

# **iPVTracker**

Precise tracking of the  
Sun in 360°

360° 精準與日共生



# iPVTracker

www.ipvtracker.com

BIG SUN's iPV Tracker is able to convert the virtually unlimited solar energy to electricity for daily needs in the most economical and efficient way, and brings real benefits for our customers and to the environment. The iPV Tracker has been granted with multi-national patents and has been awarded with Taiwan Industry Innovation Award (2013). In addition, its derivative product "iPV Smart Farm" has won the Taiwan Outstanding Photonics Award (2015) and the Top 10 Highlights Award (2015 · 2016 · 2017) at the SNEC PV Expo.

iPV Tracker 智慧追日系統為 BIG SUN 太陽光電集團提升太陽能發電效率的劃時代力作，將源源不絕的太陽能，以最經濟且有效的方式轉換成每日用電所需，為客戶及環境帶來實質的貢獻。iPV Tracker 智慧追日系統已取得多國專利，並於 2013 年獲得臺灣產業創新成果獎；其應用產品「iPV 智慧農業大棚」，更榮獲 2015 年臺灣傑出光電產品獎、2015 · 2016 · 2017 SNEC 十大亮點獎，備受專家肯定。



**Taiwan 2013**  
Industrial Innovation  
Awards



**Taiwan 2015**  
Outstanding Photonics  
Product Awards



**SNEC 2015 ~ 2017**  
TOP10 Highlight  
Awards



## OVER 60 Global Patents

Irreplaceable Capability  
Patents Competitive Advantage

## 超過 60 項全球專利

不可取代的能力 專利競爭的優勢

# OUTSTANDING PERFORMANCE

## 傑出的表現

"iPV Tracker has been tested and verified in field operations, delivered more than 99.9% availability from global case studies. Also, the internationally renowned consulting firm, Black and Veatch, has issued their technical due diligence report for the iPV Tracker. Thus, we can say the technology of iPV Tracker is really mature." - Chairman of BIG SUN, Summer Luo

「iPV Tracker 智慧追日系統經過測試及實際營運驗證，產品在一年內的稼動率達 99.9% 以上，2015 年系統程式優化後，全球各地的產品妥善率接近 100%，價格也能讓中國系統大廠接受，並且技術上已獲得 Black & Veatch 的查驗，如此足以認定 iPV Tracker 智慧追日系統已經真正成熟。」

- BIG SUN 董事長 羅家慶

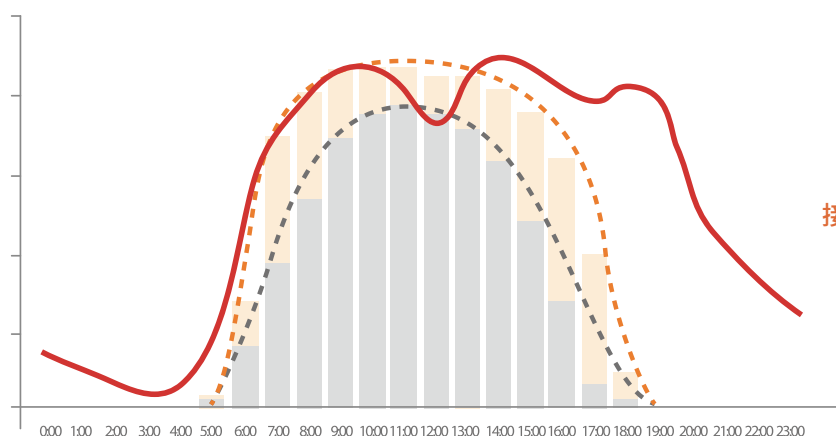


BLACK & VEATCH  
技術可靠驗證

20 年的妥善率（稼動）表現，于合理每年正常保養條件下：

| 架設首年  | 第五年標準 | 第十年標準 | 二十年標準 |
|-------|-------|-------|-------|
| 99.9% | 99.8% | 99.5% | 99%   |

Legend:   
 - iPV Tracker (Orange line)   
 - Fixed-tilt 固定型 (Grey line)   
 - The average load Curve of spring and fall. 春秋均值每日電力負載量 (資料來源：臺灣電力公司網站)



Solar Radiation  
接收日照量提升

Power Generation  
發電量提升

Profit Incoming  
利潤收益提升

# OUTSTANDING DESIGN

## 傑出的設計

This **CABLE-DRIVEN** dual-axis solar tracker with universal-joint design is able to swivel in **360°** to maximize power generation and matches best to the grid load curve. In conjunction with web-based iPVita control and monitoring system enables it as an **IoT PV SYSTEM**.

專利鋼索傳動十字雙軸追日系統，首創 **360 度** 轉動角度，將太陽光電發電量最大化，並最能符合電網日間供電曲線。其精實的結構，不但可靠，更能降地維運成本，搭配 BIG SUN iPVita 能源管理系統，達成高妥善率，為最先進之 **IoT 太陽光電系統**。

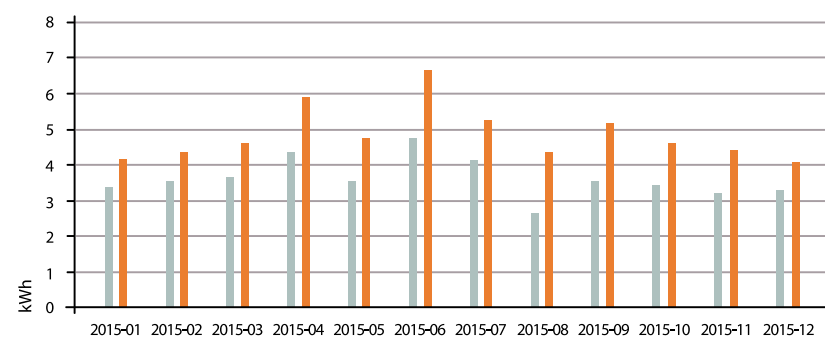


# MAXIMIZING OUTPUT

## 精準追蹤

iPV Tracker is consistent in pointing to the Sun has provided more stable power and up to **30-100%\*** power generation than a fixed system, and tracks 1.25 degree every five minutes, features a full 360 degrees azimuth rotation and altitude tilt of -40 to 40 degrees.

iPV Tracker 智慧追日系統每 5 分鐘轉動 1.25 度，範圍可至 360 度方位角、0-40 度傾斜角，在白天能精準追蹤太陽軌跡，從日出至日落提供更穩定的電量，相較固定型系統有效提升整體發電量高達 **30-100%\***。



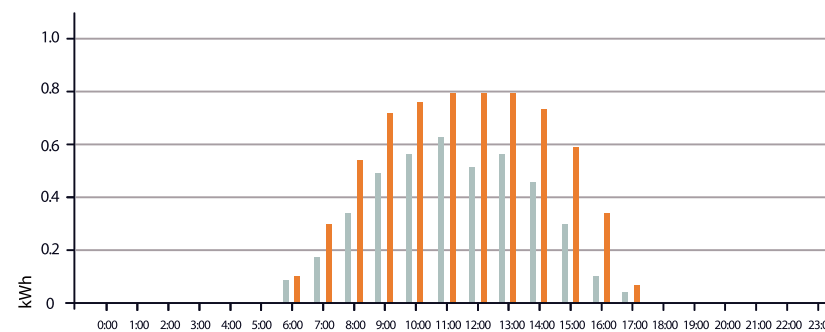
### ► YEARLY

# +35%

Actual energy production comparison in Tainan area (latitude N 23.14 degrees) in 2015

臺灣台南地區 (北緯 23.14 度) 2015 年一年發電量比較

iPV Tracker Fixed-tilt 固定型



### ► DAILY

# +47%

Actual energy production comparison in Tainan area (latitude N 23.14 degrees) in a single day in September.

臺灣台南地區 (北緯 23.14 度) 9 月份單日發電量比較

iPV Tracker Fixed-tilt 固定型

# RISING CASH FLOW

## 現金流量逐年增高

The overall profit from iPV Tracker is much higher than the total investment costs. Therefore, its stable cash flow derives a much higher 20-year cumulative cash flow than those from fixed and single-axis systems.\*

iPV Tracker 智慧追日系統的獲利能力遠高於整體投資成本，因此可以提供穩定的現金流，20 年累計現金流量遠高於固定式及單軸式系統 \*

\* The yield is location and system dependent. 實際發電情況依不同的系統及地區環境有所調整。



# EASY MAINTENANCE

## 簡易維護

This patented system consists primarily of a universal joint, high torque steel cables, pulleys, and springs, operated according to the controller algorithm. Compared to other complex dual-axis trackers, iPV Tracker is more reliable, with more affordable maintenance costs.

獨家專利設計，使用十字雙軸、鋼索、滑輪、彈簧，根據控制器內建的日晷程式進行運轉，相較其他雙軸跟蹤系統更為可靠，而且零件及維護成本更為經濟實惠。

### The universal joint

is designed to rotate the module frame in two perpendicular directions.

十字雙軸 設置於支柱上，使平台能夠二維旋轉。



### The steel cables

steer the module frame and also function as four anchor points.

鋼索 由四角帶動平台，並能協助動態平衡。



### The springs

act as cushions for wind gusts.

彈簧 的避震功能可幫助提升抗風性。



### The steel reels

accurate tracing within  $\pm 0.5^\circ$  deviation

線盤 微幅傳動達  $\pm 0.5^\circ$  精準追日



# SMART CONTROL

## 智慧控管

iPVita™



iPVita web-based monitoring system provides real-time monitoring of power generation, environmental information, system status, fault notification, troubleshooting tracking, PR analysis, as well as remote control of iPV Tracker. It also provides free App and customized display service. The iPVita data is stored in the cloud server, which offers secured backed up and the data can be saved for 20 years.

搭配 iPVita 智慧監控系統提供最即時的系統管理，包含發電量及環境資料監視、即時異常分析與燈號顯示、故障通報、追蹤派工流程、PR 值分析、歷史資料查詢、遠端控制 iPV Tracker 智慧追日系統等功能，並提供免費 APP 及客制化的頁面服務。各量測資料可以在雲端主機保存 20 年，並能夠異地即時備援。



# HIGH RELIABILITY

## 因地制宜

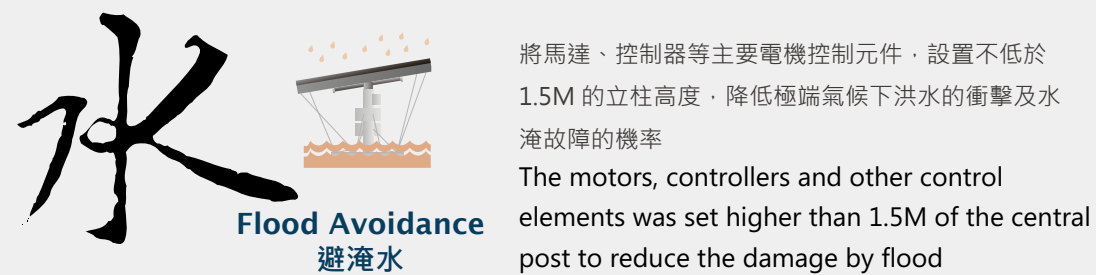
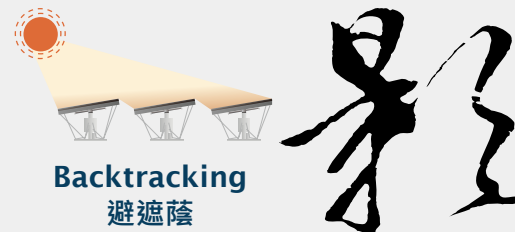


日落後可順應不同季節風向，調整跟蹤傾斜方位使之與風向平行，減少沙塵累積於跟蹤支架平台

iPVtracker can be activated to rotate at a tilted angle to remove excessive dust



將太陽能板傾斜至相互不遮蔭的最大角度以吸收最多日照量，並提高土地使用率  
iPVtracker is programmed automatically to adjust to an optimal angle according to location, season and time of day, to prevent mutual shading



# FAST INSTALLATION

## 快速安裝

Fast option is offered to speed up installation.

iPV Tracker 智慧追日系統使用牢靠且便利的方法，加快安裝時間，降低施工成本。



### Cross-Foundation

十字水泥基墩

iPV Tracker can be deployed on flat roofs or ground sites.

力學平衡工法，適用於平面屋頂等案場。



### H-Piling

H 型鋼打樁

iPV Tracker can be installed rapidly without extensive land grading and concrete curing time.

利用 H 型打樁工法、鋼索力學平衡，

超越地形限制，降低整地費用及時間



### H-beam base

螺旋地樁工法

High pullout resistance and high loading capacity. Easy construction. Low construction cost.

高抗拔與承載能力。施工簡單降低成本



### Japan Akagi yama Power Plant

日本赤城山電站

Capacity 系統容量 : 5MW

Completed 完工年份 : 2017

Product 產品型號 : iPV Tracker T6024

## REFERENCE PROJECTS

### 應用案例

iPV Tracker is applicable to ground-mount, roof-mount, agro-solar, and carport, with either on-grid or off-grid systems.

iPV Tracker 智慧追日系統適用在各種商用電站，包含屋頂型、地面型、農業大棚型、車棚型，並聯電網或獨立自用的形式皆有配套措施。

## Ground-Mount 地面型

iPV Tracker has been utilized throughout the world, with recognized effectiveness.

iPV Tracker 智慧追日系統目前已在多個地區設置地面型電站，效益備受客戶肯定。



### Xinjiang TBEA Power Plant

中國新疆柳樹泉特變電站

Capacity 系統容量 : 132 kW

Completed 完工年份 : 2015

Product 產品型號 : iPV Tracker T6024



### Jiangxi AKCOME Power Plant

中國江西贛州愛康電站

Capacity 系統容量 : 80 kW

Completed 完工年份 : 2016

Product 產品型號 : iPV Tracker T6024



### Japan Shiga-ken Power Plant

日本滋賀大津電站

Capacity 系統容量 : 795kW

Completed 完工年份 : 2016

Product 產品型號 : iPV Tracker T6024



### Japan Hyogo Power Plant

日本小野電站

Capacity 系統容量 : 524 kW

Completed 完工年份 : 2014

Product 產品型號 : iPV Tracker T6024

## Taiwan Pingtung Power Plant

### 台灣屏東電站

Capacity 系統容量 : 840 kW

Completed 完工年份 : 2015

Product 產品型號 : iPV Tracker T6024

World's Largest Rooftop Dual-Axis Solar Power Station  
全球最大屋頂型雙軸追日電廠



## Roof-Mount 屋頂型

iPV Tracker can be installed on the flat roofs of buildings such as warehouses and factories.

iPV Tracker 智慧追日系統在有限的空間上也能將效益做最大的提升。



## Taiwan Tainan Power Plant I

### 台灣台南電廠一期

Capacity 系統容量 : 274.5 kW

Completed 完工年份 : 2013

Product 產品型號 : iPV Tracker T6006



## Taiwan Tainan Power Plant II

### 台灣台南電廠二期

Capacity 系統容量 : 224.64 kW

Completed 完工年份 : 2014

Product 產品型號 : iPV Tracker T6012

## Agro-solar 農棚型

iPV Smart Farm is agriculture integrated with iPV Tracker, iPVita monitoring system, and steel frame to provide a more cost-effective solar shared farming for crops and energy.

iPV Tracker 智慧追日系統結合農業大棚鋼構，不但適合種植半日照植物也能達到發電收益，iPV Tracker 智慧追日系統還可以調節日照讓植物得到最佳日照量，結合 iPVita 智慧監控系統，能隨時上網監看發電資料、溫濕度、風速、日照量、遠端控制 iPV Tracker 智慧跟蹤系統，讓維護與農作更為簡便。



## ▲ Taiwan Yulin Farm A 台灣雲林農棚 A

Capacity 系統容量 : 300 kW

Completed 完工年份 : 2014

Product 產品型號 : iPV Tracker T6024

## ◀ Taiwan Yulin Farm B 台灣雲林農棚 B

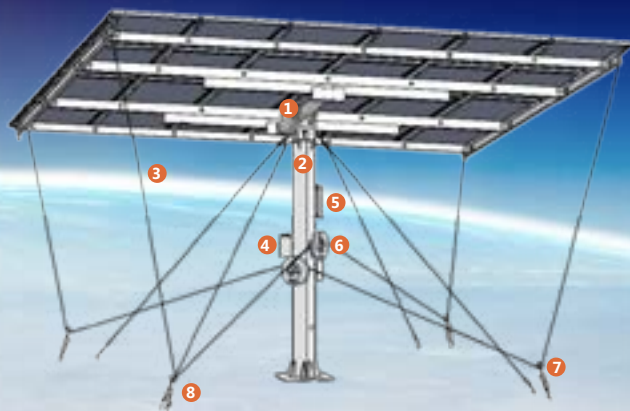
Capacity 系統容量 : 374.4 kW

Completed 完工年份 : 2014

Product 產品型號 : iPV Tracker T6024

# SPECIFICATION

## 規格



- ① Universal Joint 十字雙軸
- ② Central Post 立柱
- ③ Steel cables 鋼索
- ④ Motor Set 馬達
- ⑤ Control Box 控制器
- ⑥ Steel reels 線盤
- ⑦ Pulley 滑輪
- ⑧ Springs 彈簧

| Model 型号                            | T6012                                                          | T6024                                                             | T6040                                                          |
|-------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------|
| Loading Surface<br>乘載面積             | 20.5 m <sup>2</sup>                                            | 40.92 m <sup>2</sup>                                              | 68 m <sup>2</sup>                                              |
| Module Capacity<br>適用太陽能組件          | 12 Modules                                                     | 24 Modules                                                        | 40 Modules                                                     |
| System Type<br>系統型式                 | On-Grid / Stand-Alone<br>併網型 / 獨立型                             | On-Grid / Stand-Alone<br>併網型 / 獨立型                                | On-Grid / Stand-Alone<br>併網型 / 獨立型                             |
| Application Type<br>應用型式            | Rooftop / Ground<br>屋頂型 / 地面型                                  | Rooftop / Ground / Agriculture / Carport<br>屋頂型 / 地面型 / 農棚型 / 車棚型 | Ground<br>地面型                                                  |
| Foundation<br>適用基墩                  | H-Piles / Cross / Others<br>H 型鋼 / 十字基墩 / 其他                   | H-Piles / Cross / Others<br>H 型鋼 / 十字基墩 / 其他                      | H-Piles / Cross / Others<br>H 型鋼 / 十字基墩 / 其他                   |
| Azimuth Angle<br>方位角範圍              | 360°                                                           | 360°                                                              | 360°                                                           |
| Tilt Angle<br>仰角範圍                  | 0° - 40°                                                       | 0° - 40°                                                          | 0° - 35°                                                       |
| Rotation Speed<br>追蹤速度              | 1.25° / 5 min.                                                 | 1.25° / 5 min.                                                    | 1.25° / 5 min.                                                 |
| Control<br>控制方式                     | Cable Drive<br>鋼索傳動                                            | Cable Drive<br>鋼索傳動                                               | Cable Drive<br>鋼索傳動                                            |
| Motors<br>馬達                        | (25 W / AC 220 V) x 2                                          | (25 W / AC 220 V) x 2                                             | (25 W / AC 220 V) x 2                                          |
| Internal Power Consumption<br>系統耗電量 | approx. 14 kWh/year                                            | approx. 14 kWh/year                                               | approx. 14 kWh/year                                            |
| Wind Gust Resistance<br>乘載陣風風速      | Operation Mode 作動模式 : ~87 km/h<br>Safety Mode 安全模式 : ~135 km/h | Operation Mode 作動模式 : ~87 km/h<br>Safety Mode 安全模式 : ~135 km/h    | Operation Mode 作動模式 : ~52 km/h<br>Safety Mode 安全模式 : ~102 km/h |
| Main Material<br>主要材質               | Steel (Hot Dip Galvanized)<br>熱浸鍍鋅鋼                            | Steel (Hot Dip Galvanized)<br>熱浸鍍鋅鋼                               | Steel (Hot Dip Galvanized)<br>熱浸鍍鋅鋼                            |
| Compliance<br>設計標準                  | Structure Design: ASCE07-10                                    | Structure Design: ASCE07-10                                       | Structure Design: ASCE07-10                                    |
| Operating Temperature<br>操作溫度範圍     | -40°C - 80°C                                                   | -40°C - 80°C                                                      | -40°C - 80°C                                                   |
| Height<br>高度                        | 2.46 m                                                         | 3.6 m                                                             | 4.5 m                                                          |
| Weight<br>淨重                        | 430 kg                                                         | 730 kg                                                            | 950 kg                                                         |
| Warranty<br>結構保固                    | 5 years for Tracker                                            | 5 years for Tracker                                               | 5 years for Tracker                                            |



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