



8 Share-Home

Smart Solar System User Manual



Thank you for choosing iShare-Home Smart Solar System!

This installation manual contains important electrical and mechanical installation information that should be known before you install iShare Home Smart Solar System. In addition, the manual contains some other security information that you must know. Copyright is owned by Slenergy Technology (A.H.) Co., Ltd. (hereinafter referred to as Slenergy) and no content of this document can be reproduced or disseminated in any form or manner without Slenergy's prior written consent.

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Slenergy Technology GmbH

Website www.Slenergy.com Address HAMBURGUR ALLEE 2-4 60486 FRANKFURT AM MAIN

Technical Support Email service@Slenergy.com

Disclaimer: The information in this document is for reference only, and does not constitute any offer or acceptance. The changes of the product parameters or configuration are subject to the latest information.

About This Manual

Purpose

This manual introduces the installation, electrical connection, debugging, use, maintenance and troubleshooting of Slenergy iShare Home Smart Solar System Before installation and operation, please read through this document to understand the security information and familiarize with the system functions and features.

Note

The installation and use of energy storage function are not mentioned in the main text of this manual. This section will be optimized in later stage.

Reader

The readers of this manual are:

- System installer
- System user

This manual is applicable to electrical installers with professional qualifications and end-users, who should have the following skills:

- Training for installation and commissioning of the electrical system, as well as dealing with hazards.
- ² Knowledge of the manual and other related documents.
- ³ Knowledge of the local regulations and directives.

Symbols

Definition of the symbols in this manual are as the following:

result in death or serious injury.

could result in death or serious injury.

could result in minor or moderate injury.



may be helpful, e.g., to help you solve problems or save time.

Indicates a hazard with a medium level of risk which, if not avoided,

Indicates a hazard with a low level of risk which, if not avoided,

Indicates a situation that, if not avoided, could result in equipment or property damage, data loss, equipment performance degradation.

Indicates additional information, emphasized contents or tips that





If fire, switch off the breaker on DC side and stay away from battery.



The battery cannot be disposed of with household waste.



This symbol identifies the precautions or instructions that may pose a risk to the safety of the user or cause significant hardware damage if not properly operated.



The SL-D5 must not be touched or put into service until 5 minutes after it has been switched off or disconnected to prevent an electric shock or injury.



This sign shows danger of hot surface!



Refer to the operating instructions.

The warning signs contain important information for the system to operate safely, and it is strictly prohibited to torn or damage them. Ensure that the warning signs are always well-functioned and correct placed. The signs must be replaced immediately when damaged.

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1.1 System schematics and wiring diagram

The system in this manual is composed of PV module, inverter, battery, iBox, mounting structure and cable sets, and can convert the DC power generated by the PV system into 230Vac single-phase AC power via the inverter. The system is connected to the original distribution box of the user. It is a smart power generation system that meets the local grid connection needs and controls the feed to the grid. The iBox in this manual works in an iShare-home PV power generation system. The basic variant of iShare-home residential PV power generation system is composed of PV modules, inverter, iBox, mounting structure and cables, Figures 1.1-1 and 1.1-2 respectively show the schematics and wiring diagram of the basic variant of iShare-home system.





Figure 1.1-2 iBox Topography

| Solution | Config | uration | | |
|----------|---------------|------------|--|--|
| Solution | Inverter | ESS | | |
| SL-D5-5 | SL-D5KTL-L100 | SL-BL-1-5 | | |
| SL-D5-10 | SL-D5KTL-L100 | SL-BL-2-10 | | |
| SL-D5-15 | SL-D5KTL-L100 | SL-BL-3-15 | | |
| SL-D5-20 | SL-D5KTL-L100 | SL-BL-4-20 | | |

Table 1.1-3 iShare Home Smart Solar System Configuration



Safety Introduction



2.1 Safety Introduction

2.1.1 Manual Keeping

This manual contains important information about operating the system. Before operating, please read it very carefully. The system should be operated in strict accordance with the instructions in the manual, otherwise it can cause damages or loss to equipment, personnel and property. This manual should be kept carefully for maintenance and reparation.

2.1.2 Setting of Warning Sign for Safety

During instruction, maintenance and repair, follow the instructions below to prevent non-specialist personnel from causing misuse or accident:

- 1 Obvious signs should be placed at front switch and rear-level switch to prevent accidents caused by false switching.
- 2 Warning signs or tapes should be set near operating areas.
- 3 The system must be reinstalled after maintenance or operation.

2.1.3 Measuring Equipment

To ensure the electrical parameters to match requirements, related measuring equipment is required when the system is being connected or tested. Ensure that the connection and use matched specification to prevent electric arcs or shocks.

2.1.4 Moisture Protection

It is very likely that moisture may cause damages to the system. Repair or maintaining activities in wet weather should be avoided or limited.

2.2 Equipment List

System configuration is as the following

| System Configuration | | | | 5kW | | |
|------------------------|---------------------------------------|---|-----------------------|------------|------------|------------|
| PV Module | 2.43kW | 3.24kW | 4.05kW | 4.86kW | 5.67kW | 6.48kW |
| No. PV modules (pcs) | 6 | 8 | 10 | 12 | 14 | 16 |
| Inverter | 5kW*1set | 5kW*1set | 5kW*1set | 5kW*1set | 5kW*1set | 5kW*1set |
| Battery | 5kWh~10kWh | 5kWh~15kWh | 5kWh~20kWh | 5kWh~20kWh | 5kWh~20kWh | 5kWh~20kWh |
| iBox | 1 set | 1 set | 1 set | 1 set | 1 set | 1 set |
| | DC Cable: H1Z2 | Z2-K 1×6mm ² ; UL 11 | 627 10AWG | | | |
| Cable set | AC Cable: NYY- | 3G 4.0mm ² | | | | |
| | Grounding Cabl | e: NYY-1×6mm²; H07 | 7V-K 6mm ² | | | |
| | Connectors | | | | | |
| Mounting Structure set | Rail, hook kit/Ha earthing lug and | anger Bolt, rail conne d other accessories | ector, mid-clamp, end | I-clamp, | | |
| Cloud & APP | 1 set | 1 set | 1 set | 1 set | | |

2.3 Technical data of PV module

2.3.1 Modules identification

3 labels on the modules contain information below:

- 1 Nameplate: product type, rated power, rated current, rated voltage, open circuit voltage, short circuit current under testing conditions, certification indicator, maximum system voltage, etc.
- 2 Current classification label: Rated working current (H indicates High, M indicates Medium, L indicates Low).
- 3 Serial Number label: A unique serial number which is laminated inside the module permanently which can be found in the front of the module. There is another same serial number beside the module nameplate.



Figure 1.3.1-1 Regular modules Mechanical drawing

| 1 Frame | 2 Glass | 3 EVA | 4 Solar Cell |
|---------------|--------------|------------------|-------------------|
| 5 Backsheet | 6 Silica Gel | 7 Junction Box | 8 Name Plate |
| 9 Cable | 10 Connector | 11 Mounting Hole | 12 Grounding Hole |
| 13 Drain Hole | 14 Bar Code | | |

| No. | Items | Specifications |
|------|---|--|
| 1 | Module Number | SL-108PA-405 |
| 2 | Electrical Characteristics | |
| 2.1 | Maximum Power (Pmax/W) | 405 |
| 2.2 | Open Circuit Voltage [Voc/V] | 37.38 |
| 2.3 | Short Circuit Current (Isc/A) | 13.76 |
| 2.4 | Voltage at Maximum Power (Vmp/V) | 31.35 |
| 2.5 | Current at Maximum Power (Imp/A) | 12.92 |
| 2.6 | Module Efficiency (%) | 20.7 |
| 3 | Mechanical Parameters | |
| 3.1 | Cell Orientation | 108 (6*18) |
| 3.2 | Junction Box | IP68, three diodes |
| 3.3 | Output Cable | 4mm², 1200mm in length |
| 3.4 | Glass | Single glass, 3.2mm coated tempered glass |
| 3.5 | Frame | Anodized aluminum alloy frame |
| 3.6 | Weight (kg) | 21.5 |
| 3.7 | Dimension (mm) | 1722*1134*30 |
| 3.8 | Packaging | 36pcs per pallet 216pcs per 20'GP 936pcs per 40'HC |
| 4 | Operating Parameters | |
| 4.1 | Operational Temperature (°C) | -40°C ~ +85 |
| 4.2 | Power Output Tolerance (W) | 0~+5 |
| 4.3 | Voc and Isc Tolerance | ±3% |
| 4.4 | Maximum System Voltage (V) | DC1500 (IEC/UL) |
| 4.5 | Maximum Series Fuse Rating (A) | 30 |
| 4.9 | Nominal Operating Cell Temperature (°C) | 42±2 |
| 4.10 | Safety Protection Class | Class II |
| 4.11 | Fire Rating | UL type 1 or 2 |
| 5 | Temperature Ratings (STC) | |
| 5.1 | Temperature Coefficient of Isc | +0.048%/°C |
| 5.2 | Temperature Coefficient of Voc | -0.250%/°C |
| 5.3 | Temperature Coefficient of Pmax | -0.300%/°C |
| 6 | Mechanical Loading | |
| 6.1 | Front Side Maximum Static Loading (Pa) | 5400 |
| 6.2 | Rear Side Maximum Static Loading (Pa) | 2400 |
| 6.3 | Hailstone Test | 25mm Hailstone at the speed of 23m/s |

2.3.2 Technical data of PV module

STC (Standard Testing Conditions) : Irradiance 1000W/m²,Cell Temperature 25°C, Spectra at AM1.5

| No. | ltems | Specifications |
|------|---|---|
| 1 | Module Number | SL-108PA-405R |
| 2 | Electrical Characteristics | |
| 2.1 | Maximum Power (Pmax/W) | 405 |
| 2.2 | Open Circuit Voltage [Voc/V] | 37.19 |
| 2.3 | Short Circuit Current (lsc/A) | 13.79 |
| 2.4 | Voltage at Maximum Power (Vmp/V) | 31.23 |
| 2.5 | Current at Maximum Power (Imp/A) | 12.90 |
| 2.6 | Module Efficiency (%) | 20.74 |
| 3 | Mechanical Parameters | |
| 3.1 | Cell Orientation | 108 (6*18) |
| 3.2 | Junction Box | IP68, three diodes |
| 3.3 | Output Cable | 4mm², 1200mm in length |
| 3.4 | Glass | Single glass, 3.2mm coated tempered glass |
| 3.5 | Frame | Anodized aluminum alloy frame |
| 3.6 | Weight (kg) | 21.5 |
| 3.7 | Dimension (mm) | 1722*1134*30 |
| 3.8 | Packaging | 36 pieces per pallet 936 pcs per 40'HC |
| 4 | Operating Parameters | |
| 4.1 | Operational Temperature (°C) | -40°C ~ +85 |
| 4.2 | Power Output Tolerance (W) | 0~+5 |
| 4.3 | Voc and Isc Tolerance | ±3% |
| 4.4 | Maximum System Voltage (V) | DC1500 (IEC/UL) |
| 4.5 | Maximum Series Fuse Rating (A) | 25 |
| 4.9 | Nominal Operating Cell Temperature (°C) | 45±2 |
| 4.10 | Safety Protection Class | Class II |
| 4.11 | Fire Rating | UL type 1 or 2 |
| 5 | Temperature Ratings (STC) | |
| 5.1 | Temperature Coefficient of Isc | +0.048%/°C |
| 5.2 | Temperature Coefficient of Voc | -0.270%/°C |
| 5.3 | Temperature Coefficient of Pmax | -0.350%/°C |
| 6 | Mechanical Loading | |
| 6.1 | Front Side Maximum Static Loading (Pa) | 5400 |
| 6.2 | Rear Side Maximum Static Loading (Pa) | 2400 |
| 6.3 | Hailstone Test | 25mm Hailstone at the speed of 23m/s |

STC (Standard Testing Conditions) : Irradiance 1000W/m²,Cell Temperature 25°C, Spectra at AM1.5

2.4 Technical data of All-in-one energy storage system

2.4.1 All-in-one energy storage system

| Battery Model | | SL-BL-1-5 | | |
|---|--|-------------------------------|---|--|
| Battery | | Operation | | |
| Battery type | LFP (LiFePO ₄) | Max. Charge/Discharge Current | 50A/80A | |
| Weight (kg) | 54 | Rated DC power | 4096W | |
| Dimension (W×H×D) (mm) | 540*490*240 | Max. Charge/Discharge Power | 2825W/4096W | |
| IP Protection | IP65 | Operating Temperature Range | -10 to 50°C charging -10 to 50°C discharging | |
| Warranty | 5 Year Product Warranty, 10 Year Performance Warranty | Humidity | 0~95% (No condensation) | |
| Electrical | | BMS | | |
| Usable Capacity (kWh) | 4.6 | Capacity | 100-400Ah | |
| Depth of Discharge (DoD) | 0.9 | Power Consumption | <2W | |
| Nominal Voltage (V) | 51.2 | Communication | CAN & RS485 | |
| DC Circuit Breaker (A) Operating Voltage Range (V) | 125 44.8-56.5V | Monitoring Parameters | System voltage, current, cell voltage, cell temperature, PCBA temperature measurement | |
| Internal Resistance (mΩ) | <20mΩ | Certificate | | |
| Cycle Life | 10000 cycle | Safety (Cell) | Pack: IEC/EN 62619;UN38.3 Cell: IEC/EN 62619;UN38.3;UL1973 | |

| Hybrid Inverter Model | SL-D5KTL-L100 |
|--|--------------------------------------|
| PV String Input | |
| Max. DC Voltage (V) | 580 |
| Nominal Voltage (V) | 400V |
| MPPT Voltage Range (V) | 80-560 |
| Start Voltage (V) | 150 |
| Number of MPPT Tracker | 2 |
| Strings Per MPPT Tracker | 1 |
| Max. Input Current Per MPPT (A) | 15 |
| Max. Short-circuit Current Per MPPT (A) | 18 |
| AC Output (Grid) | |
| Nominal AC Output Power (W) | 5000 |
| Max. AC Apparent Power (VA) | 7360 (from grid) |
| Max. AC Output Power (W) | 50001 |
| Nominal AC Voltage (VAC) | 230 |
| AC Grid Frequency Range (Hz) | 50 / 60±5 |
| Max. Output Current (A) | 22A2 |
| Max. Input Current (A) | 32 |
| Power Factor (cosΦ) | 0.8leading-0.8lagging |
| THDi | <3% |
| Battery Input | |
| Battery Type | LFP (LiFePO ₄) |
| Nominal Battery Voltage (V) | 48 |
| Charging Voltage Range (V) | 40-60 |
| Max. Charging Current (A) | 100 |
| Max. Discharging Current (A) | 100 |
| Battery Capacity (Ah) | 100-400 |
| Charging Strategy for Li-ion Battery | Depend on the BMS |
| AC Output (Backup) | |
| Max. Output Apparent Power (VA) | 5000 |
| Peak Output Appare nt Power (VA) | 6900VA 10sec |
| Max. Output Current (A) | 20 |
| Nominal Output Voltage (V) | 230 |
| | |
| Nominal Output Frequency (Hz) | 50/60 |
| Nominal Output Frequency (Hz) Output THDv (@Linear Load) | 50/60 <3% (Linear Load) |
| Nominal Output Frequency (Hz) Output THDv (@Linear Load) Efficiency | 50/60 <3% (Linear Load) |
| Nominal Output Frequency (Hz) Output THDv (@Linear Load) Efficiency Euro. PV Efficiency | 50/60 <3% (Linear Load) 97.00% |

| Hybrid Inverter Model | SL-D5KTL-L100 | | |
|----------------------------------|---|--|--|
| Protection | | | |
| DC Switch | Bipolar DC Switch (125A/Pole) | | |
| Anti-islanding Prote ction | Yes | | |
| Output Over Current | Yes | | |
| DC Reverse Polarity Protection | Yes | | |
| String Fault Detection | Yes | | |
| AC/DC Surge Protection | DC Type II; AC Type III | | |
| Insulation Detection | Yes | | |
| AC Short Circuit Protection | Yes | | |
| General Specifications | | | |
| Dimensions W×H×D (mm) | 540*590*240 | | |
| Weight (kg) | 32 | | |
| Operating Temperature Range (°C) | -25°C~+60°C | | |
| Noise (dB) | <25 | | |
| Cooling Type | Natural Convection | | |
| Max. Operation Altitude (m) | 2000 | | |
| Operation Humidity | 0~95% (No Condensation) | | |
| IP Class | IP65 | | |
| Topology | Battery Isolation | | |
| Communication | RS485/CAN2.0/WIFI/4G | | |
| Display | LCD/APP | | |
| | IEC/EN61000-6-1; IEC/EN61000-6-2; EN61000-6-3; IEC/EN61000-6-4; IEC/EN61000-3-11; EN61000-3-12; | | |
| Certification & Standard | IEC60529; IEC60068; IEC61683; IEC61683; IEC61727; EN50549-1; AS 4777.2; NRS 097; VDE-AR-N-4105; CEI0-21;G98; G99;C10/C11; NTS 631 TYPE A | | |

*1. Nominal AC output power is 4999W for Australia and 4600W for Germany and South Africa.

*2. Maximum output current is 21.7A for Australia and 20A for Germany and South Africa.

2.5 Technical data of mounting system

| Technical Parameter | |
|-------------------------|--|
| Product Name | Solar Mounting System |
| Building Type | Pitched Roof |
| Tile Type | Concrete Tile, Clay Tile, Slate Tile |
| Tilt Angle | 15-60° |
| Wind Load | 0.52KN/m² |
| Snow Load | 0.6KN/m ² |
| Applicable Solar Module | Framed |
| Panel Layout | Portrait or Landscape |
| Design Standard | EN 1991-1-1: 2002 UNE EN1991-1-3-2018 UNE EN 1991-1-4-2018 |
| Main Material | AL6005-T6 (Anodized) |
| Fastener | SUS304 & Zinc-Nickel Alloy Electroplated Steel |
| Small Components | AL6005-T6 (Anodized) |
| Color | Silver and black |
| Certificate | TUV |

| | Item No. | Description | Material |
|--------|-----------|---------------------|------------|
| | 51211786A | Rail H40 | AL6005-T6 |
| | 31220174A | Rail Splice | AL6005-T6 |
| Ŷ | 31101261A | Universal clamp kit | AL6005-T6 |
| | 31101262A | Tile hook | AL6005-T6 |
| | 31101262A | Hanger Bolt | AL6005-T6 |
| | 51230026R | End cap | Silica Gel |
| * | 55110091 | Cable clip | SUS304 |
| | 31510043A | Grounding Lug | AL6005-T6 |
| \sim | 51500011F | Earthing clip | SUS304 |

2.6 Technical data of iBox

| | iBox | SL-BH5KL |
|-----|----------------------------|--------------------------|
| 1 | DC Side | |
| 1.1 | Max input/output voltage | DC560V |
| 1.2 | Max input/output current | 15A |
| 2 | AC Side | |
| 2.1 | Rated input/output voltage | AC230V |
| 2.2 | Max input/output current | 22A |
| 2.3 | Rated Frequency | 50/60Hz |
| 3 | Working environment | |
| 3.1 | Operation Temp. | -10°C~+50°C |
| 3.2 | Relative Hum. | 98% Non-condensation |
| 3.3 | Altitudes | <2000m |
| 3.4 | P Degree | IP54 |
| 3.5 | Installation methods | Indoor, Hanging |
| 4 | Standards & Certifications | |
| 4.1 | Standards | IEC61439-1 IEC61439-2 |
| 4.2 | Certifications | CE |
| 4.3 | Dimensions(mm) | W×H×D: 400×400×160mm |
| 4.4 | Weight | 23kg |

2.7 Technical data of cable

2.7.1 Cable set

| No. | Name | Specification | From | То | Remark | Length(m) | Accessory bag |
|-----|--------------------------------------|------------------------------|--------------------------------|------------------------------|--|-----------|---------------|
| 1 | PV DC Cable | H1Z2Z2-K 1×6mm² | PV Modules | iBox PV Input | Cable terminals are made and installed on site | 40-80 | MC4 Connector |
| 2 | iBox to Inverter | UL 11627 10AWG | iBox DC Output | Inverter DC input | Both side terminals are prefabricated and installed at the factory | 4 | |
| 3 | inverter to IBox | NYY- 3G4.0mm² | Inverter AC output terminal | iBox AC input | Both side terminals are prefabricated and installed at the factory | 2 | - |
| 4 | iBox to original distribution box | NYY- 3G4.0mm ² | IBox AC output | Original distribution box | iBox side terminal is prefabricated and installed at the factory | 20 | - |
| 5 | PV Roof Grounding | NYY-1×6mm ² | PV supporting bracket | External ground Bar | Cable terminals are made and installed on site | 20-40 | - |
| 6 | Inverter & iBox Grounding | H07V-K 6mm ² | Inverter grounding hole | External ground Bar | Inverter side terminals are prefabricated and installed at the factory | 20 | - |

2.7.2 DC Cable

| Туре | 1×6mm ² DC 1500V |
|---|--|
| Conductor | Stranded tinned copper (IEC 60228 Class 5) 84/0.285mm (mix0.277mm max0.293mm) |
| Stranded OD | 3.01mm |
| Inner Insulation | Halogen free crosslinked polyolefin Color: black |
| Outer Insulation | Halogen free crosslinked polyolefin Color: black |
| Inner Diameter | 4.6±0.15mm |
| Outer Diameter | 6.3±0.15mm |
| Maximum resistance of conductor at 20°C | ≤3.39Ω/km |
| Insulation resistance at 20°C | ≥610 MΩ·Km |
| Insulation resistance at 90°C | ≥0.61 MΩ·Km |
| Surface resistance of sheath | ≥10 9Ω |
| DC Voltage test of insulation | 900V, 240h(85°C, 3%Nacl) No break |
| Tensile strength of insulation | ≥10.3Mpa |
| Rating voltage | IEC/EN: DC1500V AC 1000V |
| Working temperature | -40~90°C |
| Max. conductor temperature | 120°C |
| Short circuit temperature | 250°C 5S |
| Bending radius | 6×D |
| Current rating | |
| Free in air | 70A |
| On surface without opposite contact | 67A |
| On surface with opposite contact | 57A |
| Rating voltage | IEC/EN: DC1500V AC 1000V |
| Working temperature | -40~90°C |
| Max. conductor temperature | 120°C |
| Short circuit temperature | 250°C 5S |
| Bending radius | 6×D |
| | |
| | |

| | CABLE TYPE | UL 11627 10AWG | |
|----------------------------------|-------------------------------|-------------------------------|----------------|
| | Area | 1×10AW | |
| | Material | TXR tinned copper wire | |
| CONDUCTOR | Size | 105/0.254±0.008mm | |
| | O.D | 3.00 mm | |
| | 20°C max conductor resistance | 3.546 Ω/k | Insulation: BK |
| | Material | PVC | |
| INSULATION | Normal thickness | 0.76 mm | |
| | 0.D. | 4.80±0.20m | |
| 1.Rated voltage | : 2000V | 1.Tensile Strength: ≥10.3 Mpa | |
| 2.Rated temperature: -15°C~105°C | | 2.Elongation: ≥100% | |
| 3.Voltage withstand test: 5.0kV | | 3.Flame test: VW-1 | |
| 4.Reference Sta | andards: UL758, UL1581 | | |
| 5.Maximum cor | nductor Capacity: 30A | | |

2.7.3 AC Cable

| | CABLE TYPE | NYY-J | |
|------------------------------------|-------------------------------|-------------------------------|--------------------------------------|
| | Area | 3 G4.0 mm ² | |
| | Material | Bare copper stranded | |
| CONDUCTOR | Size | 73/0.25±0.008mm | |
| | O.D | 2.46mm | |
| | 20°C max conductor resistance | 4.95Ω/km | Insulation: According to requirement |
| | Material | FRPVC 40P | |
| INSULATION | Normal thickness | 1.00mm | |
| | 0.D. | 4.5±0.10m | |
| CABLING | O.D. (ref) | 9.7mm | |
| | Material | FRPVC | |
| IA CIVET | Normal thickness | 1.80mm | |
| JACKET | Minimum thickness | 1.43mm | |
| | O.D | 14.0±0.40mm | |
| 1.Rated voltage: | 0.6/1kV | 1.Tensile Strength: ≥12.5 Mpa | 3 |
| 2.Rated temperature: -15°C~70°C | | 2.Elongation: ≥125% | |
| 3.Voltage withstand test: AC 4.0kV | | 3.Flame test: 60332-1 | |
| 4.Reference Standards: IEC 60502 | | 4.UV resistance: 300h, UL75 | 8 |
| 5.Rated Capacit | ty: 32A | | |

2.7.4 Earthing Cable

| | CABLE TYPE | NYY 1×6QMM | |
|---|-------------------------------|--|---------------------------------|
| | Area | 1×6mm² | |
| | Material | Bare copper stranded | |
| CONDUCTOR | Size | 109/0.25±0.008mm | |
| | 0. D. | 3.01mm | |
| | 20°C max conductor resistance | 3.3 Ω/km | Insulation: YE/GN Jacket: BK |
| | Material | FRPVC 40P | |
| INSULATION | Normal thickness | 1.20mm | |
| | Minimum thickness | 0.98mm | - |
| | 0.D. | 5.40±0.2mm | _ |
| | Material | FRPVC | _ |
| | Normal thickness | 2.00mm | _ |
| JACKET | Minimum thickness | 1.70mm | _ |
| | 0.D. | 9.5±0.2mm | _ |
| 1.Rated voltage: 0.6/1kV 2.Rated temperature: -15°C~70°C 3.Voltage withstand test: AC 4kV 4.Min. Insulated resistance: 20.0MΩ·km 5.Carrying capacity: 40A 6. Reference Standards: IEC 60502 | | 1.Tensile Strength: ≥10 Mpa 2.Elongation: ≥100% 3.Flame test: IEC60332-1 4.UV resistant: 300h, UL758 5.Fixed installation Min bend | ing radius: 10×OD |
| 7.Maximum con | ductor temperature: 70°C | | |
| 8.Maximum sho | rt - circuit temperature: 1 | 60°C | |

2.8 Safety notice

iShare Home Smart Solar System is a new energy generation system that uses PV modules to generate electricity for household loads. Improper use of this system may cause harm to the life and health of the user or third parties as well as damage to the system and other items of value, The following points must therefore be observed in order to comply with the intended use of the system:

- 1 Before performing operations, read through this manual and follow all the precautions to prevent accidents. The DANGER, WARNING, CAUTION, and NOTICE statements in the document do not represent all the safety instructions. They are only supplements to the safety instructions.
- 2 Only certified electricians are allowed to install, connect cables for, commission, maintain, and troubleshoot the system, and they must understand basic safety precautions to avoid hazards.
- 3 The transport and storage conditions must be observed.

PV modules

- 1 Children or unauthorized personnel are not allowed to access the installation area or module storage area.
- 2 Use insulating tools to reduce the risk of electric shock.
- 3 Do not use or install damaged module.
- 4 The installation of the module array must be carried out under the condition that the sun light isolation device is provided, and the installation and maintenance of the module can only be carried out by qualified professionals.
- 5 Do not use a mirror or lens to focus sunlight on module.
- 6 If battery is used in photovoltaic system, the configuration of module shall follow the opinions of battery manufacturer.
- 7 The front glass has the function of protecting the module. The damaged module has the electrical hazard (electric shock and fire). Such module cannot be repaired or repaired, so it should be replaced immediately.
- 8 Do not install module in areas where combustible gases may be present.
- 9 All module systems shall be grounded. If there is any special regulation, please follow international electrical standards or other international standards.

Inverter

During instruction, maintenance and repair, follow the instructions below to prevent non-specialist personnel from causing misuse or accident:

- 1 Obvious signs should be placed at front switch and rear-level switch to prevent accidents caused by false switching.
- 2 Warning signs or tapes should be set near operating areas.
- 3 The system must be reinstalled after maintenance or operation.
- 4 To ensure the electrical parameters to match requirements, related measuring equipment is required when the system is being connected or tested. Ensure that the connection and use matched specification to prevent electric arcs or shocks.
- 5 It is very likely that moisture may cause damages to the system. Repair or maintaining activities in wet weather should be avoided or limited.
- 6 The battery system is part of the energy storage system which stores life-threatening high voltage even when the DC side is switched off. Touching the battery outlets is strictly prohibited. The inverter can keep a life-threatening voltage even after disconnecting it from the DC and / or AC side. Therefore, for safety reasons, it must be tested with a properly calibrated voltage tester before an installer works on the equipment.

Battery

Classification of the hazardous chemical

Exempt from classification according to Australian WHS regulations.

Other hazards

This product is a Lithium Iron Phosphate Battery with certified compliance under the UN Recommendations on Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, subsection 38.3. For the battery cell, chemical materials are stored in a hermetically sealed metal case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous materials' leakage. However, if the product is exposed to afire, added mechanical shocks, decomposed, added electric stress by misuse, the gas release vent will be operated. The battery cell case will be breached at the extreme. Hazardous materials may be released. Moreover, if heated strongly by the surrounding fire, acrid or harmful fume may be emitted.

Mounting Structure

- 1 Please abide by the local national or local building regulations and environmental protection regulations. Please comply with the regulations on the prevention of industrial accidents and the relevant regulations of the insurance union.
- 2 When working at heights, please set up scaffolds and carry out construction after eliminating the danger of falling. Please use gloves and seat belts.
- 3 In order to prevent accidents and failures, please do not arbitrarily change the product style.
- 4 Please pay attention to the profile section and sharp parts, and avoid collision and injury during construction.
- 5 Please pay attention to tightening the bolts, nuts, self-tapping screws, etc. of each part, and pay great attention to whether they are locked.
- 6 When working on electrical wiring works, please pay attention not to touch the profile section, which may damage the wiring.
- 7 Please do not use damaged, faulty, or deformed products in case injury or accident happens. Please always prepare at least one installation work instruction when installing.
- 8 Please use the accessories designated by Slenergy for construction parts, and do not arbitrarily transform and change the products.
- 9 Please avoid hitting strongly on the profile as aluminum profile is easy to deform and scratch.
- 10 This information is related to the installation of the system. Please consider the characteristics of the stand during the construction of the foundation, components, inverter, and electrical wiring.

iBox

The iBox is used in iShare-home residential PV Systems, which is a new energy generation system that uses PV modules to generate electricity for household loads. Improper use of iBox may cause harm to life and health of personnel as well as damage to the iBox and other items. The following points must therefore be observed to comply with the intended use of the system:

- 1 Before performing operations, read through this manual and follow all the precautions to prevent accidents.
- 2 The DANGER, WARNING, CAUTION, and NOTICE statements in the document do not represent all the safety instructions. They are only supplements to the safety instructions.
- 3 Only certified electricians are allowed to install, connect cables, commission, maintain, and troubleshoot the product, and they must understand basic safety precautions to avoid hazards.
- 4 The transport and storage conditions must be observed.

2.9 Disclaimer

Slenergy shall not be liable for any consequence caused by any of the following events:

- 1 Damage during the transportation by the customer;
- 2 Transport damage (including painting scratch caused by rubbing inside packaging during shipping). A claim should be made directly to shipping or insurance company in this case as soon as the container/packaging is unloaded and such damage is identified;
- 3 Storage conditions that do not meet the requirements specified in this document;
- 4 Incorrect storage, installation, or use;
- 5 Installation or use by unqualified personnel;
- 6 Fail to follow any/all of the user manual, the installation guide and the maintenance regulations;
- 7 Operation in extreme environments which are not covered in this document;
- 8 Operation beyond specified ranges;
- 9 Unauthorized modifications to the product or software code or removal of the product;
- 10 Device damage due to force majeure (such as earthquake, fire, and storm);
- 11 Warranty expiration without extension of warranty service;
- 12 Installation or use in environments which are not specified in relevant international standards;
- 13 Product modified, design changed or parts replaced without authorization; Changes, repair attempts and erasing of series number or seals by non-company technician;
- 14 System design and installation are not in compliance with standards and regulations;
- 15 Fail to comply with the local safety regulations (VDE for DE, SAA for AU);
- 16 Improper use or misuse of the device; Insufficient ventilation of the device;
- 17 The maintenance procedures relating to the product have not been followed to an acceptable standard;
- 18 Force majeure (violent or stormy weather, lightning, overvoltage, fire etc.);
- 19 Damages caused by any external factors.

2.10 Operator requirements

The installation, electrical connection, commissioning, maintenance, troubleshooting and replacement of the system must be performed by professional technicians. The operator must meet the following requirements:

- 1 Operation personnel should receive professional training or instructing.
- 2 Operation personnel should read through this document and follow all the precautions.
- 3 Operation personnel should be familiar with the safety standards relevant to electrical systems.
- 4 Operation personnel should understand the composition and working principles of the grid-tied PV system and be aware of local regulations.
- 5 Operation personnel must wear proper personal protective equipment (PPE).

2.11 Protecting Labels

Do not scrawl, damage, or block any warning label on the device.

2.12 Regular Safety

PV Module

- 1 Do not stand or walk on the package or module; do not drop one module on another.
- 2 Do not install or dispose of module during wet, rainy, snowy or windy periods at the installation site.
- 3 Do not allow the cable plugs to contact each other in wet conditions, which may cause corrosion. Any corroded module shall not be used.
- 4 Do not lift the entire module by grasping the junction box or wire under any circumstances.
- 5 Do not connect the male and female connectors wrongly, check the wiring condition, and all connecting wires shall not be separated from the module.
- 6 Do not let the object directly hit the module or fall on the module directly.
- 7 Do not use sharp tools to scrub the glass of module, which will leave scratches on the module.
- 8 Do not touch the junction box or male and female head with bare hands during installation or when there is light on the module.
- 9 Do not repair the damaged module by yourself.
- 10 Do not split module or move any part of them.

All-in-one energy storage system



Danger to life due to high voltages of the PV array, battery and electric shock. When exposed to sunlight, the PV array generates dangerous DC voltage which will be present in the DC conductors and the live components of the inverter. Touching the DC conductors or the live components can lead to lethal electric shocks. If you disconnect the DC connectors from the system under load, an electric arc may occur leading to electric shock and burns.

- 1 Do not touch uninsulated cable ends. Do not touch the DC.
- 2 Do not open the inverter and battery.
- 3 Do not wipe the system with damp cloth.
- 4 Have the system installed and commissioned by qualified people with the appropriate skills only.
- 5 Prior to performing any work on the inverter or the battery pack, disconnect the inverter from all voltage sources as described in this document.



Risk of chemical burns from electrolyte or toxic gases. During standard operation, no electrolyte shall leak from the battery pack and no toxic gases shall form. Despite careful construction, if the Battery Pack is damaged or a fault occurs, it is possible that electrolyte may be leaked or toxic gases formed.

- 1 Do not install the system in any environment of temperature below -10°C or over 50°C and in which humidity is over 95%.
- 2 Do not touch the system with wet hands.
- 3 Do not put any heavy objects on top of the system.
- 4 Do not damage the system with sharp objects.
- 5 Do not install or operate the system in potentially explosive atmospheres or areas of high humidity.
- 6 Do not mount the inverter and the battery pack in areas containing highly flammable materials or gases.
- 7 If moisture has penetrated the system (e.g. due to a damaged enclosure), do not install or operate the system.
- 8 Do not move the system when it is already connected with battery modules. Secure the system to prevent tipping with restraining straps in your vehicle.
- 9 The transportation of SL-D5 must be made by the manufacturer or An instructed personal. These instructions shall be recorded and repeated.
- 10 A certified ABC fire extinguisher with minimum capacity of 2kg must be carried along when transporting.
- 11 It is totally prohibited to smoke in the vehicle as well as close to the vehicle when loading and unloading.
- 12 For the exchange of a battery module, please request for new hazardous goods packaging if needed, pack it and let it be picked up by the suppliers.
- 13 In case of contact with electrolyte, rinse the affected areas immediately with water and consult a doctor without delay.



Risk of injury through lifting or dropping the system. The inverter and battery are heavy. There is risk of injury if the inverter or battery is lifted incorrectly or dropped during transport or when attaching to or removing from the wall.

1 Lifting and transporting the inverter and battery must be carried out by more than 2 people.

2.13 Operation Safety

2.13.1 PV Module

- 1 Do not stand or walk on the package or module; do not drop one module on another.
- 2 Do not install or dispose of module during wet, rainy, snowy or windy periods at the installation site.
- 3 Do not allow the cable plugs to contact each other in wet conditions, which may cause corrosion. Any corroded module shall not be used.
- 4 Do not lift the entire module by grasping the junction box or wire under any circumstances.
- 5 Do not connect the male and female connectors wrongly, check the wiring condition, and all connecting wires shall not be separated from the module.
- 6 Do not let the object directly hit the module or fall on the module directly.
- 7 Do not use sharp tools to scrub the glass of module, which will leave scratches on the module.
- 8 Do not touch the junction box or male and female head with bare hands during installation or when there is light on the module.
- 9 Do not repair the damaged module by yourself.
- 10 Do not split module or move any part of them.

2.13.2 Operation after Power Failure

The battery system is part of the energy storage system which stores life-threatening high voltage even when the DC side is switched off. Touching the battery outlets is strictly prohibited. The inverter can keep a life-threatening voltage even after disconnecting it from the DC and / or AC side. Therefore, for safety reasons, it must be tested with a properly calibrated voltage tester before an installer works on the equipment.

2.14 Fire Safety

PV Module

Do not install the modules in places where they will be immersed in water or continuously exposed to water wheels or fountains

Please do not apply modules in where exposed inflammable gases are nearby.

All-in-one energy storage system

Please refer to the chapter Fire-fighting instruction.

2.15 Grounding

2.15.1 PV module grounding

The module needs to be grounded. It has been confirmed that the module meets the safety level II and the grounding method meets the local electrical instructions and regulations.

The grounding connection shall be carried out by qualified electricians.

In design of modules, the anodized corrosion resistant aluminum alloy frame is applied for rigidity support. For safety utilization and to protect modules from lightning and static-electricity damage, the module frame must be grounded. The grounding device must be in full contact with inner side of the aluminum alloy and penetrate surface oxide film of the frame.

Do not drill additional grounding holes on module frame.

The grounding conductor or wire may be copper, copper alloy, or any other material acceptable for application as an electrical conductor per respective National Electrical Codes. The grounding conductor must then make a connection to ground with a suitable ground electrode.

Holes marked with a grounding mark on the frame can only be used for grounding but not for mounting.

Grounding methods below are permissible

A Grounding by Earthing Clip

The PV module frame and mounting structure rail are made of aluminum alloy coated with oxidized film which is insulated. In order to make PV module frame grounded, a device called earthing clip is used in between PV module frame and mounting structure rail. The earthing clip has sharp strikes on both surfaces which can penetrate the oxidized film on aluminum alloy, conducting PV module frame and mounting structure rail. Please refer to 4.3.5 Installation of PV Modules for detail.

B The third-party grounding devices

The third-party grounding device can be used for grounding of PV modules but such grounding shall be proved to be reliable.

Grounding device shall be operated in line with stipulations of the manufacturer.

2.15.2 Mounting system grounding

PV module is connected with mounting bracket, and then reliable grounding is completed through downlead. When connecting the PV module frame and mounting bracket, it is necessary to remove the oxide film on the metal surface to reduce the grounding resistance.

Please refer to 4.3.6 Installation of Grounding Lug.

2.15.3 All-in-one energy storage system grounding

Please refer to the Chapter 4.4.4.6 Wiring Diagram

2.15.4 iBox grounding

Please refer to the Chapter 4.5.2 iBox Wiring

Transportation and storage



3.1 Storage and transportation of PV modules

3.1.1 Transportation and handling

PV module is made of glasswork and fragile silicon wafer, need to be quite careful during transportation and handling;

- 1 Do not stack module at the project site.
- 2 If the module needs to be covered with rain cloth during long-term turnover to prevent the module from moisture, and do not remove the packaging.
- The packed finished products can be transported by land, sea and air. During the transportation, it is necessary to ensure that the packaging will not roll over.
- 4 Turnover: normal truck transportation can be carried out after stacking up to two layers.
- 5 Do not use the backboard support assembly or the single-back assembly when transporting or installing module. Do not use the rope back assembly.
- 6 It is forbidden to turn around the tricycle. When the project is turned over, only one layer of transportation is allowed.
- 7 Please use a forklift to unload the module from the truck. The forklift can support up to two modules at a time and place the module on the horizontal ground.

3.1.2 Storage

Module should be stored in a dry and ventilated environment to avoid direct sunlight and moisture. If the modules are stored in an uncontrolled environment, the storage time should not exceed three months and additional measures are required to prevent the connectors from getting wet or the module being exposed to sunlight. For example, use a connector cover. Under no circumstances should you stand, climb, walk or jump on module. Partial heavy loads can create microcracks on the battery, which in turn can degrade module reliability.

- 1 Do not support the backboard support assembly when handling or installing module.
- 2 Do not drop or stack items (such as installation tools) on the module.
- 3 It is forbidden to contact the module with sharp objects. In particular, it is necessary to prevent the back plate of the module from being scratched by sharp objects. The scratches directly affect the safety of the module.
- 4 Do not place the module in an environment where there is no reliable support or is not fixed.
- 5 It is forbidden to change the wiring method of the bypass diode.
- 6 Please protect the package from damage. Open the package according to the recommended unpacking procedure. Care must be taken to open the packaging, transportation and storage process.

3.1.3 Unpacking

3.1.3.1 Unpacking security

- 1 When unpacking outdoors, it is forbidden to work under the conditions of rain.
- 2 Wear protective gloves during unpacking to avoid hand injury and fingerprints on the glass side.
- The working floor needs to ensure that the box can be placed horizontally and stably to avoid dumping.
- 4 The unpacking process must be performed by two people at the same time, and the module need to be lifted by both hands.

3.1.3.2 Unpacking

- 1 The package is placed horizontally, dry, and leveled, and the wrapping film, packing tape, upper cover, and carton are removed in turn.
- 2 After the panel is removed and placed between the box and the supporting object, the protection module is not scratched by the support. One person at each short side of the tray is ready to hold the module to prevent the module from falling over after the strap is disassembled. The person removes the strap and the two push the assembly so that the assembly rests on the support.
- 3 If the single glass module needs to be stacked, the pallets are placed on a level surface and the module must be stacked on the pallets; The number of modules is ≤ 5pcs, and the stacking time is ≤ 2 days; Isolation material must be used between the two modules, the height of the insulation material is greater than the maximum point size of the module protrusion 15mm (junction box), If there is no insulation material, horizontal stacking is not recommended.

3.2 Storage and transportation — of All-in-one energy storage system

3.2.1 Transporting

- 1 Do not install the system in any environment of temperature below -10°C or over 50°C and in which humidity is over 95%.
- 2 Do not touch the system with wet hands.
- 3 Do not put any heavy objects on top of the system.
- 4 Do not damage the system with sharp objects.
- 5 Do not install or operate the system in potentially explosive atmospheres or areas of high humidity.
- 6 Do not mount the inverter and the battery pack in areas containing highly flammable materials or gases.
- 7 If moisture has penetrated the system (e.g. due to a damaged enclosure), do not install or operate the system.
- 8 Do not move the system when it is already connected with battery modules. Secure the system to prevent tipping with restraining straps in your vehicle.
- 9 The transportation of SL-D5 must be made by the manufacturer or instructed personnel. These instructions shall be recorded and repeated.
- 10 A certified ABC fire extinguisher with minimum capacity of 2kg must be carried along when transporting.
- 11 It is totally prohibited to smoke in the vehicle as well as close to the vehicle when loading and unloading.
- 12 For the exchange of a battery module, please request for new hazardous goods packaging if needed, pack it and let it be picked up by the suppliers.

3.2.2 Storage environment requirements:

- Ambient temperature: -10°C~45°C; recommended storage temperature: 20°C~30°C;
- Relative humidity: 0%RH~95%RH (No condensation) ;
- In a dry, ventilated and clean place;
- No contact with corrosive organic solvents, gases and other substances;
- No direct sunlight;
- Less than 2 meters from any heat source.

3.2.3 Storage expiration

In principle, it is not recommended to store the battery for a long time. Be sure to use it in time. The stored batteries should be disposed according to the following requirements.

Table 3.2.3-1 Stored lithium battery recharging interval

| Required Storage Temperature | Actual Storage Temperature | Recharge Interval |
|------------------------------|---|-------------------|
| -10°C~+45°C | -10°C≤T≤30°C | 12 months |
| | 30°C <t≤45°c< td=""><td>8 months</td></t≤45°c<> | 8 months |
| | | |

- 1 If a battery is deformed, broken or leaking, discard it immediately regardless of its storage time.
- 2 The allowable maximum stored battery recharging period is 3 years and the allowable maximum stored battery recharging times is 3. For example, if recharging is performed once every 8 months, the allowable maximum recharging times is 3 times; if recharging is performed once every 12 months, the allowable maximum recharging times is 3 times; if the allowable maximum stored battery recharging period or times is exceeded, it is recommended to discard the battery.
- 3 A lithium battery will have its capacity decreasing after being stored for a long time, and typically will have its capacity irreversibly decreasing by 3%–10% after being stored at the recommended storage temperature for 12 months. If the customer conducts the discharge test and acceptance according to the specification, there is a risk that the battery with a capacity less than 100% after being stored will fail the test.

3.2.4 Inspection before battery recharging

Before recharging a battery, check its appearance: Deformation/Shell damage/Leakage

3.2.5 Recharge Operation Steps

Step 1 Connect power cables to the battery charger correctly. The maximum number of battery PACK connected parallel is 5.

Step 2 Turn on the battery PACK DC breaker to ON; Press the battery "start key" for 3 second to start the battery PACK. Check the LED on the battery PACK is on.

Step 3 Turn on the battery charger.

Step 4 Set charging parameter on the battery charger.

Case #1, one battery PACK is charged. Set the charge limited voltage 56.5V; Set the charge limited current 50A;

Case #2, Two ~ Five battery PACKs are charged. Set the charge limited voltage 56.5V; Set the charge limited current 100A;

Step 5 after the battery is charged, switch off the battery charger and then the battery DC breaker. Disconnect the DC cables and then press the battery "start key" for 3 second to switch off the battery PACK.

3.3 Transportation and storage of iBox

If the iBox does not need to be installed for the time being, the following should be noted when storing.

3.3.1 Storage environment

The iBox shall be stored in a cool, dry, water-free steam-free or corrosive gas-free, dust-free environment with ambient temperature not exceeding $-25^{\circ}C^{-}60^{\circ}C$.

Design protection grade of iBox is IP54, but before installing wiring, the inlet and outlet holes are not locked and may be in open state. At this point, if exposed to rain or water vapor, ingress of water vapor or corrosive gas into the iBox may occur, and then affect the electrical performance of the iBox and safe use.

3.3.2 Stacking Restrictions

The iBox should be stacked horizontally, vertical stacking is prohibited.



3.3.3 Using after long-term storage

If the iBox is stored for more than one year, the user should have it checked and tested by a professional person before us, or contact the manufacture.


Equipment installation



4.1 Checking Before Installation

4.1.1 Installation tools





iBox Mounting Accessories

4.1.2 Pre-installation check of the module

- 1 Before installing module, you should contact the relevant department to obtain information about the installation site and construction permit, and also comply with the requirements of the authorized party for installation and inspection.
- 2 When installing the module, make sure that the modules are installed on a fire-resistant roof. The SL-108PA-405 single-glass module have a minimum fire rating of C according to IEC61730-2.
- 3 If the terminal of the PV module is wet, no work can be done to avoid electric shock. It is recommended to install it immediately after unpacking.
- 4 Do not stand on the glass when working, so as to avoid damage caused by broken glass or risk of electric shock.
- 5 Don't work alone (Always keep working with a team of 2 or more people).
- 6 When fastening the PV assembly to the bracket by clamps or screws, do not damage the back panel of the PV assembly.
- 7 Take precautions during installation to prevent the module from being squeezed or impacted by external forces.

4.1.2.1 Installation condition

A. Working environment

The recommended installation ambient temperature is between -40°C and 85° C.

Do not install the module where they may be immersed in water.

B. Installation site

Note: The mechanical load of the module (including the pressure of wind and snow) is based on the installation method and installation location. The mechanical load must be calculated by a professional installer based on the design requirements of the system.

In general, solar modules should be installed at locations where they receive the lightest throughout the year. In the northern hemisphere, the modules are best placed south, while in the southern hemisphere, the module are best placed north. If the tilt angle of the module deviates from the positive south (or north) direction by 30 degrees, approximately 10% to 15% of the power output will be lost; If the tilt angle of the module is 60 degrees away from the true south (or north) direction, approximately 20% to 30% of the power output will be lost. When choosing a location, avoid trees, buildings, or other obstacles that create shadows on the module. Although the manufacturer has installed appropriate bypass diodes to minimize this loss, the shadows still cause a reduction in output power.

When a photovoltaic power generation system uses a battery, the battery must be installed correctly, which can protect the operation of the system and ensure the safe use of the user; Please follow the battery manufacturer's instructions for installation instructions, operation and maintenance; In general, batteries should be kept away from the main traffic routes of people and animals; While ensuring the normal operation of the battery, avoid direct sunlight, rain and snow erosion, and maintain good ventilation; Most batteries generate hydrogen when they are charged, which is prone to explosions. Do not spot fire or create sparks around the battery. If the battery is installed outdoors, it must be placed in a specially designed location with good insulation and ventilation.

Do not install module near open flames or flammable materials.

Do not install the module where they are soaked in water or where they are continuously exposed to waterwheels or fountains.

4.1.3 Checking Before iBox Installation

The following cautions should be noticed before installing the AC Box.

Electric shock! Installation and operation by on-professional personnel is prohibited. ANGE Make sure the power is off during installation and maintenance/operation. Do not operate AC IN or AC OUT plug when load is on. DANGE If the AC IN or AC OUT plug needs to be disconnected, make sure both are disconnected, do not leave only one of the plugs connected to the box. After disconnecting both the plugs, wait for no less than 2 minutes to make sure no electricity is left in the box. Install the iBox and All-in-one energy storage system in the same room of the original distribution box of the user, and the distance should be less than 5m between the iBox and the original distribution box, the distance between iBox and All-in-one energy storage system

Packing List of iBox package

| No. | Item | Specification | Qťy | Unit | Remarks |
|-----|--------------------------|--|-----|------|---------|
| 1 | iBox | SL-BH5KL | 1 | Pcs | |
| 2 | Installation Accessories | Mounting plate-A 1pcs Mounting plate-B 1pcs Mounting plate-C 1pcs Screws M6×10 5pcs Screws ST6.3×60 T30 4pcs Expansion tubeφ6×60 T30 4pcs | 1 | Set | |
| 3 | Inspection report | \ | 1 | Pcs | |
| 4 | Feedback Form | 1 | 1 | Pcs | |
| 5 | Installation Dimensions | 1 | 1 | Pcs | |
| 6 | Quality Certificate | 1 | 1 | Pcs | |
| 7 | PV Connector Accessories | PV Connector Positive Electrode Housing 4pcs PV Connector Positive Electrode Terminal 4pcs | 1 | Set | |
| 8 | PV Connector Accessories | PV Connector Negative Electrode Housing 4pcs PV Connector Negative Electrode Terminal 4pcs | 1 | Set | |

should be less than 2m.

4.1.4 Checking before Mounting system Installation

Slenergy tile hook system is a roof photovoltaic mounting system applied to tile roofs. The hooks are designed based on various types tile roofs. In that case, each roof has its corresponding and fitting hook for installation, which greatly improves the firmness of the connection between mounting system and roof structure. Multiple high-quality components and different types of rails can be used for different types tile roof in different countries and regions, while improving the stability of the overall supports. The whole system has fewer mounting accessories, which saves the users' installation time and cost. It is an efficient solution for large-scale tile roof projects.

| Hook | Rail | Rail Splice | Common End Clamp |
|------------------|---------------|-------------|------------------|
| | | | |
| Common Mid Clamp | Grounding Lug | Rail Cap | |

Main Components

4.1.5 Checking before All-in-one energy storage system Installation

Check the following parts list to ensure it is complete.

Delivers a total system separately on site to client, this consists of:



Accessory - Cable (PACK5.1)



Accessory - Cable (PACK10.2)





Accessory - Cable (PACK15.3)





Accessory - Cable (PACK20.4)









Accessory - Cable (PACK25.5)





| Communication cable(1*PCS) | 80 018 |
|----------------------------|---------------|
| Communication cable(3*PCS) | ≜∎ |
| Communication cable(1*PCS) | (). |
| Power cable(1*Black) | ê=€î |
| Power cable(3*Black) | ÷ |
| Power cable(1*Black) | \$= |
| Power cable(3*Red) | •==•• |
| Power cable(1*Red) | iz zi |
| Power cable(1*Red) | te – et |
| PE cable(3*PCS) | |
| PE cable(1*PCS) | 0 |
| PE cable(1*PCS) | 0 0 |

Accessory - Mechanical Top cover





Accessory - Floor stand support



4.2 Installation Mounting system and PV module installation

4.2.1 Mounting angle

The tilt angle of a solar module refers to the angle between the surface of the module and the ground plane (see Figure 1 below). The power output is greatest when the module is facing the sun.



Figure 4.2.1-1 Mounting angle



Installation of side fixture(≥50mm)



Installation of midd lle fixture(≥40mm)

4.2.2 Installation method introduction

4.2.2.1 Fixture installation

If connected to a stand-alone PV system, the installation angle of the module should be maximized in terms of season and lighting conditions. In general, if the output of the module can be satisfied with the lowest light intensity in a year, the module output of the selected angle can meet the needs of the whole year; For systems connected to the grid, the installation angle of the module should be based on the basic principle of maximizing output throughout the year.

(a) When the briquetting method is selected, ensure that there are at least 4 briquettes on each module. Install two on each long side (longitudinal) or each short side (lateral) of the assembly. How many pressure blocks are used in the fixture depends on the local wind and snow pressure intensity If the pressure exceeds the expected estimate, additional clamps or brackets are required to ensure that the assembly can withstand this pressure.

(b) After testing its module with different fixtures from multiple manufacturers, it is recommended to use clamps with EPDM or similar insulating gaskets that can at least secure M8 bolts.

(c) The fixture must clamp the frame of the assembly more than 7mm but not more than 10mm, and the minimum spacing between the two module is 10mm.

(d) The module fixture cannot be in contact with the glass on the front side and must not deform the frame. Be sure to avoid the shading effect of the module fixture.

(e) The frame of the module cannot be adjusted under any circumstances; the drain hole cannot be blocked under any circumstances during installation or use.

(f) The applied torque shall be determined according to the mechanical design criteria of the bolts used by the customer, for example: M8 ---- 16-20N. (140-180lbf.in)

(g) If the customer needs other sizes of compacts, Slenergy is required for full evaluation.

4.2.2.2 Mounting hole mounting

(a) Use the bolts to secure the assembly to the bracket through the mounting holes on the back frame of the assembly. The mounting details are shown below.

(b) Each module has a $4-\phi 9^{*1}4mm$ mounting hole on the long bezel, which allows the assembly to be securely attached to the support structure.

(c) To maximize installation life, Slenergy recommends the use of corrosion-resistant (stainless steel) fasteners

(d) As shown, use M8 bolts, flat washers, spring washers and nuts to secure the assembly at each fixed position and tighten to 16 to 20 N.m (140-180 lbf.in) of torque.

(e) All parts in contact with the frame shall be flat stainless-steel washers with a minimum thickness of 1.8 mm and an outer diameter of 20-24 mm (0.79-0.94 inches).

4.2.2.3 Module installation method



Note:

All installation methods described here are for reference only. Slenergy is not responsible for providing related installation module, design and installation of module systems. Machine load and safety must be done by a professional system installer or an experienced person.

Before installation, you need to confirm the following important items:

(a) Before installation, check for bugs or other debris, if any, and erase.

(b) Check that the serial number of the module is correct.

4.3 Installation of mounting structure

4.3.1 Installation Precaution

Notes for the installation dimensions

The specific dimensions of all installations involved are subject to the construction drawings. This installation instruction is only for the description of the product installation method.

Notes for Stainless Steel Fasteners

Because of the good ductility for stainless steel, the fasteners have big difference with carbon steel one in nature. If use in improper way, it will result in bolt and nut being "locked", which commonly known as "seizure". Prevention from lock basically has the following ways:

• Reduce the Friction Coefficient

- (1) Ensure that the bolt thread surface is clean and tidy (No dust, grit, etc.);
- (2) It is recommended to use yellow wax or lubricant during installation (such as lubricating grease, 40# engine oil, which are prepared by users).

Correct Operation Method

- The bolt must be perpendicular to the axis of the thread, and not inclined (Do not tighten Obliquely);
- (2) In the process of tightening, the strength needs to be balanced, tightening torque shall not exceed the prescribed safety torque value;
- (3) Choose torque wrench or socket wrench as far as possible, avoid using adjustable wrench or electric wrench. Lower the rotating speed while have to use electric wrenches;
- (4) Avoid using electric wrenches etc. under high temperature conditions, do not rotate fast when using, to avoid rapid rise in temperature and cause "seizure".

4.3.2 Installation of Tile Hook/Hanger Bolt

Self-tapping screws of tile hook or hanger bolt need to be fixed to the roof purlins. Please mark the positions of tile hook/hanger bolt according to shop drawing and make sure all tile hooks/hanger bolts are installed on the same horizontal line. Then install the tile hooks/hanger bolts accordingly and fasten them to the roof purlins by self-tapping screws.

Shown as bellow:

• Mark the positions of tile hook on the roof and make sure they are on the same horizontal line.



For Spain and Italy country, two types of fixtures of mounting structure are provided. The installation guide is listed here for both. Please refer to the corresponding guide for the type you are using.

4.3.2.1 installation of hanger bolt



• The installation diagram of hanger bolt, L feet and rail clamp:

Calculate the hanger bolt span in Slenergy calculation tool based on snow zone, wind zone, altitude and other parameters. The actual installed hanger bolt span has to be not more than the calculated value in Slenergy calculation tool, otherwise the mounting structure might have risk of failure when it comes to extreme condition.

The hanger bolts need to be fixed on the rafter underneath tile, plan the location where hanger bolt kit will be installed on rooftop first, then use alignment line to ensure the subsequence hanger bolt are installed on the same line, make a mark on the wave crest of tile, and then use electrical drill to dill a Φ 10 hole at the marked position. Finally, pass the hanger bolt through the predrilled hole and fix it on the rafter. the installation step is also shown in the figure below:

• The hanger bolt kits are installed on tile as shown figure below:





4.3.2.2 installation of tile hook

Calculate the hook span in Slenergy calculation tool based on snow zone, wind zone, altitude and other parameters. The actual installed hook span has to be not more than the calculated value in Slenergy calculation tool, otherwise the mounting structure might have risk of failure when it comes to extreme condition.

• Install all hooks to the tile roof.



4.3.3 Installation of Rail

Fix rails to tile hooks after adjusting the length and height and tighten them by bolts.

After fixing the hook, adjust the height of the rail, loosen the bolt on the upper end of the hook to separate the key A and key B for a certain distance, first align the protrusion of key B with the groove of the rail, and then rotate the rail until the concave on the other side is aligned with the protrusion of key A and locked. The length of rail shall be selected according to the corresponding drawings.

• Connect and fix the remaining rails to the hook according to the previous step.



Figure 4.3.3-2 Hook type



Figure 4.3.3.-3 Hanger bolt type



4.3.4 Installation of Rail Splice

Rails should be connected by rail splice if needed, as shown below:

Slide half of the rail splice into the first rail, adjust the fixed position, and tighten the bolts. Then slide the second rail into the rail splice, tighten them by bolts when leveled.



• Completed installation is as the picture shown below



Figure 4.3.4-2 Hook type completed installation



Figure 4.3.4-3 hanger bolt type completed installation



According to the installation dimension of the drawing, place the PV modules on the rail, and press and fix it with the common end/mid clamp. Note that when the clamps are installed, as shown in the figure below, the mounting surface of the common mid clamp is different, and it needs to be rotated by 90 degrees.



Place the PVmodule on the rail and adjust the position according to the drawing.

Then fix the end clamp into the rail channel, and tighten the bolts.



After fixing the end clamp of first PV module, please put the second PV module on the rail at proper position.

Connecting firmly the first PV module and the second one with mid clamp and fasten the bolts. If there are earthing clips needed, place them between the PV modules and rails while installing the mid clamps. Adjusting the position to ensure the sharp spikes on earthing clips are pressed by both PV modules. Then tighten the mid clamps by bolts.



Repeat the steps above. When it comes to the last PV module, fix it with the end clamp and tighten with bolts.



4.3.6 Installation of Grounding Lug

Install grounding lug at the end of the rail as the picture shown below and fix it with bolts.



At the edge of the layout, connect each grounding lug with PE NYY 1*6mm² ground cable, use knife to cut a small notch at the position where grounding cable sit on the grounding lug, and then fix the ground cable with M8 bolts, and conduct the end of the ground cable to the grounding point.



4.3.7 Installation of Rail Cap

Align the rail cap with the end of the rail and buckle it in.



4.3.8 Installation Diagram



Figure 4.3.8-1 Axonometric drawing

4.3.9 Electrical Connections of PV Modules

4.3.9.1 Recommended Wiring Method



The electrical performance parameters of the module were tested under standard test conditions, i.e., light intensity of 1000 W/m², AM 1.5, and ambient temperature of 25°C. In some cases, module may produce higher or lower voltage or current values than the rating. When the other modules of the PV system are rated voltage, conductor rated current, fuse size, and the specifications of the control module connected to the output of the solar module, the short-circuit current and open-circuit voltage values marked on the module are multiplied by a factor of 1.25.

All wiring should be performed by qualified installers in accordance with local regulations and procedures.



5kW inverter: Please be aware that the number of PV modules in one string might be between 6-16.

4.3.9.2 Assembling the PV Connector

Make sure that the connectors are securely connected and properly connected. The connectors must not be subjected to external pressure. The connectors can only be used for circuit connection functions and should not be used to turn the circuit on and off. Connections should be kept dry and clean to prevent rain and moisture. Avoid direct sunlight and water soaking of the connector.

(1) Insert the positive and negative cables into the corresponding positive and negative connectors, pull back the DC cable to ensure that the terminal is tightly attached in the connector.

(2) Use an open-end wrench to screw the nut to the end to ensure that the terminal is well sealed.



1



(Open-end Wrench)

- The connector does not have any waterproof function before docking. When installing the module, it is necessary to dock the connector as soon as possible or take waterproof measures to prevent the connector from being exposed to moisture and dust.
- 2 When connecting in series, the solar modules with the same gear current must be selected for connection. The voltage of the module connected in series cannot be higher than the maximum voltage allowed by the system. The number of modules per string depends on the system design, inverter type and environmental conditions.
- **3** The maximum rated fuse current value of each string of module is identified in the product label and specification sheet. The rated fuse current corresponds to the maximum reverse current value of the module. Based on the maximum fuse current and local electrical performance installation requirements, match the appropriate fuse to protect the series-parallel module in the circuit.

4.4 All-in-one energy storage system installation



Figure 4.4.1-1 SL-D5 Delivery scope

4.4.1 System Appearance

| Object | Description |
|--------|------------------------------------|
| 1 | Hybrid Inverter |
| 2 | EMS Display Screen |
| 3 | Cable Box (connected to Inverter) |
| 4 | PACK5.1 (Battery 1) |
| 5 | PACK5.1 (Battery 2, if configured) |



Figure 4.4.2-2 Cable Box Part without Covers-Front View

| Object | Description |
|--------|---------------------------------|
| 1 | Battery circuit breaker |
| 2 | Output terminal block (BACK UP) |
| 3 | DC isolation switch |



| Object | Description | DVC class | Object | Description | DVC class |
|--------|-------------|-----------|--------|-------------|-----------|
| 1 | PV1, PV2 | DVC C | 2 | GRID | DVC C |
| 3 | BACKUP | DVC C | 4 | DRM | DVC A |
| 5 | СОМ | DVC A | 6 | CT/METER | DVC A |
| 7 | INV | DVC C | 8 | BAT+, BAT- | DVC C |
| 9 | RJ45 | DVC C | | | |

4.4.3 Installation location

This SL-D5 energy storage system is outdoor version and can be installed in an outdoor location.

When SL-D5 systems are installed in a room, SL-D5 must not be hampered by the structure of the building, the furnishings and equipment of the room.

The SL-D5 is naturally ventilated. The location should therefore be clean, dry and adequately ventilated. The mounting location must allow free access to the unit for installation and maintenance purposes, and the system panels must not be blocked.



Install the SL-D and iBox in the same room of the original distribution box of the user, and the distance should be less than 5m between the iBox and the original distribution box.



Do not put flammable and explosive articles around the SL-D.

The following locations are not allowed for installation:

- 1 Habitable rooms;
- 2 Ceiling cavities or wall cavities;
- 3 On roofs that are not specifically considered suitable;
- 4 Access / exit areas or under stairs / access walkways;
- 5 Where the freezing point can be reached, such as garages, carports or other places as well as wet rooms (environmental category 2);
- 6 Locations with humidity and condensation over 95%;
- 7 Places where salty and humid air can penetrate;
- 8 Seismic areas additional security measures are required;
- 9 Sites with altitude over 2000m;
- 10 Places with an explosive atmosphere;
- 11 Locations with direct sunlight or a large change in the ambient temperature;
- 12 Places with flammable materials or gases or an explosive atmosphere.

The SL-D5 shall not be installed:

(a) In restricted locations as defined for panels in AS/NZS 3000;

- (b) Within 600mm of any heat source, such as hot water unit, gas heater, air conditioning unit or any other appliance.
- (c) Within 600mm of any exit;
- (d) Within 600mm of any window or ventilation opening;
- (e) Within 900mm of access to 240Vac connections;
- (f) Within 600mm of side of another device.

A SL-D5 installed in any corridor, hallway, lobby or the like and leading to an emergency exit shall ensure sufficient clearance for safe egress of at least 1 meter. The SL-D5 must also not be installed in potentially explosive atmospheres for gas cylinders that are heavier than air gases and have a vent clamp in accordance with AS / NZS 3000.

Barrier to Habitable Rooms

To protect against the spread of fire in living spaces where the SL-D5 is mounted or on surfaces of a wall or structure in living spaces with a SL-D5 on the other side, the wall

or structure shall have a suitable non-combustible barrier. If the mounting surface itself is not made of a suitable non-combustible material, a non-combustible barrier can be placed

between the SL-D5 and the surface of a wall or structure.

If the SL-D5 is mounted at a wall or at a distance of 300mm from the wall or the structure separating it from the habitable space, the distances to other structures or objects must be increased. The following distances must remain free:

- (i) 600 mm beside the SL-D5;
- (ii) 500 mm above the SL-D5;
- (iii) 600 mm before the SL-D5.

The distance between the SL-D5 and the ceiling or any object above the system should be more than 500mm, and any structural surface above the system must be made of noncombustible material within a radius of 600mm around the system.

The SL-D5 must be mounted to ensure the highest point is not more than 2.2m above the ground or the platform.



Figure 4.4.3-1 Limited Distance of Installation to Neighboring Objects

4.4.4 Installation

Step 1 Remove the battery and inverter from the packaging box.



4.4.4.1 Battery Installation

Step 2 Assemble the battery mounting panel on the battery.



Step 3 Position the battery parallel to the wall and use a Φ 10mm drill to drill holes at a depth of about 70mm in the wall for subsequent fix action of the mounting plates.





The inverter's built-in residual-current monitoring unit (RCMU) removes DC residual current above 6mA, so an external RCD (type A or type B) can be used with the system (≥30mA).In addition, the installation of inverter must fulfill AS/NZS 3000, AS/NZS 4777.1 and AS/NZS 5033. The internal N line of converter is connected to grid neutral via internal relays, when in stand-alone mode.

Step 4 Remove the debris baffle and secure the battery to the wall with screws and gaskets.



Step 5 To assemble the second (and all other) battery, repeat step 6 and 7, respectively.



Figure 4.4.4.1-4 Battery Installation Second Battery Installation

4.4.4.2 Inverter Installation Step 6 Inverter Installation.



Figure 4.4.4.2-1 Inverter Installation

Step 7 Hang the inverter onto the mounting panels, adjust the entire system and ensure that the battery and the inverter have been securely hung onto the panels and brackets.



Step 8 Please make AC cables on site.

Step 8-1 Please follow the AC cable requirements below. For all AC connections, 4-10mm² 105 XJ cable is required to be used. Please make sure the resistance of cable is lower than 1 ohm. If the wire is longer than 20m, it's recommended to use 10mm² cable.



There are "L" "N" " " symbols marked inside the connector, the Line wire of grid must be connected to "L" terminal; the neutral wire of grid must be connected to "N" terminal; the earth of grid must be connected to " "



| Object | Description | Value |
|--------|---|---------------------------------------|
| A | External diameter | 12mm to 18mm |
| В | Copper conductor cross-section | 4mm ² to 10mm ² |
| С | Stripping length of the insulated conductors | approx.13mm |
| D | Stripping length of the outer sheath of the AC cable | approx.53mm |
| | The PE conductor must be 10mm longer than the L and N | conductors |

1-6 steps have been pre-installed during manufacturing.

1. Insert the conductor into the suitable ferrule acc. to DIN 46228-4 and crimp the contact.



3. Insert the crimped conductors L, N and PE into the corresponding terminals and tighten the screw with a hex key wrench screwdriver (size: 2.5, 1.2~2.0 N.M). Ensure that all conductors are securely in place in the screw terminals on the bush insert. **2.** Unscrew the swivel nut from the threaded sleeve and thread the swivel nut and threaded sleeve over the AC cable.



4. Screw the swivel nut onto the threaded sleeve. This seals the AC connector and provides strain relief for the AC cable. When doing so, hold the bush insert firmly by the locking cap. This ensures that the swivel nut can be screwed firmly onto the threaded sleeve.





5. Assembly the plug shell ,adapter as below picture, Push the adapter and Shell by hand until a "Click" is heard or felt.



6. Plug the AC connector into the jack for the AC connection by hand until a "Click" is heard or felt.

7. Use tool to clamp the AC wiring terminal and wire rod; screw the nut, but do not tighten it. Make sure that the cable is free to pass through the waterproof components. Once the terminal is connected to the right site of the inverter, tighten the nut.



8. Connect the AC wiring terminal to the corresponding hole site of the inverter and lock it with a screw driver or electric screw driver (suggestion: stem diameters and torsion of screwdriver or electric screwdriver should be 4mm and 8~12kg-f.cm respectively)

9. Tighten the nut.

10. Circuit breaker parameters are recommended:

Back-up 32A/400Vac 6KA On-grid 40A/400Vac 6KA

Step 8-2 Connect the Backup and Grid cables in advance according to the connector mode, and connect them to the Backup and Grid board connectors in turn.



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Step 9 Connect the BAT communication cable of the cable box from Step 13 to the topmost battery at the right side. Then use the communication cable supplied with the batteries to connect the batteries to each other via the respective connectors on the left side. After you have connected all the modules together, close all covers (if you want to connect further battery modules, you must mount them before closing).



Step 10 Connect the power cables of the bottom battery from Step 4 to the side terminals of the top battery. Make sure that red connects to red and black connects to black.



Figure 4.4.4.2-5 Wiring the Battery Power Cable **Step 11** Close the battery covers and connect the PV-MC4 connectors to the system (connection on both sides). Also, connect all AC cables, the meter communications cable METER, and the Ethernet cable LAN. Then close the cable box cover. The installation is now complete.



Step 12 Close the lid and tighten the screw.



If you connect more than 2 battery modules to the system, please only install the additional batteries 3~5 on the side of the system. You can connect up to 5 batteries, 2 each mounted on top of each other, to the SL-D5. To do this, carry out the individual installation steps as for the first two batteries.



Figure 4.4.4.2-8 Increase the Battery Modules

Step 13 Commissioning of the energy storage system.

After the installation of the energy storage system completed, in order to ensure the normal operation of the system, it is necessary to check the battery, PV and grid input parameters according to the following steps.

a. Manually press the reset button of the battery pack touch screen for 3-5S, then turn on the battery switch of both the battery pack and the hybrid inverter after the green light of the capacity indicator on the battery pack touch screen is on and there is no red light alarm indication, and check the screen 4.2.4 Battery and 4.2.5 Battery parameter interfaces after the inverter LCD screen is on for 5-10S, and check whether the temperature, voltage and capacity are normal (the temperature determination is roughly based on the current ambient temperature of the system, the voltage determination is in the range of 50V \pm 3V, and the capacity determination is 100AH for a single battery pack, when multiple battery packs are connected in parallel, the capacity is the number of battery packs multiplied by 100AH).

b. After PV input connected and PV switch of the hybrid inverter closed, check whether the voltage display on the 4.2.1 and 4.2.2 PV input display interface is normal.

c. After connecting to the grid, check whether the voltage display on the 4.2.7 Grid-connected output interface is normal.





The method of anti-islanding protection is Method(c).

4.4.4.3 External CT Connection

The electricity meter should be mounted and connected at the grid transition point (feed-in point) so that it can measure the grid reference and feed-in power.

1 Loosen the nut, and untangle the single-aperture sealing ring.

| Pin | Description | Pin | Description | |
|-----|-------------------------------|-----|-------------|--|
| 1 | CT positive electrode (White) | 3 | RS485-A | |
| 2 | CT negative pole (Black) | 4 | RS485-B | |



- 2 Install the waterproof component and screw on the waterproof sheath nut.
- 3 Open the external CT wiring port, the arrow points to the direction of the power grid, put the wire into the external CT card slot, and buckle the buckle.





External CT should be placed near the power grid. If CT test pass but inverter still can't achieve export power (power is not controllable or always 0 power output). Please check installation location of the CT.

4.4.4.4 DRED/ RRCR Port Connections (optional)

DRED means demand response enable device. The AS/NZS 4777.2:2015 required inverter needs to support demand response mode (DRM). This function is for inverter that complies with AS/NZS 4777.2:2015 standard. Inverter which fully complies with all DRM. A 6P terminal is used for DRM connection.

The default state of DRM/RRCR function is disabled. Only when the "DRM enabled" is enabled, the function will be activated according to the specific grid code (e.g., Australia, Germany or UK)

| Pin | Description | RRCR | Description |
|-----|-------------|-------|-------------|
| 1 | DRM 1/5 | DI_1 | |
| 2 | DRM 2/6 | DI_2 | |
| 3 | DRM 3/7 | DI_3 | |
| 4 | DRM 4/8 | DI_4 | REF_1 |
| 5 | RefGen | Ref_2 | DY_IN |
| 6 | Com/DRM 0 | | |

Please follow below figure to assemble DRM connector.



Figure 4.4.4-1 DRM connector



4.4.4.5 Single Line Diagram

The single line diagrams of DC-, AC- and Hybrid-coupled system are as below:



4.4.4.6 Wiring Diagram

N and PE cables are connected together in the Main Panel for wiring.



Below wirings are applicable to areas in Australia, New Zealand, South Africa, and etc.



N and PE cables in the Main Panel shall be wired separately.



Ensure that the grounding of BACK-UP is correctly and tightened. Otherwise, the BACK-UP function may be abnormal in case of grid failure. Other areas except Australia, New Zealand, South Africa, etc., are applicable to the following wirings:



4.5 iBox installation

4.5.1 iBox installation



The iBox can only be installed indoor, far from heat sources.

The iBox should be bolted on the wall with a right angel like bellow. The iBox should be installed under the following Installation tilts



Step 1 Determine the installation positions for drilling holes, and mark the positions using a marker. Drill installation holes on the wall, knock in the wall lugs, mount the Mounting Plate-A. Four installation holes are need, the distance between holes is like bellow:



Mark the position of 4 holes with Mounting Plate-A Figure 4.5.1-2 Drill holes on the wall and mount the Mounting Plate-A

Step 2 Install the Mounting Plate B&C onto the iBox enclosure.



Step 3 Hung the iBox onto the back plate, and fasten the plate on the bottom.



4.5.2iBox Wiring




4.5.3 Check Before Power-On



Please check the installation again before turning on the system.

| No. | Check Item | Acceptance Criteria |
|-----|----------------------------|---|
| 1 | Cable layout | Cables are routed properly as required by the customer. |
| 2 | Cable tie | Cable ties are secured evenly, and no burr exists. |
| 3 | Grounding | The grounding cable is connected correctly, securely, and reliably. |
| 4 | Turn off the switches | The DC SWITCH and all the switches connected to the inverter are set to OFF. |
| 5 | Cable connections | The AC output power cable and DC input power cable are connected correctly, securely, and reliably. |
| 6 | Unused terminals and ports | Unused terminals and ports are locked by watertight caps. |
| 7 | Installation environment | The installation space is proper, and the installation environment is clean and tidy, without foreign matter. |



System Operation



5.1 Switch On

When turning on the system, it is very important to follow the steps below to prevent damage to the system.



- **Step 1** Turn on the external PV switch.
- Step 2 Turn on the iBox QF1 then QF2.
- **Step 3** Turn on the external grid switch.
- **Step 4** If backup load is applied, turn on the external Backup switch.
- **Step 5** Open the outer shell of the cable box. Open the battery switch cover and turn on the battery switch on the cable box.
- Step 6 Press power button on all the batteries until the indicator lights turn on.
- Step 7 Close the battery switch cover and the outer shell of the cable box.



5.2 Switch Off

- **Step 1** Press the power button on all the batteries, till the lights turn off.
- Step 2 Open cable box outer shell, open the battery switch cover and turn off the battery switch.
- Step 3 Turn off the external grid switch. Turn off QF1 and QF2.
- **Step 4** If backup load is applied, turn off the external backup switch.
- Step 5 Turn off the external PV switch on the cable box.
- **Step 6** Close the battery switch cover and the outer shell of cable box.

5.3 Emergency Procedure

When the SL-D5 energy storage system appears to be running abnormally, you can turn off the grid-connected main switch that directly feeding the BESS, and turn off all load switches within the BESS, turn off the battery switch at the same time. To prevent a potentially fatal personal injury, if you want to repair or open the machine after the power is switched off, please measure the voltage at the input terminals with a suitably calibrated voltage tester. Before working on this equipment, please confirm that there is no grid electric supply to the BESS! The upper cover plate cannot be opened until the DC-link capacitance inside the battery modules discharges completely about 15 minutes later.

5.3.1 Emergency Handling Plan

- 1 Disconnect the AC breaker.
- 2 Check the control power supply. If it is OK, return the power supply to find out the reason.
- 3 Please record every detail related to the fault, so Company can analyse and solve the fault. Any operation of equipment during a fault is strictly forbidden, please contact Company as soon as possible.
- 4 As battery cells contain a little Oxygen inside and all cells have got explosion-proof valves, explosion hardly happens.
- 5 When the indicator light on the battery shows a red fault, check the fault type through the communication protocol, and contact our after-sales service personnel for advice.

5.3.2 Hazards

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below:

Inhalation: Evacuate the contaminated area, and seek medical attention.

Eye contact: Rinse eyes with running water for 5 minutes, and seek medical attention.

Contact with skin: Wash the affected area thoroughly with soap and water, and seek medical attention.

Ingestion: Induce vomiting and seek medical attention.

5.3.3 Fire

If a fire breaks out in the place where the battery pack is installed, perform the following countermeasures:

Fire extinguishing media

During normal operation, no respirator is required. Burning batteries can't be extinguished with a regular fire extinguisher, this requires special fire extinguishers such as the Noves 1230, the FM-200 or a dioxin extinguisher. If the fire is not from a battery, normal ABC fire extinguishers can be used for extinguishing.

Fire -fighting instructions

- 1 If fire occurs when charging batteries, if it is safe to do so, disconnect the battery pack circuit breaker to shut off the power to charge.
- 2 If the battery pack is not on fire yet, extinguish the fire before the battery pack catches fire.
- 3 If the battery pack is on fire, do not try to extinguish but evacuate people immediately.



There may be a possible explosion when batteries are heated above 150°C. When the battery pack is burning, it leaks poisonous gases. Do not approach.

Effective ways to deal with accidents

Battery in dry environment: Place damaged battery into a segregated place and call local fire department or service engineer.

Battery in wet environment: Stay out of the water and don't touch anything if any part of the battery, inverter, or wiring is submerged.

Do not use a submerged battery again and contact the service engineer.



EMS Introduction and Set Up





6.1 Function Description

| Object | Name | Description |
|--------|-----------------|---|
| А | | Grid connection |
| В | Indicator LED | Off-grid |
| С | - | Red: The inverter is in fault. |
| D | | Return Button: Escape from current interface or function. |
| E | Button Function | Up button: Move cursor to upside or increase value. |
| F | | Down Button: Move cursor to downside or decrease value. |
| G | - | ENT Button: Confirm the selection. |

LED indicator description

Table 6.1-1 LED working status indication

| status | Normal/Alarm | /Protect | ion | RUN | ALM | Power | indicato | or LED | • | Instruction |
|-----------|---|----------|----------------|-------------------|----------------------|--|------------------------|------------|--------------------|---|
| Shut down | dormancy | | | off | off | off | off | off | off | ALL OFF |
| | Normal | | | Flash one time | off | | | | | standby mode |
| Standby | Alarm | | | Flash one time | Flash three times | According to battery indicator Module low voltage | | | Module low voltage | |
| | Normal | | | light | off | Accord | ing to bat | tery indic | ator | The maximum power |
| | Alarm | | | light | Flash three times | (Power LED fla | indicator shes two) | highest | | LED flashes twice, and the ALM does not flash when an overcharge alarm occurs |
| charge | Overcharge prote | ection | | light | off | light | light | light | light | If there is no mains electricity, the indicator light turns to standby |
| | Temperature, overcurrent, failure, protection | | | off | light | off | off | off | off | Stop charging |
| | Normal | light | Flash three | ı e times | off | — Accord | ing to bat | tery indic | ator | |
| | Alarm | light | Flash three | e times | Flash three times | | | , | | |
| Discharge | Under voltage protectio | light | off | | off | off | off | off | off | Stop discharging |
| | Temperature, overcurrent, short circuit, reverse connection, failure protection | light | off | | light | off | off | off | off | Stop discharging |
| Failure | | off | off | | light | off | off | off | off | Stop charging and discharging |

6.2 Display and Setting

6.2.1 PV1 input display interface



DISCHARGE: 100A

Battery discharging current

6.2.7 Grid-connected output

Interface



6.2.8 Inverter output

| Interface | |
|---|--|
| INV DATA VOLT: 0.0V CURR: 0.00A FREQ: 0.00Hz | Inverter real-time voltage Inverter real-time current Inverter real-time frequency |
| 6.2.9 Load | |
| Interface | |
| BACKUP DATA VOLT: 0.00V CURR: 0.00A | Emergency load (BACKUP) voltage Emergency load (BACKUP) current |
| 6.2.10 Power | |
| Interface | |
| POWER INV: W GRID: W LOAD: W | Inverter real - time total power Grid real-time total power Load real-time total power |
| 6.2.11 Power | |
| Interface | |
| POWER PV: W BACKUP: W BAT: W | PV real-time total power. BACKUP real-time power. Battery real-time power. |
| 6.2.12 Temperature | |
| Interface | |
| TEMPERATURE INV: 25°C DCDC: 26°C AMBIENT: 27°C | Real-time temperature of inverter system radiator. Real-time temperature of Bidirectional DCDC system adiator. Internal ambient temperature. |

6.2.13 Status information

Interface

| STATE | |
|---------------|--|
| SYS: ERROR | |
| INV: STANDBY | |
| DCDC: STANDBY | |
| UNIT: SEC | |

Explanation

System information: Power-up mode, standby mode, hybrid grid-connection, off-grid operation, mains charging mode, PV charging mode, bypass mode, fault mode, DSP programming, ARM programming.

INV: standby mode, off-grid inverter mode, grid-connected mode, and transition of grid-connection to off-grid, transition of off-grid to grid mode.

DCDC: standby mode, soft start mode, charging mode, discharging mode.

6.2.14 Error information

| Interface | Explanation | |
|--|-------------------------|--|
| ERROR NO. WARNING: W11-1 FAULT: F101 | → Alarm code Error code | |

6.2.15 System setting

| Interface | Explanation |
|------------------------------|---|
| SYSTEM STATE: PEAK SHIFT | Status mode: Self-generation and self-consumption, Peak load shifting, and Battery priority. |
| grid: CHN PV I/P: Indepen | Grid-connection standards: China, Germany, Australia, Italy, Spain, UK, Hungary, Belgium, Western Australia, Greece, France, Bangkok, Thailand, local and 60Hz. |
| | PV input mode: independent connection, |

6.2.16 User setting

| Interface | | |
|----------------|--|--|
| | | |
| - USER - | | |
| →1: SETUP | | |
| 2: INQUIRE | | |
| 3: STATISTIC | | |
| 4: FCTRY RESET | | |

Explanation

Press ESC on the Main Display Interface to enter the user interface. See chapter 8.2 for more setting details.

parallel connection, constant voltage.

Enter the password before setting up the user.

| Interface | Explanation |
|--------------|--|
| - PASSWORD - | After entering the setup interface, the system will prompt to input password; |
| INPUT: XXXXX | The default password is"00000", which can be altered in Password setting menu; |
| | Press UP/DOWN button to increase or decrease the figure that is input; |
| | Press ENTER button to move the cursor backwards or confirm the setting; |
| | Press ESC button to move the cursor forward. |

6.3 Setting

Interface

| | SETUP |
|---------------|-----------------|
| \rightarrow | 1: SYS SETTING |
| | 2: BAT SETTING |
| | 3: GRID STD |
| | 4: RUN SETTING |
| | 5: 485 ADDRESS |
| | 6: BAUD RATE |
| | 7: LANGUAGE |
| | 8: BACKLIGHT |
| | 9: DATE/TIME |
| | 10: CLEAR REC |
| | 11: PASSWORD |
| | 12: MAINTENANCE |
| | 13: AUTO TEST |

6.3.1 System setting

Interface

| | SYS SETTING |
|---------------|-----------------|
| \rightarrow | 1: WORK MODE |
| | 2: PV INPUT |
| | 3: ZERO EXPORT |
| | 4: DRM ENABLE |
| | 5: EPS ENABLE |
| | 6: REMOTE CTRL |
| | 7: START DELAY |
| | 8: CEI SPI CTRL |
| | 9: GFCICHK ENB |
| | 10: DISC MODE |
| | 11: DOD ENABLE |
| | 12: GENERATOR |
| | 13: CT OR METER |
| | 14: AC COUPLE |
| | 15: CT DIRECTIO |
| | 16: RS485 Pctrl |
| | |

6.3.1.1 Working mode

Interface

Explanation

This interface is used for various information inquiry options.

Press UP/DOWN button to move the corresponding options.

Press ENTER to enter the selected menu.

Press ESC button to return to the user interface.

There are 13 options in total, including system mode, battery parameters, grid standard, operation parameters, 485 address, 485 baud rate, language display, LCD backlight, date/time, clear history, password setting and maintenance, and auto test.

Explanation

This interface is used to access system information.

Press UP/DOWN button to move corresponding options.

Press ENTER to enter the selected menu.

Press ESC button to return to the setting interface.

There are 16 options in total, including working mode, PV input type, zero export enable, DRM enable, EPS enable, remote controlled enable, start delay. (see from 1 to 16)

| Interface | Explanation | |
|---|---|--|
| WORKE MODE | This interface is used to opt for the working mode. | |
| 1: SELF CONSUME \rightarrow 2: PEAK SHIFT | After selecting the three modes, the restart interface will be entered. | |
| 3: BAT PRIORITY | Press ESC button to return to setting interface. | |

After completing the setup of peak load shifting mode, the time for charging and discharging also needs to be set.

Interface

Explanation

| CHARGE FROM GRID |
|------------------|
| 1: DISABLE |
| → 2: ENABLE |

1.DISABLE 2.ENABLE

After selecting self-consume mode, the setting of charge from grid can be disabled or enabled. If enabled, the charging time setting page will be displayed.

Interface

| CHARGE TIME |
|---------------|
| 00:00-23:59 |
| MAX SOC: 100% |

Time setup

Interface

Explanation

1. Self-consumption mode disables grid charging: Battery pack can only be charged by PV.

2. Self-consumption mode enables grid charging: Grid charges battery pack until MAX SOC during set time.

| | This interface is used to set the time-1 of |
|-------------------|---|
| CHA STAR1: 00:00 | peak load shifting. |
| CHAR END1: 00:00 | Press UP/DOWN button to change the value. |
| DIS START1: 00:00 | Press ENTER to confirm. |
| DISC END1: 00:00 | Press ESC button to return. |
| | |
| | This interface is used to set the time-2 of |
| CHA STARZ. 00.00 | peak load shirting. |
| CHAR END2: 00:00 | Press UP/DOWN button to change the value. |
| DIS START2: 00:00 | Press ENTER to confirm. Press ESC button to |
| DISC END2: 00:00 | return. |
| | |

Description

6.3.1.2 Input mode

| Interface | Description |
|--|---|
| INPUT MODE → 1: INDEPENDENT 2: PARALLEL 3: CV | Setup of PV Input mode. The factory setting by default is independent mode. When parallel input is set to be independent mode, PV power will be imbalanced. |

6.3.1.3 ZERO EXPORT

| Inter | face |
|---------------|--|
| \rightarrow | Zero export 1: Enable 2: Power |
| \rightarrow | ZERO EXPORT 1: DISABLE 2: ENABLE |

Description

Limiting inverter power to be injected into the grid, disable by default

6.3.1.4 DRM enable

Interface -- DRM ENABLE --→ 1: DISABLE 2: ENABLE

Description

Only applicable in Australia and New Zealand. Default option is disabling.

6.3.1.5 Backup enable

Interface -- EPS ENABLE -- \rightarrow 1: DISABLE 2: ENABLE

Description

It should be enabled if BACKUP load needs power supply after grid black out.

6.3.1.6 Remote Control enable

| rface | Description |
|-------------|---|
| REMOTE CTRL | The power switch of the machine can be realized through remote control. |
| 1: DISABLE | Default option is Enabling. |
| 2: ENABLE | |

6.3.1.7 START-UP delay

Inte

 \rightarrow

| Interface | Description |
|--|--|
| START-UP DELAY INPUT: 30 UNIT: SEC | The input value ranges from 20 to 300, Which varies with different standards. |

6.3.1.8 CEI SPI CTRL

Interface

| CEI SPI CTRL | |
|--------------------------|--|
| \rightarrow 1: DISABLE | |
| 2: ENABLE | |

6.3.1.9 GFCICHK ENB

Interface



Description

CEI SPI CTRL: (1. Disable 2. Enable)

When the DRM signal is enabled, this is used as a local signal. When the DRM signal is enabled, when the CEI SPI Ctrl is enabled, the frequency range is 50.2Hz ~ 49.8Hz. When the CEI SPI Ctrl is disabled, the frequency range is 51.5Hz ~ 49.8Hz

Description

GFCICHK ENB (1. Disable 2. Enable) PV leakage protection enable

6.3.1.10 DISC MODE

Interface

| DISC MODE | |
|------------------------------|---|
| \rightarrow 1. RATED POWER | ۲ |
| 2. LOAD PRIO | |

Description

DISC MODE (1. Rated Power, 2. Load Prio) This is only for test.

6.3.1.11 DOD ENABLE

Interface



6.3.1.12 GENERATOR

Interface

| GENERATOR | |
|-------------------------|--|
| 1. DISABLE | |
| \rightarrow 2. ENABLE | |

6.3.1.13 CT OR METER

Interface

| CT OR METER |
|------------------------|
| 1. CT |
| \rightarrow 2. METER |

6.3.1.14 AC COUPLE

Interface

-- AC COUPLE --

1. DISABLE → 2. ENABLE

6.3.1.15 CT DIRECTION

→ 2. ENABLE

| Interface | Explanation |
|--|--|
| CT DIRECTION 1. POSITIVE → 2. NEGATIVE | If the CT connection is reversed, there is no need to change the direction actually but only set the direction on the interface by changing 1. POSITIVE to 2. NEGATIVE or 2. NEGATIVE to 1. POSITIVE, which is equivalent to changing the direction of the CT wiring. |
| 6.3.1.16 RS485 P ctrl | For example, when the battery is being charged and the grid power is positive "+", it means the CT connection is reversed. If the CT direction is 1. POSITIVE on the LCD, set it to 2. NEGATIVE, then the grid power will become negative "-". |
| Interface | Explanation |
| RS485 P ctrl 1 DISABLE | 1. Enable for enabling the function that allows adjusting the active power by RS485 commands. |

2. Disable by default.

Discharge depth (1. Disable 2. Enable).

When the battery SOC reaches (100 minus the set discharge depth), the battery will stop discharging if it is enabled. If it is disabled, the battery will discharge to 0%. Enable by default.

Description

Generator mode enabling (1. Disable 2. Enable) when the generator needs to be connected for AC measurement, the enabling generator mode is prohibited, and the generator mode is prohibited in other times. In the mode of enabling generator, the frequency protection range measured by AC will be relaxed to + -10%, the frequency protection range at 50Hz is 45Hz-55Hz, and that of 60Hz is 54Hz-66Hz.

Description

CT or meter (1. CT 2. meter): the energy storage inverter supports the connection of three-phase ammeter.

Replace CT with three-phase ammeter to detect the utility power. When connecting three-phase ammeter, select "ammeter" option, and when connecting CT, select "CT" option

Explanation

When ESS connects to other inverter by AC side, with other inverter charging PACK, please enable AC couple.

6.3.2 Battery parameters

Interface

| | BAT SETTING |
|---------------|------------------|
| \rightarrow | 1: BAT TYPE |
| | 2: DISC-DEPTH |
| | 3: OFF GRID DOD |
| | 4: CHG CURR |
| | 5: DISC POWER |
| | 6: CHG POWER |
| | 7: BAT END VOLT |
| | 8: BAT WAKE-UP |
| | 9: HEATING FLIM |
| | 10: BMS DOD |
| | 11: MAINTAIN SOC |
| | 12: FORCE WAKE |

Description

This interface is used to select battery parameters. Press UP/DOWN button to move corresponding options;

Press ENTER button to enter the selected menu; Press ESC button to return to setting interface.

6.3.2.1 Battery type

Interface Description This interface is used to select battery type. Press UP/DOWN button to move corresponding options; -- BAT TYPE --Press ENTER button to enter the selected menu; 1: LEAD-ACID Select the LEAD-ACID enter button to enter the \rightarrow 2: LFP LEAD-ACID interface;

OTHER_Li interface; Other Li battery parameter

-- OTHER LI BAT--1: FLOAT VOLT → 2: EQUALT VOLT 3: BAT CAP 4: BAT OVP

Lead-acid battery parameter

Interface

Interface

6.3.2.2 Discharge depth

Interface

| | DISC DEPTH |
|---------------|------------|
| \rightarrow | INPUT: 60 |
| | UNIT: % |

Select the OTHER_Li enter button to enter the Description

This interface is used to select other Li battery parameter.

Press UP/DOWN button to move corresponding options;

Press ENTER button to enter the selected menu; Options include battery charge voltage, battery discharge end voltage and battery over voltage protection.

Description

This interface is used to select other lead-acid battery parameter.

Press UP/DOWN button to move corresponding options;

Press ENTER button to enter the selected menu; Options include battery charge voltage, battery capacity, battery discharge end voltage, battery over voltage protection.

Description

Grid connected discharge depth: the maximum allowable discharge depth of the machine with normal grid connection.

If the grid connected discharge depth is set to 80%, when the SOC of the battery is lower than or equal to 20% with normal grid connection, the battery will stop discharging. Press UP/DOWN to increase or decrease the input figure;

Press Enter to move cursor backward, confirm input and return to battery parameters interface;

Press ESC to move cursor forward and return to battery parameters interface;

The value ranges between 10% and 95%.

6.3.2.3 OFF GRID DOD

Interface

-- OFF GRID DOD --INPUT: 0-100% Default: 90%

Explanation

Off grid discharge depth: the maximum allowable discharge depth of the machine in off-grid mode in case of grid power failure. The settable range is 0~100%.

If the off-grid discharge depth is set to 90%, when the SOC of the battery is less than or equal to 10% with grid power failure, the battery will stop discharging.

Relationship between off grid discharge depth and grid connected discharge depth.

Grid connected discharge depth < off grid discharge depth. Off grid discharge depth grid connected discharge depth = off grid standby SOC. For example, if the grid connected discharge depth is set to 80%, and the off-grid discharge depth is set to 90%, the battery will stop discharging if the SOC is equal to or lower than 20% with normal grid connection. When the grid power is off, the inverter will run in off-grid mode. At this time, 10% SOC of the battery can supply power to important loads.

6.3.2.4 Charge current

Interface

-- CHARGE CURR --INPUT: 25 UNIT: A

6.3.2.5 Discharge Power

Interface

-- DISC PERCENT --INPUT: 080%

6.3.2.6 Charge Power

Interface

-- CHAR PERCENT --INPUT: 020%

Description

Press UP/DOWN button to increase or decrease the input figure;

Press Enter to move cursor backward, confirm input and return to battery parameters interface; Press ESC button to move cursor forward and return to battery parameters interface.

Description

ress UP/DOWN button to increase or decrease the input figure;

Press Enter button to move cursor backward, confirm input and return to battery parameters interface;

Press ESC button to move cursor forward and return to battery parameters interface.

Description

Press UP/DOWN button to increase or decrease the input figure;

Press Enter to move cursor backward, confirm input and return to battery parameters interface; Press ESC button to move cursor forward and return to battery parameters interface.

6.3.2.7 BAT END VOLT

Interface



6.3.2.8 BAT WAKE-UP

| Interface | Description |
|-------------|---|
| BAT WAKE-UP | Enter the option 1 to enable or disable the |
| → 1: ENABLE | Function. Enter the option 2 to adjust the |
| 2: TIME | value of the time. |

Battery wake up enable

| WAKE-UP ENB |
|--------------------------|
| \rightarrow 1: DISABLE |
| 2: ENABLE |
| |

Description

Description

Description

Battery wake-up enable setting. The default option is ENABLE.

Bat Wake Time

Interface

Interface

| WAKE-UP TIME | |
|---------------|--|
| INPUT: 060min | |

decrease the input figure;

Press Enter button to move cursor backward, confirm input and return to battery parameters interface;

Press UP/DOWN button to increase or

6.3.2.9 HEATING FILM

| Interface | Explanation |
|---|--|
| HEATING FILM → 1: AUTOMATIC 2: ON 3: OFF | This setting is only applicable for battery packs with heating film. 1. "Automatic" means that the system detects the external temperature and opens the heating film as required. 2. "On" means that the heating film will be turned on immediately after selecting "On". 3. "Off" means that the heating film will be turned off immediately after selecting "Off". |
| 6.3.2.10 BMS DOD | is Automatic by default. |
| Interface | Explanation |
| BMS DOD → 1: DISABLE | 1.Disable BMS DOD: It will not close the discharge circuit when BMS discharging to the set SOC. |
| 2: ENABLE | 2.Enable BMS DOD: It will close the discharge circuit when BMS discharge to the set SOC. |
| | Note that don not enable BMS DOD unless there's a special reason. |

6.3.2.11 MAINTAIN SOC

Interface



6.3.2.12 FORCE WAKE

Interface

| FORCE WAKE |
|--------------------------|
| \rightarrow 1: DISABLE |
| 2: ENABLE |

Explanation

1. Disable: The minimum SOC will not be maintained.

2. Enable: The minimum SOC 2% is maintained. When the battery SOC is less than 2%, the grid charges the battery pack to 5% through the inverter.

Explanation

1. Disable: Do not force to wake up battery packs.

2. Enable: Force to wake up the battery pack immediately if the battery is not connected.

6.3.3 Grid standard

Interface

| | GRID STD |
|---------------|--------------|
| \rightarrow | 1: China |
| | 2: Germany |
| | 3: Australia |
| | 4: Italy |
| | 5: Spain |
| | 6: U.K. |
| | 22: Local |
| | 23: 60Hz |
| | 24: Denmark |
| | |
| | |

Description

Press UP/DOWN button to move corresponding options. Here are 24 countries for selection, including China, Germany, Australia, Italy, Spain and U.K.;

Press ENTER button to confirm the selection and enter restart interface;

Press ESC button to cancel the selection and return to setting interface.

6.3.4 Operation parameters

| Interface | Description |
|--|--|
| Interface RUN SETTING → 1: REACT MODE 2: GRID POWER 3: VOLT MAX 4: VOLT MIN | Description Press UP/DOWN button to move corresponding options; Press Enter to enter the selected menu; Press ESC button to return to setting interface. Options include reactive power compensation |
| 5: FREQ MAX 6: FREQ MIN 7: OVER VOLT 8: UNDER VOLT 9: OVER FREQ 10: UNDER FREQ 11: REACT RESP 12: VRT ENABLE 13: POW SI RATE | mode, grid power, low/high grid voltage, low/high grid frequency, Grid over/under voltage derating and Grid over/under frequency derating, etc. |

6.3.4.1 Reactive mode

| Interface | Description |
|-------------------------------------|---|
| - REACT MODE - | Press UP/DOWN button to move corresponding options; |
| → 1: POWER FACTOR 2: REACT POWER | Press Enter to confirm the input and enter power factor setting interface; |
| 3: QU CURVE 4: QP CURVE | (Select 2, press Enter to confirm input and enter reactive power interface; Select 3, 4, the corresponding mode will be selected and return to the parameter setting interface.) Press ESC button to cancel the input and |

return to operation parameters interface.

Power factor setting

| Interface | Description |
|----------------------------------|---|
| - POWER FACTOR - INPUT: C1.00 | Press UP/DOWN to increase or decrease the input figure; |
| | Press ENTER button to confirm or ESC button to cancel the input and return to working |
| Value range (L1.00~C1.00) | interface; The input value should range between L0.80 and L1.00 or C0.80 and C |

Reactive Power

| Interface | Description |
|--|--|
| - REACT POWER - INPUT: +60% Value range (-60%~+60%) | Press UP/DOWN button to adjust the input figure; Press ENTER button to confirm or ESC button to cancel the input and return to working interface; The input value should range between -60% and +60%, which varies with the standard. |
| 5.3.4.2 Grid Power Interface | Description |
| | |

| - GRID PERCENT - INPUT: 100% | |
|---------------------------------|--|
| Value range (0~100) | |

| Press UP/DOWN button to adjust the input |
|--|
| figure; Press ENTER button to confirm or ESC |
| button to cancel the input and return to |
| operation parameters interface; |

The input value should range between 0 and 100.

6.3.4.3 Volt Max

Interface



Description

Description

restart interface;

Description

Description

enter restart interface;

INV Low Voltage Protection Point Press UP/DOWN button to adjust the input figure; Press Enter to confirm the input and

Press ESC button to cancel the input and return to operation parameters interface; The value should range between 150V and 220V, which varies with different standards.

Enter option 1 to adjust the maximum volt of the INV.

Enter option 2 to adjust the maximum volt of the grid.

INV Over Voltage Protection Point Press UP/DOWN to adjust the input figure; Press Enter to confirm the input and enter

operation parameters interface;

Press ESC to cancel the input and return to

The value should range between 240V and 280V, which varies with different standards.

High INV voltage

Interface

| - INV VOLT HIGH - INPUT: V |
|-------------------------------|
| Value range (240~280V) |

GRID VOLT MAX

| Interface | Description |
|-----------------------------|---|
| - GRID MAX - INPUT: 270V | GRID Over Voltage Protection Point Press UP/DOWN to adjust the input figure; Press Enter to confirm the input. |

Volt Min

Interface Description Enter option 1 to adjust the minimum volt of - VOLT MIN the INV. Enter option 2 to adjust the minimum volt of the grid.

Low INV voltage

 \rightarrow 1: INV-MIN 2: GRID MIN

Interface

| - INV VOLT LOW - INPUT: V |
|------------------------------|
| Value range (150~200V) |

Grid Volt Min

Interface

| | GRID Low Voltage Protection Point |
|--------------|---|
| - GRID MIN - | Press UP/DOWN to adjust the input figure; |
| INPUT: 170V | Press Enter to confirm the input. |

Freq Max

Interface - FREQ MAX - \rightarrow 1: INV-MAX 2: MGRID AX

Description

Enter option 1 to adjust the maximum frequency of the INV. Enter option 2 to adjust the maximum frequency of the grid.

High INV frequency

| Interface | Description |
|---|--|
| | INV Over Frequency Protection Point |
| - INV FREQ HIGH - | Press UP/DOWN to adjust the input number; |
| INPUT: 52.0Hz | Press ENTER to confirm the input and enter restart interface: |
| Value range | Press ESC to cancel the input and return to |
| (50.5~55) | Operational parameters interface; |
| GRID Freq Max | The value ranges between 50.5 and 55, which varies with different standards. |
| Interface | Description |
| | GRID Over Frequency Protection Point |
| - GRID MAX - | Press UP/DOWN to adjust the input figure: |
| INPUT: 53.5Hz | Press Enter to confirm the input. |
| Freq Min | Description |
| | |
| - FREQ MIN - → 1: INV MIN 2: GRID MIN | Enter option 1 to adjust the minimum frequency of the INV. Enter option 2 to adjust the minimum frequency of the grid. |
| Low INV frequency | |
| Interface | Description |
| - INV FREQ LOW - INPUT: Hz | INV Low Frequency Protection Point Press UP/DOWN to adjust the input figure; Press Enter to confirm the input and enter |

GRID Freq Min

Value range

(45~49.8)

Interface

| ncy Protection Point |
|-------------------------|
| adjust the input figure |
| ī |

Description

restart interface;

Press ESC to cancel the input and return to

The value ranges between 45 and 49.8, which

peration parameters interface;

varies with different standards.

OVER VOLT

Interface Description Enter the option 1 to enable or disable the - OVER VOLT function that the power of inverter derates when voltage is too high. Enter the option 2 \rightarrow 1: ENABLE to adjust the exact value of the voltage when 2: VOLT power starts to derate. OVER VOLT ENABLE Interface Description Derate power when Voltage over. - OVER VOLT -The default option is enable. \rightarrow 1: DISABLE

OVER VOLT START

2: ENABLE

| Interface | Description |
|---------------|---|
| - OVER VOLT - | Press UP/DOWN to adjust the input figure; |
| INPUT: 264V | Press Enter to confirm the input. |

UNDER VOLT

| Interface | Description |
|--|--|
| - UNDER VOLT - → 1: ENABLE 2: VOLT | Enter the option 1 to enable or disable the function that the power of inverter derates when voltage is too low. Enter the option 2 to adjust the exact value of the voltage when |

power start to derate.

UNDER VOLT ENABLE

Interface

| - UNDER VOLT - | |
|--------------------------|--|
| \rightarrow 1: DISABLE | |
| 2: ENABLE | |

Description

Enable or disable the function that the power of inverter derates when voltage is too low.

UNDER VOLT START

Interface

- UNDER VOLT -INPUT: 200V

Description

Press UP/DOWN to adjust the input figure; Press Enter to confirm the input.

OVER FREQ

Interface - OVER FREQ -→ 1: ENABLE 2: FREQ

Description

Enter the option 1 to enable or disable the function that the power of inverter derates when frequency is too high. Enter the option 2 to adjust the exact value of the frequency when power start to derate.

OVER FREQE ENABL

- OVER FREQ -→ 1: DISABLE 2: ENABLE

OVER FERQ START

- OVER FREQ -

INPUT: 50.50Hz

Description

Description

Press UP/DOWN to adjust the input figure; Press Enter to confirm the input.

Derate power when Frequency over.

The default option is enable.

UNDER FREQ

Interface

Interface Description - UNDER FREQ Enter the option 1 to enable or disable the function that the power of inverter derates when frequency is too low. Enter the option 2 to adjust the exact value of the frequency when power start to derate.

UNDER FREQ ENABLE

Interface

| - UNDER FREQ - | |
|--------------------------|--|
| \rightarrow 1: DISABLE | |
| 2: ENABLE | |

UNDER FREQ START

Interface

- UNDER FREQ -INPUT: 50.50Hz

Description

Derate power when Frequency is too low. The default option is enable.

Description

The function that the power of inverter derates when frequency is too low. Press UP/DOWN to adjust the exact value of the frequency when power start to derate.

REACT RESP

Interface

| - REACT RESP - INPUT: 10s | |
|------------------------------|--|
| Value Range (6s ~ 60s) | |

Description

The input value of Reactive response time. The value ranges from 6s to 60s and default value is 10s.

VRT_ENABLE

Interface

| - | VRT_ENABLE - | |
|-----------------|--------------|--|
| $\rightarrow 1$ | DISABLE | |
| 2 | : ENABLE | |
| | | |

Description

Enable or disable the High/Low voltage ride through capability.

POW SI RATE

| Interface | |
|-----------------|---|
| | - |
| - POW SI RATE - | |
| INPUT: 250% | |

Description

The input value of power rising rate. Default value is 250%.

6.3.5 485 Address

| Interface | Description |
|-----------------------------|--|
| - 485 ADDRESS - INPUT: 1 | Press UP/DOWN button to adjust the input figure; Press ENTER button to confirm or ESC button to cancel the input and return to setup |
| Value range (1~32) | between 1 and 32. |

6.3.6 485 Baud rate

| Interface | Description |
|---------------|---|
| - SELECT - | Press UP/DOWN button to move corresponding options; |
| 1: 2400 bps | Press ENTER button to confirm or ESC button |
| 2: 4800 bps | to cancel the selection and return to setup |
| → 3: 9600 bps | interface; there are three alternative options: 2400/4800/9600. |

6.3.7 Language



Description

Description

interface;

Description

and 2099.

Description

menu.

interface.

120.

Press UP/DOWN button to move corresponding options;

Press ENTER button to confirm or ESC button to cancel the selection and return to setup interface;

Press UP/DOWN button to adjust the input figure; Press ENTER button to confirm or ESC button to cancel the input and return to setup

The input value should range between 20 and

Press UP/DOWN button to adjust the input figure; Press Enter button to move cursor backward, confirm input and return to setup interface; Press ESC button to move cursor forward and return to setup interface; The input value should range between 2000

Clear all the previous history in Inquiry/Record

Press ENTER button to confirm or ESC button to cancel the selection and return to setup

Press UP/DOWN button to move

corresponding options;

6.3.8 LCD backlight

Interface

| - LIGHT | TIME - |
|----------|-----------|
| INPUT: 2 | 20 |
| UNIT: S | (seconds) |

6.3.9 Date/time

Interface

| DATE/TIME |
|-------------------|
| DATE: 2007-19 20- |
| TIME: 10: 01: 12 |
| WEEK: Monday |

6.3.10 Clear history

Interface



6.3.11 Password Setting

| Interface | Description | |
|--|---|--|
| PASSWORD OLD: XXXXX NEW: XXXXX CONFIRM: XXXXX | This interface will be used to change password for entry into the setup interface; Press UP/DOWN to adjust the input figure; Press Enter to move cursor backward, confirm input and return to setup interface; Press ESC to move cursor forward and return | |
| o.3.12 Maintenance | to setup interface; | |
| Interface | Description | |
| | | |
| →12: MAINTENA NCE | Maintainer use only. Press Enter to enter the selected item | |

6.3.13 Auto Test

| Interface | Description |
|--|---|
| PASSWORD INPUT: XXXXX | The Auto test function works only in the Italy grid standard. After entering the Auto test interface, the system will prompt to input password; The password is"00000". |
| Interface | Description |
| Auto test 603 s | The self-test countdown interface. This interface will show up at the beginning of the self-test. The countdown will last for 603 seconds. You can press the ESC Key to exit the self-test. |
| Interface | Description |
| TEST LIST 1: VOLT MAX → 2: VOLT MIN 3: FREQ MAX 4: FREQ MIN | After the countdown there is a test list interface which is used to select the parameter for Auto test. There are four kinds of test results including Volt Max , Volt Min ,Freq Max and Freq Min. After entering the submenu items, you can press the UP and Down key to scan the result. |
| Interface | Description |
| OVER VOLT Set: 253.0V 603s Tes: 253.0V 603s VACMAX(S2) Set: 264.0V 190ms Tes: 264.0V 188ms Cur: 230.0V Pass! | Threshold setting value: The value set by upper computer software. Threshold setting trip time: The trip time set by upper computer software. Threshold auto test value: The value of threshold during coincidence between the threshold and current measured value. Threshold auto test trip time: The time from the coincidence between the threshold and current to the trip signal of disconnection switch. Current measured voltage or frequency value: The measurement value of grid voltage or frequency during the coincidence. |
| Interface | Description |
| VACMIN Set: 195.0V 1.52s Tes: 195.0V 1.50s Cur: 230.0V Pass! | Threshold setting value: The value set by upper computer software. Threshold setting trip time: The trip time set by upper computer software. Threshold auto test value: The value of threshold during coincidence between the threshold and current measured value. Threshold auto test trip time: The time from the coincidence between the threshold and current to the trip signal of disconnection switch. Current measured voltage or frequency value: The measurement value of grid voltage or frequency during the coincidence. |

Interface

OVER VOLT Set: 50.2Hz 100ms Tes: 50.2Hz 94ms Cur: 49.9Hz Pass!

FACMAX(S2) Set: 51.5Hz 100ms Tes: 51.5Hz 94ms Cur: 49.9Hz Pass!

Interface

| FACMIN(S1) |
|-------------------|
| Set: 49.8Hz 100ms |
| Tes: 49.8Hz 97ms |
| Cur: 49.9Hz Pass! |
| |
| FACMIN(S2) |

Set: 47.5Hz 100ms Tes: 47.5Hz 94ms Cur: 49.9Hz Pass!

Description

• Threshold setting value: The value set by upper computer software.

• Threshold setting trip time: The trip time set by upper computer software.

• Threshold auto test value: The value of threshold during coincidence between the threshold and current measured value.

• Threshold auto test trip time: The time from the coincidence between the threshold and current to the trip signal of disconnection switch. Current measured voltage or frequency value: The measurement value of grid voltage or frequency during the coincidence.

Description

Threshold setting value:

• The value set by upper computer software. Threshold setting trip time:

• The trip time set by upper computer software.

• Threshold auto test value: The value of threshold during coincidence between the threshold and current measured value.

Threshold auto test trip time:

• The time from the coincidence between the threshold and current to the trip signal of disconnection switch.

Current measured voltage or frequency value:

• The measurement value of grid voltage or frequency during the coincidence.

6.4 Inquiry

| Interface | Description |
|---|--|
| INUIREQ → 1: INV MODEL 2: MODEL SN 3: FIRMWARE 4: REGION 5: RUN SETTING 6: RECORD 7: BMS INFO | Press UP/DOWN button to move corresponding options; Press Enter button to jump to the selected menu; Press ESC button to return to user interface; There are four alternative options: machine model, serial number, firmware version region, running setting, running records and BMS information. (Refer to 1 to 7). |
| 1) Machine model | |
| Interface | Description |
| INVERTER SL-D5 | This interface displays machine model of the inverter; Press ESC button to return to inquiry interface. |
| Serial number | |
| Interface | Description |
| SERIAL NUMBER SN: 123456789532625 3 Firmware Version | This interface displays serial number of the inverter; Press ESC button to return to inquiry interface. |
| Interface | Description |
| FIRMWARE ARM VER: 1.0.0 DSP VER: 1.0.0 | This interface displays firmware version for ARM and DSP of the inverter; Press ESC button to return to inquiry interface. |
| ④ Region | |
| Interface | Description |
| REGION Aus-A | This interface displays the current selection of region. Press ESC button to return to inquiry |

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interface.

⑤ Run Setting

| Interface | Description |
|---|--|
| RUN SETTING INV VOLT MAX: 200 V INV VOLT MIN: 170 V INV FREQ HIGH: 52.0 Hz INV FREQ LOW: 48.0 Hz OVER VOLT: 264 V UNDER VOLT: 200 V OVER FREQ: 50.5 Hz UNDER FREQ: 49.5 Hz GRID POWER: 100% | This interface displays the current settings for grid protection and power quality response modes. Note that the parameters here are only available for view. Press ESC button to return to inquiry interface. |

6 Running Records

| Interface | Description | |
|-------------------------------------|---|--|
| REC(500) 1: F10-1 | SN of the fault: Fault warning codes (500 at utmost) (the latest fault or alarm marked as No.1) Time of the fault: | |
| ATE: 2018-12-01 TIME: 00: 01: 02 | Press UP/DOWN button to view the record; Press ENTER button to enter the description interface for corresponding records; | |
| | Press ESC button to return to Inquiry interface. | |

Description

⑦ Bms Info

| Interface |
|--|
| PACK INFO → 1: PACK 1 2: PACK 2 3: PACK 3 4: PACK 4 5: PACK 5 |
| PACK 1 1: INFO 2: WARN 3: FAULT 4: PROTECT |

Battery information, warning records, fault records and protect information of the five battery packs

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can be queried in this interface.

6.5 Statistics

| Interface | Explanation | |
|-----------------------------|---|--|
| STAT | This interface is used to select statistics items; | |
| \rightarrow 1: TIME STAT. | Press UP/DOWN button to move | |
| 2: CONNE.TIMES | Press Enter to enter the selected menu; | |
| 4: E-TODAY | Press ESC button to return to user interface; | |
| 5: E-MONTH | There are eight alternative options in total: time accounting, grid-connection frequency/ | |
| 6: E-YEAR | peak power/ power generation for the day / | |
| 7: E-TOTAL | power generation for the month/ power generation for the year/gross power generation (refer to 1 to 7). | |

① Time accounting

Description

| - TIME - | Operation length of inverter (hours) Grid-connection length (hours) |
|-------------------|--|
| RUN: 5 GRID: 0 | Press ESC button to return to statistics interface. |
| UNIT: HOUR | |

Description

2 Grid-connection frequency

Interface

Interface

| CONNE.TIMES TIMES: 0 | This interface displays grid-connection | |
|-------------------------|--|--|
| | frequency of the inverter; | |
| | Press ESC button to return to statistics | |
| | interface. | |

③ Peak power

Interface

| PEAK POWER | |
|---------------|--|
| HISTORY: 5000 | |
| TODAY: 0 | |
| UNIT: W | |

Description

This interface displays power peak in history and for the day. Press ESC button to return to statistics interface.

④ The day

Interface -- E-TODAY --PV: 0.0KW HMETER: 0.0KWH GRID: 0.0KWH LOAD: 0.0KWH CHARG: 0.0KWH DISCH: 0.0KWH

Description

This interface displays power generation for the day (kWh) ; PV power generation; Electric energy selling to grid; Electric energy buying from grid; Power consumption of load.

⑤The month

| Interface | Description |
|--|--|
| E-MONTH PV: 0.0KWH METER: 0.0KWH GRID: 0.0KWH LOAD: 0.0KWH | This interface displays power generation for the month (kWh); PV power generation; Electric energy selling to grid; Electric energy buying from grid; Power consumption of load. |
| | |

6 The year

| Interface | Description |
|---------------|---|
| E-YEAR | This interface displays power generation for the year (kWh); PV power generation; |
| PV: 0.0KWH | Electric energy selling to grid; Electric energy |
| METER: 0.0KWH | buying from grid; Power consumption of load. |
| GRID: 0.0KWH | |
| LOAD: 0.0KWH | |
| | |

O Gross generation

| Interface | Description |
|---|--|
| Interface E-TOTAL PV: 0.0KWH METER: 0.0KWH GRID: 0.0KWH LOAD: 0.0KWH | Description This interface displays gross power generation; PV power generation; Electric energy selling to grid; Electric energy buying from grid; Power consumption of load; |
| CHARG: 0.0KWH DISCH: 0.0KWH | |

6.6 Factory default setting

| Interface | Description |
|--|---|
| - FACTORY RESET - → 1: CANVEL 2: CONFIRM | Press UP/DOWN button to move corresponding options; |





7.1 Battery storage requirements

Storage environment requirements:

- Ambient temperature: -10°C~45°C; recommended storage temperature: 20°C~30°C;
- Relative humidity: 0%RH~95%RH (No condensation);
- In a dry, ventilated and clean place;
- No contact with corrosive organic solvents, gases and other substances;
- No direct sunlight;
- Less than 2 meters from any heat source.

7.2 Storage expiration

In principle, it is not recommended to store the battery for a long time. Be sure to use it in time. The stored batteries should be disposed according to the following requirements.

Table 5.2 Stored lithium battery recharging interval

1. If a battery is deformed, broken or leaking, discard it immediately regardless of its storage time.

2. The allowable maximum stored battery recharging period is 3 years and the allowable maximum stored battery recharging times is 3. For example, if recharging is performed once every 8 months, the allowable maximum recharging times is 3 times; if recharging is performed once every 12 months, the allowable maximum recharging times is 3 times; if the allowable maximum stored battery recharging period or times is exceeded, it is recommended to discard the battery.

3. A lithium battery will have its capacity decreasing after being stored for a long time, and typically will have its capacity irreversibly decreasing by 3%-10% after being stored at the recommended storage temperature for 12 months. If the customer conducts the discharge test and acceptance according to the specification, there is a risk that the battery with a capacity less than 100% after being stored will fail the test.

| Required Storage Temperature | Actual Storage Temperature | Recharge Interval |
|------------------------------|----------------------------|-------------------|
| -10°C ~ +45°C | -10°C≤T≤30°C | 12 months |
| | 30°C < T≤45°C | 8 months |

7.3 Inspection before battery recharging

Before recharging a battery, check its appearance: Deformation/Shell damage/Leakage.

7.4 Recharge Operation Steps

Step 1 Connect power cables to the battery charger correctly. The maximum number of battery PACK connected parallel is 5.

Step 2 Turn on the battery PACK DC breaker to ON; Press the battery "start key" for 3 second to start the battery PACK. Check the LED on the battery PACK is on.

Step 3 Turn on the battery charger.

Step 4 Set charging parameter on the battery charger.

Case #1, one battery PACK is charged. Set the charge limited voltage 56.5V; Set the charge limited current 50A;

Case #2, Two ~ Five battery PACKs are charged. Set the charge limited voltage 56.5V; Set the charge limited current 100A;

Step 5 after the battery is charged, switch off the battery charger and then the battery DC breaker. Disconnect the DC cables and then press the battery "start key" for 3 second to switch off the battery PACK.

8

Stick Logger Quick Guide



8.1 Download APP

Step 1 Scan the QR Code on the right side and download the APP.



IPhone:Search "SOLARMAN Smart" in Apple Store. Android:Search "SOLARMAN Smart" in Google Play.

8.2 Stick Logger Installation

Step 1 Assemble logger to the inverter communication interface as shown in the diagram.





Please do not hold the logger body to rotate while install or remove the logger.



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8.3 Logger Status

8.3.1 Check Indicator Light

| Lights | Implication | Status Description (All lights are single green lights.) |
|------------|----------------|---|
| | | Light off: Fail to connect to the router. |
| | | On 1s/Off 1s (Slow flash): Successful connection to the router. |
| NET | Communicate | Light keeps on: Successful connection to the server. |
| | with router | On 100ms/Off 100ms (Fast flash): Distributing network fast. |
| • COM | | Light keeps on: Logger connected to the inverter. |
| | Communicate | Light off: Fail to connect to the inverter. |
| | with inverter | On 1s/Off 1s (Slow flash): Communicating with inverter. |
| • READY | | Light off: Running abnormally. |
| | Logger | On 1s/Off 1s (Slow flash): Running normally. |
| | running status | On 100ms/Off 100ms(Fast flash): Restore factory settings. |

The normal operation status of the stick logger, when router connected to the network

normally:

- 1. Successful connection status with serve: NET light keeps on after the logger powered on.
- 2. Logger running normally: READY light flashes.
- 3. Successful connection status with inverter : COM light keeps on.
8.4 Abnormal State Processing

If the data on platform is abnormal when the stick logger is running, please check the table below and according to the status of indicator lights to complete a simple troubleshooting. If it still can't be resolved or indicator lights status do not show in the table below, please contact our Customer Service. (Note: Please using the following table query after power-on for 2mins at least.)

| NET | СОМ | READY | | | |
|------------|-----------|------------|--|---|---|
| NET | СОМ | READY | Fault Description | Fault Cause | Solution |
| Any state | OFF | Slow flash | Communicate with inverter abnormally | Connection between stick logger and inverter loosen. Inverter does not match with stick logger's communication rate. | Check the connection between stick logger and inverter. Remove the stick logger and install again. Check inverter's communication rate to see if it matches with stick logger's. Long press Reset button for 5s, reboot stick logger. |
| | | | | | 1. Check if the wireless network configured. |
| | | | | 1. Stick logger does not have a network. | 2.Check the antenna, if there is any damage or loose. |
| OFF | ON | Slow flash | Connection between logger and router abnormal | Antenna abnormal Router WiFi signal strength weak. | 3.Enhance router Wi-Fi signal strength. Long press Reset button for 10s, reboot stick logger and networking again. |
| | | | Connection betwe- | 1.Router networking abnormal. | |
| | | | en logger and router normal, connection between logger and | 2.The server point of logger is modified. | 1. Check if the router has access to the network. |
| Slow flash | ON | Slow flash | remote server abnormal. | 3.Network limitation, server cannot be connected. | 2.Check the router's setting, if the connection is limited. |
| | | | | 1. Connection between stick logger and inverter loosen or abnormal. | |
| | | | Power supply | 2. Inverter power in sufficient. | 1. Connection between logger and router normal, connection between logger and |
| OFF | OFF | OFF | abnormal | 3. Stick Logger abnormal. | remote server abnormal. |
| | | | | | 1. Exit automatically after 5mins. |
| | | | | | 2. Long press Reset button for 5s, reboot stick logger. |
| Fast flash | Any state | Any state | SMARTLINK networking status | Normal | 3. Long press Reset button for 10s, restore factory settings. |
| | | | | | 1. Exit automatically after 1mins. |
| | | | | | 2. Long press Reset button for 5s, reboot stick logger. |
| Any state | Any state | Fast flash | Restore factory settings | Normal | 3. Long press Reset button for 10s, restore factory settings. |

8.5 Usage Methods and Notices for Reset Button

8.5.1 Usage methods and key-press descriptions for reset button



| Key-press | Status Description | Light Status |
|----------------|------------------------------------|--|
| Short press 1s | SMARTLINK rapid networking status. | NET light flashes fast for 100ms. |
| Long press 5s | Rebooting the stick logger. | All lights are extinguished immediately. |
| Long press 10s | Resetting the stick logger. | All lights are extinguished after 4s. READY light flashes fast for 100ms. |

8.5.2 Notice



Do not remove waterproof plug.





SOLARMAN Smart APP



9.1 Registration

Go to SOLARMAN Smart and register. Click "Register" and create your account here.



9.2 Create a Plant

Click "Add Now " to create your plant. Please fill in plant basic info and other info here.

| My Plants + | < Plant Datails |
|-----------------------------|---|
| 1 | Basic info |
| | Plant Name Demo plant-Commoncial () |
| | Plant Loo Zhinjiang yuyeo 1 |
| 111 | Time Zone (IU/TC+08:00Balling.Chongong + HongKong.Jfurng + |
| 111 | Creation Data 2019-05-04 / |
| You have no plants for now. | Founder - Clavin - |
| | System Inte |
| Add Now | Plant Type Residential Roothop |
| | System Type All on Orid |
| | Installed Capacity (kWp) 18350 |
| | |
| A 4 | Finish |

9.3 Add a Logger

Method 1: Enter logger SN manually.

Method 2: Click the icon in the right and scan to enter logger SN You can find logger SN in the external packaging or on the logger body.



9.4 Network Configuration

After the logger is added, please configure the network to ensure normal operation. Go to "Plant Details"-"Device List", find the target SN and click "Networking".



Step 1: Confirm Wi-Fi Info

Please make sure your phone has connected to the right WIFI network. And click "Start".





5G WiFi is not supported . Special characters (e.g. , ; " =" " `) in router name and password are not supported.

Step 2: Connect to AP

network Click "Go to connect" and find the right "AP_XXXXX" network (XXXXX refers to logger SN). If the password is required, you can find the password on the logger body. Go back to SOLARMAN Smart APP, after connecting to AP network.

| Go to WI AN Setting and connect the | < settings WLAN | |
|---|-----------------|----------------|
| following network manually | WLAN | |
| Adred T II Pressed | MY NETWORKS | |
| AP_622602179 🗢 🛈 | Android | ? 0 |
| 100440 + + = = = = = = = = = = = = = = = = = | ChinaNet | |
| Some devices might need a password | AP_622602179 | ? 0 |
| to connect the network. You can find the password on the device enclosure. | HYH123 | ≜ ≈ 0 |
| Connected. | IGEN-5G | ≜ 奈 @ |
| Go to connect | OTHER NETWORKS | |
| | act-blue | ₹ 0 |
| Cancelar | ChinaNet-igen | ≜ ≑ © |

Step 3: Auto Configuration

Please wait for a while to complete the configuration. Then system will switch to the following page. Click "Done" to check plant data. (Usually, the data will be updated in 10 mins)



If configuration failure occurs, please check the following reason and try it again.

- (1) Make sure WLAN is ON.
- (2) Make sure WIFI is normal.
- (3) Make sure wireless router does not implement the white-black list.
- (4) Remove the special characters in Wi-Fi network.
- (5) Shorten the distance between the phone and device.
- (6) Try to connect to other Wi-Fi.

10

Maintenance & Troubleshooting



10.1 Maintenance and troubleshooting of PV modules

Module need to be inspected and maintained on a regular basis, especially during the warranty period. The following maintenance measures are recommended to ensure optimal performance of the module:

10.1.1 Visual inspection

• It is recommended to perform a preventive inspection for 6 months without replacing the module of the module. If electrical or mechanical performance inspection or maintenance is required, it is recommended that qualified personnel perform the operation to avoid electric shock or personal injury.

• The borderless single glass corner protector is used as the transportation protection part, and the appearance control is not performed. The customer chooses to disassemble or retain it.

- Check if the module glass is damaged.
- Confirm if there is a sharp object touching the surface of the module.
- Check if the module is blocked by obstacles or foreign objects.
- Check if the module terminals are disconnected.
- Confirm the rupture caused by unmanned surface of the module.

• Check the fixing screws between the module and the bracket for looseness or damage, and adjust or repair them in time.

10.1.2 Connector and cable inspection

• It is recommended to perform a preventive check every 6 months and check all cables to verify that they are securely connected; Avoid directing the cable from direct sunlight and away from the water. Keep the connector dry and clean. Make sure the connector's nut is tightened before connecting. Do not connect the connector while the connector is wet, dirty, or otherwise.

• Check the sealant at the junction box for cracks, gaps, and signs of aging of the PV modules. This includes possible rodent damage, weathering, and the tightness and corrosion of all connectors. Check that the modules are well grounded

• It is recommended that the torque of the terminal bolts and all aspects of the wiring be checked at least once a year. Also, check that the installed hardware is securely in place. Loose connections can cause arcing and electric shocks that can damage the array.

10.1.3 Cleaning

The accumulation of dust in the air on the glass surface of the assembly reduces its power output and performs cleaning as often as possible (as for the frequency of cleaning, depending on the conditions at the installation site). Wipe the PV module with a dry or damp soft and clean cloth when cleaning. Do not use corrosive solvents or wipe the PV module with a hard object.

• Under no circumstances should the surface be cleaned with a rough surface.

• The back of the assembly usually does not need to be cleaned. However, when it is deemed necessary to clean it, avoid using any sharp objects that may cause damage or penetrate the substrate material.

• Do not attempt to clean PV modules that have broken glass or exposed wires, which pose a risk of electric shock.

Water quality requirements PH: 5~7; Chloride or salt content: 0-3,000 mg/L Turbidity: 0-30 NTU Conductivity: 1500~3000 µs/cm Total dissolved solids: ≤1000 mg/L Water hardness: 0-40 mg/L Non-alkaline water must be used, and demineralized water is used when conditions are met. 6.3.2 Component inspection after cleaning.

• The overall appearance of the visual components is clean, bright and free of stains. Sampling checks for the presence of ash on the surface of the component. There are no obvious scratch marks on the surface of the component. There is no rupture caused by the surface of the component.

• Whether the component bracket is tilted or bent after cleaning. Whether the component terminals are disconnected or the like.

• After the PV modules are cleaned, the PV module cleaning records are completed.

10.1.4 Troubleshooting

If it does not work properly after installation, please notify the installer immediately.

10.2 Troubleshooting and -Maintenance of All-in-one energy storage system

10.2.1 Alarm Code and Error Code

10.2.1.1 Alarm Code

| Codes | English description |
|-------|----------------------------|
| W00 | Grid Volt Low |
| W01 | Grid Volt High |
| W02 | Grid Frequency Low |
| W03 | Grid Frequency High |
| W04 | Solar Loss |
| W05 | Bat Loss |
| W06 | Bat Under Volt |
| W07 | Bat Volt Low |
| W08 | Bat Volt High |
| W09 | Over Load |
| W10 | GFCI Over |
| W11 | LN Reverse |
| W12 | Fan Fault |
| W13 | BAT Power Down |
| W14 | BMS Discharge Over Current |
| W15 | BMS charge Over Current |
| W16 | BMS Over Volt |
| W17 | BMS Over Temp |
| W18 | BMS Discharge Low Temp |
| W19 | BMS Volt Imbalance |
| W20 | BMS Communicate Fault |
| W21 | BMS Under Volt |
| W22 | BMS Chg Temp Low |
| W23 | BMS Severe Over Volt |
| W24 | BMS Severe Over Temp |
| W25 | BMS Updating |
| W26 | BMS Program Version Err |
| W27 | BMS Program Update Fail |
| W28 | CT Reverse |
| W29 | Clock Initiate Fail |

10.2.1.2 Error Code

| Codes | English description |
|-------|------------------------|
| F00 | Soft Time Out |
| F01 | INV Volt Short |
| F02 | GFCI Sensor Fault |
| F04 | Bus Volt Low |
| F05 | Bus Volt High |
| F06 | Bus Short Circuit |
| F07 | PV ISO Under Fault |
| F08 | PV Input Short Circuit |
| F09 | Bypass Relay Fault |
| F10 | INV Curr Over |
| F11 | INV DC Over |
| F12 | Ambient Over Temp |
| F13 | Sink Over Temp |
| F14 | Grid Relay Fault |
| F15 | DisChg Curr Over |
| F16 | Chg Curr Over |
| F17 | Current Sensor Fault |
| F18 | INV Abnormal |
| F19 | EPS Relay Fault |
| F20 | Always Over Load |
| F32 | SCI Fault |

10.2.2 Routine Maintenance of All-in-one energy storage system

10.2.2.1 Maintenance Plan

- Check if wire connections are loose.
- Check if cables are aged/damaged.
- Check if cable insulating ribbon drops.
- Check if cable terminal is loose, any overheat sign.
- Check if ground connection is good.

10.2.2.2 Operating Environment

(Every six months)

Carefully observe whether the battery system equipment is ineffective or damaged;

When the system is running, listen to any part of the system for abnormal noise;

Check whether the voltage, temperature and other parameters of the battery and other equipment parameters are normal during system operation.

10.2.2.3 Equipment Cleaning

(Every six months to one year, depending on the site environment and dust content, etc.) Ensure that the ground is clean and tidy, keep the maintenance access route unblocked, and ensure that the warning and guiding signs are clear and intact.

Monitor the temperature of the battery module and clean the battery module if necessary.

10.2.2.4 Cable, Terminal and Equipment Inspection

(Every six months to one year)

Check if the cable connections are loose. Check whether the cables are aged / damaged.

Check whether the cable tie of the cable has fallen off.

Check if the cable terminal screws are loose and the terminal position has any signs of overheating.

Check whether the management system of the system equipment, monitoring system and other related equipment are invalid or damaged.

Check that the grounding of the equipment is good and the grounding resistance is less than 10 ohms.

10.2.2.5 Notes

After the equipment is out of operation, please pay attention to following notes while maintaining:

Related safety standards and specifications should be followed in operation and maintenance.

Disconnect all the electrical connections so that the equipment would not be powered on.

Wait at least 5 minutes after disconnection, so that the residual voltage of the capacitors drops to a safe voltage. Use a mustimeter to make sure that the equipment is completely discharged.

The equipment should be repaired by professional staff only and it is strictly forbidden for maintenance staff to open equipment modules on their own.

Appropriate protective measures should be taken while maintaining, such as insulated gloves, shoes, and anti-noise ear plugs.

Life is priceless. Make sure no one would get hurt first.

In case of a deep discharge, the battery must be charged to a SOC rate of 30% to 50%, If the entire system is static (i.e. the battery has not been charged for two weeks or more).

Please contact us in time if there are any conditions that could not be explained in the manual.

10.2.2.6 Fault Diagnosis and Solutions

The inverter is easy to maintain. When you encounter the following problems, please refer to the Solutions below, and contact the local distributor if the problem remains unsolved. The following table lists some of the basic problems that may occur during the actual operation as well as their corresponding basic solutions.

Fault diagnosis table

| Types | Codes | Solutions |
|------------------------|-------------|---|
| Soft Time Out | F00 | (1) Restart the inverter and wait until it functions normally;(2) Contact customer service if error warning continues. |
| INV Volt Short | F01 | (1) Cut off all the power and shut down all the machines; disconnect the load and plug in to restart machines, then check whether the load is short circuited if the fault has been eliminated;(2) Contact customer service if fault remains unremoved. |
| GFCI Sensor Fault | F02 | Cut off all the power, Restart the inverter and wait until it functions normally. Contact customer service if error warning continues. |
| Bus Volt Low | F04 F05 | Check the input mode setting is correct. Restart the inverter and wait until it functions normally. Contact customer service if error warning continues. |
| Bus Volt Short | F06 | Restart the inverter and wait until it functions normally. Contact customer service if error warning continues. |
| PV ISO Under Fault | F07 | (1) Check for good ground connection; (2) Check if the earth resistance of PV+ and PV- is greater than 2MΩ; (3) If it is smaller than 2MΩ, check PV string for ground fault or poor ground insulation; if it is greater than 2MΩ, please contact the local inverter customer service once fault is not removed. |
| PV Input Short Circuit | F08 | Check the input mode setting is correct. Disconnect the PV input, restart the inverter and wait until it functions normally. Contact customer service if error warning continues. |
| Relay Fault | F09 F19 F14 | Disconnect the PV input, restart the inverter and wait until it functions normally. Contact customer service if error warning continues. |
| INV Current Over | F10 | Wait five minutes for the inverter to automatically restart; Check whether the load is in compliance with the specification; Contact customer service if error warning continues. |
| INV DC Over | F11 | Restart the inverter and wait until it functions normally. Contact customer service if error warning continues. |
| NTC/Sink Temp Over | F12 F13 | (1) Restart the inverter, restart the machine after a few minutes of cooling, and observe whether the machine can return to normal.(2) Check if the ambient temperature is outside the normal operating temperature range of the machine.(3) Contact customer service if error warning continues. |
| Dischg Curr Over | F15 | Wait one minute for the inverter to restart; Check whether the load is in compliance with the specification; Contact customer service if error warning continues. |
| CHG Current Over | F16 | Check if battery wiring port is short circuited; Check if charging current is in compliance with presetting; Contact customer service if error warning continues. |
| Current Sensor Fault | F17 | Restart the inverter and wait until it functions normally. Contact customer service if error warning continues. |

| Турез | Codes | Solutions |
|---------------------|-----------------|--|
| INV Abnormal | F18 | (1) Please contact the distributor. |
| EPS Relay Fault | F19 | The off-grid relay is faulty. Contact customer service if error warning continues. |
| Always Over Load | F20 | The system load always exceeds the rated value. Contact customer service if error warning continues. |
| Communication Fault | F32 | (1) Restart the inverter and wait until it functions normally.(2) Contact customer service if error warning continues. |
| Grid Fault | W00 W01 W02 W03 | Check if the local voltage and frequency is in compliance with the machine specification; If voltage and frequency are within the accepted range, then wait 2 minutes for the inverter to function normally; but if no recovery or fault repeats, please contact the local inverter customer service; Contact the local power company if voltage and frequency are beyond range or unstable. |
| Solar Loss | W04 | PV is not connected; Check grid connection; Check PV availability. |
| Bat Loss | W05 | Battery is not connected; Check if battery wiring port is short circuited; Contact customer service if error warning continues. |
| Bat Volt Low | W06 W07 | Check the battery availability; Contact customer service if error warning continues. |
| Bat Volt High | W08 | (1) Check if the battery is in line with the presetting;(2) If so, power off and restart;(3) Contact customer service if error warning continues. |
| Over Load Warning | W09 | (1) Wait one minute for the inverter to restart;(2) Check whether the load is in compliance with the specification; |
| GFCI Over | W10 | Check PV string for direct or indirect grounding phenomenon; Check peripherals of machine for current leakage; Contact the local inverter customer service if fault remains unremoved. |
| LN Reverse | W11 | (1) Check whether the installation follows the instructions;(2) Contact customer service if error warning continues. |
| Fan Fault | W12 | Restart the inverter and wait until it functions normally. Contact customer service if error warning continues. |
| BMS Fault | W14~W27 | (1) Please contact the distributor. |
| CT Reverse | W28 | Perform CT self-check; Contact customer service if error warning continues. |
| Clock Initiate Fail | W29 | Restart the inverter and wait until it functions normally. Contact customer service if error warning continues. |

10.3 Troubleshooting and removing & disposing of iBox

10.3.1 Troubleshooting of iBox

| No. | Faults | Possible Cause | Troubleshooting Suggestion |
|-----|----------|--|--|
| 1 | QF1 Trip | Faulty connections between AC Box and Inverter, a short-circuit. Breaker fault | Check the connection between AC Box and the inverter. Replace the broken OE1 breaker |
| 2 | QF2 Trip | A leakage fault happened on the D-Lan extender, Ethernet switch, or IOT. QF2 broken. | Remove the cover plate and check the circuit behind QF2. Replace QF2. |

10.3.2 Removing and Disposing of iBox



Before removing the iBox, disconnect both the AC IN and AC OUT power connectors. After powering off the iBox, wait at least 5 minutes before performing operations on the iBox.

Perform the following operations to remove the iBox:

Disconnect all cables from the iBox, including communications cables, AC output power cables and GND cables.

Remove the iBox from the mounting bracket on the wall.

10.4 Maintenance and trouble shooting of Mounting structure

In order to ensure the reliable operation of the solar mounting structure and improve the safety of the equipment, a daily patrolling inspection system should be established in the daily operation and maintenance work. Patrolling inspection should be conducted at least once every month. The purpose of inspection work is to discover hidden troubles in time, prevent them before occurrence, and effectively improve the reliability of solar mounting structure.

Please take note that after severe conditions such as strong winds above level 6, tropical storms, heavy snow weather and earthquakes etc., maintenance and repair personnel should be organized to conduct a thorough inspection of the solar mounting structure and write down corresponding inspection records. If the solar mounting structure is found to be damaged, it should be reported immediately for the handling of issues.

Check whether there is rubbish or debris on the surface; check whether the entire structure of the solar mounting system is corroded, or any part is missing or falling off; pay attention to the sealing tightness of places where they have been sealed, and repair if necessary.

When the height of solar mounting structure exceeds 2.5m, the dressing of the climber shall meet the climbing requirements. They should be equipped with safety belts before installation. All on-site maintenance and inspection personnel must wear safety helmets and other protective equipment. Maintenance and inspection work are prohibited when there are strong winds above grade 4, there is rain and snow weather or there are no night-time construction lighting facilities in the evening. Maintenance and inspection personnel are strictly prohibited from smoking and drinking during installation time.



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