



# **User Manual**

## **NS-16T**

16 Port Fast Ethernet Switch

## **NS-24T**

24 Port Fast Ethernet Switch



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### **Caution**

Electronic Circuit devices are sensitive to static electricity. Dry weather conditions or walking across a carpeted floor may cause you to acquire a static electrical charge.

To protect your switch, always:

- Touch the metal chassis of your computer to ground the static electrical charge before you handle the switch.
- Pick up the switch by holding it on the left and right edges only.

### **Electronic Emission Notices**

#### **Federal Communications Commission (FCC) Statement**

This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

#### **European Community (CE) Electromagnetic Compatibility Directive**

This equipment has been tested and found to comply with the protection requirements of European Emission Standard EN55022/EN60555-2 and the Generic European Immunity Standard EN50082-1.

EMC:

EN55022(1988)/CISPR-22(1985)	class A
EN60555-2(1995)	class A
EN60555-3	
IEC1000-4-2(1995)	4K V CD, 8KV, AD
IEC1000-4-3(1995)	3V/m
IEC1000-4-4(1995)	1KV – (power line), 0.5KV – (signal line)

#### **Australian C-Tick Compliance.**

This equipment is compliant with the required Australian C-Tick standards

## About this User Manual

This User Manual will guide you on procedures to install Alloy 16 port Fast Ethernet (NS-16T) and 24 port (NS-24T) Fast Ethernet Switch models.

The two models NS-16T and NS-24T differ in terms of port density – the former model offering 16x 10/100Mbps Fast Ethernet ports, and the latter 24x ports of the same specification. In all other respects the two models share identical characteristics.

## Overview of the User Manual

- Chapter 1 “Introduction” describes the features of NS-16T and NS-24T Fast Ethernet switches
- Chapter 2 “Unpacking and Installation”
- Chapter 3 “Identifying External Components”
- Chapter 4 “Technical Specifications”

## Terms Used

### **16/24 Port Fast Ethernet Switches:**

This term is used when discussing information that relates to both NS-16T 16 port and NS-24T 24 port Fast Ethernet Switch models

### **NS-16T:**

This term is used when discussing information that relates to the 16 port Fast Ethernet switch.

### **NS-24T:**

This term is used when discussing information that relates to the 24 port Fast Ethernet switch.

## Introduction

This chapter describes the features of the Switch and some background information about Ethernet/Fast Ethernet switching technology.

### Fast Ethernet Technology

The growing importance of LANs and the increasing complexity of desktop computing applications are fueling the need for high performance networks. A number of high-speed LAN technologies have been proposed to provide greater bandwidth and improve client/server response times. Among them, 100BASE-T (Fast Ethernet) provides a non-disruptive, smooth evolution from the current 10BASE-T technology.

100Mbps Fast Ethernet is a standard specified by the IEEE 802.3 LAN committee. It is an extension of the 10Mbps Ethernet standard with the ability to transmit and receive data at 100Mbps, while maintaining the CSMA/CD Ethernet protocol. Since 100Mbps Fast Ethernet is compatible with all other 10Mbps Ethernet environments, it provides a straightforward upgrade and takes advantage of the existing investment in hardware, software, and personnel training.

### Switching Technology

Another approach to pushing beyond the limits of Ethernet technology is the development of switching technology. A switch bridges Ethernet packets at the MAC address level of the Ethernet protocol transmitting among connected Ethernet or Fast Ethernet LAN segments. Switching is a cost-effective way of increasing the total network capacity available to users on a local area network. A switch increases capacity and decreases network loading by dividing a local area network into different *segments*, which don't compete with each other for network transmission capacity.

The switch acts as a high-speed selective bridge between the individual segments. The switch, without interfering with any other segment, automatically forwards traffic that needs to go from one segment to another. By doing this the total network capacity is multiplied, while still maintaining the same network cabling and adapter cards.

For Fast Ethernet networks, a switch is an effective way of eliminating problems of chaining hubs beyond the "two-repeater limit." A switch can be used to split parts of the network into different collision domains, making it possible to expand your Fast Ethernet network beyond the 205-meter network diameter limit for 100BASE-TX networks. Switches supporting both traditional 10Mbps Ethernet and 100Mbps Fast Ethernet are also ideal for bridging between the existing 10Mbps networks and the new 100Mbps networks.

Switching LAN technology is a marked improvement over the previous generation of network bridges, which were characterised by higher latencies. Routers have also been used to segment local area networks, but the cost of a router, the setup and maintenance required make routers relatively impractical. Today switches are an ideal solution to most kinds of local area network congestion problems.

## Features

The 16/24 Port Fast Ethernet Switches were designed for ease of installation and high performance in an environment where traffic on the network and the number of users increase continuously.

The Switch with its 19" standard rack size is specifically designed for middle to large workgroups. The Switch provides immediate access to a rapidly growing network through a wide range of user-reliable functions.

The Switch is ideal for deployment with multiple high-speed servers for shared bandwidth 10Mbps or 100Mbps workgroups. With the highest bandwidth 200Mbps (100Mbps full-duplex mode), any port can provide workstations with a congestion-free data pipe for simultaneous access to the server.

The Switch is expandable by cascading two or more switches together. As all ports support 200Mbps, the Switch can be cascaded from any port and to any number of switches. The Switch is a perfect choice for site planning to upgrade to Fast Ethernet in the future. Ethernet workgroups can connect to the Switch now, and change adapters and hubs anytime later without needing to change the Switch or reconfigure the network.

The Switch combines dynamic memory allocation with store-and-forward switching to ensure that the buffer is effectively allocated for each port, while controlling the data flow between the transmit and receive nodes to guarantee against all possible packet loss.

Other key features are:

- **16/24-port 10/100Mbps Fast Ethernet Switch with RJ-45 connectors**
- **Supports Auto-negotiation for speed and duplex modes on each port**
- **Supports Auto-MDI/MDI-X for each port**
- **Wire speed reception and transmission**
- **Store-and-Forward switching technology**
- **Integrated address Look-Up Engine, supports 8K absolute MAC addresses**
- **Supports 1.25Mbits of RAM for data buffering**
- **Front-panel diagnostic LED's**
- **Broadcast storm protection**
- **IEEE 802.3x flow control for full-duplex**
- **Back pressure flow control for half-duplex**
- **Standard 19" Rack-mountable size**

# Unpacking and Installation

This chapter provides unpacking and setup information for the 16/24 Port Fast Ethernet switches.

## Unpacking

Before you start installing your switch, verify that the package contains the following:

- A NS-16T or NS-24T Fast Ethernet Switch
- Mounting Accessories (for 19" Rack Shelf mounting)
- This Users Manual CD-ROM
- AC Power Cord

Please notify your supplier immediately if any of the aforementioned items are missing or damaged.

## Installation

The site where you install the 16/24 Port Fast Ethernet Switch may greatly affect its performance. When installing, consider the following pointers:

Install the Switch in a fairly cool and dry place. See *Specifications* for the acceptable temperature and humidity operating ranges.

Install the Switch in a site free from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.

Leave at least 10cm of space at the front and rear of the switch for ventilation.

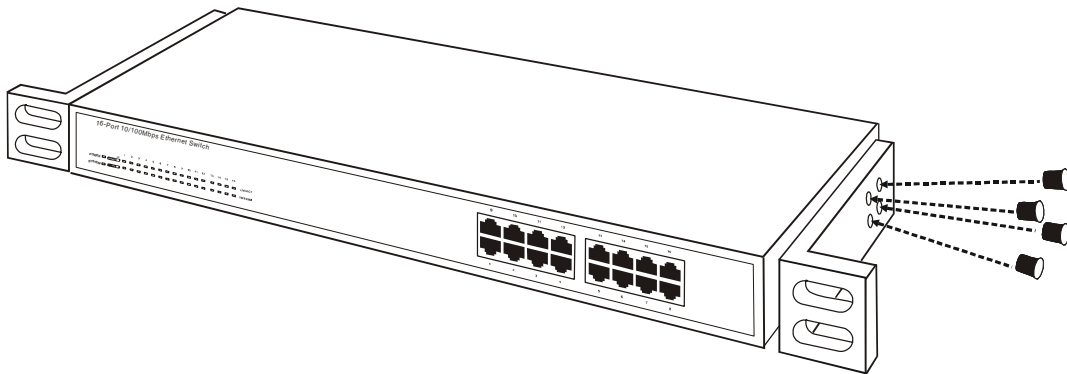
Install the Switch on a sturdy, level surface that can support its weight, or in an EIA standard-size equipment rack. For information on rack installation, see the next section, Rack mounting.

When installing the Switch on a level surface, attach the rubber feet to the bottom of each device. The rubber feet cushion the hub and protect the hub case from scratching.

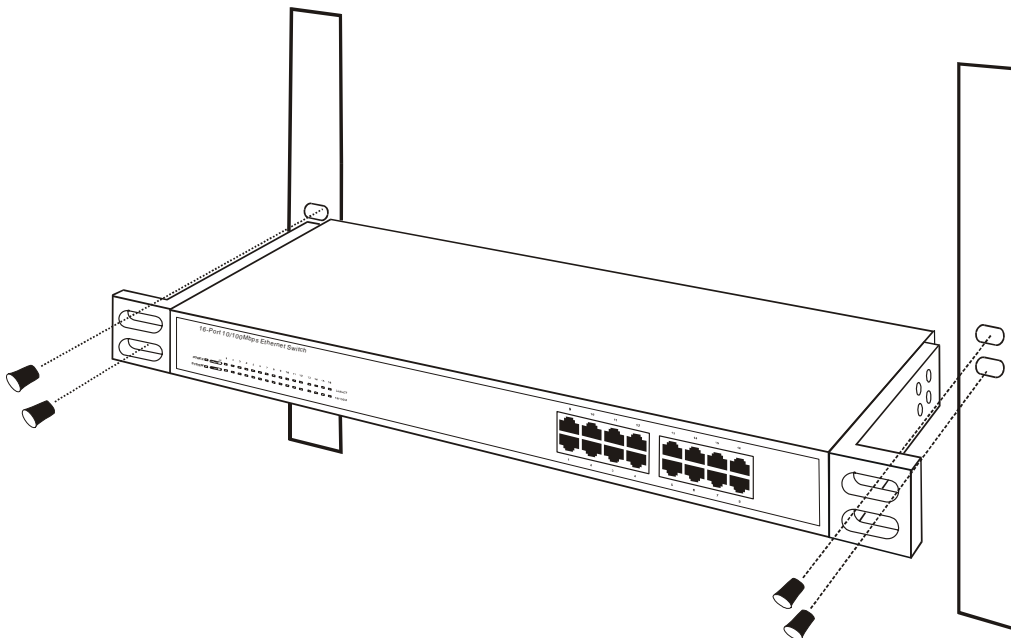


## Rack Mounting

The 16/24 Port Fast Ethernet Switch can be mounted in an EIA standard-size, 19-inch rack, which can be placed in a wiring closet with other equipment. Attach the mounting brackets to the switch's front panel (one on each side), and secure them with the provided screws.



Then, use screws provided with the equipment rack to mount each switch in the rack.

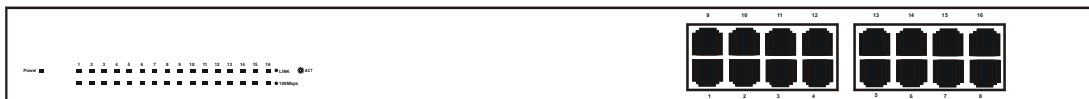


# Identifying External Components

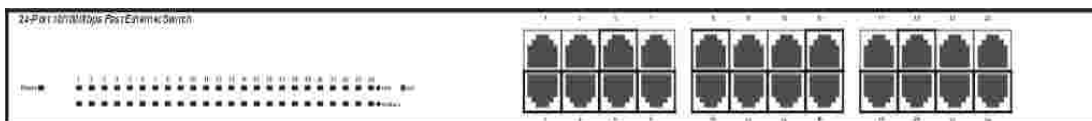
This section identifies all the major external components of the switch.

## Front Panel

The figures below show the front panels of each of the switches.

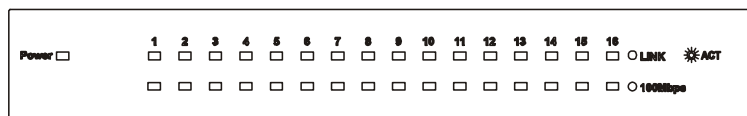


**16-port 10/100Mbps Fast Ethernet Switch**

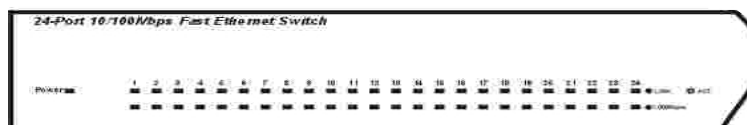


**24-port 10/100Mbps Fast Ethernet Switch**

## LED Indicator Panel



**16-port 10/100Mbps Fast Ethernet Switch**



**24-port 10/100Mbps Fast Ethernet Switch**

### ◆ Power (PWR)

This indicator lights green when the switch is receiving power, otherwise, it is off.

### ◆ Link / Activity ( green )

This indicator lights green when the port is connected to a Fast Ethernet or Ethernet station, if the indicator is blinking green then traffic is present on the port.

### ◆ 100Mbps ( green )

This LED indicator lights green when the port is connected to a 100Mbps Fast Ethernet station. Otherwise, the LED is off when the port is connected to a 10Mbps Ethernet station.

## Rear Panel

The figure below shows the rear panel of the 16/24 Port Fast Ethernet switches.



AC Power Connector

## Technical Specifications

<b>General</b>	
Standards	IEEE 802.3 10BASE-T Ethernet IEEE 802.3u 100BASE-TX Fast Ethernet
Protocol	CSMA/CD
Data Transfer Rate	Ethernet: 10Mbps (half duplex), 20Mbps (full-duplex) Fast Ethernet: 100Mbps (half duplex), 200Mbps (full-duplex)
Topology	Star
Network Cables	10BASE-T: 2-pair UTP Cat. 3,4,5, EIA/TIA- 568 100-ohm STP 100BASE-TX: 2-pair UTP Cat. 5, EIA/TIA-568 100-ohm STP
Number of Ports	16 x 10/100Mbps Auto-MDI ports (NS-16T) 24 x 10/100Mbps Auto-MDI ports (NS-24T)
<b>Physical and Environmental</b>	
AC inputs	100 to 240 VAC, 50 or 60 Hz internal universal power supply
Power Consumption	6 watts. (max.)
Temperature	Operating: 0° ~ 40° C, Storage: -10° ~ 70° C
Humidity	Operating: 10% ~ 90%, Storage: 5% ~ 90%
Dimensions	440 x 140 x 44 mm (W x H x D)
EMI:	FCC Class A, CE Mark Class A, VCCI Class A
Safety	CUL, CB
<b>Performance</b>	
Transmit Method:	Store-and-forward
RAM Buffer:	1.25Mbits per device
Filtering Address Table:	8K entries per device
Packet Filtering/Forwarding Rate:	10Mbps Ethernet: 14,880/pps 100Mbps Fast Ethernet: 148,800/pps
MAC Address Learning:	Automatic update