

INTRODUCTION

IGEN Tech Co., Ltd., founded in 2009, a high-tech enterprise, is professional in innovative applications based on technologies of IoTs, cloud computing and big data. Being focus on energy field for 12 years, the company has integrated state-of-the-art technologies into energy system, and has developed a complete solution including hardware, software and data analysis to offer smart energy for global customers.

SOLARMAN is a brand of IGEN-Tech, specialized in intelligent PV solutions. SOLARMAN product has been a global leading PV monitoring and management platform, which covers the whole life cycle of PV station and provides differentiated solutions for distinct users.



Products and Services

Different types of external data loggers Embedded monitoring module for inverters Smart meters and sockets Weather stations Web-based monitoring portal Monitoring app and dashboard Customerized software platform

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SOLARMAN Smart Energy Management System around the world

North America



Globally presented and trusted by renewable energy customers



25+ GW



122 Countries



1,000,000+ PV Plants

South America



Residential Solution - Home Energy Management

Wisely managing energy use has been a high priority when households decide to pursue a smart life with sustainable energy, improved efficiency and reduced bills.

By applying advanced technologies of IoTs (Internet of Things) and wireless communication, etc., SOLARMAN products are able to connect a variety of devices in your home, to make your daily operation in a more convenient, more comfortable and more environmentally friendly manner.



Objectives we can achieve together are

- Precisely reporting real time data of your power generation and energy consumption;
- Visualizing your energy usage pattern and offering smart suggestion if needed;
- Enabling solar panels/batteries to be used more effectively;
- Remotely switching "ON/OFF" status of your home appliances.

Commercial&Industrial Solution - Plant Energy Management

More and more corporates are going green by increasing usage of renewable energy-particularly solar power generated from their plants' and buildings' rooftops, and battery storage is also getting popular in order to leverage renewable energy to the upmost efficiency.



Along the changing approach, SOLARMAN helps customers make smart decisions by

- Recording and analyzing generated power and consumed energy;
- Serving all periods of life-cycle of your PV plants assets, from project evaluation to asset trading;
- Calculating and comparing performance index (i.e. PR) of your PV plants; And giving smart advices for better O&M;

Overview of SOLARMAN Software

With the most reliable hardware devices, functional software and outstanding service, SOLARMAN is the right choice for everyone. It meets requirements of device manufacturer, investor, project developer, EPC and plant owner, etc. Moreover, the tailor-made needs can be easily covered under SOLARMAN modular design.

SOLARMAN software consists of two different products-SOLARMAN Business and SOLARMAN Smart. Both products are available in web-based portal and APPs.



SOLARMAN Business is developed to support professional technical management, covering the

full life-cycle of PV plants:



SOLARMAN Smart offers excellent experience to individual users, who can get all important data/infer mation at a glance. The product is designed in simple style, ease of use, perfect for end-users.

SOLARMAN Business - Device Access, Control and Data Processing

SOLARMAN solution is compatible with the inverter models from all major manufacturers and with numerous components, i.e. energy meter, gas meter, weather station, heat pumps and smart plugs, etc.

SOLARMAN	O&M Device	Management igen-tech ~
	Device	Inverter: 1701543080 📀 🗙
Device	Al Trees COL	O Online O No Alerta 13:45 17/04/2019 UTC+8
Firmware	see after the second	Parameter Read&Write
S Operation Log	5N	
	1701543080	Last Command Record >
	MXC0838259	Command Names Read Daily Production Command Sent Times 12:20:00 17/04/2019 Command Status 🧟 Send successfully Feedback Times 12:20:02 17/04/2019
		Select Command Command Names Read Daily Production < 20 %
		Timeout + 10 mins 🔮 Send Command
	Select AL Pages ()	

Key features of SOLARMAN Business - Device Sector:

- Fast adaption with new devices and protocols;
- Remote upgrade device firmware in batches;
- Intelligent device controls under local/remote mode, fast response within seconds;
- Customization for warnings and alerts;
- Great flexibility for real-time data processing and authorization.

SOLARMAN Business - PV Plant Management

SOLARMAN Business perfectly fulfills the needs of technical professionals, making PV plant management easy, effective and efficient.

Besides visualizing real-time data and analyzing performance indexes, i.e. PR, the product enables comparison among different plants, and comparison between plant's actual generation and weather-based simulation. The expanded performance analysis gives extra meaningful messages for plant management.



Furthermore, a powerful function – "Physical Examination" - of SOLARMAN Business allows O&M staff to run a diagnosis program for selected PV plants, and the results of plant performance rankings and possible defects/advices will be given to customers for taking following actions, such as work order release, site investigation and fault recovery.

SOLARMAN Smart - An Energy Expert Around You

SOLARMAN Smart monitors and visualizes all conditions of smart devices in end- user's home, the household energy management has never been easier.



Key features of SOLARMAN Smart:



Fast setup - completes a plant setup after a few steps and adds smart devices as you need;



Accurate analysis - calculates and reports energy usage pattern and give reasonable advice;



Graphic display - understands power generation&consumption status from a glimpse of energy flow chart;



Device management - adds, deletes, changes, controls any devices at any time, any place;



Plant management - shares a plant to a service provider or any friends within SOLARMAN platform, creating great convenience.



Stick Logger

4G/GPRS/WiFi/Ethernet

SOLARMAN stick logger supports GPRS, WiFi, 4G, Ethernet and other communication method. Furthermore, stick logger supports RS485/RS232/RS422/TTL and other serial communication. With the design of multi-cover, it adapts to a vast majority of inverters. By collecting operating status and power generation of inverter, stick logger can run a long-term and efficient monitoring of PV system, which increases work efficiency and reduces management cost significantly. With its extended functions, such as GNSS, power-off reminder, Bluetooth, stick logger enables a qucik configuration at site and an easy plant O&M.

- External indicator lights, ensuring collection status at a glance;
- Plug and play, no extra power supply is required;
- Independent module, protecting internal parts of inverter;
- Waterproof design, resistant to bad weather;
- External design, easy to replace faulty equipment;
- Review data and yields via SOLARMAN Smart at anytime and anywhere;
- Extended function: Power-off reminder;
- Extended function: GNSS.



Product Model	LS4G-5	LS4G-4	LSW-5	LSW-3	LSG-3	LSE-3
Remote Communication Interface	4G	4G	2.4G WiFi	2.4G WiFi	GPRS	LAN
GNSS	<20m	-	-	-	-	_
Antenna	Internal Antenna	External Antenna	Internal Antenna	External Antenna	External Antenna	-
Data Interface			RS485/RS232/TTL			
Working Voltage			DC 5-12V			
Working Power	3.5W	3.5W	1.5W	1.5W	3W	1W
SIM Card	Chip Card,	/MicroSIM	-	-	Chip Card/MicroSIM	-
Memory	8M Flash	8M Flash	8M Flash	2M Flash	2M Flash	2M Flash
Working Temperature			-40°C ~+85 $^{\circ}\text{C}$			
Working Humidity		<90% (No Condensation)				
No. of Connections	One					
Serial Communication Rate	9600bps (1200—115200bps Configurable)					
Data Acquisition Interval	Default: 5 mins (1-15 mins Configurable)					
User Configuration	BT/APP	APP	BT/APP/Web	APP/Web	APP/BT	Web/APP
Firmware Upgrade	BT/Remote	Remote	BT/Remote/Web	Remote/Web	Remote	Remote/Web
Real-time Control			\checkmark			
Data Rresuming			\checkmark			
Power-off Reminder	\checkmark	\checkmark	\checkmark	-	_	-





SOLARMAN pro logger is applicable to various types of devices, including inverter, combiner box, weather station, meter and etc,. It is specially designed for industrial&commercial scenarios, which can be mounted both on DIN-rail and the wall.

Featuring in customization, it perfectly adapts to different kinds of distributed PV projects. Moreover, it furnishes plant developers, installers, O&M service providers with sophisticated tools to increase work efficiency and reduce management cost.

- Multiple-way RS485, RS232, RS422, CAN interface; Supports P1 meter;Accommodate hundreds of devices;
- Support magnetic latching relay external control (AC 250V/16A);
- 8GB TF card (Standard), 20-year storage; Data in SOLARMAN platform will be saved permanently;
- Multiple-way digital/analog input interface; Support grid dispatching, sensor and other scenarios;
- Through SOLARMAN Business, users can achieve an intelligent plant management.

- Dual SIM cards, supporting grid-tied project that requires private network power supply;
- Support static page configuration or upgrade, local/remote multi-mode monitoring;
- Support importing data and fault history via USB;
- Embedded ultra-capacitor supports power-off reminder; Simplify plant O&M significantly;

	Product Model	LP-2
	Remote Communication 1	4G
Wireless Parameters	Remote Communication 2	4G
	Remote Communication 3	LAN
	Antenna	Sucker Antenna
	Local Configuration	WiFi (Embedded Antenna)
	Input Voltage	DC 15V~60V
	Working Power	<10W
	Output Voltage	DC 12V 500mA
	Indicator Light	LED x4
	Memory	128MByte NAND FLASH 8GB TF Card (Optional)
	Analog / Digital Input	Analog Input x4 / Digital Input x6
	Digital Output	AC 16A 250V Magnetic Latching Relay Output x2
	USB	USB 2.0
	S0 in	2
Hardware Parameters	RS485	x4
	RS232	x1
	CAN	x1
	P1 Meter	x1
	Internal Clock	\checkmark
	Power-off Reminder	\checkmark
	Working Temperature	-20°C ~ +60°C
	Relative Humidity	5%-95% (No Condensation)
	Dimension	240*118*49mm
	IP Grade	IP20
	Installation Method	35mm Din-Rail Mount
	No. of Connections	1-128
	Data Acquisition Interval	Default: 5 mins (1-15 mins Configurable)
Software Parameters	User Configuration	AT+Instruction Set, Remote Server
	Firmware Upgrade	Remote Server/ Local
	Real-time Control	\checkmark
	Data Resuming	\checkmark

DIN-Rail Logger

4G/GPRS/WiFi/Ethernet

By collecting operating status and power generation of inverter, meter and other devices, DIN-Rail logger can run a long-term and efficient monitoring of PV system.

Logger can connect to multiple devices via RS485/RS422/RS232 and other interfaces. Meanwhile, remote monitoring cloud platform (SOLARMAN Portal) provides powerful data support for the logger. Logger sends the data to the monitoring platform via WiFi/Ethernet/G-PRS. The real-time status and historical data can be displayed with graphs, enabling intuitive and clear understanding of PV system.









Logger+Meter+More Devices

Product Model	LD4G-2	LDG-2	LDW-1	
Remote Communication Interface	4G	GPRS	WiFi	
Working Frequency	LTE-FDD, LTE-TDD, WCDMA TD-SCDMA, CDMA, GSM	GSM850/EGSM900/ DCS1800/PCS1900MHz	2.142GHz~2.484GHz	
No. of Connections	1-16	1-16	1-10	
Ethernet	-	-	10/100M (Adaptive Network)	
Working Voltage	DC 4.7-15V	DC 4.7-15V	DC 4.7-15V	
Working Power	3.8W	ЗW	1W	
Local Communication		RS485/RS422/RS232		
Serial Communication Rate	1200—115200bps Configurable			
Data Acquisition Interval	Default: 5 mins (1-15 mins Configurable)			
Memory		2M Flash (512K-16M Optional)		
User Configuration	AT+Instruction Set, Remote Server	AT+Instruction Set, Remote Server (BT3.0+EDR Configuration&Access)	AT+Instruction Set, Remote Server	
SIM Card	MicroSIM	Chip Card/MicroSIM	-	
Antenna	GPRS Small Antenna (Sucker Antenna Optional)			
Working Temperature	-40℃~+85℃ (Battery Version: -20℃~+60℃)	-40 ℃ ~+85 ℃ (Battery Version: -20 ℃ ~+60 ℃)	-40 °C ~+85 °C	
Working Humidity		< 90% (No Condensation)		
Dimension	91mm×76mm×18mm			
Installation Method		35mm DIN-Rail		

DIN-Rail Power Supply Device

DIN-Rail power supply device is used to provide DC 5V input for DIN-Rail logger or other equipment at site. According to real situation, it would turn AC 85-265V or DC 24V power input to DC 5V as output. In addition, an embedded capacitor will power DIN-Rail logger for another 20s in case of power outage, enabling data logger to send out a warning alert.



Wide Voltage Design

AC Voltage Input Range: AC 85V-265V DC Voltage Input Range: DC 5V-24V

High Power Output

Support DC 5V, 2000mA output

Power-off Reminder

Equipped with an embedded capacitor, easy for O&M

Easy Installation

Standard 35mm DIN-Rail mount



DIN-Rail Power Supply Device (Capacitive)			
	Input Voltage	AC 85~265V/DC 5~24V	
	Output Current&Voltage	DC 5V, 2000mA	
	Indicator Linkto	AC IN: AC Power Input	
Hardware	Indicator Lights	DC IN: DC Power Input	
Parameters	Working Temperature	'-40 °C ~+75 °C	
	Storage Temperature	'-45°C~+90°C	
	Dimension	91mm×76mm×18mm	
	Installation Method	DIN-Rail	

Smart Meter

SOLARMAN smart meter is applied for energy management purpose, and it works to measure and control electricity consumption of apartment renting, household and industrial electricity, charging station, PV plant, intelligent building, chain stores, communication stations and etc,. It features in high reliability, high accuracy, compact size and easy to install, etc.

Single-Phase Meters

Three-Phase Meters

- Compact size, 2P width.
- Embedded relay, supports ON/OFF switch locally/remotely.
- Protection functions in case of overvoltage, undervoltage, overcurrent, overload.
- Embedded communication module, support GPRS, NB-IoT, WiFi, 4G, etc.
- Measuring range: 0~60A, 0~13200w.
- Embedded high-capacity capacitor, able to trigger power-off alert.

- 2P width, less space occupied in distribution panel.
- Embedded communication module, support GPRS, NB-IoT, WiFi, 4G and etc.
- Max. measurement: 6 circuits with single CT, or 2 circuits with three-phase CTs.
- Open-type CT, easy for installation.
- Protection functions in case of overvoltage, undervoltage, overcurrent, overload.

	Single-Phase		Three-Phase		
	DIN-Rail Single- Phase Meter	Single-Phase Remote Control Meter	DIN-Rail Three- Phase Meter	Six-circuit Multi- function Meter	
Product Name					
Product Model	DDS122-D	DDZY422-D2	DTSD422-D	DTSD422-D3	
Dimension (mm)	92*76*18	110*77*36	91.5*76*36	91.5*85*36	
Remote Communication	NA	4G/WiFi/GPRS/NB-IoT	NA	4G/WiFi/GPRS/NB-IoT	
Serial Communication	R	6485	RS	485	
Rated Voltage	2	20V	3x220	0/380V	
Frequency	50/	(60Hz	50/	60Hz	
Rated Current	5 (40) A	5 (60) A	3x6A/100A	6x6A/100A	
Rated Power	8.8kW	13.2kW	6	6kW	
Power Consumption	0.5W	3W	0.5W	ЗW	
Accuracy	1		1		
Two-way Metering		\checkmark	\checkmark		
Working Temperature	-25°C -+60°C	-30 °C -+70 °C	-25 °C -+60 °C	-30 °C -+70 °C	
Power Supply	1 circiut with single-phase CT		1 circiut with three-phase CTs/ 3 circuits with single-phase CT	6 circuits with single-phase CT/ 2 circuits with three-phase CTs	
Measurement	High Accuracy	Sampling Mn-Cu	Clip	-On CT	
No. of CTs		NA	3	6	
Electrical Parameters	Voltage, Current,Voltage, Current,Voltage, Current,Active Power, ActiveActive Power, ActiveActive Energy, Apparent Power, Split-phasEnergy, Frequency,Energy, Time-sharingEnergy, Time-sharing Power, Reactive PowerPower FactorsPower FactorsReactive Energy, Frequency, Power Factors		Power, Apparent Power, Power, Split-phase ower, Reactive Power, ency, Power Factors		
Remote Switch	×	\checkmark		×	
Automatic Settlement	×	\checkmark		\checkmark	
Data-frozen	× Point-frozen, Daily-frozen, Scheduled-frozen		Point-frozen		
Power-off Reminder	×	\checkmark		×	
Protection	× Overvoltage/Undervoltage, Overcurrent, Overload (break-off)		× Overvo Overcui	ltage/Undervoltage, rrent, Overload (Alert)	
Data Acquisition (Inverter)	×	\checkmark	×	\checkmark	
Installation Method	35mm	DIN-Rail	35mm DIN-Rail		





SOLARMAN data logger is specially designed for Distributed Household/Industrial&Commercial plants. With its brand new design, it features in high reliability, high accuracy and high efficiency. Featuring in customization, it perfectly adapts to different kinds of distributed PV projects. Moreover, it furnishes plant developers, installers, O&M service providers with sophisticated tools to increase work efficiency and reduce management cost.

For household plants, it supports the monitoring of inverter, energy storage battery and other devices. For industrial&commercial plants, it is durable. And it supports inverter, combiner box, meter, weather station and other devices.



Equipped with BT, optimizing networking experience and simplifying local configuration; \ast

Product Name	Data Logger	Data Logger
Product Model	EMH-2	EMB-2
Usage Scenario	Distributed Household Plant	Distributed Industrial&Commercial Plant
No. of Connections	10	32
Working Voltage	DC 5V	AC 85-265V
Consumption	3.5W	3.5W
	WiFi (2.4GHz)	WiFi (2.4GHz)
	Ethernet x2	Ethernet x1
Remote Communication	4G (Optional)	4G (Optional)
	NB (Reserved)	NB (Reserved)
	Slot SIM (IP20)	Slot SIM (IP65)
	BT	BT
Remote Communication	RF (Optional)	RF (Optional)
	LoRa (Reserved)	LoRa (Reserved)
Configuration	APP/Remote	APP/Remote
Serial Communication	RS485 x2 (RS232 compatible)	RS485 x1
Data Acquisition Interval	5min	5min
Memory	128M NAND FLASH	128M NAND FLASH
Memory	-	8G TF (Optional)
	Data Resuming	Data Resuming
Extended Function	Real-time Control	Real-time Control
	-	Power-off Reminder
Dimension (mm)	160x85x27	150x120x75
Enclosure	PC	Aluminium Alloy
Installation Method	Flatwise/Suspension/DIN-Rail	Suspension
IP Grade	IP20	IP65
Working Temperature	-30 °C ~+70 °C	- 30 °C ~+70 °C
Working Humidity	10%-90% (No Condensation)	10%-90% (No Condensation)

RF Gateway Stick Logger (RF)



SOLARMAN RF series include RF Gateway and Stick Logger (RF). RF gateway supports local networking, no communication wiring is required. Furthermore, RF gateway features in long communication distance and strong through-wall ability. One RF gateway can connect to multiple stick logger (RF).

- No communication wiring is required, decreasing construction cost;
- Long communication distance, reaching 200m without shelter;
- Strong through-wall ability, 2 reinforced concrete walls at max.;
- Support multi-networking, high efficiency in data acquisition.

RF Gateway		Stick Logger (RF)	
Product Model	RF-100	Product Model	RF-100
Remote Communication	Ethernet	Local Communication	RF
Local Communication	RF	Serial Communication	RS485/RS232/TTL
No. of Connections	10	No. of Connections	1
Local Networking Distance	200m (Without shelter) Through-wall Ability: 2 reinforced concrete walls (15cm) (Networking distance reaches 20m if going through 2 walls.)	Working Voltage	DC 5V-12V
Working Voltage	DC 5V	Memory	8M Flash
Memory	8M Flash	Working Temperature	-30°C ~+70°C
Configuration	APP/Web	Working Humidity	10%-90% (No Condensation)
Working Temperature	-30 °C ~+70 °C		
Working Humidity	10%-90% (No Condensation)		

Weather Station

SOLARMAN weather station is specifically designed for PV system. It provides a comprehensive environmental monitoring solution for users including irradiance, ambient temperature and humidity, wind direction and speed, and module temperature. With the combination of accurate real-time data, durable products and powerful online platform, SOLARMAN helps users evaluate yield efficiency in a more comprehensive and convenient way.





Accurate real-time and historical data, enabling a comprehensive evaluation of system performance;



SOLARMAN platform provides visualized meteorological data;



Standard sensors for general demands (High accuracy sensor for project with high demands).



Compatible with SOLARMAN data logger, ensuring simple configuration and lower O&M cost;



Real-time alerts with timely notification, ensuring fast troubleshoot;

Product Model	WP-2S
Irradiance (Sub-reference Level)	ISO 9060:1990 (Sub-reference Level) Sensitivity: $7 \sim 14\mu$ V/W/m2 Instability (Year): <0.5% Measuring Range: $0 \sim 4000$ W/m2 Spectral Range: $270 \sim 3000\mu$ m Zero Offset (No ventilation) (a) Thermal Irradiance (200W/m2): <7W/m2 (b) Temperature Variation (5K/h): <2W/m2 Nonlinear: <0.2% Directional Response (80°, 1000W/m2 at max.): <10W/m2 Spectral Selectivity (350 ~ 1500nm): <1% Tilt Response (0°-90°, 1000W/m2): <0.2% Temperature Response (-10 C ~ +40 °C): <1% Visual Angle: 180°
Irradiance (Level 1)	Sensitivity: 7~14µV/W/m2 Instability (Year): ±2% Measuring Range: 0~2000W/m2 Cosine (Deviation between solar altitude angle 10° in sunny day and ideal value): ≤±2% Spectral Range: 0.28~3.0µm Temperature Characteristic (-20℃~+40℃): ±2% Nonlinear: ±2% Visual Angle: 180° Measurement Accuracy: 2%
Irradiance (Level 2)	Sensitivity: 7~14µV/W/m2 Instability (Year): <2% Measuring Range: 0~2000W/m2 Cosine (Deviation between solar altitude angle 10° in sunny day and ideal value): ≤±5% Spectral Range: 0.28~3.0µm Temperature Characteristic (-20 C ~+40 C): ±5% Nonlinear: ±5% Visual Angle: 180° Measurement Accuracy: 5%
Ambient Temperature	Measuring Range: -50.0℃ ~+80.0℃ Resolution: 0.1℃ Accuracy: ±0.1℃ Working Environment: Temperature -40℃ ~+80℃ Humidity ≤100%RH
Ambient Humidity	Measuring Range: 0.0~100.0%RH Resolution: 0.1%RH Accuracy: ±2% (≤80%), ±5% (>80%) Working Environment: Temperature -40℃ ~+80℃ Humidity ≤100%RH
Wind Direction	Measuring Range: 0~360° Resolution: 3° Accuracy: ±3° Startup Wind Speed: ≤0.5m/s Working Environment: Temperature -40℃~+80℃ Humidity ≤100%RH
Wind Speed	Measuring Range: 0 ~ 70m/s Resolution: 0.1m/s Accuracy: ±(0.3+0.03V)m/s Startup Wind Speed: ≤0.5m/s Working Environment: Temperature -40℃ ~+80℃ Humidity ≤100%RH
Module Temperature	Measuring Range: -50℃~+80℃ Resolution: 0.1℃ Accuracy: ±0.1℃ Working Environment: Temperature -40℃~+80℃ Humidity ≤100%RH
Height	1.5m
Power Supply&Communication Junction Box	Power: AC 230V, COM: RS485
IP Grade	IP65



Part of Supported Brands









IGEN Tech Co., Ltd.

Address: A2-405, Tian'an iPark, No. 228, Ling Hu Avenue, Wuxi, Jiangsu, China Tel: +86-510-68005664 Fax: +86-510-81816208 Email: info@solarmanpv.com Website: www.solarman.cn





Monitored . Analyzed . Networked for Smart Energy