

# **SWH-2009F**

**7 PORT 10/100BASE-TX ETHERNET SWITCH  
WITH 2 PORT 100BASE-FX UPLINK FIBER  
(FIBER REDUNDANCY OPTION)**

**User's Guide**

**Ver: 1.01**

## 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 limitations are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if no installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. 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 a different outlet from that the receiver is connected.
- Consult your local distributors or an experienced radio/TV technician for help.
- Shielded interface cables must be used in order to comply with emission limits.

Changes or modifications to the equipment, which are not approved by the party responsible for compliance, could affect the user's authority to operate the equipment.

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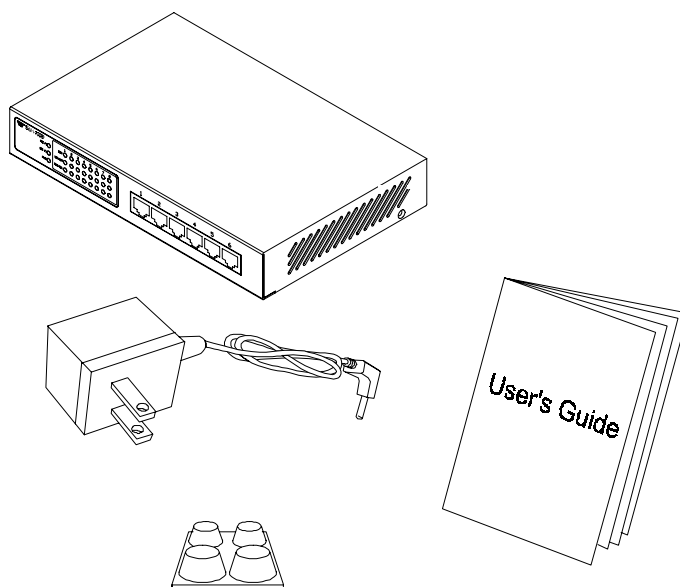
### 5. Product Specifications

## 1. Unpacking Information

Thank you for purchasing the 9-port SWH-2009F NWay switching hub. Before you start, please check all the contents of this package.

The product package should include the following:

1. One 9-port NWay switching hub
2. One external power supply
3. Rubber foot
4. User's manual



## 2. Introduction to 9 Port NWay Switching Hub

### 2.1 General Description

This device is a powerful, high-performance Ethernet / Fast Ethernet Switch with two fiber uplink ports. Twisted pair ports are capable of 10 or 100Mbps auto-negotiation operation (N-Way). 100Mbps according to the 100Base-FX standard are supported on the fiber interface. The SWH-2009F is an ideal solution for micro-segmenting large networks into smaller sub-networks for overall improved performance, so enabling the most demanding bandwidth multimedia and imaging applications. Moreover, the 10/100Mbps auto-sensing capability provides an easy way in which to move from a 10Mbps to a 100Mbps network.

Compared with shared 10Mbps or 100Mbps networks, this N-Way switch delivers a dedicated 10/100Mbps connection to every attached client with no bandwidth congestion problems. Store-and-forward switching modes guarantee low latency and fast data transmission. Full-duplex mode allows the simultaneous transmission and reception of frames without the risk of collisions as well as a doubling of the network bandwidth.

For network connection:

The switching hub can use the following types of cabling:

- 10BASE-T Category 3, 4 or 5 UTP/STP
- 100BASE-TX Category 5 UTP/STP

Fiber Optic: 50/125, 62.5/125, or 100/140 $\mu$ m multimode  
8.3/125, 8.7/125, 9/125 or 10/125 $\mu$ m singlemode

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**Category 5 cable is preferred to be used with this product in structured wiring environments. This will ensure correct operation of all ports at 10Mbps or 100Mbps.**

### 2.2 Key Features

The SWH-2009F switching hub provides the following key features:

- 2K MAC address table, 1M Bit buffer memory
- 8 RJ-45 (STP) ports for 10/100Base-T/TX and two 100Base-FX ports (TP port 8 can alternate FX Port 1)

- Redundant operation for fiber port Complies with IEEE802.3 and IEEE802.3u standards
- Supports N-Way protocol for 10Base-T and/or 100Base-TX connections Full/ Half duplex mode operation
- Small size
- Store-and-forward switching mechanism
- Automatic filtering of fragmented and CRC error packets
- Extensive LED indicators for network diagnostics
- External power adapter

### 2.3 The Front Panel

The front panel of the switching hub is shown below.



The auto-negotiation feature of the switching hub allows port 1 to port 8 running at one of the following four operation modes:

1. 100Mbps full-duplex
2. 100Mbps half-duplex
3. 10Mbps full-duplex
4. 10Mbps half-duplex

Port F1 and F2 can be used as fiber uplink ports for connecting to another fiber optic device or operation as redundant function. You can easily extend the distance from 2,000m to 100,000m by multimode or singlemode fiber cable.

**Warning:** The RJ-45 ports are shielded data sockets. They can not be used as telephone sockets. Only RJ45 plugs are allowed to connect these sockets.

#### 2.3.1 System LEDs

System LED indicators are located on the front panel for showing the operating status of the whole device.

##### 2.3.1.1 Power LED

This indicator lights green when the hub is receiving power; otherwise, it is off.

#### 2.3.2 Port LEDs

Port LED indicators are located on the front panel for showing the operating status of each port.

### 2.3.2.1 Speed LED

The Speed LED indicates the link speed of each port. If the LED lights green then the connection speed is 100Mbps, off for 10Mbps.

### 2.3.2.2 Link/Act LED

Every port has a Link/Activity LED. Steady green (link state) indicated that the port has good linkage to its associated device. Flashing green indicates that the port is receiving or transmitting data between its associated devices.

If the port is connected but the Link/Activity LED is dark, check the following items:

1. The switching hub and the connected device's power are on or not
2. The port's cable is firmly seated in its connectors in the switching hub and in the associated device.
3. The connecting cable is good and with correct type
4. The connecting device, including any network adapter is functioning.

From the Speed LED and Link/Activity, we could judge the connection speed as following:

Speed LED	Link/Activity LED	Status
Off	Off	No Connection
Off	Green	Connect as 10Mbps
Green	Green	Connect as 100Mbps

### 2.3.2.3 FDX/COL LED

A collision occurs when two stations within a collision domain attempt to transmit data at the same time. Intermittent flashing amber of the collision LED is normal; the contending adapters resolve each collision by means of a wait-then-retransmit algorithm. Frequency of collisions is an indicator of heavy traffic on the network.

If the FDX/COL light green which means the port is under full-duplex operation or dark for half-duplex mode. The following table is a summary of Port LEDs.

LED	Operation
100M	100Mbps (Green), 10Mbps (Off)
Link/Act	Link is present (Green), Activity (Blinking Green)
FDX/COL	Full-Duplex (Amber), Half-Duplex (Off), COL (Blinking Amber)

### 2.3.3 Fiber Port LED

The port F1 and F2 are fiber uplink ports with redundant function. The Status and Redundant LEDs indicate enough information in Fiber port operation.

#### 2.3.3.1 TP / Fiber LED

The TP/Fiber LED indicates TP8 and F1 link status, if TP LED on it indicates the port 8 links to TP or F1 link to Fiber.

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**NOTE:** *The TP Port 8 default priority is higher than Port F1, if user link both TP port7 and Port F1, it will switch to TP Port 8.*

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### 2.3.3.2 Status LED Reserve

### 2.3.3.3 Redundancy LED

The "Redundancy" LED will be "Green" when the "Redundant" function enable and F1/F2's with fiber link stage.

Redundant	Off	On	On	On	On
F2Link	Off	On	On	Off	Off
F1 Link	Off	On	Off	On	Off
F2 Redundancy	Off	Green	Green	Off	Off
F1 Redundancy	Off	Off	Off	Green	Off

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**NOTE:** *The default primary is Port F2 and Secondary is Port F1.*

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## 2.4 The Rear Panel

The rear panel of the hub is shown below



### 2.4.1 Power Connecting

Plug the circle end of the power adapter firmly into the rear panel of the switching hub, and the other end into an electric service outlet then the system is ready.

### 2.4.2 DIP Switch

The DIP switch provides redundant function enable/disable and Port 8 setting function.

Pin 2:

- ON → Port 8 /F1 set to TX,
- OFF → Port 8/F1 set to FX

Pin 4:

- ON → Disable Redundant function



- OFF → Enable Redundant function when Port 8/F1 forced to FX mode

Others Pin: Reserves

#### 2.4.3 Fiber Port

The F1 and F2 are Fiber Optic link ports.

#### 2.4.4 Diag button

Reserves

### 3. Installing and Using 9 Port NWay Switching Hub

#### 3.1 Installing the 9 Port NWay Switching Hub

The SWH-2009F does not require software configuration. Users can immediately use any of the features of this product simply by attaching the cables and turning the power on.

##### 3.1.1 Desktop Installation

To locate the switching hub on the desktop and place the hub on a clean, flat desk or table close to a power outlet. Plug in all network connections and the power cord, and then the system is ready.

When deciding where to put the switching hub then you must ensure:

- It is accessible and cables can be connected easily
- Cabling is away from:  
Sources of electrical noise such as radios, transmitters and broadband amplifiers, Power lines and fluorescent lighting fixtures.
- Water or moisture can not enter the unit
- Air flow around the unit and through the vents in the side of the case is not restricted (company recommend that you provide a minimum of 25mm inch clearance)

To prolong the operational life of your units:

- Never stack units more than eight high if freestanding.
- Do not place objects on top of any unit or stack
- Do not obstruct any vents at the sides of the case

##### 3.1.2 Installing Network Cables

After placing the hub on the desktop, then we need to know how to connect the device to network.

###### 3.1.2.1 Station Connections with Twisted-Pair Cable

Connect each station to the switching hub by a twisted-pair straight cable (10BASE-T or 100BASE-T cables). Plug one RJ-45 connector into a front-panel port of the hub, and plug the other RJ-45 connector into the station's network adapter.

###### 3.1.2.2 Station Connections with Fiber Cable

Connect station to switching hub fiber port by a fiber cable. Plug fiber cable connector into rear panel fiber port and plug the other fiber connector into the other fiber device.

#### 3.1.2.3 Switch to Switch Connections with Twisted-Pair Cable

In making a switch to switch connection, you could use port 1 to port 6 to connect another switch with crossover cable.

#### 3.1.2.4 Switch to Switch Connections with Fiber Cable

In making a switch to switch connection, you could use port 7 to port 8 to connect another switch with fiber cable. And the distance can be extending from 2,000m to 100,000m with multimode or singlemode cable.

### 3.2 Installing Redundant Fiber Port

The SWH-2009F built in one pair redundant fiber port function in port F1 and port F2. In the event of a failure in the primary connection (port F2), a fully redundant secondary connection (port F1) is made available to the failed connection.

#### 3.2.1 Redundant Installation

DIP Switch Pin 4 slide to "OFF" with Pin 2 "OFF" and F1 and F2 link fiber cable. You can monitor redundant function operation status from front panel LED indication.

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**NOTE:** *Strong recommend user must link SWH-2009F with "Redundant Function" device if want to setup SWH-2009F under Fiber Redundant function. The SWH-2009F is not supported full Fiber Redundant function if link with non-redundant function base device.*

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## 4. Switch Operation

### 4.1 MAC Address Table and Learning

The switching hub is implemented with a MAC address table which is composed of many entries. Each entry is used to store the address information of network nodes on the network, including MAC address, port ID, etc. The information is the most important base to do packet filtering and forwarding.

When one packet comes in from any port, the switching hub will learn the source address, port ID, and the other related information in address table. Therefore, the content of the MAC table will update dynamically.

## 4.2 Filtering and Forwarding

When one packet comes in from any port of the switching hub, it will check the destination address besides the source address learning. The hub will look up the address table for the destination address. If not found, this packet will be forwarded to all the other ports except the port which this packet comes in. If found, and the destination address is located at different port from this packet comes in, the packet will be forwarded to the port where this destination address is located according to the information of address table. But, if the destination address is located at the same port as this packet comes in then this packet will be filtered.

## 4.3 Store and Forward

Store-and-forward is one kind of packet-forwarding methodology. As a store-and-forward switching hub, it will store the complete packet in the internal buffer and do the complete error checking before transmitting to the network. Therefore, no error packets will disturb the network. It is the best choice when a network needs efficiency and stability.

## 5. Product Specifications

<b>Standard</b>	IEEE802.3, 10BASE-T IEEE802.3u, 100BASE-TX/FX
<b>Interface</b>	RJ-45 x8 NWay switching ports FO-SC or ST fiber connector x 2
<b>Cable Connections</b>	RJ-45 (10BASE-T) : UTP Category 3,4,5 RJ-45 (100BASE-TX) : UTP Category 5 Fiber Optic :50/125, 62.5/125, or 100/140 $\mu$ m multimode 8.3/125, 8.7/125, 9/125 or 10/125 $\mu$ m singlemode
<b>Network Data Rate</b>	Auto-negotiation (10Mbps, 100Mbps)
<b>Transmission Mode</b>	Auto-negotiation (Full-duplex, Half-duplex)
<b>LED indications</b>	System Power x1 Port 100M Link/Activity FDX/COL Redundancy PRI SEC
<b>System Buffer Memory</b>	1M Bit
<b>MAC Address Table</b>	2K entries
<b>Filtering/Forwarding Rate</b>	10Mbps: 14,880pps/14,880pps 100Mbps: 148,800pps/148,800pps
<b>Emission</b>	FCC Class A, CE
<b>Dimensions</b>	240 X 145 X 34 mm
<b>Weight</b>	1.75 KG
<b>Operating Temperature</b>	0 <sup>o</sup> ~ 50 <sup>o</sup> C
<b>Storage Temperature</b>	-20 <sup>o</sup> ~ 60 <sup>o</sup> C
<b>Operating Humidity</b>	10% - 90%
<b>External Power Adapter</b>	AC IN 100~240 V AC, 50/60 Hz AC DC Out 12 V DC 2A