

Operational Mastery: Magnetic Navigation AGV Series

Model SFY03

Automated Logistics Solutions for
Smart EMS Factories





Key Credentials

Engineering the Automated Factory

Founded in 2011 in Shenzhen, Southern Machinery specializes in SMT and THT assembly solutions. We serve over 237 EMS clients worldwide, delivering production-ready automation that integrates seamlessly with industry standards.



Global Reach: Serving 237+ EMS clients worldwide.



Integration Partners: Trusted supplier for Panasonic, Mirae, JUKI, and YAMAHA integration.



Core Portfolio: From Component Feeding (STF1003) to Wave Soldering (S-WS450) and Autonomous Logistics.



System Architecture: The 'Backpack' Autonomous Unit



No Central Server Required.

The AGV operates as a fully independent single-machine system.



Backpack Load Mode.

Cargo is carried directly on the chassis (50kg capacity) for maximum stability in narrow aisles.

On-Board Logic.

Route editing, monitoring, and operations are handled directly via the integrated HMI.


Technical Specifications & Dimensional Constraints

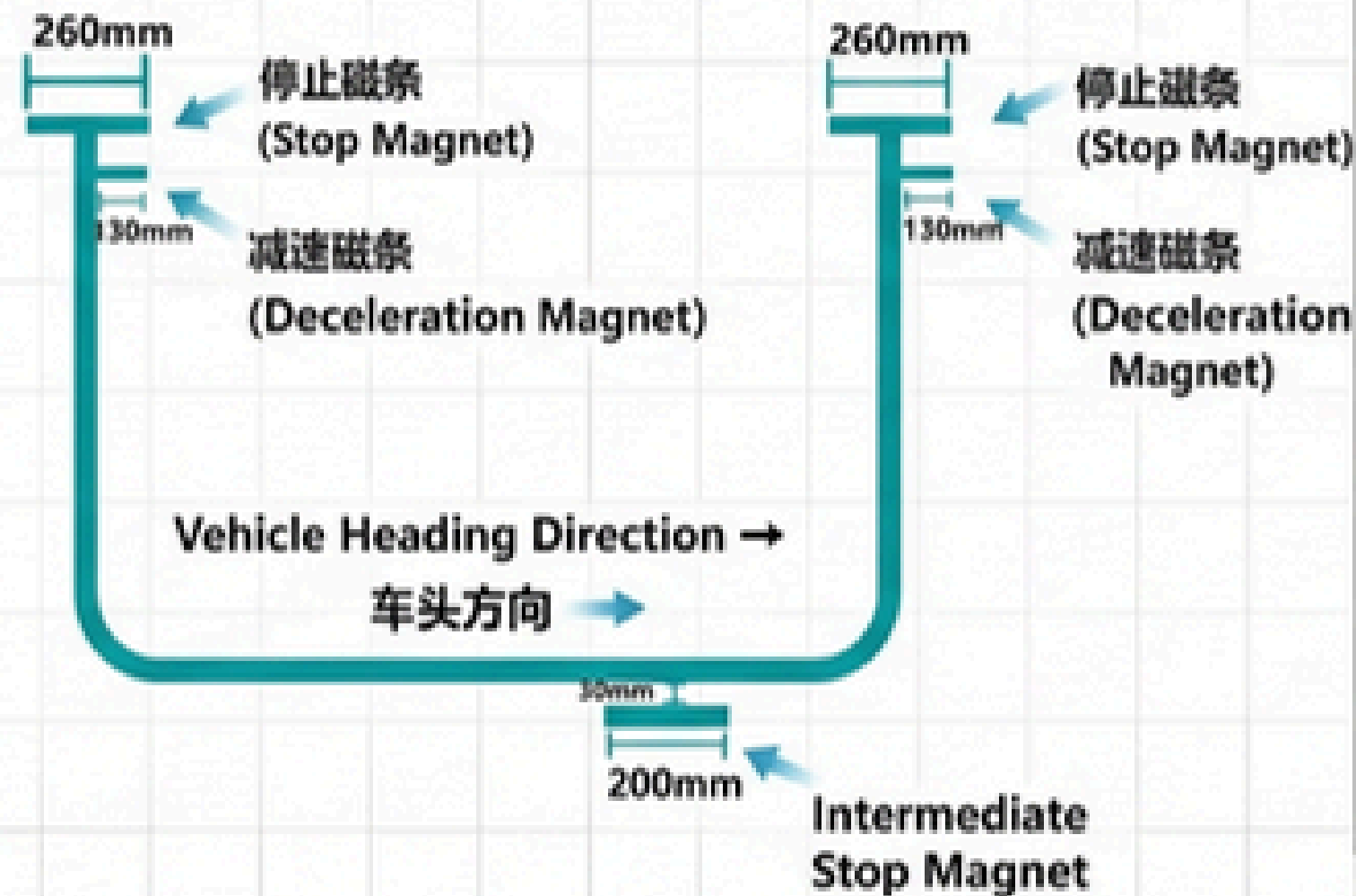


Specification	Value
Rated Load	50 KG (Allows 50% momentary overload)
Navigation Speed	0.7 m/s (Max 0.8 m/s)
Turning Radius	0M (Spin in place) / 1M (Navigation turn)
Climbing Capacity	< 1%
Battery	24V / 10Ah (Standard) or 20Ah (Optional)
Runtime	6-8 Hours (Depending on Load)
Ground Clearance	25mm

Navigation Physics: Magnetic Strip & RFID Logic

The Road (Magnetic Guidance)




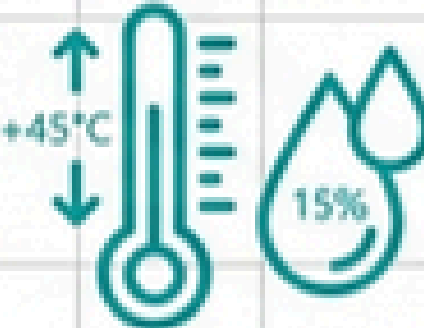
- Material: 30mm or 50mm Magnetic Strip.
- Polarity: Defaults to N-Pole detection. 
- Sensors: High-precision magnetic sensors at front and rear chassis.



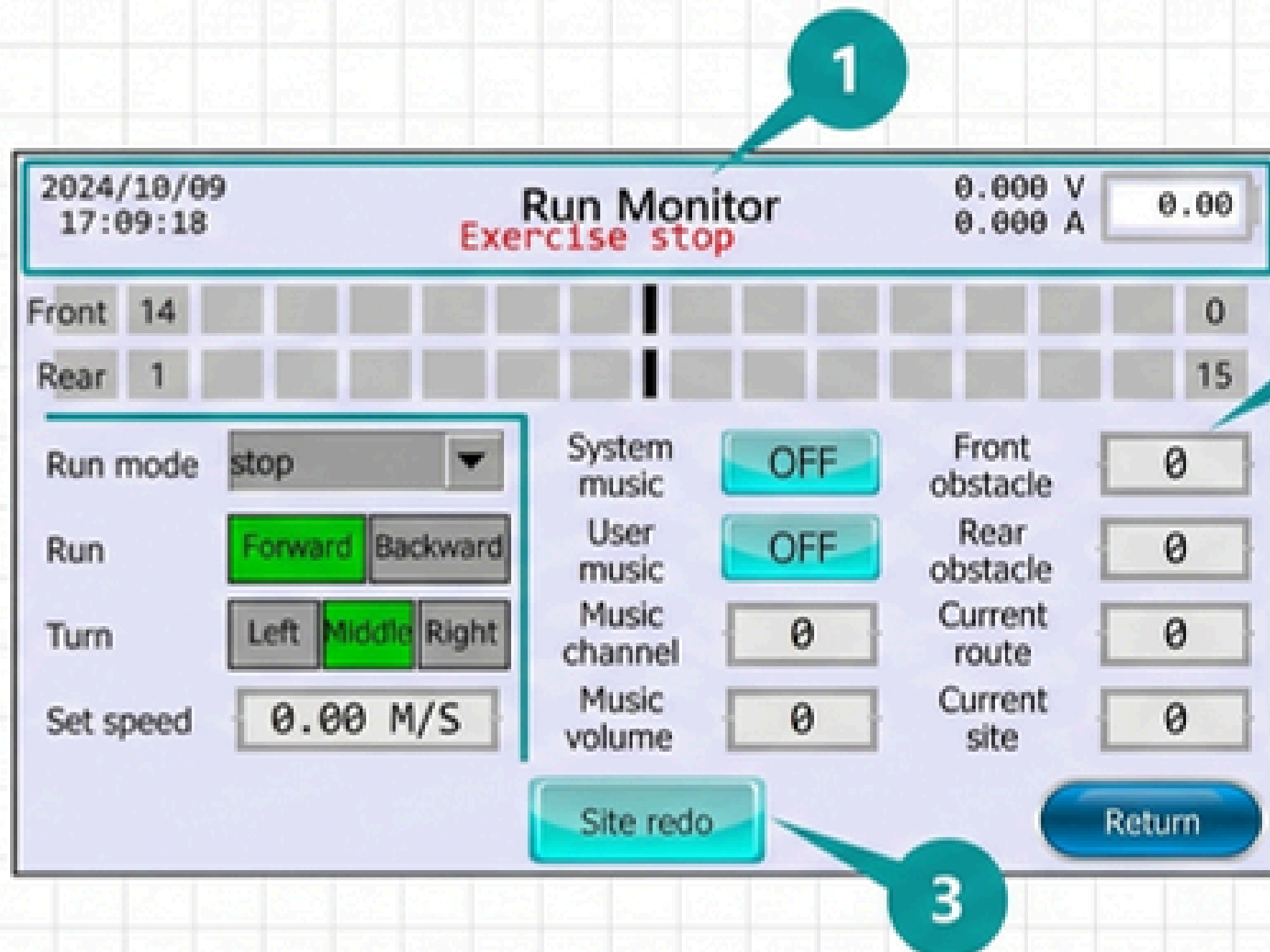
The Signposts (RFID Stations)

- Technology: 13.56MHz High-speed RFID card reader.
- Function: RFID cards pasted on the floor act as 'Sites'. Reading a card triggers operations like Stop, Turn, or Speed Change.

Environmental Requirements & Operating Limits

	<h2>Slope Limits</h2>		<h2>Surface Regularity</h2>
	<p>Max Slope: ≤ 0.05. For precise parking: ≤ 0.01.</p>		<p>Step Height: $\leq 5\text{mm}$. Groove Width: $\leq 10\text{mm}$.</p>
	<h2>Floor Condition</h2>		<h2>Atmosphere</h2>
	<p>Must be non-slip, clean, and free of magnetic interference.</p>		<p>Temp: -10°C to $+45^{\circ}\text{C}$. Humidity: $15\% - 80\%$ (No condensation).</p>

The Command Center: HMI Overview

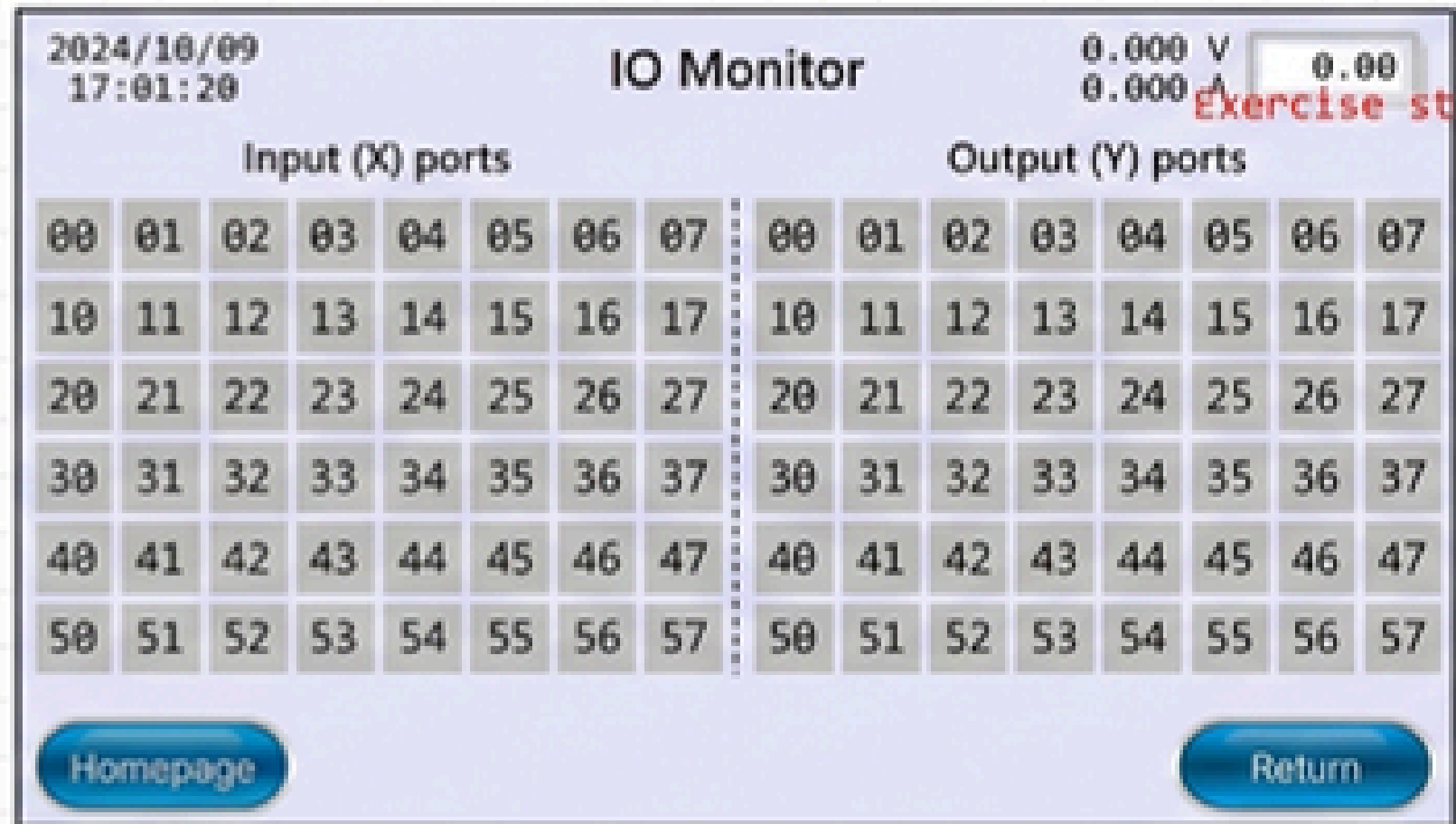


- 1 Status Bar:** System Time, Battery Voltage, Current Alarms.
- 2 Motion Dashboard:** Displays Route #, Site #, and Operation Status.
- 3 Menu Navigation:** Access IO Monitor, Parameters, and Editors.

Interface Hardware: 4.3 Inch Industrial Touch Screen.

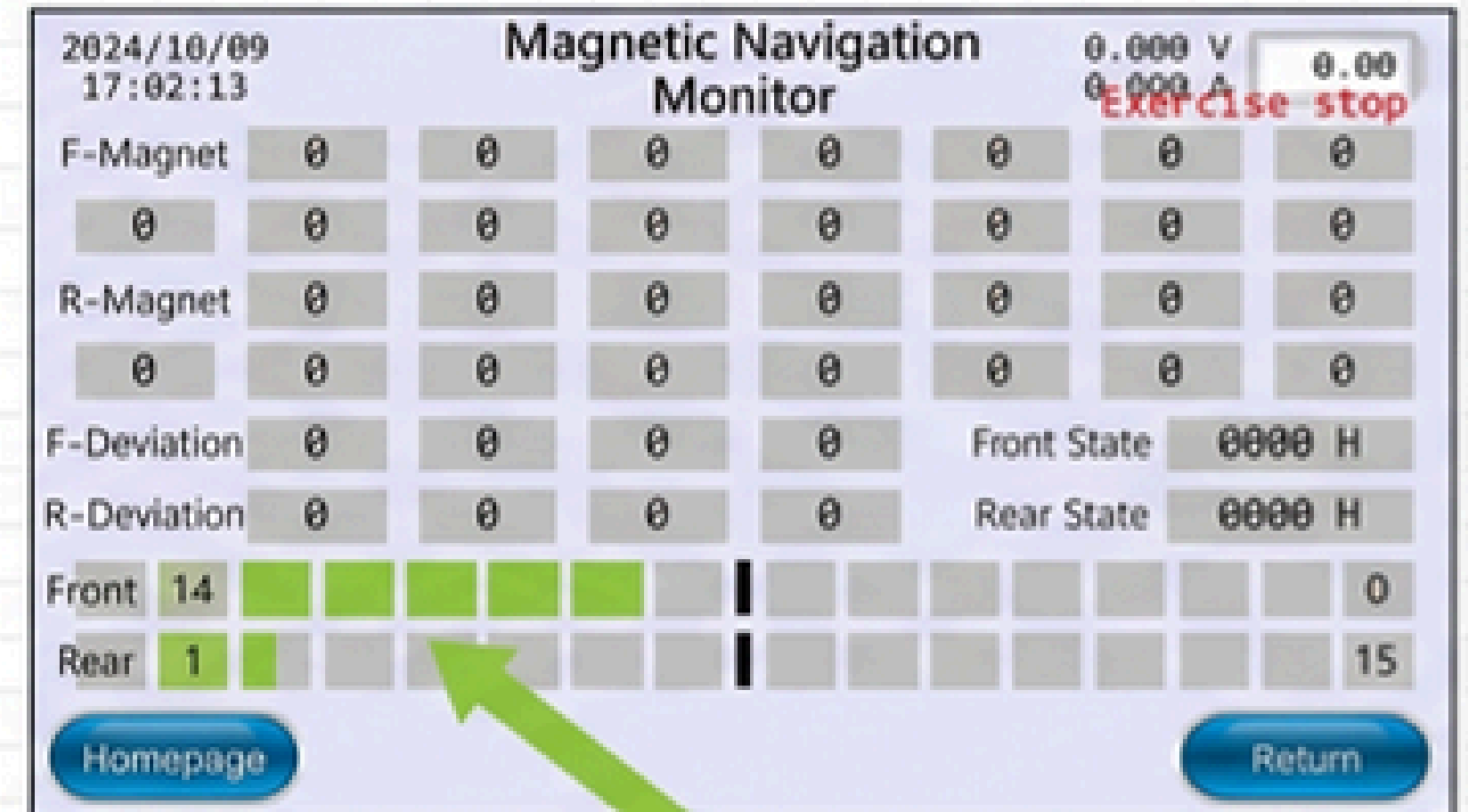
Real-Time Diagnostics & Sensor Monitoring

IO & Sensor Status



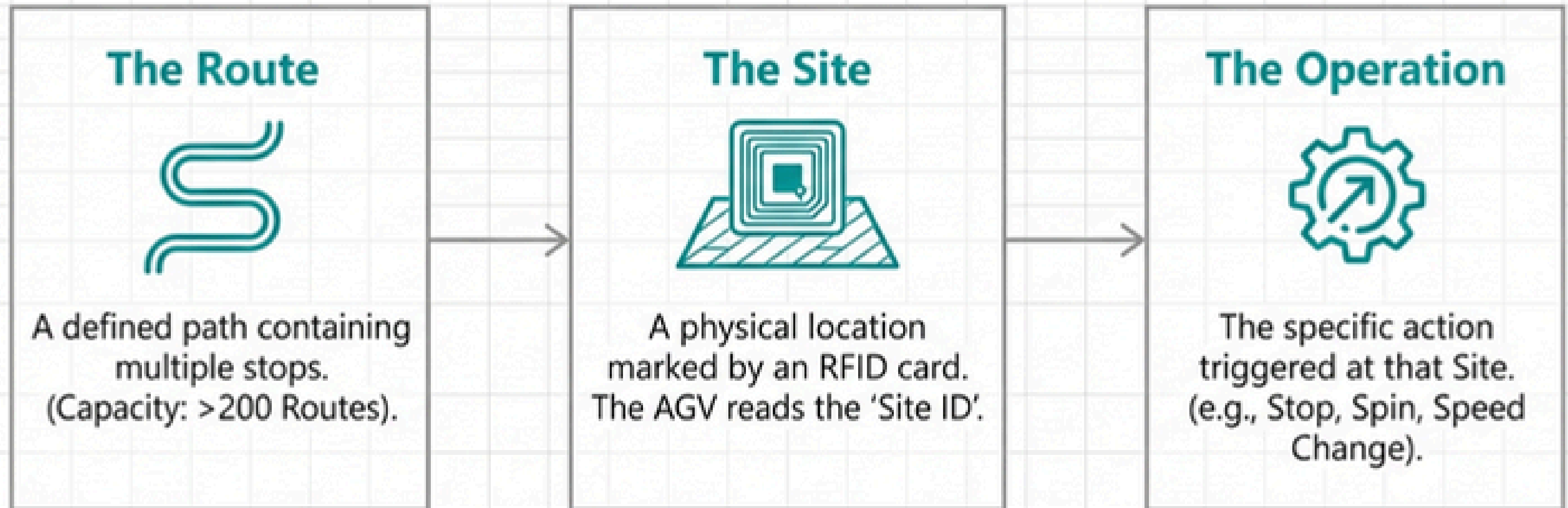
IO Monitor visualizes Input (X) and Output (Y) ports to verify signal integrity.

Magnetic Navigation Data



Visualizes the magnetic strip detection (Green bars). F-Deviation/R-Deviation data confirms if the AGV is centered on the track.

Navigation Logic: The Hierarchy of Movement



Key Concept: A Route contains Sites. A Site triggers Operations.

Programming Movement: The Route Editor

1. "Route No": Input field for the Route ID.

2. "Site No": Input field for the RFID Site Card ID.

3. "Op Code": The Command ID (e.g., 15 for Spin).

2024/10/09 17:04:55

Authorize 0.000 V 0.000 A 0.00 Exerci

Running time 0000000000 S 0 D 0 H

Total time 0000000000 S 0 D 0 H

Available time 0000000000 S 0 D 0 H

Source code 0000 0000 0000 0000 0000 0000 0000

Key 0000 0000 0000 0000 0000 0000 0000

Authorized results 0000 0000 0000 0000 0000 0000

Generate Authorize

Homepage Return

4. "Params": The variable data (D0-D3) for speed or time.

Critical Note

Directional Logic: The system distinguishes between Forward and Backward operations. You must program specific behaviors for the direction of travel.

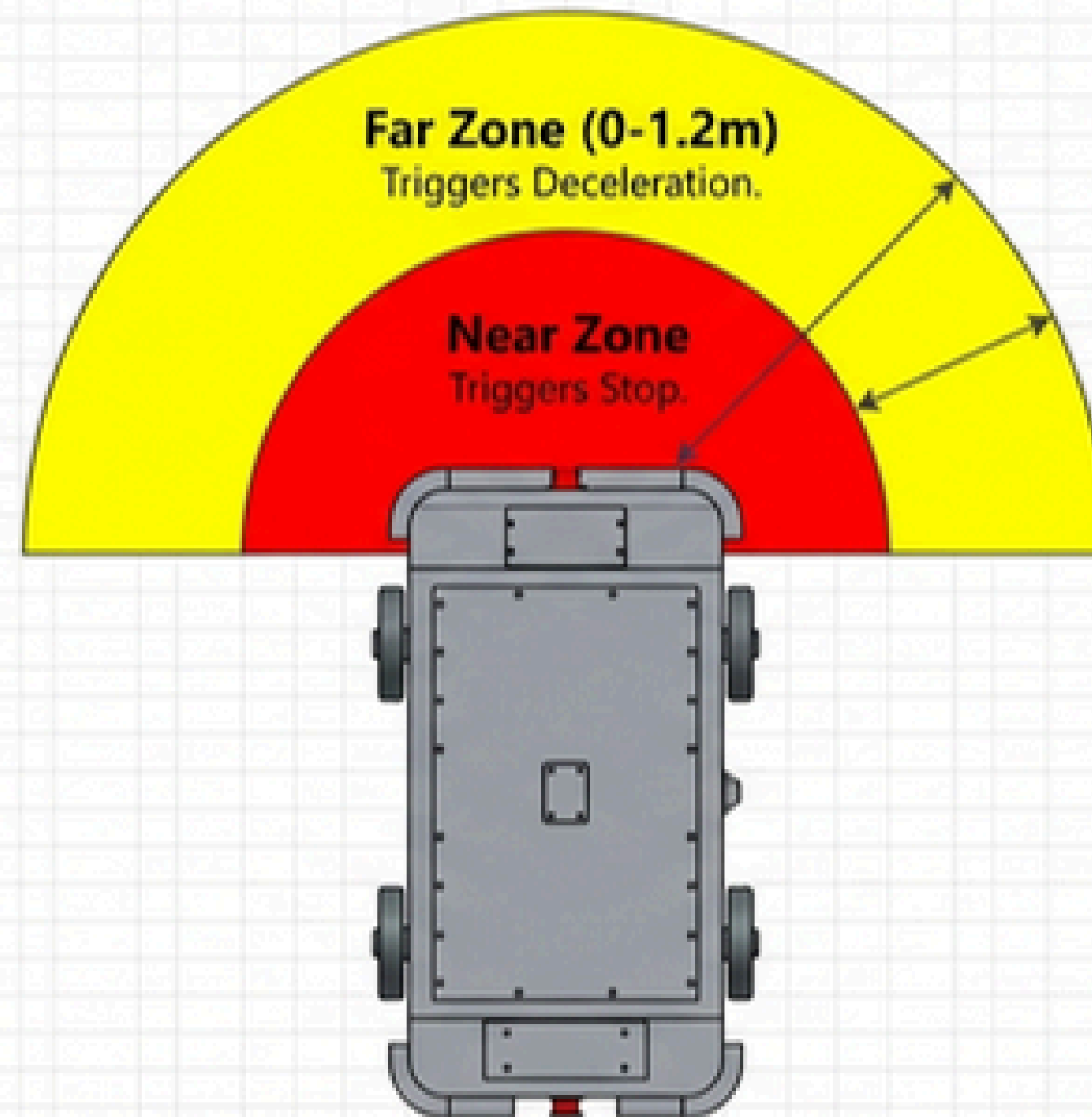
Advanced Control: Essential Operation Codes

Code	Function	Description
01	Sports Parking	Immediate Stop.
02 / 03	Navigation Start	Resume movement (With or without params).
04	Switch Direction	Toggle between Forward and Backward logic.
15	Left Spin Orbit	Spin left in place (Forward).
40	Switch Route	Jump to a different Route Number.
100	Wait Time	Pause for set time (D0 = Time in 0.1s).
150	Wait Distance	Continue for set distance (D0 = Distance in 0.1m).

Safety Architecture: Detection & Avoidance

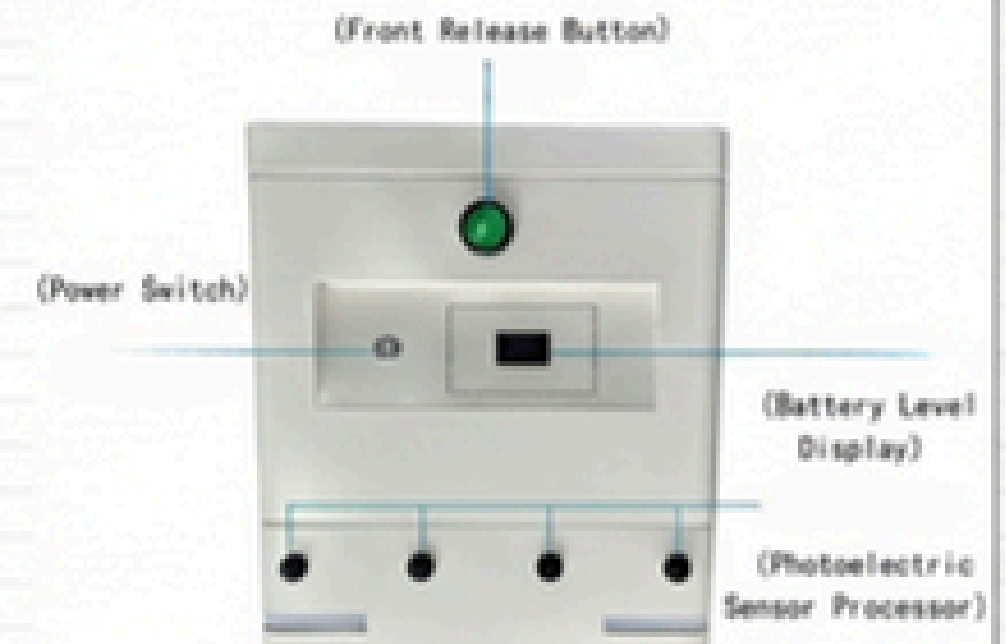
Primary System

- Laser/Photoelectric Sensors:
Non-contact detection.
Configurable up to 1.2M.
Note: May be sensitive to strong direct light.

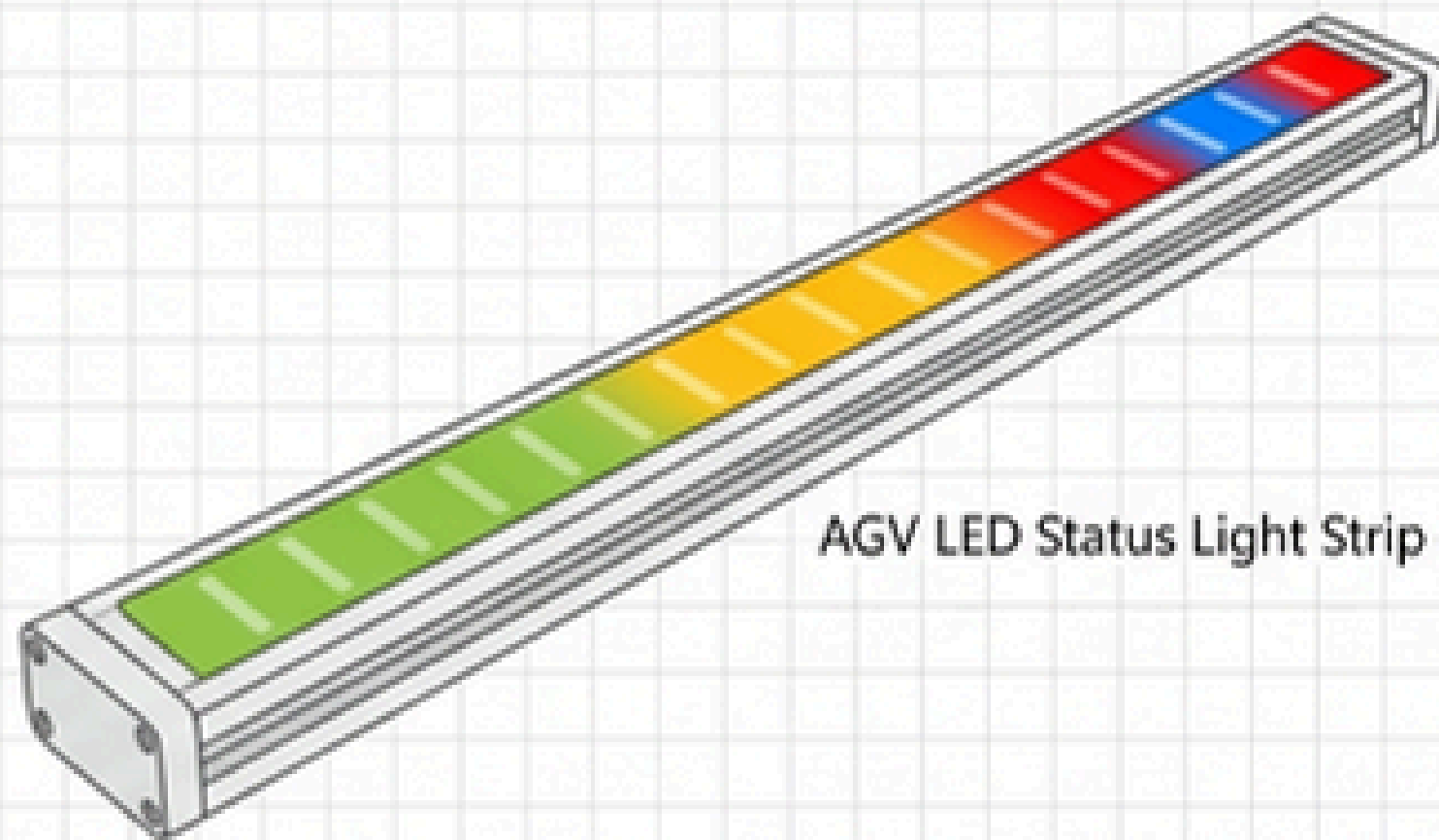


Secondary & Tertiary Systems

- Mechanical Bumper:
Physical contact triggers immediate E-Stop.
- Emergency Buttons:
Physical knobs on front/rear.
Press to lock, rotate to release.



Status Communication: Lights & Audio



AGV LED Status Light Strip

Status Key

●	Running / Straight Line
⦿	Standby / Idle
⦿	Warning: Obstacle or Low Battery
●	General Fault / Alarm
⦿	Busy State

Audio System

System Prompts: "Warning, Obstacle Sensor Abnormal", "Emergency Stop".

Music Channel: Customizable tracks (e.g., "Alice") for movement warnings.

Diagnostics & Error Recovery

Troubleshooting

Error Code/Symptom	Cause	Recovery Action
Mag Nav Sensor Error	Connection line issue or sensor damage	Check wiring and Reset.
Derailment Exception	Exceeded max deviation distance	Place back on track and Reset.
Low Battery Stop	Voltage below threshold	Charge immediately.
Obstacle Stop	Object in path	Remove obstacle (Auto-recovery).

Pro Tip

Most errors require pressing the physical 'Reset' button on the panel or the 'Reset' soft-key on the HMI.

Maintenance Protocols & Support

Daily Care

- ✓ **Weekly:** Clean dust/debris from sensors.
- ✓ **Daily:** Check E-Stop and Button functionality.
- ✓ **Daily:** Verify Antenna communication.

Battery Care & Charging



- Protocol: Turn OFF power switch when charging.
- Warning: Charge immediately upon "Low Power" warning to prevent deep discharge.

Global Support Contact

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