



Smart PV Guardian

SmartPV

P V S t a t i o n R e m o t e M o n i t o r i n g s y s t e m

A kind of logger to support station O&M and effectively improve the station management efficiency.

It is important to monitor the running status of each equipment in the PV station. Taoke Logger can provide 24 hours continuous monitoring service and keep the station operation in a good condition.

Compared with CT monitoring, it is more affordable with more detailed PV data information such as the fault status and equipment generated energy etc.

Moreover, it can collect the day, month, year and total energy production information and weather information and support the data analysis function.



SmartPV



Q. Why the PV station
needs remote
monitoring system?



To protect the vital assets **A.**

To know the fault ASAP!

In the process of normal station operation, some environmental factors such as lightning stroke, snow cover and typhoon etc., which always happened to damage the site equipments and give rise to abnormal energy production; other factors also cause the poor sunlight such as the tall plant or grass which lower the energy production and delay the ROI. For avoiding these risk, it is necessary to install the PV station remote monitoring system.



E.g.

There are 5 normal inverters (capacity 10Kw per site)
Fault happened to one of them and such situation still didn't be found after 1 month later.

12,000kWh/12× ¥ 32.00≈ **¥ 32k** loss

※ the year energy production is about 120 thousand kWh, calculated in case FIT ¥ 32.



Fault happened for one month...

Actually more than **2GW** PV station monitoring platform

SmartPV



Applied in Japan, China, Germany, Italy, Australia, Demark India and Britain. We are improving and updating the platform system for keeping pace with the development of PV industry.

Cases in Japan

LV	360 areas	20.49MW
HV		9.30MW
Total		29.79MW

※To Sept. 2016



Installation Record in Japan (1)



Kashiwa-shi, Chiba

Inverter: Omron
Capacity: 11kW



Tokai University, Tokyo

Inverter : YASKAWA
Capacity : 50kW



Tosu-shi, Saga

Inverter : Shindengen
Capacity : 50kW



Miyakonojo-shi, Miyazaki

Inverter : Tabuchi
Capacity : 396kW



Iseaki-shi, Gunma

Inverter : SMA
Capacity : 57.24kW



Tako-machi, Chiba

Inverter : Diamond
Capacity : 16.5kW

Installation Record in Japan (2)



Isai-shi, Kagoshima
Inverter : Toshiba
Capacity : 990kW



Yatsushiro-shi, Kumamoto
Inverter : GS YUASA
Capacity : 40kW



Honjo-shi, Saitama
Inverter : Hitachi
Capacity : 543.5kW



Inzai-shi, Chiba
Inverter : TABUCHI
Capacity : 1MW



Takehara-shi, Hiroshima
Inverter : Delta
Capacity : 400kW



Uki-shi, Kumamoto
Inverter : Huawei
Capacity : 900kW

About TAOKE

Most inverter brands are compatible in Japan market in 2016

More than 200 loggers sold in Japan in 2015 and global monitoring capacity exceeded more than 2GW.

Entered into Japan market in July 2014 and set up data center in HK.

Realized docking with national Gold Sun data center in 2012 and monitoring equipment sales exceeded more than 200 units.

Total installed capacity of PV monitoring exceeded more than 1GW in 2013.

Attended to build national renewable energy data center in 2011;

Formally published SmartPV mobile version software;

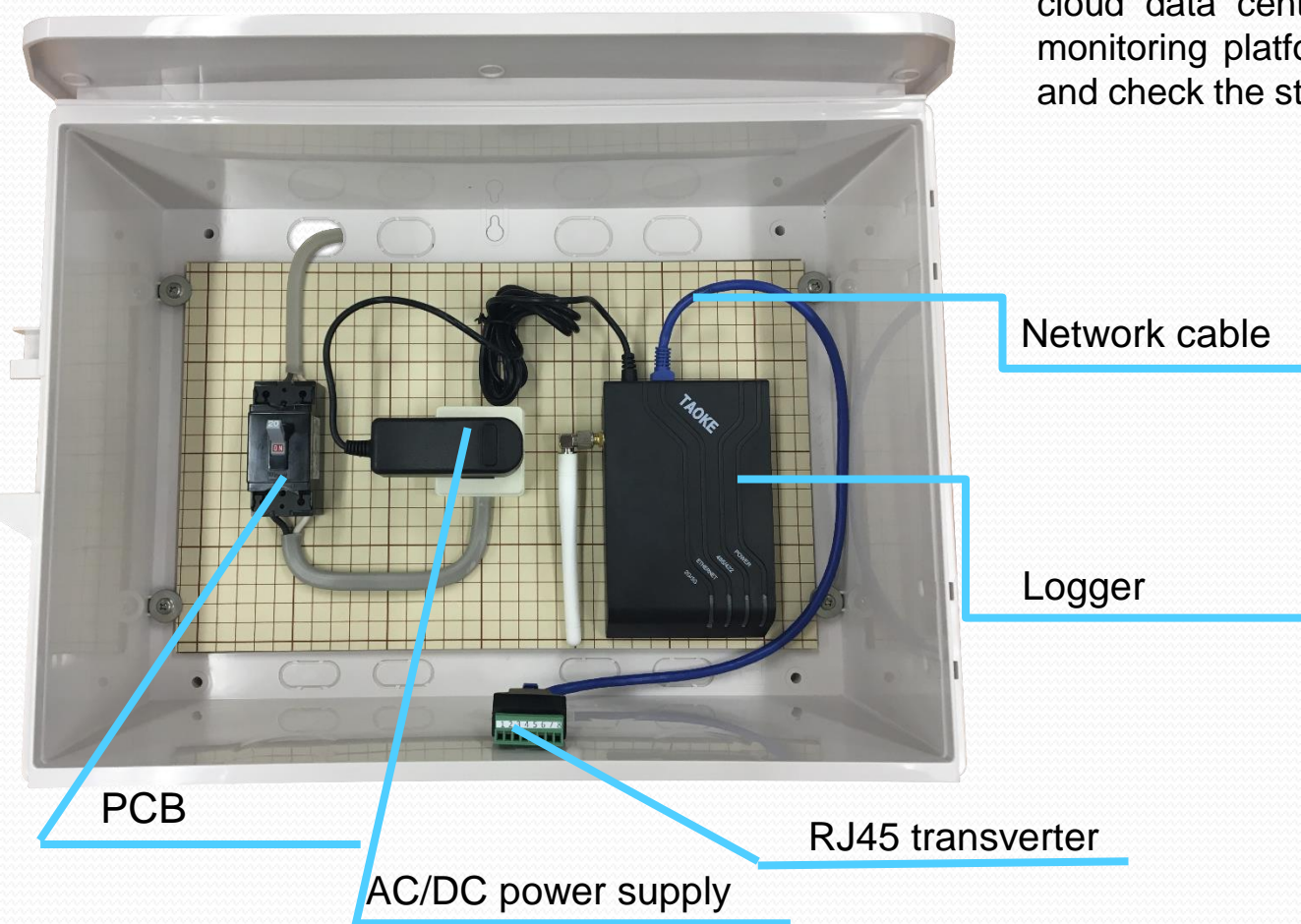
Taoke founded in 2010;

Started to PV data logger sales;

SmartPV platform started to operation;

Product introduction

Logger collects the data from inverter through RS485 cable and uploads the data to SmartPV cloud data center. User can login the remote monitoring platform through Internet to manage and check the station data.



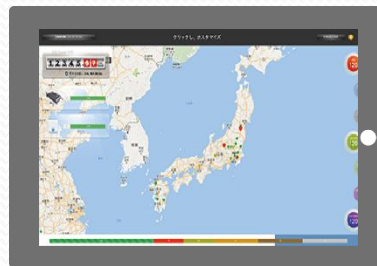
Product introduction

Check the station status anytime and anywhere

Be able to check all site equipments simultaneously



Mobile APP



Tablet PC

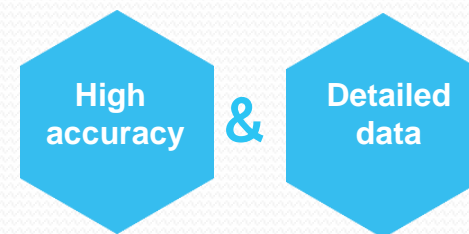


Computer

Check and view the station energy production, inverter status and local weather data information through computer, intelligent mobile and tablet PC etc. anytime and anywhere.

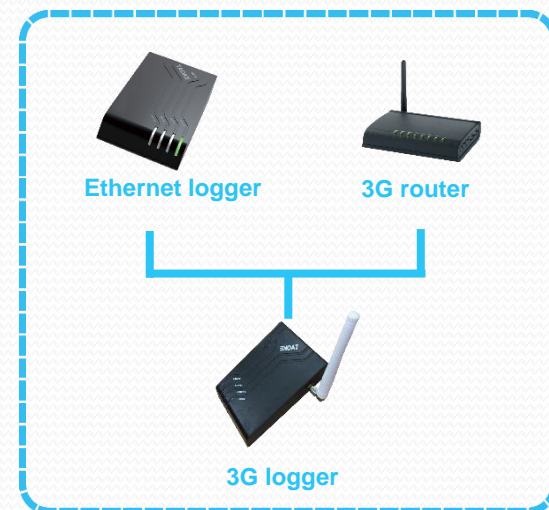
01 Low cost; Be able to get detailed data.

The cost for SmartPV and CT monitoring is similar, but SmartPV monitoring system can monitor and get high accurate and detailed data from each inverter, so if any abnormal situation happened, user can know the inverter running status and solve the problem quickly.



02 Simultaneously combine with the function of Ethernet logger and 3G router.

TK series logger adopts high intensification design, simultaneously combined with data collection function of Ethernet logger and wireless transmission function of 3G router, in other word, one pay with double service enjoy.



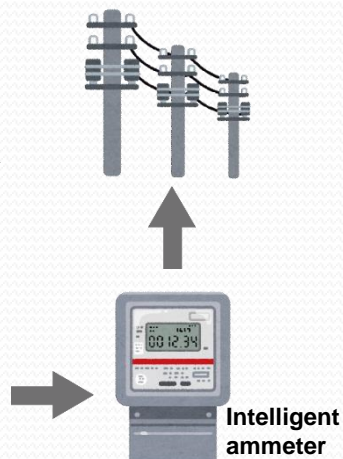
03 Long-term data store and real time data view

If user adopts the service from SmartPV monitoring system, the real time power generation data can be freely stored for 10 year. User can view the historical data and analysis data etc. at any time.

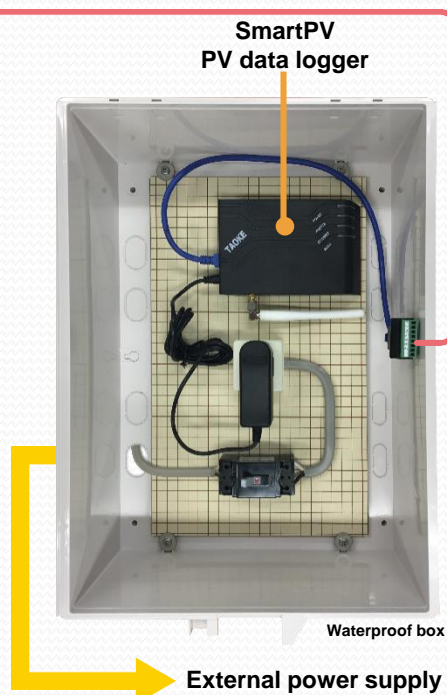
04

Logger model and Qty. of monitored inverter

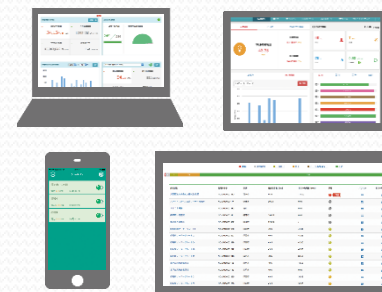
Qty. of attachable equipment	Purpose	Model
12	Industrial PV (PCS: 1 ~ 12)	TK-W30-12



LAN cable/485 cable



SmartPV cloud data platform provides data store and web monitoring page.



View the energy production status through computer, intelligent mobile phone, tablet PC and large display.

05

Be compatible with most brands inverter in global market

Corresponding brand list

- Delta Electronics, Inc.
- Hitachi, Ltd.
- GS Yuasa Corp.
- Omron Corp.
- Mitsubishi Electric Corp.
- Meidensha Corp.
- Sanyo Denki Co., Ltd.
- Huawei Technologies Co., Ltd
- Panasonic Corp.
- IDEC Corp.
- Sanken Electric Co., Ltd.
- TMEIC Company
- Daihen Corp.
- Fujisaki Electric Co., Ltd.
- Shindengen Electric Mfg. Co., Ltd.
- Yaskawa Electric Corp.
- Sungrow Power Supply Co., Ltd.
- Nissin Electric Co., Ltd.
- Tabuchi Electric Co., Ltd.
- Schneider electric Corp.
- SMA Japan Corp.
- ABB Corp.

※ Ranking listed in no particular order

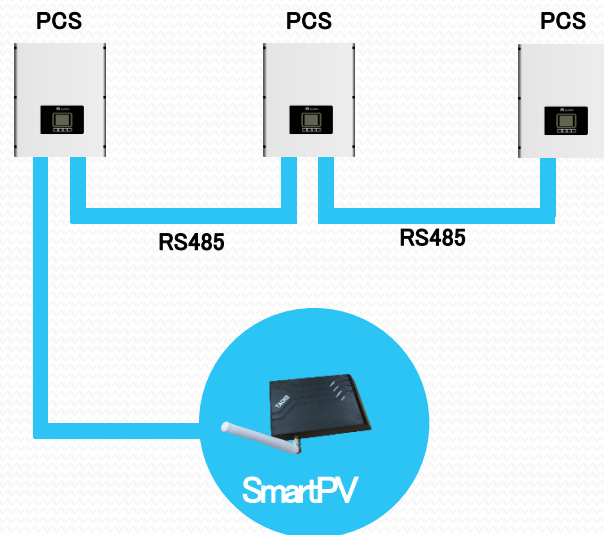
※ Reserve for listed brand is available

The compatibility for the brand not listed here is also available, for more information, please contact us.

Provide detailed inverter monitoring data information

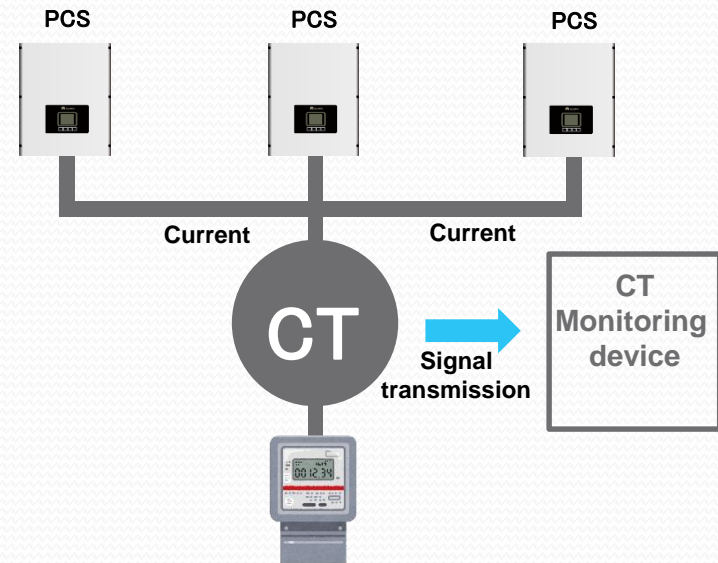
Measuring method difference between SmartPV and CT

SmartPV



Logger directly connect with inverter' communication module to collect the data, compared with CT, the data is from inverter itself, so the data error is small and easy to monitor the abnormal status of each inverter.

CT



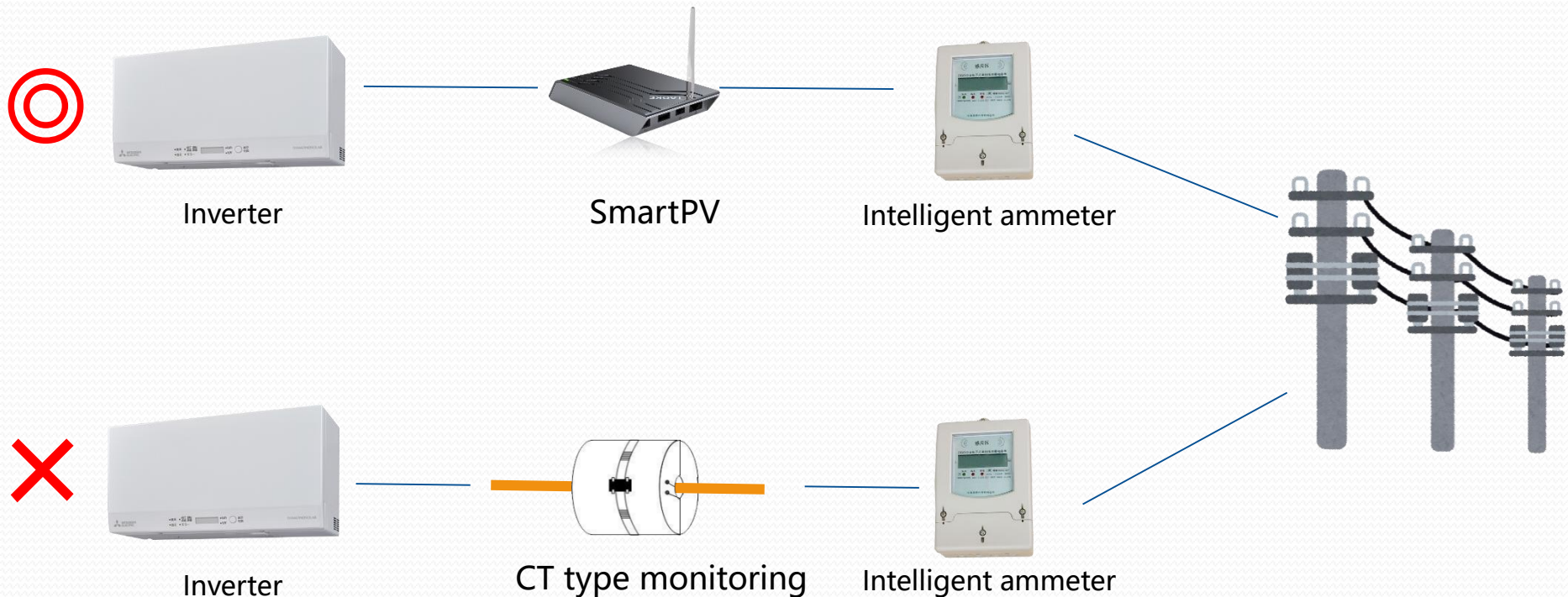
Can not get the inverter status and detailed information and the data is not detailed enough.

Comparison between SmartPV monitoring system and CT monitoring system

		SmartPV	CT
Monitoring content (Collected data)	Inverter daily energy production	○	×
	Inverter MPPT information	○	×
	Inverter fault alarm notification	○	×
	Inverter energy production comparison	○	×
	Station real time running status (6 types)	○	×
Other	Measuring accuracy	○	△
	Measuring interval	○	△
	Inverter daily halt alarm (day)	○	×
	Inverter month low efficiency alarm (month)	○	×

Provide assistance to PV station investment I

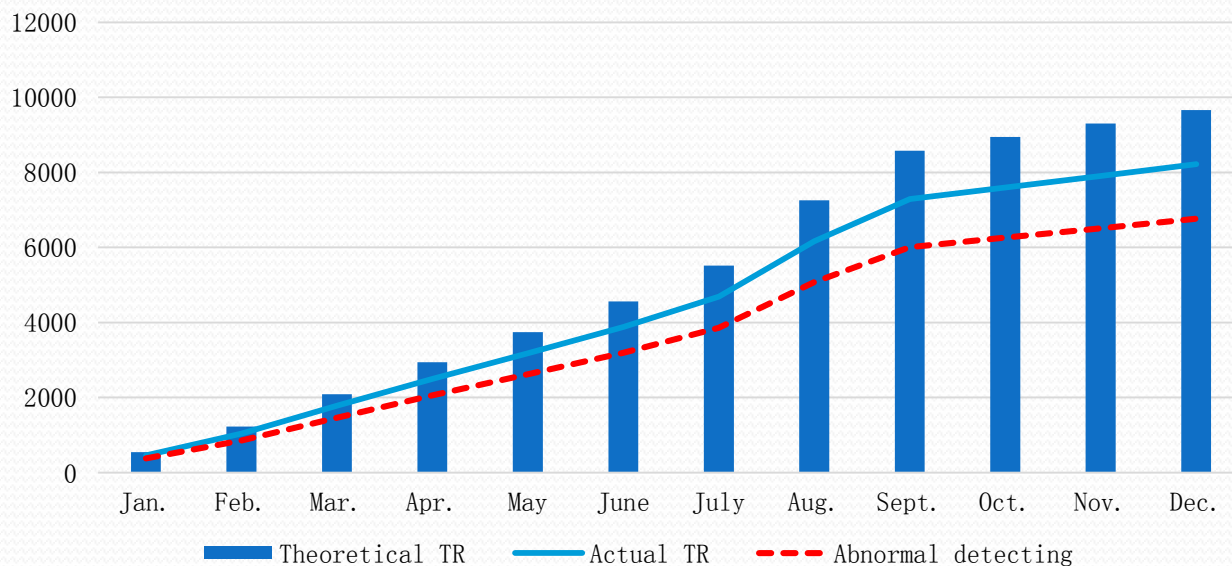
SmartPV reads the inverter digital signal through RS485 and within 3% difference with ammeter. The difference between electricity sale recorded by CT and actual revenue is obvious.



Provide assistance to PV station investment II

SmartPV monitoring system can monitor the station energy production status and daily energy production efficiency to keep the station stable operation.

Revenue statistics in 2015



Station month
low efficiency alarm

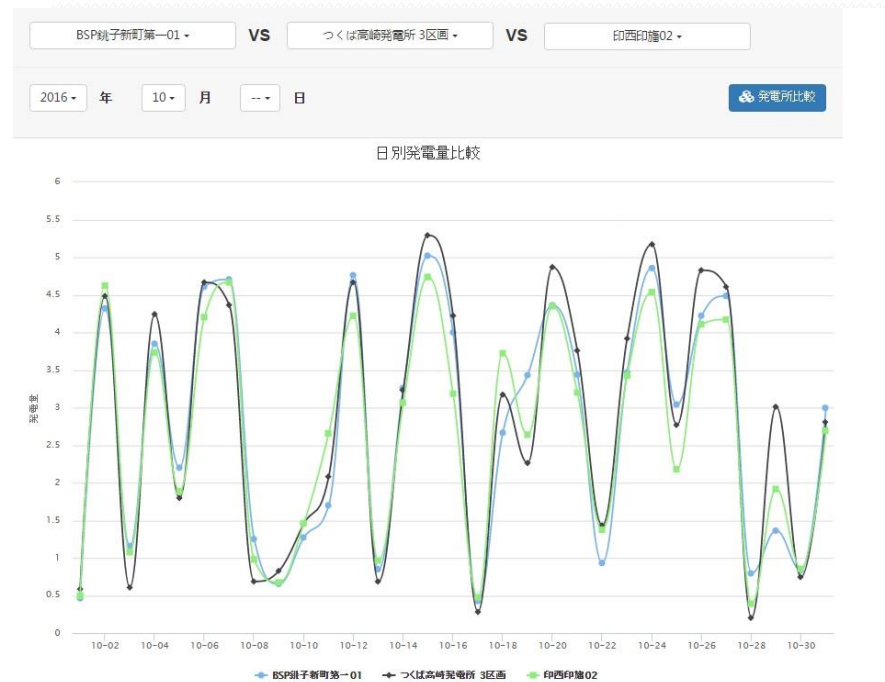
Equipment month
low efficiency alarm

Station
daily halt alarm

Equipment
daily halt alarm

Provide assistance to PV station investment Ⅲ

SmartPV monitoring system can compare the station energy production (three stations) and show the comparative result of energy production efficiency.

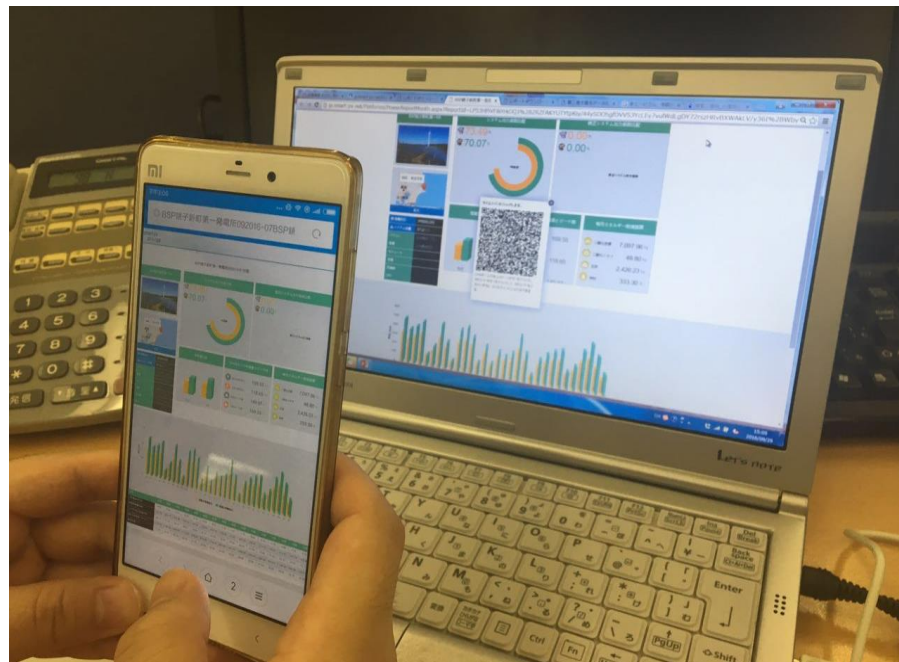


SmartPV platform provides station report share function and the shared report can be viewed without login (real time data).



Provide assistance to PV station investment V

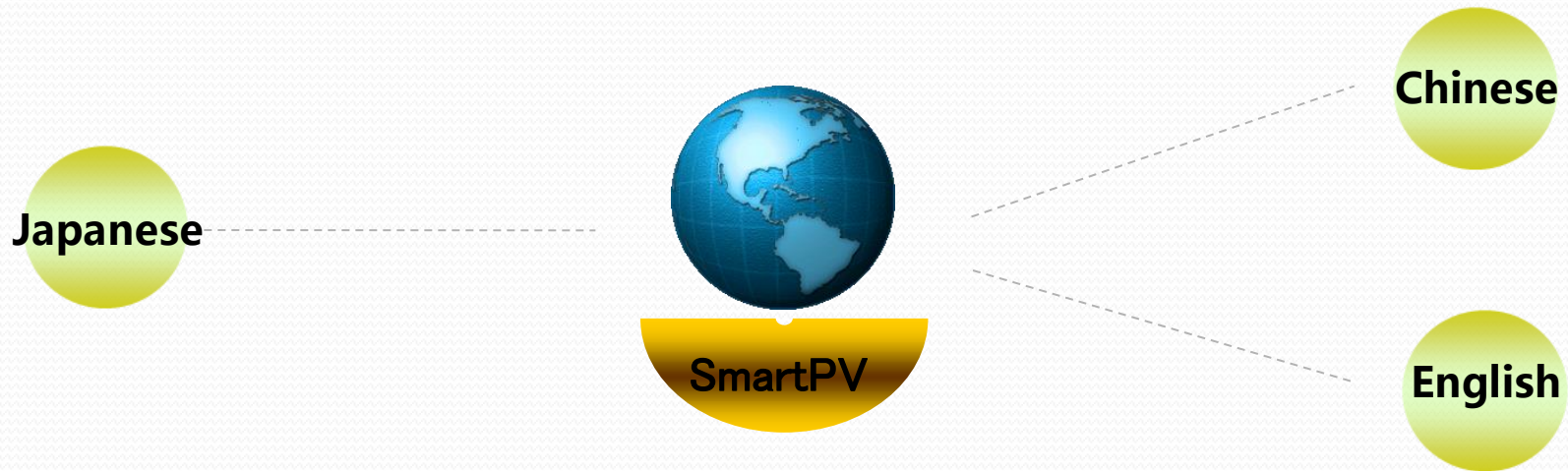
Use mobile to scan the QR code of shared report and user can view the shared station report (real time data) without login.



Provide assistance to PV station investment VI

Customers from Japan, China (Mainland, HK and Taiwan), Singapore, USA, Thailand and Malaysia.

SmartPV language: in Japanese, simplified Chinese and English



PV station O&M assistance I

All Station management



PV station O&M assistance II

Management page TOP (Manage user)

Manage user can manage and view the whole station operation status.



All Station management

Station Status

Fault

Level:★★★★★

Halt

Level:★★★☆☆☆

Abnormal communication

Level:★★★★☆

Equipment off-line

Level:★★☆☆☆☆

Part Normal

Level:★★★★☆☆

Normal

Level:★★☆☆☆☆

Station Alert

Fault

Level:★★★★★★

Equipment daily halt alarm

Level:★★★☆☆☆

Logger off-line

Level:★★★★☆☆

Station low month efficiency

Level:★★☆☆☆☆

Equipment off-line

Level:★★★★☆☆

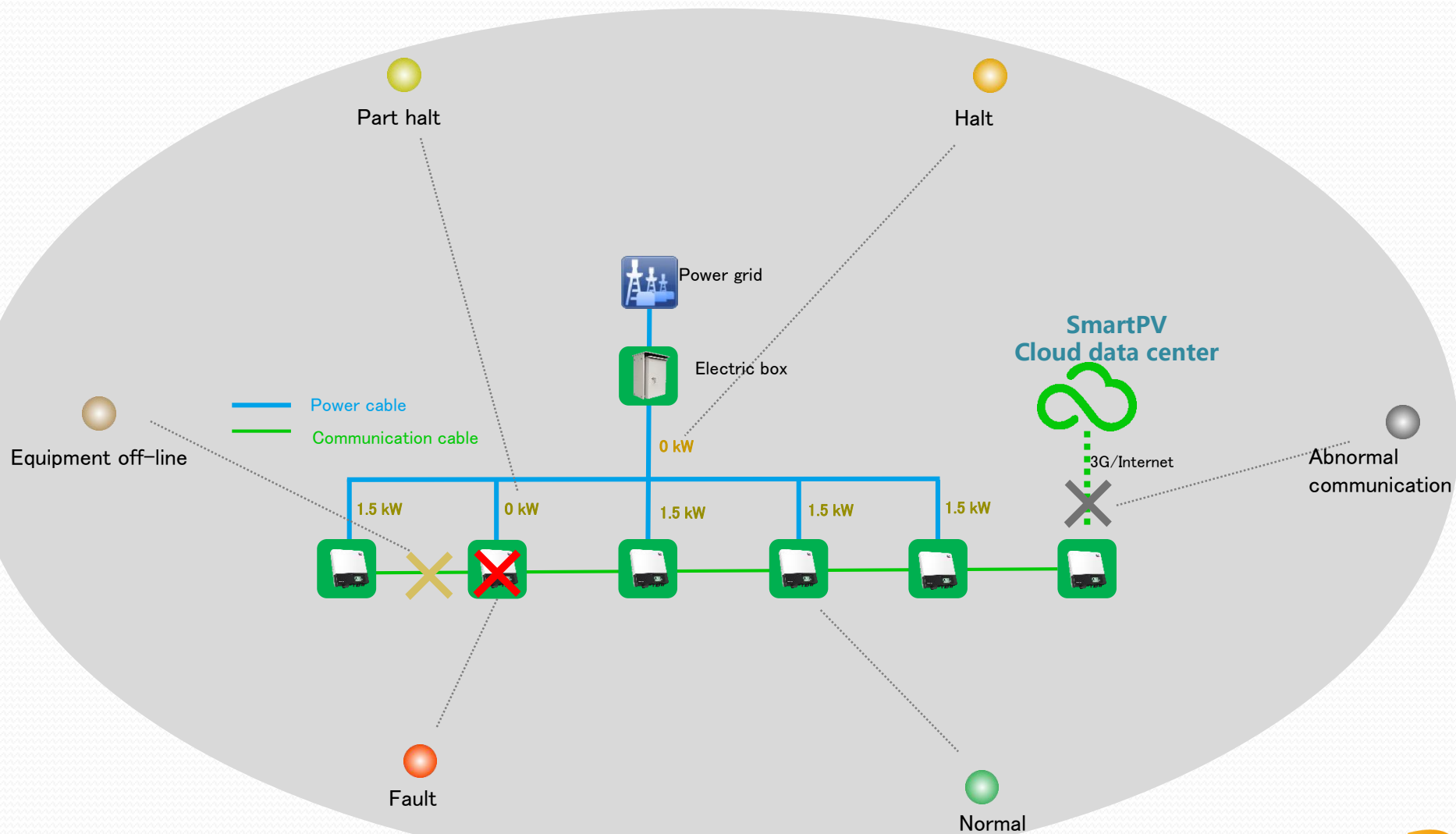
Equipment low month efficiency

Level:★★☆☆☆☆

Station daily halt alarm

Level:★★★★☆☆

PV station O&M assistance III



PV station O&M assistance IV



All Station management

Equipment low efficiency alarm

Station low efficiency alarm



Equipment daily halt alarm

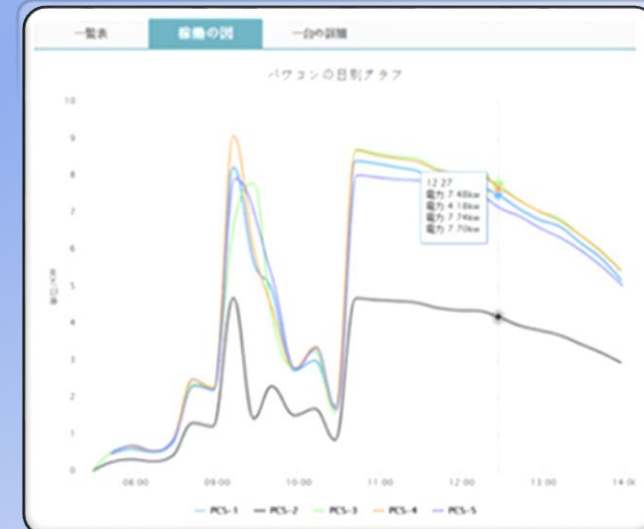
Station daily halt alarm

PV station O&M assistance V

To view detailed station data



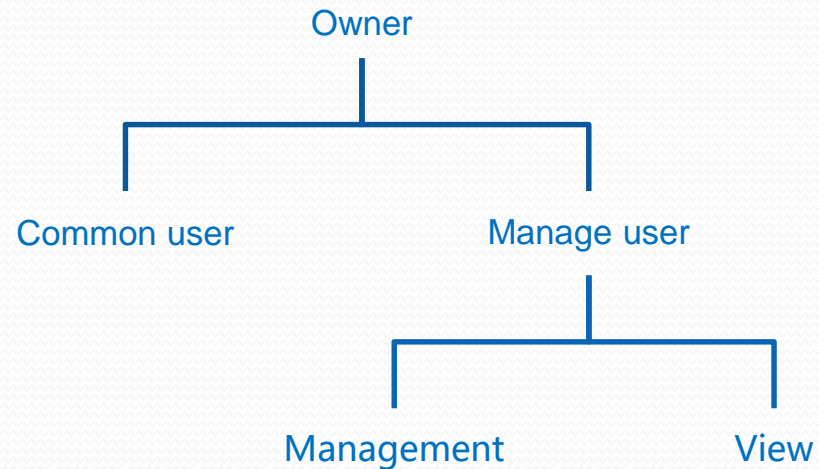
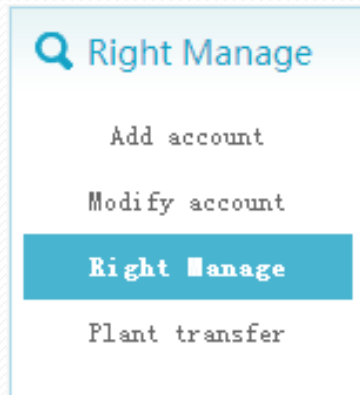
交流発電パラメータ				直流発電パラメータ			
バクコンの電力	-W			MPPT-1	MPPT-2	MPPT-3	
交流出力電圧	A	B	C	バクコン 発電電圧	-V	-V	-V
交流出力電圧 (V _{ac})	267.32V	269.45V	272.50V	現在の直流電圧 (V _{dc})	572.10V	572.10V	565.50V
交流出力電流 (A _{ac})	2.74A	2.74A	3.25A	現在の直流電流 (A _{dc})	0.61A	0.60A	0.79A
交流出力電力 (P _{ac})	2.39kW			現在の直流電力 (P _{dc})	0.35kW	0.50kW	0.45kW
交流系統連系周波数	59.94Hz						1 2 3
本日の発電量	88.94kWh			バクコン 動作温度	38.10℃		
当月の累計発電量	1.718kWh			太陽電池モジュール温度	-℃		
本年の累計発電量	15.108kWh						
総発電電力	15.108kWh						



PV station O&M assistance VI

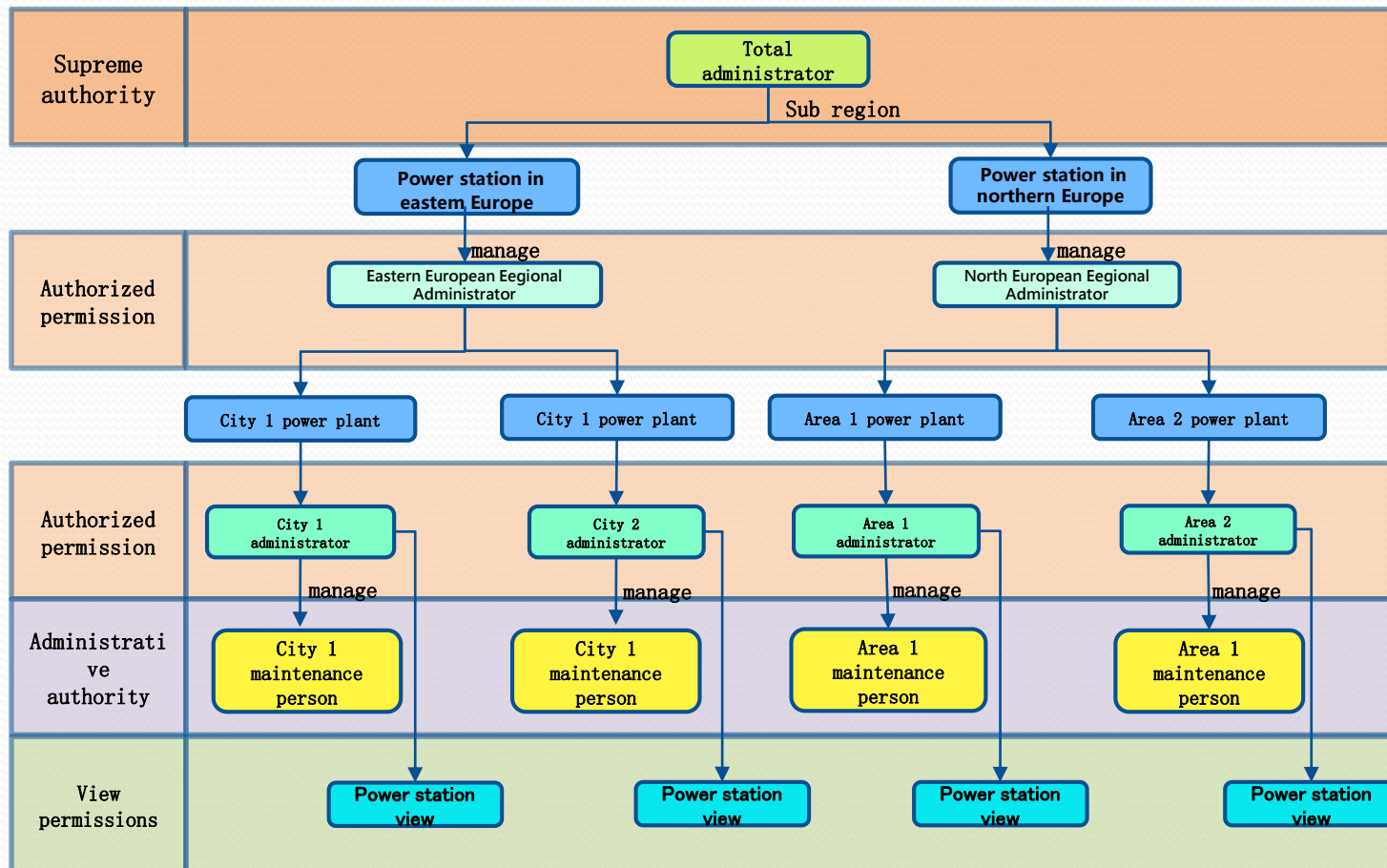
The platform provides station authorization and assignment functions and user can perform the station assignment directly through SmartPV platform.

Station authorization



PV station O&M assistance VII

Management user can configure the user right



PV station O&M assistance VIII

Manage the station through many channels such as Web, APP, WeChat and Email etc.



PV station O&M assistance IX

Manage the station through many channels such as Web, APP, WeChat and Email etc.

SmartPV alarm



Email alarm



Mobile APP alarm



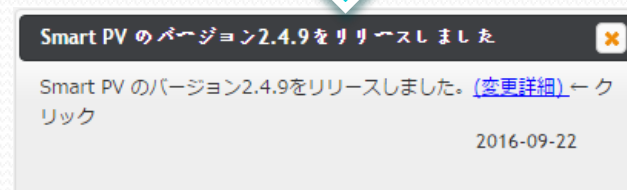
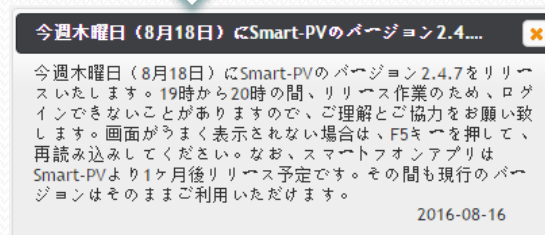
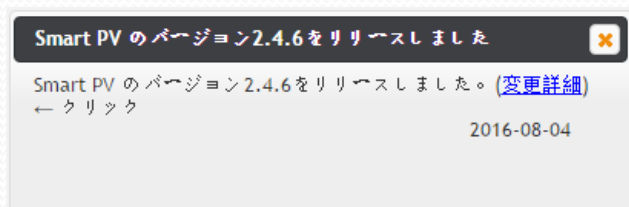
※ Mobile APP alarm function will be available in Jan. 2017

WeChat alarm



SmartPV comprehensive technical support

Taoke keeps updating the SmartPV platform for better service to customers



SmartPV comprehensive technical support

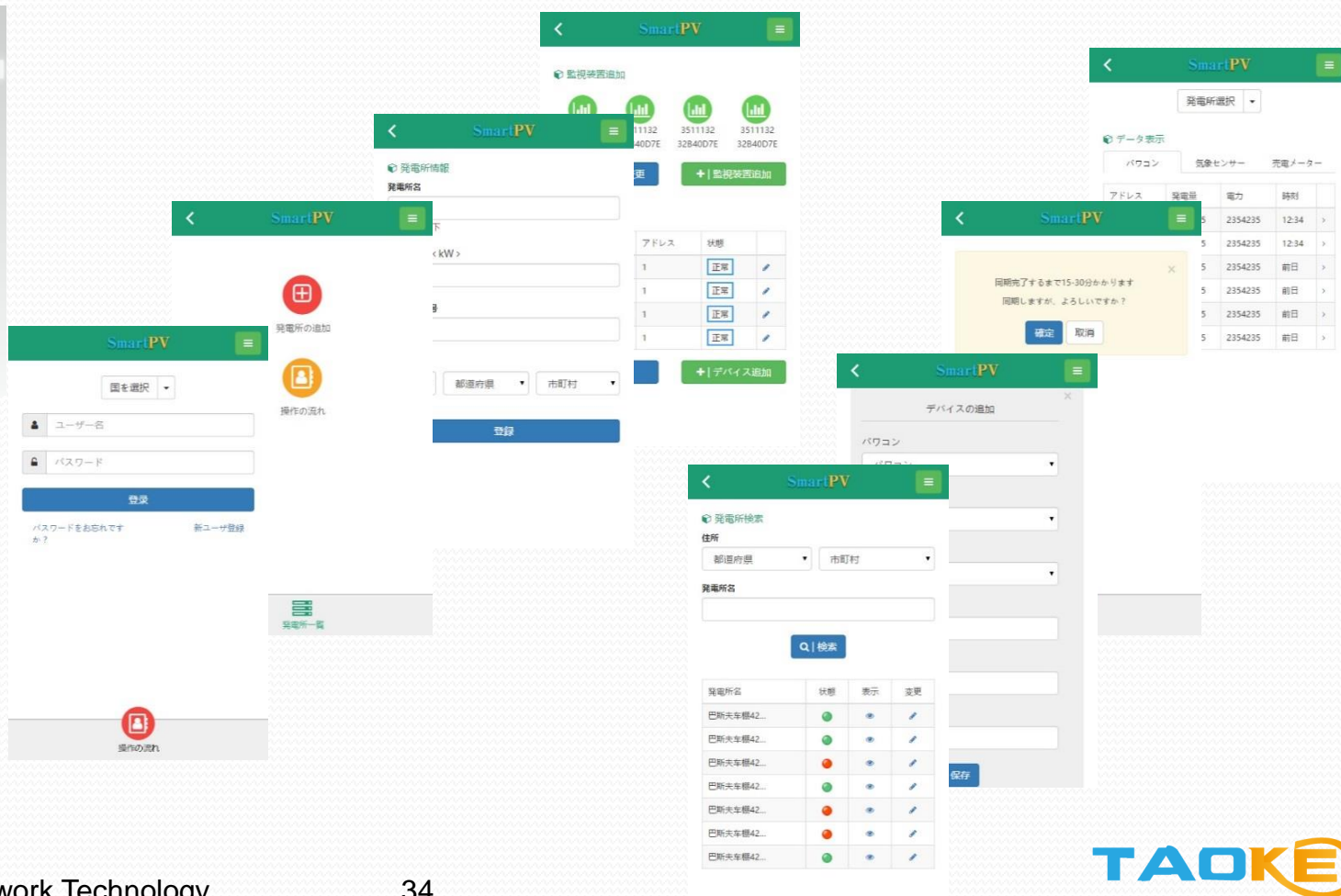
- When something wrong with the inverter in the PV station, if use other type or brand equipment for replacement, it is no need to replace the monitoring system, just remote updating to system is required (for free);
- If the station operation efficiency is low and can not find out the problem, Taoke engineers provide remote data analysis assistance (for free for the first time) ;
- When SmartPV monitoring system updating, it is no need for manual service on site and Taoke can update the system remotely;

SmartPV site debugging technical support

Be able to use the mobile debugging software for site debugging



Packing box



SmartPV technical support documents

SmartPV user manual

Smart-P V
操作ガイド

【一般ユーザー編】

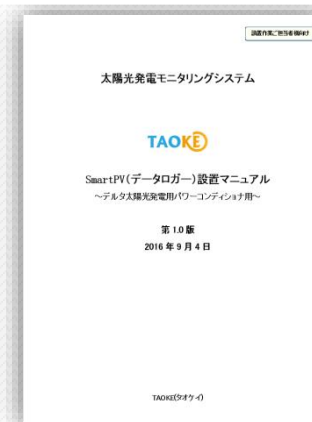
Smart-P V
操作ガイド

【管理ユーザー編】

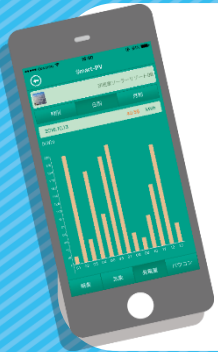
Construction precautions



Various brands inverter debugging manual



Try out the SmartPV monitoring platform from the Channels below,



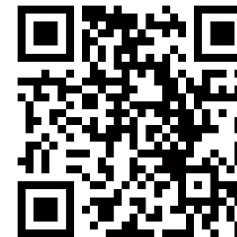
Mobile version

Use your mobile or tablet to scan the QR code and download the software.



WEB version

Use the browser to visit the WEB version SmartPV monitoring platform.



jp.smart-pv.net



Mobile & WEB common version

Account

jp@smart-pv.net

Password

smartpv



make the solar easy

Thanks !

TAOKE Network Technology Co., LTD.

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Email: info@smartpv.net