

# **Volition™**

## **Network Solutions**



# **VOL-1081**

## **Fast Ethernet**

### **Mini-switch 8+1**

*User Guide*

**3M** *Innovation*

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# Contents

<b>1. Introduction.....</b>	<b>4</b>
Figure 1-1. The VOL-1081 Fiber Switch .....	4
Features .....	4
<b>2. Hardware Description.....</b>	<b>5</b>
Front Panel.....	5
Figure 2-1. The Front Panel of the VOL-1081 Mini-switch with VF-45 connector.....	5
LED Indicators.....	6
Rear Panel.....	6
Figure 2-2 The Rear Panel of the VOL-1081 Fiber Switch.....	6
Desktop Installation .....	7
Attaching Rubber Feet.....	7
Power On .....	7
<b>3. Network Application .....</b>	<b>8</b>
Desktop Application .....	8
Figure 3-1. Desktop Application .....	8
<b>4. Trouble Shooting.....</b>	<b>9</b>
Diagnosing with the LED Indicators .....	9
Link .....	9
Power.....	9
Transmission Mode .....	9
Cabling .....	9
<b>5. Technical Specifications - VOL-1081 Mini-switch .....</b>	<b>10</b>
Interfaces and Cabling.....	10
Standards and Performance .....	10
Power requirements.....	11
Physical and Environmental Specifications .....	11
<b>6.0 Agency Approvals .....</b>	<b>11</b>
Electromagnetic and Safety Approvals .....	11
FCC Statement .....	11

# 1. Introduction

The VOL-1081 Mini-switch is a compact desktop size switch that is ideal for small office or home office networks. It provides wire-speed, Fast Ethernet switching offering high-performance at low-cost.

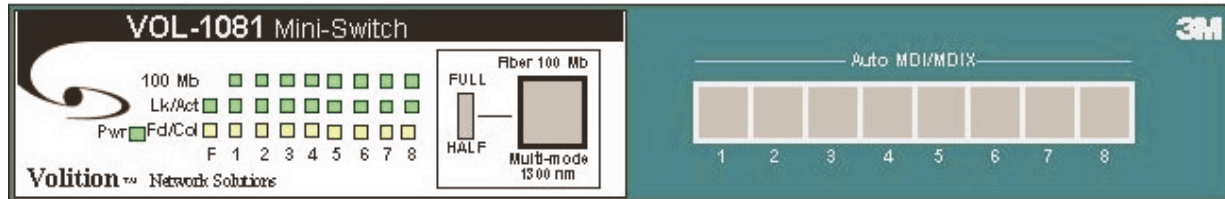


Figure 1-1. The VOL-1081 Fiber Switch

- The VOL-1081 Mini-switch provides 8 switched N-Way 10/100 Mbps RJ-45 Ethernet ports and one 100Base-FX VF-45™ fiber port.
- The Switch automatically detects the speed of the remote device to allow use of 10 and 100Mbps devices.
- The Switch features store-and-forward switching and auto-learn of source addresses, which it stores on a 4K-entry MAC address table.
- The 100Base-FX VF-45 fiber port allows connections up to 2 Kilometers away.

## Features

- 8x 10/100Mbps Fast Ethernet UTP Switch ports
- Automatic MDI/MDIX crossover for each 10Base-T/100Base-TX port
- One 100Mbps Fast Ethernet Fiber (VF-45) port
- One Dip-Switch to select fiber port full-duplex or half-duplex mode
- N-way auto-negotiation supported
- Full-duplex and half-duplex supported
- Store-and-forward switching architecture for abnormal packet filtering
- Full wire speed forwarding rate
- 4K-entry MAC address table
- 256KB memory buffer sharing
- LED-indicators for power, 100M, LK/ACT, FD/COL statuses
- Compact size

## 2. Hardware Description

The VOL-1081 Mini-switch is a compact switch with 8x 10/100 N-way UTP switch ports plus one 100Base-FX fiber port.

### Front Panel

- The Front Panel of the VOL-1081 Mini-switch consists of 8x 10/100 N-way UTP switch ports (automatic MDI/MDIX), one 100Base-FX fiber port and one Dip-switch to select fiber port full-duplex or half-duplex mode. The LED indicators are also located on the front panel of the switch.

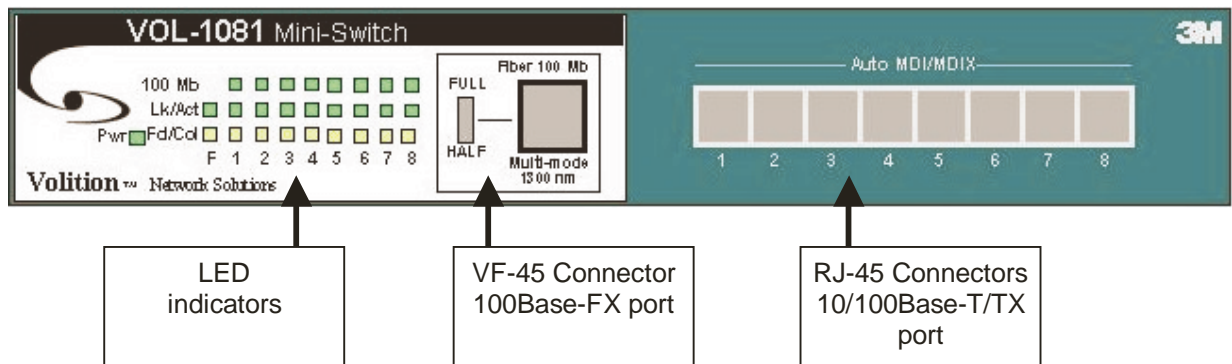


Figure 2-1. The Front Panel of the VOL-1081 Mini-switch with VF-45 connector

- **RJ-45 Ports (Auto MDI/MDIX):** Eight 10/100 N-way auto-sensing for 10Base-T or 100Base-TX connections.
- [In general, **MDI** means connecting to another Hub or Switch while **MDIX** means connecting to a workstation or PC. Therefore, **Auto MDI/MDIX** means that you can connect to another Switch or workstation without changing straight through or crossover cabling.]
- **100Base-FX Fiber Port:** One VF-45™ fiber connector is available for the VOL-1081 Mini-switch as shown above. The distance for fiber cabling can be extended up to 2 kilometers using full duplex.
- **DIP-switch:** the DIP-switch selects Full-duplex or Half-duplex mode for fiber port. Generally Full-duplex is used. When the switch is changed, power must be cycled to read the switch.

## LED Indicators

- The following table describes the LED status and description. The LEDs provide a real-time indication of system conditions.

LED	Status	Color	Description
Power	On	Green	Power On
100 Mb	On	Green	The port is operating at the speed of 100Mbps.
	Off		In 10Mbps mode or no device attached
Lnk / Act	On	Green	The port is successfully connecting with the device.
	Blinks		The port is receiving or transmitting data.
	Off		No device attached.
Fdx / Col	On	Yellow	The port is operating in Full-duplex mode.
	Blinks		Collision of Packets occurs in the port.
	Off		Half-duplex mode or no device attached.

## Rear Panel

The 3-pronged power plug is located at the Rear Panel of the Mini-switch as shown in Figure 2-2. The Switch will work with 100-240V AC, 50-60Hz.



Figure 2-2 The Rear Panel of the VOL-1081 Fiber Switch

## **Desktop Installation**

- Set the Switch on a clean, smooth, level, and sturdy surface with a power outlet nearby.
- Make sure there is enough clearance around the Switch to allow attachment of cables, power cord and air circulation.

## **Attaching Rubber Feet**

- Make sure the surface on the bottom of the Switch is grease and dust free.
- Remove adhesive backing from the rubber feet and apply them to each corner on the bottom of the Switch, to minimize shock and vibration.

## **Power On**

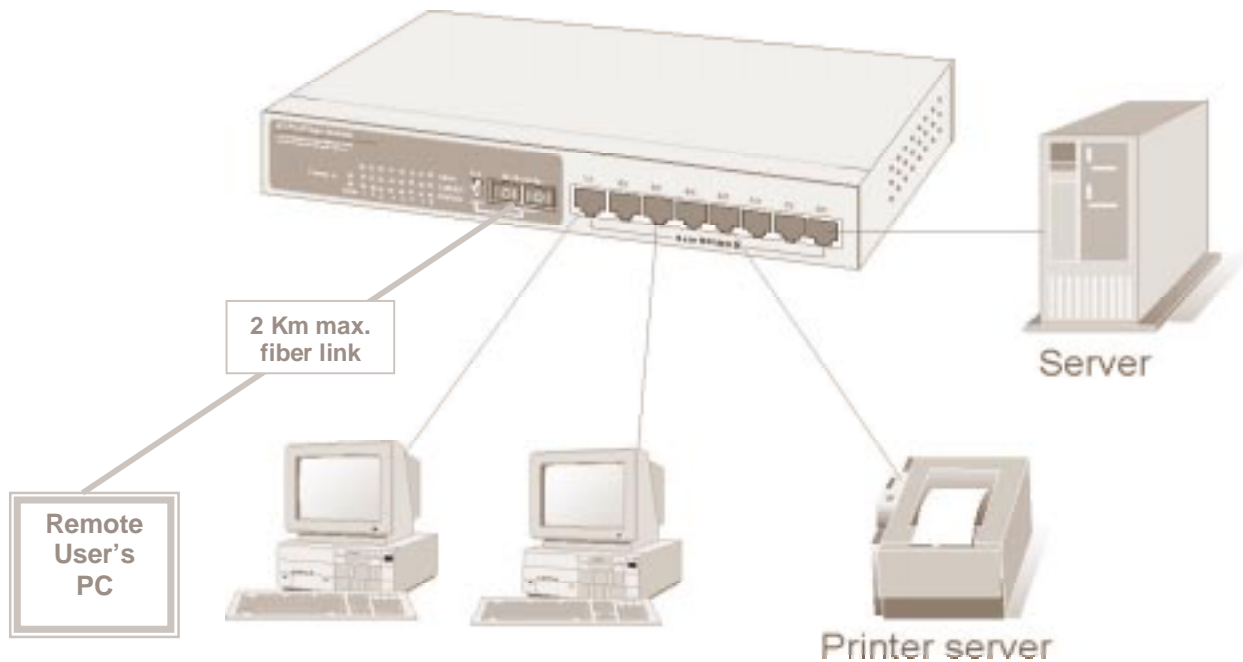
- Connect the power cord to the power socket on the rear panel of the Switch.
- Connect the power cord to any power outlet in the range 100-240 V, 50~60Hz.
- Check that the power indicator on the front panel is on.

### 3. Network Application

This section provides an example of network topology in which the Switch is used. In general, the VOL-1081 Mini-switch is designed to be used as a desktop or segment switch. You can use the VOL-1081 Mini-switch to connect PCs, workstations, and servers to each other by connecting these devices directly to the Switch. The Switch automatically learns node address, which are subsequently used to filter and forward all traffic based on the destination address.

#### Desktop Application

The VOL-1081 Mini-switch is designed to be a desktop switch, which is ideal for small workgroups. The Switch can be used as a standalone switch to which personal computers, servers, or printer servers are directly connected to form a workgroup.



*Figure 3-1. Desktop Application*



## 4. Trouble Shooting

This troubleshooting section is intended to help you solve the most common problems on the VOL-1081 Fiber Switch. The Switch can be easily monitored through panel indicators to assist in identifying problems. This section describes common problems you may encounter and where you can find possible solutions.

### Diagnosing with the LED Indicators

#### Link

If the Lnk / Act indicator does not light up after making a connection check whether the network interface (e.g., a network adapter card on the attached device), network cable, or switch port is defective. Verify that the switch and attached device are on. Be sure the cable is plugged in at both ends. Verify that the proper cable type is used and its length does not exceed specified limits.

#### Power

If the Pwr indicator does not turn on when the power cord is plugged in, you may have a problem with power outlet, or power cord. However, if the Switch powers off after running for a while check for loose power connections, power losses or surges at power outlet.

#### Transmission Mode

The VOL-1081 RJ-45 ports use auto-negotiation to set the transmission mode (i.e., half or full duplex). Verify that each attached device is configured to use auto-negotiation to set the transmission mode. If auto-negotiation fails the switch will default to half duplex. This means no connection will occur if the device attached to the RJ-45 port is set to full duplex mode.

The fiber port requires a manual setting of the transmission mode by means of the DIP switch. This means the device attached to the fiber port must be similarly configured (i.e., half or full duplex). Remember to cycle the power on the VOL-1081 after the DIP switch is changed.

#### Cabling

- **RJ-45 ports:** Use unshielded twisted-pair (UTP) or shield twisted-pair (STP) cable for RJ-45 connections: 100 Category 3, 4 or 5 cable for 10Mbps connections or 100 Category 5 cable for 100Mbps connections. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).
- **100Base-FX fiber port:** Fiber port can use 50, or 62.5um multi-mode fiber cable to connect devices over a 2-kilometer distance.

## 5. Technical Specifications - VOL-1081 Mini-switch

### Interfaces and Cabling

Copper	Connector	RJ-45 / 8 ports
	Impedance	100 ohm
	Network Cables and Distances	UTP - 10Base-T: 2-pair Cat. 3, 4, 5 cable (100m), UTP - 100Base-TX: 2-pair Cat. 5 cable (100m), EIA/TIA-568 100-ohm STP (100m)
Fiber	Connector	VF-45™ / 1port
	Source, Wavelength	LED, 1300 nm
	Optical budget	11dB min. (62.5/125 um fiber) 7dB min. (50/125 um fiber)
	Sensitivity	-31dBm min.
	Network Cables and Distances	100Base-FX: 50, 62.5/125 micron multi-mode fiber-optics VF-45 Multi-mode: Full-duplex- 2Km, Half-duplex- 412m

### Standards and Performance

Standards Compliance	IEEE 802.3 10Base-T Ethernet, IEEE 802.3u 100Base-TX/FX Fast Ethernet ANSI/IEEE 802.3 N-Way auto-negotiation				
Protocol	CSMA/CD				
Architecture	Store-and-forward switching Abnormal packet filtering 4K-entry MAC address table 256KB memory buffer sharing				
Back plane	2.4 Gb / 2Mb Memory				
Performance	Full wire speed forwarding / filtering rate: 14,880 pps per Ethernet port (10 Mbps) max. 148,800 pps per Fast Ethernet port (100 Mbps) max.				
LED-indicators	Pwr = Power 100Mb = 100 Mb/s operation Lk/Act = Link / Activity Fdx/Col = Full duplex operation / Collision				
Port Features	<table border="0"> <tr> <td style="padding-right: 20px;">VF-45</td> <td>1 port, 100Mbps Fast Ethernet Fiber Full-, half-duplex mode selected by dip-switch</td> </tr> <tr> <td>RJ-45</td> <td>8 ports, 10Base-T/100Base-TX Automatic MDI/MDIX crossover N-way Auto-negotiating Full-, half-duplex support</td> </tr> </table>	VF-45	1 port, 100Mbps Fast Ethernet Fiber Full-, half-duplex mode selected by dip-switch	RJ-45	8 ports, 10Base-T/100Base-TX Automatic MDI/MDIX crossover N-way Auto-negotiating Full-, half-duplex support
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RJ-45	8 ports, 10Base-T/100Base-TX Automatic MDI/MDIX crossover N-way Auto-negotiating Full-, half-duplex support				

## Power requirements

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AC Input	100 to 240 Volts AC, 50 to 60Hz
Power consumption	Max. 12 Watts

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## Physical and Environmental Specifications

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Dimensions	Switch	250 x 132 x 37 mm L x W x H, (9.84 x 5.19 x 1.47 inches)
Weight	Switch	1.01 kg (2.2 lbs.)
Temperature	Operating	0 to 45 °C (32 to 113 °F)
	Storage	-40 to 70 °C (-40 to 158 °F)
Humidity	Operating/Storage	10 to 90% non-condensing

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## 6.0 Agency Approvals

### Electromagnetic and Safety Approvals

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EMI	FCC Class B CE Mark
Safety	UL 1950, cUL

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### FCC Statement

This equipment has been tested and found to comply with the limits for a class B device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions, may cause harmful interference on 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 the user's own expense.

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### **Telecommunications**

6801 River Place Blvd.  
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800/695-0447

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