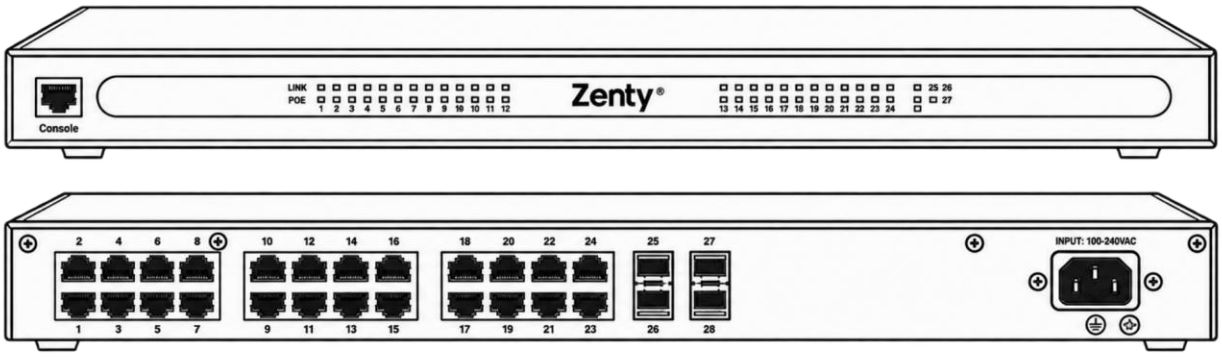
ZT-IPSW24P

ZT-421 | 24-Port Gigabit PoE+ • 4 x 10G Uplinks • Managed AV-over-IP Switch

Purpose-built by Zenty for Pro AV: an out-of-the-box network foundation optimized for audio, video, and control over IP.



ZT-IPSW24P • Front Panel • Rear Panel

24 × 1G PoE+ Access Ports	**4 × 10G** High-Speed Uplinks	**300 W** PoE Power Budget	**128 Gbps** Switching Capacity

01 Purpose-Built and Preconfigured for AV-over-IP

Purpose-built by Zenty for AV-over-IP, the ZT-IPSW24P combines the mature Realtek RTL9301 switching platform with AV-rack-oriented hardware and a factory-optimized network baseline. Rear-facing PoE, 10G uplink, and AC connections keep rack cabling organized, while the front panel provides centralized port-status LEDs and an RJ45 RS-232 console for local service. Preconfigured multicast, jumbo-frame, flow-control, and PoE settings reduce setup time for supported single-switch systems.

Plug-and-Play AV Networking Factory-configured multicast and port baselines reduce on-site setup.	**Centralized PoE+** Centralized power delivery and port management for encoders, decoders, and other endpoints.
Front Service Access Front-mounted console port simplifies local configuration and troubleshooting.	**AV Rack-Friendly Layout** Standard 19-inch 1U chassis with rear-facing network and power connections plus side-to-side airflow.

Typical Applications

Whole-Home AV Centralized connectivity for AV encoders, decoders, controllers, and PoE endpoints in residential low-voltage and AV racks.	**Meetings & Collaboration** Low-latency IP audio/video networking for conference rooms, training rooms, and multipurpose spaces.
Digital Signage Efficient multicast content distribution for retail, hospitality, education, and public information displays.	**Video Walls & Control Rooms** Aggregate multiple high-bitrate media streams over 10G uplinks, with QoS and multicast control for predictable operation.

02 Network Architecture & System Design

ZT-IPSW24P is preconfigured for AV-over-IP networks, supporting a smooth path from plug-and-play single-switch deployments to scalable multi-switch architectures.

> **Default AV-over-IP Baseline**
> The factory configuration supports Zenty IP300, IP400, and IP700 series products. In typical single-switch, single-AV-VLAN systems, encoders, decoders, and the controller can be connected for rapid deployment.

Platform Compatibility & Deployment Scope

- Built on standard Ethernet and IP multicast mechanisms, ZT-IPSW24P can be deployed with Dante, AES67, Crestron DM NVX, Extron NAV, and other systems when configured to meet each vendor's IGMP, VLAN, QoS, PTP, and EEE requirements.
- Third-party interoperability and suitability of the factory configuration must be validated through interoperability testing and the relevant vendor's network design guide. Timing, QoS, VLAN, multicast, EEE, and firmware requirements may vary.

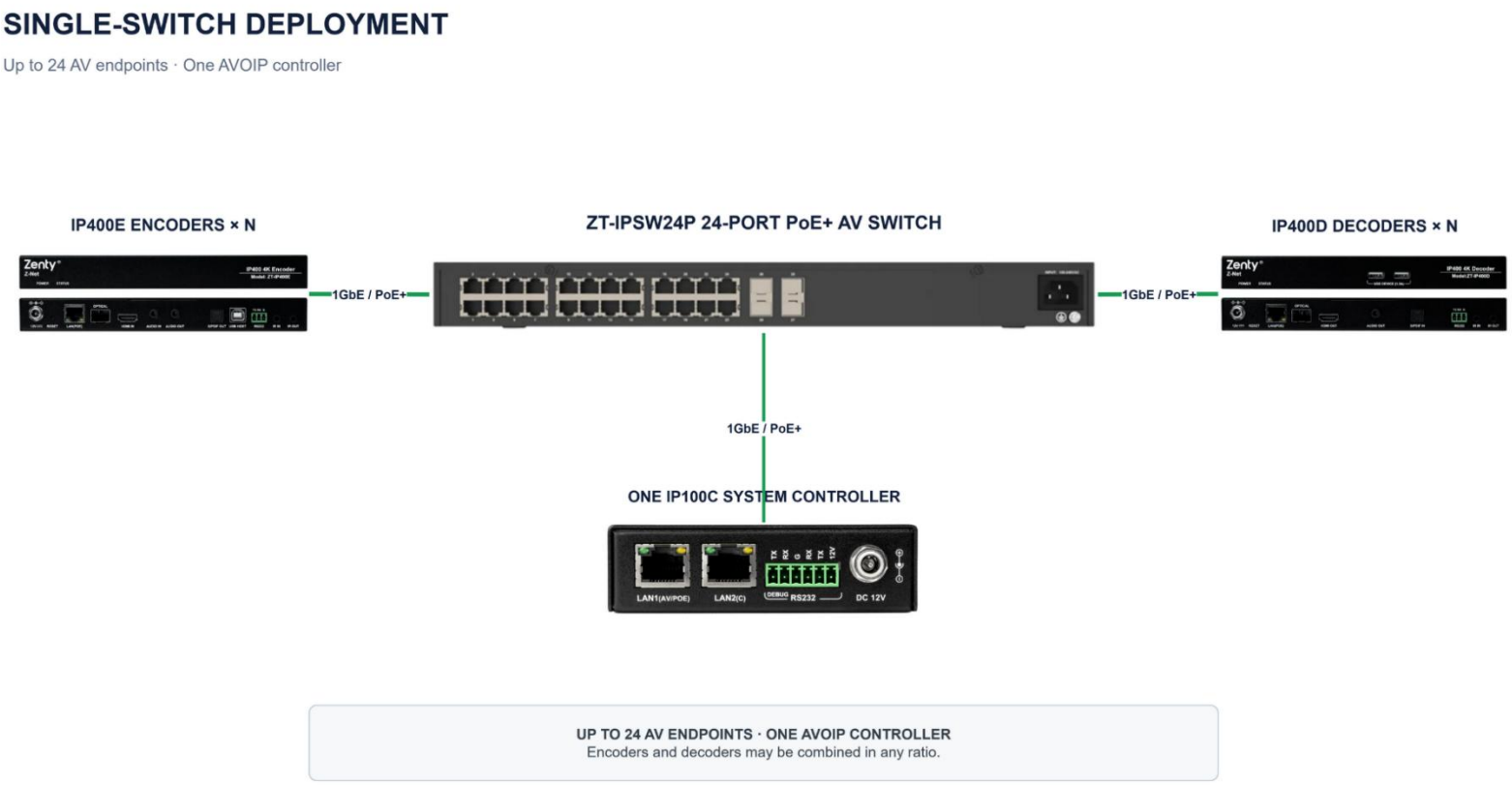
Three Recommended Deployment Models

- **Plug-and-Play Single Switch |** Connect encoders, decoders, and one controller in any mix required by the project. Ideal for single rooms, residential AV, meeting spaces, sports bars, restaurants, and other compact systems.
- **Dual-Switch, Cross-Zone |** For two floors, rooms, or building zones. The example uses a 2 × 10G SFP+ LACP connection, with one controller managing both zones.
- **Three-Switch Star |** One core switch connects two edge switches, using a separate 2 × 10G LACP group for each uplink direction.

Multi-Switch Design Guidelines

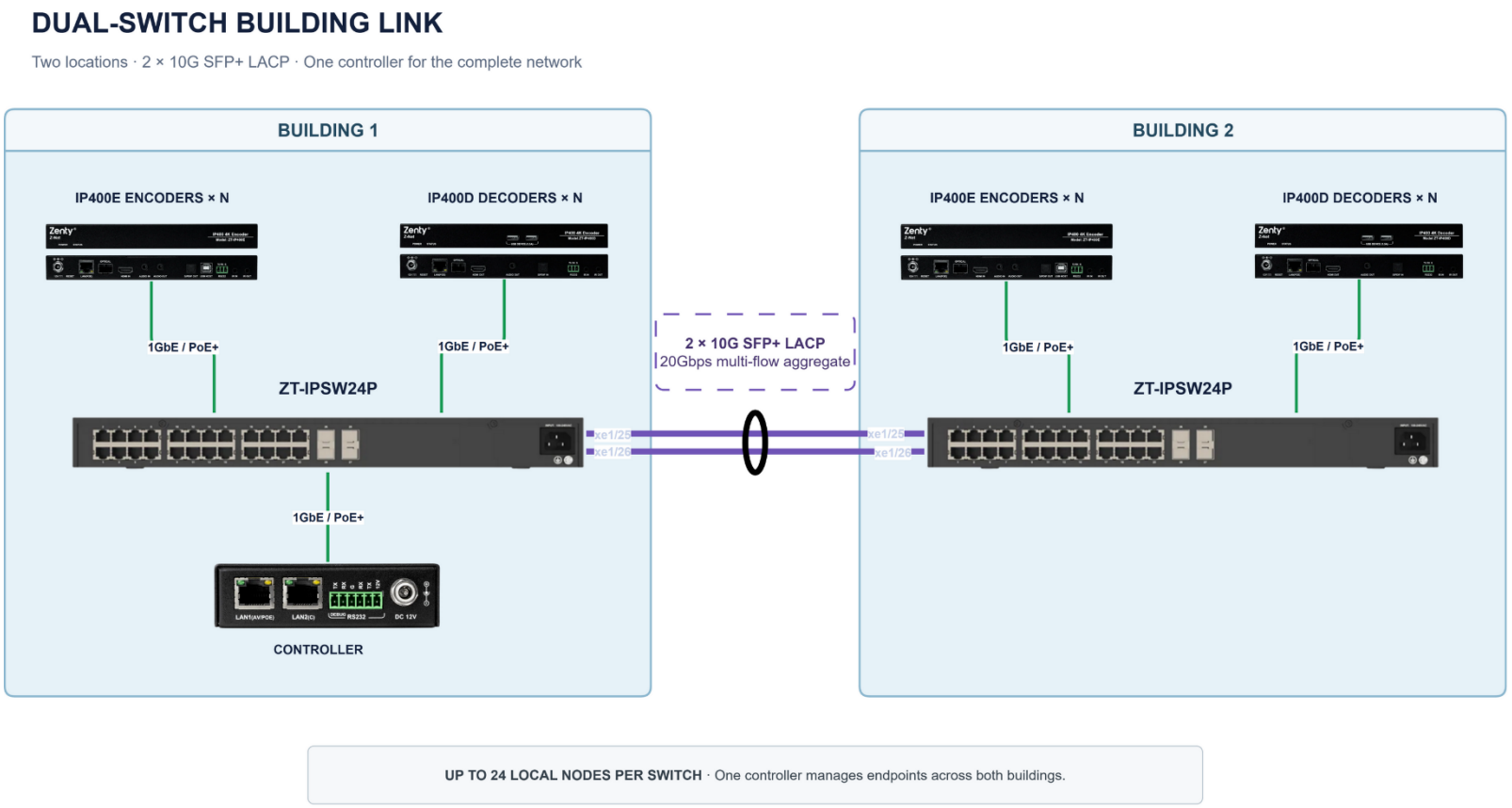
- For every dual-link example in this section, configure IEEE 802.3ad LACP at both ends before connecting or enabling the second link. Never connect two parallel links unless they are members of the same aggregation group.
- A single 10G uplink does not require LACP, but provides less aggregate bandwidth and no link-level redundancy. A 2 × 10G LAG provides up to 20 Gbps of aggregate multi-flow bandwidth; an individual flow typically remains limited to one 10G member link.
- Before interconnecting switches, assign each switch a unique management IP address. Keep the AV VLAN, trunk, IGMP, jumbo-frame, and flow-control settings consistent across the fabric. Define an IGMP Querier strategy for each AV VLAN and verify the election result.
- Use Fast Leave only on access ports directly connected to a single AV endpoint. Validate it before enabling it on switch uplinks or downstream ports that may serve multiple receivers.
- Size uplinks for the worst-case traffic direction, with headroom for encoder bursts, bidirectional media, control traffic, and future expansion.

Topology 1 | Plug-and-Play Single-Switch Deployment



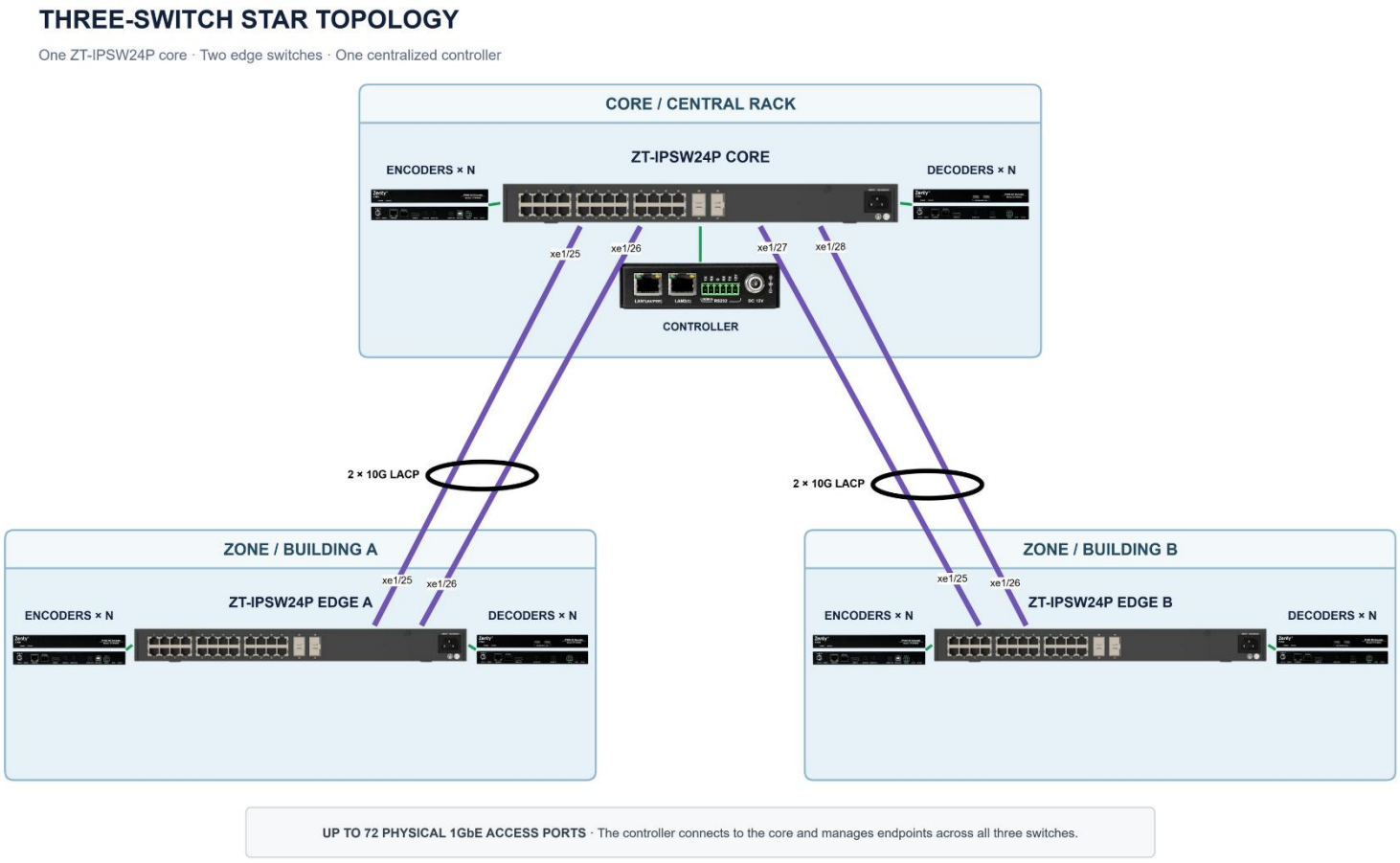
Supports up to 24 AV endpoints under one AV-over-IP controller. Encoders and decoders may be combined in any ratio required by the project.

Topology 2 | Dual-Switch, Cross-Zone Link



Two ZT-IPSW24P switches are interconnected through a 2 × 10G SFP+ LACP group and managed by a single controller across both zones.

Topology 3 | Three-Switch Star Architecture



The core uses separate 2 × 10G LACP groups to connect Edge A and Edge B. One controller connects to the core and manages all three zones.

03 Purpose-Built for AV-over-IP

Zenty combines a mature switching platform, factory-optimized AV multicast, and AV-rack-oriented hardware to reduce deployment time and simplify long-term service.

Purpose-Built by Zenty for AV-over-IP

An AV-focused product design combining rear-facing rack connectivity, front service access, and factory network optimization.

AV-Optimized Factory Configuration

Factory baselines for IGMP multicast, jumbo frames, flow control, and PoE reduce setup for typical supported systems.

AV Rack-Oriented I/O

PoE access ports, 10G uplinks, and AC power are rear-facing; LEDs and the serial console remain accessible from the rack front.

Mature Realtek RTL9301 Platform

A proven Layer 3 managed switching platform provides the hardware foundation for high-bitrate media and multicast forwarding.

High-Bandwidth Uplinks

Four 10G uplink ports provide capacity for switch interconnects, core links, and multi-stream aggregation.

Managed Multicast and QoS

IGMP controls, eight hardware queues per port, CoS/DSCP classification, and WRR scheduling help keep AV traffic predictable.

Typical Plug-and-Play Conditions

Network Scope	Typical single-switch deployment or a properly designed Layer 2 network
Endpoint Access	Untagged Ethernet endpoints with no VLAN segmentation requirement
Multicast	Standard IPv4 IGMP multicast
IP Addressing	Static IP, Auto-IP, or external DHCP
Bandwidth	Combined video, audio, USB, and control traffic remains within access-port and uplink capacity
Jumbo-Frame Path	If endpoints use jumbo frames, the entire path must support the same frame size

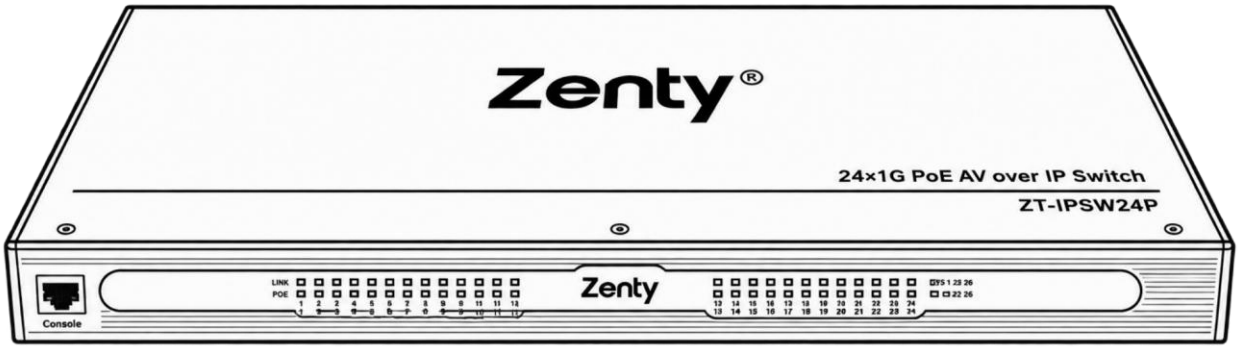
Factory AV-over-IP Baseline

- Default service access: VLAN 1, access/untagged (standard factory setting)
- IGMP Snooping: enabled globally; Querier and Fast Leave enabled on VLAN 1
- Jumbo frames: all physical ports factory-configured for 9000 bytes
- Flow control: IEEE 802.3x enabled on all physical ports
- Management address: 192.168.168.254/24 (change the default credentials and address during commissioning)
- PoE: enabled by default on access ports; see Technical Specifications for the total power budget

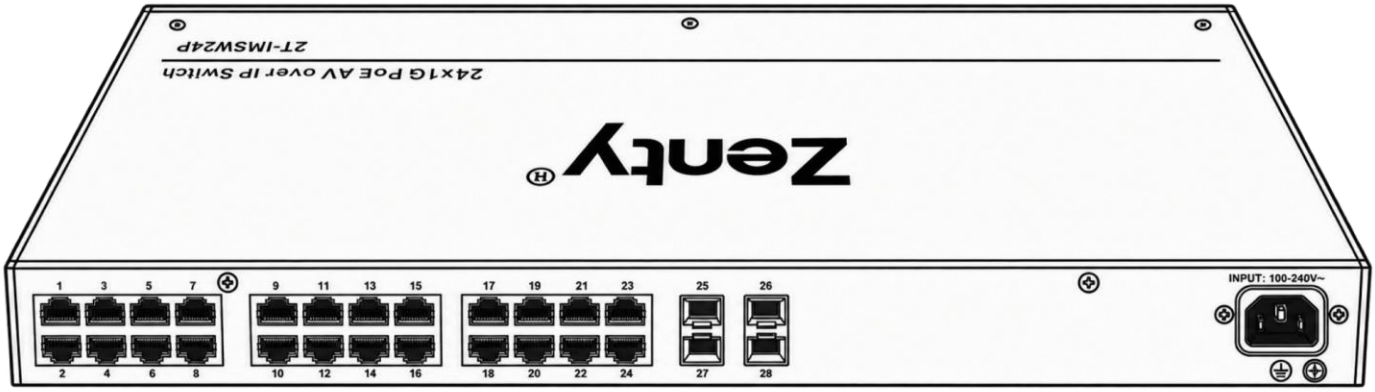
Deployment boundary: multiple AV platform segmentation, inter-VLAN multicast, multi-switch redundancy, or vendor-specific network requirements require appropriate VLAN, trunk, querier, and loop-protection design.

04 Designed Around the AV Rack

ZT-IPSW24P is purpose-built around AV installation and service workflows, with rear-facing connectivity and front-facing status and maintenance access.



Front Panel: Centralized port-status LEDs and RJ45 RS-232 console



Rear Panel: 24 x RJ45 PoE+, 4 x10G uplinks, and AC input

Front Panel: Status and Service Access

The front panel provides centralized status indication for all 24 PoE access ports and the 10G uplink ports.

The RJ45 RS-232 console is also front-mounted, allowing local service without disturbing rear network or power cabling.

Rear-Facing Connectivity for AV Racks

All 24 RJ45 PoE+ ports, four 10G uplink ports, and the AC power input are rear-facing for organized rack-side cabling.

Unlike conventional IT switches designed around front-access patching, the ZT-IPSW24P keeps the rack face clean and the active cabling at the rear.

The standard 19-inch 1U metal chassis is approximately 200 mm deep, making it well suited to space-constrained AV racks.

Rack Installation & Service Guidelines

Rack Space	Standard 19-inch rack, 1U; use the supplied rack ears and secure the unit
Airflow Clearance	Keep both sides unobstructed; do not block vents with cables, rack panels, or adjacent equipment
Cable Management	Route service and power cables at the rear; do not overbend or strain SFP+/DAC assemblies
Grounding	Connect protective earth and follow rack, power, and local electrical requirements
Service	Use the front-mounted console for local troubleshooting
Environment	Operating temperature 0 °C to 40 °C; 5% to 95% RH, non-condensing. Maintain adequate airflow at full PoE load

05 Switching and Management for High-Bitrate Media

Multicast & AV Transport

IGMP	IGMP Snooping; IGMP Querier; Fast Leave; IGMP v2/v3 membership learning
Multicast Status	Per-VLAN display of group addresses, member ports, and member versions
IPv6 Multicast	MLD Snooping
Jumbo Frame	Factory set to 9000 bytes; supported range 1523-12288 bytes
Flow Control	IEEE 802.3x full-duplex flow control
QoS	8 queues per port; CoS/DSCP classification; WRR scheduling by default
Storm Control	Broadcast, multicast, unknown multicast, and unknown unicast control

Layer 2 & Resiliency

VLAN	IEEE 802.1Q; up to 4K VLAN entries; access/trunk modes; Q-in-Q capability
Link Aggregation	Static trunks and LACP
Spanning Tree	STP/RSTP/MSTP capability
LLDP	IEEE 802.1AB LLDP; bidirectional Rx/Tx; IEEE 802.1, IEEE 802.3, and LLDP-MED TLVs; local, neighbor, operational-status, and per-port statistics queries
Port Features	Port mirroring, rate limiting, loop detection, UDLD, and RMON

PoE Management

PoE Standards	IEEE 802.3af/802.3at (PoE/PoE+)
Per-Port Power	Up to 30 W/port
Total Power Budget	300 W
Monitoring	Per-port status, power, current, voltage, PD class, and PoE controller temperature
Automatic Recovery	PoE Watchdog, PD IP probing, query interval, timeout count, and power cycling
Policy	Per-port PoE enable/disable and time-based PoE schedules

Management & Security

Web, CLI, and SNMP management; supports saving running and startup configurations.

Front-mounted RJ45 RS-232 console; no dedicated management port; in-band management through service ports.

Supports ACLs, IEEE 802.1X, port security, DHCP Snooping, IP/MAC binding, logging, and RMON.

Protocol versions, capacities, and default security policies are subject to the final software feature matrix.

06 Technical Specifications

Interfaces & Performance

Access Ports	24 × 10/100/1000BASE-T RJ45 PoE+
Uplink Ports	4 × 10G SFP+
Console	1 × RJ45 RS-232 console, front panel
Dedicated MGMT	None; in-band management supported
Switching Capacity	128 Gbps

Packet Forwarding Rate	Up to 95.23 Mpps
MAC Address Table	16K
Packet Buffer	12 Mbit / 1.5 MB
ACL	2K shared VLAN/ingress ACL entries
VLAN	4K VLAN entries
Multicast Table	1K independent L2/IP multicast forwarding entries
Hardware Queues	8 hardware queues per standard port
Jumbo Frame	Factory set to 9000 bytes; supported range 1523-12288 bytes

System, PoE & Physical Specifications

Switching Platform	Realtek RTL9301
CPU	800 MHz MIPS-34Kc
System Memory	256 MB DDR
Flash	32 MB SPI NOR
PoE	24 × IEEE 802.3af/at; up to 30 W/port
PoE Budget	300 W
Switch Power Consumption	<30 W, excluding PoE output
AC Input	AC 100-240 V, 50/60 Hz
Dimensions	440 × 200 × 44 mm (W × D × H)
Rack Space	Standard 19-inch, 1U
Net Weight	Approx. 3.5 kg
Enclosure	Metal
Cooling	Dual-fan, side-to-side airflow
Operating Temperature	0 °C to 40 °C

Storage Temperature	-40 °C to 75 °C
Operating Humidity	5% to 95% RH, non-condensing

Note: Product functionality may vary by firmware version and configuration. Chip capabilities do not automatically indicate that every feature is enabled in production firmware. Plug-and-play applies to typical deployments that meet the conditions stated in this document; complex networks should be designed by qualified network or AV system engineers.

Ordering & Delivery Information

Model	ZT-IPSW24P
Manufacturer Part Number	ZT-421
Product Category	AV-over-IP PoE+ Managed Switch
Mounting	19-inch rack mount, 1U
Package Contents	Switch, AC power cord, rack ears, and documentation
Warranty	1 year

ZT-IPSW24P brings together a mature switching platform, factory-optimized AV multicast, centralized PoE, and an AV-rack-oriented mechanical design in one purpose-built product, helping integrators deploy faster while retaining the professional management capabilities required for expansion, monitoring, and service.