Z920K

RS485/RS232

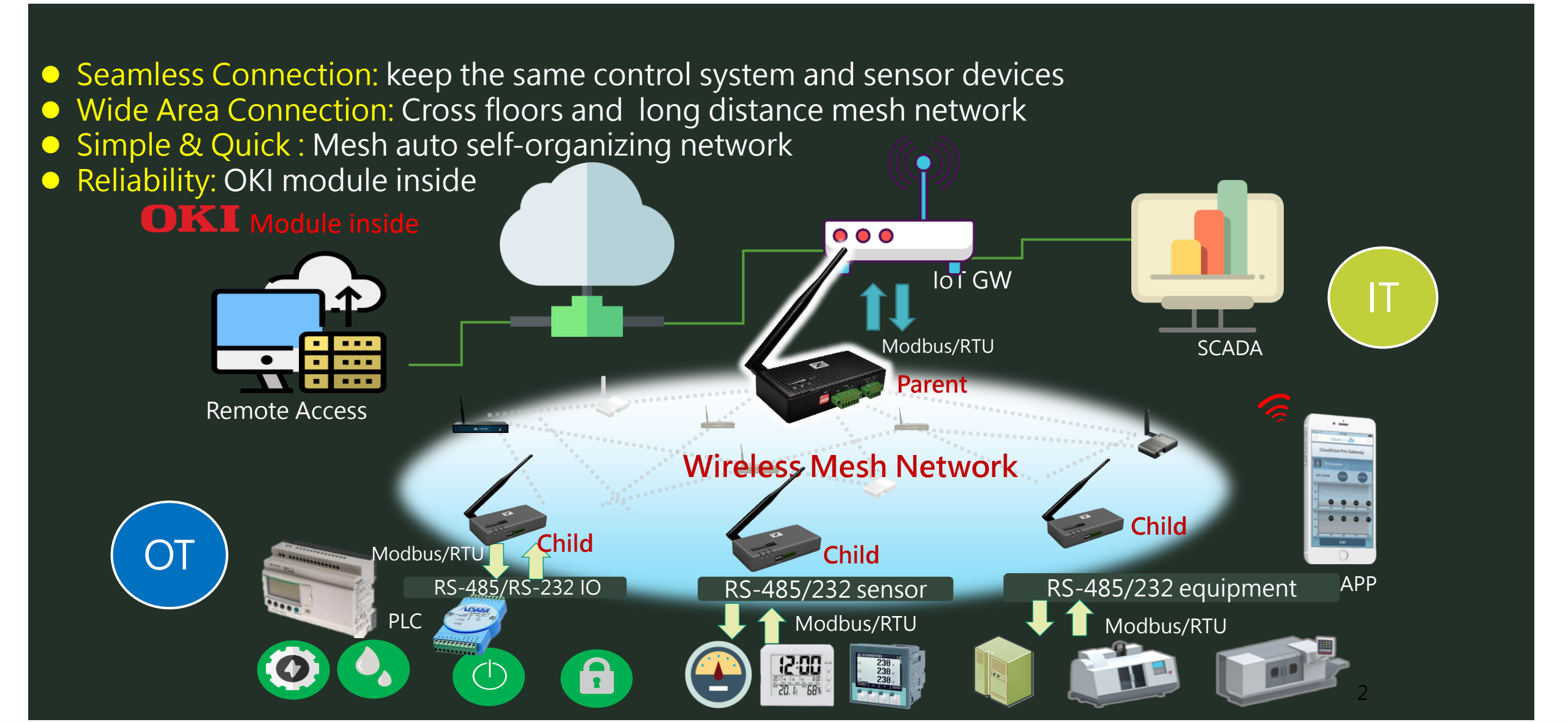
Wireless Mesh Converter

OCT, 2020

Z920K Wireless Mesh Network

- Seamless Connection: keep the same control system and sensor devices
- Wide Area Connection: Cross floors and long distance mesh network
- Simple & Quick : Mesh auto self-organizing network
- Reliability: OKI module inside

OKI Module inside

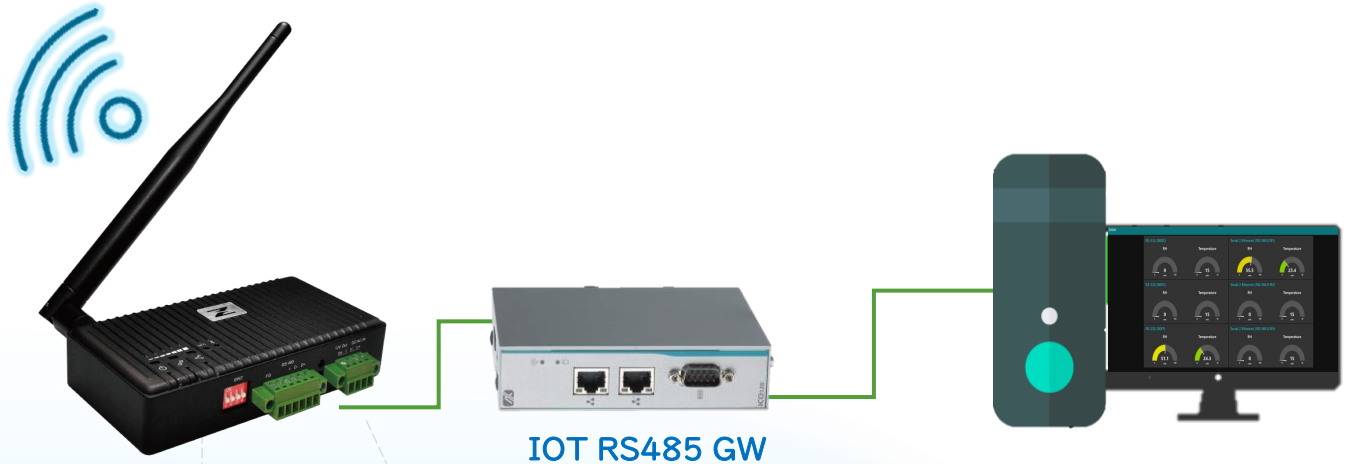


Field Application & Test Case

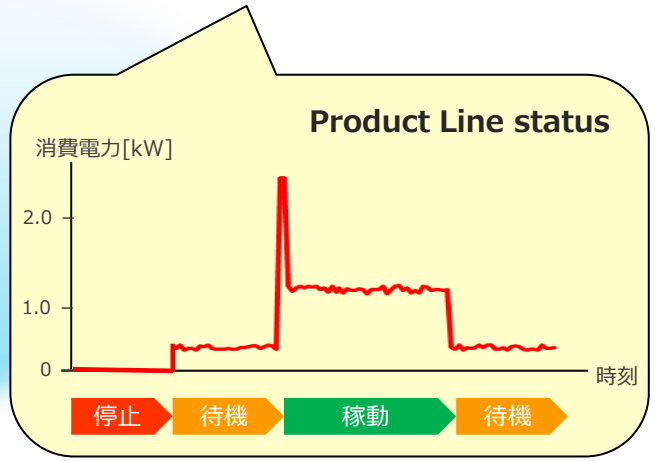
Smart Manufacture

Data Logger/SCADA /MES

- Warehouse/Storage Temperature, Humidity monitor and data logger
- Status & utilization rate update (3-color light)
- Machine real-time/history data (Power consumption, current, working time)



Mesh Network



Environment monitor

-Environment management (Temperature, Humidity, CO2, PM2.5 monitor and data collect)

Dashboard

lab

RS232/485

Z920K-C

Node 01

Warehouse

Medicine Store

RS232/485

Z920K-C

Node xx

Sub-G Mesh Network

Root

Z920K-P

WAN

ICO120

RS232/485

AXView

AWS/AZURE

RS232/485

Scada

Beverage factory test case- Water level data collection

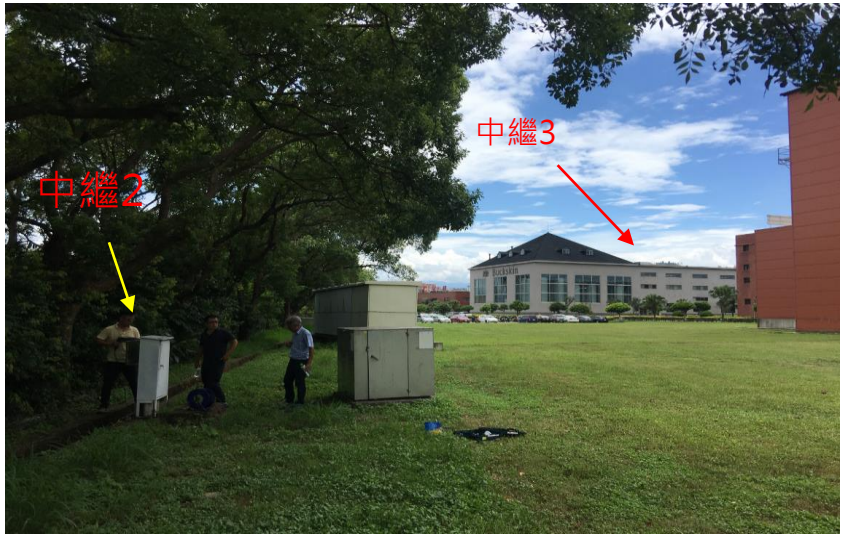
Collect the information (temperature, depth, pressure) by a water level sensor

- The distance between the central control and the data collection point is 300-400 meters
- Multiple high-rise thick RC wall factories over the whole area.
- Mesh self-organizing network: no complicated network settings, each Node learns the best transmission path by itself
- Mesh and multi-hop extend the whole transmission distance

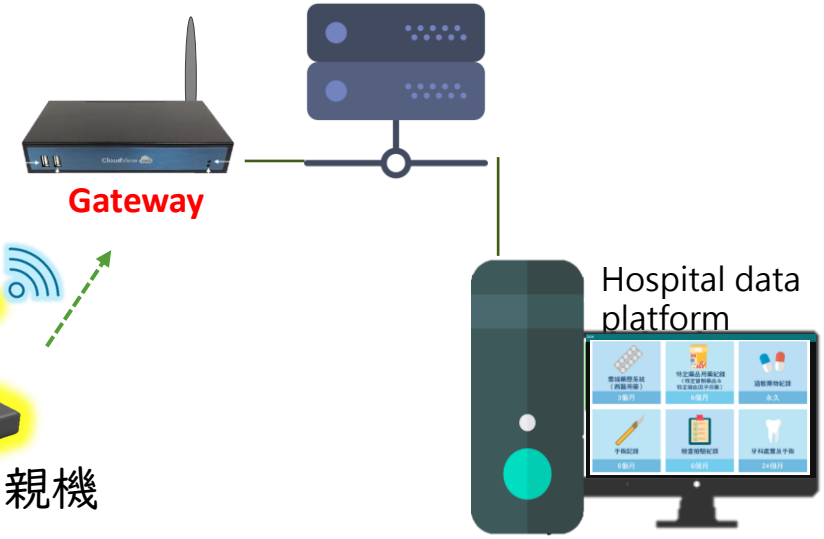
Mesh Topology—4 hopping network

No	Parent	1-Child	2-Child	3-Child	4-Child
001	0000	0006			
002	0000	0006	0003		
003	0000	0006	0003	0004	
004	0000	0006	0003	0004	0001
005	0000	0006	0003	0009	
006	0000	0006	0003	0009	0002

Installation Pictures



Smart Medical- Data Collection in a Dialysis Center



- Real-time data collection can be integrated into a hospital information platform for recording, data analysis and warnings
- Sub-G mesh network collects data from nearly 40 dialysis machines in the entire district

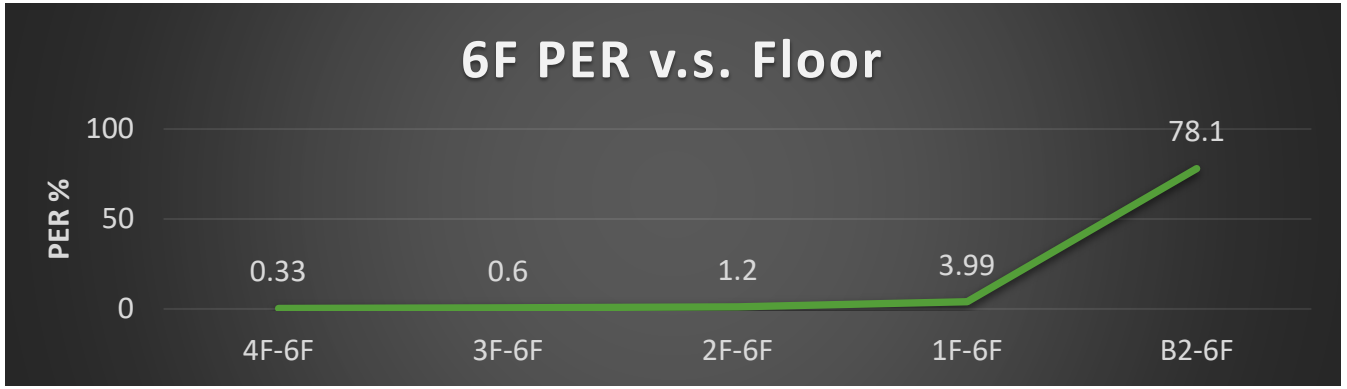
Smart Building- Multi-floor Communication

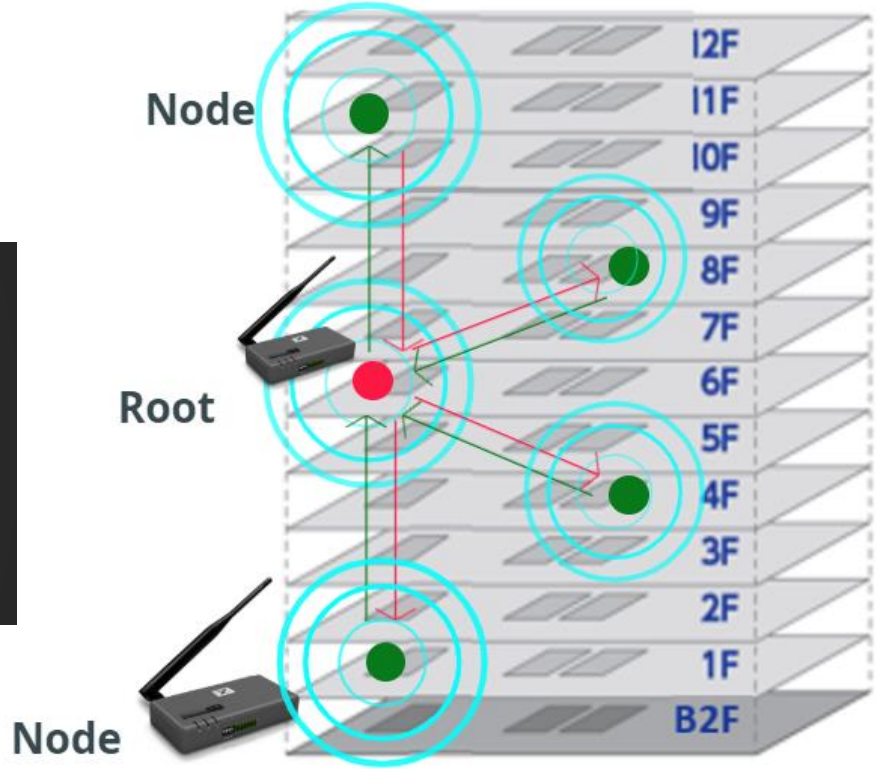
High penetration: Sub-G 920MH (multi-floor data transfer)

Far better than WiFi 2.4G/5G penetration (single floor)

Actual measurement in Sanchuang Park :

- Penetrate 6 floors





1F (Node1) can be directly transmitted to 6F (Root)
11F (Node2) can be directly transmitted to 6F (Root)

Smart Building (TWN Chicony)

Better Anti-interference & High stability

Compared with 2.4G WiFi/ZigBee/BLE, 920MH has a better anti-interference capacity to lead in the connection much stable.

Replacing WiFi connection with Z920K Sub-G mesh network for a stabler electrical curtain control.

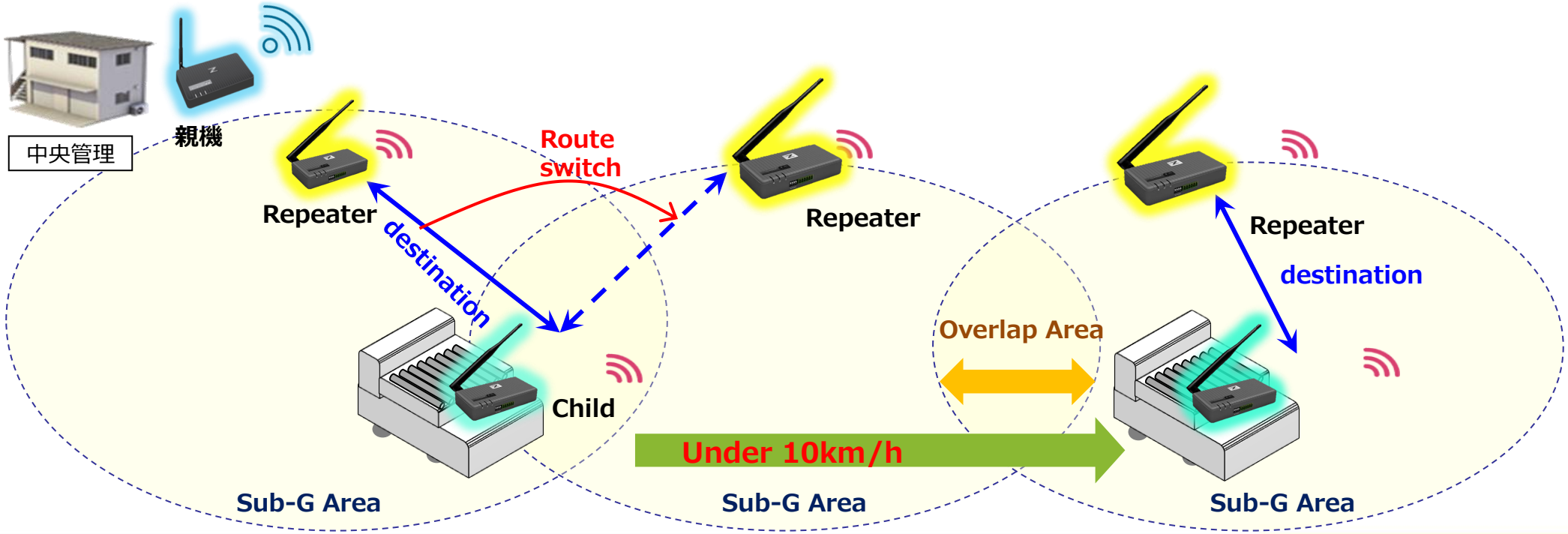
AGV/AMR Application

Mobile mode communication

-Mobile communication mode
-Mesh dynamically optimized network

Wide range Mesh network

- Significantly saves the wiring costs
- Reduce the overall equipment costs

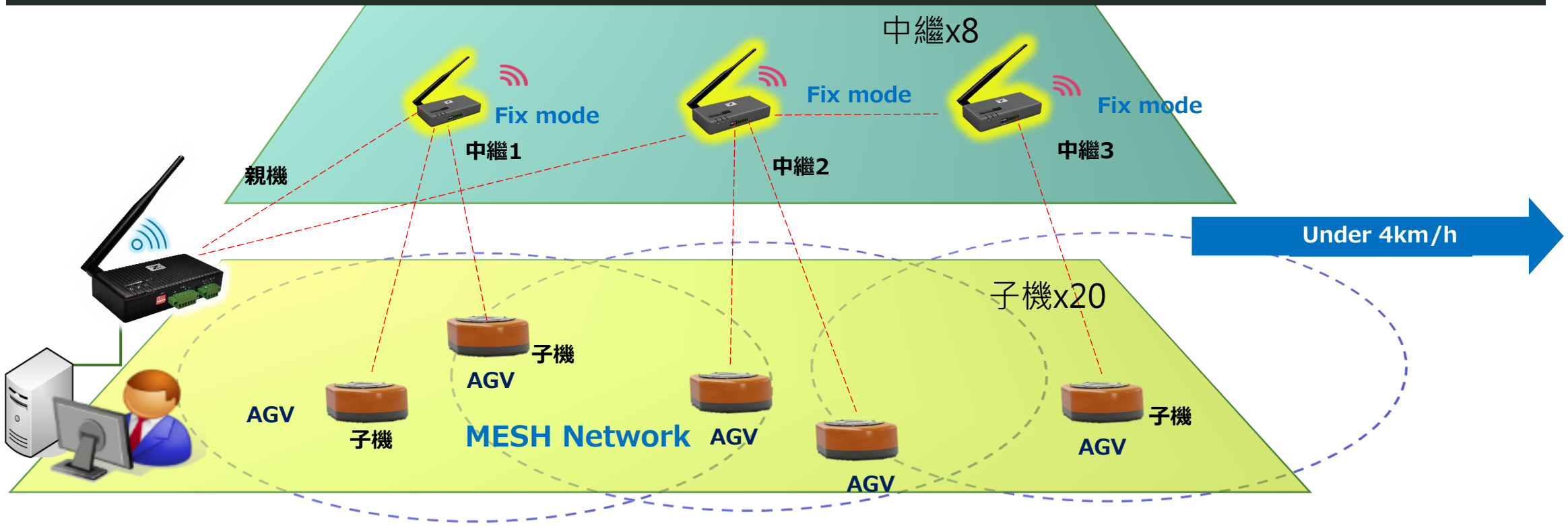


Nissan Tochigi Factory test case:

80AGV is divided into four groups for a better communication quality and speed

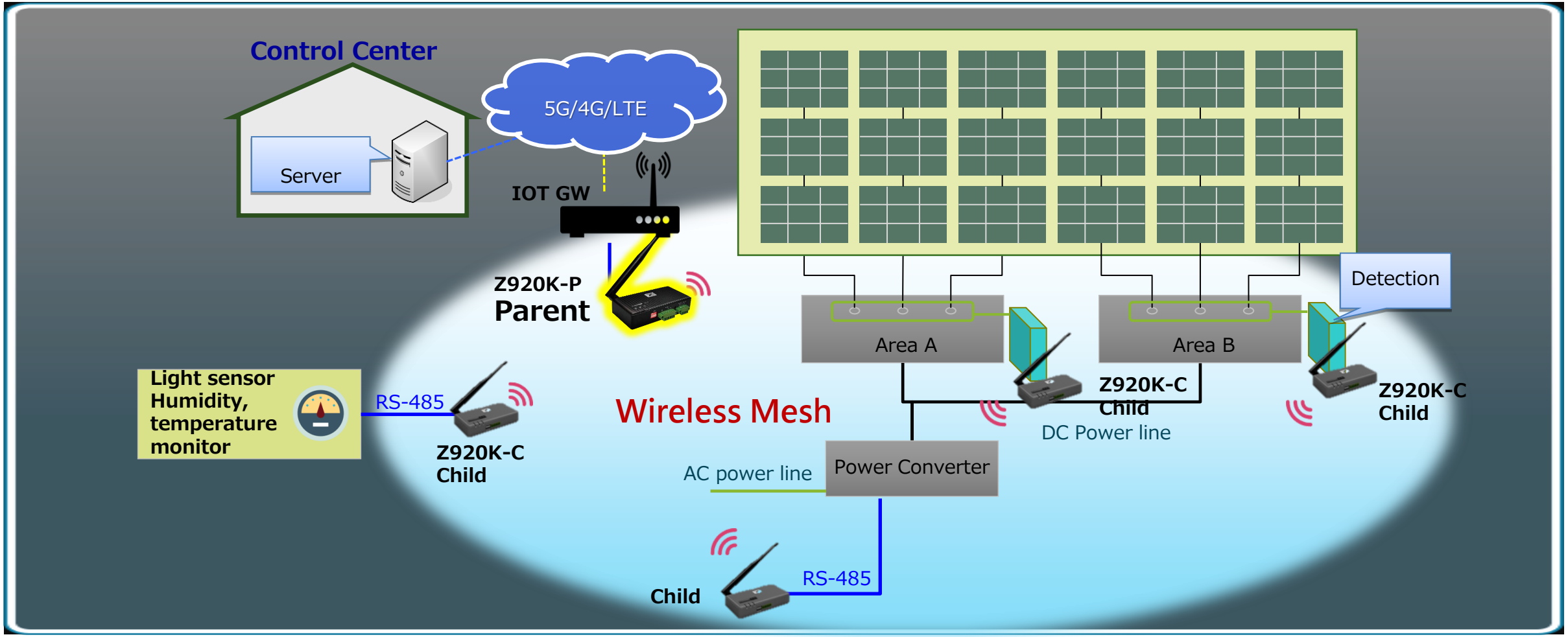
- Parent x1, repeater x8 and 20 child machines as a group
- AGV (slave machine) actively returns data every 3 seconds
- Speed at less than 4km/h

The number of repeaters is reduced to **1/4**, which saves more wiring costs, and the overall equipment and wiring costs can be reduced by **70%**



Solar Power Panel Monitor

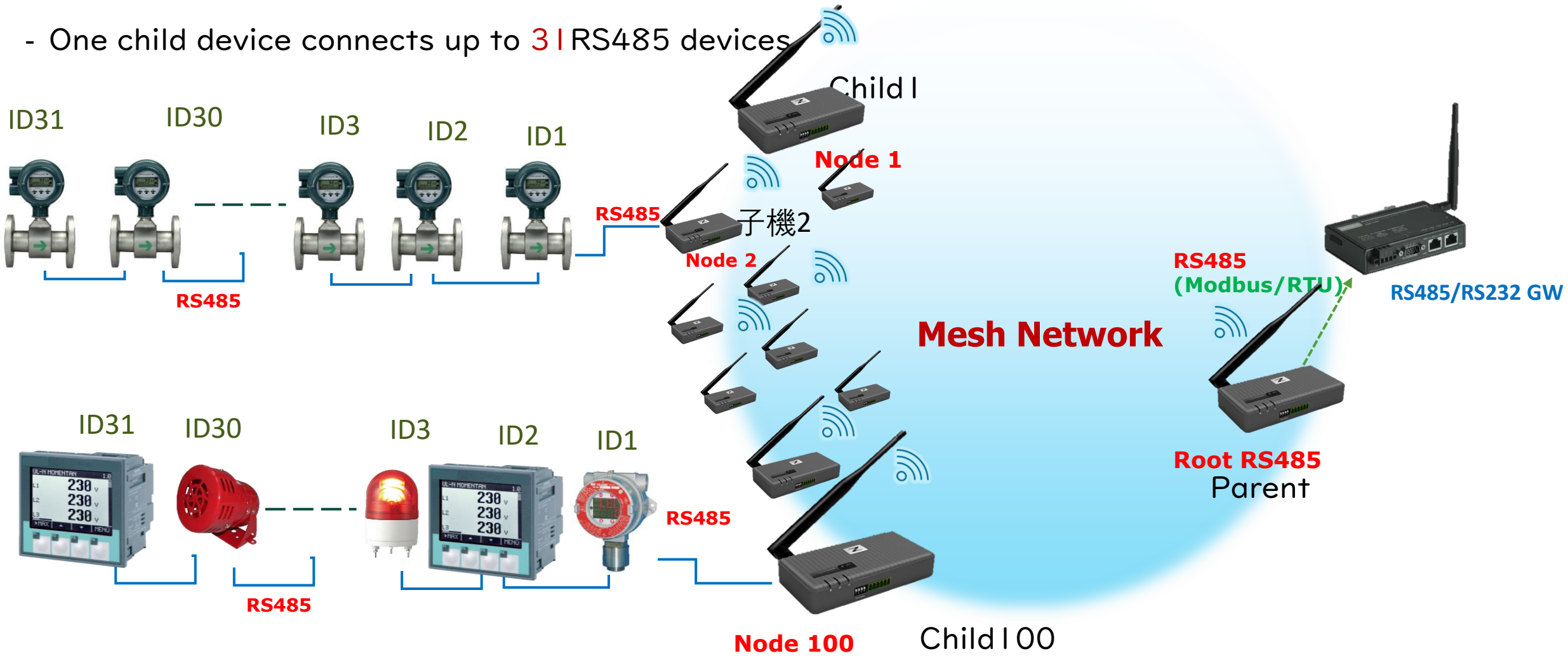
- Wireless panel monitor equipment
- Scheduling, power inspection and error alert



Z920K Competitions

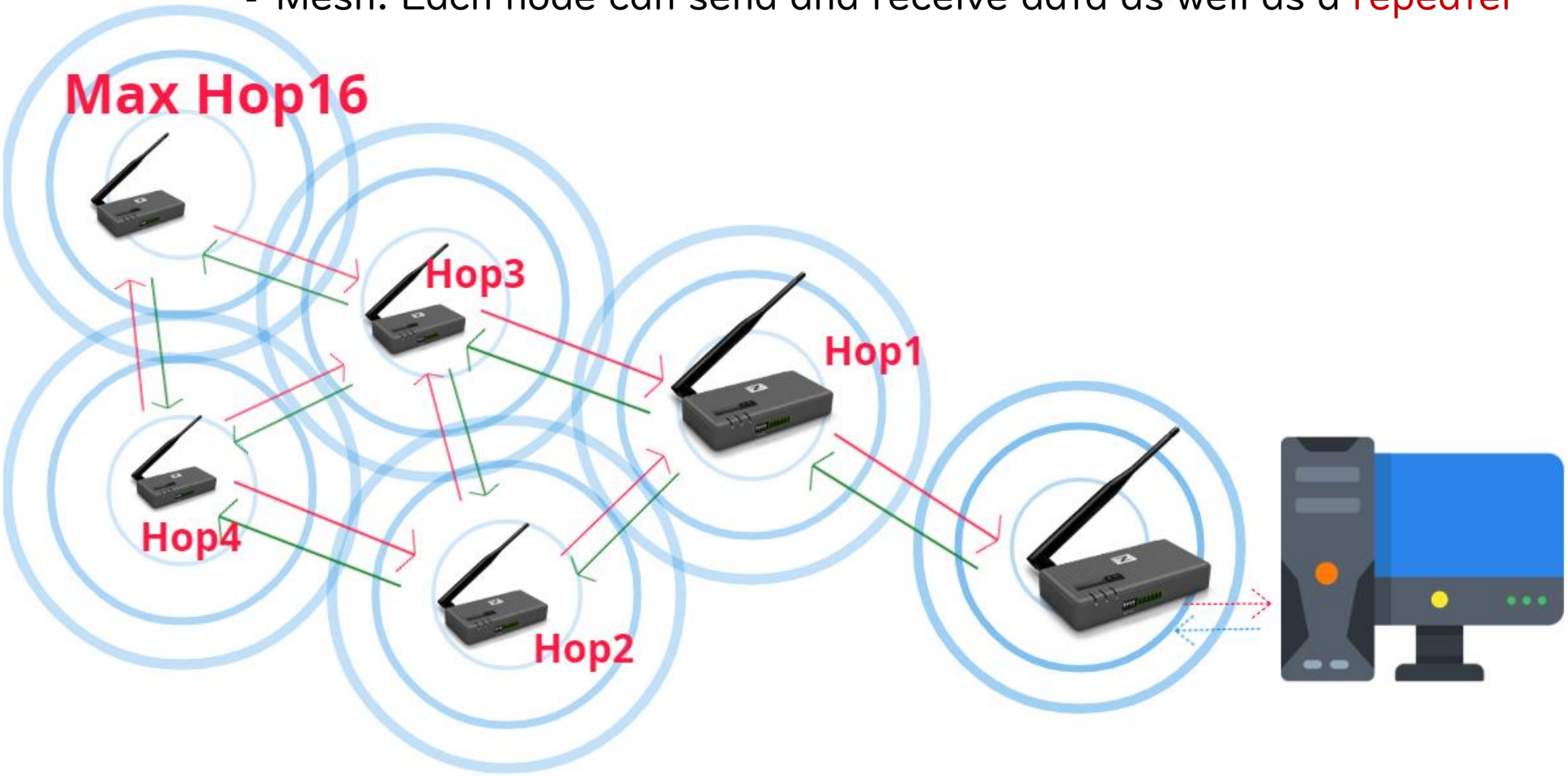
1-to-N Multi-Connection

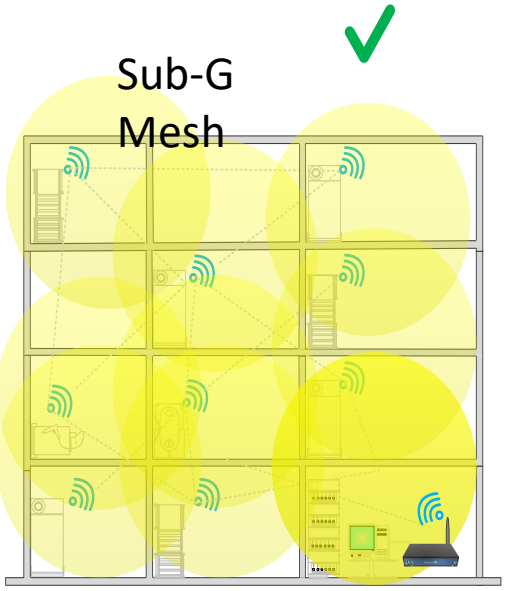
- One to 100 Child devices connection
- One child device connects up to 31 RS485 devices

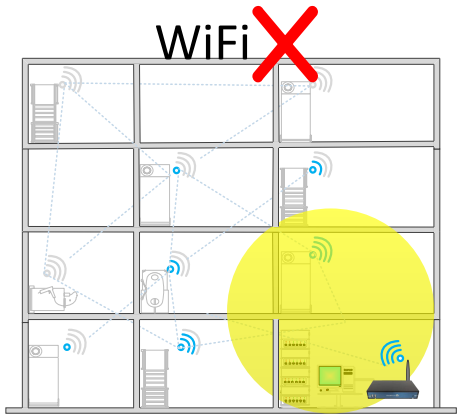


Mesh Network (Multi hops)

- Mesh: Dynamic optimum path, no need IP setting
- Up to 16 hops to extend the overall distance
- Mesh: Each node can send and receive data as well as a repeater







Long Point-to-point distance

- Long distance: Max point-to-point distance 500m-1km (at a visible distance)
- Up to 16 hops to extend the overall distance

Taipei Mei-Tea part field test 569m@RSSI -80dBm

Long MESH connection

- Extend the transmission distance by multi hops in a mesh network

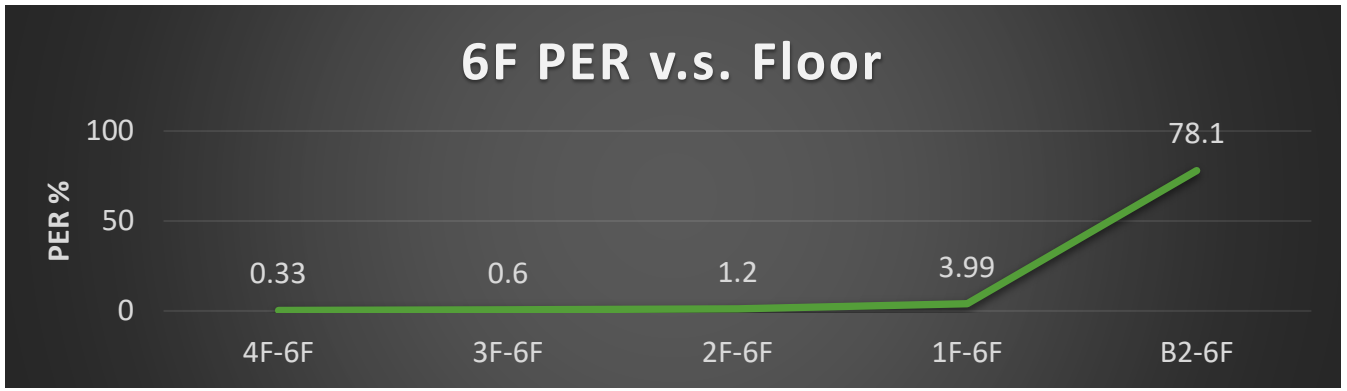
Taipei Mei-Tea part field test 1000m@RSSI -82dBm

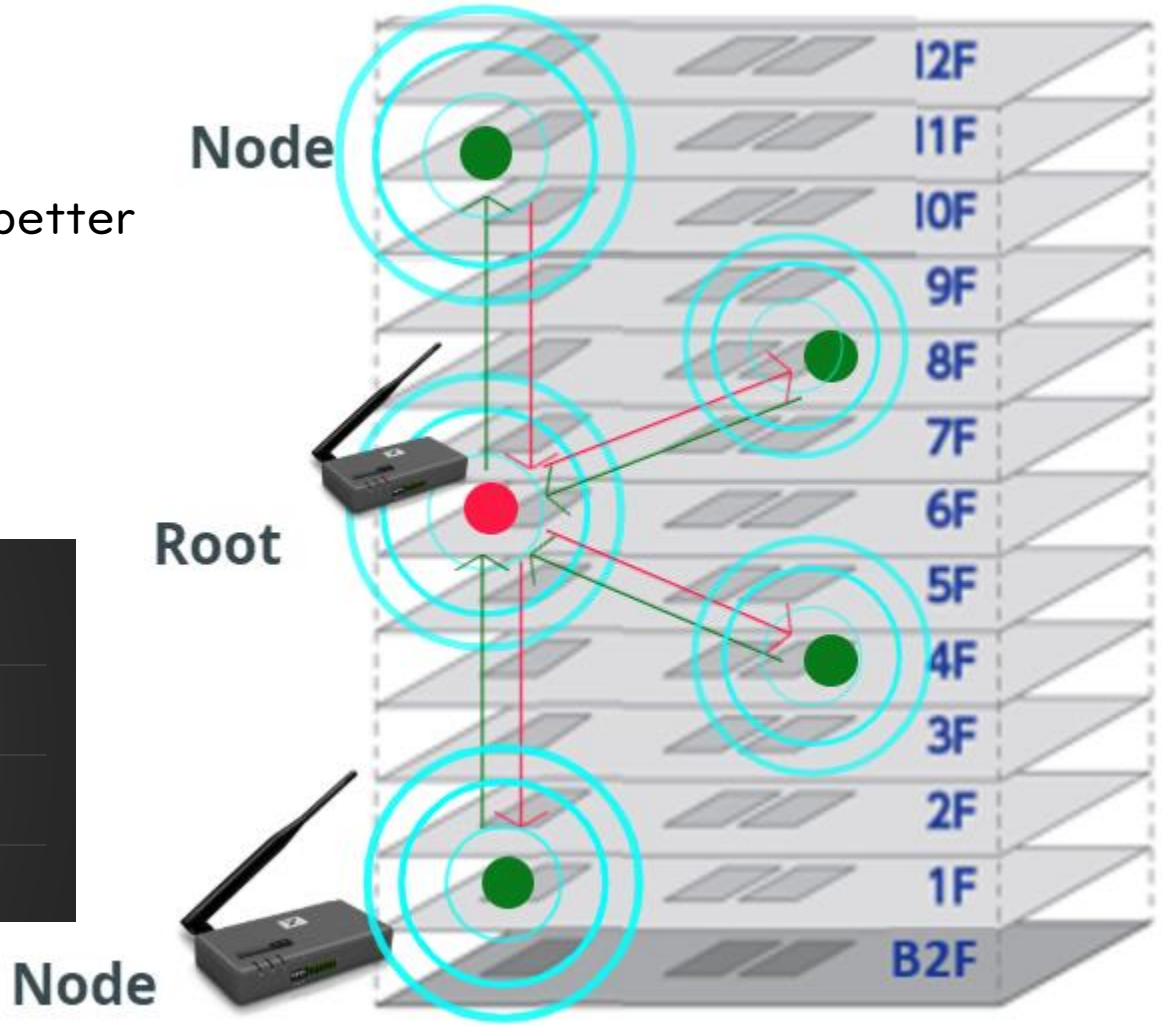
Strong Wall Penetration

- Wall penetration: 920MHz(through multi-floors)
- Compare with WiFi 2.4G/5G (single floor) much better

Field try at 3C mall:

Tx pass trough 6 floors

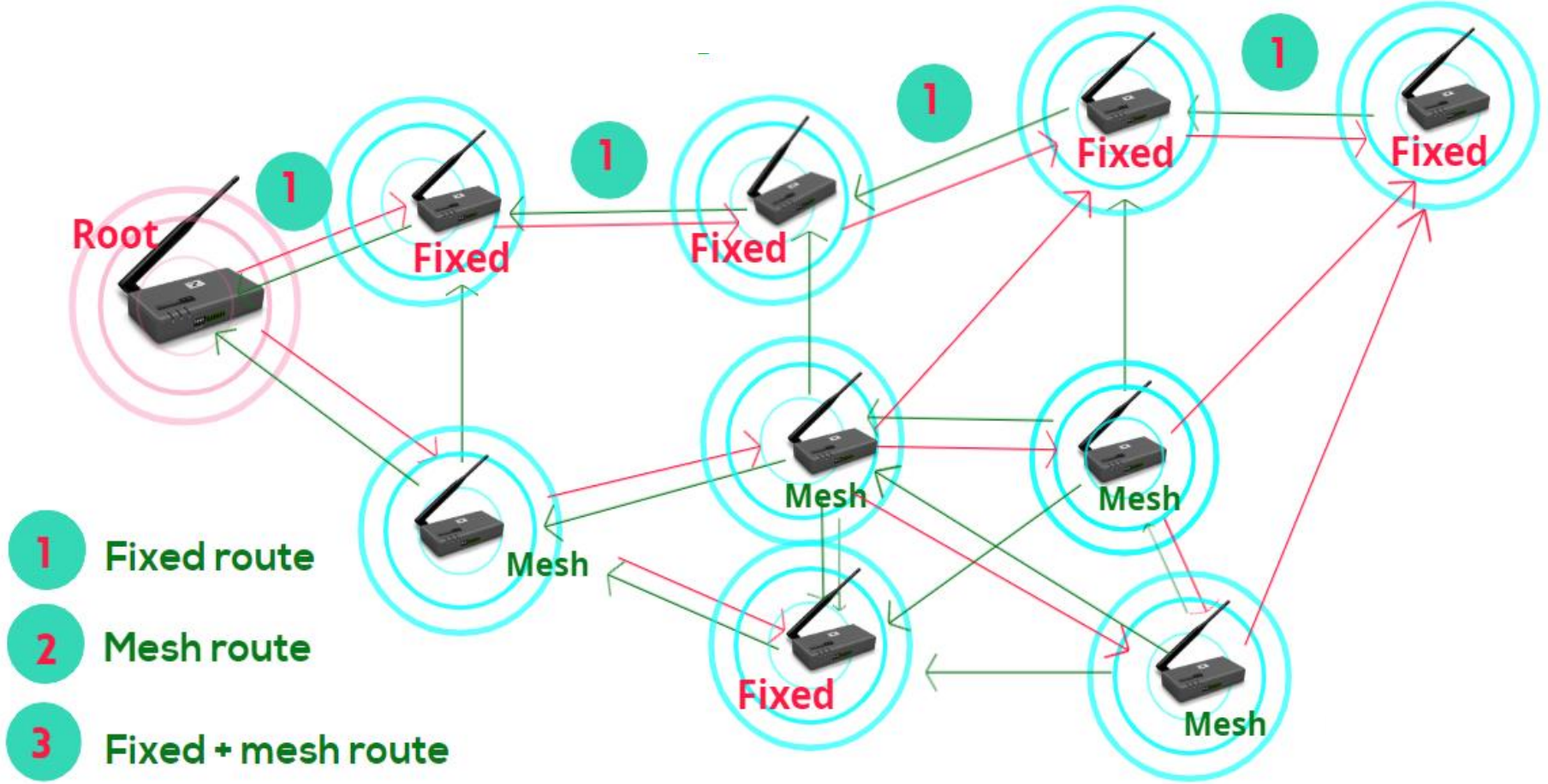




Field try in a 3C mall:
-1F(Node1) to6F (Root)
-11F(Node2) to6F (Root)

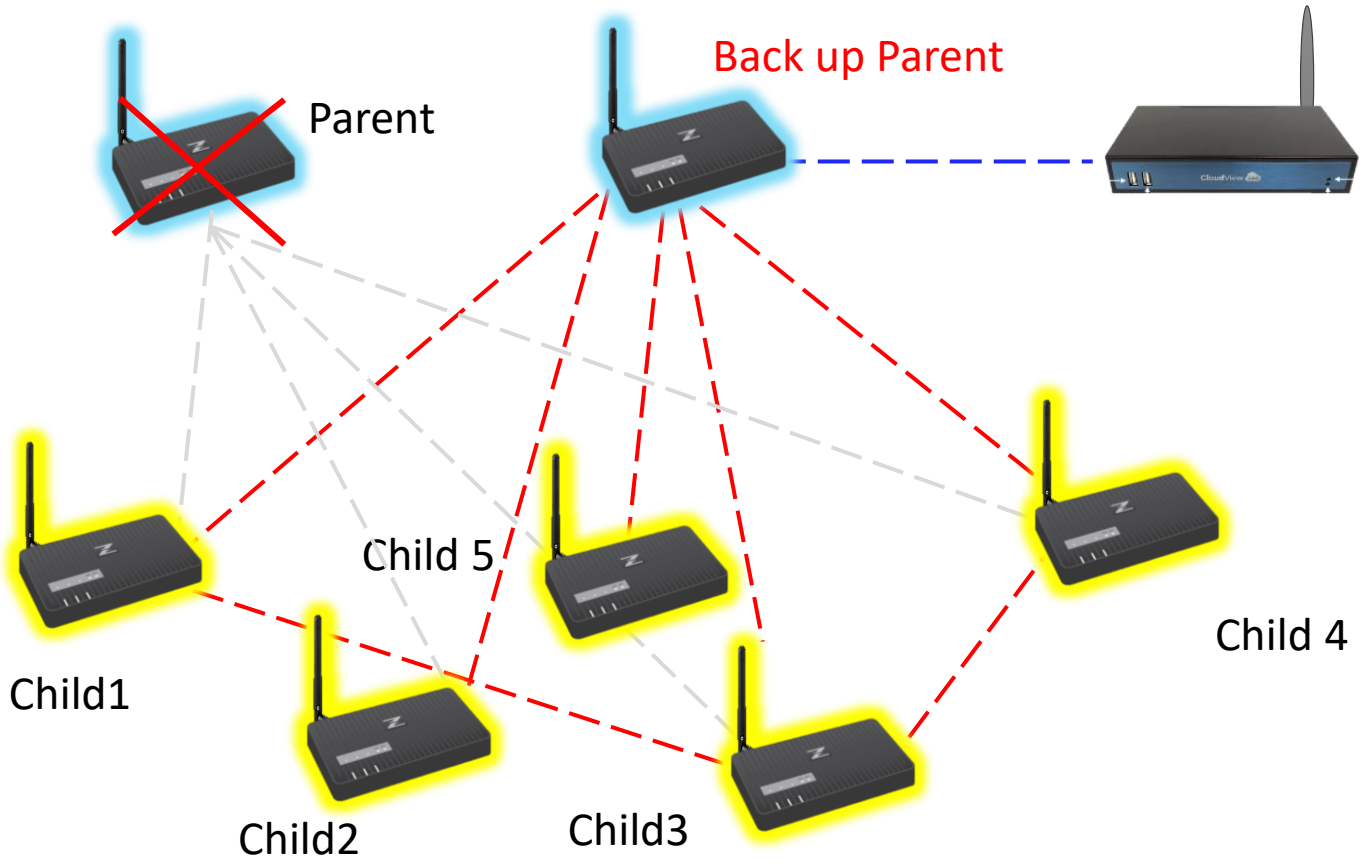
Flexible Route Setting

- 3 flexible route setting: Fixed, Mesh, Fixed+Mesh route
  - Fixed: Each node assigns the next hop as a fixed route
  - Dynamic optimum path: Mesh algorithm will work out the optimum hopping route automatically
  - Fixed+Mesh route: Once the fixed route is broken, the network will switch back to the mesh mode.



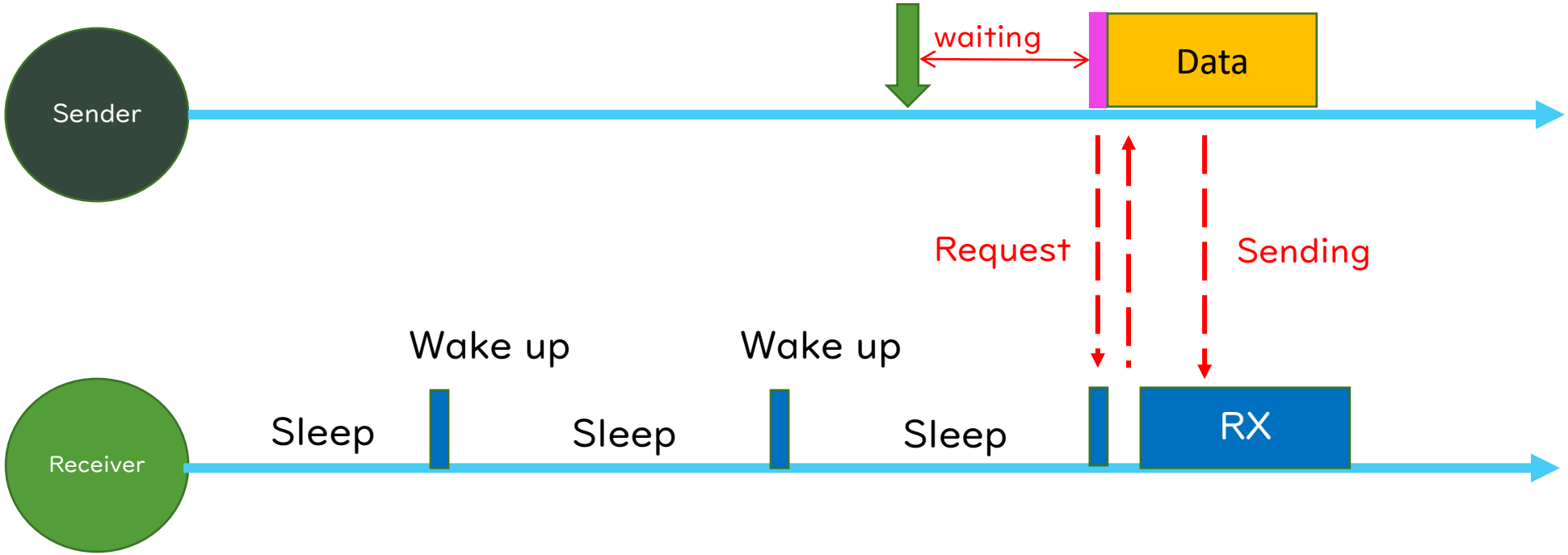
HA (High Availability) Reliability

- A back up root can be set in a the same network to avoid the major root is broken
- Each node can set the retransmit times



Low Power Consumption

- Support sleep mode
- -Low Tx current consumption 70mA



Measurement Tool

Tool:

- Channel Noise Scan: The function will scan environment in-band (920MHz-928Mhz) noise. The result will be referred as a choice of the communication channel choice. The scan channels and duration can be adjusted.

- RSSI/PER measurement: The function can measure package error rate(PER) and wireless signal level(RSSI)to confirm the connection reliability.

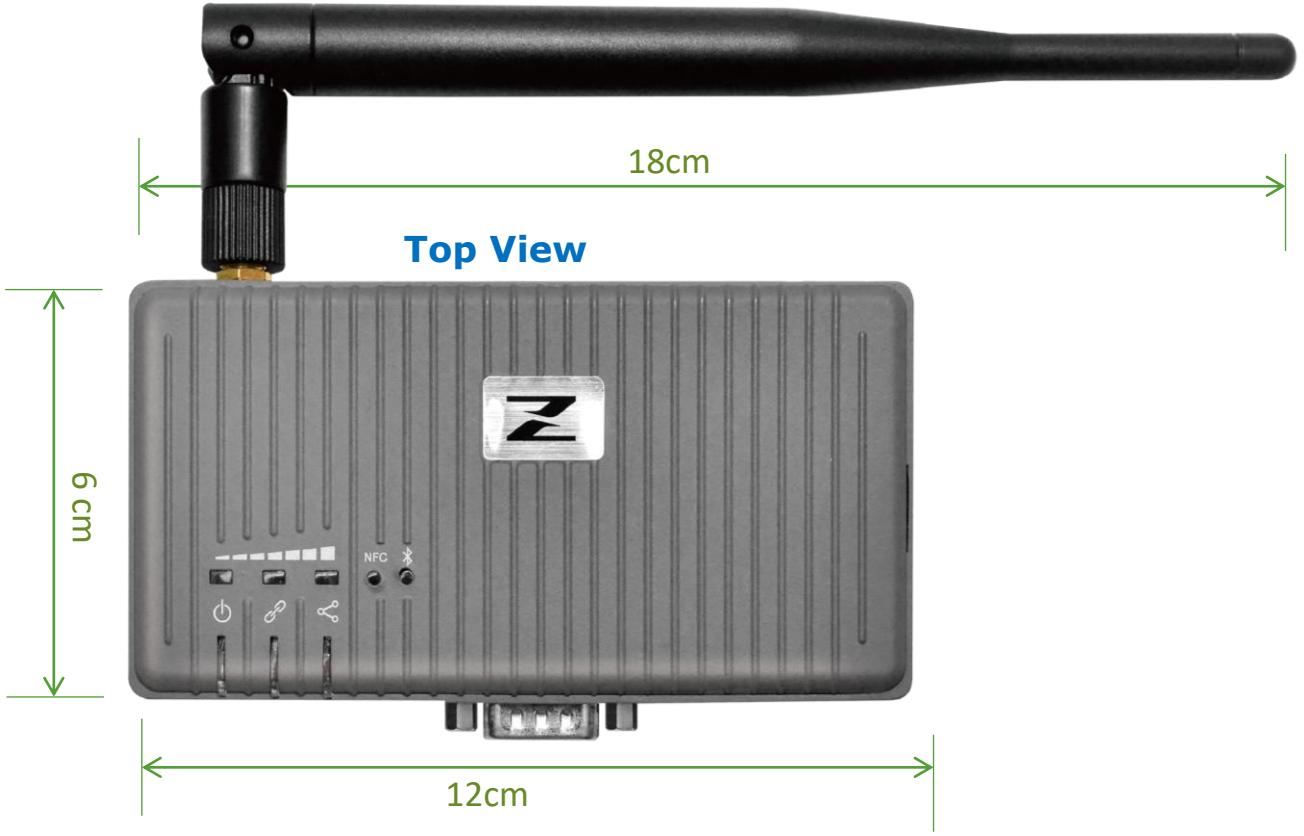
Mesh network topology

- All network topology information can be checked from a parent device.
- The information include the hopping route how each child node connects to parent.
- Configuration file export and import

Z920K Specification

Z920K Mechanical

Rear View



Top View

Front View (RS485)

Front View (RS232)

Major Specifications

- NCC/CE/FCC/TELEC/NTBC certification
- IEEE 802.15.4g Japan OKI Sub-G wireless module
- Tx Frequency: 920MHz(920.3MHz~928.1MHz, support multi channels)
- Rx Sensitivity -103 dBm (100kbps, BER<0.1%)
- Max Tx rate: 100 kbps
- P-P longest distance 500m~1KM
- Support Mesh up to 16 hops
- Tx power 0.16mW/ 1mW/ 20mW (13 dBm)
- RS-485 (1-100) network: one Parent to100 Child nodes
- Interface
  - RS485 Modbus/RTU, ASCII
  - RS232
- Windows console utility---USB/Windows
- DC input 10-48V
- Power consumption 50mA@24Vdc
- Support USB 5Vdc In

Din Rail Adaptor

Magnetic Adaptor

Z920K Series

Z920K – RXXXX – XX – XX

- RXXXX: RS485, RS232, RS422
- XX (1st): **P** = Parent, **C** = Child
- XX (2nd): **J** = Japan, **U** = US, **T** = Taiwan, **H** = Thailand, **K** = Korea
- XX (3rd): **EXA** = 1 external sleeve antenna, **EXB** = 1 external roof top antenna

Ordering Info.	Description	Telecom Cer.
Z920K-RS485-PJ-EXA	RS-485 to Sub-1G mesh, 920MHz, ext. sleeve antenna, JPN/ Parent	TELEC
Z920K-RS485-CJ-EXA	RS-485 to Sub-1G mesh, 920MHz, ext. sleeve antenna, JPN/ Child	TELEC
Z920K-RS485-PT-EXA	RS-485 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, TWN/ Parent	NCC
Z920K-RS485-CT-EXA	RS-485 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, TWN/ Child	NCC
Z920K-RS485-PH-EXA	RS-485 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, Thailand/Parent	NBTC
Z920K-RS485-CH-EXA	RS-485 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, Thailand/ Child	NBTC
Z920K-RS485-PU-EXA	RS-485 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, US/ Parent	FCC
Z920K-RS485-CU-EXA	RS-485 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, US/ Child	FCC
Z920K-RS232-PJ-EXA	RS-232 to Sub-1G mesh, 920MHz, ext. sleeve antenna, JPN/ Parent	TELEC
Z920K-RS232-CJ-EXA	RS-232 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, JPN/ Child	TELEC
Z920K-RS232-PT-EXA	RS-232 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, TWN/ Parent	NCC
Z920K-RS232-CT-EXA	RS-232 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, TWN/ Child	NCC
Z920K-RS232-PH-EXA	RS-232 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, Thailand/Parent	NBTC
Z920K-RS232-CH-EXA	RS-232 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, Thailand/Child	NBTC
Z920K-RS232-PU-EXA	RS-232 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, US/Parent	FCC
Z920K-RS232-CU-EXA	RS-232 to Sub-1G mesh, 920 MHz, ext. sleeve antenna, US/Child	FCC

ZO TECH
www.zotech.com.tw

Contact us

Kindly get in touch to let us know if you have any questions.

THANK YOU FOR YOUR TIME!

Information
www.zotech.com.tw

Product Inquiries
allen.lai@zotech.com.tw

Technical Support
support@zotech.com.tw

Location
2F., No.5, Aly. 22, Ln. 513, Ruiguang Rd.,
Neihu Dist., Taipei city 114, Taiwan