INTERLINK POWER SYSTEM PTE LTD

Specialist in DC & AC Power System

www.interlinkpower.com

DESIGN, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF SOLAR PV SYSTEM AT POLLEN COLLECTION

OPERATION & MAINTENANCE MANUAL

INTERLINK POWER SYSTEM PTE LTD

32 Ang Mo Kio Industrial Park 2

#04-13, Sing Industrial Complex

Singapore 569510

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CONTENT PAGE

Introduction

PROJECT : **POLLEN COLLECTION**
INSTALLER : **INTERLINK POWER SYSTEM PTE LTD**

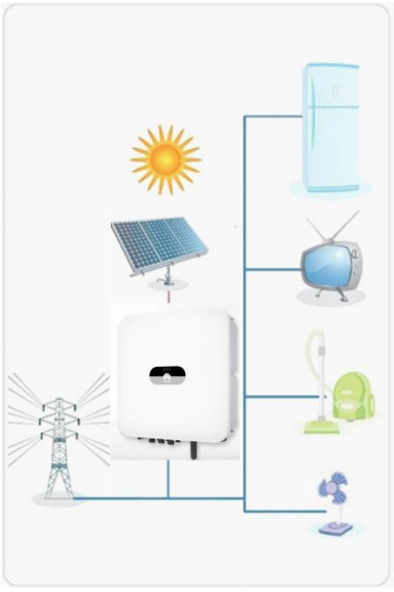

Figure 1 - Solar PV System Overview

The Solar Photovoltaic System at Pollen Collection has an installed capacity of 1.96kWp from 4pcs solar panels connected to 1 Inverter to generate power to the power grid through the Electrical DB.

The solar panels from both solar arrays convert sunlight into DC electrical energy, which is fed into solar inverters to be converted to AC electrical energy for use by the building electrical loads.

The solar panels are installed on the roof away from shade caused by nearby structures for the best possible energy generation. The inverter is installed in the under shelter, which helps to keep them cool in the day thus prolonging the life of the inverters.

Equipment Description

Solar Panel

Shine Solar SNM120H-182M-490W
Quantity : 4pcs

Solar Inverter

Huawei SUN2000-3KTL-L1
Quantity : 1pcs

POWER-PLUS

WEBSITE : WWW.INTERLINKPOWER.COM.SG
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32 ANG MO KIO INDUSTRIAL PARK 2, #04-13, SING INDUSTRIAL COMPLEX, SINGAPORE 569510
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Share the sun
clean the earth

182mm 10BB

490W N-type Half-Cell Module

SNM120H-182M-490W

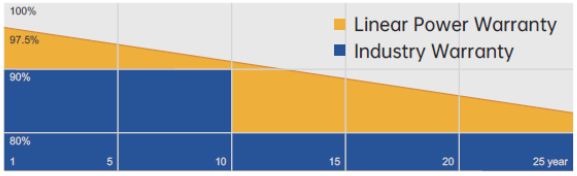
INTRODUCTION

Assembled with high-efficiency N-type cells, the half-cell configuration of the modules offers the advantages of higher power output, better temperature-dependent performance, reduced shading effect on the energy generation, lower risk of hot spot, as well as enhanced tolerance for mechanical

- Higher output power
- Lower temperature coefficient
- Less shading effect
- Better mechanical loading tolerance

SUPERIOR WARRANTY

- 15-year product warranty
- 25-year linear power output warranty

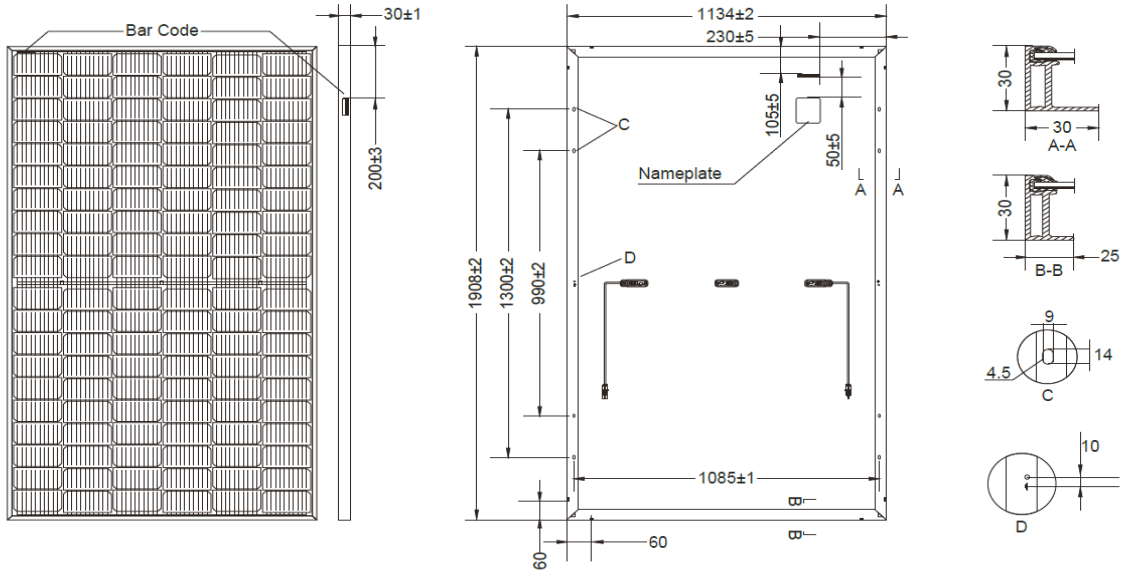


92% output power than rating power under STC with TEN years
90% output power than rating power under STC with FIFTEEN years
88% output power than rating power under STC with TWENTY years
85% output power than rating power under STC with TWENTY FIVE years

PRODUCT PERFORMANCE ADVANTAGE

- Excellent space utilization performance, increasing power density effectively and reducing costs
- Reducing the temperature of the solar module hot spot battery above 20°C , to ensure system stability and reliability
- Larger Size of Light Receiving Area, Higher Solar Panel Power, Lower System Cost
- Lower temperature coefficient, zero depth reflection increasing
- More Busbars, the Less of Broken and cracking , As the Narrowed Cell Bus Bar Width,the Light Receiving Area and Power are Increased too
- Reducing the loss of current mismatch and resistance

MECHANICAL DIAGRAMS



MECHANICAL PARAMETERS

Solar Cells	10BB Monocrystalline 182×91mm
Cell Orientation	120 (6×20)
Junction Box	IP68, three diodes
Glass	Single glass 3.2mm coated tempered glass
Frame	Anodized aluminum alloy frame
Weight	24.2kg
Dimension	1908×1134×30mm
Packaging	72pcs/sfack, 864pcs/40'HQ confainer
Cable	4mm², 300mm in length, length can be customized

OPERATING PARAMETERS

Operating Temperature	-40℃~ +85℃
Power Tolerance	0 ~ +5W
Voc and Isc Tolerance	± 3%
Max System Voltage	DC1500V (IEC/UL)
Maximum Series Fuse Fuse	25A
NOCT	45±2℃
Safety Class	Class II
Fire Rating	Class C

ELECTRICAL CHARACTERISTICS

TYPE	SNM120H-182M-490W
Maximum Power(Pmax/W)	490
Maximum Power Voltage(Vmp/V)	36.38
Maximum Power Current(Imp/A)	13.47
Open Circuit Voltage(Voc/V)	43.61
Short Circuit Current(Isc/A)	14.51
Module Efficiency(%)	22.64%

Standard Testing Condition: Irradiance 1000W/m² , Cell Temperature 25℃, Air Mass 1.5

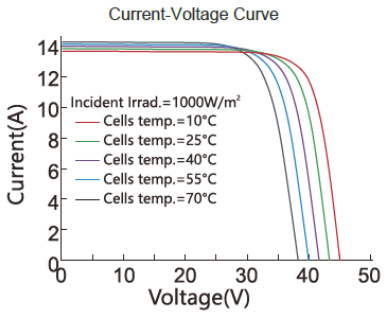
TEMPERATURE COEFFICIENT (STC)

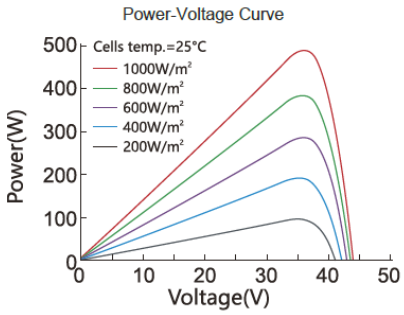
Temperature Coefficient of Isc	+0.048%/℃
Temperature Coefficient of Voc	-0.270%/℃
Temperature Coefficient of Pmax	-0.350%/℃

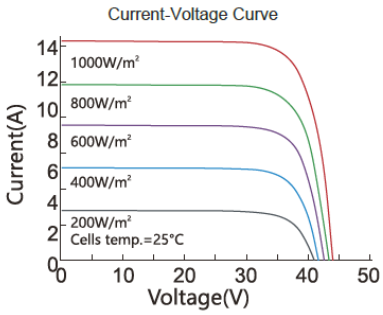
MECHANICAL LOADING

Front side Maximum Static Load (Wind or Snow)	5400Pa
Rear side Maximum Static Load (Wind)	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

I-V CURVE







* Note: Due to continuous technical innovation, R&D and mprovement, technical data above mentioned may be of modification accordingly. Shine Solar have the sole right to make such modification at anytime without further notice.

HUAWEI

SMART ENERGY CONTROLLER

SUN2000-2/3/3.68/4/4.6/5/6KTL-L1

Active Safety
Active Arcing Protection

Higher Yields
Up to 30% More Energy with Optimizer

Battery Ready
Plug & Play, Whole-house power backup

Version No.: 03-202312

SUN2000-2/3/3.68/4/4.6/5/6KTL-L1

Technical Specification

Technical Specification	SUN2000 -2KTL-L1	SUN2000 -3KTL-L1	SUN2000 -3.68KTL-L1	SUN2000 -4KTL-L1	SUN2000 -4.6KTL-L1	SUN2000 -5KTL-L1	SUN2000 -6KTL-L11
Efficiency							
Max. efficiency	98.2%	98.3%	98.4%	98.4%	98.4%	98.4%	98.4%
European weighted efficiency	96.7%	97.3%	97.3%	97.5%	97.7%	97.8%	97.8%
Input (PV)							
Recommended max. PV power [1]	3,000 Wp	4,500 Wp	5,520 Wp	6,000 Wp	6,900 Wp	7,500 Wp	9,000 Wp
Max. input voltage	600 V						
Startup voltage	100 V						
MPPT operating voltage range	90 ~ 560 V						
Rated input voltage	360 V						
Max. input current per MPPT	12.5 A						
Max. short-circuit current	18 A						
Number of MPP trackers	2						
Max. inputs per MPP tracker	1						
Input (DC Battery)							
Compatible battery	LUNA2000-5/10/15-S0						
Operating voltage range	350 ~ 560 Vdc						
Max. operating current	15 A						
Max. charge power	5,000 W						
Max. discharge power	2,200 W	3,300 W	3,680 W	4,400 W	4,600 W	5,000 W	5,000 W
Output (On Grid)							
Grid connection	Single-phase						
Rated output power	2,000 W	3,000 W	3,680 W	4,000 W	4,600 W	5,000 W	6,000 W
Max. apparent power	2,200 VA	3,300 W	3,680 W	4,400 VA	5,000 VA	5,500 W	6,000 VA
Rated output voltage	220 Vac / 230 Vac / 240 Vac						
Rated AC grid frequency	50 Hz/60 Hz						
Max. output current	10 A	15 A	16 A	20 A	23 A	25 A	27.3 A
Adjustable power factor	0.8 leading ... 0.8 lagging						
Max. total harmonic distortion	≤ 3%						
Backup power output	Yes (via Backup Box - B0, SmartGuard-63A-S0)						
Protection Feature							
Anti-islanding protection	Yes						
DC reverse polarity protection	Yes						
Insulation monitoring	Yes						
DC surge protection	Yes, compatible with TYPE II protection class according to EN/IEC 61643-11						
AC surge protection	Yes, compatible with TYPE II protection class according to EN/IEC 61643-11						
Residual current monitoring	Yes						
AC overcurrent protection	Yes						
AC short-circuit protection	Yes						
AC overvoltage protection	Yes						
Over-heat protection	Yes						
Arc fault protection	Yes						
Battery charging from grid	Yes						
General Specification							
Operating temperature range	–25°C to +60°C (Derating above 45°C @ Rated output power)						
Relative operating humidity	0%-100% RH						
Operating altitude	0-4,000 m (Derating above 2,000 m)						
Cooling	Natural convection						
Display	LED indicators; integrated WLAN + FusionSolar app						
Communication	RS485, WLAN via inverter built-in WLAN module, Ethernet via Smart Dongle-WLAN-FE (Optional); 4G/3G/2G via Smart Dongle-4G (Optional)						
Weight (incl. mounting brackets)	12.0 kg (26.5 lb)						
Dimensions (incl. mounting brackets)	365 mm x 375 mm x 156 mm						
IP rating	IP65						
Nighttime power	< 2.5 W						
Optimizer Compatibility							
DC MBUS compatible optimizer	SUN2000-450W-P2, SUN2000-600W-P						
Standards Compliance (More Available Upon Request)							
Safety	EN/IEC 62109-1, EN/IEC 62109-2						
Grid connection standards	G98, G99, EN 50549-1, CEI 0-21, VDE-AR-N-4105, AS 4777.2, C10/11, ABNT, UTE C15-712, RD 1699, TOR D4, IEC61727, IEC62116						

*1 The inverter max input PV power is 10,000 Wp when long strings are designed and fully connected with optimizers.

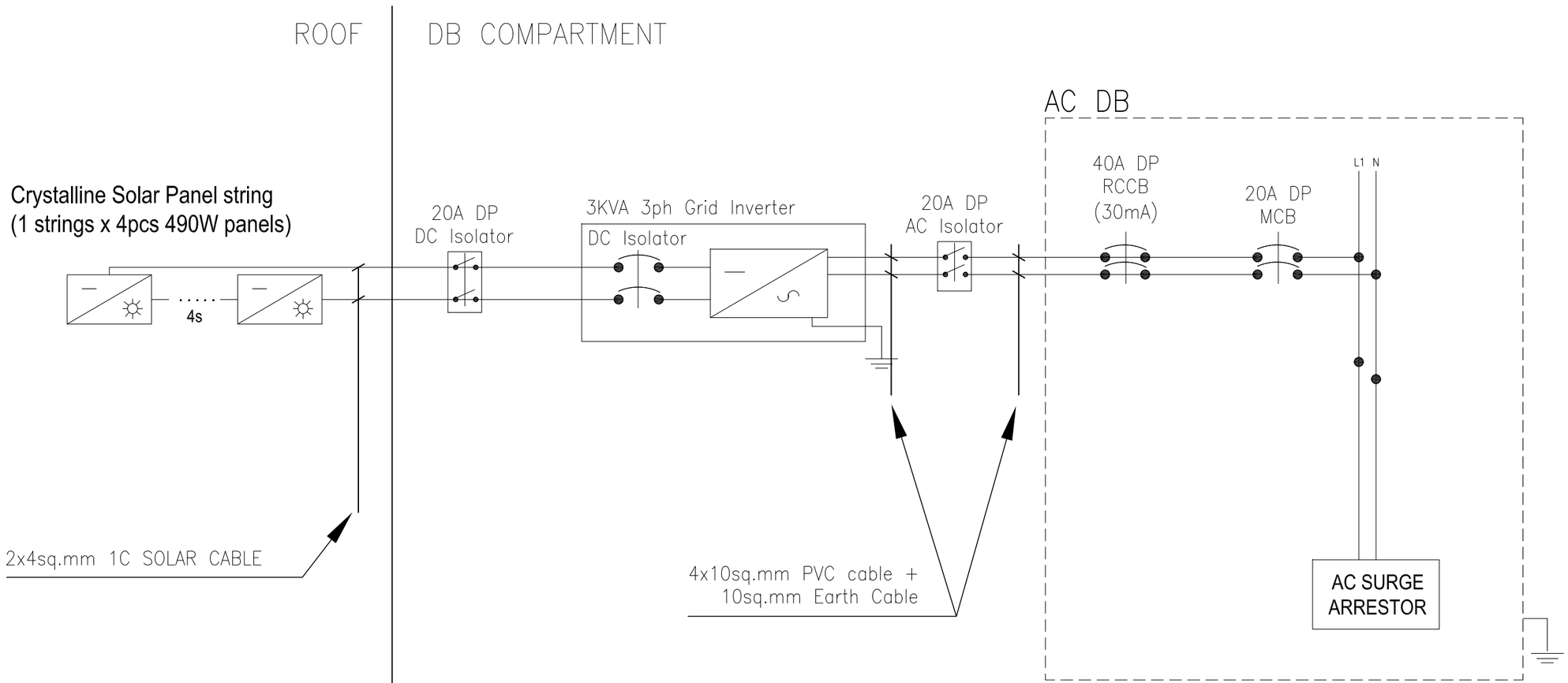
Disclaimer: the preceding values are measured by an internal laboratory of Huawei in a specific environment. The actual values may vary with products, software versions, usage conditions, and environmental factors.

PV System on Metal Roof

No. of 490W PV panels : 4 pcs

Total System DC Capacity : 1.96 kWp

PV Module Details		
Model	Dimension	Qty
SNM120H-182M-490W	1903 x 1134 x 30mm, 24.2kg	4



NOTE: DRAWING SUBJECTED TO CHANGES

REV	DATE	
0	30/03/26	Preliminary Design of schematic drawing

INTERLINK POWER SYSTEM PTE LTD

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CUSTOMER

WAH SYN ENGINEERING PTE LTD

PROJECT DESCRIPTION

GRID-TIED SOLAR PV SYSTEM ON ROOF OF
POLLEN COLLECTION

DRAWING TITLE

SCHEMATIC DRAWING FOR PV SYSTEM

FINAL DRAWING APPROVED BY CUSTOMER

Signature & Name Date

Checked	KM Leung	Print Date	30/03/2026
Drawn	Alan Leung	Rev.	0
Scale	NTS	Sht. no.	1 of 1

Drawing no.

260330-1741

START-UP & SHUTDOWN

PRE-START CHECKS

1. Once the system has be installed, the following (mainly visual) checks should be performed prior to starting the system.

2. Check the system is secure and as level as possible.

3. Ensure the external surfaces of the system are free from dust, packing materials, etc.

4. Check all switches, meters and lamps are in good condition and free from transit damage.

5. Check inside cabinets to ensure there are no obvious defects; such as loose PCB, loose or broken connectors, loose component mounts, etc.

6. Check all MCB are secure and in place

7. Check all external wiring to the system is correctly wired up and safely installed:-

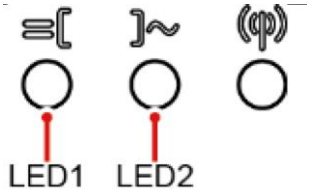
8. Check :-
   Mains AC feeds to the system.
   AC load circuit connections.
   Solar Panel connections and inter-cell connections.

START-UP PROCEDURE

In order to start the system whether it be following a controlled shut-down or post installation, the following procedure should be observed.

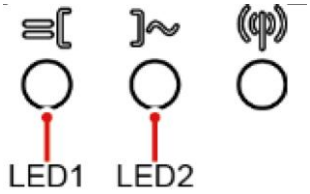
The instructions should be followed in the order listed.

System Start-up

ACTION	RESULT
Initialise the System controls as stated:- • INVERTER INPUT CIRCUIT BREAKER - *OFF* • AC CIRCUIT BREAKER – *OFF*	No Change.
Close the AC CIRCUIT BREAKER, THEN SOLAR PANEL INPUT CIRCUIT	LCD will green light on the LED1 (DC connection) and LED2 (AC Connection). Please wait afew minutes for the inverter to startup and synchronize with the grid when it is just turn on. 
The system is now up and running, the solar panel (sunny daytime) are supplying the requirements of the load.	*The inverter will supply the power to the lighting load.*

NORMAL OPERATION

During normal operating conditions only the following LED1 and LED2 should be steady green :-



SHUTDOWN PROCEDURE

To shutdown the system for maintenance purposes, etc., the following procedure should be observed.Procedure:-

■ **SYSTEM SHUTDOWN**

ACTION	RESULT
• INVERTER INPUT AND OUTPUT BREAKER - *OFF*	LEDs will be off

NOTE:- If the system is shutdown the supply to the load may be lost. Refer to Circuit Diagram supplied

CAUTION!:- Before proceeding with maintenance of the system consult the Health and Safety part of this manual.

WARNING!:- Even though the system is shutdown, high voltages may still be present within the cubicle. Refer to the Circuit Diagram supplied and isolate elsewhere before working on the system.

How to Connect to the Inverter Wirelessly

1. For localized communications to the inverter, download and install the Huawei SUN2000 app on your phone. For inverters connected to FusionSolar cloud, download and install the FusionSolar app.


SUN2000 app


Huawei FusionSolar app

2. Ensure the inverter is powered on. Also turn-on Bluetooth and Wifi on your phone.

3. Activate the SUN2000 app and setup an account.

4. Go to “Setup Wizard” and scan the QR code on the side of the inverter to connect to the Inverter.

5. When prompted to login, select Installer and password “00000a”

6. Click on “Quick Settings” and follow instructions on the screen.

    a. Setting Basic Parameters
    Grid code “Singapore” and activate “Sync phone time”.
    Press NEXT.

    b. Device detection
    Ensure inverter is listed on the next screen.
    Do not press “Cascaded inverters”.
    Press NEXT.

    c. Connect to management system
    If user wants to connect the inverter to Fusion Solar via home internet, enable “Monitor the PV plant through the management system”
    Select a router that can connect to the Internet and enter the wifi password.
    Press NEXT.

    d. Completed
    Ensure status are successful.

7. Add plant and fill in the details.

MAINTENANCE OF SOLAR PV PANEL

The inverter is virtually maintenance free, maintenance is limited to the following which can be carried out:-

- Ensure that all inverter conection plugs are secure in their respective sockets.
- Check that all circuit breakers are in their correct state.
- Clean and remove any deposits of dust
- Cleaning of solar panels with water and squeegee. Solar panel access is required.

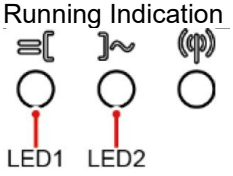
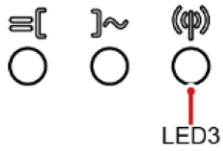
If a fault has occurred this should be investigated and if possible rectified. Refer to the troubleshooting part of this manual for further details.

TROUBLE SHOOTING

Introduction
It is usually informative to ascertain and record the operating condition immediately prior to the failure.

Before attempting fault diagnosis, ascertain and record the condition of the metering's and light's on the front panels as these may provide a guide to the location of the fault.

Inverter operational messages
The inverter comes with a LED status lights to indicate the status of the inverter. The following is a description of the status of the inverter.

Category	Status		Description
Running Indication 	**LED1**	**LED2**	N/A
	Steady green	Steady Green	Inverter operating in Grid-Tied mode.
	Blinking green at long intervals (on for 1s and then off for 1s)	Off	The DC is on and the AC is off.
		Blinking green at long intervals (on for 1s and then off for 1s)	The DC is on, the AC is on, and the inverter is not exporting power to the power grid.
	Off	Off	The DC is off.
	Blinking red at short intervals (on for 0.2s and then off for 0.2s)	N/A	DC environmental alarm
	N/A	Blinking red at short intervals (on for 0.2s and then off for 0.2s)	AC environmental alarm
	Steady red	Steady red	Fault
Communication indication 	**LED3**		N/A
	Blinking green at short intervals (on for 0.2s and then off for 0.2s)		Communication is in progress. (When a mobile phone is connected to the inverter, the indicator first indicates that the phone is connected to the inverter): blinks green at long intervals.)
	Blinking green at long intervals (on for 1s and then off for 1s)		The mobile phone is connected to the inverter.
	Off		There is no communication.

Our Contact :

INTERLINK POWER SYSTEM
www.interlinkpower.com.sg Tel : 6484-1406
32 Ang Mo Kio Industrial Park 2, #04-13 Sing Industrial Complex, Singapore 569510

Emergency Contact Details

The system is generally maintenance free and does not require a manual operator. The Owner may choose to clean the panels once or twice a year to remove stains if there is any.

In case of emergency, the Owner may contact the following:

Emergency Number
In case of doubt, please do not hesitate to contact the following numbers for assistance: **INTERLINK POWER SYSTEM PTE LTD** **32 Ang Mo Kio Industrial Park 2,** **#04-13 Sing Industrial Complex** **Singapore 569510**
Office number : 6484 1406