



The **Hirschmann™** BAT Operating System

Information regarding Release

HiLCOS Software Version 9.12.5940-RU9

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2020-11-26

Table of Contents

1. Preface.....	3
2. Known Issues	3
3. Improvements since Version 9.12.5920-RU8.....	4
WLAN	4
WLC.....	4
4. Improvements since Version 9.12.5910-RU7.....	4
WLAN	4
5. Improvements since Version 9.12.5900-RU6.....	4
WLAN	4
6. Improvements since Version 9.12.5850-RU5.....	4
WLAN	4
7. Improvements since Version 9.12.5800-RU4.....	4
WLAN	4
8. Improvements since Version 9.12.5750-RU3.....	4
WLAN (Client-Mode)	4
9. Improvements since Version 9.12.5700-RU2.....	4
Security / WLAN	5
10.Improvements since Version 9.12.5600-RU1.....	5
WLAN	5
11.Improvements since Version 9.12.5500-REL.....	6
WLAN	6
Network connectivity	6
Security	6
System	6
12.Improvements since Version 9.10.5126-REL.....	7
WLAN	7
Security	7
System	7
13.Improvements since Version 9.00.5112-RU1.....	8
WLAN	8
Network connectivity	8
Security	8
System	8
14.Improvements since Version 9.00.5103-REL.....	9
WLAN	9
Network connectivity	9
Security	9
System	9
15.Comments	10



The **Hirschmann™** BAT Operating System

1. Preface

This document describes the innovations within HiLCOS software version 9.12.5940-RU9.

The Version 9.12.5940-RU9 supports OpenBAT-R, OpenBAT-F and BATWLC devices.

2. Known Issues

The use of RSTP together with AutoWDS can lead to an unstable AutoWDS network. It is recommended to use AutoWDS with RSTP disabled.

In very rare cases when adding a new Access Point (AP) in the AutoWDS network interactions between neighboring AutoWDS APs can occur. This can cause short-term disruptions of wireless links.

If APs are added in an AutoWDS network before enabling Auto-Accept, these APs must be accepted manually after switching Auto-Accept.

When running a BAT device in IEEE 802.11n WLAN mode, the option of Soft-Retries are not supported.

3. Improvements since Version 9.12.5920-RU8

WLAN

- Optimization in roaming process on WLAN clients to connect to the best available Access Point if hidden SSIDs are used.
- “4-way-key-handshake quick switch over” to the next available Access Point for fast moving WLAN clients.
- Improved management of Public-Spot User Accounts

WLC

- The Ethernet driver now has more CPU time to process packets faster.

4. Improvements since Version 9.12.5910-RU7

WLAN

- User preferred channel-selection in DFS bands in case uniform spreading is not required.
- Solves forwarding of unicast ARP packets in station mode, for scenarios without client bridge support.

5. Improvements since Version 9.12.5900-RU6

WLAN

- The PoE LED, on the OpenBAT-R, OpenBAT-F and BAT450-F, now indicates operation with power supply in client mode via PoE.

6. Improvements since Version 9.12.5850-RU5

WLAN

- Correction of TX power limits in channel 149 for Singapore and China profiles

7. Improvements since Version 9.12.5800-RU4

WLAN

- Adding capability to OpenBAT-R devices to operate as „Short Range Device“ in 5.8GHz Band according to EN 300 440.

8. Improvements since Version 9.12.5750-RU3

WLAN (Client-Mode)

- Improved Roaming-Handover delay for client mode in an IEEE 802.1x secured WLAN network.
- Optional setting to delay roaming event after the detection of a better suited access point.

9. Improvements since Version 9.12.5700-RU2



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Security / WLAN

- Fix for WPA2 Vulnerability KRACK

10. Improvements since Version 9.12.5600-RU1

WLAN

- Update regulatory approvals on the BAT devices
- Regulatory update regarding 2014/53/EU - Radio Equipment Directive (RED)



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11. Improvements since Version 9.12.5500-REL

WLAN

- Update regulatory approvals of the BAT devices
- Configurable WLC preference option added to managed-AP configuration
- Improved client scanning behavior
- Reduction of False-Positive detections in radar detection algorithm for EN301893
- Fixed noise floor calculation
- Fixed increased packet loss due to frequent background scanning

Network connectivity

- Improved client recovery timeout during AP failure in a roaming scenario
- Improved RSTP recovery time
- Fixed address usage in CAPWAP protocol stack when VRRP is used

Security

- Improved L2-Firewall multicast forwarding

System

- Added SNMP-Traps for the following events: DFS-Radar detected, Roaming-Client handover, NTP clock sync
- Added missing SNMP Trap descriptions
- Fixed script configuration for user-defined daylight-saving-time settings
- Fixed SNMPv2 Trap enterprise OIDs



The **Hirschmann™** BAT Operating System

12. Improvements since Version 9.10.5126-REL

WLAN

- Update regulatory approvals of the BAT devices
- Fix of configuration problems when operating a 1:1 NAT on a WLAN interface in client mode
- Improved roaming handover delay by the use of Opportunistic Key Caching and several logical WLAN Networks on separate WLAN interfaces

Security

- Fix of device specific TLS certificate generation on BAT450-F devices

System

- HiLCOS 9.12 is compliant to FCC regulations U-NII, ET Docket No. 13-49 (FCC 14-30 and FCC 16-24)
- SNMP Trap for status change of the Power Supply Unit

13. Improvements since Version 9.00.5112-RU1

WLAN

- C2C (WLAN Coach Coupling) for full automatic coupling of access points in trains.
- 1:1 NAT on WLAN interfaces in client mode.
- Wireless Link Status to allow the long term observation of the quality of a WLAN connection.
- It is possible to use the Public Spot web API to create 802.1x users.
- SSIDs with a space in the name are correctly handled.
- Now it is possible to use a * as a wildcard in the station table.
- Now it is possible to define a max bandwidth per client per SSID.
- Double entries of MAC addresses in the station table are now avoided.

Network connectivity

- Improved roaming times for Train-To-Trackside applications.
- Improvements for seamless handover when roaming together with PRP (Parallel Redundancy Protocol).
- Devices with a name longer than 16 characters are now correctly displayed in the web search.
- With the cli command „show script error“, it is now possible to show errors in an applied script.
- Client-Binding is supported when load balancing is used.
- For new access points the state of the certificate is now displayed in CAPWAP.
- The length of the device name is extended up to 64 characters.
- Automatic configuration synchronization between BAT-Controller.

Security

- WIDS Intruder Identification for improved identification of an intruder inside the WLAN.
- WIDS configuration rollout with BAT-Controller.
- For the TLS/SSL certificates a unique RSA key is generated after a reset of the BAT.
- SCEP is extended by the AES-192, AES-256, SHA-256, SHA-384 und SHA-512 algorithms.
- The BAT offers now the possibility to save the configuration in an encrypted format on the PC.

System

- HiLCOS 9.10 supports the brand new BAT450 hardware.



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14. Improvements since Version 9.00.5103-REL

WLAN

- Improved stability of WPA1 connections
- Improved reliability and monitoring of AP - Client connections
- Configuration of Client-Bridge support on OpenBAT-Client devices
- Improved configuration and management of Public-Spot User Accounts
- Improved stability when configuring the WLC SCEP-Client

Network connectivity

- Improved stability of PRP connections
- Improved stability of the IP-Router
- Improved stability when handling SNMP packets

Security

- Improved security of devices with default configuration by using device specific default SSL/TLS keys
- A status object is added to display the use of Default-Passwords

System

- Improved device handling with the fix of the following problem: With a firmware Up- or Downgrade to HiLCOS 9.00-Rel the device LEDs might be turned off. The LEDs can be turned back on by manually switching off and on the corresponding setting.



The **Hirschmann™** BAT Operating System

15. Comments

Backing up the current configuration

Before upgrading your BAT devices to a new HiLCOS version it is **essential** to backup the configuration data!

Due to extensive features it is not possible to downgrade to a previous firmware without using the backup configuration.

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

Please see the HiLCOS reference manual for instructions on how to upgrade the firmware.

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 Hirschmann Automation and Control GmbH .