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IO-Power IOP-USSS-12V3556-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

IO-Power USSS-12V3556-OA series is designed specifically for systems engineering project planning system, facing the scene without any power supply system, resulting in the project could not set up system operation, in particular, put forward a solar energy-efficient charge and discharge-type power supply system, expecting to completely solve the system engineering business in outdoor engineering construction could not be achieved stable and effective power problems.

IOP-USSS-12V3556-OA Series -40℃~ +80℃ industrial temperature tolerance level as the basis for the design requirements, the hardware circuit and electronic components planning and import, with affordable -20℃~ +60℃ high-temperature Explosion-proof Lithium Iron Phosphate batteries, combined with the metal shell IP66 above the design and use of high-intensity 1500W lightning surge protection to create a solar outdoor waterproof online intelligent DC non-stop operation of the power system , Can withstand -35℃~ +75℃ operating environment of outdoor high temperature products to meet the requirements to help system engineers to solve outdoor high temperature environment use the power supply problem.

For a long time, the projects of Solar PV power system project contractors who import solar power have faced the problem of cell damage caused by high temperature solar power generation in summer and the shortage of solar sunshine or continuous rainy days or continuous snowing days in winter. The solar power generation system could not really full charge battery or solar power system is very low power generation could not be charged and power supply or other issues, resulting in the introduction of solar power systems project contractors, almost all facing the ultimate failure of the solar power system.

In view of the shortage of winter sunshine or continuous rainy days or continuous snowing days ... and other harsh weather conditions, it is very easy to cause the operating system to run out of power due to the battery consuming electricity and the charging efficiency too low that resulting in fail in the operation of the maintenance system. IO-Power Technology introduced 90 ~ 95% high efficiency capacity charge & discharge solar energy system, supplemented by the solar system specifically developed outdoor automatic selection of power source parallel to the protector (DAPS), trying to continuous rainy days can still produce valuable and efficient power supply system to use, so that low power consumption of the maintain system can cope with the normal operation of the rainy day requirements.

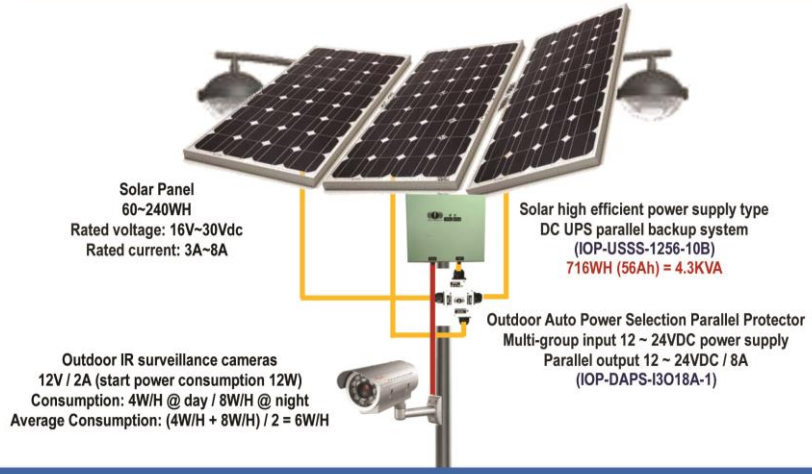
IOP-USSS-12V3556-OA series with outdoor automatic selection of parallel power supply into the protection (DAPS), in addition to the solar panels can be expanded in parallel to enter the total power wattage, and can also be used with the general AC power or street light power or temporary generator or Other green energy ... and many other different sources of electricity for multiple backup power amplification.

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 4W/H; design 3 solar panels , during the day and rainy days can generate 4W/H * 3Pcs = 12W/H .

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 - 12W / 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.

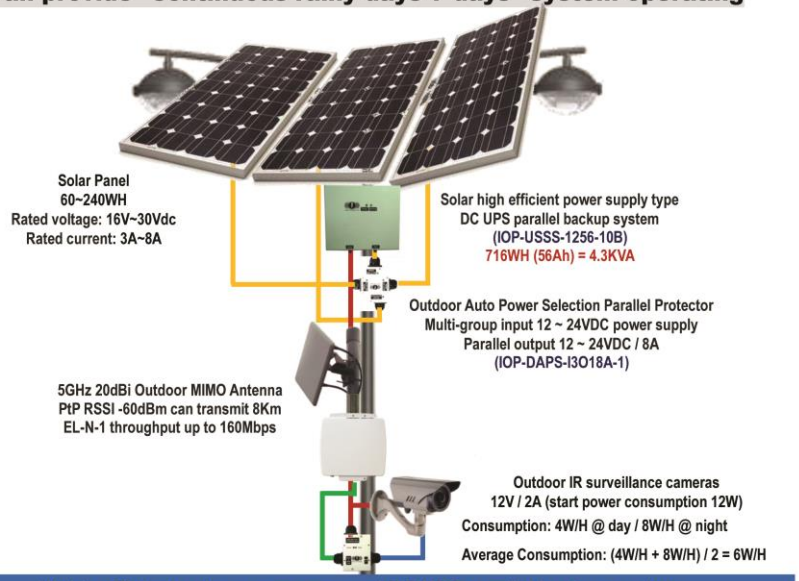
The estimated solar charging time of the system is calculated: one day can fully charge the battery

- 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 4W/H; design 3 solar panels , during the day and rainy days can generate 4W/H * 3Pcs = 12W/H .

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 - 12W / 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.

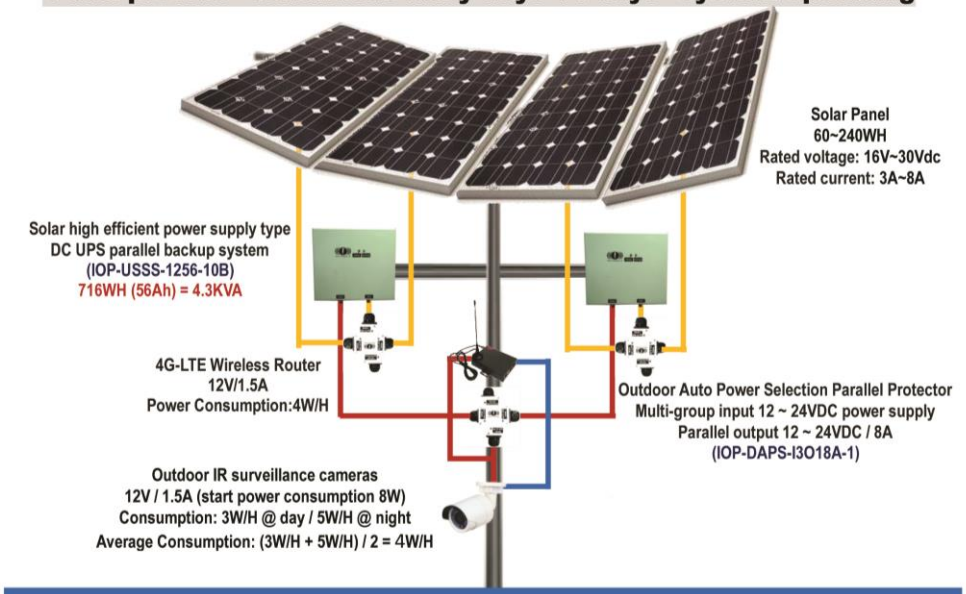
The estimated solar charging time of the system is calculated: one day can fully charge the battery

- 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 = 519W/H (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.

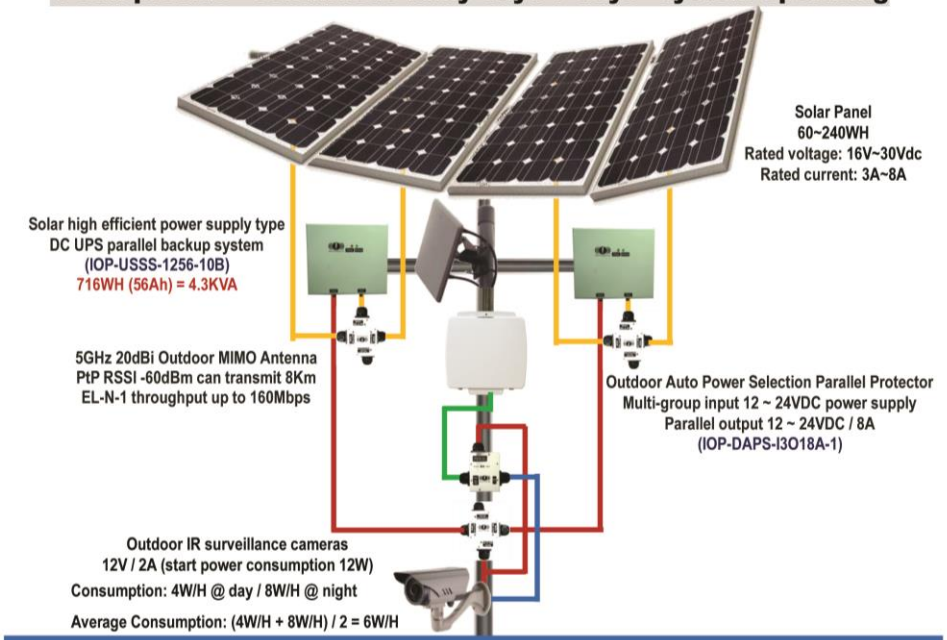
The estimated solar charging time of the system is calculated: one day can fully charge the battery

- 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 = 505W/H (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.

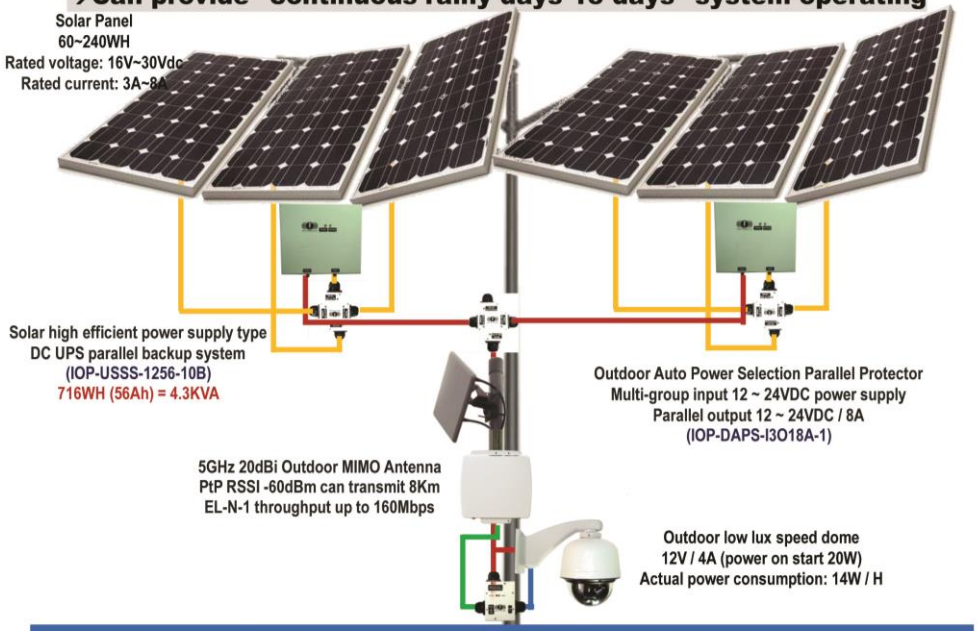
The estimated solar charging time of the system is calculated: one day can fully charge the battery

- 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



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 6W/H; design 6 solar panels , during the day and rainy days can generate 6W/H * 6Pcs = 36W/H.

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 -36W / 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.

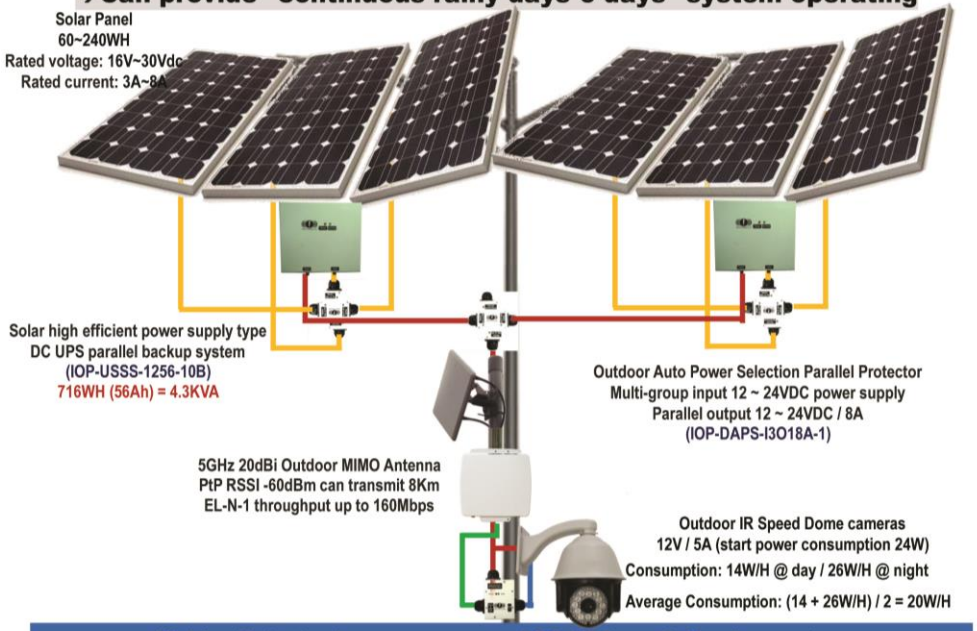
The estimated solar charging time of the system is calculated: one day can fully charge the battery

- 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

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 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 6W/H; design 6 solar panels , during the day and rainy days can generate 6W/H * 6Pcs = 36W/H.

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 -36W / 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-12V3556-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 automatic selection of parallel power supply into the protection (DAPS): Including the input 12 ~ 24VDC: IOP-DAPS-I3O18A-1 or input 12 ~ 48VDC: IOP-DAPS-I3O18A-2 models

Due to the instantaneous change of solar panel through solar irradiance, resulting in erratic voltage level and charging current unstable, at the same time by the power of electronic components such as frequency changes and power supply feedback noise and other issues, likely to cause solar charge and discharge controller when the frequency of occurrence offset and current oscillation anomalies, leading to the vulnerability of electronic components, so be sure to front with outdoor automatic selection of power supply parallel protection (DAPS) and other voltage-limiting & current limiting & absorption of noise and other protective equipment.

With outdoor automatic selection of power parallel protection (DAPS), can be paralleled 3 times 240W solar panels, in a continuous rainy weather power generation environment, to expand the total energy concentration of light energy, and can also be combined with the general AC power or street AC power or temporary generators or other green energy ... and so many different sources of power for the expansion of backup power supply.

2. Can be used with solar panels Specifications:

Due to the power generated by the solar cells, they will be paralleled in the outdoor automatic selection of power supply parallel protection (DAPS), so that the specifications of the solar panel that can be paired with the outdoor automatic selection of power supply parallel protection (DAPS) are limited to the maximum Specifications.

Outdoor Automatic Select Power DAPS inputs and outputs are both capable of handling DC 30Vdc and 8A current

limits, so they can be used with solar panels rated at 30Vdc / 8A max (open-circuit voltage / The maximum current is about 36V / 8.5A). However, if the outdoor solar power system operator is erected and fixed by a light pole or a pole or by other non-ground cement fixing methods, the outdoor wind pressure of the solar panel needs to be estimated; Board construction of a fixed pressure bearing safety test data, it is recommended to set up a single wattage solar panels should be controlled at about 120W better.

3. MCU microprocessor module power supply and control system operation include:

System boot start detection management and protection, input / output power detection management and protection, battery charge / discharge management and protection, over voltage / over current / polarity reverse / short circuit protection / battery anomalies, such as independent protection of their respective interfaces, Open case photosensitive record management, temperature detection and protection management, detection of battery cycle life record and the use of cycle life control management ... And so on.

4. Solar panels for charging and discharging control circuit:

Through the built-in MCU solar energy efficient charge-discharge controller, with a unique CV / CC automatic charging control technology for battery 2.0A / 4.0A / 5.0A charging current control, At the same time after the battery is fully charged overcharge voltage protection, overcharge current protection, full power switch after the direct power supply... and so on, to detect management. Similarly, through the built-in MCU smart charge-discharge controller, the battery is too low voltage, low current, low voltage protection and low voltage protection after the start of the system to quickly restore power supply operation ... to provide the best protection and high efficiency the operating mechanism. It is worth mentioning that the specially designed hardware plays the ultimate input / output voltage and current protection. The independent protection design of each independent interface is adopted to avoid the transient abnormal charging and discharging affecting the

operation of the system.

5. Continuous cloudy / rainy day / snow-day efficient energy-intensive charge and discharge system:

MCU solar energy-efficient energy-intensive charge-discharge controller, using more than 95% high-performance MCU processor design, with high temperature and high efficiency electronic components, and then optimized through the hardware circuit design, weather conditions in general sunshine, reach 90 ~ 95% of the high efficiency of solar energy conversion charging; in the face of continuous cloudy days / rainy days / snowy days of harsh power generation environment, solar energy-efficient charge-discharge controller can achieve the convergence of light power generation efficiency; if Equipped with outdoor automatic power supply parallel protection (DAPS), the 120W solar panel has the opportunity to generate an average of 4W / H (2W / H ~ 6W / H average) per hour under rainy and daytime daylight conditions. Give full play to the energy-efficient power generation effect, can save a large number of solar system battery capacity or substantially increase the number of days to deal with continuous rainy days.

6. The battery is fully charged direct power supply mode, can improve battery cycle life:

Through the built-in MCU solar energy-efficient energy-intensive charge and discharge controller, DC power supply discharge detection control and total discharge control protection, load equipment for the power requirements, to take the appropriate current power supply, from the minimum 0.5A to the maximum 7A DC current supply control, while designing the hardware circuit with the MCU processor, so that the battery has additional support for power supply mode of operation, in order to cope with large power system equipment instantaneous large power requirements. At the same time, in order to avoid the summer solar panels have been fully charged after the battery is fully charged, the charge and discharge are still carried out the implementation of the load operation, resulting in the cycle of the battery life are affected, in particular, to take full charge of the battery after the solar power conversion through the power supply design, In order to improve the

battery standby power at full load status and improve battery life.

7. Particularly enhanced protection measures:

Due to the high and low temperature changes of the outdoor environment of the solar power generation system, the lifetime and the use efficiency of the battery may have a serious impact and may even cause the use of safety issues. Therefore, built-in MCU solar intelligent charge-discharge controller, it can do -35℃ low temperature and +75℃ high temperature safety protection mechanism, and use industrial-grade sealed aluminum heat shield and waterproof and dustproof IP66 body design to avoid solar power generation system in the outdoor environment on the safety issues occur.

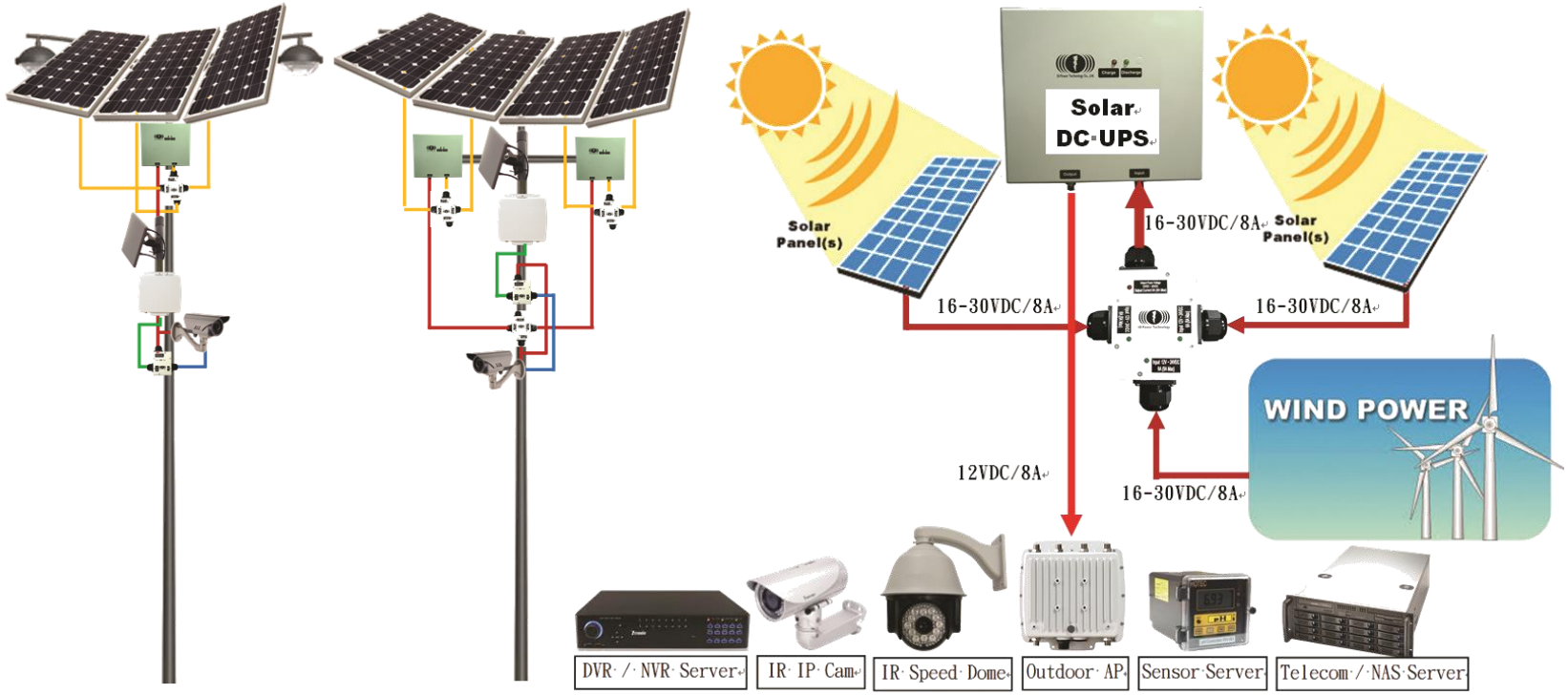
In response to sudden surge of outdoor lightning or solar panel voltage and current drift problems or mains backup surge and voltage instability or excessive noise ... and other risks, especially the use of high-intensity 1500W lightning surge and filter stability pressure anti-static double protection design.

Consider the input and output terminals and the battery terminal, often happen by human factors, resulting in anomalous short circuit or reverse polarity or leakage of electricity ... etc, especially dual hardware and software protection designed to completely eliminate the use of abnormal short-circuit risk factors.

8. High-temperature explosion-proof long-term iron lithium battery:

Considering the changes in the outdoor environment and the impact of the increasingly harsh high and low temperature environment, with the exception of a few such as lithium iron phosphate batteries, the traditional lead-acid batteries or lead-acid deep-cycle gel batteries or lithium batteries or nickel-metal hydride batteries ... , Used in outdoor solar DC UPS operating in high temperature environment, are faced with the great feasibility of the use of challenges.

IOP-USSS-12V3556-OA Series Specification

Model	USSS-1232-10B	USSS-1235-10B	USSS-1240-10B	USSS-1247-10B	USSS-1256-10B
Outdoor High Temperature Model M12 Connector Aluminium Radiating Airtight Housing IP 66 rate					

Note 1: The product does not include solar panels

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.

Note 3: With DAPS using parallel charge and discharge protection, can choose the rated voltage of 16 ~ 30Vdc (open circuit voltage 18V ~ 38Vdc) / rated current 3A ~ 8A Max

Built In C-LiFePO4 Lithium Batteries Power Capacity	412 WH (32.2Ah @ 12.8V)	445 WH (34.8Ah @ 12.8V)	515 WH (40.2Ah @ 12.8V)	594 WH (46.4Ah @ 12.8V)	716 WH (56Ah @ 12.8V)
General UPS Label Size (DC Power Factor is Equal to 1)	2472VA (2.47KVA)	2670VA (2.67KVA)	3090VA (3.09KVA)	3564VA (3.56KVA)	4296VA (4.29KVA)
Max Output Wattage (Battery Life Protection Design)	85W/H	85W/H	85W/H	85W/H	85W/H
UPS Discharge Power Supply Time	More than 4.5hr @85W/H Discharge	More than 5.0hr @85W/H Discharge	More than 6.0hr @85W/H Discharge	More than 6.5hr @85W/H Discharge	More than 8.0hr @85W/H Discharge
Solar daylight full charge DC UPS battery time	About 6.5hr @5A Charging	About 7hr @5A Charging	About 8hr @5A Charging	About 9.5hr @5A Charging	About 11.5hr @5A Charging
Solar battery input DC voltage / current	Due to the instantaneous change of solar panel by solar irradiance, resulting in erratic voltage level and charging current, at the same time by the power of electronic components such as frequency changes and power supply feedback noise and other issues, likely to cause solar charge and discharge controller when the frequency of occurrence Offset and current oscillation anomalies, leading to the vulnerability of electronic components, so be sure to front with outdoor automatic selection of power parallel protection (DAPS) and other voltage-limiting current limiting and absorption of noise and other protective equipment. With DAPS using parallel charge and discharge protection, can choose the rated voltage 16 ~ 30Vdc (open circuit voltage 18V ~ 38Vdc) / rated current 3A ~ 8A Max				
Recommended with solar cells Rated voltage / open circuit voltage Rated current	Need to be paired with automatic outdoor power supply protection (DAPS) 60W ~ 240W Max 16 ~ 30Vdc / 18 ~ 38Vdc Max 3A ~ 8A Max				
External load voltage	DC 11.5V~14.4V +-5%				
External load current**	3.5A (maximum 7A about 85W/H)				

Battery charging voltage	13.8V~14.4V +-5% Max
Battery standard charging current	4A
Transform Efficiency	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.
Strengthen protection measures and Special operation function design	● Solar energy is not interrupted when the system is in power-off operation (the monitor system will not be black) ● MCU microprocessor starts, automatic charging and discharging systems functioning State protection ● Automatically detect abnormal voltage the battery status and abnormal aging or faulty battery or battery charging protection ● The input voltage of the solar cell adopts the hardware-limited 11V ~ 35V limit voltage protection function ● Solar cells in the cloudy / rainy days / snow days ... and other harsh weather for efficient collection function ● Solar cell hardware limited reverse charging protection ● Solar power input voltage changes, adopt hardware-limited operation protection ● Solar power input current changes, adopt hardware-limited operation protection ● Input overvoltage protection ● Input power supply over-current protection ● Input of positive and negative polarity reverse protection ● Input short-circuit protection ● Input lightning or power surge protection up to 1500W ● Input recoverable fuse protection design ● Input port dual anti-static and power surge protection design ● After the solar battery is fully charged, the input power is directly supplied to the load end to reach the maximum output power, and at the same time, the overcharge protection of the battery can be avoided ● Output power limit voltage protection ● Output power limit current protection

	● Output of positive and negative polarity reverse protection ● Output short circuit protection ● Output lightning or power surge protection up to 1500W ● Output recoverable fuse protection design ● Output port dual anti-static and power surge protection design ● The battery is in the 11.5V low voltage stop state. After the solar or other power supply re-inputs the power for charging, wait for the battery voltage to rise to 12.15V + -3% before performing the normal discharge operation ● Battery discharged below 11.5V, MCU microprocessor automatically stop discharging into the battery under low voltage protection ● When the battery voltage is lower than 11V, the MCU microprocessor enters the hibernation protection state ● Low battery static low power state of the ultra-low power protection ● When the battery is in a low voltage state and the solar panel inputs enough starting power, the MCU microprocessor automatically starts the wake-up mechanism ● Battery low voltage protection restart the battery discharge, specially designed discharge voltage protection ● Discharge under heavy load, the battery has additional support for power supply mode of operation ● With anti-sabotage detection of open-shell detection and RS-485 signal alarm mechanism (optional) ● With temperature detection record and read mechanism ● Safety protection mechanism with low temperature (@ -35℃) and high temperature (@ + 75℃) (please refer to Notes 3 & 4) ● Specially designed battery cycle life definition and record and control mechanism (optional function) ● RS-485 output & input interface to enhance the management of real-time remote control (optional) ● Have the system operating status record function ● Support industrial MODBUS protocol (allows PLC programmable logic control)
Support Battery Type	C-LiFePO4 Lithium Batteries Lead-acid batteries or lithium batteries or other battery, can be customized to modify (optional function)

Battery Safety Protection	Use pressure type explosion-proof battery design
Built-in battery capacity range	32.2Ah @ 12.8V (412 WH) ~ 56.0Ah @ 12.8V (716 WH)
Battery Charge Mode	CC/CV MCU Automatic charging mode control
Battery Charge Voltage	14.4V +- 3%
Battery Cut-off Discharge Voltage	11.5V +- 5%
Battery recovery discharge voltage	12.15V +- 5%
Max. Charge Current	5A
Max. Discharge Current**	7A (Using load-discharge C-LiFePO4 Lithium Batteries, the maximum discharge current is 7A around 85W/H)
Charging and Discharging at same time, the discharge current**	3.5A
Charging and Discharging at same time, the discharge watts**	40W/H, recommends assessing the normal functioning of the system total power consumption, lower wattage requirements is appropriate.
Life cycle the battery 0.2C charge & 0.5C discharge (Battery capacity remaining after using 80%, the defined service life will terminate)	@ 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% 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.

Industrial Housing & Connector	Aluminum Airtight Housing IP 68 M12 Connector				
Connector Type	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				
Operating Temperature (Discharge Temperature)	-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% 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.				
Charging Temperature	-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 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.				
Storage Temperature	-35°C ~ +75°C，Recommendations at +20°C ~ +30°C environmental temperature for storage.				
Rel. Humidity	10~95%RH				
Storage Time	Do not wake the system can store 12 months **(after you wake the system, each 3 months charging 1 times; Please fully charging battery in first times to use)**				
Dimension	210(L) x 200(W) x 195mm(H)				
Weight	4.8Kg (Box 6.0Kg)	5.2Kg (Box 6.4Kg)	5.8Kg (Box 7.0Kg)	6.5Kg (Box 7.2Kg)	7.7Kg (Box 8.5Kg)

LED Indicator	1. Enter the solar DC power: red light is on, it means the battery is fully charged. 2. Enter the solar DC power supply: red light flashes 1 time per second display, on behalf of the battery in a high current charging state. 3. Enter the solar DC power: red light flashing 2 times per second display, on behalf of the battery in a low current charging state. 4. Enter the solar DC power: rainy days or snowy days or low sunlight conditions, a few seconds flashing 1 display, on behalf of the battery in a high-efficiency low-current charge state. 5. The battery is not charging, 12VDC device load discharge device is inserted, the discharge green light will be displayed constantly 6. If the discharge green light shining, on behalf of the battery is lower than 12.15V low-voltage discharge, please charge operation; if no charge operation, wait until the battery discharge voltage as low as 11.5V, the system will enter the stop discharge and battery low voltage protection , The discharge green light will be extinguished. 7.12VDC device load discharge insertion: rapid green light flashing, on behalf of the output power or output port or battery discharge abnormal state, please remove the output power terminal as soon as possible.
Waterproof and dustproof level	IP66
Approvals	CE & FCC
Installation	1. Lamppost / wire harness with a fixed way (optional) 2. Pole fixed way 3. Wall fixing method 4. DIN Rail (optional)
Warranty	Intelligent charge & discharge main board & IP66 housing & parts support two years limited warranty. Customize C-LiFePO4 lithium batteries support one year limited 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: detect the temperature reached -30℃, start the red LED have low temperature warning, reach low temperature -35 ℃, a start-stop system function

will enable, when temperatures returned to above -30℃, normal operation will resume.

Note 4: detect the temperature reached +70℃, start red LED have high temperature warning, reach high temperature +75℃, a start-stop system function will enable, when temperatures back below +70℃ temperature, normal operation will resume.

** Note 5: 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):

5-1. Uncharged state, only battery direct discharge, the battery is fully charged state use: The maximum discharge Amp & Wattage is 6A / 75W.

5-2. Uncharged state, only battery direct discharge, the battery is not fully used state: The maximum discharge Amp & Wattage is 3.5A / 40W.

5-3. 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.

5-4. Charging and discharging operation at the same time, the battery is fully charged state use: The maximum discharge Amp & Wattage is 7A / 85W.

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

5-6. 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.