

X C H A S S I S

Hardware Installation Guide

Product Model: DGS-6604

Modular Layer 3 Chassis Ethernet Managed Switch

Release 1.0



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FCC Warning

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 manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

CE Mark Warning

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.

Warnung!

Dies ist ein Produkt der Klasse A. Im Wohnbereich kann dieses Produkt Funkstörungen verursachen. In diesem Fall kann vom Benutzer verlangt werden, angemessene Massnahmen zu ergreifen.

Precaución!

Este es un producto de Clase A. En un entorno doméstico, puede causar interferencias de radio, en cuyo caso, puede requerirse al usuario para que adopte las medidas adecuadas.

Attention!

Ceci est un produit de classe A. Dans un environnement domestique, ce produit pourrait causer des interférences radio, auquel cas l'utilisateur devrait prendre les mesures adéquates.

Attenzione!

Il presente prodotto appartiene alla classe A. Se utilizzato in ambiente domestico il prodotto può causare interferenze radio, nel cui caso è possibile che l'utente debba assumere provvedimenti adeguati.

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Intended Readers

The *DGS-6604 Layer3 Chassis Ethernet Managed Switch Hardware Installation Guide* contains information on how to install the Switch hardware. This manual is intended for network managers familiar with network management concepts and terminology.

Typographical Conventions

The conventions used in this Configuration Guide are explained in the following table:

Convention	Description	Example
Typewriter Font	This is used in the CLI examples to represent the text that is seen in the Switch console window and the output. This is also used to indicate Switch responses.	DGS-6600:2>
Boldface Typewriter Font	This is used in the CLI examples to represent the commands that the user will type in the Switch console window. The commands must be typed exactly as printed in the manual.	configure terminal
BOLD UPPER CASE ITALIC TYPEWRITER FONT	This is used in the CLI examples to indicate the parameters in a CLI command.	VLAN-NAME
Square brackets []	This token specifies optional elements. A user can specify zero, one, or multiple elements.	[view <i>VIEW-NAME</i>]
Vertical bar	This token separates the alternative elements.	dhcp bootp
Braces { }	This token specifies a required element. The user must specify one of the elements.	{1 2c 3 {auth noauth priv}}
, -	These tokens specify that multiple interfaces can be specified. The '-' symbol is used to represent a range of interfaces and the ',' symbol is used to connect multiple ranges.	[, -]
Angle brackets <>	This token represents the numeric range of a parameter. The available range is enclosed in the <> symbols.	<1-10>
Bold Font	Indicates a Switch command or a Keyword.	configure terminal
<i>Italic Font</i>	Indicates a variable or parameter that is replaced with an appropriate word or string.	Type the <i>IP address</i> of your TFTP Server.

Notes, Notices, and Cautions



A **NOTE** indicates important information that helps make better use of the device



A **NOTICE** indicates either potential damage to hardware or loss of data and tells how to avoid the problem.



A **CAUTION** indicates a potential for property damage, personal injury, or death.

Safety Suggestions

Please read the safety suggestions carefully before installing the DGS-6604.



NOTE: The following safety suggestions do not cover all potential dangers.

Safety Precautions for Installing the Switch

- Keep the chassis clean and free from any dust.
- Do not place the Switch in a location that will obstruct a walkway.
- Do not wear loose clothes or any other items that may get caught in the chassis during installation and maintenance.

Safety Precautions for Removing the Switch

Since the DGS-6604 is large and heavy, pay attention to the following requirements when handling the Switch.

- Avoid moving the equipment frequently.
- Seek assistance if the chassis is too heavy to lift by yourself.
- Keep your balance when moving the equipment and try to avoid injuring your legs and feet or spraining your wrist.

Before moving the chassis, remove all line cards, the fan tray, and all power modules. After removing all line cards, the fan tray, and all power modules, use the handles on the top of the chassis to move the Switch to avoid causing any damage.

- Switch to avoid causing any damage.

- Before removing the chassis, ensure that all the power supplies are turned off and that all power cables are unplugged.

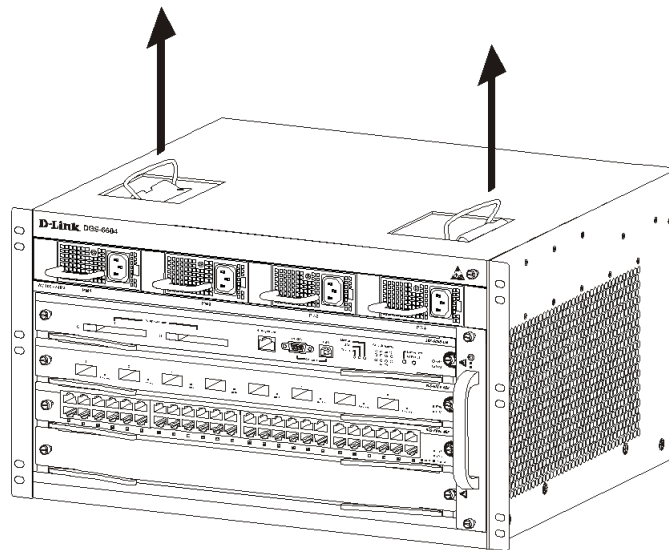


Figure 1 Schematic diagram for correctly moving the DGS-6604



NOTE: Do not move the equipment by grasping the panel, power supply handle, or the ventilation holes of the chassis as they are not designed to bear the weight of the entire equipment. Attempting to move the Switch in this way may cause damage or cause you an injury.

Electrical Safety

- Please follow local regulations and specifications when performing any electrical work. Any electrical work must be carried out by a qualified operator.
- Carefully check for any potential dangers in the working area, for example a damp/wet floor, an ungrounded power supply, or an unreliable grounding of the power supply.
- Locate the emergency power off switch in the room before installing the Switch.
- If an accident occurs, cut off the power supply to the Switch first.
- Do not carry out any maintenance on the equipment alone when the Switch is powered on, unless absolutely necessary.
- Before shutting down the power supply, check that it is safe to do so.
- Do not place the Switch in a damp/wet location. Ensure that no liquid enters the chassis.
- Ensure that all grounding conductors are connected before and after the line and neutral (AC) conductors are connected.

Grounding requirements

Proper grounding will help to ensure stable and reliable operation of the DGS-6604. Be sure to verify that the grounding conditions at the installation meet the grounding requirements and ground all devices appropriately.

All grounding conductors should be connected before the AC power is applied to the DGS-6604 installed AC power supplies.

The DGS-6604 with AC power supplies must be grounded with a minimum of 0.823 mm² (or 18AWG) of conductive grounding cable. This cable is connected between the Equipment Room Ground and the DGS-6604 Chassis Ground Terminal.



CAUTION: Indirectly or directly contacting the mains supply with a wet object can cause fatal danger.



CAUTION: Hazards, including electrical shocks and fires, can be caused by any non-standard and inaccurate electrical operation. This may cause severe or fatal damage to the human body or equipment.

Preventing Static Discharge Damage

Despite the fact that a lot has been done in the DGS-6604 to prevent damage from static electricity, if the static electricity exceeds a certain limit, great damage may be caused to the Switch's circuitry and equipment.

Electrostatic induction may come from the following sources on the network that the DGS-6604 is a member of:

- External electric fields produced by high-voltage cable supplies, lightning etc..
- Internal building factors, such as the internal floor or the building structure.

The following factors must be paid attention to in order to prevent damage from static electricity:

1. Proper grounding of the equipment and floor.
2. Carrying out dust prevention methods in the room the Switch will be located in.
3. Maintaining an appropriate humidity level.
4. Always wearing an anti-static wrist strap when touching any circuit board.
5. Handle any circuit boards by the edges and do not touch any of its components or the PCB.
6. Prevent any clothing from contacting the circuit board. An anti-static wrist strap can only prevent any static damage from the person wearing the anti-static wrist strap, but cannot prevent any damage caused by clothing.

Laser Safety

A number of the optical modules included in the DGS-6604 are Class I laser products. Therefore, when using these products pay careful attention to the following:

- Ensure that any working fiber transceivers are either connected to a working optical fiber connection or covered with a dust cap, to keep out of dust and avoid damaging your eyesight.
- Never look into any optical port.



CAUTION: Never stare into any optical port under any circumstances, as this may damage your eye sight.

Chapter 1 Introduction

Switch Description

DGS-6604 Product Specifications

DGS-6604 Product Appearance

DGS-6604 Hardware Composition

DGS-6604 Ventilation/Heat Dissipation System

DGS-6604 Modules

Switch Description

D-Link's DGS-6600 series switches are a modular, chassis-based Ethernet backbone switch designed for adaptability and scalability. Currently, the DGS-6600 series chassis is only available in a single form factor: a 4-slot chassis (DGS-6604). The DGS-6604 Switch provides a management platform with a backplane switch capacity of 480 Gbps. The chassis contains one slot for the management module and three slots for line card modules. Depending on the type of line cards installed, the three module slots can provide up to 144 gigabit Ethernet ports or 24 ten gigabit Ethernet ports. All the supported modules are capable of being hot-swapped. The DGS-6604 chassis provides a built-in power shelf that supports up to four redundant power modules, enabling continuous operation in the event of a power module failure.

DGS-6604 Product Specifications

Product Features

- **Powerful Expansion Capabilities**
The DGS-6604 is capable of supporting strategic routing and IPv6. With support for multiple types of line cards, the DGS-6604 allows users to customize their Switch configuration to meet their network requirements.
- **Hot-Swappable Line Cards, Fan Tray, and Power Supplies**
The DGS-6604 supports the hot-swapping of line cards, the fan tray, and power supplies to minimize disruption to the network when a fault occurs.
- **Power Supply Redundancy**
The DGS-6604 has a built-in power shelf that can host up to four power modules. If the DGS-6604 is running in a non-PoE environment, the Switch can operate using only one power supply.
- **Efficient Data Processing Design**
The DGS-6604 implements complicated functions, such as switching, routing, ACL, and QoS via the Switch hardware. Using the Switch hardware avoids the issues that can occur when implementing complex functions within software.

Several functions are performed by the management module, including network management, route management, and providing network services. The line card modules are capable of using their hardware to independently implement functions like routing, switching, and multicast using their hardware. The individual switch ports are capable of using their hardware to implement ACL and QoS functions. These combined features greatly improve the equipments processing capability.
- **Physical Resilience**
The DGS-6604 includes several features that ensure physical resilience, including redundant power supplies and the capability of hot-swapping line cards or modules in the event of a fault.
- **Secure Switch Management Methods**
The DGS-6604 supports several features to prevent non-administrators from logging into the Switch and potentially causing disruption to the network. These features include the Secure Shell (SSH)

encrypted login function and the option of restricting Telnet and web access to a specific group of source IP addresses.

- **Support for 802.1X**

The DGS-6604 supports 802.1X. 802.1X is a mechanism that is designed to only allow authorized users, or other network devices, access to network resources by establishing criteria for each port on the Switch that a user or network device must meet before allowing that port to forward or receive frames.

- **Support for a Wide Range of Applications**

The DGS-6604 supports a wide range of applications including QoS and multicast.

The QoS techniques supported by the Switch include Strict Priority Mode, Weighted Round Robin (WRR), Deficit Round Robin (DRR), and Head of Line (HOL) blocking. These QoS techniques help to provide bandwidth assurance for the various applications.

The multiple multicast support techniques supported by the Switch include IGMP snooping, IGMP, PIM (SM,DM), and DVMRP. These multicast support techniques ensure that the minimum bandwidth required for multicast applications is provided on the network.

- **Support for Equal-Cost Multipath Routing (ECMP)**

When traditional routing techniques are used on a network that has multiple links that can reach the same address, packets can only take one of the links to reach their destination, with all other links being in standby or inactive. Another issue with traditional routing techniques is that the switching between the various links can take some time in an environment that is using dynamic routing. Compared to traditional routing techniques, ECMP is a great improvement as it can use multiple links at the same time in a resilient network environment. As well as increasing transmission bandwidth, ECMP also backs up the data transmission on the link that has failed without causing any delays or packet loss.

- **STP and VRRP Support**

The DGS-6604 supports both the Spanning-Tree Protocol (STP) and Virtual Router Redundancy Protocol (VRRP). The Spanning-Tree Protocol (STP) versions supported by the Switch include Spanning-Tree Protocol (IEEE 802.1D), Rapid Spanning-Tree Protocol (IEEE 802.1w), and Multiple Spanning-Tree Protocol (IEEE 802.1s).

- **High Port Density**

The DGS-6604 supports up to 144 gigabit Ethernet ports or 24 ten gigabit Ethernet ports.

DGS-6604 Product Appearance

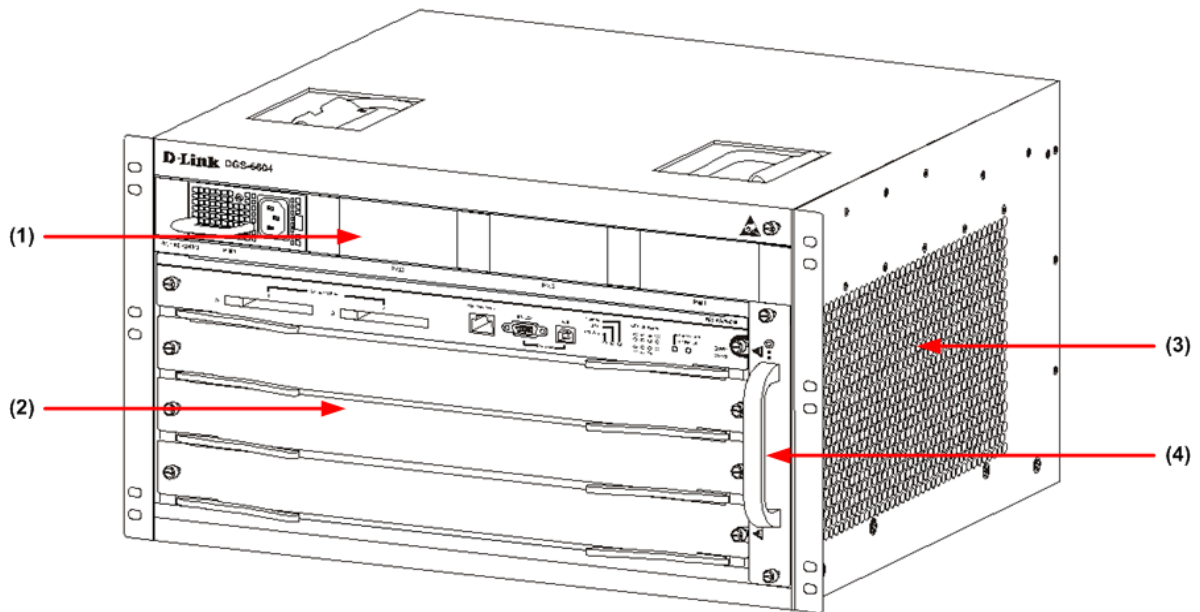


Figure 1-1 DGS-6604 Product Appearance

Number	Item Name	Description
1	Power Layer	The built-in power shelf can host up to four power modules.
2	Module Layer	The module layer offers 4 module slots.
3	Air Outlet	The air outlet is located on the right side of the Switch.
4	Fan Tray	The fan tray is installed in the slot on the right side of the Switch. The fan tray is the Switch's main heat dissipation unit.

Table 1-1 DGS-6604 Product Appearance Descriptions

DGS-6604 Hardware Composition

The DGS-6604 hardware consists of a chassis, management card, line cards, power system and a fan system.

Chassis

The DGS-6604 uses a standard 19-inch chassis, that has a height of 280mm, a width of 484mm, and a depth of 470mm. The chassis consists of the system module layer, fan layer, and power layer.

The layer that handles system modules consists of a module plug-in frame, which is used for connecting the various DGS-6604 modules.

The built-in power shelf is located at the top of the chassis.

The fan tray is located on the right-hand side of the chassis. The fan tray consists of eight fans. The dimension of each fan is 80x80x20mm.

Module Plug-in Frame

The module plug-in frame of the DGS-6604 consists of the module slots and the backplane.

The DGS-6604 supports four module slots. The slot at the top of the Switch can only be used for the control management module. The other three slots can be used to connect to various line cards. All the modules supported by the DGS-6604 are of the same height, width and depth. The dimensions of each module are a height of 42mm, a width of 388mm, and a depth of 422mm. The modules of the DGS-6604 are inserted into the Switch horizontally. The backplane of the DGS-6604 is used to interconnect the control management card and the line cards that have been installed in the Switch.

The main functions of the DGS-6604 backplane are listed below:

- Provides a mechanism for transmitting various signals between the modules and providing channels for high-speed communication.
- Acts as a passive backplane.
- Automatically identifying the type of line card that has been installed in each slot.
- Manages the load distribution among the installed power supplies.

When the slots of the DGS-6604 are fully populated, the modules of the DGS-6604 have the following properties:

- One control management module.
- Three line card modules to meet the network requirements.

The slot number used for the Control Management module is 1. Slots 2, 3, and 4 are used for the various line card modules.

DGS-6604 Ventilation/Heat Dissipation System

The DGS-6604 operates at a temperature of 0-50°C. The hardware of the DGS-6604 has been thermally designed so the surface temperature of the components does not exceed the allowed ambient temperature of 50°C without affecting the reliability, security, and repairability of the Switch. The thermal design of the DGS-6604 hardware uses fans to induct air in a forced convection so that the equipment operates normally in the specified environment. The diagram below shows the ventilation/heat dissipation system that has been implemented on the DGS-6604.

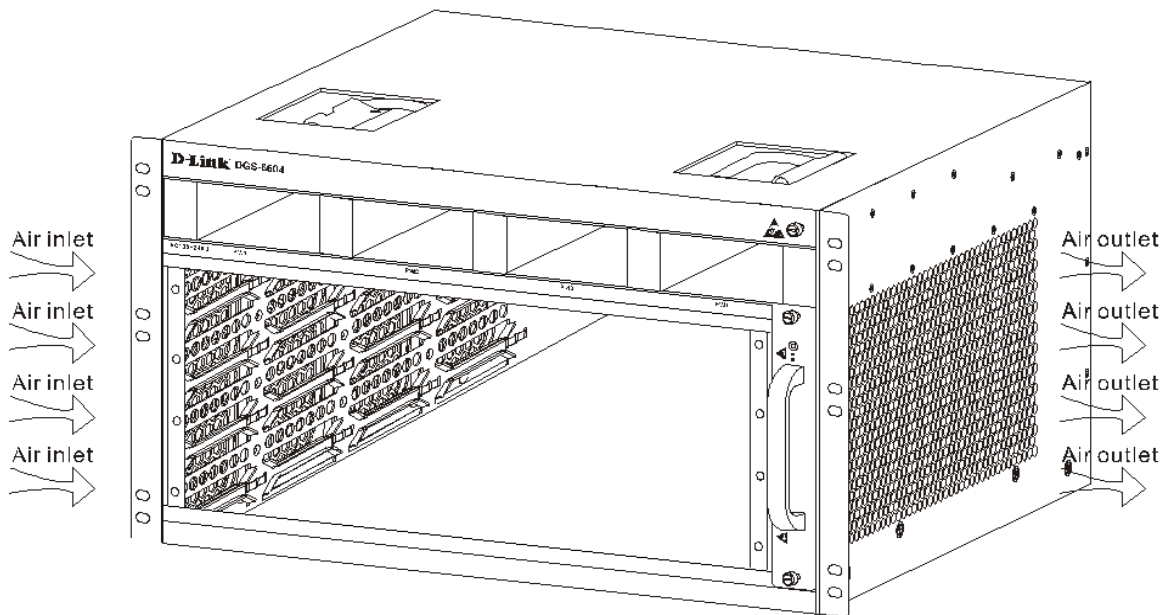


Figure 1-2 DGS-6604 Ventilation/Heat Dissipation System



NOTE: The air flow direction for the DGS-6604 is from the left to the right.

DGS-6604 Modules

The DGS-6604 supports the modules described below:

DGS-6600-CM: This module is the CPU module for the DGS-6600 Series. The CPU module is used to manage the entire system, including layer 2 and layer 3 processes, controlling and managing user access, managing routes, and maintenance on the network and operations.

DGS-6600-48T: This module includes 48 10/100/1000 Base-T ports.

DGS-6600-48S: This module includes 48 SFP interfaces.

DGS-6600-48TS: This module includes 24 10/100/1000 Base-T ports and 24 SFP interfaces.

DGS-6600-8XG: This module includes 8 10G XFP interfaces.

DGS-6600-CM Control Module

The basic appearance of the DGS-6600-CM management module is shown below. The DGS-6600-CM management module is used to manage the entire system, including system switching, controlling and managing user access, controlling the system status, managing routes, and maintenance on the network and operations. The DGS-6600-CM management module needs to be inserted in slot 1 of the chassis.



NOTE: The DGS-6604 needs one DGS-6600-CM management module to operate.



Figure 1-3 Basic Appearance of DGS-6600-CM

Interface

UART Console Interface

The DGS-6600-CM front panel provides two types of UART Console Interface, with one being an RS-232 connector and the other being a USB connector. These two interfaces are mutually exclusive, with the USB interface having a higher priority. If the Switch is currently being managed via the RS-232 console connection and a USB connection is established, the CLI engine will use the USB connection and automatically disconnect the user who is connected to the Switch via the RS-232 console connection.

Out-of-Band Management Port

The DGS-6600-CM module features an out-of-band Management port. The management port uses an RJ-45 connected so it can be easily connected to a notebook computer using a standard Ethernet cable. Connect to the port for out-of-band management using a web browser or Telnet command prompt interface. The Management port is enabled by default, so it can be used for the first time that you connect to the Switch.

To use the management port, use an Ethernet cable to connect the port to the Ethernet interface of a computer used for Switch management. The default IP address of the management port is 10.90.90.90 with a subnet mask of 255.0.0.0, make sure the computer used for Switch management has a non-conflicting IP address in the 10.0.0.0/8 subnet.

LEDs

The DGS-6600-CM features various system LEDs, as described in the following table:

LED Indicator	Color and Status	Description
Power	Solid Green	This LED will light solid green when the Switch is powered on.
	Off	This LED will remain off when the Switch is powered off.
System	Solid Green	This LED will light solid green when the Switch is operating normally.
	Solid Red	This LED will light solid red when the Switch has failed.
	Blinking Green	This LED will blink green while the Switch is booting up or shutting down.
	Off	This LED will remain off when the Switch is shut down.
CPU Utilization	Solid Green	These LEDs are used to indicate the percentage of CPU utilization. The valid values are from 30% to 100%.
Master	Solid Green	This LED will light green when the CPU module is acting as the master management card.
	Off	This LED will remain off when the CPU module is acting as the backup management card.
USB	Solid Green	This LED will light green when a user has logged into the Switch via the USB console port.
	Off	This LED will remain off when the USB console port is not in use.
RS-232	Solid Green	This LED will light green when a user has logged into the Switch via the RS-232 console port.
	Off	This LED will remain off when the RS-232 console port is not in use.
Compact Flash	Blinking Green	This LED will blink green when the CF card is being read or written to.

Table 1-2 DGS-6600-CM LED Behavior

Technical Specifications

Item	Description
Standard Compliance	Management port supports IEEE802.3, IEEE802.3u, IEEE802.3ab Half/Full-duplex support
Management Mode	CLI Telnet Web-based
Port Type	1x Female DCE RS-232 DB-9 console port 1x Female USB series type B console port 1x RJ-45 management port
LED	Power System CPU Utilization Master USB RS-232 Compact Flash
Hot Swap Ability	Not-supported
Power Consumption	53.856 Watts
EMC	EMC (Class A): FCC Part 15, CSA C108.8, 89/336/EEC, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11, EN 55024, AS/NZS 3548, VCCI V-3, BSMI
Safety Regulation	UL 1950, CSA C22.2 No. 950, 73/23/EEC, EN 60825, EN 60950, IEC 950
MTBF	263581 Hours
Heat Dissipation	183.6 BTU/Hour
Operating Temperature	0~50°C
Storage Temperature	-40~70°C
Operating Humidity	10% - 90% RH non-condensed
Weight	3.605 Kilograms
Dimensions	height - 42mm, width - 388mm , depth - 422mm

Table 1-3 DGS-6600-CM Technical Specifications

DGS-6600-48T Module

The basic appearance of the DGS-6600-48T module is shown below. The DGS-6600-48T is a line card module of the DGS-6600, which provides 48x10/100/1000 Base-T ports.

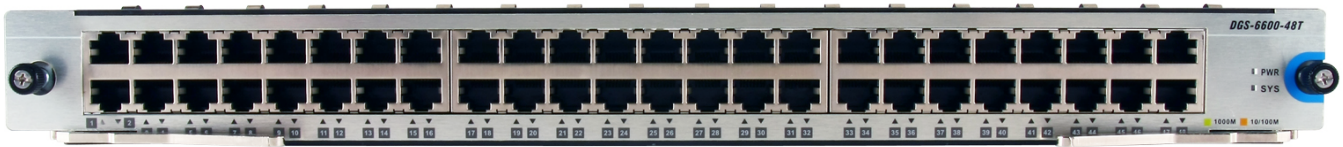


Figure 1-4 Basic Appearance of DGS-6600-48T

Interface

The DGS-6600-48T features 48x10/100/1000 RJ-45 ports.

LEDs

The DGS-6600-48T features various system LEDs, as described in the following table:

LED Indicator	Color and Status	Description
Power	Solid Green	This LED will light solid green when the Switch is powered on.
	Off	This LED will remain off when the Switch is powered off.
System	Solid Green	This LED will light solid green when the Switch is operating normally.
	Solid Red	This LED will light solid red when the Switch has failed.
	Blinking Green	This LED will blink green while the Switch is booting up or shutting down.
	Off	This LED will remain off when the Switch is shut down.
Link/Act/ Speed Mode	Solid Green	This LED will light solid green when there is a secure connection (or link) to a device that is operating at 1000Mbps.
	Blinking Green	This LED will blink green when there is activity occurring on a port that is operating at 1000Mbps.
	Solid Amber	This LED will light solid amber when there is a secure connection (or link) to a device that is operating at 10/100Mbps.
	Blinking Amber	This LED will blink green when there is activity occurring on a port that is operating at 10/100Mbps.
	Off	This LED will remain off when there is no link on the port.

Table 1-4 DGS-6600-48T LED Behavior

Technical Specifications

Item	Compliance
Standard Compliance	IEEE 802.3, IEEE 802.3u, IEEE 802.3ab Half/Full-duplex Support
Port Type	48x 10/100/1000 Mbps RJ-45 ports
LED	Power System
Hot Swap Ability	Supported
Power Consumption	109.8 Watts
EMC	EMC (Class A): FCC Part 15, CSA C108.8, 89/336/EEC, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11, EN 55024, AS/NZS 3548, VCCI V-3, BSMI
Safety Regulation	UL 1950, CSA C22.2 No. 950, 73/23/EEC, EN 60825, EN 60950, IEC 950
MTBF	249309 Hours
Heat Dissipation	374.4 BTU/Hour
Weight	3.51 Kilograms

Table 1-5 DGS-6600-48T Technical Specifications

DGS-6600-48S Module

The basic appearance of the DGS-6600-48S module is shown below. The DGS-6600-48S is a line card module of the DGS-6600, which provides 48x SFP modules.



Figure 1-5 Basic Appearance of DGS-6600-48S

Interface

The DGS-6600-48S features 48x SFP modules.

LEDs

The DGS-6600-48S features various system LEDs, as described in the following table:

LED Indicator	Color and Status	Description
Power	Solid Green	This LED will light solid green when the Switch is powered on.
	Off	This LED will remain off when the Switch is powered off.
System	Solid Green	This LED will light solid green when the Switch is operating normally.
	Solid Red	This LED will light solid red when the Switch has failed.
	Blinking Green	This LED will blink green while the Switch is booting up or shutting down.
	Off	This LED will remain off when the Switch is shut down.
Link/Act/ Speed Mode	Solid Green	This LED will light solid green when there is a secure connection (or link) to a device that is operating at 1000Mbps.
	Blinking Green	This LED will blink green when there is activity occurring on a port that is operating at 1000Mbps.
	Solid Amber	This LED will light solid amber when there is a secure connection (or link) to a device that is operating at 100Mbps.
	Blinking Amber	This LED will blink amber when there is activity occurring on a port that is operating at 100Mbps.
	Off	This LED will remain off when there is no link on the port.

Table 1-6 DGS-6600-48S LED Behavior

Technical Specifications

Item	Compliance
Standard Compliance	IEEE 802.3z Full-duplex support
Port Type	48x SFP modules
LED	Power System
Hot Swap Ability	Supported
Power Consumption	118.6 Watts
EMC	EMC (Class A): FCC Part 15, CSA C108.8, 89/336/EEC, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11, EN 55024, AS/NZS 3548, VCCI V-3, BSMI
Safety Regulation	UL 1950, CSA C22.2 No. 950, 73/23/EEC, EN 60825, EN 60950, IEC 950
MTBF	318790 Hours
Heat Dissipation	404.6 BTU/Hour
Weight	3.37 Kilograms

Table 1-7 DGS-6600-48S Technical Specifications

DGS-6600-48TS Module

The basic appearance of the DGS-6600-48TS module is shown below. The DGS-6600-48TS is a line card module of the DGS-6604, which provides 24x 10/100/1000 Base-T ports and 24x SFP module ports.



Figure 1-6 Basic Appearance of DGS-6600-48TS

Interface

The DGS-6600-48TS provides 24x 10/100/1000 Base-T ports and 24x SFP module ports.

LEDs

The DGS-6600-48TS features various system LEDs, as described in the following table:

LED Indicator	Color and Status	Description
Power	Solid Green	This LED will light solid green when the Switch is powered on.
	Off	This LED will remain off when the Switch is powered off.
System	Solid Green	This LED will light solid green when the Switch is operating normally.
	Solid Red	This LED will light solid red when the Switch has failed.
	Blinking Green	This LED will blink green while the Switch is booting up or shutting down.
	Off	This LED will remain off when the Switch is shut down.
10/100/ 1000Mbps Link/Act/ Speed Mode	Solid Green	This LED will light solid green when there is a secure connection (or link) to a device that is operating at 1000Mbps.
	Blinking Green	This LED will blink green when there is activity occurring on a port that is operating at 1000Mbps.
	Solid Amber	This LED will light solid amber when there is a secure connection (or link) to a device that is operating at 10/100Mbps.
	Blinking Amber	This LED will blink amber when there is activity occurring on a port that is operating at 10/100Mbps.
	Off	This LED will remain off when there is no link on the port.
SFP Module Link/Act/ Speed Mode	Solid Green	This LED will light solid green when there is a secure connection (or link) to a device that is operating at 1000Mbps.
	Blinking Green	This LED will blink green when there is activity occurring on a port that is operating at 1000Mbps.
	Solid Amber	This LED will light solid amber when there is a secure connection (or link) to a device that is operating at 100Mbps.
	Blinking Amber	This LED will blink amber when there is activity occurring on a port that is operating at 100Mbps.
	Off	This LED will remain off when there is no link on the port.

Table 1-8

Table 1-9 DGS-6600-48TS LED Behaviors

Technical Specifications

Item	Compliance
Standard Compliance	IEEE: 802.3, 802.3u, 802.3ab, 802.3z, 802.3x flow control support for full-duplex mode Half/full-duplex support
Port Type	24x 10/100/1000 Mbps ports, 24x SFP modules
LED	Power System
Hot Swap Ability	Supported
Power Consumption	114.2 Watts
EMC	EMC (Class A): FCC Part 15, CSA C108.8, 89/336/EEC, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11, EN 55024, AS/NZS 3548, VCCI V-3, BSMI
Safety Regulation	UL 1950, CSA C22.2 No. 950, 73/23/EEC, EN 60825, EN 60950, IEC 950
MTBF	295803
Heat Dissipation	389.5 BTU/Hour
Weight	3.38 Kilograms

Table 1-10 DGS-6600-48TS LED Behaviors

DGS-6600-8XG Module

The basic appearance of the DGS-6600-8XG module is shown below. The DGS-6600-8XG is a line card module of the DGS-6604, which provides 8x 10 Gigabit Ethernet XFP module ports.



Figure 1-7 Basic Appearance of DGS-6600-8XG

Interface

The DGS-6600-8XG features 8x 10 Gigabit Ethernet XFP module ports.

LEDs

The DGS-6600-8XG features various system LEDs, as described in the following table:

LED Indicator	Color and Status	Description
Power	Solid Green	This LED will light solid green when the Switch is powered on.
	Off	This LED will remain off when the Switch is powered off.
System	Solid Green	This LED will light solid green when the Switch is operating normally.
	Solid Red	This LED will light solid red when the Switch has failed.
	Blinking Green	This LED will blink green while the Switch is booting up or shutting down.
	Off	This LED will remain off when the Switch is shut down.
Link/Act/ Speed Mode	Solid Green	This LED will light solid green when there is a secure connection (or link) to a device that is operating at 10000Mbps.
	Blinking Green	This LED will blink green when there is activity occurring on a port that is operating at 10000Mbps.
	Off	This LED will remain off when there is no link on the port.

Table 1-11

Table 1-12 DGS-6600-8XG LED Behavior

Technical Specifications

Item	Compliance
Standard Compliance	IEEE 802.3ae, Full-duplex support XFP MSA compliant transceiver support
Port Type	8x 10G XFP modules
LED	Power System
Hot Swap Ability	Supported
Power Consumption	200.26 Watts
EMC	EMC (Class A): FCC Part 15, CSA C108.8, 89/336/EEC, EN 55022, EN 61000-3-2, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11, EN 55024, AS/NZS 3548, VCCI V-3, BSMI
Safety Regulation	UL 1950, CSA C22.2 No. 950, 73/23/EEC, EN 60825, EN 60950, IEC 950
MTBF	265455 Hours
Heat Dissipation	683.28 BTU/Hour
Weight	3.38 Kilograms

Table 1-13 DGS-6600-8XG Technical Specifications

Chapter 2 Installation

Installation Site Requirements

System Grounding Requirements

Installation Tool Requirements

Inspection Requirements when Unpacking the Switch

Installation Flowchart

Verifying the Installation

Installing the Cabinet

Mounting the DGS-6604 into the Cabinet

Fan Tray Installation

Power Supply Installation

Air Filter Installation

System Ground Connection

Connecting the AC Power Supply to the Power Module

Connecting the Management Module Cable

Removing Line Cards from the DGS-6604

Installing Line Cards in the DGS-6604

Connecting the External Interface Cables

Cable Management

Installation Checks

Installation Site Requirements

The DGS-6604 must be used indoors. To ensure normal operating conditions and prolong the life of the Switch, the following conditions should be met.

Rack Mounting Requirements

If you plan to rack mount the DGS-6604, the rack should conform to the following conditions:

- Try to install the Switch in an open cabinet. If you install the Switch in a closed cabinet, ensure that the cabinet has a good ventilation and heat dissipation system.
- Ensure that the cabinet is stable and strong enough to support the weight of the DGS-6604 and its accessories.
- Ensure that the cabinet has enough space for the installation of the front, rear, left, and right panels of the DGS-6604.
- Ensure that the cabinet is properly grounded.

Ventilation Requirements

The diagram below shows the ventilation requirements of the DGS-6604. To ensure normal ventilation conditions, sufficient spacing must be reserved at the ventilation openings. After connecting the various cables, ensure that they are arranged into bundles or placed in a way that avoids blocking the Switch's air inlets in the cabling rack.

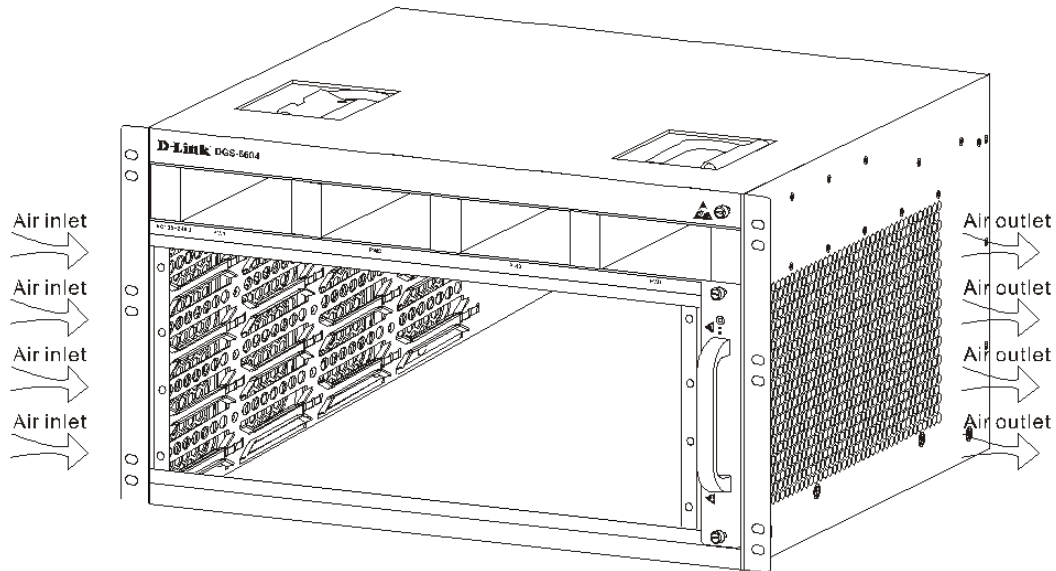


Figure 2-1 Schematic Diagram for the ventilation of the DGS-6604

Power Requirements

When an AC power supply is being used to power up the DGS-6604, the following power is required:

Rated voltage : 110VAC

220VAC

Tolerance range : 90~264VAC

Total power consumption: 853.5W/set

Total Heat Dissipation: 2912.4 BTU/Hour@110V

2912.4 BTU/Hour@220V

System Grounding Requirements



NOTE: The power supply of the DGS-6604 provides 1+1 redundancy. In order to ensure the stability and continuous operation of the Switch, multiple power supplies should be installed in the Switch to avoid the impact that would be caused by an unexpected failure of a power supply. Be sure to install the same type of redundant power supplies as using a mixture of different power supplies is not supported by the Switch.

The DGS-6604 requires a good grounding system as a basis for stable and reliable operations. The grounding system is the most important factor for preventing damage from lightning or resistance interference. Before

installing the Switch, carefully check the grounding conditions at the installation site to see if they conform to the grounding requirements, and perform the necessary grounding work.

Safety Grounding

Any equipment using an AC power supply must be grounded using the yellow/green safety grounding cable. There may be a risk of an electric shock if the yellow/green safety cable is not used and the insulating resistance decreases in the power supply and in the equipment enclosure.

Lightning Grounding

The Switch includes a separate system for handling lightning protection. The lightning protection system consists of a lightning rod, downlead conductor, and a connector for the grounding system. The connector for the grounding system usually shares the power reference ground and the yellow/green safety cable ground. The lightning discharge ground is only used by the lightning protection system and is irrelevant for the rest of the switch system.

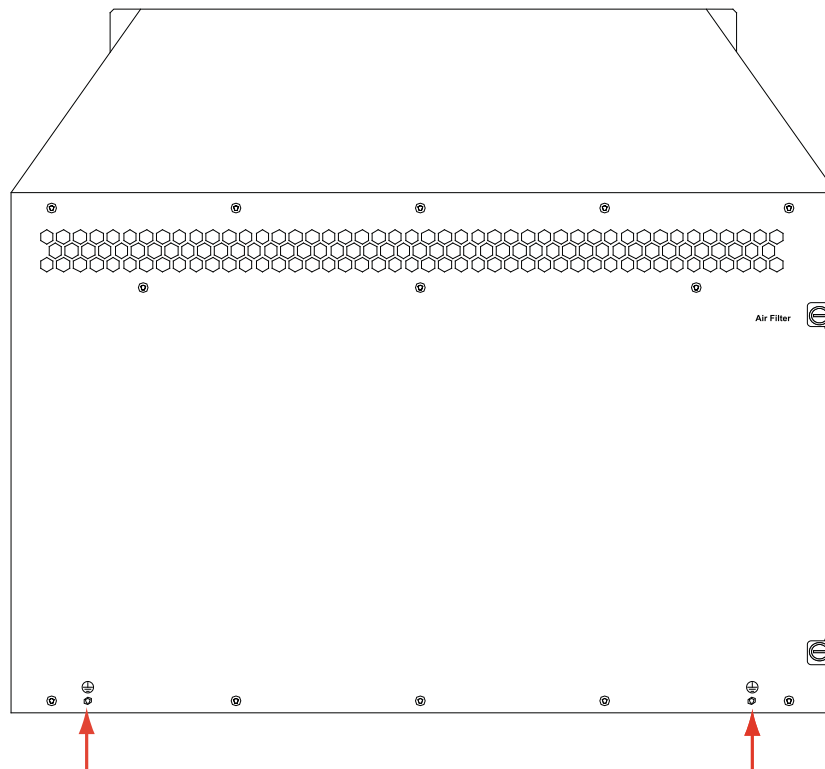


Figure 2-2 Diagram showing the schematic for the grounding of the DGS-6604

The power cables that the Switch uses must ensure normal operation. Before connecting any cables to the Switch, carefully read the precautions in the next few pages.

EMI Considerations

The system can be affected by various interference sources that can be either external or internal of the equipment or application system. Interference can affect the system in several conductive ways, including capacitive coupling, inductive coupling, and electromagnetic radiation.

The two types of electromagnetic interference are conductive interference and radiated interference. The type of electromagnetic interference will vary depending on the type of propagation path.

Radiated interference refers to the energy, usually RF energy, that arrives from a component to a sensitive component through the air. The source of the interference can either be from the system that is affected by interference or from a unit that is completely electrically isolated. The electromagnetic wire or signal cable connection between the source and the sensitive component can cause conducted interference results. A cable that is affected by interference can conduct interference to other units in the network. The power supply of the equipment is often affected by conductive interference. However, a filter can be used to control any interference problems. Any signal path in the equipment may be affected by radiated interference, making it difficult to shield against.

1. In order to prevent interference from the power grid, effective measures should be taken for the power system.
2. The grounding device of the power equipment or the anti-lightning grounding device should ideally be located as far away as possible from the working ground of the router.
3. Ensure that high-frequency large-current devices, high-power radio transmitters, and radar transmitting stations are kept away from the Switch.
4. Take appropriate measures to isolate static electricity.

Precautions for Fiber Connections

Ensure that the cables you will use in the Switch are of the right optical connector type and that the fiber type matches the optical interface type used. You should also be aware of the Tx and Rx directions of the fiber. The Tx end of the Switch should connect to the Rx end of the switch at the remote end and the Rx end of the Switch should connect to the Tx end of the remote switch.

Installation Tool Requirements

In order to install the Switch, the following tools are required:

Common Tools	Cross-head screwdriver, flat-head screwdriver, required electrical and optical cables Bolts, diagonal pliers, straps
Special-purpose Tools	Anti-static tool
Meter	Multimeter

Table 2-1 Required Installation Tools

Inspection Requirements when Unpacking the Switch

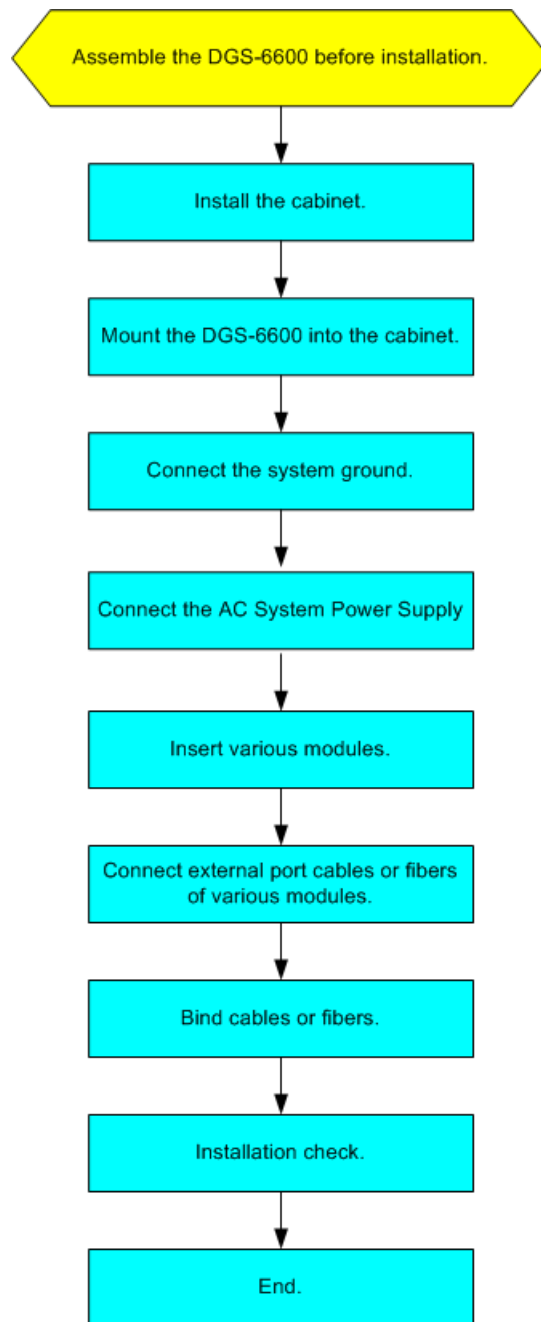
Checking Goods

1. DGS-6604 Chassis Carton
 - **DGS-6604 Chassis (no cards installed)**
2. Card Module Carton (s)
 - **1 CM Card DGS-6600-CM**
 - **Line Cards (specific per order)**
 - **Power Supplies Units (number specific per order)**

3. DGS-6604 Accessories Carton including:

- **AC Power Cord**
- **RS-232 Console Cable (9 pin D-Sub)**
- **USB Console Cable (Type 1 to Type2)**
- **Fan Tray**
- **Air Filter**
- **CD software and manual**
- **QIG**

Installation Flowchart



Verifying the Installation

Careful consideration must be taken before deploying the DGS-6604. Some of the items that need to be considered are the installation location, the mode of networking that will be used, the power supply requirements, and the network cabling.

The following should be verified before installing the DGS-6604:

- The temperature and humidity of the intended installation location meets the requirements for the Switch.
- The air flow of the intended installation location meets the requirements of the Switch.
- The intended installation location has a power supply that meets the Switch's requirements.

- The intended installation location has the required network cabling installed.
- The power source has the rated AC requirements.

Installing the Cabinet

Cabinet Installation Precautions

Pay attention to the following when installing the cabinet:

- Ensure that all the expansion bolts for fastening the cabinet base to the ground are installed from the bottom up and tightened in the correct sequence (large plain washer, spring washer, and nut), and ensure that all the expansion bolts are aligned to the installation holes on the base of the cabinet.
- Ensure that the cabinet is stable and sturdy after installation has been completed.
- Ensure that the cabinet is installed on the ground vertically.
- If installing the cabinet next to another cabinet, ensure that the cabinets are aligned within 5mm.
- Ensure that the front/back doors of the cabinet can open and close properly when installation is complete. Also verify that the cabinet locks are functioning and that there are a complete set of keys.
- Ensure that any labelling on equipment is accurate.
- Ensure that all the back panels of the cabinet are installed.
- Ensure that all the screws and bolts that will be used to install rack equipment are of the same type.
- Ensure that all the boards installed in the equipment are installed securely and that all fastening screws are properly tightened.
- In order to prevent rodents and other small animals from entering the cabinet, the cabling inlets at the top and bottom of the cabinet should be fitted with rodent-resistant nets with seams that are no more than 1.5cm in diameter.
- The cabinet should always have a set of antistatic wrist bands available.

Simple Installation Steps

1. Before installing the cabinet, make sure that there is enough space for the cabinet, ensuring that the front and rear doors can fully open and that there is enough space to carry out any necessary maintenance.
2. After verifying the installation location, mount and fasten the 19" cabinet in the planned location.
3. Fit the appropriate chute and cables.
4. Fit the appropriate accessories to the cabinet.

Mounting the DGS-6604 into the Cabinet

Cabinet Mounting Precautions

Verify that the front and rear brackets of the cabinet are in the right locations before mounting the DGS-6604 into the cabinet. If the front bracket is installed too far to the front, the Switch's front panel may be too close to the cabinet's front door, making it impossible to close the front door when the network cables and fiber patch leads are connected. In most cases, at least 10cm of space should be reserved between the front panel of the equipment and the front of the cabinet after installation.

Before installing the Switch, please verify the following:

- The cabinet has been properly fastened.
- The various modules in the frame have been installed.
- Ensure that there are no obstacles for installing the Switch in the frame and the surrounding areas.
- Ensure that the Switch is ready for installation and near the frame that it will be installed in.

Simple Installation Steps

1. With a person on each side of the Switch, move the Switch to the appropriate position in the rack.
2. With one person supporting the Switch, fasten the screws into all the available bracket holes. The Switch should be stable and steady after it has been installed in the cabinet.

Fan Tray Installation

The DGS-6600-FAN fan tray is used as the DGS-6604's ventilation system. Carry out the following to install the fan tray:

1. Use the thumb-screws to remove the fan tray blank panel.
2. Insert the fan tray into the guide rail of the fan tray slot.
3. Secure the fan tray by tightening the fan tray's captive-screws.

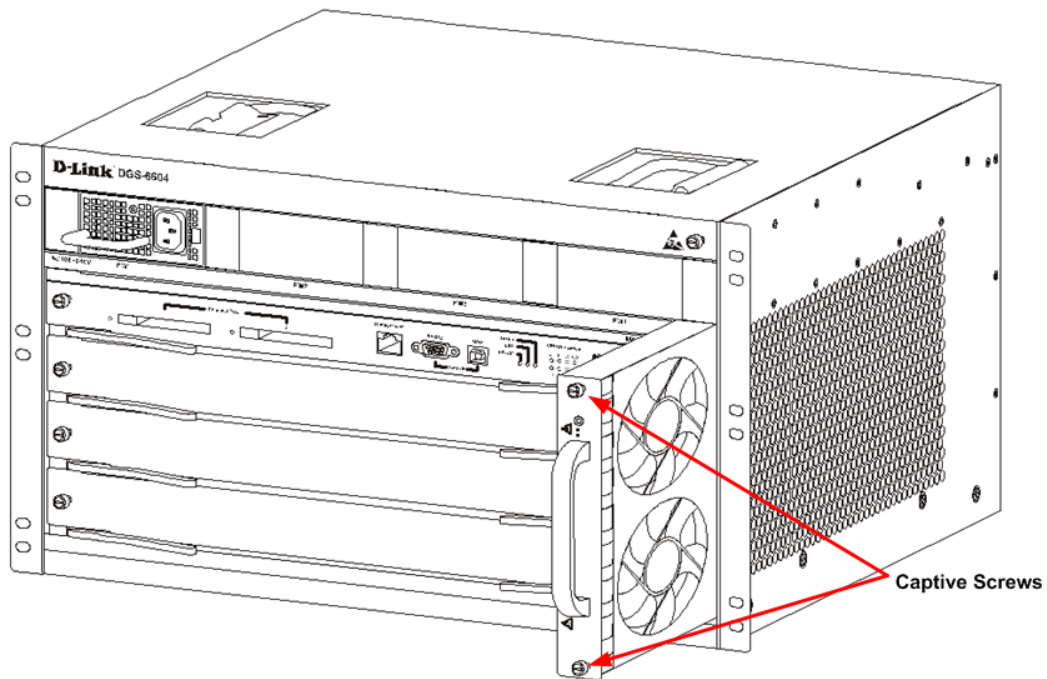


Figure 2-3 Schematic diagram for installing the fan tray in the DGS-6604

Power Supply Installation

The DGS-6604 switch is powered up using an AC power source. The procedure for installing the AC power supply is shown in the diagram below:

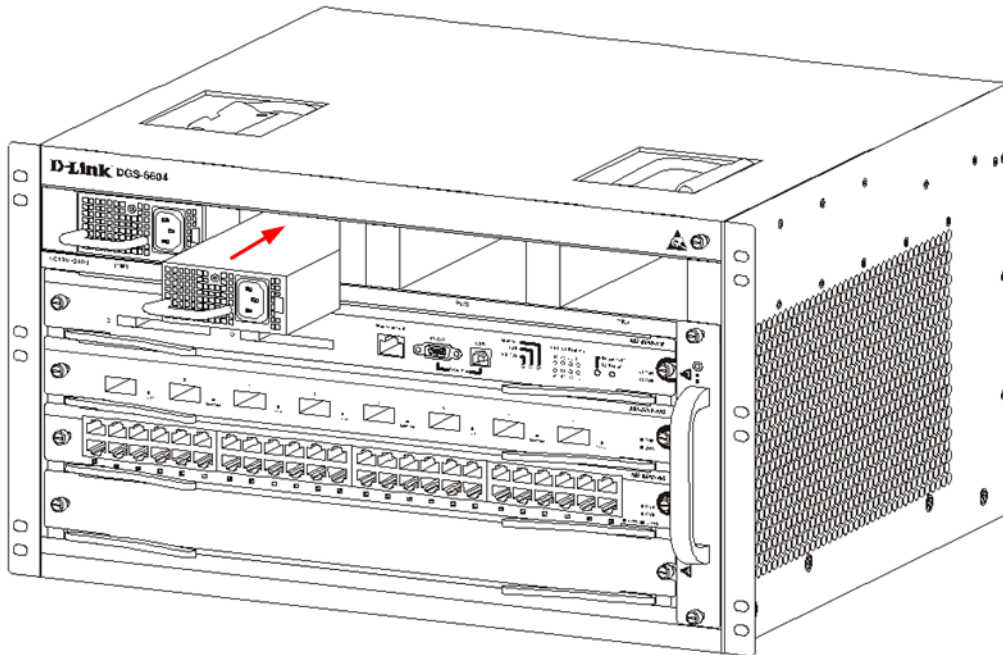


Figure 2-4 Schematic diagram for installing an AC power supply

Air Filter Installation

On the back of the chassis on the edge of the right-side is a vertical slot where the air filter can be fitted. Slide in a cleaned or new air filter into the slot as per the following diagram. Then screw the two thumb-philips screws (see the diagram arrows) to secure the air filter into the chassiss. With the air filter installed screw-in two screws on the side of the chassis as indicated by the red arrows in the diagram.

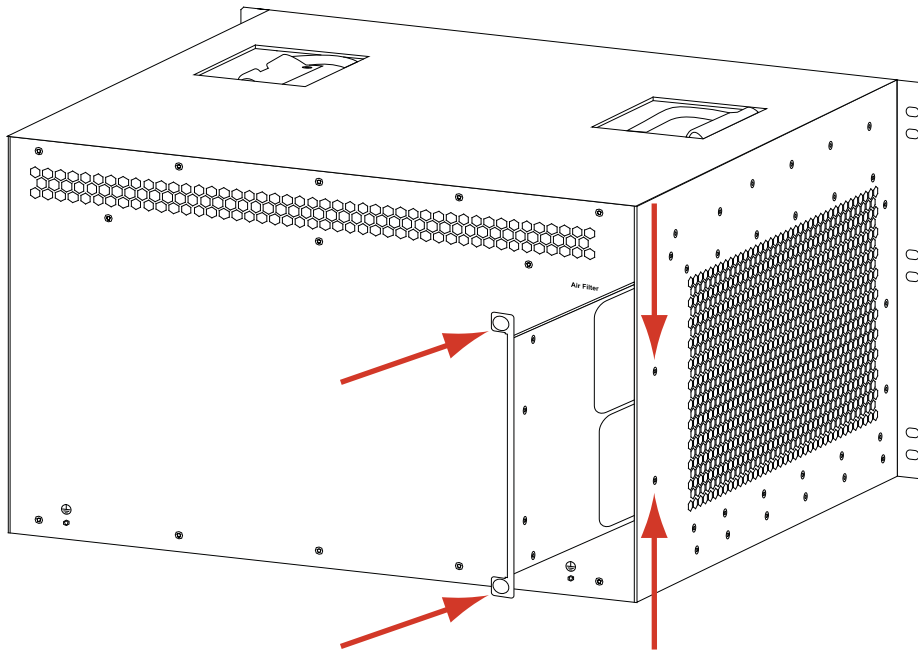
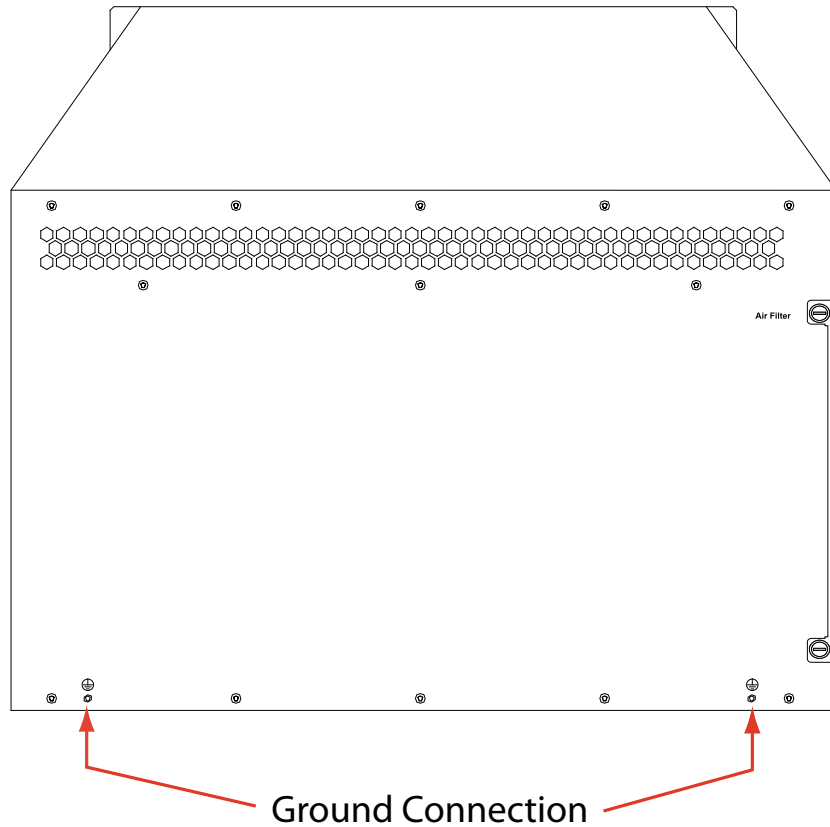


Figure 2-5 Schematic diagram for installing the Air Filter

System Ground Connection

The back of the DGS-6604 includes two working ground connections on its back panel. The ground must be well treated to provide adequate protection for the system. The ground connection must directly connect to the ground pole or the ground bar of the equipment room.



Grounding Precautions

- The maximum possible current should determine the sectional area of the grounding cable. The grounding cable should be of good conduction quality.
- Never use bare wire.
- Combined grounding should have a grounding resistance that is less than 1Ω.

Simple Grounding Steps

1. Release the nut on the Switch's rear grounding post.
2. Lock the grounding cable's terminal to the grounding pole.
3. Tighten the nut.
4. Connect the related terminals according to the steps mentioned previously and the wiring diagram.

Connecting the AC Power Supply to the Power Module

Use the related AC power cable to connect to the AC power module panel, as indicated in the diagram below:

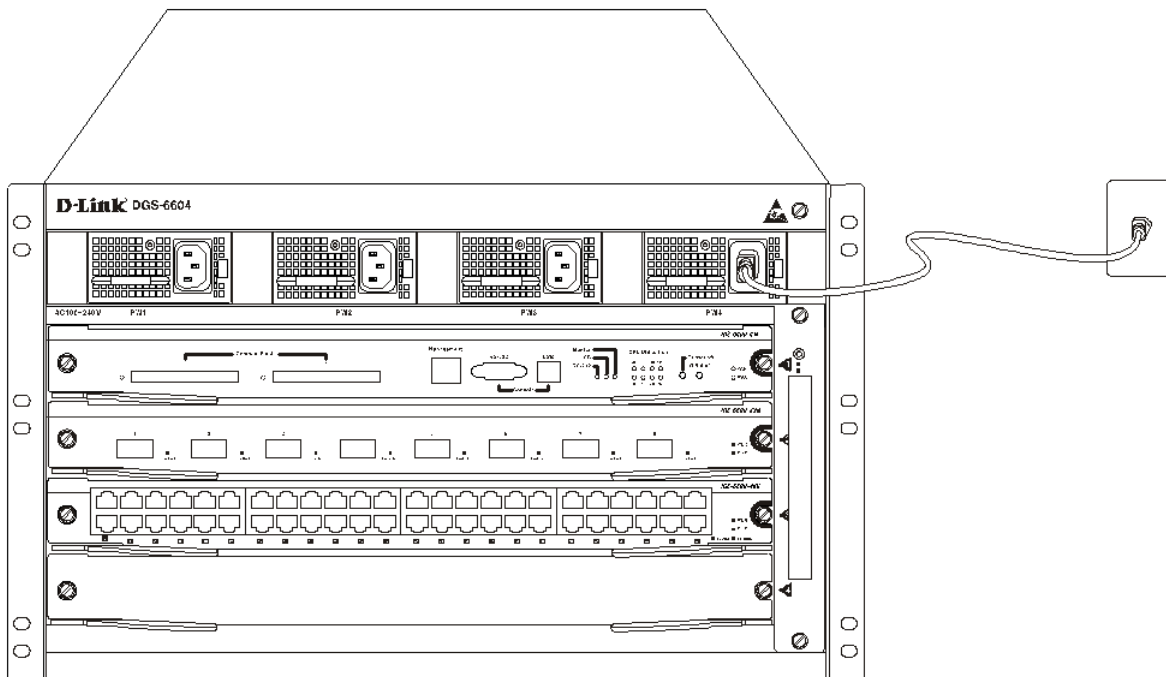


Figure 2-6 Connecting the DGS-6604 to an AC power supply connection

AC Power Supply Connection Precautions

- Verify that the provided external power supply matches the power module installed in the Switch before connecting the power supply.
- Use a power cable with a standard 3-pin connector to make the power connection.
- Ensure that the connected power cables have good contacts.

Simple AC Power Connection Steps

1. Insert the power cable's plug into the power module.
2. Secure the power cable to the cable clip on the right.
3. Connect the other end of the power cable into the corresponding socket or connector.

Connecting the Management Module Cable

Simple Management Module Cable Connection Steps

1. Connect the RJ45 connector of the Ethernet cable to the Ethernet port of the Switch's management module (DGS-6600-CM) and insert the other end to the LAN access equipment that your PC/Notebook or control terminal has access to.
2. Connect the standard DB9 end of the serial cable to the RS-232 serial port of the Switch's management module and the other end to the serial port of either a Serial Port Switch (that your PC/Notebook or control terminal can access) or directly to your PC/Notebook or control terminal.



NOTE: The DGS-6604 must have a management module installed to operate.

Removing Line Cards from the DGS-6604

Carry out the following steps to remove boards from the DGS-6604:

1. Unplug all copper/fiber cabling, i.e. RJ45 twisted-pair and fiber optic cables, from the board that you want to remove.
2. Untighten the panel's two captive screws.
3. Use both hands to pull the levers on the left and right hand side of the board to remove the board from the DGS-6604, as shown in the diagram below.



CAUTION:

1. Before removing/adding a board, always wear an anti-static wrist strap.
2. Take care not to hold the edge of the PCB or collide the components of the PCB.

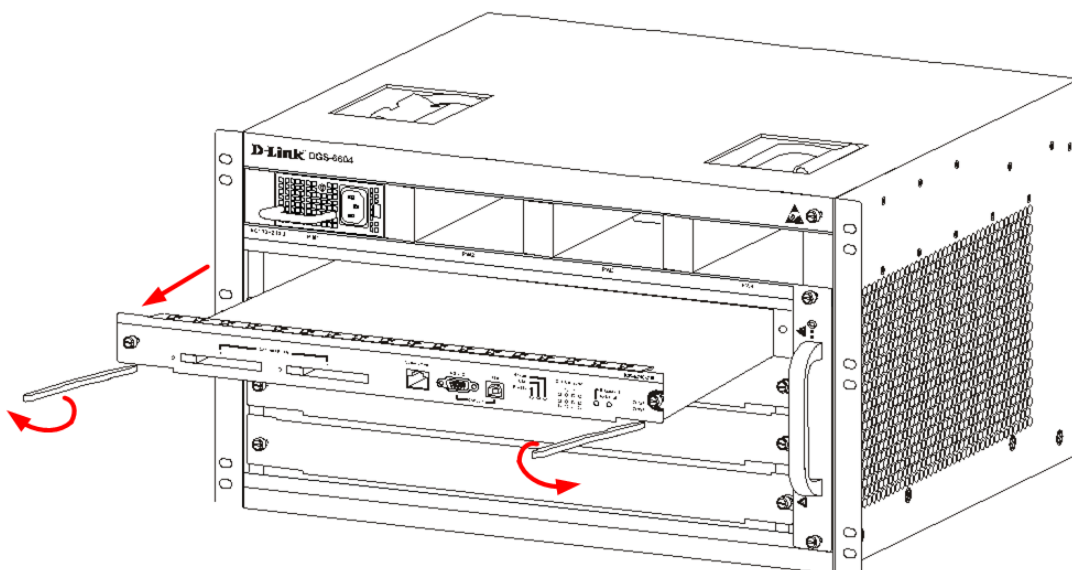


Figure 2-7 Schematic diagram for removing a line card

Installing Line Cards in the DGS-6604

Carry out the following steps to install boards in the DGS-6604:

1. Remove the component card or blank panel as instructed in the section "Removing Line Cards from the DGS-6604" on page 32.
2. Insert the new board into the guide rail of the vacant slot.
3. Use the levers on the left and right hand side to push the board into position and tighten the two captive screws on the board using a straight screw driver.



CAUTION:

1. Take care not to hold the edge of the PCB or collide the components of the PCB.
2. Always use the levers to plug/unplug a PCB module. Never use force to remove a PCB module.

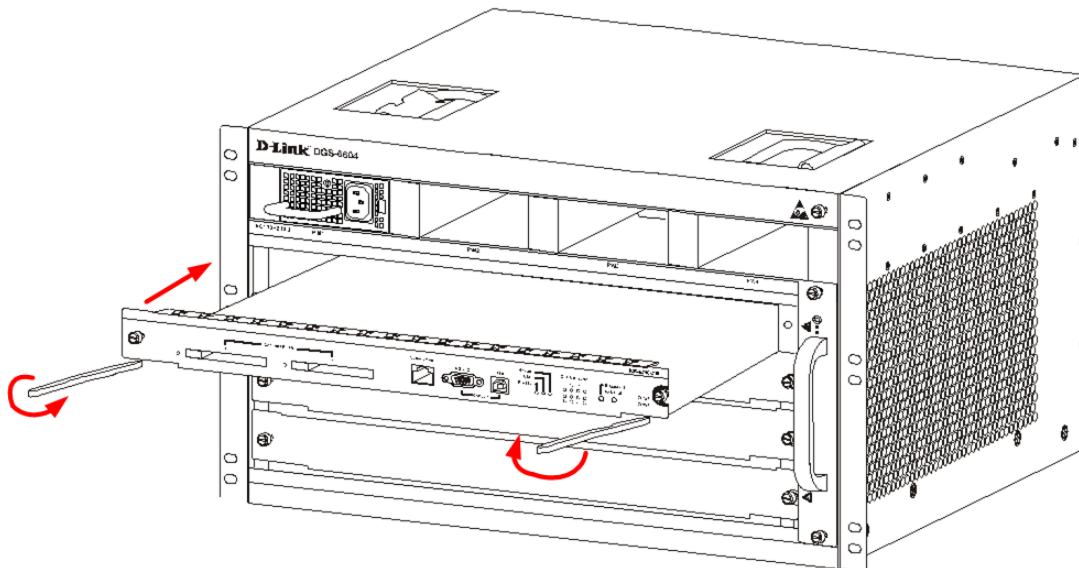


Figure 2-8 Schematic diagram for installing a line card

Connecting the External Interface Cables

Connecting External Interface Cable Precautions

- Ensure that you correctly distinguish between single-mode and multi-mode fibers and interfaces.
- Avoid small radius bends at the connector.

Simple External Interface Cable Connection Steps

1. Connect the RJ45 connector of the Ethernet cable to the Ethernet port of the Switch's management module and insert the other end to the Local LAN (that your PC/Notebook or control element has access to) or directly to your PC/Notebook or control terminal.
- or -
Connect the standard DB9 end of the serial cable to the RS-232 serial port of the Switch's management module and the other end to either a Serial Port Server (that your PC/Notebook or control element has access to) or directly to the PC/Notebook or control terminal.
2. Insert either the single-mode or multi-mode fiber cable into the corresponding fiber-optic interface. Be sure to identify the RX/TX ends of the fiber optic cable.
3. Insert the twisted-pair cable with the RJ45 connector into the corresponding RJ45 interface. Be sure to identify whether the cable type is cross-over or straight-through.
4. Connect the twisted-pair and fiber-optic cables to each board in the correct sequence.

Cable Management

Cable Management Precautions

- All cabling should be bound and managed in a way that is aesthetically pleasing.
- When binding and running fiber-optic cabling ensure that bends are kept to a minimum. Ensure that any bends have a large radius.
- Avoid binding fiber-optic and twisted-pair cabling too tightly. Binding fiber-optic cables too tightly may break the glass inside and cause transmission problems. Binding twisted-pair cables too tightly may negatively impact the twisted-pair cable's performance.

Simple Cable Management Steps

1. Ensure that cables are patched in a way where they can easily connect to the required line card. Secure any loose sections of the fiber-optic and twisted-pair cabling neatly in the cabling management system.
2. Use the cabling management system to secure the fiber-optic and twisted-pair cabling.
3. Try to bind the power cables as straight as possible along the bottom of the cabinet..

Installation Checks

Checking the Cabinet

- Ensure that the external power supply corresponds with cabinet's distribution panel.
- Check that the cabinet door can close properly after all the equipment has been installed.
- Check that the cabinet has been completely fastened and that it does not move or tilt.
- Check that all the necessary equipment has been installed in the cabinet and that all the cables have been properly fastened to the cabinet.

Checking the Cables

- Check that the fiber-optic and twisted pair cables have been connected to the correct interfaces.
- Check that the cables have been properly bound.

Checking the Power Supply

- Check that the contacts on the power cable are in good condition and that they comply to all relevant safety standards.
- Check the power supply is working normally by turning on the power switch.

Chapter 3 Connecting the Switch

Switch to End Node

Chassis to Switch

Connecting To Network Backbone or Server

Connecting the Management Module Cable

Connecting the External Interface Cables

Switch to End Node

End nodes include PCs outfitted with a 10, 100 or 1000 Mbps RJ-45 Ethernet Network Interface Card (NIC) and routers. An end node connects to the Switch via a twisted-pair UTP/STP cable. Connect the end node to any of the 1000BASE-T ports of the Switch. The Link/Act LEDs for each Ethernet port will light green or amber when the link is valid. A blinking LED indicates packet activity on that port.

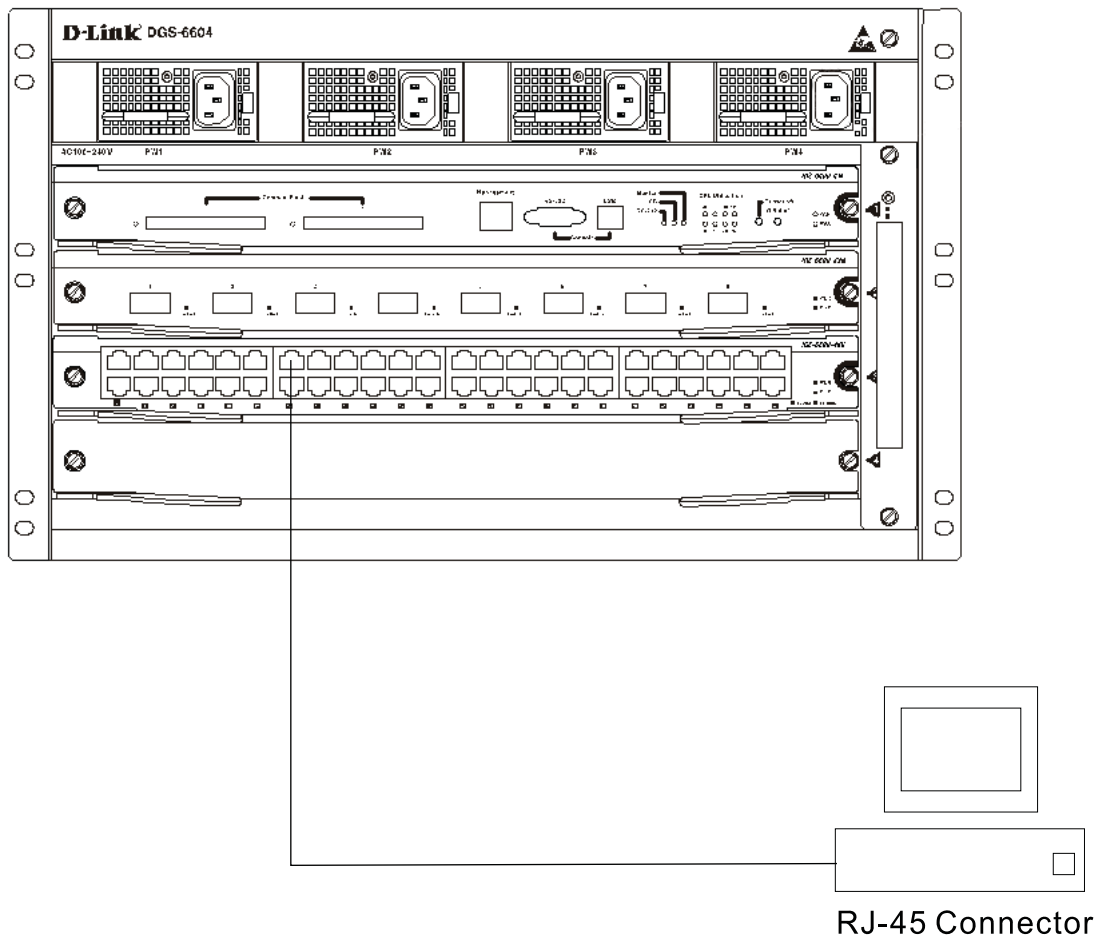


Figure 3-1 Connecting a DGS-6604 Switch to an end node

Chassis to Switch

- There is a great deal of flexibility on how connections are made using the appropriate cabling.
- "Connect a 10BASE-T switch port to the Switch via a twisted-pair Category 3, 4 or 5 UTP/STP cable.
- "Connect a 100BASE-TX switch port to the Switch via a twisted-pair Category 5 UTP/STP cable.
- "Connect 1000BASE-T switch port to the Switch via a twisted pair Category 5e UTP/STP cable.
- "Connect switch supporting a fiber-optic uplink to the Switch's SFP ports via fiber-optic cabling. See cabling guidelines in Appendix B for more information.

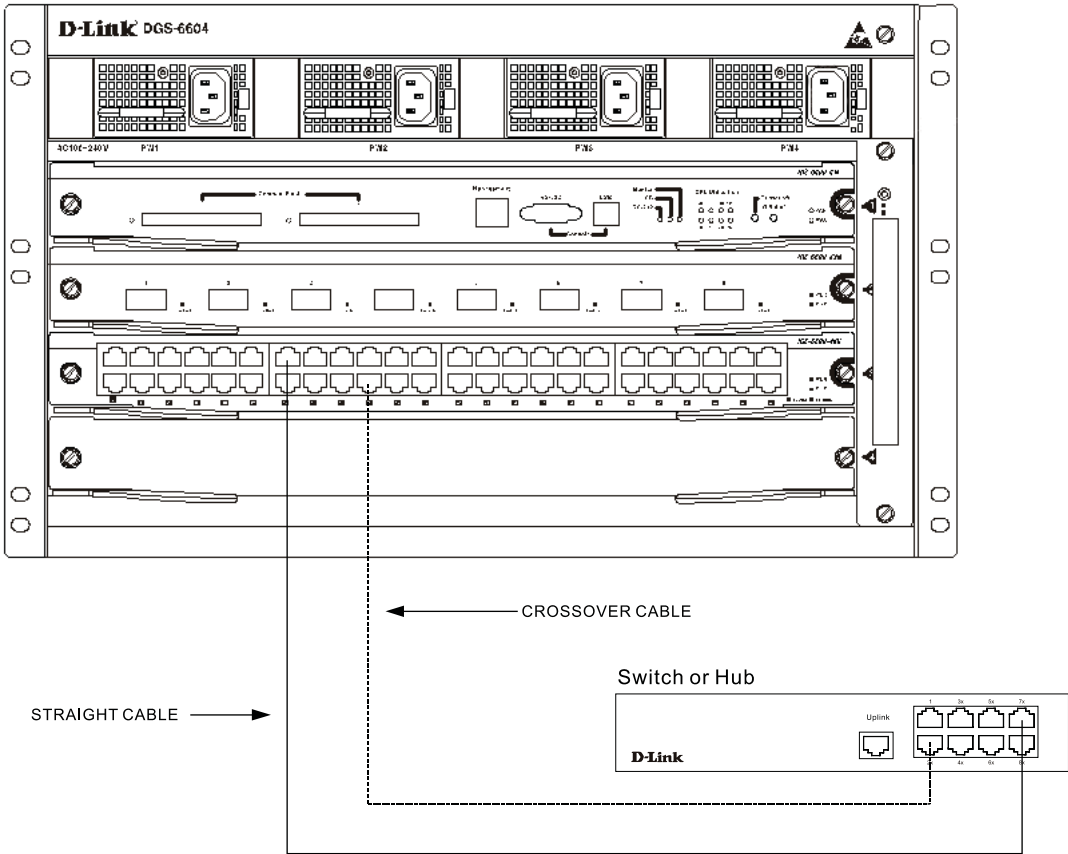


Figure 3-2 Connecting a DGS-6604 Chassis Switch to another switch

Connecting To Network Backbone or Server

The combo SFP ports and the 1000BASE-T ports are ideal for uplinking to a network backbone, server or server farm. The copper ports operate at a speed of 1000, 100 or 10Mbps in full or half duplex mode. The fiber-optic ports can operate at both 100Mbps and 1000Mbps in full duplex mode.

Connections to the Gigabit Ethernet ports are made using a fiber-optic cable or Category 5e copper cable, depending on the type of port. A valid connection is indicated when the Link LED is lit.

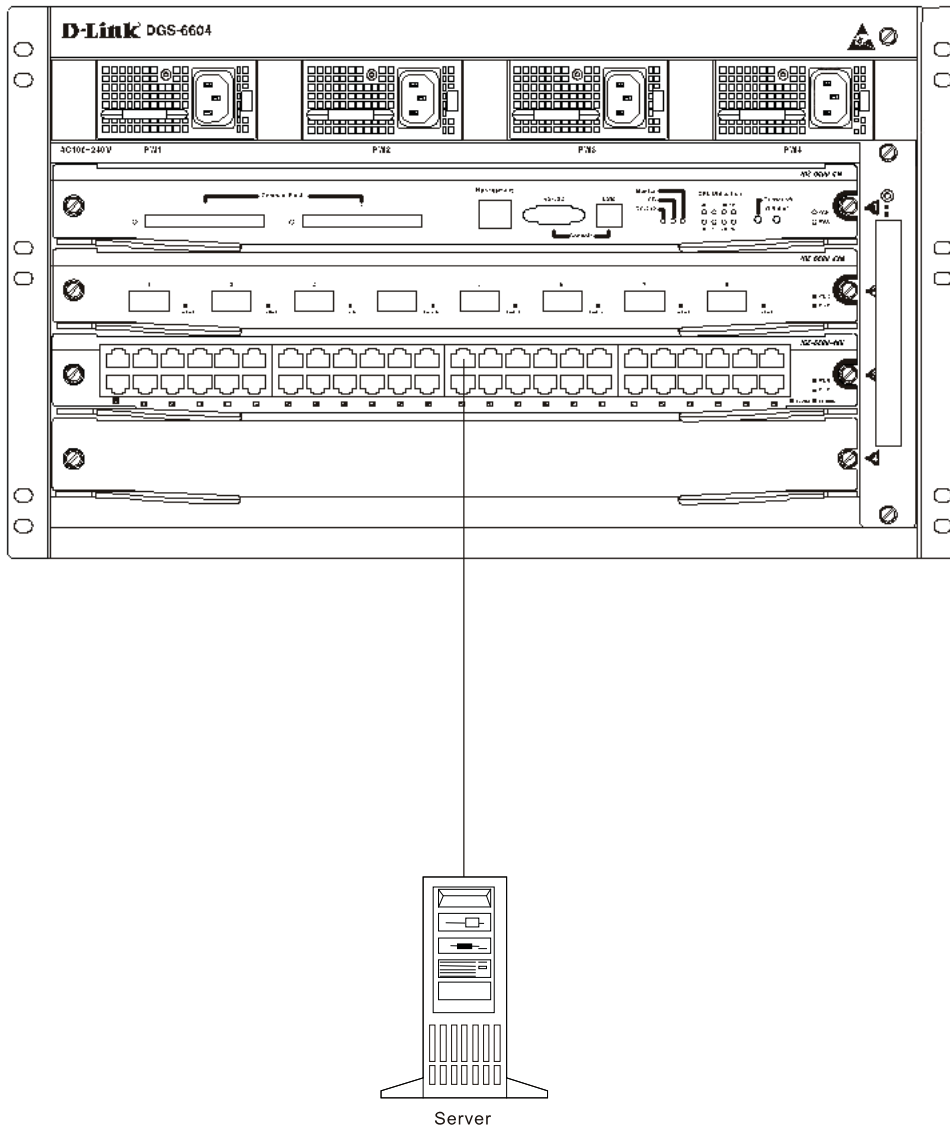


Figure 3-3 Connecting a DGS-6604 Chassis to a server

Connecting the Management Module Cable

Refer to Connecting the Console Port on page 40

Connecting the External Interface Cables

Connecting External Interface Cable Precautions

- Ensure that you correctly distinguish between single-mode and multi-mode fibers and interfaces.
- Avoid small radius bends at the connector.

Simple External Interface Cable Connection Steps

1. Connect the RJ45 connector of the Ethernet cable to the Ethernet port of the Switch's management module and insert the other end to the Local LAN (that your PC/notebook or control element has access to) or directly to your PC/Notebook or control terminal.
- or -
Connect the standard DB9 end of the serial cable to the RS-232 serial port of the Switch's management module and the other end to either a Serial Port Server (that your PC/notebook or control element has access to) or directly to the PC/notebook or control terminal.
2. Insert either the single-mode or multi-mode fiber cable into the corresponding fiber-optic interface. Be sure to identify the RX/TX ends of the fiber optic cable.
3. Insert the twisted-pair cable with the RJ45 connector into the corresponding RJ45 interface. Be sure to identify whether the cable type is cross-over or straight-through.
4. Connect the twisted-pair and fiber-optic cables to each board in the correct sequence.

Cable Management

Cable Management Precautions

- All cabling should be bound and managed in a way that is aesthetically pleasing.
- When binding and running fiber-optic cabling ensure that bends are kept to a minimum. Ensure that any bends have a large radius.
- Avoid binding fiber-optic and twisted-pair cabling too tightly. Binding fiber-optic cables too tightly may break the glass inside and cause transmission problems. Binding twisted-pair cables too tightly may negatively impact the twisted-pair cable's performance.

Simple Cable Management Steps

1. Ensure that cables are patched in a way where they can easily connect to the required line card. Secure any loose sections of the fiber-optic and twisted-pair cabling neatly in the cabling management system.
2. Use the cabling management system to secure the fiber-optic and twisted-pair cabling.
3. Try to bind the power cables as straight as possible along the bottom of the cabinet..

Chapter 4 Introduction to Switch Management

Management Options

Connecting the Console Port

First Time Connecting to the Switch

Connecting to the Ethernet Management Port

Password Protection

Saving Configuration Changes

SNMP Settings

Management Options

This system may be Command Line managed out-of-band through either the serial console ports (RS-232/USB) or through the Management Ethernet port (Telnet) on the front of the CM module. The user may also choose the web-based User Interface, accessible through a web browser.

Web-based User Interface

After successfully installing the Switch, the user can, monitor the CM LEDs , and display statistics and logs graphically using a web browser, such as Netscape Navigator (version 6.2 and higher) or Microsoft® Internet Explorer (version 5.0 and higher). Further the user can configure the Management Interface Ethernet Port settings through the WEB UI (WEB-bases User Interface).

SNMP-Based Management

The Switch can be managed with an SNMP-compatible console program. The Switch supports SNMP version 1.0, version 2.0 and version 3.0. The SNMP agent decodes the incoming SNMP messages and responds to requests with MIB objects stored in the database. The SNMP agent updates the MIB objects to generate statistics and counters.

Remote Command Line Interface using Telnet

The user can telnet from a computer to access the Switch through the Management Ethernet port. The command line interface provides complete access to all Switch management features.

Command Line Interface through the Serial Ports

The user can also connect a computer or terminal to one of the serial console ports (USB or RS-232) to access the Switch. The command line interface provides complete access to all Switch management features. The following section provides details on how to setup this connection.

Connecting the Console Port

The DGS-6600-CM front panel provides two types of UART Console Interface, an RS-232 connector and a USB connector. These two interfaces are mutually exclusive, with the USB interface having a higher priority. If the Switch is currently being managed via the RS-232 console connection and a USB connection is established, the CLI engine will use the USB connection and automatically disconnect the user who is connected to the Switch via the RS-232 console connection.

The switching between the RS-232 and USB console connection is automatically controlled by the firmware. However, this feature is disabled during system bootup. Therefore, it is recommended not to change the console connection interface during system bootup, as important bootup information may be missed.

In order to use the USB console interface the host will need to have a terminal emulation application (e.g., Hyper Terminal, Teraterm etc.) installed and the correct USB driver for the Switch which you can find on the CD-ROM that was bundled with your Switch. You will need the following:

- A terminal with an RS-232 port or a computer with either an RS-232 or USB serial port or and the ability to emulate a terminal (Note: if you are using the USB port then the computer needs the USB driver from the CD-ROM package installed).
- A console cable with a male DB-9 connector on one end and a female DB-9 connection on the other. This cable should be included with the Switch. It establishes the physical connection to the console port.

- or -
- A USB cable with a Type A connector on one end and a Type B connector on the other. This cable should be included with the Switch. It also can establish the physical connection to the console port as per the RS-232 cable above.

To connect a terminal to the console port:

Connect the female DB-9 connector on the console cable (shipped with the Switch) to the RS-232 serial port on the computer running terminal emulation software then connect the male DB-9 connector onto the RS-232 console port on the front of the Switch.

- or -

Connect the Type A USB connector on the console cable (shipped with the Switch) to the USB serial port on the computer running terminal emulation software then connect the Type B USB connector onto the USB console port on the front of the Switch.

Set the terminal emulation software as follows:

- Select the appropriate serial port (COM port 1 or COM port 2).
- Set the data rate to 115200 baud.
- Set the data format to 8 data bits, 1 stop bit, and no parity.
- Set flow control to none.
- Under Properties, select VT100 for Emulation mode.
- Select Terminal keys for Function, Arrow and Ctrl keys. Make sure to use Terminal keys (not Windows keys) are selected.



NOTE: When using HyperTerminal with the Microsoft® Windows® 2000 operating system, ensure that Windows 2000 Service Pack 2 or later is installed. Windows 2000 Service Pack 2 allows use of arrow keys in HyperTerminal's VT100 emulation. See www.microsoft.com for information on Windows 2000 service packs.

- After you have correctly set up the terminal, plug the power cable(s) into the power receptacle in each of the power modules of the Switch. The boot sequence appears in the terminal.
- After the boot sequence completes, the console login screen displays.

- If the user has not logged into the command line interface (CLI) program, press the Enter key at the User name and password prompts. There is no default user name and password for the Switch. The administrator must first create user names and passwords. If user accounts have been previously set up, log in and continue to configure the Switch.
- Enter the commands to complete desired tasks. Many commands require Privileged EXEC (administration) level access privileges.
- See the DGS-6600 Chassis Switch Series CLI Manual on the documentation CD for a list of all commands and additional information on using the CLI.
- To end a management session, use the logout command or close the emulator program.

If problems occur in making this connection on a PC, make sure the emulation is set to VT-100. The emulation settings can be configured by clicking on the File menu in the HyperTerminal window by clicking on Properties in the drop-down menu, and then clicking the Settings tab. This is where you will find the Emulation options. If you still do not see anything, try rebooting the Switch by disconnecting its power supply.

Once connected to the console, the screen below will appear on the console screen. This is where the user will enter commands to perform all the available management functions. The Switch will prompt the user to enter a user name and a password. Upon the initial connection, there is no user name or password and therefore just press enter twice to access the command line interface.

```
PROM Version: 1.00.001

DRAM Test ..... done
Loading Runtime Image ..... done

System initializing. Please wait!

Initializing: kutil
Initializing: bsp
    i2c ...
    gpio ...
    cpld ...
    isr ...
    eeprom ...
    bspmgmt ...
    bspioc1 ...
    cf ...
    devinfo ...
Initializing: path setting
Initializing: ASICdriver-1
    kernel bde ...
Initializing: protocol stack
Initializing: vr
Initializing: fm
    wait runtime images sync ...
```

Figure 4-1 DGS-6604 initial boot messages

First Time Connecting to the Switch

The Switch supports user-based security that can allow prevention of unauthorized users from accessing the Switch or changing its settings. This section tells how to log onto the Switch via out-of-band console connection or the out-of-band Management port connection.

Upon initial connection to the Switch, the login screen appears (see example below).

```
rip ...
  dvmrp ...
  pdm ...
  ospf6 ...
  pim ...
  ripng ...
  dhcpr4 ...
  dhcps4 ...
  dhcpc4 ...
  web ...
  time ...
  dhcpc6 ...
  dhcpr6 ...
  sflow ...
  devinfo ...
  acl ...
  ospf ...

DGS-6604 Chassis-based High-Speed Switch
Command Line Interface

Firmware: 1.00.021
Copyright (c) 2011 D-Link Corporation. All rights reserved.
DGS-6600:2>
```

Figure 4-2 Initial screen first time connecting to the switch

There is no initial login procedure until at least one user is created through the CLI Command Interface. The Switch will automatically login to the User Exec level. To gain access to enter the configuration mode use the following command:

```
DGS-6600:2>enable
DGS-6600:15#configure terminal
DGS-6600:15(config)#
```

The *enable* command enters the user into the Privileged EXEC mode (administration rights) and *configure terminal* enters the user into the Global configuration mode.



NOTE: The initial login automatically gets Administrator level (Privileged EXEC) privileges until a user is created if the user does not have Privileged EXEC rights then an Enable password should be set). It is recommended that at least one Admin-level user account should be created for the Switch

Connecting to the Ethernet Management Port

The front panel of the CM Module features an out-of-band Ethernet Management port. The port is an RJ-45 port so it can be easily connected to a notebook computer using a standard Ethernet cable. Connect to the port for out-of-band management using a Telnet command prompt interface. The Management port is enabled by default, so it can be used for the first time connection to the Switch.

An IP Address must be assigned to each switch, which is used for communication with an SNMP network manager or other TCP/IP application (for example BOOTP, TFTP). . The user may change the default Switch IP address to meet the specification of your networking address scheme.

To use the Management port, use an Ethernet cable to connect the port to the Ethernet interface of a computer used for Switch management. The default IP address of the Management port is 10.90.90.90 with a subnet mask of 255.0.0.0, make sure the computer used for Switch management has a non-conflicting IP address in the 10.0.0.0/8 subnet.

Before you use it, the IP settings or enabled status of the Ethernet Management port can also be changed through the console port. To change the configuration of the Management port, use the following commands

```
DGS-6600:2>enable
DGS-6600:15#configure terminal
DGS-6600:15(config)#mgmt-if
DGS-6600:15(mgmt-if)#ip address 10.78.62.51/8
DGS-6600:15(mgmt-if)#end
DGS-6600:15#
```

To view the status or IP settings, use the command:

```
DGS-6600:15#show mgmt-if
Management Interface
-----
Admin Status       : Up
IPv4 Address       : 10.78.62.51/8
Default Gateway    : 10.1.1.254
IPv6 Address       : ::/0
IPv6 Default Gateway : ::
IP MTU             : 1500
Link Status        : Up
DGS-6600:15#
```

To save configuration changes refer to the following: Saving Configuration Changes on page 46.

The Switch CM is also assigned a unique MAC address by the factory. This MAC address cannot be changed, and can be found by entering the command **show system** into the command line interface. The MAC address of the CM management ethernet port can be seen below in the information section for Slot 1

```
DGS-6600:15(mgmt-if)#show system

Device Type           :Chassis-based High-Speed Switch
First MAC Address     :00:01:02:03:04:00
Number of MAC Address(es) :4096

Slot: 1
Hardware Version     :0A1G
Bootloader Version   :1.00.001
Firmware Version     :1.00.021
S/N                  :123456789-123456789-123456789-0123456789
Model Name           :DGS-6600-CM
First MAC Address     :06:60:0c:10:00:35
Number of MAC Address(es) :1

Slot: 4
Hardware Version     :0A1G
Bootloader Version   :1.00.001
Firmware Version     :1.00.021
S/N                  :123456789-123456789-123456789-0123456789
Model Name           :DGS-8000-48P
First MAC Address     :00:01:02:03:04:00
Number of MAC Address(es) :48
```

The Switch's MAC address also appears in the Device Information and System Information windows of the Web-based management interface.

Password Protection

The switches do not have a default user name and password. One of the first tasks when settings up the Switch is to create user accounts. Logging in using a predefined administrator-level user name will give the user privileged access (Privileged EXEC) to the Switch's management software.

After the initial login, define new passwords for both default user names to prevent unauthorized access to the Switch, and record the passwords for future reference.

To create an administrator-level account for the Switch, do the following:

Creating User Accounts

The Switch supports user accounts with different access levels. The following access levels can be assigned to user accounts, Level 1, Level 2, Level 12, & Level 15. If another level is specified, an error message will be displayed on the console.

When a user logs in with a Level 1 or Level 2 account, the user will access the Switch in user EXEC mode. In order to access higher privilege levels, a user needs to use the **enable** command. However, if a user logs onto the Switch using a Level 1 user account, they will not be allowed to enter privileged EXEC mode.

When a user logs in with a user account that has a privilege level of 12 or 15, the user will directly enter privileged EXEC mode.

When creating a user account, the user can specify if the password will be entered in encrypted or plain text form. If a password is entered into the Switch in plain-text form, but the password encryption function is enabled, the password will be converted to encrypted form.



NOTICE: Make sure that the password is changed correctly before saving the changes to the startup configuration

To create a new user account, use the following command in global configuration mode:

```
DGS-6600:15(config)#username admin privilege 15 password plain-text mypassword
DGS-6600:15(config)#
```

The command creates a user with the administrator level 15 (Privileged EXEC) and account username *admin*. The password is *mypassword* which is not encrypted. To save configuration changes refer to the following: Saving Configuration Changes on page 46.

Saving Configuration Changes

When making changes to the DGS-6604 configuration you must copy the current configuration (running-config) to the Start-up configuration (startup-configuration). If this configuration copy is not performed the next bootup of the switch will not initialize with the changes made and they will be lost. Use this command after making changes you want to save:

```
DGS-6600:15#copy running-config startup-config
Save system configuration (y/n) [n]?Y
Configuration has been copied successfully.
DGS-6600:15#
```

SNMP Settings

Simple Network Management Protocol (SNMP) is an OSI Layer 7 (Application Layer) designed specifically for managing and monitoring network devices. SNMP enables network management stations to read and modify the settings of gateways, routers, switches and other network devices. Use SNMP to configure system features for proper operation, monitor performance and detect potential problems in the Switch, switch group or network.

Managed devices that support SNMP include software (referred to as an agent), which runs locally on the device. A defined set of variables (managed objects) is maintained by the SNMP agent and used to manage the device. These objects are defined in a Management Information Base (MIB), which provides a standard presentation of the information controlled by the on-board SNMP agent. SNMP defines both the format of the MIB specifications and the protocol used to access this information over the network.

The Switch supports SNMP versions 1, 2c, and 3. The administrator may specify which version of SNMP to use to monitor and control the Switch. The three versions of SNMP vary in the level of security provided between the management station and the network device.

In SNMP v.1 and v.2, user authentication is accomplished using 'community strings', which function like passwords. The remote user SNMP application and the Switch SNMP must use the same community string. SNMP packets from any station that has not been authenticated are ignored (dropped).

The default community strings for the Switch used for SNMP v.1 and v.2 management access are:

"public - Allows authorized management stations to retrieve MIB objects.

"private - Allows authorized management stations to retrieve and modify MIB objects.

SNMP v.3 uses a more sophisticated authentication process that is separated into two parts. The first part is to maintain a list of users and their attributes that are allowed to act as SNMP managers. The second part describes what each user on that list can do as an SNMP manager.

The Switch allows groups of users to be listed and configured with a shared set of privileges. The SNMP version may also be set for a listed group of SNMP managers. Thus, a group of SNMP managers can be created to view read-only information or receive traps using SNMP v.1 while assigning a higher level of security to another group, granting read/write privileges using SNMP v.3.

Using SNMP v.3 individual users or groups of SNMP managers can be allowed to perform or be restricted from performing specific SNMP management functions. The functions allowed or restricted are defined using the Object Identifier (OID) associated with a specific MIB. An additional layer of security is available for SNMP v.3 in that SNMP messages may be encrypted. To read more about how to configure SNMP v.3 settings for the Switch read the section entitled Management.

Traps

Traps are messages that alert network personnel of events that occur on the Switch. The events can be as serious as a reboot (someone accidentally turned OFF the Switch), or less serious like a port status change. The Switch generates traps and sends them to the trap recipient (or network manager). Typical traps include trap messages for Authentication Failures, Topology Changes and Broadcast\Multicast Storms. The current traps generated by the DGS-6600 are limited to only inband IPv4 events.

Management Information Base (MIB)

The Switch in the Management Information Base (MIB) stores management and counter information. The Switch uses the standard MIB-II Management Information Base module. Consequently, values for MIB objects can be retrieved from any SNMP-based network management software. In addition to the standard MIB-II, the Switch also supports its own proprietary enterprise MIB as an extended Management Information Base. The proprietary MIB may also be retrieved by specifying the MIB Object Identifier. MIB values can be either read-only or read-write.

Chapter 5 Web-based Switch Management

Introduction

Enabling and Configuring the Web User Interface

Logging onto the Web Manager

Web-based User Interface (Web UI)

Configuring the Management Interface using the Web UI

Introduction

Some of the software functions of the Switch can be managed, configured, and monitored via the embedded web-based (HTML) interface. Manage the Switch from remote stations anywhere on the network through a standard browser, such as Internet Explorer 5.5 or later, Netscape 8.0 or later, or Firefox 2.0 or later. The browser acts as a universal access tool and can communicate directly with the Switch using the HTTP protocol. user can



NOTE: Only one user can be logged into the Switch using the Web UI.

The Web-based management module and the Console or Telnet module are different ways to access the same internal switching software and configure it. The settings in the Web-based management module are only a small subset of all the functions found through the Console or Telnet CLI. The following is a list of the Web UI functionality:

Table 5-1 Web UI Configuration Functionality

Configuration Item	Display Configuration	Edit Configuration
Device Information	Y	N
Slot 1 Information	Y	N
Slot 3 Information	Y	N
Protocol Status	Y	N
Management Interface Settings	Y	Y
System Logging Settings	Y	Y
System Log Servers	Y	Y
Interface Settings	Y	Y
CPU Utilization	Y	N
Environment Temperature	Y	N
Environmentn Fans	Y	N
Power Status	Y	N

Enabling and Configuring the Web User Interface

To re-enable the Web interface after it has been disabled by the user, enter the following CLI commands in privileged EXEC mode:

```
DGS-6600:2>enable
DGS-6600:15#configure terminal
DGS-6600:15(config)#ip http server
DGS-6600:15(config)#end
DGS-6600:15#
```

The following example shows how to configure the TCP port number for the WEB UI to be 8000:

```
DGS-6600:2>enable
DGS-6600:15#configure terminal
DGS-6600:15(config)#ip http service-port 8000
DGS-6600:15(config)#end
DGS-6600:15#
```

Display the Web UI settings as per the example below (blue text):

```
DGS-6600:15(config)#show system protocol-state
Password Encryption           :Disabled
SNMP Server                   :Disabled
Sys Logging                   :Enabled
TELNETv4                     :Enabled(TCP:23)
TELNETv6                     :Enabled(TCP:23)
WEB                           :Enabled(TCP:8000)
SSH                           :Disabled(TCP:22)
IP Domain Lookup             :N.A
RMON                          :Disabled
Spanning Tree Version        :Enabled(MSTP)
LACP                          :Enabled
802.1x                        :Disabled
GVRP                          :Disabled
RIP                           :Enabled
OSPF                           :Enabled
BGP                           :Disabled
Multicast Routing            :Disabled
DVMRP                         :Enabled
PIM-DM                       :Enabled
PIM-SM                       :Enabled
IGMP Snooping                :Enabled
IGMP                          :Enabled
DHCPv4 Relay                  :Disabled
DHCPv4 Client                 :Enabled
DHCPv4 Server                 :Disabled
AAA Authorization            :Disabled
Vlan Tunnel                   :Disabled
RIPng                         :Disabled
OSPFv3                       :Disabled
IPv6 DHCP Relay              :Disabled
IPv6 DHCP Client              :Disabled
VRRP                          :Enabled
DGS-6600:15(config)#
```

Logging onto the Web Manager

To begin managing the Switch, simply run the browser installed on your computer and point it to the IP address you have defined for the device. The URL in the address bar should read something like: `http://123.123.123.123`, where the numbers 123 represent the IP address of the Switch.

NOTE: The factory default IP address is 10.90.90.90

This opens the Web UI user authentication window, as seen below.



Enter a username and password in the fields provided and click OK. If this is the first time accessing the switch or no usernames have been configured you can leave the fields blank and click OK. This will open the Web-based user interface. The Switch management features available in the web-based manager are explained below.

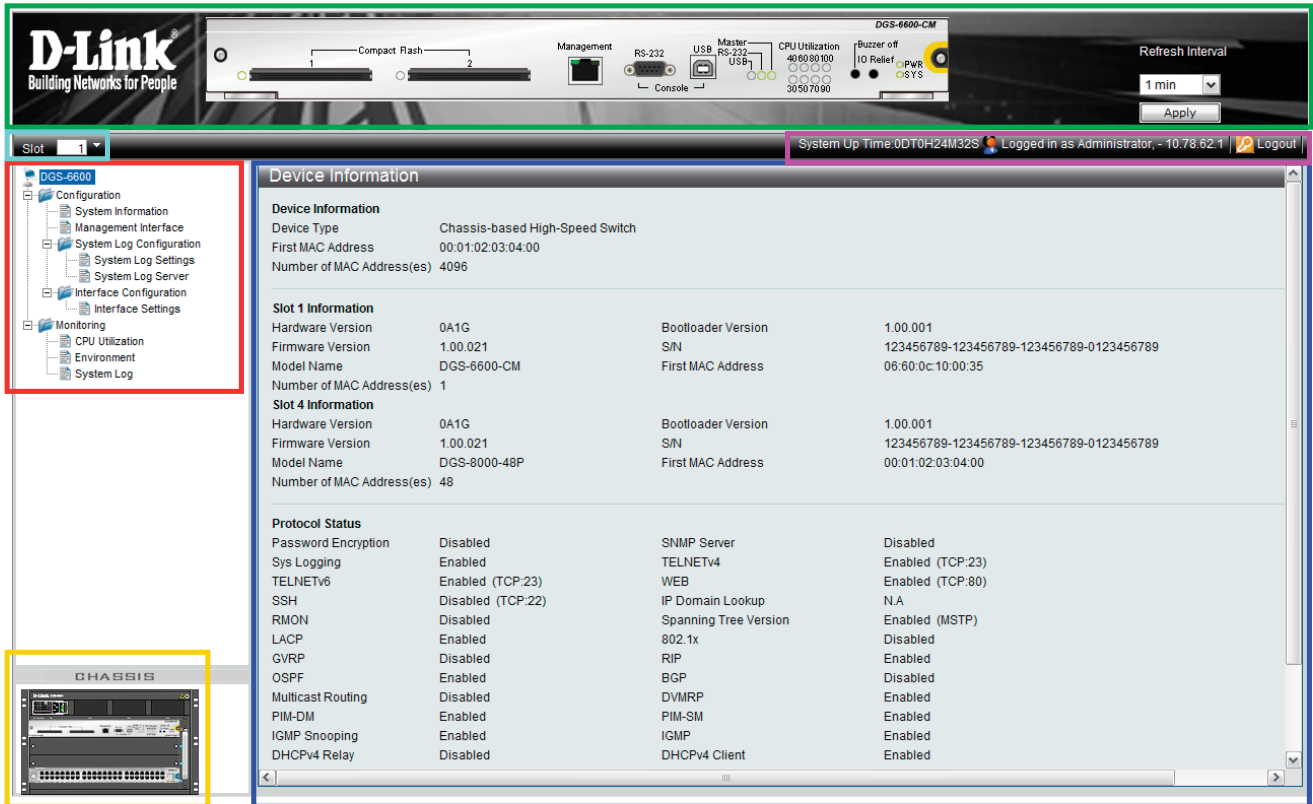
Web-based User Interface (Web UI)

The user interface provides:

- access to various Switch configuration and management windows.
- the user a view of various performance statistics.
- graphical monitoring of the system status.

Areas of the User Interface

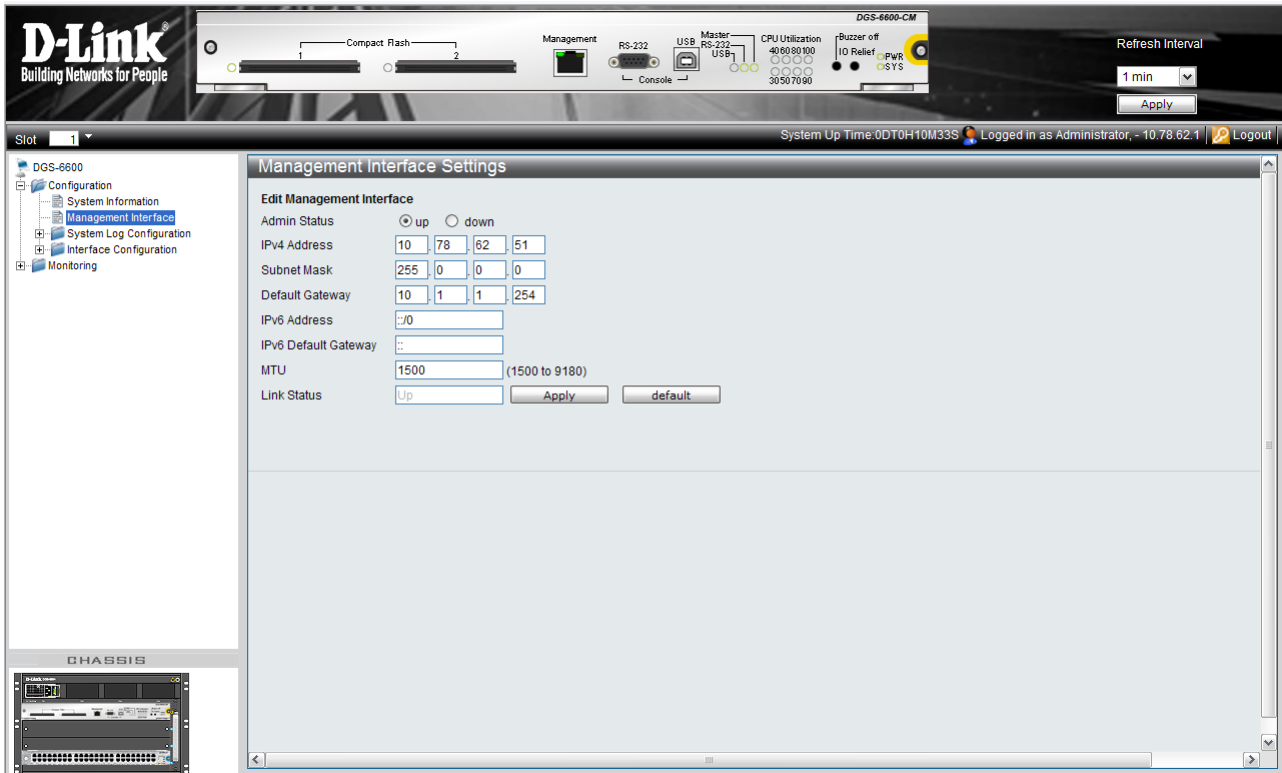
The figure below shows the user interface. 6 areas divide the user interface and are described in the table below.



Area	Function
Green	Presents a graphical near real-time image of the front panel of the module selected (slots 1 to 4). This area displays the Module's LED activity, ports, buttons and specific module features depending on the slot. Click the D-Link logo to go to the D-Link Website. Select the Refresh Interval time from the drop down menu on the right and then click the Apply button to set the interval when the specific modules LED's will be updated in the graphical view.
Light Blue	To display the module in a different slot click on the drop-down menu to select the chassis slot (slots 1-4) desired. The realtime front view of the new module chosen should appear in the green area.
Red	Select the folder or window to display. Open folders and click the hyperlinked window buttons and subfolders contained within them to display windows.
Yellow	This area provides a chassis view with the currently installed modules and power supplies.
Blue	Displays the Switch parameter status based on user selection (in the red area) and also provides configuration data fields and drop-down menus for settable parameters.
Pink	Displays the system uptime in days, hours, minutes and seconds. Displays the currently logged in Username and IP address of the user. Provides a logout button. Click the Logout word to logout of the Web UI.

Configuring the Management Interface using the Web UI

1. In the folder window expand the Configuration folder by clicking on the Plus (+) symbol to the left.
2. Then click on the Management Interface item in the newly expanded list.
3. Enter the desired IPv4 or IPv6 address and network parameters in the fields provided.
4. Click on the Apply button.
5. You will need to re-login to the Web UI with the new IP address.



Chapter 6 Maintenance

DGS-6604 Monitoring Function

Maintaining the DGS-6604 Hardware

Remote Maintenance

DGS-6604 Monitoring Function

Each board installed in the DGS-6604 features a System LED, which can be used to monitor the status of each board installed in the DGS-6604 while the Switch is running. If the System LED on a line card is red, a fault has occurred on the line card and some diagnostics will need to be carried out to establish the root cause.

If the LED on the DGS-6600-FAN fan tray is red, one or more of the fans on the tray has failed.

The LED on the front of the DGS-6600-PWR power module will be off if it has failed and should be replaced as soon as possible.

The user can execute various CLI commands to monitor the status of the Switch, including the following:

- Whether a switch slot has a line card inserted in it or module port has a module installed in it.
- A port's status and configuration information.
- The operating status of the power supplies and fan tray.
- The Switch's temperature.

Please see the *DGS-6604 Configuration Guide* for more information on the commands that are used for monitoring the DGS-6604.

Maintaining the DGS-6604 Hardware

Maintaining the DGS-6604 Boards

If a board in the DGS-6604 fails due to a fault, replace the board using the procedure outlined in *Installing Line Cards in the DGS-6604* on page 33.

Maintaining the Ventilation System

- The fan in the Switch sends regular status updates to inform the Switch about its health. If the fan fails, an alarm will be raised to inform the user.
- If a fan needs to be replaced, carry out the following:
 1. Loosen the fastening screws on the fan tray.
 2. Replace the fan that has failed with a working fan.
 3. Tighten the fastening screws on the fan tray.



NOTE: When replacing a faulty fan, it is recommended to clean the air filter of the DGS-6600.

Maintaining the Power Supply

Carry out the following to replace a faulty power supply:

1. Hold the power cable and gently pull the cable clip to the left to release the cable from the cable clip.
2. Disconnect the power cable from the power supply.
3. Lightly push the the green lever on the power supply to the left-hand side and unplug the faulty power module.
4. Install a replacement power module in the vacant power supply slot.
5. Reconnect the power cables.

Remote Maintenance

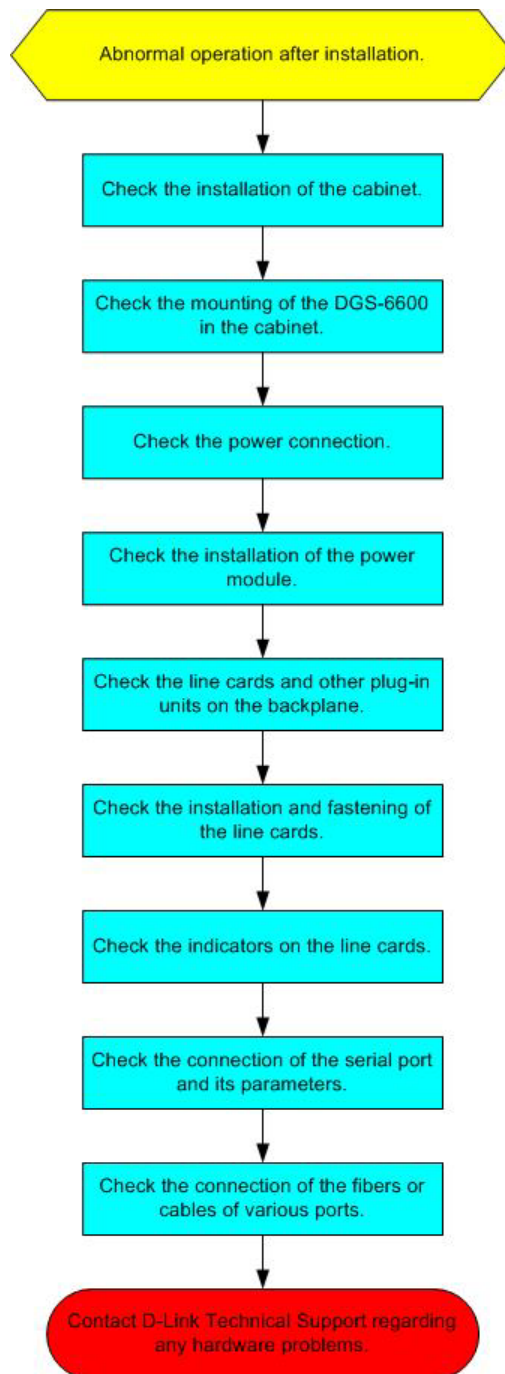
Remote maintenance is supported by the DGS-6604. When installation of the Switch is complete, the user can connect the Switch to the Internet. The user can then use the Internet to to establish a Telnet connection to the Switch.

Chapter 7 Troubleshooting

General Flow for Troubleshooting Installation Faults

Common Troubleshooting Procedures

General Flow for Troubleshooting Installation Faults



Common Troubleshooting Procedures

Fault 1: The system login password has been forgotten.

Description:

The Switch's system login password has been forgotten or lost, making it impossible to login and configure the Switch.

Troubleshooting:

To resolve this issue please contact the D-Link Customer Service Department for technical support.

Fault 2: The AC power module is not working.

Description:

The System LED of each line card is OFF, the power module LED is OFF, the fan tray LEDs are OFF, and the fans are not working.

Troubleshooting:

1. Check if all the cabinet's cables have been correctly connected.
2. Check whether the power cables are firmly connected to the cabinet power sockets and power modules.
3. Check if the power modules have been installed correctly.
4. Check if the connectors on the backboard of the power system are tightened.
5. Check the AC power source.

Fault 3: The line card LEDs do not light as expected when the Switch is powered on.

Description:

The line card's System LED is OFF, flashing GREEN, or RED. The line card's Link/Act LED is solid ON when no network cable or fiber optic cable is plugged in. The fault remains after a restart.

Troubleshooting:

Check if the line card has become loose. If the line card has become loose, re-install the line card, ensuring that it has been inserted in the right position, and tighten the fastening screws. If the line card still does not work, check if the connector on the back of the slot on the backplane is loose and check if the guiding rails for the slot have become distorted. If there is a problem with the backplane's slot or the guiding rails have become distorted, try to install the line card in another slot. If the slot or connection is not the cause of the problem, send the line card back for repair.

Fault 4: The LEDs on a line card start to behave strangely after the line card has been working for a while.

Description:

The line card's Status LED suddenly turns OFF, starts to flash, or lights RED. The line card's Link/Act LED lights solidly when no network cable or fiber optic cable is plugged in. The fault remains after a restart.

Troubleshooting:

Check if the line card has become loose. If the line card has become loose, re-install the line card, ensuring that it has been inserted in the right position, and tighten the fastening screws. If the line card still does not work, check if the connector on the back of the slot on the backplane is loose and check if the guiding rails for the slot have become distorted. If there is a problem with the backplane's slot or the if the guiding rails have become distorted, try to install the line card in another slot. If the slot or connection is not the cause of the problem, return the line card for repair.

Fault 5: The LED of the control management module is abnormal.

Description:

The control management module's LED becomes abnormal after the board is powered on or after it has been working for some time. For example, the Status LED is flashing or turned off.

Troubleshooting:

Check if the management module has become loose. If the management module has become loose, re-install the management module, ensuring that it has been inserted in the right position, and tighten the fastening screws. If the management module still does not work, check if the connector on the back of the slot on the backplane is loose and check if the guiding rails for the slot have become distorted.

Fault 6: The fan tray does not work the fan tray's LED behavior is unusual.

Description:

After the system has started, the fans in the fan tray do not work or the Power LED is OFF, and the Alarm LED is RED.

Troubleshooting:

Check if there is a secure connection between the fan tray and the backplane. If there is a secure connection, the fan tray needs to be replaced.

Fault 7: There is no output from the console when connected to the serial port.

Description:

There is no information displayed in the serial port console after the Switch has been powered on.

Troubleshooting:

Check if the serial port cables have been connected properly and if the console and the Switch have the same type of serial port. Check that the configuration of the serial port is identical to the configuration described in the *DGS-6604 Configuration Guide*. If the configuration of the serial port does not match the settings specified in the *DGS-6604 Configuration Guide*, modify the serial port parameters so that it matches. If this does not solve the problem, please contact the D-Link Customer Service Department for technical support.

Fault 8: Illegible characters appear in the serial port console.

Description:

Illegible characters appear in the serial port console.

Troubleshooting:

These kinds of problems usually relate to the serial port's settings. Check that the serial port's settings, such as the baud rate, are identical to the settings described in the *DGS-6604 Configuration Guide*.

Appendix A Technical Specifications

Technical Specifications

General	
Module slots	4 (1 slot for the CPU Management Module and 3 for Line Cards)
Number of supported VLANs	4094 VLAN groups
Layer 2 protocols	IEEE: 802.3, 802.3u, 802.3z, 802.3ae, 802.3x, 802.3af, 802.3ab, 802.1X RSPAN, IGMP Snooping, Jumbo Frame (1,536-9,728 bytes), GVRP, STP/RSTP/MSTP, Link Aggregation, Port Mirroring, VLAN/Protocol Base VLAN/Hybrid VLAN/VLAN-tunnel
Layer 3 protocols	RIPv1/v2, OSPFv2, OSPFv3, BGPv4, RIPv4, PIM-SM, ECMP/WCMP, VRRP, ARP, IGMPv1/v2/v3, DVMRP, PIM-DM
Management mode	RJ45 out of band management port, SNMP v1, SNMP v2c, SNMP v3, Telnet, Web
Other protocols	VRRP, DHCPv4/v6 client, DHCP relay, DHCP Server, Syslog, QoS, ACLv4/v6, SNMPv1/v2/v3, SNTP
Control Module	DGS-6600-CM
I/O Module	DGS-6600-48T, DGS-6600-48S, DGS-6600-48TS, DGS-6600-8XG
Fan Tray	DGS-6600-FAN
Hot-swap ability	Supported on all cards except DGS-6600-CM

Environment	
EMC	EMC (Class A): <ul style="list-style-type: none"> • FCC Part 15 • CSA C108.8 • 89/336/EEC • EN 55022 • EN 61000-3-2 • EN 61000-3-3 • EN 61000-4-2 • EN 61000-4-3 • EN 61000-4-4 • EN 61000-4-5 • EN 61000-4-6 • EN 61000-4-11 • EN 55024 • AS/NZS 3548 • VCCI V-3 • BSMI
Safety Regulations	<ul style="list-style-type: none"> • UL 1950 • CSA C22.2 No. 950 • 73/23/EEC • EN 60825 • EN 60950 • IEC 950
Operating Temperature	0~50°C (32~122°F)
Storage Temperature	-40~70°C (-40~158°F)
Operating Humidity	10% - 90% RH (non-condensed)

Power Supply / Fan	
Power Supply	<p>Rated voltage : 110 VAC 220 VAC</p> <p>Tolerance range : 90~264 VAC</p> <p>Power consumption: 853.5 W/set</p> <p>Heat Dissipation: 2912.4 BTU/hr@110V 2912.4 BTU/hr@220V</p>
Power Supply Redundancy	Supported - all power supplies must be of the same type (AC only).
Fan	<p>The DGS-6600-FAN fan tray is hot-swappable and has an alarm feature to alert the user of any faults.</p> <p>Power Consumption: 42.3 Watts</p> <p>Heat Dissipation: 144 BTU/Hour</p>

Weight	
Main Unit	21.6 Kilograms (47.6 Pounds)

Dimensions	
Millimeters	484 (width) * 280 (height) * 470 (depth)
Inches	19.06 (width) * 11.02 (height) * 18.5 (depth)

Connection Modules

The DGS-6604 supports several types of SFP and XFP modules to suit the requirements of the user's network. The tables below list the available SFP and XFP modules.

SFP Module Models and Technical Specifications

Model	Description	Media Type	Transmission Distance	Standard Compliance
DEM-310GT	1000 Base-LX	Single-mode	10KM	IEEE 802.3z Full-duplex
DEM-311GT	1000 Base-SX	Multi-mode	550M	
DEM-312GT2	1000 Base-SX	Multi-mode	2KM	
DEM-314GT	1000 Base-LX	Single-mode	50KM	
DEM-315GT	1000 Base-LX	Single-mode	80KM	
DEM-330T/R	WDM Transceiver	Single-mode	10KM	
DEM-331T/R	WDM Transceiver	Single-mode	40KM	
DEM-210T	100 Base-FX	Multi-mode	2KM	
DEM-211T	100 Base-FX	Single-mode	15KM	

Table A-1 Supported SFP Module Technical Specifications

XFP Module Models and Technical Specifications

Model	Description	Media Type	Transmission Distance	Standard Compliance
DEM-421XT	10G Base-SR	Multi-mode	300M	IEEE 802.3ae Full-duplex XFP MSA compliant transceiver
DEM-422XT	10G Base-LR	Single-mode	10KM	
DEM-423XT	10G Base-ER	Single-mode	40KM	

Table A-2 Supported XFP Module Technical Specifications

Appendix B Connectors and Connection Media

1000BASE-T/100BASE-TX/10BASE-T Port

A 1000BASE-T/100BASE-TX/10BASE-T port is a port that can automatically adjust between three different speed rates and automatically determine whether to operate in MDI or MDIX crossover mode. In order to take advantage of the 1000BASE-T speed rate, the user needs to use CAT5e or higher cabling, which supports a maximum length of 100M. The 1000-BASE-T speed rate complies with IEEE 802.3ab. The Switch's 1000BASE-T port uses all four pairs of the cable for transmission. The following diagram shows how the twisted pair cables are connected for a 1000BASE-T port.

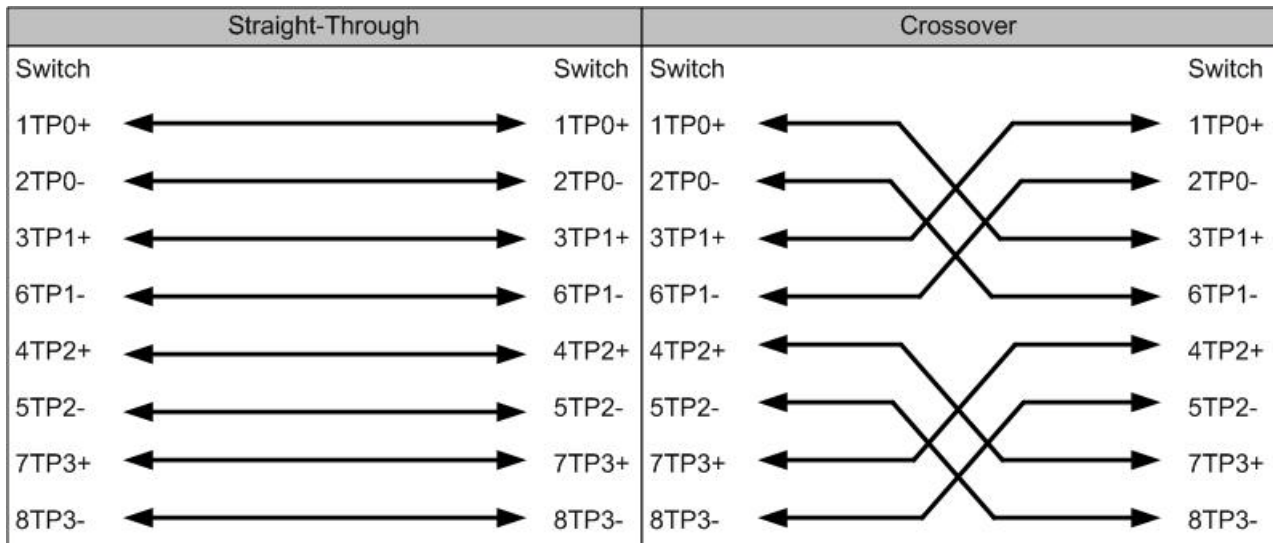


Figure B-1 Straight-Through Vs Crossover Schematic Diagram for the four twisted pair required for 1000BASE-T

In addition to the cable types described above, 100BASE-TX/10-BASE-T connections can also use lower grade cabling, such as 100-ohm Category 3, 4, and 5 cables for 10Mbps connections, and 100-ohm Category 5 cables for 100Mbps connections, which can be run for a length of up to 100 Meters. The following table shows the pinouts used by 100BASE-TX/10BASE-T.

Pin	Socket	Plug
1	Input Receive Data+	Output Transmit Data+
2	Input Receive Data-	Output Transmit Data-
3	Output Transmit Data+	Input Receive Data+
6	Output Transmit Data-	Input Receive Data-
4,5,7,8	Not Used	Not Used

Table B-1 Pinouts for 10BASE-T/100BASE-TX

The following diagram shows how the twisted pair cables are connected for a 10BASE-T/100BASE-TX straight-through and crossover connection.

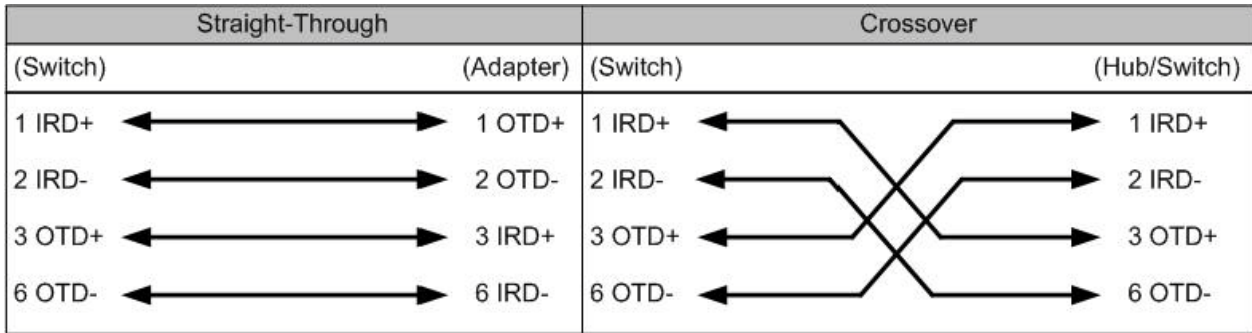


Figure B-1 Straight-Through Vs Crossover Schematic Diagram for the four twisted pair required for 10BASE-T/100BASE-TX

Optical Fiber Connection

If using fiber-optic ports, be sure to select the correct fibre cables. Fiber modules can use either single-mode or multi-mode fibre cables. The following diagram shows the schematic diagram for a fiber-optic connection.

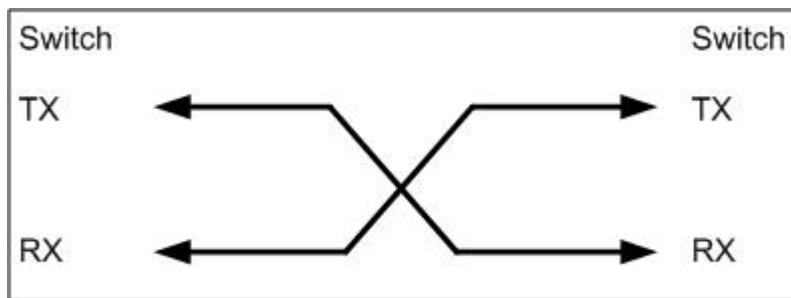


Figure B-2 Fiber-Optic Schematic Diagram

Subject to the terms and conditions set forth herein, D-Link Systems, Inc. ("D-Link") provides this Limited Warranty:

- Only to the person or entity that originally purchased the product from D-Link or its authorized reseller or distributor, and
- Only for products purchased and delivered within the fifty states of the United States, the District of Columbia, U.S. Possessions or Protectorates, U.S. Military Installations, or addresses with an APO or FPO.

Limited Warranty: D-Link warrants that the hardware portion of the D-Link product described below ("Hardware") will be free from material defects in workmanship and materials under normal use from the date of original retail purchase of the product, for the period set forth below ("Warranty Period"), except as otherwise stated herein.

Limited Lifetime Warranty for the product is defined as follows:

- Hardware: For as long as the original customer/end user owns the product, or five (5) years after product discontinuance, whichever occurs first (excluding power supplies and fans)
- Power supplies and fans: Five (5) Years
- Spare parts and spare kits: Ninety (90) days

The customer's sole and exclusive remedy and the entire liability of D-Link and its suppliers under this Limited Warranty will be, at D-Link's option, to repair or replace the defective Hardware during the Warranty Period at no charge to the original owner or to refund the actual purchase price paid. Any repair or replacement will be rendered by D-Link at an Authorized D-Link Service Office. The replacement hardware need not be new or have an identical make, model or part. D-Link may, at its option, replace the defective Hardware or any part thereof with any reconditioned product that D-Link reasonably determines is substantially equivalent (or superior) in all material respects to the defective Hardware. Repaired or replacement hardware will be warranted for the remainder of the original Warranty Period or ninety (90) days, whichever is longer, and is subject to the same limitations and exclusions. If a material defect is incapable of correction, or if D-Link determines that it is not practical to repair or replace the defective Hardware, the actual price paid by the original purchaser for the defective Hardware will be refunded by D-Link upon return to D-Link of the defective Hardware. All Hardware or part thereof that is replaced by D-Link, or for which the purchase price is refunded, shall become the property of D-Link upon replacement or refund.

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Non-Applicability of Warranty: The Limited Warranty provided hereunder for Hardware and Software portions of D-Link's products will not be applied to and does not cover any refurbished product and any product purchased through the inventory clearance or liquidation sale or other sales in which D-Link, the sellers, or the liquidators expressly disclaim their warranty obligation pertaining to the product and in that case, the product is being sold "As-Is" without any warranty whatsoever including, without limitation, the Limited Warranty as described herein, notwithstanding anything stated herein to the contrary.

Submitting A Claim: The customer shall return the product to the original purchase point based on its return policy. In case the return policy period has expired and the product is within warranty, the customer shall submit a claim to D-Link as outlined below:

- The customer must submit with the product as part of the claim a written description of the Hardware defect or Software nonconformance in sufficient detail to allow D-Link to confirm the same, along with proof of purchase of the product (such as a copy of the dated purchase invoice for the product) if the product is not registered.
- The customer must obtain a Case ID Number from D-Link Technical Support at 1-877-453-5465, who will attempt to assist the customer in resolving any suspected defects with the product. If the product is considered defective, the customer must obtain a Return Material Authorization ("RMA") number by completing the RMA form and entering the assigned Case ID Number at <https://rma.dlink.com/>.
- After an RMA number is issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit, and the RMA number must be prominently marked on the outside of the package. Do not include any manuals or accessories in the shipping package. D-Link will only replace the defective portion of the product and will not ship back any accessories.
- The customer is responsible for all in-bound shipping charges to D-Link. No Cash on Delivery ("COD") is allowed. Products sent COD will either be rejected by D-Link or become the property of D-Link. Products shall be fully insured by the customer and shipped to **D-Link Systems, Inc., 17595 Mt. Herrmann, Fountain Valley, CA 92708**. D-Link will not be held responsible for any packages that are lost in transit to D-Link. The repaired or replaced packages will be shipped to the customer via UPS Ground or any common carrier selected by D-Link. Return shipping charges shall be prepaid by D-Link if you use an address in the United States, otherwise we will ship the product to you freight collect. Expedited shipping is available upon request and provided shipping charges are prepaid by the customer.

D-Link may reject or return any product that is not packaged and shipped in strict compliance with the foregoing requirements, or for which an RMA number is not visible from the outside of the package. The product owner agrees to pay D-Link's reasonable handling and return shipping charges for any product that is not packaged and shipped in accordance with the foregoing requirements, or that is determined by D-Link not to be defective or non-conforming.

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CE Mark Warning: This is a Class A product. In a residential environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

FCC Statement: 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 in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. Operation of this equipment in a residential environment is likely to cause harmful interference to radio or television reception. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

For detailed warranty information applicable to products purchased outside the United States, please contact the corresponding local D-Link office.

Product Registration

Register your D-Link product online at <http://support.dlink.com/register/>

Product registration is entirely voluntary and failure to complete or return this form will not diminish your warranty rights.

Tech Support

Technical Support

You can find software updates and user documentation on the D-Link website.

D-Link provides free technical support for customers within the United States and within Canada for the duration of the service period, and warranty confirmation service, during the warranty period on this product. U.S. and Canadian customers can contact D-Link technical support through our website, or by phone.

Tech Support for customers within the United States:

D-Link Technical Support over the Telephone:

USA - 877-DLINK-55 (877-354-6555)

D-Link Technical Support over the Internet:

<http://support.dlink.com>

Tech Support for customers within Canada:

D-Link Technical Support over the Telephone:

877-354-6560

D-Link Technical Support over the Internet:

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Home Wireless/Broadband 0871 873 3000 (9.00am–06.00pm, Sat 10.00am-02.00pm)
Managed, Smart, & Wireless Switches, or Firewalls 0871 873 0909 (09.00am – 05.30pm)
(BT 10ppm, other carriers may vary.)

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All Products 1890 886 899 (09.00am-06.00pm, Sat 10.00am-02.00pm)
€ 0.05ppm peak, €0.045ppm off peak Times

Internet

<http://www.dlink.co.uk>

<ftp://ftp.dlink.co.uk>

Technische Unterstützung

Deutschland:	Web:	http://www.dlink.de
	Telefon:	+49(0)1805 2787 0,14 € pro Minute
	Zeiten:	Mo. –Fr. 09:00 – 17:30 Uhr
Österreich:	Web:	http://www.dlink.at
	Telefon:	+43(0)820 480084 0,116 € pro Minute
	Zeiten:	Mo. –Fr. 09:00 – 17:30 Uhr
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Assistance technique D-Link par téléphone : 0820 0803 03

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0,067 €/min

De Lunes a Viernes de 9:00 a 19:00

<http://www.dlink.es>

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Supporto Tecnico dal lunedì al venerdì dalle ore 9.00 alle ore 19.00 con orario continuato

Telefono: 199400057

<http://www.dlink.it/support>

TECHNISCHE ONDERSTEUNING

Technische ondersteuning voor klanten in Nederland:

www.dlink.nl / 0900 501 2007 / €0.15per minuut.

Tech Support for customers within Belgium:

www.dlink.be / 070 66 06 40 / €0.175per minuut(spitsuren), €0.0875per minuut(daluren)

Technische ondersteuning voor klanten in Luxemburg:

www.dlink.be / +32 70 66 06 40

Pomoc techniczna

Telefoniczna pomoc techniczna firmy D-Link: 0 801 022 021

Pomoc techniczna firmy D-Link świadczona przez Internet:

<http://www.dlink.eu/support/>

Technická podpora

Web: <http://www.dlink.cz/support/>

E-mail: support@dlink.cz

Telefon ČR: +420 211 151 640 nebo SK: +421 (0)692 147 110

Telefonická podpora je v provozu: PO - PÁ od 09:00 do 17:00

Volání je zpoplatněno dle příslušných tarifů Vašeho operátora.

Technikai Támogatás

Tel. : 06 1 461-3001

Fax : 06 1 461-3004

Land Line 14,99 HUG/min - Mobile 49.99,HUF/min

email : support@dlink.hu

URL : <http://www.dlink.hu>

Teknisk Support

D-Link Teknisk Support over Internett: <http://www.dlink.no>

D-Link Teknisk telefonsupport: 820 00 755

(Hverdager 08:00-20:00)

Teknisk Support

D-Link teknisk support over telefonen: Tlf.: 9013 8899

Normale åbningstider: Hverdage kl. 08:00 - 20:00

D-Link teknisk support på Internettet: <http://www.dlink.dk>

Teknistä tukea asiakkaille Suomessa:

Internetin kautta : <http://www.dlink.fi>

Arkisin klo. 9 - 21

Numerosta : 0600 155 57

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D-Link Teknisk Support via Internet: <http://www.dlink.se>

D-Link Teknisk Support via telefon: 0900-100 77 00

Vardagar 08:00-20:00

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Assistência Técnica da D-Link na Internet:

<http://www.dlink.pt>

e-mail: soporte@dlink.es

Τεχνική Υποστήριξη

D-Link Hellas Support Center

Κεφαλληνίας 64, 11251 Αθήνα,

Τηλ: 210 86 11 114 (Δευτέρα- Παρασκευή 09:00-17:00)

Φαξ: 210 8611114

<http://www.dlink.gr/support>

Tehnička podrška

Hvala vam na odabiru D-Link proizvoda. Za dodatne informacije, podršku i upute za korištenje uređaja, molimo vas da posjetite D-Link internetsku stranicu na www.dlink.eu
www.dlink.biz/hr

Tehnična podpora

Zahvaljujemo se vam, ker ste izbrali D-Link proizvod. Za vse nadaljnje informacije, podporo ter navodila za uporabo prosimo obiščite D-Link - ovo spletno stran www.dlink.eu
www.dlink.biz/sl

Suport tehnic

Vă mulțumim pentru alegerea produselor D-Link. Pentru mai multe informații, suport și manuale ale produselor vă rugăm să vizitați site-ul D-Link www.dlink.eu
www.dlink.ro

Technical Support

You can find software updates and user documentation on the D-Link website.

Tech Support for customers in

Australia:

Tel: 1300-766-868
24/7 Technical Support
Web: <http://www.dlink.com.au>
E-mail: support@dlink.com.au

India:

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Tel: 0800-900-900
24/7 Technical Support
Web: <http://www.dlink.co.nz>
E-mail: support@dlink.co.nz

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08600 DLINK (for South Africa only)
Monday to Friday 8:30am to 9:00pm South Africa Time
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Technical Support

You can find software updates and user documentation on the D-Link website.

Tech Support for customers in

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Обновления программного обеспечения и документация доступны на Интернет-сайте D-Link. D-Link предоставляет бесплатную поддержку для клиентов в течение гарантийного срока. Клиенты могут обратиться в группу технической поддержки D-Link по телефону или через Интернет.

Техническая поддержка D-Link:

+7(495) 744-00-99

Техническая поддержка через Интернет

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SOPORTE TÉCNICO

Usted puede encontrar actualizaciones de softwares o firmwares y documentación para usuarios a través de nuestro sitio www.dlinkla.com

SOPORTE TÉCNICO PARA USUARIOS EN LATINO AMERICA

Soporte técnico a través de los siguientes teléfonos de D-Link

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Colombia	01800 - 9525465
Costa Rica	0800 - 0521478
Ecuador	1800 - 035465
El Salvador	800 - 6335
Guatemala	1800 - 8350255
México	01800 - 1233201
Panamá	011 008000525465
Perú	0800 - 00968
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Horario de atención Soporte Técnico en www.dlinkla.com

e-mail: sosporte@dlinkla.com & consultas@dlinkla.com

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Telefones

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*GO: 4052-1850 (Ligação local)

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如果您還有任何本使用手冊無法協助您解決的產品相關問題，台灣地區用戶可以透過我們的網站、電子郵件或電話等方式與D-Link台灣地區技術支援工程師聯絡。

D-Link 免付費技術諮詢專線

0800-002-615

服務時間：週一至週五，早上9:00到晚上9:00

(不含周六、日及國定假日)

網 站：<http://www.dlink.com.tw>

電子郵件：dssqa_service@dlink.com.tw

如果您是台灣地區以外的用戶，請參考D-Link網站全球各地分公司的聯絡資訊以取得相關支援服務。

產品保固期限、台灣區維修據點查詢，請參考以下網頁說明：

<http://www.dlink.com.tw>

產品維修：

使用者可直接送至全省聯強直營維修站或請洽您的原購買經銷商。

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Update perangkat lunak dan dokumentasi pengguna dapat diperoleh pada situs web D-Link.

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Dukungan Teknis D-Link melalui telepon:

Tel: +62-21-5731610

Dukungan Teknis D-Link melalui Internet:

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Technical Support

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ディーリンクジャパン Web サイト

URL:<http://www.dlink-jp.com>

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技术支持

办公地址：北京市东城区北三环东路 36 号 环球贸易中心 B 座
26F 02-05 室 邮编: 100013

技术支持中心电话：8008296688/ (028)66052968

技术支持中心传真：(028)85176948

各地维修中心地址请登陆官方网站查询

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Print, type or use block letters.

Your name: Mr./Ms _____

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Your title at organization: _____

Telephone: _____ Fax: _____

Organization's full address: _____

Country: _____

Date of purchase (Month/Day/Year): _____

Product Model	Product Serial No.	* Product installed in type of computer	* Product installed in computer serial No.

(* Applies to adapters only)

Product was purchased from:

Reseller's name: _____

Telephone: _____

Answers to the following questions help us to support your product:

1. Where and how will the product primarily be used?

Home Office Travel Company Business Home Business Personal Use

2. How many employees work at installation site?

1 employee 2-9 10-49 50-99 100-499 500-999 1000 or more

3. What network protocol(s) does your organization use ?

XNS/IPX TCP/IP DECnet Others _____

4. What network operating system(s) does your organization use ?

D-Link LANsmart Novell NetWare NetWare Lite SCO Unix/Xenix PC NFS 3Com 3+Open Cisco Network
Banyan Vines DECnet Pathwork Windows NT Windows 98 Windows 2000/ME Windows XP
Others _____

5. What network management program does your organization use ?

D-View HP OpenView/Windows HP OpenView/Unix SunNet Manager Novell NMS
NetView 6000 Others _____

6. What network medium/media does your organization use ?

Fiber-optics Thick coax Ethernet Thin coax Ethernet 10BASE-T UTP/STP
100BASE-TX 1000BASE-T Wireless 802.11b and 802.11g wireless 802.11a Others _____

7. What applications are used on your network?

Desktop publishing Spreadsheet Word processing CAD/CAM
Database management Accounting Others _____

8. What category best describes your company?

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9. Would you recommend your D-Link product to a friend?

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