

DATA SHEET

# AP 650X

Enterprise-grade 4x4, 4-stream, 802.11ax Access Point with External Antennas





**The AP650X is designed for high performance environments – combining the latest in Wi-Fi standards (IEEE 802.11ax technology), the latest in Ethernet standards (2.5GE capability), and Aerohive’s software-defined dual 5 GHz radios for indoor and industrial environments. AP650X has integrated BLE and USB connectivity for enhanced location-driven services and the ability to provide additional wireless access options for IoT and other devices.**

Powered by HiveOS and the innovative distributed Cooperative Control architecture, **AP650X** brings the best of capacity and advanced high-efficiency 802.11ax technology. In addition, the integrated BLE radio and a USB interface in the access point opens up a multitude of deployment use-cases in IoT and proximity/location-oriented services.

The AP650X benefits from an AI-driven Wi-Fi architecture capable of self-organizing, self-learning, self-healing and self-optimizing in the most challenging environments. Cooperative Control eliminates single points of failure and bottlenecks, delivering stability and unbridled performance, complimenting the capabilities of HiveOS - a stateful L2-L7 DPI firewall for context-based access security, advanced and customizable QoS for traffic optimization, intelligent meshing algorithms, Private Pre-Shared Key (PPSK) and much more.

All Aerohive APs can be centrally managed using Aerohive’s out-of-band cloud network management system - *HiveManager*. HiveManager is an industry-leading and visionary approach to cloud-managed networking, built from the ground up to take full advantage of the SD-LAN solution from Aerohive. Working in tandem with Aerohive’s HiveOS, HiveManager leverages state-of-the-art cloud technology. Benefit from unified, full-stack management of Wi-Fi, switching and routing, centralized monitoring and configuration, real-time and historical reporting, simplified troubleshooting, integrated RF planner tools and much more.

HiveManager is available in two editions: *Connect* and *Select*. The *Connect* solution is bundled with Aerohive access points and switches and is free for the lifetime of the device. *Connect* is the perfect solution for those looking to provide robust, yet enterprise-grade connectivity, without having to invest in the full suite of management features. The optional upgrade to *Select* unlocks a multitude of advanced features and capabilities that enhance network management, security and visibility.

## Radio Specifications

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### Wireless Frequency Range

- USA: 2.400 ~ 2.483 GHz, 5.15 ~ 5.35 GHz, 5.47 ~ 5.725 GHz, 5.725 ~ 5.85 GHz
- Europe: 2.400 ~ 2.483 GHz, 5.15 ~ 5.35 GHz, 5.47 ~ 5.725 GHz
- Japan: 2.400 ~ 2.497 GHz, 5.15 ~ 5.35 GHz, 5.47 ~ 5.725 GHz
- China: 2.400 ~ 2.483 GHz, 5.725 ~ 5.85 GHz

### Modes

- IEEE802.11a 5GHz OFDM
- IEEE802.11b 2.4GHz DSSS/CCK
- IEEE802.11g 2.4GHz OFDM
- IEEE802.11n 2.4 GHz/5 GHz OFDM
- IEEE802.11ac OFDM
- IEEE802.11ax OFDMA

## Channel Support

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### 802.11 b/g/n/ax

- US/Canada: 11 (1 ~ 11)
- Europe: 13 (1 ~ 13)
- Japan: 11b: 14 (1~13 or 14th), 11g: 13 (1 ~ 13)
- China: 13 (1 ~ 13)

### 802.11 a/n/ac/ax

- US/Canada: 24 non-overlapping channels (36,40,44,48,52,56,60,64;100,104,108, 112,116,120,124,128,132,136,140; 149,153,157,161,165)
- Europe: 19 non-overlapping channel (36,40,44,48,52,56,60,64;100,104,108,112, 116,120,124,128,132,136,140)
- Japan: 19 non-overlapping channels (36,40,44,48,52,56,60,64;100,104,108,112, 116,120,124,128,132,136,140)
- China: 5 non-overlapping channels (149,153,157,161,165)

## Modulation Technology

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### 802.11 Legacy a/b/g

- DSSS (DBPSK, DQPSK, CCK) OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
- DSSS (Direct Sequence Spread Spectrum) with DBPSK (Differential Binary Phase Shift Keying 1 Mbps), DQPSK (Differential Quaternary Phase Shift Keying 2 Mbps), and CCK (Complementary Code Keying 5.5 & 11 Mbps), and OFDM (Orthogonal Frequency Division Multiplexing with BPSK for 6, 9 Mbps. QPSK for 12, 18 Mbps, 16QAM for 24, 36 Mbps, 64QAM for 48, 54 Mbps)

### 802.11n

- OFDM (BPSK, QPSK, 16-QAM, 64-QAM)

### 802.11ac

- OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)

### 802.11ax

- OFDMA (1024-QAM)

## Interfaces

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- 1x 10/100/1000 Gigabit Ethernet
- 1x 2.5 mGig
- RJ-45 Console Port
- USB Interface
- 802.3az supported
- Redundant PoE Capable

## Radios

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- Dual Radio AP, 2.4 GHz and 5 GHz, simultaneous dual band
- 2.4 GHz, 802.11b/g/n/ax, 4x4
- 5 GHz, 802.11 a/n/ac/ax, 4x4
- 160MHz, 1024-QAM supported

## Power Consumption

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- DC Power: Typical 18.78 W, Max 20.65 W
- 802.3at PoE Power: Typical 15.72 W, Max 19.92 W

## Environmental

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- Operating Temperature: -20 to 55 °C
- Storage Temperature: -40 to 70 °C
- Humidity: 10 to 95%

## Physical

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- Dimensions: 225mm x 225mm x 37.5mm
- Weight: 2.8lb (1.27kg)
- Wall or ceiling mountable
- MTBF: >500,000 Hours @ 25 °C (*estimate*)
- RoHS: -2 Compliant

## Antenna

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- 4x 2.4 GHz, RPSMA Connectors
- 4x 5 GHz, RPSMA Connectors
- 1x Internal Bluetooth Antenna

### Peak Antenna Gain:

- 2.4 GHz Omni Directional, gain 4.6 dBi
- 5 GHz Omni Directional, gain 5.7 dBi
- Bluetooth Omni Directional, gain 5.2 dBi

**Power - 2.4 GHz**

CHANNEL	DATA RATE	POWER (dBm)
<b>11b</b>	1,2,5,5,11 Mbps	21
	6 Mbps	15
<b>11g</b>	36 Mbps	16
	48 Mbps	17
	54 Mbps	18
	MCS0,1,2,3,4	20
<b>11n HT20</b>	MCS5,13,21	18
	MCS6,14,22	17
	MCS7,15,23	16
	MCS8,9,10,11,12	20
	MCS16,17,18,19,20	20
<b>11n HT40</b>	MCS0,1,2,3,4,8	20
	MCS5,13,21	18
	MCS6,14,22	17
	MCS7,15,23	16
	MCS9,10,11,12,16	20
	MCS17,18,19,20	20

**Receive Sensitivity - 2.4 GHz**

CHANNEL	DATA RATE	SENSITIVITY
<b>11b</b>	1 Mbps	-100
	11 Mbps	-93
<b>11g</b>	6 Mbps	-95
	36 Mbps	-86
	48 Mbps	-82
	54 Mbps	-80
<b>11n HT20</b>	MCS0,8,16	-95
	MCS5,13,21	-81
	MCS6,14,22	-79
	MCS7,15,23	-77
<b>11n HT40</b>	MCS0,8,16	-92
	MCS5,13,21	-78
	MCS6,14,22	-76
	MCS7,15,23	-74

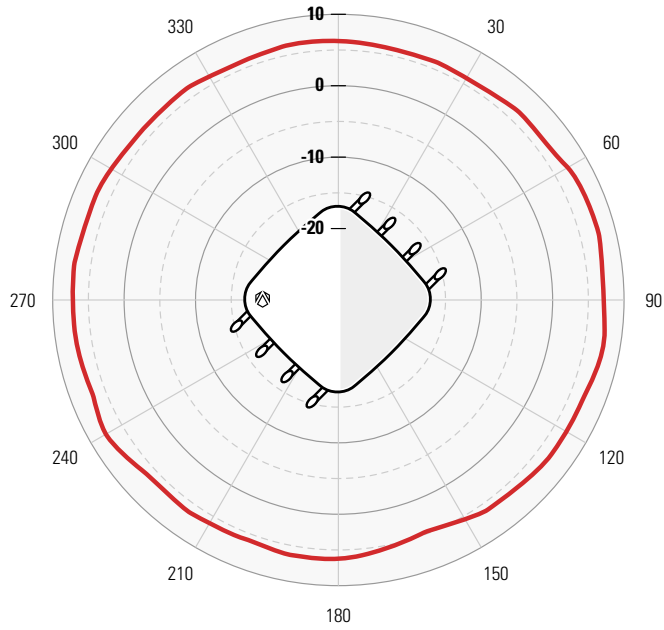
**Power and Receive Sensitivity Tables (5 GHz)**
**Power - 5 GHz**

CHANNEL	DATA RATE	POWER (DBM)
<b>11a</b>	6 Mbps	19
	36 Mbps	18
	48 Mbps	16
	54 Mbps	15
<b>11n HT20</b>	MCS0,1,2,3,4,8,9,10,11	19
	MCS5,13,21	18
	MCS6,14,22	16
	MCS7,15,23	15
	MCS12,16,17,18,19,20	19
<b>11n HT40</b>	MCS0,1,2,3,4,8	19
	MCS5,13,21	18
	MCS6,14,22	16
	MCS7,15,23	14
	MCS9,10,11,12,16	19
	MCS17,18,19,20	19
<b>11ac HT</b>	256QAM @ 3/4 Code Rate	12
	256QAM @ 5/6 Code Rate	11

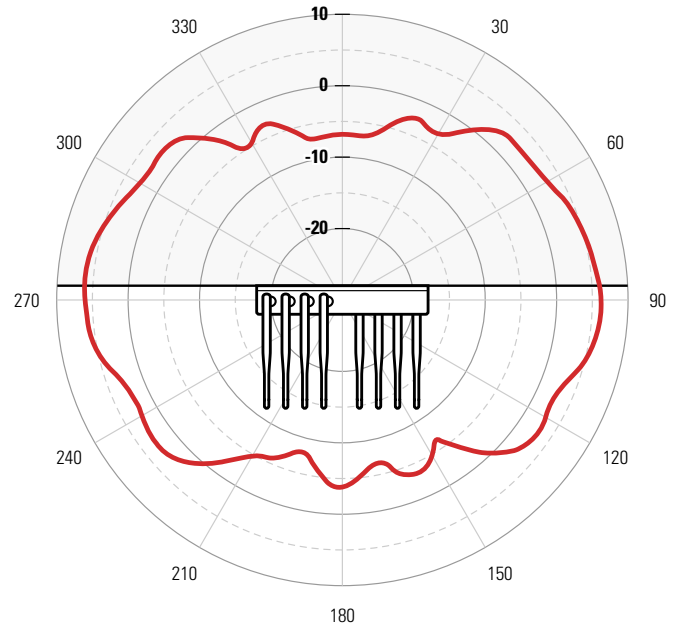
**Receive Sensitivity - 5 GHz**

CHANNEL	DATA RATE	SENSITIVITY
<b>11a</b>	6 Mbps	-95
	36 Mbps	-86
	48 Mbps	-81
	54 Mbps	-80
<b>11n HT20</b>	MCS0,8,16	-91
	MCS5,13,21	-78
	MCS6,14,22	-76
	MCS7,15,23	-74
	MCS12,16,17,18,19,20	-88
<b>11n HT40</b>	MCS0,8,16	-88
	MCS5,13,21	-75
	MCS6,14,22	-73
<b>11ac HT20</b>	MCS7,15,23	-71
	3/4	-65
	5/6	-63
<b>11ac HT40</b>	3/4	-62
	5/6	-60
<b>11ac HT80</b>	3/4	-59
	5/6	-57
<b>11ac HT160</b>	3/4	-56
	5/6	-54

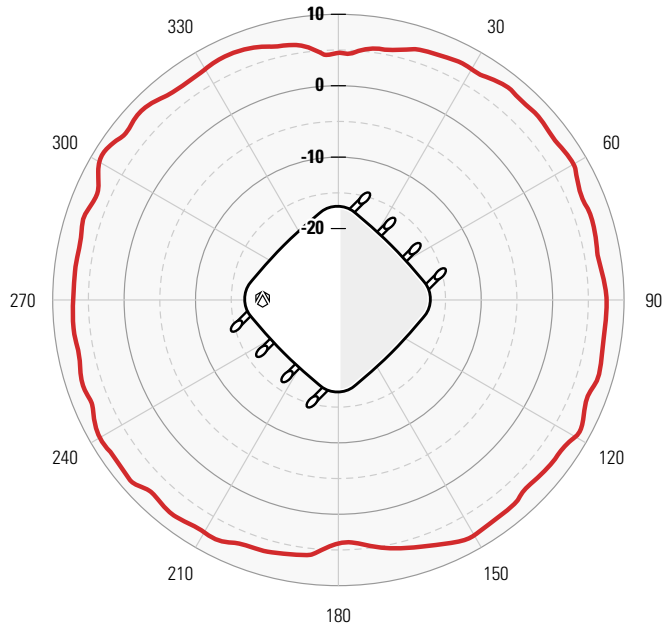
Azimuth - 2.4 GHz



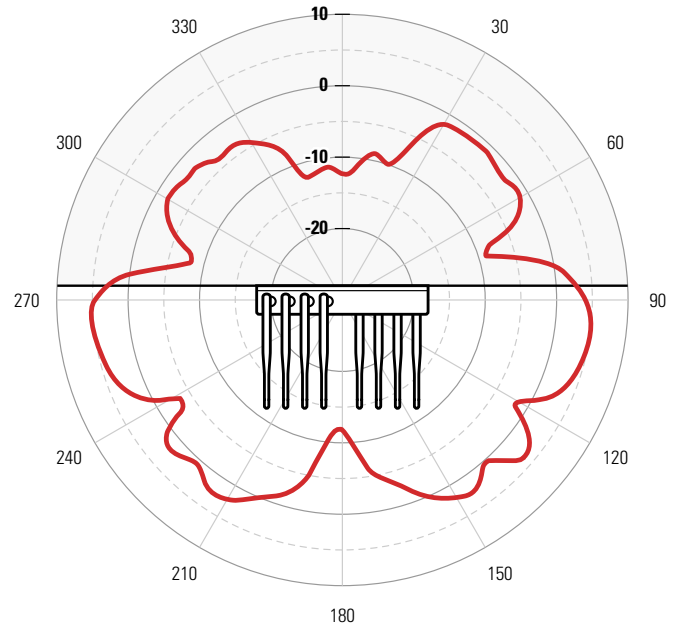
Elevation - 2.4 GHz



Azimuth - 5 GHz



Elevation - 5 GHz



**AP650X - SKUs**

SKU	DESCRIPTION
<b>AH-AP-650X-AX-XX</b>	AP650X Indoor plenum rated AP, dual 5 GHz 4x4:4 802.11ac/ax, 1x NBASE-T™ Ethernet and 1x GE, supports external antennas and extended temp range. Antennas sold separately. Includes HiveManager Connect and HiveCare Community. (Regulatory Domains available: FCC, CE, W (World), CAN (Canada))

**AP650X - MISCELLANEOUS SKUs**

SKU	DESCRIPTION
<b>AH-ACC-INJ-30W-UK</b>	30W POE power injector with UK power cord for AP122,AP122X,AP130, AP200 series,AP550,AP630,AP650 and AP650X
<b>AH-ACC-INJ-30W-US</b>	30W POE power injector with US power cord for AP122,AP122X,AP130, AP200 series,AP550,AP630,AP650 and AP650X
<b>AH-ACC-INJ-30W-AU</b>	30W POE power injector with Australia/New Zealand power cord for AP122,AP122X,AP130, AP200 series,AP550,AP630,AP650 and AP650X
<b>AH-ACC-INJ-30W-EU</b>	30W POE power injector with EU power cord for AP122,AP122X,AP130, AP200 series,AP550,AP630,AP650 and AP650X

