

# Gigabit Network Switches

## OVERVIEW

### NS3500-24T-4C

This Enterprise-Class Network Switch provides 24 Gigabit Ethernet ports with 4 shared 100/1000Mbps SFP slots. This switch provides a high-performance switch architecture and non-blocking switch fabric capable of wire-speed throughput as high as 48Gbps.

#### User-Friendly Traffic Control

Designed to deliver optimal IP video transmission performance for applications with limited network resources, the NS3500-24T-4C offers user-friendly traffic management features, including quick and simple QoS configuration through a Web interface.

#### Flexible Management

The NS3500-24T-4C is equipped with console, Web and Simple Network Management Protocol (SNMP) management capabilities, and can be accessed via telnet. It also supports secure remote management via a SNMPv3 connection which encrypts the packet content at each session.

#### Quiet, Energy-Efficient Technology

Designed as a fanless switch, the NS3500-24T-4C provides a quiet, energy-efficient, high-speed network environment, delivering Gigabit performance at a cost similar to Fast Ethernet.

### NS3702-24P-4S-V2

This Enterprise-Class Network Switch is engineered to meet a variety of high-performance applications, including PoE distribution, optical network architectures and high-density performance through reliable technology and advanced Layer 3 networking features.

#### Simple Web Management

All switch management functions, including Port Speed Configuration, Port Link Aggregation, IEEE 802.1Q VLAN and Q-in-Q VLAN, Port Mirroring, Rapid Spanning Tree and ACL security can be programmed via a simple, yet powerful GUI interface.

The NS3702-24P-4S-V2 supports standard SNMP and includes an advanced SNMP feature set to monitor the status of the switch and



NS3500-24T-4C  
Layer 2 (Non-PoE)



NS3702-24P-4S-V2  
Layer 3 (PoE-at)

traffic per port. The switch can also be monitored via any standards-based SNMP management software.

#### Full Power, Isolated per Port PoE

The NS3702-24P-4S-V2 provides optimized deployment and safe power management to PoE edge devices such as IP Surveillance cameras, access control panels, wireless access points (WAP) and Voice over IP (VoIP).

Full power PoE-af (15.4w) is provided to all 24 ports with no power sharing, and added port circuit protection isolates and prevents power interference between ports. In addition to standard IEEE 802.3af (15.4w), the NS3702-24P-4S-V2 provides support for up to 14 ports of IEEE 802.3at (30w) PoE+.

#### Built-in Monitoring, Diagnostics and Trouble-Shooting Tools

The NS3702-24P-4S-V2 can be configured to monitor the status of a connected PD (Powered Device) in real-time via IP ping. If a PD (IP Camera, IP Access Reader, IP Intercom, VoIP phone, Wireless Access Point) no longer responds to a ping, the switch will cycle PoE power on the port, thus rebooting the PD to operational status.

Other features for enhanced troubleshooting and management include PoE monitoring, management and scheduling to support energy-savings, built-in cable diagnostics, and support for SNMP – all designed to help reduce IT time and costs while keeping network downtime to a minimum.

#### Static Routing

The NS3702-24P-4S-V2 supports IPv4/IPv6 Layer 3 static routing, providing a cost-effective solution for inter-VLAN routing in a LAN production network. This allows flexible network design and greater control of network traffic – essential for larger IP Video systems.

#### Management in TruVision® Navigator

The NS3702-24P-4S-V2 simplifies management of your IP video system by providing integration into TruVision Navigator 8.0 and above.

The NS3702-24P-4S-V2 can provide information to TruVision Navigator such as ONVIF labels of cameras, bandwidth usage per port and POE power control making installation and management IP Video systems simpler and effortless.

# STANDARD FEATURES

## Physical Ports

### 24-port Gigabit Layer 3 Managed PoE+ Switch (NS3702-24P-4S-V2)

- 24-ports 10/100/1000Base-T Gigabit Ethernet RJ-45 with IEEE 802.3at PoE+
- 4 SFP/mini-GBIC slots shared with ports 21 to 24 - compatible with 1000Base-SX/LX/BX and 100Base-FX SFP transceivers
- RS-232 DB9 console interface for basic switch management and setup

### 24-port Gigabit Managed Switch (NS3500-24T-4C)

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- RS232 (DB9) console interface for basic switch management and setup

## High-performance Switch Architecture

- Complies with the IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3z standards
- High performance Store and Forward architecture, broadcast storm control, runt/CRC filtering reduces erroneous packets to optimize the network bandwidth
- Prevents packet loss with back pressure (half-duplex) and IEEE 802.3x PAUSE frame flow control (full-duplex)
- Up to 56Gbps non-blocking switch fabric
- 10K bytes Jumbo frame support
- 8K MAC address table, automatic source address learning and ageing

## Full Multicast Support for IP Video

- IGMP Snooping v1, v2 and v3 fast leave
- IGMP Query mode support
- Up to 256 multicast groups

## VLAN Support

- IEEE 802.1Q Tag-Based VLAN
- Up to 255 VLANs groups, out of 4096 VLAN IDs

## Layer 3 IP Routing (NS3702-24P-4S-V2)

- Supports maximum 128 static routes and route summarization

## Spanning Tree Protocol

- STP, IEEE 802.1D (Spanning Tree Protocol)
- RSTP, IEEE 802.1w (Rapid Spanning Tree Protocol)
- MSTP, IEEE 802.1s (Multiple Spanning Tree Protocol); Up to 8 MSTP instances

## Quality of Service (QoS)

- 4 priority queues on all switch ports
- Traffic classification:
  - IEEE 802.1p Class of Service
  - IP TOS/DSCP code priority
  - Port Base priority
- Strict priority and weighted round robin (WRR) CoS policies
- Ingress/Egress Bandwidth Control on each port

## Power over Ethernet (NS3702-24P-4S-V2)

- Complies with IEEE 802.3at Standard
- 380 Watt Total Power Budget
- Auto-detects PoE powered devices (PD)
- Provides full-power (15.4W) PoE up to 24 ports and up to 12 ports (30.8W) PoE+
- Circuit protection isolates and reduces power interference between ports
- End-Span (PSE) configuration supplies power up to 100m
- PoE Management Features
  - Total power budget control
  - Per port control (enable/disable, priority, power limit)
  - Per port scheduling
  - PD classification detection
  - Power Supply Over temperature Protection
  - PD alive-checking

## Link Aggregation

- IEEE 802.3ad LACP (Link Aggregation Control Protocol)
- Up to 12 Trunk groups
- Up to 16 ports per trunk group with 1.6Gbps bandwidth (Full Duplex mode)
- Supports Cisco ether-Channel (Static Trunk)

## Advanced Security

- IEEE 802.1x Port-based authentication
- RADIUS and TACACS+ users access authentication
- Layer 3 and Layer 4 Access Control List (ACL)
- MAC Filtering and Source IP/MAC address port-binding
- Port Mirroring to monitor incoming or outgoing traffic on a particular port

## Switch Management

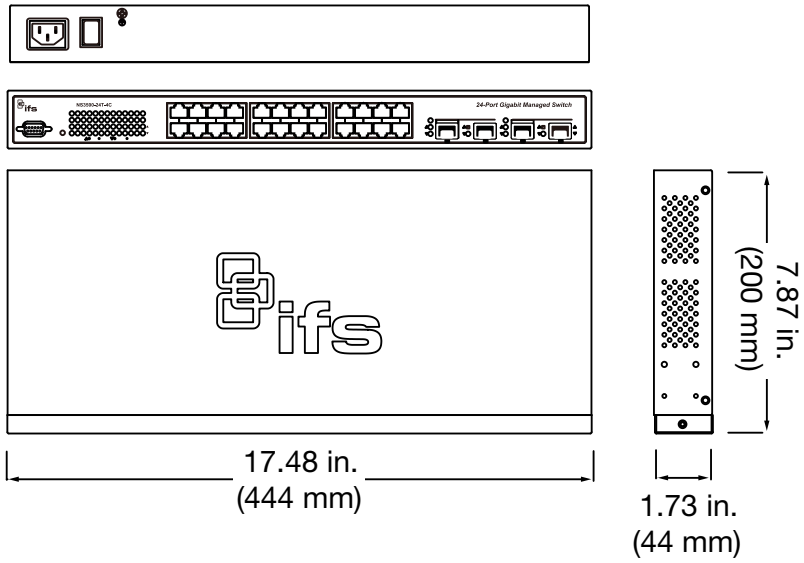
- Support for TruVision® Navigator version 8.0 and above
- Local console or remote switch management via Web browser, Telnet CLI, SNMP v1, v2c, v3
- SNMP Trap for alarm notification of events
- Four RMON groups 1, 2, 3, 9 (history, statistics, alarms, and events)
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- Configuration upload/download via TFTP or HTTP
- Firmware upgrade via TFTP or HTTP
- SNTP (Simple Network Time Protocol)
- LLDP Protocol
- Supports Ping function
- Reset button for system management

## Warranty

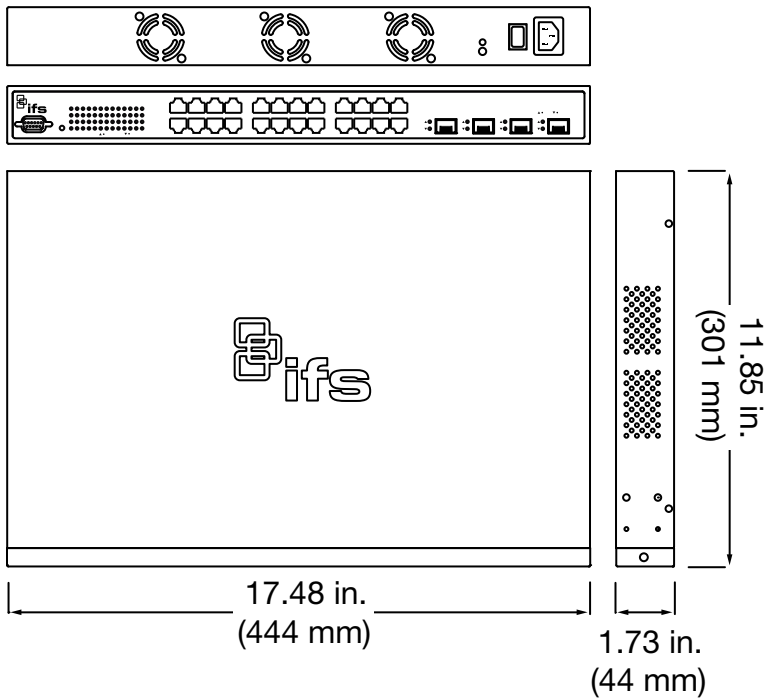
- 3-year Limited Warranty

## Dimensional Diagrams



NS3500-24T-4C





NS3702-24P-4S-V2



# Specifications

Part No.		NS3500-24T-4C	NS3702-24P-4S-v2	
Description				
Physical Ports	10/100/1000Base-T (X) Ports	RJ-45 (24)	RJ-45 (24) with IEEE 802.3at PoE	
	SFP/Mini-GBIC Slots	SFP/Mini-GBIC Slots (4) - Shared with RJ-45 Ports-21 to 24; 1000Base-SX/LX/BX and 100Base-FX SFP transceiver compatible	SFP/Mini-GBIC Slots (4) - Shared with RJ-45 Ports-21 to 24; 1000Base-SX/LX/BX and 100Base-FX SFP transceiver compatible	
	Port Configuration	Auto MDI/MDI-X		
	Port Speed	Auto-negotiate		
	Switch Architecture	Store-and-Forward		
Switch Performance	Switch Fabric	48Gbps non-blocking		
	Switch Throughput	35.7Mbps@64Bytes		
	Mac Address Table	8K entries	16K entries	
	Share Data Buffer	1392kB	4.1 megabits	
	Jumbo Frame Size	10kB		
	Flow Control	IEEE 802.3x Pause Frame for Full-Duplex Back pressure for Half-Duplex		
Layer 2 Functions	Management Interface	Console, Telnet, Web Browser, SNMPv1, v2c and v3		
	Port Configuration	Port enable/disable; Auto-negotiation; 10/100/1000Mbps full and half duplex mode selection; Flow Control enable/disable; Bandwidth control on each port		
	Port Status	Display each port's: speed duplex mode, link status, flow control status, Auto negotiation status, trunk status		
	Port Mirroring	TX/RX/Both; Many-to-1 monitor		
	Bandwidth Control	Ingress: 500Kb to 80Mbps; Egress: 64Kb to 80Mbps	Ingress/Egress rate control: configure per 128Kbps VLAN	
	VLAN	802.1Q tagged-based VLAN Up to 255 VLAN groups, out of 4094 VLAN IDs 802.1ad Q-in-Q tunneling Voice VLAN Protocol VLAN Private VLAN (Protected port) GVRP	802.1Q Tagged-based VLAN, up to 256 VLAN groups Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-Based VLAN IP Subnet-based VLAN Voice VLAN MVR (Multicast VLAN Registration) GVRP Up to 255 VLAN groups, out of 4094 VLAN IDs	
	Layer 3 IP Routing	Max. 32 routing entries, Max. 8 VLAN interfaces	Supports maximum 128 static routes and route summarization	
	Link Aggregation	IEEE 802.3ad LACP and static trunk Supports 10 groups of 16-port trunk	IEEE 802.3ad LACP and static trunk Supports 12 groups of 16-port trunk	
	Quality of Service (QoS)	8 mapping ID to 8 level priority queues - Port Number - 802.1p priority - 802.1Q VLAN tag - DSCP field in IP Packet Traffic classification based, Strict priority and WRR		
	Multicasting/IGMP	IGMP (v1/v2/v3) Snooping, up to 255 multicast groups; IGMP Querier mode support		
	MLD Snooping	MLD (v1/v2) Snooping, up to 256 multicast groups		
	Access Control List	IPv4 / IPv6 IP-based ACL / MAC-based ACL		
	Security	IEEE 802.1X – port-based authentication Built-in RADIUS client to co-operate with RADIUS server RADIUS / TACACS+ user access authentication IP-MAC port binding MAC filter		
	SNMP MIBs	RFC 3635 Ethernet-like MIB RFC 2863 Interface Group MIB RFC 2819 RMON (1, 2, 3, 9) RFC 1493 Bridge MIB		

# Specifications (continued)

		Part No.	NS3500-24T-4C	NS3702-24P-4S-V2
<b>Description</b>				
Power over Ethernet	<b>PoE Standard</b>			IEEE 802.3at
	<b>PoE Power Supply Type</b>			End-Span (PSE)
	<b>PoE Power Budget</b>			380 Watts
	<b>Max. number of PD @ 30.8 Watts</b>			12
	<b>Max. number of PD @ 15.4 Watts</b>			24
	<b>PoE Power Output Per Port</b>			56VDC; Max 30.8 Watts
	<b>Power Pin Assignment</b>			1/2(+), 3/6(-)
LED Indicators & Switch	<b>Power</b>	On/Green		
	<b>10/100/1000Base-TX Ports</b>	1000Mbps (green), LNK/ACT (orange)	10/100/1000Mbps LNK/ACT (green) PoE In-Use (orange)	
	<b>10/100/1000Base-T/SFP Ports</b>	1000 (green), 100 (orange)		
	<b>FAN(s)</b>	Fanless Design	FAN1 (green), FAN2 (green), FAN3 (green)	
	<b>Reset Button</b>	System reboot: push and hold < 5 sec. Factory Default: push and hold > 5 sec.		
Electrical & Mechanical	<b>AC Power Input Voltage</b>	100 ~ 240VAC, 50 / 60Hz, Auto-sensing		
	<b>Power Consumption</b>	30 Watts	422 Watts	
	<b>Dimensions (WxDxH); in/cm</b>	17.32 x 7.87 x 1.75 in. (44 x 20 x 4.45 cm)	17.32 x 11.81 x 1.75 in. (44 x 30 x 4.45 cm)	
	<b>Weight; lbs/kgs</b>	7.28 lbs, 3.3 kgs	10.5 lbs, 4.75 kgs	
Environmental	<b>Operating Temperature</b>	0°C~50°C		
	<b>Storage Temperature</b>	-20°C~70°C		
	<b>Relative Humidity</b>	0%~95% (non-condensing)		
Standards Compliance	<b>Regulatory Standards</b>	FCC Part 15 Class A, CE, UL, cUL		
	<b>IEEE Standards</b>	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX/100Base-FX IEEE 802.3z Gigabit SX/LX IEEE 802.3ab Gigabit 1000T IEEE 802.3x Flow Control and Back pressure IEEE 802.3ad Port Trunk with LACP IEEE 802.1D Spanning Tree protocol IEEE 802.1w Rapid Spanning Tree protocol IEEE 802.1s Multiple Spanning Tree protocol IEEE 802.1p Class of Service IEEE 802.1Q VLAN Tagging IEEE 802.1x Port Authentication Network Control IEEE 802.1ab LLDP IEEE 802.3af Power over Ethernet IEEE 802.3at High Power over Ethernet RFC 768 UDP RFC 793 TFTP RFC 791 IP RFC 792 ICMP RFC 2068 HTTP RFC 1112 IGMP version 1 RFC 2236 IGMP version 2 RFC 3376 IGMP version 3 RFC 2710 MLD version 1 RFC 3810 MLD version 2		

# Gigabit Network Switches



TruVision® Navigator works with NS3702-24P-4S-V2 only.

## Ordering Information

<b>NS3500-24T-4C</b>	24-Port Gigabit Ethernet w/4 Gigabit SFP Ports
<b>NS3702-24P-4S-V2</b>	24-Port Gigabit Ethernet w/4 Gigabit SFP Ports, PoE+ and L3 Static Routing
<b>Included Accessories</b>	User's Manual CD, Quick Installation Guide, Power Cord, Console Port Cable, Rubber Feet, Rack Ears with Screws

Note: These switches require a Small Form-factor Pluggable (SFP) for optical uplink use. IFS SFPs are available for multi-mode, single mode, and 1 or 2 fibers for various transmission distances over optical fiber. Please refer to the IFS SFP data sheet to select the appropriate SFP for your particular application needs. IFS S20 or S30 series SFPs are recommended. Gigabit SFPs (S30) are recommended for best trunking bandwidth performance.

## Accessories

<b>SFP</b>	S30 Series
<b>SFP</b>	S20 Series



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