Buoyant 12PL2 Series
Railway Certified Managed Gigabit PoE 110VDC Switch

The Buoyant railway certified Ethernet switch is the best solution for providing high-speed Gigabit connectivity within carriages of Railway applications. Its rugged enclosure can effectively protect the Switch core in any environment. 12 numbers of M12 Connectors Gigabit ports can supply PoE Power (802.3af or 802.3at) to your PoE device providing an overall maximum budget of 240W. This makes this switch the ideal solution for on-board surveillance by simplifying the wiring where it's difficult, risky and expensive to introduce new elements. The embedded redundant-power supply input provides a reliable and failure-proof safety mechanism to minimize down-times.

The switch comes in redundant DC power input (77~137.5 VDC). Each power module, including a Relay-output alarm, uses a K-coded M12 connector that makes it ideal and simple for engineers setting up a Fault- Alarm System. Its IP67 compliant housing protection, combined with a wide operating temperature of -40 to 75°C and wall mounting make it suitable to most Railway applications in harsh environments or industrial field applications.

Highlights

- Built for harsh environments and temperature ranges (-40°C to +75°C)
- Hardened for vibration, shock, surge, and electrical noise immunity
- Supports 12 x PoE ports [Power budget - upto 240W]
- Full Gigabit Ethernet with comprehensive Industrial communication functions
- IEEE 1588v2 Precision Time Protocol HW-Based Transparent clock
- CE/FCC and EN50155 certified for Railway and Trackside applications

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Salients	Highlights
Designed to railway needs	Built for harsh environments and temperature ranges (-40°C to +75°C) Fanless, convection-cooled with no moving parts for extended durability Hardened for vibration, shock, surge, and electrical noise immunity Covers a wide range of Power over Ethernet (PoE/PoE+) application requirements
High-density railway Power over Ethernet (PoE)	Supports 12 x PoE/PoE+ ports [Power budget - upto 240W] Controls costs by limiting wiring, distribution panels, and circuit breakers Reduces equipment needs, thus requiring less space and reducing heat dissipation Enables ready-to-use PoE devices, such as IP phones, cameras, and wireless access points
Full Gigabit Ethernet with comprehensive railway communication functions	Provides secure access for new high-speed applications in the railway space Packs 12 numbers of M12 Connected Gigabit Ethernet-PoE/PoE+ ports Delivers multiple rings and redundant ring topologies for new network configurations, supporting advanced protocols, such as ERPS, RSTP, STP, MRP (Client) and compatible rings IEEE 1588v2 Precision Time Protocol HW-Based Transparent clock
User friendly web based GUI	Allows easy configuration and monitoring Eliminates the need for more complex terminal emulation programs Reduces the cost of deployment
Certifications tailored to multiple vertical segments	CE/FCC EN50155 certified for Railway and Trackside applications

Port configuration Listing				
Buoyant-12PL2-12PoE-HV	12-Port Industrial L2 Gigabit Switch with 12 x M12 PoE			
Model	X-coded M12 (PoE/PoE+)		Fiber SFP	Power
Buoyant-12PL2-12PoE-HV	12		0	Dual
Model	Power budget	Relay	Console	
Buoyant-12PL2-12PoE-HV	240W*	2	1	

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Performance parameters	
Forwarding rate	Line rate for all ports and all packet sizes
Number of Queues	8
MAC Table Size	16K
Packet Buffer Size	16MB
Jumbo Frame Size	9216 Byte
VLAN Table	4096
MAC-Based VLAN	512
VLAN ID Range	VID 1 to 4094
Trunk Group	4
Static IGMP Groups	128
Dynamic IGMP Groups	1024
Spanning Tree Protocol instances	128
Access control lists (PACL/VACL/RACL)	1.5K

Power specifications	
Input Voltage range	Nonimal input 110VDC for PoE/PoE+ Continuous Voltage Range 77-137 VDC
Maximum input current	Max 3.8A @ 77 VDC
Power consumption	Max. 286W @ 77 VDC
Connnector	2 M12 K-coded 5- pin male connector

Software features	
Layer 2 switching	IEEE 802.1, 802.3 standard, NTP, UDLD, LLDP, unicast MAC filter, LACP, Private VLAN, Auto Surveillance VLAN, voice VLAN, VLAN double tagging (QinQ), MSTP, GARP, GMRP, GVRP, SNMPv1/v2c/v3, SNMP Inform, ICMP, Telnet, SSH, DHCP Server/Relay/Client, DHCP Option 66/67/82, BootP, RARP, TFTP, SMTP, SMTP (Gmail), RMON, HTTP, HTTPS, Syslog, MRP (Client), LLDP, 802.1x, EAP, RSTP, NetFlow/sFlow, Port and VLAN mirroring (RSPAN), OpenFlow v1.3 support, Digital Diagnostic Monitoring (DDM) and Cable fault locator (TDR), MLD snooping v1, v2
Quality of Service (QoS)	Rate limit, auto QoS, ingress policing, egress queuing and shaping

Software features	
Multicast	IGMPv1, v2, v3 snooping, IGMP filtering, IGMP querier
Security	Port security, 802.1x, Dynamic VLAN assignment, Dynamic Host Configuration Protocol (DHCP) snooping, dynamic ARP inspection, IP source guard, guest VLAN, Port-based learn limits (intrusion detection), MAC authentication bypass, 802.1x, Tri-authentication: MAC-based, Web-based and IEEE 802.1X, multidomain authentication, storm control - unicast, multicast, broadcast, SCP, SSH, SNMPv3, TACACS+, RADIUS server/client, MAC address notification, BPDU guard, SUDI 2099 (Secure Unique Device identifier), Access Lists (PACL/RACL/VACL), MACsec-128
Redundancy	ITU-T G.8032 ERPS Ring, STP, RSTP, MSTP, Compatible Ring/Chain, U-Ring
IPv6	IPv6 host support, SNMP over IPv6, HTTP/HTTP(s) over IPv6, SNMP over IPv6, Syslog over IPv6, DHCPv6 relay source, DHCPv6 bulk lease query (RFC 5460), IPv6 stateless Auto Config, SCP/SSH, Radius, TACACS+, NTP over IPv6, IPv6 VRF aware BGPv6, IPV6 ND cache expire, IPv6 support for TFTP, IPv6 DNS transport, IPv4 and IPv6 dual stack
Industrial and Fieldbus protocols	IEEE 1588 PTP
Network Synchronization	NTP Server/Client, SNTP
Precision Network Synchronization	IEEE1588v1 Ordinary Clock/Boundary Clock IEEE1588v2 End 2 End Transparent Clock IEEE1588v2 Ordinary Clock/Boundary Clock

Interfaces	
LED Indicator	PWR1, PWR2, Run, Alarm, Ring, R.M., Ethernet PoE/ Act/Link
Ethernet	12 x 10/100/1000 BASE-T(X) auto negotiation speed (M12 X-coded female connector)
Console	RS232 (M12 A-coded female connector)
Relay outputs	2 relay outputs with current carrying capacity of 1A @ 24 VDC (through M12 A-coded 4 pin female connector)

Physical Characteristics	
Housing	IP67 compliant protection
Dimension (W x H x D)	343mm x 200mm x 105 mm
Weight	5 kg
Installation	Wall-mount

Compliance	
Aspect	Details
Safety	EN62368-1 (LVD)
EMC	EN 55032/35
EMI	CISPR 22, 32, FCC Part 15B Class A EN61000-6-4
EMS	IEC 61000-4-2 ESD IEC 61000-4-3 RS IEC 61000-4-4 EFT IEC 61000-4-5 Surge IEC 61000-4-6 CS IEC 61000-4-8 PFMF
Railway	EN50121-4/EN50155
RoHS II	Yes

Environmental limits	
Operating Temperature	-40°C~75°C (-40°F~167°F)
Storage Temperature	-40°C~85°C (-40°F~185°F)
Ambient Relative Humidity	5%~95%, 55°C (Non-condensing)

Warranty
10 years limited hardware warranty on all Pantherun branded products

Management and Standards		
IEEE Standards	IEEE 802.3 for 10BaseT	IEEE 1588v2 PTP Precision Time Protocol
	IEEE 802.3u for 100BaseT(X)	IEEE 802.1AB LLDP
	IEEE 802.3ab for 1000BaseT(X)	IEEE 802.3x for Flow Control, back pressure flow control
	IEEE 802.3z for 1000BaseX	IEEE 802.1D-2004 for Spanning Tree Protocol
	IEEE 802.3ah 100BASE-X SMF/ MMF only	IEEE 802.1w for Rapid Spanning Tree Protocol
	IEEE 802.3x full duplex on 10BASE-T	IEEE 802.1s for Multiple Spanning Tree Protocol
	IEEE 802.3af Power over Ethernet	IEEE 802.1Q for VLAN Tagging
	IEEE 802.3at Power over Ethernet plus	IEEE 802.1p for Class of Service
	IEEE 802.1D MAC Bridges, STP	IEEE 802.1X for Authentication

Management and Standards		
IEEE Standards	IEEE 802.1p Layer2 COS prioritization	IEEE 802.3ad for Port Trunk with LACP
	IEEE 802.1x Port Access Authentication	IEEE 802.3az for Energy Efficient Ethernet
RFC Compliance	RFC 768: UDP	RFC 1492: TACACS+
	RFC 783: TFTP	RFC 1493: Bridge MIB Objects
	RFC 791: IPv4 protocol	RFC 1534: DHCP and BOOTP interoperation
	RFC 792: ICMP	RFC 1542: Bootstrap Protocol
	RFC 793: TCP	RFC 1643: Ethernet Interface MIB
	RFC 826: ARP	RFC 1757: RMON
	RFC 854: Telnet	RFC 2068: HTTP
	RFC 959: FTP	RFC 2131, 2132: DHCP
	RFC 1157: SNMPv1	RFC 2236: IGMP v2
	RFC 1901,1902-1907 SNMPv2	RFC 3376: IGMP v3
	RFC 2571: SNMP Management	RFC 2474: DiffServ Precedence
	RFC 1256: ICMP Router Discovery	RFC 3046: DHCP Relay Agent Information Option
	RFC 951: BootP	RFC 3580: 802.1x RADIUS
	RFC 2273-2275: SNMPv3	RFC 4250-4252 SSH Protocol
	RFC 1166: IP Addresses	RFC 5460: DHCPv6 bulk lease query
	RFC 1305: NTP	-
SNMP MIB	MIB II, IF-MIB, SNMPv2 MIB, BRIDGE-MIB, RMON MIB Group 1,2,3,9, RFC RFC 1157, RFC 1213, RFC 1215, RFC 1493, RFC 1643, RFC 1757, RFC 2011,RFC 2012, RFC 2013, RFC 2233, RFC 2571, RFC 2742, RFC 2819, RFC 2863,RFC 3411, RFC 3412, RFC 3413, RFC 3414, RFC 3415, RFC 2674	

Ordering Information	
Buoyant-12PL2-12PoE-HV	12-Port Industrial L2 Gigabit Switch with 12 x M12 PoE, input 110VDC

* Waterproof cap for unused ports not included

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