



LANCOM LN-860

Dual-radio enterprise-class 11ac Wave 2 Wi-Fi access point with up to 867 Mbps – 100% Cloud-ready

The LANCOM LN-860 is a high-performance 11ac Wi-Fi Wave 2 enterprise access point. Based on the Wi-Fi standard IEEE 802.11ac Wave 2, this device significantly increases the efficiency of any wireless network. Featuring Multi-User MIMO, it allows all of the available streams to be used by several clients at the same time. The clients also benefit from beamforming for a better signal. The LANCOM LN-860 provides fast Wi-Fi to 11n-clients in the 2.4-GHz frequency band as well as the growing number of 11ac-enabled devices in the 5-GHz band. On top of that, the access point can be versatily operated: it can be orchestrated via the LANCOM Management Cloud, centrally managed by a WLAN controller or operated as a stand-alone device.

- › Dual concurrent Wi-Fi – parallel operation at 2.4 and 5 GHz with up to 867 Mbps with IEEE 802.11ac Wave 2 and 300 Mbps with IEEE 802.11n
- › 2x2 Multi-User MIMO for simultaneous beam-steering for multiple clients
- › Beamforming steers the signal towards the Wi-Fi clients
- › Supports 160-MHz channel width
- › Dynamic WLAN optimization thanks to LANCOM Active Radio Control (ARC)
- › Professional security features such as IEEE 802.1X
- › SD-WLAN – automatic WLAN configuration via the LANCOM Management Cloud
- › Integrated layer-7 application detection
- › Elegant LANCOM design with integrated antennas

LANCOM LN-860

Dual concurrent Wi-Fi with up to 867 Mbps

The LANCOM LN-860 features two Wi-Fi radio modules, one offering IEEE 802.11ac Wave 2 and the other offering IEEE 802.11n. This provides fast Wi-Fi to 11n-clients in the 2.4-GHz frequency band and also the growing number of modern 11ac-enabled devices in the 5-GHz band.

2x2 Multi-User MIMO

Multi-User MIMO (MU-MIMO for short) simultaneously distributes all of the available spatial streams of the LANCOM LN-860 between several different Wave 2 clients, rather than one after the other as was formerly the case. The available bandwidth is used more efficiently and delays in the wireless network are substantially reduced.

Beamforming

The LANCOM LN-860 uses beamforming to actively steer the signal to the clients and minimize interfering radio signals for other clients. In combination with MU-MIMO, the clients receive dedicated spatial streams with a minimum of interference, which positively influences the data rates for all of the clients.

160-MHz channel width

Increasing the channel width from 80 to 160 MHz doubles the performance for Wave 2 clients. By optimizing the use of the radio spectrum, a client can be supplied with a data rate of up to 867 Mbps.

Active Radio Control for dynamic radio-field optimization

The LANCOM LN-860 supports the WLAN optimization feature LANCOM Active Radio Control. This intelligent combination of innovative features included with the LCOS operating system—such as Band Steering, Adaptive Noise Immunity, Adaptive RF Optimization, Airtime Fairness and Client Steering—sustainably increases WLAN performance and supports administrators with professional tools for WLAN management.

LANCOM security for wireless networks

With numerous integrated security features, such as IEEE 802.1X, this enterprise-class access point provides optimal security for networks. Administrators and employees alike benefit from professional security policies on the network.

Operation via LANCOM Management Cloud, WLAN controller or stand-alone

The LANCOM LN-860 can be versatilely operated: Managed via the LANCOM Management Cloud it is integrated into a comprehensive, automated network orchestration, based on Software-defined Networking technology. It can also be operated via a LANCOM WLAN controller or be applied in stand-alone operation.

Layer-7 application detection

Knowing what the bandwidth in your network is actually being used for can be crucial in any industry. Layer-7 application detection gives you a completely transparent overview. This means that the user-friendly LANCOM Management Cloud delivers clear and professional insight into exactly which applications (such as YouTube, Netflix, etc.) are operating anywhere on the network—true added value for all-round network monitoring.

Elegant LANCOM design with integrated antennas

The white LANCOM LN-860 has a fascinating, puristic elegance. Its modern design is ideal for unobtrusive operation in any industry as it blends seamlessly into any environment.

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LCOS 10.10

WLAN product specifications	
Frequency band 2.4 GHz and 5 GHz	2400-2483.5 MHz (ISM) and 5150-5700 MHz (depending on country-specific restrictions)
Integrated Antenna Gain	up to 3 dBi in 2.4 GHz, up to 4.5 dBi in 5 GHz (per antenna (3) @ WLAN-1 and WLAN-2)
Data rates IEEE 802.11ac/n	867 Mbps according to IEEE 802.11ac with MCS9 (fallback to 6,5 Mbps with MCS0). Compatible to IEEE 802.11ac/n/a, IEEE 802.11ac/n, IEEE 802.11n/a compatibility mode or pure IEEE 802.11ac, pure IEEE 802.11n, pure IEEE 802.11a mode and data rates selectable
Data rates IEEE 802.11n	300 Mbps according to IEEE 802.11n with MCS15 (fallback to 6,5 Mbps with MCS0). Compatible to IEEE 802.11a/n, IEEE 802.11g/n, IEEE 802.11b/g/n or IEEE 802.11b/g compatibility mode or pure IEEE 802.11n, pure IEEE 802.11a, IEEE 802.11g or pure IEEE 802.11b mode and data rates selectable
Data rates IEEE 802.11a/ h	54 Mbps (fallback to 48, 36 , 24, 18, 12, 9, 6 Mbps, Automatic Rate Selection), fully compatible with TPC (adjustable power output) and DFS (automatic channel selection, radar detection) and data rates selectable
Data rates IEEE 802.11b/g	54 Mbps to IEEE 802.11g (fallback to 48, 36, 24, 18, 12, 9, 6 Mbps, Automatic Rate Selection) compatible to IEEE 802.11b (11, 5.5, 2, 1 Mbps, Automatic Rate Selection), IEEE 802.11b/g compatibility mode or pure IEEE 802.11g or pure IEEE 802.11b and data rates selectable
Range IEEE 802.11ac/n/a/g/b *	Up to 150 m (up to 30 m in buildings)
Output power at radio module WLAN-1, 5 GHz	IEEE 802.11a/h: +17 up to +18 dBm @ 6 up to 48 Mbps, +13 up to +15 dBm @ 54 Mbps, IEEE 802.11n: +17 up to +18 dBm @ (MCS0/8/16, 20 MHz), +11 up to +13 dBm @ (MCS7/15/23, 20 MHz), +16 up to +17 dBm @ (MCS0/8/16, 40 MHz), +9 up to +12 dBm @ (MCS7/15/23, 40 MHz)
Output power at radio module WLAN-2, 5 GHz	IEEE 802.11a/h: +18 dBm @ 6 and +15 dBm @ 54 MBit/s, IEEE 802.11ac: 18 dBm @ (MCS0/1, 20 MHz), 17 dBm @ (MCS2-3, 20 MHz), 16 dBm @ (MCS4/5, 20 MHz), 15 dBm @ (MCS6, 20 MHz), 14 dBm @ (MCS7, 20 MHz), 12 dBm @ (MCS8, 20 MHz), 11 dBm @ (MCS9, 20 MHz), 18 dBm @ (MCS0/1, 40 MHz), 17 dBm @ (MCS2/3, 40 MHz), 16 dBm @ (MCS4/5, 40 MHz), 15 dBm @ (MCS6, 40 MHz), 14 dBm @ (MCS7, 40 MHz), 12 dBm @ (MCS8, 40 MHz), 11 dBm @ (MCS9, 40 MHz), 18 dBm @ (MCS0/1, 80 MHz), 17 dBm @ (MCS2/3, 80 MHz), 16 dBm @ (MCS4/5, 80 MHz), 15 dBm @ (MCS6, 80 MHz), 14 dBm @ (MCS7, 80 MHz), 12 dBm @ (MCS8, 80 MHz), 11 dBm @ (MCS9, 80 MHz), 18 dBm @ (MCS0/1, 160 MHz), 17 dBm @ (MCS2/3, 160 MHz), 16 dBm @ (MCS4/5, 160 MHz), 15 dBm @ (MCS6, 160 MHz), 14 dBm @ (MCS7, 160 MHz), 12 dBm @ (MCS8, 160 MHz), 11 dBm @ (MCS9, 160 MHz)
Output power at radio module WLAN-1, 2.4 GHz	IEEE 802.11b: +22 dBm @ 1 and 2 Mbps, +22 dBm @ 5,5 and 11 Mbps, IEEE 802.11g: +22 dBm @ 6 up to 36 Mbps, +20 dBm @ 48 Mbps, +18 dBm @ 54 Mbps, IEEE 802.11n: +22 dBm @ (MCS0/8/16, 20 MHz), +16 dBm @ (MCS7/15/23, 20 MHz), +21 dBm @ (MCS0/8/16, 40 MHz), +15 dBm @ (MCS7/15/23, 40 MHz)
Minimum transmission power	Transmission power reduction in software in 1 dB steps to min. 0.5 dBm
Receiver sensitivity WLAN-1, 5 GHz	IEEE 802.11a/h: -98 dBm @ 6 Mbps, -81 dBm @ 54 Mbps, IEEE 802.11n: -94 dBm @ (MCS0, 20 MHz), -76dBm @ (MCS 7, 20 MHz), -92 dBm @ (MCS0, 40 MHz), -72 dBm @ (MCS7, 40 MHz)
Receiver sensitivity WLAN-2, 5 GHz	IEEE 802.11a/h: -87 dBm @ 6 MBit/s, -71 dBm @ 54MBit/s, IEEE 802.11ac: -87 dBm @ MCS0 20 MHz(HT), -85 dBm @ MCS0 20MHz(VHT), -70 dBm @ MCS7 20 MHz, -66 dBm @ MCS8 20 MHz, -85 dBm @ MCS0 40 MHz(VHT), -67 dBm @ MCS7 40 MHz, -85 dBm @ MCS0 40 MHz(VHT), -61 dBm @ MCS9 40 MHz(VHT), -81 dBm @ MCS0 80 MHz, -58 dBm @ MCS9 80 MHz
Receiver sensitivity WLAN-1, 2.4 GHz	IEEE 802.11b: -97 dBm @ 1 MBit/s, -93 dBm @ 11 MBit/s, IEEE 802.11g: -95dBm @ 6 MBit/s, -81dBm @ 54 MBit/s IEEE 802.11n: -94 dBm @ 6,5MBit/s (MCS0, 20 MHz), -77 dBm @ 65 MBit/s (MCS7, 20 MHz), -91 dBm @ 15 MBit/s (MCS0, 40 MHz), -74 dBm @ 150 MBit/s (MCS7, 40 MHz)
Radio channels 5 GHz	Up to 26 non-overlapping channels (available channels and further obligations such as automatic DFS dynamic channel selection depending on national regulations)
Radio channels 2.4 GHz	Up to 13 channels, max. 3 non-overlapping (depending on country-specific restrictions)
Multi-SSID	Up to 31 (Simultaneous use of up to 16 independent WLAN networks at WLAN interface 1 and up to 15 independent WLAN networks at WLAN interface 2.
Concurrent WLAN clients	Up to 200 clients (recommended), 512 clients (max.)**
Others	Wireless Quality Indicators (WQI)
*) Note	The effective distances and transmission rates that can be achieved are depending of the onsite RF conditions
**) Note	The 11ac WLAN module supports max. 128 clients, this specification refers to the combination with the 11n radio module.
Supported WLAN standards	
IEEE standards	IEEE 802.11ac Wave 2, IEEE 802.11n, IEEE 802.11a, IEEE 802.11g, IEEE 802.11b, IEEE 802.11i, IEEE 802.1X, IEEE 802.11u, IEEE 802.11r (Fast Roaming), IEEE 802.11w (Protected Management Frames), WME and U-APSD/WMM Power Save as defined in IEEE 802.11e, IEEE 802.11h, IEEE 802.11d

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Standard IEEE 802.11ac	
Supported features	2x2 MIMO, 80 MHz/160 MHz channels, MU-MIMO, QAM-256
Standard IEEE 802.11n	
Supported features	2x2 MIMO, 40 MHz channel, 20/40MHz coexistence mechanisms in the 2.4 GHz band, MAC aggregation, Block Acknowledgement, STBC (Space Time Block Coding), LDPC (Low Density Parity Check), MRC (Maximal Ratio Combining), Short Guard Interval
WLAN operating modes	
Modes	WLAN access point (standalone, WLC or LANCOM Management Cloud managed), WLAN bridge (P2P or P2MP) (standalone or AutoWDS*), (standalone, WLC or LANCOM Management Cloud managed), WLAN client mode, transparent WLAN client mode
*) Note	Only in installations with WLAN controller
Security	
Encryption options	IEEE 802.1X (WPA2-Enterprise), IEEE 802.11i (WPA2-Personal), Wi-Fi Certified™ WPA2™, WPA, WEP, IEEE 802.11w (Protected Management Frames), LEPS (LANCOM Enhanced Passphrase Security)
Encryption	AES:CCMP (Advanced Encryption Standard with Counter Mode and Cipher Block Chaining Message Authentication Code Protocol), TKIP (Temporal Key Integrity Protocol), RC4 (only used by WEP)
EAP types (authenticator)	EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0/EAP-MSCHAPv2, PEAPv1/EAP-GTC, EAP-SIM, EAP-AKA, EAP-AKA Prime, EAP-FAST
RADIUS/EAP-server	User administration MAC-based, rate limiting, passphrases, VLAN user based, authentication of IEEE 802.1X clients via EAP-TLS, EAP-TTLS, EAP-MD5, EAP-GTC, PEAP, MSCHAP or MSCHAPv2
Others	WLAN protocol filters, IP-redirection of any packet received over the WLAN interface, IEEE 802.1X supplicant, background scanning, client detection ("rogue WLAN client detection"), Wireless Intrusion Detection System (WIDS)
LANCOM Active Radio Control	
Client Steering*	Steering of WLAN clients to the ideal access point
Band Steering	Steering of 5GHz clients to the corresponding high-performance frequency band
Managed RF Optimization*	Selection of optimal WLAN channels by the administrator
Adaptive Noise Immunity	Better WLAN throughput due to immunity against interferences
Spectral Scan	Monitoring your WLAN for sources of interference
Adaptive RF Optimization	Dynamic selection of the optimal WLAN channel
Airtime Fairness	Improved utilization of the WLAN bandwidth
Adaptive Transmission Power	Automatic adjustment of the transmission power for Wi - Fi backup scenarios
*) Note	Only in installations with WLAN controller
Roaming	
Roaming	IAPP (Inter Access Point Protocol), IEEE 802.11r (Fast Roaming), OKC (Opportunistic Key Caching), Fast Client Roaming (only in operating mode client modus)
Layer 2 features	
VLAN	4.096 IDs based on IEEE 802.1q, dynamic assignment, Q-in-Q tagging
Quality of Service	WME based on IEEE 802.11e, Wi-Fi Certified™ WMM®
Rate limiting	SSID based, WLAN client based
Multicast	IGMP-Snooping
Protocols	Ethernet over GRE-Tunnel (EoGRE), ARP-Lookup, LLDP, DHCP option 82, IPv6-Router-Advertisement-Snooping, DHCPv6-Snooping, LDRA (Lightweight DHCPv6 Relay Agent), Spanning Tree, Rapid Spanning Tree, ARP, Proxy ARP, BOOTP, DHCP, LACP
Layer 3 features	
Firewall	Stateful inspection firewall including paket filtering, extended port forwarding, N:N IP address mapping, paket tagging, user-defined rules and notifications
Quality of Service	Traffic shaping, bandwidth reservation, DiffServ/TOS, packetsize control, layer-2-in-layer-3 tagging
Security	Intrusion Prevention, IP spoofing, access control lists, Denial of Service protection, detailed settings for handling reassembly, session-recovery, PING, stealth mode and AUTH port, URL blocker, password protection, programmable reset button

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Layer 3 features	
PPP authentication mechanisms	PAP, CHAP, MS-CHAP, and MS-CHAPv2
High availability / redundancy	VRRP (Virtual Router Redundancy Protocol), analog/GSM modem backup
Router	IPv4-, IPv6-, NetBIOS/IP multiprotokoll router, IPv4/IPv6 dual stack
Router virtualization	ARF (Advanced Routing and Forwarding) up to separate processing of 16 contexts
IPv4 services	HTTP and HTTPS server for configuration by web interface, DNS client, DNS server, DNS relay, DNS proxy, dynamic DNS client, DHCP client, DHCP relay and DHCP server including autodetection, NetBIOS/IP proxy, NTP client, SNTP server, policy-based routing
IPv6 services	DHCPv6 client, DHCPv6 server, DHCPv6 relay
IPv6 compatible LCOS applications	WEBconfig, HTTP, HTTPS, SSH, Telnet, DNS, TFTP, firewall, RAS dial-in
Dynamic routing protocol	RIPv2
IPv4 protocols	DNS, HTTP, HTTPS, ICMP, NTP/SNTP, NetBIOS, PPPoE (server), RADIUS, RADSEC (secure RADIUS), RTP, SNMPv1,v2c,v3, TFTP, TACACS+
IPv6 protocols	NDP, stateless address autoconfiguration (SLAAC), stateful address autoconfiguration (DHCPv6), router advertisements, ICMPv6, DHCPv6, DNS, HTTP, HTTPS, PPPoE, RADIUS, SMTP, NTP, Syslog, SNMPv1,v2c,v3
WAN operating mode	VDSL, ADSL1, ADSL2 or ADSL2+ additional with external DSL modem at an ETH port
WAN protocols	PPPoE, Multi-PPPoE, ML-PPP, GRE, EoGRE, PPTP (PAC or PNS), L2TPv2 (LAC or LNS) and IPoE (using DHCP or no DHCP), RIP-1, RIP-2, VLAN, IPv6 over PPP (IPv6 and IPv4/IPv6 dual stack session), IP(v6)oE (autokonfiguration, DHCPv6 or static)
Tunneling protocols (IPv4/IPv6)	6to4, 6in4, 6rd (static and over DHCP), Dual Stack Lite (IPv4-in-IPv6-Tunnel)
Interfaces	
Ethernet ports	2 x 10 / 100 / 1000 Base-TX, autosensing, auto node hub, line bundling via LACP, IEEE 802.3az, PoE adapter compliant to IEEE 802.3at required
Serial interface	Serial configuration interface / COM port (8 pin Mini-DIN): 9,600 - 115,000 baud, suitable for optional connection of analog/GPRS modems. Supports internal COM port server and allows for transparent asynchronous transmission of serial data via TCP
Internal antennas per radio module	Each radio is connected to one of the two internal 2x2 MIMO antennas
Hardware	
Power supply	12 V DC, external power adapter (230 V) with bayonet cap. PoE (Power over Ethernet), compliant with IEEE 802.3at
Environment	Temperature range 0° to 45 °C (vertical wall mount with LANCOM Wall Mount (LN)), 0° to 37 °C (horizontal ceiling mount with LANCOM Wall Mount (LN)). Access point overheating is avoided by automatic throttling of the Wi-Fi modules. Humidity 0 to 95 %; non-condensing
Power consumption (max)	Approx. 15.1 W via 12 V / 1,5 A power adapter (value refers to the total power consumption of access point and power adapter), Approx. 14.9 W via PoE (value solely refers to the power consumption of the access point)
Housing	Robust synthetic housing, rear connectors, ready for wall mounting, Kensington lock; 205 x 42 x 205 mm (W x H x D)
Management and monitoring	
Management	LANconfig, WEBconfig, LANCOM Management Cloud, WLAN controller, LANCOM Layer 2 management (emergency management)
Management functions	Alternative boot configuration, voluntary automatic updates for LCMS and LCOS, individual access and function rights up to 16 administrators, RADIUS and RADSEC user management, remote access (WAN or (W)LAN, access rights (read/write) adjustable separately), SSL, SSH, HTTPS, Telnet, TFTP, SNMP, HTTP, access rights via TACACS+, scripting, timed control of all parameters and actions through cron job
FirmSafe	Two stored firmware versions, incl. test mode for firmware updates
Monitoring	LANmonitor, WLANmonitor, LANCOM Management Cloud
Monitoring functions	Device SYSLOG, SNMPv1,v2c,v3 incl. SNMP-TRAPS, extensive LOG and TRACE options, PING and TRACEROUTE for checking connections, internal logging buffer for firewall events
Monitoring statistics	Extensive Ethernet, IP and DNS statistics; SYSLOG error counter, accounting information exportable via LANmonitor and SYSLOG
iPerf	iPerf is a tool for measurements of the bandwidth on IP networks (integrated client and server)
SLA-Monitor (ICMP)	Performance monitoring of connections

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Declarations of conformity*	
CE	EN 60950-1, EN 301 489-1, EN 301 489-17
5 GHz WLAN	EN 301 893
2.4 GHz WLAN	EN 300 328
Medical	Medical conformity with EN 60601-1-2
IPv6	IPv6 Ready Gold
Country of Origin	Made in Germany
*) Note	You will find all declarations of conformity in the products section of our website at www.lancom-systems.eu
Scope of delivery	
Manual	Installation Guide (DE/EN/FR/ES/IT/PT/NL)
Cable	1 Ethernet cable, 3 m
Power supply unit	External power adapter (230 V), coaxial power connector 2.1/5.5 mm, temperature range from -5 to +45° C
Support	
Warranty	3 years support via hotline and Internet KnowledgeBase
Software updates	Regular free updates (LCOS operating system and LANtools) via Internet
Options	
LANCOM Warranty Basic Option S	Option to extend the manufacturer's warranty from 3 to 5 years, item no. 10710
LANCOM Warranty Advanced Option S	Option to extend the manufacturer's warranty from 3 to 5 years and replacement of a defective device, item no. 10715
LANCOM Public Spot	Hotspot option for LANCOM access points and the LANCOM 17xx series for user authentication (up to 64), versatile access (via voucher, e-mail, SMS), including a comfortable setup wizard, secure separation of guest access and internal network, item no. 60642
Accessories	
LANCOM WLAN controllers	LANCOM WLC-4006+, item no. 62035 (EU), item no. 62036 (UK) and item no. 62037 (US), LANCOM WLC-4025+, item no. 61378, item no. 61379 and item no. 61384 (US), LANCOM WLC-4100, item no. 61369 (EU) and item no. 61377 (UK), LANCOM WLC Basic Option for Routers, item no. 61639
LANCOM Wall Mount LN	Robust mounting plate for simple, theft-proof mounting of LANCOM devices with LN housing, Item no. 61342
LANCOM Serial Adapter Kit	For the connection of V.24 modems with AT command set and serial interface for the connection to the LANCOM COM interface, incl. serial cable and connection plug, item no. 61500
Power over Ethernet Injector	1-port PoE injector with Gigabit support, integrated power supply, compatible with the standard IEEE 802.3af/at, item no. 61738 (EU) and 61739 (UK)
Item number(s)	
LANCOM LN-860 (EU/UK)	61773 (EU), 61774 (UK)

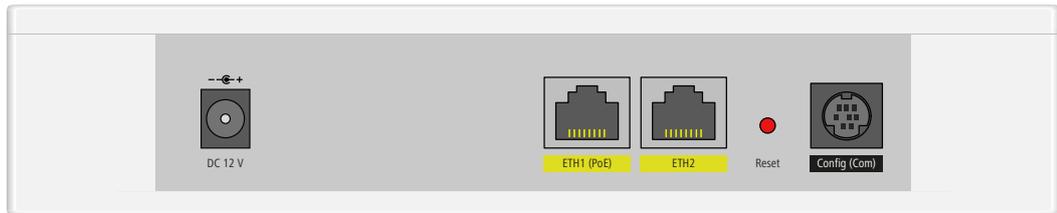
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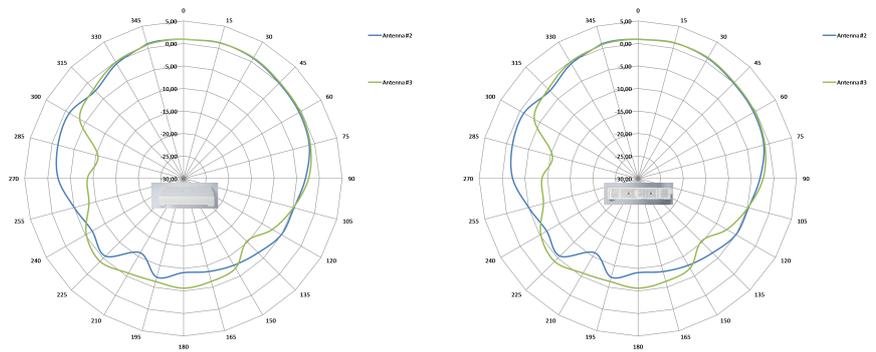
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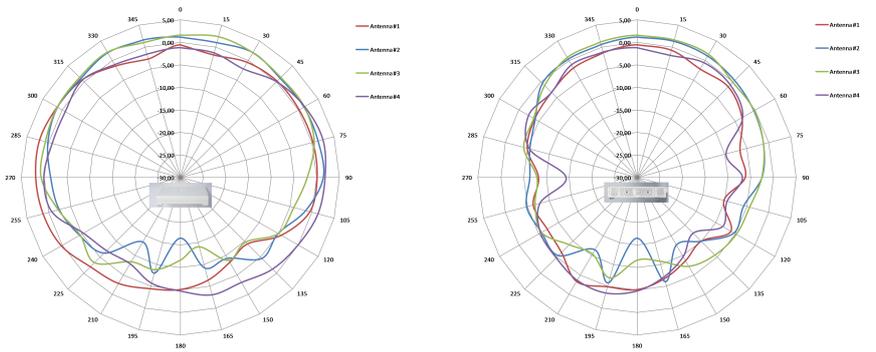


Antenna Gain

antenna pattern, 2.4 GHz



antenna pattern, 5.2 GHz



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