LevelOne

GSW-0440T

GSW-0840T

4/8-Port 10/100/1000Mbps 11" Gigabit Ethernet Smart Switch

User's Guide

Version: 1.0

TABLE OF CONTENTS

1 UNPACKING INFORMATION

Thank you for purchasing this LevelOne 11" Smart Switch. Before continuing, please check the contents of the product package. This product package should contain the following items:

   One (1) Gigabit Ethernet Switch.
   One (1) Power Cord.
   One (1) Console Cable
   Four (4) Rubber Feet.
   Rackmount Kit.
   This User's Guide.

If anything is missing, please contact your place of purchase immediately.
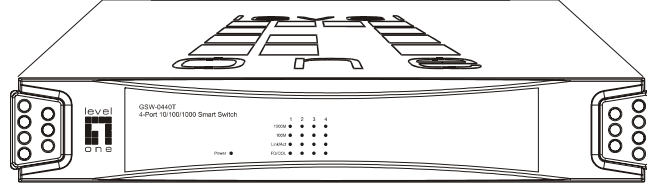
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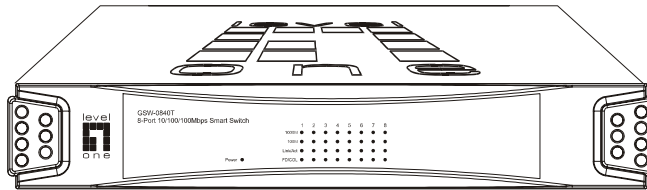
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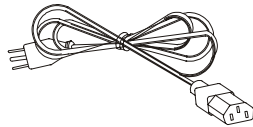
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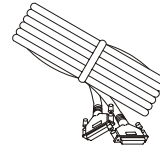
Console Cable

Rackmount Kit

Four (4) Rubber Feet

User's Guide

4

2 PRODUCT INTRODUCTION

2.1 Models

These LevelOne 11" smart switches provide Four (4) / Eight (8) Gigabit copper ports. Each port is equipped with 2000 Mbps, Full-Duplex, Collision Free Bandwidth. It's a multi-speed, versatile network device that combines Gigabit, Fast Ethernet, and Ethernet ports in a single device.

2.2 Key Features

Provides four (4) or eight (8) ports 1000Base-T/100Base-TX/10Base-T.
Supports 8K MAC address entries.
Provides 256K Bytes Packet Memory Buffer.
Supports up to 4 or 8 Port-Based VLANs.
Provides Port-Mirroring function.
Asymmetric Flow-Control supported for Full-Duplex operation.
Backpressure Flow-Control supported for Half-Duplex operation.
Provides Store-and-Forward forwarding scheme.
Auto-Negotiation and Auto-MDIX supported.
Broadcast Storm Control.
Aging function supported.
Supports Tag-Based VLAN as in IEEE 802.1Q.

2.3 The Front Panel
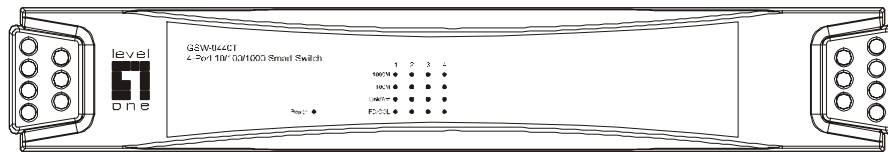
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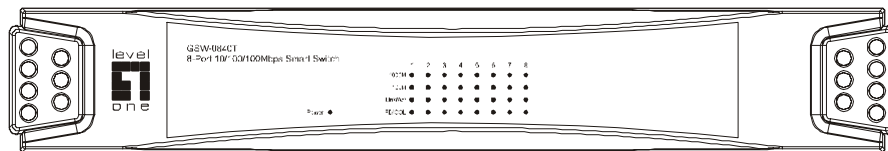
GSW-0840T

2.3.1 1000BASE-T

The switch is primarily used for network backbone connections.
For the 1000BASE-T TP port, it provides an Auto-Negotiation function that senses for the attached device's maximum operating speed and automatically sets the Switch to operate at that speed. Users only need to connect a network cable into any TP port, and the Auto-Negotiation function will do the rest.

2.3.2 Cabling

1000Mbps -   To transmit at 1000Mbps requires Category 5 TP cabling that must use all Four (4) pairs twisted-pair wire for RJ-45 connector.

100Mbps - To transmit at 100Mbps requires Category 5 TP cabling.

10Mbps -   When transmitting at 10Mbps Category 3, 4 or 5 TP cabling with RJ-45 sockets can be

5

used.

Port Type	Cable Type	Connector
1000BASE-T	Cat.5 TP	RJ-45
100BASE-TX	Cat.5 TP	RJ-45
10BASE-T	Category 3, 4 or 5 TP	RJ-45

Note: Category 5 TP cable recommended whenever installing new cabling.
To transmit at 1000Mbps requires Category 5 TP cable using Four (4) pairs Twisted-Pair wire.

2.3.3   Status LEDs
The Switch comes with a complete range of LEDs. The table below lists each LEDs name, color and a brief description of its function.

GSW-0440T

Name	Color	Function
Pwr	Green	Lit: Power "On"
1000	Green	Lit: Link on 1000Mbps speed
100	Green	Lit: Link on 100Mbps speed
LNK/ACT	Green	Lit: Link on Blink: Sending or receiving packets
FDX/COL	Amber	Lit: Full-Duplex operation Blink: Collision occurs in Half-Duplex operation

GSW-0840T

Name	Color	Function
Power	Green	Power on, normal operation
	Off	Power off
Link/Act	Green	Link On
	Blink	Activity
	Off	Link Off
1000M	Green	1000M Speed
	Off	Not 1000M Speed
10M/100M	Green	100M Speed
	Off	10M speed
Full	Green	Full-duplex mode
Collision	Blinking	Collision
Half	Off	Half-duplex mode

2.4   The Rear Panel

GSW-0440T

6
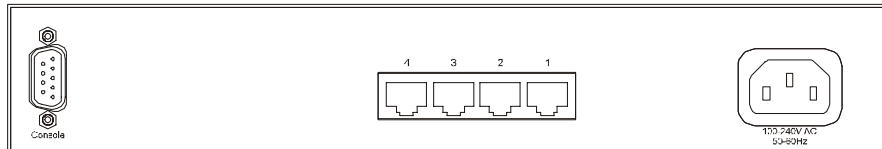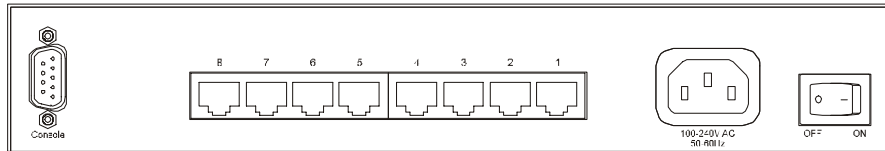
GSW-0840T

2.4.1   Power Socket
The Power Socket is designed to be used with the power cord included in the product package.
Attach the female end of the power cord to the male power connector on the back panel.
Attach the male end of the power cord to a grounded power outlet.

2.4.2   Network Ports
The Switch provides Four (4) / Eight (8) 1000Base-T/100Base-TX/10Base-T (RJ-45 connector) ports.

2.4.3   Console Port
The console port interface conforms to the RS-232 electrical specification. This interface supports asynchronous data of Eight (8) data bits, One (1) stop bit, and no parity bit. The unit only operates at 9600bps rates for 4-Port's and 9600bps rates for 8-Port's with RS-232 cable in system configure.

7

3   INSTALLATION

The LevelOne 11" Gigabit Ethernet Smart Switch is "Plug-&-Play". It does not require software configuration. Users can immediately use any of the features of this product simply by attaching the cables and turning on the power.

3.1   To locate the switch on a rackmount:

Attach the Four (4) rubber feet included in the product package to the bottom of the Switch, one in each corner.
Place the Switch on a rackmount.
Plug in all network connections and the power cord

3.2   Rackmount placement

Attach One (1) rackmounting bracket on each side of the Switch front panel and secure each bracket with the provided screws.
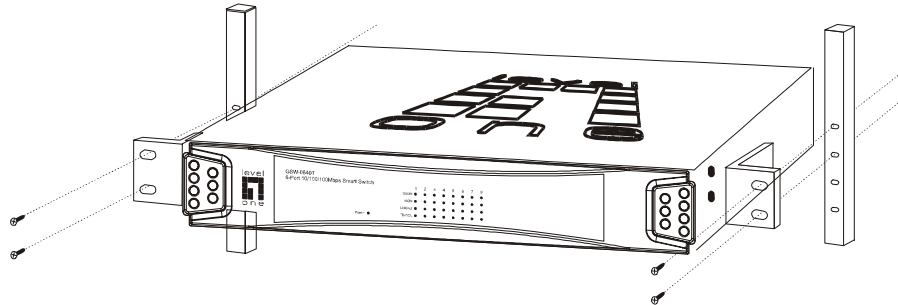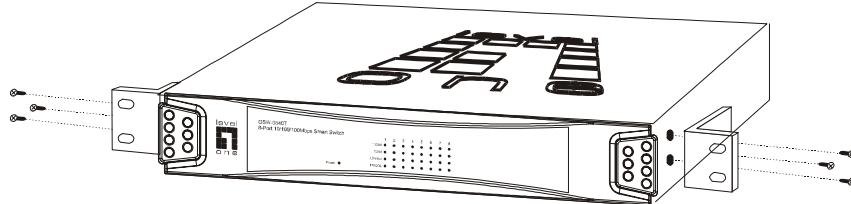
4 HELPFUL SUGGESTIONS

4.1 Prior to Installation

Before installing the Switch and connecting network devices, it is important to plan the network's layout. Things you should consider include:

Dedicated Bandwidth: File servers and other high-traffic hardware improve their performance if they have their own dedicated 10Mbps, 100Mbps, or 1000Mbps bandwidth.

Full-Duplex: Determine which devices support Full-Duplex connections.

Fast Ethernet & Gigabit Ethernet: Make sure rules for cable lengths and categories are followed. 100BASE-TX and 1000BASE-T have the same rules for cable and distance.

Auto-Negotiation: Devices with different speeds may be easily swapped when the other end of the cable is fixed to a port with Auto-Negotiation.

4.2 Half- and Full-Duplex

The Switch supports both Half- and Full-Duplex modes for 10BASE-T and 100BASE-TX. But the 1000BASE-T only supports Full-Duplex mode.

In Half-Duplex mode: Data cannot be transmitted and received at the same time. Attached devices must finish transmitting data before they can receive data.

In Full-Duplex mode: Data can be transmitted and received at the same time.

However:

Full-Duplex transmission is only possible between two devices with a dedicated link (e.g., Switch-Switch, Switch-PC)

Both devices must have Full-Duplex capability

Both devices must be set to Full-Duplex (e.g. Auto-Negotiation – Auto-Negotiation, Non-Auto-Negotiation to Non-Auto-Negotiation)

The 100BASE-TX/10BASE-T or 1000BASE-T/100BASE-TX/10BASE-T ports on the Switch detect and set the line's operating mode by using their Auto-Negotiation function.

4.3 Auto-Negotiation

Every 10/100/1000Mbps speed port on these Switches has a built-in "Auto-Negotiation" function. This technology automatically sets the best possible bandwidth as soon as a connection is established with another network device (usually at Power "On" or Reset). This is capability is achieved via the Switch's Auto-Negotiation function that automatically detects the modes and speeds the second (attached) device is capable of.

Evaluating Auto-Negotiation Capability:

if attached device is:	the Switch will automatically set its TP ports to operate at:
1000Mbps with Auto-Negotiation	2000Mbps (1000BASE-T, Full-Duplex) Note: Almost all 1000Mbps devices only operate in Full-Duplex mode.
100Mbps no Auto-Negotiation	100Mbps (100BASE-TX, Half-Duplex)
100Mbps with Auto-Negotiation	200Mbps (100BASE-TX, Full-Duplex)
10Mbps no Auto-Negotiation	10Mbps (10BASE-T, Half-Duplex)
10Mbps with Auto-Negotiation	20Mbps (10BASE-T, Full-Duplex)

Note: If the attached device is set to a fixed mode (ex: Forced Full-Duplex) it will not operate as an Auto-Negotiation device.

4.4 MAC Address Table

Every Ethernet data packet includes both source and destination addresses. This Six (6) bytes ID is called the MAC (Media Access Control) Address.

The models can automatically learn and store MAC addresses. However, the MAC address table is volatile: it disappears when the Switch is powered "Off" or reset.
Note: When the network needs reconfiguration, we recommend to restart the Switch first. After all nodes have been moved, Remove the power cord and re-attach it to rebuild the internal MAC address table.

5   SAMPLE APPLICATION

The application for these Switches is as a "big pipe" backbone interconnecting file servers with bandwidth-hungry workgroups, departments, and offices.

GSW-0840T

1000BASE-T

GSW-0440T

1000BASE-T   1000BASE-T

Workstation with 1000Mbps
Gigabit Ethernet Adapter

Workstation with 1000Mbps
Gigabit Ethernet Adapter

11
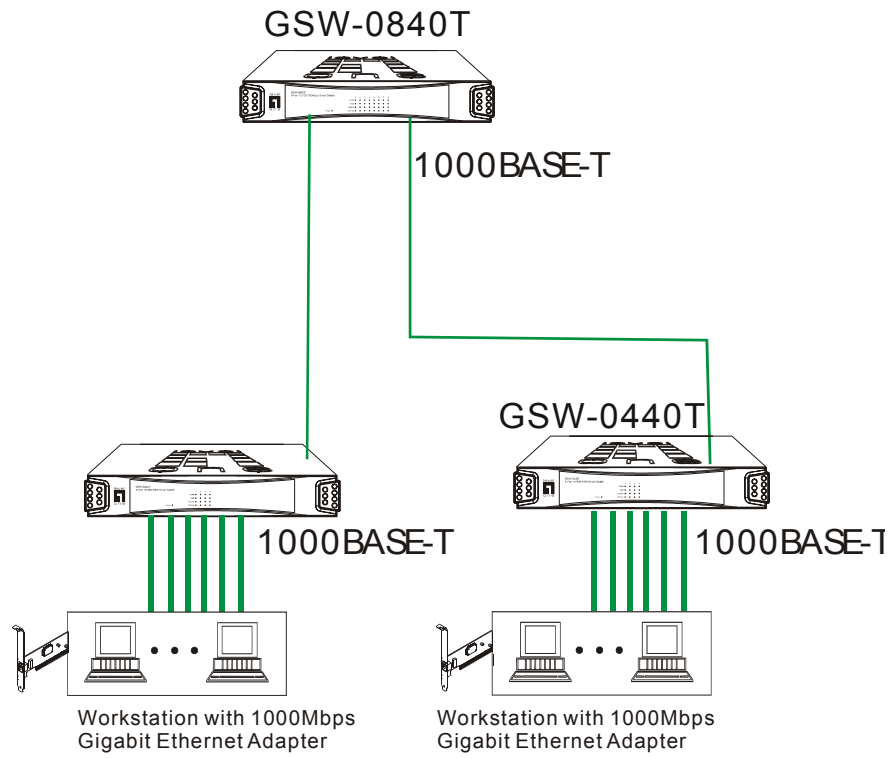
6   SMART FUNCTION CONFIGURATION

6.1   HyperTerminal

The Switch has a smart function that you can use to manage your local area network (LAN) more effectively. You can also use the default setting to operate the Switch as a dumb switch.

If you want to use smart function, install the Switch as below:

Use the "RS-232" connector to connect the Switch to a computer. Connect one (1) cable end to the Switch, and connect the other end to the computer's "COM1" or "COM2" port.

Note: If your Windows program doesn't have a hyper terminal, you have to install it first.

Power "ON" the Switch

Execute the "HyperTerminal" program:

Start Menu → Application Program → Communication → Hyper Terminal

Setup the connection content of Hyper Terminal:

In connection tag, select which "COM" port is used to connect PC and the Switch.

Then press the "SETUP" button, set "Bits per second" to **9600**, "Data bits" to **8**, "Parity" to **None**, "Stop bits" to **1**, "Flow control" to **None**.

Item	Setting
Port	COM
Baud rate	9600
Data bits	8 bits
Parity	None
Stop bits	1
Flow control	NA

7   Configuration Menu

7.1   Main Menu

The main menu function selections are listed below:

1. Port Status
2. Port Config
3. Mirror Config
4. VLAN Config
5. Misc Config
6. Save Config
7. Load Default

Now we use the 8 ports switch as an example for explanation; the functions of 4 ports switch is the same as 8 ports switch.

When you connect the switch through console port, the first menu you will see is as below:

```
              LevelOne GSW-0840T
              8-Port Gigabit Smart Switch
              ==========================

              Main Menu
              ==========================

              <1> Port Status
              <2> Port Config
              <3> Mirror Config
              <4> VLAN Config
              <5> Misc Config
              <6> Save Config
              <7> Load Default




              <+>:Next Item        <->:Back
              <ESC>:Exit           <Enter>:Toggle
                                         Version A1
```

You can press the -/+ key (on the right hand side of the keyboard) for moving up and down the menu bar, or you can choose the number 1 to 7 to select the item. When the menu bar stops on the right item that you want to execute, press "Enter" to go into the sub-menu.

7.2   Port Status

When you go into the "Port Status" sub-menu, the current state will be scanned for all 4 ports of the Switch and shown on the screen as follow:

13

```
                    LevelOne GSW-0840T
                    8-Port Gigabit Smart Switch
                    ===========================

                    Speed/Dpx   LinkStatus
                    ===========================

                    P1   1000/F       Off
                    P2   1000/F       Off
                    P3   1000/F       Off
                    P4   1000/F       Off
                    P5   1000/F       Off
                    P6   1000/F       Off
                    P7   1000/F       Off
                    P8   1000/F       Off




                    <+>:Next Item        <->:Back
                    <ESC>:Exit           <Enter>:Toggle
                                              Version A1
```

Users can only monitor the following status items: Speed/Dpx, LinkStatus.

7.3   Port Config

You can set each port's Flow-Control function and its priority.

```
                    LevelOne GSW-0840T
                    8-Port Gigabit Smart Switch
                    ===========================

                         FlowControl    Priority
                    ===========================

                    P1      Enable      Disable
                    P2      Enable      Disable
                    P3      Enable      Disable
                    P4      Enable      Disable
                    P5      Enable      Disable
                    P6      Enable      Disable
                    P7      Enable      Disable
                    P8      Enable      Disable




                    <+>:Next Item        <->:Back
                    <ESC>:Exit           <Enter>:Toggle
                                              Version A1
```

For Flow-Control, follow IEEE802.3x Flow-Control standard, you can set to Enable or Disable the flow control function. For Port Priority, you can set it up as Disable, Class 0, Class 1, Class 2, Class 3.

7.4   Mirror Config

Port Mirroring means setting up a monitored port so that data flowing through that port is copied to the snooping port. The port used to monitor other port is called the Snooping port. The port being watched is called the Mirrored Port. The Switch is able to monitor one port at one time. The transmitting and receiving direction can be monitored exclusively. Be sure to activate this function before setting port selection and direction.

14

```
                    LevelOne GSW-0840T
                    8-Port Gigabit Smart Switch
                    ===========================


                    Port Mirroring:    Disable












                    <+>:Next Item        <->:Back
                    <ESC>:Exit           <Enter>:Toggle
                                               Version A1
```

In the "Port Mirroring" sub-menu, you can setup the following settings.
Port Mirroring: Enable or Disable the Port Mirroring function.
Monitored Port: Select port's number from 1 to 8.
Snooping Port: Select port's number from 1 to 8.
Monitored Pkts: Incoming, Outgoing, Incoming&Outgoing.

```
                    LevelOne GSW-0840T
                    8-Port Gigabit Smart Switch
                    ===========================


                    Port Mirroring:    Enable
                    Monitored Port:    1
                    Snooping Port :    1
                    Monitored Pkts:    None








                    <+>:Next Item        <->:Back
                    <ESC>:Exit           <Enter>:Toggle
                                               Version A1
```

7.5   VLAN Config

The VLAN Configuration sets up the VLAN configuration of this switch. It supports 4 VLANs for 4 ports switch and 8 VLANs for 8 ports switch.

```
                LevelOne GSW-0840T
                8-Port Gigabit Smart Switch
                ===========================


                          1 2 3 4 5 6 7 8
                1 VLAN1  [O O O O O O O O ]
                2 VLAN2  [X X X X X X X X ]
                3 VLAN3  [X X X X X X X X ]
                4 VLAN4  [X X X X X X X X ]
                5 VLAN5  [X X X X X X X X ]
                6 VLAN6  [X X X X X X X X ]
                7 VLAN7  [X X X X X X X X ]
                8 VLAN8  [X X X X X X X X ]




                <+>:Next Item        <->:Back
                <ESC>:Exit           <Enter>:Toggle
                                            Version A1
```

You can Enable or Disable 8 VLAN groups from 1 to 8. "O" means the port is selected in the VLAN group while "X" is not selected.

7.6   Misc Config
You can set aging function and set the priority function for TCP/IP header's TOS/DS.

```
                LevelOne GSW-0840T
                8-Port Gigabit Smart Switch
                ===========================


                Aging Time:    1200sec

                IP Priority Mapping: Disable







                <+>:Next Item        <->:Back
                <ESC>:Exit           <Enter>:Toggle
                                            Version A1
```

You can Disable or Enable Aging Time by 300sec, 600sec, 900sec, or 1200sec.

```
                    LevelOne GSW-0840T
                    8-Port Gigabit Smart Switch
                    ===========================


                    Aging Time:     300sec

                    IP Priority Mapping: Enable
                    Tos0:0 Tos1:0 Tos2:0 Tos3:0 Tos4:0 Tos5:0 Tos6:0
Tos7:0








                    <+>:Next Item        <->:Back
                    <ESC>:Exit           <Enter>:Toggle
                                                    Version A1
```

7.7 Save Config

You can save the configuration, the functions will not disappear when power reset.

```
                    LevelOne GSW-0840T
                    8-Port Gigabit Smart Switch
                    ===========================


                    Waiting ...









                    <+>:Next Item        <->:Back
                    <ESC>:Exit           <Enter>:Toggle
                                                    Version A1
```

7.8 Load Default

When Load Default, the configuration would be set to factory default.

```
LevelOne GSW-0840T
8-Port Gigabit Smart Switch
===========================


Waiting ...




<+>:Next Item        <->:Back
<ESC>:Exit           <Enter>:Toggle
                              Version A1
```

8   PRODUCT SPECIFICATIONS

Model	GSW-0440T
Standards	IEEE 802.3: 10BASE-T IEEE 802.3u: 100BASE-TX IEEE 802.3ab: 1000BASE-T IEEE 802.3x: Flow-Control support
Ports	Four (4) 1000BASE-T/100BASE-TX/10BASE-T TP Copper Ports
Media Support	10BASE-T: Category 3, 4 or 5 TP 100BASE-TX/1000BASE-T: Category 5 TP
Bandwidth	1000BASE-T 2000/200/100/20/10 Mbps
Forwarding/Filtering Rate	1488095 packets/second per port @ 1000Mbps maximum 148810 packets/second per port @ 100Mbps maximum 14881 packets/second per port @ 10Mbps maximum
Latency	2.2μsec @1000Mbps minimum 11 μsec @100Mbps minimum 75 μsec @ 10Mbps minimum
MAC Addresses	8K Self-Learning
Configuration Utility	Console port
Buffer Memory	256K Bytes packet memory
Duplex Modes	Auto-Negotiation
Crossover	Auto-Crossover function
LED Indicators	One (1) for Power One (1) per port for display Link/ACT One (1) per port for display speed - 1000Mbps(Green) One (1) per port for display speed - 100Mbps(Green) One (1) per port for display Full-Duplex mode or collision status (Half –Duplex)
Power Supply	Full range Auto-Switching Input voltage: 100 ~ 240 +-10% VAC/ 50 ~ 60Hz
Power Consumption	21.50 W maximum
Environment	Operating Temperature: 0° ~ 45°C (32° ~ 113°F) Storage Temperature: 0° ~ 70°C Humidity: 10% ~ 90% Non-Condensing
Dimensions	265x185x44mm (10.4x7.3x1.7inches)

Model	GSW-0840T
Standards	IEEE 802.3: 10BASE-T IEEE 802.3u: 100BASE-TX IEEE 802.3ab: 1000BASE-T IEEE 802.3x: Flow-Control support
Ports	Eight (8) 1000BASE-T/100BASE-TX/10BASE-T TP Copper Ports
Media Support	10BASE-T: Category 3, 4 or 5 TP 1000BASE-TX/1000BASE-T: Category 5 TP
Bandwidth	1000BASE-T 2000/1000/200/100/20/10 Mbps
Forwarding/Filtering Rate	1488000 packets/second per port @ 1000Mbps maximum 148800 packets/second per port @ 100Mbps maximum 14880 packets/second per port @ 10Mbps maximum
Latency	2.2μsec @1000Mbps minimum 11 μsec @100Mbps minimum 75 μsec @ 10Mbps minimum
MAC Addresses	8K Self-Learning
Configuration Utility	Console port
Buffer Memory	256K Bytes Packet Memory
Duplex Modes	Auto-Negotiation
Crossover	All ports have Auto-Crossover function
Switch	One (1) for Power
LED Indicators	One (1) per port for display Link/ACT One (1) per port for display speed- 1000Mbps(Green) One (1) per port for display 100Mbps(Green) or 10Mbps(Off) One (1) per port for display Full-duplex and Half –Duplex (collision)
Power Supply	Full range Auto-Switching Input voltage: 100 ~ 240 +-10% VAC/ 50 ~ 60Hz
Power Consumption	30 W maximum
Environment	Operating Temperature: 0° ~ 45°C (32° ~ 113°F) Storage Temperature: 0° ~ 70°C Humidity: 10% ~ 90% Non-Condensing
Dimensions	265x185x44mm (10.4x7.3x1.7inches)

FCC WARNING

This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Part 15 of FCC Rules, which are designed to provide reasonable protection against electromagnetic interference in a commercial environment.

Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.