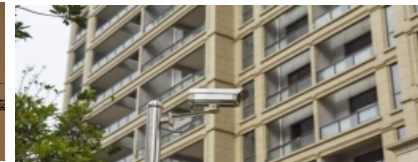# IP-COM

**World Wide Wireless**

# IP-COM Point-to-Multipoint Surveillance Wireless Transmission Solutions

## Surveillance Wireless Transmission Solution For Orchard/Farm

# Contents

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# Orchard Scenario Requirements

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#Orchard

**Reservoirs**
1. Prevention of vandalism
2. Prevention of water leakage

**Junctions**
1. Prevention of fruit theft
2. Recording the People Flow

**Water tank**
1. Prevention of vandalism
2. Prevention of water leakage

1#valley

1#utility poles

2#junction

3#junction

1#fences

6#junction

reservoir

5#junction

4#junction

1#entrance&exit

4#monitoring room

**Fences**
1. Prevention of fruit theft
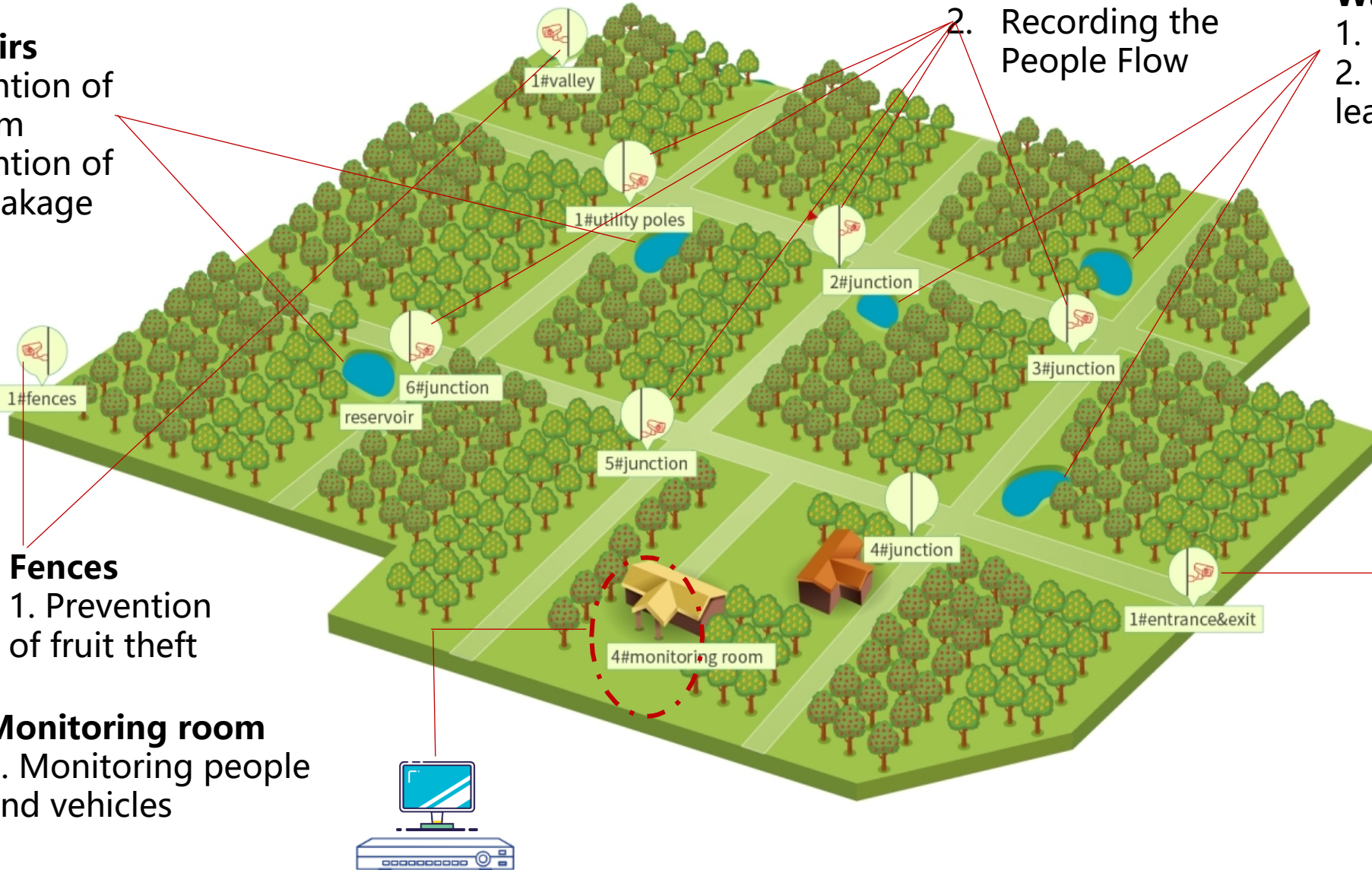
**Entrance&Exit**
1. Recording people and vehicles

**Monitoring room**
1. Monitoring people and vehicles

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1 Cameras need to be installed at orchard entrances&exits, road junctions, reservoirs and other areas. Stable signals need to be transmitted to the monitoring room



2 Cameras and the monitoring room are far apart and scattered, ranging from 200m to 3km



3 There is a height drop and obstruction between cameras and the monitoring room, which requires a central point in the middle for forwarding the signals.



4 The outdoor CPEs around the monitoring room can be powered by PoE switches or utility poles, others need to be powered by solar/wind power panels

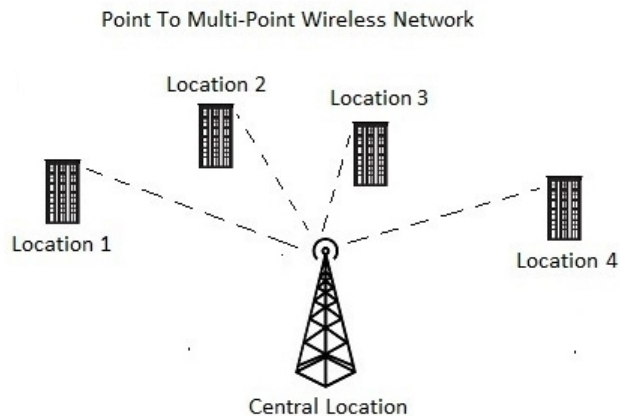5 Devices, installed in high outdoor locations, need to be protected from lightning, dust and water

6 Builders do not have enough network knowledge, have to simplify installation





7 Point-to-multipoint transmission need to be stable



Point To Multi-Point Wireless Network

Location 2

Location 3

Location 1

Location 4

Central Location

# Contents

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Mark all surveillance cameras locations, numbers and specifications, do on-the-spot investigation and plan data backhaul routes
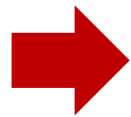
# Solution-2-Distance recording, Bandwidth counting and CPE model selecting

Record the distance of each backhaul line, calculate number of cameras, count bandwidth and select the appropriate models

#Orchard



| Backhaul line | Distance | Camera quantity | Bandwidth | Connection method | AP Model | Station Mode |
|---|---|---|---|---|---|---|
| 1#Fences->6#Reservoir | 1.5km | 2 | 8Mbps | P2P | CPE6S | CPE6S |
| 6#Reservoir->5#Wired pole | 1km | 6 | 24Mbps | P2P | CPE6S | CPE6S |
| 5#Wired pole->Monitoring room | 800m | 10 | 8Mbps | P2MP | BS9+ANT19-5G120 | MS-5AC |
| 1#Valley->1#Wired pole | 500m | 2 | 8Mbps | P2P | CPE6S | CPE6S |
| 1#Wired pole->2#Wired pole | 2.2km | 5 | 20Mbps | P2P | CPE6S | CPE6S |
| 2#Wired pole->Monitoring room | 1.2km | 7 | 28Mbps | P2MP | BS9+ANT19-5G120 | MS-5AC |
| 3#Wired pole->4#Wired pole | 1.5km | 3 | 12Mbps | P2P | CPE6S | CPE6S |
| 1#Entrance&Exit->4#Wired pole | 800m | 2 | 8Mbps | P2P | CPE6S | CPE6S |
| 4#Wired->Monitoring room | 800m | 8 | 32Mbps | P2P | MS-5AC | MS-5AC |
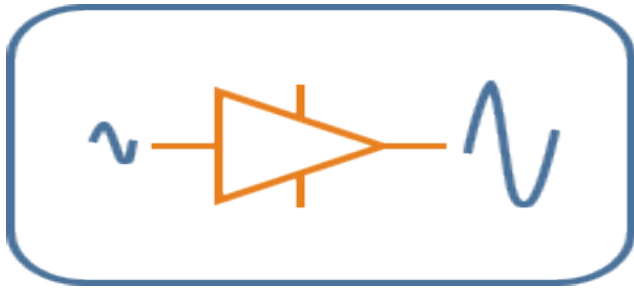
## External signal amplifier

Enhances wirelessly transferable energy
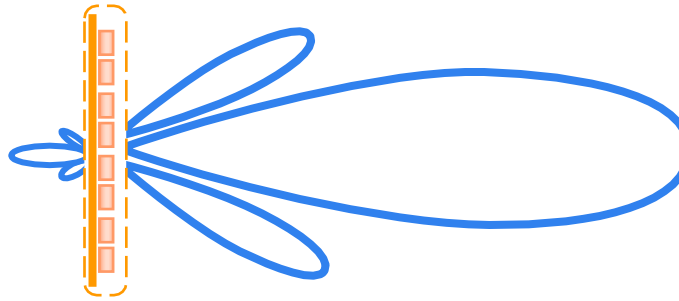
## Directional antenna

Focuses energy on a specific direction of emission and reception of electromagnetic waves, increasing effective signal utilization
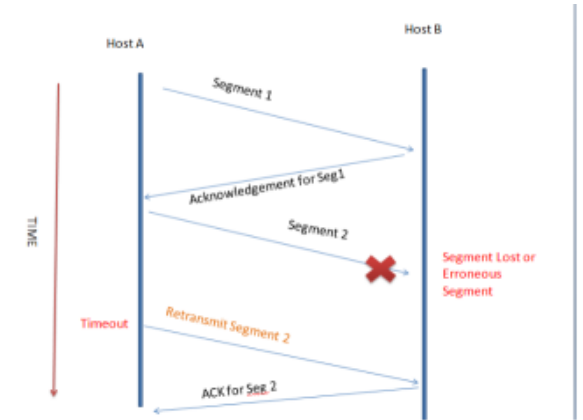
## ACK-Timeout Optimisation

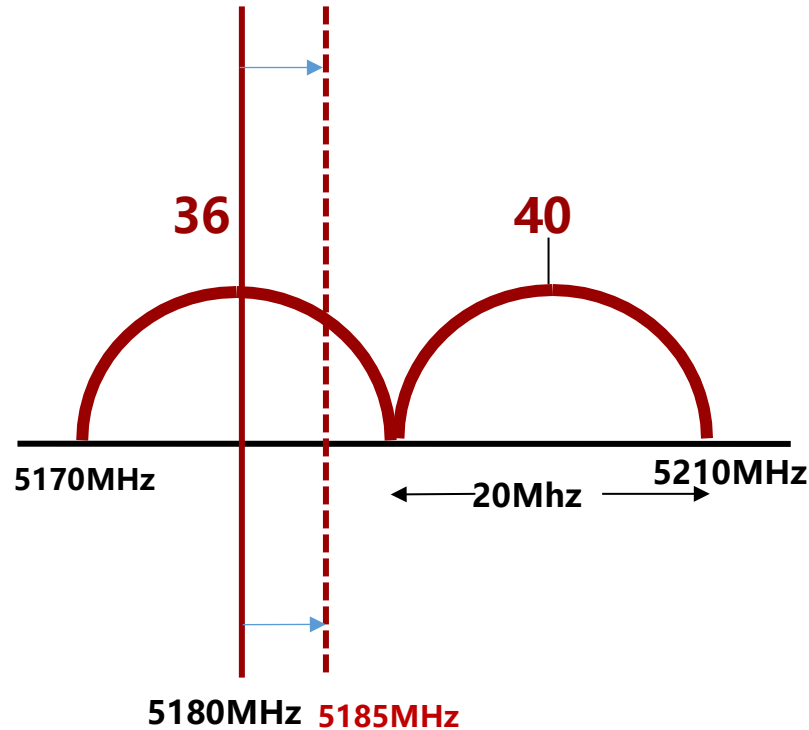Indoor APs or routers can only transmit up to 300 metres, while ACK-Timeout Optimisation extends limitation up to 25km

# Solution-4-How to ensure the capacity can meet surveillance requirements

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1 With 5Ghz 11AC technology to enhance wireless maximum speed up to 867Mbps

2 Adopts wireless frequency bias anti-interference mechanism to reduce the interference from circumferential devices to the connection and improves the capacity

3 Provides more optional non-overlapping channels



**867Mbps 5GHz**

36    40

5170MHz                5210MHz

20Mhz

5180MHz  5185MHz

**Central frequency**
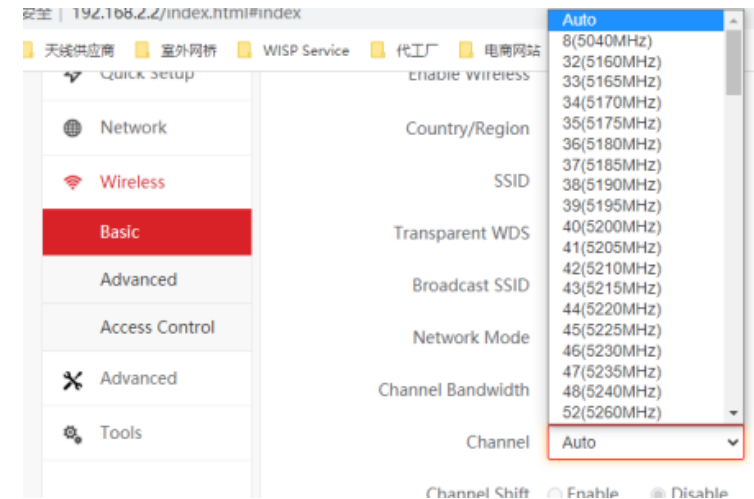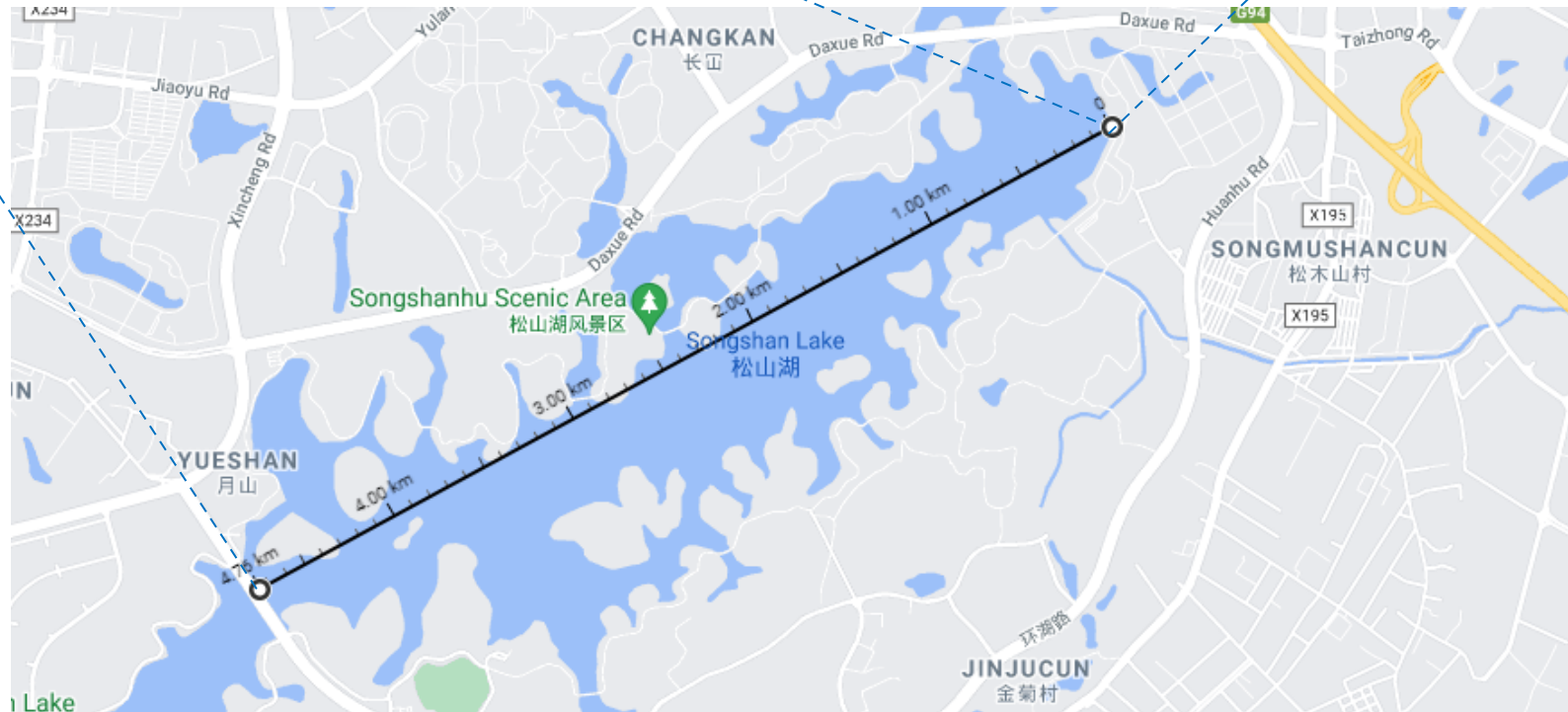
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The devices support 12V/24V passive PoE, 12V1A DC power supply and standard PoE power supply and can draw power directly from the surrounding utility poles, solar panels or wind power integrated systems
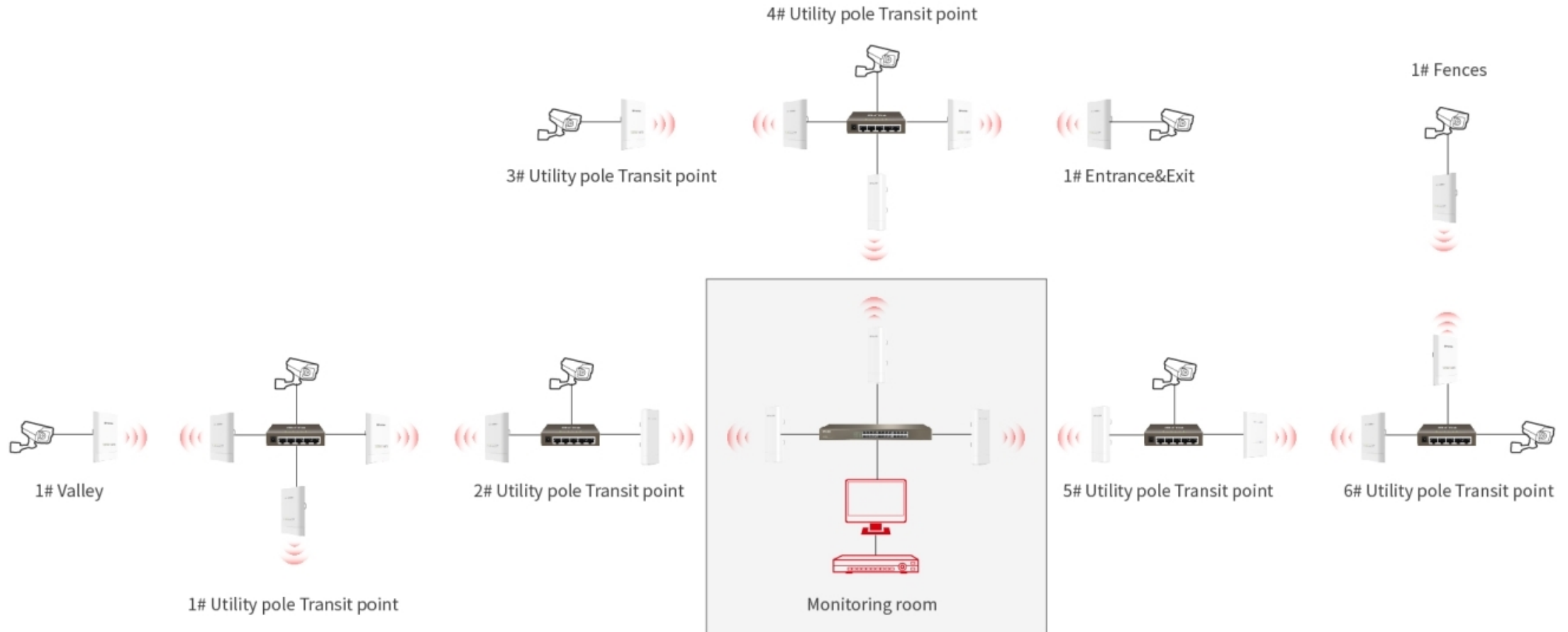
# Solution-6-How to align the devices

Outdoor CPEs usually have directional antennas, and angular misalignment will result in poor wireless signal quality. Installation can be done with the help of maps and reference points.

1. Drawing connection with AP site and station site

2. Look for landmarks near two points, install CPE in line with the landmarks.

3. Install client site with the landmark building. Adjust CPE according to signal LED or signal status on the web management.

# Solution-Topography

#Orchard



4# Utility pole Transit point

1# Fences

3# Utility pole Transit point

1# Entrance&Exit

1# Valley

2# Utility pole Transit point

5# Utility pole Transit point

6# Utility pole Transit point

1# Utility pole Transit point

Monitoring room

# Contents

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# 1. Stability is of Top Priority

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As the surveillance video needs to be uploaded to the monitoring room 24 hours a day, stability of the CPEs' wireless connection is the most important guarantee in the application scenario of video surveillance wireless transmission.



Stability tests with cameras over 30 days
in a real environment



7*24 hours, -30°~+60° temperature
cycle aging test

# 2. Wireless performance optimisation technology for over 20% improvement in capacity

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**1** Channel redefinition to provide more optional non-overlapping channels
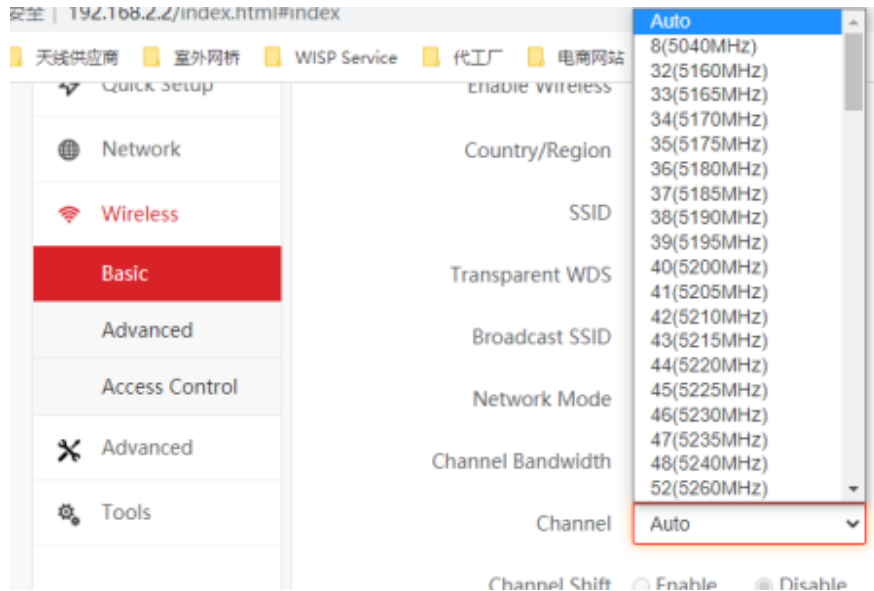
**2** ipMAX point-to-multipoint user capacity optimisation
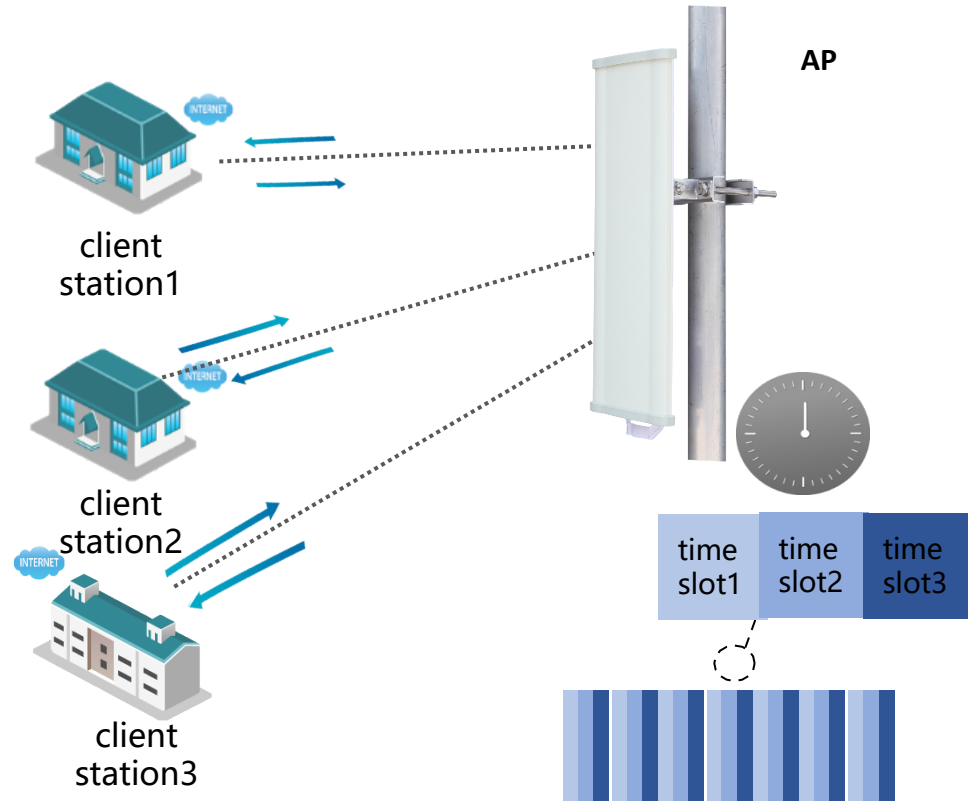
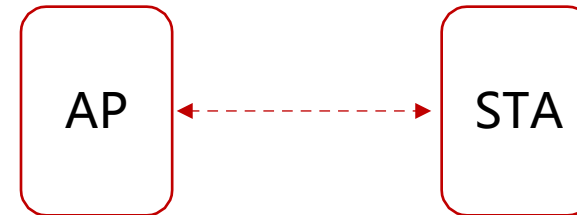# 3. Simple installation and easy configuration

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**1** **Plug and Play Kit**
The kits can be installed directly by factory default

| NVR | Camera |
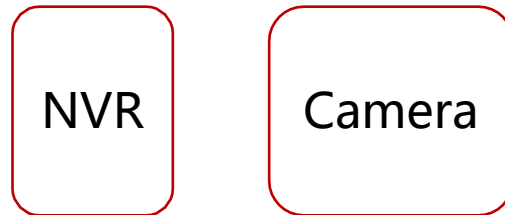
**2** **Automatic pairing and bridging**
By default, two devices are automatically paired and bridged after powering on, instead of entering management page

AP ←----------→ STA

**3** **P2MP auto-bridging**
Every single device supports automatic bridging. Once the two devices are automatically paired, others can join easily.

AP → STA
AP → STA
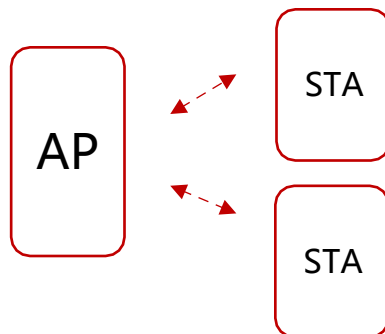
**4** **Bridging indicator**
Bridge LED can be used to recognize bridge status and signal strength

PoE/LAN     LED1     LED2
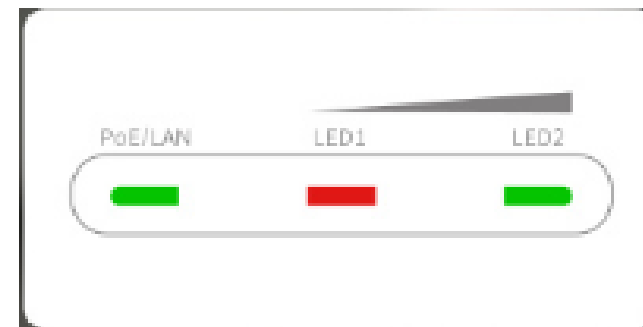
# 4. Three types of power supply available, low labor cost



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**1** **Passive PoE**

When the device is installed on the roof, it can be powered directly by the 12V/24V passive PoE Injector.
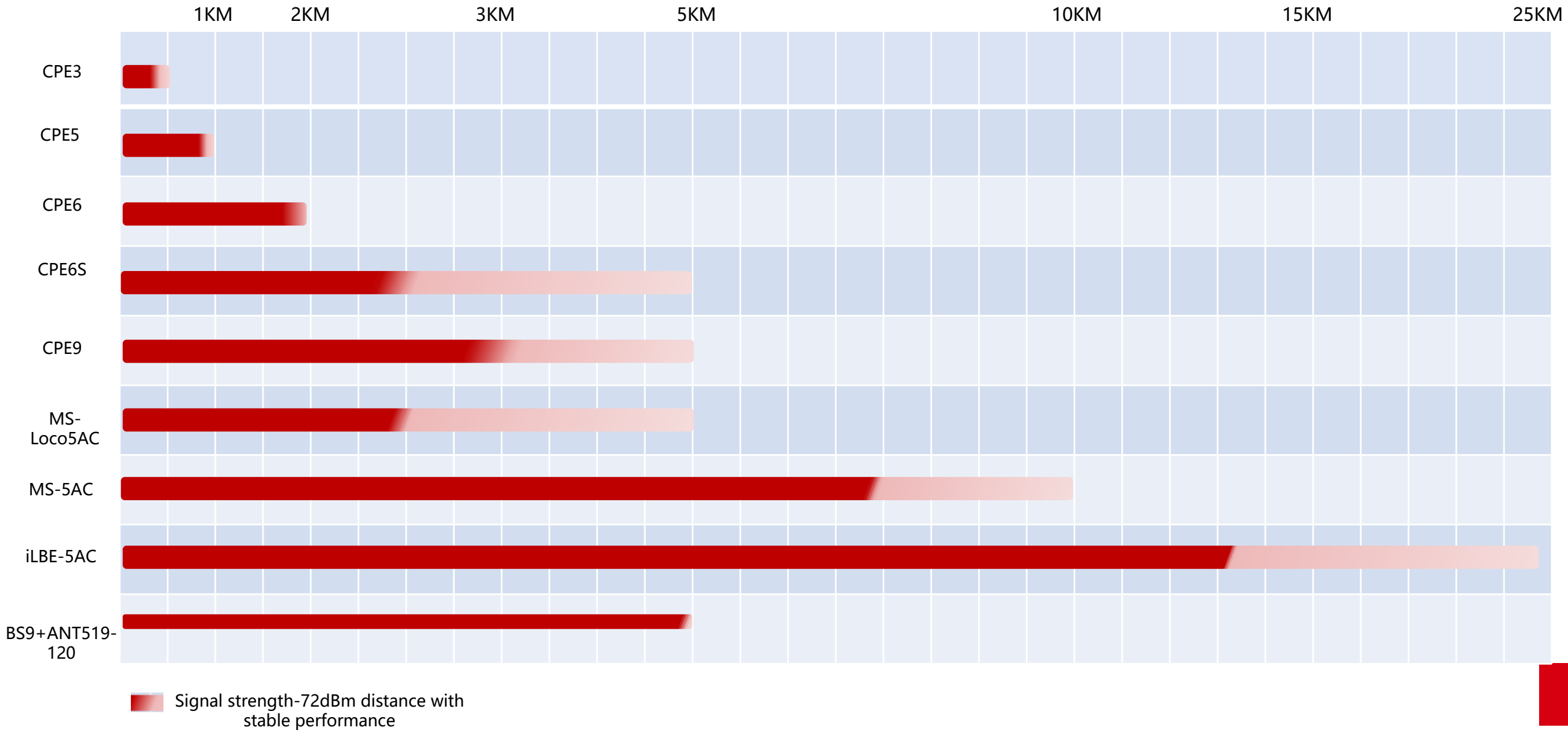
**2** **Standard PoE switch power supply**

When the installation point is close to the monitoring room, device can share power by PoE switch

**3** **12V1A DC power supply**

The device can be powered directly with 12V1A DC solar panels outdoors, no inverter conversion is required

# 5. A product portfolio solution



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| | 1KM | 2KM | 3KM | 5KM | 10KM | 15KM | 25KM |
|---|---|---|---|---|---|---|---|
| CPE3 | | | | | | | |
| CPE5 | | | | | | | |
| CPE6 | | | | | | | |
| CPE6S | | | | | | | |
| CPE9 | | | | | | | |
| MS-Loco5AC | | | | | | | |
| MS-5AC | | | | | | | |
| iLBE-5AC | | | | | | | |
| BS9+ANT519-120 | | | | | | | |

Signal strength-72dBm distance with stable performance

# 6.More useful tools

**1** Wireless Data Capacity Test

**2** Frequency analysis for optimal channel selection
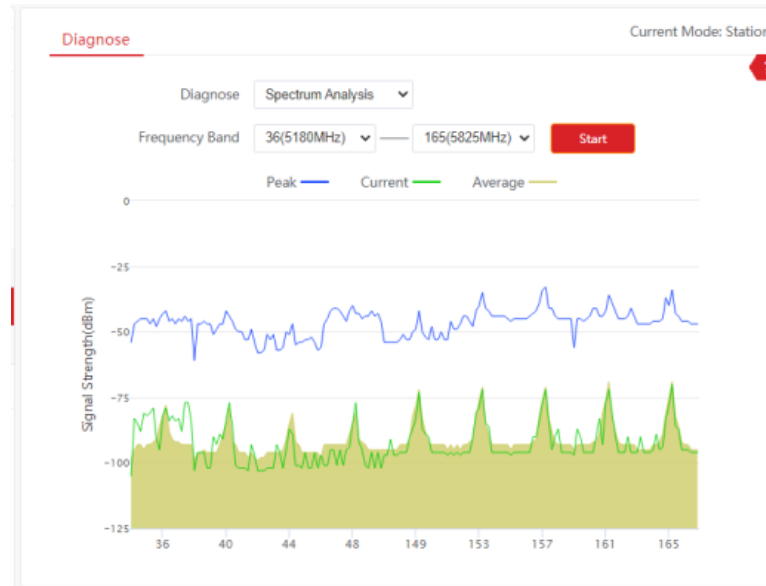
**3** Automatic distance calculation between CPEs

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# Product Recommendations - Cost-Effective Solutions

| Scene | Device | Model | Image | Features | Layer |
|---|---|---|---|---|---|
| Monitoring room | Switch | G1124P-24-250W |  | ➢ 24*10/100/1000M RJ45 ports<br>➢ All 24 ports support af/at PoE power supply<br>➢ Whole device PoE Power Supply: 250W | Access layer |
| Monitoring room | Basestation | BS9 |  | ➢ 2*RG-SMA RF ports<br>➢ 5GHz 11AC 867Mbps<br>➢ 1*Gigabit Ethernet port<br>➢ TDMA supported, point-to-multipoint with up to 20 cameras | Access layer |
| Monitoring room | Antenna | ANT19-5G120 |  | ➢ 120° horizontal wireless transmission<br>➢ 5GHz frequency<br>➢ 19dBi high-gain antenna<br>➢ Range up to 5km connecting to BS9 | Access layer |
| Monitoring room | Outdoor CPE | MS-Loco5AC |  | ➢ Transmission range 5km<br>➢ 5GHz 11AC 867Mbps<br>➢ 2*Gigabit Ethernet port<br>➢ Standard PoE/24V0.5A/12V1A DC<br>➢ 2km point to point with 20 cameras | Access layer |
| Transmit point | Outdoor CPE | MS-Loco5AC | | | |
| Transmit point | Switch | G1005 |  | ➢ 5 *10/100/1000Mbps ports<br>➢ All ports 6KV lightning protection | Access layer |
| Valley | Outdoor CPE | CPE6S |  | ➢ Transmission range 5km<br>➢ 5GHz 11AC 867Mbps<br>➢ 4*FE ports<br>➢ 12V1A DC/Passive PoE<br>➢ 2km point to point with 8 cameras | Access layer |
| Fences/Entrance&Exit | Outdoor CPE | CPE6S | | | |

# Product Recommendations - High-Performance Solutions

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| Scene | Device | Model | Image | Features | Layer |
|---|---|---|---|---|---|
| Monitoring room | Switch | G1124P-24-250W |  | ➤ 24*10/100/1000M RJ45 ports<br>➤ All 24 ports support af/at PoE power supply<br>➤ Whole device PoE Power Supply: 250W | Access layer |
| Monitoring room | Basestation | BS9 |  | ➤ 2*RG-SMA RF ports<br>➤ 5GHz 11AC 867Mbps<br>➤ 1*Gigabit Ethernet port<br>➤ TDMA supported, point-to-multipoint with up to 20 cameras | Access layer |
| Monitoring room | Antenna | ANT19-5G120 |  | ➤ 120° horizontal wireless transmission<br>➤ 5GHz frequency<br>➤ 19dBi high-gain antenna<br>➤ Range up to 5km connecting to BS9 | Access layer |
| Monitoring room | Outdoor CPE | MS-5AC |  | ➤ Transmission range 10km<br>➤ 5GHz 11AC 867Mbps<br>➤ 1*Gigabit Ethernet ports<br>➤ Standard PoE/24V0.5A/12V1A DC<br>➤ 2km point to point with 40 cameras | Access layer |
| Transmit point | Outdoor CPE | MS-5AC | | | |
| Transmit point | Switch | G1005 |  | ➤ 5 *10/100/1000Mbps ports<br>➤ All ports 6KV lightning protection | Access layer |
| Valley | Outdoor CPE | MS-Loco5AC |  | ➤ Transmission range 5km<br>➤ 5GHz 11AC 867Mbps<br>➤ 2*Gigabit Ethernet ports<br>➤ Standard PoE/12V1A DC/Passive PoE<br>➤ 2km point to point with 20 cameras | Access layer |
| Fences/Entrance&Exit | Outdoor CPE | MS-Loco5AC | | | |

# IP-COM / THANKS

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