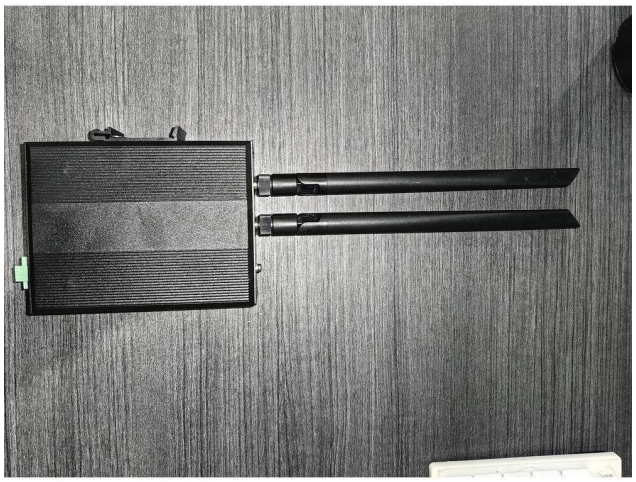
Intrinsically Safe Wi-Fi 6 Wireless Client / Access Point BL5000X



Features and Advantages

- Flexible AP, Client and Router operation for Intrinsically Safe wireless links
- 802.11k/v/r fast roaming with handover time of 15ms or less
- Independent SSID security settings and wireless-user isolation
- Manual or automatic channel selection with configurable RF power
- Optional directional or omnidirectional antenna configurations
- Compact housed or embedded bare-board deployment options
- 6kV Ethernet protection for harsh electrical environments
- Designed for robots, cameras, AGVs and embedded enclosures
- Wide-temperature operation from -40°C to 70°C

Introduction

The BL5000X is an Intrinsically Safe Wi-Fi 6 wireless client and access point based on the IEEE 802.11ax standard. Its Qualcomm platform provides simultaneous 2.4GHz (2×2) and 5GHz (2×2) connectivity, delivering up to 574Mbps on 2.4GHz and 2402Mbps on 5GHz.

Designed for demanding Intrinsically Safe applications, the BL5000X combines multi-stage power protection, protected Ethernet interfaces and a wide operating-temperature range. These features support stable long-term operation in mines, warehouses and other harsh Intrinsically Safe environments.

Its compact form factor allows easy integration into inspection robots, Intrinsically Safe cameras, handheld controllers, explosion-proof boxes and automated guided vehicles.

The BL5000X offers strong receive performance, interference resistance and fast roaming. When paired with a BL6000X base station, it supports low-latency, high-bandwidth wireless communication for mobile video, data acquisition and Intrinsically Safe control.

Typical applications include smart mines, warehouse logistics, robotic inspection, Intrinsically Safe corridors and other mobile communication scenarios that require reliable wireless coverage.

Hardware Specifications

Model	BL5000X
Chipset	IPQ5018 + QCA6102 + QCA8337
Memory	256MB
Flash	128MB + 16MB
Working frequency	2.4GHz + 5GHz
Operating mode	AP / Client / Router
Dimensions	128 × 93 × 35mm with housing; 124 × 71 × 2mm bare board
Ethernet interface	2 × 10/100/1000M LAN; 1 × 10/100/1000M WAN
Antenna	Optional directional or omnidirectional antenna configurations
Surge protection	6kV Ethernet over-voltage protection
Power consumption	≤9W at full load
Operating environment	-40°C to 70°C; 5% to 95% RH, non-condensing
Storage temperature	-50°C to 80°C
Mechanical structure	Compact housed unit or embedded bare-board configuration

Software function

Working mode	AP / Client / Router
Wireless standards	IEEE 802.11b/g/n/ax and 802.11a/n/ac/ax
WLAN basic	2×2 MIMO; 2.4GHz and 5GHz simultaneous dual-band operation
Wireless rate	2.4GHz: up to 574Mbps; 5GHz: up to 2402Mbps
Channel bandwidth	20/40MHz at 2.4GHz; up to 160MHz at 5GHz

Fast roaming	802.11k/v/r; handover time ≤15ms
Channel selection	Manual or automatic best-channel selection
Transmit control	Manual/automatic data rate and user-defined RF power
Multiple SSIDs	Independent wireless and security settings for each SSID
System status	Connection status, channel/frequency and operating-mode display
User management	Connected-user list and user-isolation support
System log	System-triggered event logging
Radio frequency	2.4–2.4835GHz and 5.15–5.85GHz
Receive sensitivity	Up to -94dBm at 2.4GHz and -93dBm at 5GHz, mode dependent
Antenna performance	Dual polarization; antenna efficiency ≥50% on both bands

WLAN Specification

WLAN Specification ±2 dB	2.4GHz	5GHz	5GHz
11 b (1Mbps)	24	-	-
11 b (11Mbps)	24	-	-
11 g (6Mbps)	24	-	-
11 g (54Mbps)	23	-	-
11 a (6Mbps)	-	24	24
11 a (54Mbps)	-	22	22
HT20(MSC 0/8)	24	24	24
HT20(MSC 7/15)	23	22	22
HT40(MSC 0/8)	24	24	24
HT40(MSC 7/15)	23	22	22

VHT80 256QAM MCS0	-	23	23
VHT80 256QAM MCS9	-	19	19
VHT80 1024QAM MCS0	-	22	22
VHT80 1024QAM MCS11	-	17	17

Receive sensitivity

Receive sensitivity (each) ±2 dB	**2.4GHz**	**5GHz**	**5GHz**
11 g (6Mbps)	-94	-	-
11 g (54Mbps)	-78	-	-
11 a (6Mbps)	-	-93	-
11 a (54Mbps)	-	-77	-
HT20(MSC 0/8)	-92	-91	-
HT20(MSC 7/15)	-75	-74	-
HT40(MSC 0/8)	-89	-88	-
HT40(MSC 7/15)	-72	-70	-
VHT20 256QAM @ 3/4 Code Rate	-	-90	-
VHT20 256QAM @ 5/6 Code Rate	-	-71	-
VHT40 256QAM @ 3/4 Code Rate	-	-88	-
VHT40 256QAM @ 5/6 Code Rate	-	-66	-
VHT80 256QAM @ 3/4 Code Rate	-	-86	-
VHT80 256QAM @ 5/6 Code Rate	-	-61	-
VHT80 1024QAM MCS11	-	-51	-

Order info

Model	2.4G/5G Dual-band antenna mount	Interface	Power	WiFi
BL5000X (with housing)	Optional	2 × LAN + 1 × WAN	Project configuration	Wi-Fi 6 AX3000
BL5000X (bare board)	Optional	2 × LAN + 1 × WAN	Project configuration	Wi-Fi 6 AX3000

Product Appearance

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