Pakedge® S3-24P 24-Port Layer 3 Managed Switch

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Product overview

The S3-24P, the flagship Layer 3 switch from Pakedge, is the convergence of commercial-grade, high-quality networking with seamless interoperability of performance-sensitive audio and video applications. This integration delivers a quality-driven, consistent, and reliable audio and video experience that professional AV and commercial integrators can depend on.

The S3-24P is a purpose-built, high-performance managed switch with advanced switch functionality, full Layer 3 dynamic and static routing, and interoperability with the most sophisticated audio and video technologies, IEEE 802.1 Audio Video Bridging (AVB), Dante™, and Q-LAN. The S3-24P combines enterprise-grade hardware with a feature-rich, AV-ready software platform, making this powerful switch a go-to solution for Pro-AV and lite commercial environments.

The S3-24P delivers 24 gigabit ports that support IEEE 802.3af/at PoE+ with a power budget of 370W. The switch also has four dedicated 10 Gb SFP+ ports to support bandwidth-intensive applications and devices, such as a network-attached storage (NAS) drive. The 10 Gb SFP+ uplinks can also be used to connect multiple switches together, ensuring high speeds throughout the network.

The S3-24P provides high-density Layer 2 and Layer 3 switching functionalities, including QoS (quality of service), IGMP v1/2/3, IGMP snooping, and static and dynamic routing, to deliver exceptional performance to video over IP and audio over IP applications across complex AV networks.

The S3-24P supports quick setup for IEEE 802.1 Audio Video Bridging (AVB), Dante, and Q-LAN to deliver seamless interoperability to performance-sensitive audio and video applications. The S3L-24P is also certified for AVB through the Avnu Alliance, ensuring high-quality audio and video performance and interoperability with AVB-supported end devices.

The S3-24P has a three-year warranty.

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Highlights

- Powerful, cost-effective, enterprise managed switch engineered for the Pro-AV and lite commercial markets
- 24-port PoE+ managed switch with four ports 10 Gbps SFP+ and functionality for high-bandwidth audio and video
- Interoperability and quick configuration with IEEE 802.1BA Audio Video Bridging (AVB), Dante, and Q-LAN
- Certified for IEEE 802.1BA Audio Video Bridging (AVB) with the Avnu Alliance
- Advanced switching protocols critical for performance-sensitive audio and video applications
- Enterprise-grade processor for optimal performance and speed
- Comprehensive security management
- Integration with BakPak® network management (RK-1 or NK-1 required)

Features

- 24 10/100/1000 Ethernet ports
- IEEE 802.3af/at (PoE/PoE+) with 370W power budget for 24 ports (up to 12 PoE+)
- Four dedicated 10 Gb SFP+ fiber ports for high-bandwidth uplinks
- Enterprise-grade chipset and processor (1 GHz CPU)
- Advanced multicast management—IGMP snooping v1/2/3, IGMP query v1/2/3, immediate leave, source-specific multicast, PIM-SM, PIM-DM, and SSM
- Full Layer 3 functionality with dynamic and static routing for up to 256 interfaces
- Advanced QoS with eight hardware queues
- Enterprise-capable VLAN support, including subnet-based VLANs
- Spanning tree protocol (STP), including rapid STP (RSTP) and multiple STP (MSTP)
- Switching capacity of 128 Gbps
- Support of SNMP v3 management protocol
- Variable speed fan for silent operation (ISO 7779 tested 31.5 ~ 42.7 dBa)—ideal for public areas, conference rooms, and performance venues
- Rear-facing ports—housing supports rear- and front-facing mounting
- Standard 19” rack mount
- Full-featured GUI

Application guide

- Pro-AV applications with high-bandwidth Audio and Video over IP
- Core switch for lite commercial applications (boardrooms, conference centers, restaurants, retail space, higher education)
- Complex audio/video-based networks (concert halls, stadiums, house of worship, etc.)
- MDU network backbone

Feature overview

Dedicated 10 Gbps uplink ports

The S3-24P supports four dedicated 10 Gbps SFP+ uplink ports that deliver speeds 10× faster than traditional 10/100/1000 Ethernet ports. These transceiver ports can be used to link multiple switches together for uninterrupted, high-speed throughput across the switches. In addition, they can be used to deliver faster speeds to fiber-compatible devices that are bandwidth intensive, such as an NAS (network-attached storage) drives.

The S3-24P 10 Gbps SFP+ ports are backwards compatible with SFP transceivers, allowing you to connect the S3-24P to an SX Series 1 Gb SFP port.

Compatible SFP+ transceiver modules and fiber optic cables are available through Pakedge. See the Accessories section for more information.

Pro-AV quick start setup

The S3-24P supports a quick setup configuration for both IEEE 802.1 AVB and Dante/Q-LAN, ensuring a seamless setup process for even the most complex AV networks. Typically, the process for configuring Pro-AV technologies can be extensive and require complicated QoS configurations. The Pro-AV quick setup section provides users the ability to bypass this complexity, greatly reducing install time.

AVB can be configured on the switch in two easy steps: globally enabling AVB, followed by assigning AVB to specific ports. Similarly, configuring Dante and Q-LAN requires a simple two-step process: selecting the Pro-AV protocol, followed by assigning the protocol to specific ports on the switch.

If a network requires the use of more than one Pro-AV protocol, such as the combination of AVB with Dante, the Pro-AV quick setup smartly adjusts to allow coexistence on the same switch without causing interference between these protocols.

Note: AVB and Dante/Q-LAN can coexist on the same switch, but they cannot operate on a single port at the same time.

IEEE 802.1 Audio Video Bridging (AVB) with Avnu Alliance certification

The S3-24P is certified with the Avnu Alliance for IEEE 802.1BA Audio Video Bridging (AVB), the IEEE standard that ensures reliable and timely transmission of audio and video streams across a network. The S3-24P supports a maximum number of 225 AVB streams, making it a perfect solution for small AVB environments (recording studios and conference rooms) to mid-sized environments (houses of worship and restaurants).

AVB eliminates the complexity associated with AV environments by delivering an open, standards-based approach designed to simplify AV network installation and management. AVB delivers several improvements to the AV network infrastructure, including precise synchronization, traffic shaping for media streams, admission control, and identification of non-participating devices. AVB saves AV integrators time and money through simplified configuration and management, improved functionality, and interoperability of AVB-supported AV devices.

The Avnu Alliance is an industry forum that works with member companies to test the interoperability of switches and end devices for highly reliable delivery of low-latency, synchronized audio across a network and to simplify professional AV system design, installation, and service.

Advanced switching software

The S3-24P delivers a comprehensive package of switching protocols designed for projects that require advanced switching capabilities. The S3-24P supports Spanning Tree Protocol (STP), including Rapid STP (RSTP) and Multiple STP (MSTP), which allows large networks with mesh connections to manage duplicate paths between switches, eliminating network loops between switches. In addition, the switch supports Loop Prevention, a port-based protocol that ensures there are no loops on the switch or devices immediately connected to the switch. The S3-24P also supports port mirroring, allowing the ability to mirror traffic from ports, VLANs, or LAG groups to help in diagnosing network issues.

Full Layer 3 functionality

The S3-24P offers full Layer 3 routing features, including dynamic and static routing of up to 256 routable interfaces, IGMP snooping v3, IGMP querier v3, and source-specific multicast. These features are used for passing unicast traffic across VLANs and managing multicast for the latest media streaming technologies. The S3-24P supports 512 IP routing entries and 256 IPv4 multicast groups.

A step up from the S3L-24P, the S3-24P supports Layer 3 dynamic routing, including RIPv2 and OSPFv2, for routing traffic across multiple large network segments. Protocol Independent Multicast (PIM) routes multicast traffic across VLANs, an important feature that enables the delivery of performance-sensitive audio and video applications across large VLANs.

For complex enterprise networks, the S3-24P supports 802.1ad (QnQ) VLAN double tagging. This provides network administrators the ability to tunnel VLAN traffic through a second VLAN in order to serve multiple customers on a single network who use the same VLAN for their networks.

Comprehensive security management

The S3-24P is designed with several enhanced security features, making it ideal for environments where security is a priority. A few of these enhanced security features include:

- IP Source Guard
- 802.11x and AAA authentication (port level)
- Access control lists and port-based network access control
- ARP spoofing prevention
- DoS and worm attack defense
- MAC filtering and MAC attack defense
- IP filtering

High-end aesthetics with flexible mounting

The S3-24P fits in a standard 19” rack mount and supports rear- or front-facing mounting. Its sleek, cutting-edge industrial design exudes an understated elegance that hides the high performance and power within. Its rear port configuration is unique among Layer 3 switches—hiding unsightly cables and providing added security by preventing tampering. Its cool blue LED lights complement existing AV equipment.

Variable fan for near-silent operation

The S3-24P is designed for near-silent operation, adding flexibility to placing the switch in locations such as conference rooms and offices. Designed with careful thermal management, the S3-24P utilizes variable-speed fans for maximum cooling efficiency and low noise. The switch is ISO 1779 tested to a max of 42 dBa (average noise level of a library).

Comprehensive GUI

A comprehensive GUI enables incredible control over the powerful features of the S3-24P switch. Firmware updates, management, security features, and enhanced configurations are available at the click of a button. Useful diagnostics are displayed directly on the dashboard, including fan speeds, temperatures, and both RAM and CPU utilization.

BakPak® remote management integration

With the addition of the RK-1 Router or NK-1 Wireless Controller, the S3-24P can be integrated with the BakPak Network Management System, allowing you to remotely manage and monitor all of your connected devices, including network audio and video devices, IP cameras, and networking products. Available BakPak features include remote login and remote power cycling, as well as PoE power control and self-healing. For more information about BakPak, check out our Dealer Portal.

Specifications

Hardware	
Physical	
Form factor	1 RU fixed form factor
Dimensions (H×W×D)	1.73 × 17.32 × 8.27 in. (44 mm x 440 mm x 210 mm)
Port form factor	Rear facing
Gigabit Ethernet ports	24
PoE/PoE+ capable ports	24
SFP+ ports (10G/1G)	4 dedicated
Console port (RJ45 Cisco pinout)	Yes
Fan	Variable-speed quiet
Number of fan modules	3
Fan speeds	Automatic high and low speed depending on internal temperature.
MTBF	>100,000 hours
Weight	11.0 lbs. (5.0 kg)
Power	
AC power supply	Input voltage: 100VAC to 240VAC Frequency: 50 Hz to 60 Hz Efficiency: 85% to 88%
Maximum power consumption	430W • 370W with full PoE load and 30W for guard band. • 30W with full non-PoE load.
PoE budget	370W
IEEE 802.3af (PoE) support	Yes (supplies 15.4W per port)
IEEE 802.3at (PoE+) support	Yes (supplies 30W per port)
Automatic PD discovery	Yes (will supply power immediately if PD device was detected)
PoE safety	Automatically disable individual ports when electrical current is over 600mA or when electrical short occurred.
Maximum heat dissipation	1541 BTU/hr
Performance	
Switching capacity	128 Gbps
Throughput (million packets per second)	95.23 Mpps
Maximum transmission units	9 Kbytes (jumbo frames)
CPU speed	1 GHz
RAM size (MBytes)	512
RAM type	DDR3
Flash size (Mbytes)	64
Packet buffer (MBytes)	1.5
Switching capacity	128 Gbps

Management	
Features	
Web interface (GUI)	Yes
Command line interface (CLI)	Yes
Access control lists (ACL)	Yes
DoS attack prevention	Yes
File system	Yes
IPv4/IPv6 dual stack	Yes
RADIUS server and client	Yes
TACACS+ server and client	Yes
SNMPv1	Yes
SNMPv2c	Yes
SNMPv3	Yes
Simple network time protocol (SNTP)	Yes
SSHv2 server	Yes
Telnet server	Yes
SSLv2/v3	Yes
PING	Yes
Traceroute	Yes
DHCP	
DHCP client	Yes
DHCP relay (with option 82)	Yes
DHCP server (IPv4)	Yes
DHCP server pools	Yes
Default routers per DHCP server pool	Yes
DHCP server clients	1024
sFlow	
sFlow (version 5)	Yes
Receivers	4
Samplers	32
Pollers	384
Minimum sampling granularity	256
Layer 2	
Table	
MAC table size	16K
L2 multicast entries	1024

Functions	
Jumbo frame (KBytes)	9216
Basic Ethernet port management	Yes
Dynamic MAC address learning	Yes
Static unicast MAC	Yes
Static multicast MAC	Yes
Digital diagnostic monitoring (DDM)	Yes
Static link aggregation	Yes
LACP	Yes
Ling agg groups	26
Members per link agg group	8
Trafic storm control	Yes
Rate limit granularity (Kbit per second)	8
Port-based mirroring	Yes
RSPAN	Yes
ERSPAN	Yes
QoS	
CoS (802.1P)	Yes
DSCP	Yes
QoS priority queues	8
QoS configuration	Per port
QoS color-aware policing	Yes
DSCP mutation	Yes
QoS scheduler	
Strict priority (SP)	Yes
Round robin (RR)	Yes
Weighted round robin (WRR)	Yes
Weighted deficit round robin (WDRR)	Yes
VLAN	
802.1Q VLAN	Yes
Auto-voice VLAN	Yes
MAC-based VLAN	Yes
Port-based VLAN	Yes
Subnet VLAN	Yes
Protocol-based VLAN	Yes
Private VLAN	Yes
802.1ad (QinQ)	Yes
Protocols	
IGMP snooping	v1/v2/v3
IGMP snooping proxy	Yes
IGMP querier	v1/v2/v3
IGMP immediate leave	Yes
Multicast VLAN registration	Yes
Local loop detection/prevention	Yes
STP	Yes
RSTP	Yes
MSTP	Yes
LLDP	Yes
LLDP-MED	Yes

AVB	
802.1BA audio video bridging (AVB)	Yes
Supported AVB streams	225
Multiple VLAN registration protocol (MVRP)	Yes
802.1AS timing and synchronization for time-sensitive applications in bridged local area networks (gPTP)	Yes
802.1Qat Stream Reservation Protocol (SRP)	Yes
Multiple Stream Reservation Protocol (MSRP)	Yes
802.1Qav forwarding and queueing enhancements for time-sensitive streams (FQTSS)	Yes
Server access control	
DHCP snooping	Yes
DHCP server filtering	Yes
Dynamic ARP inspection (DAI)	Yes
IP source guard (IPSG)	Yes
IEEE 802.1X	Yes
Layer 3 - IPv4	
Table size	
IP optimized host prefixes (CIDR)	1024
IP routing entries (static/dynamic)	512
Router interfaces	256
IPv4 multicast groups	256
Routing	
Static routing	Yes
Address resolution protocol (ARP)	Yes
IP multinetting	Yes
RIPv2	Yes
OSPFv2	Yes
Multicast routing	
Protocol independent multicast sparse Mode (PIM-SM)	Yes
Protocol independent multicast dense mode (PIM-DM)	Yes
Protocol independent multicast source-specific multicast (SSM)"	Yes
Layer 3 - IPv6	
Table size	
IP optimized host prefixes (CIDR)	512
IP routing entries (static/dynamic)	128
Router interfaces	64
RIPng	Yes
OSPFv3	Yes

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