

ADVANTECH

Enabling an Intelligent Planet

EKI-6333AH-1FPO-NA

**Filling the long-range wireless Ethernet gap
between Typical Wi-Fi and LoRaWAN**

Industrial Wireless and Sensing
ICWG, IOT Automation

Edge Computing &
AI-Powered WISE Solutions



Product Positioning

Wi-Fi HaLow is a long-range wireless Ethernet bridge for PLC, remote I/O, and industrial sensors where cabling or typical Wi-Fi coverage is difficult

Typical Wi-Fi

- High bandwidth and low latency for PLC, video, AGVs, and other data-intensive applications.
- Coverage and wall penetration are limited in obstacle-heavy environments.

Longer
Distance

Wi-Fi HaLow

Sub-GHz wireless Ethernet designed for **longer reach, better penetration, and mid-to-high bandwidth** for PLC, remote I/O, and Modbus TCP traffic.

Target application:

- Temperature & Humidity
- Pressure
- Leak
- Vibration
- Equipment status

Product Positioning:

Wi-Fi HaLow: Extending Wi-Fi-style IoT Coverage

Best fit: User already using Wi-Fi systems, but needing longer reach for sensors, PLC bridges, and remote OT assets

Bandwidth

Typical Wi-Fi
High bandwidth
short-to-medium range

Longer reach than Wi-Fi
Higher bandwidth than LoRaWAN

Wi-Fi HaLow
Mid-high bandwidth
long range

LoRaWAN
Low bandwidth
long range

Distance / Penetration

LoRaWAN value
Longer reach + lower power

+

Wi-Fi value
IP-native + familiar networks

=

Wi-Fi HaLow scenario
Wi-Fi users needing longer-distance IoT

Technical requirement	Typical Wi-Fi	Wi-Fi HaLow	LoRaWAN
Ultra-low power	Limited	Balanced	Excellent
Long-range coverage	Limited	Excellent	Excellent
High bandwidth	Excellent	Balanced	Limited
Massive node density	Balanced	Balanced	Excellent
IP-native architecture	Excellent	Excellent	Limited
Real-time capability	Balanced	Balanced	Limited
Direct OT device connectivity	Excellent	Balanced	Limited

Full-Site Wireless Deployment Strategy

LoRaWAN

Outdoor utilities | Low data rate



Best for battery-powered, low-frequency sensing across wide outdoor areas.

Typical data: meter values, tank level, leak alarm, simple status.



Gateway: WISE-6610 V2
I/O Node: WISE-4610 Series
Vibration Sensor: WISE-2410

Wi-Fi

Factory area | Shorter indoor coverage



Best where IT infrastructure already exists and data volume is high.

Typical data: IAQ, occupancy, camera/video, real-time environmental data.



AP: EKI-6333 Series
I/O Node: WISE-4000/4250 Series

Wi-Fi HaLow

Large factory / warehouse | Longer range



Best for one AP reaching multiple remote industrial nodes across a wider factory, warehouse, or sub-fab area.

Typical data: Temperature & Humidity, pressure, leak, vibration, equipment status.



AP/Node: EKI-6333AH-1FPO-NA

Product Feature: EKI-6333AH-1FPO-NA

902–928 MHz

NA frequency band

1 × RJ45

Fast Ethernet

IP67

Outdoor design



Item	Specification
Wi-Fi standard	IEEE 802.11ah Wi-Fi HaLow
Operation modes	Access Point / Client / Bridge / Mesh
Data rate	150 Kbps – 15 Mbps
Antenna	1 × Type-N antenna connector
Power	IEEE 802.3af/at PoE, or PoE 12–36 VDC input
Configuration	Web browser, Linux-based platform

1. Longer Reach

Sub-GHz is better suited to long distance and obstacle-rich environments, reducing the need for extra APs or new cabling.

2. Ethernet Extension

Convert Ethernet links from PLCs, IPCs, remote I/O, or switches into wireless links without redesigning the customer’s application architecture.

3. Mesh Flexibility

When direct links are limited by floors, walls, or machine obstacles, mesh can extend coverage through relay nodes.

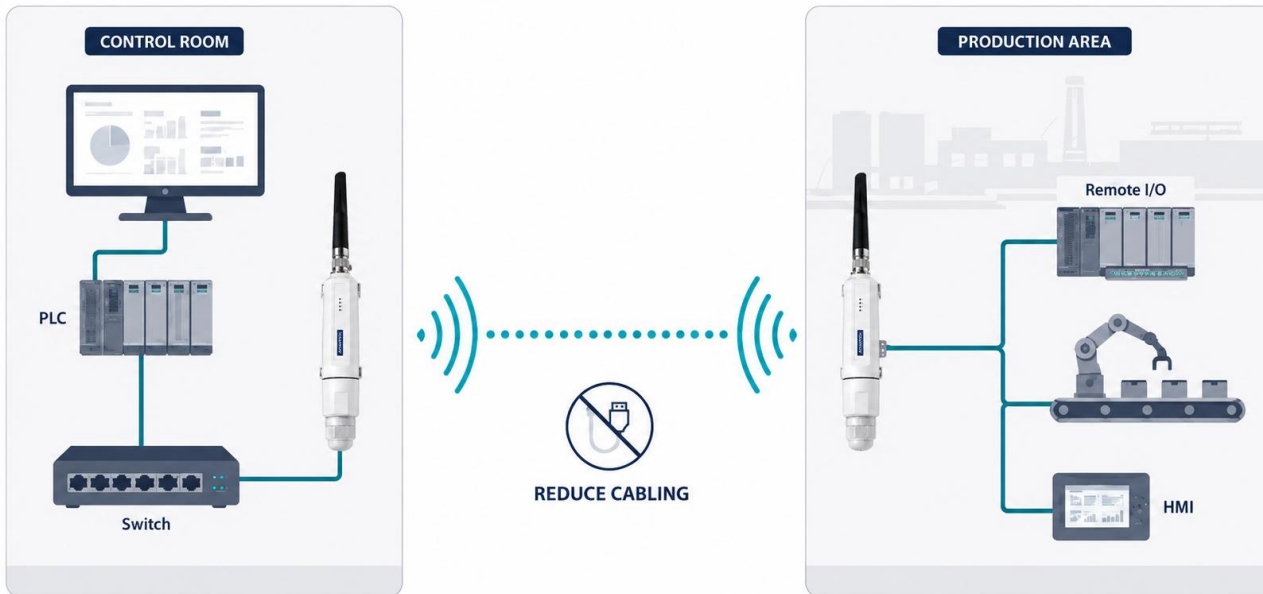
4. Industrial Deployment

Type-N antenna, PoE, IP67 design, and web-based configuration support fast PoC and field integration.

Target Applications

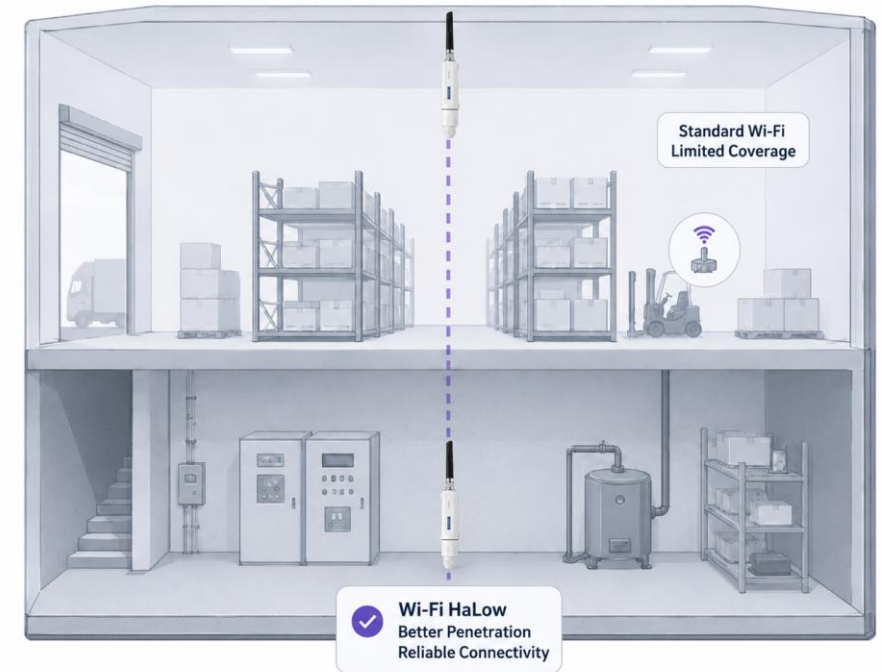
PLC / Remote I/O Bridge

Bridge PLCs, gateways, and remote I/O with stable Ethernet-class data



Warehouse/Basement Connectivity

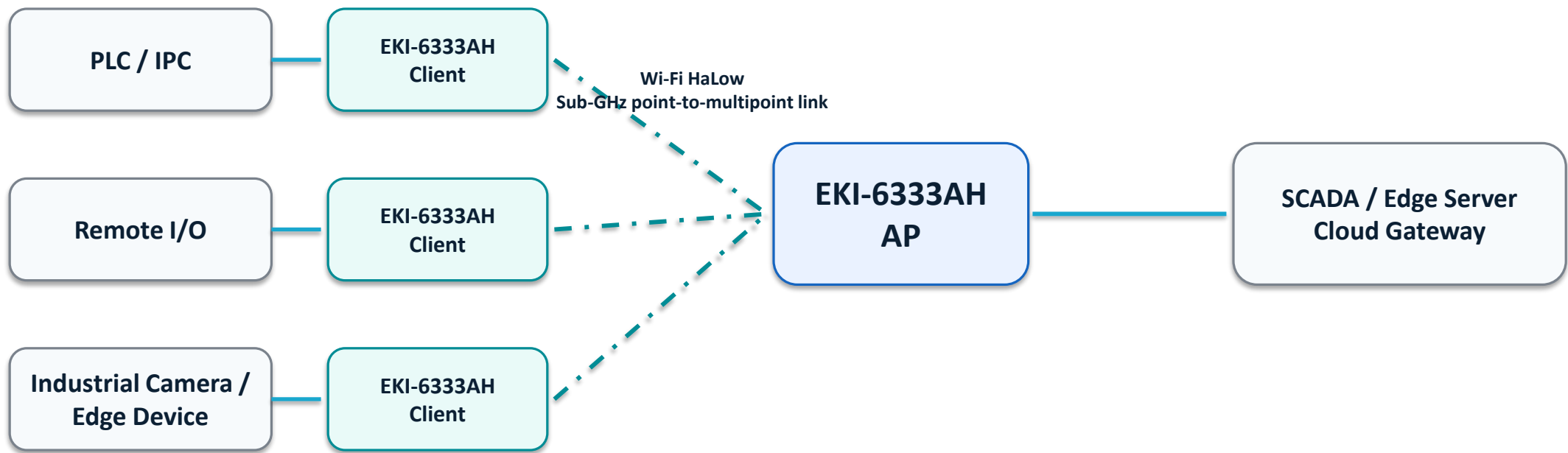
Improve connectivity in obstacle-heavy or hard-to-wire areas



Typical Architecture: One AP Serving Multiple HaLow Clients

Wireless Ethernet bridge for multiple field devices

One EKI-6333AH AP can connect to multiple EKI-6333AH clients in a point-to-multipoint deployment.

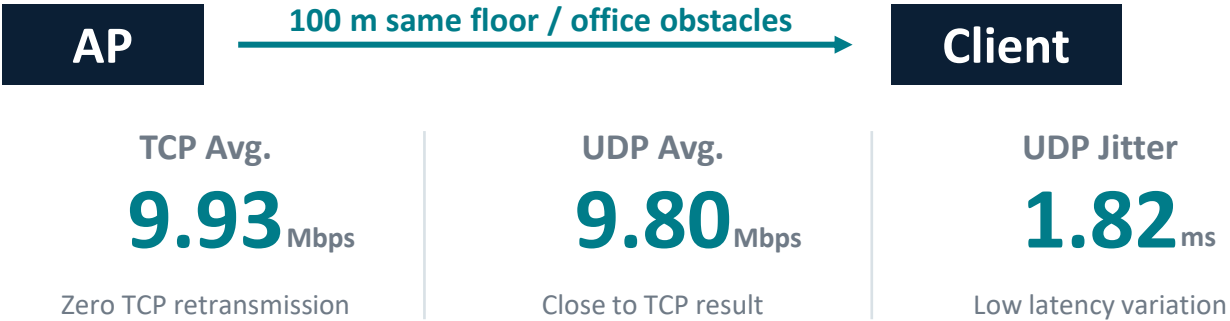


Customer pain point	HaLow value
Long cable runs are expensive	One AP can cover multiple clients and reduce cable work
Conventional Wi-Fi coverage may be limited in large, obstructed areas	Sub-GHz improves deployment margin and penetration
Existing systems already use Ethernet/IP	No protocol translation is required in basic bridge use cases

Office Field Test: 100 m P2P Ethernet over Wi-Fi HaLow

P2P / AP-Client baseline

Same-floor office validation: one EKI-6333AH as AP and one as Client, tested with 60-sec iPerf TCP/UDP traffic.

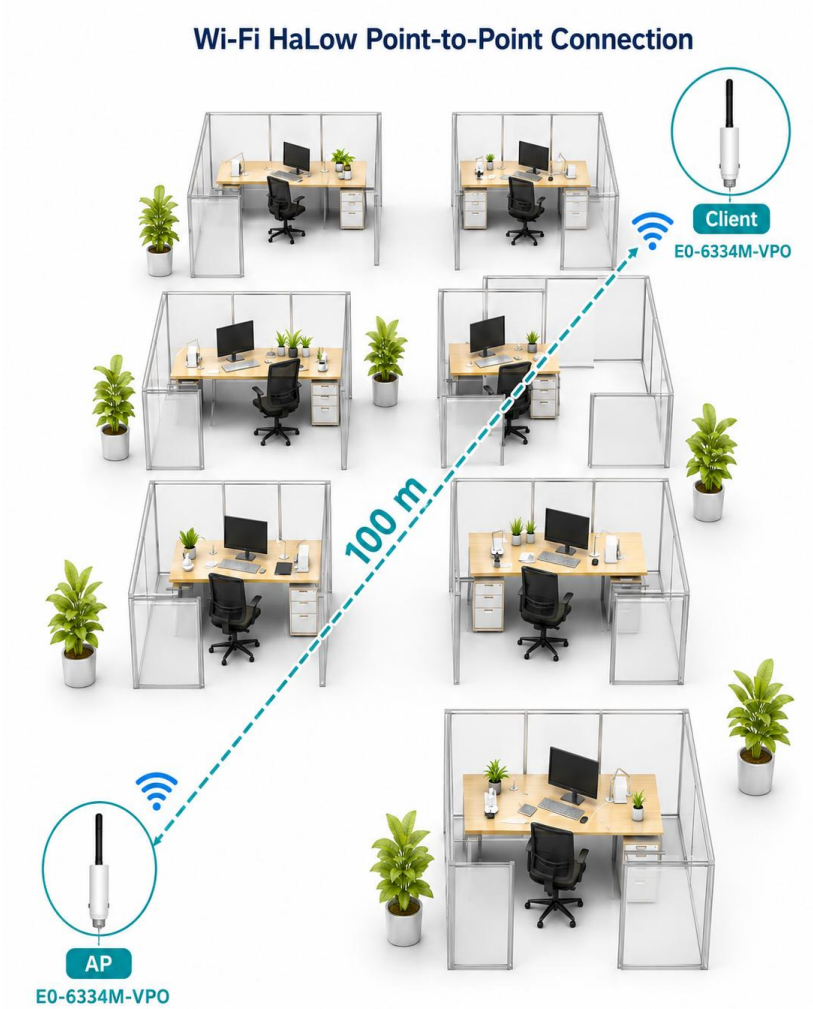


Test Setup

Item	Input / Result
Mode	AP-Client / Point-to-Point
Device	EKI-6333AH-1FPO × 2
Environment	Same floor office
Distance	100 m
Traffic tool	iPerf TCP + UDP
Test duration	60 sec

Interpretation Suitable baseline for Ethernet extension where cabling is difficult and typical 2.4/5 GHz Wi-Fi coverage is limited.

💡 Insight: : EKI-6333AH-1FPO delivered practical ~10 Mbps Ethernet-class connectivity over 100 m in a same-floor office AP-Client test.



Cross-Floor Mesh Test: 4F to 6F via 1-Hop Relay

802.11s Mesh / cross-floor validation

Objective: Validate whether EKI-6333AH can extend Ethernet connectivity across floors when a direct point-to-point link is affected by structural obstruction.

Scenario: AP on 4F → mesh relay → client on 6F

TCP

2.62 Mbps

end-to-end avg.

UDP

8.5 Mbps

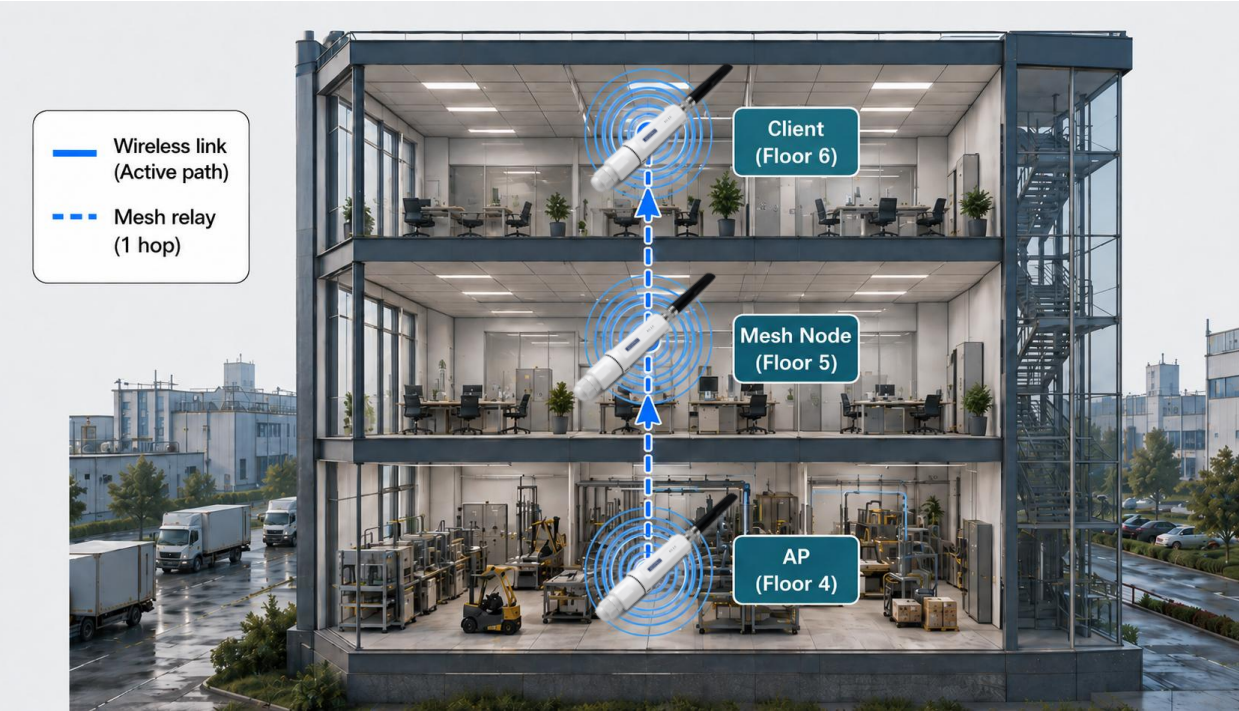
avg. throughput

Jitter

2.43 ms

low variation

Test item	Input / Result
Topology	AP → Mesh Node → Client
Floors	Floor 4 to Floor 6
Hop count	1 hop
Traffic tool	iPerf TCP / UDP, 60 sec
Measured result	TCP 2.62 Mbps / UDP 8.5 Mbps
Jitter / loss	2.43 ms jitter / ~14% UDP loss
TCP stability	0 TCP retransmits



Insight: Even with UDP packet loss in mesh mode, the available bandwidth remains well above the requirement for typical IIoT payloads such as DI/DO/AI signals, alarms, and machine status data.

Use Case: Mobile Chicken Coop Farm

Location: USA

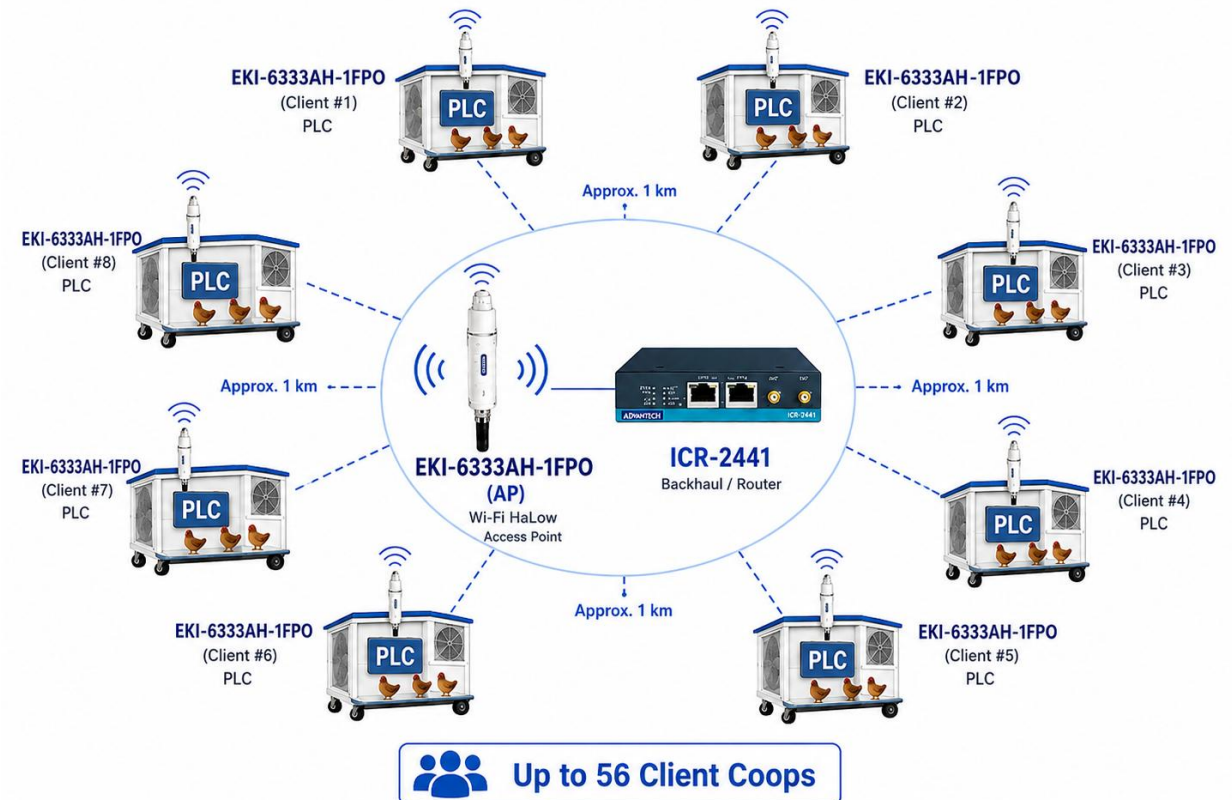
Wi-Fi HaLow for long-distance Ethernet-class connectivity across moving farm assets

Customer scenario

- **Site** Flat farm, approx. 1km square / up to 500 acres
- **Nodes** ~56 mobile chicken coops moving daily
- **Payload** PLC sensor data back to local monitoring point
- **Pain point** LoRaWAN bandwidth is insufficient; legacy Wi-Fi bridge vendor support risk

Wi-Fi HaLow Farm Architecture

Central AP with Surrounding Client Coops



Why HaLow fits?



Wi-Fi HaLow can extend Ethernet-class connectivity to distributed mobile assets where LoRaWAN lacks bandwidth and typical Wi-Fi bridges require more infrastructure

Order information



EKI-2705G-1GP

4GE PoE+1GE, Unmanaged Ethernet Switch,
IEEE802.3af/at, 24~48VDC, -40~75°C



EKI-6333AH-1FPO

Industrial 802.11ah Wi-Fi AP/Client (902-928MHz)

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