

# Information regarding

## LCOS Software Release 8.62 SU8

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## 1. Preface

LCOS („LANCOM Operating System“) is the operating system for all LANCOM routers, wireless LAN access points and WLAN controllers. In the context of the hardware given by the products the at a time latest LCOS version is available for all LANCOM products and is available free of charge for download from LANCOM Systems.

This document describes the innovations within LCOS software release 8.62 SU8, as well as the improvements since release 8.50

### **Warning hints – Backing up the current configuration**

Before upgrading your device to a new LCOS version it is **essential** to backup the configuration of your router. Due to extensive features it is **not possible to downgrade** to a previous firmware without using the backup configuration.

Please see the reference manual for instructions on how to backup the router configuration.

If you want to upgrade devices which are only accessible via router connections or WLAN bridges, please keep in mind to upgrade the remote device first and the local device afterwards.

### **Warning hint – LCOS upgrade for devices LANCOM OAP/IAP-321-(3G) and LANCOM 1780EW-3G**

Some of the current LANCOM WLAN routers and access points with LCOS 8.5 or earlier, which are to receive new firmware or extensive new configurations over the wireless LAN interface, may under certain circumstances suffer from WLAN connection loss. The result of this error is that the wireless link is interrupted and, in the worst case —such as with an outdoor point-to-point link— the device may lose contact completely. In this case, re-establishing the radio link would require a manual restart of the remote device by pressing the reset button. To prevent this we recommend to configure an [alive test](#) before uploading a new firmware.

### **Note – Upgrading central site components**

We strongly recommend updating productive systems only after internal tests in client environment. Despite intense internal and external quality assurance procedures possibly not all risks can be eliminated by LANCOM Systems.

### **Note – Using converter firmwares**

You will need enough free memory to use a firmware 6.0 and newer in your LANCOM 15x1, 1611+, 821+ and DSL/I-10+ and LCOS 8.0 in a LANCOM XAC or LANCOM 1823 VoIP.

Due to the implementation of several new features within the current build of the firmware, it is no longer possible to store two main firmware versions side by side. To gain more free space for the current version, it is now necessary to upload a converter firmware into your device. The converter-firmware has a much smaller size, so that it is now possible to store the main release of the firmware besides the converter-firmware.

This setup is only necessary once for a single device and is done with the so-called converter-firmware (see readme.pdf of the affected devices).

After having flashed the converter-firmware the firmsave function of the LANCOM device is available only on a limited scale. The update to a newer firmware is furthermore possible. However, in case of an update failure the LANCOM will only work with a minimal-firmware which allows just local access to the device. Any extended functionality, in particular remote administration, is not possible when running the minimal-firmware.

#### Note – Dynamic VPN registration

By reason of patent you have to register the functionality „Dynamic VPN“ with IP address transmission over ISDN. This operating mode is usually required when you configure a VPN tunnel with dynamic IP addresses on both sides without dynamic DNS services.

Any other Dynamic VPN operation mode (e.g. transmitting the IP address via ICMP, provoking a callback etc.) does not require registration.

The registration process is fully anonymous - no personal or company data will be transmitted.

The registration of the Dynamic VPN option requires administrator rights on the LANCOM device.

#### Note – Using VoIP options

VoIP options for LANCOM 1821 Wireless ADSL are discontinued with LCOS 7.20. The final version containing the VoIP Call Manager is LCOS 6.32.

As from LCOS 7.5x support for VoIP options for the devices LANCOM 1511 Wireless DSL and 1521 Wireless ADSL is discontinued. The final version containing the VoIP Call Manager is LCOS 7.30.

For the „VoIP ready“ routers LANCOM 1711 VPN, 1721 VPN and 1811 Wireless DSL support for the subsequently installed VoIP option will be discontinued with LCOS version 7.56. If you want to continue using your VoIP option, please do only use LCOS versions up to and including 7.54.

For T-Systems Business LAN R800+ VoIP functionality is discontinued in LCOS 7.60

LCOS 7.70 is the final version supporting VoIP options for the remaining „VoIP ready“ devices.

#### Note – Device specific support of the current LCOS version

As from LCOS 8.50 support for the following devices is discontinued:

- LANCOM 1811 Wireless
- LANCOM 1721 VPN

For the following devices the additional, LANconfig-like WEBconfig view is removed as from LCOS 8.60:

- LANCOM L-310
- LANCOM L-305
- LANCOM L-54dual
- T-Systems Business LAN R800+

Please use instead either LANconfig or use the configuration view “LCOS Menu Tree” in WEBconfig

## **2. Known Issues**

Latest support notes and known issues regarding the current LCOS version can be found in the download area of our website <http://www.lancom-systems.eu/Common-Support-Hints.64.0.html>

### 3. New Features, Improvements and History

#### LCOS improvements 8.62.0103 RU7 ► 8.62.0112 SU8

##### Bugfixes / Improvements:

- A security issue within WPA2 authentication (KRACK attack) using P2P connections with 802.11a/b/g/n Wi-Fi modules has been fixed:

*CVE-2017-13077: reinstallation of the pair-wise key in the Four-way handshake*

*CVE-2017-13080: reinstallation of the group key in the Group Key handshake*

The WLAN client mode / WLAN station mode with 802.11a/b/g/n Wi-Fi modules is not affected.

##### Note:

- LCOS is not affected by the following WPA2 security issues (KRACK attack):

*CVE-2017-13084: reinstallation of the STK key in the PeerKey handshake*

*CVE-2017-13086: reinstallation of the Tunneled Direct-Link Setup (TDLS) PeerKey (TPK) key in the TDLS handshake*

*CVE-2017-13087: reinstallation of the group key (GTK) when processing a Wireless Network Management (WNM) Sleep Mode Response frame*

*CVE-2017-13088: reinstallation of the integrity group key (IGTK) when processing a Wireless Network Management (WNM) Sleep Mode Response frame*

*CVE-2017-13078: reinstallation of the group key in the Four-way handshake*

*CVE-2017-13079: reinstallation of the integrity group key in the Four-way handshake*

*CVE-2017-13081: reinstallation of the integrity group key in the Group Key handshake*

- LCOS would only be affected by the following WPA2 security issues (KRACK attack) when using 802.11r (fast roaming), but this is not supported by this LCOS version:

*CVE-2017-13082: accepting a retransmitted Fast BSS Transition Reassociation Request and reinstalling the pair-wise key while processing it*

#### LCOS improvements 8.62.0101 SU6 ► 8.62.0103 RU7

##### Bugfixes / Improvements:

##### Network Connectivity:

- Fixed a bug in the encryption routine which could possibly lead to a device restart

##### WLAN:

- Correction in bandwidth limitation for received data packets
- 3- and 4-address-frames are no longer transferred mixed in one aggregate in send direction, so that incoming WLAN packets will be answered always if frame aggregation is enabled

## **LCOS improvements 8.62.0086 RU5 ► 8.62.0101 SU6**

### **Bugfixes / Improvements:**

#### **VoIP:**

- **WAN access restrictions for SIP accounts** - For the VoIP routers 1722 VoIP, LANCOM 1723 VoIP, LANCOM 1724 VoIP and LANCOM 1823 VoIP a previously permitted access over WAN is once automatically set to "only via VPN" for SIP users. This way a violation of SIP accounts over WAN is prevented. This change will be included in all future LCOS versions.  
In order to access SIP accounts over WAN, you can still configure the access via LANconfig. Please make sure to use highly secure passwords during manual configuration.

## **LCOS improvements 8.62.0074 RU4 ► 8.62.0086 RU5**

### **Bugfixes / Improvements:**

#### **Network Connectivity:**

- Uncategorized sites are no longer treated like whitelist addresses by the content filter
- Certificates may now be exchanged using the file system's replace function
- LL2M now uses correct VLAN-Tags in the answer packets
- Improvements in the manual UMTS network selection for the LANCOM 1751
- Support for DFS 4  
Due to LCOS 8.62 script compatibility reasons the configuration shows EN301893 1.5. The functionality is instead according to the new specification EN 301893 1.6.1. The display is fixed for the upcoming LCOS Major release

## **LCOS improvements 8.62.0050 RU2 ► 8.62.0074 RU4**

### **Bugfixes / Improvements:**

#### **WLAN:**

- No more WLAN performance problems due to aggregation errors on a LANCOM L-32x (from Hardware release E)
- If Public Spot is secured with „WLAN Authentification Pages Only“ there is no configuration access possible via HTTPS
- An additionally via WLC tunnel configured SSID on an access point can be used without device restart

#### **Network Connectivity:**

- If DNS server and gateway were obtained via DHCP, the LANCOM can send emails again
- Error correction with USB autoloading of a \*.lcf configuration file
- A LANCOM can be configured via HTTPS using Internet Explorer 10

## **LCOS improvements 8.62.0029 RU1 ► 8.62.0050 RU2**

### **Bugfixes / Improvements:**

#### **WLAN:**

- The PublicSpot wizard is available in WEBconfig on all access points
- If a particular Public Spot voucher template is used, the printout of the comment field can be suppressed optionally

#### **VoIP:**

- The LANCOM device does not answer a re-invite with a bigger codec list as offered from the remote site

#### **Network Connectivity:**

- Corrected DSLoL interface selection for access points
- Fixed a memory leak
- Fax is complete when transmitted via LANCAP1
- DNS answers are forwarded to the client accurately, even if the answer packet contains "additional records"
- An incompletely received fax via LANCAP1 is no longer shown as successfully transmitted
- 802.3az can be used without errors
- UMTS cards are immediately recognized even after cold boot on a LANCOM 3850
- SNMP read access via Public Community is possible on VPN connections, too

**LCOS improvements 8.62.0017 Release ► 8.62.0029 RU1****Bugfixes / Improvements:****WLAN:**

- Comment fields in the Public Spot module must not contain spaces
- If a parameter-containing URL is forwarded to the login page of the Public Spot module, no "404 not found" error is displayed
- If a WLAN SSID is disabled on a managed access point, clients which were connected to this SSID are de-associated
- WLC tunnels are displayed correctly in the WLAN management's net count status table
- Lower case characters can be used within the Public Spot module's SSID table
- If WLAN country settings are set to Switzerland the LCOS threshold for radar detection and DFS is not user configurable.
- The LCOS threshold for radar detection is increased

**Network Connectivity:**

- Fixed a potential security issue when using QoS with VPN
- If firewall data traffic is limited in bandwidth, DNS requests are no longer filtered by a deny-all rule
- Firewall / masquerading can handle FTP HOST commands which are used by different FTP clients
- If a port is masked inversely, port blocking applies not only to the forwarded protocol but to all
- A VPN backup can be used for an unmasked IPoE connection
- Improved processing of time controlled events in the SCEP client

## **LCOS improvements 8.60.0194 RU1 ► 8.62.0017 Release**

### **New Features:**

#### **WLAN:**

- A LANCOM WLC-6 option can be activated on the devices LANCOM 1781EF, LANCOM 1781A, LANCOM 1781 A-3G and LANCOM 1781-4G
- Probe responses with an empty SSID can be inhibited via „Closed Network“ switch
- A possible multi-login can be configured using the WEBconfig's PublicSpot Wizard
- Extended status information can be displayed using WEBconfig's PublicSpot user management. If a user is deleted via wizard he will be deauthenticated immediately

#### **Network Connectivity:**

- LANCOM devices with integrated UMTS modem will read call number and IMSI (International Mobile Subscriber Identity) of the SIM card
- Support for VPN configuration by LANCOM MyVPN App
- The number of encrypted (PPTP-)connections is displayed in the status tree

### **Bugfixes / Improvements:**

#### **WLAN:**

- No fallback to the previous running LCOS version in case of a defective radio module. Instead of that an error is displayed via WLAN LED
- A DMZ which is linked to a WLC tunnel does no longer lead to multiple displays of the same access point
- If a 5GHz WLAN is configured with 11n mode disabled on a 802.11n capable access point, DFS channel selection does no longer privilege channels where 40MHz mode is possible
- Public Spot users are not deleted after device restart
- Manual update check on a WLC includes already connected access points
- If a 5GHz radio cell is restarted due to a configuration change, channels with detected DFS signals are skipped during channel search

#### **Network Connectivity:**

- WEBconfig's DynDNS wizard can be used again
- Improved analysis for answers of the content filter rating server
- Corrected free VPN licenses check for encrypted PPTP connections

## **LCOS improvements 8.60.0189 Release ► 8.60.0194 RU1**

### **Bugfixes / Improvements:**

#### **Network Connectivity:**

- The DNS forwarder works again, even with disabled DNS module
- Script up- and downloads via HTTP(S) can be used again



## **LCOS improvements 8.60.0169 RC3 ► 8.60.0189 Release**

### **Bugfixes / Improvements:**

#### **WLAN:**

- The WLAN interfaces of the LANCOM IAP-321-3G and OAP-321-3G are no longer managed by a WLC by default

#### **VoIP:**

- SIP-ALG can now be used with all designated devices

### **Network Connectivity:**

- Improvements in UMTS throughput
- A LANCOM router can be configured from LAN using its WAN address even if the content filter is active
- Corrected status display for the mobile radio interface
- The LANCOM 1721+ MIB can be loaded into MIB browsers again
- xAUTH connections which are authenticated via RADIUS are no longer limited to 250 negotiations
- The interface column of the TCP network table was enlarged for complete WLC tunnel specification

## **LCOS improvements 8.60.0134 RC2 ► 8.60.0169 RC3**

### **New Features:**

#### **WLAN:**

- The new rate adopt mechanism „Minstrel“ is now activated by default

### **Bugfixes / Improvements:**

#### **WLAN:**

- A user-dependent volume restriction specified in the Public Spot wizard is now saved to the configuration in the correct unit
- iOS devices can authenticate to a LANCOM Public Spot without error

#### **VoIP:**

- After a Re-Invite no codec is used which was not previously offered as possible codec
- SIP clients authenticated from WAN can do outgoing calls again

### **Network Connectivity:**

- A UMTS dial-in with a LANCOM 178XX-3G via private APN is now possible
- Using RSA keys bigger than 2k for an SSH session does not lead to an LCOS watchdog
- Additional administrators can be created with a password length of more than 16 characters using WEBconfig
- NAT-Traversal is activated by default (e.g. after configuration reset)

**LCOS improvements 8.60.0104 RC1 ► 8.60.0134 RC2****New Features:****VoIP:**

- Implementation of a SIP proxy which allows SIP connections behind a NAT without STUN
- Restrictable SIP authentication via LAN

**Bugfixes / Improvements:****WLAN:**

- Possible sorting of the Public Spot user table in the 'Manage Public Spot account' wizard by „Expiry-Type“ or „Absolute Expiry“
- Corrected CSV export of the Public Spot user table
- Public Spot users which were created prior to LCOS 8.60 are displayed in WEBconfig's user management

**Network Connectivity:**

- HTTPS connections are possible with disabled content filter if the corresponding firewall rule is active
- FCC devices can establish an IPoE connection again
- Fixed a memory leak for FCC devices
- T-Home Entertain can be used with IGMP Snooping again
- A LANCOM device can be used as a PPTP client with activated MPPE

## **LCOS improvements 8.50.0161 RU2 ► 8.60.0104 RC1**

### **New Features:**

#### **WLAN:**

- Conformity of the 40 MHz mode approved by WiFi-Alliance
- Separate group keys for each VLAN can be allocated via 802.1x
- 16 Point-to-Point connections can be configured per WLAN module
- Improved rate-adaption algorithm
- Configurable maximum amount of clients in the PublicSpot module
- The voucher wizard within the Public-Spot module is now able to print multiple vouchers at the same time
- It is now possible to specify forwarding address URLs with a length up to 251 characters within the PublicSpot module
- Improved automatic radio field optimization

#### **Network Connectivity:**

- Support for TLS 1.1 and 1.2
- Table rows can be called recursively by „cd“ and „ls“ and thus be displayed well-arranged
- Fields „Location“ and „comment 1“ are passed to LANconfig in order to show this information in column view
- Wireshark compatible files can be generated
- The output of the „show“ command can be limited by using filters
- A broken VPN connection of the LANCOM Advanced VPN Client (Version 2.30 ff) can be re-used when dialing-in again; no need for complete connection clearing by DPD
- PPTP connections can be encrypted (MPPE)
- Configurable Vendor class identifier for DHCP
- Support for PPPoA and IPoA connections on the LANCOM 1781 devices with integrated ADSL modem
- The „ls“ console command can be called recursively
- A loopback address can be configured for communication with a Content filter rating server
- For memory usage optimization, the additional, Lanconfig-like WEBconfig was removed from the devices L-310, L-305, L-54dual and T-Systems Business LAN R800+ in LCOS 8.60

## Bugfixes / Improvements:

### VoIP:

- No more improvements in DTMF tone codecs
- Register packets are no longer sent with wrong sender address
- No more changes in DTMF tone codecs

### WLAN:

- When detecting radar on a Point to Point connection the 40MHz mode is considered when selecting new channels
- If client profiles with different encryptions are used (WEP and WPA), the client is able to authenticate correctly even after a fallback to WEP
- The serial number of a managed access point is displayed correctly
- 256 802.1x negotiations now possible at the same time
- TLS authentication no longer broken by beacon timeouts
- Using ist WAN interface, a LANCOM accesspoint can be connected to a WLC
- Further roaming improvements for Apple clients
- If client profiles with different encryptions are used (WEP and WPA), the client is able to authenticate correctly even after a fallback to WEP
- WLAN log table extended to 100 entries
- MAC broadcasts received via WLAN are no longer forwarded to the routing module
- When detecting radar on a Point to Point connection the 40MHz mode is considered when selecting new channels
- The serial number of a managed access point is displayed correctly

### Network Connectivity:

- No more device restart if a wrong password is used during ISDN admin dial-in
- Fixed the bug „Timeout on I2C transfer“, shown in syslog
- If a rating server of a content filter sends an invalid answer, another server is selected
- MC8705 UMTS modules which up to now could only establish HSUPA connections can now be used with HSPA+
- Single remote stations of a loadbalancer can be used in the firewall
- Packets with source- and destination address in the LANCOM device's IP (ARF) network are no longer forwarded (backrouting trap).
- The LANCOM itself is not displayed in accounting
- Fixed a possible LCOS watchdog when using VPN hardware acceleration
- Unnecessary packet retries are avoided if the client sends user data during TCP negotiation
- Fixed errors in the LANCOM 1721(+) MIB
- If a rating server of a content filter sends an invalid answer, another server is selected
- MC8705 UMTS modules which up to now could only establish HSUPA connections can now be used with HSPA+

#### 4. Comments

If you want to upgrade the firmware of your device to a new version, please install the latest LCMS version first. **Before running the firmware-upload you should save the router configuration to a file.** After that you can use LANconfig to load the latest LCOS-version into the device.

In principle, we suggest upgrading the firmware of your device only if you are in need of the latest features.

Please note that different firmware files might be available for your device. Further information can be found in the file README.PDF in the download area of our homepage.