

SOLUTION MRO

EXPERT OF SOLAR MODULE-LEVEL CONTROL

AdvanSol Power Technology Co., Ltd



V2.5 Module-Master™ Solution MRO

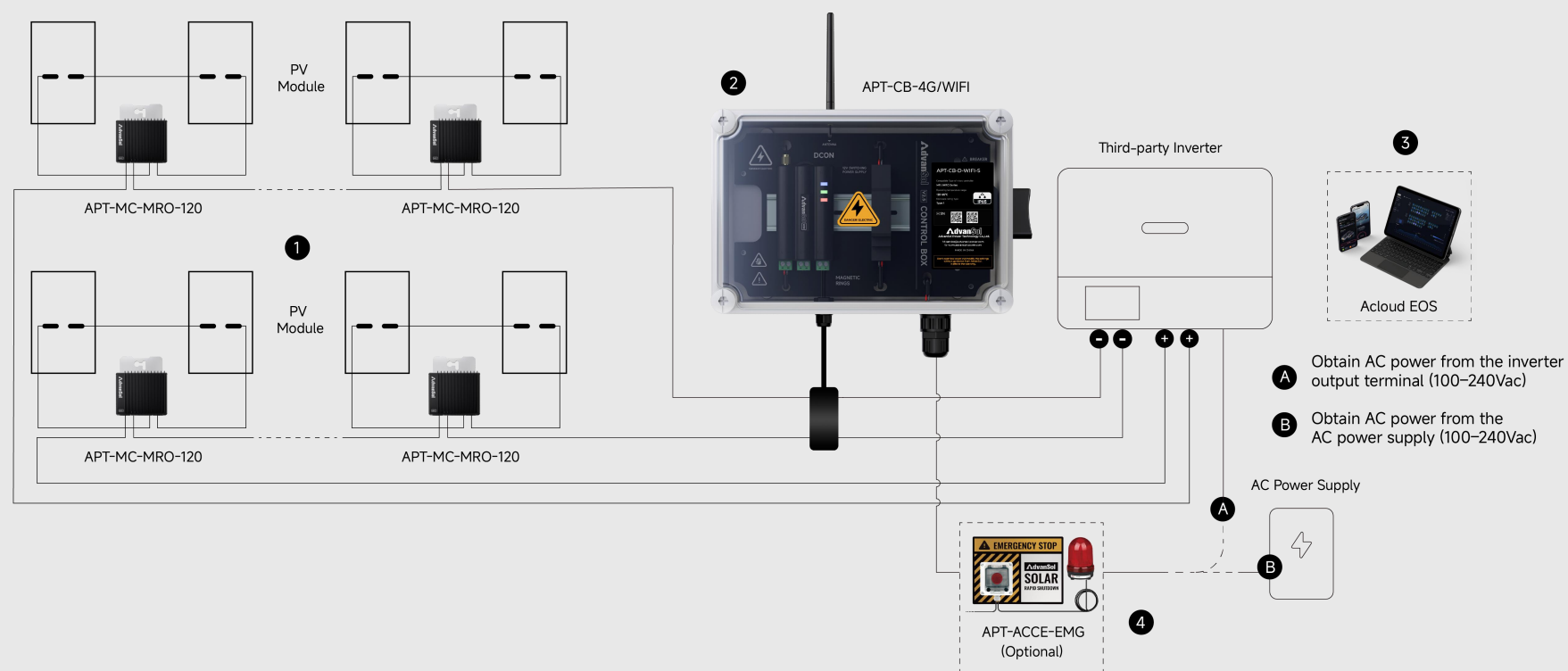
Module-Level Full-Function Solution
(Rapid Shutdown/Monitoring/Optimization)

Centered on module-level shutdown, monitoring, and MPPT optimization, this solution upgrades traditional string systems into safe, visible, and energy-optimized modern PV plants.

After deploying Solution MRO, the system delivers full module-level functionality, including rapid shutdown, real-time monitoring, and MPPT optimization. Module-level MPPT mitigates shading and roof orientation mismatch, increasing overall system energy yield by up to 30%+. Fully certified to UL 1741 / UL 3741 / IEC / CE standards.



Topology Diagram & Products of Solution MRO



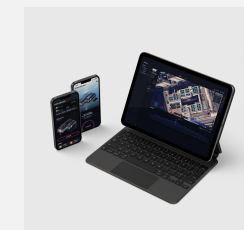
APT-MC-MRO/MRO-120



APT-CB-4G/WIFI



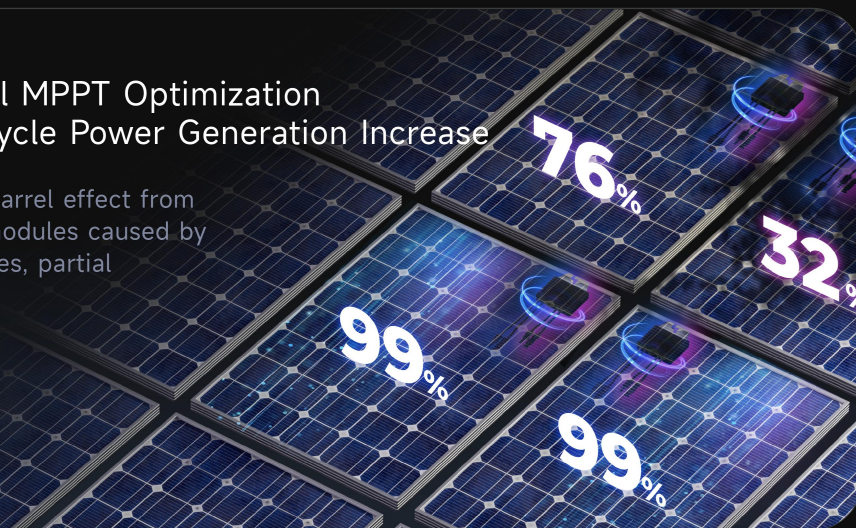
Optional
APT-ACCE-EMG



Acloud EOS APP

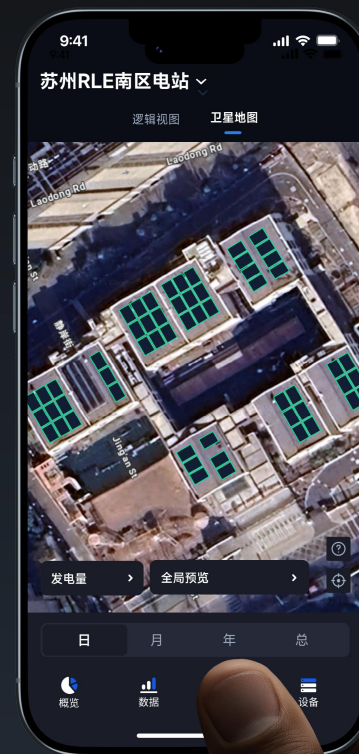
Module-level MPPT Optimization 30% Total-cycle Power Generation Increase

Eliminates the barrel effect from subpar power modules caused by installation angles, partial shading, etc.

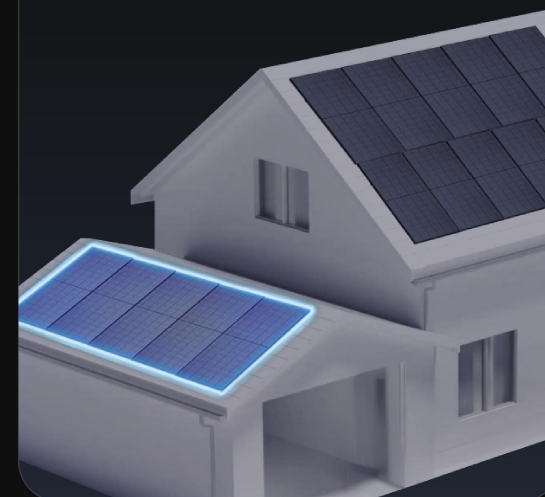


1:1 Virtual PV Plant

Multi-view access to virtual power plants via both APP and Web terminals, module-level data monitoring, and precise fault location

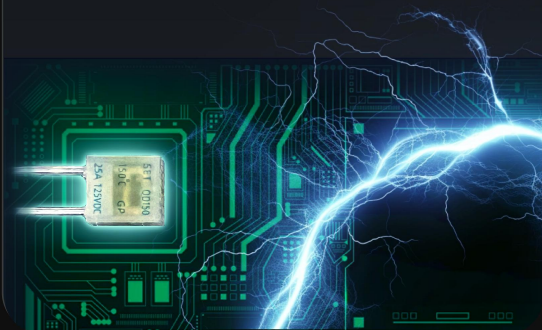


30% Higher Installation Capacity



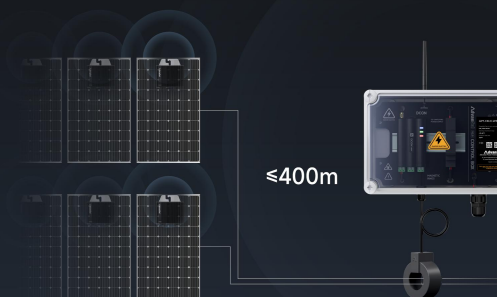
Backup Protection Design

Backup shutdown activates on communication/shutdown failure for device protection.



Super-HPLC Unlimited Communication Distance

∞ Unlimited distance



Global authoritative certifications





MRO series Micro Controller Model MRO

APT-MC-MRO/MRO-120

Product Model	APT-MC-MRO	APT-MC-MRO-120
Functions	Module-level Rapid Shutdown ; Module-level Monitoring ; Moudle-level MPPT Optimization	
Number of Modules Connected	1	2
Input		
Rated Input Power	800W	1600W
Max.Input Voltage	80V	120V
MPPT Operating Range	12V-80V	15V-105V
Max. Operating Current (I _{mp})	20A	20A
Max. Short-circuit Current (I _{sc})	25A	25A
Max. Efficiency	99.5%	99.5%
Output		
Max. Output Voltage	80V	80V
Max. Output Current	22A	22A
Bypass Output	☑	☑
Output Shutdown Voltage	< 1V	< 2V
Shutdown Response Time	30s	30s
Communication		
Communication Mode	HPLC	HPLC
PLC Maximum Communication Distance (Along the Cable)*	Distance from the data control box to the nearest micro-controller ≤ 400 m Distance between micro-controllers ≤ 50 m	
Communication Rate	200k-1M/s Self-Adaptive	200k-1M/s Self-Adaptive
Compatible V2.5 Control Box	APT-CB-D-4G / WIFI-S / L	APT-CB-D-4G / WIFI-S / L
Safety Certification		
Safety	UL1741 / UL3741 / CE / IEC62109-1 / EN18031 / CSA C22.2 No.107.1 / CSA C22.2 NO.330 comply with NEC Code Article 690.12 module-level shutdown characteristics	
EMC	FCC part 15b	FCC part 15b
RoHS Certification	☑	☑
General Parameters		
Dimensions (L x W x D)	123.8 x 112 x 27 mm	133.8 x 115 x 37 mm
Weight (Including Cables)	0.66KG	0.86KG
Input and Output Terminals	MC4 / Compatible with MC4 / Customized	MC4 / Compatible with MC4 / Customized
Length of Cable(mm)	OUT:+770 -770 IN:+770 -260	OUT:+1400 -1400 IN:+1200 -1200
Operating Temperature Range	-40°C to +85°C	-40°C to +85°C
Humidity Range	0%-100%	0%-100%
Protection Rating	IP68	IP68
Max.System Voltage	1000V / 1500V	1000V / 1500V



V2.5 Control Box DCON-4G/WIFI

APT-CB-D-4G/WIFI-S/L

Product model	APT-CB-D-4G-S/L	APT-CB-D-WIFI-S/L
Data controller	DCON-4G	DCON-WIFI
Compatible micro controller	MR/MRO series	MR/MRO series
Communication mode with Acloud	4G	WIFI
Communication mode with micro controller	HPLC	HPLC
PLC Maximum Communication Distance (Along the Cable)**	Nearest microcontroller ≤ 400m Distance between microcontrollers ≤ 50m	
Number of Communication Magnetic Rings	S:1/L:3	S:1/L:3
Max. number of strings supported	6 strings/mag ring (Rec.) Total max Isc/mag ring ≤ 160A	
Max.number of Modules each ring	Each magnetic ring ≤ 160	
Power Supply	100-240VAC	100-240VAC
Communication Interval	5min	5min
Local Data Storage time	7Days	7Days
Working ambient temperature	-20°C~65°C	-20°C~65°C
Dimensions(LxWxD)	280 x 190 x 130 mm 340 x 280 x 130 mm	280 x 190 x 130 mm 340 x 280 x 130 mm
Protection Rating	IP65	IP65

MRO series Micro Controller Model MRO/MRO-120

Full-Function Optimizer

- Module-Level MPPT Optimization + Monitoring + Rapid Shutdown
- Three-Level Protection System (Patented Hardware Protection Module)
- Super-HPLC | Unlimited Communication Distance
- Internationally Recognized Certifications
- Compatible Mixed Installation with MR Series
- Dual High Standards: Protection & Flame Retardancy



V2.5 Control Box DCON-S/4G/WIFI

Data Controller

- V2.5 Module-Master™ Solution Accessories
- Super-HPLC | Unlimited Communication Distance (4G WIFI)
- Multi-String Management
- Premium Design × Plug-and-Play
- All-in-One Integrated Design
- Compatible with Third-Party String Inverters



V2.5 Control Box DCON-4G/WIFI ASP

AFCI Data Controller

- V2.5 Module-Master™ Solution Accessories
- Optional AFCI Configuration
- Anti-Vibration & Impact Resistance
- IP65 Protection Rating
- Plug-and-Play Installation
- Integrated Design



APT-CB-D-4G/WIFI-ASP-S



APT-CB-D-4G/WIFI-ASP-L

APT-CB-D-4G/WIFI-ASP



EMERGENCY BUTTON KIT

【Accessory】

- One-Click Emergency Shutdown
- On-Site Warning Indication
- Compliance with International Safety Standards
- V2.5 Module-Master™ Solution Accessories

APT-ACCE-EMG



Acloud EOS AI Cloud Platform

Energy Operating System

- Comprehensive Module-Level Power Plant Monitoring
- 50% Reduction in O&M Costs
- AR-Based Satellite Power Plant View
- AI-Assisted Operations & Maintenance
- Cross-Platform Access × Multi-User Collaboration
- Visualized Data × Decision-Grade Analytics



ACLOUD EOS



Philippines LCM Project

- Challenge: A high-traffic SEA commercial landmark with complex rooftop & extreme climate demands (safety + adaptability).
- Solution: "All-in-one" solar-storage (high-efficiency generation + Module-level protection + digital O&M).
- Results: 30% more power, 80% safer, 2× O&M efficiency.

6MWP

Power Station Scale

4600+

Installation Quantity



APT-MC-MRO

Product

Cagayan de Oro

Location



Changzhou Jintan Large Factory Rooftop Solar Power Station

- A large-scale rooftop PV project for a factory (large area, high installed capacity, heavy O&M workload). The client aimed to lower O&M costs via intelligent control.
- With MR series products, we enabled real-time component data monitoring & precise fault localization—slashing O&M costs by 50%.

500kWp

Power Station Scale

500+

Installation Quantity



APT-MC-MR-T2

Product

Changzhou

Location



Global Case Study



BI Project

1.5MWp



APT-MC-MR-T2



Zhuhai China



WSE Project

1.2MWp



APT-MC-MR-T2



Shanghai China



FLK Project

649 kWp



APT-MC-MR-T2



GuangDong China



ZR Project

1.5MWp



APT-MC-MRO-120 、 APT-MC-MR



Changzhou China



RLE Project

400 kWp



APT-MC-MRO



SuZhou China



YZ Project

400 kWp



APT-MC-MRO



Yangzhou China

Global Case Study



NMP Project

649 kWp



APT-MC-MR-T2



Malaysia



JMC Project

649 kWp



APT-MC-MR-T2



Philippines



KB Project

200 kWp



APT-MC-R-T2



Thailand



GTZ Project

255 kWp



APT-MC-MRO



Panan China



CDH Project

128 kWp



APT-MC-MRO



Philippines



XN Project

150 kWp



APT-MC-MRO



Xuzhou China

Global Case Study



LM Project

122 kWp

 APT-MC-MRO

 Wuxi, China



LS Project

121 kWp

 APT-MC-MRO

 Zhuhai, China



CPD Project

161 kWp

 APT-MC-MRO

 Philippines



GMH Project

100 kWp

 APT-MC-MRO

 Shanghai China



Solar Ark 5.0 Project

22 kWp

 APT-MC-MRO

 Panan China

Contact AdvanSol for the best solution

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