
# LANCOM WLC-4006+

## Powerful WLAN controller for the central management of 6 to 30 access points and WLAN routers with integrated hotspot functionality

The LANCOM WLC-4006+ is a powerful WLAN controller with central WLAN management for installations with up to 30 access points. The distribution of firmware updates and configurations takes place via only one device - a massive assistance and time saver for every administrator.

- Central firmware rollout, monitoring & management of 6 to 30 access points and WLAN routers
- Zero-touch deployment of connected WLAN devices
- Optimized raoming behavior of WLAN clients via IEEE 802.11r and OKC
- Comprehensive VLAN-, RADIUS-, and IEEE 802.1X/EAP functions
- Highest operational reliability without "single-point-of-failure"
- Dynamic WLAN optimization thanks to LANCOM Active Radio Control (ARC)
- Integrated Public Spot Option

LANCOM
Systems

# LANCOM WLC-4006+

### Central firmware rollout, monitoring & management

With the LANCOM WLC-4006+ up to 30 access points and WLAN routers can be configured and managed automatically and centrally - a massive assistance and time saver for the administrator. This way the WLAN controller offers a consistent network control, security, and reliability.

### Zero-touch deployment

Quick and easy network integration of new access points as well as automatic configuration rollout – without the need of manual configuration. After network authentication, the LANCOM WLC-4006+ immediately sends an appropriate configuration to the WLAN device.

### Optimized roaming behavior of WLAN clients

LANCOM WLAN controllers assure the communication between the administrated access points and WLAN routers. This way, clients can be passed from one WLAN device to another – crossing two radio fields – without any connection losses.

### VLAN-, RADIUS-, and IEEE 802.1X/EAP functions

hanks to extensive virtualization and security functions, wireless networks can be set up efficiently and compliant to the proprietary security policies. The integrated VLAN functionality enables the separation of several wireless networks in only one infrastructure. Furthermore, there are professional security functions which allow the administrator to grant network access only to authorized clients.

### Highest operational security

The LANCOM Smart Controller principle assures highest operational security: While administration data is transferred via the controller, traffic data is sent directly from the client to the access point and therefrom directly to the router. If one controller breaks down, the access point switches to "stand-alone mode" in order to maintain the communication between client and access point. This way, there are no unproductive hours due to employees not getting Internet access or the failure of WLAN-based machines.

### Active Radio Control for dynamic radio-field optimization

The LANCOM WLC-4006+ supports the WLAN optimization concept LANCOM Active Radio Control. This intelligent combination of innovative features included with the LCOS operating system – such as Band Steering, Adaptive Noise Immunity, RF Optimization, and Client Steering – sustainably increases WLAN performance and supports administrators with professional tools for WLAN management.

### Integrated Public Spot Option

Thanks to the integrated hotspot functionality the LANCOM WLC-4006+ is ideal for providing a public Internet access. 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 hotspot.

### 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 profile settings* | |
|---|---|
| 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) |
| Concurrent WLAN clients | Depends on the access points in operation |
| IEEE 802.11u | Managed LANCOM Access Points support the WLAN standard IEEE 802.11u (Hotspot 2.0) which allows mobile clients a seamless transition from the cellular network into WLAN hotspots. Authentication methods using SIM card information, certificates or username and password, enable an automatic, encrypted login to WLAN hotspots of roaming partners - without the need to manually enter login credentials |
| Roaming | Seamless handover between radio cells, IAPP support with optional restriction to an ARF context, IEEE 802.11d support |
| Opportunistic Key Caching | Opportunistic key caching allows fast roaming processes between access points. WLAN installations utilizing a WLAN controller and IEEE 802.1X authentication cache the access keys of the clients and are transmitted by the WLAN controller to all mananged access points |
| Protected Management Frames | Protection of WLAN Management Frames, based on the standard IEEE 802.11w, against man-in-the-middle attacks by using Message Ingegrity Codes (MIC) |
| Security | IEEE 802.11i / WPA2 with passphrase (WPA2-Personal) or IEEE 802.1X (WPA2-Enterprise) and hardware-accelerated AES, closed network, WEP64, WEP128, WEP152, user authentication, IEEE 802.1x /EAP, LEPS, WPA1/TKIP |
| RADIUS Accounting per SSID | A RADIUS server can be set for each individual SSID |
| Quality of Service | Prioritization according to Wireless Multimedia Extensions (WME, subset of IEEE 802.11e) |
| Background scanning | Detection of rogue AP's and the channel information for all WLAN channels during normal AP operation. The Background Scan Time Interval defines the time slots in which an AP or Router searches for a foreign WLAN network in its vicinity. The time interval can be specified in either milliseconds, seconds, minutes, hours or days |
| Client detection | Rogue WLAN client detection based on probe requests |
| Auto WDS* | Auto WDS allows wireless integration of access points in existing WLAN infrastructure, including managment via WLAN controller. |
| Space Time Block Coding (STBC)* | Coding method according to IEEE 802.11n. The Space Time Block Coding improves reception by coding the data stream in blocks. |
| Low Density Parity Check (LDPC)* | Low Density Parity Check (LDPC) is an error correcting method. IEEE 802.11n uses convolution coding (CC) as standard error correcting method, the usage of the more effective Low Density Parity Check (LDPC) is optional. |
| *) Note | Depends on the access points in operation |
| **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-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) |
| Others | 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 |

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|---|---|
| **LANCOM Active Radio Control** | |
| Adaptive RF Optimization | Dynamic selection of the optimal WLAN channel |
| Airtime Fairness | Improved utilization of the WLAN bandwidth |
| *) Note | Depends on the access points in operation. Steering of WLAN clients is not available in US version |
| **WLAN-Controller** | |
| Number of managed devices | Any combination of up to 6 LANCOM access points and WLAN routers can be centrally managed by the LANCOM WLAN controller. The WLC AP upgrade expansion option enables you to increase the number of access points up to 30 LANCOM WLAN access points and WLAN routers to be managed. Capacities can be expanded even further by employing multiple Controllers. |
| Smart Controller technology | The WLAN controller can switch user data per AP Radio or per SSID in the following ways: – Direct switching to the LAN at the AP (for maximum performance, e.g. for IEEE 802.11n-based access points) – Logical seperation of user data into VLAN's (e.g. for WLAN guest access accounts) – Central tunneling to the Controller (layer 3 tunneling between different IP Subnets) |
| Auto Discovery | LANCOM access points and WLAN routers automatically discover the WLAN controller by means of DNS name or IP addresses. Even AP's at remote sites or in home offices with no direct access to the Controller can be integrated into the central Controller |
| Authentication and Authorization | Access Points can be authenticated manually or automatically. Signaling of new access points by LED, e-mail message, SYSLOG and SNMP traps. Manual authentication via LANmonitor or WEBconfig GUI tools. Semi-automatic authentication based on access-point lists in the Controller ('bulk mode'). Fully automatic authentication with default configuration assignement (can be activated/deactivated separately, e.g. during the rollout phase). Authenticated access points can be identified by means of digital certificates; certificate generation by integrated CA (Certificate Authority); certificate distribution by SCEP (Simple Certificate Enrollment Protocol). Access points can be blocked by CRL (Certificate Revocation List). |
| Management communication protocol | CAPWAP (Control and Provisioning Protocol for Wireless Access Points) |
| Layer-3 Tunneling | Layer-3 Tunneling in conformity with the CAPWAP standard allows the bridging of WLANs per SSID to a separate IP subnet. Layer-2 packets are encapsulated in Layer-3 tunnels and transported to a LANCOM WLAN controller. By doing this the access point is independent of the present infrastructure of the network. Possible applications are roaming without changing the IP address and compounding SSIDs without using VLANs |
| Encryption | DTLS encryption of the control channel between WLAN controller and Access Point (256-bit AES encryption with digital certificates, incl. hardware encryption accelerator; encryption can be disabled for diagnostic purposes). |
| Firmware deployment | Central Firmware deployment and management of the Access Points. Requires an external web server. Automatic Firmware update on the Access Points is also possible. The Controller checks every day, depending on the defined policy, for the latest Firmware and compares it with the versions in the devices. This can also be activated using Cron jobs. If there is a Firmware mismatch, then the Controller downloads the matching Firmware from the server and updates the corresponding Access Points and Routers. |
| Script distribution | Enables the complete configuration of non-WLAN specific functions such as Redirects, Protocol Filter, ARF etc. Internal storage of up to three script files (max. 64 kByte) for provisioning access points without a separate HTTP server |
| RF management and automatic RF optimization | The channel deployment can be static or can be automated. Upon activation of the RF Optimization setting, the Access Points search for an optimal channel in the 2.4 GHz band. The selected channels are sent to the Controller saves these channels on the corresponding Access Points. RF Optmization can also be activated for individual Access Points. Transmit power setting static between 0 to -20 dB. Alarm notification in case of Access Point failure by LED, e-mail, SYSLOG and SNMP traps. |
| Configuration management | Definition and grouping of all logical and physical WLAN parameters by means of WLAN configuration profiles. Fully automatic or manual profile assignment to WLAN Access Points; automatic transfer and configuration verification (policy enforcement). |
| Inheritance of configuration profiles | Support of hierarchical WLAN profile groups. New profiles can be easily created by inheriting parameters from existing profiles. |
| Management operating modes | The AP can be set to 'managed' or 'unmanaged' mode for each radio interface. With LANCOM WLAN routers, the Controller manages the WLAN part only (split management). |
| Stand alone operation | In 'Managed' mode, an adjustable setting defines the time-span for which the AP continues Stand-alone operation in the event the connection to the Controller fails. After this time-span the AP configuration is deleted and the AP resumes operation only after the connection to the Controller is reestablished. By default this value is set to zero and AP ceases operation as soon as connection to the Controller is lost. Alternatively, a special time setting allows the AP to function in Stand-alone mode indefinetly. In Stand-alone mode only Pre-shared Key SSID's are functional. |
| VLAN and IP contexts | A fixed VLAN can be set for each SSID. The WLAN controller can independently provide up to 16 separate IP networks, and each of these can be individually mapped to VLANs and, consequently, to SSIDs (Advanced Routing and Forwarding, ARF). The Controller can provide, among others, individual DHCP, DNS, routing, firewall and VPN functions for these networks. |
| Dynamic VLAN assignment | Dynamic VLAN assignment for target user groups based on MAC addresses, BSSID or SSID by means of external RADIUS server. |

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| WLAN-Controller | |
|---|---|
| RADIUS server | Integrated RADIUS server for MAC address list management. Support for RADSEC (Secure RADIUS) for secure communication with RADIUS servers. |
| EAP server | Integrated EAP server for authentication of IEEE 802.1X clients via EAP-TLS, EAP-TTLS, EAP-MD5, EAP-GTC, PEAP, MSCHAP or MSCHAPv2 |
| RADIUS/EAP proxy per SSID | Proxy mode for external RADIUS/EAP servers (forwarding and realm handling) per SSID |
| Redundancy, Controller backup and load balancing | Every managed LANCOM AP can be assigned to a group of alternative WLAN controllers. A suitable Controller is selected within this group depending on AP load. This ensures that also in backup state the load of larger installations remains equally distributed. |
| LED control | The LEDs of administrated WLAN devices can be centrally deactivated via the WLAN controller |
| CA hierarchy | The Certificate Authority (CA) can be structured hierarchically when using multiple WLAN controllers. This allows access points to swap between different WLAN controllers without certificate conflicts. The Certificate Revocation Lists (CRL) can be shared between the different devices |
| Load balancing | When using multiple WLAN controllers the access points are distributed evenly among the different WLAN controllers to offer the best load balancing. In case one WLAN controller is unavailable the access points are edistributed among the remaining WLAN controllers automatically. Once it is restored they are redistributed again. |
| Backup | A priority can be set for the WLAN Controller which allows operating in hot standby mode. Access points switch automatically to the WLAN controller with the highest priority |
| Fast roaming | VoWLAN devices require seamless roaming for ensuring optimal speech quality. The Access Points support PMK caching and Pre-authentication for such demanding applications. WPA2 and WPA2-PSK operate with sub-85 ms roaming times (requirements: adequate signal quality, sufficient RF overlap, clients with a low roaming threshold). |
| QoS | IEEE 802.11e / WME: Automatic VLAN tagging (IEEE 802.1p) in the Access Points. Mapping to DiffServ attributes in the WLAN controller if this is deployed as a layer-3 router |
| Background scanning, rogue-AP and rogue-client detection | Background scanning does not interupt normal AP operation and collects information on the radio channel load (AP acts as a 'Probe' or 'Sensor' by going off-channel). Foreign Access Points and clients is sent to the Rogue AP Detection in LANCOM WLANmonitor. |
| WLAN visualization | The management tool LANCOM WLANmonitor (included) acts as a central monitoring program for the WLAN controller and visualizes the performance of all WLAN controllers, Access Points, SSIDs and clients. |
| WLAN guess access accounts | Static mapping of guest SSIDs in VLANs, access limitations and VLAN routing by means of ARF (Advanced Routing and Forwarding). |
| Public Spot function | Easy set-up of guest accounts with just a few mouse clicks using the Voucher-Wizard (max. 256 concurrent user). The vouchers can be printed over any standard Printer on the network. The Voucher-Wizard can be customized by uploading an individual logo. Function works without external RADIUS and Accounting servers. Configuration of time and/or traffic budgets as well as when accounting should start. Support of public certificates and certificate chains from trust centers for Public Spots. This allows popular browsers to access trustworthy login pages with secure access (HTTPS) without warnings |
| WLAN client limiting | To ensure that load is evenly balanced between multiple Access Points, each one can be set with a maximum number of allowable WLAN clients. |
| Management software | Included: - LANCOM LANconfig - LANCOM LANmonitor - LANCOM WLANmonitor |
| **Supported Access Points and WLAN routers** | |
| Indoor | ■ LANCOM L-151gn Wireless, LANCOM L-151E Wireless, LANCOM L-54g Wireless, LANCOM L-54ag Wireless, LANCOM L-54 dual Wireless<br>■ LANCOM L-305agn Wireless, LANCOM L-310agn Wireless, LANCOM L-315agn dual Wireless<br>■ LANCOM L-320agn Wireless, LANCOM L-320agn Wireless (white), LANCOM L-321agn Wireless, LANCOM L-322agn dual Wireless, LANCOM L-322E Wireless, LANCOM L-330agn dual Wireless<br>■ LANCOM L-451agn Wireless, LANCOM L-452agn dual Wireless, LANCOM L-460agn dual Wireless<br>■ LANCOM LN-830acn dual Wireless, LANCOM LN-830E Wireless, LANCOM L-822acn dual Wireless, LANCOM L-1302acn dual Wireless, LANCOM L-1310acn dual Wireless, LANCOM LN-860, LANCOM LN-862<br>■ LANCOM LN-1700, LANCOM LN-1702 |

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| Supported Access Points and WLAN routers | |
|---|---|
| Outdoor | ■ LANCOM OAP-54 Wireless, LANCOM OAP-54-1 Wireless<br>■ LANCOM OAP-310 Wireless<br>■ LANCOM OAP-321, LANCOM OAP-321-3G<br>■ LANCOM OAP-382, LANCOM OAP-322<br>■ LANCOM OAP-821, LANCOM OAP-822, LANCOM OAP-830 |
| Industrial | ■ LANCOM IAP-54 Wireless<br>■ LANCOM XAP-40-2 Wireless<br>■ LANCOM IAP-321, LANCOM IAP-321-3G, LANCOM IAP-322<br>■ LANCOM IAP-821, LANCOM IAP-822 |
| UMTS/HSPDA | ■ LANCOM 1780EW-4G, LANCOM 1780EW-3G, LANCOM 1780EW-4G+<br>■ LANCOM 3850 Wireless |
| WLAN-Router and IADs | ■ LANCOM 1781VAW, LANCOM 1781AW, LANCOM 1781EW(+)<br>■ LANCOM 1811n Wireless, LANCOM 1821n Wireless, LANCOM 1823 VoIP, LANCOM 1821+ Wireless ADSL |
| **Functions in layer-3 routing mode** | |
| Note: | Some of the below functions are only active when the device is operating as a router, firewall or VPN gateway. |
| **Public Spot - Technical details** | |
| Number of supported users | 256 concurrent user |
| Login via web portal (Captive Portal) | Login to the hotspot after entry of username and password via a web portal (freely definable) |
| Self-service login to the hotspot (Smart Ticket) | Login credentials to the public spot network are sent to the user through SMS or e-mail. The e-mail is sent via SMTP. The sms is transmitted via the integrated 3G/4G modem, an e-mail-2-SMS gateway or a 3G/4G router in the network |
| Voucher print | With just a few mouseclicks up to 256 tickets with login credentials for the hotspot can be generated and be printed with any office printer. The voucher can be individually designed. |
| Easy Public Spot login with one click | After accepting the terms of use, the user gets a WLAN guest access for a definable period |
| WISPr | Wireless Internet Service Provider roaming allows smart clients to connect to a Public Spot without the need of manual input of login credentials on a website. |
| Re-login | The Public Spot identifies known WLAN clients for an automatic authentication. After an initial authentication, the hotspot stores the relevant client information so that there is no need for an additional manual entering of login credentials - significantly increased comfort for regular guests. |
| Walled Garden functionality | Enables a free access to selected websites, even without activation of the guest access (e.g. sponsoring, corporate or hotel websites) |
| Bandwidth management | The available bandwidth for Public Spot user groups (e.g. “gold”, “silver”, “bronze”) can be individually configured: An ideal functionality for preferring “premium users” and for limiting the bandwidth of standard accounts |
| Support of volume- and time-based accounts | Validity of a hotspot access can be defined with regard to download volume limitation per user or to a limited time period |
| Redirection to advertisment websites | The Public Spot user can be redirected to advertisement websites of the provider at configurable time intervals |
| Dynamic VLAN allocation | Allocation of Public Spot users to individually configurable networks |
| Idle timeout-based disconnect | Connection will be disconnected after x minutes without Internet access |
| Disconnection at WLAN logout | Automatic logout from the hotspot if the client is no longer seen in the WLAN, function only available for WLAN devices |
| Multi login | Allows Public Spot users to login to one hotspot account with multiple devices |

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| **Public Spot - External data interfaces** | |
| RADIUS server interface | By default the Public Spot records session-specific data for later billing on an internal RADIUS server. The forwarding to an external RADIUS server can be configured on a device with Public Spot, if required |
| SYSLOG | LANCOM devices are equipped with an integrated SYSLOG. Alternatively, LANCOM devices can be connected to external SYSLOG servers |
| XML | In order to provide further authentication szenarios apart from login with username and password, the LANCOM Public Spot solution can be connected to external servers via an XML interface |
| FIAS (optional) | Enables a direct communication between the LANCOM Public Spot and a Property Management System (PMS) which supports the FIAS protocol as supported by Micros Fidelio. The interface can only be operated in combination with the LANCOM Public Spot PMS Accounting Plus Option |
| **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 |
| 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, BGPv4, OSPFv2 |
| 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, BGP, 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) |
| **VPN** | |
| IPSec over HTTPS | Enables IPsec VPN based on TCP (at port 443 like HTTPS) which can go through firewalls in networks where e. g. port 500 for IKE is blocked. Suitable for client-to-site connections and site-to-site connections. IPSec over HTTPS is based on the NCP VPN Path Finder technology |
| Number of VPN tunnels | Max. number of concurrent active IPSec, PPTP (MPPE) and L2TPv2 tunnels: 5. Unlimited configurable connections. |

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| VPN | |
|---|---|
| Hardware accelerator | Integrated hardware accelerator for 3DES/AES encryption and decryption |
| 1-Click-VPN Site-to-Site | Creation of VPN connections between LANCOM routers via drag and drop in LANconfig |
| IKE, IKEv2 | IPSec key exchange with Preshared Key or certificate (RSA signature, digital signature) |
| Smart Certificate | Convenient generation of digital X.509 certificates via an own certifaction authority (SCEP-CA) on the webpage or via SCEP. |
| Certificates | X.509 digital multi-level certificate support, compatible with Microsoft Server / Enterprise Server and OpenSSL. Secure Key Storage protects a private key (PKCS#12) from theft. |
| Certificate rollout | Automatic creation, rollout and renewal of certificates via SCEP (Simple Certificate Enrollment Protocol) per certificate hierarchy |
| Certificate revocation lists (CRL) | CRL retrieval via HTTP per certificate hierarchy |
| OCSP Client | Check X.509 certifications by using OCSP (Online Certificate Status Protocol) in real time as an alternative to CRLs |
| XAUTH | XAUTH client for registering LANCOM routers and access points at XAUTH servers incl. IKE-config mode. XAUTH server enables clients to register via XAUTH at LANCOM routers. Connection of the XAUTH server to RADIUS servers provides the central authentication of VPN-access with user name and password. Authentication of VPN-client access via XAUTH and RADIUS connection additionally by OTP token |
| Proadaptive VPN | Automated configuration and dynamic creation of all necessary VPN and routing entries based on a default entry for site-to-site connections. Propagation of dynamically learned routes via RIPv2 if required |
| Algorithms | 3DES (168 bit), AES-CBC and -GCM (128, 192 or 256 bit), Blowfish (128 bit), RSA (1024-4096 bit) and CAST (128 bit). OpenSSL implementation with FIPS-140 certified algorithms. MD-5, SHA-1, SHA-256, SHA-384 or SHA-512 hashes |
| Hardware NAT | Wirespeed NAT performance through hardware support (offloading) for plain IP connections (incl. DHCP) where source and destination addresses are not withn the same /20 network. |
| NAT-Traversal | NAT-Traversal (NAT-T) support for VPN over routes without VPN passthrough |
| IPCOMP | VPN data compression based on Deflate compression for higher IPSec throughput on low-bandwidth connections (must be supported by remote endpoint) |
| Dynamic DNS | Enables the registration of IP addresses with a Dynamic DNS provider in the case that fixed IP addresses are not used for the VPN connection |
| Specific DNS forwarding | DNS forwarding according to DNS domain, e.g. internal names are translated by proprietary DNS servers in the VPN. External names are translated by Internet DNS servers |
| IPv4 VPN | Connecting private IPv4 networks |
| IPv4 VPN over IPv6 WAN | Use of IPv4 VPN over IPv6 WAN connections |
| IPv6 VPN | Connecting private IPv6 networks |
| IPv6 VPN over IPv4 WAN | Use of IPv6 VPN over IPv4 WAN connections |
| Radius | RADIUS authorization and accounting, outsourcing of VPN configurations in external RADIUS server in IKEv2, RADIUS CoA (Change of Authorization) |
| **VPN throughput (max., AES)** | |
| 1418-byte frame size UDP | 288 Mbps |
| **Firewall throughput (max.)** | |
| 1518-byte frame size UDP | 504 Mbps |
| **Hardware firewall throughput (max.)** | |
| HW-NAT TCP | 930 Mbps |
| **Content Filter (optional)** | |
| Demo version | Activate the 30-day trial version after free registration under http://www.lancom.eu/routeroptions |

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| Content Filter (optional) | |
|---|---|
| URL filter database/rating server* | Worldwide, redundant rating servers from IBM Security Solutions for querying URL classifications. Database with over 100 million entries covering about 10 billion web pages. Web crawlers automatically search and classify web sites to provide nearly 150,000 updates per day: They use text classification by optical character recognition, key word searches, classification by word frequency and combinations, web-site comparison of text, images and page elements, object recognition of special characters, symbols, trademarks and prohibited images, recognition of pornography and nudity by analyzing the concentration of skin tones in images, by structure and link analysis, by malware detection in binary files and installation packages |
| URL check* | Database based online check of web sites (HTTP/HTTPS). HTTPS websites are checked based on DNS names of HTTPS server certificates or based on “Reverse DNS lookup“ of IP addresses. |
| Categories/category profiles* | Filter rules can be defined in each profile by collecting category profiles from 58 categories, for example to restrict Internet access to business purposes only (limiting private use) or by providing protection from content that is harmful to minors or hazardous content (e.g. malware sites). Clearly structured selection due to the grouping of similar categories. Content for each category can be allowed, blocked, or released by override |
| Override** | Each category can be given an optional manual override that allows the user to access blocked content on a case-by-case basis. The override operates for a limited time period by allowing the category or domain, or a combination of both. Optional notification of the administrator in case of overrides |
| Black-/whitelist | Lists that are manually configured to explicitly allow (whitelist) or block (blacklist) web sites for each profile, independent of the rating server. Wildcards can be used when defining groups of pages or for filtering sub pages |
| Profiles | Timeframes, blacklists, whitelists and categories are collected into profiles that can be activated separately for content-filter actions. A default profile with standard settings blocks racist, pornographic, criminal, and extremist content as well as anonymous proxies, weapons/military, drugs, SPAM and malware |
| Time frames | Timeframes can be flexibly defined for control over filtering depending on the time of day or weekday, e.g. to relax controls during break times for private surfing |
| Flexible firewall action | Activation of the content filter by selecting the required firewall profile that contains content-filter actions. Firewall rules enable the flexible use of your own profiles for different clients, networks or connections to certain servers |
| Individual display pages (for blocked, error, override) | Response pages displayed by the content filter in case of blocked sites, errors or overrides can be custom designed. Variables enable the inclusion of current information such as the category, URL, and rating-server categorization. Response pages can be issued in any language depending on the language set in the user's web browser |
| Redirection to external pages | As an alternative to displaying the device's own internal response pages to blockings, errors or overrides, you can redirect to external web servers |
| License management | Automatic notification of license expiry by e-mail, LANmonitor, SYSLOG or SNMP trap. Activation of license renewal at any time before expiry of the current license (the new licensing period starts immediately after expiry of the current license) |
| Statistics | Display of the number of checked and blocked web pages by category in LANmonitor. Logging of all content-filter events in LANmonitor; log file created daily, weekly or monthly. Hit list of the most frequently called pages and rating results. Analysis of the connection properties; minimum, maximum and average rating-server response time |
| Notifications | Messaging in case of content-filter events optionally by e-mail, SNMP, SYSLOG or LANmonitor |
| Wizard for typical configurations | Wizard sets up the content filters for a range of typical scenarios in a few simple steps, including the creation of the necessary firewall rules with the corresponding action |
| Max. users | Simultaneous checking of HTTP(S) traffic for a maximum of 100 different IP addresses in the LAN |
| *) Note | Categorization is maintained by IBM. Neither IBM or LANCOM can guarantee full accuracy of the categorization. |
| **) Note | The Override function is only available for HTTP websites. |
| **VoIP** | |
| SIP ALG | The SIP ALG (Application Layer Gateway) acts as a proxy for SIP communication. For SIP calls the ALG opens the necessary ports for the corresponding media packets. Automatic address translation (STUN is no longer needed). |
| **LAN protocols** | |
| IP | ARP, proxy ARP, BOOTP, DHCP, DNS, HTTP, HTTPS, IP, ICMP, NTP/SNTP, NetBIOS, PPPoE (server), RADIUS, RIP-1, RIP-2, RTP, SIP, SNMP, TCP, TFTP, UDP, VRRP, VLAN |
| **Interfaces** | |
| Ethernet ports | 4 individual 10/100/1000 Mbps Ethernet ports; up to 3 ports can be operated as additional WAN ports with load balancing. Ethernet ports can be electrically disabled within LCOS configuration. The ports support energy saving according to IEEE 802.3az |

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|---|---|
| **Interfaces** | |
| Uplink | 10/100/1000 Mbps Ethernet port, set as LAN port in default; Ethernet ports can be electrically disabled within LCOS configuration. The ports support energy saving according to IEEE 802.3az |
| Port configuration | Each Ethernet port can be freely configured (LAN, WAN, monitor port, off). LAN ports can be operated as a switch or separately. Additionally, external DSL modems or termination routers can be operated at the WAN port together with policy-based routing. |
| USB 2.0 host port | USB 2.0 hi-speed host port for connecting USB printers (USB print server), serial devices (COM port server), USB data storage (FAT file system); bi-directional data exchange is possible |
| 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 |
| **Hardware** | |
| Housing | Robust synthetic housing, rear connectors, ready for wall mounting, Kensington lock; 210 x 45 x 140 mm (W x H x D) |
| **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 |
| 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, Layer 7 Application Detection including application-centric tracking of traffic volume |
| 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 |
| SD-WAN | SD-WAN – automatic WAN configuration via the LANCOM Management Cloud |
| **Hardware** | |
| Weight | 0,99 lbs (450 g) |
| Power supply | 12 V DC, external power adapter (230 V/110 V US version) with bayonet cap to protect against accidentally unplugging |
| Environment | Temperature range 0–40° C; humidity 0–95%; non-condensing |
| Housing | Robust synthetic housing, rear connectors, ready for wall mounting, Kensington lock; 210 x 45 x 140 mm (W x H x D) |
| Fans | None; fanless design without rotating parts, high MTBF |
| Power consumption (max) | Approx. 8.5 watt |
| **Declarations of conformity*** | |
| CE | EN 60950-1, EN 55022, EN 55024 |
| FCC | FCC Part 15, Class B with FTP cabling |
| 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** | |
| CD/DVD | Data medium with management software (LANconfig, LANmonitor, WLANmonitor, LANCAPI) and documentation |
| Cable | 1 Ethernet cable, 3 m |

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| **Support** | |
| Warranty | 3 years support |
| Software updates | Regular free updates (LCOS operating system and LANtools) via Internet |
| **Options** | |
| Management | LANCOM WLC AP Upgrade +6 Option, enables your WLC to manage 6 Access Points/WLAN router in addition, item no. 61629 |
| LANCOM Content Filter | LANCOM Content Filter +10 user, 1 year subscription, item no. 61590 |
| LANCOM Content Filter | LANCOM Content Filter +25 user, 1 year subscription, item no. 61591 |
| LANCOM Content Filter | LANCOM Content Filter +10 user, 3 year subscription, item no. 61593 |
| LANCOM Content Filter | LANCOM Content Filter +25 user, 3 year subscription, item no. 61594 |
| 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 PMS Accounting Plus | Extension of the LANCOM Public Spot (XL) Option for the connection to hotel billing systems with FIAS interface (such as Micros Fidelio) for authentication and billing of guest accesses for 178x/19xx routers, WLCs, and current central-site gateways, item no. 61638 |
| LANCOM WLC AP Upgrade +6 | LANCOM WLC AP Upgrade +6 Option, enables your WLC to manage 6 Access Points/WLAN router in addition, item no. 61629 |
| **LANCOM Management Cloud** | |
| LANCOM LMC-B-1Y LMC License | LANCOM LMC-B-1Y License (1 Year), enables the management of one category B device for one year via the LANCOM Management Cloud, item no. 50103 |
| LANCOM LMC-B-3Y LMC License | LANCOM LMC-B-3Y License (3 Years), enables the management of one category B device for three years via the LANCOM Management Cloud, item no. 50104 |
| LANCOM LMC-B-5Y LMC License | LANCOM LMC-B-5Y License (5 Years), enables the management of one category B device for five years via the LANCOM Management Cloud, item no. 50105 |
| **Accessories** | |
| 19" Rack Mount | 19" rack mount adaptor, item no. 61501 |
| **Item number(s)** | |
| LANCOM WLC-4006+ | 62035 |
| LANCOM WLC-4006+ (UK) | 62036 |

# LANCOM WLC-4006+

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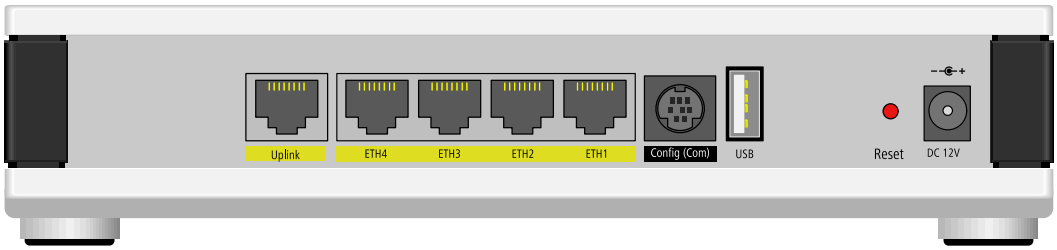
| Item number(s) | |
|---|---|
| LANCOM WLC-4006+ (US) | 62037 |





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