

FSW-1607TFX

FSW-2407TFX

16/24 port 10/100Mbps Smart NWay Switch

User's Guide

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Trademarks

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Disclaimer

The information contained in this documentation is subject to change without notice.

We do not assume any liability that may occur due to the use or application of the product(s) herein.

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device in accordance with the specifications in Subpart B of Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to take whatever measures may be necessary to correct the interference at their own expense.

EN 55 022 Declaration of Conformance

This is to certify that the Levelone FSW-1607/2407TFX 10/100Mbps Smart NWay Switch is shielded against the generation of radio interference in accordance with the application of Council Directive 89/336/EEC, Article 4a. Conformity is declared by the application of EN 55 022:1987 Class A (CISPR 22:1985/BS 6527:1988).

***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 appropriate measures.*

Certificate of the Manufacturer/Importer

It is hereby certified that the Levelone FSW-1607/2407TFX 10/100Mbps Smart NWay Switch has been suppressed in accordance with the conditions set out in the BMPT-AmtsblVfg 243/1991 and Vfg 46/1992. The operation of some equipment (for example, test transmitters) in accordance with the regulations may, however, be subject to certain restrictions. Please refer to the notes in the operating instructions.

Federal Office for Telecommunications Approvals has been notified of the placing of this equipment on the market and has been granted the right to test the series for compliance with the regulations.

Voluntary Control Council for Interference (VCCI) Statement

This equipment conforms to Class A of the standards set by the Voluntary Control Council for Interference by Data Processing Equipment and Electronic Office Machines that are aimed at preventing radio interference in commercial and/or industrial areas.

Consequently, when this equipment is used in a residential area or in an adjacent area thereto, radio interference may be caused to equipment such as radios and TV receivers.

Safety

Please read the following instructions carefully. This manual should be retained for future reference.

1. Do not place the unit on an unstable surface.
2. Do not place anything on top of the power cord. Make sure the cord is placed in an area where it will not be stepped on.
3. Do not remove the cover or attempt to service this unit by yourself. You may void the warranty. Servicing of any nature should be performed only by an authorized technician.
4. Safe storage of the unit is in a range of minus 20 to plus 70 degrees Celsius. Storing the unit outside this range could result in permanent damage.
5. If any of the following occurs, immediately unplug the unit and call an authorized technician.
 - The power cord is frayed or damaged.
 - Liquid has been spilled into the unit, or it has been exposed to rain.
 - The case has been damaged.

About this manual

This user's manual describes how to install and operate the Levelone FSW-1607/2407TFX 10/100Mbps Smart NWay Switch. Please read this manual before you install the product.

This manual includes the following topics:

- Product description, features and specifications
- Hardware installation procedure
- Advanced configuration
- Troubleshooting procedures

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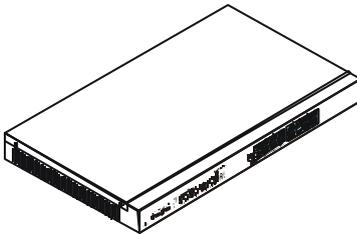
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Chapter 1

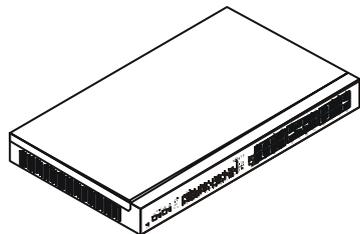
Introduction

Congratulations on your purchase! The Levelone FSW-1607/2407TFX 10/100Mbps Smart NWay Switch is a scalable network switching solution built for small and medium enterprise networks. Units are light, compact, and easy to install on a desktop or rack mount cabinet.

Two models of the Levelone FSW-1607/2407TFX are covered in this manual; the FSW-1607TFX (16-port model) and the FSW-2407TFX (24-port model). Aside from the number of ports, the switches share identical features and are thus referred to throughout the manual as *FSW-1607/2407TFX*.



FSW-1607TFX
16 Port 10/100Mbps
Smart NWay Switch



FSW-2407TFX
24 Port 10/100Mbps
Smart NWay Switch

The Levelone FSW-1607/2407TFX supports 10/100 Mbps dual-speed flexibility, high-performance Ethernet, and Fast Ethernet switching. Other features include port trunking, which reduces the

bottleneck effect when interconnecting switches, and VLAN, which allows you to set up virtual LANs within your network.

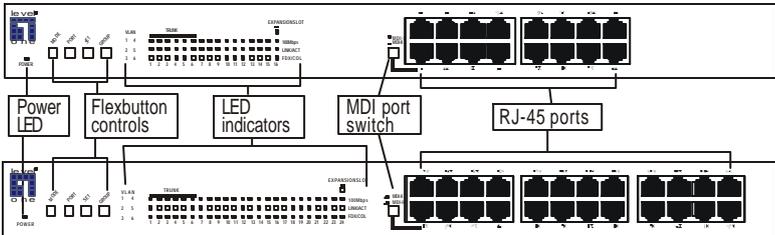
Features

- Optional 100BASE-FX module for long distance expansion
- Uplink button for MDI-II connection
- Full/half-duplex support on all ports
- Port trunking
- Supports Virtual LAN for increased network security

Front view of FSW-1607/2407TFX

Refer to the following illustration for a description of the front panel of the Smart Switch:

FSW-1607TFX



FSW-2407TFX

FlexButton configuration controls

The Flexbutton controls let you easily configure the FSW-1607/2407TFX 10/100Mbps Smart NWay Switch as you want. The following table describes the functions of the FlexButton controls:

Button	Function
Mode	Lets you scroll through the settings: VLAN; Trunk; and normal port status
Port	Allows you to select a port

Set	Applies the setting to the selected port
Group	Lets you select the ports to group in VLANs and Port Trunk

LED indicators

The following table describes the meaning of the LEDs:

LED	State	MEANING
Power	On (green) Off	The unit is receiving power. The unit is not receiving power.
VLAN	On (green) On (orange) Off	Indicates VLAN is configured VLAN is being configured. VLAN is not configured.
TRUNK	On (green) On (orange) Off	Port Trunk is configured. Port Trunk is being configured. Port Trunk is not configured.
LINK/ACT	On (green) On (flashing green) Off	Link is established Packet transmit or receive activity No Link activity
100Mbps	On (green) Off	The connection speed is 100 Mbps. The connection speed is 10 Mbps.
FDX/COL	On (green) On (flashing orange) Off	Full-duplex mode Collision has occurred Half-duplex mode
Expansion slot	On (green) Off	Expansion module installed No expansion module installed
VLAN group 1 - 6	On (green) Off	The selected VLAN group is being configured. The VLAN group is not selected.

Note 

If you notice any other LED activity other than described in the table above, such as an LED flashing or staying on, refer to Troubleshooting in Appendix A.

MDI port switch

The MDI (Medium Dependent Interface) port or uplink port is used to connect other hubs or switches to the Smart Switch. This switch lets you toggle between MDI-II (straight-through) and MDI-X (cross-over) depending on the cable used. (Refer to *Cables and connectors* on page 29 of Appendix C.)

10/100 Mbps RJ-45 ports

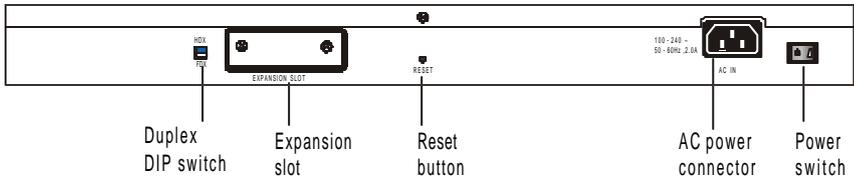
The Auto-Negotiation 10/100 Mbps RJ-45 switching ports are autosensing: 10/100 Mbps speed and duplex transmission mode are automatically configured.

Uplink port

The uplink port (port 1) lets you connect the FSW-1607/2407TFX 10/100Mbps Smart NWay Switch to another switch or hub.

Rear view

Refer to the following illustrations for a description of the rear panel of the FSW-1607/2407TFX 10/100Mbps Smart NWay Switch.



Duplex DIP switch

This DIP switch lets you choose between half-duplex (HDX) and full-duplex (FDX) transmission modes when an expansion module is installed.

Note *Half-duplex transmits data in both directions, but only one direction at a time, whereas full-duplex transmits and receives simultaneously.*

Expansion slot

Remove this cover when installing an optional expansion module. Refer to *Installing the expansion module* on page 10 for instructions on this procedure.

Note *The expansion slot is shared with port 16 of the Level-one FSW-1607TFX 16 Port 10/100Mbps Smart NWay Switch, and port 24 of the FSW-2407TFX 24 port 10/100Mbps Smart NWay Switch. These RJ-45 ports are disabled when an expansion module is installed.*

Reset button

The reset button is used to restore the factory default settings. To reset the system: power the unit off, then press and hold the reset button and power the unit on. When the 100 Mbps LED of port 2 comes on, release the reset button.

When the system is reset, all configuration changes are cleared.

AC power connector

Connect the supplied power cord to this connector.

Note

For added protection, we recommend you use a "Surge Protection" device plugged between the AC adapter and the electrical wall outlet to prevent the effects of sudden current variations from reaching the LevelOne FSW-1607/2407TFX 10/100Mbps Smart NWay Switch and your network.

Power switch

Push this switch to power the unit up.

This concludes Chapter 1. The next chapter covers installation and operation procedures.

Chapter 2

Installing the FSW-1607/2407TFX

This chapter covers the options for setting up your FSW-1607/2407TFX 10/100Mbps Smart NWay Switch and connecting stations to the unit. There's also a section devoted to the optional expansion module.

Setup combinations

The Levelone FSW-1607/2407TFX units are easy to set up. Packaged with the FSW-1607/2407TFX you will find mounting brackets for installing the unit in a rack mount cabinet. Rubber pads are also provided for placing the unit on a horizontal desktop or on top of another Smart NWay Switch unit.

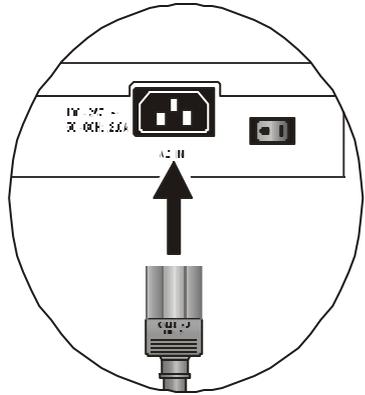
Setup location

Take a moment to prepare a suitable place to set up your FSW-1607/2407TFX 10/100Mbps Smart NWay Switch. You need a stable flat dust-free surface with good ventilation. At the back of the FSW-1607/2407TFX leave space for fiber-optic cabling and the power cord. There should be at least 8 cm (3.15 inches) at the sides for cooling.

Testing the FSW-1607/2407TFX

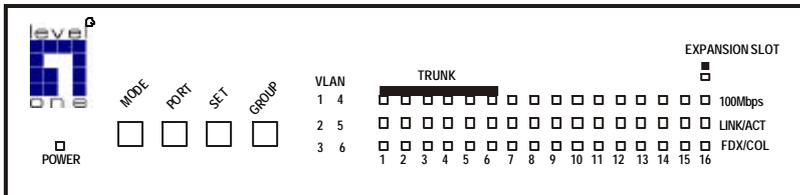
Before proceeding to set up the FSW-1607/2407TFX 10/100Mbps Smart NWay Switch it's a good idea to first check if the FSW-1607/2407TFX passes its self-test. Refer to the following:

1. Connect the supplied power cord to the power connector on the back of the FSW-1607/2407TFX.
2. Power up the unit. You will notice the LEDs on the front panel will begin to light. The following section describes the LED behavior.



LED activity and POST

Every time the FSW-1607/2407TFX is powered on the POST (Power On Self Test) is run. The test takes only a few seconds to run.



Initially, the LEDs of the top and bottom rows are on for a few seconds. Then, the LEDs go on and off in sequence.

When the test completes successfully, the power LED and the corresponding LEDs of any ports that have connections established are on.

If the test does not complete successfully, refer to *POST diagnostics* on page 26 of Appendix A.

Installing the expansion module:MDU-0121FXC

To provide better networking options, an optional 100BASE-FX (SC) fiber-optic module can be installed in the FSW-1607/2407TFX. The expansion module allows you to extend your network up to two kilometers.

Refer to the following to install an expansion module:

1. Turn off the power to the FSW-1607/2407TFX.
2. Use a Phillips screwdriver to remove the two screws from the module cover and remove the cover. Store the module cover for future use.
3. Install the module.

Note

The installation procedure may vary, depending on the particular expansion module you purchased. Refer to the Quick Installation Guide of the model you are using for detailed installation instructions.

Duplex mode

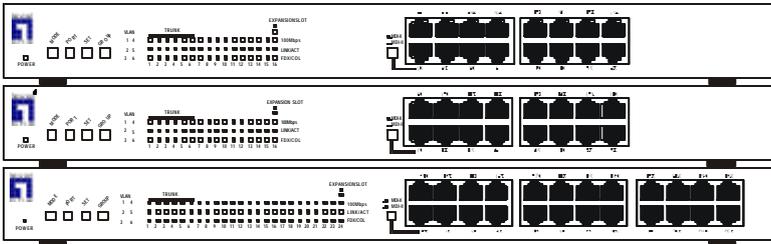
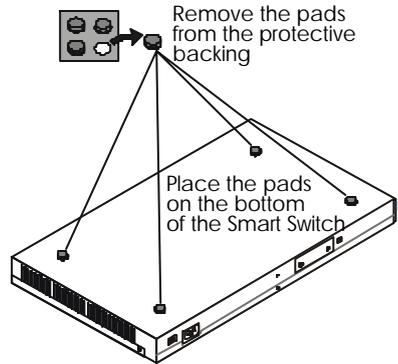
The expansion module can accommodate fiber-optic cable up to 2 kilometers in length when set to full-duplex. The maximum cable length when set to half-duplex is 228 meters.

The duplex mode default setting for the expansion module is full-duplex. Refer to *Rear view* on page 5, if you have trouble locating the duplex DIP switch.

Desktop mounting

Refer to the following when placing switches on a desktop surface:

1. Fix the supplied rubber pads to the bottom of the FSW-1607/2407TFX as shown below.
2. Place the FSW-1607/2407TFX on the desktop. Fix rubber pads to the bottom of a second switch. Then place the second switch on top of the first.



3. Repeat steps 1 and 2 for all subsequent switches.

Note

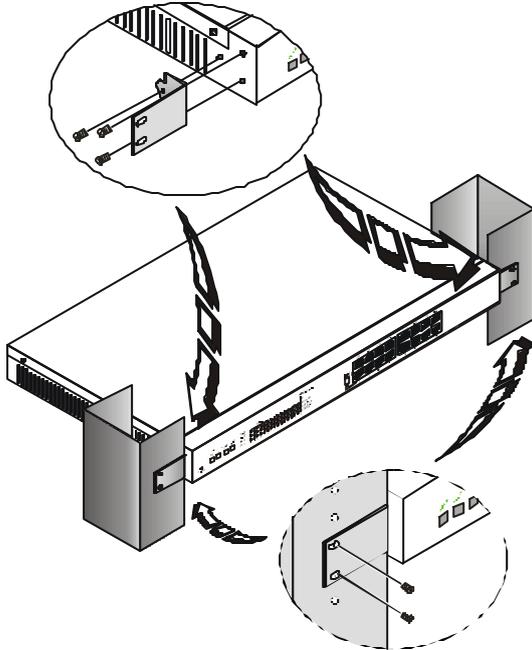
When stacking more than four switches we recommend that you mount the switches in a rack mount cabinet. See the Cabinet mounting section that follows.

4. Connect the switches to an electrical outlet. (For instructions on linking the switches to each other, refer to *Interconnecting FSW-1607/2407TFX* on page 17.)

Cabinet mounting

The following procedure tells you how to install the FSW-1607/2407TFX 10/100Mbps Smart NWay Switch in a rack mount cabinet.

1. Use a Phillips (cross-head) screwdriver to attach the supplied brackets to the FSW-1607/2407TFX as shown here.



2. Place the FSW-1607/2407TFX 10/100Mbps Smart NWay Switch in the rack securing it with screws (supplied with cabinet) as shown.
3. Repeat steps 1 and 2 for all subsequent switches.

This concludes Chapter 2. In the following chapter, you will read how to set up and configure your network.

Notes

Chapter 3

Connecting to a network

Setting up networks

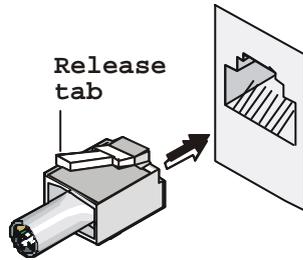
The FSW-1607/2407TFX is a Plug and Play device—just connect to the Smart NWay Switch and you are ready to go. This chapter tells you how to set up and expand your network.

Using RJ-45 connectors

To connect:

Align the plug with the socket as shown here. Push the plug until it clicks into place.

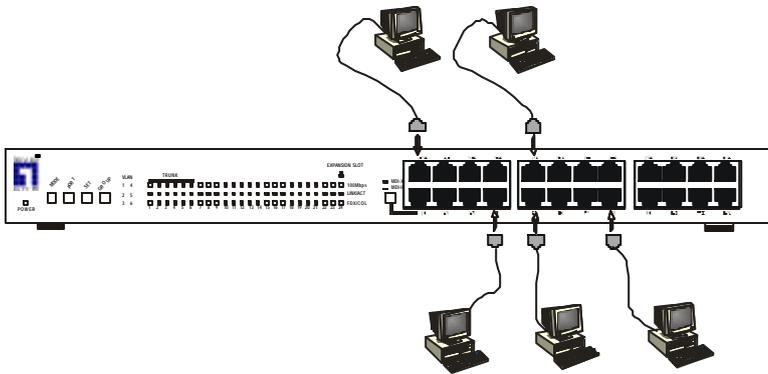
To remove the connector, push down on the small release tab and pull the plug out of the socket.



Connecting stations to the FSW-1607/2407TFX

Whether you've set up on a desktop or rack mount cabinet, the procedure for connecting stations to the FSW-1607/2407TFX is the same. Refer to the following:

1. Connect the RJ-45 plug to the Smart Switch.
2. Plug the RJ-45 on the other end of the cable into the network adapter on the station.



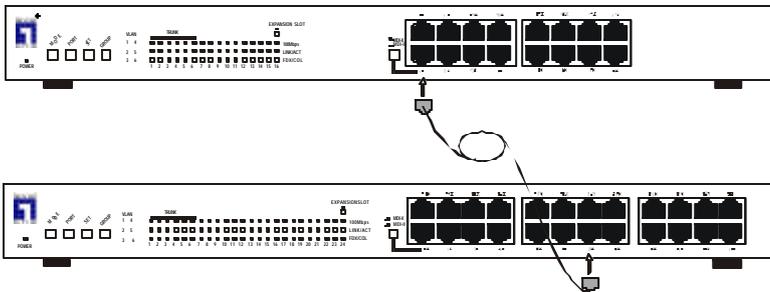
If the FSW-1607/2407TFX was powered up when you made the connection, the LINK/ACT LEDs for all the above stations should be on.

If the LED does not light, refer to *POST diagnostics* on page 26 of Appendix A.

Interconnecting the FSW-1607/2407TFX

To increase the connectivity of your network, you can connect two Smart Switches together. Refer to the following procedure:

1. Insert the RJ-45 plug into the RJ-45 socket of port 1 (the uplink port) on the Smart Switch.
2. Insert the RJ-45 plug on the other end of the cable into the one of the ports on the other Smart Switch.



3. Set the MDI switch accordingly.

Note

The MDI switch setting will depend on the cable used. Refer to Cables and connectors on page 29 of Appendix C.

If the Smart Switch was powered up when you made the connection, the LINK/ACT LEDs of both switches should be on.

If the LEDs do not light, refer to *POST diagnostics* on page 26 of Appendix A.

Advanced configuration

The advanced configuration settings offer you more flexibility in setting up your networks. This section tells you how to benefit from the FSW-1607/2407TFX's port trunk and VLAN features.

Port trunk configuration

To expand your network additional switches can be connected to your FSW-1607/2407TFX 10/100Mbps Smart NWay Switch. Depending on the number of stations on each switch, the cables have to carry increased amounts of data between these switches. The result can be a bottleneck in your network with data transfer slowed down considerably.

Advantages of port trunking

Port trunking (or link aggregation) can help to reduce the bottleneck by providing extra channels to carry data between switches, improving the overall efficiency of your network.

Configuring port trunking

Port trunking is assigned to the first six ports of the FSW-1607/2407TFX. The following four modes are available:

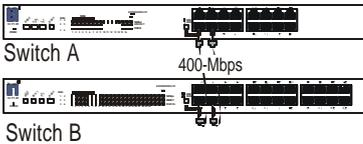
Mode	Ports	MEANING
1	1, 2	One link is assigned over two ports
2	1, 2, 3, 4	One link is assigned over four ports
3	1, 2 and 5, 6	Two separate links are assigned over ports 1 and 2, and over ports 5 and 6.
4	None	Port trunking is not configured

The following instructions tell you how to configure port trunking.

1. Press the **MODE** button until the Trunk LED is on (orange).
2. Press the **GROUP** button to scroll between trunk modes 1 and 4.
3. Press the **SET** button to save the setting.
4. Press the **MODE** button to return to normal (port status) mode.

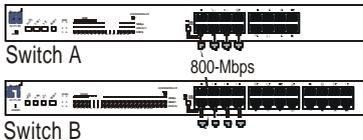
The following illustration demonstrates how to connect your switches for Port Trunk modes 1, 2, and 3.

Mode 1: 400-Mbps Trunk



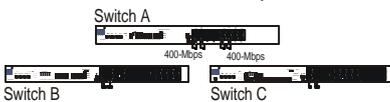
	Trunk configuration
Switch A	Mode 1
Switch B	Mode 1

Mode 2: 800-Mbps Trunk



	Trunk configuration
Switch A	Mode 2
Switch B	Mode 2

Mode 3: Two 400-Mbps Trunks



	Trunk configuration
Switch A	Mode 3
Switch B	Mode 1
Switch C	Mode 1

Note

When setting up port trunking between two switches, port trunking has to be configured correctly on both

switches.

VLAN configuration

Virtual LAN—or VLAN—is a logical subgroup within a local area network that is created through port configuration. It combines user stations and network devices into a single group regardless of the physical LAN segment they are attached to and allows traffic to flow more efficiently within these smaller virtual networks.

Advantages of VLAN

VLANs can be configured to optimize traffic or to isolate specific workstations for reasons of security or convenience. Each VLAN (subgroup) you configure behaves as an isolated broadcast domain just as if it were a separate switch. There is no communication between ports on the separate VLANs unless the VLANs are connected by an external router.

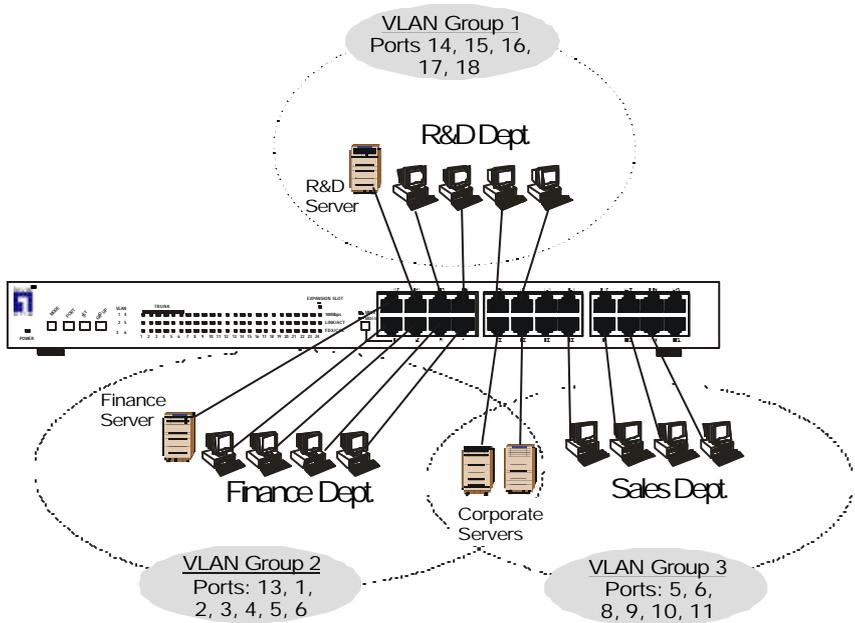
Configuring a VLAN

Six VLAN groups can be configured on the FSW-1607/2407TFX. VLAN groups can be overlapped to provide added flexibility. Refer to the following to assign ports to a VLAN:

1. Press the **MODE** button. The VLAN LED (orange) comes on and VLAN group 1 LED (green) comes on. Press the **GROUP** button to scroll between the VLAN groups 1 and 6.
2. Press the **PORT** button to scroll through the 16/24 ports.
3. Press the **SET** button to assign the selected port (port's LED is flashing) to the VLAN group. After you press **SET** the LED flashes more rapidly signifying the port has been assigned to that VLAN group. Press the **SET** button again to remove the assigned port from the VLAN group.

4. Repeat steps 2 and 3 to assign more ports to the selected VLAN group.
5. When you are finished configuring one VLAN group, press the **GROUP** button to scroll to the next VLAN group. Repeat steps 2 through 4 to assign ports to the new group.
6. Press the **MODE** button to save the configuration settings and go to the next function (Port Trunking).
7. Press the **MODE** button to return to normal (port status) mode.

With a little planning and minimum effort, you can cordon off workstations in your company for effective and practical “Smart Groups”, as demonstrated below.



Note 

Before you begin configuring VLAN, plan your groups. Refer to the VLAN planning sheet on page 28 of Appendix B.

This concludes Chapter 3. The following appendixes provide information on troubleshooting, technical specifications, and the cables and connectors that can be used with the FSW-1607/ 2407TFX.

Appendix A

Troubleshooting

Where to start troubleshooting

Problems often arise with systems that can easily be avoided. Before you begin troubleshooting, check the following:

Faulty or loose cables: Make sure all cables are correctly inserted in their sockets. If the cables appear to be ok, try changing cables with a cable you know is working to isolate faulty cables.

Non-standard cables: Use a new correctly-wired cable for all connections. Refer to *Cables and connectors* on page 29 of Appendix C.

Incorrect connections: When connecting to other switches or hubs, make sure you are using the correct cable type—crossover or straight-through. Refer to *Cables and connectors* on page 29 of Appendix C.

Incorrect network topology: Topology problems can arise from excessive cable length, or excessive repeater delays between end nodes. If a topology problem occurs after a recent change to your network, change back to the previous topology to isolate the problem.

POST diagnostics

When the FSW-1607/2407TFX is powered up the POST (Power On Self Test) is run. A series of built-in diagnostics are performed to check that the system is functioning and configured correctly.

As the diagnostics are run, the LEDs on the FSW-1607/2407TFX go on in sequence. If the LED does not go off, but instead flashes, the diagnosis has failed and the POST will stop at the point of failure. Note the port number where the diagnosis failed and contact your local authorized service technician.

Common problems

Problem: Power LED not on.

Solution: Make sure the connections are good. Verify that the power source is active by testing with another electrical device. Try unplugging and plugging the power cord back in.

Problem: All LEDs stay on

Solution: Try power cycling the switch by turning the unit off and then on.

Problem: The network connection is not functioning correctly.

Solution: Verify that the cables for the indicated port are connected correctly and the device connected is powered on. Verify that you have used the correct cable (see the following appendix).

Resetting the FSW-1607/2407TFX

Resetting the FSW-1607/2407TFX will test its circuitry and may solve some configuration problems. To reset the switch, do the following:

Power the unit off, then press and hold the reset button and power the unit on. When the 100 Mbps LED of port 2 comes on, release the reset button.

Resetting the switch clears any previous configuration changes you have made but usually can resolve any temporary operational problems.

Contact your dealer

If after reviewing this troubleshooting appendix, you are still experiencing problems with the FSW-1607/2407TFX you should contact an authorized dealer for further assistance.

Appendix B

VLAN planning sheet

Virtual LAN Planning Sheet							
Port	Port Alias Name	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
1							
2							
3							
4							
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Appendix C

Cables and connectors

Cables and connectors

This appendix provides specifications and pin-out information for cables to be used with FSW-1607/2407TFX. The importance of this appendix can not be over-emphasized as many problems with LAN communications can be traced back to incorrectly wired cabling.

Twisted-pair cables and connectors

Fast Ethernet network connections require twisted pair cables as specified in the IEEE 802.3u standard for 100BASE-TX. Twisted pair cables are available unshielded (UTP) or shielded (STP). UTP is the most common. Both UTP and STP come in stranded and solid wire varieties and should be Underwriters Laboratories (UL) or Electronic Testing Laboratories (ETL) certified.

Note

If you are setting up your network in a factory or around heavy machinery, use STP cables. The shield protects against excessive electromagnetic interference found in such noisy environments.

Types of cable

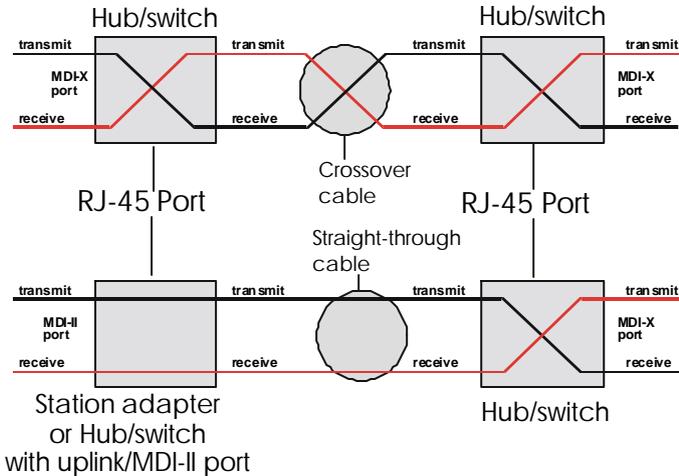
For 100 Mbps connections to the ports, you will require 100-ohm Category 5 UTP or STP cables as supported by the IEEE 802.3u Type 100BASE-TX standard.

Category 3, 4, or 5 UTP cables as supported by the IEEE 802.3u Type 10BASE-T standard is required for 10 Mbps connections to the ports.

Straight-through or Crossover cable

The RJ-45 ports on the FSW-1607/2407TFX are wired as MDI-X ports. Whether you use straight-through or crossover cable to connect to these ports will depend on the other device you are connecting to.

When devices connect to each other on a network, they connect through a transmit and a receive line. The objective is to put the transmitted data onto the receive line of the receiving machine.



The RJ-45 port on computer and workstation adapter cards, which connects them to the network, is referred to as the MDI-II (straight-through) port. If you are connecting an MDI-X port at one end and an MDI-II port at the other end—that is, connecting a hub or switch to a station—a straight-through cable should be used. To connect MDI-X ports at both ends—connecting two hubs for instance—use a crossover cable.

Note 

The uplink port (port 1) can be designated as a MDI-II or MDI-X port, allowing you to connect both straight-through or cross-over cables to it.

Patch panels and cables

If you installed patch panels to interconnect hubs and switches in different floors of a building, you also need to use Category 3 or Category 5 UTP patch cables for 10BASE-T connections and Category 5 UTP patch cables for 100BASE-TX.

To wire patch panels, use patch cables that have male RJ-45 connectors. (You will need to use two UTP patch cables.)

Fiber-optic cables

To connect fiber-optic cables to the ports on the FSW-1607/2407TFX 's 100BASE-FX switch module, you must use 130 nm wavelength, multimode cable conforming to the ISO/IEC 793-2 type B1 and ITU-T G.652 standards. SC-type connectors must also be used with the cables.

Appendix D

Specifications

Standards Compliance:	IEEE 802.3 10BASE-T, 802.3u 100BASE-TX, 100BASE-FX	
Connectors:	16/24 Auto-negotiation 10/100 Mbps RJ-45 switching ports (optional 100BASE-FX module with SC connector)	
Cable requirements:	10BASE-T	UTP category 3, 4, or 5
	100BASE-TX	UTP category 5
	100BASE-FX	Multi-mode fiber-optic cable
Forwarding method:	Store and forward	
Packet forwarding rate:	10BASE-T	14,880 pps to 10 Mbps ports
	100BASE-TX/FX	148,800 pps to 100 Mbps ports
MAC address size:	1K Media Access Control (MAC) address	
Buffer memory size:	FSW-1607TFX	Dynamic 2 MB per unit
	FSW-2407TFX	Dynamic 3 MB per unit
Virtual LAN support:	User specified VLAN grouping	
Port trunking support:	Link aggregation up to 800 Mbps	
Flow control:	Standard backpressure on half-duplex mode Standard IEEE 802.3x on full-duplex mode	
FlexButton:	Mode, port, set, group, reset	
Easy Visual Display (LED indicators):	System	Power, VLAN, Trunk,
	Port	100 Mbps, Link/Act, FDX/Col
Dimensions:	441 mm x 44 mm x 230 mm (WxHxD)	
Environmental:	Operating temperature	0 C to 50 C
	Storage temperature	-20 C to 70 C
	Operating humidity	10% to 90% RH
	Storage humidity	5% to 90% RH
Safety compliance:	UL, cUL, TUV, CE	
EMC compatibility:	FCC Part 15 Class A, VCCI Class A, C-Tick,	

EN55022 Class A, CE

WARRANTY

DDC warrants the functionality of all switch products, except the fan and power supply/power adapter, for the life of the product.

The fan and power supply/power adapter are warranted for one year from the date of purchase.

- ❑ Customer shall pay return shipping charges to DDC. And, DDC will re-pack the repaired product or a replacement and send it to customer at DDC's expense.
- ❑ The warranty does not apply if, in the judgment of DDC the product's failure is due to damage from handling, storage, accident, abuse, or misuse. The maximum liability of the warranty is limited to the purchase price of the product covered by the warranty.
- ❑ DDC reserves the right in its sole discretion to replace the returned Product with a new Product in the same model if the returned Product is found non-repairable.

Products that fail after the warranty period from the original date of purchase will have two options:

1. DDC will replace the failed product with an equivalent model at the current wholesale price. Customer must return the defective product to receive replacement.
2. Customer can return the failed product to DDC for non-warranty repair and agree to a quoted price for time and materials for cost of repair. Payment arrangements must be confirmed prior to repair(s).

Prior to returning any defective product to DDC, the end user or the reseller from which the customer originally purchased the product must obtain an RMA (Return Material Authorization) number from DDC. All defective products should be returned to DDC with shipping charges prepaid.

DDC is not responsible for any loss of data or equipment attached to or connected with enclosed product. Furthermore, DDC is not liable for any costs incurred or charges for recovery of data, equipment, materials and/or labor due to network downtime or lost productivity.