

VX6009 Series Long Reach Ethernet Switch User Manual

Versa Technology Inc

Jan 2006

Copyright

© 2002 Versa Technology, Inc. All rights reserved. Printed in U.S.A.

The products and programs described in this User's Manual are the products or licensed products of Versa Technology, Inc. This User's Manual contains proprietary information protected by copyright, and this User's Manual and all accompanying hardware, software, and documentation are copyrighted. No part of this User's Manual may be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form by any means, electronic or mechanical, including photocopying, recording, or information storage and retrieval systems, for any purpose other than the purchaser's personal use, without the prior express written permission of Versa Technology, Inc.

Disclaimer

Versa Technology, Inc. does not warrant that the hardware will work properly in all environments and applications, and makes no warranty and representation, either implied or expressed, with respect to the quality, performance, merchantability, or fitness for a particular purpose.

Versa Technology, Inc. has made every effort to ensure that this User's Manual is accurate; Versa Technology, Inc. disclaims liability for any inaccuracies or omissions that may have occurred.

Information in this User's Manual is subject to change without notice and does not represent a commitment on the part of Versa Technology, Inc. Versa Technology, Inc. assumes no responsibility for any inaccuracies that may be contained in this User's Manual. Versa Technology, Inc. makes no commitment to update or keep current the information in this User's Manual, and reserves the right to make improvements to this User's Manual and/or to the products described in this User's Manual, at any time without notice.

If you find information in this manual that is incorrect, misleading, or incomplete, we would appreciate your comments and suggestions.

Trademarks

The VersaXpress logo is a trademark of Versa Technology, Inc.

This documentation may refer to numerous hardware and software products by their trade names. In most, if not all cases, these designations are claimed as trademarks or registered trademarks by their respective companies.

First Edition

Versa Technology, Inc.

4711 Chino Avenue

Chino, California 91710

CONTENT

1. PRODUCT INTRODUCTION	4
1.1 BACKGROUND	4
1.2 SYSTEM OVERVIEW	4
1.3 PRODUCT FEATURES	4
2. CENTRAL OFFICE UNIT -- VX6009LRO	6
2.1 OVERVIEW	6
2.2 PRODUCTION FEATURES	6
2.3 HARDWARE STRUCTURE.....	7
2.3.1 <i>Appearance</i>	7
2.3.2 <i>Physical Interface</i>	7
2.3.3 <i>DIP Switch</i>	7
2.3.4 <i>LED Indicator</i>	8
2.4 ENVIRONMENTAL REQUIREMENT	9
3. SUBSCRIBER UNIT -- VX6009LRT	10
3.1 OVERVIEW	10
3.2 PRODUCT FEATURES	10
3.3 HARDWARE STRUCTURE.....	11
3.3.1 <i>Appearance</i>	11
3.3.2 <i>Physical Interface</i>	11
3.4 LED INDICATOR	11
3.5 ENVIRONMENTAL REQUIREMENT	12
4. SYSTEM INSTALLATION.....	13
APPENDIX A - STRAIGHT CABLE AND CROSS-OVER CABLE.....	14

1. Product Introduction

1.1 Background

Today's ability to expand Ethernet network faces constraints caused by limitations in reach of distance of copper media. To address this issue, Versa Technology, Inc. has introduced its extra-long reach distance and high performance long-reach Ethernet (LRE) switch. The emergence of this LRE switch greatly extends the application and capability of the Ethernet arena.

1.2 System Overview

VX6009 series switch extends the transmission distance of Ethernet to more than ten times than before. VX6009LRE provides stable bandwidth of 10Mbps when the distance is between 1 meter and 1300 meters. In addition to the extraordinary transmission performance, VX6009 does not require special cabling. Regular UTP3/5 or even two pair telephone lines can accommodate for the signal transmission of the VX6009. Furthermore, the VX6009 series have excellent compatibility. The LRE port of the switch supports 802.3 10BASE-T and 802.3U 100BASE-TX protocol allowing for compatibility with traditional 10/100Mbps Ethernet switch and eases the network deployment.

The VX6009 series LRE unit also permits for the provision of broadband service without placing new fiber and repeater. Regular UTP cable or two pair telephone lines are sufficient enough to extend the 10Mbps broadband connection from the community access point to every family in the community. This product is an ideal transportation platform for broadband, digital TV and IPTV.

1.3 Product Features

The LRE switch from Versa has the following features:

- (1) Extra long transmission distance
LRE switch extends the transmission distance of Ethernet to more than ten times than before.
- (2) High bandwidth
Bandwidth can reach 10Mbps at distance of 1300 meter.
- (3) Auto-negation port
10/100Mbps auto-negation port supports manual and automatic crossover for

MDI/MDIX.

(4) Solid media adaptive capability

Regular UTP cable (CAT3/CAT5) or even two pairs telephone lines can accommodate its signal transmission.

(5) Excellent Compatibility

The switch ports support 802.3 10Base-T and 802.3U 100Base-Tx protocol, compatible with traditional 10/100Mbps Ethernet switch.

2. Central Office Unit -- VX6009LRO

2.1 Overview

Central Office (CO) unit VX6009LRO has 9 ports. One of the ports is a regular 10/100Mbps self-adaptive uplink port. The other 8 LRE ports connect to uplink ports of the eight VX6009LRT which are located remotely.

2.2 Production Features

- Support IEEE 802.3 10BASE-T and 802.3U 100BASETX, compatible with existing Ethernet.
- Eight long-reach Ethernet ports; provide 10Mbps at 1300 meters distance.
- One 10/100Mbps regular Ethernet port
- Automatic crossover for MDI/MDIX
- Support voice/data mixed network
- Full speed layer 2 switching for all ports
- Built-in 1K MAC address table
 - Automatic address learning
 - Automatic address aging
- Provides QoS capability based on 802.1P and IP TOS/DS field
 - Two queues per port
 - WRR/WRED-based packet processing capability
 - No flow control required, WRED drop packets during congestion
 - Two levels packet dropping capability
- Support full/half-duplex on all ports
- In concentration mode, user data security can be assured through VLAN. Provides port-based packet priority for up to four ports.
 - Port priority configurable
 - IP phone port identification
- Flow control capability
 - Half-duplex back-pressure flow control
 - 802.3X full-duplex flow control
- Support power save mode on inactive ports
- Transmission latency control and maximum latency guarantee (<1mS)
- Port mirroring

2.3 Hardware Structure

2.3.1 Appearance

Fig 1 and Fig 2 are the front view and back view of the VX6009LRO.



Fig 1 VX6009LRO Front View



Fig 2 VX6009LRO Back View

2.3.2 Physical Interface

- 1、 Power Socket
- 2、 Uplink port (10/100Mbps regular Ethernet port)
- 3、 Long reach port (1~8)

2.3.3 DIP Switch

Bits 1~4 of the DIP switch are used for port mirroring. Port mirroring for port one to seven is based on port 8, i.e., port 8 is used to check one of the other ports. During mirroring, the auto-negotiation, duplex, rate and flow control of port 8 should be set to exactly the same as that for the port being mirrored. The bit 5 of the DIP switch is reserved. Mirroring function is listed in the table below.

Port Mirroring	S1	S2	S3	S4
Port 1 RX	Up	Up	Up	Up
Port 1 TX	Down	Up	Up	Up
Port 2 RX	Up	Up	Up	Down
Port 2 TX	Down	Up	Up	Down
Port 3 RX	Up	Up	Down	Up
Port 3 TX	Down	Up	Down	Up
Port 4 RX	Up	Up	Down	Down
Port 4 TX	Down	Up	Down	Down
Port 5 RX	Up	Down	Up	Up
Port 5TX	Down	Down	Up	Up
Port 6 RX	Up	Down	Up	Down
Port 6 TX	Down	Down	Up	Down
Port 7 RX	Up	Down	Down	Up
Port 7 TX	Down	Down	Down	Up

2.3.4 LED Indicator

- 1、 PWR: Power indicator. This indicator light is solid on when power is normal.
- 2、 LRE Port:
 - DPX: Duplex indicator. For full-duplex (default), the light is solid when “on.” For half-duplex, the light is off and flashes quickly when passing traffic.
 - LNK/ACT: This indicator light is solid when port is linking successfully. Otherwise, the indicator light is off. When link is normal and data is passing, this indicator flashes quickly.
 - SPD: Indicator light is on when the link rate is 100Mbps. Indicator light is off for 10Mbps.
 - Uplink Port:
 - SPD: Indicator light is on when the link rate is 100Mbps. Indicator light is off for 10Mbps.

- LNK/ACT: Indicator light is solid when port is linking successfully. Otherwise, indicator light is off. When link is normal and data is passing, this indicator flashes quickly.

2.4 Environmental Requirement

Power Supply	85~265VAC Input for adapter, output 5VDC/2A
Temperature	0~50°C
Humidity	5%~95% (non-condensed)
Storage	-10~+85°C

3. Subscriber Unit -- VX6009LRT

3.1 Overview

VX6009LRT is deployed remotely. This switch has 9 ports, including eight 10/100Mbps auto-negotiation Ethernet ports and one long-reach port.

3.2 Product Features

- Support IEEE 802.3 10BASE-T and 802.3U 100BASETX, compatible with existing Ethernet.
- One long-reach Ethernet ports; provide 10Mbps at 1300 meters distance.
- Eight 10/100Mbps regular Ethernet port
- Automatic crossover for MDI/MDIX
- Support voice/data mixed network
- Full speed layer 2 switching for all ports
- Support up to eight port-based VLAN
- One local CONSOLE port for configuration update
- Built-in 1K MAC address table
 - Automatic address learning
 - Automatic address aging
- Provides QoS capability based on 802.1P and IP TOS/DS field
 - Two queues per port
 - WRR/WRED-based packet processing capability
 - No flow control required, WRED drop packets during congestion
 - Two levels packet dropping capability
- Support full/half-duplex on all ports
- In concentration mode, user data security can be assured through VLAN. Provides port-based packet priority for up to four ports.
 - Port priority configurable
 - IP phone port identification
- Flow control capability
 - Half-duplex back-pressure flow control
 - 802.3X full-duplex flow control
- Support power save mode on inactive ports
- Transmission latency control and maximum latency guarantee (<1mS)
- Port mirroring

3.3 Hardware Structure

3.3.1 Appearance

Fig 3 and Fig 4 are the front view and back view of the VX6009LRT.



Fig 3 VX6009LRT Front View



Fig 4 VX6009LRT Back View

3.3.2 Physical Interface

1. Power socket
2. Uplink port (long reach)
3. Regular port (1~8)

3.4 LED Indicator

- 1、PWR: Power indicator. Indicator light is solid when power is normal.
- 2、LRE Port:
 - DPX: Duplex indicator. For full-duplex (default), indicator light is solid. For half-duplex, light is off and flashes quickly when passing traffic.
 - LNK/ACT: Indicator light is solid on when port link successfully. Otherwise, light is off. When link is normal and data is passing, this indicator flashes quickly.
 - SPD: Indicator light is on when the link rate is 100Mbps. Indicator light is off for 10Mbps.
- 3、Uplink Port:
 - SPD: Indicator light is on when the link rate is 100Mbps. Indicator light is off for

10Mbps.

- LNK/ACT: Indicator light is solid on when port link successfully. Otherwise, light is off. When link is normal and data is passing, this indicator flashes quickly.

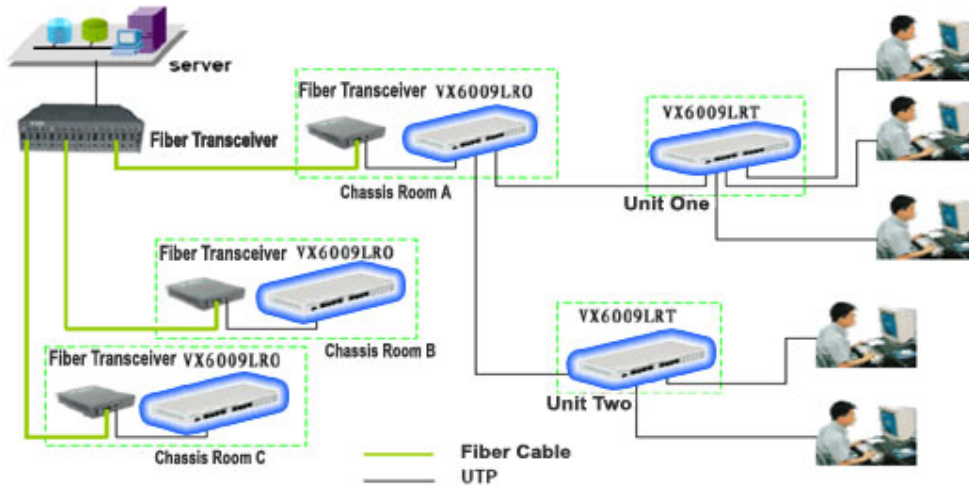
3.5 Environmental Requirement

Power Supply	85~265VAC Input for adapter, output 5VDC/2A
Temperature	0~50°C
Humidity	5%~95% (non-condensed)
Storage	-10~+85°C

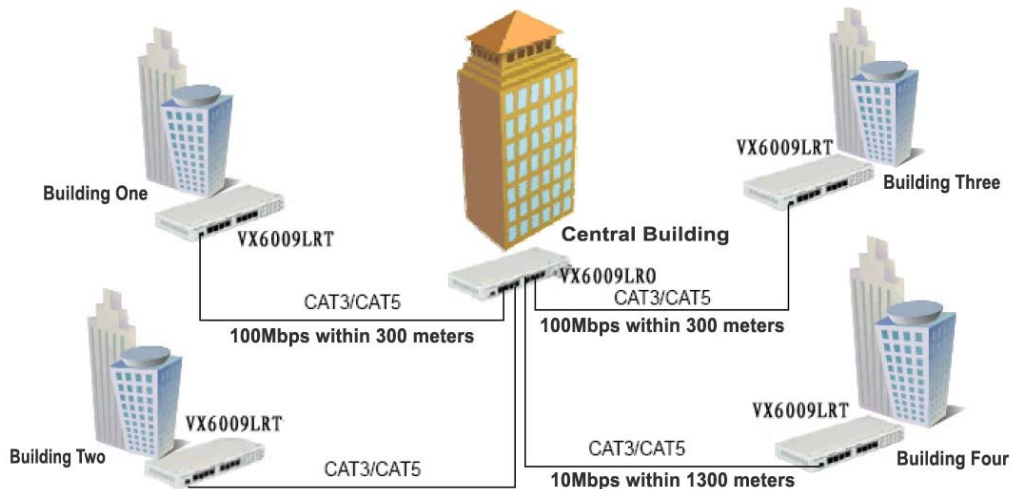
4. System Installation

Community Broadband Application

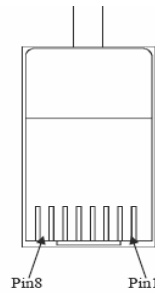
Traditional ADSL technology does not meet the high bandwidth demand from current applications and services such as video/IPTV. "Fiber + LAN" is overly expensive and difficult to deploy. Long Reach Ethernet switch provides a feasible solution for this issue. Due to the low requirement for the transmission of media, two pairs phone lines or regular Ethernet network cable can accommodate bandwidth of 10Mbps at 1.3KM and 100Mbps at 300M. Through this approach, it becomes easy to extend the 10Mbps or 100Mbps bandwidth from the access point to every family house in the community. It is an ideal transmission platform for broadband, digital TV and IPTV.



Building Cluster Application



Appendix A - Straight cable and Cross-over cable



The two tables below list the pin definition of the RJ-45 connector in MDI mode and MDIX mode.

Pin	Signal	Functionality
1	<u>TxData +</u>	Send data
2	<u>TxData -</u>	Send data
3	<u>TxData +</u>	Receive data
4	Reserved	
5	Reserved	
6	<u>TxData -</u>	Receive data
7	Reserved	
8	Reserved	

RJ45 MDI Connector Pin Definition

Pin	Signal	Functionality
1	<u>TxData +</u>	Receive data
2	<u>TxData -</u>	Receive data
3	<u>TxData +</u>	Send data
4	Reserved	
5	Reserved	
6	<u>TxData -</u>	Send data
7	Reserved	
8	Reserved	

RJ45 MDIX Connector Pin Definition