



# DirectIP™ Gigabit PoE Switch

Operation Manual

*DH-2112PF*

*DH-2128PF*

# Before reading this manual

This operation manual contains basic instruction on installing and using DirectIP™ Gigabit PoE Switch, an IDIS product.

Users who are using this product for the first time, as well as users with experience using comparable products, must read this operation manual carefully before use and heed to the warnings and precautions contained herein while using the product. Safety warnings and precautions contained in this operation manual are intended to promote proper use of the product and thereby prevent accidents and property damage and must be followed at all times.

Once you have read this operation manual, keep it at an easily accessible location for future reference.



- Unauthorized reproduction of this manual is prohibited.
- The manufacturer will not be held responsible for any product damage resulting from the use of unauthorized parts and accessories or from the user's failure to comply with the instructions contained in this operation manual.
- It is recommended that first-time users of DirectIP™ Gigabit PoE Switch and individuals who are not familiar with its use seek technical assistance from their retailer regarding product installation and use.
- If you need to disassemble the product for functionality expansion or repair purposes, you must contact your retailer and seek professional assistance.
- Both retailers and users should be aware that this product has been certified as being electromagnetically compatible for commercial use. If you have sold or purchased this product unintentionally, please replace with a consumer version.

## Safety Symbols

Symbol	Type	Description
	<b>Warning</b>	An important instruction or set of important instructions that can lead to severe injury or even death if not followed.
	<b>Caution</b>	An instruction or set of instruction that can lead to personal injury and/or property damage if not followed.

## In-Text

Symbol	Type	Description
	<b>Caution</b>	Important information concerning a specific function.
	<b>Note</b>	Useful information concerning a specific function.

## FCC Compliance 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 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 THE INSTRUCTION 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 USERS WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT THEIR OWN EXPENSE.

**WARNING:** CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT. THIS CLASS OF DIGITAL APPARATUS MEETS ALL REQUIREMENTS OF THE CANADIAN INTERFERENCE CAUSING EQUIPMENT REGULATIONS.

## WEEE (Waste Electrical & Electronic Equipment)

### ***Correct Disposal of This Product***

***(Applicable in the European Union and other European countries with separate collection systems)***



This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

## Safety Precautions

Information contained in this section of the manual serve to prevent accidents and property damage through proper use of the product. Please read the following instructions carefully and follow them at all times.



### **Warning**

**Failure to comply can lead to severe injury or even death.**

## Installation

**Make sure to turn off the product before installing it and to use a dedicated power outlet.**

- Presents overheating, fire, and electric shock hazards.

## Safety Precautions

**Do not use the product in an excessively hot (50°C or above), cold (0°C or below), or humid environment.**

- Presents a fire hazard.

**Set up the product in a shaded area providing protection against exposure to direct sunlight and maintain an even ambient temperature. Do not set up the product in the vicinity of heat-generating objects and appliances such as candles and heaters.**

- Presents a fire hazard.

**There are high-voltage components inside the product. Do not attempt to open the cover or disassemble, repair, or modify the product.**

- Presents fire, electric shock, and physical injury hazards.

**Connection ports on the rear of the product protrude out slightly, and placing the back of the product too close to a wall will cause the cables to bend excessively and even break. Maintain a distance of at least 15cm between the back of the product and the wall it faces.**

- Presents fire, electric shock, and physical injury hazards.

**Do not use the product in an particularly humid, dusty, or sooty environment.**

- Presents electric shock and fire hazards.

**Always keep the operating environment clean and free of dust. Use a piece of dry cloth to clean the product. Do not use water, thinner, or organic solvents.**

- Failure to do so can damage the product's finish and presents an electric shock hazard.

## Power

**Voltage fluctuation of the power supply must be within 10% of the voltage rating, and the power outlet must be grounded. Do not plug in electrical appliances such as a hair dryer, iron, and refrigerator into the same power outlet as the product.**

- Presents overheating, fire, and electric shock hazards.

**Do not bend the power cable excessively or place heavy objects on top of it.**

- Presents a fire hazard.

**Do not pull on the power cable or handle the power plug with wet hands. Do not insert the power plug into a loose power outlet.**

- Presents fire and electric shock hazards.

## Product Use

**Do not place a cup or container filled with a liquid on top of the product.**

- The liquid may spill over and damage the product's internals and cause a fire hazard.

**Avoid dangerous situations such as placing the product or its power cable on a humid/wet floor, using an ungrounded extension cord, using a damaged (exposed) power cable, and failing to properly ground the product. Contact the retailer or a specialist if you encounter a problem.**

- Presents fire and electric shock hazards.

**If there is a strange noise or smell coming from the product, unplug the power cable and contact the service center right away.**

- Presents fire and electric shock hazards.



### **Caution**

**Failure to comply can lead to minor injury and/or product damage.**

## **Installation**

**Do not set up the product in an area that is exposed or susceptible to strong magnetism, radio waves, and/or impact and avoid setting up the product in the vicinity of wireless transmission devices such as a radio or a television.**

- Set up the product in an area devoid of magnetic objects, radio waves, and vibrations.

**Set up the product in an open and well-ventilated area.**

- Environmental factors greatly affect the product's performance and durability. Allow at least 15cm of clearance behind the product and at least 5cm of clearance on either side of the product.

**Set up the product on a flat and stable surface. Do not stand the product on its side or at an angle.**

- The product may tip over or drop on the floor, which can lead to a malfunction and/or personal injury.

**Ensure the product's power plug is easily accessible.**

- It must be easy to pull out the power plug in the event of a serious malfunction or fire.

**Do not set up the product in an area susceptible to strong impact or vibrations.**

- Failure to do so can cause the product to malfunction.

## **Product Use**

**Do not allow conductive objects to enter inside the product's ventilation openings.**

- Failure to do so can cause the product to malfunction.

**Do not place heavy objects on top of the product.**

- Failure to do so can cause the product to malfunction.

**Do not unplug the power cable or pick up/move the product while it is in operation.**

- Failure to do so can cause the product to malfunction.

**Always remember to turn off the product before connecting an optical cable.**

**Do not remove the optical cable's rubber cover until it's time to connect it to the product. The cover protects the cable from contamination. Once removed, store it at a safe location for future use.**

**Do not look directly into the tip of the optical cable or the laser beam emitting through it. In addition, do not point the laser at your eyes.**

**Regularly inspect the operating status of the product and contact the retailer or service center right away if any issues are identified.**

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# Part 1 - Introduction

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## Product Features

This multi-port, DirectIP™-based, and IEEE 802.3af and IEEE 802.3at Power over Ethernet-enabled Gigabit Switch offers the following features:

- **DirectIP™**

- Automatic network IP configuration
- Individual port data transmission to DirectIP™ NVR (Network Video Recorder)

- **PoE**

- IEEE 802.3af/at compliant
- Power to application over Ethernet cabling
- Central power control for greater network utility
- PoE alternate A power supply



Power feeding over 1/2 & 3/6 data twisted.

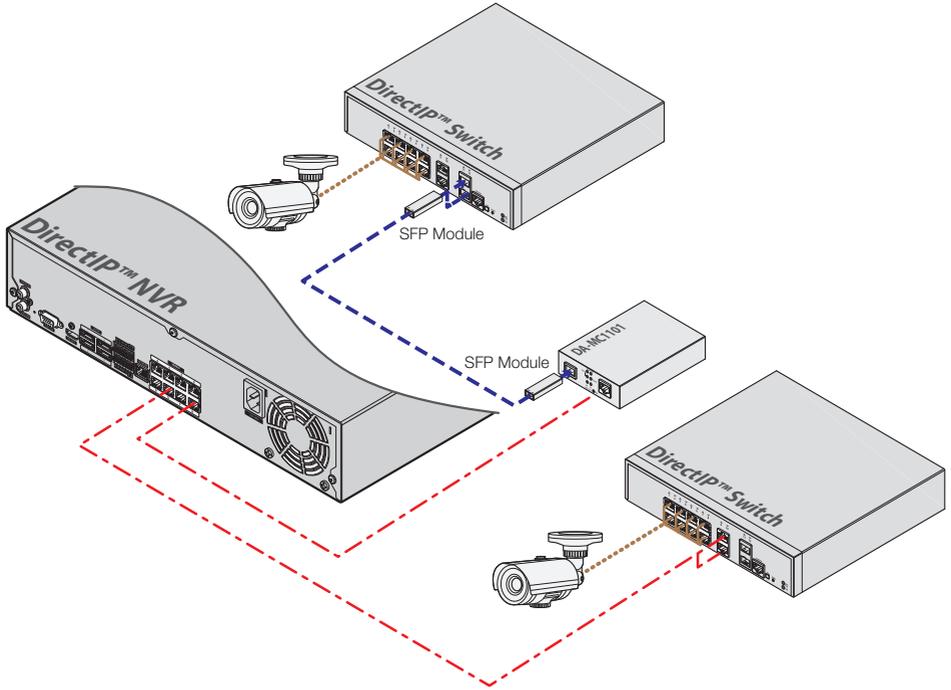
- **Advanced Interface**

- 1Gbps data transfer rate on all service and uplink ports
- Flexible uplink port select (RJ-45 or SFP) based on network environment

- **Network Security**

- IEEE 802.1x network login
- SSH-encrypted data protection (SSH v1/v2)
- L4-based ACL (Access Control List)

## DirectIP™ Gigabit PoE Switch Connection Diagram



### Types of Cables

	Optical Cable
	UTP Cable (Data only)
	UTP Cable (Data + PoE)

## Accessories

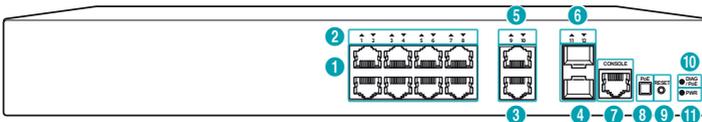
Upon unpackaging the product, check the contents inside to ensure that all the following accessories are included.

- DH-2112PF/2128PF
- Power Cable
- Installation Manual
- Rack Mount Brackets: 2EA
- Screws
  - DH-2112PF: 8EA
  - DH-2128PF: 4EA

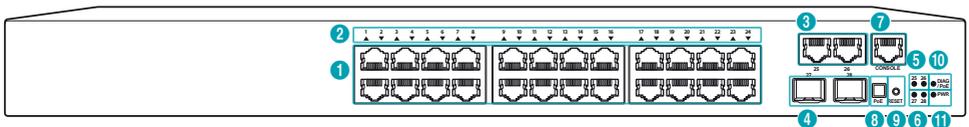
## Overview

### Front Panel

#### DH-2112PF



#### DH-2128PF



①	RJ-45 Service Ports	②	RJ-45 Service Port LEDs	③	RJ-45 Uplink Port(s)
④	SFP Uplink Ports	⑤	RJ-45 Uplink Port LEDs	⑥	SFP Uplink Port LEDs
⑦	Console Port	⑧	PoE LED Button	⑨	Reset Button
⑩	DIAG/PoE LED	⑪	Power LED		

① **RJ-45 Service Ports**

These are PoE-enabled RJ-45 ports. Connect a network camera to one of these ports.

Model	Port Number
DH-2112PF	1 - 8
DH-2128PF	1 - 24



- PD network cameras will receive power over the signal line, without the use of an external power source.
- Each port is enabled with Auto-MDI/MDI-X detection.
- The ports operate in different modes based on the network speed. (10/100Mbps: full/half duplex, 1000Mbps: full duplex)

② **RJ-45 Service Port LEDs**

These LEDs indicate the status of the RJ-45 service ports. The LEDs are mapped sequentially with port numbers from left to right.

Model	Port LEDs								
DH-2112PF	<table style="border: none; text-align: center;"> <tr> <td>▲</td> <td>▼</td> <td>▲</td> <td>▼</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>...</td> </tr> </table>	▲	▼	▲	▼	1	2	3	...
▲	▼	▲	▼						
1	2	3	...						
DH-2128PF	<table style="border: none; text-align: center;"> <tr> <td>1</td> <td>2</td> <td>3</td> <td>...</td> </tr> <tr> <td>▲</td> <td>▼</td> <td>▲</td> <td>▼</td> </tr> </table>	1	2	3	...	▲	▼	▲	▼
1	2	3	...						
▲	▼	▲	▼						



- The LED color indicates connection and communications speeds with the connected device.
- Each LED indicates LNK/ACT or PoE status based on the position of the PoE LED button.

## LED Status Indications

Mode	Status	Color	Description
LNK/ACT (Link/Activity)	On	Amber	Normal network connection at 10/100Mbps
		Green	Normal network connection at 1000Mbps
	Blinking	Amber	Data transmission over the network in progress at 10/100Mbps
		Green	Data transmission over the network in progress at 1000Mbps
	Off	-	No network connection or a problem with the connection
PoE (while PoE LED button is pressed)	On	Amber	Connected to an IEEE 802.3af powered device
		Green	Connected to an IEEE 802.3at powered device
	Off	-	Not connected to a powered device

### ③ RJ-45 Uplink Ports

RJ-45 uplink ports are used to connect the switch to a higher tier device. These ports are useful when cascading multiple network devices.

Model	Port Number
DH-2112PF	9 (top) and 10 (bottom)
DH-2128PF	25 (left) and 26 (right)



- If not using for uplinking purposes, these ports can be used as service ports, but they do not support PoE.
- The ports operate in different modes based on the network speed. (10/100Mbps: full/half duplex, 1000Mbps: full duplex)

④ **SFP Uplink Slots**

These ports are used to connect the switch to higher tier devices that are some distances away via optical cables. These ports are useful when cascading multiple network devices.

Model	Port Number
DH-2112PF	11 (top) and 12 (bottom)
DH-2128PF	27 (left) and 28 (right)



- If not using for uplinking purposes, these ports can be used as service ports.
- These ports operate in full duplex mode only.
- For more information on SFP modules supported by the SFP uplink ports, refer to **Part 3 - Miscellaneous > Supported SFP Transceiver Module List.**

⑤ **RJ-45 Uplink Port LEDs**

These LEDs indicate the status of the RJ-45 uplink ports.

Model	Port LEDs
DH-2112PF	▲ 9 ▼ 10
DH-2128PF	● 25 ● 26



The LED color indicates connection and communications speeds with the connected device.

LED Status Indications

Mode	Status	Color	Description
LNK/ACT (Link/Activity)	On	Amber	Normal network connection at 10/100Mbps
		Green	Normal network connection at 1000Mbps
	Blinking	Amber	Data transmission over the network in progress at 10/100Mbps
		Green	Data transmission over the network in progress at 1000Mbps
	Off	-	No network connection or a problem with the connection

## ⑥ SFP Uplink Port LEDs

These LEDs indicate the status of the SFP uplink ports.

Model	Port LEDs
DH-2112PF	▲ ▼ 11 12
DH-2128PF	● ● 27 28



The LED color indicates connection and communications speeds with the connected device.

## LED Status Indications

Mode	Status	Color	Description
LNK/ACT (Link/Activity)	On	Amber	SFP transceiver connected to the port. Port connected normally to the network at 100Mbps
		Green	SFP transceiver connected to the port. Port connected normally to the network at 1000Mbps
	Blinking	Amber	Data transmission over the network in progress at 100Mbps
		Green	Data transmission over the network in progress at 1000Mbps
	Off	-	No network connection or a problem with the connection

## ⑦ Console Port

Console port is not supported.

## ⑧ PoE LED Button

PoE LED button is used to select the status of RJ-45 service port LEDs.

- Pressed: Network LEDs indicate PoE status.
- Not Pressed: Network LEDs indicate LNK/ACT status.

⑨ **Reset Button**

The reset button, which is located to the right of the PoE LED button, is used to reset the product's settings. Pressing the reset button immediately reboots the product.



If the product does not reboot after pressing the button, press and hold the button for 5 seconds.

⑩ **DIAG/PoE LED**

DIAG/PoE LED indicates system diagnosis and PoE statuses.

LED Status Indications

Mode	Status	Color	Description
LNK/ACT (Link/Activity)	On	Amber	System diagnosis in progress
		Green	System diagnosis complete - Normal
	Blinking	Amber	System diagnosis complete - Abnormal
		Amber/Green	System rebooting
PoE (while PoE LED button is pressed)	On	Amber	Service Port LEDs indicating PoE status
	Blinking	Amber	Power to the connected PoE device has reached maximum level allowed
	Off	-	Service Port LEDs indicating LNK/ACT status

⑪ **Power LED**

Power LED indicates the system's power on/off status.

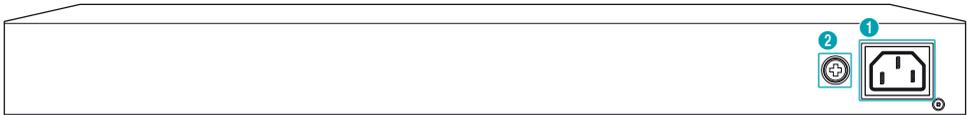
The LED lights up in green to indicate the system is powered on.

## Rear Panel

DH-2112PF



DH-2128PF



①	Power Connector	②	Grounding Terminal
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### ① Power Connector

Connect the power cable to this connector. This product does not feature a separate power on/off button and will turn on the moment power is supplied.



- Organize the power cable so that it will not cause people to trip over or become damaged from chairs, cabinets, desks, and other objects in the vicinity.
- Do not run the power cable underneath a rug or carpet.
- The power cable is grounded. It's plug, however, should not be modified even if the power outlet does not feature a grounding contact.
- Use a dedicated power outlet.

### ② Grounding Terminal

The grounding terminal is used to ground the system along with a grounding wire. This is done to prevent electrical accidents.



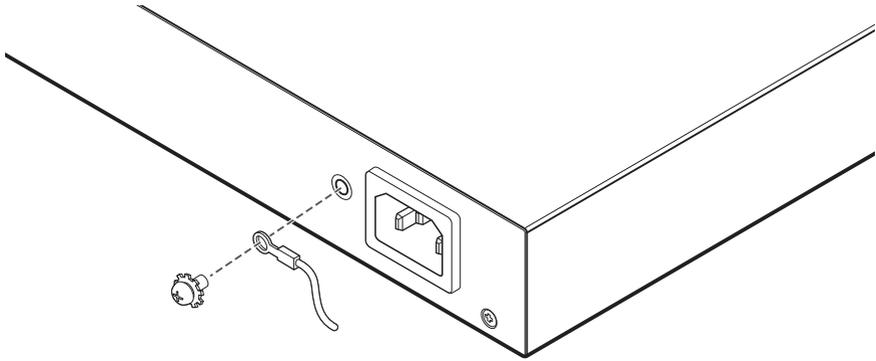
For more information on grounding the system, refer to **Part 2 - Installation > Grounding**.

# Part 2 - Installation

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## Grounding

The system must be grounded before use. Refer to the instructions below:



[Grounding (based on DH-2128PF)]

## Connection

- 1 Remove the grounding screw located on the back of the product, next to the power switch.



DH-2112PF's grounding terminal is located on the upper left section on the back of the product.

- 2 Thread the grounding screw through a grounding wire and screw it back in place.
- 3 Connect the other end of the grounding wire to the rack or any other grounding point.

## Port Connection

### DirectIP™ NVR Connection

#### Via UTP Cable

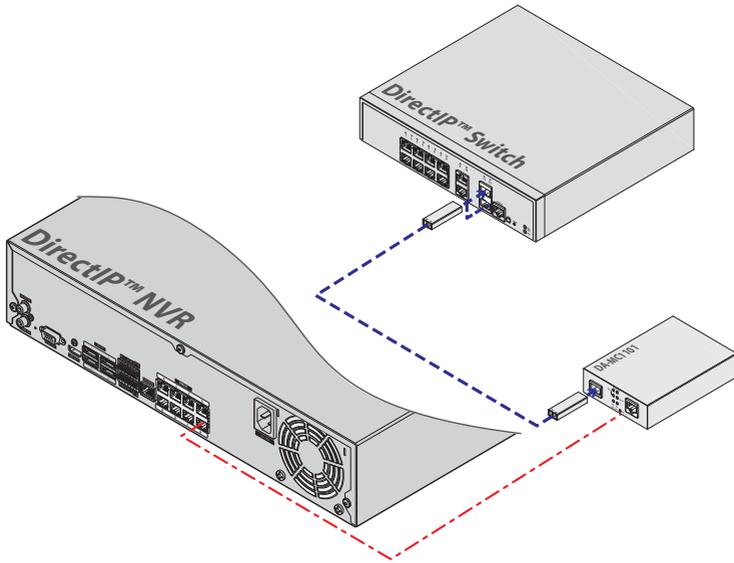
- 1 Connect the DirectIP™ NVR's **VIDEO IN** port to the system's **RJ-45 uplink** port using a UTP cable.
- 2 Check the **RJ-45 uplink** port LED's status and verify that a normal connection has been established.

#### Remote Connection via an Optical Cable

- 1 Connect the DirectIP™ NVR's **VIDEO IN** port to DA-MC1101<sup>1)</sup>'s **RJ-45 port** using a UTP cable.
- 2 Insert an SFP module into DA-MC1101's **SFP slot** and connect one end of the optical cable to the module.
- 3 Insert an SFP module into the system's **SFP uplink slot** and connect the other end of the optical cable to the module.
- 4 Check the **SFP uplink port** LED's status and DA-MC1101's **TX** and **FO** LED status and verify that a normal connection has been established.



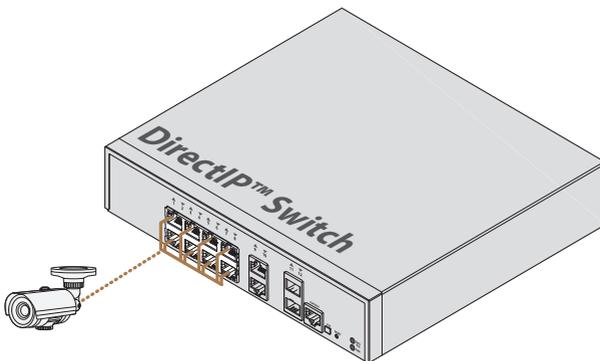
**DA-MC1101<sup>1)</sup>** (10/100/1000BASE-T to Gigabit Fiber Media Converter) is an IDIS converter unit designed exclusively for gigabit network needs.



## DirectIP™ Camera Connection

- 1 Connect the system's **RJ-45 service port** to the network camera's **RJ-45 port** using a UTP cable.
- 2 Check the **RJ-45 service** port LED's status and verify that a normal connection has been established.

PoE cameras can receive power through the UTP cable.



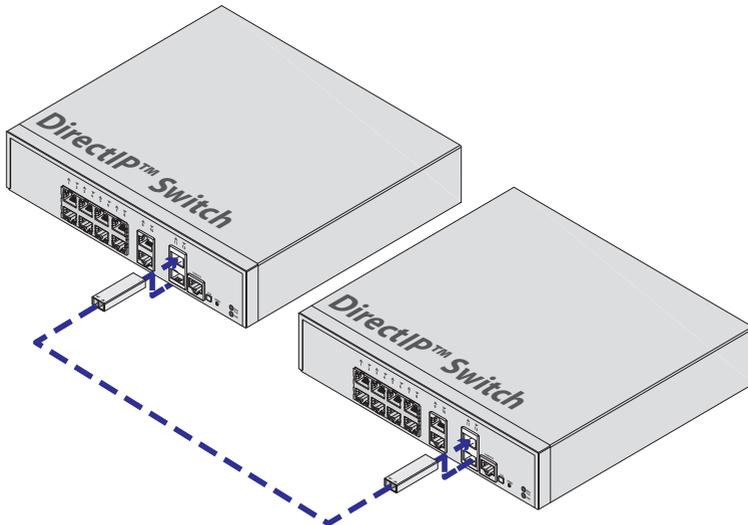
## Cascading

### Via UTP Cable

- 1 Connect the **RJ-45 uplink ports** of system 1 and system 2 using a UTP cable.
- 2 Check the **RJ-45 uplink** port LED's status and verify that a normal connection has been established between the two products.

### Remote Connection via an Optical Cable

- 1 Insert SFP modules into the **SFP uplink slots** of system 1 and system 2 and then connect the modules using a fiber optic cable.
- 2 Check the **SFP uplink port** LEDs and verify that a normal connection has been established.



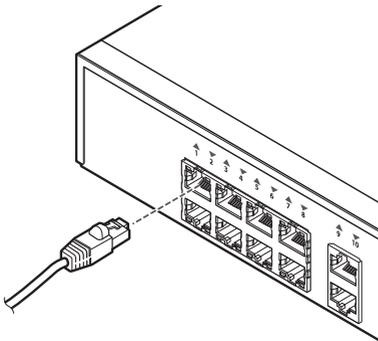
## Port Connection Warnings and Tips



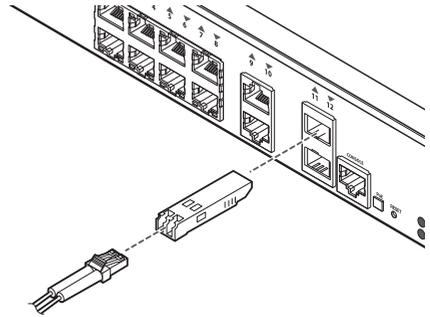
- Keep the UTP cable length to less than 100m.
- If you need to replace an SFP uplink transceiver module while the system is operating, deactivate the port first and then replace the transceiver module in order to avoid a system malfunction.
- This product uses lasers to transmit signals via its SFP uplink ports. These laser beams are Class 1-compliant beams that pose no threat to human eyes if operating normally. It is, however, recommended that you do not look directly into the ports while the system is powered on.
- Do not remove the optical cable's rubber cover until it's time to connect it to the product. The cover protects the cable from contamination.
- If using a dual-core SFP module, make sure that the user's RX port is connected to the target device's TX port and the user's TX port is connected to the target device's RX port.



- Only use category 5 or 6 UTP cables with RJ-45 connectors to connect to the system's 10/100/1000BASE-T ports. The system's ports can automatically distinguish between MID and MDIX connectors, so there is no need to use a crossover cable when connecting to a different device's TX port.
- The system's RJ-45 uplink ports may be used as service ports, but they do not support PoE.
- The connection distance can be extended to 500m to 10km using fiber optic cables. The maximum distance may vary depending on the SFP module being used.
- To ensure safety, choose optical cables with a maximum operating temperature equal to or higher than the system's maximum operating temperature (50°C).
- Keep the ports clean. Port contamination can hinder optical signal transmission. Use a dab of ethanol on a clean tissue or q-tip and gently clean the ports.



[10/100/1000BASE-T Port Connection]



[1000BASE-X SFP Port Connection]

# Part 3 - Miscellaneous

## Supported SFP Transceiver Module List

The system's SFP ports support the following types of SFP modules:

Standard	Diameter (um)	Wavelength (nm)	Length	Mode	Connector	SFP Module
1000BASE-SX	50/125	850	500m	Multi	LC	Finisar FTLF8519P3BNL
	62.5/125	850	300m	Multi	LC	
1000BASE-LX	9/125	1310	10Km	Single	LC	Finisar FTLF1318P3BTL



Some SFP Modules may not function properly when mounted on to this product. Refer to the compatibility chart above.

## Troubleshooting

Problem	Check
Power LED will not turn on.	<ul style="list-style-type: none"> <li>● Check the power cable.</li> <li>● Check the power supply status to the outlet the power cable is connected to.</li> </ul>
The system shuts down shortly after powering on.	<p>Check power connection components for electric leakage.</p> <ul style="list-style-type: none"> <li>● Check the outlet for electric leakage and current stability.</li> <li>● Make sure the system's vents and ports are clean.</li> <li>● If the problem persists, it could indicate a problem with the system's internals. Please contact the service center.</li> </ul>
The system will not boot up.	<p>Press the reset button on the front panel and see if the system boots up normally.</p> <ul style="list-style-type: none"> <li>● Unplug the power cable and then plug it in again.</li> </ul>
The system is unable to recognize network interface.	<p>Check the interface cable and the cable's connection status.</p> <ul style="list-style-type: none"> <li>● Check each port's LED.</li> </ul>

# Specifications

Model		DH-2112PF	DH-2128PF
<b>CPU</b>		Embedded MIPS	
<b>System Memory</b>		128MB SDRAM, 32M Flash	
<b>Switching Capacity</b>		24Gbps	56Gbps
<b>Copper Service Port</b>		8 RJ-45 Connectors (10/100/1000BASE-T)	24 RJ-45 Connectors (10/100/1000BASE-T)
<b>Copper Uplink Port</b>		2 RJ-45 Connectors (10/100/1000BASE-T)	
<b>Optical Uplink Port</b>		2 SFP Slots (1000BASE-X)	
<b>Console Protocol</b>		1 RJ-45 Connector (RS232 Protocol)	
<b>Rated Input</b>		AC100-240V, 50/60Hz, 4.0-2.0A	AC100-240V, 50/60Hz, 6.5-3.3A
<b>Power Consumption</b>		200W	450W
<b>PSE Power</b>		150W	400W
<b>PoE-supported Standards</b>		IEEE 802.3af-2003 and IEEE 802.3at-2009	
<b>PD Device Connection</b>		Up to 8 IEEE 802.3af devices or 4 IEEE 802.3at devices	Up to 24 IEEE 802.3af devices or 13 IEEE802.3at devices
<b>Environmental Conditions</b>	<b>Operating Temperature</b>	0°C - 50°C (32°F - 122°F)	
	<b>Operating Humidity</b>	10 ~ 90%	
	<b>Storage Temperature</b>	-20°C - 70°C (-4°F - 158°F)	
<b>Dimensions (W1 x H x D)</b>		330mm x 44mm x 204mm	440mm x 44mm x 220mm
<b>Weight (Main Unit)</b>		2.4Kg	3.1Kg
<b>Weight (Packaging)</b>		2.9Kg	3.9Kg
<b>Electrical Approvals</b>		FCC, UL, CE, CB, KC	
<b>IEEE Standards</b>		IEEE 802.3 10BASE-T [1], IEEE 802.3u 100BASE-TX [2], IEEE 802.3z[3] 1000BASE-SX, IEEE 802.3ab 1000BASE-T, IEEE 802.3ad Link Aggregation, IEEE 802.3x Flow Control Support, IEEE 802.1p Priority Support, IEEE 802.1D (Bridging), IEEE 802.1w Rapid Spanning Tree	
<b>Internet Standards</b>		RFC 1157 SNMP, RFC 791 IP, RFC 768 UDP, RFC 793 TCP, RFC 783 TFTP, RFC 1157 SNMP, RFC 1213 MIB-II, RFC 1215 Traps, RFC 1493 Bridge MIB, RFC 1757 RMON, RFC 1866 HTML, RFC 2068 HTTP	



- Dimensional width is exclusive of rack-mounting wings.
- These product specifications may change without prior notice.