APC™
by Schneider Electric

Installation

24-Port 10/100 Ethernet Switch

AP9224110

This manual is available online at www.apc.com in the following languages:

Chinese

French

German

Italian

Brazilian Portuguese

Spanish

Contents

Technical Specifications.. 9

Overview

Important Safety Information

Read the instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ **DANGER**

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ **WARNING**

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

⚠ **CAUTION**

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

NOTICE

NOTICE addresses practices not related to physical injury including certain environmental hazards, potential damage or loss of data.

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A qualified person is one who has skills and knowledge related to the construction, installation, and operation of the equipment and has received safety training to recognize and avoid the hazards involved.

About This Manual

This manual is intended for users of the specified APC equipment. It contains important safety warnings and instructions, and provides detailed information for proper use of the equipment.

Related Documents

Download technical publications and other technical information or look for updates to your manual at our website at **www.apc.com**.

User Comments

Contact www.apc.com/support. We welcome your comments about this document.

General Information

Safety

Important Safety Instructions

Save These Instructions This manual contains important instructions that must be followed during installation, operation, and maintenance of the device.

⚡ ⚠ DANGER
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH • Do not operate the device with covers removed. • No user-serviceable parts inside. Refer servicing to qualified personnel. • Use indoors only in a dry location. **Failure to follow these instructions will result in death or serious injury.**

Installation

Preliminary Information

Overview

The American Power Conversion (APC®) Ethernet Switch (AP9224110) is a multi-port switch that can be used to create high-speed backbone connections among switches, servers, databases, and end stations. The switch fits into any enterprise-level network as an exit to the backbone switch.

Features

Each switch features:

- Automatic MDI/MDIX for all ports
- N-way Auto-negotiation
- Store-and-Forward architecture
- 1U 19-inch rack-mount design
- Internal power supply

Inventory

The Ethernet Switch package includes the following items:

- One APC Ethernet Switch
- Power cord
- Four rubber feet
- Rack mount kit
    - Two brackets
    - Eight Phillips-head screws
- This *Installation Manual*

If any item is missing or damaged, contact APC Customer Support using the contact information on the back cover of this manual.

Front panel
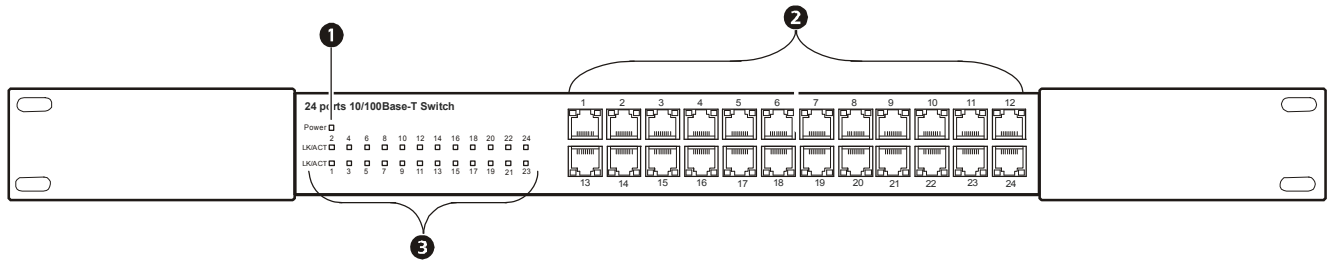
❶ One Power LED indicator

❷ 24 10/100Base-TX RJ-45 ports

❸ LED indicators (one for each RJ-45 port)

LED Indicators. The LED indicators provide real-time information on the operating status of the system.

LED	Status	Description
Power	Green	Power is on.
	Off	Power is not connected.
LK/ACT	Green	The port is connecting with the device.
	Blinking	The port is receiving or transmitting data.
	Off	No device is attached.
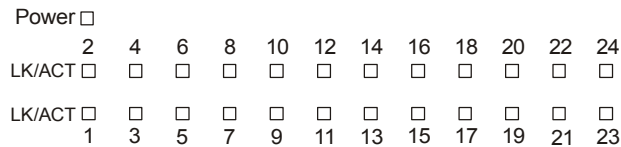
Rear panel

The power input connector is located on the rear panel of the switch. The power input connector serves as the disconnect for the switch.
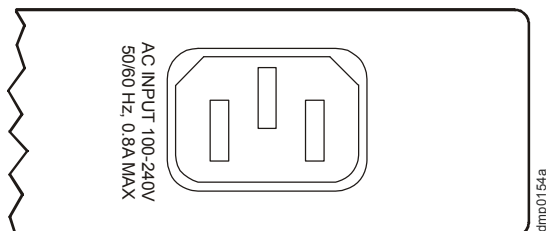
Installation

Desktop installation

Place the switch on a large, clean, level surface with a power outlet nearby. Make sure there is enough clearance around the switch for attaching cables and the power cord, and for air circulation.

Attaching rubber feet.

1. Make sure the mounting surface on the bottom of the switch is free of grease and dust.
2. Remove the adhesive backing from the rubber feet.
3. Apply one rubber foot to each corner on the bottom of the switch to protect the switch from shock and vibration.

Rack-mounted installation

The switch comes with a rack-mount kit and can be mounted in an EIA standard size, 19-inch rack. The switch can be placed in a wiring closet with other equipment. When installing the switch, take into consideration the following:

- Install the switch in an environment compatible with the maximum ambient temperature (Tma) specified in "Technical Specifications" on page 9. Switches installed in a closed or multi-unit rack assembly can experience a greater operating ambient temperature than the ambient room temperature.
- Install the switch in a way that allows sufficient airflow for proper operation.
- When installing the switch, review the switch nameplate to avoid overloading the circuits.
- Be sure the switch is properly grounded by plugging it directly into a wall outlet or by verifying the ground path if you connect the switch to the power supply through power strips.

To mount the switch in a rack:

NOTICE
• Use only the provided hardware to install the brackets.   • Do not use the device as a shelf.

To avoid equipment damage, use only the provided hardware to install the brackets.

1. Position one bracket to align with the holes on one side of the switch and secure the bracket with the smaller bracket screws. Attach the remaining bracket to the other side of the switch.

2. Choose a location for the unit:

Note: The unit occupies one U-space. A notched hole (or a number, on newer enclosures) on the vertical rail of the enclosure indicates the middle of a U-space.
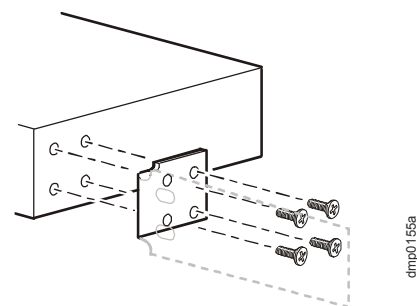
a. Insert cage nuts (provided with the enclosure) above and below a notched hole on each vertical mounting rail in your chosen location.

NOTICE

Install cage nuts horizontally, with the ears engaging the sides of the square hole. Do NOT install cage nuts vertically with the ears engaging the top and bottom of the square hole.

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b. Align the mounting holes of the brackets with the installed cage nuts. Insert and tighten screws.
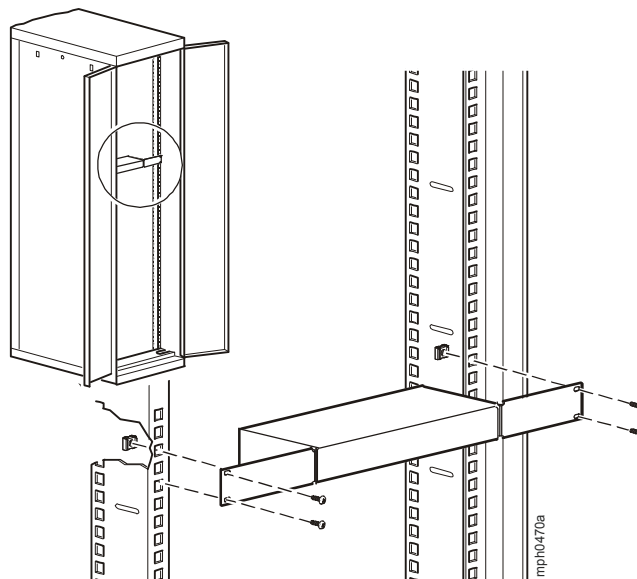
Applying power

Connect the cord of the power adapter to the power socket on the rear panel of the switch. Connect the other end of the power cord to an appropriately-protected power source. Check the power indicator on the front panel to make sure that the switch is receiving power.

Connecting the switch

The RJ-45 ports use either unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable.

- For 10 Mbps connections use $100\,\Omega$ Category 3, Category 4, or Category 5 cable
- For 100 Mbps connections use $100\,\Omega$ Category 5 cable

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NOTICE

The length of any twisted-pair connection must not exceed 328 feet (100 meters).

Troubleshooting

How to Resolve Problems

This chapter describes common problems that may occur when using the switch and their possible solutions. First, use the information in this chapter to attempt to resolve a problem. If this information does not resolve the problem, contact APC Customer Support using the contact information on the back cover of this manual.

Specific Problems and Their Solutions

Diagnosing LED Indicator

If the LNK LED does not illuminate after connection, check the following:

- Verify that the switch and any devices attached to it are turned on.
- Be sure the connecting cable is plugged into both the switch and its corresponding device.
- Verify that the proper cable type is used and its length does not exceed specified limits. See "Connecting the switch" on page 7.

Power

If the power indicator on the front panel of the switch does not turn on when the power cord is plugged in, the power outlet or power cord may be defective.

If the switch loses power after running for a while, check for loose power connections, or power fluctuations at the power outlet.

Incorrect connections

The switch can auto-detect whether a device is connected with a straight-through or crossover cable. If the RJ-45 connector pins are not properly configured, linking will be unsuccessful.

Loose cables. Look for loose or damaged connections. Make sure the connections are snug. If that does not correct the problem, try a different cable of the same category.

Non-standard cables. Verify that you are using the correct cables. See "Connecting the switch" on page 7.

Improper network topologies. Make sure that you are using a valid network topology. Too many hubs or repeaters between the connected computers in the network may increase the number of packet collisions or cause other issues. Remove unnecessary hubs from the network.

Data path loops. Check for data path loops. There should be only one cabling path at any time between the switch and the device to which it connects.

Transmission mode

The RJ-45 ports use auto-negotiation to set the transmission mode to either full-duplex or half-duplex.

Verify that each port is set to the same transmission mode used by the attached device. If the attached device operates at half-duplex, the default when auto-negotiation is unsuccessful, it does not support auto-negotiation.

Technical Specifications

24-Port 10/100 Switch (AP9224110)

Performance

Transfer rate	14,880 packets per second for 10 mbps
	148,800 packets per second for 100 mbps
MAC address	8K MAC address table
Memory buffer	1.75 Mbits
Backplane	4.8 gbps

Electrical

Input connector	IEC-320-C14
Nominal input voltage	100–240 Vac
Input frequency	50–60 Hz
Power consumption	4.4 Watts (Maximum @ 100 VAC)
	5.0 Watts (Maximum @ 240 VAC)

Communication and Management

Protocol	CSMA/CD
Technology	Store-and-Forward switching architecture
LED	System: Power
	RJ-45 port: Link/Activity

Physical

Size (H x W x D)	37 x 250 x 133 mm (1.45 x 9.84 x 5.23 in)
Connector	RJ-45: 24 ports
Network cable	10BASE-T: 2 pairs UTP/STP CAT3, CAT4, or CAT5 cable EIA/TIA 568 100 Ω (100 M)
	100BASE-TX: 2 pairs UTP/STP CAT5 cable EIA/TIA 568 100Ω (100M)

Environmental

Condition	Temperature
Operating	0ºC to 45ºC (32ºF to 113ºF)
Storage	-40ºC to 70ºC (-40ºF to 158ºF)
	Relative Humidity
Operating	10% to 90% (Non-condensing)

Compliance

Standard	IEEE 802.1p CoS
	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-TX
	IEEE 802.3x Flow control

Regulatory Approvals

Product Safety	UL/C-UL, TÜV, CE
EMC	EMC -Class A-FCC part 15, ICES-003, VCCI EU- EMC Directive 2004/108/EC

Radio Frequency Interference

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

USA—FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this user manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. The user will bear sole responsibility for correcting such interference.

Canada—ICES

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Japan—VCCI

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準
に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると、電波
妨害を引き起こすことがあります。この場合には、使用者が適切な対策を講ず
るように要求されることがあります。

Taiwan—BSMI

警告使用者：
這是甲類的資訊產品，在居住的
環境中使用時，可能會造成射頻
干擾，在這種情況下，使用者會
被要求採取某些適當的對策。

Australia and New Zealand

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

European Union

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. APC cannot accept responsibility for any failure to satisfy the protection requirements resulting from an unapproved modification of the product.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide a reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Korean 한국

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  - **www.apc.com/support/**
    Global support searching APC Knowledge Base and using e-support.
- Contact the APC Customer Support Center by telephone or e-mail.
  - Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

For information on how to obtain local customer support, contact the APC representative or other distributors from whom you purchased your APC product.