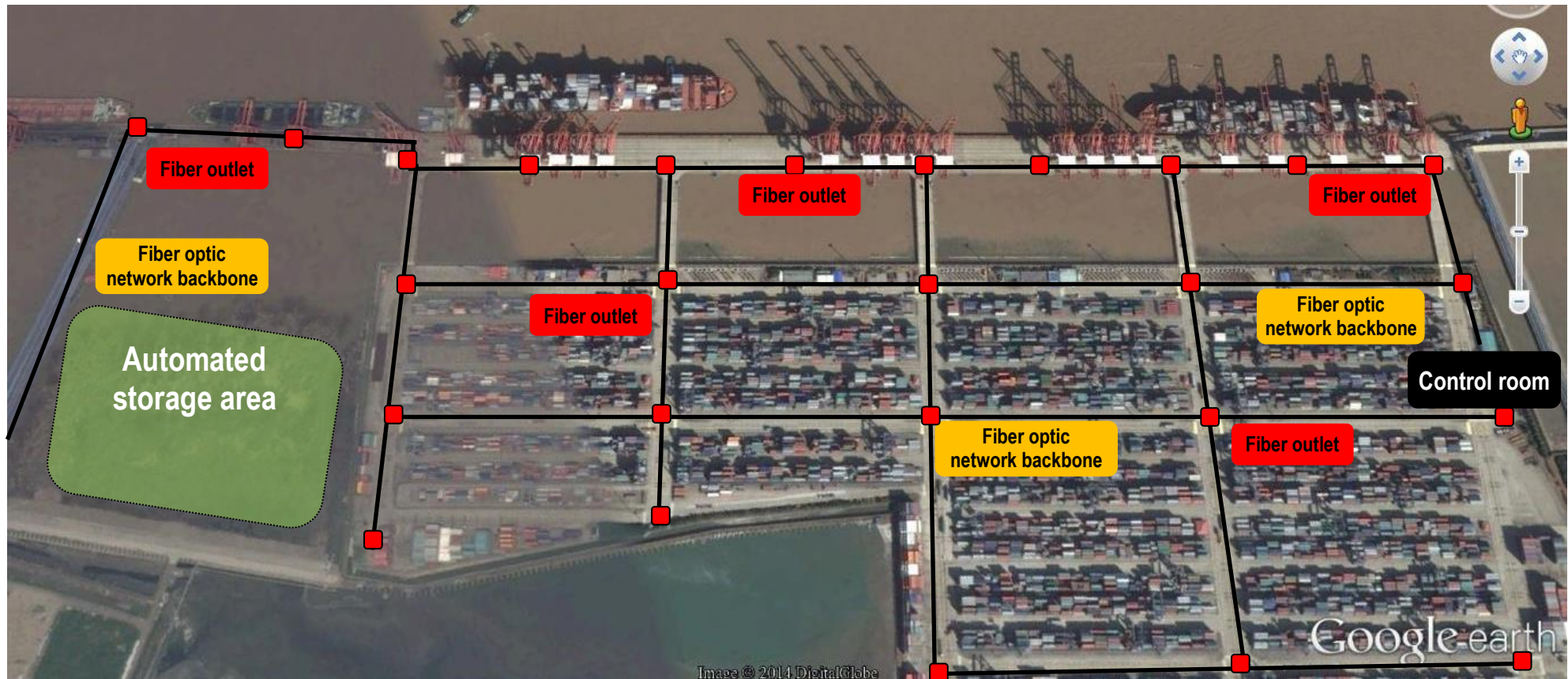


Design of Hi-mobile wireless surveillance and transmission system for port cranes, container yards and storage areas

--Port container crane / plant area mobile crane / warehouse transmission system / forklift mobile transmission/chemical plant mobile industrial safety monitoring / AI / ID 4.0 / IoT... and other applications

1. Wireless system installation environment map:

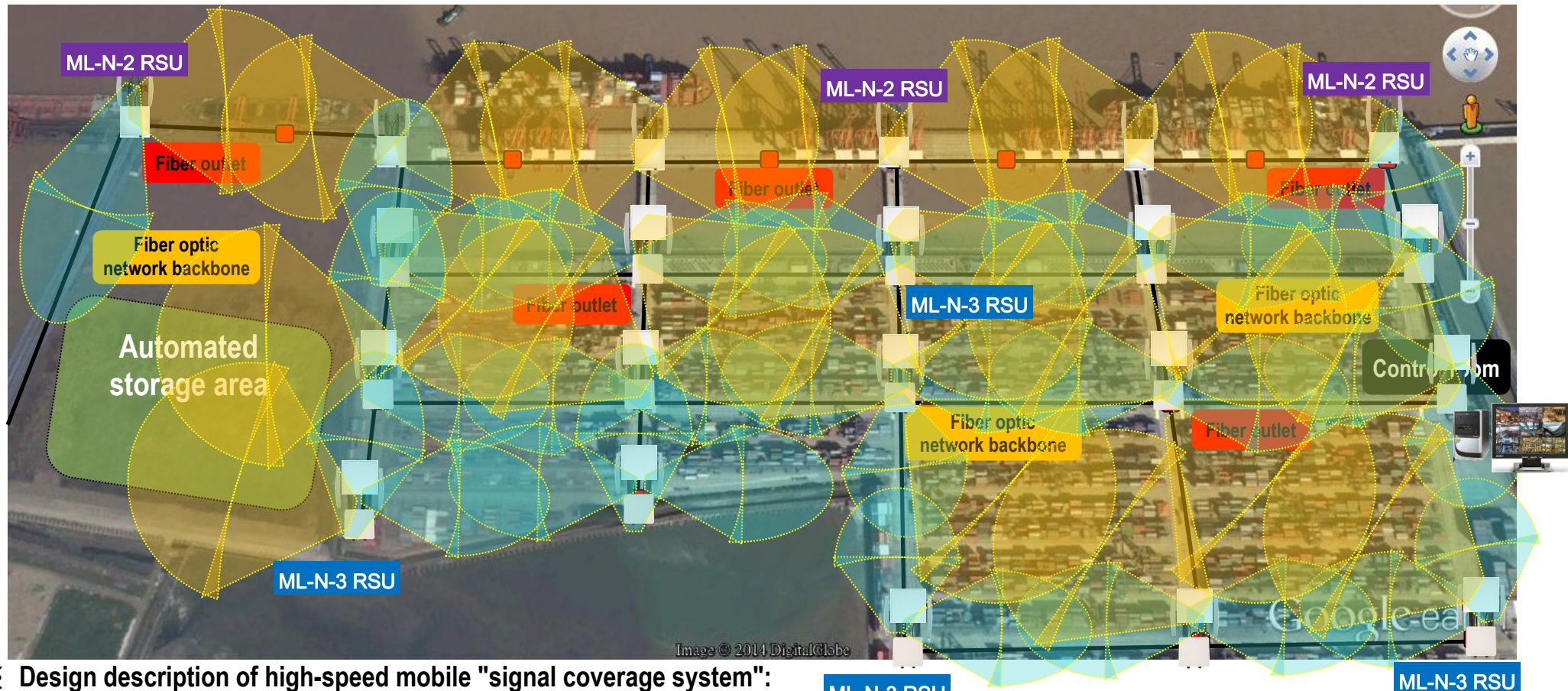
(Total length of 10,000 m, laying of fiber optic backbone, every 300 meters of tower cranes and fiber optic exit points of the container area)



※ Main wireless transmission system applications:

- Dock crane : wireless mobile monitoring + detection data mobile transmission + industry 4.0 / AI artificial intelligence... and other data transmission
- Exclusive container trucks at the port: wireless high-speed mobile monitoring + mobile storage data transmission + industry 4.0 / AI artificial intelligence... and other data transmission
- Container stacker in container yard: wireless mobile monitoring + mobile transmission of warehousing data + Industry 4.0 / AI artificial intelligence / IoT... and other data transmission
- Automatic storage area stacker and automatic storage and inventory system: wireless mobile monitoring + mobile storage data transmission + industry 4.0 / AI artificial intelligence / IoT... and other data transmission

2. Outdoor Hi-mobile wireless signal coverage system planning: ML-N-2 RSU (Signal coverage terminal)



※ Design description of high-speed mobile "signal coverage system":

- "Blue" wireless signal coverage area: RSU operation mode + pointing plate antenna for lane wireless signal coverage
- "Orange" wireless signal coverage area: using RSU operation mode + pointing sector 90-degree antenna for wireless signal coverage in the container area
- The wireless signal coverage needs to have an overlap area, which must be at least 50 meters in the signal overlap area, so that the vehicle-mounted OBU can quickly switch hands in 20ms.
- Because the backbone of the network is a wired optical fiber network, it can provide up to 60 RSU wireless signal coverage at the same time = $60 * 50\text{Mbps} = \text{more than } 3000\text{Mbps}$ high-speed mobile wireless transmission bandwidth
- Because the wired optical fiber network may form multiple loop states, it is necessary to adopt the loop back up path exit parameter setting to achieve the operation of the loop backup repair transmission mechanism

** RSU: Road Side Unit roadside (street light) signal coverage terminal / OBU: On Board Unit vehicle (onboard) mobile connection terminal

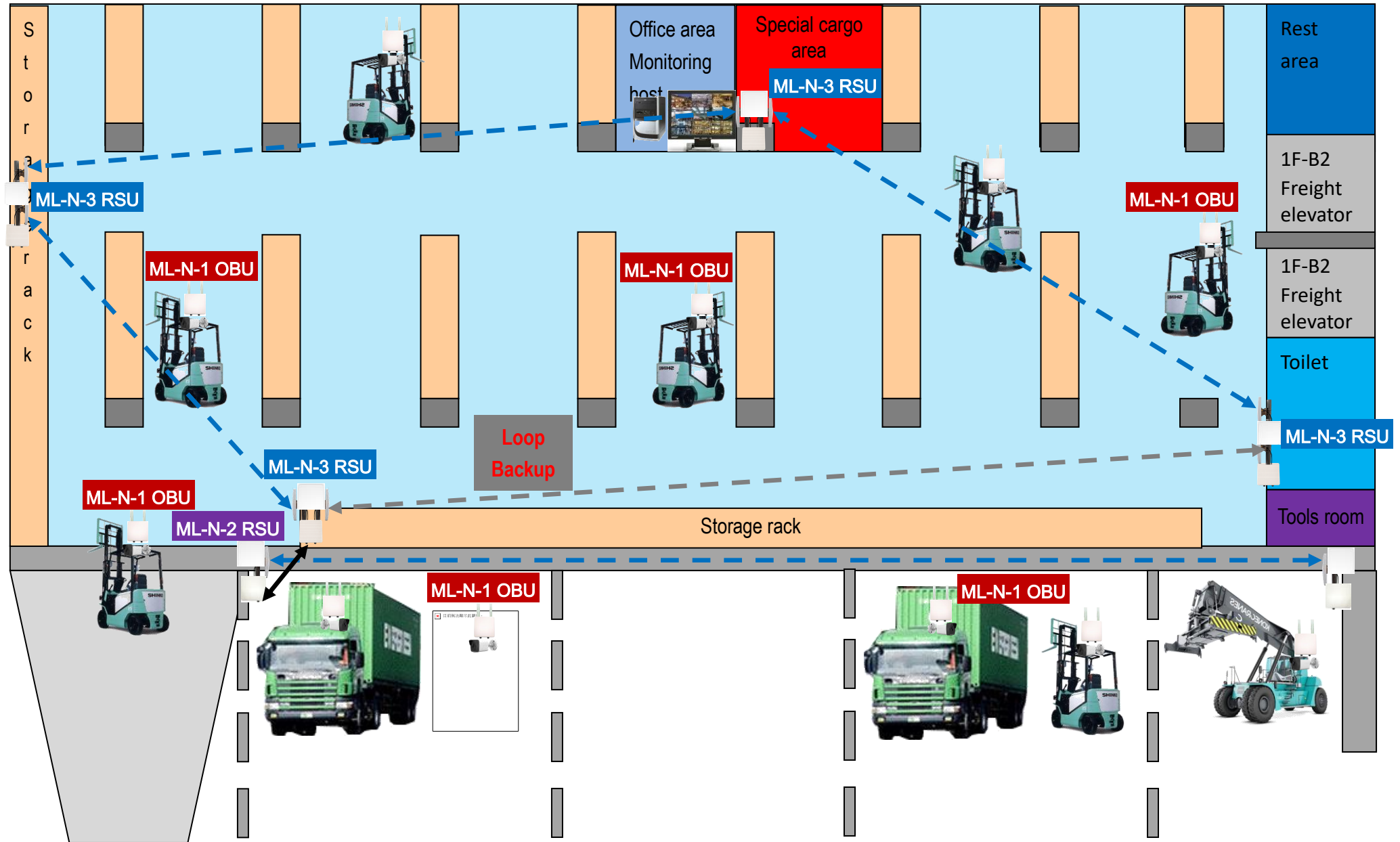
3. Outdoor Hi-mobile wireless connection transmission system planning: ML-N-1 OBU (Vehicle mobile terminal)



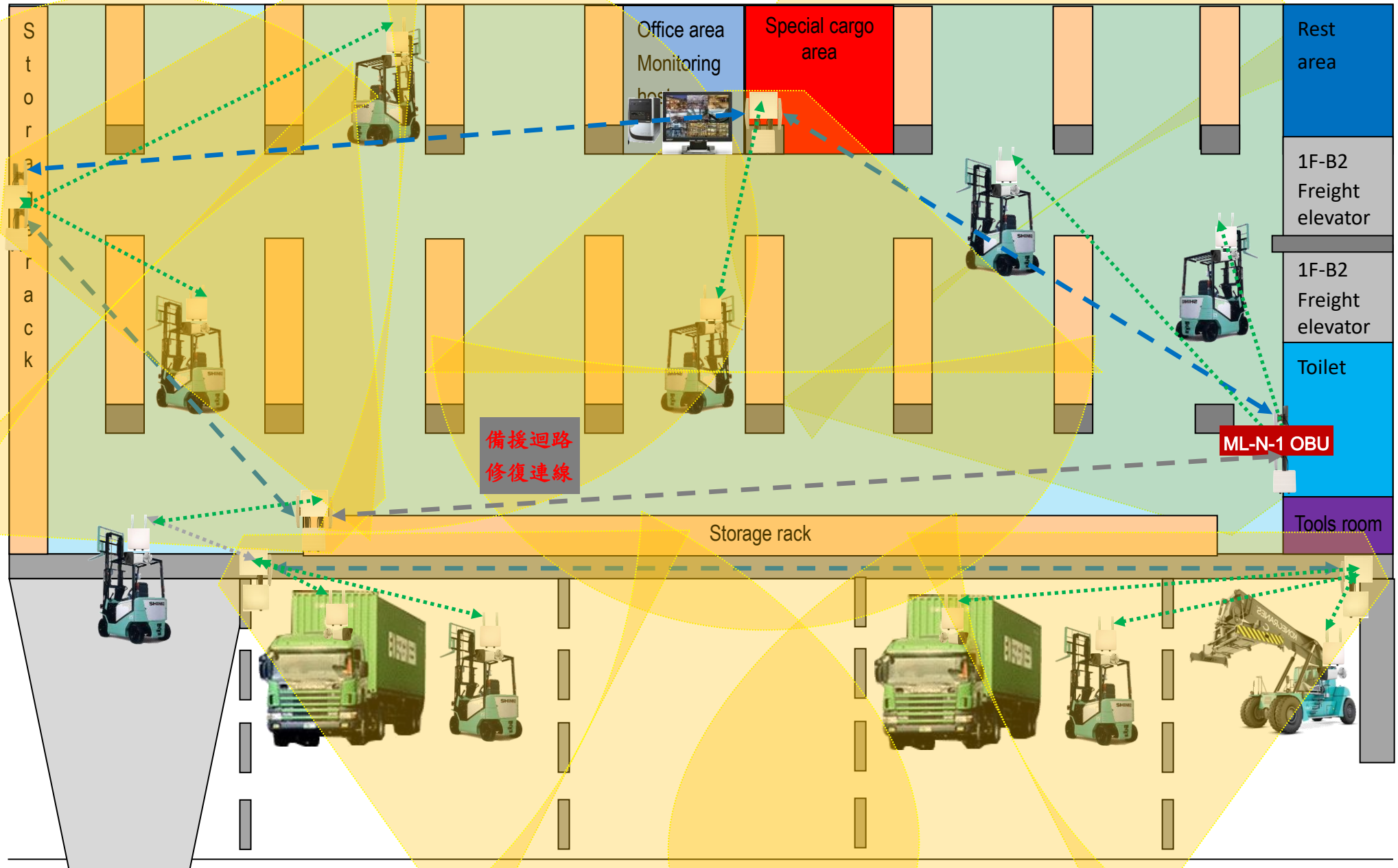
✘ Design description of high-speed mobile "vehicle mobile system":

- "Vehicle terminal" wireless mobile transmission: using OBU operation mode + dual-band Omni 360-degree antenna, and "blue" and "orange" RSU wireless signal coverage equipment for connection transmission
- Hi-mobile wireless transmission system, using PTP MESH type military encryption and dedicated software operation design for RSU coverage end and OBU vehicle end, truly provides the "best transmission path" that can connect multiple groups at the same time + "automatic smart selection connection Line"...and other functions.
- "Onboard OBU" can support 200Km/s vehicle speed transmission, 50-100Mbps transmission bandwidth, 20-50ms fast handover connection, resistance to general WiFi wireless equipment interference, military-like encryption... etc.
- Because the network backbone is a wired optical fiber network, it can provide up to 60 RSU wireless signal coverage at the same time = $60 * 50\text{Mbps} = 3000\text{Mbps}$ or more high-speed mobile wireless transmission bandwidth, easily achieve real-time mobile monitoring and detection data of the OBU vehicle mobile terminal Transmission of data.

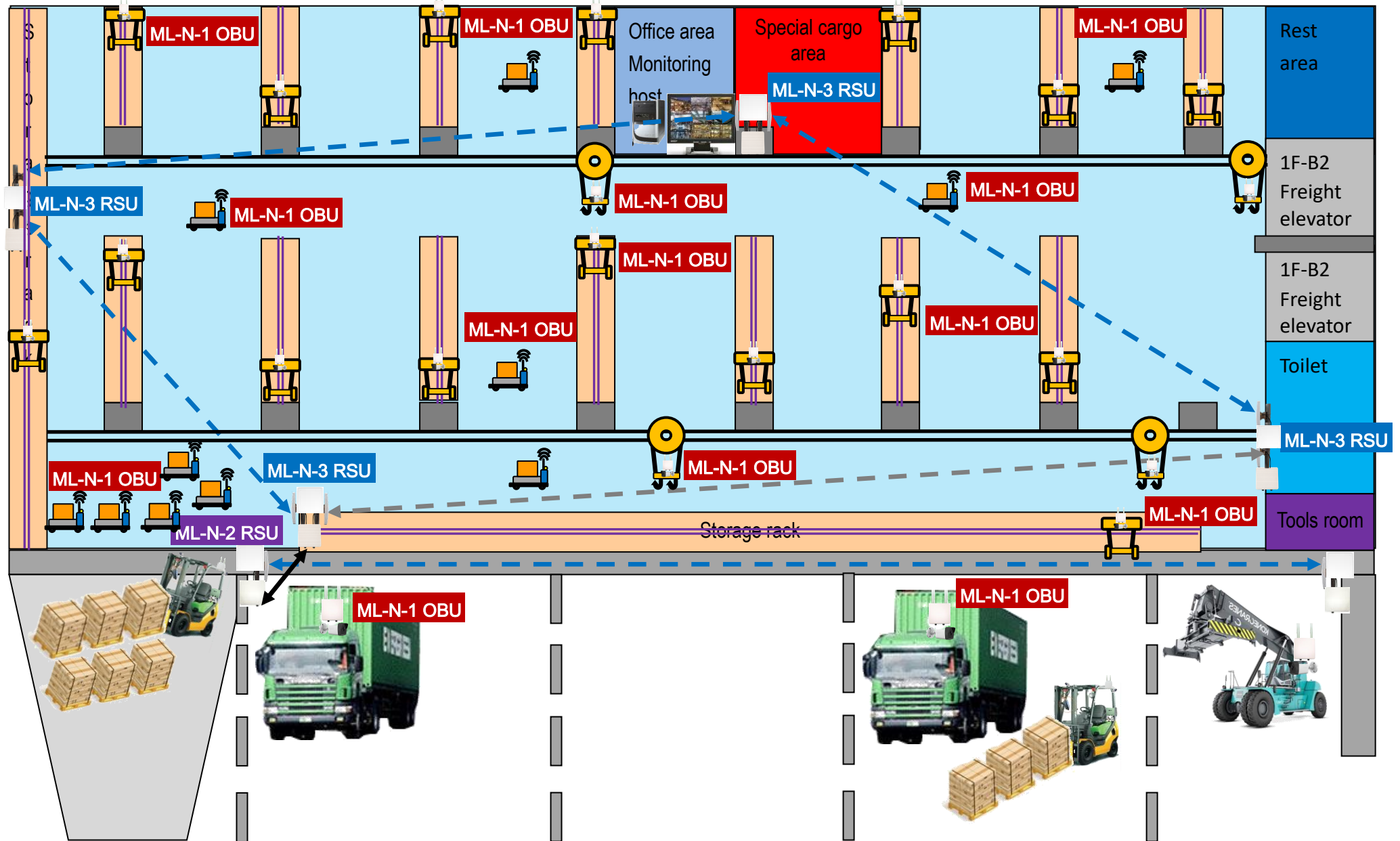
4. "Automatic storage area" Hi-mobile mobile wireless signal coverage and transmission system planning: **storage** **wireless mobile transmission backbone design**



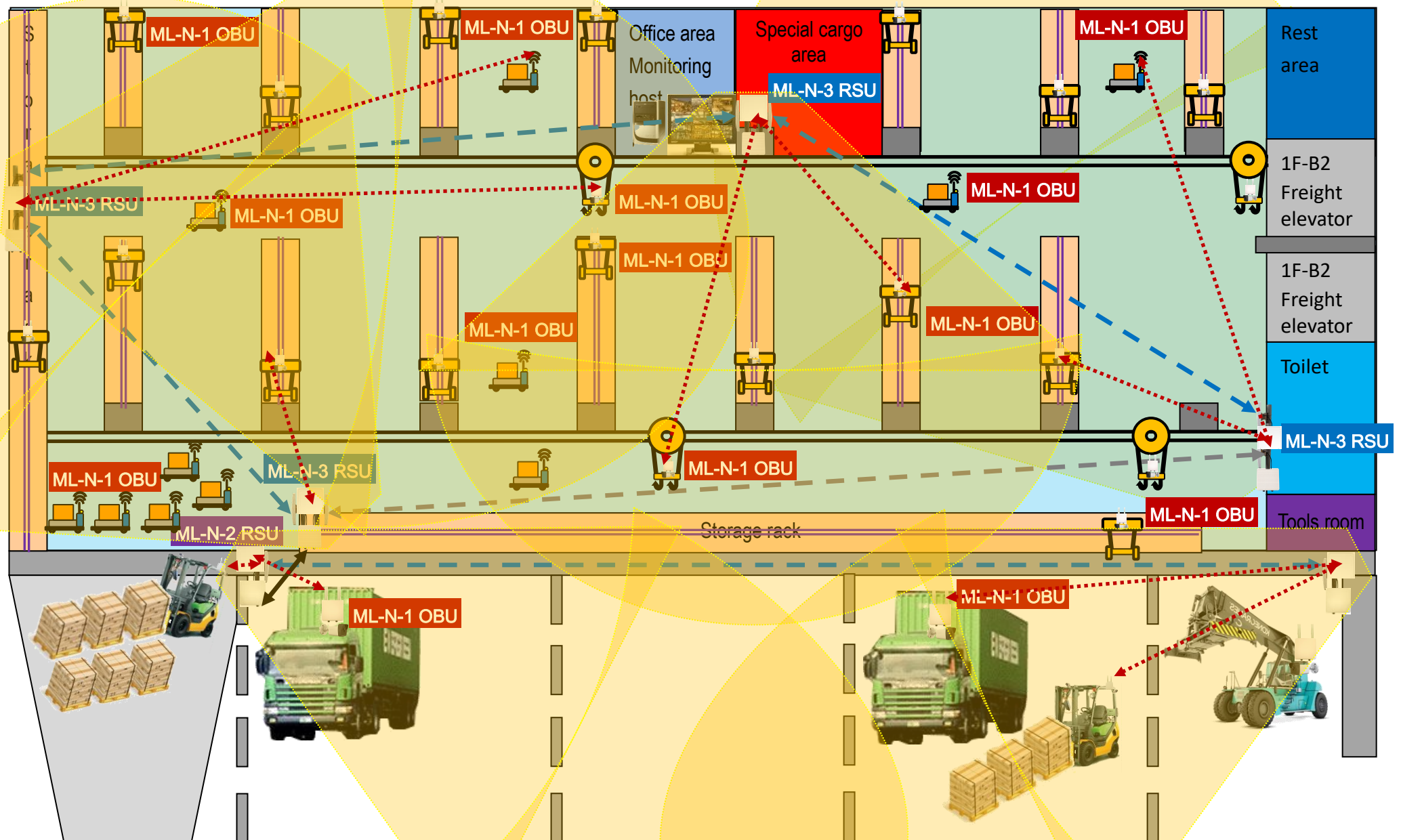
5. "Automatic storage area" Hi-mobile wireless signal coverage and transmission system planning: storage wireless mobile signal coverage and transmission design



6. "Automatic storage area" Hi-mobile wireless signal coverage and transmission system planning: storage and crane and inventory system application schematic design



7. "Automatic storage area" Hi-mobile wireless signal coverage and transmission system planning: high-speed mobile transmission of storage, crane and inventory system



8. Planning and design of stacker WiFi wireless mobile monitoring and data transmission system (including mobile DC UPS power supply system)

■ Graphical description of the WiFi wireless monitoring and data transmission system of the stacker



Stacker WiFi wireless monitoring and data transmission system

1. Equipment list:

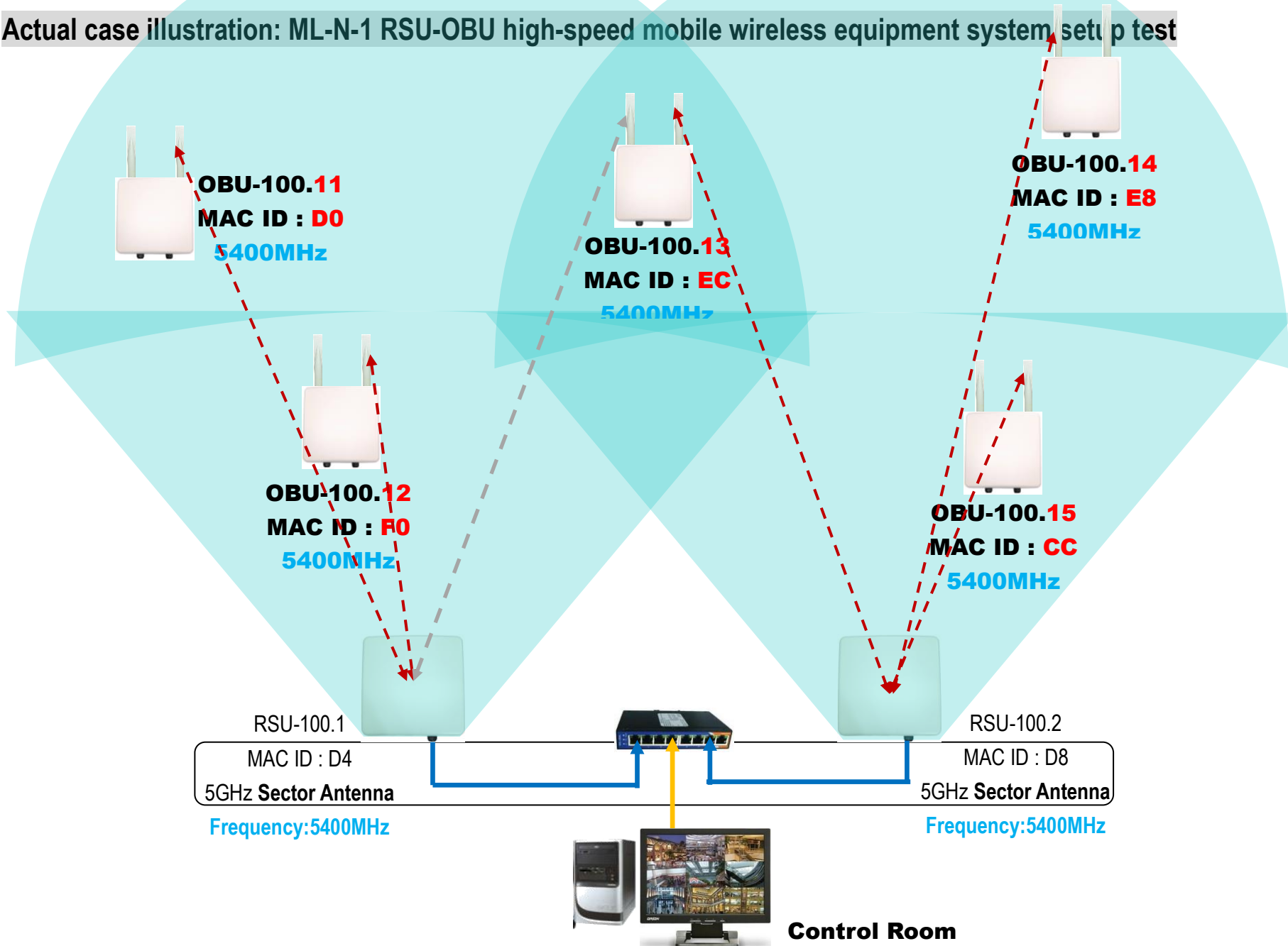
- Outdoor monitoring equipment (camera): 2 sets, power consumption 4W/H
- Online real-time video display (industrial host): 1 set, power consumption 15W/H
- Outdoor wireless device (802.11an): 1 set, power consumption 6W/H
- Outdoor DC UPS mobile power supply equipment: 1 set, power consumption 0.5W/H
- Outdoor PDU power controller: 1 unit, power consumption 4W/H
- Outdoor booster: 1 set, power consumption 1W/H
- Outdoor parallel power supply: 1 set, power consumption 0.5W/H

Total power consumption: $2 \times 4 + 15 + 6 + 0.5 + 4 + 1 + 0.5 = 35\text{W/H}$

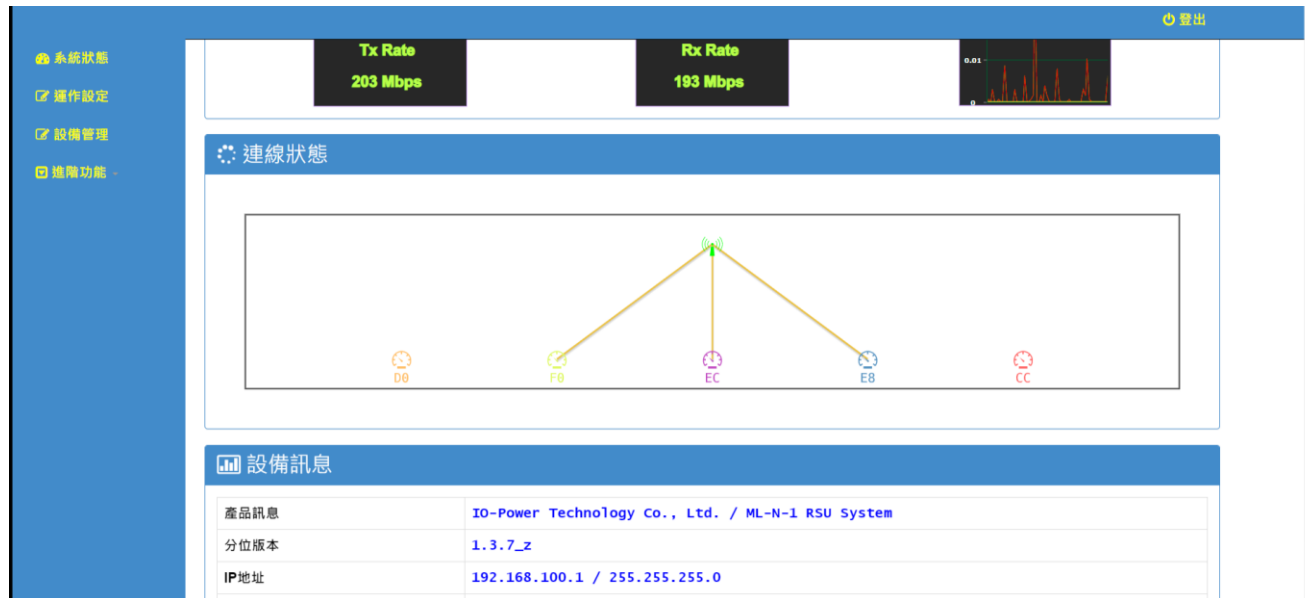
2. Outdoor high and low temperature resistant explosion-proof DC UPS mobile power capacity estimation:

- Designed to supply power for 8 hours (110% is a supplement of 10% of battery consumption after 3 years of use)
 - $(35\text{W/H} \times 8\text{H}) \times 110\% = 308\text{W}$
 - It is recommended to use $297\text{WH} (23.2\text{Ah} @ 12.8\text{V}) = 1.782\text{KV DC UPS system}$
- Designed to supply power for 16 hours (110% is supplemented by 10% of battery consumption after 3 years of use)
 - $(35\text{W/H} \times 16\text{H}) \times 110\% = 616\text{W}$
 - It is recommended to use $594\text{WH} (46.4\text{Ah} @ 12.8\text{V}) = 3.564\text{KV DC UPS}$

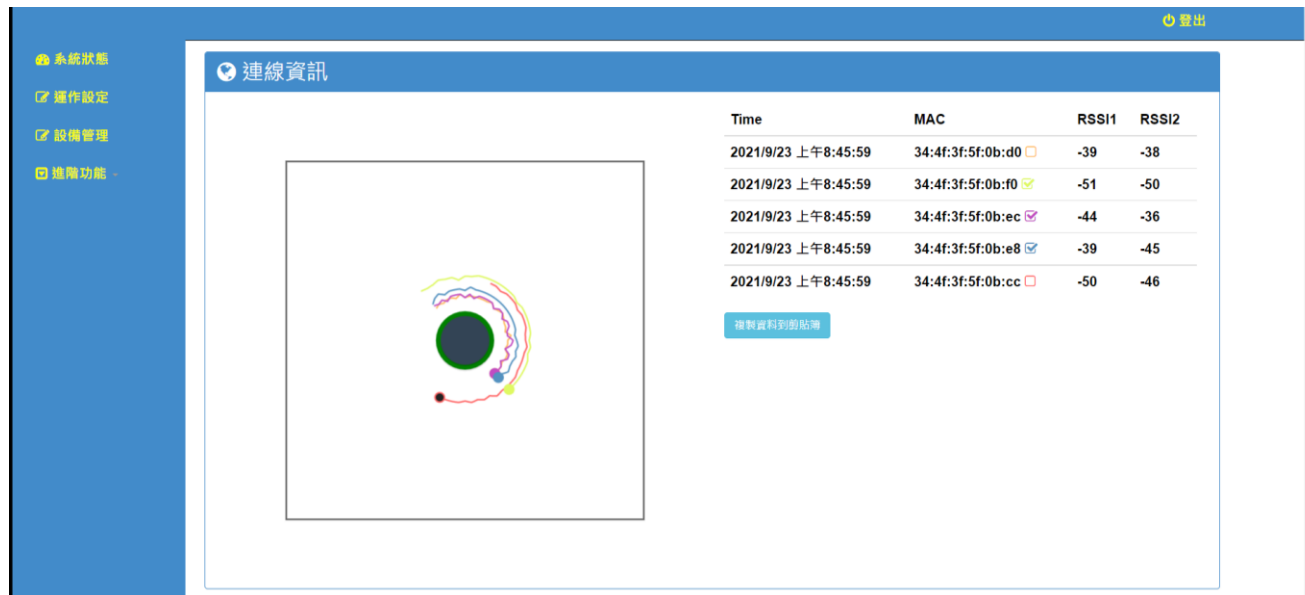
9. Actual case illustration: ML-N-1 RSU-OBU high-speed mobile wireless equipment system setup test



■ 192.168.100.1 – RSU – D4



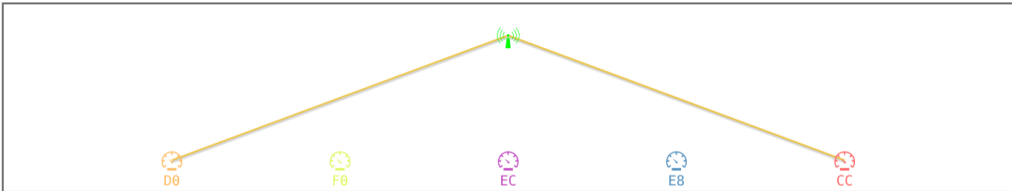
■ 192.168.100.2 – RSU – D8



- 系統狀態
- 運作設定
- 設備管理
- 連線功能

登出

連線狀態



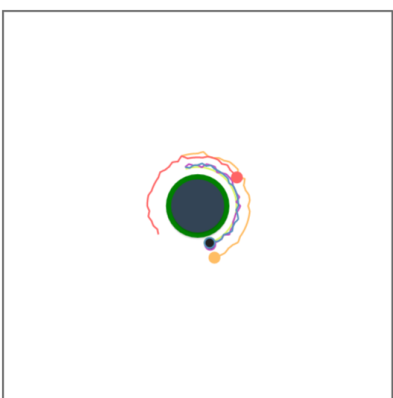
設備訊息

產品訊息	IO-Power Technology Co., Ltd. / ML-N-1 RSU System
分位版本	1.3.7_z
IP地址	192.168.100.2 / 255.255.255.0
MAC地址	34:4F:3F:5F:0B:D8
授權代碼	A3558E1C-CCF1-4055-A9F1-84732B7E35D5

- 系統狀態
- 運作設定
- 設備管理
- 連線功能

登出

連線資訊



Time	MAC	RSSI1	RSSI2
2021/9/23 上午8:46:59	34:4f:3f:5f:0b:d0 ☒	-44	-39
2021/9/23 上午8:46:59	34:4f:3f:5f:0b:f0 ☐	-37	-29
2021/9/23 上午8:46:59	34:4f:3f:5f:0b:ec ☐	-35	-34
2021/9/23 上午8:46:59	34:4f:3f:5f:0b:e8 ☐	-33	-34
2021/9/23 上午8:46:59	34:4f:3f:5f:0b:cc ☒	-37	-40

複製資料到剪貼簿

Form No. : IOP-OAPA-001-001

11 / 13

Retention date : 6Years

■ 192.168.100.11 – OBU – D0

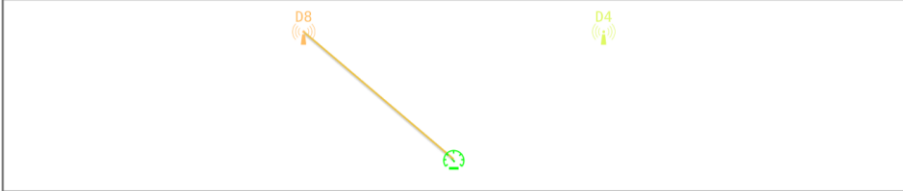
系統狀態

運作設定

設備管理

進階功能

登出



設備訊息

產品訊息	IO-Power Technology Co., Ltd. / ML-N-1 OBU System
分位版本	1.3.7_z
IP地址	192.168.100.11 / 255.255.255.0
MAC地址	34:4F:3F:5F:0B:D0
授權代碼	7C3FD083-6226-4739-913C-4303CB07A94F

系統狀態

運作設定

設備管理

進階功能

登出

連線資訊



Time	MAC	RSSI1	RSSI2
2021/9/23 上午8:48:35	34:4f:3f:5f:0b:d8	-44	-38
2021/9/23 上午8:48:36	34:4f:3f:5f:0b:d8	-44	-38
2021/9/23 上午8:48:37	34:4f:3f:5f:0b:d8	-44	-38
2021/9/23 上午8:48:38	34:4f:3f:5f:0b:d8	-44	-38
2021/9/23 上午8:48:39	34:4f:3f:5f:0b:d8	-44	-38
2021/9/23 上午8:48:40	34:4f:3f:5f:0b:d8	-44	-38
2021/9/23 上午8:48:41	34:4f:3f:5f:0b:d8	-44	-38
2021/9/23 上午8:48:42	34:4f:3f:5f:0b:d8	-44	-38
2021/9/23 上午8:48:43	34:4f:3f:5f:0b:d8	-44	-38

複製資料到剪貼簿

■ 192.168.100.12 – OBU – F0

- 系統狀態
- 操作設定
- 設備管理
- 進階功能

登出

連線狀態



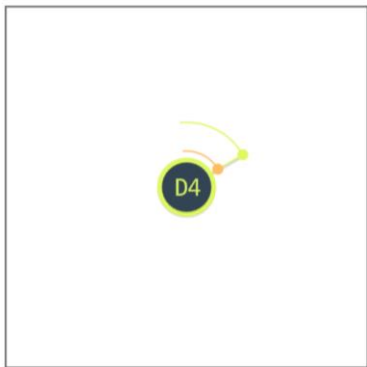
設備訊息

產品訊息	IO-Power Technology Co., Ltd. / ML-N-1 OBU System
分位版本	1.3.7_z
IP地址	192.168.100.12 / 255.255.255.0
MAC地址	34:4F:3F:5F:0B:F0
授權代碼	DA4D8F0A-4606-4AE7-953D-E1D0D13181BE

- 系統狀態
- 操作設定
- 設備管理
- 進階功能

登出

連線資訊



Time	MAC	RSSI1	RSSI2
2021/9/23 上午8:50:39	34:4f:3f:5f:0b:d4	-50	-49
2021/9/23 上午8:50:40	34:4f:3f:5f:0b:d4	-50	-49
2021/9/23 上午8:50:41	34:4f:3f:5f:0b:d4	-50	-49
2021/9/23 上午8:50:42	34:4f:3f:5f:0b:d4	-50	-49
2021/9/23 上午8:50:43	34:4f:3f:5f:0b:d4	-50	-49
2021/9/23 上午8:50:44	34:4f:3f:5f:0b:d4	-50	-49
2021/9/23 上午8:50:46	34:4f:3f:5f:0b:d4	-50	-49
2021/9/23 上午8:50:47	34:4f:3f:5f:0b:d4	-50	-49
2021/9/23 上午8:50:48	34:4f:3f:5f:0b:d4	-50	-49
2021/9/23 上午8:50:49	34:4f:3f:5f:0b:d4	-50	-49
2021/9/23 上午8:50:50	34:4f:3f:5f:0b:d4	-50	-49

[複製資料到剪貼簿](#)