

# **Stratus ftServer 3000 Series: Site Planning Guide**

Stratus Technologies  
R472-03

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## Purpose of This Manual

The *Stratus ftServer 3000 Series: Site Planning Guide* (R472) documents the operating environment required to install systems in the ftServer 3000 series, including space, power and HVAC requirements and the required cables with an uninterruptible power supply (UPS).

## Audience

This manual is intended for those responsible for preparing a site for the installation of a system in the ftServer 3000 series.

## Revision Information

This manual is a revision. This revision incorporates site planning information for:

- Ultra160 SCSI storage enclosure and the U521 Two-Port Ultra160 SCSI PCI Adapter
- ftGateway, which allows multiple ftServer systems to connect to the Stratus Service Network (SSN) through one system that has a modem connection

## Notation Conventions

This document uses the notation conventions described in this section.

### Warnings, Cautions, and Notes

Warnings, cautions, and notes provide special information and have the following meanings:



#### **WARNING** \_\_\_\_\_

A warning indicates a situation where failure to take or avoid a specified action could cause bodily harm or loss of life.



#### **CAUTION** \_\_\_\_\_

A caution indicates a situation where failure to take or avoid a specified action could damage a hardware device, program, system, or data.

#### **NOTE** \_\_\_\_\_

A note provides important information about the operation of an ftServer system.

## Typographical Conventions

The following typographical conventions are used in this document:

- The bold font emphasizes words in text and also indicates text that you type or the name of screen objects, such as menu names, command buttons, icon names, tabs, check box names, and dialog box names. For example:

**Before** handling or replacing the clock card, make sure that you are properly grounded by using a grounded wrist strap.

In the **System Properties** dialog box, click the **Hardware** tab.

- The italic font introduces new terms or indicates command-line arguments that the user defines. For example:

Each ftServer system uses *Dual Modular Redundancy*.

**copy** *filename1 filename2*



- The monospace font indicates sample program code and output, including message text. For example:

```
#include <iostream.h>
The operation completed successfully.
```

## Related Documentation

This section contains a complete list of manuals about ftServer software and hardware.

### ftServer 3000-Series Software-Related Manuals

The software-related manuals describe how to install and use ftServer System Software on systems in the ftServer 3000 series, and how to manage systems in the ftServer 3000 series.

Software Manual	Content
<i>Stratus ftServer 3000 Series: System Administrator's Guide</i> (R008W)	Describes how to administer and troubleshoot systems in the ftServer 3000 series. Explains how to configure and use ftServer Management Console.
<i>Stratus ftServer Software Installation and Configuration Guide</i> (R002W)	Explains how to install and configure ftServer Software.
<i>Stratus ftServer Access User's Guide</i> (R003W)	Explains how to configure and use ftServer Access Console to remotely control, monitor, and troubleshoot an ftServer system.
<i>Stratus ftServer 3000 Series: Release Notes</i> (R010W)	Provides release-specific information about systems in the ftServer 3000 series.
<i>Stratus ftServer Software Availability Manager User's Guide</i> (R007W)	Explains how to configure and use ftServer Software Availability Manager.
<i>Stratus ftServer: SSN Configuration Guide</i> (R013W)	Explains how to set up and configure the system for support by the Stratus Service Network (SSN).

**ftServer 3000-Series Hardware-Related Manuals**

The hardware-related manuals document how to prepare a site for the installation of a system in the ftServer 3000 series, and how to install, operate, and service ftServer hardware.

Hardware Manual	Content
<i>Stratus ftServer 3000 Series: Site Planning Guide</i> (R472)	Explains how to prepare a site for a system.
<i>Stratus ftServer 3000 Series: Hardware Installation Instructions</i> (R475)	Explains how to install pedestal systems.
<i>Stratus ftServer 3000 Series: Operation and Maintenance Guide</i> (R473)	Explains how to operate, troubleshoot, and service systems.
<i>Stratus ftServer 3000 Series: CRU Reference Guide</i> (R474)	Lists the part numbers of customer-replaceable units (CRUs).
<i>Stratus ftServer: PCI Adapter Guide</i> (R461)	Describes the PCI adapters that Stratus supports for ftServer systems.
<i>Stratus ftServer 3000 Series: Rack-Mounting and Installing a System</i> (R479)	Explains how to use the rack-mounting kit to install a rack-mounted system and optional components.
<i>Stratus ftStorage Fibre Channel Array Installation Guide</i> (R503)	Describes how to install and configure the ftStorage Fibre Channel Array hardware and software.

**ftServer Online Documentation**

The **ftServer Help and Manuals** folder on the ftServer desktop contains links to the Stratus ftServer manuals in Portable Document Format (PDF) and the same documents in HTML Help format.

The **Manuals** folder provides the documentation in PDF; the **Hardware Help** folder is a single HTML Help system that contains the information in the hardware-related manuals; and **Software Help** is another HTML Help system that contains the information in the software-related manuals.

To gain access to the documents on the World Wide Web, point your browser to the [ftServer StrataDOC Web site](http://stratadoc4ftserver.stratus.com):

<http://stratadoc4ftserver.stratus.com>

## Getting Help

If you have a technical question about Windows® 2000 or an ftServer system, try these online resources first:

- **Online support from Stratus Customer Service.** You can find the latest technical information about an ftServer system through online product support at the [Stratus Customer Service Web site](#):

<http://www.stratus.com/support/technics.htm>

- **Online product support for Microsoft® products.** Your primary source for support is the computer manufacturer who provided your software, or an authorized Microsoft Support Provider. You can also find the latest technical information about Microsoft products through online product support at the [Microsoft Web site](#):

<http://www.microsoft.com/windows2000/support/>

If you are unable to resolve your questions with the help available at these online sites, and the ftServer system is covered by a service agreement, please contact the [Stratus Customer Assistance Center \(CAC\)](#) or your [authorized Stratus service representative](#). For information about how to contact the CAC, see:

<http://www.stratus.com/support/cac/>

Your system administrator may have configured a Stratus Support phone number in ftServer Management Console (ftSMC), a snap-in to Microsoft Management Console (MMC). In ftSMC, under **Stratus Configuration**, click **Service Network** to display the node's properties. The properties include a **Stratus Support Phone** item. The value of this property, if configured, is a telephone number you can call for support. For more information about ftSMC, refer to the *Stratus ftServer 3000 Series: System Administrator's Guide* (R008W).

## Hardware Replacement and System Support

Hardware replacement and system support services require a service agreement and are handled through the CAC or an authorized Stratus service representative. Support services are facilitated by the Stratus Service Network (SSN), a worldwide network with secure dial-back capabilities.

If the system is covered by a service agreement, you can receive advanced parts exchange and support services as outlined in your agreement. Support coverage can include remote system support and monitoring, telephone support, electronic support services, and hardware remedial services.

The Stratus service model enables you to replace *customer-replaceable units* (CRUs) in accordance with the procedures explained in the documentation provided with your system. All *field-replaceable units* (FRUs) require replacement by authorized service

personnel. All *distributor-replaceable units* (DRUs) must be returned to your distributor for repair or replacement. If you are unsure whether the part needing replacement is a CRU, FRU, or DRU, contact the CAC or your authorized Stratus service representative, or see the following Stratus Web page:

<http://www.stratus.com/support/ftserver/3200parts>

This Web page provides illustrations of the hardware components of systems in the ftServer 3000 series.

If you suspect that a CRU has failed, and the system is not covered by a service agreement but is still under warranty, contact the party from whom you purchased your system for return instructions. You may also obtain return instructions from your local Stratus sales offices; from the Stratus ftServer Service Warranty Parts Replacement Process and Return Instructions Web page <http://www.stratus.com/support/ftserver/partreturn.htm>; or from your local authorized Stratus service representative. These sources can also provide you with information about the customer service assistance options available to you.

## Ordering Manuals

To order manuals, customers in North America can call the CAC at (800) 221-6588 or (800) 828-8513, 24 hours a day, 7 days a week. Customers outside North America can contact the nearest Stratus Sales office, CAC office, or distributor. Manual orders will be forwarded to Order Administration.

## Commenting on the Documentation

Stratus welcomes any corrections and suggestions for improving its documentation. Send your feedback by email to [Comments@stratus.com](mailto:Comments@stratus.com). If it is possible, please include specific information about the documentation on which you are commenting:

- For a manual, include the book title and page numbers.
- For online Help, include the Help subject and topic title.

This information will assist Stratus Publications in making any needed changes to the ftServer documentation. Your assistance is most appreciated.

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# Chapter 1

## Site Planning Overview

Careful selection, planning, and preparation of the installation site for your ftServer system are important activities that can contribute directly to the proper operation and reliability of your system. Before installing your system, make sure that:

- You are familiar with the information in [“ftServer 3000-Series Systems”](#) below and in [Chapter 2](#)
- Your installation site meets the requirements described in this site planning guide. Use the checklist in [“Using the Site Planning Checklist”](#) on [page 1-2](#) to track your site preparation progress. The checklist provides a step-by-step breakdown of the specific activities involved in site planning.

During the site planning and preparation processes, work closely with your facilities group or contractor to determine space, power, and environmental requirements and to provide a suitable location with sufficient AC power, HVAC capabilities, and communications connections.

If your system is covered by a service agreement and you need help with site planning, call the Stratus Customer Assistance Center (CAC) or your authorized Stratus service representative. If you have contracted with the CAC or your authorized Stratus service representative for installation of the system, contact them after you move the system to the installation site. For more information about the CAC, see [“Getting Help”](#) in the Preface.

### ftServer 3000-Series Systems

Systems in the ftServer 3000 series are enterprise-class servers that support the Windows 2000 Advanced Server operating system on a fault-tolerant hardware platform. These servers operate with software customized by Stratus for fault-tolerance, which provides fault-hardened device drivers, enhancements to the operating system, and application reliability and availability.

Systems in the ftServer 3000 series incorporate Intel® Pentium® III processors and one-way (one processor per CPU enclosure) or two-way (two processors per CPU enclosure) symmetric multiprocessing (SMP). To achieve fault tolerance, the system contains pairs of CPU enclosures, I/O enclosures, and power supplies. If one component of a pair fails, the system switches operation over to the remaining

component. The system also has a storage enclosure, which can house up to six physical hard drives, which are mirrored, thus providing three logical drives.

The ftServer 3000 series contains the following models:

- **ftServer 3210.** Entry-level systems that connect to the Stratus Service Network (SSN) over an external modem. This implementation uses Windows Routing and Remote Access Service (RRAS), and Internet Authentication Service (IAS) to implement the connection to the SSN. SSN connectivity is only possible if Windows 2000 is operational.
- **ftServer 3220.** Entry-level systems that contain an ftServer Access Adapter. This adapter connects to the SSN over a PCMCIA modem and provides SSN connectivity even when Windows 2000 is not operational. The adapter also allows internal administrators to remotely service the system over an IP network, regardless of the state of the operating system.

Systems that contain two duplexed ftServer Access Adapters provide the highest level of availability. Each adapter contains a PCMCIA modem, which allows the CAC or your authorized Stratus service representative to remotely manage the system over the SSN. An Ethernet port allows you to connect the cards to your network so that you can perform remote management from remote systems.

ftServer System Software has been tested and qualified with Windows 2000 Advanced Server and a qualified service pack for the English, French, German, Spanish, Japanese, Simplified Chinese, Traditional Chinese, and Korean languages.

## Using the Site Planning Checklist

The [Site Planning Checklist](#) helps you to ensure that the installation site provides the following:

- Proper location suitable for the reliable operation of computer equipment
- Adequate space for the system, its servicing, and its associated components, cables, and furniture
- Environment that maintains proper air cleanliness, and required temperature and humidity ranges
- Electrical power sources that meet the system's requirements
- Provisions for network connectivity (as required) and communications over an analog telephone line

See [“Specifications and HVAC Requirements” on page 3-2](#) for detailed system specifications and requirements.

Use the Site Planning Checklist to help you plan and prepare the installation site. As you perform each step, check the associated box. Before the system is installed, review this checklist to ensure that all the necessary steps have been taken for an efficient installation of the system.

## Site Planning Checklist

Make sure you answer the following questions:

- ☐ Does your system include any of the following optional PCI adapters? If so, indicate how many of each.

Adapter	Number of Adapters
U486 Eight-Port Asynchronous PCI Adapter	
U515 One-Port 10/100-Mbps Ethernet PCI Adapter	
U570 One-Port 1000Base-SX Ethernet PCI Adapter	
U571 One-Port 10/100/1000 Base-T Ethernet PCI Adapter	

- ☐ Does your system include internal tape drives, an option for pedestal units only, or external tape drives and U516 One-Port Ultra2 SCSI PCI Adapters?
- ☐ Does your system include any ftStorage Fibre Channel array storage enclosures and U514 Fibre Channel PCI Adapters?
- ☐ Does your system include an Ultra160 SCSI storage enclosure and U521 Two-Port Ultra160 SCSI PCI Adapter?
- ☐ Will you provide power to the system through an uninterruptible power supply (UPS)?
- ☐ Will you supply your own monitor, keyboard, and mouse, or will you use a monitor and USB keyboard and mouse supplied by Stratus?
- ☐ Will your system and its external components fit where you plan to place them? See [“Specifications and HVAC Requirements” on page 3-2](#) for physical size specifications.
- ☐ Is the AC power service is wired properly? See [Appendix A](#) for additional information.
- ☐ What are the AC power requirements of your system, including all external components? See [Table 3-1](#) to calculate the AC power requirements for the system and its components. For customer-supplied components, see the manufacturer’s documentation.

- ☐ What are the lengths and types of all power cords provided with your system? See [Table 3-3](#) for details. For customer-supplied components, see the manufacturer's documentation.
- ☐ What are the lengths and types of all interface and communication cables provided with your system? See ["Network and Telephone Line Connection Requirements" on page 3-11](#) for details. For customer-supplied components, see the manufacturer's documentation.
- ☐ Do you have an external analog telephone line for the modem to provide data communications with the SSN?

If your system does not have ftServer Access Adapters, an external modem provides connectivity to the SSN.

If your system has ftServer Access Adapters, a Y-style cable is shipped with the system to connect the PCMCIA modems to a single analog telephone line.

**NOTE** \_\_\_\_\_

A dedicated phone line provides the most reliable service. SSN calls routed through a PBX might be slow due to load on the PBX, or might not complete successfully due to disconnections. If you must use a PBX, do not route the telephone extension through a switchboard; instead, provide a direct-dial analog number.

- ☐ Do you have an additional telephone line and telephone near the operator's station for voice communications when calling for support?
- ☐ Have you created a sketch of how the system will be arranged at the installation site? Consider the available cable lengths, the placement of external devices, and the location of network, modem, and voice communication connections. On the sketch, show the location of the system and its external components; its power cords, telephone and interface cables; and the locations of AC power receptacles, phone jacks, Ethernet jacks, switches, and/or hubs.

**NOTE** \_\_\_\_\_

Make sure that all cords and cables are long enough to reach between their respective components and connectors. Also make sure that all cables are routed so they are out of the way of foot traffic.

- ☐ Have you provided your facilities group and/or contractors with the sketch and copies of the following:
  - A site layout sketch
  - [Table 3-2](#), Worksheet for Calculating Power Requirements



- [Appendix A, “Electrical Circuit and Wiring Information”](#)
- Any notes you have taken about site planning

Review and discuss the requirements with the facilities people and/or contractors to ensure that all site modifications are understood and implemented.

If you have any questions about the number and types of components, contact your Stratus account executive or distributor.



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## Chapter 2

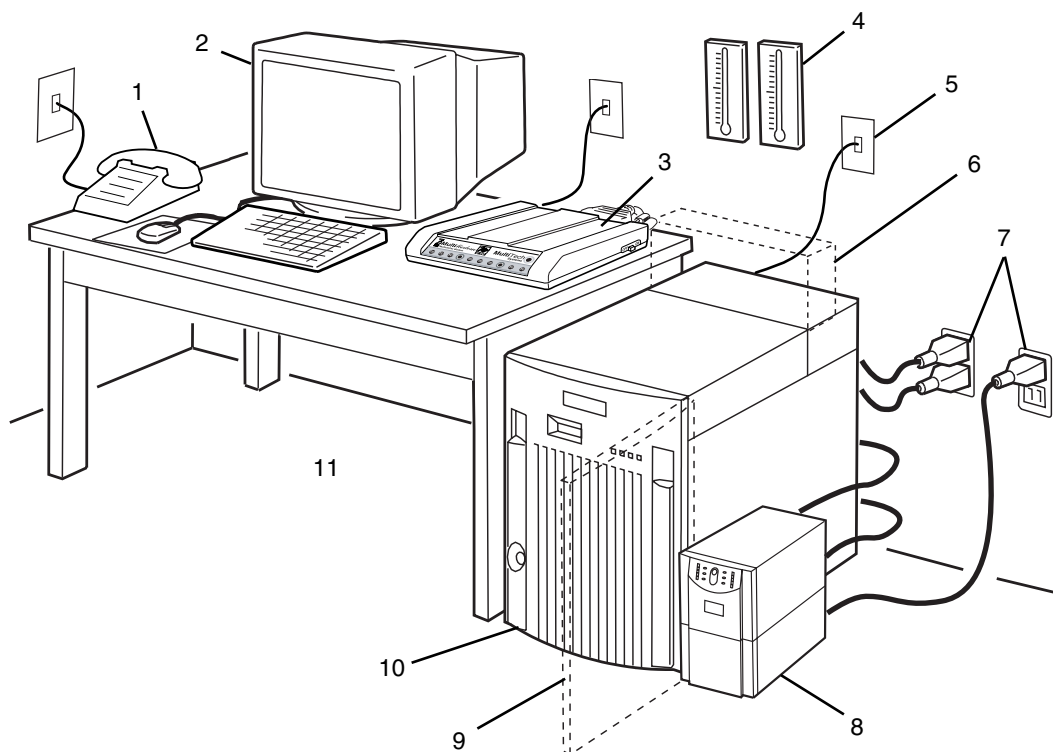
# System Overview for Site Planning

To plan for your system, determine which type of system and which components you will be installing:

- Pedestal system
- Rack-mountable system
- V125 monitor unit for rack-mounted systems
- V122 monitor for pedestal systems
- Your own monitor, keyboard, and mouse
- Ultra160 storage enclosure
- ftStorage Fibre Channel array
- Tape drives
- UPS

Figure 2-1 shows a typical office configuration for a pedestal system in the ftServer 3000 series that includes two tape drives and uses an optional uninterruptible power supply (UPS). However, you can use the information for planning a rack-mountable system as well.

**Figure 2-1. Typical System Installation**



tsys157

- 1 Telephone with separate line for use when calling for service
- 2 Monitor, keyboard, and mouse
- 3 Modem with separate telephone line for the SSN connection
- 4 Thermometer and humidistat to monitor room temperature and humidity
- 5 Ethernet jacks, switches, or hubs as needed
- 6 Space to open cable and tape drive access door (Do not place items on the equipment.)
- 7 Two electrically separate AC grounded wall outlets within reach of the modem and system power cords
- 8 Uninterruptible power supply (optional, not supplied by Stratus)
- 9 Space to open front bezel completely
- 10 Pedestal system placed on floor (or on a sturdy desk or stand)
- 11 An environment that maintains a reasonable temperature and humidity level

## Pedestal System

Because the pedestal system is a large heavy unit, set it on the floor or on a sufficiently sturdy table or stand. Place the monitor, keyboard, and mouse on a table or desktop near the system. Be sure to place the table close enough to the system to allow the monitor and keyboard cables to connect to the VGA and USB ports on the rear panel.



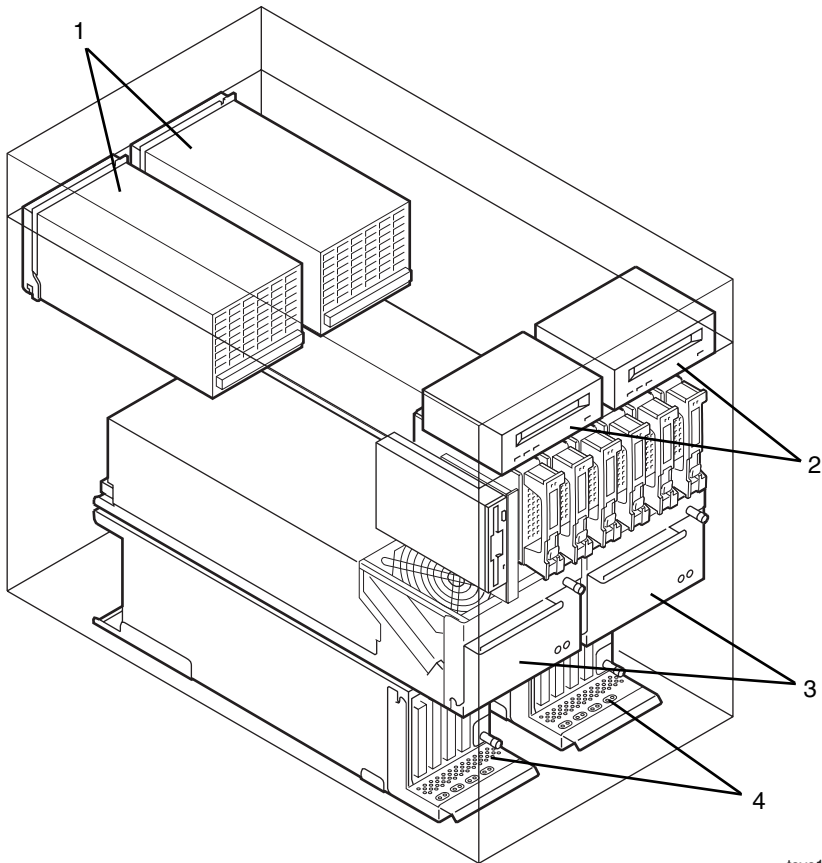
### CAUTION

---

Leave sufficient room around the front and sides of the computer unit. When opened completely, the front bezel protrudes approximately 1.38 in. (3.5 cm) beyond the right side.

[Figure 2-2](#) shows a pedestal system in the ftServer 3000 series with the dual tape drive option.

**Figure 2-2. Pedestal System Configuration**



tsys156

- 1 Dual power supplies
- 2 Optional tape drives
- 3 Dual CPU enclosures
- 4 Dual I/O enclosures

## Rack-Mountable System

A rack-mountable system in the ftServer 3000 series, shown in [Figure 2-3](#), fits in any 19-inch Electronic Industries Association (EIA) 310-D standard rack that has:

- Front and rear vertical EIA rails that have the EIA universal square-hole pattern (**not** the wide EIA wide square-hole pattern or round-hole pattern)
- Front vertical EIA rails that extend at least 0.5 in. (1.27 cm) beyond the inside edge of the accessory leg if present
- Front and rear vertical EIA mounting rails that are spaced between 24.5 in. and 30 in. (62 cm and 76 cm) apart

ftServer systems draw air in through the front and expel air through the back. The following requirements are necessary to ensure the thermal performance of the ftServer system:

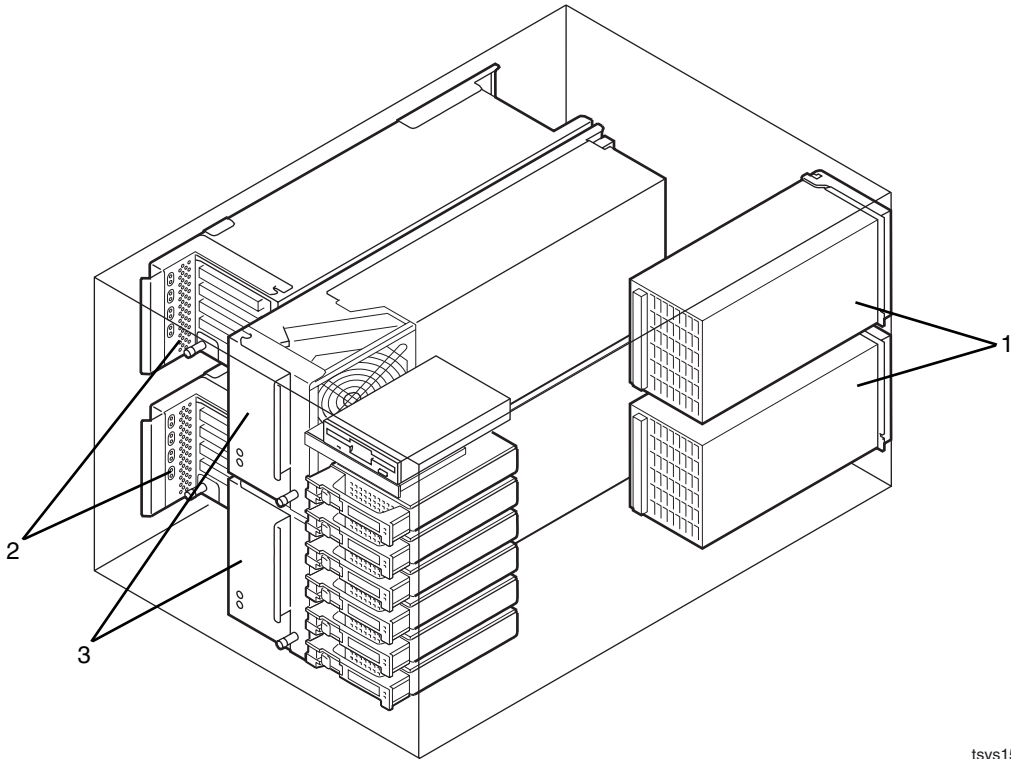
- Airflow through the rack must flow front to back.
- If your rack does not have vented front and rear doors, Stratus recommends that you remove the doors from the rack while the ftServer system is operating.
- The front and rear doors of the rack should allow for 14 square in. (90 square cm) of open area for each 1U of aperture size.

### NOTES \_\_\_\_\_

1. 1U is equal to 1.75 in. (4.5 cm).
2. For vertical reference, every three screw holes on the EIA universal square-hole pattern vertical rail are equal to 1U.

A rack-mountable system contains no internal tape drives.

**Figure 2-3. Rack-Mounted System Configuration**



tsys155

- 1 Dual power supplies
- 2 I/O enclosures
- 3 Dual CPU enclosures



## Monitor Options

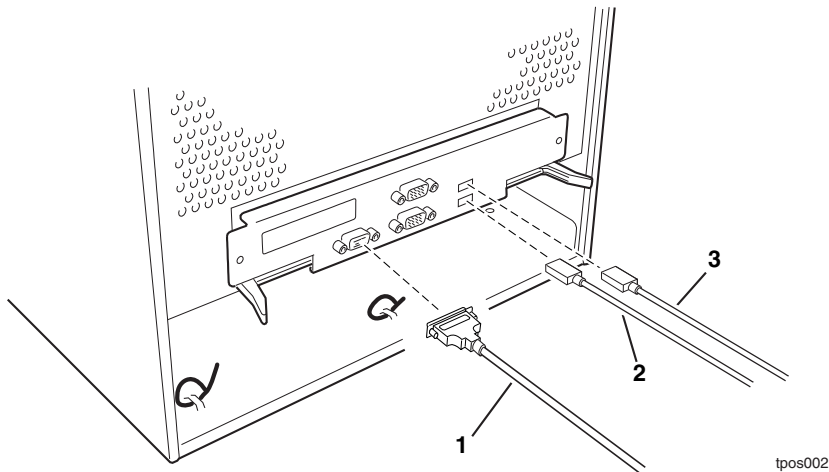
Stratus supplies one of two monitor, keyboard, and mouse options:

- For a pedestal system, a [V122 17-inch color VGA monitor](#)
- For a rack-mountable system, a [V125 1U flat-panel LCD monitor with integrated keyboard and trackpad](#)

Instead, you may use [your own monitor, keyboard, and mouse](#).

The monitor connects to the VGA port, the keyboard connects to a USB port, and the mouse connects to the keyboard or to the second USB port. The VGA and USB ports are in the I/O panel at the back of the system, as shown in [Figure 2-4](#).

**Figure 2-4. I/O Panel**



- 1 VGA cable to video port
- 2 Keyboard cable to USB port
- 3 Mouse cable to USB port

For more information, see:

- [“Specifications and HVAC Requirements” on page 3-2](#) for space planning information
- [“Interface Cabling Requirements” on page 3-12](#) for cable specifications

## V122 17-Inch Color Monitor

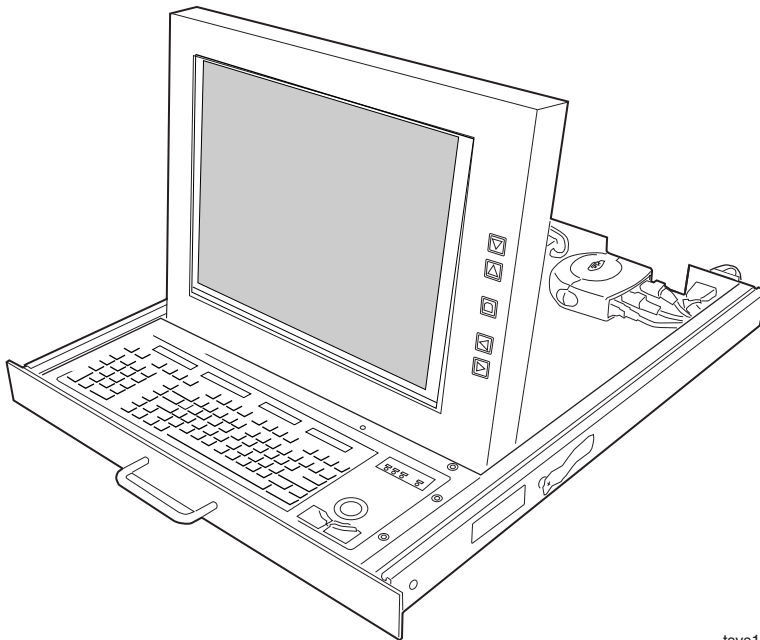
The V122 17-inch color VGA monitor is available for use with a pedestal system. Make sure to provide a table that can support the monitor, and make sure that the table is placed close enough to the rack to allow the monitor to connect to the VGA port at the back of the system.

[Figure 2-1](#) shows a system and a V122 17-inch color VGA monitor, plus the V127 keyboard and mouse.

## V125 Monitor Unit

For a rack-mountable system, Stratus offers the rack-mountable V125 1U flat-panel LCD monitor with integrated keyboard and trackpad, shown in [Figure 2-5](#). Make sure sufficient room exists in the rack for this monitor option.

**Figure 2-5. V125 Monitor Unit**



tsys119

## Using Your Own Monitor, Keyboard, and Mouse

You can provide your own monitor provided it meets the following requirements:

- The monitor VGA cable has a 15-pin D-sub connector.
- The monitor accepts universal 100–240 VAC, 50–60 Hz power.
- The monitor power cord is long enough and the plug type is compatible with the external power source at the site.

You can provide your own keyboard and mouse provided it meets the following requirements:

- The keyboard is USB compatible.
- The keyboard has a port for the mouse; or if the mouse has a USB interface, you can connect the mouse to the second USB port.

### NOTE \_\_\_\_\_

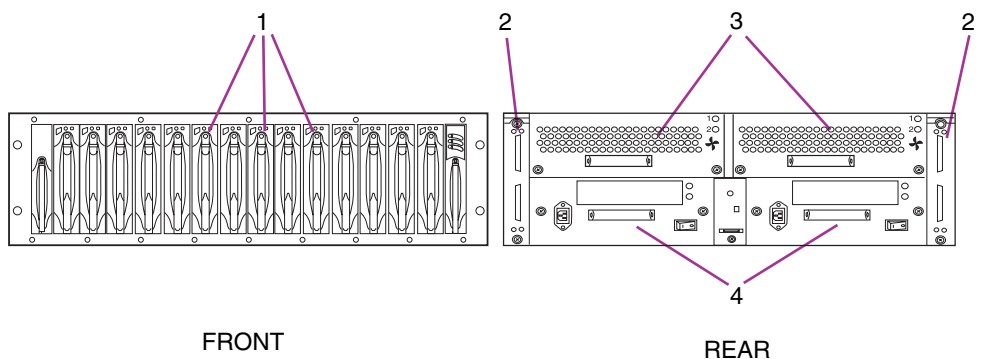
To connect a PS2-based Keyboard/Video/Mouse (KVM) switch to the system, obtain a PS/2-to-USB converter to connect to the USB keyboard port of the system.

## Ultra160 SCSI Storage Enclosure

An Ultra160 SCSI storage enclosure provides additional SCSI storage, with up to 14 disks. ftServer 3000-series systems can contain one Ultra160 SCSI enclosure.

Figure 2-6 shows the Ultra160 SCSI enclosure and its subassemblies.

**Figure 2-6. Ultra160 SCSI Storage Enclosure**



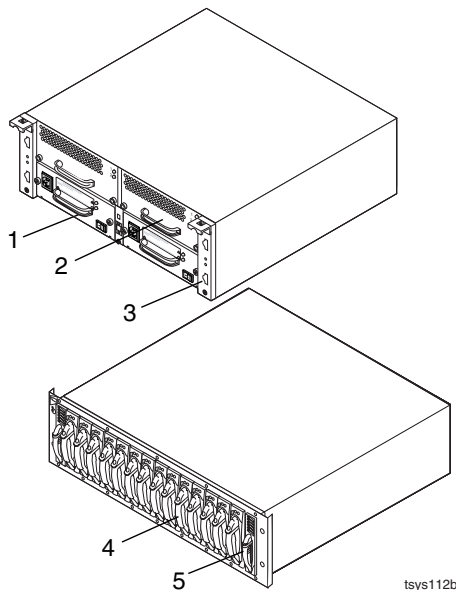
- 1 Up to 14 physical (seven logical) disk drives
- 2 Two cluster services module (CSM)
- 3 Two advanced cooling modules (ACM)
- 4 Two power supplies

## ftStorage Fibre Channel Array

The ftStorage Fibre Channel Array storage enclosures provide RAID disk storage. An ftServer system can have up to three ftStorage Fibre Channel Array storage enclosures attached to it. One of the enclosures must be a D570 array, which contains the RAID controller.

Figure 2-7 shows front and rear views of a D570 ftStorage Fibre Channel Array and shows the subassemblies.

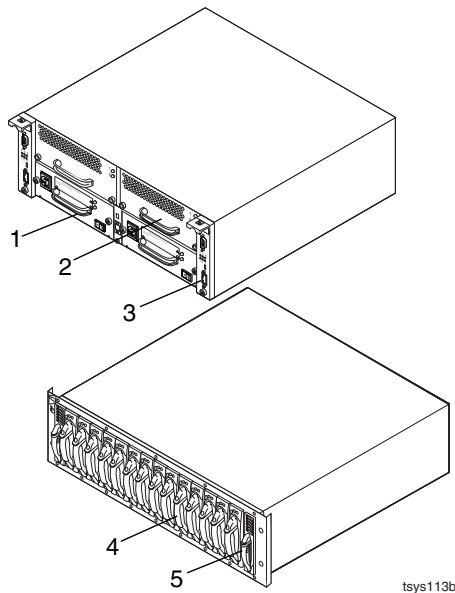
**Figure 2-7. Front and Rear Views of the D570 Array**



- 1 Two Fibre Channel RAID controllers
- 2 Two hot-pluggable power supplies
- 3 Two hot-pluggable ACMs, each containing two fans, and one battery-backup unit (BBU) for the RAID controller.
- 4 Up to 14 hot-pluggable physical (7 logical) disk drives
- 5 Two hot-pluggable loop resiliency circuit module/SCSI enclosure services (LS) modules

Figure 2-8 shows front and rear views of a D580 ftStorage Fibre Channel Array and shows the subassemblies.

**Figure 2-8. Front and Rear Views of the D580 Array**



- 1 Two hot-pluggable I/O modules
- 2 Two power supplies
- 3 Two hot-pluggable ACMs, each containing two fans
- 4 Up to 14 hot-pluggable physical (7 logical) disk drives
- 5 Two hot-pluggable LS modules

## Tape Drives

An ftServer system can contain a maximum of four tape drives, with a maximum of two drives daisy-chained and connected to a U516 PCI adapter. The tape drive options consist of:

- One or two [internal T811 tape drives](#) in a pedestal system
- One or two internal T811 tape drive in a pedestal system and one or two [external tape drives](#)
- Up to four external tape drives attached to a pedestal or rack-mounted system.

### Internal T811 Tape Drives

The internal T811 tape drives are options for pedestal systems, and each requires its own power source. A *tape drive bay* that accommodates the tape drives is built into the top of the system case. The tape drive bay is factory installed (you cannot add the bay to a rack-mounted system). Two internal tape drives can be daisy-chained to a single U516 One-Port Ultra2 SCSI PCI Adapter or to two separate U516 PCI adapters. The separate adapters provide some tape storage redundancy if an adapter fails.

### External Tape Drives

The external tape drive options are:

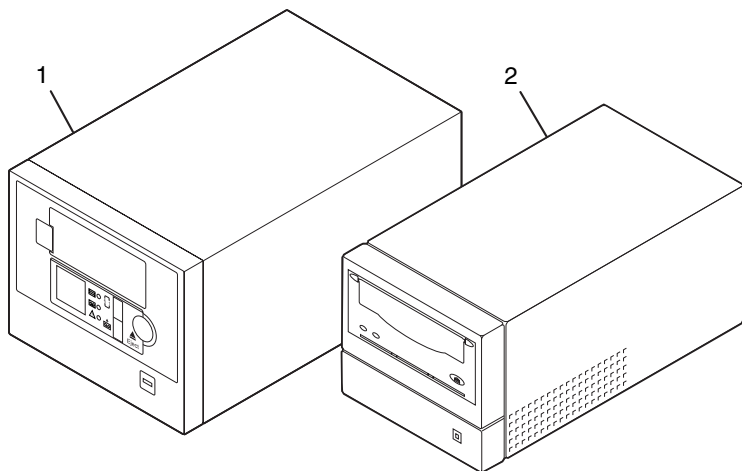
- T511 DDS-4 DAT Tape Drive
- T512 DDS-4 DAT Tape Drive with Autoloader
- T513 DLT 8000 Tape Drive

The T511 tape drive and the T512 autoloader are functionally equivalent except that the autoloader can contain up to six tapes.

The external tape drives are all tabletop units and each requires its own power source. A SCSI cable connects the first tape drive to the U516 One-Port Ultra2 SCSI PCI Adapter. A shorter SCSI cable connects a first tape drive to a second tape drive.

Figure 2-9 shows the T511 DDS-4 DAT Tape Drive and T512 DDS-4 DAT Tape Drive with Autoloader external tape drives.

**Figure 2-9. T511 Tape Drive and T512 Autoloader**



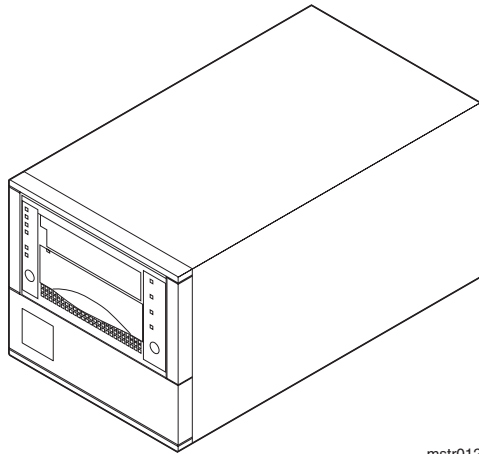
mstr011a

- 1 T512 tape drive with autoloader
- 2 T511 tape drive



The T513 tape drive, shown in [Figure 2-10](#), is DLT 8000 compatible.

**Figure 2-10. T513 Tape Drive**



## Uninterruptible Power Supply (UPS)

Stratus has qualified the American Power Conversion (APC) Smart-UPS 1400 for system configurations that include **no more than one** D570 ftStorage Fibre Channel Array, and the Smart-UPS 3000 for system configurations that include a second D570 ftStorage Fibre Channel Array. Choose the specific model number that matches the electrical service in the country where the system is to be installed.

For more information about the UPS, see [Chapter 4](#).



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## Chapter 3

# Site Requirements

The site planning and preparation process ensures that the installation site provides:

- Sufficient and well-ventilated physical space
- Appropriate electrical power

Take into consideration the number and types of outlets needed and the lengths of the power cords.

- Required network and telephone line connections

Take into consideration the LAN, WAN, and analog phone line connections needed, and the lengths and types of interface cables. Some cables are shipped with the system or optional component and you must provide some cables.

## Space and HVAC Requirements

Select a site for an ftServer system installation that has sufficient space, maintains reasonable temperature and humidity levels, and is as free of dust as possible. Dust buildup in the system can impede air circulation and heat transfer, causing components to become less reliable as the ambient temperature rises.

To allow air circulation, allow some space between the front and rear of the system and any walls or other obstructions.

Provide a table or desktop for external devices such as a telephone, an external modem, tape drives, and a monitor, keyboard, and mouse. If you plan to put the system on a table, make sure that the table is strong enough to carry the weight of the system.

If the site has an elevated floor, make sure that the floor has cutouts for routing cables.



### CAUTION

Do not place the system in an area of high electrostatic discharge. Static electricity may damage components.

Do not locate components near transformers or other electromagnetic devices.

## Bringing a System Out of Storage

If the system was stored at a temperature below the minimum operating temperature of 41°F (5°C) or above the maximum operating temperature of 95°F (35°C), allow the system to adjust by placing it in a room whose temperature is between 41°F and 77°F (5°C to 25°C) and test it for one hour. Then place the system in its operating environment.

## Specifications and HVAC Requirements

Use the following information in planning the system installation in your site.

### **Pedestal Computer**

Height: 20.75 in. (52.7 cm)

Width: 13.75 in. (35.0 cm)

Depth: 27.75 in. (70.5 cm)

One-way SMP: 135 lb (61 kg)

Two-way SMP: 148 lb (67 kg)

Operating temperature: 41°F to 95°F (5°C to 35°C)

Maximum rate of temperature change during operation: 18°F/hr (10°C/hr)  
or 0.30°F/min (0.17°C/min)

Relative humidity during operation: 20% to 80% (noncondensing)

Relative humidity during storage: 8% to 80%

### **Rack-Mounted Computer**

Height: 13.75 in. (35 cm) (approximately 8U)

Width: 17.75 in. (45 cm)

Depth: 27.75 in. (70.5 cm)

One-way SMP: 124 lb (56 kg)

Two-way SMP: 137 lb (62 kg)

Operating temperature: 41°F to 95°F (5°C to 35°C)

Maximum rate of temperature change during operation: 18°F/hr (10°C/hr)  
or 0.30°F/min (0.17°C/min)

Relative humidity during operation: 20% to 80% (noncondensing)

Relative humidity during storage: 8% to 80%

### **Internal Tape Drive**

Height: 1.6 in. (4.12 cm)

Width: 5.9 in. (14.9 cm)

Depth: 6 in. (15 cm)

Weight: 2 lb (0.9 kg)

### **T511 and T512 Tape Drives without Autoloader**

Height: 3.75 in. (9.5 cm)

Width: 4.5 in. (11.6 cm)

Depth: 8.6 in. (22.0 cm)

Weight: 5.7 lb (2.6 kg)

Temperature: 41°F to 104°F (5°C to 40°C)

Relative humidity: 20% to 80% (noncondensing)

### **T511 and T512 Tape Drives with Autoloader**

Height: 5.3 in. (13.5 cm)

Width: 6.5 in. (16.5 cm)

Depth: 10.6 in. (26.9 cm)

Weight: 10.5 lb (4.8 kg)

Temperature: 41°F to 104°F (5°C to 40°C)

Relative humidity: 20% to 80% (noncondensing)

### **T513 Tape Drive**

Height: 6.5 in. (16.5 cm)

Width: 6.9 in. (17.5 cm)

Depth (including tape eject handle): 12.8 in. (32.5 cm)

Weight: 14 lb (6.35 kg)

Temperature: 50°F to 104°F (10°C to 40°C)

Relative humidity: 20% to 80% (noncondensing)

### **Ultra160 SCSI Storage Enclosure**

Height: 5.22 inches (13.3 cm) (3U)

Width: 17.5 inches (44.5 cm)

Depth: 20 inches (50.8 cm)

Weight, without disks: 33 lb (15.9 kg)

Weight, fully configured: 75 lb (34 kg)

Operating temperature: 32°F to 113°F (0°C to 45°C)

### **NOTE** \_\_\_\_\_

Drives can operate at this temperature but should not be cold-started below 5°C.

Storage temperature: -40°F to 158°F (-40°C to +70°C)

Maximum rate of temperature change: 68°F (20°C) per hour

Relative humidity during operation: 10% to 80% (noncondensing)

Relative humidity during storage: 10% to 95% (noncondensing)

Operating altitude: -200 to 10,000 feet

Storage altitude: -200 to 40,000 feet

### **ftStorage Fibre Channel Array**

Height: 5.22 in. (13.3 cm) (3U)

Width: 15.5 in. (44.5 cm)

Depth: 20 in. (50.8 cm)

Weight: 59 lb (26.76 kg) maximum

Operating temperature: 32°F to 104°F (0°C to 40°C)

Storage temperature: -40°F to 158°F (-40°C to 70°C)

Maximum rate of temperature change: 68°F (20°C) per hour

### **V125 1U Flat-panel LCD Monitor with Integrated Keyboard and Trackpad**

Height: 1.75 in. (4.45 cm) (1U)

Width: 19 in. (48.3 cm)

Depth: 27 in. (68.6 cm)

### **V122 17-inch Color VGA Monitor (Not supported in standard 19-inch racks)**

Height: 16 in. (41 cm)

Width: 16 in. (41 cm)

Depth: 16.5 in. (40.8 cm)

Weight: 30 lb (13.61 kg)

### **Keyboard**

Height: 2.5 in. (6.4 cm) (2U)

Width: 19 in. (48.3 cm)

Depth: 8 in. (20.4 cm)

### **UPS (Optional)**

Height: 8.50 in. (21.59 cm)

Width: 6.70 in. (17.02 cm)

Depth: 17.30 in. (43.94 cm)

Weight: 53 lb (24.09 kg)

### **External Modem**

Height: 1.00 in. (2.5 cm)

Width: 4.25 in. (10.8 cm)

Depth: 5.60 in. (14.2 cm)

For information about the UPS, see the manufacturer's documentation on the <http://www.apcc.com> Web page.

## Electrical Power Requirements

The power requirements for the system depend on the type and number of components. A system with an external modem requires at least three separate and independent AC power sources: one to supply power to the modem, and two to supply power to the system. A system without an external modem requires at least two separate and independent AC sources to supply power to the system. One of the power sources for the system can be a UPS. Other power sources are needed for internal tape drives and components installed outside the rack.

The power service must be properly wired and grounded according to local standards and regulations. See [Chapter 4](#) for information about connecting power cords to your system. See [Appendix A](#) for important power service information.

[Table 3-1](#) describes the power requirements for base and optional system components, specifying the number of power service sources, and the line voltage (VAC) and frequency (Hz) required at each source.

**Table 3-1. AC Power Service Requirements**

Component	Number of AC Sources	AC Service Required
System power	2	100–240 VAC; 50/60 Hz
V122 17-inch color VGA monitor option	1	100–240 VAC; 50/60 Hz
V125 monitor unit option	1	100–240 VAC; 50/60 Hz
External modem power transformer	1	100–240 VAC; 50/60 Hz
Ultra160 SCSI storage enclosure (optional)	2	85–264 VAC; 47/63 Hz
ftStorage Fibre Channel Array (optional)	2 to 6 (two for each enclosure)	100–240 VAC; 50/60 Hz
Internal tape drive (optional)	1 or 2	100–240 VAC rms, with a maximum harmonic distortion of 10%; 50/60 Hz
T511 tape drive and T512 autoloader (optional), or T513 tape drive (optional)	1 to 4 (one for each unit)	110–240 VAC; 50/60 Hz

### Calculating Power Requirements

To calculate the power requirements for your ftServer system, ascertain the exact configuration and use the worksheet in [Table 3-2](#).

**To calculate power requirements**

- 1. In the Quantity column, write the number of each type of component.
- 2. Multiply the entry in the Quantity column by the number in the Power column, and enter the result in the Watts Subtotal column.
- 3. Add all the results in the Watts Subtotal column, and enter the sum on the bottom line labeled Total. This value indicates the power and HVAC requirements for your system.

**NOTE** \_\_\_\_\_  
Make adjustments for any user-supplied components, including a UPS.

**Table 3-2. Worksheet for Calculating Power Service Requirements**

System Component	Quantity		@ Power (Watts)		AC Power (Extended)
Power supplies, 1-way and 2-way SMP (no monitor, keyboard, or mouse)	2	x	750	=	
V125 monitor unit (optional)		x	45	=	
V122 17-inch color VGA monitor, keyboard, and mouse (optional)		x	100	=	
Ultra160 SCSI storage enclosure (optional)		x	400	=	
ftStorage Fibre Channel Array fully loaded with 36- or 72-GB disk drives (optional)		x	400	=	
TOTAL					



## Power Cord Lengths and Plug Types

When choosing a location for the system, consider the length of the power cords and the location of power receptacles. To receive the appropriate cords, specify the appropriate country kit when you order your system.

Stratus supplies power cords for:

- [System power supplies, monitors, and tape drives](#)
- [ftStorage Fibre Channel Arrays and Ultra160 storage enclosures](#)
- [External modems](#)

APC supplies power cords for the [UPS](#).



### **WARNING**

Place all power cords out of the way of foot traffic.



### **WARNING**

The power transformer supplied with the external modem is the only one that should be used. Use of any other transformer could cause damage to the modem.

## System, Monitor, and Tape Drive Power Cords

[Table 3-3](#) lists the specifications and length of the power cords that connect external AC power sources to the ftServer 3000-series system power supplies and tape drives, and to monitors for countries outside the United States.

**Table 3-3. System, Monitor, and Tape Drive Power Cords**

Locale	Description	Length	Marketing ID
United States	120V/15A, plug type NEMA 5-15	6 ft (1.8m)	B20218
Australia	250V/10A, plug type AS/NZS 3112-1993	6.5 ft (2.0m)	B20222
Continental Europe	250V/10A, plug type CEE 7 VII (10A)	8.2 ft (2.5m)	B20220
Great Britain	250V/10A, plug type BS1363/A (10)	8.2 ft (2.5m)	B20221
Israel	250V/10A, plug type SI 32/1971	6.5 ft (2.0m)	B20223
Japan	100V/15A, plug type NEMA 5-15	9.8 ft (3.0m)	B20219

**Table 3-3. System, Monitor, and Tape Drive Power Cords** *(Continued)*

Locale	Description	Length	Marketing ID
South Africa	250V/10A, plug type BS546	8.2 ft (2.5m)	B20239

## ftStorage Fibre Channel Array and Ultra160 SCSI Storage Enclosure Power Cords

[Table 3-4](#) describes the power cords that connect enclosures to external AC power sources.

**Table 3-4. ftStorage and Ultra160 Enclosure Power Supply Power Cords**

Locale	Description	Length	Marketing ID
United States	120V/15A, plug type NEMA 5-15	6 ft (1.8m)	B51001
Australia	250V/10A, plug type AS/NZS 3112-1993	6.5 ft (2.0m)	B51005
Continental Europe	250V/10A, plug type CEE 7 VII (10A)	8.2 ft (2.5m)	B51002
Great Britain	250V/10A, plug type BS1363/A (10A)	8.2 ft (2.5m)	B51003
Israel	250V/10A, plug type SI 32/1971	6.5 ft (2.0m)	B51006
Japan	100V/15A, plug type NEMA 5-15	9.8 ft (3.0m)	B51004
South Africa	250V/10A, plug type SABS 164-1 BS546	8.2 ft (2.5m)	B51007

## External Modem Power Cords

[Table 3-5](#) describes the power cords that connect external modems to external AC power sources. (The modem card on an ftServer Access Adapter does not require additional power sources.)

**Table 3-5. External Modem Power Cords**

Locale	Description	Length	Marketing ID
Brazil, Canada, Japan, Mexico, Philippines, Bolivia, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Panama, Saudi Arabia, Venezuela, Taiwan, United States	120V/15A, plug type NEMA 5-15	6 ft (1.8m)	AK-000369

**Table 3-5. External Modem Power Cords (Continued)**

<b>Locale</b>	<b>Description</b>	<b>Length</b>	<b>Marketing ID</b>
Argentina, Chile, China, Cyprus, Czech Republic, Greece, Hong Kong, Hungary, Indonesia, Korea, Liechtenstein, Luxembourg, Poland, Portugal, Bahrain, Egypt, Estonia, Israel, Ivory Coast, Jordan, Kuwait, Malaysia, Oman, Pakistan, Paraguay, Peru, Qatar, Slovak Republic, Slovenia, South Africa, Thailand, Ukraine, United Arab Emirates, Uruguay, Yemen, Russia, Singapore, Spain, Turkey	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000370
Australia	250V/10A, plug type AS/NZS 3112-1993	6.5 ft (2.0m)	AK-000371
Austria	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000372
Belgium	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000373
Denmark	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000374
Finland, Norway	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000375
France, Morocco	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000376
Germany	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000377
Iceland, Sweden	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000378
India	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000379
United Kingdom, Ireland	250V/10A, plug type BS1363/A (10)	6.5 ft (2.0m)	AK-000380
Italy	250V/10A, plug type CEI 23-16	6.5 ft (2.0m)	AK-000381
Netherlands	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000382

**Table 3-5. External Modem Power Cords** *(Continued)*

Locale	Description	Length	Marketing ID
New Zealand	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000383
Switzerland	250V/10A, plug type CEE 7 VII (10A)	6.5 ft (2.0m)	AK-000384

## UPS Power Cords

[Table 3-6](#) describes the power cords that connect the UPS to external AC power sources.

**Table 3-6. UPS Power Cords**

Locale	Description	Length	Marketing ID
North America	Model SU1400NET, SU1400RM2U, SU3000NET, or SU3000RM3U. One cord with NEMA 5-15P plug. Provides 6 NEMA 5-15R outlets.	6 ft (1.8m)	Purchase from APC
Japan	Model SU1400J, SU1400RMJ, SU3000J, or SU3000RMJ. One cord with NEMA 5-15P plug. Provides 6 NEMA 5-15R outlets.	6 ft (1.8m)	Purchase from APC
Rest of the world	Model SU1400INET, SU1400RM12U, SU3000INET, or SU3000RM13U. Provides one IEC-320-C14 inlet for customer-supplied cord, and 4 IEC-320-C13 outlets.	Customer-supplied	Purchase from APC

## Network and Telephone Line Connection Requirements

Systems in the ftServer 3000 series have the following network and telephone communications requirements:

- **Without ftServer Access Adapters**

- A minimum of two Ethernet connections for fault-tolerant network connectivity
- One telephone line connected to a telephone to call the CAC or your authorized Stratus service representative for help
- One analog telephone line for each system or one analog telephone line for each *ftGateway group*

**NOTE** \_\_\_\_\_

One system in the group, the ftGateway system, must contain ftServer Access Adapters.

- **With ftServer Access Adapters**

- A minimum of two Ethernet connections for fault-tolerant network connectivity; optionally, two more Ethernet connections to connect the ftServer Access Adapter to the network
- One telephone line connected to a telephone to call the CAC or your authorized Stratus service representative for help
- One analog telephone line for each system or one analog telephone line for each *ftGateway group*

You use the supplied two-way (Y-style) connector to connect the PCMCIA modems on the ftServer Access Adapters to this analog telephone line.

The option of one analog telephone line for each *ftGateway group*, requires that one ftServer system be set up as a *gateway* for SSN connectivity. Each ftGateway group is limited to a maximum of 20 ftServer systems. All systems in a group must connect to the same subnetwork over the system Ethernet port, over Ethernet adapter cards, or through ftServer Access Adapters. Using ftServer Access Adapter cards provides the highest level of manageability by allowing the system to be serviced even when the operating system is not operational.

See [“ftGateway Phone Line Requirements” on page 3-12](#) for more information about the site requirements for implementing a gateway for SSN connectivity.

**NOTE** \_\_\_\_\_

A dedicated phone line provides the most reliable service. SSN calls routed through a PBX might be slow due to load on the PBX, or might not complete successfully because

the calls can become disconnected. If you must use a PBX, do not route the telephone extension through a switchboard; instead, provide a direct-dial analog number.

You may need to arrange for other network connections, depending upon how the system will be used and what networks the system will connect to. Stratus has qualified asynchronous adapters to connect the ftServer system to various types of networks. If you have a unique network requirement, Stratus Professional Services can work with you to meet that requirement.

## ftGateway Phone Line Requirements

Multiple ftServer systems at a single site can share a single telephone connection to the SSN by implementing an *ftGateway group*. The systems in the group must be connected to a **single** physical Ethernet subnetwork. One system acts as a *gateway* for SSN connectivity; this system requires an analog telephone line that connects to the PCMCIA modem on the ftServer Access Adapters on the gateway system. Other systems in the *gateway group*, *gateway slaves*, connect to the gateway system over the network. In this case, Ethernet connections are required for each system, but only two analog telephone lines for each site are required.

## Interface Cabling Requirements

When choosing a location for the system, consider the available cable lengths, the placement of external devices, and the location of computer network, telephone modem data, and voice communication connections.

Plan the placement of the system and its external components so that the distance between them does not exceed the lengths of the cables. If you have chosen to supply your own monitor, make sure that it meets the system's requirements (see [“Using Your Own Monitor, Keyboard, and Mouse” on page 2-9](#)) and that the cable you provide is of the correct type and of sufficient length.

VGA, USB, and serial cables for the UPS and modem connect to the I/O panel (on the rear of the system near the bottom). Cables connected to the system's Ethernet ports or to PCI adapter ports connect to those ports from the front of the system and route through the system and out the rear. This routing requires approximately 32 in. (80 cm).



### **WARNING**

**Place all interface cables out of the way of foot traffic.**

## Interface Cables You Supply

[Table 3-7](#) describes the interface cables you supply. Be sure to provide a cable of sufficient length for the distance between a component and a wall jack or hub.

### NOTE

Ethernet and ftServer Access adapters must be paired for fault-tolerance and require a cable for each member of the pair.

**Table 3-7. Customer-Supplied Interface Cables**

Component	Cable
System Ethernet ports	<p>Two Shielded Twisted Pair (STP) Category-3 or Category-5 Ethernet cables with RJ-45 modular connectors</p> <p>The system Ethernet ports are serviced by the embedded Ethernet adapters.</p> <p>For 100-Mbps (fast Ethernet) operation, provide full-duplex, or Category 5 cable Ethernet cables.</p> <p>The maximum allowable distance from an Ethernet port to a switch or a hub is 100 meters.</p>
ftServer Access Adapters  U515 One-Port 10/100-Mbps Ethernet PCI Adapters  U571 One-Port 10/100/1000 Base-T Ethernet PCI Adapter	<p>Two Ethernet cables for a pair of ftServer Access Adapters, which are required for systems to operate in an ftGateway environment, but optional otherwise</p> <p>Two Ethernet cables for each optional pair of U515 PCI adapters or U571 PCI adapters</p> <p>Provide 24 AWG, 4-pair, Unshielded Twisted Pair (UTP) EIA/TIA-Verified, Category-3 or Category-5 wire, with RJ-45 modular connectors terminated with pair-wiring adhering to the EIA/TIA 568-A or EIA/TIA 568-B standard. For connections to an Ethernet hub or switch, provide a straight-through cable.</p> <p>For 100-Mbps (fast Ethernet) operation, provide full-duplex, or Category 5 Ethernet cables.</p> <p>The maximum allowable distance from an Ethernet port to a switch or a hub is 100 meters.</p>
U570 One-Port 1000Base-SX Ethernet PCI Adapter	<p>Two multi-mode, 62.5-micron, DUAL fiber cable with two SC-type connectors, and two connectors that are compatible with the network switch, for each optional pair of U570 One-Port 1000Base-SX Ethernet PCI Adapters</p>

**Table 3-7. Customer-Supplied Interface Cables** *(Continued)*

Component	Cable
PCMCIA modem card on ftServer Access Adapters (not required if the system is connected to an ftGateway system)	One serial cable to connect the dual modem extension cable to the phone jack
UPS	One Smart UPS signaling RS-232 cable

**Interface Cables Stratus Supplies**

Stratus supplies cables to connect the monitor and keyboard to the system and, except for Ethernet cables, cables for the cards you purchase from Stratus.

[Table 3-8](#) describes the interface cables you purchase from Stratus or that Stratus supplies when you purchase a system or component. [Table 3-8](#) lists the lengths of each cable so that you can plan for proximity between components.

**Table 3-8. Interface Cables Available from Stratus**

Component	Cable Description	Length	Marketing ID
V122 monitor, keyboard, and mouse	One VGA cable attached to the monitor and which plugs into the VGA port in the I/O panel	59 in. (1.5m)	N/A
	One USB cable attached to the keyboard and which plugs into the top USB port in the I/O panel	59 in. (1.5m)	N/A
	One PS/2 cable attached to the mouse and which plugs into the keyboard USB hub or into the USB port in the I/O panel		N/A
V125 monitor unit	One VGA cable attached to the monitor	6 ft (1.8m)	B20240
	One USB cable attached to the keyboard	6 ft (1.8m)	B51100



**Table 3-8. Interface Cables Available from Stratus (Continued)**

Component	Cable Description	Length	Marketing ID
External modem for systems without ftServer Access Adapters (not required if the system is connected to an ftGateway system)	One RJ-11 phone cable. Shipped with the modem localization kit. Global adapters are provided in the country kit.	14 ft (4.267m)	N/A
	Shielded, DB-25 male to DB-9S female serial cable. Shipped with the modem.	5.5 ft (1.7 m)	N/A
PCMCIA modem card on ftSAs (optional)	One dual modem extension cable (Y-style, for use in the United States and Canada)  Global Adapters are provided in the localization kit.	5.5 ft (1.7m)	B50600
Ultra160 SCSI storage enclosure (optional)	Four SCSI-3 high-density cables, with a 0.8 mm VHDCI connector at each end. The cables connect to U521 Two-Port Ultra160 SCSI PCI Adapters.	5.5 ft (1.7m)	N/A
ftStorage Fibre Channel Array storage enclosure (optional)	One Fibre Channel copper cable from each U514 Fibre Channel PCI Adapters	9.75 ft (3m) Included with ftStorage Array	B50700
		32.5 ft (10m) Ordered separately	B50900
First internal T811 tape drive (optional)	One SCSI-3 high-density cable with one 0.8 mm VHDC connector and 68-pin SCSI-3 connector. Connects to a U516 One-Port Ultra2 SCSI PCI Adapter		808744621-001A
Second T811 internal tape drive (optional)	One SCSI-3 high-density cable with one 0.8 mm VHDC connector and one 68-pin SCSI-3 connector to connect a second tape drive to a second U516 PCI adapter		808744621-002A
	Or, one SCSI daisy-chain cable to connect a second T811 tape drive to the first T811 tape drive		808744624-030A

**Table 3-8. Interface Cables Available from Stratus** *(Continued)*

Component	Cable Description	Length	Marketing ID
First external tape drive (all models) (optional)	One SCSI-3 high-density cable with one 0.8 mm VHDC connector and 68-pin SCSI-3 connector. Connects to U516 One-Port Ultra2 SCSI PCI Adapters.	10 ft (3m)	B1046-01
		30 ft (9m)	B1046-02
Second external tape drive (optional)	One SCSI-3 high-density daisy chain cable with one 0.8 mm VHDC connector and one 68-pin SCSI-3 connector	3 ft (1m)	B1072
U486 Eight-Port Asynchronous PCI Adapter (optional)	One eight-port fan-out cable with DB-25 connectors	6 ft (1.8m)	B1122
		32.5 ft (10m) Ordered separately	B50900

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## Chapter 4

# Planning Power Connections

You can connect power to the system:

- [Without an uninterruptible power supply \(UPS\)](#)
- [Using a UPS](#)

For fault tolerance, the ftServer system must be powered by two independent AC power sources: one source connected to one power supply unit (PSU), and the other source connected to the second PSU. Stratus recommends, for system reliability, that you [use a UPS](#) as one of the sources.

Stratus has qualified specific American Power Conversion Corporation (APC) UPS models for use with systems in the ftServer 3000 series. Site planning information for the customer-supplied UPS is of a general nature only. For detailed information about this component, see the manufacturer's documentation.

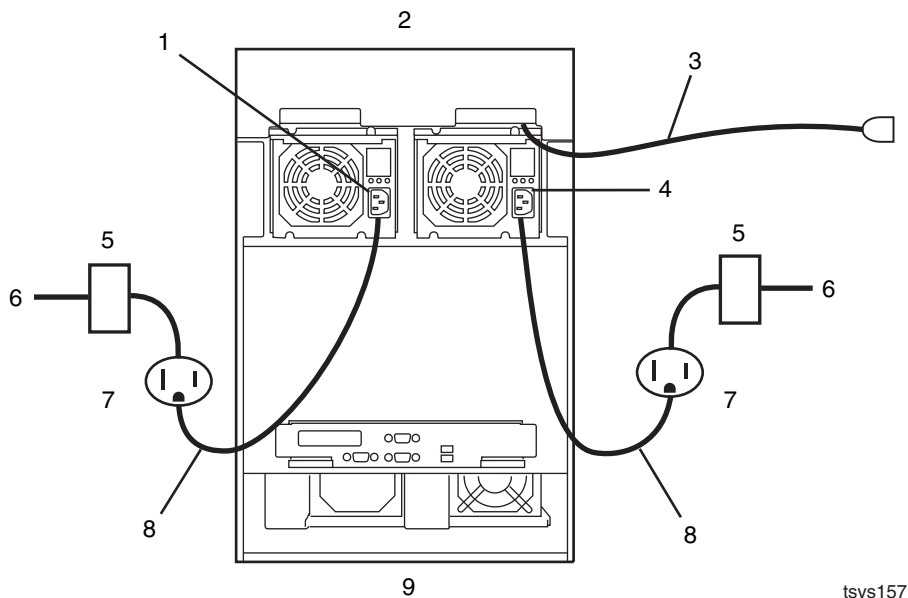
See [Appendix A](#) for site wiring information and [Chapter 3](#) for system power requirements.

## Connecting Power to a System without a UPS

If you operate your ftServer system without a UPS, the two AC power sources should be as electrically independent of each other as the installation site allows. The two power sources must at least be powered by separate distribution transformers and, if possible, be independent of each other beyond that level. The more electrical separation between the two power sources, the less likely they will both fail at the same time. Due to redundancy in the ftServer system, power to either side of the ftServer system keeps duplexed components of the system in operation.

[Figure 4-1](#) shows the power connections for a pedestal system connected to two separate power sources.

**Figure 4-1. Power Connections for an ftServer System**



- |   |                                     |   |                       |
|---|-------------------------------------|---|-----------------------|
| 1 | PSU1 power outlet                   | 6 | To power distribution |
| 2 | System cabinet                      | 7 | AC power outlet       |
| 3 | Power cord for optional tape drives | 8 | Power cord            |
| 4 | PSU1 power outlet                   | 9 | Rear view             |
| 5 | Distribution transformer            |   |                       |

## Connecting a System to Power with a UPS

If power at a site fails, a UPS temporarily supplies the ftServer system with the required power. In addition to providing uninterrupted power, the UPS also maintains a communications link with the ftServer system to alert the system of imminent power outages and other power problems. The UPS communicates with the system through a serial port on its rear panel.

Stratus has qualified the following UPS models for use with systems in the ftServer 3000 series:

- **APC Smart-UPS 1400.** The Smart-UPS 1400 can supply up to 950 watts to the ftServer system. Use this UPS if you have **no more than one** ftStorage Fibre Channel Array storage enclosure.

- **APC Smart-UPS 3000.** The Smart-UPS 3000 can supply up to 2250 watts to the ftServer system. Use this UPS if you have more than one ftStorage Fibre Channel Array storage enclosure.



### CAUTION

Stratus recommends that you **not** connect both ftServer system power supplies to a single UPS because the UPS would then become a single source of power as well as a single source of failure.

## APC Smart-UPS 1400

Use one of the Smart-UPS 1400 UPS models listed in [Table 4-1](#) or [Table 4-2](#) for a configuration that includes a system in the ftServer 3000 series and up to one ftStorage Fibre Channel Array storage enclosure.

**Table 4-1. Smart-UPS 1400 Models for Pedestal Systems**

Model	Description
<a href="#">SU1400NET</a>	Use this UPS model in North America, parts of Latin America, and Saudi Arabia.
<a href="#">SU1400J</a>	Use this UPS model in Japan.
<a href="#">SU1400INET</a>	Use this UPS model in the rest of the world.

**Table 4-2. Smart-UPS 1400 Models for Rack-Mounted Systems**

Model	Description
<a href="#">SU1400RM2U</a>	Use this UPS model in North America, parts of Latin America, and Saudi Arabia.
<a href="#">SU1400RMJ</a>	Use this UPS model in Japan.
<a href="#">SU1400RMI2U</a>	Use this UPS model in the rest of the world.

**SU1400NET and SU1400RM2U (120-VAC Output).** The SU1400NET and SU1400RM2U UPS models are available for use in North America, Latin America, and Saudi Arabia. Input voltage to these models is 120 VAC. These models provide an output voltage of 120 VAC. These models require a NEMA 5-15R receptacle to accommodate the NEMA 5-15P input power plug from the UPS.

**SU1400J and SU1400RMJ (100-VAC Output).** The SU1400J and SU1400RMJ UPS models are available for use in Japan. Input voltage to these models is 100 VAC. These models provide an output voltage of 100 VAC. These models require a NEMA 5-15R receptacle to accommodate the NEMA 5-15P input power plug from the Smart-UPS 1400.

**SU1400INET and SU1400RMI2U (230-VAC Output).** The SU1400INET and SU1400RMI2U UPS models are available for use in Latin America, Eastern and Western Europe, the Middle East, Africa, Asia, Australia, and the South Pacific. Input voltage to these models is 230 VAC. These models provide an output voltage of 230 VAC. These models require a IEC-320 C14, Schuko CEE 7/EU1-16P, or British BS1363A receptacle to accommodate the input power plug from the UPS.

## APC Smart-UPS 3000

Use one of the Smart-UPS 3000 UPS models listed in [Table 4-3](#) or [Table 4-4](#) for a configuration that includes a system in the ftServer 3000 series and more than one ftStorage Fibre Channel Array storage enclosure.

**Table 4-3. Smart-UPS 3000 Models for Pedestal Systems**

Model	Description
<a href="#">SU3000NET</a>	Use this UPS model in North America, parts of Latin America, and Saudi Arabia.
<a href="#">SU3000J</a>	Use this UPS model in Japan.
<a href="#">SU3000INET</a>	Use this UPS model in the rest of the world.

**Table 4-4. Smart-UPS 3000 Models for Rack-Mounted Systems**

Model	Description
<a href="#">SU3000RM3U</a>	Use this UPS model in North America, parts of Latin America, and Saudi Arabia.
<a href="#">SU3000RMJ</a>	Use this UPS model in Japan.
<a href="#">SU3000RMI3U</a>	Use this UPS model in the rest of the world.

**SU3000NET and SU3000RM3U (120-VAC UPS Output).** The SU3000NET and SU3000RM3U UPS models are available for use in North America, Latin America, and Saudi Arabia. Input voltage to these models is 120 VAC. These models provide an output voltage of 120 VAC. These models require a NEMA 5-15R receptacle to accommodate the NEMA L5-30P input power plug from the UPS.

**SU3000J and SU3000RMJ (100-VAC UPS Output).** The SU3000J and SU3000RMJ UPS models are available for use in Japan. Input voltage to these UPS models is 100 VAC. These UPS models provide an output voltage of 100 VAC. These models require a NEMA L5-30R receptacle to accommodate the NEMA L5-30P input power plug from the UPS.

**SU3000INET and SU3000RMI3U (220/240-VAC UPS Output).** The SU3000INET and SU3000RMI3U UPS models are available for use in Latin America, Eastern and Western Europe, the Middle East, Africa, Asia, Australia, and the South Pacific. These models require an IEC-320 C20, Schuko CEE 7/EU1-16R, or British BS1363A receptacle to accommodate the input power plug from the UPS. The input voltage range for main operations is 174 to 286 VAC, and the input voltage adjustable range for main operations is 168 to 302 VAC. These models are configurable for 230 or 240 VAC output voltage.





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# Appendix A

## Electrical Circuit and Wiring Information

You should provide electrical circuit and wiring information to the contractor and/or facilities personnel responsible for wiring the power at the system installation site. The information you need to provide includes:

- The site's [fault-protection requirements](#)
- Important [grounding considerations](#)
- [Circuit wiring diagrams](#) for different types of AC service
- [Electrical power connector types](#)

### Fault Protection Requirements

Each customer-replaceable unit (CRU) in the ftServer system contains fault/overload current protection. However, the system relies on the power distribution system at your site for protection against potential faults in the power cords and the wiring in the system base. You must use circuit breakers in each power distribution branch feeding the system.

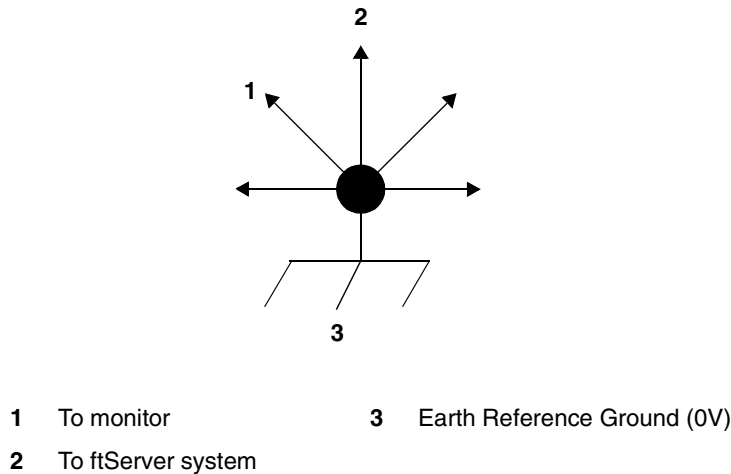
### Grounding Considerations

The system obtains an earth reference ground through the power cords attached to the system. Similarly, each peripheral device connected to the system obtains ground through its power cord. For each peripheral device, you **must** ensure that a high-integrity safety-ground conductor is installed as part of the wiring system (in accordance with U.S. national electric code NFPA 70 or the equivalent). The international safety standard (EN60-950) for electronic data processing (EDP) equipment also requires a ground conductor, but calls it a potential earth (PE) ground.

Depending upon local conditions, ground potentials may differ between the system base and any peripheral devices connected to the system base. All grounds in the system **must** return to the same reference point in the power distribution system, as close as possible to **zero (0) volt potential** relative to earth reference ground. Earth reference ground is typically a metal stake in the ground to which the ground conductors from one or more buildings are attached.

As shown in [Figure A-1](#), a *star ground* is often used to obtain the same earth reference ground. Each earth reference ground, such as the system base ground, is returned separately to a common point where a zero-volt (0V) earth ground exists. The star ground ensures that all equipment is at the same potential and that no noise or safety problems associated with an unpredictable or uncharacterized grounding system will occur.

**Figure A-1. Star Ground Example**



## Circuit Wiring Diagrams

These diagrams show how the hot, ground, and/or neutral AC signals should be connected to the system's power input plug. Connections for several different types of AC power services are shown.

This section contains the following circuit connection diagrams:

- [Figure A-3](#) illustrates a single-phase 110-VAC circuit connection.
- [Figure A-4](#) illustrates a single-phase 220-VAC circuit connection.
- [Figure A-5](#) illustrates a three-phase 208-VAC, Y-, or  $\Delta$ -source circuit connection, phase-to-neutral.
- [Figure A-6](#) illustrates a three-phase 208-VAC, Y-, or  $\Delta$ -source circuit connection, phase-to-phase.
- [Figure A-7](#) illustrates a three-phase 380-VAC, Y-, or  $\Delta$ -source circuit connection, phase-to-neutral.

**NOTE**

As shown in [Figure A-2](#), the power inputs for the ftServer system are labeled X and Y in the diagrams in this appendix to eliminate any ambiguities in the nomenclature. For single-phase applications, the X input is connected to the L (Line) *hot* input, and the Y input is connected to the N (Neutral) input. However, for three-phase applications, the X and Y inputs are connected to L1, L2, or L3 (but to separate lines). Therefore, for three-phase applications, both X and Y can be electrically hot with respect to the system base (earth reference ground). [Figure A-2](#) shows the physical locations of the X and Y inputs on the system base.

**Figure A-2. Power Input Labeling**

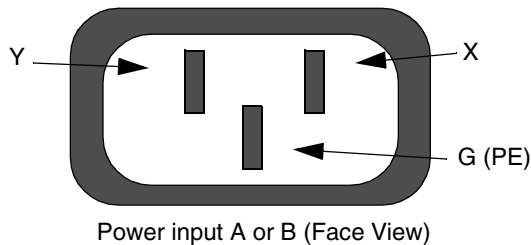


Figure A-3 shows a single-phase 110-VAC circuit connection. Note that this application requires a single-pole circuit breaker.

Figure A-3. Single-Phase 110-VAC Circuit Connection

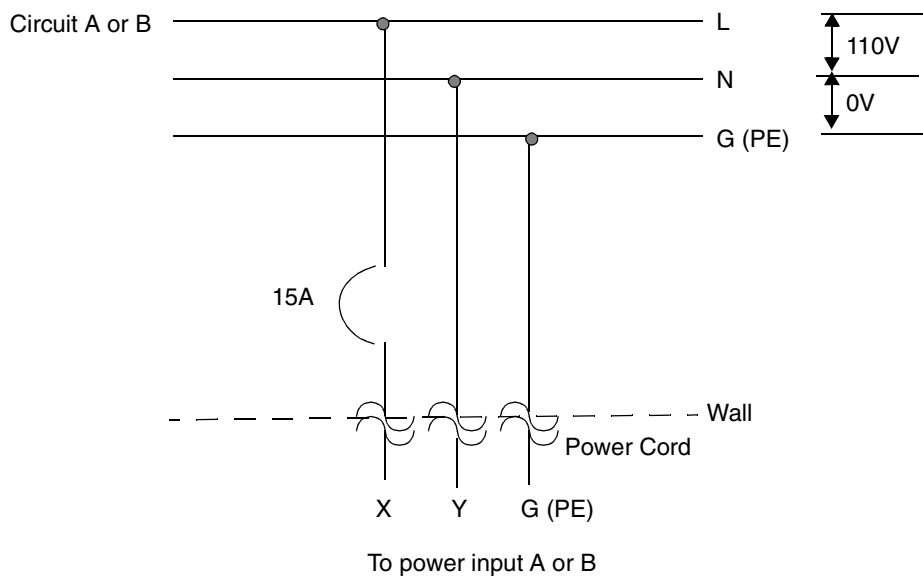


Figure A-4 shows a single-phase 220-VAC circuit connection. Note that this application requires a double-pole circuit breaker.

**Figure A-4. Single-Phase 220-VAC Circuit Connection**

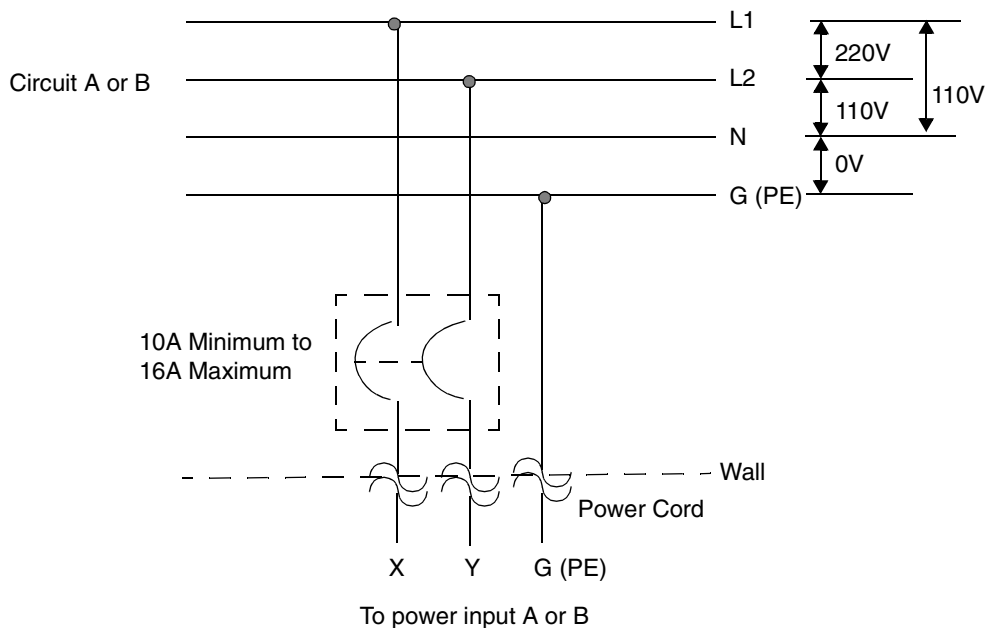


Figure A-5 shows a three-phase 208-VAC, Y-, or  $\Delta$ -source circuit connection, which is a phase-to-neutral source connection. Note that the ftServer X input may be connected from L1, L2, or L3. This application requires a single-pole circuit breaker.

Figure A-5. Three-Phase 208-VAC, Y-, or  $\Delta$ -Source Circuit Connection, Phase-to-Neutral

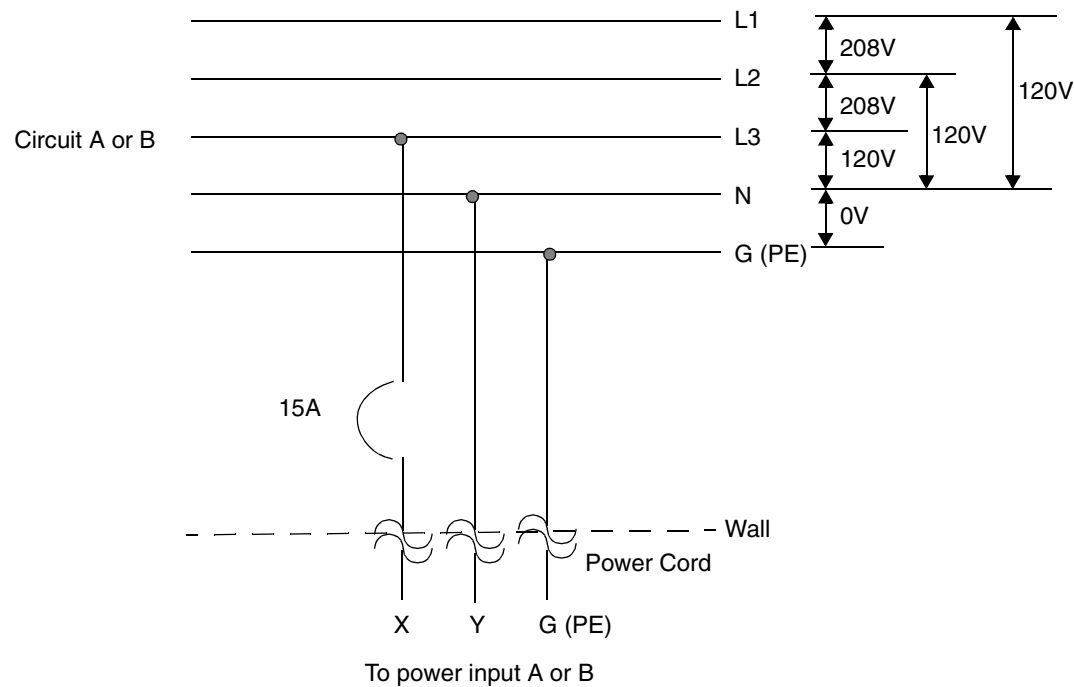


Figure A-6 shows a three-phase 208-VAC, Y-, or  $\Delta$ -source circuit connection, which is a phase-to-phase source connection. Note that the ftServer X and Y inputs may be connected from L1 and L2, L2 and L3, or L1 and L3. This application requires a double-pole circuit breaker.

**Figure A-6. Three-Phase 208-VAC, Y-, or  $\Delta$ -Source Circuit Connection, Phase-to-Phase**

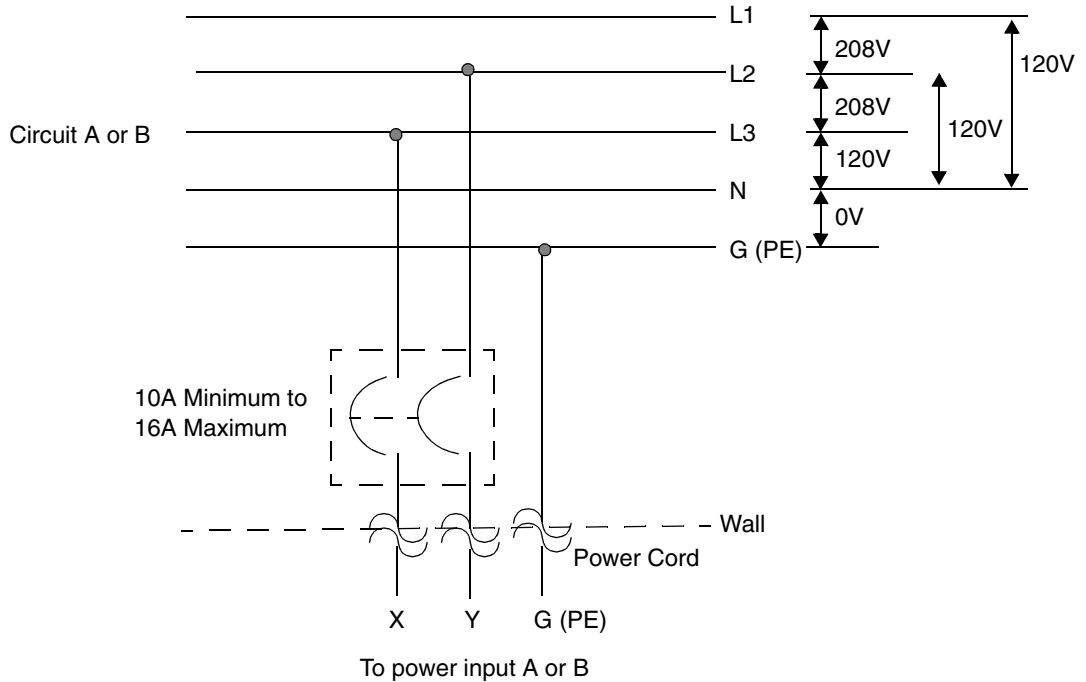
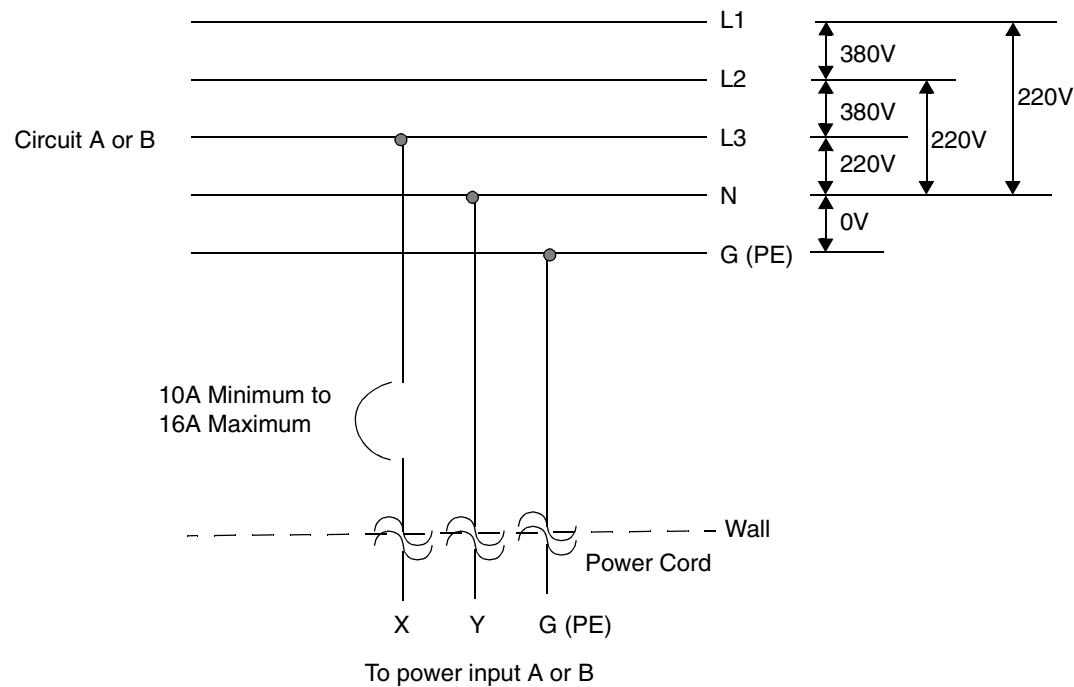


Figure A-7 shows a three-phase 380-VAC, Y-, or  $\Delta$ -source circuit connection, which is a phase-to-neutral source connection. Note that the ftServer X input may be connected to L1, L2, or L3. This application requires a single-pole circuit breaker.

Figure A-7. Three-Phase 380-VAC, Y-, or  $\Delta$ -Source Circuit Connection, Phase-to-Neutral

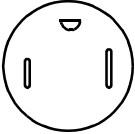
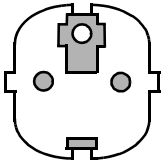
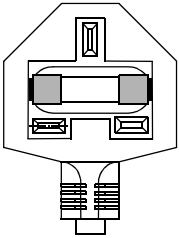
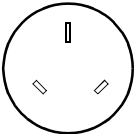




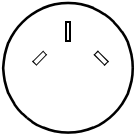
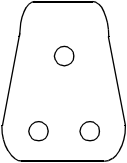
## Electrical Power Connectors

Table A-1 describes the connectors that Stratus uses to connect the ftServer 3210 system and its peripheral devices, such as tape drives, to AC power outlets.

**Table A-1. Connectors for AC Power Outlets**

Connector	Configuration	Rating	Description
NEMA 5-15		15A, 125V	2-pole, 3-wire
CEE 7 VII Continental Europe		20A, 250V	2-pole, 3-wire
BS 1363/A Great Britain and India		13A, 250V	2-pole, 3-wire
AS/NZS 3112-1993 Australia		15A, 250V	2-pole, 3-wire

**Table A-1. Connectors for AC Power Outlets** *(Continued)*

Connector	Configuration	Rating	Description
SI 32/1971 Israel		16A, 250V	2-pole, 3 wire
SABS 164-1 BS546 South Africa		15A, 250V	2-pole, 3 wire

---

## Appendix B

### Standards Compliance

Systems in the ftServer 3000 series comply with the electromagnetic interference (EMI), immunity, safety, and noise regulations listed in [Table B-1](#) through [Table B-4](#). All necessary agency labels are on the system.

#### NOTES

---

1. **This system must be configured with the components listed and described in the product configuration specifications. Deviations from this list of components will void agency certification.**
2. You must install all wiring, including power and communications cables, in compliance with local and national electrical code (in the United States, national electrical code NFPA 70). In addition, you must use shielded communications cables to remain in compliance with Federal Communications Commission (FCC) and other international EMC regulations.
3. All EMC emissions compliance tests are performed at a third-party certified test laboratory. You can obtain compliance reports for these tests from your Stratus account representative, who will contact the Product Compliance Group in the Stratus engineering organization.

**Table B-1. EMI Standards**

Standard	Description	Country/Region
FCC Part 15 Class A	Code of Federal Regulations 47 (1998) Class A	North America
EN 55022	Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment	European Union

**Table B-1. EMI Standards** *(Continued)*

Standard	Description	Country/Region
AS/NZS 3548	Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment	Australia/New Zealand
CNS13438	Chinese National Standard 13438	Taiwan
VCCI Class A	Voluntary Control Council for Interference by Information Technology Equipment	Japan

**Table B-2. Immunity Standards**

Standard	Description	Country/Region
EN 50082-1	Generic Immunity Standard, Electromagnetic Compatibility, Residential, Commercial, and Light Industrial	European Union
EN 55024	Limits and methods of measurement of immunity characteristics of Information Technology Equipment	European Union

**Table B-3. Safety Standards**

Standard	Description	Country/Region
UL 60950	Safety of Information Technology Equipment	North America
EN 60950	Safety of Information Technology Equipment	European Union

**Table B-4. Noise Standards**

Standard	Description	Country/Region
ISO 9614-2	Acoustics. Determination of Sound Power Levels of Noise Source using Sound Intensity	European Union
ISO 7779	Measurements of Airborne Noise emitted by Computers and Business Equipment	European Union

**VCCI Note**

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

**BSMI Note****警告使用者**

這是甲類的資訊產品、在居住的環境中使用時、可能會造成射頻干擾、在這種情況下、使用者會被要求採取某些適當對策



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