

# Automatic Solar Panel Cleaning Robot

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**More Power More Life**

<http://www.multifitsolar.com>



# COMPANY HONOR



## Some Authoritative Test Reports And Certificates Of Honor.



100<sup>+</sup> Patents  
40<sup>+</sup> CE Certificates  
20<sup>+</sup> Software Copyright



In Total 10<sup>+</sup> GWP  
More Power More Life



Stock Exchange  
280768  
2009 Multifit Establish



# HONOR



# MULTIFIT PROFILE

2009  
Since

16+  
Years In Solar Industry

Multifit Solar is a high-tech manufacturer which is mainly dedicated to research and development, production, sales, and construction of solar power systems and other green energy.

Our cleaning equipments include solar panel tracking cleaning robots, track-mounted fully automatic walking solar cleaning trolley, the third generation four-wheel drive mode of the solar cleaning robot with stronger cross-barrier ability, crawler-type upper and lower cleaning robot and semi-automatic photovoltaic cleaning brush for civil power stations.

Our cleaning robots realize the remote intelligent control and have many functions: automatic avoidance function to prevent the robot from slipping, automatic rectification mechanism and automatic adjustment to prevent the machine from deviation, running tilt, jamming, and good obstacle surmounting performance to surmount certain slopes, steps, and dislocations. Also, a new intelligent management cloud platform for remote photovoltaic panel cleaning robot has been set up in our robot. And our cleaning robot has our own unique technology in intelligent cleaning of photovoltaic panels by robots, automatic detection, tracking and positioning, group communication and control functions, as well as the establishment of an intelligent management platform with multi-terminal control.

In the future, Multifit will be continually committing to improve the renewable energy industry and develop more efficient and cost-effective solar cleaning solutions.



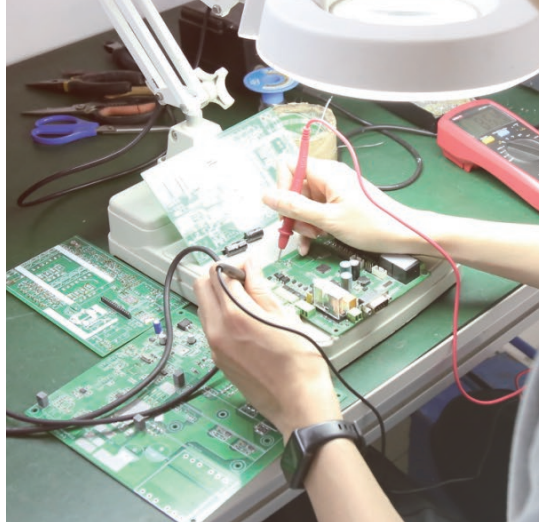
Research and development



Production



Sell



Independent R&D,  
Professional



# MULTIFIT CULTURE



ENTERPRISE MISSION

Bring more green electricity into our lives.



TALENT CULTURE



Respect



Trust



Responsibility



DEVELOPMENT VISION

Develop more efficient and cost-effective solar solutions.



Grow up



Share



Happy

# THE IMPORTANCE OF CLEANING SOLAR PANELS



The effect of power generation efficiency.



① Pollutant Rust



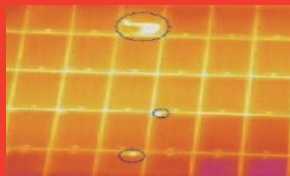
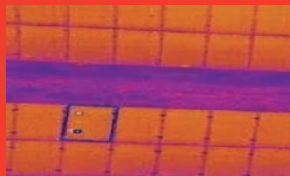
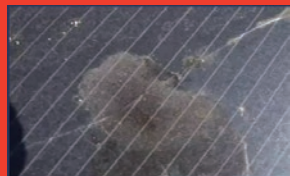
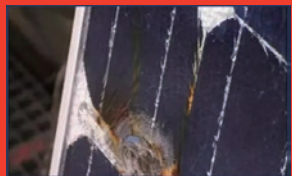
② Bird Droppings



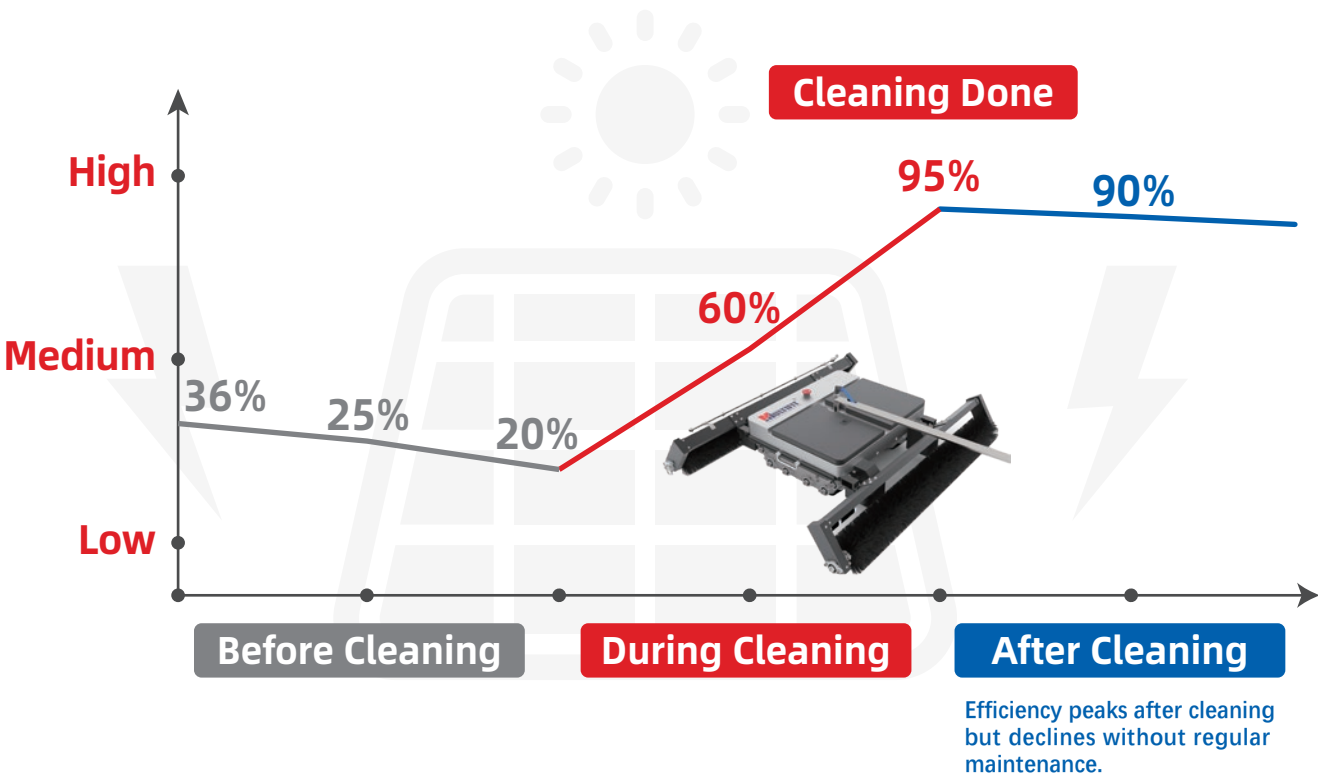
③ Dust



The solar panels covered by pollutant may cause hot spots, which will damage the panel and even make the panel burned.



# SOLAR PANEL POWER GENERATION EFFICIENCY



# THE ADVANTAGES OF USING SOLAR PANEL CLEANING ROBOT



Extended Service Life



Improve Energy Production



Improve Efficiency



# CHOOSING THE CLEANING EQUIPMENT YOU NEED

## Cleaning Efficiency Of Cleaning Robot

Module	Reference value	MW	Area (m²)	Efficiency (m²/H)	Daily cleaning area (m²/day)	Required time (d)
MR-G1 (single panel)	Robot walking speed 12m/min, 550W solar panel	10	47000	1640	13120	4
MR-G1 (double panels)		10	47000	3280	26240	2
MR-XY		10	47000	6560	52480	1
MR-T1	Robot walking speed 25m/min, 550W solar panel	10	47000	1500	12000	4

## Scene Selection Of Cleaning Robot

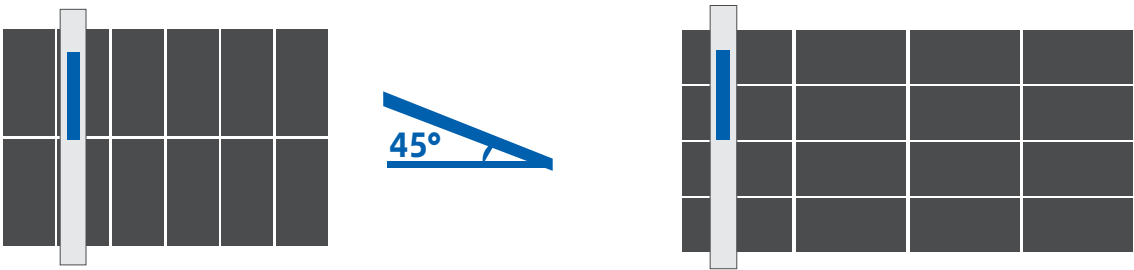
MR-G series, MR-T1 series, MR-XY series and MULR series

• MR-G Series



Single-panel Robot

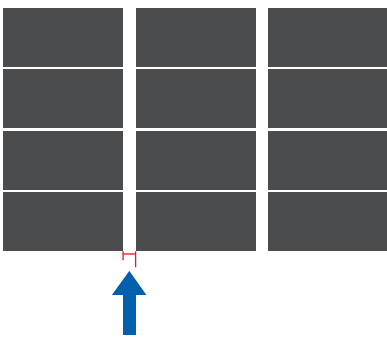
MR-G Series can be applied in common single-panel and double-panel, single-panel robot can be suited in angle under 45°.



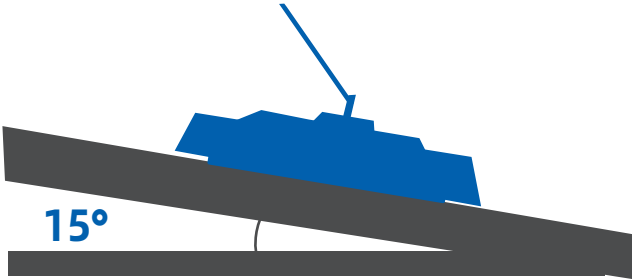
Double-panel Robot

Double-panel robot can be applied in panels size under 2384mm, angle under 45°. It also can be applied in four-panel transverse arrangement solar arrays. If there are pressing blocks, the robot should be customized.

• MR-T1 Series

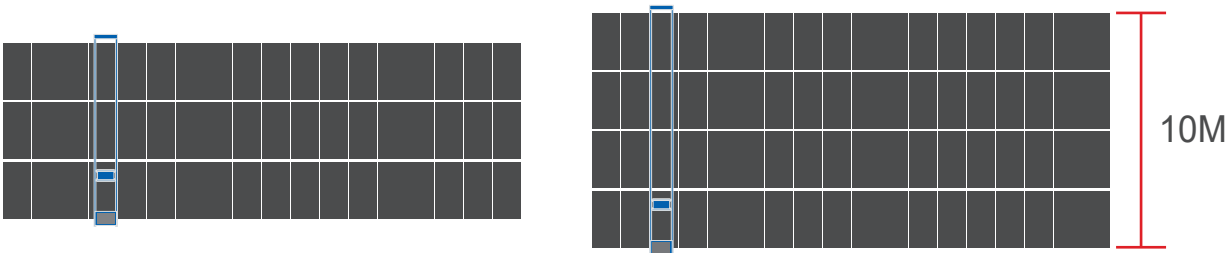


The gap is 60mm.



T1 robot is suitable for the array without panel joints, and angle under 15°.

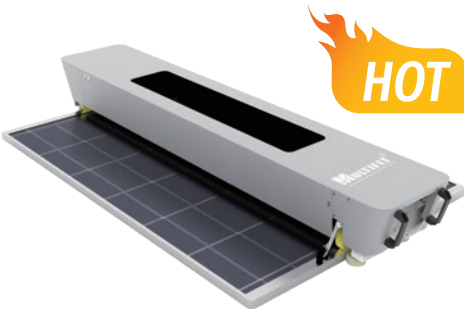
• MR-XY Series



XY robot can be applied in three-panel and four-panel solar array, the width of panels can up to 10m.

# PRODUCT CATEGORY

## 01 MR-G Series Right & Left Solar Cleaning Robot



Through automatic walking right and left in the aluminum frame to achieve intelligent cleaning of the solar panels .

MR-G1

MR-G2

MR-G3

MR-G-D (Double Brush)

BRIDGE, PARKING SPOT, RETURNING SPACE

P5-9

## 02 MR-AR Series Shuttle Solar Robot Transfer Vehicle

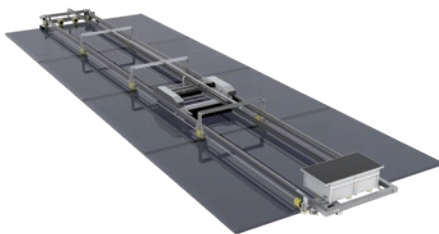


By laying the track on the side of the solar array, the transport vehicle walks on the track automatically, and the automatic transport cleaning robot performs the cleaning task in different solar arrays.

MR-AR (Full-automatic rail-type transfer vehicle)

P10-11

## 03 MR-XY Series Up&Down Solar Cleaning Robot



Through automatic up and down cleaning to achieve intelligent cleaning of the solar panels.

MR-XY

P12

## 04 MR-T1 Series Tracking Solar Cleaning Robot



Through AI algorithm and visual detection to achieve full automatic cleaning of solar panels, cleaning the scene, without missing any dead corners.

MR-T1

MR-T1 (AUT)

P14-16



# MR-G Series HOT

## Right & Left Solar Cleaning Robot

# 01

### Product Introduction

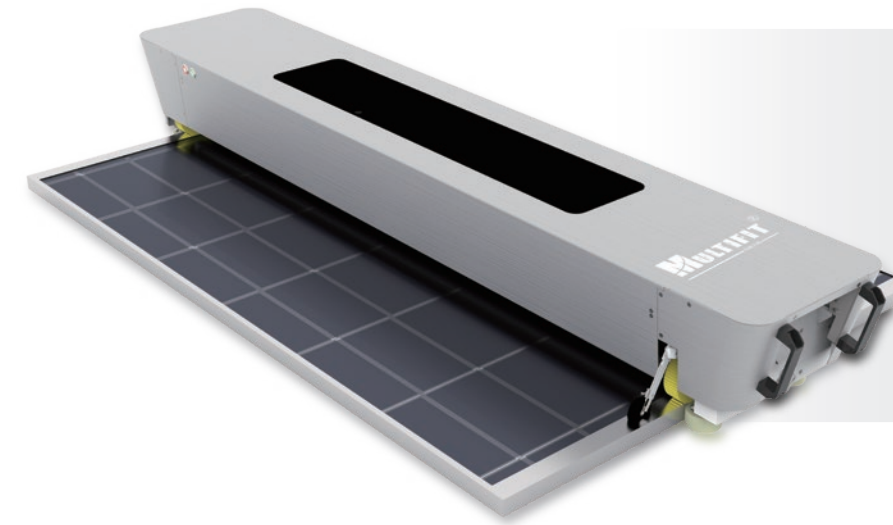
The MR-G series solar panel cleaning robot is an intelligent cleaning equipment specifically designed for photovoltaic (PV) power plants. By moving left and right along the PV array and utilizing a rotating brush mechanism, it provides efficient, non-damaging dry or wet cleaning for solar panels. This robot is suitable for various PV power plant environments, including ground-mounted stations and distributed rooftop PV systems. It can operate effectively under different angles and environmental conditions, significantly enhancing the power generation efficiency of PV modules and extending the lifespan of solar panels.

### Application Scenarios

- Large-scale Ground-Mounted PV Power Plants
- Fishery-Photovoltaic Complementary PV Power Plants
- Commercial and Industrial Rooftop PV Power Plants
- Agro-Photovoltaic Complementary PV Power Plants
- Centralized PV Power Plants
- Distributed PV Power Plants
- Other Applicable PV Power Plants

### Installation Method

Walking along the edge aluminum frame of the photovoltaic panel, fully automatic walking.



**1**  
Generation  
**MR-G1**



**2**  
Generation  
**MR-G2**



**3**  
Generation  
**MR-G3**

# PRODUCT FEATURES



## Automatic Adjustment

Automatically correct and adjust to prevent machine deviation and jamming.



## Danger avoidance

Automatic edge sensing technology to prevent the robot from sliding down and avoid danger.



## Strong Adaptability

Applicable to various arrangement arrays and various power stations.



## Lightweight equipment ≈30kg

The whole machine is about 30kg, which is more than 30% lighter than similar products, and it is convenient to carry.



## Solar power system

Self-charging-comes with a solar power system, convenient and efficient, can last 4-6 hours.



## 1min Disassembly and Assembly of Brushes

Applicable to various arrangement arrays and various power stations.



## Intelligent Control Internet of Things Technology Application

Independent control, grouping, Control by mobile, automatic cleaning time and cleaning mode can be set.



## Stronger Obstacle-crossing Ability

Including slope, step and misalignment, etc. Capable of spanning over 20mm misalignment of flat or end faces.

## MR-G-D ( Double Brush )

Better cleaning effect with double roller brush, overcome the disadvantage that the single-roller brush cannot clean the edge of the photovoltaic array, and can adapt to the photovoltaic system assembled by multiple rows of solar panels in an array.



# Unique advantages of MR-G3

The **third-generation** cleaning robot has more advantages than market robots in terms of performance, product design, and intelligent control. It can handle complex terrains and easily cross misalignments, slopes, and steps exceeding 50mm.

## • The body sways with movement

The head of the robot can form a certain swing Angle with the body in two directions respectively, and automatically adjust according to the ups and downs of the solar panels to prevent getting stuck during the cleaning process. Even if there are certain angular and height differences between the solar panels, as long as they are connected through bridging, MR-G3 can pass through easily.

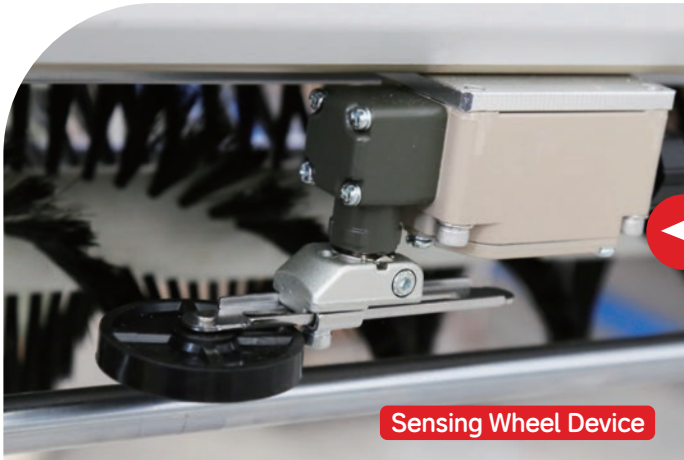
## • 8-wheel drive system

The head walking wheel, the head end hanging wheel and the tail walking wheel of the robot are all equipped with powerful and uniform power. There is no need to worry about the robot slipping during the walking process. MR-G3 can adapt to large-angle arrays and various complex environmental working conditions.





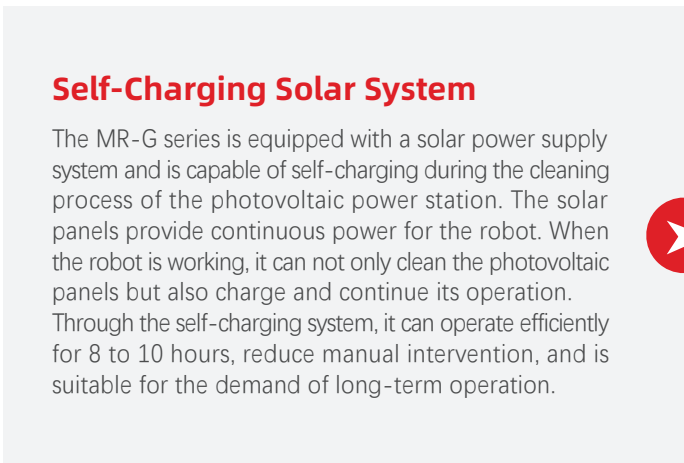
# PRODUCT DETAILS



Sensing Wheel Device

## Edge Detection & Automatic Hazard Avoidance

Equipped with a Edge Detection & Automatic Hazard Avoidance, MR-G series is capable of monitoring its surrounding environment in real time and identifying dangerous areas close to the edge. When the robot approaches the edge of the solar panel, the system will automatically activate the avoidance mechanism to prevent the robot from sliding or colliding. In addition, the system can also identify other potential dangerous areas and adjust the route in a timely manner to ensure that the robot always operates within a safe area.



## Self-Charging Solar System

The MR-G series is equipped with a solar power supply system and is capable of self-charging during the cleaning process of the photovoltaic power station. The solar panels provide continuous power for the robot. When the robot is working, it can not only clean the photovoltaic panels but also charge and continue its operation. Through the self-charging system, it can operate efficiently for 8 to 10 hours, reduce manual intervention, and is suitable for the demand of long-term operation.



Raindrop Sensing Device

## Auto Sensory Mode

The MR-G series is equipped with a self-sensing function and can automatically adjust the cleaning mode according to the weather changes. For instance, on rainy days, the robot will automatically activate the water-washing mode for cleaning to adapt to the cleaning demands brought about by weather changes. This function enables MR-G series to work reliably under various climatic conditions and maintain efficient cleaning.



## One-Button Start

Just press the start button, and the cleaning robot will start working. The operation is quick and convenient.



## Two Cleaning Modes

Dry cleaning and water washing. Even the water-free dry cleaning mode demonstrates remarkable cleaning efficiency.



## Specialized Brush

Cleaning is more thorough. The brush can be quickly replaced within 1 minute with simple operations.



# UPGRADE AND OPTIMIZATION

		
<b>MR-G1</b>	<b>MR-G2</b>	<b>MR-G3</b>
<b>Obstacle Crossing Capability</b> Can cross gaps 20mm Non-twisting structure	<b>Obstacle Crossing Capability</b> Can cross gaps 20mm Non-twisting structure	<b>Obstacle Crossing Capability</b> Can cross gaps 50mm With-twisting structure
<b>Deviation Correction Function</b> None	<b>Deviation Correction Function</b> Customizable	<b>Deviation Correction Function</b> Automatically corrects when robot walk skewed
<b>Maximum climbing Angle</b> ≤8°	<b>Maximum climbing Angle</b> ≤8°	<b>Maximum climbing Angle</b> ≤20°
<b>Running Wheel</b> φ 90mm Quantity: 4	<b>Running Wheel</b> φ 90mm Quantity: 8	<b>Running Wheel</b> φ 120mm Quantity: 4
<b>Housing</b> Aluminum	<b>Housing</b> Anti-Corrosion Aluminum Removable	<b>Housing</b> Stainless Steel Wear-resistant
<b>Battery</b> LCo Lithium Battery Cycle Life: 2000 cycles	<b>Battery</b> LFP Lithium Battery Cycle Life: 4000 cycles	<b>Battery</b> LFP Lithium Battery Cycle Life: 6000 cycles
<b>Remote Controller</b> No screen display Control range: 50m	<b>Remote Controller</b> Display: LCD Control range: 100m	<b>Remote Controller</b> Display: Large LCD Control range: 400m
<b>Flexible Solar Panel</b> Rated Power: 27W	<b>Silicon Solar Panel</b> Rated Power: 40W Polycrystalline	<b>Silicon Solar Panel</b> Rated Power: 60W Monocrystalline
<b>Adaptability</b> Only for 1-2 panels array	<b>High Adaptability</b> Meet multiple panels and removable	<b>Strong Adaptability</b> Match most solar projects

# INTELLIGENT CONTROL

**WiFi/4G communication module, supporting cloud platform**

**Intelligent Management Platform Webpage (Remote)**

**Remote control (local)**

**Direction control/Speed control/Return to the parking station**

**Customize the cleaning time and frequency**

**Robot Group Control System (optional)**





# OVERVIEW OF BRIDGE, ROBOT-PARKING SPOT AND RETURNING SPACE



The purpose of the construction is to make the cleaning robot work faster, start and stop smoothly and reduce the frequency of personnel handling cleaning machines.

## Parking Spot ▼

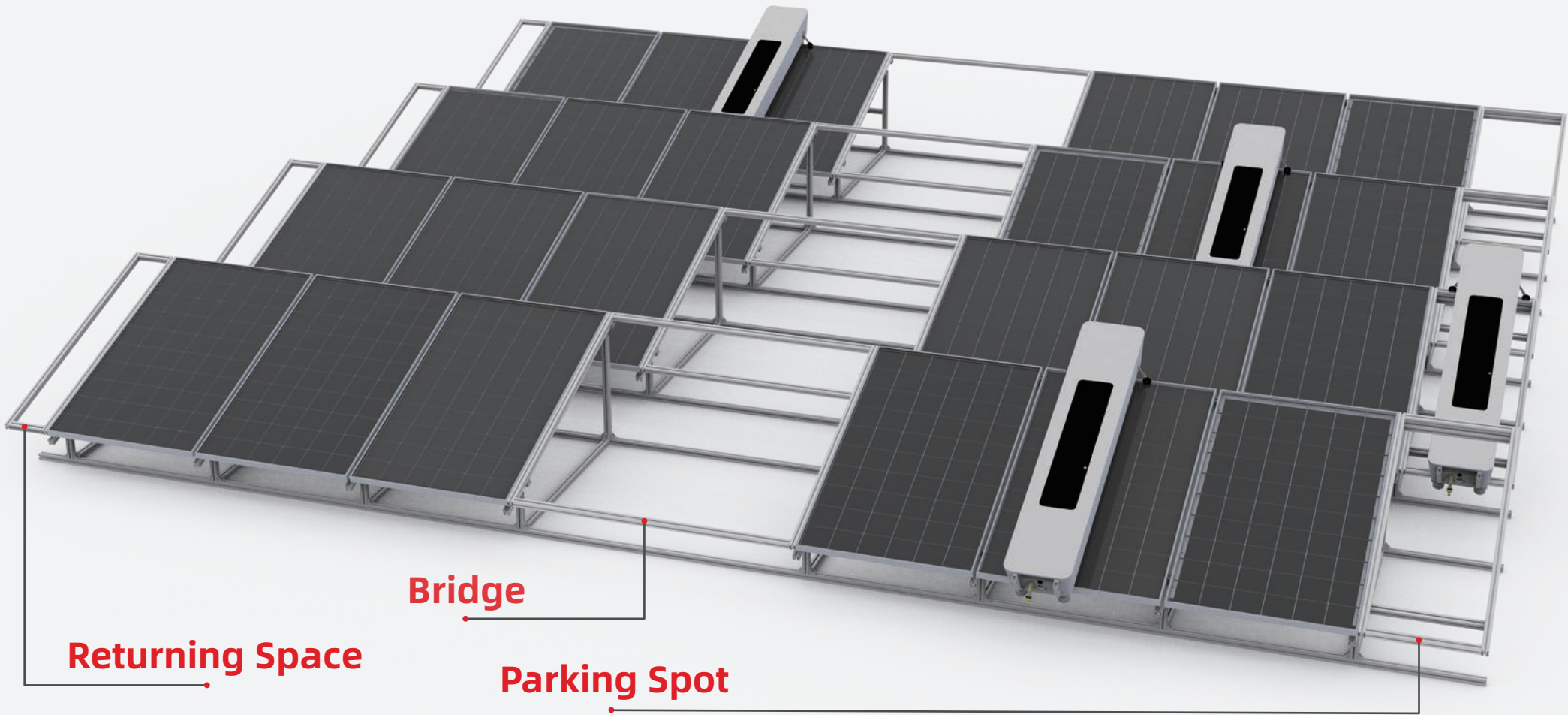
The harbor where the solar cleaning robot is parked.

## Bridge ▼

According to the ups and downs of the array, establish a link track to allow the cleaning robot to walk smoothly into the next PV panel cleaning range.

## Returning Space ▼

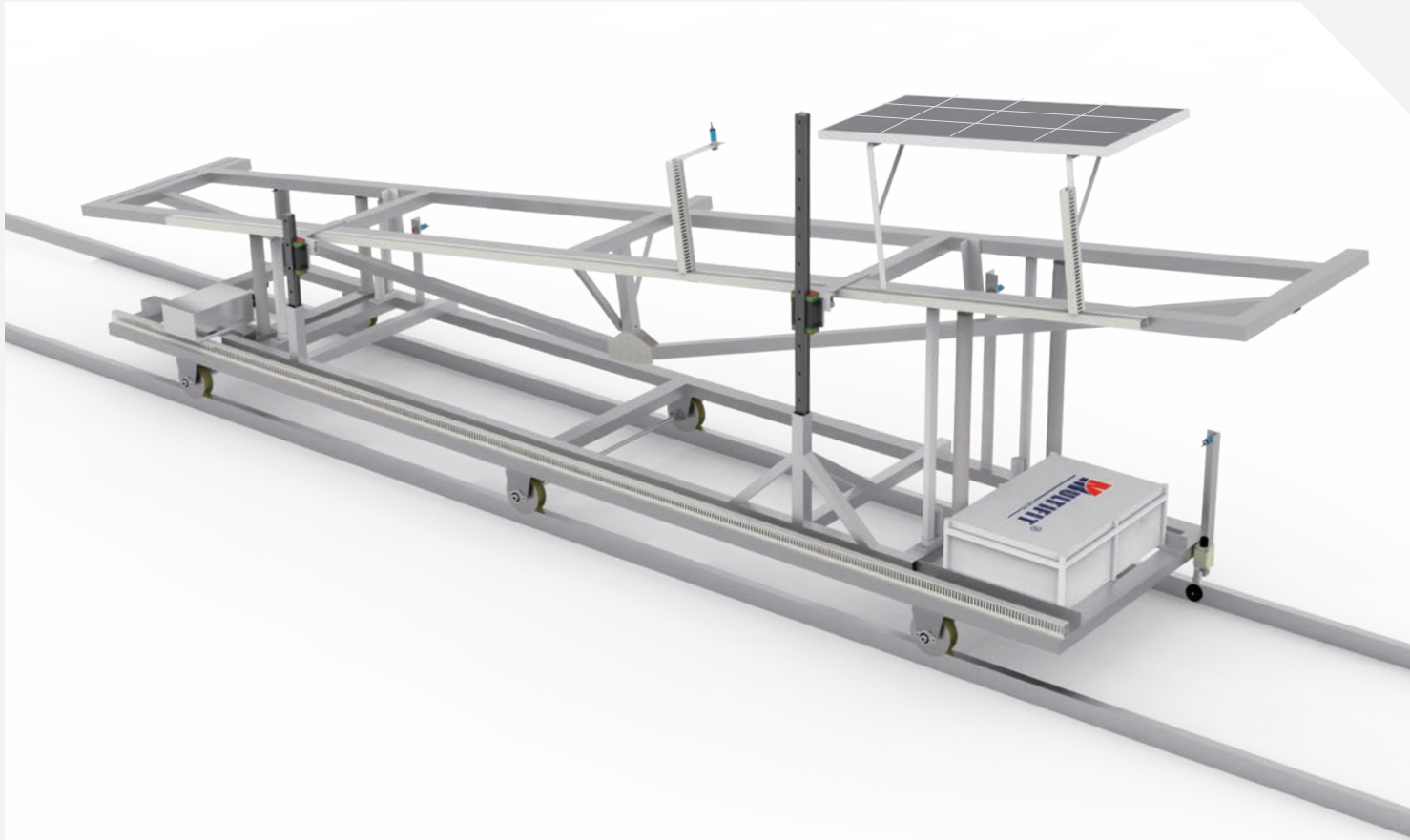
The return position is to allow the cleaning robot to extend the cleaning range and make each solar panel of the photovoltaic array clean in place, in addition, it can protect the cleaning robot from falling when the sensing wheel is out of control.



# MR-AR Series

## Shuttle Solar Robot Transfer Vehicle

02



### Characteristics of MR-AR series



#### Precise Positioning

Through sensor identification, it achieves precise positioning of photovoltaic arrays, ensuring that MR-G series cleaning robots seamlessly access the cleaning area.



#### Improve Efficiency

It replaces manual handling, taking only 2-3 minutes for a single transfer, which improves efficiency by over 10 times compared to manual handling.



#### Adaptive Scenarios

It supports scenarios such as flat ground, rooftops, and gentle mountain slopes.



#### Intelligent Control

Controlling the transfer vehicle via a remote control saves labor costs and significantly improves cleaning efficiency.



# Overview of Transfer Vehicle



## PURPOSE OF CONSTRUCTION

It is used for the maintenance of large photovoltaic power station system, reducing the manual handling process, and can clean photovoltaic panels in time.



## IMPROVE EFFICIENCY

It is time-consuming and laborious to carry the cleaning robot manually. If the photovoltaic power station is built on a flat ground and roof, it is recommended that you equip a transfer vehicle that can walk automatically when purchasing the cleaning robot.

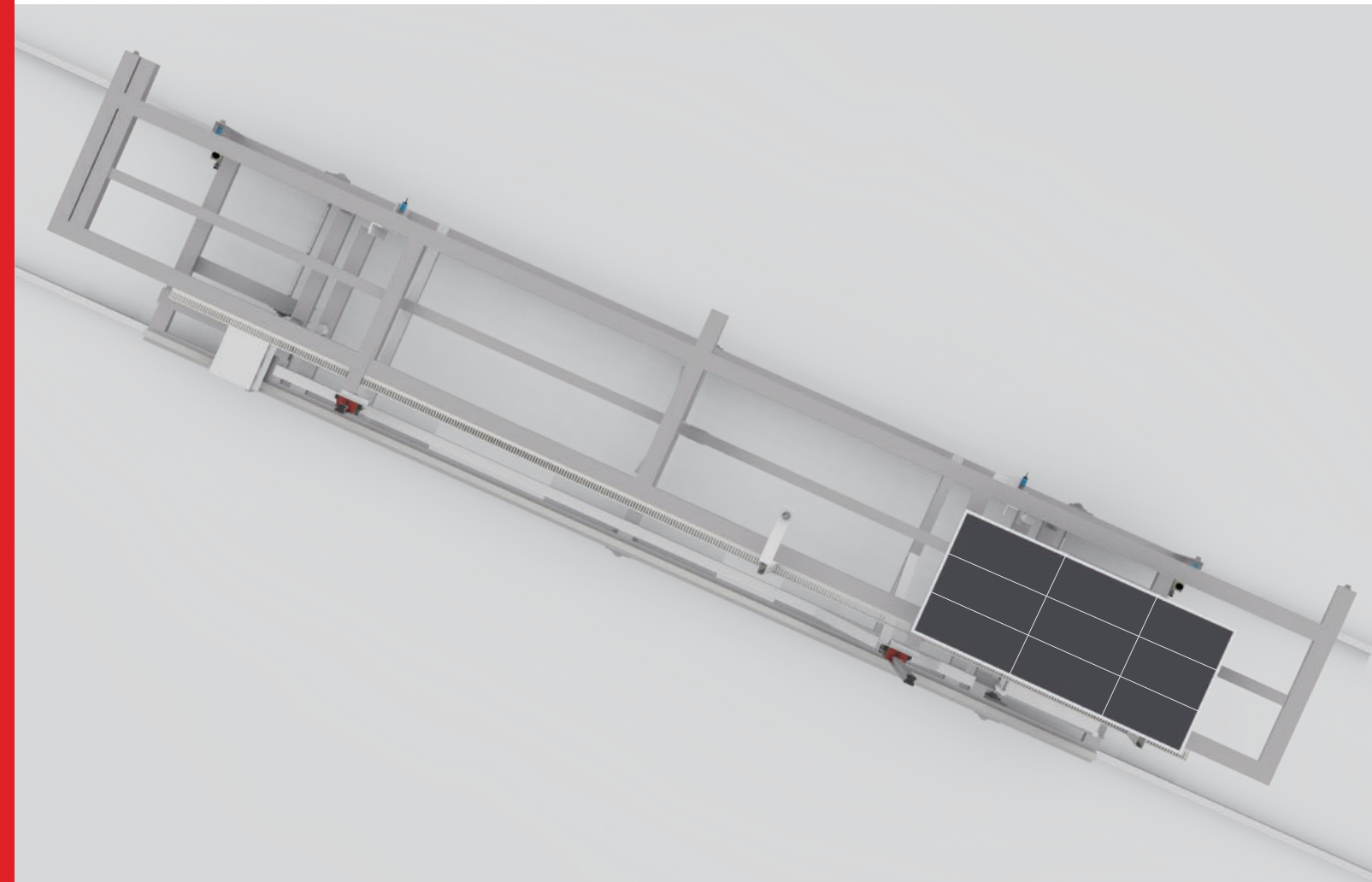


## INTELLIGENT WORK

- ① Press the start switch, the transfer vehicle moves forward, the sensor on the transfer vehicle senses the photovoltaic array and aligns with the array, the transfer vehicle stops moving forward.
- ② At this time, the front and rear rods are adjusted and lifted to the level of the photovoltaic array, and the G1 solar cleaning robot senses and starts the equipment to start cleaning.
- ③ After cleaning, the G1 solar cleaning robot moves to the transfer vehicle, and the transfer vehicle moves to the next array to continue cleaning.

# Customization of Transfer Vehicle

According to the array data of your photovoltaic power station, the technical department will provide you with the design scheme.



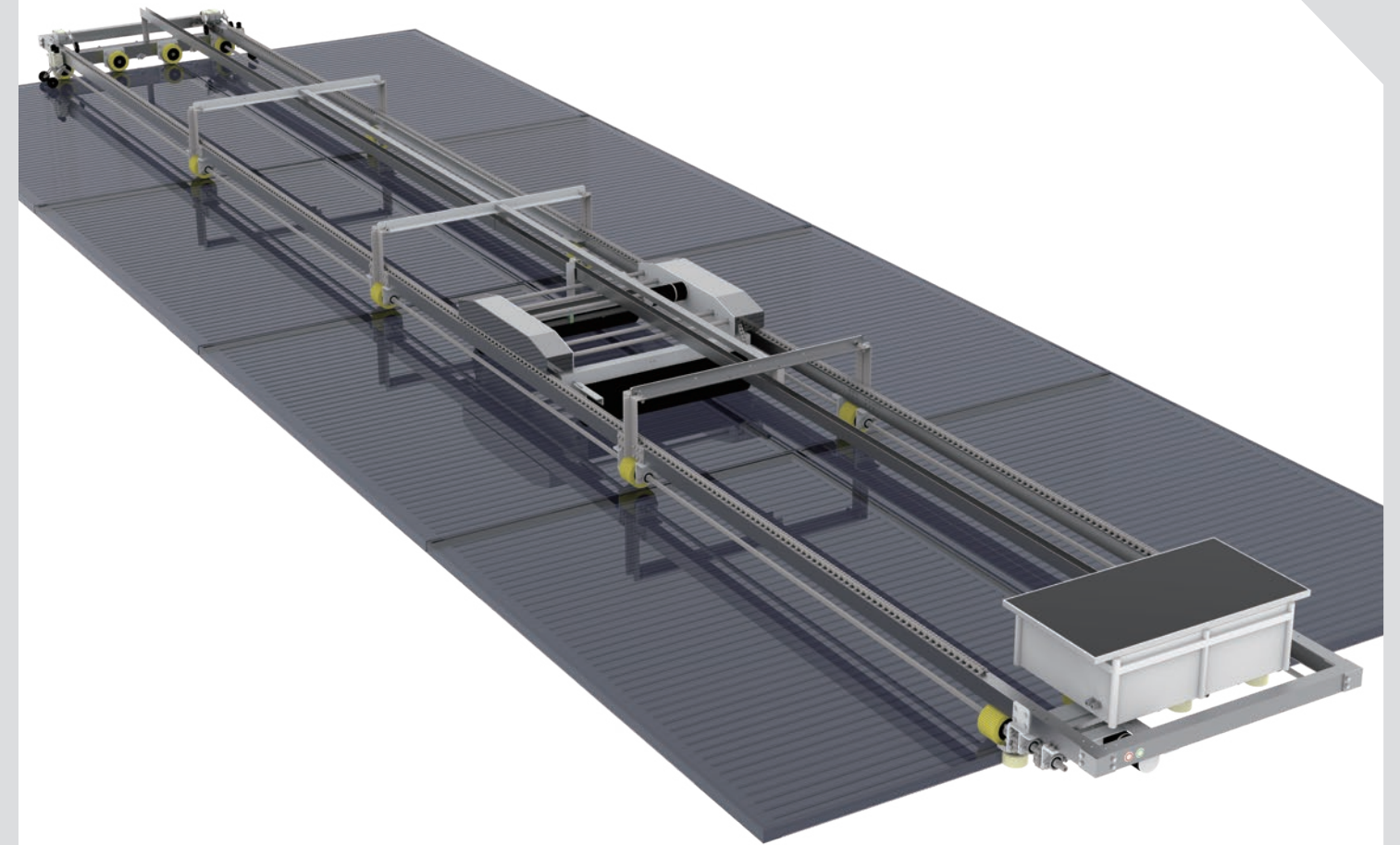
The data required are:

1. Width of solar panel array.
2. The height (maximum and minimum dimensions) of the solar panel array and the angle of the photovoltaic panel.
3. Array drawings and panoramic photos of the photovoltaic power station.

# MR-XY Series

## Up&Down Solar Cleaning Robot

03



### Characteristics of MR-XY series



The cleaning robot can adapt to the photovoltaic system assembled by multiple rows of solar panels in an array.



The aluminum alloy support. The frame part adopts multi segment splicing structure, which is convenient for transportation.



Without manual cleaning, integrated dry cleaning and water cleaning model.



Convenient to use in different photovoltaic power stations. Remote control with independent power supply.



Automatic edge sensing technology to prevent the robot from sliding. Automatic danger avoidance. The length of the equipment can be adjusted according to the size of solar panel.



It adopts lithium battery and brushless motor, which is durable.

### Smart Management Control System

Track the status of the MR-XY Cleaning Robot

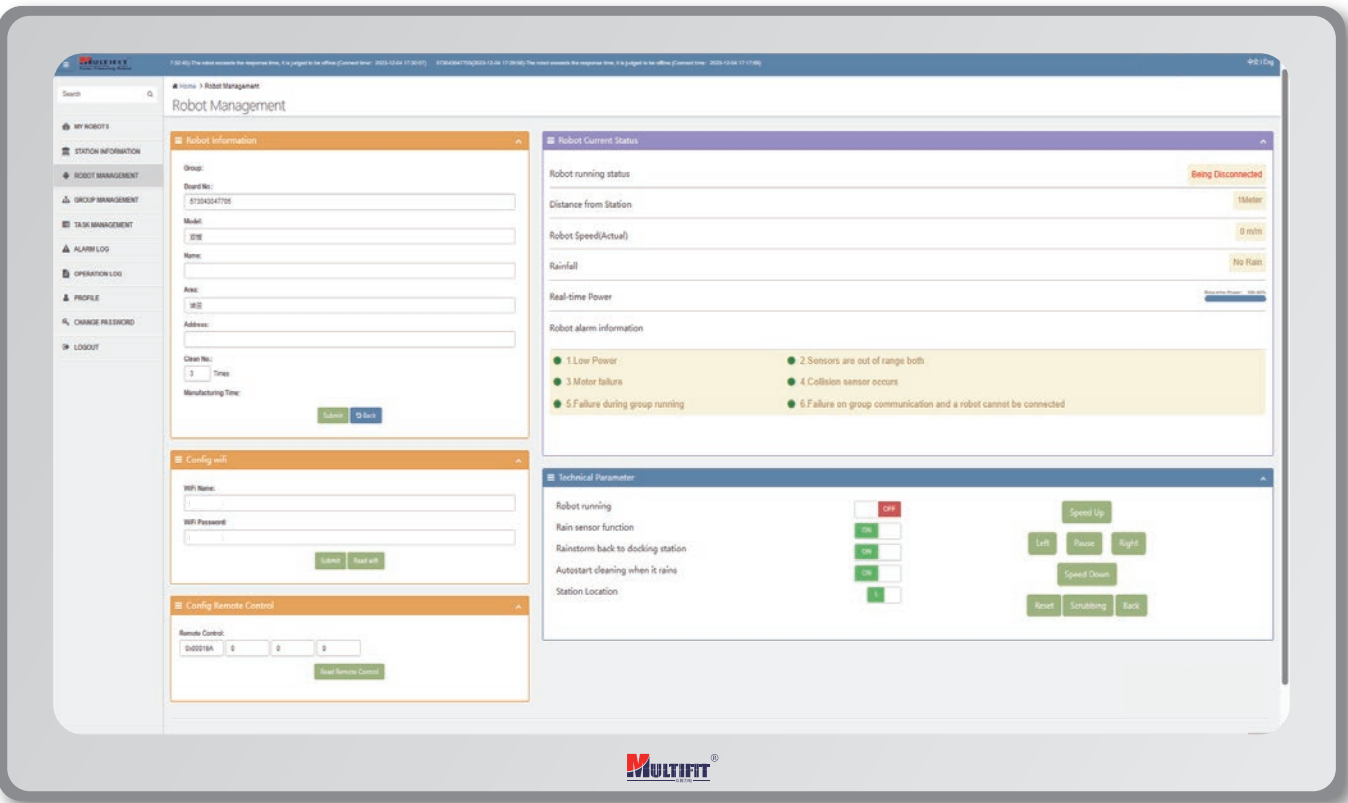
1. Improve the transmission efficiency of solar panels.
2. Extend the service life of the panel.

Turn on the intelligently managing control system according to your needs, follow up in real time, and keep your solar panels as clean as new.



# CONTROLLER/REMOTE SMART MANAGEMENT CONTROL SYSTEM

## Smart Management Control System





**Remote Control**  
Start at any time, stop at any time, scrub repeatedly, where there is no network, you can use the remote control to start and operate the solar panel cleaning robot.




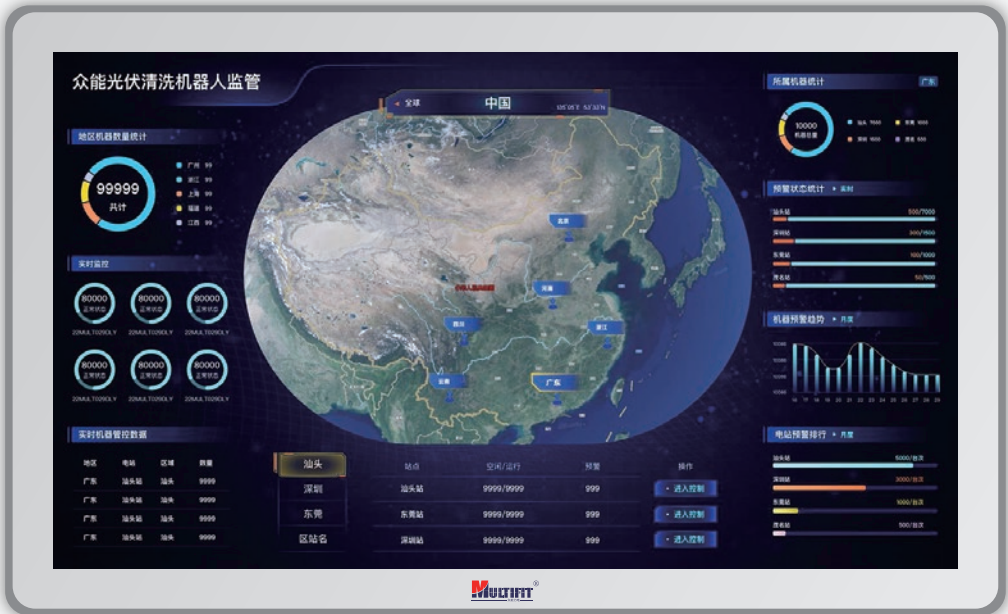
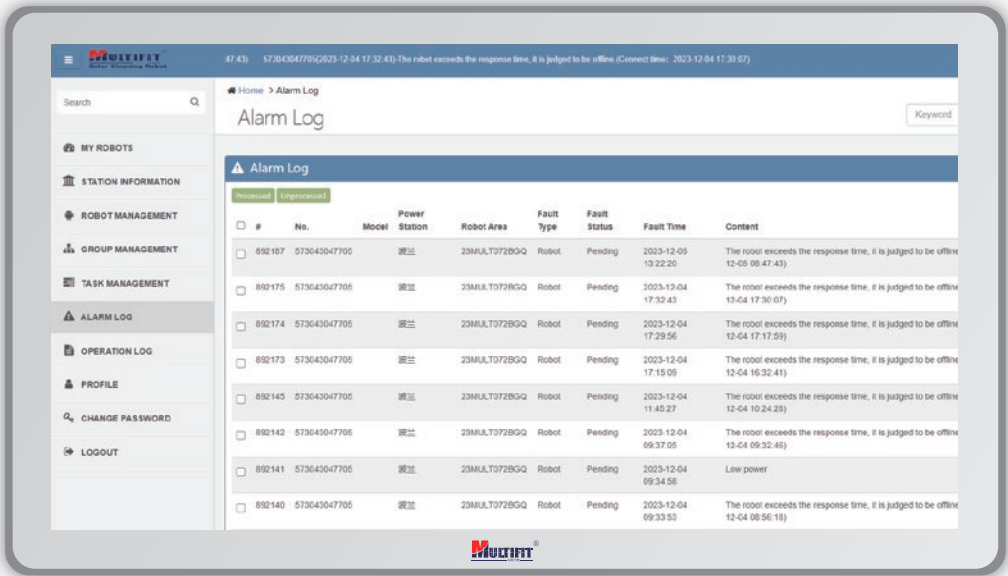
# REMOTE SMART MANAGEMENT CONTROL SYSTEM

## Platform

  
Fully automated operation.

  
No need for you to be on site.

  
Multiple cleaning robots work simultaneously.



# MR-T1 Series

## Tracking Solar Cleaning Robot

04

### Product Introduction

The MR-T1 solar panel cleaning robot is compatible with various panel types and arrays, and can achieve multiple uses within a certain range, without the need to customize robots according to the array. It has the characteristics of small size, light weight, and is not limited by the distribution and arrangement of the array.

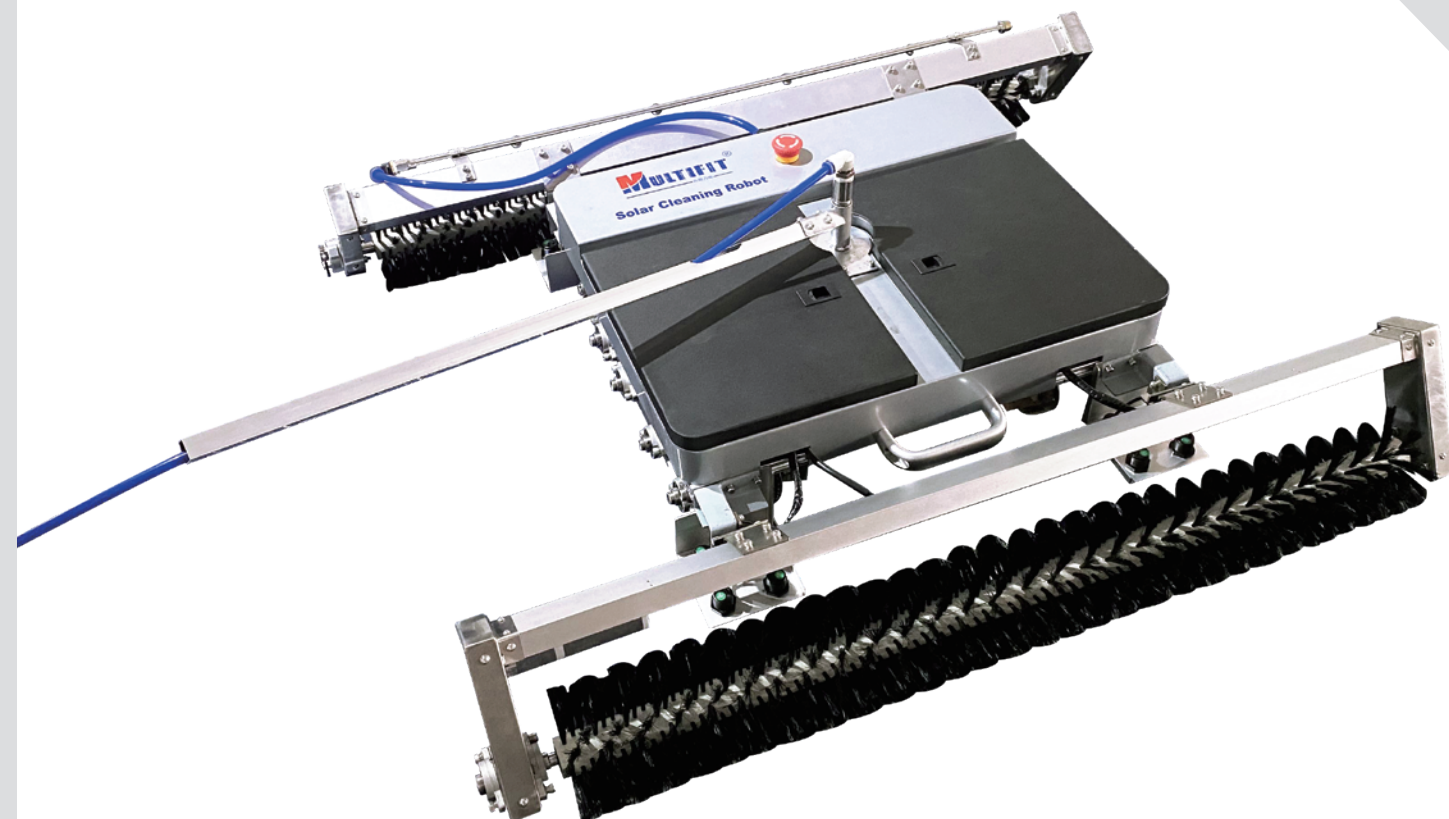
In the process of intelligent cleaning, robots can automatically detect, track, locate, communicate and control groups, to meet the demands of different kinds of devices control and management.

### Application Scenarios

- Large-scale Ground-Mounted PV Power Plants
- Fishery-Photovoltaic Complementary PV Power Plants
- Commercial and Industrial Rooftop PV Power Plants
- Agro-Photovoltaic Complementary PV Power Plants
- Centralized PV Power Plants
- Distributed PV Power Plants
- Other Applicable PV Power Plants

### Installation Method

It can be placed on PV panels and operated via fully automatic walking or a remote control.



### Characteristics of MR-T1 series



#### Tracked Chassis

Adopting high grip track design, suitable for complex terrain (such as sandy, muddy, sloped and rugged terrain).



#### Strong Obstacle Crossing Ability

The climbing angle can reach 0-15°.



#### Efficient Cleaning Rate

Utilizing a 1-meter roller brush, the system achieves  $\geq 99\%$  cleaning coverage per photovoltaic panel, enhancing power generation efficiency by 10%-30% (depending on contamination levels).



#### Water-Saving and Eco-Friendly

Compared to traditional manual washing, it significantly reduces water consumption by over 50%, minimizing environmental impact.



#### Remote Control

Supports manual remote operation with a range of up to 400 meters, allowing operators to perform cleaning tasks from a safe location.

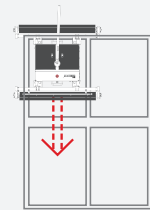


#### Anti-Fall Design

Equipped with laser sensors to intelligently detect photovoltaic panel edges and prevent falls. Integrated with a self-check function that verifies laser sensor operation before startup, ensuring reliability.

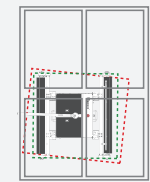


# FUNCTION DESCRIPTION



## Excellent Obstacle Climbing Ability

MR-T1 is capable of handling complex terrains and easily crossing gaps of over 60mm, allowing the robot to move smoothly in different environments, making it particularly suitable for large-scale photovoltaic power plants and ground photovoltaic fields. Even when encountering uneven ground or obstacles, MR-T1 can ensure continuous operation, ensuring that each photovoltaic panel is thoroughly cleaned.



## Automatic Posture Correction

Equipped with an image recognition system, MR-T1 can monitor the robot's posture in real-time, automatically adjust direction, and prevent deviation or jamming during the cleaning process. This mechanism ensures that the robot can maintain the correct working posture even on complex terrain or uneven surfaces, thereby improving cleaning accuracy and efficiency.



## Edge Detection & Automatic Hazard Avoidance

Equipped with advanced edge perception technology, MR-T1 can monitor its surrounding environment in real-time and identify hazardous areas close to the edge. When the robot approaches the edge of the photovoltaic panel, the system will automatically activate the avoidance mechanism to prevent the robot from slipping or colliding. In addition, the system can also identify other potential hazardous areas and adjust the route in a timely manner to ensure that the robot always operates within a safe area.



## Quick Brush Replacement

Adopting modular design, the brush of MR-T1 can be quickly replaced within 1 minute. This design greatly reduces equipment maintenance time and improves work efficiency. Users only need a simple operation to quickly replace the brush, ensuring that the equipment is always in the best cleaning condition and avoiding prolonged downtime.



## Dry and Wet Cleaning Integration

According to different environmental requirements, MR-T1 can switch between dry cleaning and wet washing modes. The dry cleaning mode is suitable for photovoltaic panels with less dust or light surface pollution, and can quickly remove accumulated dust; The wet washing mode is suitable for stubborn stains and can thoroughly clean the surface of photovoltaic panels through water washing. The combination of two modes provides users with flexible and diverse cleaning solutions.



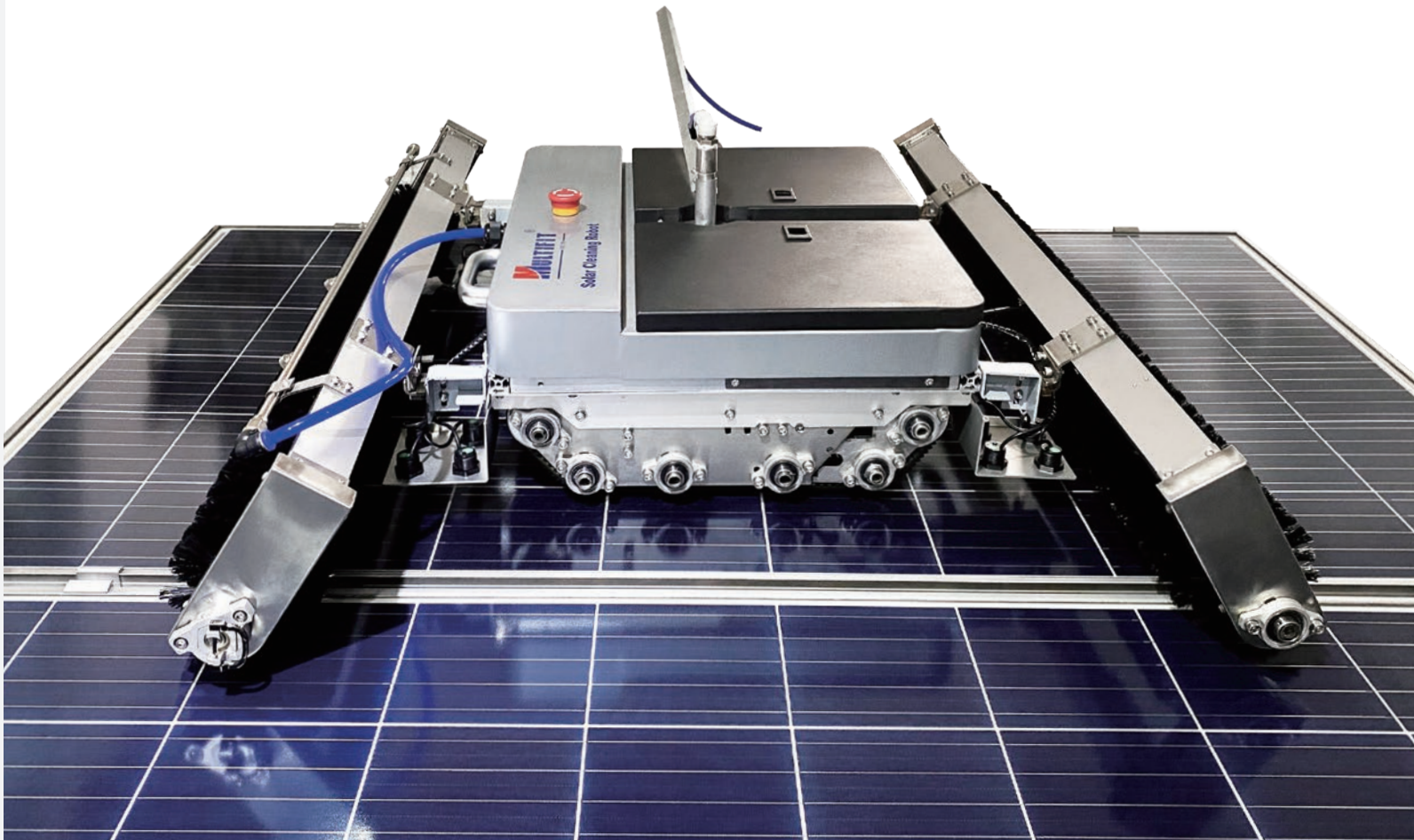
## Lightweight Design

Most of the structure of the whole machine is made of aluminum alloy material, which reduces the overall weight of the equipment while meeting the strength requirements for use, and meets the requirements for portable handling and mobility.



## Cost-Effective

Compared to traditional manual cleaning or mechanical equipment, MR-T1 has lower initial investment and operating costs. Its efficient cleaning capability greatly improves the power generation efficiency of the power station, thereby accelerating investment returns. Robots reduce labor and maintenance costs, provide a high return on investment (ROI), and make long-term operations more economical.

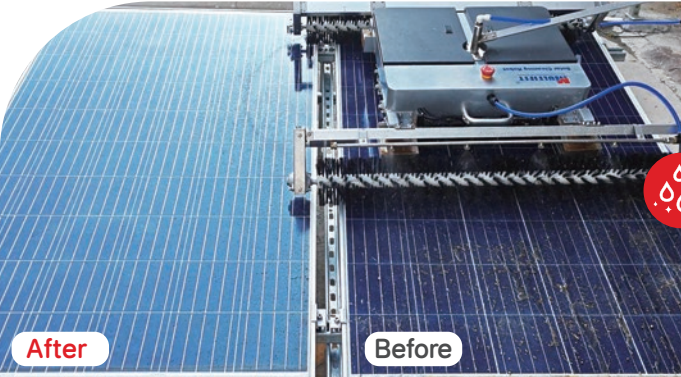




# PRODUCT ADVANTAGES

◆ The MR - T1 series of fully automatic cleaning robots has more advantages than other robots on the market in terms of performance, product design, and intelligent control. For example, it is easy to carry, has a long service life, and is equipped with an intelligent remote control. Moreover, its rolling brushes are easy to disassemble, install, adjust, and maintain.

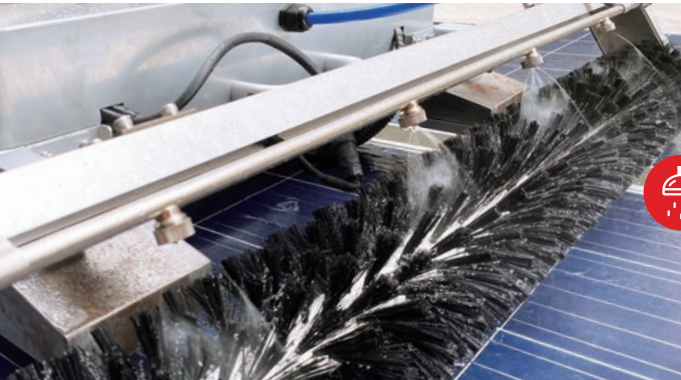
◆ The robot can completely accomplish high-precision tasks such as the point-to-point navigation and regional coverage in complex photovoltaic module scenarios. Our robot can achieve 100% coverage at one time to achieve clean photovoltaic panels without the dead ends. Through this way, it can effectively increase the power generation.



⌚ **Two Cleaning Models**  
Dry Cleaning and Water Cleaning.  
Even the dry cleaning model without the water has the prominent efficiency.

⌚ **Path Planning Algorithm**  
It conducts intelligent path planning to ensure that every inch of photovoltaic panels can be thoroughly cleaned, effectively increasing the power generation.

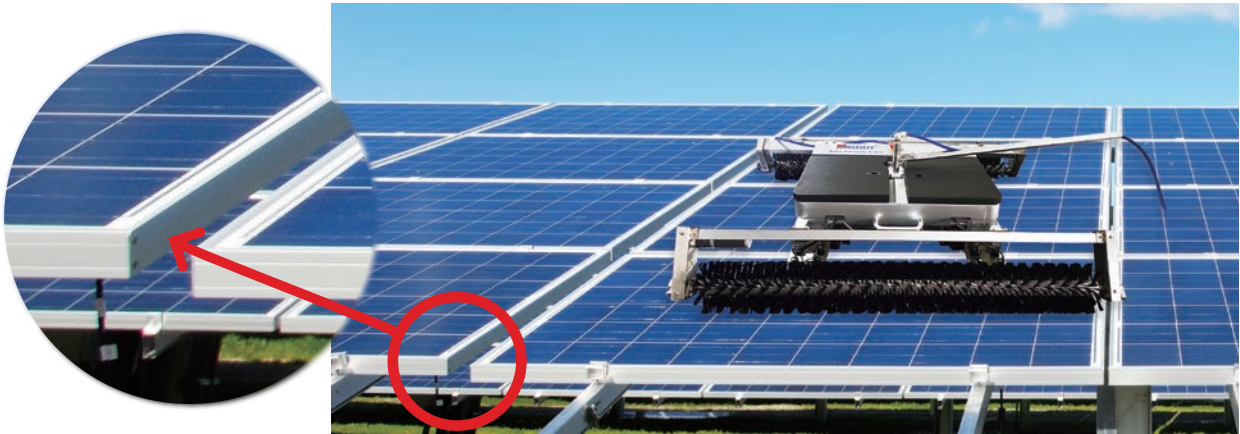
A diagram showing a 3x3 grid of solar panels. Red dashed arrows indicate a systematic cleaning path, starting from the bottom-left panel and moving in a zig-zag pattern across the grid. A small robot icon is shown at the start of the path.



⌚ **Four Water Outlet Nozzles**  
The spray-type water outlet can evenly cover the photovoltaic panels, improving the cleaning efficiency. It is water-saving and environmentally friendly.

## Scene Selection ▼

- ↔ ① The maximum panel gap distance is 60 mm.
- ↑↓ ② The maximum distance between upper and lower panel gaps is 20 mm.



## Remote Control ▼

- ◆ Start at any time, stop at any time, scrub repeatedly.
- ◆ The remote control is equipped with an "Automatic Mode" button. Simply press it, and the solar cleaning robot will enter the full-automatic working state.
- ◆ The remote control has strong remote control capabilities, with an effective control distance of up to 400 meters.

A black remote control device with two antennas and a small LCD screen. The screen displays various settings and buttons. A red arrow points from the screen to a detailed view of the display.

**Remote Control Screen Display ▼**

A detailed view of the remote control's LCD screen. It shows a grid of buttons and text: 'LEFT 060', 'RIGHT 060', 'STOP', 'Mode: Manually', 'SetMD', '1 ADJSP', 'AUTOS', 'BRUSH', and 'OFF/ON' toggle switch.




MR-G2 Series Right & Left Solar Cleaning Robot

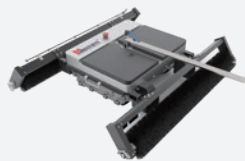


Mechanical parameters	
Water consumption	180~360 L/H (0.3mpa)
Width	470mm
Height	340mm
Net weight	39-86kg
Robot Body Material	Aluminum Alloy
Protection Grade	IP65
Corrosion-proof Grade	C4
Brush Lifespan	2-3 Years
Mounting Type	Fully automatic walking, no need to add tracks
Electrical parameters	
Motor Power	120W/200W/300W
Power Input	24VDC
Battery Capacity	24V/10Ah (20Ah)
Working time	4-8H
Charging time	6H
Self-charging Board Power	40W/60W
Operating parameters	
Applicable Angle	0-45°
Applicable Panel Gap	20mm
Cleaning Method	Dry Cleaning/Water Cleaning
Cleaning Speed	12-20m/min
Movement Mode	The walking wheels and hanging wheels are attached to the aluminum frame of the photovoltaic panel
Navigation Mode	Along the aluminum frame of the array photovoltaic panel
Maximum climbing Angle	≤8°
Cleaning Mode	Once/multiple times/scrub/Clean at regular intervals
Bridge Mounting Rail/ Intelligent Management App/ Robot Group Control Module	Optional Configuration
4G Module / WiFi Module Rain Sensor Device / Wireless Remote Controller/	Standard Configuration

MR-G3 Series Right & Left Solar Cleaning Robot

	Mechanical parameters	
	Water consumption	180~360 L/H (0.3mpa)
	Width	470mm
	Height	310mm
	Robot Body Material	304 stainless steel material
	Protection Grade	IP65
	Corrosion-proof Grade	C4
	Brush Lifespan	2-3 Years
	Mounting Type	Fully automatic walking, no need to add tracks
	Electrical parameters	
Motor Power	120W/200W/300W	
Power Input	24VDC	
Battery Capacity	24V/10Ah (20Ah)	
Working time	4-8H	
Charging time	6H	
Self-charging Board Power	60W	
Operating parameters		
Applicable Angle	0-45°	
Applicable Panel Gap	50mm	
Cleaning Method	Dry Cleaning/Water Cleaning	
Cleaning Speed	12-20m/min	
Movement Mode	The walking wheels and hanging wheels are attached to the aluminum frame of the photovoltaic panel	
Navigation Mode	Along the aluminum frame of the array photovoltaic panel	
Maximum climbing Angle	≤20°	
Cleaning Mode	Once/multiple times/scrub/Clean at regular intervals	
Bridge Mounting Rail/ Intelligent Management App/ Robot Group Control Module	Optional Configuration	
4G Module / WiFi Module Rain Sensor Device / Wireless Remote Controller/	Standard Configuration	

MR-T1 Series Tracking Solar Cleaning Robot



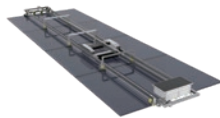
Model	MR-T1	MR-T1 AUT
Mechanical parameters		
Control mode	Manual remote control operation	Automatic operation
Travel route	Remote control selection	Set path planning
Water consumption	180L/H	
Robot size (excluding roller brush)	685mm×617mm×320mm	
Roller Brush Size	Length: 1 meter; Diameter: 130mm	
Package size	Main body wooden box: 820×705×480mm; Brush roller wooden box: 1250×340×350mm	
Weight	Main body: 29kg; Brush roller: 10.5kg	
Number of brush rollers	2	
Body material	Aluminum alloy	
Protection grade	IP65	
Anti corrosion grade	C4	
Brush lifespan	2-3 Years	
Electrical parameters		
Motor attributes	Brushless motor	
Power input	24VDC	
Battery capacity	10AH	
Working time	4-6H	
Charging time	3-4H	
Operating parameters		
Cleaning width	1m (Acceptable customized length)	
Applicable angle	≤15°	
Obstacle surmounting ability	Slab joint 60mm	
Cleaning mode	Dry cleaning/Water cleaning	
Sweeping speed	20m/min	15-25m/min

MR-AR Series Shuttle Solar Robot Transfer Vehicle



Rated power of the motor	200W/300W (With brake)
Rated voltage	24V
Capacity of the lithium battery	10Ah
Self-charging board power	36V60W
Sweeping speed	12-25m/min
Working time	6 - 8 hours
Control mode	Remote control

MR-XY Series Up&Down Solar Cleaning Robot



Name	Working Time (H)	Walking Speed (m/min)	Walking Distance (m)	Ambiant Temperature (°C)
MR-XY	> 4	8-12 (m/min)	> 2000m	-20°C~70°C No Condense

Control Mode	Field Remote Control And Manual Keys
Working Way	Use Remote Control To Operate Cleaning, No Manual Work Is Required
Parking Apron	Parking Areas On The Left And Right Side Of The Panel Array
Protection Level	IP65
Remark	Customized Based On Solar Pv Array Size

Quality Implementation Standard MR-G MR-XY MR-T1

Essential requirement		Applied Specifications/Standards
Art.3.1(a)	Safety	EN IEC 62368-1:2020+A11:2020
Art.3.1(a)	Health	EN 62479:2010
Art.3.1(b)	EMC	ETSI EN 301 489-1 V2.2.3 (2019-11) Final draft ETSI EN 301 489-3 V2.2.0 (2021-11)
Art.3.2	Radio	ETSI EN 300 330 V2.1.1(2017-02)
Test Standard		EN ISO 12100:2010      EN 60204-1:2018 EN IEC 61000-6-2:2019      EN IEC 61000-6-4:2019



# PROJECT CASES



50KW rooftop PV project in Jakarta, Indonesia



5MW ground PV power station in Malta



30.2KW roof of a cement plant



200KW rooftop PV power station bridge in Guang'ao, Shantou

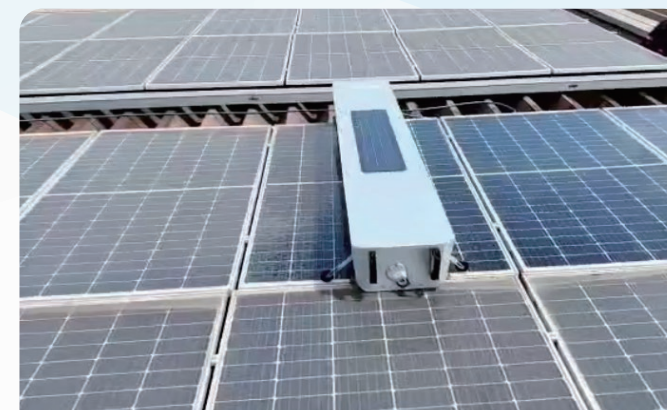


50KW in Belgium



1.5MW rooftop PV power station in Turkey

# CLEANING ROBOT



2MW industrial and commercial PV power station in Malaysia



200KW PV poverty alleviation power station in Zhengzhou, Henan province



2.1MW in Xinjiang



20MW ground-based PV power station in the United States



Transfer vehicle in Indonesia



# PROJECT CASES



1.134MW ground-based PV power station in the Guang Dong



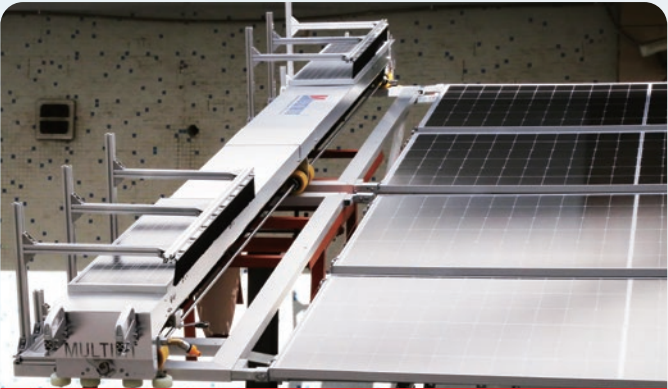
Bus Station Photovoltaic project in Qatar



6.3MW Qatar World Cup-Transportation photovoltaic power station



30MW solar panels cleaning solutions in Hainan, China



Bridge, robot-parking spot and returning space customization project



20MW ground-based PV power station in the United States



25.5KW rooftop in Australia



300kw roof photovoltaic project in Lebanon





5MW Photovoltaic project in Yemen



286KW Photovoltaic project in Oman



3MW Photovoltaic power station project - Dongguan



4.2MW Photovoltaic project in Saudi Arabia



1.28MW Photovoltaic project in Brazil



MR-T1 AUT for roof photovoltaic cleaning project in Spain



# COOPERATION



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## RECRUITMENT

- Hot blue ocean projects in emerging industry market.

## ONE-STOP SUPPORT FOR ENTREPRENEURSHIP

- The heart-level service of the headquarters saves you the trouble to start.

## AUTHORIZED DISTRIBUTION

- Franchised dealers sell products in authorized areas or channels.

## FREE TRAINING

- Provide marketing and technical training for franchised dealers.

## REBATE REWARD

- Complete the sales task and reward according to the incentive policy.

## TECHNICAL SUPPORT

- Assist in the design of schemes and comprehensive technical consulting services during the support period.

## PRODUCT SUPPORT

- Provide copies of relevant certificates and letters of authorization.