RAH305 Wi-Fi HaLow Router



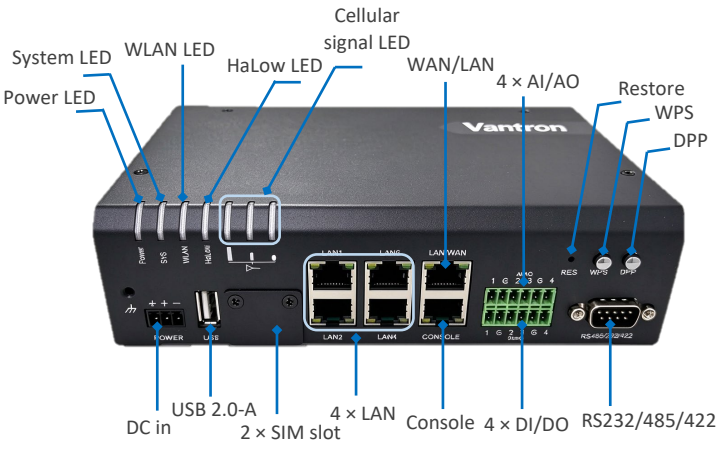
Product Brief

Powered by the advanced MM8108 Wi-Fi HaLow chipset, Vantron RAH305 redefines the long-range connectivity. Complying with the IEEE 802.11ah (Wi-Fi HaLow) standard and the latest WPA3 security protocol, it delivers exceptional kilometer-range wireless coverage with superior penetration through obstacles. This enables secure, massive connectivity for thousands of IoT devices across vast areas. It also supports traditional Wi-Fi 6, providing unparalleled deployment flexibility for large-scale industrial, agricultural, and smart city applications.

The RAH305 ensures always-on connectivity with integrated cellular backup, precise GNSS location tracking, and Bluetooth 5.3 support. Its wired connectivity includes five Gigabit Ethernet ports—one configurable WAN/LAN and four LAN—delivering robust network infrastructure. A comprehensive suite of industrial interfaces, including a USB 2.0 port, a DB9 serial port (configurable for RS232/422/485), and 4 × DI/DO and 4 × AI/AO channels, allows for seamless integration with a wide array of machinery, sensors, and legacy systems.

The RAH305 features WPS and DPP buttons for quick Wi-Fi 6 and Wi-Fi HaLow pairing. It supports AP mode for both Wi-Fi 6 and Wi-Fi HaLow, with the latter also supporting Mesh functionalities, facilitating resilient, scalable, and future-proof IoT network deployment.

Layout and Features



Left-side antennas (far → near): Cellular, HaLow, Cellular
Right-side antennas (far → near): Wi-Fi 6, GNSS, Wi-Fi 6

- Both Wi-Fi HaLow and Wi-Fi 6 supported
- 4 × LAN, 1 × WAN, 4G/5G, BT 5.3, GNSS
- Sub-1 GHz HaLow operating bands
- Extended communication coverage up to 1km
- Improved penetration through walls and obstacles
- AI/AO, DI/DO, USB, serial port for edge data transmission
- WPS & DPP support for quick Wi-Fi 6 & HaLow pairing
- Static routing, port mapping, QoS, and ACL support
- Optional BlueSphere GWM support for remote control

RAH305 Wi-Fi HaLow Router Datasheet

RAH305			
HARDWARE			
System	CPU	TI AM64 64-bit Arm® Cortex®-A53 microprocessor, up to 1GHz	
	Wi-Fi HaLow SoC	Morse Micro MM8108	
	Memory	512MB DDR4	
	Storage	8GB eMMC	
WLAN	Wi-Fi 6	Standard: IEEE 802.11ax/ac/b/g/n	
		Frequency range: 2.400GHz~2.4835GHz, 5.150GHz~5.850GHz (Subject to local regulations)	
		Channel bandwidth: 20/40/80MHz	
		Data rate: up to 1200Mbps @80MHz	
		Quick pairing: WPS quick pairing supported	
		Working mode: **AP, STA**	
	Wi-Fi HaLow	Standard: IEEE 802.11 ah	
		Frequency range: 903.5MHz~926.5MHz (US)	
		Channel bandwidth: 1/2/4/8MHz, dynamic channel selection (DCS) supported	
		Max. transmit power: 28.5 dBm (700 mW)	
		Data rate: up to 43.3 Mbps @8 MHz bandwidth	
		Application mode: Mesh, Bridge WAN	
		Quick pairing: DPP quick pairing supported	
		Working mode: **AP, Mesh**	
Bluetooth	Version	BT 5.3	
Cellular	Modem	4G/5G	
GNSS	Satellite Support	GPS, BeiDou, GLONASS, GALILEO, QZSS (A-GNSS supported)	
	Positioning Precision	2.5m (CEP50)	
I/O	Ethernet	5 × RJ45, 10/100/1000Mbps (1 × WAN/LAN, 4 × LAN)	
	Console	1 × RS232-to-RJ45 port	
	USB	1 × USB 2.0 Type-A	
	Serial Port	1 × RS485/232/422 (DB9)	
	DI/DO	4 × DI/DO (Software switchable, DI: 0-12V, DO: Follows device supply voltage)	
	AI/AO	4 × AI/AO (Software switchable, AI: 0-10V, AO: 4-20mA)	
	SIM Slot	2 × Micro SIM slot	
	Antenna	1 × Wi-Fi HaLow antenna	2 × Wi-Fi (6) antenna
		2 × Cellular antenna	1 × GNSS antenna

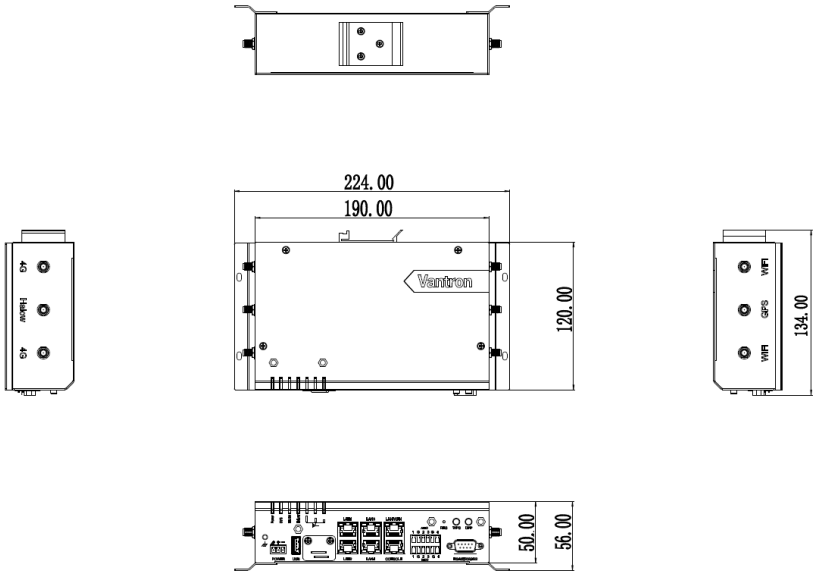
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System Control	LED indicators	1 × Power indicator	1 × Wi-Fi HaLow activity indicator
		1 × System indicator	1 × WLAN (Wi-Fi 6) activity indicator
		3 × Cellular signal strength indicator	
	Button	1 × Restore button (pinhole)	
		1 × WPS button (For Wi-Fi quick pairing)	1 × DPP button (For HaLow quick pairing)
Miscellaneous	RTC	Supported	
	WDT	Supported	
Mechanical	Enclosure Material	SGCC (Steel Galvanized Cold Commercial)	
	Dimensions	224mm × 134mm × 56mm	
	Installation	Wall mounting, DIN rail mounting	
Power	Input	9V ~ 36V DC	
	Port	3-Pin × 3.81mm terminal (Over-current protection, reverse polarity protection)	
Environmental Conditions	Temperature	Operating: -20℃~+60℃	Storage: -40℃~+70℃
	Humidity	Storage: 5%~95% RH (Non-condensing)	
Certification	Compliance	CE, FCC, ISED, PTCRB (In progress)	
	Carrier Certification	AT&T, Verizon, T-Mobile	

SOFTWARE			
Device Management	Operating System	Web-based VantronOS	
	Configuration	VantronOS, SSH, console, cloud-based BlueSphere GWM (Optional)	
	Remote Management	BlueSphere GWM (Optional)	
Routing & Network Reliability	Network Protocol	IPV4, HTTPS, TCP & UPD, NTP client and server, ARP, TLS	
	Link Detection & Report	Address: IP, URL	Protocol: ICMP, TCP, HTTP
	Failover	Auto routing	Network priority: Ethernet > Wi-Fi client > Cellular (Def.)
	Dual SIM	Dual SIM failover, automatic switch	
	NAT	Network address translation Supported	
	WAN Protocol	DHCP client, PPPoE, Static IP	
	IP Application	Ping, Traceroute, DHCP Server/Client, DDNS	
	IP Routing	Static routing	
Network Diagnostics	Statistics	Traffic data and up time at Ethernet WAN, Wi-Fi client WAN, cellular WAN Cellular and Wi-Fi signal strength; SIM card switch frequency	
	Health check	Usage of CPU, memory, disk; service running status Alarm on Ethernet/Wi-Fi/cellular hardware abnormality	
	Log	System log, diagnostic log; log export supported	
Security	Firewall	Stateful, whitelist control, ingress/egress filtering	
	Access Control	MAC address filtering, IP address filtering	
	VPN	OpenVPN, PPTP*, L2TP*, GRE*, IPSec*	
	Firmware Validation	SHA256 checksum	

* Function under development

Mechanical Outline



Ordering Information

Ordering No.	Memory	Storage	Description	Installation
RAH305	512MB	8GB	4 × LAN, 1 × WAN/LAN, cellular, Wi-Fi HaLow, Wi-Fi 6, BT 5.3, GNSS, AI/AO, DI/DO	Wall mounting, DIN rail mounting

Packing List			
RAH305 Wi-Fi HaLow router	1	12V 2A DC power adapter	1 kit
Wi-Fi HaLow antenna	1	DC power connector	1
2.4GHz/5GHz Wi-Fi antenna	2	2 × 6-pin × 3.81mm terminal connector	1
Cellular antenna	2	GNSS antenna	1

Since 2002 established by two Silicon Valley entrepreneurs, Vantron Technology has been a pioneer in connected IoT devices and IoT platform solutions. Today, Vantron is serving customers all over the world, including many Global Fortune 500 companies. The product lines cover intelligent edge hardware, IoT communication devices, industrial displays and the cloud-based BlueSphere device management platform.

Vantron offers IoT communication devices that enable multi-protocol connections for industrial equipment and local data processing through edge computing. With abundant wired and wireless connectivity options, remote operations and maintenance have become easier than ever. Such devices can be deployed across different sectors such as smart retail, medical and warehousing. Moreover, Vantron's IoT solutions are designed to facilitate enterprises' digital transformation, streamline operations, enhance productivity, etc.

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