HIRSCHMANN
A BELDEN BRAND

Switch Software

Seamlessly Manage and Secure Modern Industrial Networks

TECHNICAL BULLETIN

Hirschmann embedded software is developed in-house and offers intuitive and familiar interfaces which appeal to both automation engineers and IT specialists. Extremely easy configuration ensures rapid network deployment at minimum cost.

HiEOS - Hirschmann Entry Operating System

As automation expands and industrial networks grow in complexity, easy-to-use network management technology that supports streamlined configuration and remote diagnostics is vital. The advanced HiEOS software runs on LEMUR lite managed switches, which are optimal for use in many industrial environments. With the HiEOS intuitive graphical user interface, switch setup and maintenance are easy – with little IT intervention or knowledge required. Also, HiEOS provides a rich feature set, including PoE/PoE+ support and device management.

Developed for the latest Hirschmann LEMUR hardware.

HiOS – Hirschmann Operating System

HiOS is the latest operating system for the new generation of Industrial Ethernet devices, combining comprehensive functionality with extensive certified security. HiOS is a single operating system running on a wide range of hardware, from field devices to backbone routers. This ensures a consistent user experience across the complete network, with a shallow learning curve and reduced operational effort. Configuration via web interface, command line and SNMP meets the requirements of all administrators. Regular updates ensure that the software offers state-of-the-art functionality into the future.

Developed for the latest Hirschmann hardware including DRAGON, GREYHOUND, OCTOPUS, MSP, RSPx, BRS, EES, and RED.

Classic Switch Software

Classic Switch Software has led the way in the specialist field of Industrial Ethernet. Since the mid 2000s, customers have deployed Hirschmann hardware running Classic software to build highly resilient OT networks from the edge to the core. As the forerunner of HiOS, Classic introduced innovations such as rapid redundancy, management through industrial protocols, and fast device replacement.

Developed for Hirschmann hardware including MACH, PowerMICE, OCTOPUS, MICE, RSR, RS, and RSB.

Software Functionality

* Hardware-dependent

Switching	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
Disable Learning (Hub Functionality)		•	•	•	•						
Fast Aging	•	•	•	•	•		•	•	•	•	•
Static Unicast/Multicast Address Entries	•	•	•	•	•	•	•	•	•	•	•
VLAN (802.1Q)		•	•	•	•	•	•	•	•	•	•
Independent VLAN Learning		•	•	•	•	•	•	•	•	•	•
Private VLANs									•*		•*
Double VLAN Tagging (QinQ)			•	•	•				•*	•*	•*
GARP VLAN Registration Protocol (GVRP)			•	•	•			•	•	•	•
Multiple VLAN Registration Protocol (MVRP)							•	•	•	•	•
Protocol-based VLAN					•				•	•	•
Voice VLAN			•	•	•			•	•	•	•
MAC-based VLAN									•	•	•
IP Subnet-based VLAN									•	•	•
VLAN Unaware Mode							•	•	•	•	•
QoS/Port Prioritization (802.1D/p)	•	•	•	•	•	•	•	•	•	•	•
TOS/DSCP Prioritization	•	•	•	•	•	•	•	•	•	•	•
Interface Trust Mode							•	•	•	•	•
IP Ingress DiffServ Classification and Policing									•	•	•
IP Egress DiffServ Classification and Policing									•*		•
CoS Queue Management				•	•	•	•	•	•	•	•
Traffic Shaping				•	•						
Queue-Shaping/Max. Queue Bandwidth						•		•*	•	•	•
Jumbo Frames			•*		•*	•	•*	•*	•	•	•
GARP Multicast Registration Protocol (GMRP)			•	•	•			•*	•	•	•
IGMP Snooping/Querier (v1/v2/v3)	•	•	•	•	•	•					
IGMP Snooping/Querier per VLAN (v1/v2/v3)							•	•	•	•	•
Unknown Multicast Filtering		•	•	•	•	•	•	•	•	•	•
IGMP Group Filtering per Port						•					
Multiple MAC Registration Protocol (MMRP)							•	•	•	•	•
Multiple Registration Protocol (MRP)							•	•	•	•	•
Egress Broadcast Limiter per Port		•	•	•	•						
Flow Control (802.3X)		•	•	•	•	•	•	•	•	•	•
Loop Detection									•	•	•
Egress Interface Shaping						•	•	•	•	•	•
Ingress Storm Protection						•	•	•	•	•	•
Ethernet Train Backbone										•*	
Time Sensitive Networking								•*	•*	•*	
FPGA-based 802.1Qbv								•*	•*	•*	

Redundancy	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
HIPER-Ring (Manager)	•	•	•	•	•						
HIPER-Ring (Ring Switch)	•	•	•	•	•				•	•	•
Fast HIPER-Ring			•*	•*	•*						
Link Aggregation with LACP			•	•	•		•	•	•	•	•
HIPER-Ring over Link Aggregation			•*	•*	•*				•	•	•
Link Backup							•	•	•	•	•
Media Redundancy Protocol (MRP) (IEC62439-2)	•	•	•	•	•		•	•	•	•	•
MRP Client Only						•					
Fast MRP (IEC62439-2)							•*	•*	•*	•*	
MRP over Link Aggregation									•	•	•
Advanced Ring Configuration for MRP			•	•	•						
High-availability Seamless Redundancy Protocol (HSR) (IEC62439-3)							•*	•*	•*	•*	
Parallel Redundancy Protocol (PRP) (IEC62439-3)							•*	•*	•*	•*	
Device Level Ring (DLR)								•*	•*	•*	
Redundant Network Coupling		•	•	•	•				•	•	•
Redundant Coupling Protocol									•	•	•
Sub Ring Manager			•*	•*	•*				•	•	•
RSTP 802.1D-2004 (IEC62439-1)	•	•	•	•	•	•	•	•	•	•	•
MSTP (802.1Q)			•	•	•				•*	•	•
RSTP Guards		•	•	•	•		•	•	•	•	•
RSTP over MRP		•	•	•	•						
RSTP over HSR							•*	•*	•*	•*	
RSTP Ring Only Mode									•	•	•
VRRP				•	•					•	•
HiVRRP (VRRP enhancements)				•	•					•	•
VRRP Tracking				•	•					•	•
ERPS (G.8032)						•					
ERPS v2 (G.8032)						•					

* Hardware-dependent

Configuration	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
Automatic Configuration Undo (roll-back)	•	•	•	•	•		•	•	•	•	•
Text-based Configuration File (XML)							•	•	•	•	•
Configuration Fingerprint		•	•	•	•		•	•	•	•	•
DHCP Server: per Port			•	•	•			•	•	•	•
DHCP Server: Pools per VLAN			•	•	•			•	•	•	•
DHCP Server: Option 43			•	•	•						
DHCP Relay per Interface				•	•						
AutoConfiguration Adapter ACA31 (SD Card)							•*	•*	•	•	•
AutoConfiguration Adapter ACA21/22 (USB)		•	•	•	•			•*	•*	•*	•
HiDiscovery	•	•	•	•	•	•	•	•	•	•	•
DHCP Relay with Option 82	•	•	•	•	•		•*	•*	•	•	•
Command Line Interface (CLI)	•	•	•	•	•	•	•	•	•	•	•
CLI Scripting			•	•	•		•	•	•	•	•
Full-featured MIB Support	•	•	•	•	•	•	•	•	•	•	•
Web-based Management	•	•	•	•	•	•	•	•	•	•	•
Context-sensitive Help	•	•	•	•	•		•	•	•	•	•

Management	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
IPv6 Management								•*	•*	•*	
LLDP (802.1AB)	•	•	•	•	•	•	•	•	•	•	•
LLDP-MED			•	•	•	•		•	•	•	•
Password change on first login	•	•	•	•	•	•	•	•	•	•	•
SSHv1			•	•	•						
SSHv2			•	•	•	•	•	•	•	•	•
V.24	•	•	•	•	•		•	•	•	•	•
HTTP	•	•	•	•	•	•	•	•	•	•	•
HTTPS			•	•	•	•	•	•	•	•	•
Responsive GUI						•		•*	•	•	•
SNMP v1/v2/v3	•	•	•	•	•	•	•	•	•	•	•
Traps	•	•	•	•	•	•	•	•	•	•	•
Telnet		•	•	•	•	•	•	•	•	•	•
TFTP	•	•	•	•	•	•	•	•	•	•	•
SFTP							•	•	•	•	•
SCP							•	•	•	•	•
DNS Client									•	•	•
Dual Software Image Support			•	•	•	•	•*	•*	•	•	•
Signed Software Images								•*	•*	•*	
Out Of Band Management									•*		•*

Routing	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
Full Wire-Speed Routing				•	•					•	•
Loopback Interface										•	•
ICMP Filter										•	•
Net-directed Broadcasts				•	•					•	•
Static Unicast Routing				•	•					•	•
Static Route Tracking					•					•	•
1:1 Network Address Translation										•	
RIP v1/v2				•	•					•	•
OSPFv2					•					•	•
ICMP Router Discovery (IRDP)				•	•					•	•
Equal Cost Multiple Path (ECMP)				•	•						•
Proxy ARP				•	•					•	•
IP/UDP Helper										•	•

Multicast Routing	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
IGMP v1, v2, v3					•					•	•
IGMP Proxy (Multicast Routing)										•	•
DVMRP					•						•*
PIM-DM (RFC3973)					•						•*
PIM-SM / SSM (RFC4601)					•						•*

* Hardware-dependent

Security	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
IP-based Port Security		•	•	•	•						
MAC-based Port Security		•	•	•	•		•	•	•	•	•
MAC Address Limit Per Port		•	•	•	•	•	•	•	•	•	•
Port-based Access Control with 802.1X			•	•	•		•	•	•	•	•
RADIUS VLAN Assignment							•	•	•	•	•
Guest/Unauthenticated VLAN			•	•	•		•	•	•	•	•
RADIUS Policy Assignment									•	•	•
MAC Authentication Bypass			•	•	•				•	•	•
Multi-Client Authentication per Port			•	•	•				•	•	•
Integrated Authentication Server (IAS)			•	•	•		•	•	•	•	•
Remote Authentication via RADIUS			•	•	•		•	•	•	•	•
LDAP									•	•	•
Basic ACL								•*			
Ingress MAC-based ACL				•	•				•	•	•
Ingress IPv4-based ACL				•	•				•	•	•
Ingress VLAN-based ACL									•	•	•
Egress MAC-based ACL									•*		•
Egress IPv4-based ACL									•*		•
Egress VLAN-based ACL									•*		•
Time-based ACL									•	•	•
VLAN-based ACL								•*	•	•	•
ACL Flow-based Limiting									•	•	•
DHCP Snooping									•	•	•
IP Source Guard									•*		•
Dynamic ARP Inspection									•	•	•
Automatic Denial-of-Service Prevention							•	•	•	•	•
Device Security Indication							•	•	•	•	•
Audit Trail							•	•	•	•	•
CLI Logging							•	•	•	•	•
HTTPS Certificate Management			•	•	•		•	•	•	•	•
Access to Management restricted by VLAN		•	•	•	•		•	•	•	•	•
Restricted Management Access			•	•	•	•	•	•	•	•	•
Appropriate Use Banner			•	•	•	•	•	•	•	•	•
SNMP Logging		•	•	•	•		•	•	•	•	•
Syslog Over TLS									•	•	•
Multiple Privilege Levels						•	•	•	•	•	•
Local User Management	•	•	•	•	•	•	•	•	•	•	•
Configurable Password Policy							•	•	•	•	•
Configurable Number of Login Attempts							•	•	•	•	•
User Account Locking							•	•	•	•	•

Time Synchronization	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
SNTP Client	•	•	•	•	•		•	•	•	•	•
SNTP Server	•	•	•	•	•		•	•	•	•	•
NTP Client						•					
Buffered Real Time Clock			•	•	•		•*	•	•	•	•
PTPv2 Transparent Clock Two-step*			•	•	•		•*	•*	•	•	•
PTPv2 Boundary Clock*		•	•	•	•		•*	•*	•	•	•
802.1AS								•*	•*	•*	•*

Industrial Profiles	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
PROFINET IO Protocol		•	•	•	•		•*	•*	•	•	•
VLAN 0 Forwarding								•*	•*		
EtherNet/IP Protocol		•	•	•	•		•*	•*	•	•	•
Separate EtherNet/IP VLAN								•*	•*	•*	
ModbusTCP							•	•	•	•	•
IEC61850 Protocol (MMS Server, Switch Model)			•	•	•		•	•	•	•	•
OPC UA Server									•	•	•

* Hardware-dependent

Diagnostics	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
Management Address Conflict Detection			•	•	•	•	•	•	•	•	•
Address Relearn Detection		•	•	•	•				•	•	•
LEDs	•	•	•	•	•	•	•	•	•	•	•
MAC Notification			•	•	•			•	•	•	•
Signal Contact	•	•	•	•	•		•*	•	•	•	•
Device Status Indication	•	•	•	•	•	•	•	•	•	•	•
TCPDump			•	•	•		•	•	•	•	•
Email Notification									•	•	•
Syslog		•	•	•	•	•	•	•	•	•	•
Persistent Logging on ACA							•*	•	•	•	•
Link Flap Detection			•	•	•		•	•	•	•	•
Overload Detection			•	•	•		•	•	•	•	•
Duplex Mismatch Detection		•	•	•	•		•	•	•	•	•
Link Speed and Duplex Monitoring			•	•	•	•	•	•	•	•	•
RMON (1, 2, 3, 9)	•	•	•	•	•	•	•	•	•	•	•
Port Mirroring 1:1	•	•	•	•	•	•	•	•	•	•	•
Port Mirroring 8:1		•	•	•	•		•	•	•	•	•
Port Mirroring N:1			•*		•*	•	•	•	•	•	•
Port Mirroring N:2							•*	•*	•	•	•
VLAN Mirroring									•	•	•
RSPAN									•	•	•
SFLOW									•	•	•
Copper Cable Test			•	•	•		•*	•*	•	•	•
System Information	•	•	•	•	•	•	•	•	•	•	•
Self-Tests on Cold Start	•	•	•	•	•		•	•	•	•	•
SFP Management	•	•	•	•	•	•	•	•	•	•	•
Configuration Check Dialog			•	•	•		•	•	•	•	•
Switch Dump		•	•	•	•		•	•	•	•	•
Snapshot Configuration Feature							•	•	•	•	•

Miscellaneous	Classic Switch Software v9.0					HiEOS v1.0	HiOS Hirschmann Operating System v9.2				
	L2B	L2E	L2P	L3E	L2P		L2E	L2S	L2A	L3S	L3A
Digital IO Management	•*	•*	•*	•*	•*				•*		•*
PoE (802.3AF)		•*	•*	•*	•*	•*	•	•*	•*	•*	•*
PoE+ (802.3AT)			•*		•*	•*	•	•*	•*	•*	•*
PoE+ Manual Power Management			•*		•*			•*	•*	•*	•*
PoE Fast Startup			•*					•*	•*	•*	•*
Port Power Down						•	•	•	•	•	•
Manual Cable Crossing	•	•	•	•	•	•	•	•	•	•	•

NOTE: For the latest software functionality overview please visit our website.