



We connect the wireless world.

From Antennas to Solutions

- Whayu HaLow Router Series

Wha Yu Industrial 2026.06

LTE HaLow Industrial Outdoor Router

MOI4231

Outdoor LTE HaLow Industrial Router MOI4231

OS	Linux (OpenWRT)
Platform	Mediatek MT7621A SPI NOR Flash 64MB DDR3 RAM 512MB
Modem	LTE CAT-4 Ant. N-type RF connector *2 SIM socket x1
Ethernet	1 * GE RJ45 port with 2 LEDs supporting 802.3at PoE PD
WiFi HaLow 802.11ah	802.11ah(US/JP/EU) Frequency Band: Sub-1GHz SISO 1x1
Button	Reset button x1
LED indicators	1* RGB LED • Power LED • Wi-Fi HaLow • 4G LTE Ethernet port with 2 LEDs in RJ45 Jack
Power input	RJ45 port supporting 802.3at PoE PD
Temperature	Operating -30 ~ 70°C , Storage -30 ~ 85°C
Enclosure Size	254.7 x 160 x 79.5 mm (IP67)
Accessory	LTE Ant x2 , WiFi HaLow Ant x1 Pole/Wall mounting kits (option)



■ LTE-Enhanced Outdoor Connectivity

LTE provides a reliable cloud backhaul and enables seamless remote management for massive HaLow IoT networks deployed in harsh outdoor environments.

■ Global Antenna Coverage

Wideband 863–930MHz support ensures seamless HaLow deployments across the US, EU, and Japan.

■ Rugged IP67 Protection

The IP67-rated enclosure with surge and ESD protection withstands harsh conditions, ensuring reliable, year-round operation.



MOI4231 Accessory – Antenna, Mounting Kits



LTE Outdoor Antenna*2



Omni Outdoor HaLow Antenna*1

- 839~930MHz
- 2.5dBi



GNSS Outdoor Antenna*1

- 1559-1608MHz
- Gain@ 5V, dB: 38±4

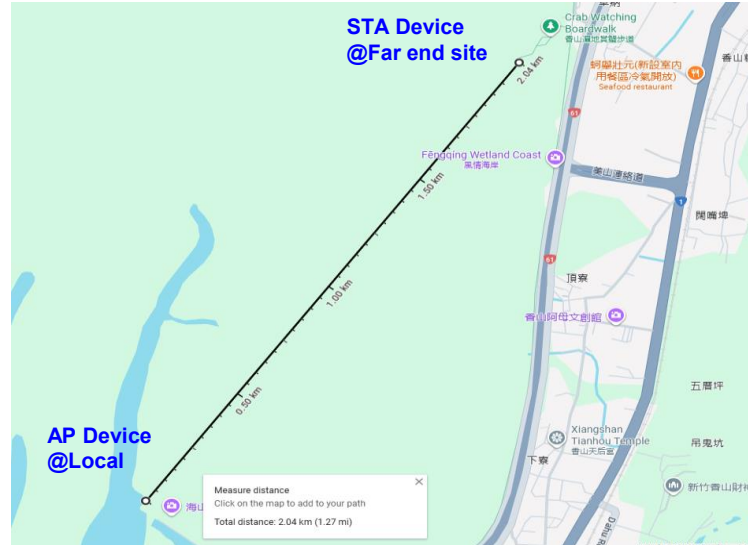
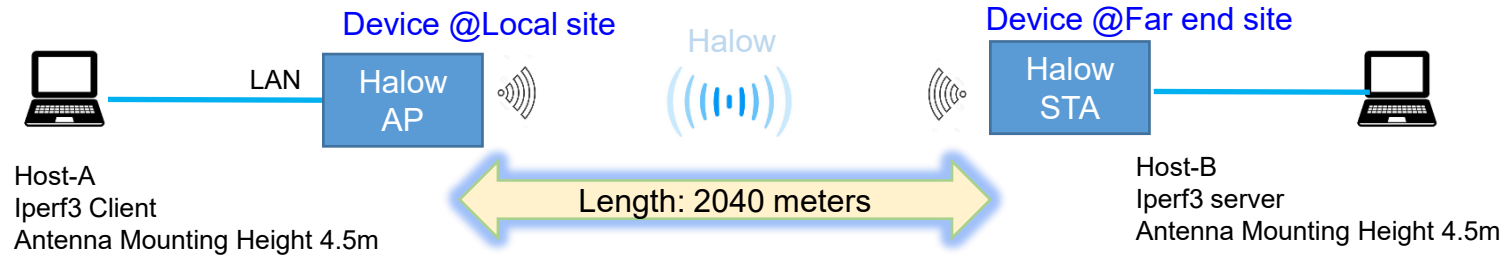


Wall Mounting Kits



Pole Mounting Kits

MOI4231 Halow OTA Range Test @ 2.04km



HaLow sku: US module

Distance(m)	Bandwidth (MHz)	Model	Ch_No	Link Rate(RX/TX) AP view	Signal (dBm) AP view	TCP (Mbps) AP TX	TCP (Mbps) AP RX	UDP (Mbps) AP TX	UDP (Mbps) AP RX
2040	8	MOI4231	12	19.5/13.0	-80	9.18	9.3	10.3	9.62

LTE HaLow Industrial Indoor Router

MII42A1

MII42A1 Indoor LTE Gateway Router



OS	Linux (OpenWRT)
Platform	Mediatek MT7621A NOR Flash 64MB DDR3 RAM 512MB
Modem	LTE CAT-4 Ant. SMA RF connector x2 SIM socket x2 with cover having security screw
Ethernet	RJ45 1Gbps WAN port x1/ LAN RJ45 port x1
WiFi HaLow 802.11ah	802.11ah (US/JP/EU) Frequency Band: Sub-1GHz SISO 1x1
RS485/RS232	RS485/RS232 (SW configurable) terminal block with D+/D-/GND x1
DI/DO	DI (Non-isolated) x1, DO (Non-isolated) x1
Button	Reset button x1
LED indicators	Power LED x1, Ethernet port LEDs (Green) in RJ45 Jack WiFi active LED x1 LTE activate LED x1 Failover active LED x1 HaLow active LED x1
Power input	DC 9V~60V terminal block & Power Jack for DC12V PSU input
Temperature	Operating -30 ~ 70°C , Storage -40 ~ 85°C
Enclosure Size	140*121.3*32.5mm (IP30)
Accessory	LTE Ant x2, WiFi Ant x2, HaLow Ant x1, GPS Ant x1, terminal block plug 9pin.
Installation	Desktop, Wall mounting(Optional), DIN-rail mounting(Optional)

■ LTE-Enhanced HaLow Connectivity

LTE strengthens HaLow by enabling remote management of multiple HaLow devices, providing seamless cloud connectivity, and serving as a reliable backhaul for IoT data transmission.

■ Supports dual-band Wi-Fi

2.4GHz/5GHz, IEEE 802.11n/ac and long-range, low-power IEEE 802.11ah (HaLow).

■ Flexible industrial I/O

RS-232/RS-485 (SW configurable) and DI/DO.

■ Dual Micro SIM slots

Reliable cellular connectivity and automatic failover.



6 Floor Full Coverage — HaLow Penetration Test



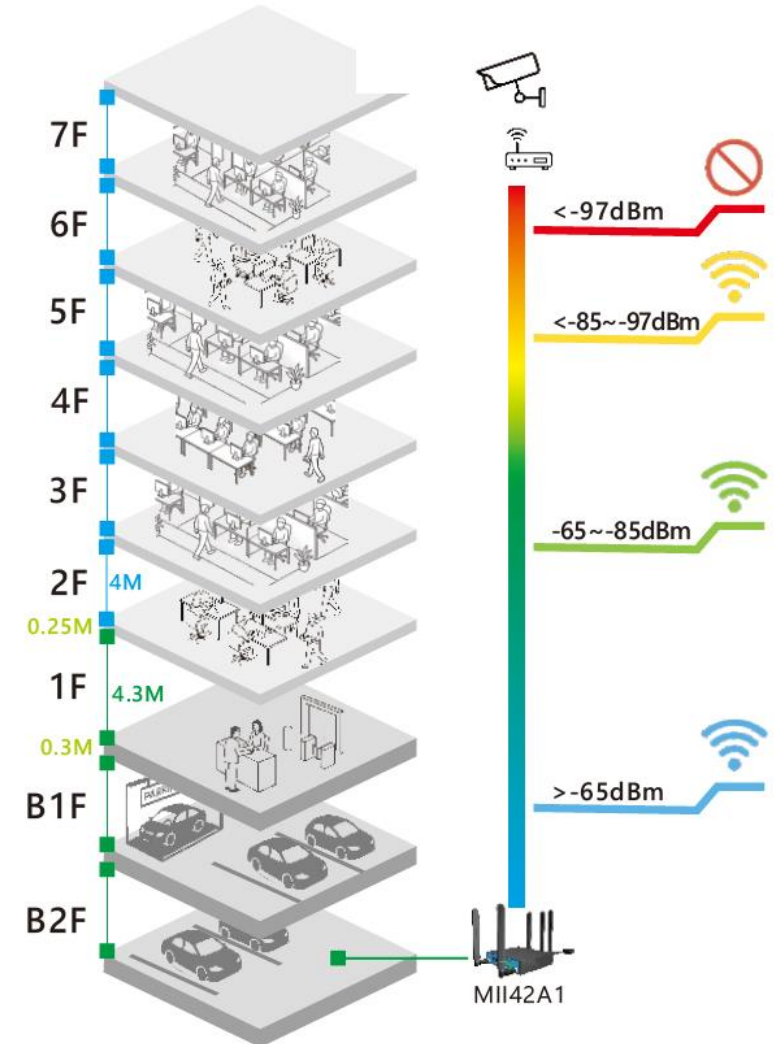
✓ Extreme Floor Penetration

Reliably transmits data by pushing the signal from the basement (B2F) straight up to the 5th floor (5F), overcoming massive concrete barriers.

✓ Dynamic Bandwidth Optimization

Adpated scales from an 8MHz at close range down to 1MHz at the furthest edge to ensure connection survival.

Level	Location	Operating Bandwidth (MHz)	Link Rate (RX/TX)	Signal (dBm)	TCP/RX (Mbps)	TCP/TX (Mbps)	UDP/RX (Mbps)	UDP/TX (Mbps)	Remark
1	B1F	8MHz	32.5/32.5	-51	16.1	17.5	17.7	22	
2	1F	8MHz	32.5/26	-70	12.9	12.6	13.1	19.7	
3	2F	8MHz	6.5/6.5	-84	5.16	5.94	5.05	5.09	
4	3F	8MHz	0.75/0.675	-89	0.153			0.651	
4	3F	1MHz(ch11)	1.376/0.390	-94	0.811	0.776	0.762	0.845	Limitation of operating bandwidth changed from 8MHz to 1MHz.
6	5F	1MHz(ch11)	0.619/0.342	-95	0.572	0.497	0.043	0.013	



RS485/RS232 HaLow Converter

CII0031

RS485 HaLow Converter – CII0031

OS	FreeRTOS
Platform	MCU STM32U585RI HaLow MM6108
WiFi HaLow 802.11ah	802.11ah(US/JP/EU) Frequency Band: Sub-1GHz SISO 1x1
Interface	1 x RS485/RS232 [D+(RX)/D-(TX)/GND, Non-Isolated]
Button	Reset button x1
LED indicators	Yellow/Green/Red LED • Power LED • Wi-Fi HaLow
Power input	USB Type-C 5V/0.5A Terminal Block: 9 ~ 52VDC
Temperature	Operating -20 ~ 70°C , Storage -20 ~ 85°C
Enclosure Size	100 x 46 x 30 mm
Accessory	WiFi HaLow Ant x1



■ Seamless Industrial Bridging

Natively converts RS485/RS232 protocols to Wi-Fi HaLow networks, enabling instant remote monitoring for legacy sensors and controllers.

■ Reliable Edge Processing

Powered by an embedded MCU platform designed for highly efficient and dependable IIoT data management.

■ Simplified Setup & Flexible Power

Features a modern USB Type-C interface that simplifies installation and provides versatile power supply options.



Omni Indoor HaLow Antenna

- 863~928MHz
- peak gain: 2.1dBi



Thank You

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