



LANCOM OAP-321

Single-radio outdoor 11ac WLAN access point for professional outdoor WLAN applications – either in the 2.4-GHz or 5-GHz frequency band

The LANCOM OAP-321 is ideal for the reliable wireless coverage of open spaces either in the 2.4-GHz or 5-GHz frequency band. Thanks to the integrated 5-GHz antenna it is also suitable for high-speed point-to-point connections for networking buildings.

- Single operation WLAN – operation at 2.4 or 5 GHz with up to 300 Mbps with IEEE 802.11a/g/n
- Integrated 5-GHz directional antenna and external antenna connectors for 2.4 GHz
- Robust IP66 protective housing – reliable even at extreme temperatures (-33°C to +70°C)
- Dynamic WLAN optimization thanks to LANCOM Active Radio Control (ARC)
- Professional security features such as IEEE 802.1X
- Operation via LANCOM Management Cloud, WLAN controller or stand-alone
- Easy and secure integration of external users with the LANCOM Public Spot Option

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Single Operation Wi-Fi with up to 300 Mbps

The LANCOM OAP-321 offers optionally reliable WLAN coverage in the 2.4-GHz frequency band or high-speed P2P links for interconnecting buildings in the 5-GHz.

Maximum reliability in all weathers

The LANCOM OAP-321 has a robust IP66 protective housing, making it fully dust proof and water-jet resistant. What's more, a temperature range of -33°C to +70°C guarantees reliable operation even under extreme conditions.

Active Radio Control for dynamic radio-field optimization

The LANCOM OAP-321 supports the WLAN optimization concept LANCOM Active Radio Control. This intelligent combination of innovative features included with the LCOS operating system - such as Adaptive Noise Immunity, RF Optimization, 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 outdoor access point provides optimal security for networks. Administrators and employees alike benefit from professional security policies on the network.

Zero-touch deployment

The LANCOM OAP-321 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.

Secure integration of external users

In combination with the LANCOM Public Spot option, the LANCOM OAP-321 is ideal for operating hotspots. Users benefit from a hotspot that is secure and easy-to-use, while hotspot operators can be sure that their own network remains separate from the guest network.

Maximum future viability

LANCOM products are designed for a service life of several years and are equipped with hardware dimensioned for the future. Even reaching back to older product generations, updates to the LANCOM Operating System - LCOS - are available several times a year, free of charge and offering major features.

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WLAN product specifications	
Frequency band 2.4 GHz or 5 GHz	2400-2483.5 MHz (ISM) or 5150-5825 MHz (depending on country-specific restrictions)
Integrated Antenna Gain	up to 17 dBi in 5 GHz possible with the integrated dual polarisation antenna
HPBW	Detailed information about the HPBW can be taken from the radio pattern below.
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 (outdoor / P2P)	The actual range depends on the environmental conditions. The Antenna Distance Calculator on www.lancom-systems.com provides information on the possible data rates and distances.
Output power at radio module, 5 GHz and per transmit chain	IEEE 802.11a/h: +14 dBm @ 54 MBit/s, IEEE 802.11n: +12 dBm @ (MCS7, 20 MHz), +11 dBm @ (MCS7, 40 MHz)
Output power at radio module, 2.4 GHz and per transmit chain	IEEE 802.11b: +19 dBm @ 54 MBit/s, IEEE 802.11g: +16 dBm @ 54 MBit/s, IEEE 802.11n: +15 dBm @ (MCS7, 20 MHz), +14 dBm @ (MCS7, 40 MHz)
Max. allowed radiation power (EIRP), 5 GHz	IEEE 802.11a/h: Up to 30 dBm / 1000 mW EIRP (depending on national regulations on channel usage and subject to further obligations such as TPC and DFS)
Max. allowed radiation power (EIRP), 2.4 GHz	IEEE 802.11b/g: Up to 20 dBm / 100 mW EIRP (transmission power control according to TPC)
Minimum transmission power	Transmission power reduction in software in 1 dB steps to min. 0.5 dBm
Receiver sensitivity 5 GHz	IEEE 802.11a/h: -77 dBm @ 54 Mbps, IEEE 802.11n: -63 dBm @ MCS7, 20 MHz, -70 dBm @ MCS7, 40 MHz
Receiver sensitivity 2.4 GHz	IEEE 802.11b: -85 dBm @ 11 Mbps, IEEE 802.11g: -77 dBm @ 54 Mbps, IEEE 802.11n: -74 dBm @ MCS7, 20 MHz, -71 dBm @ 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 16 independent WLAN networks
Concurrent WLAN clients	Up to 30 clients per radio (recommended), 512 clients (max.)
Supported WLAN standards	
IEEE standards	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
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	WPA3-Personal, IEEE 802.1X (WPA3-Enterprise, WPA2-Enterprise), IEEE 802.11i (WPA2-Personal), Wi-Fi Certified™ WPA2™, WPA, WEP, IEEE 802.11w (Protected Management Frames), LEPS-MAC (LANCOM Enhanced Passphrase Security MAC), LEPS-U (LANCOM Enhanced Passphrase Security User)
Encryption	AES-CCMP AES-GCMP, TKIP, RC4 (only used by WEP)
EAP types (authenticator)	EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0/EAP-MSCHAPv2, PEAPv1/EAP-GTC, EAP-FAST

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Security	
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), RADIUS CoA (Change of Authorization)
LANCOM Active Radio Control	
Client Management*	Steering of WLAN clients to the ideal access point
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, Multicast-to-Unicast-conversion on WLAN interfaces
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
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
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, Bonjour-Proxy, RADIUS
IPv6 services	HTTP and HTTPS server for configuration by web interface, DHCPv6 client, DHCPv6 server, DHCPv6 relay, DNS client, DNS server, dynamic DNS client, NTP client, SNTP server, Bonjour-Proxy, RADIUS
IPv6 compatible LCOS applications	WEBconfig, HTTP, HTTPS, SSH, Telnet, DNS, TFTP, firewall, RAS dial-in
Dynamic routing protocols	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

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Layer 3 features	
WAN protocols	PPPoE, Multi-PPPoE, ML-PPP, GRE, EoGRE, PPTP (PAC or PNS), L2TPv2 (LAC or LNS), L2TPv3 with Ethernet-Pseudowire, 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)
WAN protocols	PPPoE, Multi-PPPoE, ML-PPP, GRE, EoGRE, PPTP (PAC or PNS), L2TPv2 (LAC or LNS), L2TPv3 with Ethernet-Pseudowire 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 port	1 x 10/100/1000BASE-T autosensing (RJ-45), PoE (Power over Ethernet)
External antenna connectors	Two N connectors
Hardware	
Power supply	12 V DC, external power adapter (230 V) with bayonet cap. PoE (Power over Ethernet), compliant with IEEE 802.3af
Environment	Temperature range -33° to +70 °C
Housing	Robust metal housing, IP 66 protection rating, ready for wall and pole mounting, 3 LEDs for status display, please note: device must not be mounted in salt water environments without a suitable protective housing; Dimensions 255 × 250 × 80 mm (length x width x depth)
Management and monitoring	
Management	LANCOM Management Cloud, LANconfig, WEBconfig, 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 seperately), 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
automatic firmware update	configurable automatic checking and installation of firmware updates
Monitoring	LANCOM Management Cloud, LANmonitor, WLANmonitor
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
SD-WLAN	SD-WLAN – automatic WLAN configuration via the LANCOM Management Cloud
SD-LAN	SD-LAN – automatic LAN configuration via the LANCOM Management Cloud
Declarations of conformity*	
CE	EN 60950-1, EN 301 489-1, EN 301 489-17
5 GHz WLAN	EN 301 893, EN 302 502
2.4 GHz WLAN	EN 300 328
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.com
Scope of delivery	
Manual	Hardware Quick Reference (DE/EN), Installation Guide (DE/EN)
CD/DVD	Data medium with management software (LANconfig, LANmonitor, WLANmonitor, LANCAPI) and documentation
Reset plug	Plug for resetting the device via serial interface
Cable	Water-resistant, UV-resistant Ethernet PoE cable with water-resistant screw connector, 15m

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Scope of delivery	
Mounting Kit	Mounting kit for wall and pole mounting
Antennas	Two 3 dBi dipole antennas (Gain depends on frequency.)
Power supply unit	Via Power over Ethernet compliant with IEEE 802.3af, 1 x PoE Injector supplied
Support	
Warranty	3 years support
Software updates	Regular free updates (LCOS operating system and LANtools) via Internet
Options	
LANCOM Warranty Basic Option L	Option to extend the manufacturer's warranty from 3 to 5 years, item no. 10712
LANCOM Warranty Advanced Option L	Option to extend the manufacturer's warranty from 3 to 5 years and replacement of a defective device, item no. 10717
LANCOM Public Spot	Hotspot option for LANCOM access points, LANCOM 17xx and LANCOM 19xx series for user authentication (17xx up to 64 / 19xx up to 256), versatile access (via voucher, e-mail, SMS), including a comfortable setup wizard, secure separation of guest access and internal network, item no. 60642
LANCOM Management Cloud	
LANCOM LMC-A-1Y LMC License	LANCOM LMC-A-1Y License (1 Year), enables the management of one category A device for one year via the LANCOM Management Cloud, item no. 50100
LANCOM LMC-A-3Y LMC License	LANCOM LMC-A-3Y License (3 Years), enables the management of one category A device for three years via the LANCOM Management Cloud, item no. 50101
LANCOM LMC-A-5Y LMC License	LANCOM LMC-A-5Y License (5 Years), enables the management of one category A device for five years via the LANCOM Management Cloud, item no. 50102
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-1000, item no. 61783 (EU), LANCOM WLC Basic Option for Routers, item no. 61639
External antenna, outdoor use	AirLancer Extender O-D80g, item no. 61221, AirLancer Extender O-D60a, item no. 61222, AirLancer Extender O-D9a, item no. 61224
Antenna cable	AirLancer cable NJ-NP 3m, item no. 61230, AirLancer cable NJ-NP 6m, item no. 61231, AirLancer cable NJ-NP 9m, item no. 61232
Surge arrester (antenna cable)	AirLancer SN-ANT surge arrester (2.4 and 5 GHz), to be integrated between Access Point and antenna, item no. 61258
Surge arrester (antenna cable)	AirLancer Extender SA-5L surge arrester (2.4 and 5 GHz), to be integrated between Access Point and antenna, item no. 61553
Surge arrester (LAN cable)	AirLancer Extender SA-LAN surge arrester (LAN cable), item no. 61213
LAN cable (outdoor)	LANCOM OAP Ethernet cable (30 m), item no. 61347
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)
*) Note	The polarization diversity antennas require 2 cables and surge arrestors
Item number(s)	
LANCOM OAP-321 Bridge Kit	61541
LANCOM OAP-321	61538

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Antenna Gain				
5 GHz, Horizontal Port, H-Plane, Co-Polarisation	Horizontal Port, H-Plane, Co-Polarization			
	Frequency [GHz]	Gain [dBi]	Beam width [°]	
	4,940	13,6	14,5	
	4,990	14,7	14,8	
	5,150	18,5	17,0	
	5,250	18,4	17,0	
	5,350	17,8	16,3	
	5,400	17,4	15,4	
	5,600	17,2	15,1	
	5,725	18,3	15,3	
	5,850	17,3	15,4	
5,875	17,6	15,1		
5 GHz, Horizontal Port, E-Plane, Co-Polarisation	Horizontal Port, E-Plane, Co-Polarization			
	Frequency [GHz]	Gain [dBi]	Beam width [°]	
	4,940	14,1	18,4	
	4,990	15,1	18,2	
	5,150	18,8	16,6	
	5,250	18,6	16,0	
	5,350	18,1	15,6	
	5,400	17,6	15,5	
	5,600	17,6	15,8	
	5,725	18,7	15,0	
	5,850	17,6	14,0	
5,875	17,9	14,0		
5 GHz, Horizontal Port, E-Plane, Cross-Polarisation	Horizontal Port, E-Plane, Cross-Polarization			
	Frequency [GHz]	Gain [dBi]	Beam width [°]	
	4,940	3,0	13,3	
	4,990	3,3	13,9	
	5,150	6,0	15,7	
	5,250	4,7	16,2	
	5,350	3,6	15,8	
	5,400	2,7	15,2	
	5,600	1,8	15,6	
	5,725	6,9	14,5	
	5,850	4,0	14,0	
5,875	3,9	14,0		

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Antenna Gain				
5 GHz, Horizontal Port, H-Plane, Cross-Polarisation	Horizontal Port, H-Plane, Cross-Polarization			
	Frequency [GHz]	Gain [dBi]	Beam width [°]	
	4,940	-3,5	17,4	
	4,990	-4,2	17,4	
	5,150	-1,7	17,4	
	5,250	-3,7	17,3	
	5,350	-4,9	17,8	
	5,400	-7,0	16,6	
	5,600	-11,1	20,7	
	5,725	0,9	15,3	
5,850	-5,0	14,8		
5,875	-5,3	15,6		
5 GHz, Vertical Port, H-Plane, Co-Polarisation	Vertical Port, H-Plane, Co-Polarization			
	Frequency [GHz]	Gain [dBi]	Beam width [°]	
	4,940	17,1	17,9	
	4,990	17,7	17,8	
	5,150	18,7	17,6	
	5,250	18,4	17,1	
	5,350	17,7	16,7	
	5,400	17,6	16,5	
	5,600	17,0	15,7	
	5,725	17,9	15,2	
5,850	16,9	15,1		
5,875	17,2	15,0		
5 GHz, Vertical Port, E-Plane, Co-Polarisation	Vertical Port, E-Plane, Co-Polarization			
	Frequency [GHz]	Gain [dBi]	Beam width [°]	
	4,940	17,3	17,5	
	4,990	17,9	17,2	
	5,150	18,9	16,7	
	5,250	18,4	16,5	
	5,350	17,8	16,6	
	5,400	17,6	16,7	
	5,600	17,1	15,3	
	5,725	18,1	14,6	
5,850	17,0	14,5		
5,875	17,2	14,4		

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Antenna Gain				
5 GHz, Vertical Port, H-Plane, Cross-Polarisation	Vertical Port, H-Plane, Cross-Polarization			
	Frequency [GHz]	Gain [dBi]	Beam width [°]	
	4,940	4,2	23,4	
	4,990	0,4	27,2	
	5,150	-9,6	42,8	
	5,250	-5,1	16,4	
	5,350	-1,0	21,7	
	5,400	1,9	22,2	
	5,600	-5,7	15,1	
	5,725	-3,0	15,1	
	5,850	-1,3	15,2	
5,875	0,0	14,6		
5 GHz, Vertical Port, E-Plane, Cross-Polarisation	Vertical Port, E-Plane, Cross-Polarization			
	Frequency [GHz]	Gain [dBi]	Beam width [°]	
	4,940	-5,6	16,9	
	4,990	-2,8	19,1	
	5,150	-2,5	21,7	
	5,250	-3,3	18,4	
	5,350	-4,4	14,4	
	5,400	-3,0	13,6	
	5,600	-3,2	12,5	
	5,725	-2,5	17,3	
	5,850	-0,1	15,0	
5,875	1,3	14,5		

