Overview:
The SES series controller integrating the functions of lithium battery solar charge and discharge management, LED step-up constant current drive, intelligent sensing control and others is especially designed for integrated lithium battery powered LED street light. It delivers high reliability, high efficiency, high precision, ease of installation and maintenance and other benefits.

Features:
• Very low sleep current for long-distance transportation and storage.
• High accuracy and high efficiency PWM charge with constant voltage and limited current
• Multi-period programmable load power/time control
• Infrared/microwave sensing function, with sensing delay time settable
• Lithium battery charge and discharge high and low temperature protection, with operating temperature settable
• A variety of lithium battery intelligent power modes, with load power adjustable automatically according to the battery level
• High precision digital step-up constant current control algorithm, ensuring high efficiency and high current constant accuracy
• Infrared wireless communication, allowing for setting/reading parameters, reading status, etc.
• Multiple protections such as battery/PV reverse polarity protection, LED short-circuit/open-circuit/limited power protection, etc.

Technical Parameters:
Infrared wireless communication, allowing for setting/reading parameters, reading status, etc.
Lithium battery charge and discharge high and low temperature protection, with operating temperature settable
Human infrared/microwave sensing function, with sensing delay time settable
High accuracy and high efficiency PWM charge with constant voltage and limited current

Wiring and Panel Description:

Indicators Description:

Items | Values |
--- | --- |
Model | SES40-WB/SES40-IR, SES20-WB/SES20-IR, SES60-WB/SES60-IR, MES60-WB/MES60-IR |
Sensing type | WB microwavesensing, IR infrared sensing |
System voltage | 12V, 12V/24V, 12V |
Zero load loss | < 10mA/12V, < 12mA/12V, < 15mA/12V |
Sleep loss | < 0.3mA/12V, < 5mA, < 5mA |
Load current | 50mA ~ 2000mA, 50mA ~ 1400mA, 50mA ~ 2000mA, 50mA ~ 3100mA |
Load voltage | 15V ~ 45V, 15V ~ 60V, 15V ~ 40V |
Maximum power of load | 40W, 20W, 40W/12V, 60W/24V, 60W |
Load conversion efficiency | 90% ~ 96%, 90% ~ 96% |
Load current accuracy | < 3% |
Sensing delay (settable) | 0s ~ 60min |
Sensing range | IR, H:6-8m, L:6-10m; WB, H:8-10m, L:7-10m |
Maximum charge current | 8A/10A, 6A/8A, 6A/8A MPPT charge |
Solar input voltage | ≤ 35V, ≤ 35V |
Charge voltage | 12.5V (settable), 12.24V system |
Charge return voltage | 12.0V (settable), ≤ 40V |
Over load voltage | 9.2V, ≤ 24V system |
Over discharge voltage | 10.2V, ≤ 24V system |
Light control voltage | 3V ~ 11V (settable), 3V ~ 11V (settable) |
Light control delay | 0s ~ 60min (settable), 0s ~ 60min (settable) |
Operating temperature | ≤ 35℃ ~ +65℃ |
IP rating | IP67 |
Weight | 150g, 120g, 210g, 210g |
Controller dimensions (mm) | 72.5×72.5×26.2, 104×52×19.7 |
Controller installation size (mm) | 38×54, 95×95 |
Probe opening diameter (mm) | ø3.5, ø3.5 |
Installation hole diameter (mm) | ø3.5 |

Items | Values |
--- | --- |
Model | SN40, SN20, DH60A, DH100, DH120 |
System voltage | 12V/24V |
Load current | 50mA ~ 2000mA, 50mA ~ 1400mA, 50mA ~ 2640mA, 50mA ~ 3300mA, 50mA ~ 3960mA |
Load voltage | 14.4V ~ 45V, 12V system: 15V ~ 60V system: 30V ~ 60V |
Maximum power of load | 40W, 20W, 40W/12V/50W/24V, 50W/12V/100W/24V, 50W/12V/100W/24V |
Load conversion efficiency | 90% ~ 96% |
Load current accuracy | ≤ 3% |
Maximum charge current | 10A, 6A, 10A, 15A, 20A |
Solar input voltage | ≤ 55V |
Step-up charge voltage/charge voltage | 14.4V (lead acid battery), 12.5V (lithium battery) (settable) |
Charge return voltage/overcharge voltage | 13.8V (lead-acid battery), 12.0V (lithium battery) (settable) |
Charge return voltage/over discharge voltage | 11.0V (lead-acid battery), 9.2V (lithium battery) (settable) |
Over discharge return voltage | 12.6V (lead-acid battery), 10.2V (lithium battery) (settable) |
Light control voltage | 3V ~ 11V (settable), 5V ~ 11V (settable) |
Light control delay | 0s ~ 5s/2s/5min ~ 60min (settable) |
Operating temperature | -35℃ ~ +65℃ |
IP rating | IP67 |
Weight | 150g, 170g, 280g |
Controller dimensions (mm) | 58×82×17, 58×82×20, 100×82×20 |
Controller installation size (mm) | 43×75, 43×75, 86×75 |
Installation hole diameter (mm) | ø3.5 |

Indicators Description:

Items | Values |
--- | --- |
Model | SES40-WB/SES40-IR, SES20-WB/SES20-IR, SES60-WB/SES60-IR, MES60-WB/MES60-IR |
Status | Blue |
Description | Load is turned on |
Color | Blue |
Status | Off |
Description | Battery is not connected |
Color | Red |
Status | Steady on |
Description | Battery works properly |
Color | Red |
Status | Slow flash |
Description | Battery is not connected |
Color | Red |
Status | Quick Flash |
Description | System failure |

Items | Values |
--- | --- |
Model | SES40-WB/SES40-IR, SES20-WB/SES20-IR, SES60-WB/SES60-IR, MES60-WB/MES60-IR |
Status | Blue |
Description | Battery works properly |
Color | Blue |
Status | Steady on |
Description | Load is turned on |
Color | Blue |
Status | Slow flash |
Description | Battery works properly |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery is not connected |
Color | Blue |
Status | Load is short circuited |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned off |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly |
Color | Blue |
Status | Slow flash |
Description | Battery is not connected |
Color | Blue |
Status | Quick Flash |
Description | Battery is not connected |
Color | Blue |
Status | Load is turned on |
Description | Battery works properly
**Wiring and Panel Description:**

Wiring sequence: Firstly connect the load, then the battery and finally the solar panel.

Note: In order to avoid short circuit between the leads, please connect one lead and wind with insulating tape before connecting the next one!!

**Indicators Description:**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Status</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar panel voltage is higher than light control voltage</td>
<td>Steady on</td>
<td>Solar panel voltage is higher than light control voltage</td>
<td></td>
</tr>
<tr>
<td>Battery works properly</td>
<td>Steady on</td>
<td>Battery works properly</td>
<td></td>
</tr>
<tr>
<td>System over-voltage</td>
<td>Quick Flash</td>
<td>System over-voltage</td>
<td></td>
</tr>
<tr>
<td>Battery is not connected/ Lithium battery protection board enabled</td>
<td>Slow Flash</td>
<td>Battery is not connected/ Lithium battery protection board enabled</td>
<td></td>
</tr>
<tr>
<td>Battery over-discharge</td>
<td>Quick Flash</td>
<td>Battery over-discharge</td>
<td></td>
</tr>
<tr>
<td>LED load is short circuited</td>
<td>Quick Flash</td>
<td>LED load is short circuited</td>
<td></td>
</tr>
<tr>
<td>Load is turned on</td>
<td>Slow Flash</td>
<td>Load is turned on</td>
<td></td>
</tr>
<tr>
<td>Load is turned off</td>
<td>Off</td>
<td>Load is turned off</td>
<td></td>
</tr>
</tbody>
</table>

- Pin 1, Red: VCC
- Pin 2, Black: GND
- Pin 3, Yellow: A/T
- Pin 4, Green: B/P

**Overview:**

The DM series waterproof all-in-one MPPT constant current controller integrates MPPT solar charge management, LED step-up constant current drive and other functions. Ideal for lead-acid battery / lithium battery / colloidal battery, it is widely used for solar street lights, solar garden lights, etc., providing high reliability, high efficiency, high precision, ease of installation and maintenance and other benefits.

**Features:**

- MPPT technology, providing a tracking efficiency of up to 99.5% and a charge conversion efficiency of up to 96%
- Multi-period programmable load power/time control
- Charge and discharge high and low temperature protection
- Load intelligent power mode, with load power adjustable automatically according to the battery level
- High precision digital step-up constant current control algorithm, ensuring high efficiency and high constant current accuracy, conversion efficiency up to 96%
- Infrared wireless communication, allowing for setting/reading parameters, reading status, etc.
- Multiple protections such as battery/PV reverse polarity protection, LED short-circuit/open-circuit/limited power protection, etc.
- All-aluminum housing, with IP68 rating, allowing for use in a variety of harsh environments.
- Extensible IOT remote communication monitoring function (U/C series)

**Technical Parameters:**

<table>
<thead>
<tr>
<th>Items</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>DM120</td>
</tr>
<tr>
<td></td>
<td>DM160</td>
</tr>
<tr>
<td></td>
<td>DM200</td>
</tr>
<tr>
<td>System voltage</td>
<td>≤ 12V/24V</td>
</tr>
<tr>
<td>Zero load loss</td>
<td>≤ 25mA/12V, ≤ 15mA/24V</td>
</tr>
<tr>
<td>Load current</td>
<td>50mA – 360mA</td>
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<tr>
<td></td>
<td>50mA – 528mA</td>
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<tr>
<td></td>
<td>50mA – 660mA</td>
</tr>
<tr>
<td>Load voltage</td>
<td>12V system: 15V to 60V</td>
</tr>
<tr>
<td></td>
<td>24V system: 30V to 60V</td>
</tr>
<tr>
<td>Maximum power of load</td>
<td>60W/12V, 120W/24V</td>
</tr>
<tr>
<td></td>
<td>80W/12V, 160W/24V</td>
</tr>
<tr>
<td></td>
<td>100W/12V, 200W/24V</td>
</tr>
<tr>
<td>Charge and discharge conversion efficiency</td>
<td>90% ~ 96%</td>
</tr>
<tr>
<td>Load current accuracy</td>
<td>&lt; 3%</td>
</tr>
<tr>
<td>MPPT tracking efficiency</td>
<td>&gt; 99%</td>
</tr>
<tr>
<td>Maximum charge current</td>
<td>10A</td>
</tr>
<tr>
<td></td>
<td>Max</td>
</tr>
<tr>
<td>Maximum solar panel power</td>
<td>130W/12V, 260W/24V</td>
</tr>
<tr>
<td></td>
<td>200W/12V, 400W/24V</td>
</tr>
<tr>
<td>Solar panel input voltage</td>
<td>≤ 60V</td>
</tr>
<tr>
<td>Step-up charge voltage</td>
<td>14.4V</td>
</tr>
<tr>
<td></td>
<td>(lead acid battery)</td>
</tr>
<tr>
<td></td>
<td>12.5V</td>
</tr>
<tr>
<td></td>
<td>(lithium battery)</td>
</tr>
<tr>
<td>Charge return voltage</td>
<td>13.8V</td>
</tr>
<tr>
<td></td>
<td>(lead-acid battery)</td>
</tr>
<tr>
<td></td>
<td>12.0V</td>
</tr>
<tr>
<td></td>
<td>(lithium battery)</td>
</tr>
<tr>
<td>Over discharge voltage</td>
<td>11.0V</td>
</tr>
<tr>
<td></td>
<td>(lead-acid battery)</td>
</tr>
<tr>
<td></td>
<td>9.2V</td>
</tr>
<tr>
<td></td>
<td>(lithium battery)</td>
</tr>
<tr>
<td>Over discharge return voltage</td>
<td>12.6V</td>
</tr>
<tr>
<td></td>
<td>(lead acid battery)</td>
</tr>
<tr>
<td></td>
<td>10.2V</td>
</tr>
<tr>
<td></td>
<td>(lithium battery)</td>
</tr>
<tr>
<td>Light control voltage</td>
<td>5V</td>
</tr>
<tr>
<td></td>
<td>(settable)</td>
</tr>
<tr>
<td>Light control delay</td>
<td>1min ~ 60min (settable)</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>≤ -35°C</td>
</tr>
<tr>
<td>IP rating</td>
<td>IP68</td>
</tr>
<tr>
<td>Weight</td>
<td>380g</td>
</tr>
<tr>
<td>Controller dimensions</td>
<td>114x88x25</td>
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<tr>
<td></td>
<td>142x88x25</td>
</tr>
<tr>
<td></td>
<td>153x114.4x34</td>
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<td>Controller installation size (mm)</td>
<td>74x82</td>
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<tr>
<td></td>
<td>102x82</td>
</tr>
<tr>
<td></td>
<td>123x103</td>
</tr>
<tr>
<td>IP rating</td>
<td>IP68</td>
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<tr>
<td>Weight</td>
<td>480g</td>
</tr>
<tr>
<td>Controller dimensions</td>
<td>104x60x23.5</td>
</tr>
<tr>
<td></td>
<td>43x82x17</td>
</tr>
<tr>
<td></td>
<td>58x82x17</td>
</tr>
<tr>
<td></td>
<td>80x82x23.5</td>
</tr>
<tr>
<td>Indicator</td>
<td>Description</td>
</tr>
<tr>
<td>Slow Flash</td>
<td>System over-voltage</td>
</tr>
<tr>
<td>Quick Flash</td>
<td>System over-voltage</td>
</tr>
<tr>
<td>Steady on</td>
<td>Solar panel voltage is higher than light control voltage</td>
</tr>
<tr>
<td>Off</td>
<td>Solar panel voltage is lower than light control voltage</td>
</tr>
<tr>
<td>Charging indication</td>
<td>In charging</td>
</tr>
<tr>
<td>Battery indication</td>
<td>Battery works properly</td>
</tr>
<tr>
<td>Load indication</td>
<td>Load is turned on</td>
</tr>
<tr>
<td></td>
<td>Load is turned on</td>
</tr>
<tr>
<td></td>
<td>Load is turned off</td>
</tr>
</tbody>
</table>

**Indicators Description:**

- Pin 1, Red: VCC
- Pin 2, Black: GND
- Pin 3, Yellow: A/T
- Pin 4, Green: B/P

**Wiring and Panel Description:**

**Overview:**

The SH series controller integrates the functions of single string lithium battery solar charge and discharge management. It is specially designed for single string lithium battery powered LED street light, presenting high reliability, high efficiency, high precision, ease of installation and maintenance and other benefits.

**Features:**

- High accuracy and high efficiency PWM charge with constant voltage and limited current
- Multi-period programmable load power/time control
- Charge and discharge high and low temperature protection
- Load intelligent power mode, with load power adjustable automatically according to the battery level
- High precision digital step-up constant current control algorithm, ensuring high efficiency and high constant current accuracy
- Infrared wireless communication, allowing for setting/reading parameters, reading status, etc.
- Multiple protections such as battery/PV reverse polarity protection, LED short-circuit/open-circuit/limited power protection, etc.
- All-aluminum housing, with IP68 rating, allowing for use in a variety of harsh environments.
- Infrared sensing function optional

**Technical Parameters:**

<table>
<thead>
<tr>
<th>Items</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>SH20</td>
</tr>
<tr>
<td></td>
<td>SNS30-P</td>
</tr>
<tr>
<td></td>
<td>SNS40-H</td>
</tr>
<tr>
<td></td>
<td>SNS60-H</td>
</tr>
<tr>
<td>System voltage</td>
<td>3.2V/3.7V</td>
</tr>
<tr>
<td></td>
<td>2.1V/2.6V</td>
</tr>
<tr>
<td>Load drive mode</td>
<td>Step-up constant current</td>
</tr>
<tr>
<td></td>
<td>PWM charge load constant-current</td>
</tr>
<tr>
<td>Load current</td>
<td>150mA – 3300mA</td>
</tr>
<tr>
<td></td>
<td>150mA – 10A</td>
</tr>
<tr>
<td></td>
<td>50mA – 2500mA</td>
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<td>50mA – 3000mA</td>
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<td>Load voltage</td>
<td>≤ 20V</td>
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<td></td>
<td>0~ battery voltage</td>
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<tr>
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<td>5 ~ 25V</td>
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<td></td>
<td>5 ~ 35V</td>
</tr>
<tr>
<td>Maximum power of load</td>
<td>20W</td>
</tr>
<tr>
<td></td>
<td>30W/3.2V</td>
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<td></td>
<td>60W/6.4V</td>
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<td>40W/6.4V</td>
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<tr>
<td></td>
<td>30W/3.2V</td>
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<td>60W/6.4V</td>
</tr>
<tr>
<td>Charge voltage</td>
<td>3.65V</td>
</tr>
<tr>
<td></td>
<td>(lithium iron phosphate battery)</td>
</tr>
<tr>
<td></td>
<td>4.20V</td>
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<tr>
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<td>(ternary lithium battery)</td>
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<tr>
<td>Charge return voltage</td>
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<tr>
<td></td>
<td>(lithium iron phosphate battery)</td>
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<td></td>
<td>3.90V</td>
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<td></td>
<td>(ternary lithium battery)</td>
</tr>
<tr>
<td>Over discharge voltage</td>
<td>2.50V</td>
</tr>
<tr>
<td></td>
<td>(lithium iron phosphate battery)</td>
</tr>
<tr>
<td></td>
<td>3.00V</td>
</tr>
<tr>
<td></td>
<td>(ternary lithium battery)</td>
</tr>
<tr>
<td>Over discharge return voltage</td>
<td>3.00V</td>
</tr>
<tr>
<td></td>
<td>(lithium iron phosphate battery)</td>
</tr>
<tr>
<td></td>
<td>3.30V</td>
</tr>
<tr>
<td></td>
<td>(ternary lithium battery)</td>
</tr>
<tr>
<td>Light control voltage</td>
<td>1V ~ 7V</td>
</tr>
<tr>
<td></td>
<td>5s ~ 60s/2min ~ 60min</td>
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<td>Light control delay</td>
<td>1min ~ 60min (settable)</td>
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<tr>
<td>Operating temperature</td>
<td>≤ -5°C ~ -65°C</td>
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<td>IP rating</td>
<td>IP68</td>
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<td>Weight</td>
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<tr>
<td>Controller dimensions</td>
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<td>43x82x17</td>
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<td></td>
<td>58x82x17</td>
</tr>
<tr>
<td></td>
<td>80x82x23.5</td>
</tr>
</tbody>
</table>

**Indicators Description:**

- Steady on: Solar panel voltage is higher than light control voltage
- Off: Solar panel voltage is lower than light control voltage
- Slow Flash: Battery works properly
- Quick Flash: Battery over-discharge
- System over-voltage

**Wiring and Panel Description:**

Wiring sequence: Firstly connect the load, then the battery and finally the solar panel.

Note: In order to avoid short circuit between the leads, please connect one lead and wind with insulating tape before connecting the next one!!