

## **IO-Power IOP-USSS-12V1224-OA Series**

**Continuous by Cloudy Days / Rainy Days / Snowy Days of Solar Power System  
Working in High Efficiency Capacity Charge & Discharge Type**

**High Efficiency Power Outlet & Ultra Low Self-wear DC UPS Power System**



The USSS-12V1224-OA series of IO-Power Technology is specially designed for system engineering business planning project system. When there is no power system available in the case, the project could not set up the system operation, especially the solar energy efficient energy storage and discharge type power supply. The system is expected to completely solve the problem that system engineering companies cannot achieve stable and effective power in outdoor engineering construction.

IOP-USSS-12V1224-OA series is based on the industrial grade environmental tolerance of  $-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$  as the design basis, the planning and import of hardware circuits and electronic components, withstand  $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$  high-low temperature explosion-proof lithium iron phosphate battery, supplemented by metal casing IP66 and above, and with 1500W ultra-high lightning protection shock protection, to create solar outdoor waterproof online intelligent DC uninterrupted operation power system. It can withstand the use of outdoor high and low temperature products in the operating environment of  $-35^{\circ}\text{C} \sim +75^{\circ}\text{C}$ , to help system engineers solve the problem of electricity use in outdoor high temperature environment.

For a long time, the project operators of solar power transmission systems have faced the problem of battery damage caused by solar high-temperature power generation in summer, and the harsh weather conditions such as insufficient winter sunshine or continuous rainy days or continuous snowfall... Really fully charged batteries or solar power systems have very low power generation performance, such as charging and power supply. As a result, the project operators of the transportation system that are introduced into the solar power generation system are almost always facing the end of the system operation failure.

In view of the harsh weather conditions such as insufficient sunshine in winter or continuous rainy days or continuous snowing days, it is easy to cause the operating system to consume power due to the battery, and the charging efficiency is too low, which causes the maintenance system to stop operating. IO-Power Technology introduced a 90~95% high-efficiency energy-collecting solar power generation system, supplemented by an Outdoor DC Automatic Power Supply Parallel Introduction Protector (DAPS) specially developed for solar energy systems, and tried to produce in a continuous rainy day environment. The use of valuable and effective power supply system's enables low-power transmission systems to cope with the normal operational requirements of continuous rainy days.

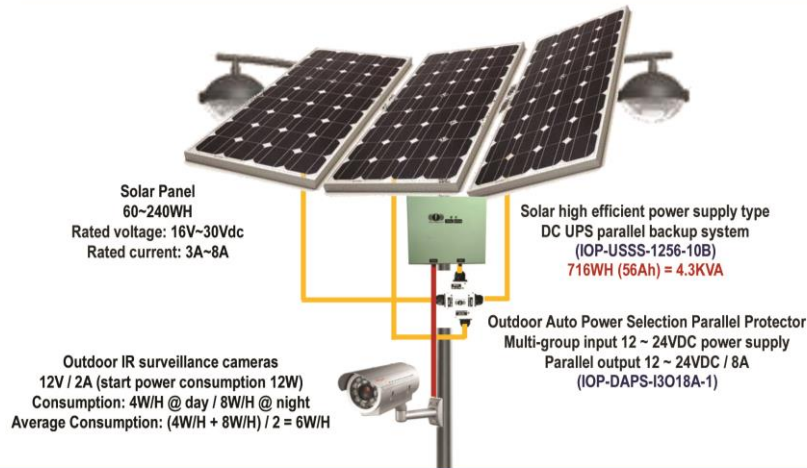
The IOP-USSS-12V1224-OA series is equipped with an Outdoor DC Automatic Power Supply Parallel Introduction Protector (DAPS), in addition to the amps of the parallel input of the achievable solar panels, and can be combined with general utility or street light power or temporary generators or Other green energy sources, such as other green energy sources, are used for the amplification of multiple backup power supplies.

# Solar power system working in continuous Cloudy Day / Rainy Day/ Snowy Day by High Efficiency Capacity Charge & Discharge system, strategy for various kinds of systematic solution methodology:

High Efficiency Capacity Charge & Discharge Solar DC UPS Parallel Backup System

Three sets of solar parallel power supply design

→Can provide "continuous rainy days 20 days" system operating



Highly efficient solar energy-powered DC UPS parallel backup system

Solar system power supply for surveillance system continuous "over 20 days" of rainy days

1. Outdoor IR camera power consumption: 6W/H (4W/H @day / 8W/H @ night) Average power consumption: (4W/H + 8W/H) / 2 = 6W/H
2. High-efficiency solar energy-powered DC UPS equipment power consumption: an average of 1W/H
3. Outdoor automatically select the power importer (DAPS parallel backup): an average of 0.5W/H
4. Design of solar energy efficient power supply system: IOP-USSS-1256-10B 716WH (56Ah); Total power capacity: 716W
5. Solar energy efficient power supply type with solar panels, light rainy day can generate an average of 4.3KVA; design 3 solar panels, during the day and rainy days can generate 4.3KVA = 3769.4.

The system is designed to provide the number of consecutive days of rainy days: 20 days

- A. Total System Power Consumption: 6W / H + 1W / H + 0.5W / H = 7.5W / H
- B. Solar energy efficient power supply system Power Consumption per day: (7.5W / H - 1.2W / H) \* 12H + (7.5W / H \* 12H) = 36W / D
- C. Solar energy efficient power supply system Total power capacity: 716W, can provide continuous rainy days operating time calculation = 716W / 36W / D = 20D
- D. Analysis: The system can cope with 20 consecutive days of climatic conditions weather is working properly, if the continuous rainy days less than 20 days, as long as one day the good weather to fully charge the battery, you can recalculate the days of consecutive rainy days, so, the system can be widely used in general outdoor wireless monitoring market.

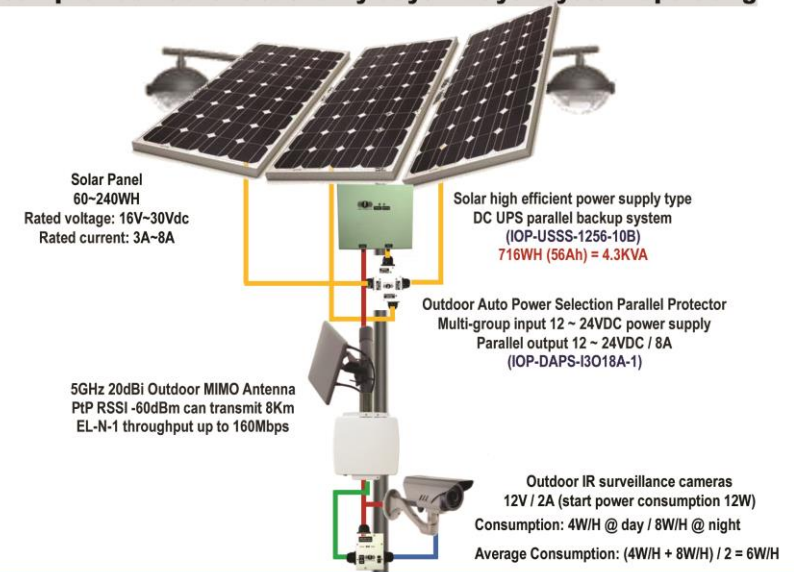
The estimated solar charging time of the system is calculated: one day can fully charge the battery

- 120W solar panels, good weather in winter, sunlight, rechargeable daily:  
08:00-10:00-360W/H \* 40% \* 80% \* 90% \* 2H=207W; 10:00-12:00-360W/H \* 70% \* 80% \* 90% \* 2H=362W  
12:00-14:00-360W/H \* 90% \* 80% \* 90% \* 2H=466W; 14:00-16:00-360W/H \* 50% \* 80% \* 90% \* 2H=259W  
16:00-17:00-360W/H \* 30% \* 80% \* 90% \* 2H=155W; Total: 207W + 362W + 466W + 259W + 155W = 1728W
- Charge Capacity 967W-(8W/H \* 8H)= 903W > IOP-USSS-1256-10B Battery Capacity 716WH (56Ah). So 1 day can be fully charged

High Efficiency Capacity Charge & Discharge Solar DC UPS Parallel Backup System

Three sets of solar parallel power supply design

→Can provide "continuous rainy days 7 days" system operating



Highly efficient solar energy-powered DC UPS parallel backup system

Solar system power supply for surveillance system continuous "over 7 days" of rainy days

1. Outdoor IR camera power consumption: 6W/H (4W/H @day / 8W/H @ night) Average power consumption: (4W/H + 8W/H) / 2 = 6W/H
2. Outdoor wireless transmission equipment power consumption: about 5W/H (EL-N-1 single wireless Module)
3. High-efficiency solar energy-powered DC UPS equipment power consumption: an average of 1W/H
4. Outdoor automatically select the power importer (DAPS parallel backup): an average of 0.5W/H
5. Design of solar energy efficient power supply system: IOP-USSS-1256-10B 716WH (56Ah); Total power capacity: 716W
6. Solar energy efficient power supply type with solar panels, light rainy day can generate an average of 4.3KVA; design 3 solar panels, during the day and rainy days can generate 4.3KVA = 3769.4.

The system is designed to provide the number of consecutive days of rainy days: 7 days

- A. Total System Power Consumption: 6W / H + 5W / H + 1W / H + 0.5W / H = 12.5W / H
- B. Solar energy efficient power supply system Power Consumption per day: (12.5W / H - 1.2W / H) \* 12H + (7.5W / H \* 12H) = 96W / D
- C. Solar energy efficient power supply system Total power capacity: 716W, can provide continuous rainy days operating time calculation = 716W / 96W / D = 7D
- D. Analysis: The system can cope with 7 consecutive days of climatic conditions weather is working properly, if the continuous rainy days less than 7 days, as long as one day the good weather to fully charge the battery, you can recalculate the days of consecutive rainy days, so, the system can be widely used in general outdoor wireless monitoring market.

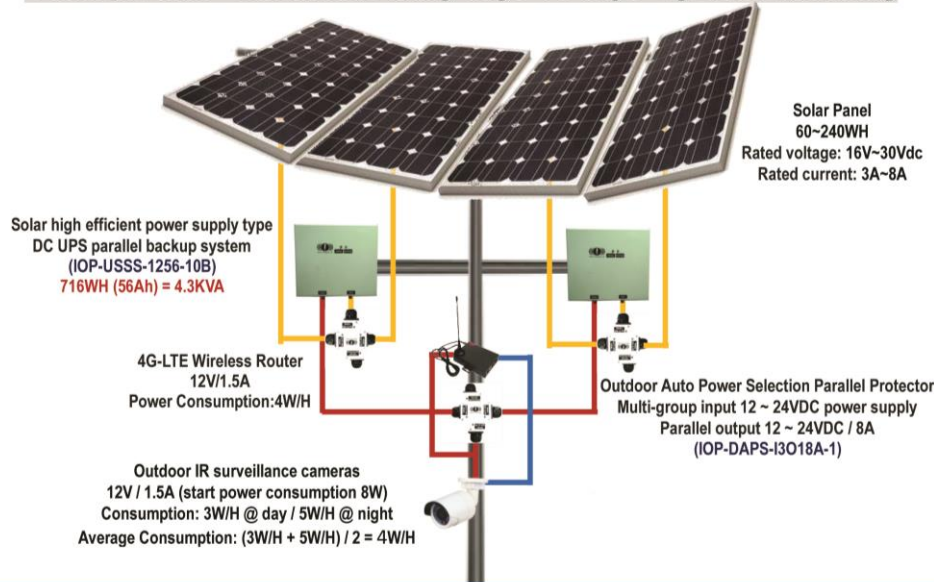
The estimated solar charging time of the system is calculated: one day can fully charge the battery

- 120W solar panels, good weather in winter, sunlight, rechargeable daily:  
08:00-10:00-360W/H \* 40% \* 80% \* 90% \* 2H=207W; 10:00-12:00-360W/H \* 70% \* 80% \* 90% \* 2H=362W  
12:00-14:00-360W/H \* 90% \* 80% \* 90% \* 2H=466W; 14:00-16:00-360W/H \* 50% \* 80% \* 90% \* 2H=259W  
16:00-17:00-360W/H \* 30% \* 80% \* 90% \* 2H=155W; Total: 207W + 362W + 466W + 259W + 155W = 1728W
- Charge Capacity 967W-(8W/H \* 8H)= 903W > IOP-USSS-1256-10B Battery Capacity 716WH (56Ah). So 1 day can be fully charged

### High Efficiency Capacity Charge & Discharge Solar DC UPS Parallel Backup System

#### Two sets of solar parallel dual redundant power supply design

→ Can provide "continuous rainy days 11 days" system operating



#### Highly efficient solar energy-powered DC UPS parallel backup system

##### Solar system power supply for surveillance system continuous "over 11 days" of rainy days

1. Outdoor IR camera power consumption: 4W/H (3W/H @ day / 5W/H @ night) Average power consumption: (3W/H + 5W/H) / 2 = 4W/H
2. 4G-LTE Wireless Router power consumption: about 4W/H
3. High-efficiency solar energy-powered DC UPS equipment power consumption: an average of 1W/H
4. Outdoor automatically select the power importer (DAPS parallel backup): an average of 0.3W/H
5. Solar panels, in rainy day 8 hours during the day can average power 4W/H (only for our efficient solar UPS power system definition)
6. Designed to be powered 11 days solar system:

Whole system power consumption: 4W/H + 4W/H + 1W/H \* 2 + 0.3W/H \* 3 = 11W/H

11 days backup battery capacity: (11W/H \* 24H \* 11D) - (4W/H \* 8H \* 11D \* 4pcs) = 2904WH - 1408WH = 1496WH

Expect 1 day to fully charge the battery: 1496W / (4H \* 80% / 90%) = 1496W / 2.88 = 519WH (Solar Panel)

Using 4 parallel power generation, each solar panel capacity about 519W / 4 = 130W

7. Suggest use solar energy efficient power supply system: IOP-USSS-1256-10B 716WH (56Ah) \* 2; The total power capacity: 1432W  
Analysis: The system can cope with 11 consecutive days of climatic conditions weather is working properly, if the continuous rainy days less than 11 days, as long as one day the good weather to fully charge the battery, you can recalculate the days of consecutive rainy days, so, the system can be widely used in general outdoor wireless monitoring market.

The estimated solar charging time of the system is calculated: one day can fully charge the battery

- 120W solar panels, good weather in winter, sunlight, rechargeable daily:

08:00-10:00-240W/H \* 40% \* 80% \* 90% \* 2H=138W; 10:00-12:00-240W/H \* 70% \* 80% \* 90% \* 2H=241W

12:00-14:00-240W/H \* 90% \* 80% \* 90% \* 2H=311W; 14:00-16:00-240W/H \* 50% \* 80% \* 90% \* 2H=172W

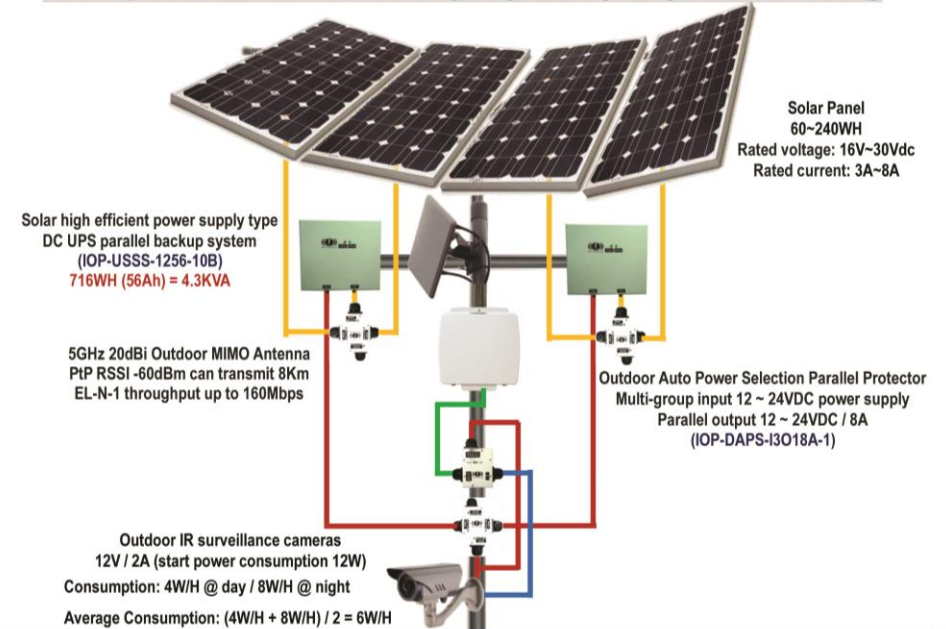
16:00-17:00-240W/H \* 30% \* 80% \* 90% \* 2H=103W; Total: 138W + 241W + 311W + 172W + 103W = 967W

- Charge Capacity 967W-(8W/H \* 8H)= 903W > IOP-USSS-1256-10B Battery Capacity 716WH (56Ah), So 1 day can be fully charged

### High Efficiency Capacity Charge & Discharge Solar DC UPS Parallel Backup System

#### Two sets of solar parallel dual redundant power supply design

→ Can provide "continuous rainy days 7 days" system operating



#### Highly efficient solar energy-powered DC UPS parallel backup system

##### Solar system power supply for surveillance system continuous "over 7 days" of rainy days

1. Outdoor IR camera power consumption: 6W/H (4W/H @ day / 8W/H @ night) Average power consumption: (4W/H + 8W/H) / 2 = 6W/H
2. Outdoor wireless transmission equipment power consumption: about 5W/H (EL-N-1 single wireless Module)
3. High-efficiency solar energy-powered DC UPS equipment power consumption: an average of 1W/H
4. Outdoor automatically select the power importer (DAPS parallel backup): an average of 0.3W/H
5. Solar panels, in rainy day 8 hours during the day can average power 4W/H (only for our efficient solar UPS power system definition)
6. Designed to be powered 7 days solar system:

Whole system power consumption: 6W/H + 5W/H + 1W/H \* 2 + 0.3W/H \* 3 = 14W/H

7 days backup battery capacity: (14W/H \* 24H \* 7D) - (4W/H \* 8H \* 7D \* 4pcs) = 2352WH - 896WH = 1456WH

Expect 1 day to fully charge the battery: 1456W / (4H \* 80% / 90%) = 1456W / 2.88 = 505WH (Solar Panel)

Using 4 parallel power generation, each solar panel capacity about 505W / 4 = 126W

7. Suggest use solar energy efficient power supply system: IOP-USSS-1256-10B 716WH (56Ah) \* 2; The total power capacity: 1432W  
Analysis: The system can cope with 7 consecutive days of climatic conditions weather is working properly, if the continuous rainy days less than 7 days, as long as one day the good weather to fully charge the battery, you can recalculate the days of consecutive rainy days, so, the system can be widely used in general outdoor wireless monitoring market.

The estimated solar charging time of the system is calculated: one day can fully charge the battery

- 120W solar panels, good weather in winter, sunlight, rechargeable daily:

08:00-10:00-240W/H \* 40% \* 80% \* 90% \* 2H=138W; 10:00-12:00-240W/H \* 70% \* 80% \* 90% \* 2H=241W

12:00-14:00-240W/H \* 90% \* 80% \* 90% \* 2H=311W; 14:00-16:00-240W/H \* 50% \* 80% \* 90% \* 2H=172W

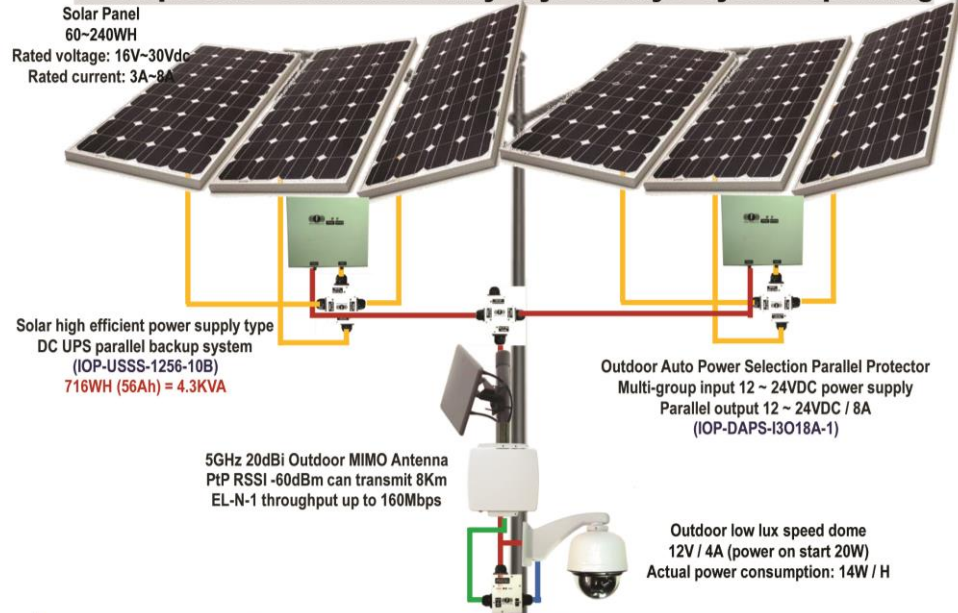
16:00-17:00-240W/H \* 30% \* 80% \* 90% \* 2H=103W; Total: 138W + 241W + 311W + 172W + 103W = 967W

- Charge Capacity 967W-(8W/H \* 8H)= 903W > IOP-USSS-1256-10B Battery Capacity 716WH (56Ah), So 1 day can be fully charged

### High Efficiency Capacity Charge & Discharge Solar DC UPS Parallel Backup System

#### Three sets of solar parallel power supply design

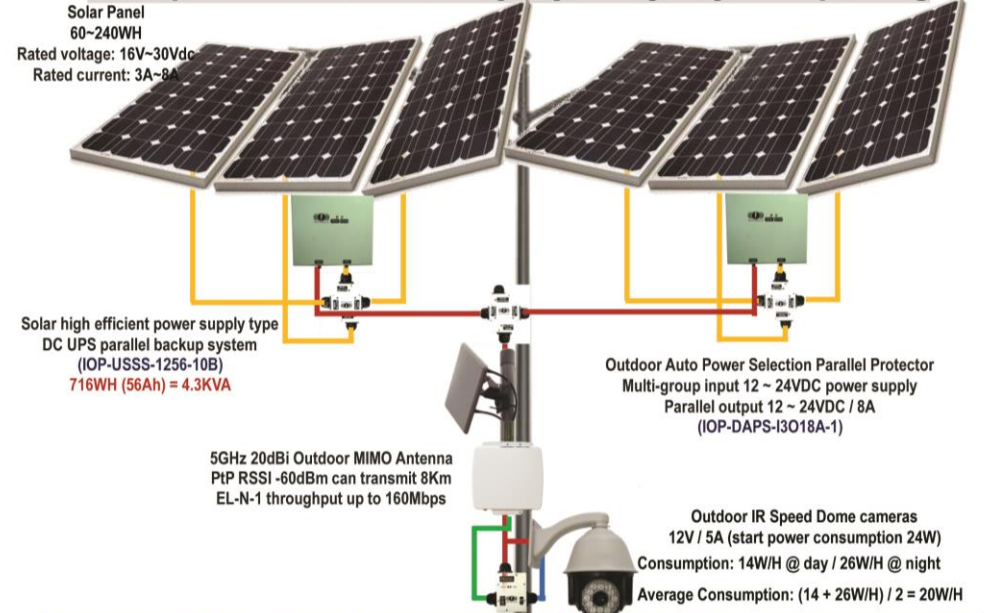
→ Can provide "continuous rainy days 15 days" system operating



### High Efficiency Capacity Charge & Discharge Solar DC UPS Parallel Backup System

#### Three sets of solar parallel power supply design

→ Can provide "continuous rainy days 6 days" system operating



#### Highly efficient solar energy-powered DC UPS parallel backup system

##### Solar system power supply for surveillance system continuous "over 15 days" of rainy days

1. Outdoor low lux Speed Dome power consumption: 14W/H
2. Outdoor wireless transmission equipment power consumption: about 5W/H (EL-N-1 single wireless Module)
3. High-efficiency solar energy-powered DC UPS equipment power consumption: an average of 1W/H
4. Outdoor automatically select the power importer (DAPS parallel backup): an average of 0.5W/H
5. Design of solar energy efficient power supply system \* 2: IOP-USSS-1256-10B 716WH (56Ah) \* 2; Total power capacity: 1432W
6. Solar energy efficient power supply type with solar panels, light rainy day can generate an average of 96W; design 6 solar panels, during the day and rainy days can generate 96WH \* 8H = 768WH

The system is designed to provide the number of consecutive days of rainy days: 15 days

- A. Total System Power Consumption: 14W / H + 5W / H + (1W / H \* 2) + (0.5W / H \* 2) = 22W / H
- B. Solar energy efficient power supply system Power Consumption per day: (22W / H - 96W / H) \* 12H + (22W / H \* 12H) = 96W / D
- C. Solar energy efficient power supply system Total power capacity: 716W \* 2, can provide continuous rainy days operating time calculation = 716W \* 2 / 96W / D = 15D
- D. Analysis: The system can cope with 15 consecutive days of climatic conditions weather is working properly, if the continuous rainy days less than 15 days, as long as one day the good weather to fully charge the battery, you can recalculate the days of consecutive rainy days, so, the system can be widely used in general outdoor wireless monitoring market.

The estimated solar charging time of the system is calculated: one day can fully charge the battery

- 120W solar panels, good weather in winter, sunlight, rechargeable daily:  
08:00~10:00~360W/H \* 40% \* 80% \* 90% \* 2H=207W; 10:00~12:00~360W/H \* 70% \* 80% \* 90% \* 2H=362W  
12:00~14:00~360W/H \* 90% \* 80% \* 90% \* 2H=466W; 14:00~16:00~360W/H \* 50% \* 80% \* 90% \* 2H=259W  
16:00~17:00~360W/H \* 30% \* 80% \* 90% \* 2H=155W; Total: 207W + 362W + 466W + 259W + 155W = 1728W
- Charge Capacity 967W~(8W/H \* 8H) = 903W > IOP-USSS-1256-10B Battery Capacity 716WH (56Ah). So 1 day can be fully charged

#### Highly efficient solar energy-powered DC UPS parallel backup system

##### Solar system power supply for surveillance system continuous "over 6 days" of rainy days

1. Outdoor IR Speed Dome power consumption: 20W/H (14W/H @day / 28W/H @ night) Average power consumption: (14 + 26) / 2 = 20W/H
2. Outdoor wireless transmission equipment power consumption: about 5W/H (EL-N-1 single wireless Module)
3. High-efficiency solar energy-powered DC UPS equipment power consumption: an average of 1W/H
4. Outdoor automatically select the power importer (DAPS parallel backup): an average of 0.5W/H
5. Design of solar energy efficient power supply system \* 2: IOP-USSS-1256-10B 716WH (56Ah) \* 2; Total power capacity: 1432W
6. Solar energy efficient power supply type with solar panels, light rainy day can generate an average of 20W; design 6 solar panels, during the day and rainy days can generate 20WH \* 8H = 160WH

The system is designed to provide the number of consecutive days of rainy days: 6 days

- A. Total System Power Consumption: 20W / H + 5W / H + (1W / H \* 2) + (0.5W / H \* 2) = 28W / H
- B. Solar energy efficient power supply system Power Consumption per day: (28W / H - 160W / H) \* 12H + (28W / H \* 12H) = 240W / D
- C. Solar energy efficient power supply system Total power capacity: 716W \* 2, can provide continuous rainy days operating time calculation = 716W \* 2 / 240W / D = 6D
- D. Analysis: The system can cope with 6 consecutive days of climatic conditions weather is working properly, if the continuous rainy days less than 6 days, as long as one day the good weather to fully charge the battery, you can recalculate the days of consecutive rainy days, so, the system can be widely used in general outdoor wireless monitoring market.

The estimated solar charging time of the system is calculated: one day can fully charge the battery

- 120W solar panels, good weather in winter, sunlight, rechargeable daily:  
08:00~10:00~360W/H \* 40% \* 80% \* 90% \* 2H=207W; 10:00~12:00~360W/H \* 70% \* 80% \* 90% \* 2H=362W  
12:00~14:00~360W/H \* 90% \* 80% \* 90% \* 2H=466W; 14:00~16:00~360W/H \* 50% \* 80% \* 90% \* 2H=259W  
16:00~17:00~360W/H \* 30% \* 80% \* 90% \* 2H=155W; Total: 207W + 362W + 466W + 259W + 155W = 1728W
- Charge Capacity 967W~(8W/H \* 8H) = 903W > IOP-USSS-1256-10B Battery Capacity 716WH (56Ah). So 1 day can be fully charged



## **IO-Power Technology USSS-12V1224-OA series, Solar Power System working in continuous Cloudy Day / Rainy Day/ Snowy Day in High Efficiency Capacity Charge & Discharge system the operation of the composition include:**

### **1. Outdoor DC Automatic Power Supply Parallel Introduction Protector (DAPS): Including the input 12 ~ 24VDC: IOP-DAPS-I3O18A-1 or input 12 ~ 48VDC: IOP-DAPS-I3O18A-2 models**

Because the solar panel's sunshine changes instantaneously, the charging voltage and charging current are erratic, and the frequency of the electronic components on the receiving end and the power supply feedback noise are easy to cause the solar energy to supply power to the charging and discharging controller. The offset and current oscillation abnormal reaction, resulting in easy damage to electronic components, so be sure to use the Outdoor DC Automatic Power Supply Parallel Introduction Protector (DAPS) and other voltage limiting current limiting and absorption noise and other protection equipment.

With the Outdoor DC Automatic Power Supply Parallel Introduction Protector (DAPS), three 240W solar panels can be connected in parallel to amplify the total power generation of light energy collection in a continuous rainy weather power generation environment, and can be matched with general utility or street lamp power supply or A variety of different power sources, such as temporary generators or other green energy sources, are used for the expansion of backup power supply.

### **2. Can be used with solar panels Specifications:**

In response to the power generated by the solar cells, they will be connected in parallel to the Outdoor DC Automatic Power Supply Parallel Introduction Protector (DAPS). Therefore, the specifications of the solar panel that can be matched with the Outdoor DC Automatic Power Supply Parallel Introduction Protector (DAPS) are limited to the maximum.

The outdoor input and output terminals of the power parallel input protection device (DAPS) can withstand DC 30Vdc

voltage and 8A current limit, so the rated voltage/rated current of the solar panel can be matched with 30Vdc/8A maximum (open voltage / The maximum current is about 32V/8.5A). However, if the system operator's outdoor solar power system is erected, using street light poles or pole-mounted fixed or other non-ground cement fixed installation methods, it is necessary to estimate the outdoor wind pressure of the solar panels; according to the high-voltage tower solar cells the wind pressure bearing safety test data of the fixed plate construction is recommended. It is recommended that the number of wattages of the solar panels to be erected should be controlled at about 120W.

### **3. Specially adopt the physical operation characteristics of the hardware charging and discharging circuit, and the operation of the power system includes:**

- Input/output power hardware protection
- Battery charging/discharging hardware protection
- Over-voltage
- Overcurrent
- Polarity reverse
- Short-circuit protection/battery abnormality, etc.

### **4. The solar panel performs charging and discharging control circuits:**

Through the physical characteristics of the hardware charge and discharge circuit design, the battery is fully self-operated by overcharge voltage protection, overcharge current protection, and direct power supply after charging. Similarly, the physical characteristics of the charge and discharge circuit are designed to provide optimal protection and high efficiency for the battery's low voltage, low current, low-voltage discharge protection, and low-voltage protection after the system is quickly restored.

## **5. High-efficiency energy-collecting and charging system for continuous cloudy/rainy/snow days:**

The physical characteristics of the hardware charge and discharge circuit can achieve the highest power generation efficiency under the minimum sunshine in rainy days. With high temperature and high efficiency electronic components, it can reach high efficiency solar energy of about 90~95% in the general environment of sunlight. Converting and charging; in the harsh power generation environment of continuous cloudy/rainy/snowy days, if equipped with an Outdoor DC Automatic Power Supply Parallel Introduction Protector (DAPS), there is a chance to let 120W solar panels, daylight in the rainy days The average power generation per hour reaches 4W/H (2W/H ~ 6W/H average), which fully utilizes the power generation effect of high-efficiency energy collection, which can save a lot of solar battery capacity matching or greatly increase the power supply for continuous rainy days.

## **6. The battery is fully charged and the direct power supply mode can improve the battery cycle life:**

Through the physical characteristics of the hardware charging and discharging circuit, the total power supply control of the DC power supply is controlled. For the power requirements of the load device, the power supply corresponding to the appropriate current is taken, and the battery is provided with a supplementary support power supply operation mode to cope with the instantaneous large power supply requirements for power system equipment. At the same time, in order to avoid the load operation of charge and discharge after the battery is fully charged due to the power generation of solar panels in summer, the cycle life of the battery is affected, especially the design of the solar power conversion through-power supply circuit after the battery is fully charged. In order to improve the battery standby power at full load status and improve battery life.

## **7. Specially enhanced protection measures:**

The high and low temperature changes in the outdoor environment of the solar power generation system may have



serious impact on the life and use efficiency of the battery, and even cause safety problems in use. The industrial grade sealed aluminum metal heat-dissipating protective casing and the waterproof and dustproof IP66 mechanism design are adopted. To avoid the safety of solar power systems in the use of outdoor environments.

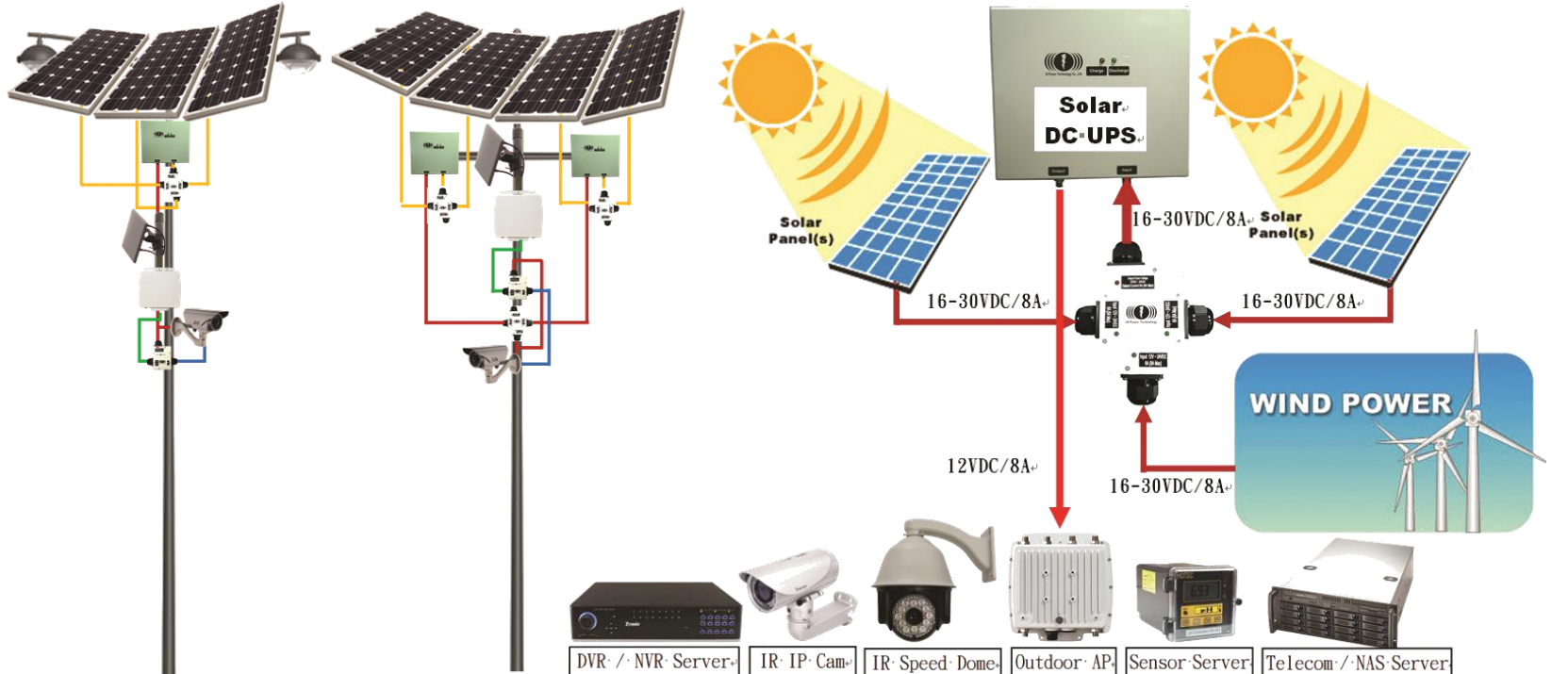
In case of outdoor lightning surge or solar panel voltage and current drift problem or sudden voltage and voltage instability or excessive noise when the mains is backed up, etc., the use of high-standard 1500W lightning strike shock and filter stability Double-layer protection design such as anti-static.

Considering the input and output terminals and the battery terminal, often due to human factors, abnormal short circuit or polarity reversal or leakage introduction, etc., especially the double protection design of the software and hardware, completely eliminate the use risk factor caused by abnormal short circuit.

#### **8. High temperature resistant low temperature iron lithium battery:**

Consider the changes in the outdoor environment and the impact of increasingly severe high and low temperature environments, except for a few lithium iron phosphate batteries, traditional lead acid batteries or lead acid deep cycle gel batteries or lithium batteries or nickel hydrogen batteries...etc. It is used in the high temperature environment of outdoor solar DC UPS, and it faces great challenges in the use of feasibility.

## IOP-USSS-12V1224-OA Series Specification

Model	USSS-1212-06B	USSS-1216-07B	USSS-1218-08B	USSS-1224-09B	USSS-1228-10B
<p>Outdoor High Temperature Model M12 Connector Aluminum Radiating Airtight Housing IP 66 rate</p>	 <p>Note 1: The product does not include solar panels</p> <p>Note 2: Due to the instantaneous change of solar panel by solar irradiance, the problems of errant voltage level and charging current may occur, and the frequency of electronic components and the noise of power supply feedback may easily cause the solar power supply to the charge-discharge controller, The occurrence of frequency offset and current shock anomalies, resulting in vulnerable electronic components, so be sure to front with the automatic selection of outdoor power protection (DAPS) and other voltage limiting current limiting and absorption of noise and other protective equipment.</p> <p>Note 3: With DAPS using parallel charge and discharge protection, can choose the rated voltage of 15 ~ 28Vdc (open circuit voltage 15V ~ 30Vdc) / rated current 4A ~ 8.5A Max</p>				



<b>Built In C-LiFePO4 Lithium Batteries Power Capacity</b>	148 WH (11.6Ah@12.8V)	206 WH (16.1Ah@12.8V)	235 WH (18.4Ah@12.8V)	297 WH (23.2Ah@12.8V)	355 WH (27.6Ah@12.8V)
<b>General UPS Label Size (DC Power Factor is Equal to 1)</b>	888VA (0.9KVA)	1236VA (1.2KVA)	1410VA (1.4KVA)	1782VA (1.8KVA)	2130VA (2.1KVA)
<b>Max Output Wattage (Battery Life Protection Design)</b>	85W/H	85W/H	85W/H	85W/H	85W/H
<b>UPS Discharge Power Supply Time</b>	More than 1.5hr @85W/H Discharge	More than 2hr @85W/H Discharge	More than 2.5hr @85W/H Discharge	More than 3hr @85W/H Discharge	More than 4hr @85W/H Discharge
<b>Solar daylight full charge DC UPS battery time</b>	About 2.5hr @5A Charging	About 4hr @5A Charging	About 4.5hr @5A Charging	About 6hr @5A Charging	About 7hr @5A Charging
<b>Solar battery input DC voltage / current</b>	<p>Because the solar panel's sunshine changes instantaneously, the charging voltage and charging current are erratic, and the frequency of the electronic components on the receiving end and the power supply feedback noise are easy to cause the solar energy to supply power to the charging and discharging controller. The offset and current oscillation abnormal reaction, resulting in easy damage to electronic components, so be sure to use the Outdoor DC Automatic Power Supply Parallel Introduction Protector (DAPS) and other voltage limiting current limiting and absorption noise and other protection equipment.</p> <p>With DAPS using parallel charge and discharge protector, you can choose the rated voltage 15 ~ 28Vdc (open circuit voltage 15V ~ 30Vdc) / rated current 4A ~ 8.5A Max</p>				
<b>Recommended with solar cells Rated voltage / open circuit voltage Rated current</b>	<p>Need to be paired with outdoor DC Automatic Power Supply protection (DAPS)</p> <p>40W ~ 240W Max</p> <p>15 ~ 28Vdc / 15 ~ 30Vdc Max</p> <p>4A ~ 8.5A Max</p>				
<b>External load voltage</b>	DC 11.5V~14.4V +-5%				
<b>External load current**</b>	3.5A (maximum 7A about 85W/H)				
<b>Battery charging voltage</b>	13.8V~14.4V +-5% Max				



<b>Battery standard charging current</b>	4A
<b>Transform Efficiency</b>	90~95% High efficiency and low self-consumption circuit design, even cloudy / rainy days / snowy days ... and other harsh weather conditions, the light can still be collected on the Solar DC UPS battery charge and discharge operations.
<b>Strengthen protection measures and Special operation function design</b>	<ul style="list-style-type: none"><li>● The system power failure is not interrupted during the solar energy collection operation (the monitor system will not be black)</li><li>● Abnormal charging protection with abnormal voltage battery or faulty battery or battery aging through hardware circuit and electronic components</li><li>● Solar cell input voltage adopts hardware type 15V ~ 28Vdc limit voltage protection function</li><li>● Solar cells are used in cloudy days/rainy days/snow days...</li><li>● Solar battery hardware limited reverse charging protection</li><li>● The voltage change of the solar input power terminal adopts the hardware-limited operation protection</li><li>● The current input from the solar input power terminal is protected by hardware.</li><li>● Input power over voltage protection</li><li>● Input power overcurrent protection</li><li>● Input positive and negative polarity reverse protection</li><li>● Input short-circuit status protection</li><li>● Protection against lightning strikes or power surges at the input end of up to 1500W</li><li>● The input has a recoverable fuse protection design</li><li>● Double anti-static and power surge protection design at the input end</li><li>● After the solar battery is fully charged, the input power supply directly supplies power to the load terminal to achieve maximum output power, and at the same time avoid overcharge protection of the battery.</li><li>● Output power supply voltage limit protection</li><li>● Output power supply current limit protection</li><li>● Output positive and negative polarity reverse protection</li></ul>



	<ul style="list-style-type: none"><li>● Output short circuit protection</li><li>● Protection against lightning strikes or power surges at the output reaches 1500W</li><li>● The output has a recoverable fuse protection design</li><li>● Dual anti-static and power surge protection design at the output</li><li>● The battery discharge is lower than 11.5V +-5%, and the system enters the battery low voltage protection state.</li><li>● Static ultra-low power protection of battery low voltage state</li><li>● Discharge under heavy load, the battery has supplementary support power supply operation mode</li></ul>
<b>Support Battery Type</b>	C-LiFePO4 Lithium Batteries Lead-acid batteries or lithium batteries or other battery
<b>Battery Safety Protection</b>	Use pressure type explosion-proof battery design
<b>Built-in battery capacity range</b>	11.6Ah @ 12.8V (148 WH) ~ 30.0Ah @ 12.8V (384 WH)
<b>Battery Charge Mode</b>	CC/CV Automatic charging mode control
<b>Battery Charge Voltage</b>	14.4V +- 3%
<b>Battery Cut-off Discharge Voltage</b>	11.5V +- 5%
<b>Battery recovery discharge voltage</b>	12.15V +- 5%
<b>Max. Charge Current</b>	5A
<b>Max. Discharge Current**</b>	7A (Using load-discharge C-LiFePO4 Lithium Batteries, the maximum discharge current is 7A around 85W/H)
<b>Charging and Discharging at same time, the discharge current**</b>	3.5A
<b>Charging and Discharging at same time, the discharge watts**</b>	40W/H, recommends assessing the normal functioning of the system total power consumption, lower wattage requirements is appropriate.



<p><b>Life cycle the battery 0.2C charge &amp; 0.5C discharge (Battery capacity remaining after using 80%, the defined service life will terminate)</b></p>	<p>@ 25°C 2000 Times (@ 25°C discharging 800 times: after more than 93% capacity, @ 25°C discharging 1100 times: after more than 90% capacity)            @ 45°C 1600 Times            @ 50°C 1200 Times            @ 60°C 550 Times            @ 60°C 720 Times 70%</p> <p>The solar system will inevitably charge and discharge once a day, so the battery life cycle needs to be accurately evaluated. For the battery temperature and the charging current and discharge current size, be sure to strictly comply with the definition of the specification, otherwise the battery cycle life will be significantly reduced.</p>
<p><b>Industrial Housing &amp; Connector</b></p>	<p>Aluminum Airtight Housing            IP 68 M12 Connector</p>
<p><b>Connector Type</b></p>	<p>Specified solar cell patented connector type Tyco or MC4            For Tyco or MC4 patented inputs, enter solar DC power supply: Tyco or MC4 patented connector to DC M12 Female            DC UPS Output DC: 11.5V ~ 14.4Vdc M12 Female to DC Jack Female            DC UPS with DAPS using parallel charge and discharge protectors, you need three M12 Male to DC Jack Female</p>
<p><b>Operating Temperature (Discharge Temperature)</b></p>	<p>-35°C ~ +75°C (Including the chassis of the machine working temperature tolerance)            -20°C ~ +60°C (Excluding institutions, the battery operating temperature tolerance)            +20°C ~ +40°C Battery Capacity:100%            -10°C Battery Capacity : 60%            -20°C Battery Capacity : 48%</p> <p>Because the solar system still needs to be charged and discharged at the same time under the strongest high temperature environment of sunshine, please install the product properly in the sheltered sunshine environment.</p>
<p><b>Charging Temperature</b></p>	<p>-35°C ~ +75°C (Including the casing machine operation)            Because the solar system sunshine at the strongest high temperature environment, still need to simultaneously charge and</p>



	discharge at the same time, over-temperature of the battery for high-current charging, it is likely to cause irreversible high temperature battery charging damage, so please install this product properly in the sheltered sunshine environment.				
<b>Storage Temperature</b>	-35°C ~ +75°C , Recommendations at +20°C ~ +30°C environmental temperature for storage.				
<b>Rel. Humidity</b>	10~95%RH				
<b>Storage Time</b>	Do not wake the system can store 12 months <b>(after you wake the system, each 3 months charging 1 times; Please fully charging battery in first times to use)</b>				
<b>Dimension</b>	210(L) x 145(W) x 195mm(H)				
<b>Weight</b>	2.5Kg (Box 3.6Kg)	3Kg (Box 4.1Kg)	3.2Kg (Box 4.3Kg)	3.8Kg (Box 4.9Kg)	4.5Kg (Box 5.5Kg)
<b>LED Indicator</b>	<ol style="list-style-type: none"> <li>1. When shipped, the green LED light is constantly on, indicating that the battery is in a normal voltage condition.</li> <li>2. If the green LED is not on, it means that the battery is in a low voltage state or has entered low voltage protection, please charge it immediately; if the charging is invalid, please contact the dealer.</li> <li>3. Plug in the 12VDC load-side equipment, and the hardware detects the load side and requires that the voltage is within the specified range, then output the power immediately.</li> <li>4. Input solar DC power: The red light is constantly displayed, indicating that the power has been input.</li> <li>5. The higher the input solar power voltage, the brighter the red LED light.</li> </ol>				
<b>Waterproof and dustproof level</b>	IP66				
<b>Approvals</b>	CE & FCC				
<b>Installation</b>	<ol style="list-style-type: none"> <li>1. Lamppost / wire harness with a fixed way (optional)</li> <li>2. Pole fixed way</li> <li>3. Wall fixing method</li> <li>4. DIN Rail (optional)</li> </ol>				
<b>Warranty</b>	Charge and discharge control panel, waterproof mechanism housing, peripheral accessories, etc., provide 2 years warranty service.				



Customized lithium iron phosphate battery (C-LiFePO4 Lithium Batteries) with 1 year warranty.

Note 1: Battery Capacity is +/- 5%.

Note 2: Product specifications change, without notice, consultation with agent or dealer before buying the latest specifications.

\*\* Note 3: The discharge wattage of the Solar DC UPS system will vary depending on whether the battery has a high or low voltage (with or without full charge) and whether it is used at the same time as charging and discharging. The following are the differences between the products Status of the proposed discharge amperage wattage (with the maximum power consumption of equipment assessment reference):

3-1. Uncharged state, only battery direct discharge, the battery is fully charged state use: The maximum discharge Amp & Wattage is 6A / 75W.

3-2. Uncharged state, only battery direct discharge, the battery is not fully used state: The maximum discharge Amp & Wattage is 3.5A / 40W.

3-3. Uncharged state, only battery direct discharge, the battery is not fully charged and the low voltage state is used. The maximum discharge Amp & Wattage is 3A / 36W.

3-4. Charging and discharging operation at the same time, the battery is fully charged state use: The maximum discharge Amp & Wattage is 7A / 85W.

3-5. Charging and discharging operation at the same time, the battery is not fully charged used state: The maximum discharge Amp & Wattage is 4A / 50W.

3-6. Charging and discharging operation at the same time, the battery is not fully charged and the low voltage state is used: The maximum discharge Amp & Wattage is 3.5A / 40W.