CONNECTION TECHNOLOGY SYSTEMS

HES-3106-PLUS SERIES

5 PORTS 10/100/1000BASE-T ETHERNET MANAGED SWITCH WITH 1 PORT 1000BASE-X or 100/1000BASE-X UPLINK

User's Guide

Version 0.92

Trademarks

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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 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 the equipment is not installed and used in accordance with the instructions, it 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 an outlet on a circuit different from that to which 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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Revision History

Version	Date	Description
0.90	2014/08/26	First Release
0.91	20150216	Add Non-Blocking Switching Fabric Section 1.1
0.92	20150806	Revise photo Section 1.2

Table of Contents

1. INTRODUCTION

Thank you for choosing this Managed Ethernet Switch. The Managed Switch can provide the best performance and price ratio when multiple copper ports need to be deployed in networking environment.

1.1 The Managed Ethernet Switch

With 5 10/100/1000Mbps RJ-45 ports, this compact 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 via SNMP based management system.

Specification

Interface

- LAN Ports: 10/100/1000BASE-T x 5
  (x 4 when LAN 5 is set as a WAN port)
- WAN Port: 1000 or 100/1000BASE-X x 1 or 10/100/1000Base-T x 1 (auto-detection)

Standards

- Comply with IEEE 802.3, 802.3u, 802.3ab, 802.3z, 802.1q, 802.1p, 802.3x, 802.3az standards

Features

- Switching:
  - Support Auto-Negotiation in TP ports
  - Support MDI/MDIX Auto-Crossover in TP ports
  - Full/Half Duplex Mode Operation
  - MAC Address Table: 2K
  - Non-Blocking Switching Fabric: 12Gbps
  - Store-and-Forward Switching Mechanism
  - VLANs: Support up to 128 VLAN Groups
  - Support Tag VLAN
  - Support Q-in-Q VLAN
  - Support IGMP Snooping V1 and V2
  - Bandwidth Control
  - QoS support 802.1p and ToS Classification
  - Priority Queues: 4 Queues

- Management:
  - Telnet/SSH/SNMP/Web interface
  - Storm Control
  - DHCP Client
  - DHCP Auto-Provisioning
  - Text Based Config
  - SFF-8472 (digital diagnostic management interface for SFP)
  - Power Down Trap
- RMON:
  - FTP/TFTP upgrade

1.2 Appearance

Front Panel

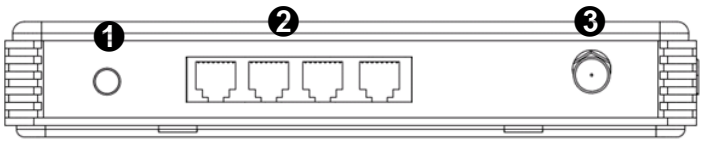

Figure 1. Front Panel for 5-Port 10/100/1000Base-T plus 1-Port 1000Base-X or 100/1000Base-X Uplink Ethernet Managed Switch with CATV RF Module

❶ **Smart Lighting Control:**

System Status LED and Port Link LEDs will be turned off by pressing the button. Only Power LED indicator stays on.

❷ **10/100/1000Mbps RJ-45 ports**

❸ **CATV RF Output** (optional)

Rear Panel

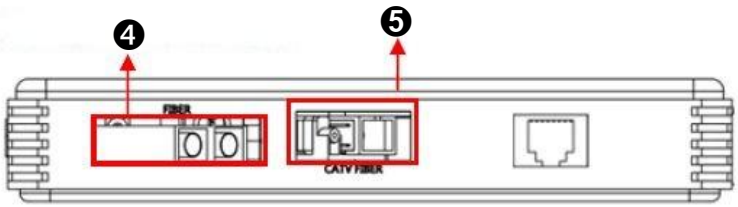

Figure 2. Rear Panel for 5-Port 10/100/1000Base-T plus 1-Port 1000Base-X or 100/1000Base-X Uplink Ethernet Managed Switch with CATV RF Module

❹ **100/1000Mbps or 1000Mbps F/O Port**

❺ **CATV Fiber Input** (optional)

Left and Right Panel

Figure 3. Left Panel

Figure 4. Right Panel

❻ **Power Jack Connector**

❼ **Reset Button:**

- Insert a pin or paper clip to press the Reset Button for 5 seconds to restart the system
- Insert a pin or paper clip to press the Reset Button for 10 seconds to reset the device back to factory defaults.

Top Panel

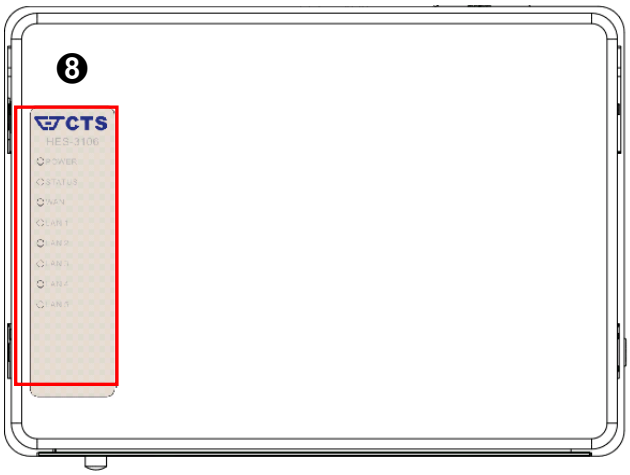

Figure 5. Top Panel with LEDs

❽ **LED:** For detail definitions, please refer to chapter *3.1 LED Definitions*

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)

2. INSTALLATION

To properly install the Managed Switch, please follow the procedures listed below. Procedures covered in this chapter are described below in separate sections.

- Installation Requirements
- Unpacking the Managed Switch
- Installing the Managed Switch
- Powering on the Managed Switch
- Connecting the Managed Switch to the Network

2.1 Installation Requirements

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 Transceivers or UTP cables

2.2 Checking the Package Contents

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

- Items included in standard package:
  - 1 Managed Switch
  - 1 Documentation CD
  - 1 Power Adaptor

If any of the above items is found missing or damaged, please contact your local sales representative for support or replacement.

2.3 Installing 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.
- The location of power outlet should not be far away from the device.
- Make sure that there is proper heat dissipation from and adequate ventilation around the switch. Do not place heavy objects on the Managed Switch.
- Make sure water and moisture cannot enter the case.
- Keep the cabling away from electrical noise.

2.4 Powering ON

The Managed Switch can be used with AC power adapter 100-240 VAC Input and 12VDC output. The input connector is located on the left panel of the Managed Switch. Before turning on the Managed Switch, please make sure that network cables and power cables are securely connected.

Procedures:

1. Plug one end of the power adaptor into the power jack on the left panel.
2. Plug the other end of the power adaptor into the power outlet. After the power is on, the Power LED indicator should light in green.

Power Failure

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

2.5 Connecting the Switch to Network

Connect to Network

This Managed Switch has 5 or 6 10/100/1000Mbps RJ-45 ports on the front panel. These ports can be inserted by 10/100/1000Base-T cables, connecting to the end devices. The connection of the fiber port on the rear panel must be matched, i.e. Transmitter to Receiver and vice versa.

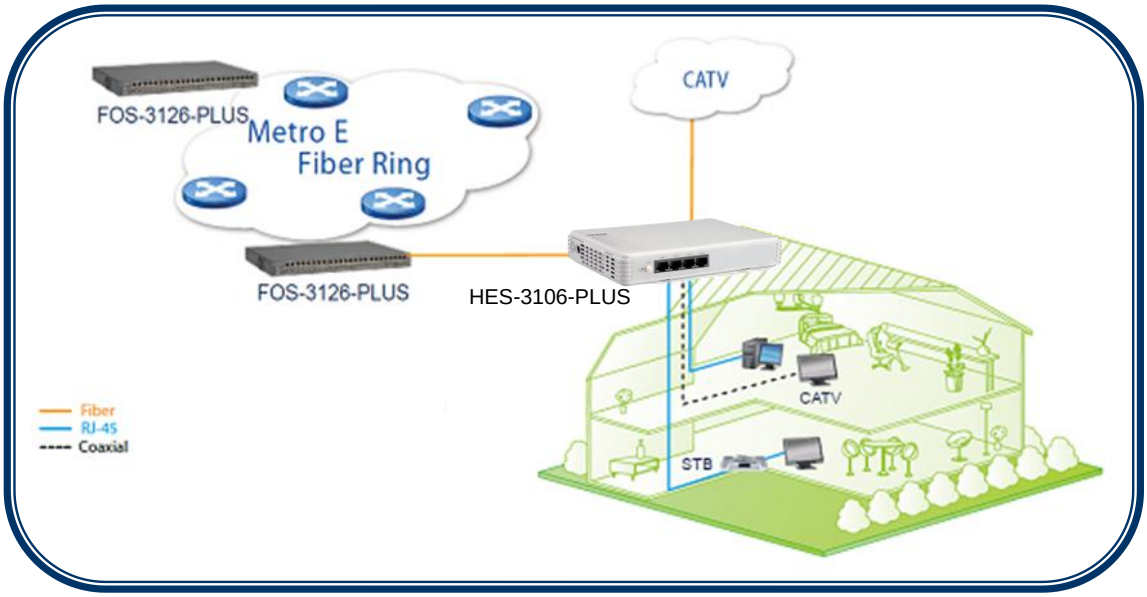

Figure 4. Example of segmenting network configuration

3. OPERATION

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

3.1 LED Definitions

LED	Definition	Color	Operation
POWER	Power	Off	Device is powered down.
		Green	Device is powered up.
STATUS	System Status	Orange	System is booting up.
		Green	System is working normally.
		Orange Blinking	When the system is set back to default factory setting, the Status LED indicator will blink 3 times in orange.
			When the system is restarted, the Status LED indicator will blink once in orange.
WAN	WAN Port Status	Off	Port link is down
		Green	Link is up and works at 100Mbps.
		Green Blinking	Receiving and transmitting data.
		Orange	Link is up and works at 1000Mbps.
		Orange Blinking	Receiving and transmitting data.
LAN 1~5	LAN Port Status	Off	Port link is down
		Green	Link is up and works at 10 or 100Mbps.
		Green Blinking	Receiving and transmitting data.
		Orange	Link is up and works at 1000Mbps.
		Orange Blinking	Receiving and transmitting data.

4. MAINTENANCE

It is easy to use and maintain this Managed Switch. The procedures are suggested when you want to identify faults, perform hardware replacement and firmware upgrading.

4.1 Fault Identification

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

Local Check

Users can perform local checks by observing LED indicators status.

- When the whole system fails to function,
  - Check Power LED status
  - Check Power connection
  - Reset power

- When certain network link fails to function,
  - Locate the port of the switch
  - Check Port Link Status LED
  - Check cable connection between the port and the connected device
  - 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 upgrading when required. New firmware can be obtained from your sales representative. For detailed upgrading procedures, please refer to the Network Management User's Manual.