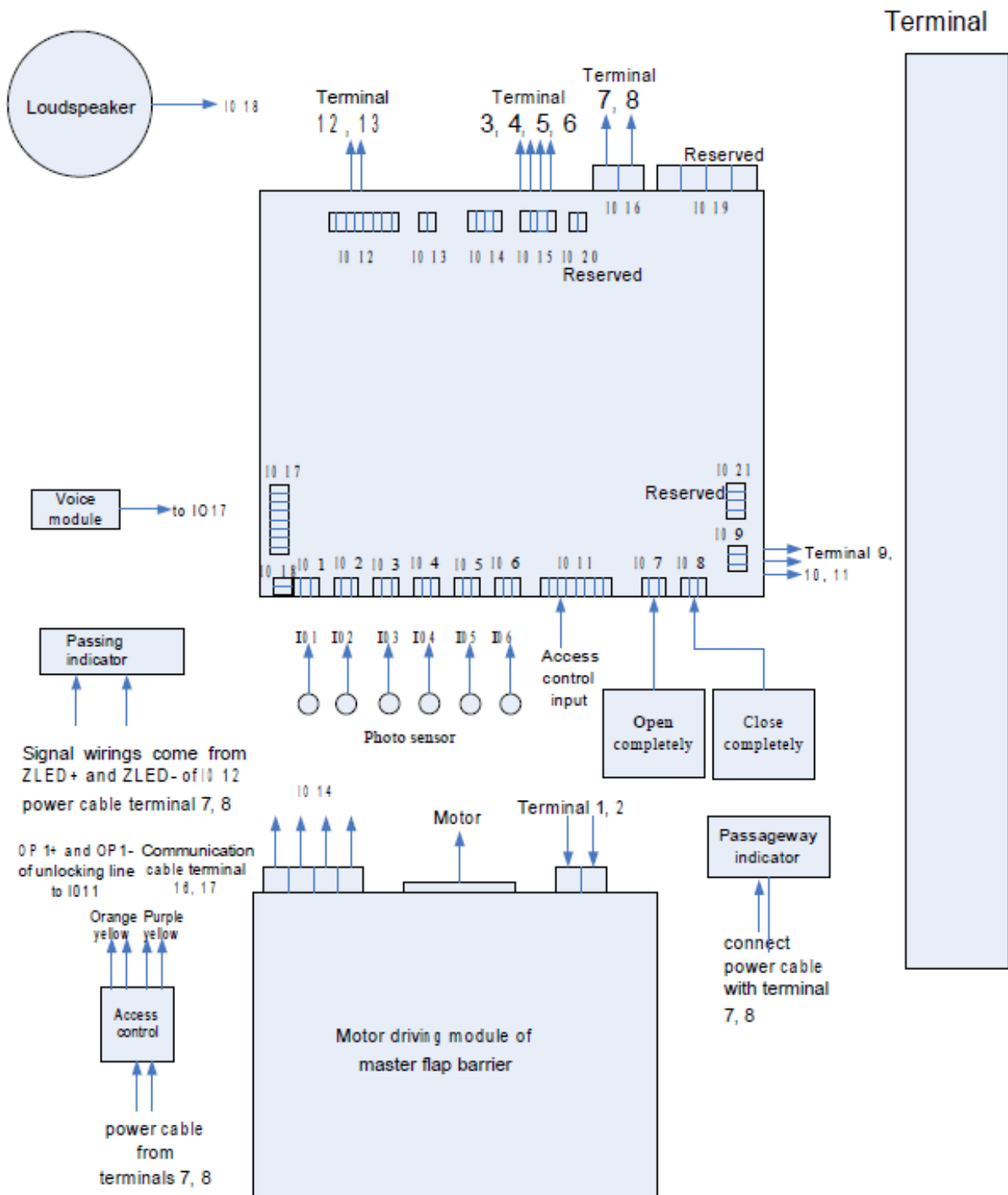
Alarm: Main controller provides 12V driving for external connecting alarms, buzzers and lamps. It is connected with IO13 on main controller.

External display: It is optional and connected with IO19 of main controller.

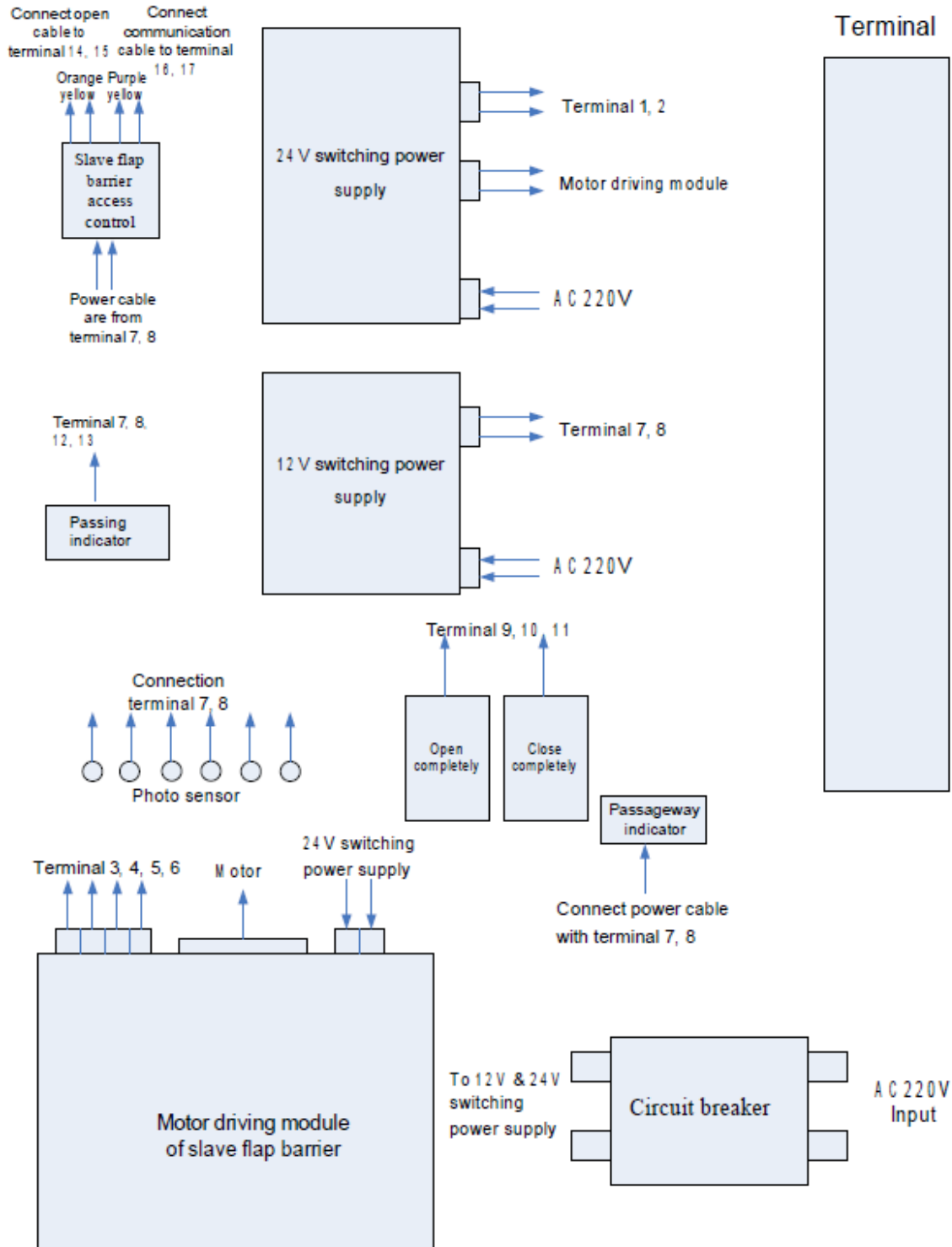
Voice prompt system: It speaks "welcome" while entering and "Good bye" while exiting. It is provided in accordance of clients' actual needs and is installed in the factory.

4.4 Inner wiring

Inner Wiring of Master Flap Barrier



Inner wiring of slave flap barrier



5. Precautions

- 5.1 Opening gate input signal width must not be more than 100ms
- 5.2 The gate will be open while opening-gate signal input is on until it goes off.
- 5.3 Entry opening signal is connected with OP1+ and OP1- on main board and the exit opening signal is connected with OP2+, OP2- on main board.
- 5.4 While using OPEN button on main board, the gate will always in open position no matter if the sensors are activated. The gate will return to normal operation after pressing the CLOSE button on main board to close the gate.
- 5.5 If any one of the six pairs of infrared beams are activated, the alarm signal will be on.
- 5.6 When the flap barrier is used as emergency exit, the gate open module needs to be added.

6. Maintenance

As flap barrier is an integrated mechanical and electronic products, it needs adequate maintenance. Effective maintenance can extend the service life of the equipment and ensure the quality and reliability.

| Maintenance Parts | Malfunction | Check | Remedy |
|---|---|--|--|
| Photo switch | Barrier panel can't be opened or closed normally. | Check if the flap can be moved. If it can be moved, check photo switch for stop signal or if it's in correct position. | Replace or adjust photo switch; Pull back the flap to right position |
| Connection of primary unit and secondary unit | Secondary unit doesn't work. | Use multimeter to check the wiring connections of the circuit; Check if screw terminal is loose. | Replace wire and tighten |
| Motor and relevant mechanical components | Abnormal running: excessive noise or stopped | Cut off the power, rotate the flap manually to check if it is easy to rotate. | If motor or motor module is damaged, relevant accessories need replacement, otherwise, you need to carry out maintenance to mechanical parts |
| Photo sensor | Erratic operation | Check if any photo sensor is damaged or not aligned, check if the wiring for photo sensor is correct after replacing. | Adjust the position of photo sensor or replace it. |