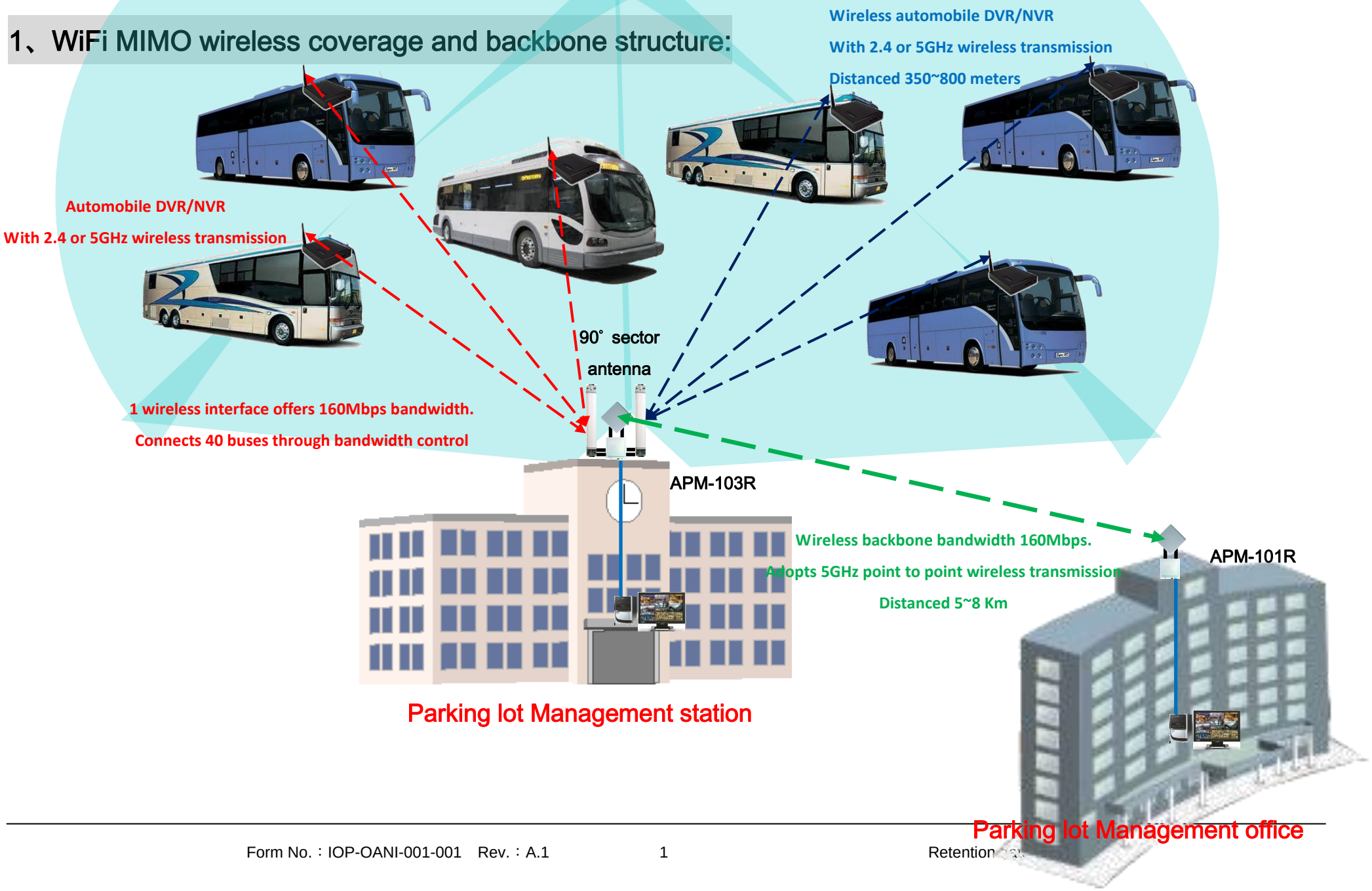
勁電科技有限公司 IO-Power Technology Co., Ltd 台灣 30055 新竹市北區金竹路 100 號 1 樓 1F,No.100, Jinzhu Rd., North Dist., Hsinchu City 30055, Taiwan
http://www.io-power.com http://www.io-power.com.cn e-mail: io-power@io-power.com.tw Tel: +886 3 5429395 Fax: +886 3 5357297

Wireless Automobile Data Transmission Solution for Parking Lot

1、WiFi MIMO wireless coverage and backbone structure:

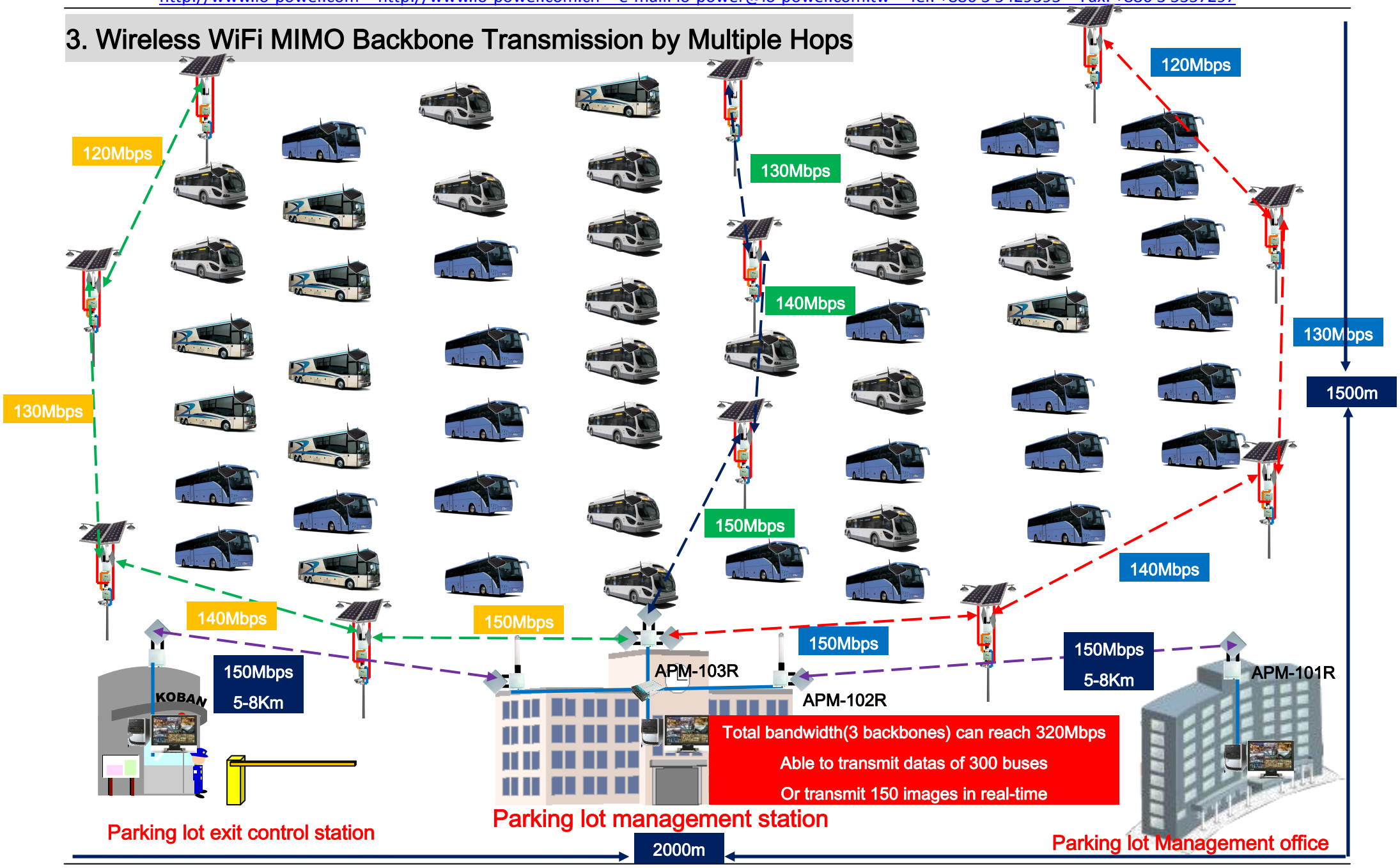


2、Devices Quantity Wireless System—802.11agn WiFi MIMO AP

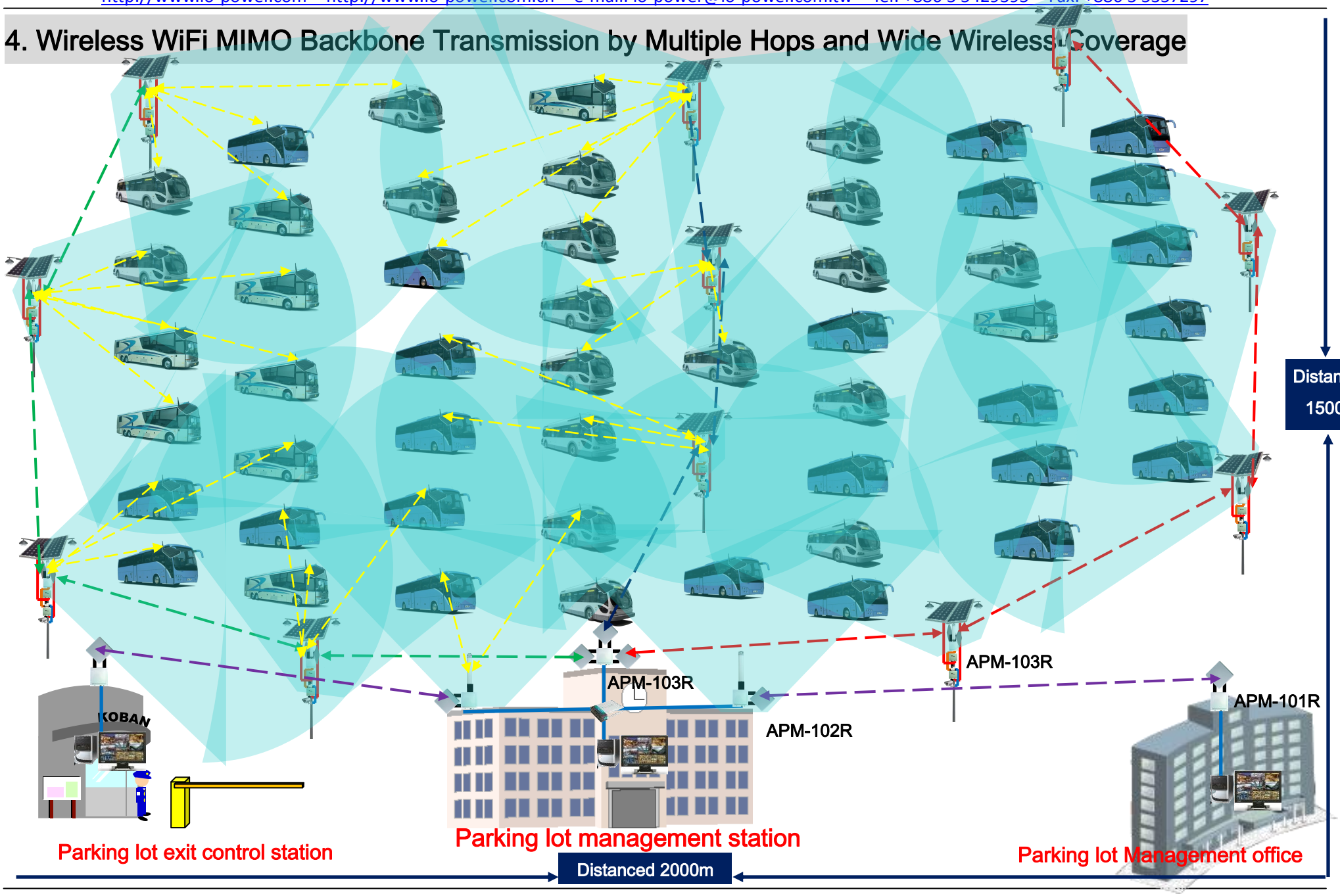
No.	Device Name	Device Model	Main SPEC	Quantity	Remark
1	Wireless WiFi MIMO AP -(Control Center)	APM-101R (1 Module)	1. Two MIMO 2*2 RF Module (802.11a/b/g/n) 2. System Operation Mode: Bridge 3. Output Power : 21dBm (Max) 4. Multiple Hops 5. Bandwidth Throughput : 320Mbps (@40MHz) 6. >= 4Hops Throughput 120Mbps	1	
2	Wireless WiFi MIMO AP -(Hops Side)	APM-103R (3Modules)	1. Two MIMO 2*2 RF Module (802.11a/b/g/n) 2. System Operation Mode: Bridge 3. Output Power : 21dBm (Max) 4. Multiple Hops 5. Bandwidth Throughput : 320Mbps (@40MHz) 6. >= 4Hops Throughput 120Mbps	1	
3	Outdoor WiFi MIMO 5GHz 20dBi Dual Linear Panel Antenna	IOP-PANFO-5M2001010	1.Frequence:5150 - 5875 MHz 2.Gain: 20dBi 3.VSWR: 2:1 4.Polarization : Dual Linear +- 45° 5.N-Type Jack * 2	2	Choose No.3 or No.4
4	Outdoor WiFi MIMO 2.4GHz 14dBi Dual Linear Sector Antenna	IOP-SANFO-2M1406013	1.Directional sector antenna 2.2.4GHz 14dBi outdoor antenna 3.Frequency：2400 - 2500 MHz 4.Connector：N-Female *2 5.802.11n MIMO	2	Choose No.3 or No.4

5	Outdoor WiFi MIMO 5.8GHz 15dBi Dual Linear Sector Antenna	IOP-SANFO-5M1506008	1. Directional sector antenna 2. 5.8GHz 15dBi outdoor antenna 3. Frequency：5100 - 5850 MHz 4. Connector：N-Female *2 5. 802.11n MIMO	2	
6	Antenna RF Cable	IOP-RFCFD-400150NMR	1. Connector: N-type Plug to N-type Plug 2. Cable Loss: <48dB/100m @5800MHz 3. Temp: - 40 ~ + 85°C	8	
7	RF Connector Rainproof Tape	IOP-RMTOC-173830510B	1. Thickness: 1.7mm ± 0.5mm 2. Elongation: 1000% 3. Adhesion: Detachment < 2cm 4. Breaking Strength: >2kg 5. Water Absorption: <0.2%	3	

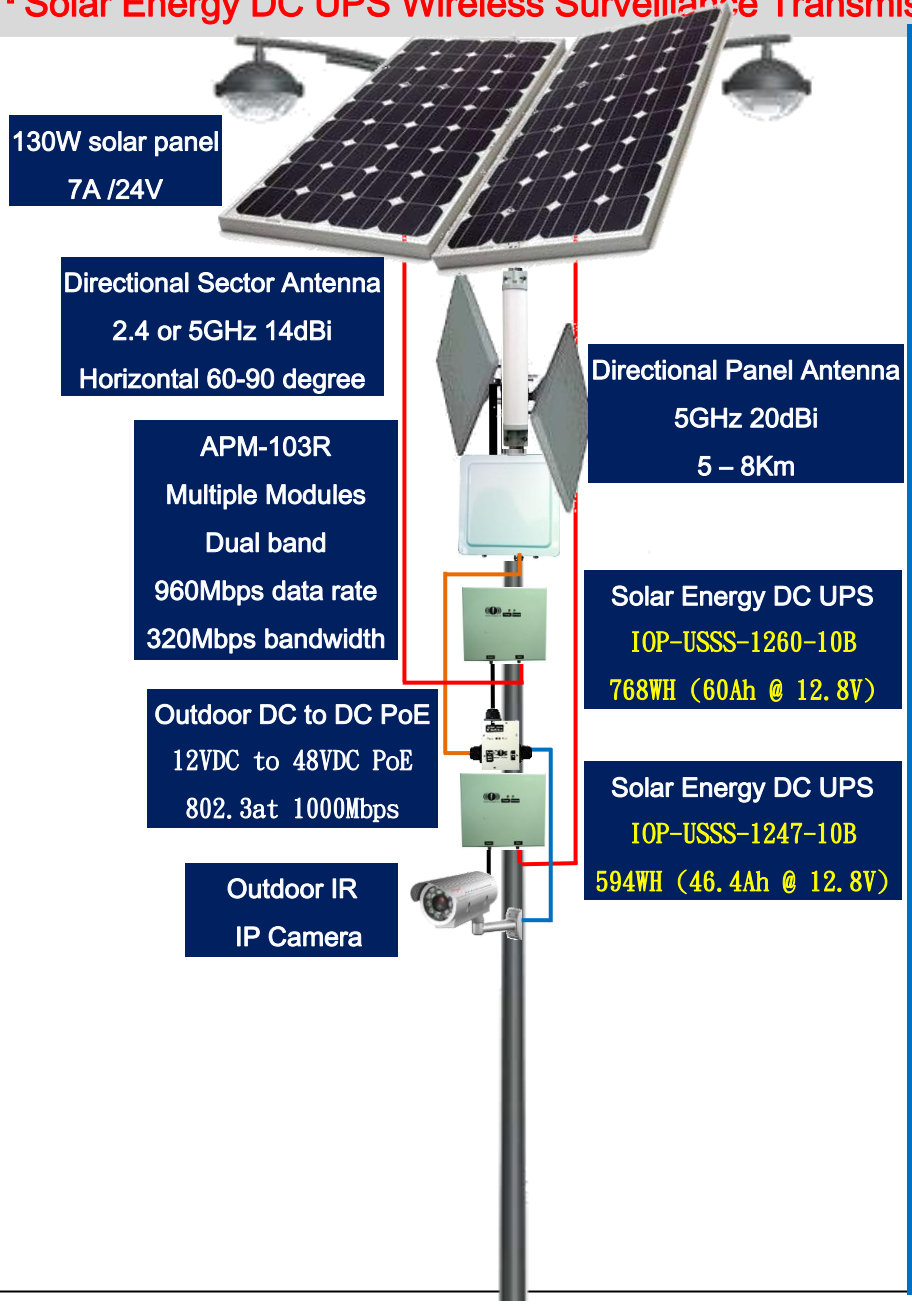
3. Wireless WiFi MIMO Backbone Transmission by Multiple Hops



4. Wireless WiFi MIMO Backbone Transmission by Multiple Hops and Wide Wireless Coverage



5、『Solar Energy DC UPS Wireless Surveillance Transmission System』(3 days of backup power for continuous cloudy weather)



Solar Energy Long DC UPS Distanced Wireless Surveillance Transmission System Design
(System Consumption Calculation)

1.Device power consumption:

1-1.Outdoor WiFi MIMO AP: APM-103R- 9W/H

1-2.12VDC to 48VDC PoE: 1W/H (for outdoor WiFi MIMO AP)

1-3.Outdoor IR IP Cam: 5W/H @ day, 10W/H @ night

2.3 days solar energy wireless surveillance transmission system for wet weather days:

2-1. Outdoor wireless device power consumption:

2-1-1. outdoor wireless system: 9+1=10W/H, 10W/H*24H*3D=720W

Suggestion for Solar UPS: IOP-USSS-1260-10B 768 WH (60Ah @ 12.8V)

2-1-2. Solar Panel: 768W/6H=128W/H

Suggestion for solar panel: IOP-OSPMC-130177301 (130W)

2-2. IP Cam power consumption:

2-2-1. IP Cam: (5W/H*12+10W/H*12)*3D=540W

Suggestion for Solar UPS: IOP-USSS-1247-10B 594 WH (46.4Ah @ 12.8V)

2-2-2. Solar Panel: 594W/6H=99W/H

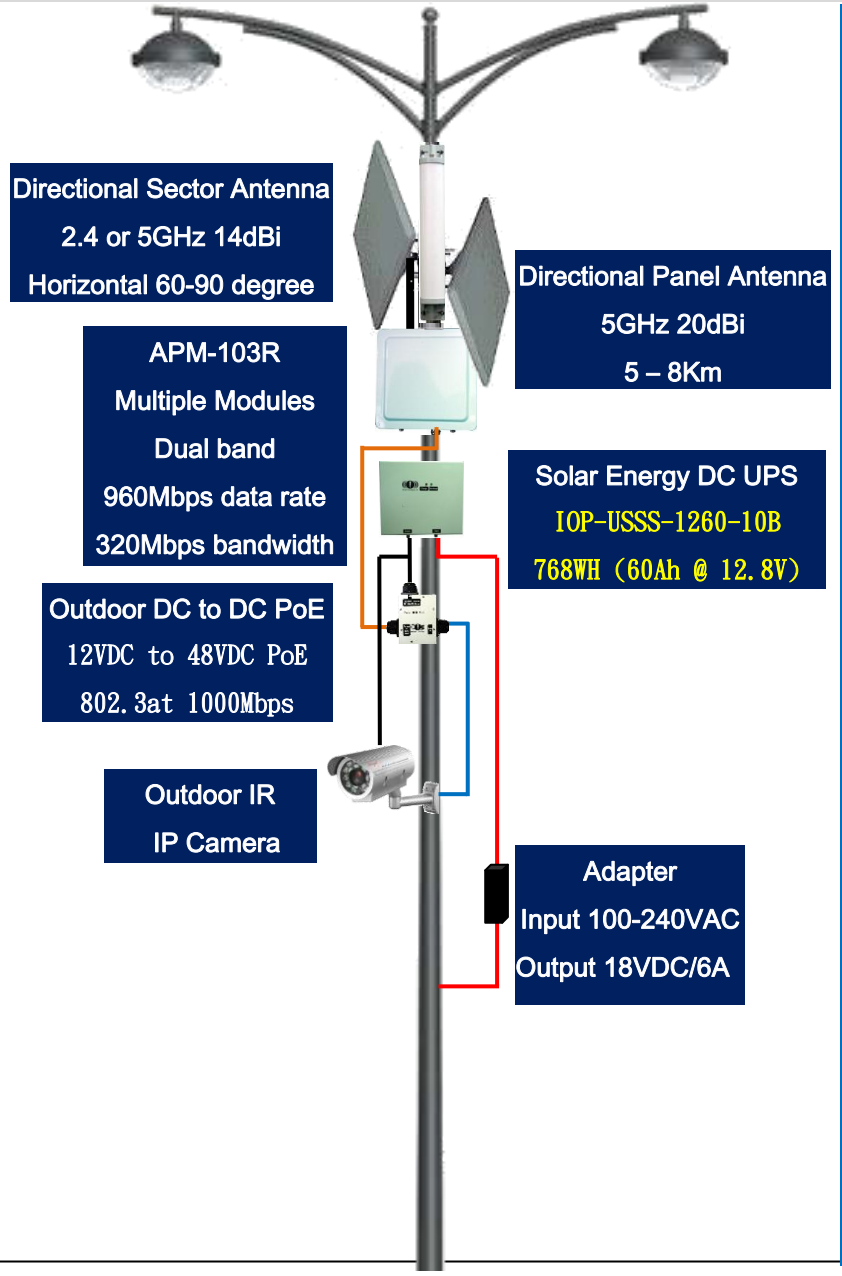
Suggestion for solar panel: IOP-C9OSPMC-130177301 (130W)

3.System instruction: When it is cloudy, each solar energy module may produce about 2~20W/H, the power production may support some device power consumption (4~10W/H) to extend the operating time.

4.Operation instruction: According to our test in real environment, our solar energy system may produce15~45% power in cloudy weather. Therefore, the system is designed for 3 continuous cloudy weather, but it can actually operate more than 3.5 days.

5.Additional Remark: Do not use Lead-Acid batteries for Solar Energy Dc UPS System. The life of use for Lead-Acid batteries is 300 times @25°C. Its life cuts half when the temperature raises every 8°C. Therefore, 150 times @ 33°C, 75 times @41°C, 30 times @ 49°C. Operating above 55°C may cause danger.

6、『Streetlamp Model DC UPS Wireless Surveillance Transmission System』(8 hours of uninterrupted power for video recording)



Streetlamp Model DC UPS Long Distanced Wireless Surveillance Transmission System Design(System Consumption Calculation)

1. Device power consumption:
   1-1. Outdoor WiFi MIMO AP: APM-103R- 9W/H
   1-2.12VDC to 48VDC PoE: 1W/H (for outdoor WiFi MIMO AP)
   1-3. Outdoor IR IP Cam: 5W/H @ day, 10W/H @ night
2.8 hours of uninterrupted power system for wireless surveillance transmission system:
   2-1.Device power consumption:
      2-1-1. Outdoor device system: 9+1=10W/H, 10W/H*20H=200W
      2-1-2. IP Cam: 10W/H*20=200W
      Total consumption: 200W + 200W = 400W (400W/12.8 = 31.5Ah)
      Suggestion for DC UPS: IOP-USSP-1235-10B 445 WH (34.8Ah @ 12.8V)
3.System operation instruction:
   3-1.The system is powered by the batteries at day while by the streetlamp at night. The control board controls the batteries charging and the power supply for the wireless surveillance devices at the same time.
   3-2. When the streetlamp electricity is blackout, the system can support 8 hours of operation.
   3-3.IO-Power Outdoor DC UPS -- stabilize the voltage, absorb the surge (lightning surge, dirty power).
   3-4.According to our outdoor real environment operation at high and low temperature, its charging and discharging times reaches more than 1700 times, equated 5 years of use. Its power capacity can still remain more than 95%.
4. Additional Remark: Do not use Lead-Acid batteries for outdoor Streetlamp Model DC UPS System. The life of use for Lead-Acid batteries is 300 times @25°C. Its life cuts half when the temperature raises every 8°C. Therefore, 150 times @ 33°C, 75 times @41°C, 30 times @ 49°C. Operating above 55°C may cause danger.