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FLEXLINE™

ONLINE STORAGE SYSTEMS

INSTALLATION INSTRUCTIONS FOR WINDOWS

Open Systems Host Attach

PRODUCT TYPE
SOLUTIONS



FlexLine™ 200/300 Series

**Installation Instructions
for Windows open
systems disk host attach**

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Summary of Changes

The following is the history and summary of changes for this publication.

Date	Edition	Description
October 2003	First	Initial Release
October 2004	Second	Converted to the new FlexLine terminology

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Windows - Installation Instructions

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The following pages help ensure that you order and configure a viable solution for your Windows operating environment running Windows and all appropriate patches. Customers and StorageTek personnel should also be familiar with the FlexLine 200 Series and 300 Series storage systems Site Preparation Guide, SANtricity Storage Manager Concepts Guide, and the Storage System Planning Checklist.

■ Introduction

This manual is organized to help plan your Windows configuration, provide order information, and help to install and attach your 200/300 Series storage systems to a Windows server. The following should be used in conjunction with the Siebel configurator.

Plan your site configuration

Prior to placing an order for StorageTek storage equipment, one should make sure of the system needs. First measure the locations of each current and future host, 200/300 Series storage systems, and other network components. Fill in this form with the requested information.

✓	Parameter	Outcome
	Windows operating system	
	Distance between host and 200/300 Series storage systems	
	Distance between other devices	
	Number of HBAs needed (two are recommended)	
	Number of 200/300 Series storage systems being installed	
	Number of FC cables needed	

Select Host Adapter (s)

Pick the type and quantity of the fibre channel Host Bus Adapters (HBAs) needed for your host systems. See examples as shown below. Refer to the connectivity information on the Interop Tool for the complete list of HBAs.

Quantity	Description	Rating
	QLogic 2310	2.0 Gb/sec
	QLogic 2342	2.0 Gb/sec

Select the Fibre Channel Cables

Select the length of fiber optic (or copper) cable and the quantity for connection to the host systems. The following is an example of optical cables that may be ordered through StorageTek to attach a QLA23xxF HBA to the 200/300 Series Controller. Write in the quantities needed.

Quantity	2 Gb FC Optical Cable Description	Part #
	10 meters (32.8 feet) LC to LC Duplex	10800221
	50 meters (164 feet) LC to LC Duplex	10800222
	100 meters (328 feet) LC to LC Duplex	10800223
Note: Other lengths are available. Consult the Siebel Configurator.		

There are also LC to SC cables that would allow one to use a 2 Gb HBA and cables with existing switches. The following cables are available in this event.

Quantity	FC Optical Cable Description	Part #
	10 meters (32.8 feet) LC to SC	10800231
	50 meters (164 feet) LC to SC	10800232
	100 meters (328 feet) LC to SC	10800233

If installing through a switch, you may need a set of the following.

Quantity	1 Gb FC Optical Cable Description	Part #
	10 meters (32.8 feet) SC to SC Duplex	10800134
	50 meters (164 feet) SC to SC Duplex	10800137
	100 meters (328 feet) SC to SC Duplex	10800138
Note: Other lengths are available. Consult the Siebel Configurator.		

Check your quantities against your earlier distance measurements to ensure your order includes all cable attachments. Also, if ordering copper cables, make sure that the connector ends meet your need. One end mates with the

HBA, and the other end, typically, mates with the 200/300 Series control module's host interface minihubs.

Note: Unless there is an existing management station, cable connections to the management station should be via 10BaseT Ethernet.

Typically, LC to LC Duplex Fibre Channel short wave optical cables are used with the HBAs and the controller's host minihubs, which have Small Form Factor Packaged (SFP) Transceivers.

Place your Order

Make sure that you have the following.

✓	Description
	Server running Windows XP, 2000*, or 2003 (and appropriate patches)
	HBA(s)
	Fibre Channel cables to configure your storage system

* See performance note on [page 4](#).

When you make a new order, a CD-ROM along with a CD insert, commonly called a Quick Start Guide will be in your host attach kit. The Quick Start Guide will walk you through an installation—first referring you to the Preconfiguration and Maintenance Setup Instructions, P/N 95966, and then to any special instructions written to support your particular operating system installation.

CD-ROM file structure

During an installation you will be asked to install files from the CD supplied in the host-attach kit. The Windows CD is structured with two main folders (Docs and Software). Inside the Docs folder are subfolders with pertinent documentation. The following table shows the subfolder names.

Sales and Preinstall	Diagnostic and Service	Engineering Papers
Hardware Install	Cabinet Docs	Miscellaneous
Software Install	Release Notes	

Inside the Software folder are files called: client, agent, runtime, RDAC, and utilities—if these packages are pertinent to your host operating system (runtime is not present for the Windows OS). Other folders may be available depending on the operating system's supported configurations.

A special SMclient (field tool) CD is available to field service personnel and required to fulfill the preconfiguration requirements. It has special software tasks and applications that may be necessary to upgrade your 200/300 Series storage systems.

Note: Refer also to the PDF documents and configuration and support files to assist with your installation.

■ Storage System and Storage Manager - Overview

The FlexLine™ 200 Series and 300 Series storage systems provide access to high-end storage using Fibre Channel and RAID technology.

This document was created to aid in installing these storage systems into a Windows operating environment. It includes driver information, steps to take when planning and assembling a SAN installation, and a list of frequently asked questions (and problems) that may be encountered. This manual is intended to provide tips on attaching to or creating a SAN environment as well as giving some examples of problems that have been encountered.

In addition to this manual, more information is available on the Customer Resource Center (CRC), which also includes tech tips, FAQs, and notices and bulletins. Backup information is also on the engineering web sites at:

<http://gandalf.stortek.com/ctp/index.html>

<http://gandalf.stortek.com/ctp/manager/index.html>

<http://gandalf.stortek.com/ctp/installation/index.html>

Upgrades to NVSRAM, controller firmware (as well as ESM and drive code) may be downloaded from the CRC (by going to Current Products >> Disk and selecting your 200/300 Series solution). It is the primary location for obtaining code downloads. On request, non-cost code downloads can be added to the engineering web pages by contacting Disk Engineering.

■ Performance Issues

You should be aware of the following performance issue(s).

W2K with servicepack3 applications performance issue.

Problem:

The SCSI standard provides a parameter with the 10 byte Read(0x28) and Write(0x2a) commands entitled Force Unit Access. The FUA bit when set will circumvent cache, essentially forcing a write-thru mode for the command. The scope of this function was pre-raid array, and the non-volatile assurance of battery backed array cache succeeds this implementation.

This function is available to W2k applications via the Win32 CreateFile function with the attribute - FILE_FLAG_WRITE_THROUGH (see Microsoft - Q99794).

All versions of SQL Server open log and data files in this manner (see Microsoft - Q234656). All DBMS applications are likely to employ this method, however,

all testing was completed in a SQL environment. Circumventing the benefit of array cache induces a performance penalty, which has been noted by some customers. Testing has revealed the impact to be as high as 50%.

Workaround:

Scripts which will change NVSRAM User Config Region, will be included on the SANtricity Storage Manager for W2K cdrom under the scripts directory. The files are named `w2kifuaon.scr` and `w2kifuaoff.scr`. Execute `w2kifuaon.scr` to defeat the performance penalty imposed by the application.

■ Installation

Once you have ordered your hardware and software, read the following information on how to attach a 200/300 Series storage system to a Windows Server (with appropriate patches as documented in the Installation Guide).

Note: If you need information about installing HBAs, drivers, or cables; refer to the Client Server Disk installation supplement, P/N 96015, or to your host installation manuals.

Before You Begin

The materials needed for the installation are listed below. Check to see that you have each of these items. The following pages provide more information about these materials (see headings) with specific steps and details on what to do.

Before you begin, make sure you have these items:

1. A host running a Windows server (and appropriate patches)
2. One or more HBA(s)—appropriate to your storage system
3. SFP Transceivers for the 200/300 Series storage systems
4. Fibre Channel cable(s) that will connect the host to the 200/300 Series
5. A 200/300 Series storage system that is fully configured.

Note: If you don't have your storage system configured, you can attach your laptop running SMclient field tool to it. This will enable you to assign drives, LUNs, and volumes.

The Product Release Notes or Planning Checklist will be updated as required patch levels change. Please refer to it, as it will most likely have the latest patch information.

Preliminary Steps

Do the following prior to the installation.

Check your operating system and patch revision levels

Verify that you have met the minimum operating system requirements by checking your PC's properties.

Install the Storage System

Refer to the appropriate 200/300 Series Site Preparation Guide and installation documentation, as needed. Do NOT, however, attach fibre channel cables at this time.

After placing the hardware, refer to the Preconfiguration and Maintenance Setup Instruction, P/N 95966, and the Storage Manager Concepts Guide. This will enable you to understand the proper configuration for your customer's business environment, and to understand how to attach your laptop to configure the storage system for communications with your management station or to get additional information from the controllers.

Note: The management station is used to configure and/or verify that the LUNs are set up as desired.

If you need more information about configuring LUNs, refer to chapter 7 or 8 of the software installation guide or use the GUI help function.

Configure the LUNs per customer requirements using your laptop; or if the customer has an independent management station, install Storage Manager onto the customer's storage management station (attached via ethernet). Make sure to verify that the LUNs are set up as desired. Refer to your documentation to ensure that you are using best practices.

Proceed to the next section to verify or install the NVSRAM file to the storage system.

Load NVSRAM

1. Verify or install the current NVSRAM (available on the CD in your host attach kit) onto the 200/300 Series control module (controller). Refer to the Storage Manager Concepts Guide, which provides the command for the SMclient:

Storage Array >> Download >> NVSRAM

The following instructions tell how to attach the HBAs and other components onto your Windows host.

Before you perform these instructions, check to see that you:

- are running a Windows OS with the appropriate and most current patches.
- have the appropriate installation kit (HBAs, cables, etc.)
- know the configuration for your customer's site.

Install the Host Bus Adapters (HBAs)

The following steps explain how to install the host adapters.

1. Quit any applications that are running and halt (down) the operating system.

Note: If your server supports, Hot Add PCI, refer to your hardware and manuals for specific instructions.

2. Power off the host, as appropriate.
3. Install the host bus adapter onto the host. See examples below.



4. Power up the host.

Install HBA Drivers

Install the driver according to the instructions that came with the HBA. Refer to the Interop Tool for the latest connectivity information (see figure below).

Note: As time goes by, drivers are improved; and older drivers are replaced with newer ones on the supplier's web page. Contact your sales support organization for assistance in finding the appropriate replacement. Download new drivers from the supplier's web site as needed. Refer to the Product Release Notes for more information.



Install Storage Manager components on to the host

Refer to the Storage Manager Installation Guide for Windows. Software components are located on the CD that comes with the host attach kit.

Note: Before rebooting (as mentioned at the end of the Installation Guide procedures), install the Fibre Channel cables as instructed in the following section.

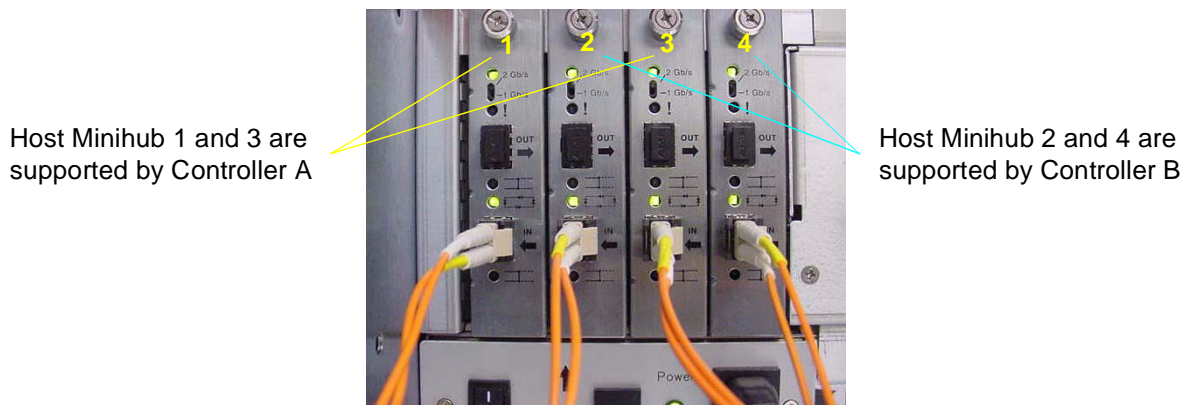
Install Fibre Channel Cable

Attach cables using the following procedures.

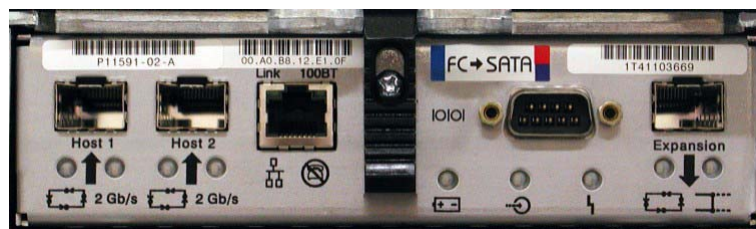
1. Route the fibre channel interface cables between the storage system and the host or per your customer's system configuration plans.
2. Attach the fibre channel cables to the INPUT connectors on the controller's host interface minihubs.

The following photograph shows the input side to the Control Module, showing the 2 Gigabit LC to LC Fibre Channel (FC) shortwave (fiber-optic) cable.

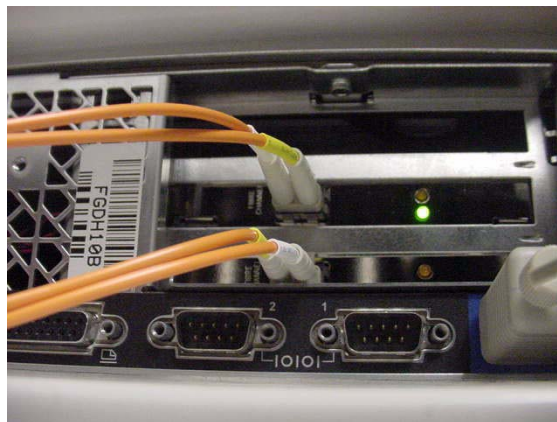
Make sure that your minihub speed is set to correspond with your HBA and switch speed. Also ensure that your host is attached to different controllers, as shown below..



Note: Storage systems that use the model 28xx controllers will have host and drive interface ports on the controller FRUs, as shown below. The left FRU is Controller A and the right FRU is Controller B. Refer to the Array Module manual for more information.



3. Connect the other end of the fibre cable(s) to the Host Bus Adapter (HBA). See example below.



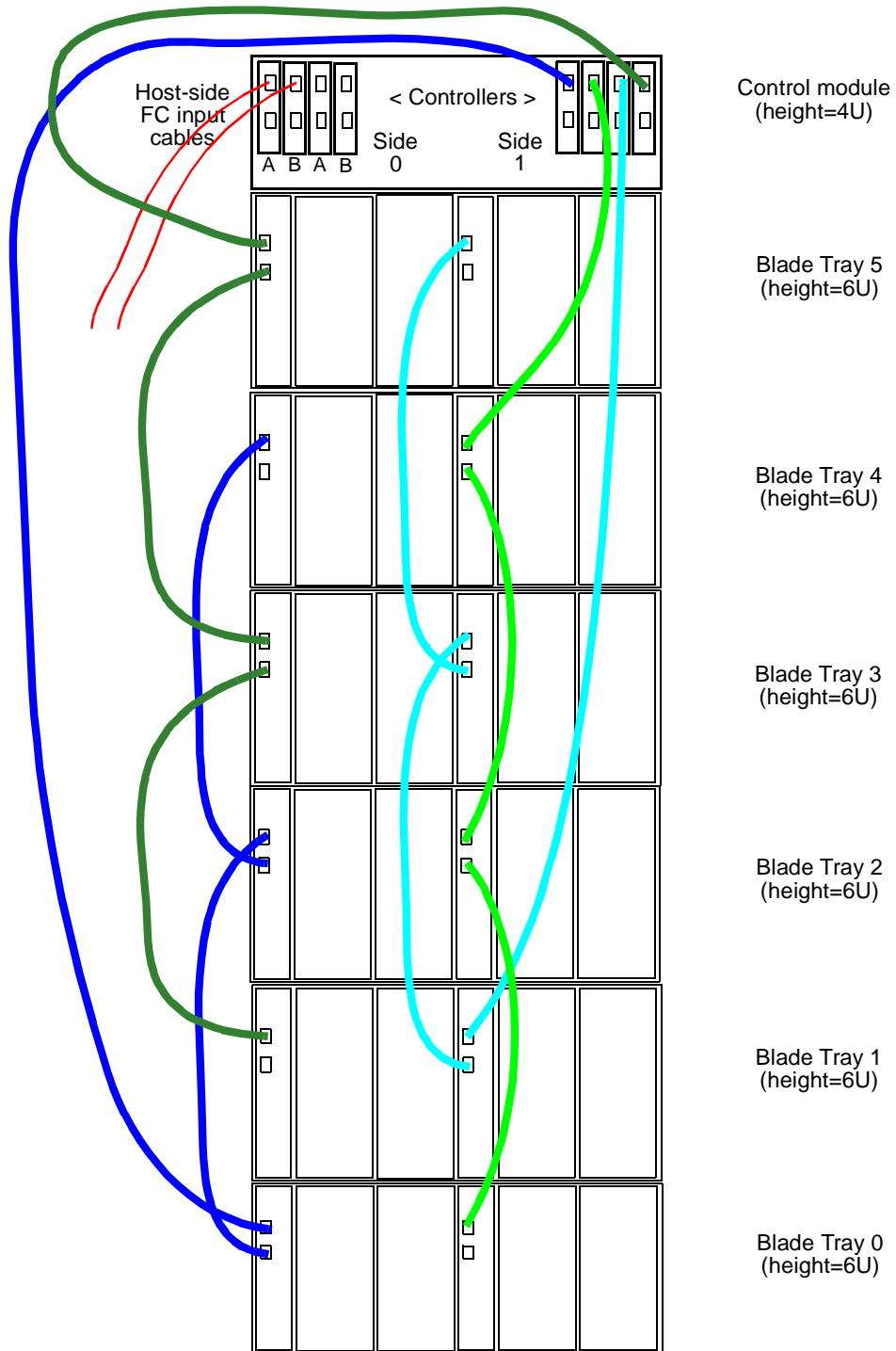
LC to LC Duplex FC cables

Note: Refer to StorageTek's Interop Tool for the latest connectivity information.

If necessary, refer to the 200/300 Series Installation Guides and User Guides or to BladeStore's Installation, Operation, and Maintenance Guide to learn how to route the drive interface cables to the drive tray/blade tray ESMS.

The following example shows a drawing of a BladeStore cabling configuration to help you install this particular storage system in a non-StorageTek cabinet. For most FlexLine™ 200/300 Series storage system configurations, however, refer to the Hardware Cabling Guide (p/n EH14782), which depicts most of the configurations shipped from the factory.

Additional information to assist with your installation may be found on the engineering web pages. Scroll down to find links to: tuning, zoning, snapshot, cabinet information, and alternate configurations. Access these web page links by going to <http://gandalf.storitek.com/ctp/>



As needed, refer to the Cabinet User's Guides and the Installation and Mounting Supplement, which are at: <http://gandalf/ctp/cabinet/>

Verify the install

After reboot, verify that you can see the volumes in the disk administrator.



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