



**CONNECTION TECHNOLOGY SYSTEMS**

# **FOS-3124-BAT-II Series**

**20 PORTS 100/1000BASE-X SFP WITH 4 COMBO  
PORTS (10/100/1000BASE-T, 100/1000BASE-X SFP)  
UPLINK MANAGEMENT SWITCH**

**User's Guide**

**Version 0.91**

## **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 user's guide, 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**

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## Revision History

Version	Date	Description
0.90	20150209	First release
0.91	20150707	Specification Rearrangement

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# 1. INTRODUCTION

Thank you for choosing 20 PORTS SFP (100/1000BASE-X) WITH 4 COMBO PORTS UPLINK MANAGEMENT SWITCH. This Managed Switch is specifically designed to meet the emerging FTTX and Metro Ethernet requirements that can extend the transmission distance up to 80KM depending on SFP modules used. The design of the Managed Switch with 1U height and 19-inch depth classic appearance is rack-mountable and also achieves the highest density. The managed Switch can provide the best performance and price ratio when multiple fiber ports need to be deployed in networking environment.

## 1.1 The Managed Switch

This Managed Switch is compact, 19-inch, and rack-mountable, and has 20 100/1000Mbps SFP ports and 4 combo ports (either 10/100/1000 copper or 1000Mbps SFP connectivity) on the front panel. This Managed Switch provides high performance store-and-forward switching capability plus other advanced features such as QoS, VLAN, etc..

Clear, at-a-glance per-port LED indicators make it easier for users to control and manage network status. The built-in management module also allows users to configure, control and monitor the system locally via console or remotely via SNMP based management system.

This Managed Switch is particularly suitable for the SFP to Metro Ethernet applications. Its low profile appearance with 1U height and laptop simple 19 inch dimensions achieves the highest density and can be used in closet wiring or used as a desktop switch.

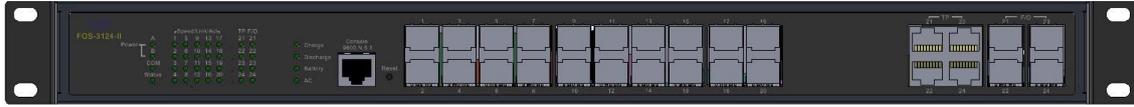
## Key Features

- **19 inch, 1U high**
- **20 x 100/1000Base-X ports**
  - IEEE 802.3/802.3u/802.3ab/802.3z compliance
  - Support Auto-Sensing for fiber ports
  - Support MDI/MDIX/Auto-Crossover
  - SFP Slot
- **4 x 10/100/1000Base-T ,100/1000Base-X Combo ports**
  - IEEE 802.3ab/802.3z
  - Support Auto-Negotiation (RJ-45) and Auto-Sensing (SFP)
  - Support MDI/MDIX/Auto-Crossover
  - RJ-45 or SFP Slot
- **Switching Features**
  - Store & forward switching
  - Non-blocking switching fabric : 48Gbps
  - Mac address table:16K
  - Memory buffer total 1536K bytes
  - VLANs support up to 2K VLAN Groups
  - Support jumbo frame on all ports up to 9K bytes size
  - QoS classification based on IEEE802.1p, VID, TOS/DSCP, Ethertype and L4 port.
  - Q-in-Q VLAN double tag
  - Rate limit control
  - SNTP time server
  - Static multicasting
  - IGMP v1/v2 snooping
  - IGMP fast leave
  - IGMP filtering via filtering profile
  - Multicast channel limitations per port
  - Multicast VLAN Register (MVR) \*\*
  - DHCP snooping
  - DHCP client and auto-provision
  - DHCP relay agent with option 82
  - Access Control List (ACL)
- **Management Functions**
  - Console
  - Telnet
  - Web
  - RADIUS authentication
  - SNMP v1/v2 and network management
  - SNMP Power-Down Trap
  - Private, RFC-1213, RMON MIBs
  - Port mirroring
  - FTP, TFTP, HTTP server and client firmware upgrade

\*\*Coming Soon

## 1.2 Front & Rear Panel

### Front Panel



The front panel is configured as follows:

- **Console port:** An asynchronous serial console port supporting the RS-232 electrical specification. This is used to connect a console to the Managed Switch by using the supplied RS-232 to RJ-45 cable with the switch. This interface configuration is 9600, N, 8,1.

- **Reset Button:** This button is used to reset the Managed Switch while it is powered on. It serves two purposes:
  - Press the Reset button for 3 seconds then release to restart the system
  - Press the Reset button for 10 seconds then release to reset (back to factory settings) and restart the system. Please note that this will clear all saved passwords and configurations.

- **20 100/1000 SFP ports:** The SFP ports are numbered from 1 to 20. They can operate at either 100 or 1000Mbps.

- **4 Gigabit combo ports:** The combo ports are numbered from 21 to 24. They can operate at 10/100/1000Mbps as copper ports or 1000Mbps as SFP ports.

- Copper ports designated as 10/100/1000BaseT

- SFP slots designated as 1000Base-X

Please note that when either one port is in operation, the other port is disabled. For example, if SFP link is active, the corresponding copper port is disabled.

- **LED:** Please refer to chapter [3.1 LED Definitions](#)

### Rear Panel

#### With AC Protector



#### Without AC Protector



The rear panel is configured as follows:

- **Power input and consumption:**

**With AC Protector**

- AC input: 200V-240V 50/60Hz
- DC input: 12V
- Power consumption: 85W (In charging state)

**Without AC Protector**

- AC input: 100V-240V 50/60Hz
- DC input: 12V
- Power consumption: 85W (In charging state)

**Note:** For BAT models, please be cautious that only **DC12V Back-up Battery** can be used. The followings are the instructions of installing and replacing back-up battery.

**I. Installing Back-up Battery**

- Step 1. Unplug AC power.
- Step 2. Connect battery positive (+) to switch positive (+).
- Step 3. Connect battery negative (-) to switch negative (-).
- Step 4. Plug AC power.

**II. Replacing Back-up Battery**

- Step 1. Unplug AC power.
- Step 2. Disconnect battery negative (-) from switch negative (-).
- Step 3. Disconnect battery positive (+) from switch positive (+).
- Step 4. Connect battery positive (+) to switch positive (+).
- Step 5. Connect battery negative (-) to switch negative (-).
- Step 6. Plug AC power.

## 1.3 Cable Specifications

The following table contains various cable specifications for the Managed Switch. Please make sure that you use the proper cable when connecting the Managed Switch.

Cable Type	Description
10Base-T	UTP Category 3, 4, 5 (100 meters max.) EIA/TIA- 568 150-ohm STP (100 meters max.)
100Base-TX	UTP Cat. 5 (100 meters max.) EIA/TIA-568 150-ohm STP (100 meters max.)
1000Base-T	UTP Cat. 5e (100 meters max.) UTP Cat. 5 (100 meters max.) EIA/TIA-568B 150-ohm STP (100 meters max.)
100BASE-FX	Multi-mode fiber module(2km) / Single-mode fiber module
1000BASE-SX	Multi-mode fiber module (550m)

1000BASE-LX	Single-mode fiber module (10km)
1000BASE-LH	Single-mode fiber module (30km/50km)
1000BASE-ZX	Single-mode fiber module (80km)
Mini-GBIC	SFP Transceiver for 1000BASE-SX Multi-mode fiber module (550m) SFP Transceiver for 1000BASE-LX Single-mode fiber module (10km) SFP Transceiver for 1000BASE-LH Single-mode fiber module (30km/50km) SFP Transceiver for 1000BASE-ZX Single-mode fiber module (80km)

## 1.4 Network Management

This Managed Switch is Plug & Play compliant. Real-time operational status can be monitored through a set of LED indicators located in the front panel. Built-in management module also allows users to configure, control and monitor the system remotely.

Following is a list of management options available in this Managed Switch:

- Local Console Management
- Telnet Management
- SNMP Management
- Web Management

### Local Console Management

Users may connect a Terminal or PC with Terminal Emulation program, to the Managed Switch RJ-45 port directly via RS-232 cable to configure, control and monitor the system. This is often referred as Out-Of-Band management.

Console management is useful when there is no network connection to the Switch, for instance configuring the Managed Switch for the first time.

### Telnet Management

Telnet is done through the network. Once there is a network connection to the Managed Switch, users can use Telnet to configure, control and monitor the system. Using network connection to manage is often referred to In-Band-Management.

### SNMP Management

SNMP is also In-Band-Management and requires a network connection to the Managed Switch. The Managed Switch private Management Information Bases (MIB) is provided for SNMP-based network management program to configure, control and monitor the system.

### Web Management

Web Management is done over the network. Once the Managed Switch is available on the network, you can login and monitor the status of it through a web browser remotely or locally. Local console-type Web management, especially for the first time use of the Managed Switch to set up the needed IP, can also be done through one of the 10/100/1000Base-T 8-pin RJ-45 ports located on the front panel of the Managed Switch. Direct RJ-45 LAN cable connection between a PC and the Managed Switch is required for this management.

Please refer to the Network Management User's Manual for the detailed management functions and required installation and operation procedures.

## 2. INSTALLATION

To properly install the Managed Switch, please follow the procedures listed below. These procedures are described below in separate sections.

- Installation Requirements
- Unpacking the Managed Switch
- Installing the Managed Switch
- Power on the Managed Switch
- Connecting the Managed Switch to the network

### 2.1 Requirement

Basic requirements for installation are as follows:

- Environmental conditions
  - One power outlet
  - Proper ventilation
  - Proper isolation to electrical noise, radio, etc.
  - UTP cables should not run in the same duct with power and phone line cables
- Required SFP Transceiver or UTP cables
- Rack mounting tools

### 2.2 Checking the Package Contents

Unpack the package carefully and check the package contents. The package should contain the following items:

- Standard
  - One Managed Switch
  - Mounting kit: 2 mounting brackets and screws (Fixed in the Managed Switch when shipped)
  - Four rubber feet with adhesive backing
  - Console RS-232 cable with RJ-45 connector
  - Documentation CD
  - AC power cord (For AC power module only)

If any item is found missing or damaged, please contact your local sales representative for support or replacement.

## 2.3 Install the Managed Switch



### CAUTION

To prevent any damage or failure of the Managed Switch, please **DO NOT** block the ventilation FAN holes.

Use the following guidelines when choosing a place to install the Switch:

- Firm and steady flat surface.
- Proper power outlet location, not too far from the device.
- Visually inspect the power cord and see that it is secured to the AC power connector.
- Make sure that there is proper heat dissipation from and adequate ventilation around the switch. Do not place heavy objects on the Managed Switch.

### Desktop Installation

The switch can be placed in any flat and steady surface with proper air ventilation. Four rubber feet with adhesive backing are provided for installation.

#### Procedure

1. Attach rubber feet on the bottom at each corner of the device.
2. Select a flat and steady surface and place the switch.
3. Allow adequate space for ventilation between the device and the objects around it.

### Rack Installation



### WARNING!

Please mount the Switch firmly in rack otherwise it may be fall and cause the system damage and possible injury to personnel.

The Managed Switch can be mounted in an EIA standard-sized, 19-inch rack, which can be placed in a wiring closet with other equipment. Rack mounting brackets are provided to mount the Switch.

### Procedure

1. Plan the rack position.
2. Attach the mounting bracket on the switch's side panels (one on each side) and secure them with the screws provided.
3. Align the Switch with mounting bracket into the selected mounting rail position.
4. Then, use the screws provided with the equipment rack to mount the switch into the selected mounting rails position carefully and firmly.
5. Please ensure that the ventilation holes are not blocked.

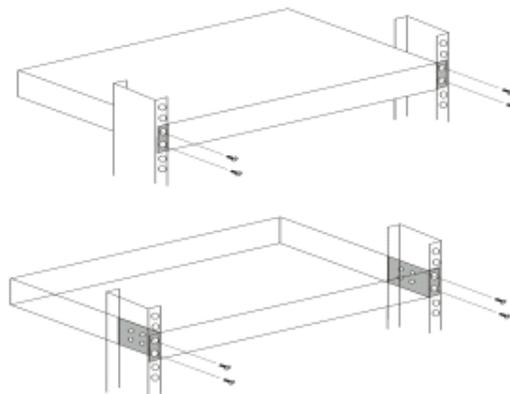


Figure 3. Example of Rack Installation

## 2.4 Power ON

The Managed Switch can be used with AC power supply 100-240 VAC, 50 – 60 Hz, DC power supply 48V or external battery charging interface 12VDC. The power switch is located at the rear of the unit adjacent to the power connector.

### Procedures:

1. Plug one end of the power cord into the power socket on the rear panel.
2. Plug the other end of the power cord into the power outlet. After the power is turned on, the Power LED indicator should light in green and the FAN should spin.

## **Power Failure**

In the event of power failure, unplug the power that is plugged into the switch at the back of the device. When power is resumed, plug the power back to the switch. Please note that the Managed Switch has no ON/OFF switch. Therefore, the only way to power on or power off the switch is to connect or disconnect the power cord.

## 2.5 Connect the Switch to network

### Connect to Network

This Managed Switch has 20 100/1000Mbps SFP ports and 4 combo ports on the front panel. These combo ports can be plug-in 10/100/1000Base-T copper or slide-in 100/1000Mbps SFP Fiber transceivers. The connection of the fiber port must be matched, i.e. Transmitter to Receiver and vice versa.

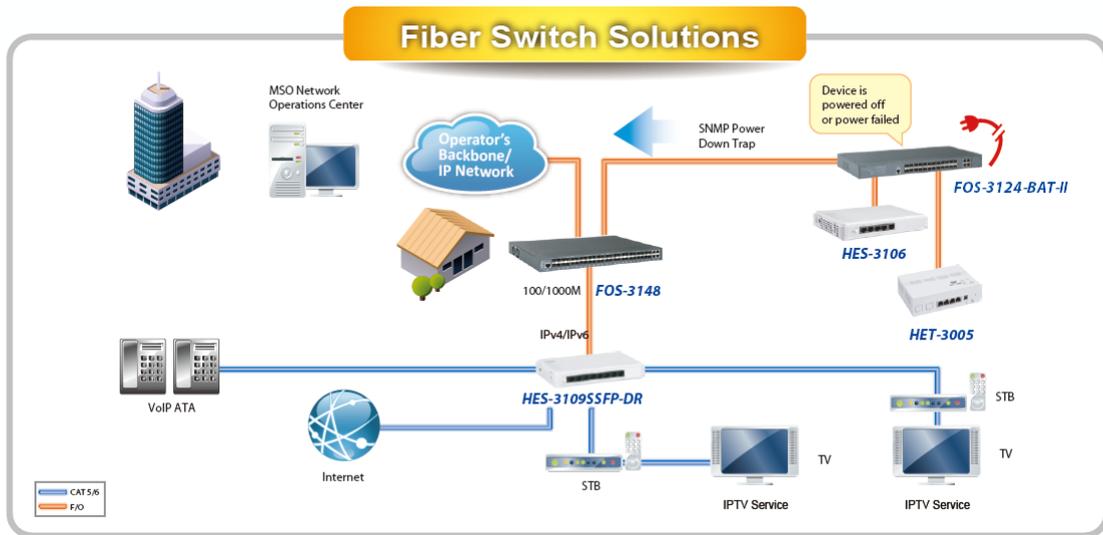
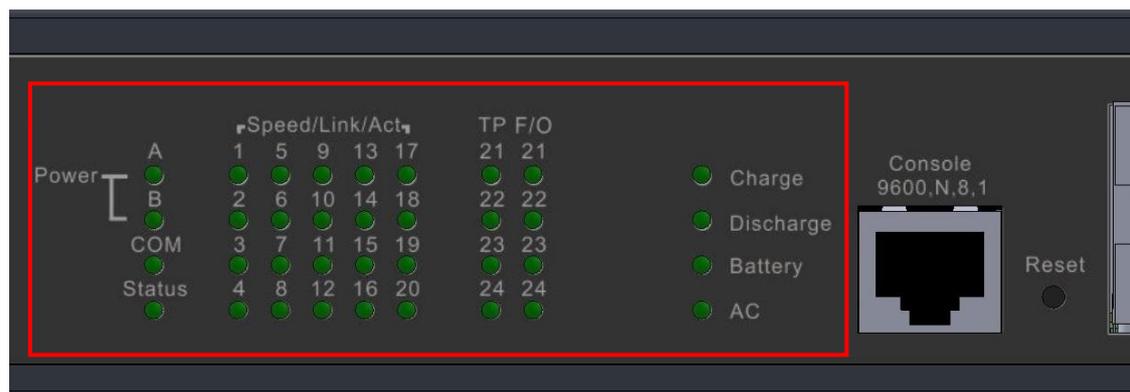


Figure 4. Example of segmenting network configuration

### 3. OPERATION

The Managed Switch is Plug & Play compliant. Real-time operational status can be monitored through a set of LED indicators located in the front panel. A built-in management module provides users flexible interfaces to configure, control and monitor the complete system remotely.

#### 3.1 LED Definitions



##### Power A/B LED

LED	Color	Operation
Power A/B	Off	Without fixed-in power module or power is off.
	Green	Power module is in normal operation.
	Orange	Fixed-in Power module is no longer receiving power or DC output fails.

##### Status LED

LED	Color	Operation
Status	Green	The device is in normal operation.
	Orange	The device is booting up.
	Green Blinking	Press the Reset button for 3 seconds and then release to restart the system. The LED indicator will blink in green for three times.
	Orange Blinking	Press the Reset button for 10 seconds and then release to reset (back to factory settings) and restart the system. The LED indicator will blink in orange for three times.

##### COM LED

The console status is indicated by the Console LED on the front panel of the device.

LED	Color	Operation
COM	Off	Out-of-band management via console port is activated.
	Green	When Console port is connected.

**Port LED 1~20**

LED	Color	Operation
Link/ACT/Speed	Off	No connection
	Green	The link is up and the speed is in 100Mbps
	Orange	The link is up and the speed is in 1000Mbps.
	Blinking Green/Orange	Traffic is present.

**TP & F/O LED 21~24**

LED	Media Type	Color	Operation
Link/ACT/Speed	TP	Off	No connection or the port link speed is in 10Mbps.
		Green	The link is up and the speed is in 100Mbps.
		Orange	The link is up and the speed is in 1000Mbps.
		Blinking Green/Orange	Traffic is present.
	F/O	Off	No connection.
		Green	The link is up and the speed is in 100Mbps.
		Orange	The link is up and the speed is in 1000Mbps.
		Blinking Green/Orange	Traffic is present.

**Battery LED**

LED	Color	Operation
Charge	Off	Battery is disconnected.
	Green	1. Power module is in normal operation. 2. Back-up battery fully charged.
	Green Flashing	Back-up battery is charging.
Discharge	Orange	1. The Managed Switch is booting up. 2. Reverse Positive (+) and negative (-) wires. (For BAT models only)
	Orange Flashing	Back-up battery is discharging.
Battery	Off	Battery is disconnected.
	Orange	Reverse Positive (+) and negative (-) wires.

**Note:**

\* For BAT models, please be cautious of the following situations.

1. If "COM" LED shows steady orange, please reverse positive (+) and negative (-) wires.
2. Reverse indication only works when AC power is unplugged.
3. Never change battery while AC Power is plugged, or the charging circuit may be damaged.

**AC Protector LED (For AC Protector Model Only)**

LED	Color	Operation
AC	Off	Power is disconnected.
	Orange	AC Protector is activated.
	Green	Power module is in normal operation.

## 4. MAINTENANCE

This Managed Switch is easy to maintain. The procedures are suggested when you want to identify faults, perform hardware replacement and Firmware upgrade.

### 4.1 Fault Identification

Identifying faults can greatly reduce the times required to find problem and solution. Users may perform local check or remote check to find the problems.

#### Local Check

Users can perform local check by observing LED indicators status or check system setup and configuration through console connection.

- When the whole system fails to function,
  1. Check Power LED status
  2. Check Power connection
  3. Reset power
  
- When certain network link fails to function,
  1. Locate the port of the switch
  2. Check LINK/ACT/Speed LED of the port
  3. Check Status LED of the port
  4. Check cable connection between the port and the connected device
  5. Reset power
  
- When local Console fails to function,
  1. Check COM LED status
  2. Check Console port connection
  3. Check Console configuration
  4. Reset power

#### Remote Check

Users may check the Managed Switch through SNMP manager remotely. For detailed procedures, please refer to the network management User's Manual.

## 4.2 Hardware Replacement Procedures



### **WARNING!**

The Managed Switch contains no user-serviceable parts. **DO NOT, UNDER ANY CIRCUMSTANCES, open and attempt to repair it.**

Failure to observe this warning could result in personal injury or death from electrical shock.

Failure to observe the above warning will immediately void any Warranty.

## 4.3 Firmware Upgrade

This Managed Switch may perform Firmware upgrade when required. New Firmware can be obtained from your sales representative. Please check the Network Management User's Manual for the detailed upgrade procedures.