



HIRSCHMANN

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Product Bulletin

PB 1072HE

HiLCOS 8.80 WLAN Firmware from Hirschmann™

Opening up a wide range of new possibilities for using WLAN in industrial automation applications is now possible with the new HiLCOS firmware, version 8.80 for all Hirschmann™ BAT access points and BAT controllers.



Used to communicate in public WLAN networks, IPv6 is essential for “smart” power distribution and provides maximum stability for the wireless connection with band steering and extensive frequency analysis options.

- IPv6 routing guarantees future-proof communication via public WLAN networks
- Innovative frequency management ensures maximum WLAN performance
- Frequency analysis identifies possible interference from other wireless devices

The access points of the OpenBAT platform, comprising of the Hirschmann™ BAT-R (IP30) and BAT-F (IP65/67) series features the most powerful WLAN operating system in the automation market with HiLOS 8.80 firmware. In combination with the extremely robust hardware, interference-free Clear Space® wireless technology, ESD protection and the option of integrated high-voltage power supply (among other features), the OpenBAT platform can now be used to implement communication solutions via WLAN that were previously the exclusive domain of cable-based networks. The new HiLOS 8.80 firmware comes standard on all OpenBAT platform devices. The integration of this firmware is possible for most access points in the BAT54 and BAT300 series as well as BAT controllers. HiLCOS 8.80 can be downloaded free of charge from www.hirschmann.com.

Applications

HiLCOS 8.80 allows cost-effective WLAN solutions even in the most demanding industrial applications, including via fast infrastructure and meshed networks, wireless distribution systems and point-to-point connections, as well as WAN and VPN applications. This will benefit many industries such as the energy sector (oil & gas and renewable energy), in power transmission and distribution, and mechanical engineering.

Customer benefits

Supporting IPv6 routing, HiLCOS 8.80 enables future communication via public WLAN networks, where the allocation of IPv4 addresses is no longer valid. The firmware also features band steering, used to transfer clients' radio communication to the 5 GHz frequency band if the 2.4 GHz band is overloaded. In these frequency bands, you can also carry out frequency analyses to determine whether any Bluetooth devices, wireless HART sensors or microwaves are already using it while preventing WLAN communication disruptions in a timely manner.

**A new product to
serve your needs.
Be certain.**

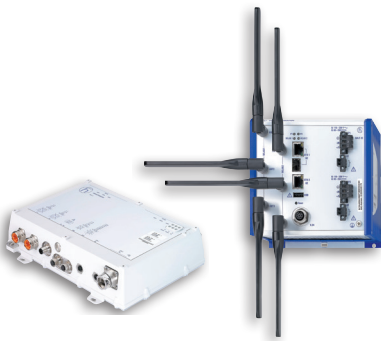


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HiLCOS 8.8

The Hirschmann™ BAT Operating System



HiLCOS 8.8 is the first industry-grade WLAN firmware to support IPv6 routing.

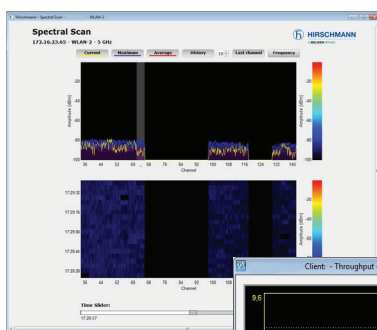
HiLCOS 8.80 from Hirschmann™

HiLCOS 8.80 can be used to set up WAN connections and hardware-encrypted VPN tunnels. The management functions available via LANconfig, LANmonitor and WLANmonitor include SNMPv2, Telnet, HTTP(S), SSH, SSL, serial COM port, TFTP, LLDP and HiDiscovery. Dual roaming, rapid spanning tree, and port grouping guarantee maximum network availability.

For maximum data security, HiLCOS 8.80 offers Wi-Fi Protected Access (WPA) as well as WPA2 and all encryption methods compliant with IEEE 802.11i. In addition, clients can be authenticated via both IEEE 802.1x and RADIUS servers. Access points and WLAN clients seeking unauthorized access to the network are reliably detected using rogue access point detection via WLAN monitor.

Benefits at a glance

- IPv6 routing guarantees maximum future security
- Innovative frequency management ensures maximum performance
- Frequency analysis identifies potential disruptions in the 2.4 GHz and 5 GHz band
- Extensive management functions via LANconfig, LANmonitor and WLANmonitor
- Dual roaming, rapid spanning tree, and port grouping for maximum network availability
- Optimum data security thanks to WPA and WPA2, as well as all encryption methods compliant with IEEE 802.11i
- Client authentication via IEEE 802.1x and RADIUS server
- Access points and WLAN Clients, detected using rogue AP detection – via WLANmonitor
- Ideal for all access points and WLAN clients of the OpenBAT platform, as well as for most BAT54 and BAT300 access points and BAT controllers
- Download free of charge from www.hirschmann.com



Hirschmann WLANmonitor

FileGroupAccess PointWLAN ControllerViewTools

QuickFinder

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Groups

Hirschmann WLANmonitor

- WLAN-Controller
 - Rogue AP Detection
 - All APs (25)
 - Belonging APs (2)
 - New APs (20)
 - Rogue APs
 - Unknown APs (5)
 - Known APs
 - Own APs (3)
 - Rogue Client Detection
 - All Clients (873)
 - New Clients (100)
 - New Clients (773)
 - Rogue Clients
 - Unknown Clients

Access Points

Name	Interface	Clients	Band	Cha...	Trans...	Noise le...	Cha...
BAT-R	WLAN-1	3	2.4 GHz	13	18 dBm	-88	2 %
BAT-R	WLAN-2	2	5 GHz	36	21 dBm	-79	0 %
BAT-R	WLAN-1	1	2.4 GHz	7	18 dBm	-88	3 %
BAT-R	WLAN-2	0	5 GHz	64	21 dBm	-86	0 %

Clients

MAC Address	Identification	Sig...	Access Point	Network Name (SSID)	Key Type	WPA	Tx Rate	Rx Rate
...	...	35 %	BAT-R	AES-CCM	2	144 MB/s	144 MB/s	
...	...	56 %	BAT-R	AES-CCM	2	40 MB/s	72 MB/s	
...	...	68 %	BAT-R	AES-CCM	2	54 MB/s	54 MB/s	
...	...	53 %	BAT-R	AES-CCM	2	72 MB/s	72 MB/s	
...	...	62 %	BAT-R	AES-CCM	2	144 MB/s	144 MB/s	
...	...	46 %	BAT-R	AES-CCM	2	150 MB/s	150 MB/s	

Configuration

QuickFinder

Configuration

- Management
 - General
 - Admin
 - Console
 - Certs
 - Display

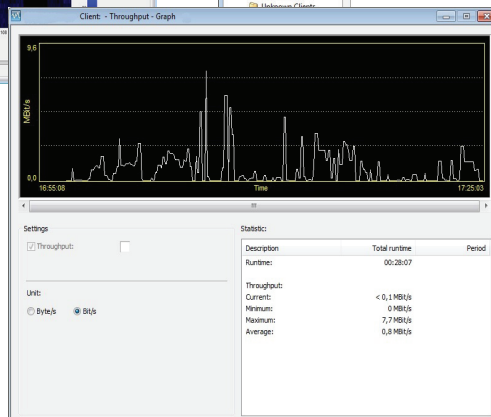
DHCPv6 server

In the table you configure the base settings of the DHCPv6 server and define the interfaces they apply to:

DHCPv6 networks

Create an address pool if the DHCPv6 server should distribute addresses statful.

Address pools



Configuration

QuickFinder

Configuration Management

- General
- Admin
- Console
- Costs
- Display
- Interfaces
- Date & Time
- Log & Trace
- Communication
- IPv4
- IPv6
- Router advertisement
- DHCPv6
- Tunnel
- IP Router
- Firewall/QoS
- Certificates
- COM Ports
- NetBIOS
- RADIUS Server
- Least-Cost-Router

DHCPv6 server

In this table you configure the base settings of the DHCPv6 server and define the interfaces they apply to.

DHCPv6 networks

Create an address pool if the DHCPv6 server should distribute addresses statful.

Adress pools

Create a prefix delegation pool (PD pool) if the DHCPv6 server should delegate prefixes to further routers.

Prefix delegation pools

Here you can assign IPv6 addresses to specified clients.

Reservations

DHCPv6 client

In this table the behavior of the DHCPv6 client is defined. Usually this is controlled by the autoconfiguration.

Client interfaces

DHCPv6 relay agent

In this table the behavior of the DHCPv6 relay agent is defined.

Relay agent interfaces

OK Cancel



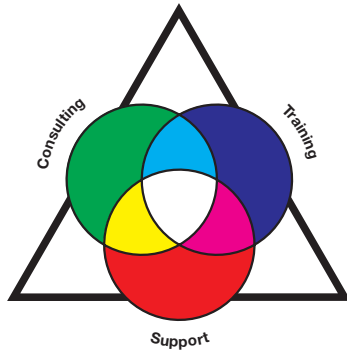
Technical Information

Product Description	
Type	HILCOS Operating System
Description	High performance operating system for the Hirschmann BAT products. Supports all WLAN functions, routing, firewall, VLAN, remote access, and redundancy. Introducing IPv6 routing. All OpenBAT devices operate as either standalone access points or as managed access points in combination with a BAT WLC Controller. The HILCOS package includes cost free management tool LANconfig and monitoring tools LANmonitor and WLANmonitor.
WLAN	
Radio standards	Support of IEEE802.11 Depending on model of BAT device IEEE802.11a/b/g/h or IEEE802.11a/b/g/h/n
Regulatory support	Support of DFS 4 according to EN301893 and TPC. Selectable country profile enables channel and output power settings according to regulatory demands. Semi automatic adjustment of output power according to antenna gain and max. EIRP limits.
Security	IEEE 802.11i / WPA2 with passphrase or 802.1x and hardware-accelerated AES, closed network, WEP64, WEP128, WEP152, user authentication, 802.1x / EAP, LEPS, WPA/TKIP, WLAN protocol filter
Data rates	Support of 3x3 MiMo for OpenBAT devices allowing up to 450Mbit/s. Support of 2x2 MiMo for BAT300 devices allowing up to 300Mbit/s. BAT54 devices allow up to 108Mbit/s with turbo mode and 54Mbit/s in single operation. All in gross data rate with automatic fallback to lower data rates.
Roaming	Seamless handover between radio cells, IAPP support with optional restriction to an ARF context, IEEE 802.11d support. Dual radio roaming. Pre-authentication and PMK caching. Background scanning.
WLAN operating modes	
WLAN access point	Infrastructure mode (autonomous operation or managed by BAT WLAN Controller)
WLAN bridge	Point-to-multipoint connection with up to 16 P2P links (OpenBAT, 6 for BAT54/300), Wireless Distribution System (WDS) allows mixed operation of bridge and infrastructure mode, broken link detection, blind mode, supports VLAN
WLAN router	IP router, NAT/Reverse NAT (IP masquerading) DHCP server, DHCP client, DHCP relay server, DNS server, PPPoE client (incl. Multi-PPPoE), PPTP client and server, NetBIOS proxy, DynDNS client, NTP, port mapping, policy-based routing based on routing tags, tagging based on firewall rules, dynamic routing with RIPv2, VRRP
WLAN client	Transparent WLAN client mode for wireless Ethernet extensions, e.g. connecting PCs or printers by Ethernet; up to 64 MAC addresses. Automatic selection of a WLAN profile (max. 8) with individual access parameters depending on signal strength or priority
WLAN managed	Supported by all BAT WLAN Controller (separate optional hardware equipment for installation, optimization, operating and monitoring of WLAN networks)
Security	
RADIUS server	Integrated RADIUS server for MAC address list management
802.1x server	Authentication of an access point in WLAN client mode at another access point via 802.1x (EAP-TLS, EAP-TTLS and PEAP) EAP-server incl. CA available in BAT-Controller.
802.1x supplicant	Authentication of an access point in WLAN client mode at another access point via 802.1x (EAP-TLS, EAP-TTLS and PEAP)
Firewall	
Router	Stateful inspection firewall, Packet filter with tagging, actions etc. Notification via e-mail, syslog or SNMP trap. Intrusion Prevention, IP spoofing, Access control lists, Denial of Service protection, URL blocker and password protection.
Quality of Service	
Router	Traffic shaping, bandwidth reservation, DiffServ/TOS, Packet-size control, Layer 2/Layer 3 tagging
WLAN	Prioritization according to IEEE 802.11e
High availability / redundancy	
Protocols	VRRP, Firmsafe, Analog/GSM modem backup, RSTP
Routing functions	
Router	OpenBAT: IPv6 router including support of VPN tunnels; IPv4 router and dual IP stack for migration from IPv4 to IPv6. BAT54/300: IPv4 router
Protocols	DNS client, DNS server, DNS relay, DNS proxy; DHCP client, DHCP relay and DHCP server with autodetection. Cluster of several BAT DHCP servers per context (ARF network) enables caching of all DNS assignments at each router; NetBIOS/IP proxy; policy based routing; dynamic routing; NAT N:N IP address mapping; PPPoE server in LAN
COM port server	
COM port forwarding	COM-port server for the serial RS232 interface. For a serial device connected to it, the server manages its own virtual COM port via Telnet (RFC 2217) for remote maintenance (works with popular virtual COM-port drivers compliant with RFC 2217). Switchable newline conversion and alternative binary mode. TCP keep alive according to RFC 1122 with configurable keep alive interval, retransmission timeout and retries.
WAN protocols	
Ethernet	PPPoE, PPTP (PAC or PNS) and plain Ethernet (with or without DHCP), RIP-1, RIP-2, VLAN, IP, dynamic DNS client, MPPE (with VPN option), VPN, MPPoE
Management	
LANconfig	Configuration program for Microsoft Windows, incl. convenient Setup Wizards. Optional group configuration, simultaneous remote configuration and management of multiple devices over IP connection (HTTPS, HTTP, TFTP). Configuration program properties per project or user. Automatic storage of the current configuration before firmware updates. Detection and display of the Hirschmann BAT devices.
LANmonitor	Monitoring application for Microsoft Windows for (remote) surveillance and logging of the status of BAT devices and connections, incl. PING diagnosis and TRACE with filters and save to file. Search function within TRACE tasks. Wizards for standard diagnostics. Export of diagnostic files for support purposes (including bootlog, sysinfo and device configuration without passwords). Graphic display of key values (marked with an icon in LANmonitor view) over time as well as table for minimum, maximum and average in a separate window, e. g. for Rx, Tx, CPU load, free memory. Monitoring of the BAT devices.
WLANmonitor	Monitoring application for Microsoft Windows for the visualization and monitoring of BAT WLAN installations, incl. Rogue AP and Rogue Client visualization.
WEBconfig	Integrated web server for the configuration of BAT devices via Internet browsers with HTTPS or HTTP. Similar to LANconfig with a system overview, syslog and events display, symbols in the menu tree, quick access with side tabs. WEBconfig also features Wizards for basic configuration, security, Internet access, LAN-LAN coupling.
Optional Software packets	
Configurable via OpenBAT configurator	VPN supporting 5, 50 or 100 IPsec based VPN tunnels, PublicSpot, Ethernet/IP (in preparation for OpenBAT), Profinet (in preparation for OpenBAT)



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The Belden® Competence Center

As the complexity of communication and connectivity solutions has increased, so have the requirements for design, implementation and maintenance of these solutions. For users, acquiring and verifying the latest expert knowledge play a decisive role in this. As a reliable partner for end-to-end solutions, Belden offers expert consulting, design, technical support, as well as technology and product training courses from a single source: Belden Competence Center. In addition, we offer you the right qualification for every area of expertise through the world's first certification program for industrial networks. Up-to-date manufacturer's expertise, an international service network and access to external specialists guarantee you the best possible support for products from Belden®, GarrettCom®, Hirschmann™ and Lumberg Automation™. Irrespective of the technology you use, you can rely on our full support – from the implementation to the optimization of every aspect of daily operations.

Always Stay Ahead with Belden

In a highly competitive environment, it is crucial to have reliable partners who are able to add value to your business. When it comes to signal transmissions, Belden is the number one solutions provider. We understand your business and want to know your specific challenges and targets to see how effective signal transmission solutions can push you ahead of the competition. By combining the strengths of our four leading brands, Belden®, GarrettCom®, Hirschmann™ and Lumberg Automation™, we are able to offer the solution you need. Today it may be a single cable, a switch or a connector, thus solving a specific issue; tomorrow it can be a complex range of integrated applications, systems and solutions.

About Belden

Belden Inc., a global leader in high quality, end-to-end signal transmission solutions, delivers a comprehensive product portfolio designed to meet the mission-critical network infrastructure needs of industrial, enterprise and broadcast markets. With innovative solutions targeted at reliable and secure transmission of rapidly growing amounts of data, audio and video needed for today's applications, Belden is at the center of the global transformation to a connected world. Founded in 1902, the company is headquartered in St. Louis, USA, and has manufacturing capabilities in North and South America, Europe and Asia.

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