

# NS3503-16P-4C

## 16-Port Gigabit Ultra-PoE Managed Switch



### NS3503-16P-4C

16-Port 10/100/1000Mbps Ultra-PoE Managed Switch plus 4 RJ45/SFP Combo ports

## OVERVIEW

For fast and efficient connectivity from the network edge to a backbone switch or server, the IFS® 16-Port Gigabit Ethernet Managed Switch by Interlogix features eight 10/100/1000Mbps Gigabit Ethernet ports with support for Ultra-PoE (60w) plus 4 RJ45/SFP combo ports. Both 100Base-X or 1000Base-X transmission is supported through two GBIC interfaces.

### Robust Layer 2 Features

For efficient switch management, the IFS 16-Port Gigabit Ethernet Managed Switch is easily programmable via a simple, yet powerful Web Interface, the switch can manage Port Speed Configuration, Port Link Aggregation, IEEE 802.1Q VLAN and Q-in-Q VLAN, Port Mirroring, Spanning Tree and ACL security. The switch includes advanced features such as Multicasting with IGMP snooping and query, QoS (Quality of Service), broadcast storm and bandwidth control to enhance bandwidth utilization.

This switch supports standard Simple Network Management Protocol (SNMP) and includes an advanced SNMP feature set to monitor the status of the switch and traffic per port. The switch can also be monitored via any standards-based SNMP management software.

### Engineered for Real-time Performance

This switch is designed with a high performance non-blocking switch fabric and provides wire-speed throughput as high as 40Gbps.

To ensure high quality of service, the IFS 16-Port Gigabit Ethernet Managed Switch classifies and prioritizes Layer 2 802.1p or Layer 3 IP TOS/DSCP traffic into four hardware queues that support strict or Weighted Round Robin (WRR) queuing algorithms. This functionality provides optimized allocation of limited network resources and high performance for real-time applications.

### Full Power, Isolated per Port PoE

This Gigabit Ultra-PoE Managed Switch 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 16-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 IFS Gigabit Ultra-PoE Managed Switch provides support for up to 13 units of IEEE 802.3at (30w) PoE+ and up to 6 units for Ultra-PoE.

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

The IFS 16-Port Gigabit Ultra-PoE Managed Switch can be configured to monitor a connected PD (Powered Device) status 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 back to operational status. This along with PoE monitoring, management and scheduling for energy-savings, built-in cable diagnostics, and support for SNMP can greatly enhance the IT administrator's trouble-shooting and management abilities, saving time and labor while keeping network downtime to a minimum.

# STANDARD FEATURES

## Physical Ports

- 16-port 10/100/1000Base-T Gigabit Ethernet RJ-45 with IEEE 802.3-af (15w) / 802.3at (30w) / Ultra-Poe (60w) PoE Injector
- RS232 RJ45 console interface for basic management and setup
- 4 RJ45/SFP Combo ports
  - 10/100/1000Mbps copper
  - 100/1000Base-X mini-GBIC/SFP slots, SFP type auto detection

## Power over Ethernet

- Complies with IEEE 802.3af Power over Ethernet End-Span PSE
- Complies with IEEE 802.3at high-power Power over Ethernet End-Span PSE
- Complies with provisional IEEE 802.3bt Ultra Power over Ethernet End-span PSE
- Supports 16-ports (15w) PoE-af; 13 units (30w) PoE-at; 6 units for Ultra-PoE
- Auto detect powered device (PD)
- Circuit protection prevents power interference between ports
- Remote power feeding up to 100m
- PoE Management
- Total PoE power budget control
- Per port PoE function enable / disable
- PoE Port Power feeding priority
- Per PoE port power limit
- PD classification detection
- PD Alive check/reboot

## Layer 2 Features

- Prevents packet loss with back pressure (Half-Duplex) and IEEE 802.3x PAUSE frame flow control (Full-Duplex)
- Store-and-Forward architecture and run/CRC filtering
- Storm Control support
- Multicast / Unknown-Unicast / Broadcast
- Supports VLAN
- IEEE 802.1Q Tagged VLAN
- Up to 256 VLANs groups, out of 4094 VLAN IDs
- Provider Bridging (VLAN Q-in-Q) support (IEEE 802.1ad)
- Private VLAN Edge (PVE)
- Protocol-Based VLAN
- MAC-Based VLAN
- Voice VLAN
- Supports 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, spanning tree by VLAN
- BPDU Guard
- Supports Link Aggregation
- 802.3ad Link Aggregation Control Protocol (LACP)
- Cisco ether-channel (Static Trunk)
- Maximum 4 trunk groups, up to 4 ports per trunk group
- Up to 40Gbps bandwidth (Duplex Mode)
- Provides Port Mirror (many-to-1)
- Port Mirroring to monitor the incoming or outgoing traffic on a particular port

## Quality of Service

- Ingress Shaper and Egress Rate Limit per port bandwidth control
- 8 priority queues on all switch ports
- Traffic classification
- IEEE 802.1p CoS
- IP TOS / DSCP / IP Precedence
- IP TCP/UDP port number
- Typical network application
- Strict priority and Weighted Round Robin (WRR) CoS policies
- Supports QoS and In/Out bandwidth control on each port
- Traffic-policing policies on the switch port
- DSCP remarking

## Multicast

- Supports IGMP Snooping v2 and v3
- Support MLD Snooping v1 and v2
- Querier mode support
- IGMP Snooping port filtering
- MLD Snooping port filtering
- MVR (Multicast VLAN Registration)

## Security

- IEEE 802.1x Port-Based / MAC-Based network access authentication
- Built-in RADIUS client to co-operate with the RADIUS servers
- TACACS+ login users access authentication
- RADIUS / TACACS+ users access authentication
- IP-Based Access Control List (ACL)
- MAC-Based Access Control List
- Source MAC / IP address binding
- DHCP Snooping to filter untrusted DHCP messages
- Dynamic ARP Inspection discards ARP packets with invalid MAC address to IP address binding
- IP Source Guard prevents IP spoofing attacks
- Auto DoS rule
- IP address access management

## Management

- Switch Management Interfaces
- Console / Telnet Command Line Interface
- Web switch management
- SNMP v1, v2c, and v3 switch management
- SSH / SSL secure access
- Four RMON groups (history, statistics, alarms, and events)
- IPv6 IP Address / NTP / DNS management
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- Firmware upload / download via HTTP / TFTP
- DHCP Relay
- DHCP Option 82
- User Privilege levels control
- NTP (Network Time Protocol)
- Link Layer Discovery Protocol (LLDP) Protocol
- Cable Diagnostic technology provides the mechanism to detect and report potential cabling issues
- Reset button for system reboot or reset to factory default

# Specifications

## Physical Ports **NS3503-16P-4C**

Copper Ports (RJ45)	16-port x 10/100/1000Base-T
RJ45/SFP Combo ports	4 - 10/100/1000Mbps copper; 4 - 100/1000Base-x mini-GBIC/SFP slots, SFP type auto detection
Port Configuration	Auto MDI/MDI-X
Port Speed	Auto-negotiate

## Switch Performance

Switch Architecture	Store-and-forward
Switch Fabric	40Gbps (non-blocking)
Switch Throughput	29.7Mpps @ 64Bytes
MAC Address Table	8K entries
Share Data Buffer	4.1 Megabits
Maximum Frame Size	10K Bytes (Jumbo Frames)
Flow Control	Back pressure for Half-Duplex; IEEE 802.3x Pause Frame for Full-Duplex

## Layer 2 Functions

Management Interface	Console, telnet, Web browser, SSH/SSL secure access, SNMPv1 and v2c and v3c
Port Configuration	Port enable/disable. Auto-negotiation. 10/100/1000Mbps full-and-half duplex mode selection. Flow control enable/disable
Port Status	Display each port's speed duplex mode, link status and flow control status.
Port Mirroring	TX/RX/Both; Many to 1 monitoring
Bandwidth Control	Ingress: 0~1000000Kbps (multiples of 16), Egress: 0~1000000Kbps (multiples of 16)
VLAN	IEEE 802.1q tagged-based VLAN, up to 256 VLANs groups, out of 4094 VLAN IDs Port-based VLAN. Q-in-Q tunneling GVRP for VLAN management, Private VLAN Edge (PVE) protected port with two protected port groups
Link Aggregation	Static Port Trunk IEEE 802.3ad LACP (Link Aggregation Protocol) Supports 4 groups of up to 4-port trunk, IEEE 802.3ad LACP
Quality of Service (QoS)	8 priority queue Traffic classification based on: • Port priority • 802.1p priority • DSCP/TOS field in IP Packet
Multicasting/IGMP	IGMP Snooping (v2, v3). IGMP Query. Up to 256 multicast groups
Access Control List	IPv4/IPv6 IP-based ACL / MAC-based ACL
SNMP MIBs	RFC-1213 MIB-II RFC-2863 Interface MIB RFC-2665 EtherLike MIB RFC-1493 Bridge MIB RFC-2819 RMON MIB (Group 1, 2, 3,9) RFC-2737 Entity MIB POWER-ETHERNET-MIB

## Power over Ethernet

PoE Standard	IEEE 802.3af / IEEE 802.3at / IEEE 802.3bt (provisional)
PoE Power Supply Type	End-Span (PSE)
PoE Power Budget	400 Watts (max.)
Max. number of PoE (15w)	16
Max. number of PoE (30w)	13
Max. number of PoE (60w)	6
PoE Power Output Per Port	48VDC, 15.4 watts (IEEE 802.3af); 52VDC, 30 watts (IEEE 802.3at); 54VDC, 60 watts (IEEE 802.3bt - provisional)
Power Pin Assignment	End-span: 1/2(-), 3/6(+); Mid-span: 4/5(+), 7/8(-)

## LED Indicators & Switch

Power/FAN Alert/PoE PWR	On/Green; On/Fan Failure; On/PoE Failure
10/100/1000Base-TX/PoE Ports (16)	10/100 LNK/ACT - Amber; 1000 LNK/ACT - Green; Ultra-PoE in Use - Green; PoE af/at - Amber
10/100/1000Base-T RJ45 Ports (4)	10/100 LNK/ACT - Amber; 1000 LNK/ACT - Green
100/1000Base-X/SFP Ports (4)	100 LNK/ACT - Amber; 1000 LNK/ACT - Green
Reset Button	System reboot: push and hold < 5 sec. Factory default: push and hold > 5 sec.

## Electrical and Mechanical

AC Power Input Voltage	100~240VAC, 50/60Hz, Auto-sensing
Full Load Power Consumption	500 Watts
Dimensions (W x D x H)	17.3 x 11.8 x 1.8 in., (440 x 300 x 45mm)
Weight	9.92 lbs., 4.5kg

## Environmental

Operating Temperature	0°C~+50°C
Storage Temperature	-20°C~+70°C
Relative Humidity	0%~95% (non-condensing)

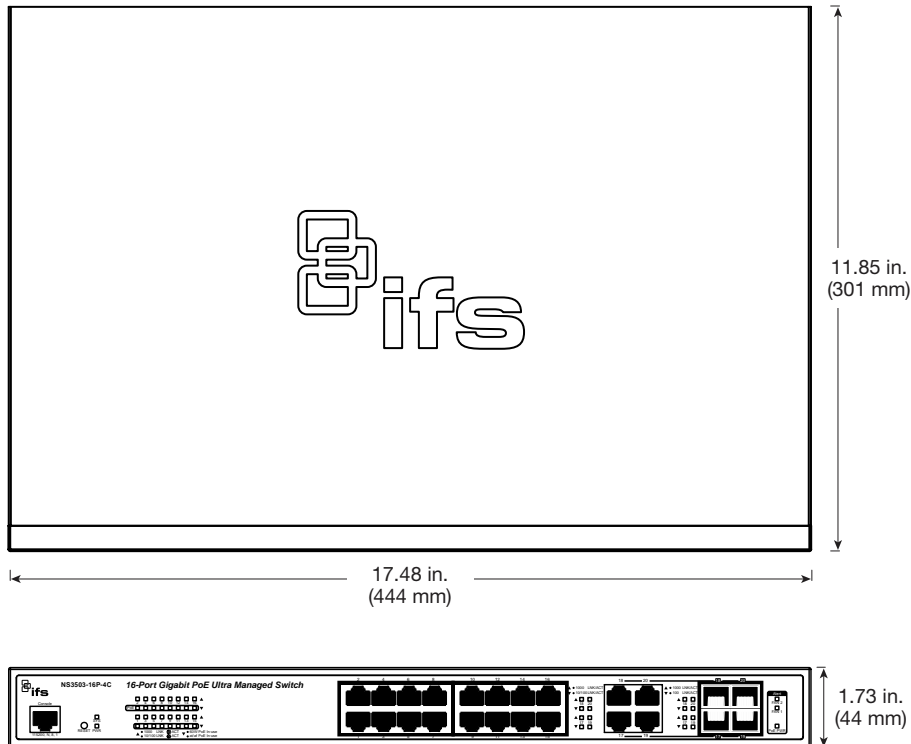
## Standards Compliance

Regulatory Standards	FCC Part 15 Class A; CE
IEEE/RFC Standards	IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX IEEE 802.3z 1000Base-SX/LX IEEE 802.3ab 1000Base-T IEEE 802.3x Flow Control and Back pressure IEEE 802.3ad Port trunk with LACP IEEE 802.1d 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 802.3af and 802.3at 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

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## Dimensional Diagrams



## Ordering Information

<b>NS3503-16P-4C</b>	16-Port Gigabit Ultra-PoE Managed Switch
<b>Included Accessories</b>	User's Manual CD, Quick Installation Guide, AC Power Cord, Console Cable, Rubber Feet, Rack Mount Ears with Screws

Note: This switch requires 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.

## Accessories

<b>SFP</b>	S30 Series
<b>SFP</b>	S35 Series (wide-temp)
<b>SFP</b>	S20 Series
<b>SFP</b>	S25 Series (wide-temp)



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