



Billion Watts Technologies

Professional Solar Monitoring & Management System



Pixel View

Professional Solar PV Monitoring and Management System

Global warming, technology advancement, cost reduction, and rapid market growth result in high demand for renewable energy. Solar energy, the most abundant natural resource, has been gradually becoming the most profitable long-term investment. Like any other equipment, it's inevitable to efficiently manage and operate solar PV plant to generate maximum energy output. We provide a total PV management solution to remotely monitor abnormal scenarios of your solar plant that can shorten downtime, reduce O&M cost and eventually boost system ROI.

We provide Pixel View, a data-driven, Web-based solar PV monitoring system that delivers detailed solar plant information at the string-level, allowing users to remotely analyze and overview solar farm operation on the universal management platform. We assist solar farm administrator, asset manager, and investor to diagnose failure to improve the overall power generation and equipment operational efficiency. Pixel View is a strategic tool of O&M solution to optimize solar system output and asset management by transforming from a manual and complicated procedure into a simple, scalable and effortless enjoyment to ensure the highest energy yield at all times.



Data Driven, user-friendly cloud management system for all browsing interfaces



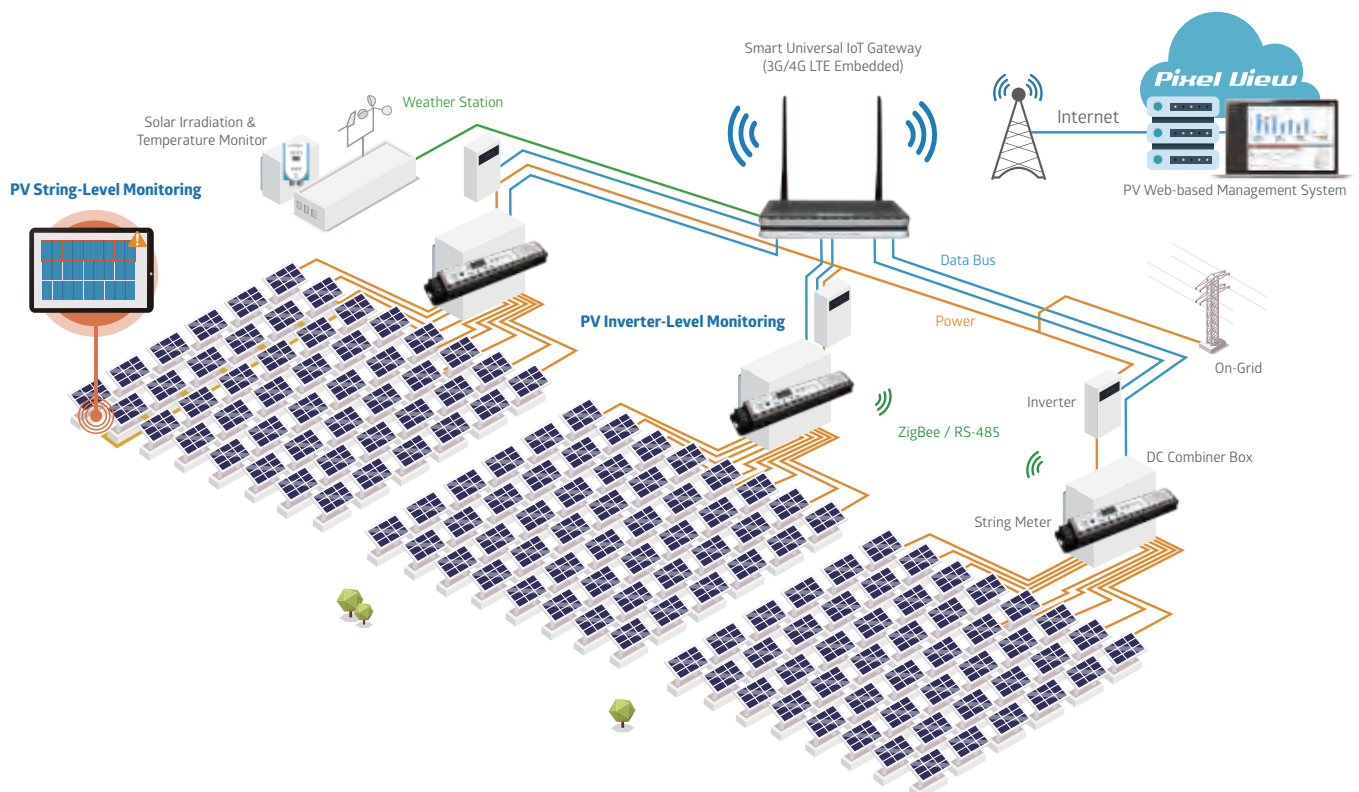
High-accuracy monitoring at the string-level to detect abnormal strings



In-depth analysis of power generation and environmental sensory data



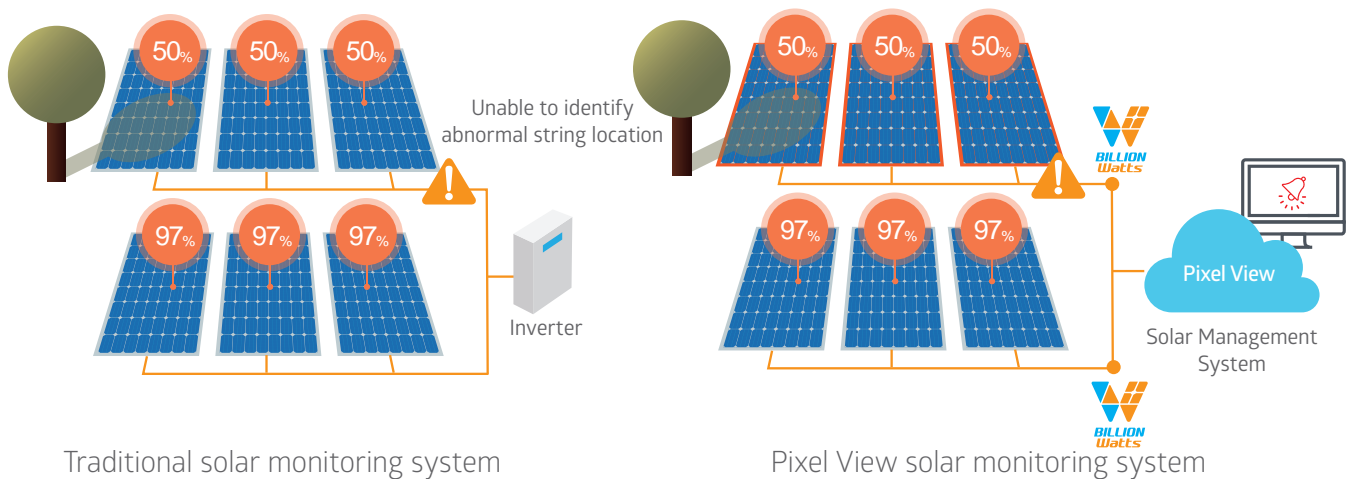
Dynamic functional configuration to meet every management demand



Reduce Operation Cost

The general solar generating system is combined with various solar modules in different series in parallels to accumulate the sufficient voltage and current. A partially shaded solar module by dust, snow, leaves, adjacent building shadow or even bird dropping may result in significant decline in power generation down to 25%.

Pixel View can display the most up-to-date performance data of solar irradiance, module/ambient temperature, wind speed/direction, PV combiner boxes and inverters, providing power plant owner, project developer, utility, and independent power producer (IPP) a user-defined platform for monitoring power generation status in real-time and to further prevent system damages.



High Compatibility

Due to cost, product warranty, market changes, and the requirements from system owners, utilizing various brands of inverters in the solar farm has been a common thing. Pixel view is a one-stop solar monitoring system which is suitable for small, medium and large solar PV plant and compatible with all types of module and inverter.

Our smart IoT gateway supports extensive range of communication protocols such RS-485, Modbus TCP, and ZigBee, 3G/4G LTE, Ethernet, and WiFi, which is compatible with all kinds of inverters, DC string meter, AC three-phase / single-phase meter and environmental sensors. Pixel View can collect and transmit all the equipment information to the back-end system in real-time to achieve comprehensive centralized management.



Integrated Inverter Brands
ABB
ABLEREX
ALLIS
DELTA
GOODWE
KACO
LTI
PV
PRIMEVOLT
SATCON
SolarEdge
Sungrow

PV Monitoring & Management System to Boost Yield of Your Solar Investment

High-Precision PV String Meter with Wide Operating Temperature

We provide 2/4/8/10/12/16 Strings DC meters that can acquire detailed power generation information of each string, enabling the administrator to monitor solar productivity remotely and shorten the O&M process.



Instant Data Tracking and Comparison Report Generation

Through "Substation Comparison," "Inverter Information," and "Site Plan," the administrator can overview DC electricity generation, AC power generation, DC RA Value, DC PR Value, AC PR Value, the efficiency per kilowatt power, and performance & efficiency ranking of various power plant groups.



Remote Troubleshooting and Color Management to Identify the Location of Abnormal Solar Strings

Utilizing "String Information" and "online color management" functions, Pixel View can pinpoint and deliver automatic alert for immediate failure detection, description, and status tracking, which enables an ever-efficient power plants operation and maintenance for site managers.



Advanced Management with User-Defined Intelligent Operation and Maintenance Filter

By self-setting filter condition in the "Site Plan," administrator can overview the metrics of each string and inverter for quality assurance of each solar farm. Pixel View provides an ultra-convenient monitoring platform for administrators to understand operation status of each solar power plant and make active judgments instantly.



One-Stop Solar Energy Monitoring Solution Satisfies Different Managerial Level

Pixel View serves as a user-defined monitoring platform for administrators to understand the operation of solar power plant and review power generation data on the daily/weekly/monthly basis. The system also supports a variety of currency calculation for users to configure the expected PV revenue and the system ROI.



A Complete PV Monitoring Solution with Universal User Interface

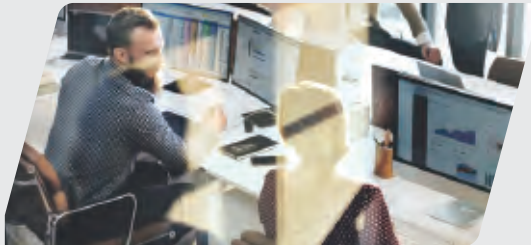
Pixel View provides a complete set of Web-based architecture that allows system integrators or software developers to take full advantage of Pixel View. Through the secondary system development of new sites & pages with an easy-to-use APP, we can cater our solutions in alignment with international users' requirements, including the multi-language display to meet all customer scenarios.



Traditional Solar Monitoring System vs Pixel View

Safety

Pixel View can not only monitor the voltage and current of each string, but it also sends out alarm notifications when the system detects any underperformance, failure, or malfunction, which significantly reduces the danger of electricity leakage and electric fire due to short circuit incidents.



Monitoring

The robust software system can immediately diagnose the cause of any unusual electricity event to minimize the traditional manual inspection costs by increasing the O&M efficiency of power plants maintenance in real time.



Immediate Judgement for Shading Effects

The output of cells declines when the panel is shaded, which directly influence the current output of the entire solar module series and drop the serial productivity. Pixel View can help users to determine when shading effect occurs and delivers alarm notification, as well as diagnosis report for immediate reaction.



Operation & Maintenance

Pixel View features site plan functionality that can precisely locate and display the abnormal solar strings to accelerate the intelligent diagnose analysis. Technicians and maintenance personnel only need to repair or clean a particular region of modules to catch the golden 30-minute system repair time.

Universal Gateways

Supporting hybrid standards of communication protocols including RS-485, ZigBee, PLC, Ethernet and 3G/4G LTE, Billion Smart Universal Gateway serves as system communication backbone and delivers a seamless connectivity to transfer collected data to Billion Watts cloud computing system for real-time monitoring.

SG6300NZL Smart Universal IoT Gateway (3G/4G LTE Embedded)



- Embedded 3G/4G module for broadband and 3G/4G connections.
- Auto fail-over between broadband and 3G/4G LTE interfaces for always-on connection
- Build-in RS485 for communicates to various Inverter & RS485 end devices.
- Build-in ZigBee for communicates to ZigBee end devices.
- Supports wireless AP mode and client mode to connect with existing wireless gateway
- Support internal storage for history data log.
- Support Real Time Clock (RTC).

SG6300NXL Smart Universal IoT Gateway



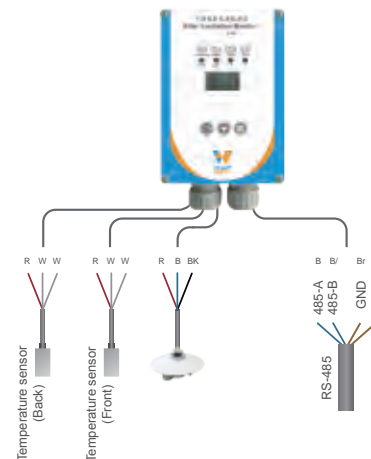
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AC Meters / DC Meters / Solar Accessories

The Solar Irradiance & Temperature Meter SG70S-V1-0



- Combine measurement, display and communication functionalities
- Wider range of solar irradiance monitor from 10.0-2500.0(W/m2)
- LCD display, for multi-display real time and measurement information
- 2 temperature sensor which support measurement panel temperature from -50°C~150°C
- Wider range operation temperature from -20°C~+65°C
- Easy operating with low power consumption
- IP55 level, suitable for outdoor use



RS-485 / ZigBee Converter - SG90-SZ-0



- Bidirectional converts serial data to wireless communication
- Reduce installation cost & increase signal coverage
- Wider range operation temperature from -40°C~+85°C
- Compact size with low power consumption
- Suitable for outdoor use

100A ~ 300A Three-Phase Wireless ZigBee / Wired RS485 Power Meter - SG3030(S)



- Fully IEEE 802.15.4 and ZigBee PRO compliant
- Electricity usage data and other indicator information collection
- < 1% Wh accuracy
- Power surge protection
- Supports 1P3W, 3P3W, 3P4W
- Dry contact for external appliance control

Single-Phase Wireless ZigBee Intelligent Current Control Box- SG3010-iCB









- Fully IEEE 802.15.4 and ZigBee PRO compliant
- Electricity usage data and other indicator information collection
- Power control: 0.1~60A, programmable setting of trip current and time to protect the relays
- < 0.5% Wh accuracy

15A ~ 300A Single-Phase Wireless ZigBee Smart Energy Meter Series - SG3015



- Fully IEEE 802.15.4 and ZigBee PRO compliant
- Electricity usage data and other indicator information collection
- < 0.5% Wh accuracy
- Power surge protection
- Compact size
- Four connector types: T1, T2, T3, T4

DC Meters

Model Name		SG3216S	SG3212S	SG3210S	SG3208S	SG3204S	SG3202S
							
Rated Current		Total 16 Strings, 10A for each String, Max. 160A Total	Total 12 Strings, 10A for each String, Max. 120A Total	Total 10 Strings, 20A for each String, Max. 160A Total	Total 8 Strings, 20A for each String, Max. 160A Total	Total 4 Strings, 10A for each String, Max. 40A Total	Total 2 Strings, 10A for each String, Max. 20A Total
Rated Voltage		1000Vdc				900Vdc	
Class of Accuracy (kWh.W.V.A)	@ TA 0~40℃	0.5%+0.5%FS				1%+0.5%FS	
	@ TA -40~70℃	1%+0.5%FS				2%+1%FS	
Measure Display	Voltage	150Vdc~1,000Vdc			40Vdc~1,000Vdc		
	Total Current	0.1A~160A	0.1A~120A	0.1A~200A	0.1A~160A	0.1A~60A	0.1A~30A
	Total Current	0.1kW~160kW	0.1kW~120kW	0.1kW~200kW	0.1kW~160kW	0.1kW~60kW	0.1kW~30kW
	Total kWh	0.1kWh ~99999 kWh					
	Each String Power	0.01kW~15kW		0.01kW~20kW		0.01kW~12kW	
	Each String Power	0.01A~15A		0.01A~20A		0.01A~15A	
Operation Interface		4 buttons			DIP switches		
Display		5-digit LCD Display			-		
Setting for string no. & ID		Panel setting buttons			Panel setting DIP switches		
SPD Indicator		Red LED x 1				-	
Comm. Interface		RS-485(Isolated Series)					
SPD Status Detection		Yes					-
Power input	From PV	V	V	V	-	-	-
	External 24Vdc	-	-	V	V	V	V
Power Consumption (@rated Voltage)		3W			1W	0.5W	
Working Temp. & Humidity		-40℃~75℃ · 5%~95%RH					
LCD Display Temperature Range		-40℃~70℃					-
Casing Material		UL94 V-0, 105℃flame retardant material					
Dimension WxHxD(mm)		332(W) x 61(H) x 36(D)	220(W) x 124(H) x 38(D)	248(W) x 76(H) x 36(D)	212(W) x 76(H) x 36(D)	141(W)x 95(H) x 40(D)	

Intelligent Solar Communication Box

SG33S1 Series



To improve the reliability of equipment operation, we provide an integrated intelligent solar monitoring box which consists of SPD (Surge Protection Device), No Fuse Breaker(NFB), AC switch, gateway, AC/DC converter and 110V/220V power outlet. The solar communication box is IP55 graded, waterproof, dust resistant and equipped with door lock that meets the specification requirement of all major solar power plants.

- Meet IP55 Waterproof Standard
- Equipped with waterproof connector
- Integrated with Timer, SPD, AC switch, NFB, AC socket, DC 24V power
- SUS304 stainless steel box
- Moderate size, easy to install
- Power point on box and door panel



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