

Outdoor empirical application scenarios

# Outdoor Multi-Channel Photovoltaic Module Aging Test System

Outdoor Multi-Channel PV Module Stability Test System

MODEL: OT-MCTA8T

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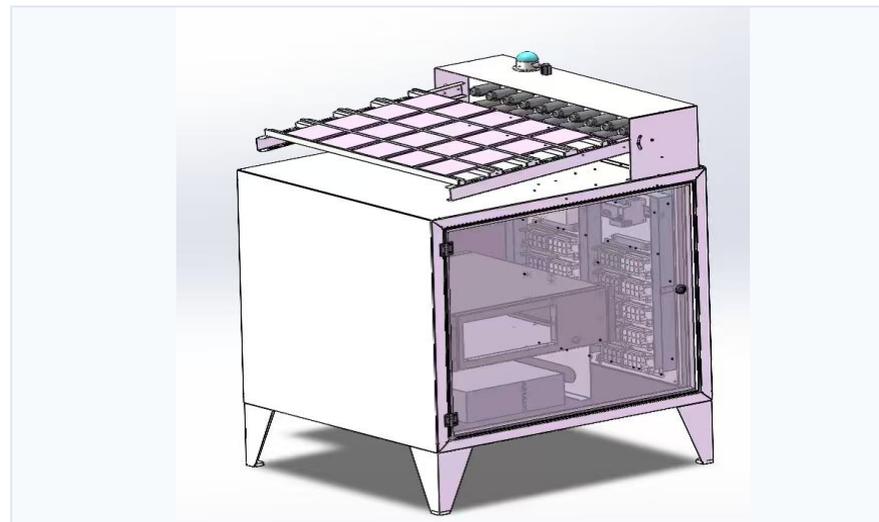


# Product Overview

High-throughput testing solutions designed specifically for **outdoor demonstration scenarios**

## Core Values

- 01 Outdoor demonstration:** Real-time monitoring of power generation performance during actual outdoor operation provides more valuable data for reference.
- 02 Intelligent tracking:** The MPPT algorithm is used to automatically track the maximum power point without manual intervention.
- 03 High-throughput testing:** Integrates multi-channel source meters and relay groups to enable parallel testing of multiple components.
- 04 Accelerated R&D:** Providing massive amounts of experimental data for the development of perovskite materials and the screening of process reliability.

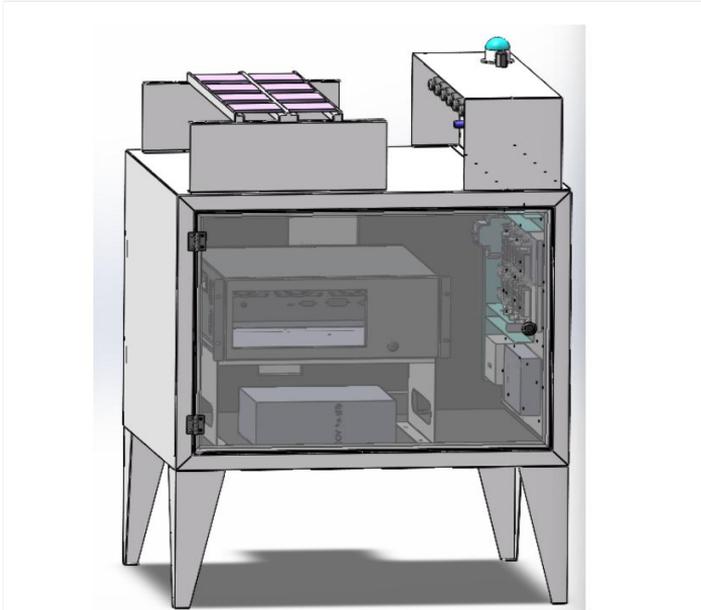


## Application scenarios

Outdoor power generation performance monitoring    perovskite material development

Process reliability screening

Long-term stability test



**Equipment structure:** Outdoor testing cabinet + indoor remote monitoring

## Highly efficient integrated multi-channel test platform

**Multi-channel source table** Simultaneous testing of 8 channels, with each channel supporting 8 points of rotation, significantly improves testing efficiency.

**Relay group** Automatically switch test points to achieve unattended automated testing processes.

**Environmental monitoring** It integrates real-time monitoring modules for temperature, humidity, and illuminance to ensure the traceability of test environment data.

**Data collection** Automatic saving, automatic naming, and remote transmission ensure data security.

**Control software** The system is independently developed and supports deep customization of the interface and functions.

### System Composition

Multi-channel source meter testing system + relay group + environmental monitoring module + data acquisition system + control software

# Test subjects and capabilities

Flexible testing solutions adaptable to various thin-film photovoltaic modules

## Test Objects

Material	Thickness range
<b>Glass substrate/flexible substrate thin-film solar cells</b>	<b>1mm — 7.0mm</b>
Small device size	Component size
<b>≤25×25mm (Custom 8-position box)</b>	<b>≤150×150mm (Customizable, with lead wire)</b>

## Testing Capabilities

<b>8</b> aisle Number of channels (customizable)	<b>8</b> point Each channel circulates	<b>18 v</b> Maximum voltage Customizable
<b>1 A</b> Maximum current	<b>0.1 %</b> Measurement accuracy	<b>10 w</b> Channel power

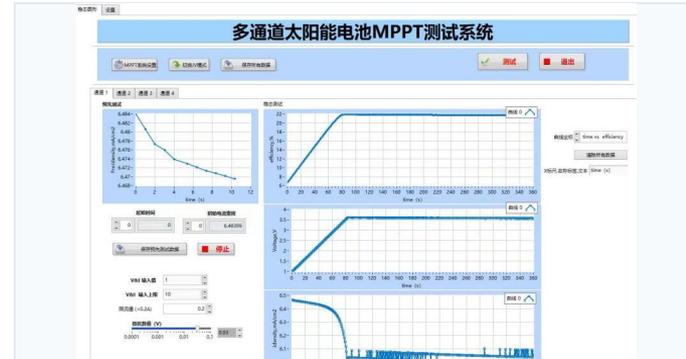
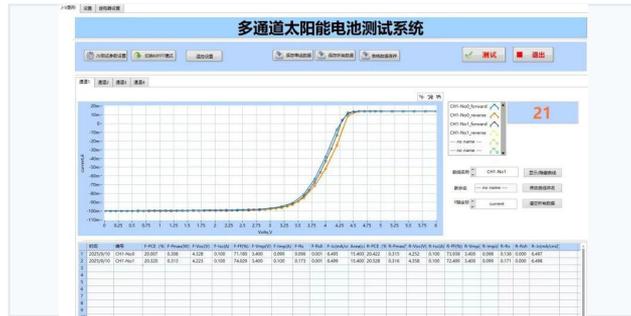


# Electrical testing function

## Comprehensive IV features and MPPT tracking capabilities

### IV Curve Test

- Forward and reverse scan test modes
- 9-point fitting method (dynamic IV can be customized)
- Automatic continuous scanning and interval testing
- Independent control of each channel



### MPPT tracking algorithm

- Perturbation and observation (P&O) method
- Incremental conductivity method (IncCond)
- Fixed voltage method (CV)
- Real-time tracking of maximum power point
- Timed data saving

### Monitored Data

Lux	Voc	Isc	FF	PCE
Pmax	Imax	Vmax	Rs	Rsh

# Environmental monitoring system

## Temperature monitoring

**Channel configuration** 4-channel independent monitoring, surface mount thermocouple

**Measurement range** -40°C to 100°C

**Measurement accuracy** 0.1°C (real-time curve display)

## Humidity monitoring

**Probe type** Single probe monitoring system

**Measurement range** 5 - 100 RH%

**Measurement accuracy** 0.1 RH% (error  $\pm 2$  RH%)

## Illuminance monitoring

**sampling frequency** 5-10 minutes per point (real-time monitoring)

**Measurement accuracy** 0.1 W/m<sup>2</sup>

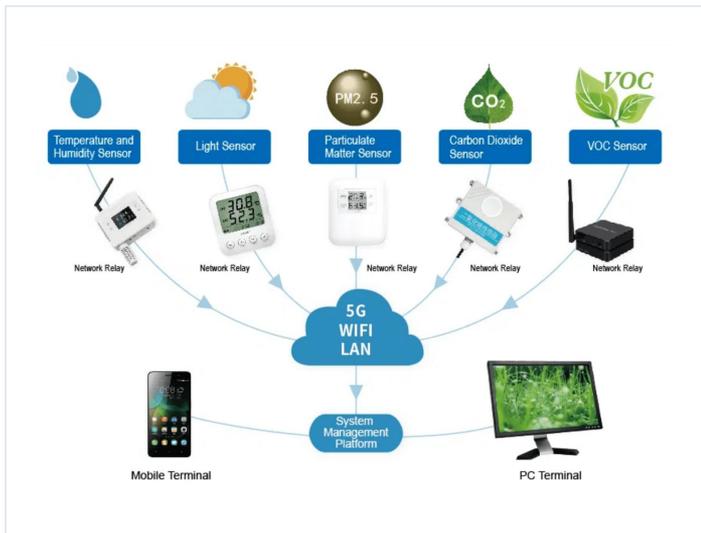
**Function** Real-time reading and calculation of cumulative irradiance values



Temp & Humidity Sensor



Digital Lux Meter



## Intelligent integration platform

With its powerful equipment integration capabilities, it supports multi-channel parallel testing and remote data management, and can be deeply customized according to customer needs.

## Independently developed intelligent testing software platform

### Core Functions

- › Multichannel IV testing: Automated continuous scan and interval testing
- › Multi-channel MPPT testing: Real-time tracking and data logging
- › Multi-channel temperature profile monitoring: real-time display and saving
- › Small component unit: Automatically performs inspection and testing on individual pixel locations.

### Data Management

- › Automatic naming and timed saving; supports independent or unified saving for each channel
- › Remote transmission to indoor computer enables unattended monitoring.
- › Supports data export and in-depth analysis

### Control ability

- › Each channel can be started and stopped independently, and parameters and temperature can be controlled independently.
- › Interface and functions can be customized according to needs.

Support Customization

# Technical Specifications Overview

## Electrical parameters

### Electrical Specs

<b>Number of test channels</b>	8 Channels (8 points/ch)
<b>Voltage range</b>	1 - 18 V
<b>Current range</b>	5 $\mu$ A - 1A
<b>Measurement accuracy</b>	0.1%
<b>Maximum channel power</b>	10 W/CH

## Environment and Plant Affairs

### Env & Facility

<b>Temperature monitoring</b>	-40 ~ 100 °C (4 Channels)
<b>Humidity monitoring</b>	5 - 100 RH%
<b>Illuminance monitoring</b>	0 - 200,000 Lux
<b>Light source type</b>	Outdoor actual sunlight
<b>Power requirements</b>	220V AC, 50Hz, 10A

PRODUCT MODEL: OT-MCTA8T

## Installation and debugging

### Delivery cycle

Within 30 days of signing the contract

### On-site installation

Completed within 3 business days

## After-sales training

### Training Content

Software usage, operating procedures, parameter settings

### Maintenance

Basic cleaning and troubleshooting

## Equipment maintenance

### Warranty period

12-month free warranty on the whole machine

### Lifetime maintenance

Lifetime repair service provided

### Regular inspection

On-site inspection and maintenance every 3 months

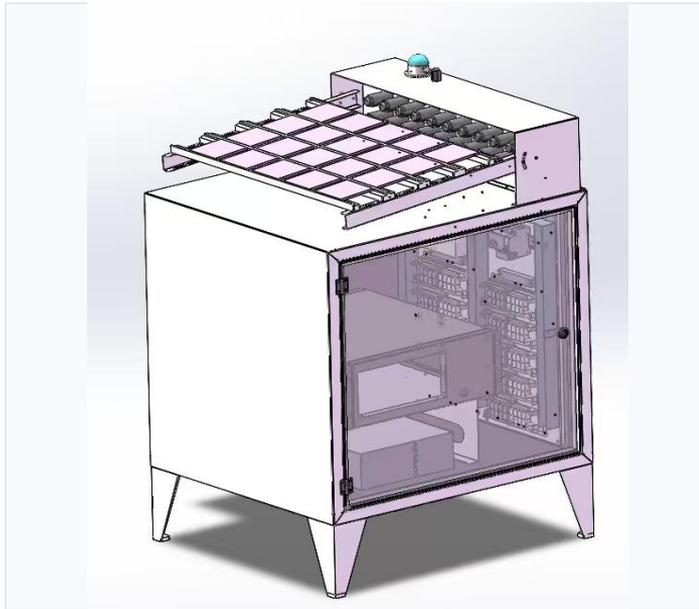
### Rapid Response

24-hour remote/72-hour on-site resolution



Comprehensive pre-sales and after-sales service guarantee

Equipped with a professional service team, providing standardized services



*Compact design, integrated test solution*

## Efficient solutions to accelerate R&D process

### 01 High-throughput parallel testing

Eight (or more) independent channels, each supporting eight-point switching, can cover 64 test points at a time, greatly improving data output efficiency.

### 02 Fully automated and unattended

The automated testing process, combined with remote monitoring, enables 24/7 uninterrupted operation and reduces labor costs.

### 03 Intelligent Algorithm Integration

It incorporates multiple MPPT tracking algorithms (perturbation observation method; incremental conductance method; fixed voltage method) to adapt to the testing needs of batteries with different characteristics and ensure data accuracy.

### 04 Flexible customization services

Both the hardware and software architectures adopt a modular design, which can be deeply customized according to the customer's specific experimental scenarios and special needs.

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**12** Months

### Free warranty

The entire machine comes with a 12-month free warranty and regular inspections and maintenance.

**∞** Life

### Lifetime maintenance

We provide lifetime maintenance services to ensure the long-term stable operation of the equipment.

**24** Hours

### Rapid Response

After-sales response time is within 24 hours, with priority given to remote guidance.

**72** Hours

### On-site solution

Emergency faults will be resolved on-site within 72 hours.