

Mppt Wind/Solar Hybrid system controller

Item No.: 3348511 (OMWS35A48MP) Controller
Item No.: 3347211 (OL-BRK05-48V) Dump load

1. General safety information

- Upon receiving the product, inspect it for any damage during transportation. If issues are found, contact our company or the shipping company immediately.
- The controller must be operated by personnel with electrical theory knowledge and practical experience, strictly following the steps and guidelines outlined in the manual.
- Use the controller in a dry, clean, and well-ventilated environment.
- Do not operate the controller in environments containing flammable or explosive gases. Avoid flames and sparks near the unit.
- Do not disassemble the controller for self-repair.
- Do not use this product without a battery connected.
- Never disconnect the battery while the controller is operating, as this may lead to unpredictable consequences.
- Keep children away from the controller.
- Prevent water from entering the unit.
- Ensure all cables in the power generation system are securely connected, properly insulated, and of suitable specifications.
- The product has a protection rating of IP20.

2. Product Introduction

This wind-solar hybrid controller is designed for small off-grid wind-solar power generation systems; it is an intelligent controller that integrates wind energy and solar energy charging control.

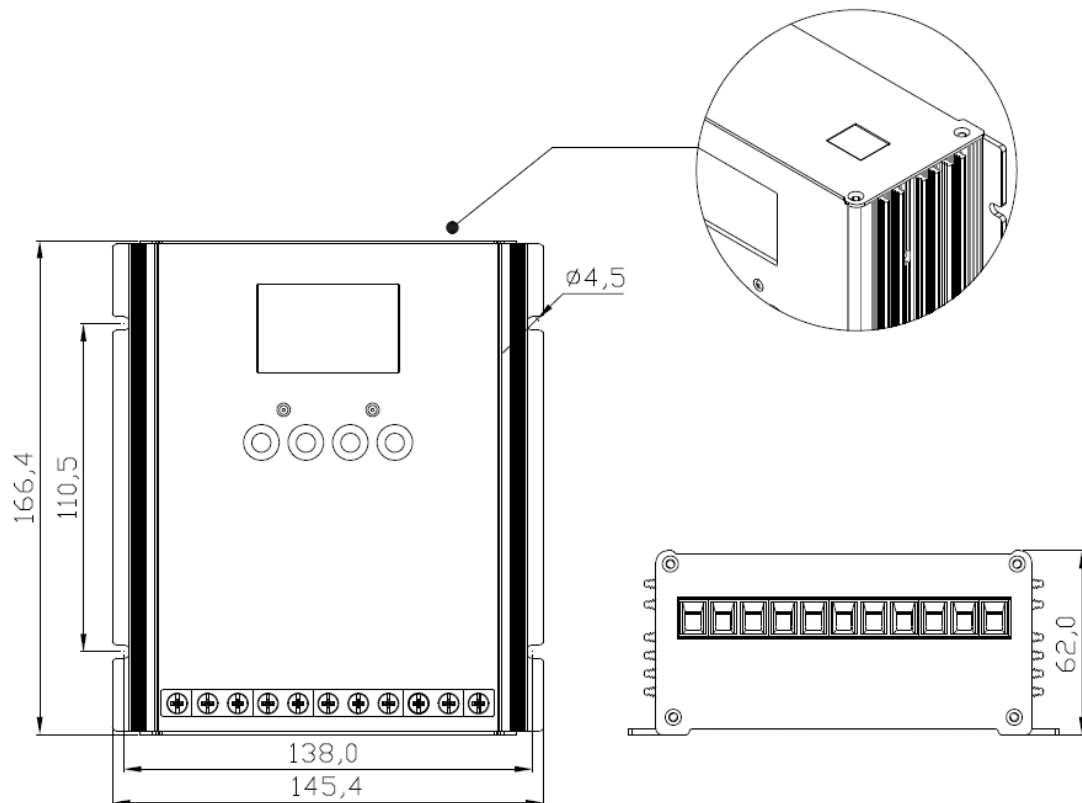
Functional features:

- Wind turbine breeze charging with MPPT boost intelligent adjustment. The controller provides an automatic wind turbine input maximum power tracking mode, maximizing the wind turbine's low wind speed and efficient power generation.
- Wind turbine PWM stepless unloading and solar PWM constant voltage and current charging.
- The LCD screen displays voltage and current information for the battery, wind turbine, solar energy, and load, as well as the power generation of photovoltaic and wind turbines. Some control parameters can be set freely.
- Load output has multiple working modes, which can be customized and combined with programming for flexible control.
- The internal circuit board of the controller is coated with three-proof paint to prevent dust, moisture, and static electricity..

Complete protection function:

1. Battery undervoltage protection, load stops output, and automatically recovers after normal.
2. Battery overvoltage protection, fan and photovoltaic stop charging, load stops output, and automatically recovers after normal.
3. Machine overtemperature protection, fan and photovoltaic stop charging, load stops output, and automatically recovers after normal.
4. Fan overspeed and overcurrent protection, fan brakes, stops charging, and recovers after 1 minute by default.
5. Photovoltaic reverse connection protection, photovoltaic stops charging, and automatically recovers after correction.
6. Photovoltaic overvoltage and overcurrent protection, photovoltaic stops charging, and automatically recovers after normal.
7. Load output overcurrent protection, default stop output 1 minute after recovery, more than 3 consecutive times, no automatic recovery, power on again to recover.
8. Load output short circuit protection, load stops output, power on again to recover.

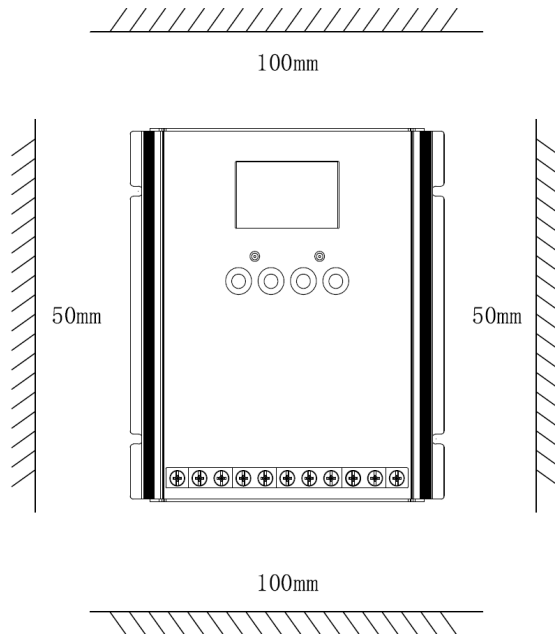
3. Appearance and size (Unit of measurement: mm)



4. Product Installation

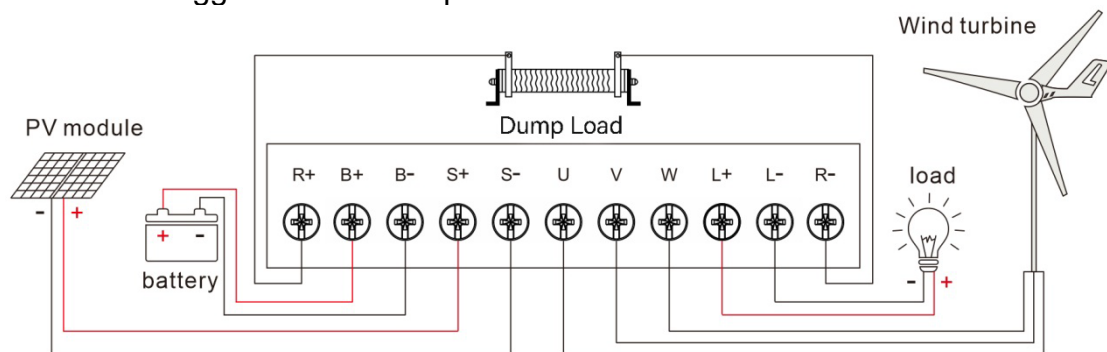
- Ensure you have thoroughly read the manual before beginning installation.
- Only experienced engineers or technicians should install the controller, strictly following the instructions in this manual.
- Before installation or maintenance, confirm that the controller is in a safe, unpowered state.
- Install the controller indoors in a dust-free, dry, and well-ventilated location, avoiding rain exposure and direct sunlight.
- If installing in a cabinet, leave adequate space around the controller or ensure reliable heat dissipation through the enclosure.
- Keep the controller away from corrosive gases and strong electromagnetic interference
- Select a location that allows easy access for installation, wiring, maintenance, and repairs.
- Mount the controller on a suitable surface, such as a wall, and apply waterproofing measures if the location is exposed to moisture.
- Ensure sufficient airflow around the heat sink to allow natural convection for effective heat dissipation.

- Refer to the provided installation diagram for proper placement and configuration of the system components.



5. Electrical connection

Follow the suggestions and steps below to make the connection.



Please refer to the table below for the maximum voltage and current of the terminal input.

Device	Voltage Range	Max Current
PV module	48Vdc-95Vdc	15A
Battery	48Vdc-62Vdc	20A
Dump Load	60V	30A
Load	48Vdc-62Vdc	20A
Wind Turbine	48Vac-50Vac	20A

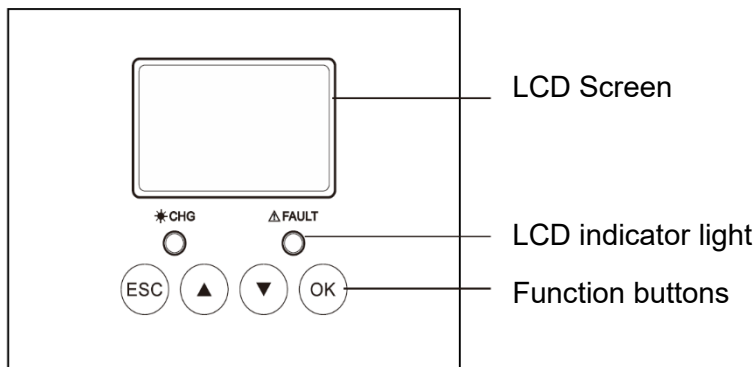


Important!

- As shown in the figure above, connect the dump load first, then the load and photovoltaic panel and battery, and finally the wind turbine.
- It is strictly forbidden to reverse the positive and negative poles of the load, battery, and photovoltaic panel!
- Please connect the wind turbine in the condition of no wind or light wind. The high-speed fan must be connected after the controller is started.
- The main function of the wind turbine unloader is to consume excess electricity. When the wind speed remains high and the battery is fully charged, the unloader is used to consume excess electricity.

6. Operation

6.1 Interface



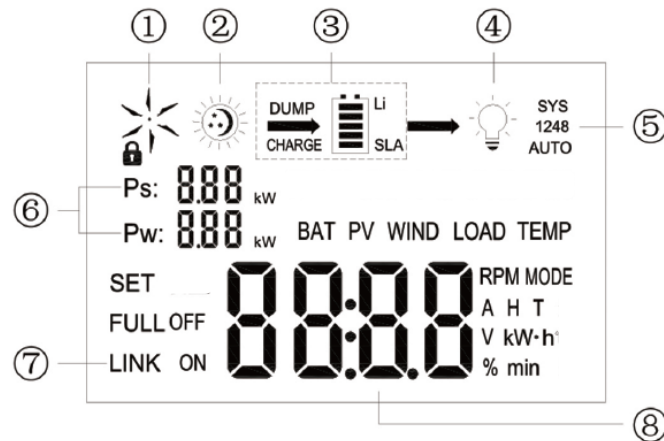
6.2 LCD indicator light

LCD indicator light		Indication information	
 CHG	Green	On	Battery full
		Flashing	Battery charging
 FAULT	Red	On	Fault status
		Flashing	Alarm status

6.3 Function buttons

Function buttons	Explain
ESC	Return/Exit setting mode
▲	Go to previous choice
▼	Go to next choice
OK	Press and hold for 3 seconds to enter setting mode / confirm in setting mode

6.4. LCD Display

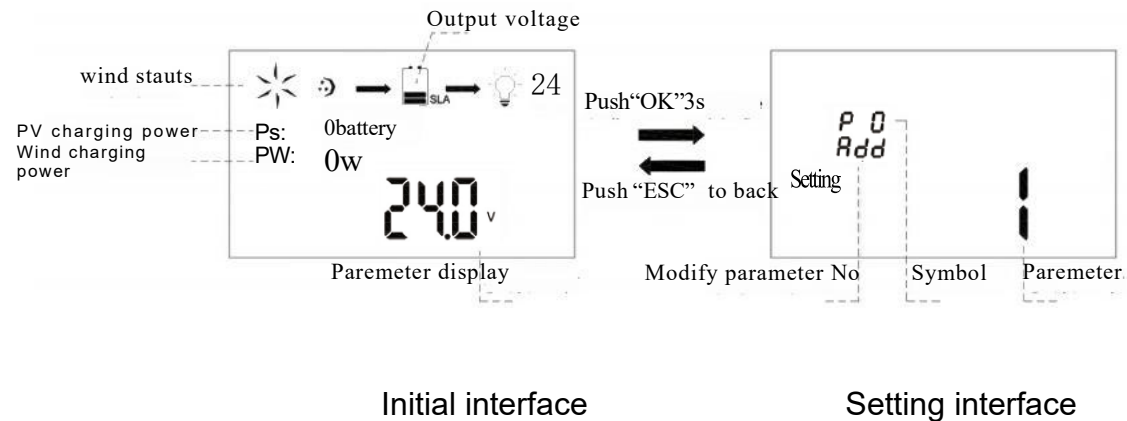


No.	Display	Explain
①		Wind turbine pattern Rotation = in charging
		Wind turbine brake
②		Day Flashing = PV overvoltage
		Night (if no PV connection, also be shown) flashing = PV connection is reversed
③	DUMP	Unloading
	CHARGE	Charging
		Battery level. flashing = over-discharge protection normal = voltage is higher than the over-discharge recovery point
	Li	Lithium battery
④	SLA	Lead-acid battery
		Controller no output Flashing = output short circuit
		Controller has output

No.	Display	Explain
⑤	SY S 12	The current controller is locked to the 12V system
	SYS 12 AUTO	The current controller is an automatic identification mode and automatically identifies as a 12V system
	SY S 24	The current controller is locked to the 24V system
	SYS 24 AUTO	The current controller is an automatic identification mode and automatically identifies as a 24V system
	SY S 48	The current controller is locked to the 48V system
	SY S 48 AUTO	The current controller is an automatic identification mode and automatically identifies as a 48V system
	Avoid using automatic voltage identification mode when connecting lithium batteries	
⑥	Pw: 0 w	Current wind turbine charging power
	Ps: 0 w	Current PV charging power
⑦	LINK	Link
⑧	12	Displays operating parameters or fault codes A = warning E = fault

6.5 Manual brake of wind turbine:

On the display interface, long press the "ESC" key and then short press the "▲" key to enable manual brake. The brake icon lights up . The same operation can be performed to cancel the manual brake function.



6.6 Parameter browsing

After the controller is powered on, the screen is in parameter view mode. Use the "▲", "▼" keys to select the parameters you want to view, and see the "Setting parameter list" for specific setting parameters.. The area displays A-XX or E-XX, A- indicates warning, E- indicates fault, and the fault code is detailed in the "Fault code table".

6.7 Modify parameters

In the parameter view interface, press and hold the "OK" key for 3 seconds to enter the setting interface, use the "▲", "▼" keys to select the parameter to be modified, and see the "Setting parameter list" for specific setting parameters. Then press the "OK" key to enter the parameter modification program. At this time, the modified parameter flashes. Use the "▲", "▼" keys to change the parameter. Finally, press the "OK" key to confirm the parameter modification. The flashing stops after the modification is successful. Press the "ESC" key to return to the display interface.

6.8 Clear power generation

In the parameter view interface, press and hold the "OK" key for 3 seconds to enter the setting interface, use the "▲", "▼" keys to select the power option, press the "OK" key to enter the password to enter the power display interface, at this time the power generation value flashes, press the "OK" key to confirm the deletion of the power generation, after the deletion is successful, it stops flashing and displays 0. Press the "ESC" key to return to the display interface.

7. Display parameter list

No.	Display	Explain	Unit
1	Battery	Battery voltage	V
2	Wind turbine generator	speed	RPM
3		charging current	A
4		charging power	WH/KWH
5	PV	voltage	V
6		charging current	A
7		charging power	WH/KWH
8	Load	Load output current	A
9	Temprature	Operating temperature	°C
10		Software version number	B100

8. Setting interface list

No.	Display	Explain	Default	Min	Max	Unit	Notes
PO	Add	485 communication address	1	1	247	V	
P1	Bud	485 communication baud rate	9600	2400	19200		
P3	LEN	Backlight control	0N	0FF	ON		
P4	BLT	Backlight time	1	1	10	Min	
P11	TOB	Battery type	USE	2	4		0:Use 1:Gel 2:Fld 3:Lit 4:Lif
P17	BOV	System overvoltage value	15.5	9	16	V	
P19	CCV	Constant Current Voltage	14.1	9	16	V	
P20	FCV	Float Charge Voltage	13.5	9	16	V	
P21	LBV	Battery undervoltage recovery value	12.8	9	16	V	
P22	LAV	Low Alarm Voltage	11.5	9	16	V	
P23	BLV	Battery undervoltage protection value	10.8	9	16	V	
P27	SCP	Charging Priority	Wind	0	1		0:Wind 1:Pv
P28	BMC	Boost Maximum Charging current	1.0	0.5	5.0	A	

P30	WMC	Wind Maximum Charging current	15.0	5.0	20.0	A	
P33	WMS	Wind speed limit	600	50	2000	RPM	
P36	WPP	Wind Pole Pair	4	1	10		
P38	BSV	Wind start boost value	20	20	100	%	Relative equalization voltage
P39	WCK	Boost charging current coefficient	0.1	0.01	0.5	A	
P40	WBT	Wind Braking Time	1	1	30	Min	
P41	WBF	Wind turbine brake	0FF	0	1		0:0FF 1:0N
P57	SMC	PV current limit value	20.0	5.0	35.0	A	
P58	SDV	PV daybreak judgment voltage	7.0	3.0	20.0	V	
P59	SNV	PV dark judgment voltage	5.0	3.0	20.0	V	
P64	LOM	Load output mode		—	—		View “8.Load Output Mode Setting”
P81	CSE	Clear wind turbine stage power generation		0	9999	KWH	Code: 1111
P83	CSE	Clear PV stage power generation	—	0	9999	KWH	Code: 1111

9. Battery status voltage point (24V ×2,48V ×4)

Battery type	Over voltage value (V)	Average recharge (V)	Floating Recharge (V)	Under voltage recovery (V)	Under voltage warning value (V)	Under voltage value (V)
USE	15.0	14.2	13.7	12.8	11.5	10.5
GEL	15.0	14.2	13.7	12.8	11.5	10.5
FLD	15.0	14.6	14.0	12.8	11.5	11.0
LiT	13.2	12.6	12.3	11.1	9.6	9.0
LiF	15.2	14.0	13.6	12.0	10.4	9.6

10. Fault code List

Fault code	Explain
A-10	Battery undervoltage warning
A-11	Battery overvoltage warning
A-17	System overtemperature warning
E-20	Battery undervoltage
E-21	Battery overvoltage
E-27	Battery connection abnormality
E-41	PV input overvoltage
E-42	PV input overcurrent
E-47	PV input reverse connection
E-49	PV current sampling fault
E-61	Output overvoltage

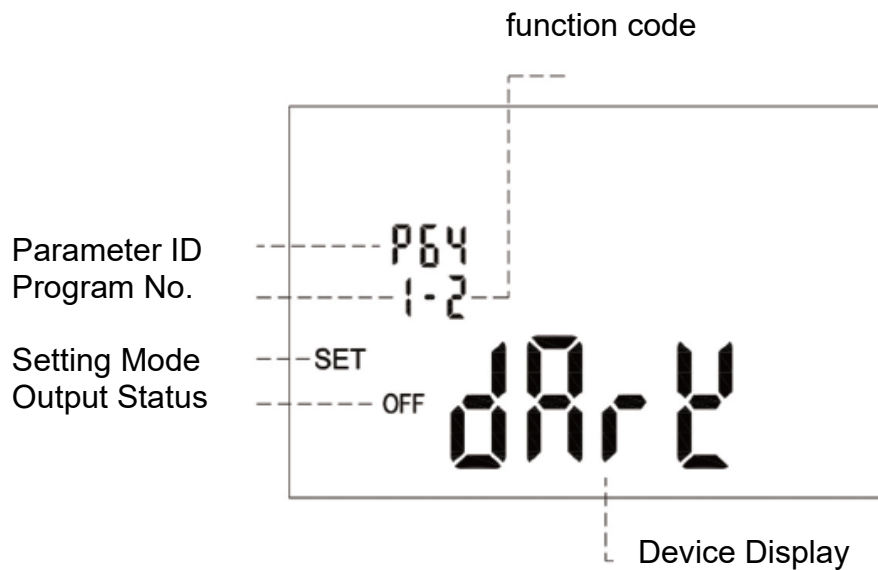
Fault code	Explain
E-62	Wind turbine overcurrent
E-67	Wind turbine overspeed
E-69	Wind turbine current sampling fault
E-72	Load output overcurrent
E-73	Load output short circuit
E-77	Load control fault
E-79	Load current sampling fault
E-80.81.82	Initialization abnormality
E-94	System overtemperature
E-97	System voltage identification fault
E-99	Temperature sensor fault

11. Load output mode setting

7.1 Load output custom function

Function Module	Explain	Code	Output status: 0: completely off 100: fully on 20-99: PWM setting	Holding time: 0-1440 minutes
Idle	Idle state	0	0 Completely closed	Permanent
Lock	Locked state, load output is permanently fixed in this state.	1	Load output status when entering this function	Permanent
Dark	Detect dark state through photovoltaic panel voltage	2	Load output status when entering this function	After dark, keep this length of time and execute the subsequent function. If there is no subsequent function, it will stay in this state.
Dawn	Detect daylight state through photovoltaic panel voltage	3	Load output status when entering this function	After dawn or keep this length of time, execute the subsequent function. If there is no subsequent function, it will stay in this state.
Keep	Maintain this state for the set time length	4	Load output status when entering this function	After keeping this length of time, execute the subsequent function. If there is no subsequent function, it will stay in this state.
Back	Return to the first function output state	5	Load output status when entering this function	After keeping this length of time, return to the first function state.

12. Load output mode programming



12.1 Load output mode programming interface

1. Enter the parameter setting mode, select P64 "LOM", then the parameter display area will display the number of currently programmed process states, the maximum number of states is 8, 0 means there is no mode setting at present, and the load output is permanently closed.
2. Press the "OK" key to enter the programming mode, as shown above. "Programming number" indicates the current programming state ID, from 1 to 8, used in sequence. "Function code" has a total of six states, Idle, Lock, Dark, Dawn, Keep, Back, and the specific content is displayed in the "Setting Display" area. There are three types of load "output state": "OFF", "ON", "PWM duty cycle". After selecting "output state", the "Setting Display" area displays the load output PWM duty cycle. "OFF" corresponds to a duty cycle of 0%, and "ON" corresponds to a duty cycle of 100%.
3. Press the "OK" key to select and modify "Programming number", "Function code", "Output state", "Hold time" in turn, press the "▲" and "▼" keys to modify the setting value, and press and hold the "OK" key to save after all parameter settings are completed.

**Notice!**

- The default output mode of the load is light control mode.
- If the function code is 0, other parameters cannot be modified.
- The hold time parameter setting in the "Lock" process function is invalid.
- All process states after the function code is 0 are ignored.
- When the load outputs PWM mode (PWM frequency is 500Hz), it is necessary to confirm with the load manufacturer whether it can match the work.

12.2 Schedule: Digital Display Tube Corresponding List

display	meaning
	A
	B
	C
	D
	E
	F
	G
	H
	I

display	meaning
	J
	K
	L
	M
	N
	O
	P
	Q
	R

display	meaning
	S
	T
	U
	V
	W
	X
	Y
	Z

12.3 Programming example

1) Light control output

Programmin g number		2	3	4	5	6	7	8
Function code	2(Dark)	3(Dawn)	5(Back)					
Output status	0	100	0					
Hold time	10	900	0					

Output status description:

The program enters the "Dark" state and turns off the load output. When the PV panel voltage is lower than the "darkness judgment voltage", it will enter the "Dawn" state after a delay of 10 minutes. At this time, the load output is turned on. When the PV panel voltage is greater than the "dawn judgment voltage" or exceeds 900 minutes (15 hours), the program enters the "Back" state, at which time the load output is turned off, and then immediately returns to the "Dark" state, and repeats over and over again.

3) Light control + time control half power output

Programmi ng number	1	2	3	4	5	6	7	8
Function code	2(Dark)	4(Keep)	4(Keep)	3(Dawn)	5(Back)			
Output status	0	100	50	0	0			
Hold time	10	240	240	300	0			

Output status description:

The program enters the "Dark" state and turns off the load output. When the PV panel voltage is lower than the "darkness judgment voltage", it enters the "Keep" state after a delay of 10 minutes. At this time, the load output is turned on. After maintaining for 240 minutes (4 hours), the program enters the "Keep" state again. At this time, the load output is turned on and the output power is halved. After maintaining for 240 minutes (4 hours), the program enters the "Dawn" state again. At this time, the load output is turned off. When the PV panel voltage is greater than the "dawn judgment voltage" or no dawn information is detected for more than 300 minutes (5 hours), the program enters the "Back" state. At this time, the load output is still turned off, and then immediately returns to the "Dark" state, and repeats over and over again.

4) Light control + stage time control output

Programmin g number	1	2	3	4	5	6	7	8
Function code	2(Dark)	4(Keep)	4(Keep)	4(Keep)	3(Dawn)	5(Back)		
Output status	0	100	0	100	0	0		
Hold time	0	360	240	60	120	0		

Output status description:

The program enters the "Dark" state, and the load output is turned off. When the PV panel voltage is lower than the "darkness judgment voltage", it enters the "Keep" state, and the load output is turned on. After 360 minutes (6 hours), the program enters the "Keep" state again, and the load output is turned off and maintained for 240 minutes (4 hours). Then it enters the "Keep" state again, and the load output is maintained for 60 minutes (1 hour), and then enters the "Dawn" state, and the load output is turned off. When the PV panel voltage is greater than the "dawn judgment voltage" or exceeds 120 minutes (2 hours), the program enters the "Back" state, and the load output is still turned off. Finally, it immediately returns to the "Dark" state, and repeats over and over again.



Notice!

- If the program encounters an overload or undervoltage fault during execution, the load output will be turned off, but it will not affect the execution process of the set program. After the fault is restored, the load status will be restored to the current program setting status.
- The last function of all programming schemes that need to be executed cyclically is the "Back" function, otherwise the program will always stay in the last function module state.
- Functions after the "Back" function will be ignored.
- The "Dark" function is often used in combination with the "Dawn" function, otherwise it is easy to repeat the "Dark" function

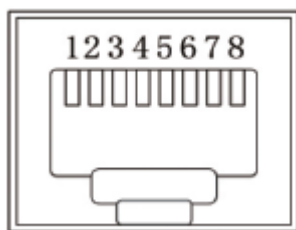
13. Controller system parameters

Specifications	OMWS35A48MP
System rated voltage	48V
Maximum charging current	35A
Wind rated power	600W
Solar rated power	300W
No-load current (DC)	≤0.03A
Control mode	Wind turbine MPPT boost charging function, PWM unloading function, PWM current and voltage limiting, photovoltaic PWM current and voltage limiting
Load	Custom working modes: normally open mode, light control mode, light control + time control mode (custom time period + brightness), etc.
Display mode	LCD, icon + text display, clear and intuitive, easy to understand
Display parameters	Voltage, current, power, load mode, temperature, battery power, photovoltaic, wind turbine power generation, etc.
Protection type	battery open circuit protection, overcurrent, overvoltage, overtemperature, overspeed soft automatic brake protection, load overcurrent, short circuit protection, etc.
Cooling method	Aluminum profile heat dissipation and self-cooling
Working temperature and humidity range	-20~+55°C/35~85%RH(no condensation)
Communication method	RS485 RTU mode
Weight	1KG
Product size	145.4*62.0*166.4(mm)

14. Monitoring module communication interface

It can communicate with the host computer via RS485.

The interface definition is shown in the figure below.。



Pinout	definition	Explain
1	RS485_A	RS485 Signal A
2	RS485_B	RS485 Signal B
4	VCC	Power positive(+12VDC)
8	GND	Power supply negative