Overview

GE’s Industrial Fast Ethernet Managed Switch Series is now IFS. The IFS Industrial Hardened Managed Switch Series is equipped with seven 10/100Mbps Fast Ethernet ports with three GigE uplink TP/SFP combo ports (two for drop and insert functionality and a third for uplinking to a backbone) or eight 10/100Mbps Fast Ethernet ports with two GigE uplink TP/SFP Combo ports. The 8+2 configuration is also available in a PoE version. These are fully managed Layer 2+ switches providing a robust industrial hardened design that provides for rapid operational recovery in the event of a network or power system failure.

Layer 2+ Managed Switch

The IFS Industrial Hardened Managed Switch Series supports advanced features including IEEE 802.1Q VLAN, GVRP, port link aggregation, QoS, broadcast storm control and MAC address filtering. The series also includes IGMP snooping and querying multicasting for media operations and bandwidth utilization to fit a variety of applications. Via aggregation of supporting ports, the series allows the operation of high-speed trunk operation combining multiple ports. A maximum of four ports can be assigned for four trunk groups and support fail-over as well. Additionally, its standards-compliant implementation ensures interoperability with equipment from other vendors.

Industrial-grade Network Redundancy and Recovery

These switches not only incorporate the industry standard Rapid Spanning Tree Protocol (IEEE 802.1w RSTP), but also an advanced Industrial Fail-Safe (IFS) technology accommodating multiple redundant ring topologies and improved network recovery time of less than 20ms. The switches incorporate a redundant power supply system to further enhance network reliability and uptime. Ideal for use in implementing highly fault-tolerant ring and mesh network architectures, these switches are well suited for harsh environments such as industrial security, factory automation and intelligent transportation systems (ITS).

Robust Hardened Design

With an IP-30 rated enclosure, IFS Industrial Fast Ethernet Managed Switches provide a high level of immunity against electromagnetic (EMI) and radio-frequency (RFI) interference typically found in industrial environments. This series of switches comply with IEC60068-2-xx standards for free-fall, shock, and vibration and operate in -40° C to 75° C temperatures found in difficult environments such as plant floors or in curbside traffic control cabinets.
Standard Features

Physical Ports
- Auto MDI/MDI-X
- Auto-negotiation
- 1 RJ-45 console port

GE-DSH-82
- 8-port 10/100Base-TX + 2 TP/SFP GigE Combo Ports

GE-DSH-82-PoE
- 8-port 10/100Base-TX with PoE + 2 TP/SFP GigE Combo Ports

GE-DSH-73
- 7-port 10/100Base-TX + 3 TP/SFP GigE Combo Ports

Switch Architecture
- Complies with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3z standards
- Store-and-forward switching architecture, broadcast storm control and runt/CRC filtering optimize network bandwidth by eliminating erroneous packets
- High performance non-blocking switch fabric (5.6 or 7.4Gbps)
- Back pressure (half-duplex) and IEEE 802.3x PAUSE frame-flow control (full-duplex) to prevent packet loss

Layer 2+ Features
- Multicasting (IGMP Snooping v1 and v2 with IGMP Query mode for Multicast Media applications)
- Quality of Service (4 priority queues on all switch ports; Traffic classification by: Port-Based priority, IEEE 802.1p Class of Service, IP TOS (Type of Service) priority; Supports strict priority and Weighted Round Robin (WRR) policies; Ingress/Egress Bandwidth control on each port)
- Supports Spanning Tree Protocol (STP, IEEE 802.1D Spanning Tree Protocol; RSTP, IEEE 802.1w Rapid Spanning Tree Protocol)
- Supports VLANs (IEEE 802.1Q Tagged based VLAN; Port-Based VLAN; GVRP; Up to 9 VLANs groups, out of 4K VLAN IDs)
- Supports Link Aggregation (Up to 4 Trunk groups; Up to 4 ports per trunk group with 800Mbps bandwidth (Full Duplex mode); IEEE 802.3ad LACP (Link Aggregation Control Protocol); Cisco ether-Channel (Static Trunk))

Industry Fail-Safe (IFS) Ring Technology
- Rapid Ring, Dual Homing and Couple Ring Topologies
- Provides redundant backup feature and recovery time of less than 20ms

Power over Ethernet (GE-DSH-82-PoE Model Only)
- Complies with IEEE 802.3af Standard
- Provides full-power (15.4W) PoE on each port - no port sharing
- Auto-detects PoE powered devices (PD)
- Power feeding On/Off and priority configuration
- LED PoE Status Monitoring

Robust Hardened Design
- Slim IP-30 metal case for protection
- Provides either DIN-rail or wall-mounting
- 12 to 48 VDC, redundant power with reverse-polarity protection
- Removable terminal block for master and slave power
- Alarm relay output for port breakdown and power-failure alert
- Voltage/surge-suppression
  - EFT 3000VDC protection for power lines
  - ESD 4000VDC or 6000VDC protection for Ethernet
- Complies with IEC60068-2-xx standards for free-fall, shock and vibration
- Wide operating temperature range of -40º C to +75º C

Advanced Security
- IEEE 802.1x Port-Based Authentication
- MAC address Filtering and MAC address Binding
- IP address security management to prevent unauthorized intruder
- Port Mirroring to monitor the incoming or outgoing traffic on a particular port

Management
- Web-based, Telnet, Console Command Line management
- Access through SNMP v1, v2c and v3 set and get requests
- SNMP Trap / SMTP email for remote notification of events
- System Log Server / Client
- Configuration backup / restore
- TFTP firmware upgrade
- Supports LLDP to allow switch to advise its identification and capability on the LAN

Warranty
- 3-year limited warranty
Application Diagrams

**GE-DSH-82/GE-DSH-82-PoE**
Self-healing Ring Topology – 2 physical routes at the edge

![Self-healing Ring Topology Diagram](image)

**GE-DSH-73**
Dual Redundant Ring Topology - 4 physical pathways (high fault-tolerant ring)

![Dual Redundant Ring Topology Diagram](image)

**GE-DSH-73**
Dual Redundant Network Architecture - 4 physical pathways to network backbone

![Dual Redundant Network Architecture Diagram](image)
# Industrial Fast Ethernet Managed Switch Specifications

<table>
<thead>
<tr>
<th>Part No.</th>
<th>GE-DSH-82</th>
<th>GE-DSH-82-PoE</th>
<th>GE-DSH-73</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10/100Base-T(x) Ports</strong></td>
<td>RJ-45 (8)</td>
<td>RJ-45 (8)</td>
<td>RJ-45 (7)</td>
</tr>
<tr>
<td><strong>GigE Combo Uplink Ports</strong></td>
<td>RJ-45 (Ports 9 and 10): 10/100/1000Mbps SFP/Mini-GBIC Slots (Shared with Ports 9 and 10): 100/1000Base-SX/LX</td>
<td>RJ-45 (Ports 9 and 10): 10/100/1000Mbps SFP/Mini-GBIC Slots (Shared with Ports 9 and 10): 100/1000Base-SX/LX</td>
<td>RJ-45 (Ports 7, 9 and 10): 10/100/1000Mbps SFP/Mini-GBIC Slots (Shared with Ports 7, 9 and 10): 100/1000Base-SX/LX</td>
</tr>
<tr>
<td><strong>Port Configuration</strong></td>
<td>Auto MDI/MDI-X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Port Speed</strong></td>
<td>Auto-negotiate</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physical Ports</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electro Static Discharge (ESD) Protection</strong></td>
<td>4KV DC</td>
<td>6KV DC</td>
<td>6KV DC</td>
</tr>
<tr>
<td><strong>Console Port</strong></td>
<td>RJ-45 (1)</td>
<td>RJ-45 (1)</td>
<td>RJ-45 (1)</td>
</tr>
<tr>
<td><strong>Digital Inputs/Digital Outputs</strong></td>
<td>6-pin removable screw terminal 2 Digital Input (DI): Level 0: -30<del>2V Level 1: 10</del>30V Max. input current: 8mA 2 Digital Output (DO): Open collector to 40VDC, 200mA</td>
<td>6-pin removable screw terminal 2 Digital Input (DI): Level 0: -30<del>2V Level 1: 10</del>30V Max. input current: 8mA 2 Digital Output (DO): Open collector to 40VDC, 200mA</td>
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</tr>
<tr>
<td><strong>Switch Architecture</strong></td>
<td>Store-and-Forward</td>
<td>Store-and-Forward</td>
<td>Store-and-Forward</td>
</tr>
<tr>
<td><strong>Switch Fabric</strong></td>
<td>5.6Gbps/non-blocking</td>
<td>5.6Gbps/non-blocking</td>
<td>7.4Gbps/non-blocking</td>
</tr>
<tr>
<td><strong>Throughput (Packet per second)</strong></td>
<td>4.16Mpps @64Bytes</td>
<td>4.16Mpps @64Bytes</td>
<td>5.5Mpps @64Bytes</td>
</tr>
<tr>
<td><strong>Address Table</strong></td>
<td>8K entries</td>
<td>8K entries</td>
<td>8K entries</td>
</tr>
<tr>
<td><strong>Share Data Buffer</strong></td>
<td>1Mbit</td>
<td>1Mbit</td>
<td>1Mbit</td>
</tr>
<tr>
<td><strong>Maximum Frame Size</strong></td>
<td>1522 Bytes packet</td>
<td>1522 Bytes packet</td>
<td>1522 Bytes packet</td>
</tr>
<tr>
<td><strong>Flow Control</strong></td>
<td>Back pressure for Half-Duplex IEEE 802.3x Pause Frame for Full-Duplex</td>
<td>Back pressure for Half-Duplex IEEE 802.3x Pause Frame for Full-Duplex</td>
<td>Back pressure for Half-Duplex IEEE 802.3x Pause Frame for Full-Duplex</td>
</tr>
<tr>
<td><strong>Port Configuration</strong></td>
<td>Port disable/enable, Auto-negotiation 10/100Mbps full and half-duplex mode selection, Flow control disable/enable and bandwidth control on each port</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Port Status</strong></td>
<td>Display each port’s speed Auto negotiation status, duplex mode, link status, Flow control status</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bandwidth Control</strong></td>
<td>Bandwidth control per port: Ingress: 500Kb<del>80Mbps, Egress: 64Kb</del>80Mbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spanning Tree</strong></td>
<td>IEEE 802.1d Spanning Tree, IEEE 802.1w Rapid Spanning Tree</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VLAN</strong></td>
<td>Port-Based VLAN, up to 9 VLAN groups IEEE 802.1q Tagged Based VLAN, 4K VLAN ID, up to 256 VLAN groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Multicast</strong></td>
<td>IGMP Snooping v1 and v2 Query mode 256 Multicast groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>QoS</strong></td>
<td>Traffic classification based on: • Port Number • 802.1Q Tag • 802.1p priority • IP DSCP/TOS field in IP Packet</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Port Mirroring</strong></td>
<td>RX / TX / Both</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td>Support 100 entries of MAC address for static MAC and another 100 for MAC filter Support 10 IP addresses that have permission to access the switch management and to prevent unauthorized intruder</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SNMP MiBs</strong></td>
<td>RFC-1213 MIB-II RFC-2863 Interface MIB RFC-1493 Bridge MIB RFC-2819 RMON MIB (Group 1, 2, 3, 9) RFC-2674 Extended Bridge MIB (Q-Bridge) Private MiB</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Link Aggregation</strong></td>
<td>Static Port Trunk, IEEE 802.3ad LACP (Link Aggregation Control Protocol), Supports 4 groups of 4-Port trunk</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Management Interface</strong></td>
<td>Console, Telnet, Web Browser, SNMP v1, v2c and v3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IEEE PoE Standard</strong></td>
<td>IEEE 802.3af PSE (Power Sourcing Equipment)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum Devices</strong></td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power over Ethernet (PoE)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output Power (per-port)</strong></td>
<td>48VDC Max. @ 350mA 15.4 watts</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PoE Pin Assignment</strong></td>
<td>1/2(+), 3/6(-)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Industrial Fast Ethernet Managed Switch Specifications

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<tr>
<td><strong>Description</strong></td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td><strong>LED Status Indicators</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power (3)</td>
<td>System Power: On/Green; Power 1: Active/Green; Power 2: Active/Green</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power/Port Fault (1)</td>
<td>Failure/Red</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IFS Ring - Master (1)</td>
<td>Active/Green</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/100Mbps Ports</td>
<td>Green LED: Steady/LNK; Blinking/ACT; Off/No device attached</td>
<td>Amber LED: Steady/Full-duplex; Blinking/Packet Collision; Off/Half-duplex or no device attached</td>
<td></td>
</tr>
<tr>
<td>RJ-45 GigE Uplink Ports</td>
<td>Green LED: Steady/LNK; Blinking/ACT; Off/No device attached</td>
<td>Green LED: On/1000Mbs, Off/10/100Mbps</td>
<td></td>
</tr>
<tr>
<td>SFP GigE Uplink Ports</td>
<td>Green LED: Steady/LNK; Blinking/ACT; Off/No device attached</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PoE (8)</strong></td>
<td></td>
<td>Green LED: IEEE802.3af device detected Off/No IEEE802.3af device attached</td>
<td></td>
</tr>
<tr>
<td><strong>Power Input 1</strong></td>
<td>12-48VDC</td>
<td>48VDC</td>
<td>12-48VDC</td>
</tr>
<tr>
<td><strong>Power Input 2</strong></td>
<td>12-48VDC</td>
<td>48VDC</td>
<td>12-48VDC</td>
</tr>
<tr>
<td><strong>Electrical Fast Transient (EFT) Protection</strong></td>
<td>3KV DC</td>
<td>3KV DC</td>
<td>3KV DC</td>
</tr>
<tr>
<td><strong>Power and Alarm Fault Connector</strong></td>
<td>6-pin removable screw terminal</td>
<td>6-pin removable screw terminal</td>
<td>6-pin removable screw terminal</td>
</tr>
<tr>
<td><strong>Alarm Fault Relay</strong></td>
<td>30VDC - 3A max.</td>
<td>30VDC - 3A max.</td>
<td>30VDC - 3A max.</td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>IP-30 Metal Case</td>
<td>IP-30 Metal Case</td>
<td>IP-30 Metal Case</td>
</tr>
<tr>
<td><strong>Mounting</strong></td>
<td>DIN-rail or wall-mount</td>
<td>DIN-rail or wall-mount</td>
<td>DIN-rail or wall-mount</td>
</tr>
<tr>
<td><strong>Dimensions (in/cm)</strong></td>
<td>2.83 x 4.18 x 5.98 in. (72 x 106.20 x 152 mm)</td>
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<td>2.83 x 4.18 x 5.98 in. (72 x 106.20 x 152 mm)</td>
</tr>
<tr>
<td><strong>Weight (lbs/kg)</strong></td>
<td>2.1 lbs., 954g</td>
<td>2.2 lbs., 993g</td>
<td>2.2 lbs., 998g</td>
</tr>
<tr>
<td><strong>Operating Temperature</strong></td>
<td>-40°C ~ -75°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Storage Temperature</strong></td>
<td>-40°C ~ -85°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Relative Humidity</strong></td>
<td>Relative Humidity 5%~95% (non-condensing)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Regulatory Standards
- FCC Part 15 Class A, CE
- IEC 60068-2-32 (Free fall)
- IEC60068-2-27 (Shock)
- IEC60068-2-6 (Vibration)

### Standards Compliance
- 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 802.1d Spanning Tree Protocol
- IEEE 802.1w Rapid Spanning Tree Protocol
- IEEE 802.1p Class of Service
- IEEE 802.1Q VLAN Tagging
- IEEE 802.1x Port Authentication Network Control
- IEEE 802.3af Power over Ethernet (GE-DSH-82-PoE)
- 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
Dimensional Diagrams

GE-DSH-82/GE-DSH-82-PoE

GE-DSH-73

Ordering Information

<table>
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<tr>
<th>Model</th>
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<tr>
<td>GE-DSH-82</td>
<td>8-port 10/100 Mbps + 2-port GigE (TP/SFP) Industrial Ethernet Managed Switch (Wide Operating Temp. -40~75°C)</td>
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<tr>
<td>GE-DSH-82-PoE</td>
<td>8-port 10/100 Mbps + 2-port GigE (TP/SFP) Industrial Ethernet Managed PoE Switch (Wide Operating Temp. -40~75°C)</td>
</tr>
<tr>
<td>GE-DSH-73</td>
<td>7-port 10/100 Mbps + 3-port GigE (TP/SFP) Industrial Ethernet Managed Switch (Wide Operating Temp. -40~75°C)</td>
</tr>
</tbody>
</table>

Note: External power supply must be purchased separately.