802.11a/g/agn/ac multiple relay hop platform hi-mobile backup functions

Outdoor WiFi MIMO Wireless Base Station

- **IOP-MBAP-SAC1 (Single Band Single Card) / IOP-MBAP-SAC2 (Single Band Double Card)**
- **IOP-MBAP-DAC1 (Double Band Single Card) / IOP-MBAP-DAC2 (Double Band Dual Card)**

This product adopts 802.11a/g/n/ac 2X2 MIMO technology and supports 5GHz single-frequency module and self-assembled interface application of 2.4GHz and 5GHz dual-band dual modules through unique and unique software settings. Single 5GHz 802.11ac wireless module transmission up to 867Mbps (Short GI) transmission rate, bandwidth up to 480Mbps; dual wireless module plus up to 1.7Gbps transmission rate, bandwidth plus up to 960Mbps, easily solve the problem of long-distance transmission bandwidth application problem.

This product has the standard WiFi AP server and STA client operation mode, providing WiFi wireless link for users to surf internet and PtP (Peer-to-Peer) and PtMP (Point-to-Multiple-Point) basic wireless transmission applications.

Through the network transmission technology of the IP data link layer of the OSI (Open System Interconnection Reference Model) Layer 2 data link layer & Layer 3, the transmission operation of the AP and the STA is enhanced, and the fast data transfer and automatic healing chain are improved. Reduce the delay of the selected path delay and the low bandwidth attenuation of the multi-point jumper relay.

In order to solve the requirements of wireless mobile transmission, uninterrupted transmission and redundant transmission of industrial automation, intelligent, data and integrated systems, further import 『Automatically find the best transmission path function』 + 『Multiple fast automatic backup repair connection』 + 『Ultra-fast roaming switch mobile wireless transmission function』 completely solves the demand for high-speed mobile and uninterrupted backup transmission required by various solutions and application solutions in the future.

In order to construct a futuristic 『Independent self-operating integrated system

architecture』, this product adopts the space design of the top cover and the lower cover and the isolating plate, and is equipped with PoE power supply and 4DC parallel lightning protection power supply … etc., it will to integrate different operating system equipment. Can support a variety of system solutions and remote management systems and smarter data applications, including integration of 4G/5G transmission, NBIoT, Lora, WiFi, IoT applications, Industry 4.0 applications, smart street lights / smart city, AI system, various detection sensor systems … etc.

Therefore, this product can be applied to campus outdoor wireless coverage Internet access, wireless monitoring remote transmission, industrial 4.0 plant to plant data transmission backbone, factory or large-scale wireless mobile surveillance transmission, urban wireless Internet coverage, large-area wireless surveillance image transmission collection 4G/5G network transmission integration, NBIot collocation application, smart street lights and smart city's large bandwidth backbone applications, solar independent self-operating system … etc.

Product model categories for this series:

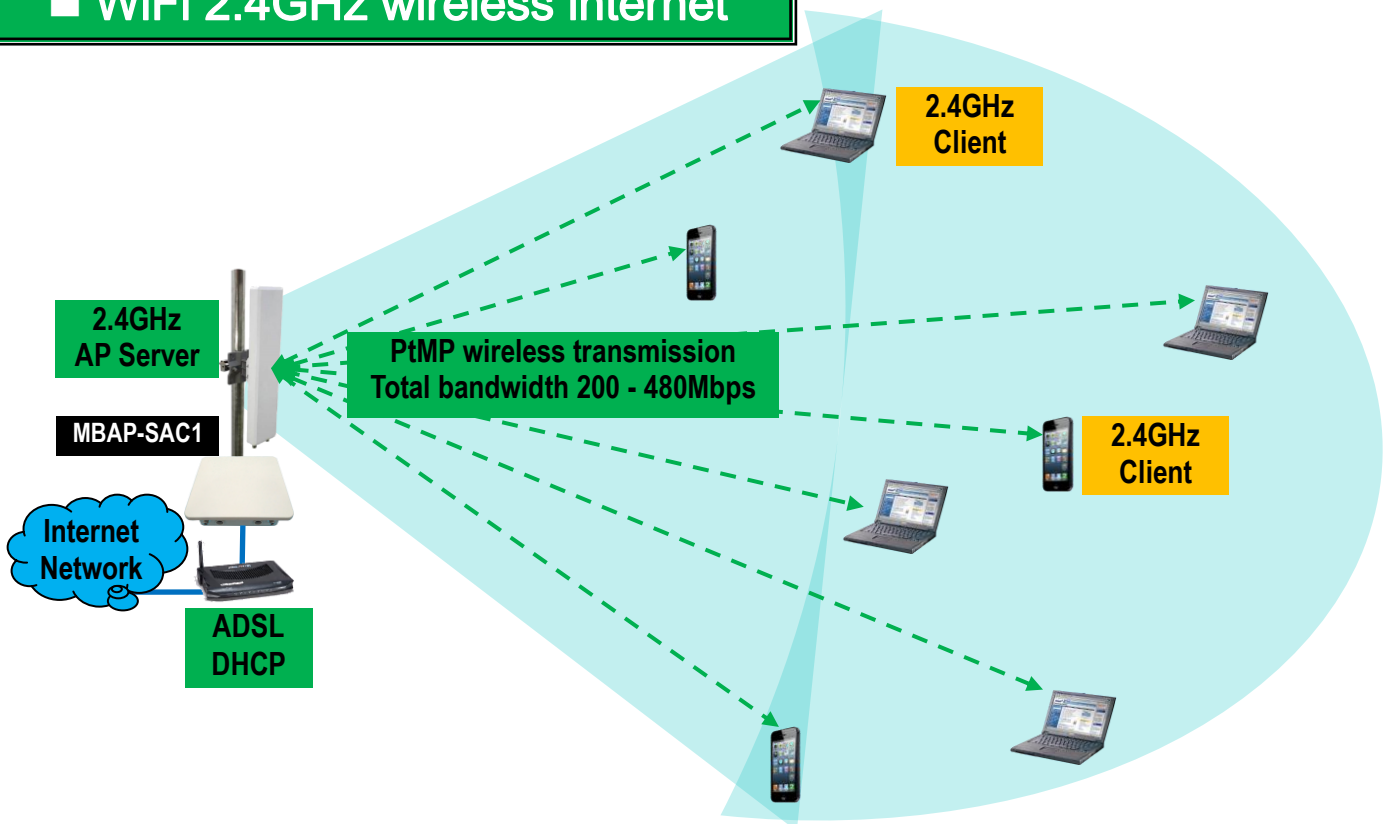
Model	Wireless module interface specification	Model RF quantity
IOP-MBAP-SAC1	802.11a/n/ac 5GHz single band 2x2 MIMO high power output 27dBm (500mW)	1
IOP-MBAP-SAC2	802.11a/n/ac 5GHz single band 2x2 MIMO high power output 27dBm (500mW)	2
IOP-MBAP-DAC1	802.11a/g/n/ac 2.4GHz & 5GHz Dual Band 2x2 MIMO output power 21dBm (125mW)	1
IOP-MBAP-DAC2	802.11a/g/n/ac 2.4GHz & 5GHz Dual Band 2x2 MIMO output power 21dBm (125mW)	2

This product has the following operational features:

- **AP operation mode, providing basic wireless Internet service and large bandwidth PtP and PtMP connection transmission operation functions:**

AP (WDS) mode of operation, providing basic WiFi 2.4GHz Internet connection service and PtP (Point-to-Point) and PtMP (Point-to-Multi-Point) transmission service, 802.11ac 2x2 MIMO wireless transmission technology, can provide single wireless network card mode use the HT80 channel width setting can support 867Mbps (Short GI) transmission rate and 480Mbps transmission traffic bandwidth; dual wireless network card module can provide 1.7Gbps transmission rate and get total of 960Mbps transmission traffic bandwidth.

■ WiFi 2.4GHz wireless internet

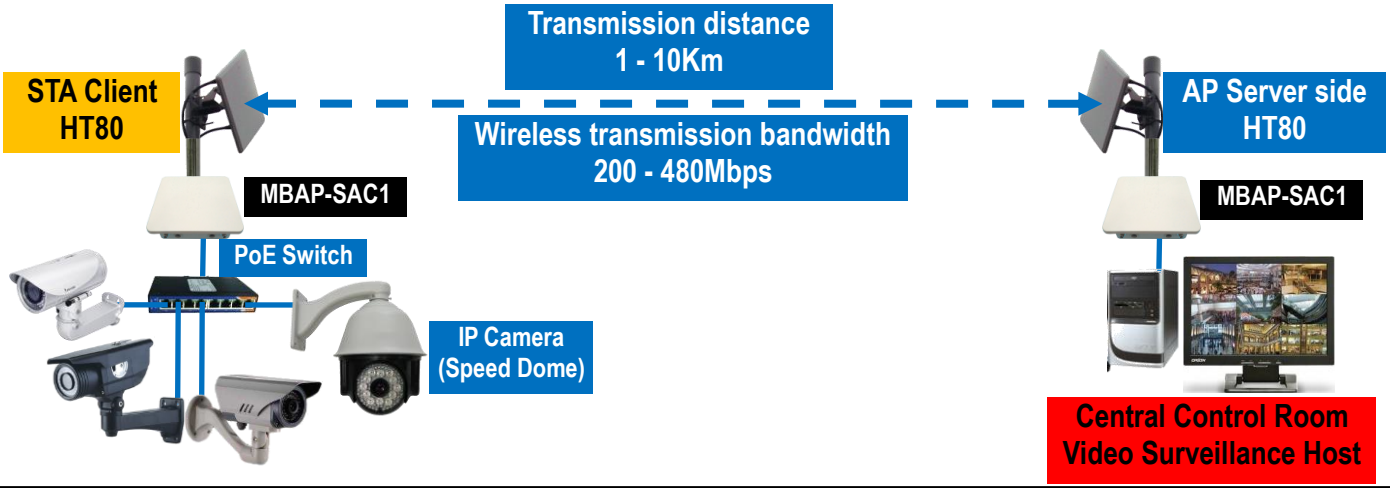


■ STA operation mode, which provides basic wireless client connection AP functions:

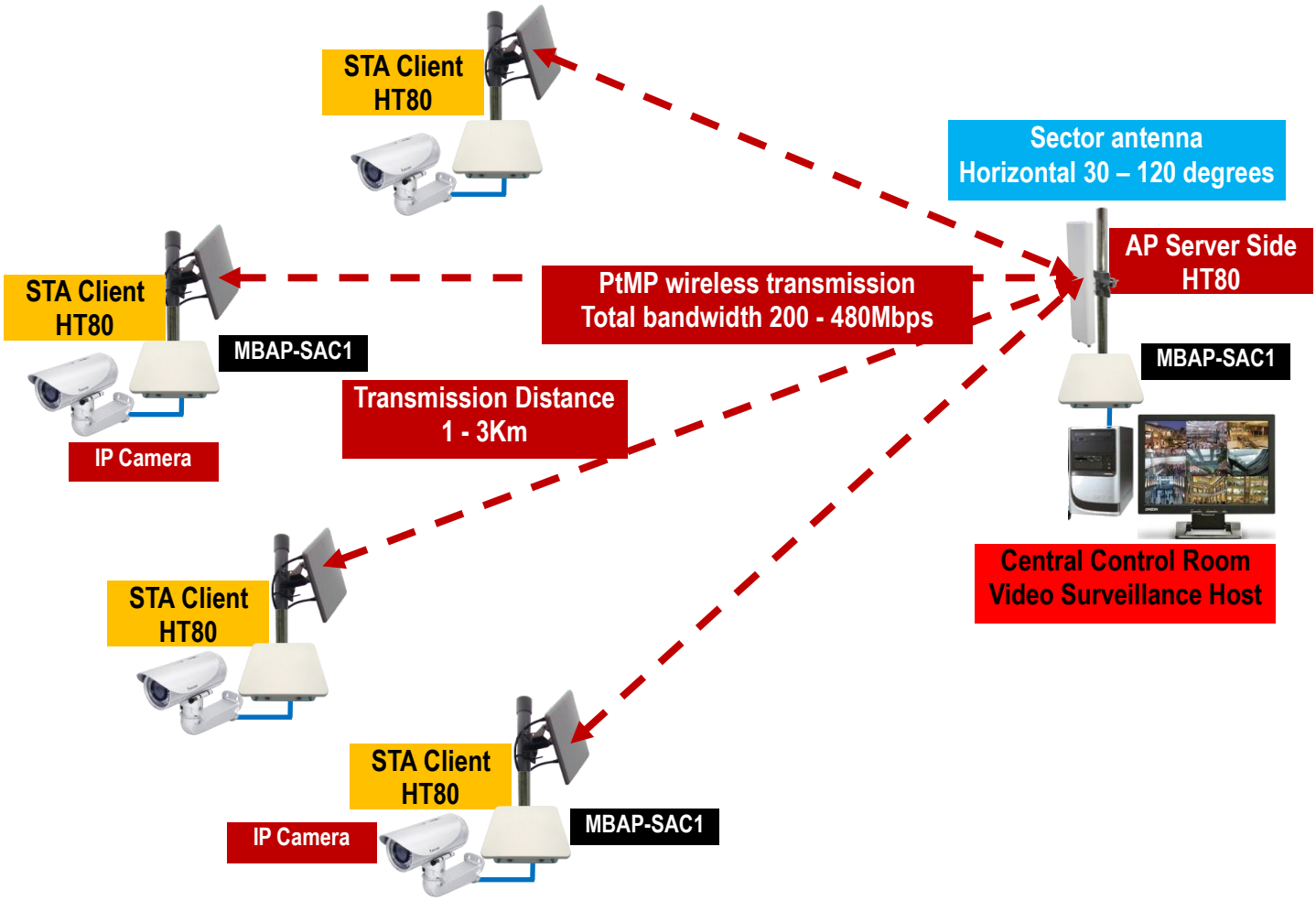
STA (WDS) operation mode, acting as a PtP and PtMP client connection transmission application, through 802.11ac 2x2 MIMO wireless transmission technology, in the HT80 channel width setting, provide a single wireless network card module 867Mbps transmission rate and 480Mbps transmission traffic bandwidth, Suitable for monitoring image and data transmission backbone erection.

■ PtP wireless backbone transmission

802.11ac channel width and transmission distance and transmission bandwidth description
1. HT20 can transmit distance 40Km, 100-150Mbps Maximum
2. HT40 can transmit distance 20Km, 150-300Mbps Maximum
3. HT80 can transmit distance 10Km, 200-480Mbps Maximum



■ PtMP wireless backbone transmission

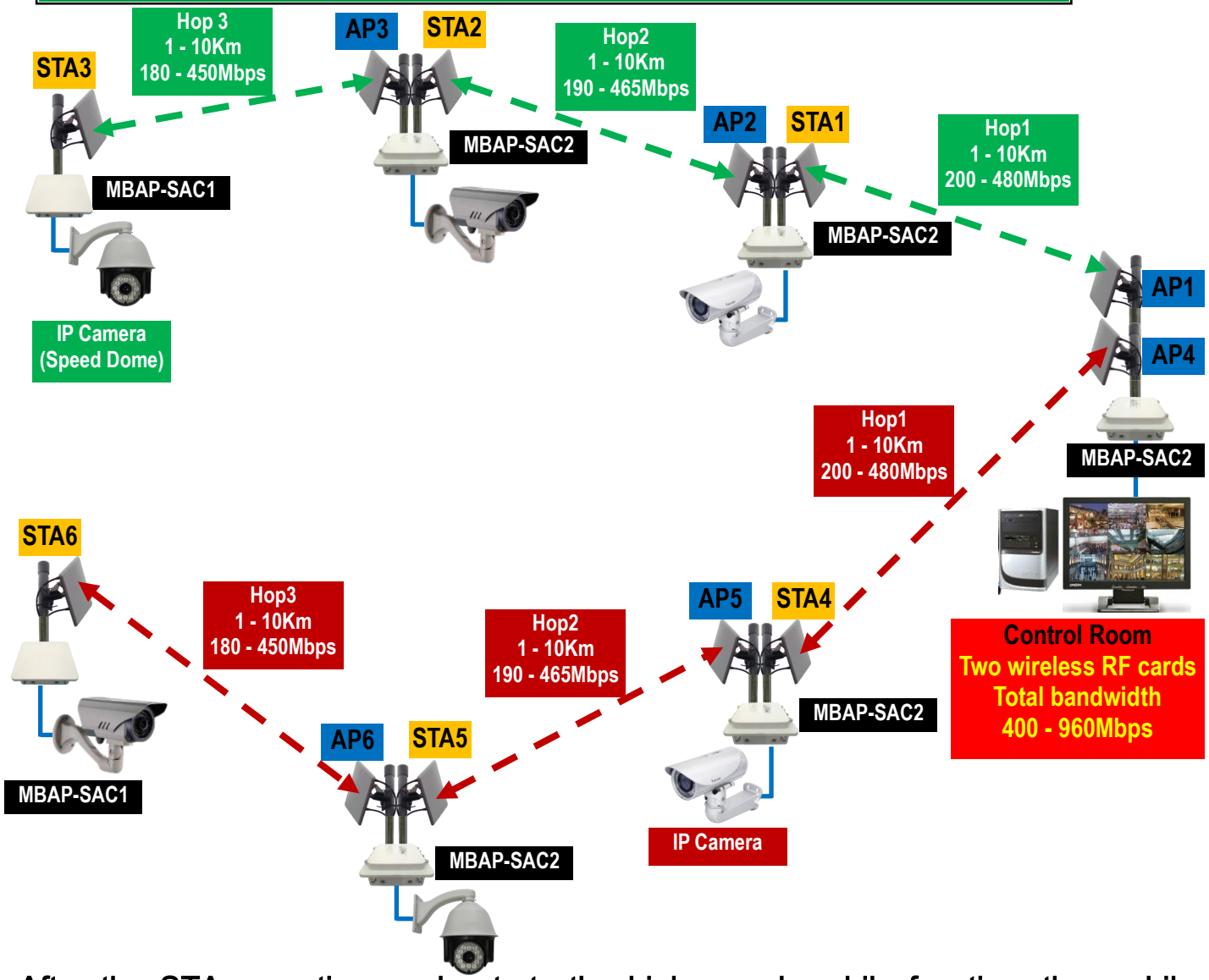


■ **Through the wireless multiple continuous relay platform technology of AP and STA, the low-loss backbone bandwidth and low-latency transmission function are achieved: (Wireless Multiple Continuous Relay Platform Technology)**

When the AP and the STA continuously relay the hop, the hops are reduced by 10-15 Mbps at a time. After the fifth hop, the transmission bandwidth is reduced by 5-10 Mbps, and after 10 hops, the bandwidth can be maintained at 350 Mbps. At the same time, it has low delay characteristics within 20ms after 10 hops.

Dual wireless module products can construct two dual-bands or same-band continuous relay platform wireless backbones to provide transmission requirements in different directions and aggregated image data streams with up to 960 Mbps bandwidth.

■ Wireless multi-point continuous relay platform technology

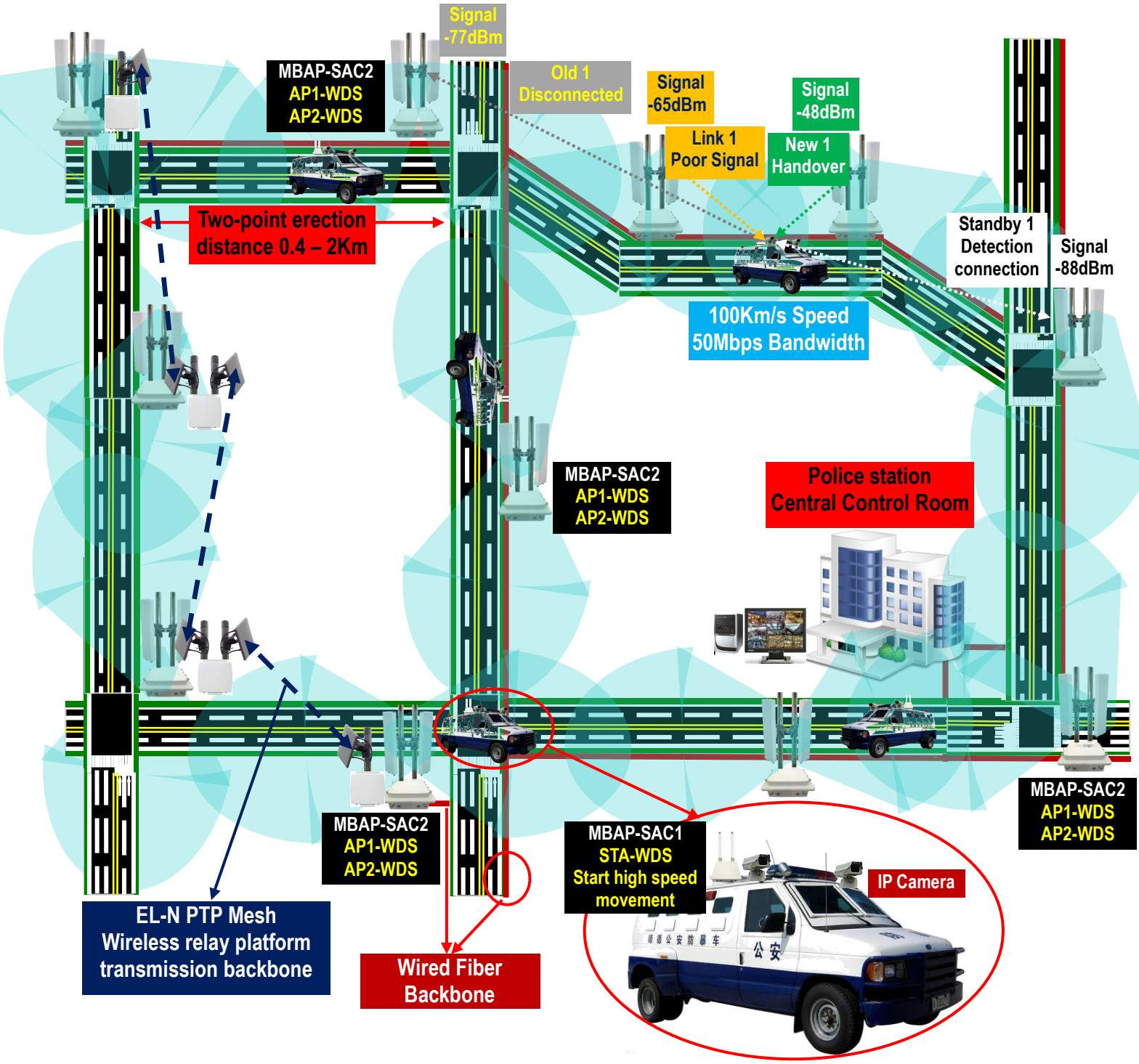


■ **After the STA operation mode starts the high-speed mobile function, the mobile terminal STA supports the "automatically find the best transmission path function": (Auto Select Best Transmit Path Features)**

When STA (WDS) starts the high-speed mobile operation function, it can simultaneously detect the function of communicating multiple groups of APs (WDS). The original AP connection signal becomes poor or the transmission communication becomes unstable or there are other APs with better connections. When the line signal quality is achieved, the "automatically find the best transmission path function" can automatically calculate the current AP detection and signal quality scores, and select the best AP wireless device to become the best transmission path.

(Special note: When starting high-speed mobile backup transmission, the transmission backbone must use wired fiber backbone (or other wired backbone) or EL-N PTP Mesh series of relay hop wireless transmission backbone architecture.)

■ Automatically find the best transmission path function

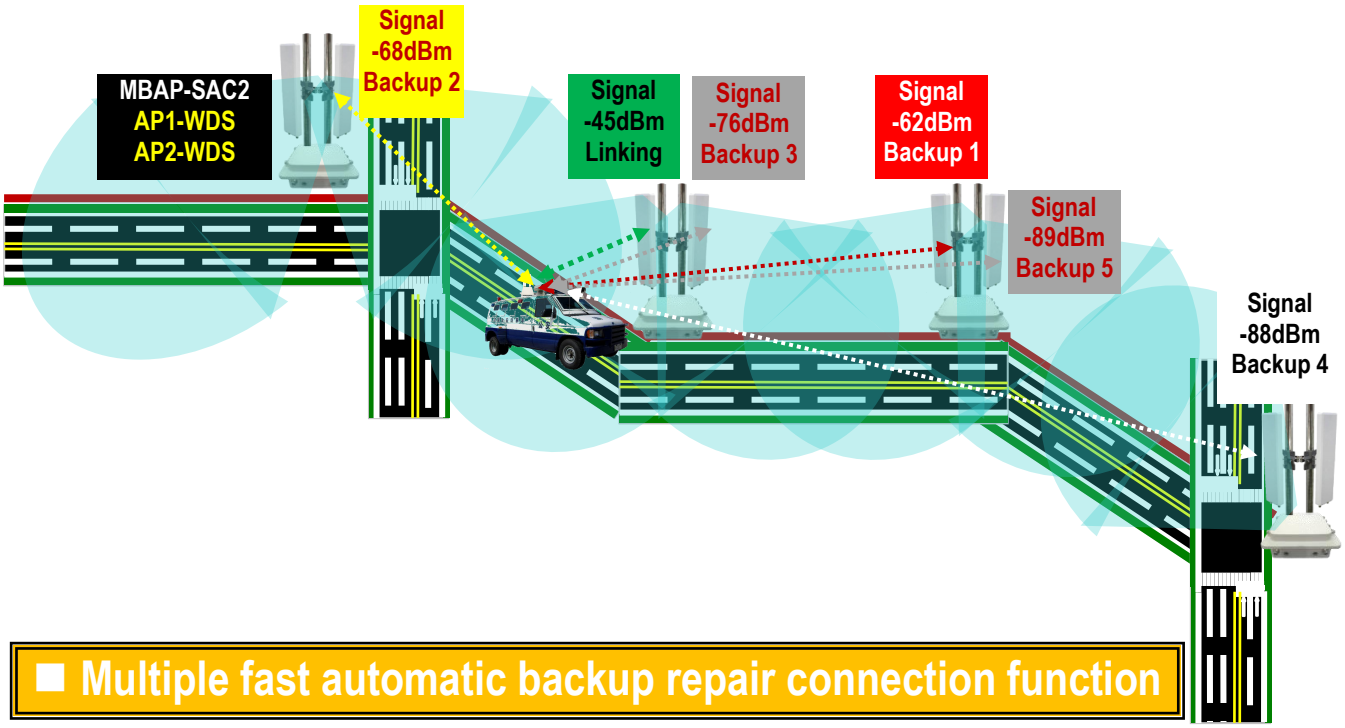


■ After the STA operating mode starts the high-speed mobile function, in order to solve the backup connection problem after the mobile client wireless connection is interrupted, the mobile STA supports the "Multiple fast automatic backup repair connection function": (Auto Multi-Fast Handover Backup Features)

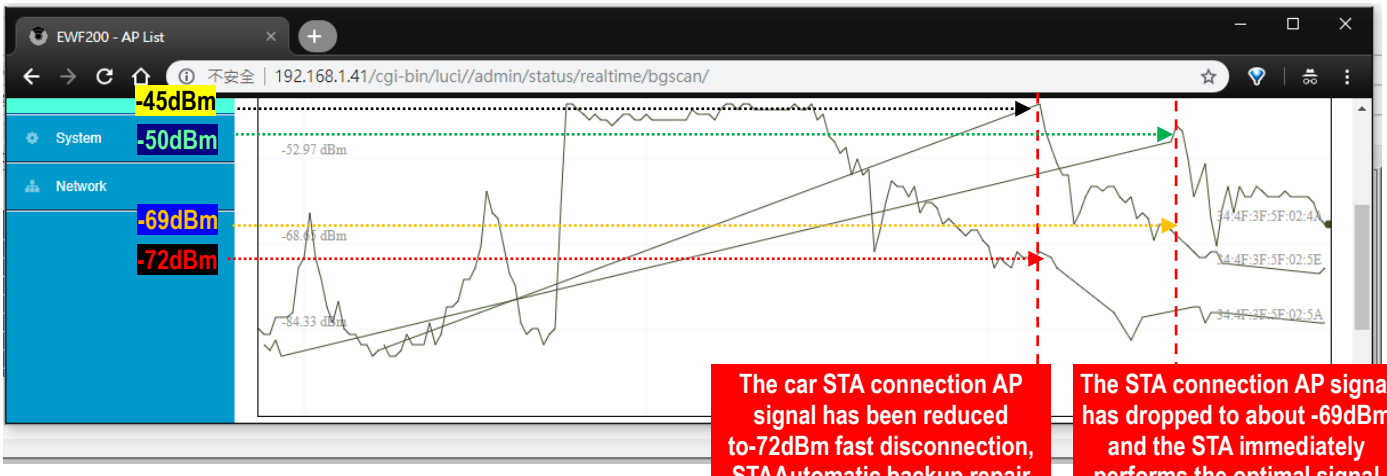
STA (WDS) mode of operation, in addition to the role of the client role of the general fixed backbone transmission, can also specifically activate the high-speed mobile

operation function, so that the STA client has the automatic communication and identification connection switching function of mobile transmission.

When STA (WDS) starts the high-speed mobile operation function, it can simultaneously detect the function of communicating multiple groups of APs (WDS). The original AP connection signal becomes poor or the transmission communication becomes unstable or there are other APs with better connections. When the line signal quality is achieved, the "Automatically find the best transmission path function" and the "Multiple fast automatic backup repair connection function" can automatically and quickly perform backup connection switching to other APs for connection transmission, and achieve millisecond automatic preparation. Support connection switching effect.



■ Multiple fast automatic backup repair connection function



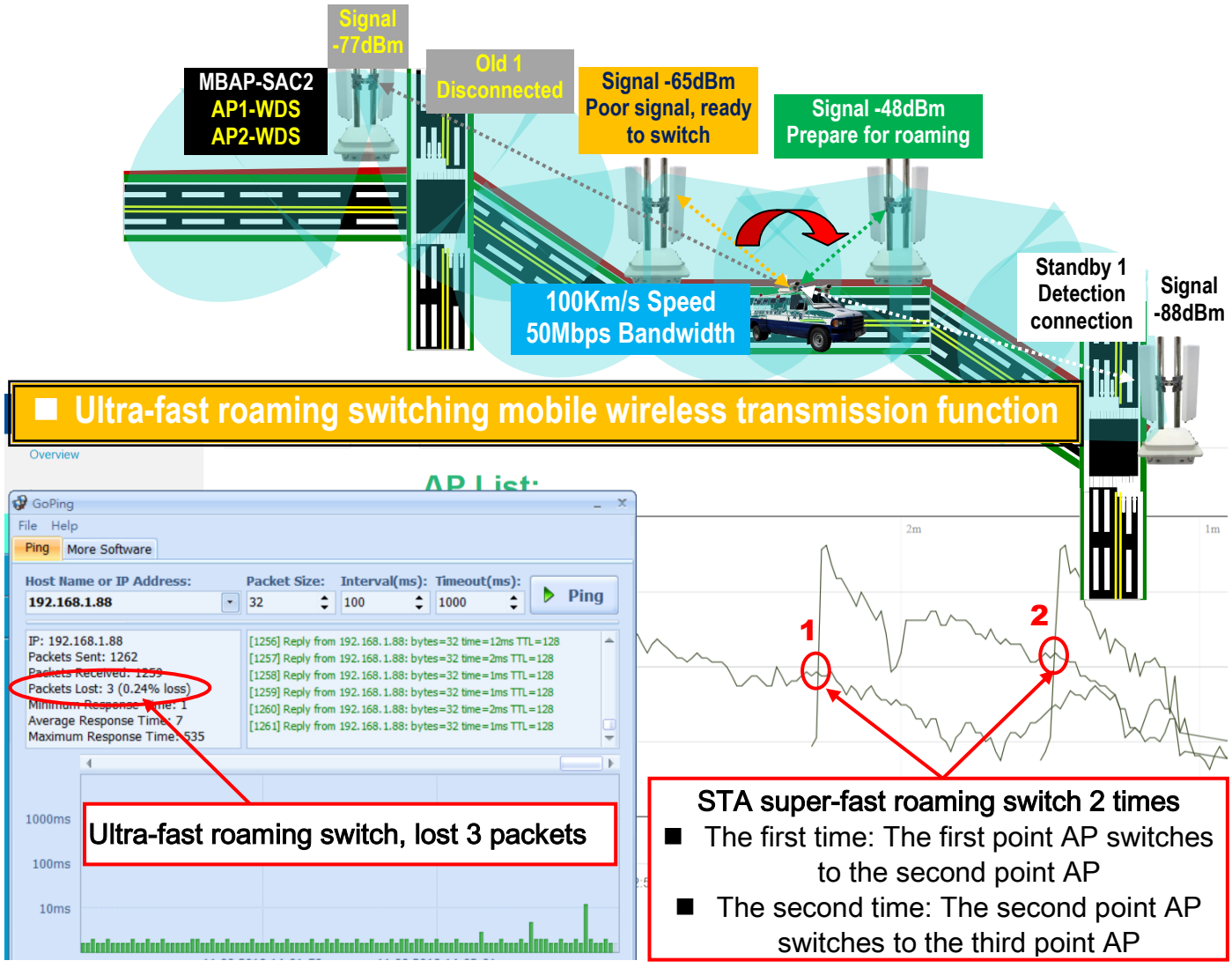
The car STA connection AP signal has been reduced to-72dBm fast disconnection, STAAutomatic backup repair work immediately, detecting APs that switch to a signal value of -45dBm

The STA connection AP signal has dropped to about -69dBm and the STA immediately performs the optimal signal path comparison and takes the automatic gap backup of the signal gap.

■ **After the STA operation mode starts the high-speed mobile function, the mobile terminal STA supports "Super-fast roaming switching mobile wireless transmission function":(Super-Fast Roaming Mobility Features)**

When the STA (WDS) starts the high-speed mobile operation function, in addition to the client role of the "Multiple fast automatic backup repair connection function", it can also perform "Super-fast roaming switching mobile wireless transmission function".

When STA (WDS) starts the high-speed mobile operation function, it will detect and communicate multiple groups of APs (WDS) at the same time. When the connected APs are disconnected, the connection signal becomes poor or the transmission communication becomes unstable or other APs are better. When connecting the signal quality, through the "Ultra-fast roaming switching mobile wireless transmission function", automatic ultra-fast roaming can be switched between many AP wireless devices to perform high-speed mobile and high-traffic bandwidth transmission of 100 Km/s vehicle speeds of 50Mbps. The fast roaming switching speed can reach the switching effect below 380ms (0.38 seconds), which meets the transmission application requirements of high-speed mobile demand.



■ Hardware Specifications

Key component	
Main Processor	Freescale P1020E / CPU Speed 800MHz
Memory RAM	1GB DDR3
Flash memory	256MB NAND Flash
Interface specification	
Wireless network card module	Atheros QCA988x mPCIe IEEE 802.11ac (11a/11an/11ac) 5.8GHz Output Power / Receive Sensitivity: ■ 26dBm @MCS0 (58.5 ~ 65Mbps) / -96dBm ■ 23dBm @MCS7 (585 ~ 650Mbps) / -77dBm ■ 19dBm @MCS9 (702 ~ 780Mbps)(867Mbps Short GI) / -72dBm IEEE 802.11ac, 2x2 MIMO, Data Rate 780Mbps Max IEEE 802.11agnc (11a/11g/11agn/11ac) 2.4GHz & 5.8GHz Output Power / Receive Sensitivity: ■ 21dBm @MCS0 (58.5 ~ 65Mbps) / -72dBm ■ 16dBm @MCS7 (585 ~ 650Mbps) / -69dBm ■ 15dBm @MCS8 (702 ~ 780Mbps)(867Mbps Short GI)/ -64dBm
Number of wireless network cards	Support Atheros QCA988x mPCIe x 2 Modules
Antenna connector	2 x N-type (1 wireless RF card) 4 x N-type (2 wireless RF card)
Antenna matching	Can be built-in antenna (optional) or external antenna Support 2.4GHz 0dBi ~ 33dBi antenna gain, in line with EIRP international regulations Support 5.8GHz 0dBi ~ 33dBi antenna gain, in line with EIRP international regulations

Wireless usage frequency	IEEE 802.11ac (11a/11an/11ac) 5.8GHz, providing 4.9~6.1GHz frequency of use IEEE 802.11agnc (11a/11g/11agn/11ac), providing 2.4GHz & 4.9~6.1GHz frequency of use
Wireless channel width	20MHz / 40MHz / 80MHz
Modulation method	802.11a,11g,11an,11gn,11ac are all OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)
Wired network interface	RJ-45 1 Port: Supports 10/100/1000Mbps RJ-45 port Auto MDI/MDIX, compatible with IEEE 802.3/802.3i/802.3u; and supports 802.3af/3at Standard PoE PD power receiving mode.RJ-45 1 Port: Supports 10/100/1000Mbps RJ-45 port Auto MDI/MDIX, compatible with IEEE 802.3/802.3i/802.3u.
Set the connection interface	UART 1 (Pin header) UART 2 (Pin header) GPIO (Pin header) RTC DS1339
Ethernet lightning protection & surge protection interface	Support PoE Port Ethernet protection against lightning strikes up to 10KA @ 8/20μs. (The component passes the total pulse discharge current of IEC 61000-4-5 10KA @ 8/20μs 10 times)
Power supply demand model	
Power supply terminal	DC 12-48V Wide Voltage Input (Terminal Block)
	With IEEE 802.3af/3at Standard PoE-PSE power supply, it provides 48Vdc 0.6A 30W maximum power.
Ethernet power receiver mode	Support IEEE 802.3af/3at Standard PoE-PD power receiving terminal 48Vdc 0.6A 30W maximum power.
Device power consumption(including PoE power supply)	The general operation is below 8W/H, the maximum speed of 10W/H is above 400Mbps, and the maximum power consumption is 16W/H.
Physical size and weight	

Size	Flat cover version: L268mm X W268mm X H70mm (including fixed frame height plus 45mm) Convex plate cover version: L268mm X W268mm X H98mm (including fixed frame height plus 45mm)
weight	Equipment weight 3.0Kg – 3.2KgProduct box (including PoE power supply and mounting bracket accessories) 4.0Kg – 4.5Kg Carton can hold 4 boxes of 18Kg
Environmental tolerance specification	
Operating temperature range	-40 ~ 70 °C operating temperature
Humidity	0% ~ 95% maximum (non-condensing)
Storage temperature	-40 ~ 85℃
Waterproof and dustproof level	Outdoor IP68 rated
Product related certification	
Electronic product certification	JRF Japan Wireless Certification (tentative) IP68 dustproof and waterproof certification (in progress) FCC (tentative) CE (tentative) NCC Taiwan Wireless Certification (in progress)

■ Software Specification

Network switching software function	
Network bridge function	1. Network data transmission with data IP of OSI (Open System Interconnection Reference Model) layer 2 data Link & Layer 3 to achieve fast data transfer and automatic healing chain, reducing selection path delay and bandwidth attenuation of multi-hop relay. 2. Fast Forwarding. 3. Support "Auto Select Best Transmit Path Features" 4. Support "Auto Multi-Fast Handover Backup Features" 5. Support "Super-Fast Roaming Mobility Features"
Wireless device operation function	
Wireless multi-mode and multi-export interface operation	Support wireless network dynamic multi-mode export interface distribution, switch to AP (WDS) or STA (WDS) operation mode according to operational needs, to cope with system applications such as multi-link relay hopping and aggregate data streaming and service access demand.
System operation mode	It has an operation switching mode such as AP (WDS)/STA (WDS) (Station) (/ Hi-mobile high-speed mobile function).Two wireless network card modules can be set to AP + AP or AP + STA (cannot be set to STA + STA)
WiFi STA connection AP transmission backbone operation mode	The transmission structure of the continuous STA connection AP can form a multiple relay jumper backbone connection transmission operation, and provides a large-scale operation structure of the data flow through the transmission of multiple backbones and extended relays.
Wireless parameter adjustment function	Support adjustment settings such as channel/transmission power/data rate/ACK Time maximum distance parameters to improve the stability of the transmission link.
Wireless site survey	Support wireless interface for environment detection scanning
High-speed mobile operation function	1. Support "Auto Select Best Transmit Path Features" 2. Support "Auto Multi-Fast Handover Backup Features" 3. Support "Super-Fast Roaming Mobility Features" 4. Fast Forwarding.

Wireless high-speed mobile transmission system performance	1. Support STA (WDS) mode the highest moving speed is: >100Km/hr of high-speed mobile operation of in-vehicle equipment. 2. Support STA (WDS) mode the maximum performance is: high speed mobile > TCP 50Mbps wireless network transmission bandwidth. 3. Support STA (WDS) mode the fastest switching is: very short-time handover transmission of <380ms under high-speed movement.
Support high-speed mobile instant connection status	Support for instant update connection diagram and connection data update and archive of connection data for subsequent analysis of connection signal adjustment and revision.
Support wireless parameter adjustment function	Support adjustment settings such as channel/transmission power/data rate to improve the stability of the transmission link.
Data security encryption and device security management	
Data security encryption	Support WPA/WPA2 PSK/CCMP AES key encryption 128bit.
System management and system maintenance functions	
System management function	1. Manage the HTTP WEB GUI through a web browser operation. 2. Support client network timing NTP Client.
System maintenance function	Support for firmware update/downgrade.

Special statement: Due to the limitation of the project contract, this product is strictly forbidden to be sold in the Japanese market.

■ Packaging and Accessories

- IOP-MBAP-SAC1 or IOP-MBAP-SAC2 of 802.11a/an/ac Outdoor Wireless AP Bridge
  Or IOP-MBAP-DAC1 or IOP-MBAP-DAC2 of 802.11a/g/agn/ac Outdoor Wireless AP Bridge
- 802.3af/at standard 48V 0.6A PoE-PSE Ethernet Power Supply
- AC 100V~240V to DC 19V/4.74A Power Transformer
- Stainless steel multi-functional fixed frame assembly with fixed functions such as pole type, lamp post, wall type, and car type
- Integrated independent operating system expansion accessories (matching according to expansion system requirements)

Product Enclosure Expansion System Integration Application Note

■ Flat cover product series:

No.	Main classification	Model / Function / Application
1	Main product model (outdoor wireless device)	IOP-MBAP-SAC1/IOP-MBAP-DAC1 (802.11ac single card single frequency wireless device) IOP-MBAP-SAC2/IOP-MBAP-DAC2 (802.11ac dual card dual band wireless device) IOP-EL-N-1 IOP-EL-N-2 IOP-EL-N-3
2	Expandable opening specifications	M20: 1Ports (PoE/Data/LAN) M16: 2~4Ports (N-Type antenna/RJ-45/DC Port/Series Port) M12: 7Ports (SMA Antenna/DC Port/Series Port/Sensor Cable)
3	Isolation stud plate	Add a piece to the lower cover
4	Expandable product model	4-1.PCBA-MBAP-XAC1 / PCBA-MBAP-XAC2 (802.11ac wireless device) 4-2. PCBA-EL-N-1 / PCBA-EL-N-2 (802.11an wireless device) 4-3.PCBA-DPOE-OSW1248-4 (4 Port PoE Switch) 4-4.PCBA-DPOE-PSP1248-IP / PCBA-DPOE-PSP1248-IS (PoE Injector) 4-5.PCBA-DAPI-12242A-1 / PCBA-DAPI-24242A-1 (DC to AC Invertor) 4-6.PCBA-SCBP-D12O48-1 / PCBA-SCBP-D24O96-1 (Series boost power supply) 4-7.PCBA-DAPS-I3O18A-1 / PCBA-DAPS-I3O18A-2 (Parallel overcurrent) 4-8.PCBA-LPDC-4D10KA-X (1DC to 4DC Lightning protection shock protection board) 4-9.PCBA-SELP-1P10KA-X (RJ-45 to RJ-45 Lightning protection surge protection board) 4-10. IOP-R200LC (4G LTE Router) 4-11.IOP-R200LC-W (4G LTE Router with 2.4GHz WiFi AP)
5	Scalable integrated system	■ 4G-LTE wireless transmission ■ 5G wireless transmission / 5G NBIoT Internet of Things ■ LoRa / Blue Tooth / ZigBee ...etc. ■ Various sensor detection controllers ■ Analog and digital converters for various Series interfaces
6	Application Type	■ Wireless signal coverage/outdoor wireless backbone transmission/wireless data and surveillance image collection (LAN)/mobile monitoring transmission ■ 4G / 5G external network connection (WAN) ■ AI Artificial Intelligence System (AI System) ■ M2M Machine Network / IoT Internet of Things / NBIoT Internet of Things ■ Industry 4.0 (Industry 4.0) / Industry 4.0 Mobile Data Transfer / Warehousing Automation Wireless Mobile Transmission ■ Smart Light / Smart City / Smart Grid ■ Integrated independent operating system application

■ Convex cover product series:

No.	Main classification	Model / Function / Application
1	**Main product model (outdoor wireless device)**	IOP-MBAP-SAC1/IOP-MBAP-DAC1 (802.11ac single card single frequency wireless device) IOP-MBAP-SAC2/IOP-MBAP-DAC2 (802.11ac dual card dual band wireless device) IOP-EL-N-1 IOP-EL-N-2 IOP-EL-N-3
2	**Expandable opening specifications**	M20: 1Ports (PoE/Data/LAN) M16: 10~12Ports (N-Type antenna/RJ-45/DC Port/Series Port) M12: 7Ports (SMA Antenna/DC Port/Series Port/Sensor Cable)
3	**Isolation stud plate**	Add a piece to the flange cover Add a piece to the lower cover
4	**Expandable product model**	4-1.PCBA-MBAP-XAC1 / PCBA-MBAP-XAC2 (802.11ac wireless device) 4-2. PCBA-EL-N-1 / PCBA-EL-N-2 / PCBA-EL-N-3 (802.11an wireless device) 4-3.PCBA-DPOE-OSW1248-4 (4 Port PoE Switch) 4-4.PCBA-DPOE-PSP1248-IP / PCBA-DPOE-PSP1248-IS (PoE Injector) 4-5.PCBA-DAPI-12242A-1 / PCBA-DAPI-24242A-1 (DC to AC Invertor) 4-6.PCBA-SCBP-D12O48-1 / PCBA-SCBP-D24O96-1 (Series boost power supply) 4-7.PCBA-DAPS-I3O18A-1 / PCBA-DAPS-I3O18A-2 (Parallel overcurrent) 4-8.PCBA-LPDC-4D10KA-X (1DC to 4DC Lightning protection shock protection board) 4-9.PCBA-SELP-1P10KA-X (RJ-45 to RJ-45 Lightning protection surge protection board) 4-10. IOP-R200LC (4G LTE Router) 4-11.IOP-R200LC-W (4G LTE Router with 2.4GHz WiFi AP) 4-12.PCBA-USSP Street Light Type DC UPS Power Supply System (7Ah (90WH) ~ 39.2Ah (502WH) 4-13.PCBA-USSS Solar Rainy Day Power Generation DC UPS Power Supply System (7Ah (90WH) ~ 39.2Ah (502WH) 4-14.PCBA-PDU remote power management system (Voltage, Current, Temperature, Humidity, Real-time status, Remote control switch, etc.)
5	**Scalable integrated system**	■ 4G-LTE wireless transmission ■ 5G wireless transmission / 5G NBIoT / 5G Micro base station ■ LoRa / Blue Tooth / ZigBee ...etc. ■ Various sensor detection controllers ■ Analog and digital converters for various Series interfaces ■ Solar / Wind / Other green power generation system
6	**Application Type**	■ Wireless signal coverage / Outdoor wireless backbone transmission / Wireless data and surveillance image collection (LAN) / Mobile monitoring transmission ■ 4G / 5G external network connection (WAN) ■ AI Artificial Intelligence System ■ M2M / IoT / NBIoT ■ Industry 4.0 / Industry 4.0 Mobile Data Transfer / Warehousing Automation Wireless Mobile Transmission ■ Smart Light / Smart City / Smart Grid ■ Integrated independent operating system application

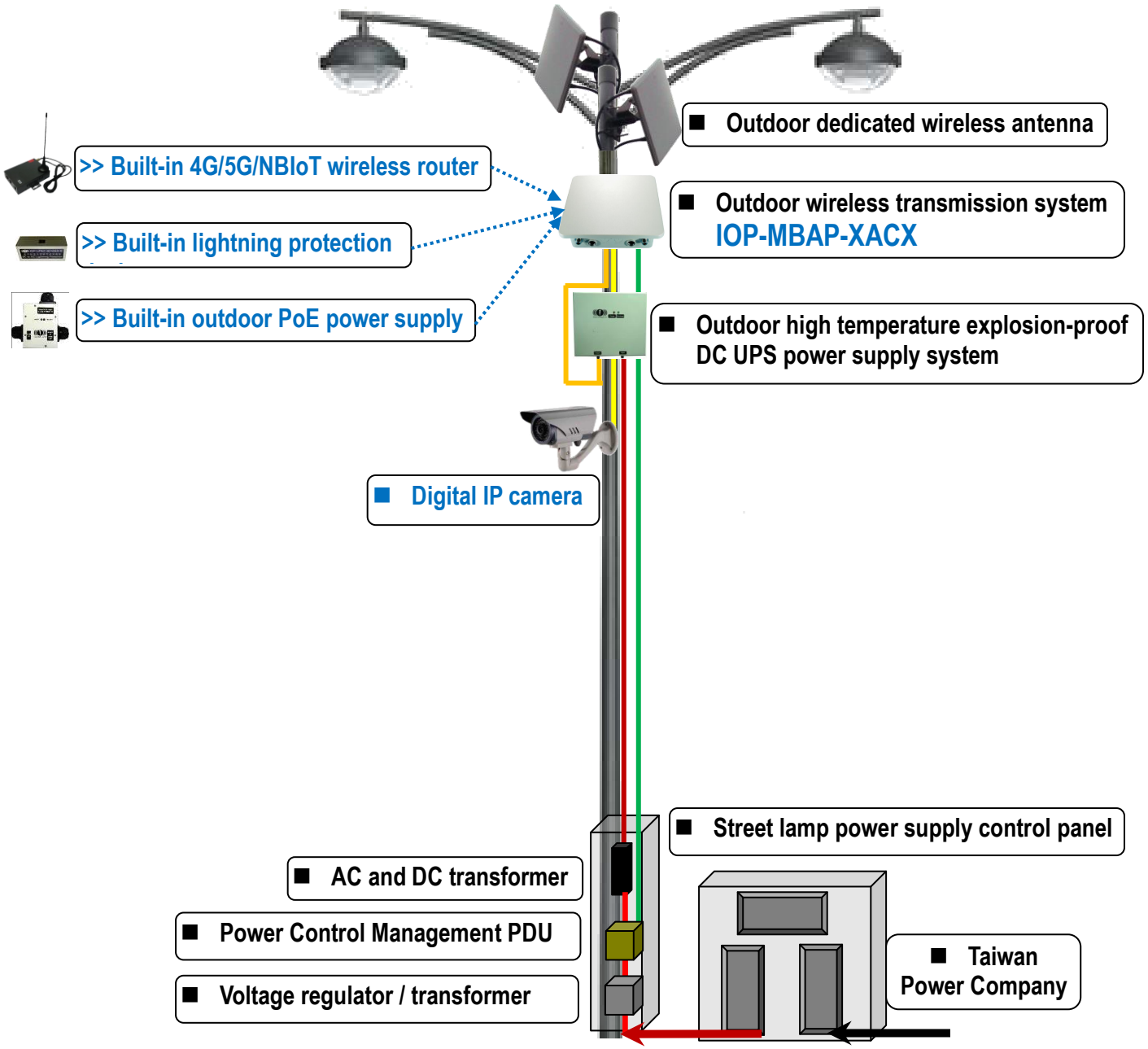
■ Double under cover product series:



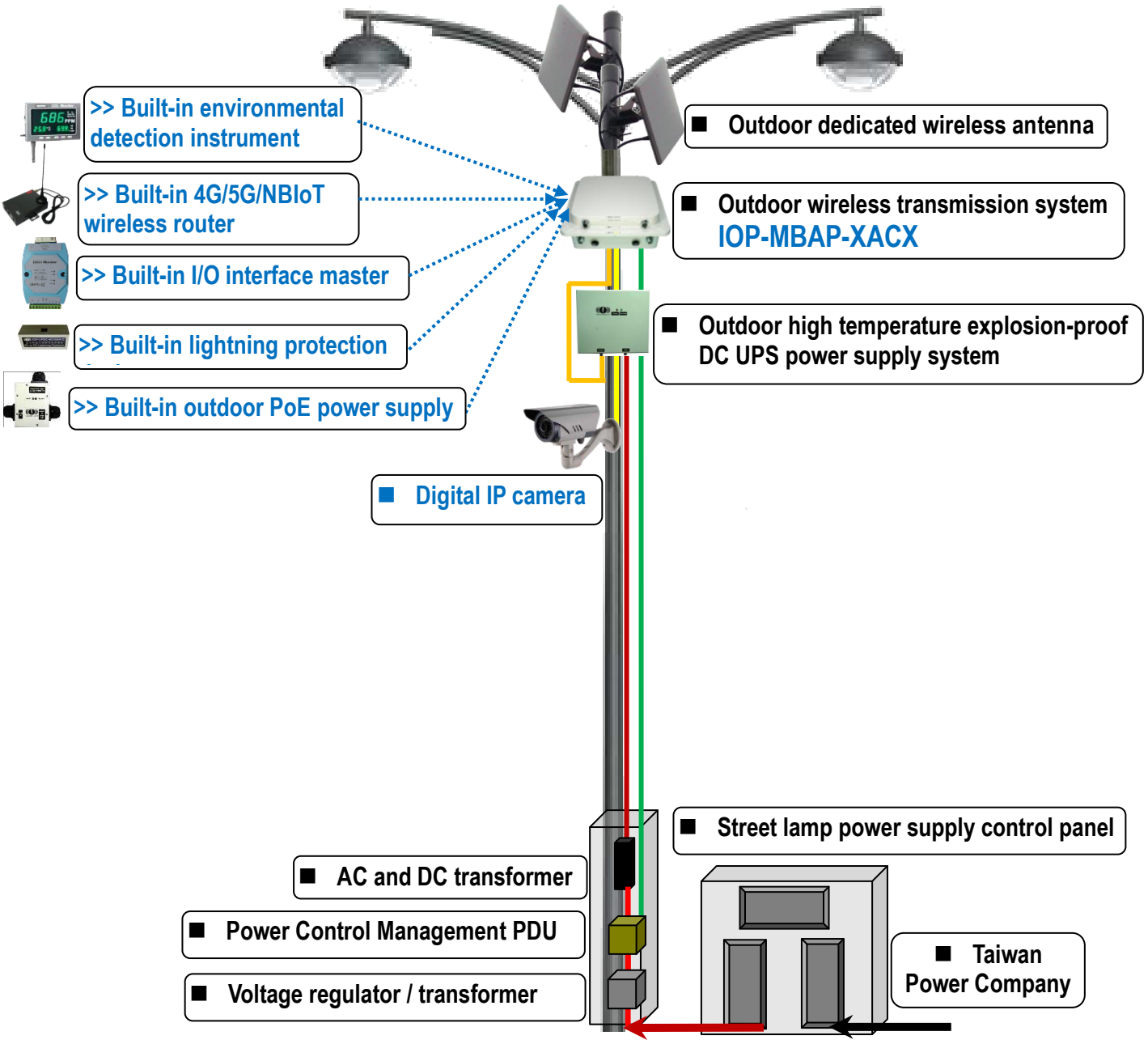
No.	Main classification	Model / Function / Application
1	**Main product model (outdoor wireless device)**	IOP-MBAP-SAC1/IOP-MBAP-DAC1 (802.11ac single card single frequency wireless device) IOP-MBAP-SAC2/IOP-MBAP-DAC2 (802.11ac dual card dual band wireless device) IOP-EL-N-1 IOP-EL-N-2 IOP-EL-N-3
2	**Expandable opening specifications**	M20: 3Ports (PoE/Data/LAN) M16: 10~12Ports (N-Type antenna/RJ-45/DC Port/Series Port) M12: 14Ports (SMA Antenna/DC Port/Series Port/Sensor Cable)
3	**Isolation stud plate**	Add a piece to the flange cover Add a piece to the lower cover
4	**Expandable product model**	4-1.PCBA-MBAP-XAC1 / PCBA-MBAP-XAC2 (802.11ac wireless device) 4-2. PCBA-EL-N-1 / PCBA-EL-N-2 / PCBA-EL-N-3 (802.11an wireless device) 4-3.PCBA-DPOE-OSW1248-4 (4 Port PoE Switch) 4-4.PCBA-DPOE-PSP1248-IP / PCBA-DPOE-PSP1248-IS (PoE Injector) 4-5.PCBA-DAPI-12242A-1 / PCBA-DAPI-24242A-1 (DC to AC Invertor) 4-6.PCBA-SCBP-D12O48-1 / PCBA-SCBP-D24O96-1 (Series boost power supply) 4-7.PCBA-DAPS-I3O18A-1 / PCBA-DAPS-I3O18A-2 (Parallel overcurrent) 4-8.PCBA-LPDC-4D10KA-X (1DC to 4DC Lightning protection shock protection board) 4-9.PCBA-SELP-1P10KA-X (RJ-45 to RJ-45 Lightning protection surge protection board) 4-10. IOP-R200LC (4G LTE Router) 4-11.IOP-R200LC-W (4G LTE Router with 2.4GHz WiFi AP) 4-12.PCBA-USSP Street Light Type DC UPS Power Supply System (21Ah (268WH) ~ 58.8Ah (753WH) 4-13.PCBA-USSS Solar Rainy Day Power Generation DC UPS Power Supply System (21Ah (268WH) ~ 58.8Ah (753WH) 4-14.PCBA-PDU remote power management system (Voltage, Current, Temperature, Humidity, Real-time status, Remote control switch, etc.)
5	**Scalable integrated system**	■ 4G-LTE wireless transmission ■ 5G wireless transmission / 5G NBIoT / 5G Micro base station ■ LoRa / Blue Tooth / ZigBee ...etc. ■ Various sensor detection controllers ■ Analog and digital converters for various Series interfaces ■ Solar / Wind / Other green power generation system
6	**Application Type**	■ Wireless signal coverage / Outdoor wireless backbone transmission / Wireless data and surveillance image collection (LAN) / Mobile monitoring transmission ■ 4G / 5G external network connection (WAN) ■ AI Artificial Intelligence System ■ M2M / IoT / NBIoT ■ Industry 4.0 / Industry 4.0 Mobile Data Transfer / Warehousing Automation Wireless Mobile Transmission ■ Smart Light / Smart City / Smart Grid ■ Integrated independent operating system application

➢ Product case expansion system integration application diagram

■ Flat cover product series:

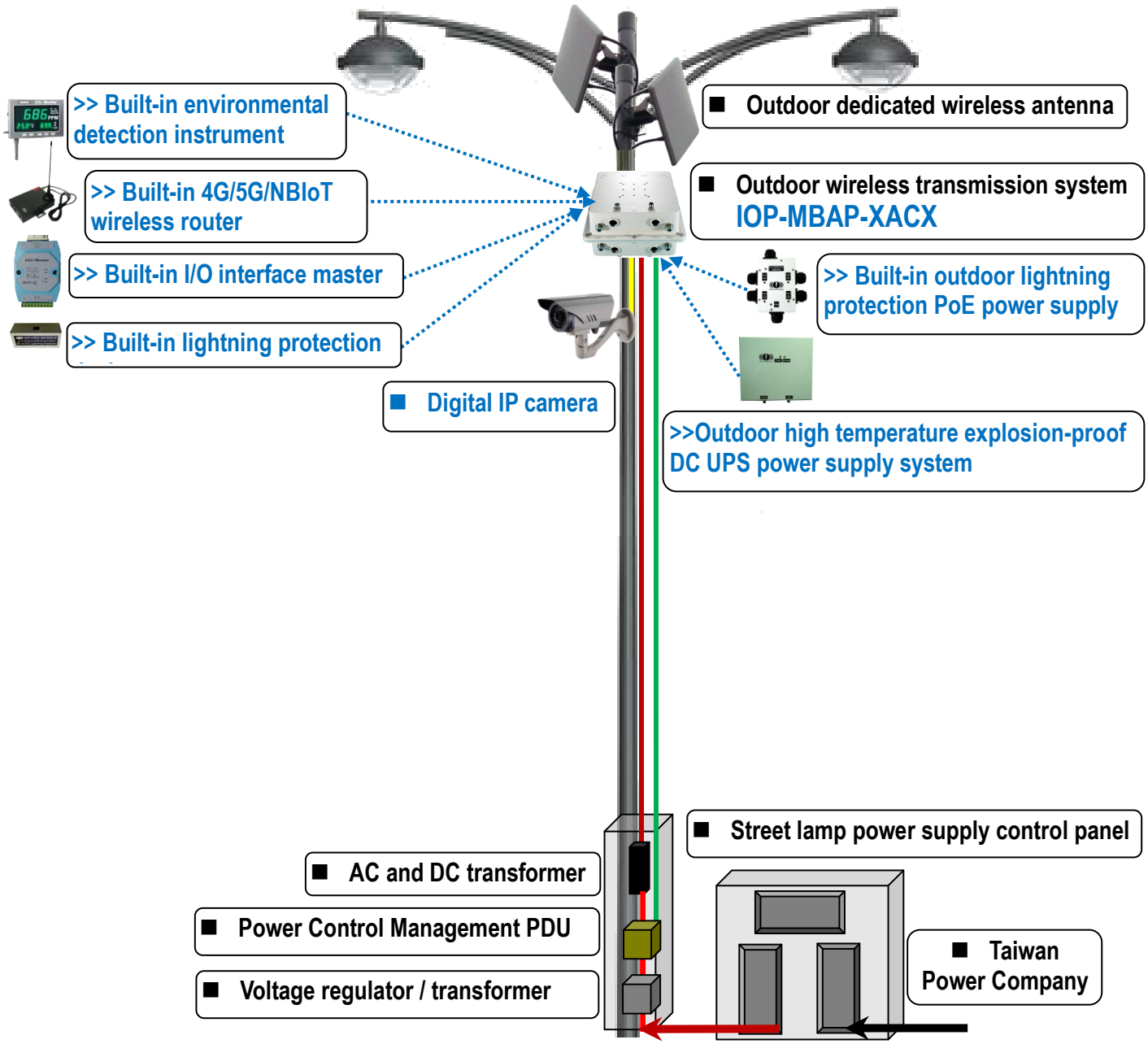


■ Convex cover product series:



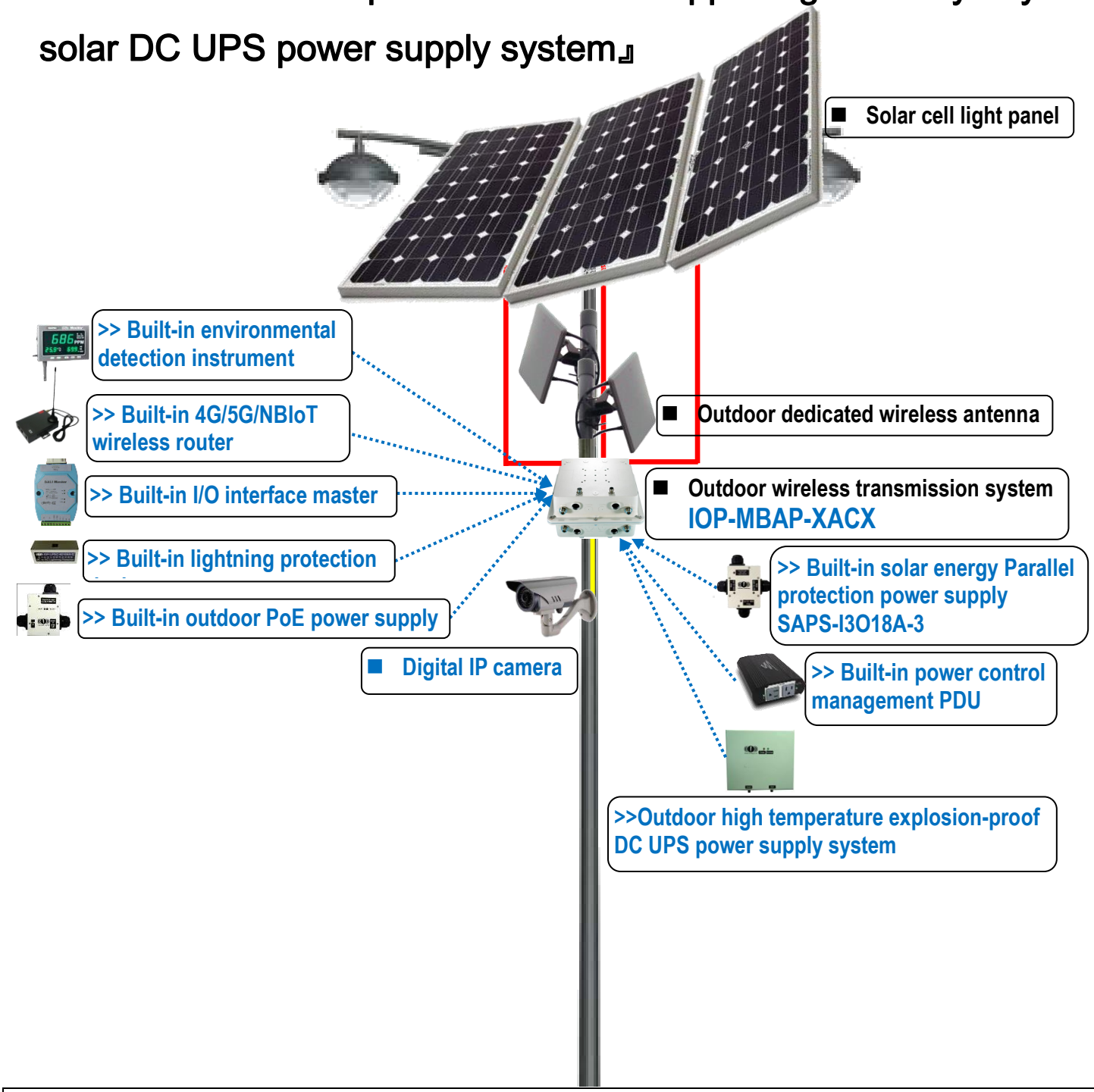
"External type" and "built-in" outdoor high temperature explosion-proof DC UPS power supply system				
No.	**Institutional installation**	**Battery capacity**	**Charging time**	**Remarks**
1	Plug-in type	23.2Ah(297WH)~46.4Ah(594WH) Equivalent to 1.78~3.56KVA	6~12hrs	■ Street light type DC UPS uninterruptible power supply system ■ Supports 24W/H operating system during the day and continues to operate for 3.5~24 hours ■ It can support the total power consumption 30W/H operating system, and the temporary power outage continues to operate for 3~20 hours.
2	Cover space	7Ah(90WH)~9.8Ah(125WH) Equivalent to 540~750VA	2~3hrs	
3	Under cover space	21Ah(268WH)~29.4Ah(377WH) Equivalent to 1.6~2.25KVA	5~7hrs	

■ Double under cover product series:



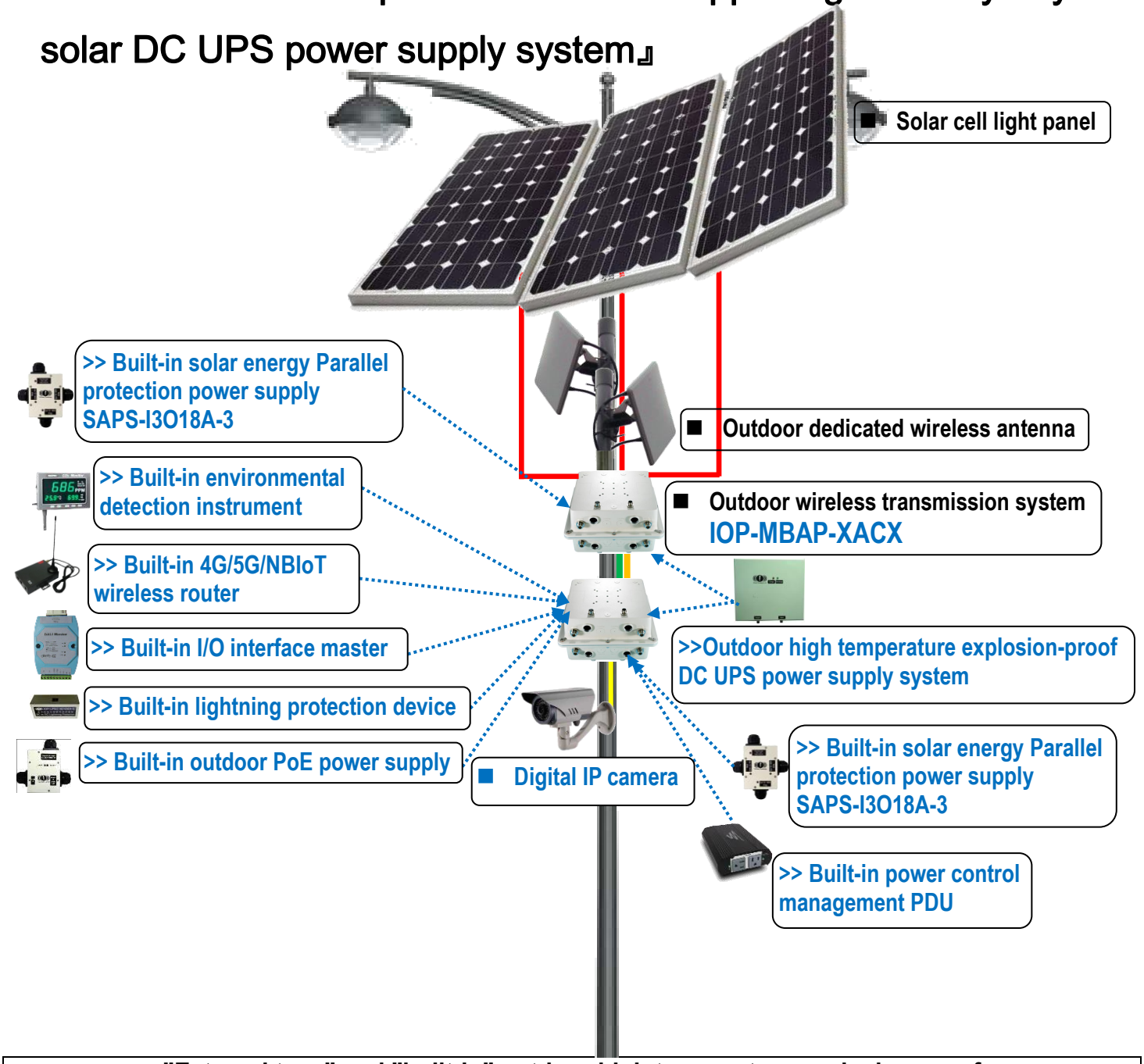
"Built-in" outdoor high temperature explosion-proof DC UPS power supply system				
No.	**Institutional installation**	**Battery capacity**	**Charging time**	**Remarks**
1	Cover space	21Ah(268WH)~29.4Ah(377WH) Equivalent to 1.6~2.25KVA	5~7hrs	■ Street light type DC UPS uninterruptible power supply system ■ Supports 24W/H operating system during the day and continues to operate for more than 15 hours ■ It can support the total power consumption of 30W/H operating system, and the temporary power outage continues to operate for 10 hours.
3	Under cover space	21Ah(268WH)~29.4Ah(377WH) Equivalent to 1.6~2.25KVA	5~7hrs	

■ Double under cover product series:『Supporting the rainy day solar DC UPS power supply system』



"Built-in" outdoor high temperature explosion-proof DC UPS power supply system				
No.	**Institutional installation**	**Battery capacity**	**Charging time**	**Remarks**
1	Cover space	21Ah(268WH)~29.4Ah(377WH) Equivalent to 1.6~2.25KVA	Sunshine time 7~10hrs	■ Street light type DC UPS uninterruptible power supply system ■ Supports 12W/H operating system during the day and continues to operate for more than 30 hours ■ Supports 12W/H operation system for more than 2 consecutive days of rainy days
2	Under cover space	21Ah(268WH)~29.4Ah(377WH) Equivalent to 1.6~2.25KVA	Sunshine time 7~10hrs	

■ Double under cover product series:『Supporting the rainy day solar DC UPS power supply system』



"External type" and "built-in" outdoor high temperature explosion-proof DC UPS power supply system				
No.	**Institutional installation**	**Battery capacity**	**Charging time**	**Remarks**
1	Cover space	21Ah(268WH)~29.4Ah(377WH) Equivalent to 1.6~2.25KVA	Sunshine time 7~10hrs	■ Solar DC UPS Uninterruptible Power Supply System ■ Supports 12W/H operating system during the day and continues to operate for 30~60 hours or more ■ Supports 12W/H operation system for more than 4 consecutive days of rainy days ■ Plug-in type recommended to add solar panel charging
2	Under cover space	21Ah(268WH)~29.4Ah(377WH) Equivalent to 1.6~2.25KVA	Sunshine time 7~10hrs	
3	Plug-in type	21Ah(268WH)~58.8Ah(750WH) Equivalent to 1.6~4.5KVA	Sunshine time 7~20hrs	