LevelOne

FSW-1620TX

FSW-2420TX

16/24-Port 10/100Mbps 11" Fast Ethernet Switch

User's Guide

Version: 1.0

TABLE OF CONTENTS
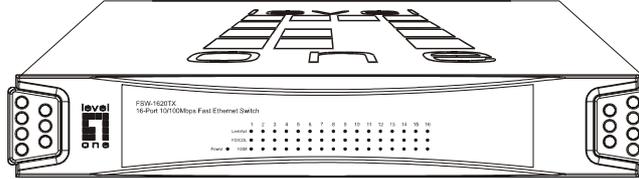
1   UNPACKING INFORMATION

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

  One (1) Switch
  One (1) Power Cord
  Four (4) Rubber Feet
  Rackmount Kit
  This User's Guide

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

16-Port 100BASE-TX Fast Ethernet Switch

24-Port 100BASE-TX Fast Ethernet Switch

Power Cord

Rubber Feet

Rackmount Kit

User's Guide

2   PRODUCT INTRODUCTION

2.1   Models
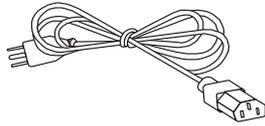These LevelOne 11" Fast Ethernet Switches are multi-speed, versatile network devices combining both standard and "Big-Pipe" ports under the same hood. The Switches are Twenty-Four (24) ports and Sixteen (16) ports Fast Ethernet Switches.
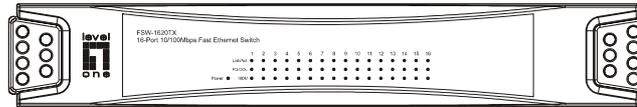
2.2   Key Features
For FSW-1620TX
Support 16-port 10/100M wire speed Ethernet
Store-and-Forward technology filtering/forwarding is used to eliminate bad packets.
Back-Pressure Flow-Control support for Half-Duplex operation.
IEEE802.3x Flow-Control support for Full-Duplex operation.
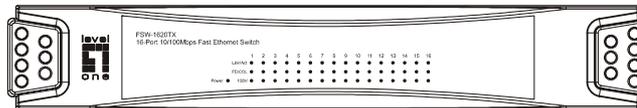All TP ports support Auto-MDI/MDIX, and Auto-Negotiation function.
For FSW-2420TX
Store-and-Forward technology filtering/forwarding is used to eliminate bad packets.
Back-Pressure Flow-Control support for Half-Duplex operation.
IEEE802.3x Flow-Control support for Full-Duplex operation.
All TP ports support Auto-MDI/MDIX, and Auto-Negotiation function.

2.3   Front Panel

16-Port 100BASE-TX Fast Ethernet Switch

24-Port 100BASE-TX Fast Ethernet Switch

2.3.1   10/100Mbps TP Ports
Each 10/100Mbps TP port 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 device into any TP port. Auto-MDIX is also supported on all TP ports which allows uplinking to another Switch free of cross-over or straight cable selection hassle.

2.3.2   Cabling
10Mbps -When transmitting at 10Mbps Category 3, 4 or 5 TP cabling with RJ-45 sockets can be used.
100Mbps -To transmit at 100Mbps requires Category 5 TP cabling.

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

Note: Category 5 TP cable is recommended whenever installing new cabling.
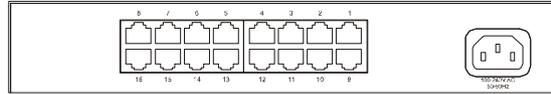
2.3.3   Status LEDs
The Switches come with a complete range of LEDs. The table below lists each LEDs name, color
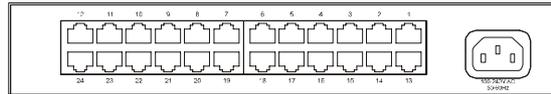
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and a brief description of its function.

Name	Color	Function
Pwr	Green	Lit: Power "On"
LINK/ACT	Green	Lit: When the port has a valid physical connection with another device. Blinks: When the port is sending or receiving data (Activity).
FD/COL	Green	Lit: When the port is set to Full-Duplex mode. Blinks: When a collision is detected, when the port is in Half-Duplex mode.
Speed	Green	Lit: When the port is operating at 100Mbps. Off: When the port is operating at 10Mbps.

2.4   Rear Panel

16-Port 100BASE-TX Fast Ethernet Switch

24-Port 100BASE-TX Fast Ethernet Switch

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 cord to the power connector on the back panel.
      Attach the male end of the cord to a grounded power outlet.

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3   INSTALLATION

The LevelOne 11" Fast Ethernet 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.
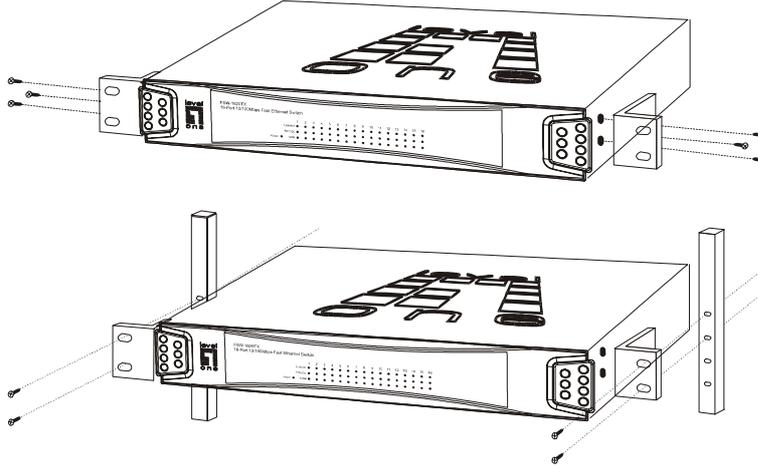
If user need advanced smart functions to manage LAN network more effectively, we provide software and cable for easy configuration of the Switch. Please see section 5 and 6 for further details.

3.1   To locate the switch on a desktop

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 clean, flat desk or tabletop close to a power outlet.

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.

Use the other provided screws to secure each Switch to the rack.

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 or 100Mbps bandwidth.

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

Fast Ethernet: Make sure rules for cable lengths and categories are followed.

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.

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 (ex: Switch-Switch, Switch-PC)

Both devices must have Full-Duplex capability

Both devices must be set to Full-Duplex (ex: Auto-Negotiation – Auto-Negotiation, Non-Auto-Negotiation to Non-Auto-Negotiation)

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

4.3 Fast Ethernet

100BASE-TX is called "Fast Ethernet". In Fast Ethernet data travels ten times faster (100Mbps) than in traditional Ethernet (10Mbps).

Below is a list of the cable types and connectors supported by the Switch for 10BASE-T and 100BASE-TX networks.

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

Note: If your 10BASE-T network currently uses Category 5 TP cabling, you can instantly upgrade the network to a 100BASE-TX network by changing network devices.

4.4 Auto-Negotiation

Every 10/100Mbps dual speed port on the Switch 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 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:
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.

4.5 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 Switch can automatically learn and store MAC addresses. However, the MAC address table is volatile: it disappears when the Switch is powered "Off" or reset.
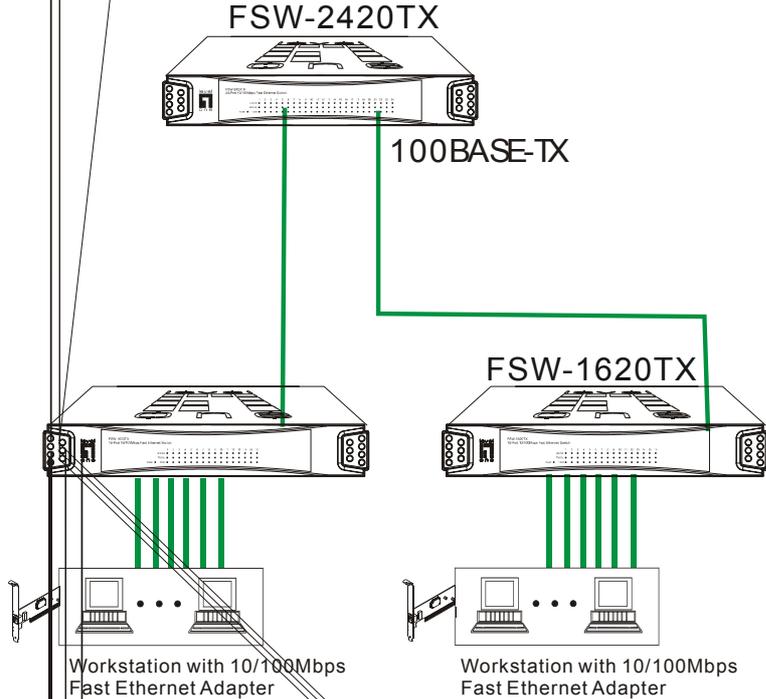
Note: When the network needs reconfiguration, we recommend turning off the power first. After all nodes have been moved, turn the Switch back "On" to rebuild the internal MAC address table.

4.6 Broadcast Storm Control (only for FSW-1620TX)

The Broadcast Storm Control discards broadcast frames when the number of cumulated non-unicast frames is over the threshold, in order to prevent Network Traffic congestion bringing the Network to a halt. In this Switch, each port will drop broadcast packets (Destination MAC ID is ff ff ff ff ff ff) after receiving continuous 64 broadcast packets. The counter will be reset to 0 every 800ms or when receiving any non-broadcast packets. (Destination MAC ID is not ff ff ff ff ff ff)

5   Sample Application

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

FSW-2420TX

100BASE-TX

FSW-1620TX

Workstation with 10/100Mbps
Fast Ethernet Adapter

Workstation with 10/100Mbps
Fast Ethernet Adapter

6 PRODUCT SPECIFICATIONS

Model	FSW-1620TX
Standards	IEEE 802.3: 10BASE-T IEEE 802.3u: 100BASE-TX EEE 802.3x: Flow-Control for Full-Duplex operation
Ports	Sixteen (16) 100BASE-TX (Copper)
Media Support	10BASE-T: Category 3, 4 or 5 TP 100BASE-TX: Category 5 TP
Bandwidth	100BASE-TX: 200/100Mbps 10BASE-T: 20/10Mbps
Forwarding/Filtering Rate	148810 packets/second per port @ 100Mbps, maximum 14881 packets/second per port @ 10Mbps, maximum
Latency	8.5 μsec @100Mbps, minimum 67 μsec @ 10Mbps, minimum
MAC Addresses	8K Six (6)-bytes entries maximum, Self-Learning
Buffer Memory	512K Bytes Packet Memory
Duplex Modes	TP ports have 10/100Mbps Full/Half-Duplex Auto-Negotiation function
Crossover	All the TP ports support Auto-MDIX function
LED Indicators	One (1) for Power One (1) per port for Link/ACT One (1) per port for Full-Duplex/Collision One (1) per port for Speed
Power Supply	Full range Auto-Switching Input voltage: 100 ~ 240 +/-10% VAC/ 50 ~ 60 Hz
Power Consumption	9.9 watt maximum
Environment	Operating Temperature: 0° ~ 45°C (32° ~ 113°F) Storage Temperature: -20° ~ 70°C (-4° ~ 158°F) Humidity: 10% ~ 90% Non-Condensing
Certifications	FCC Class A CE Mark
Dimensions	265x185x44mm (10.4x7.3x1.7inches)

Model	FSW-2420TX
Standards	IEEE 802.3: 10BASE-T IEEE 802.3u: 100BASE-TX EEE 802.3x: Flow-Control for Full-Duplex operation
Ports	Twenty-Four (24) 100BASE-TX (Copper)
Media Support	10BASE-T: Category 3, 4 or 5 TP 100BASE-TX: Category 5 TP
Bandwidth	100BASE-TX: 200/100Mbps 10BASE-T: 20/10Mbps
Forwarding/Filtering Rate	148810 packets/second per port @ 100Mbps, maximum 14881 packets/second per port @ 10Mbps, maximum
Latency	8 μsec @100Mbps, minimum 75 μsec @ 10Mbps, minimum
MAC Addresses	8K Six (6)-bytes entries maximum, Self-Learning
Buffer Memory	320K Bytes packet memory
Duplex Modes	TP ports have 10/100Mbps Full/Half-Duplex Auto-Negotiation function
Crossover	All the TP ports support Auto-MDIX function
LED Indicators	One (1) for Power One (1) per port for Link/ACT One (1) per port for Full-Duplex/Collision One (1) per port for Speed
Power Supply	Full range Auto-Switching Input voltage: 100 ~ 240 +/-10% VAC/ 50 ~ 60 Hz
Power Consumption	16.5 watt maximum
Environment	Operating Temperature: 0° ~ 45°C (32° ~ 113°F) Storage Temperature: -20° ~ 70°C (-4° ~ 158°F) Humidity: 10% ~ 90% Non-Condensing
Certifications	FCC Class A CE Mark
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.