SFY03 **User Manual**

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For the safe use of this product, please always read this manual and use it correctly

⚠ note

⊗ Prohibit

1. Brief introduction

SFY03Magnetic Navigation AGV (Automa ted Guided Vehicle) is a well-equipped mobile robot with magnetic stripe as the target path autonomous navigation, according to the predetermined path, and automatically stop, turn or unload when needed; with laser ranging as safety obstacle avoidance detection; multiple state sound and light indication and friendly human-computer interaction.

Single-machine version of the complete system, to meet the common functions of AGV. Without connecting to the external system, the independent system enables the user to easily conduct equipment monitoring, system setting, operation monitoring, route editing, site editing, and select parking sites on the man-machine interface; it can customize storing multiple routes, multiple sites and multiple operations.

The vehicle control unit has strong expansion to for various applications; it has multiple abnormal protection mechanism to effectively protect the outside
Exception caused by a partial error.

Typical application: used for transporting goods in factories, warehouses and other places.

2. AGV operating site and environmental requirements

➤**The AGV operating site description**

● The degree of fluctuation

When the fluctuation degree of the AGV road is below the maximum allowable value, the AGV shall be able to achieve a controllable rated speed, and the fluctuation degree shall be the difference between the highest and the lowest height within the base range. The maximum allowable value of the fluctuation degree in the range of 1 ㎡ should be less than 3mm (including 3mm). The AGV running ground should be clean, with no particles and dirty things, and the ground should not slip.

● Grade of the I pavement

The road slope (H / L) is defined as the maximum ratio of the road level height difference to the route length over a length range of 100mm. The AGV shall achieve a controlled rated speed of driving when the slope of the AGV running road surface is below the maximum allowable value. The maximum allowable value of pavement slope should be less than or equal to 0.05, and the AGV must be less than or equal to 0.01.

● Step height

The abutment height is the maximum value of the pavement level height difference within 100mm. When the road step height of the AGV operation is below the maximum allowable value, the AGV should be able to achieve a controllable rated speed, but the AGV parking space does not allow the steps. The maximum allowable value of the step height shall be less than or equal to 5mm.

● The I-groove width amplitude

The trench width range is that when the AGV running pavement trench width range is below the maximum allowable value, the AGV should be able to achieve controllable rated speed, but the AGV parking space does not allow grooves. The maximum allowable value of the pavement trench width should be less than 10mm (including 10mm). When the trench width range is greater than the maximum allowable value, it shall be required according to the step height.

➤**AGV use environment requirements**

● Use site: flat wear-resistant ground;

● Ambient temperature: -10℃ ~ 45℃;

● Humidity: 15%~80%, no condensation;

● Air: no dust, flammable, explosive and corrosive gas;

● The I power circuit: 220 (± 10%) V 50 (± 2%) Hz;

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- static electricity: in order to easily discharge static electricity, the ground material should be easy to discharge substances;

In the environment with noise such as electromagnetic waves, scattered light, ultrasonic waves and static electricity, the user and the manufacturer shall jointly confirm in advance whether it affects the normal operation of AGV or not;

- AGV There must be no tape magnetic material on the driving path.

    ⚠ Beyond the above AGV operating site or environmental requirements may lead in reduced AGV operating life or unstable operation.

    ⚠ The equipment must be operated by the professional authorized personnel.

    ⚠ Do not touch the non-operating parts during the equipment work.

    ⚠ Select the corresponding running line according to the actual production requirements, and the unauthorized operators shall not change it at will.

    ⚠ When running AGV trolley runs, pedestrians must avoid and keep a safe distance with AGV trolley (not less than 1 meter).

    ⚠ Strictly follow the instructions and equipment operation procedures.

    ⚠ Strictly check the equipment according to the equipment spot inspection table before working.

    ⚠ Please do not set things in the AGV path or the shelter place, otherwise it will cause the system to stop running caused by the collision.

    ⚠ Please do not park the AGV on the slope, otherwise it may cause the equipment to fail out of control, slip away, etc.

    ⚠ Before the operation starts every day, spot inspection must be performed to ensure that the equipment is not abnormal and ensure that the function of the safe installation is normal.

    ⚠ Please do not let the oil or water wet the path of the AGV, otherwise it may stray or collide due to skid.

    ⚠ Please do not let the water or oil wet the AGV body, otherwise it may lead to equipment failure, abnormal start, electric shock, derailment, collision and other phenomena.

    ⚠ Please surround the walking path of AGV through some safety countermeasures, so that operators can clearly distinguish the running path of AGV, or set up ground paint, zoning lines and other means to achieve the safety purpose.

    ⚠ Even if the safety device is installed, there will be dead corners in the safety device sensor, so pedestrians and other vehicles should not enter the AGV walking path. In addition, there may be a sudden turning and other road conditions, please pay special attention to it.

    ⚠ When charging the battery, charge the battery using the standard charger.

    ⚠ Other facilities for AGV without professional guidance.

    ⚠ When the battery power is low (no automatic charging mode), it is necessary to replace the battery in time, and no further operation is allowed, which will easily lead to the reduction of the battery life.

    ⚠ Regular maintenance and maintenance of AGV.

    🚫 It is strictly prohibited to change the AGV program setting, private disassembly, change components and other behaviors without the authorization of the manufacturer. The equipment failure caused by this reason will not be covered by the warranty.

    🚫 It is strictly prohibited to open the electric control box during AGV operation, otherwise the control board may be damaged and the system will not work.

    🚫 Never contact water and other conductive liquid, otherwise it is easy to cause short circuit damage equipment.

    🚫No contact with corrosive objects such as sulfuric acid, otherwise the equipment may be damaged.

    🚫Is not close to fireworks, otherwise it may cause fire, especially battery, is strictly close to fireworks or put in a high temperature and high pressure place

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⊗ It is strictly prohibited to contact the equipment with wet body or clothes, otherwise it may cause equipment failure and the risk of electric shock.

⊗ It is strictly prohibited for unauthorized professionals to remove or open the electric control box or change the line.

⊗ It is strictly prohibited to use the AGV in outdoor operation.

⊗ It is strictly prohibited to sit or rely on or rely on the AGV car body in any part of the car body, otherwise it may cause people to fall or fall injured.

⊗ It is strictly prohibited to force the AGV in the boot state, otherwise it may damage the AGV control board or other control components.

⊗ It is strictly prohibited to maintain and overhaul the AGV under live conditions.

⊗It is strictly prohibited to move the AGV batteries for power supply for other facilities.

3. technical parameter

project	parameter	explain
Navigation mode	magnetic navigation	
Load mode	backpack	
Magnetic bar parameters	50MM / 30 MMN pole / S pole	Default 30 MMN pole magnetic strip
outline dimension	600mm (L) X450mm (W) X472mm (H)	
Cargo platform size	600mm (L) X 450mm (W)	
The chassis is off-ground height	25MM	
Rated load	50KG	A 50% overload is allowed
Design self-respect	< 50KG	
maximum speed	0.8M/S	
Navigation speed	0.7M/S	
direction of motion	Forward, backward, and spin in place	
turning radius	Rotate 0M in situ / navigation turn 1M	
navigation accuracy	±10mm	
Read the card stop accuracy	±10mm	
Precise stop accuracy	±5mm	secondary localization
climbing capacity	< 1%	
Walking motor	DC brushless motor	
cell	24V/12AH	Optional 24V / 20 AH
Battery replacement	Independent battery warehouse	Can quickly change electricity
Rated working hours	Full load 6H, general working condition 8H	The 24V / 20 AH battery is fully loaded for 10H
Obstacle sensor	Single point laser	The software detects the distance and is not sensitive to the color
obstacle avoidance sensor	not have	selectable
Light instructions	Full-color LED light set	Diversification of the display status
Music instructions	Multi-channel speech module	A variety of alarm prompt sound, walking sound, station sound, etc
human-computer interface	4.3 Inch	
System communication interface	have	obligate
Site card reader	13.56MHz High-speed RFID card reader	
Site editor	support	Using the man-machine interface operation can be used
Route editor	support	Using the man-machine interface operation can be used
Route number	With> 200 bars	
Number of sites	With> 200 of each one	
Number of actions supported at a single site	Ten	
Case material	Q235A + SUS 304	
working temperature	-10~45℃ (no condensation)	
Working humidity	Below 80% (no condensation)	
Media environment	No corrosive, combustible gas or metal dust, etc.; shall not be used in special environment containing	

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	radioactive substances, strong magnetic field interference and vacuum	
Save the temperature	-25~80℃ (no condensation)	
Preserve humidity	Below 85% (no condensation)	

4. Description of the main components

front

back

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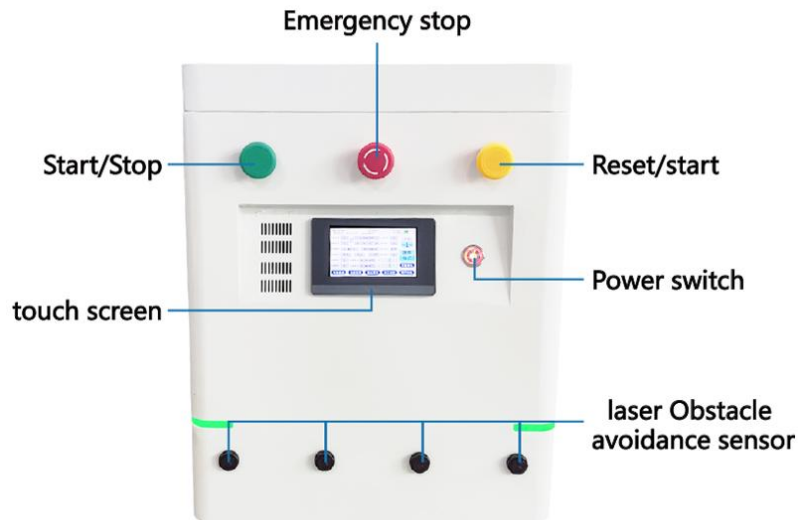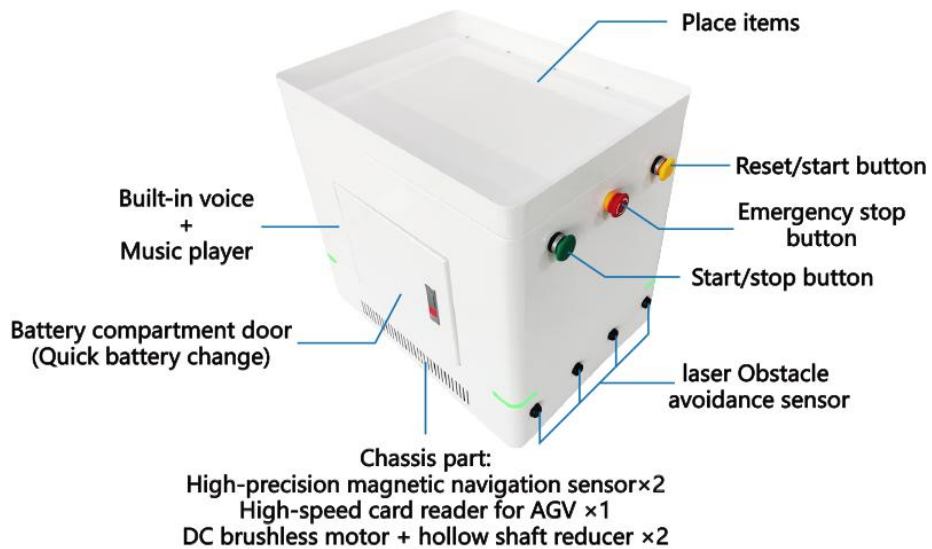
➤**Front panel (define the installation direction of the industrial touch screen as the forward direction)**

● mains switch

Pull up, turn on the AGV vehicle power; pull down, turn off the AGV, the vehicle power.

● Industrial touch screen

Monitor AGV current operation status, parameters, control data and target operation route editing, please see the HMI section for details.

● front laser obstacle avoidance sensor

Check for the presence of obstacles in the front laser sensor enabling state.

● Before I, full-color light indication

Indicate the current operating status of the AGV, see the LED Status Definition section.

● The I front reset / release button

After the AGV fails and the fault is recovered, press this button and the AGV fault is removed.

● Emergency stop knob before I

Press this button at any time, and stop the AGV urgently; rotate the arrow of the knob, and the knob rises. After pressing the reset, the emergency stop alarm fault is lifted.

➤**back panel**

● The rear laser obstacle avoidance sensor

With the front laser obstacle avoidance sensor, the detection direction is the rear.

● After I full color light indication as the previous full color light indication.

● The I rear reset / release button is the same as the front reset / release

● Start/stop button

After I, start / stop Button Switch the running state of AGV, and press under the running state to enter the stop state; press the stop state to enter the running state.

● Emergency stop knob

The I rear emergency stop knob is the same as the former emergency stop knob

➤**Battery warehouse door**

Open: press the PUSH position on the battery compartment door, open the compartment door lock, and you can directly change the power.

Close: rotate the warehouse door to the closing state, press the lock rebound part, lock the lock.

➤ **Voice module**

With several kinds of voice and music, you can carry out the relevant voice prompt, or music prompt.

➤**Cargo platform**

Full size, maximize the user to put goods space.

➤**Chassis part**

● The I high-precision magnetic navigation sensor

The main components of AGV magnetic navigation, installed at the bottom of AGV, front and rear direction, one, high precision magnetic stripe detection sensor, to ensure the accuracy and stability of navigation.

● AGV Dedicated high-speed card reader

The AGV site number reading and writing function is installed in the middle of the bottom of AGV, which is used to read the card number of R FID card (site card). Different card numbers can correspond to different function definitions, and support users to edit.

● The I walking drive part

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Using the power wheel mode of brushless DC motor + hollow shaft reducer, the super load operation capacity is much greater than that of similar products.

5. The AGV security components

➤**Urgent stop knob**

When the AGV is abnormal or the user wants to stop urgently, the user can press this button to brake the AGV car quickly. Knob This knob, the knob bounce, then press the reset button, emergency stop lift.

➤**Obstacle sensor**

The obstacle sensor adopts a single point laser, a single point covering 15 degrees, the detection distance can be set to 1.2M, the detection principle is TOP, so it is not sensitive to the color of the target, this sensor is obviously better than the infrared switch of diffuse reflection detection mode. At the same time, support multiple alarm distance setting
As well as dynamically switching the alarm detection distance, the setting method can be modified through the system software.

⚠Any way of obstacle detection can not fully protect the unknown obstacles, AGV operation process, should pay attention to avoid.

⚠The way of laser detection may form a misdetection of strong light or strong reflective objects, which is a normal phenomenon of the sensor.

➤**obstacle avoidance sensor**

The anti-collision sensor adopts rubber strip and internal circuit detection. When there is a mechanical collision with the AGV, the anti-collision sensor will collect the electrical signal and change, and produce the anti-collision sensor alarm, and stop running the AGV. After confirming the safety, press the reset button to clear the anti-collision alarm.

⚠This AGV anti-collision sensor is optional.

6. Battery and charging

⚠ It is recommended to choose a dry and ventilated local environment, to stay away from the inflammable and explosive dangerous goods warehouse, garage and other dangerous areas.

⚠ Please charge the battery using our matching charger.

⚠ Please avoid the transition between charge and discharge.

⚠Please check the charger and battery regularly. If there is abnormality, replace it in time.

# 7. appearance size

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8. Man-machine interface operation instructions

The man-machine interface can set multiple account and password. By default, no account can log in. Some of these pages require higher permission to log in before they appear. The factory permission, user name and password are as follows:
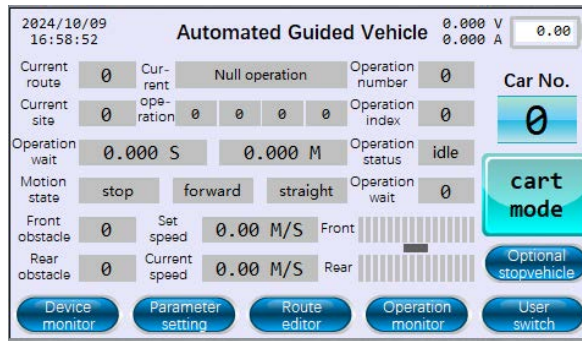
user permission	user name	password
Level 1	user	123456
Level 2	conservator	230619

➤**User switch**
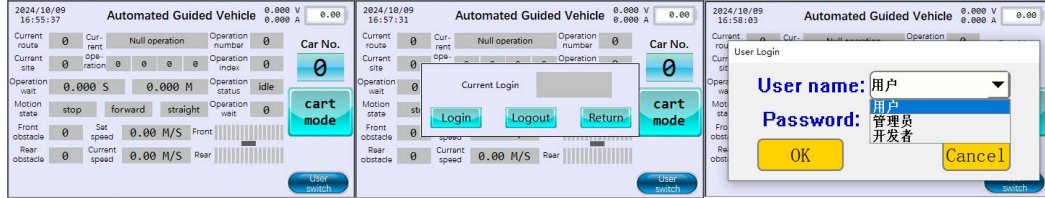
The main page after the man-machine interface login administrator is described in detail.

➤**Principal sheet**

- Title: System time, equipment model SFY03-XXX, battery power and voltage, system alarm bar;

- The l Current route: the current route number;

- Current site: current or most recent arrival of AGV;

- Current operation: a series of operations executed by the current site in the current route, a single step operation currently being performed, including the operation name and four parameters of the operation;

- The l Total operation number: the number of single-step operations included in the series of operations at the current site;

- Operation index: the single step operation number of the car body being performed at the observation time;

- The l Operation status: including idle, Run, Pause, and Finish, indicating the execution status of the series operations;

- Operation wait: When the series of operations of the current site of the current route include "Wait xx", the wait is displayed in real time;

- Motion state: indicates the current operating state of AGV

    Box 1 contains the Stop, Emergency Stop, Navigation, Offline, Remote Control,

    Box 2 contains Forward, Back,

    Box 3 contains "left bifurcation", "middle bifurcation" and "right bifurcation"

- The l Front / rear obstacle: obstacle area value;

- Set speed: set speed;

- Current speed: actual walking speed;

- Front / rear magnetic navigation offline / online indication;

9

- Car number: user custom AGV number (can be set in the parameter setting-> car number).

- Button: cart mode: start AGV cart mode, remove the motor self-lock, light cart, protect the machine;

- Button: start / stop: AGV start and pause switch;

- The I function page button:Toggle the " device monitoring"、"Parameter setting"、"Route editor" 、"Operation monitoring"、"Optional stopvehicle"、"User switch ".

➤Equipment monitoring
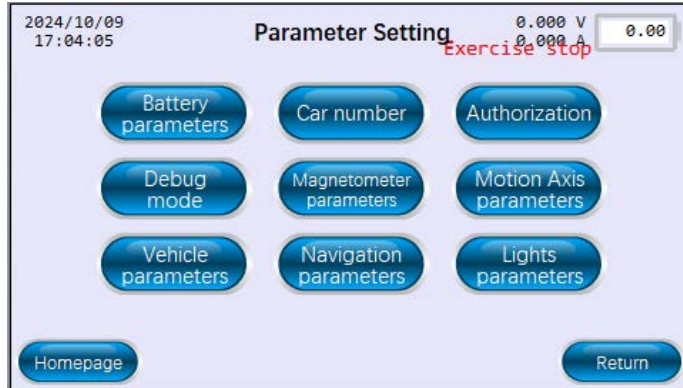
- Title: System time, title of "Equipment monitoring", battery power and voltage, rolling bar of system alarm item;

- Button of I sub-menu page: enter the monitoring details page of each device, "IO Monitoring", "AD / DA monitoring", "Battery Monitoring","Magnetic navigation monitoring", "obstacle monitoring", "motor monitoring","Card Reader Monitor", "Milometer monitoring" (see the next series of pictures);

- Other function pages of the I interaction system: Home page, Return.

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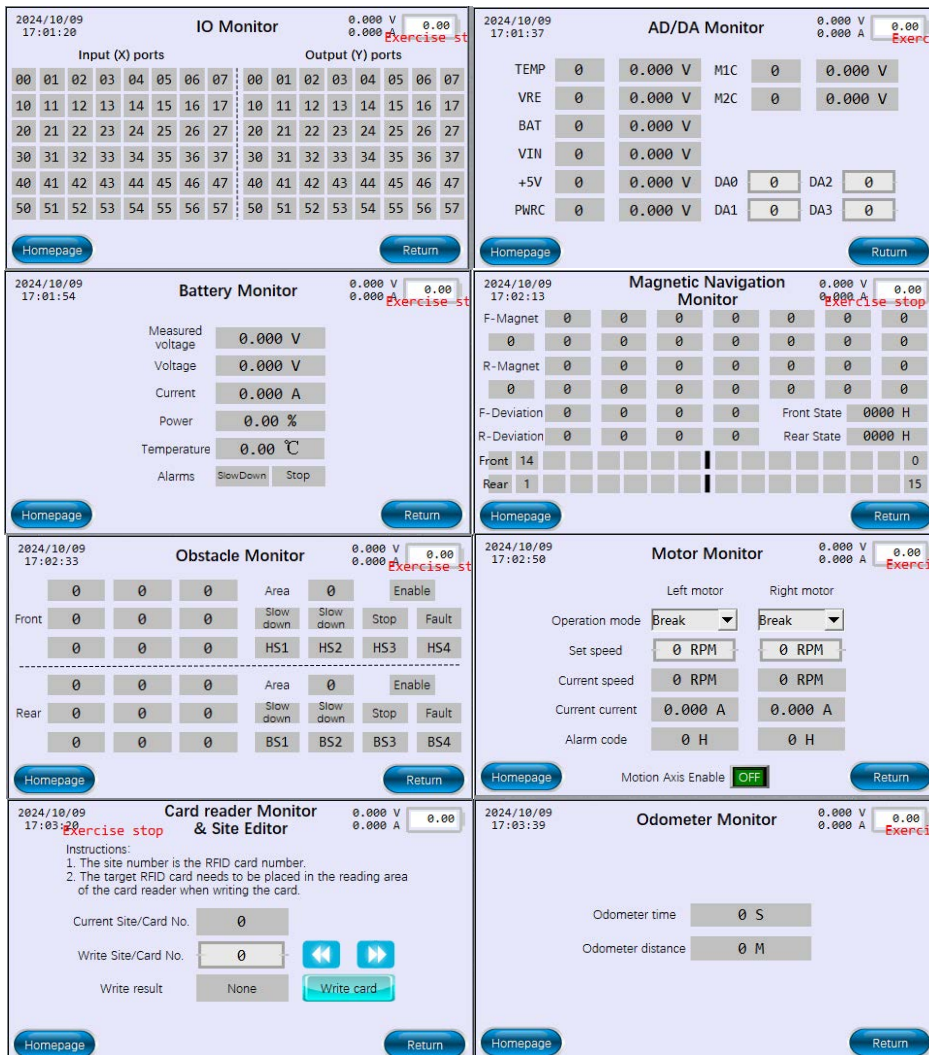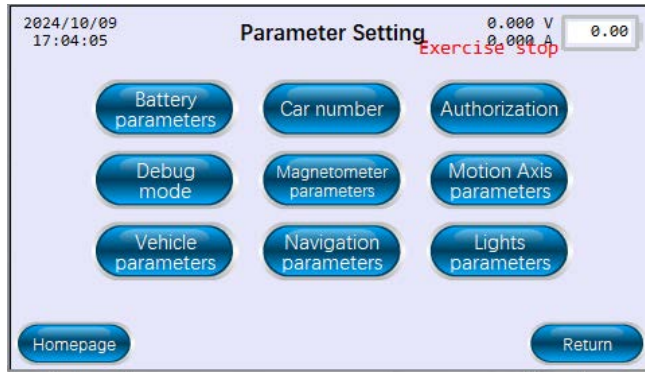
➤**Parameter setting**

- Title: System time, title of "System setting", battery power and voltage, system alarm item rolling bar;

- Button of I sub-menu page: enter the setting details page of each parameter, "battery parameters", "car number", "authorization" and "debugging mode" (see the next series picture);

- Other function pages of the I interaction system: Home page, Return.

➤**Route Editor-Forward**

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- Title: System time, title of "Route site operation editor-forward / backward", battery power and voltage, system alarm item scroll bar;

- Route l: route number of the route;

- Site number: the site number of the site;

- Operation code-forward: set up the series of operations running in the route number, read to the site number, forward,

- Operation code-back: set the series of operations running in the route number, read the site number and backward,

- After setting up, when the AGV runs on this route and reads the site card number, the preset operation will be executed from 0 to 9,

- Click the operation text box, you can select the operation instruction through the drop-down list of the pop-up window (see the following figure), or directly enter the operation code after the drop-down list.
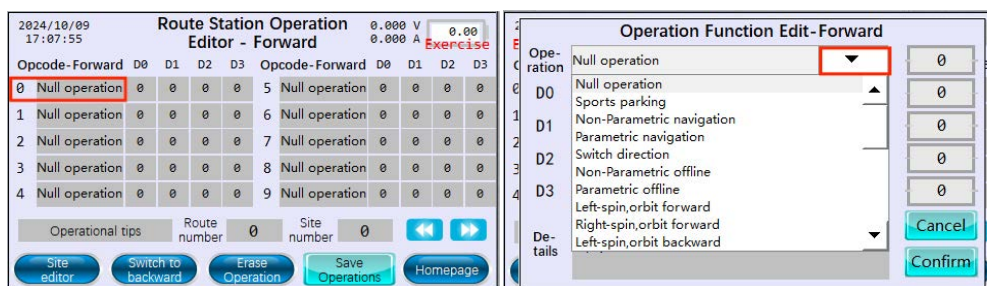
⚠See for alternative operationsChapter 10, Route-site-operation and editing instructions

- Save operation: save the set series of operations to F lash, without losing the power;

- The l site editor: the same device monitoring-> card reader monitoring, details seeChapter 9, site editing description;

- Forward and back switch: switch and edit forward / backward series operations (see shown below);

- Wipe operation: the pop-up prompts whether to erase all the operation contents of the current route site, confirm that all will be erased (both front and rear operations can not be restored), and do not erase;

- Home page: return to the home page

  ➢**Route Edit-Back (click switch Back and forth)**

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- Operation mode as in previous section (route editor-forward)。

  ➤ **Operation monitoring**

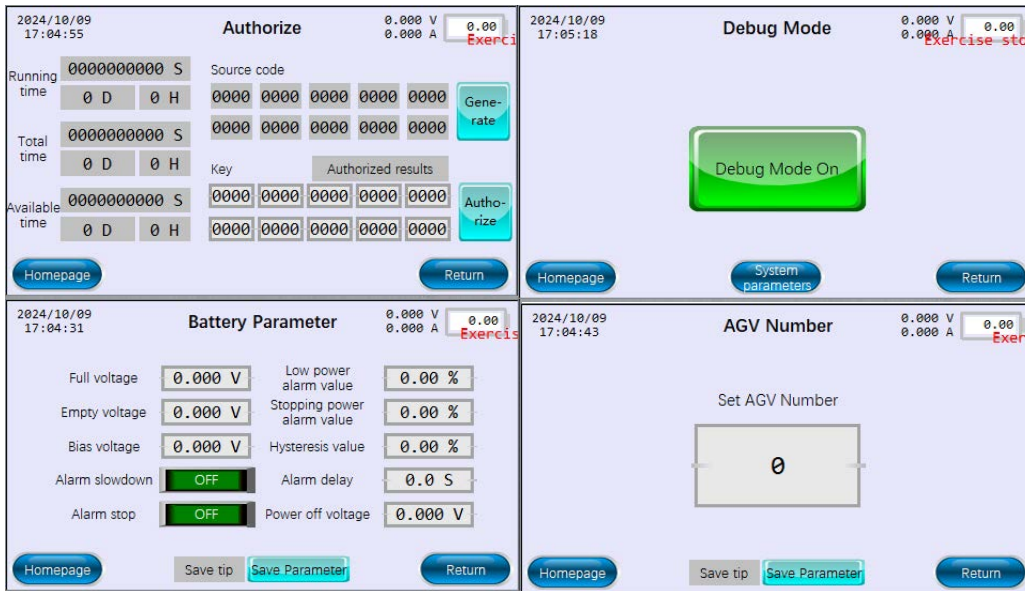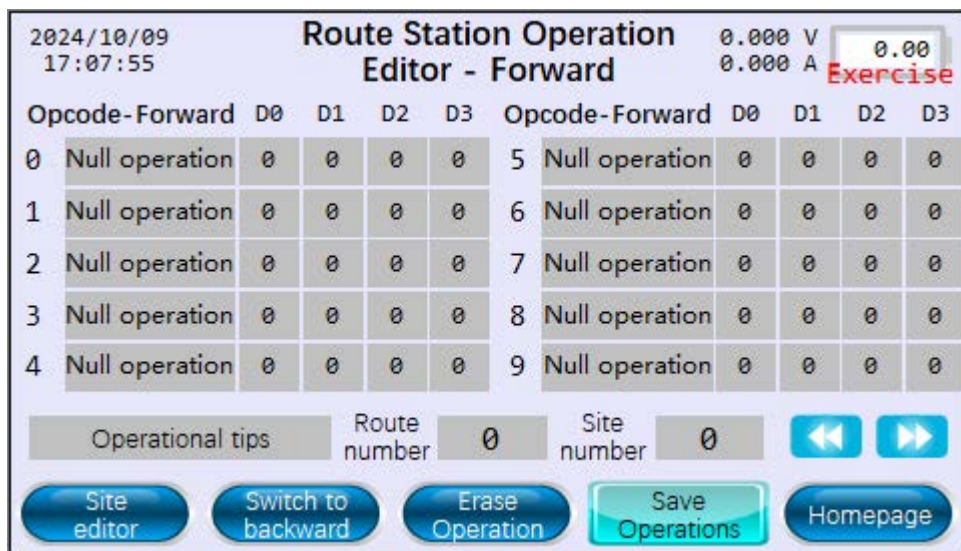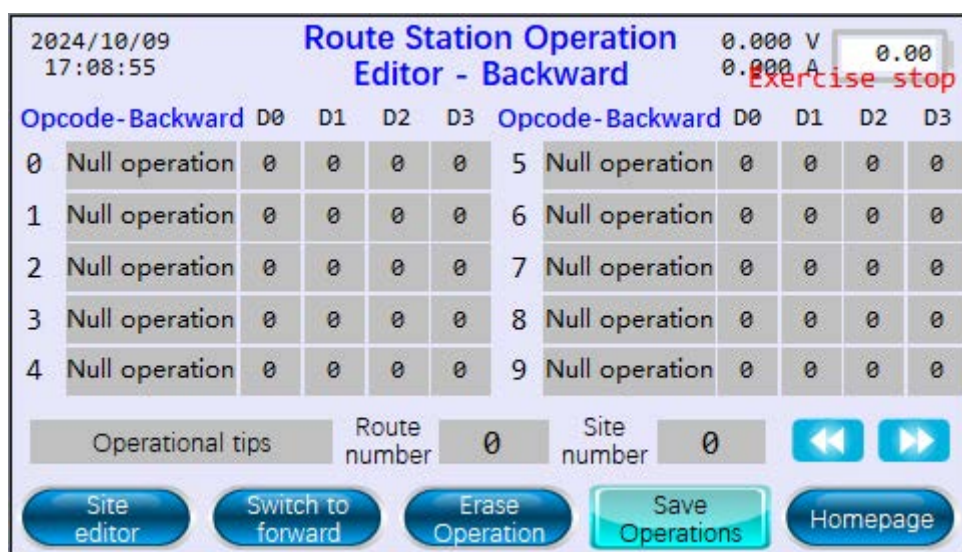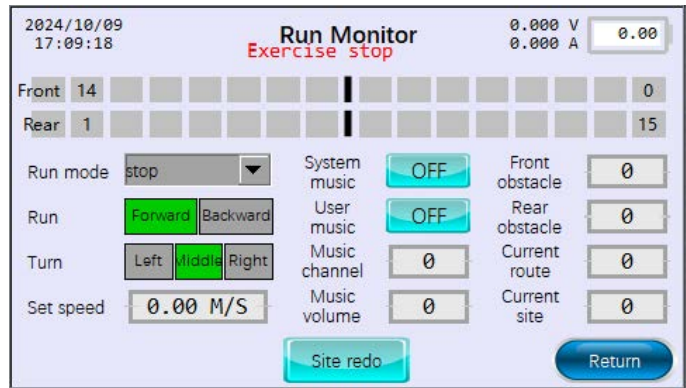

- Title: System time, title of "Operation monitoring", battery power and voltage, rolling bar of system alarm item;

- Double horizontal bar indicator box: front and rear magnetic navigation to identify the magnetic stripe position, identify the display green;

- Operation mode: including "stop", "emergency stop", "navigation", "offline", "hand control";

- Navigation direction: set the AGV walking direction, forward / backward;

- Navigation bifurcation: set up AGV when the fork when the choice of fork, left / middle / right;

- Set the speed: set the AGV walking speed;

- System music: turn on system music / off;

- User music: turn on / off user music;

- Music l channel: manually set up the playback music serial number (0-29, see the music listappendix);

- Music volume: set music volume (this model AGV set is invalid, need to open the warehouse door manual adjustment);

- front / rear obstacles: set the working area value of front / rear obstacles, 0-15 automatically open, 50 forced to close, 100-115 forced to open area 0-15, area 0-15 distance from far to near;

- Current route: Set up AGV operation route number;

- Current site: set the site number of AGV route;

- The l Other function page of the interactive system: switch to "Home page".

  ➤ **Optional parking**

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- Title I: System time, title of "optional parking", battery power and voltage, system alarm bar;

- Optional stop point-forward: set the card number of a station as a parking point. When the AGV passes through the station and reads the card number, the AGV stops (when the parking is enabled);

- Optional stop point-back: Set the card number of a station as a parking point. When the AGV passes through the station and the card reader, the AGV stops (when the stop is enabled);

- Parking enables: whether the main manager of all stops need to stop;

- reset release: whether it can be released by pressing the reset button;

- Stop time: waiting time for all stops of the manager;

- One-key erasing: empty all the selected parking spots;

- Save parameters: save the set parking point to Fla sh, and not lose the power.

9. The site editing instructions
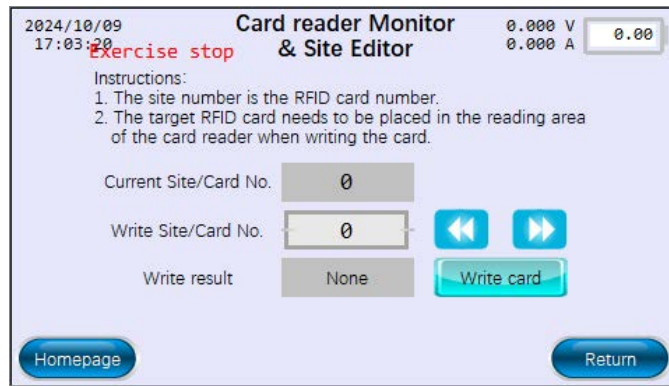
It can be accessed from the Home page-> Device Monitoring-> Card Reader Monitoring, or Home page-> Route Edit-> Site Edit. The site number is the RFID card number.

Current site / card number: display the read card number; write site / card number step:

- RFID The card is set on the horizontal ground without interference, and the AGV is pushed above the RFID card until the "drop" prompt sound issued by the card reader;

- Click the digital display box behind "Write site / card number" to enter the target card number to write the card;

- Click the write card, and the write result shows "Write success" or "Write failure".

- After I successful writing, the place where the card is a site, the card number is the site number.

10. Route-site-operation and editing instructions

For to multiple guide routes laid in the factory, multiple "routes" can be stored inside the AGV; the current route entered by the user manually the the route number.

According to several characteristic points set for each route (such as fork point, charging station, entrance and exit of deceleration section, etc.), multiple "stations" can be stored for each route inside this AGV. AGV is equipped with RFID card reader, and the user pastes RFID cards with different card numbers at the feature points of the guide track. When AGV tracking is identified to the RFID card, read the card number, the card number is the site number, and the current site will automatically switch to the identified card number.

In the figure below, select the AGV running route in the homepage-> motion monitoring; the site can be switched manually, or read by the card reader to the site The RFID card number is automatically switched.

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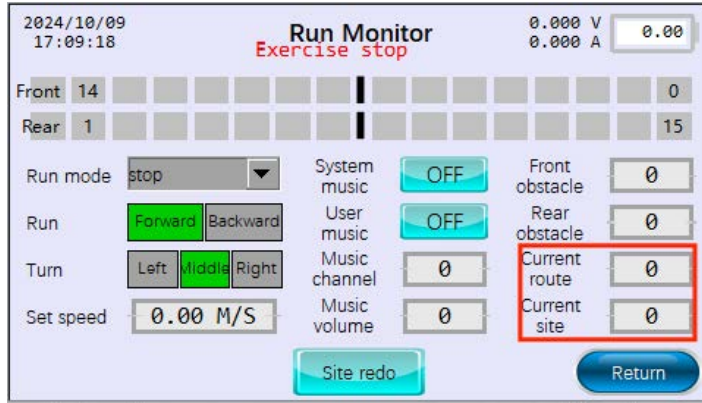
Corresponding to the common requirements of AGV work, the AGV can be different routes of different stations, different directions of preset storage, a series of actions is called 10 "operations" in the AGV system.

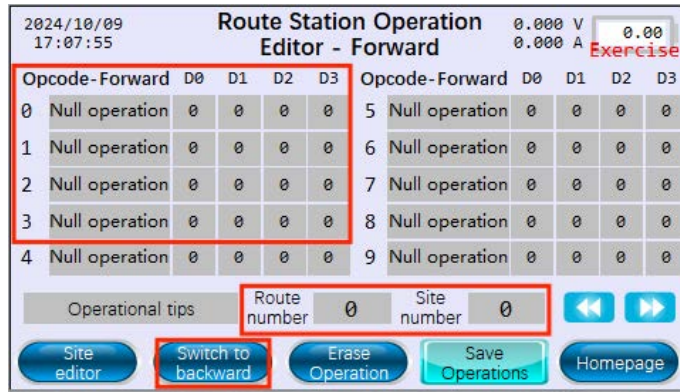When AGV walks on route X, read the RFID card of Y (1, station No). If the marching direction is forward, the preset forward series operation will be performed for the station of Route Y, and if the marching direction is backward, the backward series operation will be performed.

You can read and write forward / backward operations for each route in the Home-> Route Edit.

A single operation instruction consists of one operation code and four parameters (D0, D1, D2, D3). Each site can store up to 10 operation instructions. Details of the operation instructions are shown in the table below.

➢ **Operation instruction table**

The following operating codes and parameters (D0, D1, D2, D3) are all 10 bases.

operational order	action code	Parameters (D0, D1, D2, D3)	explain
do-nothing operation	0	/	do-nothing instruction.
Sports parking	1	/	Sports parking.
No parametric navigation	2	/	Start the navigation, and run according to the original parameters.
There is parameter navigation	3	D0: Direction 0 forward and 1 backward D1: bifurcation-1 left, 0 middle and 1 right D2: Speed MM / S D3：/	Start the navigation, and run according to the set parameters.
Switch navigation direction	4	/	Switch over the navigation direction. Forward-> backward; backward-> forward.
Unparameterized offline	10	/	Start the offline motion, and run according to the original parameters.
There are parameters offline	11	D0: front and rear speed MM / S D1：/ D2: rotational velocity radian / S D3：/	Start the offline movement, and run according to the set parameters.

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| Function	Code	Parameters	Description
Left-spin orbit forward	15	D0: Target magnet number 1 before 2 after D1: leave the magnetic strip velocity radian / S D2: close to the magnetic stripe velocity radian / S D3: Complete the navigation speed MM / S	Rotate left / right in place, detect the new stripe and forward / back at the set navigation speed
Right-spin orbit forward	16		
Left-spin orbit retreat	17		
The right spin turns back	18		
Set up obstacles	20	D0: front barrier area / closed D1: rear obstacle area / closed D2：/ D3：/	Obstruction area and closure 0 – 15 Automatic region, distance from far to near 50 Mandatory closure.
Set user music	25	D0: Music control: 0-3 D1: Music channel 0-255 D2: Music volume is 0-28 D3：/	Music control: 0 full open, 1 close system tone, 2 close user tone, 3 full close; some models have no volume adjustment.
Set up alarm shielding	30	D0:16 bit lower D1: shield position 16 bit higher D2, D3: /	The corresponding bit writes 1, then the corresponding bit alarm is ignored.
Switch route	40	D0: Target running route # D1, D2, D3: /	Switch to the target route number to run.
Site redo	41	D0: Site number D1、D2、D3：/	Interrupt the current operation immediately and perform the site number function corresponding to the current route.
Y port bit output	50	D0: Y port number 00-07:Y00-Y07 10-17:Y10-Y17 20-27: Y20-Y27 and so on D1: output value 0 off 1 on D2,D3: /	Set up the target Y port output.
Set up the MBUS data	60	D0: Address number D1: Length 1:16 bit 2:32 bit D2: Low-byte data value D3: High-byte data value	This function needs to be used under the guidance of a technician.
wait time	100	D0: Time 0.1S D1, D2, D3: /	After waiting for the specified time to arrive, perform the later operation.
Waiting time release	101	D0: Time 0.1S (0, etc.) D1, D2, D3: /	Wait for the release button within the specified time, and continue after the overtime or release.
Wait for the time X port	105	D0: Time unit 0.1S0, etc D1: X port number 00-07:X00-X07 10-17:X10-X17 20-27: X20-X27 and so on D2: Wait value 0 off 1 pass D3: Timeout 0 ignore the alarm 1 and pause the alarm	Wait for X port on / off within the set time, optional alarm after timeout.
Waiting time magnetic strip	110	D0: Time 0.1S (0 always) D1: Target magnetotance number 1 before 2 D2: Target state 0 No magnetic strip 1 Into the magnetic strip 2 full magnetic stripe / transverse magnetic stripe 3 middle 8 point magnetic stripe 4 middle 8 points into magnetic stripe 5 middle 4 point magnetic stripe 6 middle 4 point into magnetic stripe 7 deviation value less than 1CM D3: Timeout 0 ignore the alarm 1 and pause the alarm	Wait for the magnetic navigation state within the set time, and select the alarm prompt after the timeout.
Waiting for distance	150	D0: Distance 0.1M D1, D2, D3: /	After waiting for the specified distance, perform the later operation.

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Wait for a distance from the port X	155	D0:0.1M (0, etc) D1: X port number 00-07:X00-X07 10-17:X10-X17 20-27: X20-X27 and so on D2: Wait value 0 off 1 pass D3: Timeout 0 ignore the alarm 1 and pause the alarm	Wait for the X port on / off within the set distance, optional alarm after timeout.
Wait for the distance magnetic strip	160	D0:0.1M (0, etc) D1: Target magnetotance number 1 before 2 D2: Target state 0 No magnetic strip 1 Into the magnetic strip 2 full magnetic stripe / transverse magnetic stripe 3 middle 8 point magnetic stripe 4 middle 8 points into magnetic stripe 5 middle 4 point magnetic stripe 6 middle 4 point into magnetic stripe 7 deviation value less than 1CM D3: Timeout 0 ignore the alarm 1 and pause the alarm	Wait for the magnetic navigation state within the set distance, and select the alarm prompt after timeout.
Power switching route	205	D0:, power value of 0-1000 corresponds to 0% -100% D1: Route number D2, D3: /	When the current power quantity is less than the judging power quantity value, switch the route number.

➤**Example of operation editing**

● And I Example 1: Control of the forward direction deceleration section (3 meters) of Route 1

Write according to the site editing instructions Enter an RFID card, the card number is set to 11, paste the 11 card at the entrance of the section.
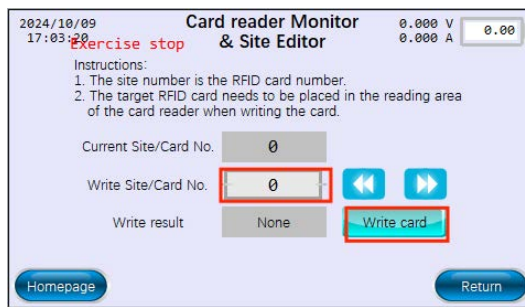
Edit the forward operation of route 1, Station 11. When reading 11 card, set the navigation speed to 0.1 M/S, and after the end of 3M, restore the navigation parameters to 0.7M / S; (see the operation list for the meaning of parameters).
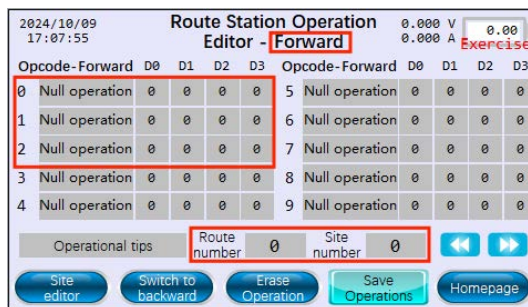
Set the current AGV route as route 1. When AGV passes through station 11, the current station will automatically switch to station 11 and perform a series of operations set in the previous step (empty operation will be automatically ski).

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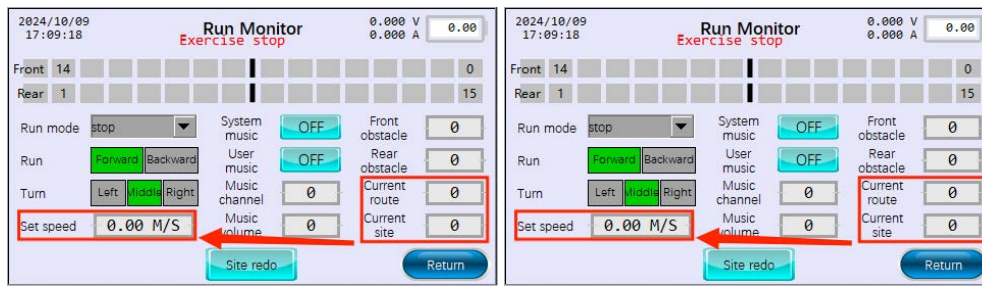
11. AGV acoustic and light indication and abnormal handling

AGV internal voice player, light bar components, man-machine interface. When the AGV state changes or fails, the AGV voice player will produce the corresponding voice, the light bar display, and the scroll bar on the man-machine interface.

➤ **Voice player**

AGV has a variety of voice prompts and music files, and uses the corresponding channel number to call. When the AGV has a fault or the corresponding state, the voice player automatically plays the corresponding prompt tone; when the AGV user tone is enabled, the voice player plays the user setting Set the music channel; the system tone priority is higher than the user tone.

number of channel	sound	description	Recovery method
		System prompt sound	
1	Warning, warning, emergency stop knob is abnormal	1. Press the emergency stop button 2. Emergency connection signal line is disconnected or has poor contact	reset
2	Warning, warning, collision sensor abnormal	2. Short circuit of the sensor signal line	reset
3	Warning, warning, your device has expired	Authorization invalid	Apply for authorization
4	Warning, warning, the magnetic navigation sensor is abnormal	1. The magnetic navigation sensor is damaged 2. Poor communication line or power supply line of the magnetic navigation sensor	reset
5	Warning, warning, the obstacle sensor is abnormal	1. The obstacle sensor is damaged 2. Poor communication line or power supply line of the obstacle sensor	reset
6	Warning, warning, card reader exception	1. Coraged card reader 2. Poor communication line or power supply line of the card reader	reset
7	Warning, warning, motor control is abnormal	1. Motor drive alarm 2. Poor communication line or power supply line of the motor driver	reset
8	Warning, warning, magnetic navigation derailment is abnormal	Maximum derailment distance was exceeded during the navigation control process	reset
9	Warning, warning, abnormal signal light	1. Light controller is damaged 2. Poor communication line or power supply line of the light controller	automatic recovery
10	Warning, warning, abnormal driving instrument	1. Damage to the driving instrument 2. Bad driving instrument communication line or power supply line	automatic recovery
11	Warning, warning, extended device failure	1. Extension equipment is damaged 2. extended equipment communication line or power supply line 3	reset
12	Warning, warning, route error	The current alignment number is incorrect	Enter the correct alignment number
13	Warning, warning, site error	Current site number is wrong	Read the correct site number
14	Warning, warning, operation error	1. Performing error operation code 2. Operation process error	reset
15	not have	/	reset
16	not have	/	reset
17	not have	/	reset
18	Warning, warning, low power stop	The power level is lower than the parking set	Replace the battery

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		point	
19	Warning, warning, obstacle stop	The obstacle distance is less than the parking threshold, and the stop warning is given	Remove obstacles
20	Warning, warning, AGV failure	AGV other fault or alarm	reset
21	Doodle warning	1. In the pushcart mode 2. AGV other warning status	Exit the status
22	The good baby AGV, has arrived at the station	When an optional parking spot is detected and parked	Exit the status
User sound			
23	To Alice	music	User switch
24	Opening Titles	music	User switch
25	Sax voyage	music	User switch
26	Phoenix tail bamboo in the moonlight	music	User switch
27	go home	music	User switch
28	Sachs jasmine	music	User switch
29	The Spanish Matador March	music	User switch
0	not have	Turn off the user sound	User switch

➤Light instructions

order number	state	description	Prompt type
1	Close display	shut down	state
2	Green breathing light	Standby in / idle	state
3	Green lights are often on	craspedodrome	state
4	1,4, running light / flashing	Left turn / left branch	state
5	2,3, running light / flashing	Right turn / right branch	state
6	1,3, running light / flashing	anticlockwise	state
7	2,4, running light / flashing	right handed rotation	state
8	Blue lights flashing	busy	state
9	Red lights are often on	generic failure rate	warn
10	The red light flashes	Emergency failure	warn
11	The yellow light is often bright	Warning stop (barrier / low power stop)	warn
12	The yellow light flashes	Warning deceleration (obstacle / low power deceleration)	warn
13	The white lamp is often bright	Read to card number 0	state
14	Green lights flashing	Start-up operation / traffic control / user pause	state
15	Sky blue lights are often bright	Site switch / read to a valid card	state
16	Purple lights are often bright	Route switching	state
17	Yellow breathing light	Waiting for release	state

➤The HMI scroll bar

number	message	description	Prompt type	Recovery method
1	Urgent stop knob abnormal	1. Press the emergency stop button 2. Emergency connection signal line is disconnected or has poor contact	warn	reset
2	The collision sensor is abnormal	1.The bumper strip collides with the object 2.Short circuit of the sensor signal line	warn	reset
3	RTC unusual	The button battery fails	warn	Replace button battery
4	Your device is already expired	Authorization invalid	warn	Apply for authorization
5	Magnetic navigation sensor is abnormal	1. The magnetic navigation sensor is damaged 2. Poor communication line or power supply line of the magnetic navigation sensor	warn	reset
6	The obstacle sensor is abnormal	1. The obstacle sensor is damaged 2. Poor communication line or power supply line of the obstacle sensor	warn	reset
7	Exception of card reader	1. Coraged card reader 2. Poor communication line or power supply line of the card reader	warn	reset
8	The motor control is abnormal	1. Motor drive alarm 2. Poor communication line or power supply line of the motor driver	warn	reset
9	Magnetic navigation derailment is abnormal	Maximum derailment distance was exceeded during the navigation control process	warn	reset
10	The voice player is abnormal	1. The voice player is damaged 2. Poor communication line or power supply line of voice player 3. Failure of voice player	warn	reset

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11	Signal lights abnormal	1. Light controller is damaged 2. Poor communication line or power supply line of the light controller	warn	automatic recovery
12	Exception of driving instrument	1. Damage to the driving instrument 2. Bad driving instrument communication line or power supply line	warn	automatic recovery
13	Expanded equipment failure	1. Extension equipment is damaged 2. extended equipment communication line or power supply line 3	warn	reset
14	Trtrolley fault 14	/	warn	/
15	Trtrolley fault 15	/	warn	/
16	Trtrolley fault 16	/	warn	/
17	Car failure 17	/	warn	/
18	Trtrolley fault 18	/	warn	/
19	Trtrolley fault 19	/	warn	/
20	The route is wrong	The current alignment number is incorrect	warn	Enter the correct alignment number
21	Site error	Current site number is wrong	warn	Read the correct site number
22	EIO	1. Performing error operation code 2. Operation process error	warn	reset
23	MBUS, abnormal connection	1. MBus cable short circuit 2. Circuit short circuit 3. No response from the machine	warn	automatic recovery
24	System connection exception	/	warn	/
25	Memory failure	1. W25Q exception 2. Pass the read and write verification	warn	Apply for authorization
26	Low power parking	Power quantity is lower than the parking setting value, and the parking warning	warn	Charging, reset
27	Obstacles parking	The obstacle distance is less than the parking threshold, and the stop warning is given	warn	reset
28	Obstruction deceleration of 1	The obstacle distance is less than 1 section of the deceleration area	warn	reset
29	Obstruction of deceleration 2	The obstacle distance is less than 2-segment deceleration areas	warn	reset
30	Low power deceleration	Power is below the deceleration setting value, and the deceleration warning	warn	Charging, reset
31	Your device is about to expire	The remaining authorization time is less than 7 days	warn	Apply for authorization
32	Cart mode	Open the AGV cart mode on the display and control home page	state	automatic recovery
33	Traffic control	The AGV is subject to traffic control	state	reset
34	Optional stop	When an optional parking spot is detected and parked	state	reset
35	The user parking	1. Detection optional parking point and stop 2. Press the start / stop button	state	reset
36	Operation pause	Perform a pause in the operations to the routing site	state	automatic recovery
37	Exercise stop	The movement mode is the movement stop	state	automatic recovery
38	Exercise to stop	Movement mode is movement emergency stop	state	automatic recovery

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12. Daily use and maintenance

➤ **Daily use and maintenance**

● And I Clean up dust and other debris regularly and keep the car body clean and hygienic.

● Check the AGV operation panel regularly to ensure that the panel switch and other buttons can be used normally.

● And I regularly check whether the sensors on the car can work normally, mainly including mechanical anti-collision sensor, obstacle sensor and path detection sensor. It is recommended to check at least once a week.

● Check the antenna communication regularly to keep the communication normal.

⊗ No rain exposure or contact with corrosive objects.

⚠ Turn off the power supply during holidays.

⊗ Never modify the program parameters during normal operation.

● Clean and lubricating the lifting hook regularly, 1-2 times a week.

● Regularly clean the drive mechanism of the drive wheel, add lubricating oil, recommended at least once a month.

➤ **matters need attention**

⚠ Because the touch screen, music box and other electrical components in the operation panel are prone to damp damage, please pay attention to keep them dry.

⚠ When cleaning the operation panel, it is recommended to use a wet towel that cannot twist the water. Please be careful not to use corrosive detergent such as oil stains.

⊗ AGV is not turned off or in cart mode, otherwise unexpected failure may occur.

⚠ Please use the emergency button when the AGV needs to be stopped. Do not drag or other means to force the AGV to stop.

⊗ Do not put things on the operation panel.

⚠ Please use the operation button correctly when stopping the AGV, please use the stop button, emergency stop, please operate the emergency stop button, drag or stand in front of the AGV to force the AGV to stop the AGV by using violence.

⚠ It is strictly prohibited to cross the AGV car, especially the AGV, otherwise it is easy to trip and cause unnecessary damage.

⚠ Do not stay when passing through the AGV running area, pay attention to avoid the AGV and keep a safe distance.

⚠ Please pay attention to AGV running direction when AGV line adjustment, and do not make AGV running in the opposite direction.

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