



User Manual

September 2001

Part Number 15.00.030

Revision A

Lightwave Communications, Inc.
100 Washington Street Milford, CT 06460 USA
(800) 871-9838 • (203) 878-9838 • Fax: (203) 874-0157
Email: info@lightwavecom.com • Internet: www.lightwavecom.com

LCI Asia/Pacific
Postal address: P.O. Box 19 Glen Iris VIC 3146 Australia
Delivery address: 16 Network Drive Port Melbourne VIC 3207 Australia
+61 3 9646 1144 • Fax: +61 3 9645 3377
Email: sales@lightwavecom.com.au • Internet: www.lightwavecom.com.au

LCI Europe
Zaubzerstraße 11 Munich D-81677 Germany
+49-89-306-3810 • Fax: +49-89-306-3812
Email: office@lightwave.de • Internet: www.lightwave.de

PC ServerSwitch 2x16 Product Handbook

Copyright © 2001 by Lightwave Communications. All rights reserved. No part of this copyrighted material may be reproduced in any form or by any means without prior written permission of Lightwave Communications, Inc.

Printed in U.S.A.

PC ServerSwitch 2x16 is a Trademark of Lightwave Communications, Inc.

Lightwave Communications is a subsidiary of Lantronix Inc.

Part Number 15.00.030, Revision History: Rev. A, September 19, 2001

Rev. A Initial Release

Table of Contents

1.0 PC ServerSwitch 2x16 - Introduction.....	4
PC ServerSwitch 2x16 features:.....	5
Specifications	5
2.0 PC ServerSwitch 2x16 - System Information	6
2.1 Video	6
2.2 Keyboard / Mouse	6
2.3 System Control.....	6
3.0 On-Screen Menus	7
Navigating the on-screen menus	7
3.1 Main Menu	7
Main Menu Options	8
System Setup Options	8
3.1.1 Main Menu: Auto Scan	9
3.1.2 Main Menu: Jump to Port...	10
3.2 System Setup.....	11
3.2.1 System Setup: Port Setup.....	12
3.2.2 System Setup: Menu Window Setup.....	13
3.2.3 System Setup: Server Window Setup.....	14
3.3 Front-panel LCD Display.....	14
Front Panel Controls.....	15
3.4 Error Messages	15
4.0 Operational Safety.....	16
5.0 Installation	17
STEP 1 -- Unpacking the Items.....	17
STEP 2 -- Initial Start-Up.....	18
STEP 3 -- Connecting CPUs	19
6.0 Cascading the PC ServerSwitch 2x16.....	20
STEP 1 - Connect CONTROL Cable.....	21
STEP 2 - Connect Video Cascade Cables	21
STEP 3 - Turn the Auxiliary Unit On	21
7.0 System Maintenance Features.....	22
7.1 Setting Factory Defaults.....	22
7.2 Flash Update Procedure	22
Materials:.....	23
Flash Update Steps:.....	23

1.0 PC ServerSwitch 2x16 - Introduction

The **PC ServerSwitch 2x16** is an intelligent KVM switch for PC keyboard, high-resolution video and mouse for up to a 2-User by 16-server configuration. The PC ServerSwitch 2x16 (for simplicity, it may be referred to as the “**2x16**”) supports PS/2 keyboards and mice. The PC ServerSwitch 2x16 has full-time keyboard and mouse emulation to each PC or server. This assures that there will be no interruptions or interference to boot processes or other CPU activity. The video switching circuitry is designed with state of the art video multiplexers that support high-resolution graphics adapters with video resolutions of 1600 x 1200 pixels.



Figure 1: PC ServerSwitch 2x16 - Front Panel

The **PC ServerSwitch 2x16** front panel has a built-in 20 character, 4 line backlit LCD display. The top two lines display Port data for the currently-selected server port, and the bottom lines are dedicated to real-time status monitoring. The PC ServerSwitch 2x16 can be controlled either through on-screen menus (see section 3.0) or directly using the Up and Down buttons on the 2x16 (see Section 3.3).

The PC ServerSwitch 2x16's rear panel provides industry-standard connections for Keyboard, Mouse and Video for 16 Servers (Inputs), 2 USER/OUTPUT console positions, and CONTROL and Video Cascade ports for expanded configurations (see Section 6.0) that supports up to 96 connected servers. Also found on the back panel is the AC power input, fuse, and Power Switch for the unit.

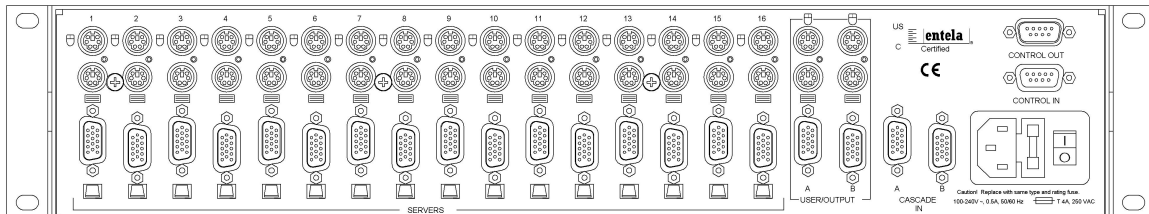


Figure 2: PC ServerSwitch 2x16 - Rear Panel

The PC ServerSwitch 2x16 is designed for rack mounting in a conventional 19-inch equipment rack, requiring 2RU (3.5 inches) of rack height. The unit may also be placed on a shelf; and the included rack mounting flanges are removable. The unit is convection cooled and does not require a fan or air conditioning.

PC ServerSwitch 2x16 features:

- Rack mountable chassis, 2RU, rack mounting flanges included with unit
- 16 server ports per chassis, expandable to 96 ports by cascading units
- Supports two Consoles with full PC Keyboard/Video/Mouse interfaces
- Industry-standard connections
 - 6 pin Mini-DIN female (PS/2) keyboard and mouse connectors
 - Video: HD15 female video connectors
 - DB9 Control connections (intra-unit)
 - Cascade Control In: DB9 female
 - Cascade Control Out: DB9 male
- Video Support for RGB, RGSB, RGBHV, up to 1600 x 1200 pixels
- Impedance-balanced RGB lines, 75 ohms
- Keyboard power sensing
- On-screen menus
- Backlit front-panel LCD display
- Non-volatile memory for server names & options
- Video cascade port for cascading PC ServerSwitch 2x16 units
- Distance between cascaded 2x16's may be up to 50 feet
- Distance from CPU to 2x16 = 25 feet
- Distance from 2x16 to User Consoles = 25 feet

Specifications

Dimensions:

- Rack size: 19"
- Height: 2U, 3.5" (8.89cm)
- Width: 17.5" (44.45 cm)
- Depth: 11.75" (29.85cm)

Weight: 13.7 lbs (6.22kg)

Shipping Weight: 15 lbs (6.8kg)

Operating Environment:

- 0°C (32°F) to 50°C (122°F)
- 10-90% humidity, non-condensing

Power Requirements:

- Input Power: 85-264 VAC, 47-63 Hz, fused at 1 ampere
- Equipped with IEC-type power connector and suitable cordset
- Power consumption: 24 watts

Heat Flow Rate: 82 BTU/hour.

2.0 PC ServerSwitch 2x16 - System Information

2.1 Video

The PC ServerSwitch 2x16 incorporates an active, high-bandwidth switch for graphics adapter cards supporting resolutions up to 1600 x 1200 pixels. A constant impedance of 75 ohms is maintained on all video lines in the 2x16, so that the video signal is not compromised by mismatched impedance. Monitor sense lines are also transported by the PC ServerSwitch 2x16. The ID lines are buffered and passed from the monitor to the attached graphics adapters in the servers.

2.2 Keyboard / Mouse

The PC ServerSwitch 2x16 is an intelligent switch for the keyboard and mouse. Each port emulates the keyboard and mouse fully, allowing an attached server or PC to boot without having been previously selected. Power for each connected device is monitored from the keyboard port.

If there is no connection on a keyboard port, an **error message** will be displayed on the front panel display. The attached servers are not affected because of the keyboard and mouse emulation.

Each port maintains a local copy of the keyboard and mouse configuration. When the user switches from one port to another, the keyboard is set up just as it was prior to switching to another port. The mouse behaves in a similar manner.

2.3 System Control

The PC ServerSwitch 2x16 is controlled either by using the UP and DOWN arrows on the front panel of the unit or via On-Screen Menus from their Console (Keyboard, Monitor and Mouse).

The 2x16 is a transparent device to the User. The User (of which there may be one or two) can select which server they wish to access from their Console, from up to 16 connected Servers. In cases where two or more 2x16 units have been cascaded, additional Servers can be accessed by the two Users, up to a maximum of 96 Servers.

To access the 2x16's switching capability, the User must "wake up" the on-screen display to control the system by pressing both 'Cntl' keys simultaneously (referred to as '**Cntl-Cntl**') or press the **Scroll Lock** key *twice* on their PS/2 keyboard.

If the User is near the 2x16 (for example, in a backroom location), the User may instead select a server by using the Up and Down buttons on the front of the Unit. The display will show which Servers are available. To select between User A and User B, press both the Up and Down buttons on the front panel of the 2x16 at the same time to shift between the two users.

3.0 On-Screen Menus

On-screen Menus are used for two purposes:

- Server Port selection for a Console
- System setup programming for the PC ServerSwitch 2x16

On-Screen Menus are displayed on the User's monitor. Either Console may administer the system, but only one user may edit the setup at a time.

NOTE: While in the on-screen menu mode, the "Caps Lock", "Num Lock", and "Scroll Lock" LEDs will flash on the User Console's keyboard.

Navigating the on-screen menus

- Press both Control keys (**Ctrl-Ctrl**) to access the on-screen menus, or press the Scroll Lock key *twice*
- **Up** Arrow/**Down** Arrow
- **+** and **-** keys on number pad
- **Enter** (select or scroll through options)
- **Esc** to exit, or to back up one level
- Most options have a single-character hot-select key, highlighted and capitalized on the screen. Press that letter to select that option.

3.1 Main Menu

Pressing and releasing both CONTROL buttons (Ctrl-Ctrl) on either Console's keyboard will bring up the main menu of the PC ServerSwitch 2x16.

```

Lightwave Communications Inc.
Curr: File Server 1
DPCSS System Setup
no Auto scan
Jump to port...
Disabled
File Server 1          1
File Server 2          2
Print Server           3
Email Server           4
Engineering            5
Enterprise             6
Firewall               7
Fax Server             8
Next unit Esc exits
  
```

Note: This window will show the current server port (e.g., **Curr: File Server 1**). Window color settings may be different than above.

Main Menu Options

Navigate through the Main Screen window by using the **up** and **down** arrows on your keyboard and “Enter” to select from the following:

- **System Setup** - for customizing your PC ServerSwitch 2x16.
- **Auto Scan** - This option scans each attached port for a duration determined by the user. See Section 3.1.1.
- **Jump to port...** - You can jump to specific ports several different ways. By selecting “Jump to port...”, navigate by typing either the name or number of the desired port. Press **[J]** and press Enter to get a prompt to enter the server Port name or number. See Section 3.1.2.
- **Disabled** - Select this entry to disconnect this User Console (A or B) from all Server ports (enabling the other user to access all Server ports).
- **Ports 1 through 8** - direct-select an association with Server Ports 1 through 8
- **Next unit** - go to the **Next** page of eight server ports using **[N]**.
- **Prev unit** - go to the **Previous** page of eight server ports using **[P]**.
- **Esc exits** - press **[Esc]** to exit the server window. If Scanning is enabled, port scanning will start upon exiting.

NOTE: *You can set up your PC ServerSwitch 2x16 options, port names, etc. before you connect your PCs or servers.*

The preset values do not list any server names, but instead identify each port with a generic Port number. The Port Number is fixed and always displayed, even if the user enters a name.

System Setup Options

System Setup Options are used for system maintenance and software updates. The System Setup options are also accessible from the Main Menu Screen, by pressing the F1 key to access the System Setup screen. System Options include System Flash Memory Update (F) and Load Factory Settings (F12).

Caution: Do NOT use System Setup Options during normal operation, as these will erase all user-entered data and may require a system reset. Updating the FLASH memory requires that the System re-enumerate (reboot) which can interrupt normal operation.

Refer to Section 7 for System Maintenance features and instructions.

3.1.1 Main Menu: Auto Scan

During auto scan the PC ServerSwitch 2x16 will scan through each PC, stopping at each active port for the duration assigned in the System Setup menu. The port name and number will appear as the attached PCs are scrolled through.

Exiting the menus using the Escape key will either send the user into auto scan mode or to a single PC, depending on which option is selected.

- To exit the auto scan mode, press any key on your keyboard.
- Return to the main menu by pressing "Ctrl-Ctrl", or Scroll Lock *twice*.
- To exit the on-screen menus, press 'Esc' until no more screens are shown.

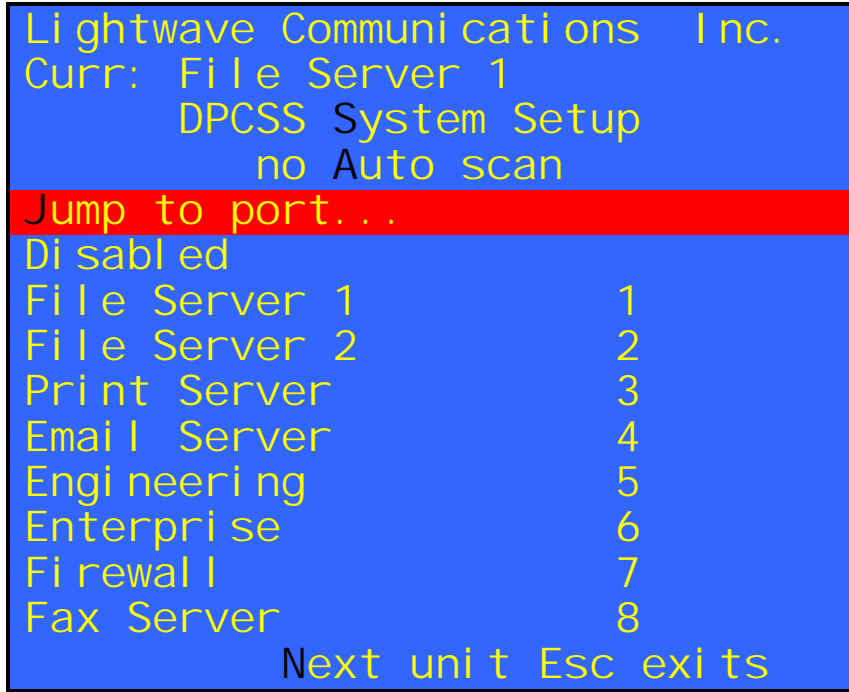
Use the + and - keys on the number pad of your keyboard, or [A] key, for 'start Auto scan' or 'no Auto scan'. Also see Section 3.2.1 for Server Port Setup for Auto Scan.

NOTE: *Server Ports can be individually programmed to be Scanned or Not Scanned. Only PCs that are set to be scanned, and are connected and powered on will be scanned.*

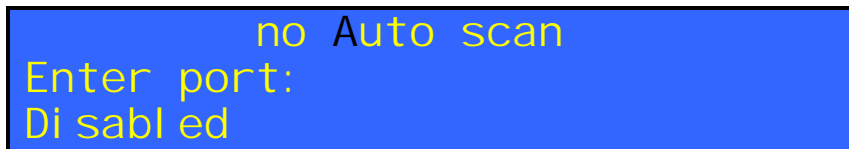
```
Lightwave Communications Inc.
Curr: File Server 1
      DPCSS System Setup
no Auto scan
Jump to port...
Disabled
File Server 1      1
File Server 2      2
Print Server       3
Email Server       4
Engineering        5
Enterprise         6
Firewall           7
Fax Server         8
Next unit Esc exits
```

3.1.2 Main Menu: Jump to Port...

Jump to Port - Jump directly to any port from the Main Menu by entering either the port name or port number. Select Jump to port and press Enter.



The screen will change to the following 'Enter port' prompt:

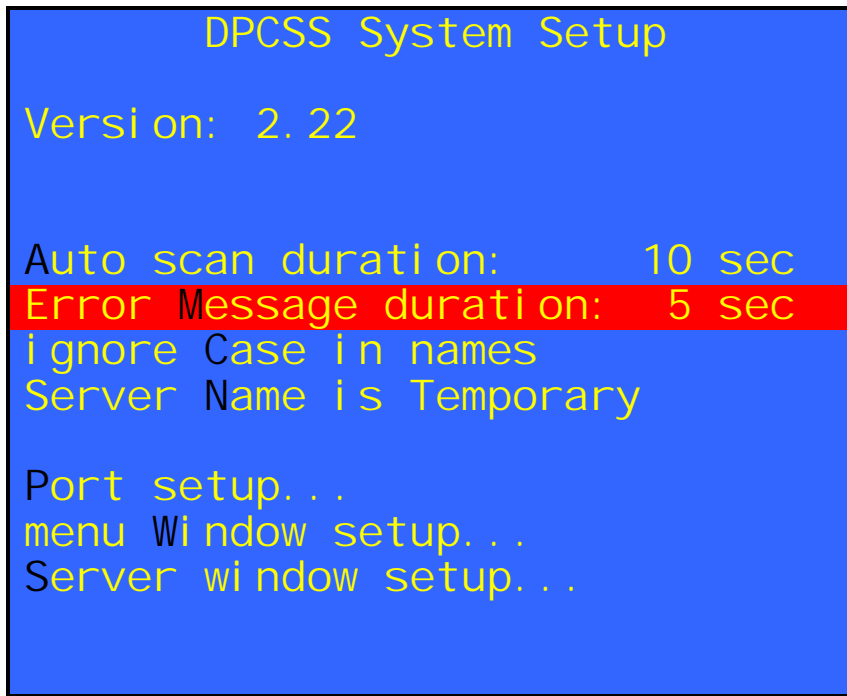


Enter the port name or port number, and press Enter. You will be immediately switched to that port (if available) and exit the on-screen mode.

NOTE: *When entering the port name, make sure you enter the name as case sensitive if “Case sensitive names” is selected in the System Setup menu. If you would like to enter names ignoring case, select “Ignore Case in Names” in the System Setup menu.*

3.2 System Setup

Selecting the 'DPCSS System Setup' line and pressing Enter will go into Set Up:



Selecting “Port setup,” “menu Window setup,” or “Server window setup” will open one of three sub-menus to be discussed in the following pages.

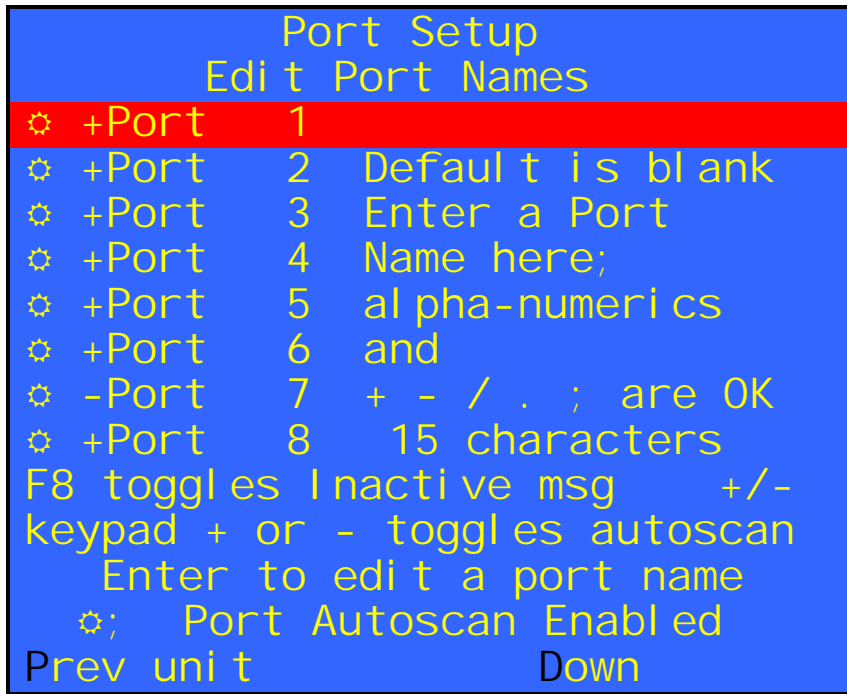
The options at the main System Setup window can be selected by highlighting the desired option using the **up/down arrows** on your keyboard to select the option and scrolling through the values of each using either the **+/- keys** OR the “Enter” key to select your desired value.

- **Auto Scan Duration** - Select the length of time, between 2 to 30 seconds, that each port will be scanned during auto scan.
- **Error Message Duration** - Select the amount of time (2 to 15 seconds) each error message appears on the LCD as the system scans the ports.
- **Ignore Case in Names/Case Sensitive Names** - This option lets you dictate whether the names entered in the “Jump to port...” mode need to be case sensitive, or not.
- **Server Name is Never On/Always On/Temporary** - As you scroll through each port and/or as each port goes through auto scan, you have the option of having the Server Window with the connected port's name/number appear permanently, temporarily, or not at all.
- **Port Setup** - discussed in a Section 3.3
- **Menu Window Setup** - discussed in a Section 3.2.2
- **Server Window Setup** - discussed in a Section 3.2.3

NOTE: *System Setup options and values are automatically saved to the memory of the PC ServerSwitch 2x16.*

3.2.1 System Setup: Port Setup

Edit Port Names - Select the desired port using the up and down arrows and the "Enter" key. Press 'Esc' to return to the previous menu screen.



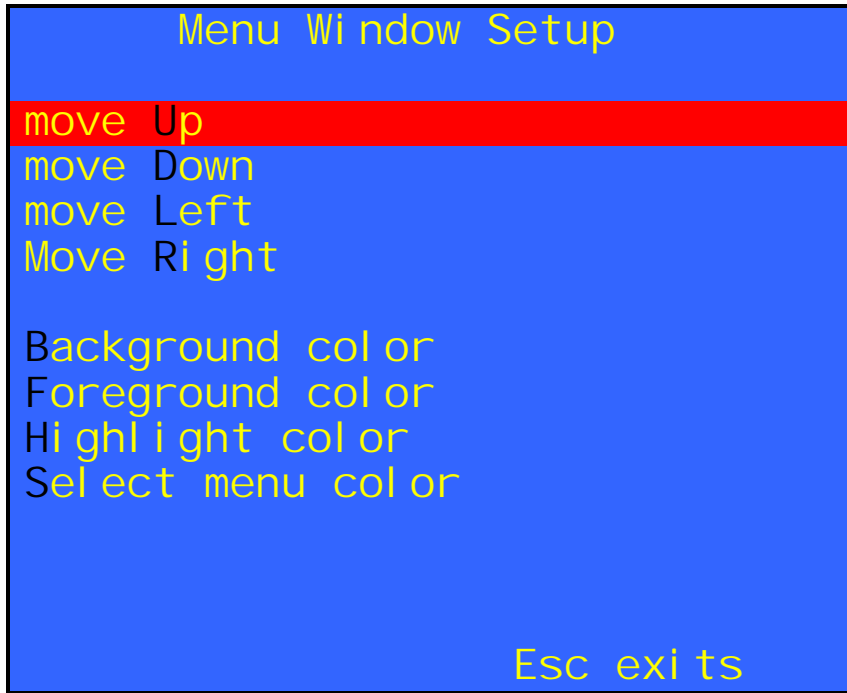
Enter any name, up to 15 characters long. Note that case-sensitivity of port names may be enabled or disabled system-wide, if required. Valid characters include **A through Z, a through z**, digits 1 through 9 and 0, and + (plus), - (minus), / (slash), . (period) and : (colon).

- The ⚙ symbol on-screen represents **Auto Scan Enabled for this port**. A Port with the ⚙ symbol showing will be included in a scan of active ports. Select which ports should be scanned during auto scan mode (default is all ports). Toggle **auto scan on/off** for each port using the + or - keys.
- The + and - symbol before the Port number shows the **LCD Inactive message** status (+ indicates that the front panel LCD will display an error message for this port, - indicates that the front panel error message is disabled for this port). To change this setting, select the Port and press **F8** to turn this option On or Off.

Note: Refer to Section 3.1.1 for Auto-Scan system setup options.

3.2.2 System Setup: Menu Window Setup

The Menu Setup window allows the user to change the **Position** and the **Colors** displayed on the Menu Window. Customize the location and color of the Main Menu window by selecting any of the options and pressing “Enter”.



The on-screen position of the Menu Window may be moved (**U**p), (**D**own), (**L**eft), or (**R**ight).

You may also select the Line (e.g., move Up) and press Enter to move the display or change the color option as desired.

The color choices include 8 color options for each of (**B**)ackground Color, (**F**)oreground Color (normal screen text), (**H**)ighlight Color (background of a highlighted line or block of text) and (**S**elect Menu Color (highlight color for Menu hot-select keys). You should assign a different color for each of these options.



Figure 3 Terminal showing Menu Window

3.2.3 System Setup: Server Window Setup

The Server Window contains the port name and number that the User is connected to. The Server window is displayed briefly when connecting to a server.

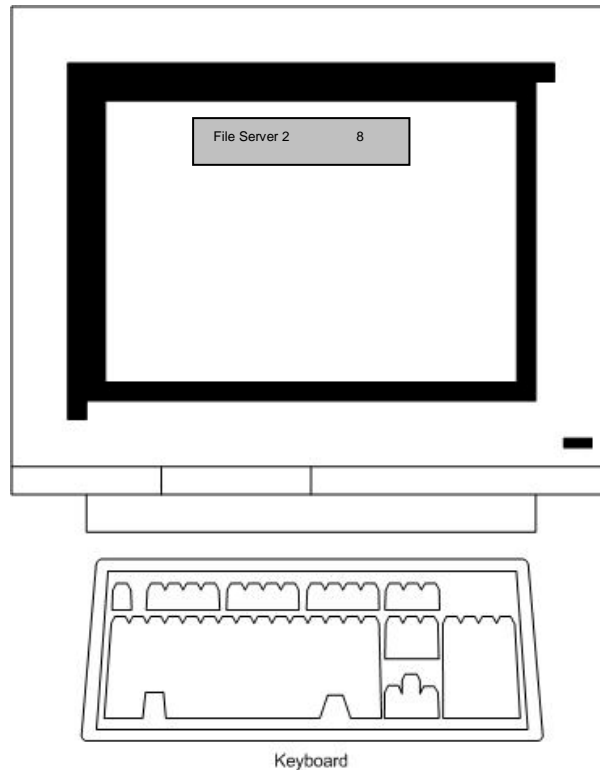


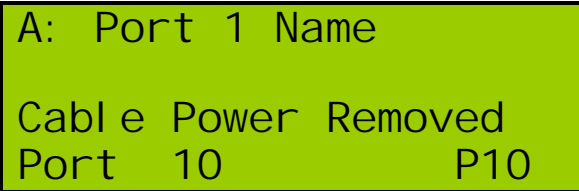
Figure 4 Terminal showing sample Server Window display

Select the **color** and **position** of the Server Window by scrolling through the above options using the up/down arrow keys and pressing “Enter” to move the window and/or change colors. Use the color and position options listed in Section 3.2.2.

To select a specific function, **press the hot-key letter** that is capitalized / highlighted.

3.3 Front-panel LCD Display

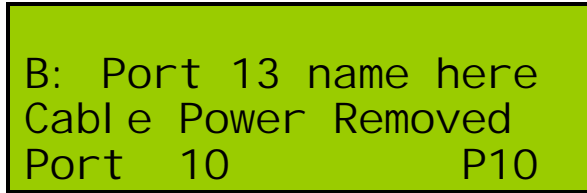
The PC ServerSwitch 2x16 is equipped with a backlit LCD display. The display is used in conjunction with the front panel UP and DOWN arrow buttons when selecting Servers for either user.



When the PC ServerSwitch 2x16 is turned on the LCD will show the version of the switch, perform quick diagnostics, and inform you that the “Unit is Ready.” The

display shows which Server Port is connected to which Console (A or B) on the top two lines, and also shows real-time error messages using the bottom two lines.

The display is 4 lines by 20 characters in each line. Note that the display will only show Console A or Console B information at any time (not both Consoles at the same time).



```
B: Port 13 name here
Cable Power Removed
Port 10                P10
```

The Port Name information entered from the System Setup screens (using the on-screen System Setup commands) will be displayed on the display. You can change the active port on the PC ServerSwitch 2x16 either via the on-screen menu or by using the up and down buttons on the unit.

If multiple 2x16 units are cascaded, the display information is repeated on all front panel displays.

Front Panel Controls

The front panel display shows which Console is connected to which Server; or, if '**disabled**' appears, that Console is not connected to any servers at that time.

- Press and release the **Up** arrow button to select the next Server number. If you reach the highest port number, the next value is 'disabled', and then it restarts at Port 1.
- Press and release the **Down** arrow button to select the previous server number. If you reach the lowest number, the next value is 'disabled' followed by the highest port number.
- To switch between Console A and Console B, press and release both the **UP** and **DOWN** buttons on the front panel at the same time. This option is blocked while another user is accessing the System using the On-Screen Menus.
- Front panel controls are disabled on Auxiliary 2x16 units; only the Master 2x16 unit's front panel buttons will operate.

To switch between Console A and Console B, press both the **UP** and **DOWN** buttons on the front panel at the same time. This option is blocked while another user is accessing the System using the On-Screen Menus.

3.4 Error Messages

The last two lines of the front panel display will show an error message if an error condition exists. The third display line will identify the error, and the fourth display line will identify which Server Port is involved if it is a Server error.

The most common Error Message will be that of a Server's Keyboard's cord being disconnected. Note that the Mouse port is not sensed for disconnection.

4.0 Operational Safety

The PC ServerSwitch 2x16 should be installed in a suitable equipment room environment. It is designed for rack mounting in a 19-inch equipment rack.

A) The PC ServerSwitch 2x16 is designed to operate in an ambient temperature of 0°C (32°F) to 50°C (122°F), 10-90% humidity, non-condensing. Ensure that closed or multi-unit racks maintain an ambient temperature not to exceed 50 °C (122 °F).

B) The PC ServerSwitch 2x16 is designed to operate with convection cooling provided by the air holes located in both sides of the unit. Heat flow rate is 82 BTU/hour. Make sure that these ventilation holes are not obstructed by equipment placed directly in contact with either side of a PC ServerSwitch 2x16.

If the unit is placed on a shelf, be sure to allow air space around the unit for air flow, especially to the sides of the unit. The unit is shipped with four rubber feet which will raise the unit off of a counter or shelf and allow air flow beneath the unit.

C) Make sure that each PC ServerSwitch 2x16 unit is properly supported in the front of the unit, by bolting the PC ServerSwitch 2x16 into a standard 19 inch rack.

D) The PC ServerSwitch 2x16 has a universal power supply which requires 85-264 VAC, 47-63 Hz at 1 ampere. Power consumption is 24 watts. It is important for each unit to be supplied with the proper operating voltage and current.

E) All rack mounted equipment should be reliably connected to earth ground. Pay close attention to grounding at all times, particularly when equipment is not directly connected to power mains (such as when a power strip is used).

WARNING: The top cover should not be removed due to the potentially hazardous voltages in the unit. No user serviceable parts are inside the PC ServerSwitch 2x16. All repairs should be performed by Lightwave to avoid cancellation of the warranty.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

5.0 Installation

The PC ServerSwitch 2x16 unit is designed to occupy 3.50 inches of rack space. Sufficient space is required behind the rear panel of the unit to allow for attached cables bend radius (6 inches should be sufficient). It is helpful to plan ahead if additional units might be added to the configuration at some later date. If cascading (adding PC ServerSwitch 2x16's) is to be used, make certain to leave enough space in the rack for additional units. The PC ServerSwitch 2x16 installation can be expanded at any time, without interfering with servers connected to existing switches.



Figure 5: PC ServerSwitch 2x16 – Front and Rear panels

STEP 1 -- Unpacking the Items

Verify that the following items are located in the packaging.

- (1) PC ServerSwitch 2x16
- (1) AC Power Cordset
- (1) Cable - DB9 Female to Male Serial data cable (6 foot long)
- (1) PC ServerSwitch 2x16 Product Handbook
- Cables, as required for your number of servers and units.

NOTE! Optional cable kits are available. (1) Kit contains:

- (2) male-male 6-pin MiniDIN cables, to connect a server's keyboard and mouse to PC ServerSwitch 2x16
- (1) HD15 male-male video cable to connect server video adapter to the PC ServerSwitch 2x16

NOTE! Other items may be ordered or shipped separately.

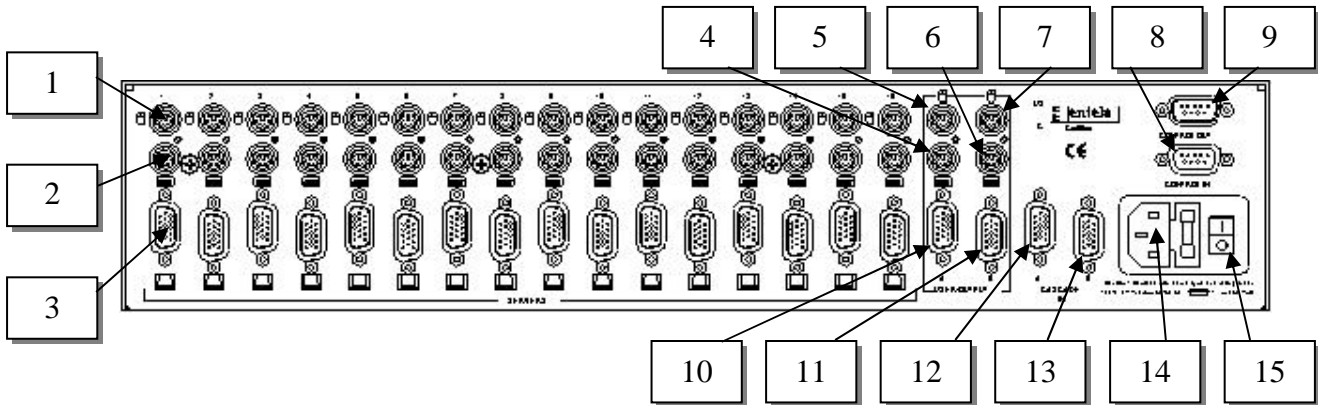


Figure 6: PC ServerSwitch 2x16 - Rear Panel View, Connections

Figure 6 Legend:

- 1) Mouse interface to a server (in this case, Server #1 in this chassis)
- 2) Keyboard interface to the server (Server #1)
- 3) Video interface to the server (Server #1)
- 4) Keyboard connector for User Console A
- 5) Mouse connector for User Console A
- 6) Keyboard connector for User Console B
- 7) Mouse connector for User Console B
- 8) Control In: DB9F; receives signal for box to box communications
- 9) Control Out: DB9M; sends signal for box to box communications
- 10) Monitor connector for User Console A, or Output A (if a cascaded unit)
- 11) Monitor connector for User Console B, or Output B (if a cascaded unit)
- 12) Video Cascade A In: Accepts video from Output A on the next 2x16 unit
- 13) Video Cascade B In: Accepts video from Output B on the next 2x16 unit
- 14) IEC-type power receptacle for AC power cordset
- 15) AC power switch

STEP 2 -- Initial Start-Up

- a) Connect the AC Power Cord to the PC ServerSwitch 2x16 and plug the power cord into a grounded outlet.
- b) Connect a monitor, keyboard and mouse (optional) to the USER/OUTPUT connections (A or B) on the rear of the PC ServerSwitch 2x16. Refer to the symbols on the back panel for Keyboard and Mouse positions (mouse is on top).
- c) Turn unit on.

Note: *At this point, it is possible to program the unit, if so desired. Follow the steps as listed in Section 3 of this manual to access the on-screen menus.*

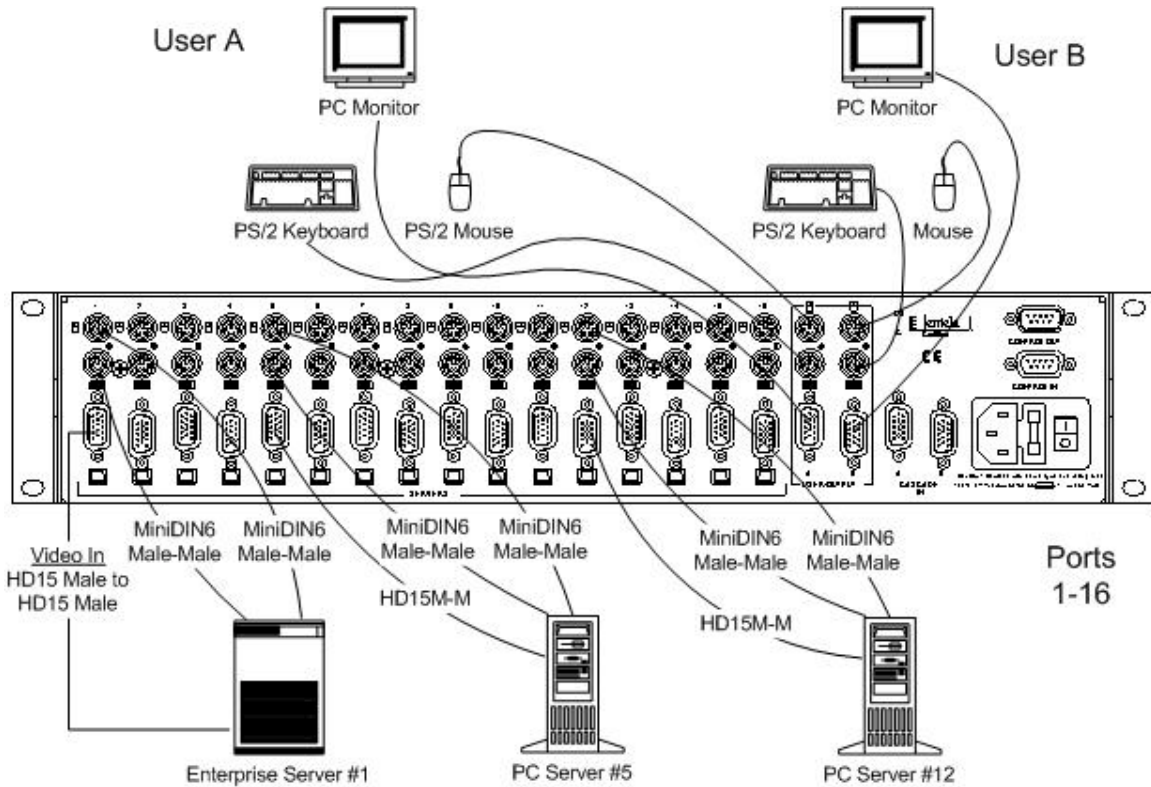


Figure 7 -- PC Server Switch 2x16 -- Rear Panel Connections, 3 Servers

STEP 3 -- Connecting CPUs

Referring to Figure 4, connect a single PC to the PC ServerSwitch 2x16 and verify its operation. Use the cables that were purchased with the PC ServerSwitch 2x16 to attach the PC. Connect the cables in the following order:

Make certain that all PCs are powered off when connecting them to the PC ServerSwitch 2x16. It is important to note that some servers do not allow for keyboards to be connected and disconnected during operation. This may cause them to halt.

- 1) A Mini-DIN6 male-to-male cable from the Server keyboard connector to the PC ServerSwitch 2x16. Maximum length is 25 feet.
- 2) A Mini-DIN6 male-to-male cable from the Server mouse connector to the PC ServerSwitch 2x16. Maximum length is 25 feet.
- 3) An HD15 male-to-male video cable from the Server graphics adapter to the PC ServerSwitch 2x16.

Once step three is complete, continue to connect the remaining PCs. Repeat step three until all of the devices are connected.

NOTE! CPUs can be connected to any port. It is not necessary to use Port 1 as the first connection, Port 2 as the second, etc.

6.0 Cascading the PC ServerSwitch 2x16

This section only applies to configurations with more than one PC ServerSwitch 2x16. Up to six (6) PC ServerSwitch 2x16 units may be cascaded for a maximum of 96 server ports and 2 Console Ports. See Figure 8.

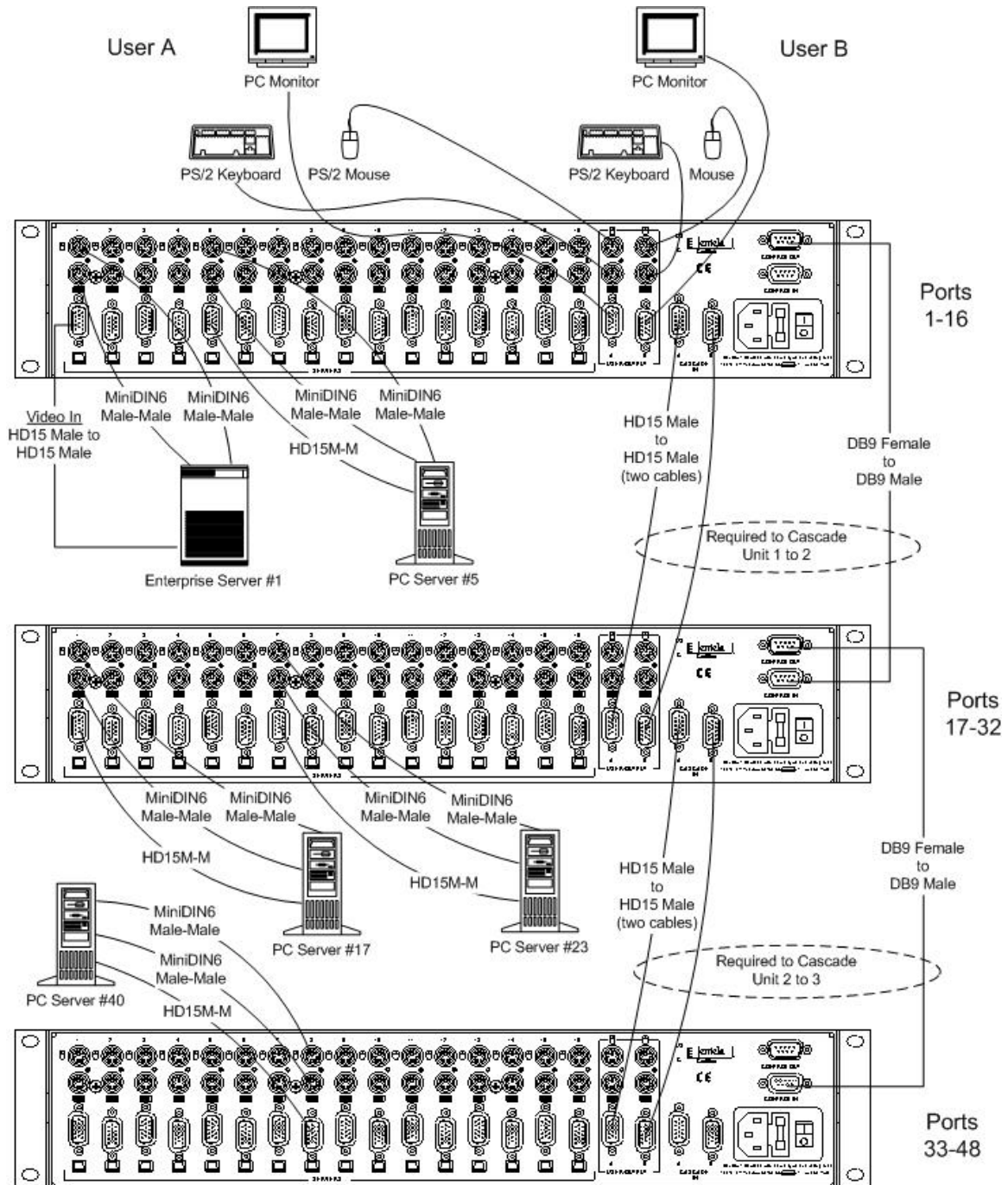


Figure 8: Cascading PC ServerSwitch 2x16 systems (3 units shown)

If more than sixteen servers are to be connected, then cascading of the PC ServerSwitch 2x16 is necessary. In a cascade environment, the first unit that is installed is considered the "Master Unit." All information is stored in the Master Unit. Cascading the units is very simple.

If the existing PC ServerSwitch 2x16 unit has been installed and running, *it is not necessary to turn off the power* to the Unit. The installation of additional units can be accomplished without any interruption to the existing servers.

STEP 1 - Connect CONTROL Cable

Connect the DB9 Serial data cable (supplied with each PC ServerSwitch 2x16) from the Master Unit "Control Out" port to the first Aux Unit "Control In" port. Make certain that these cables are securely fastened to the units. These data cables carry all mouse, keyboard, and control data necessary for cascading units. Follow this procedure for as many Aux units

If more units are cascaded, connect the Control Out port to the Control In port of the next unit to be cascaded, using a DB9 Female to Male serial cable.

STEP 2 - Connect Video Cascade Cables

Connect the "Video Cascade In" ports on the Master Unit to the "USER/OUTPUT" video ports (Port A Output to Port A Cascade In, Port B Output to Port B Cascade In). This will allow the video signals from the Aux units to reach the Consoles that are connected to the Master unit. Follow this procedure for as many Aux units (**one Master plus 5 Auxiliary units, max**) as required for the servers.

STEP 3 - Turn the Auxiliary Unit On

Turn on all of the Auxiliary units that were installed. Connect the servers to these units as done in the earlier installation for a single unit.

To install a PC ServerSwitch 2x16 as the *new* master, turn the old master off, connect it, and then turn it back on. Turning off the old master may affect PCs connected to it, so it is recommended that you shut down any PCs connected to the old master before performing this installation.

7.0 System Maintenance Features

System Maintenance features include Flash Memory Update and Restore Factory Settings. These options require the system be taken out of service for maintenance.

The System Setup options are also accessible from the Main Menu Screen, by pressing the **F1 key** to access the System Setup submenu. System Options include **System Flash Memory Update (F)** and **Load Factory Settings (F12)**. Other options listed there are for *FUTURE USE* and should not be attempted.

Caution: Do NOT use System Setup Options during normal operation, as these can erase all user-entered data and will require a system power reset to restore normal operation.

7.1 Setting Factory Defaults

If it becomes necessary to reset the PC ServerSwitch 2x16 to its factory-set values, the users may do so from the **System Setup** menu. The System must be out of service during this procedure. All connections will be dropped, and all default values will be restored. The whole process takes less than 5 minutes.

1. Access the **System Setup** menu by pressing **Cntl-Cntl** on any attached keyboard, or pressing the **Scroll Lock** key *twice*.
2. Once at the **System Setup** menu, access the System Setup submenu by pressing the <F1> key.
3. Press the <F12> key. You are prompted "**Are You Sure?**", and then press the **Y** key to confirm that the PC ServerSwitch 2x16 parameters and server port names should be set to the factory default values. If not, press '**N**' to exit this option.
4. The Display will change to 'Restoring Factory Defaults'. Then, the on-screen menu will temporarily disappear, and reappear at the main on-screen menu once the parameters are reset. The front LCD display will show "Save Database" when it is completing the update.

The ServerSwitch will not be able to switch to another port or pass keyboard/mouse signals during the reset to factory defaults.

7.2 Flash Update Procedure

The flash update feature allows the user to install newer versions of operating software in the PC ServerSwitch 2x16 without removing the unit from its installation (the system must be removed from service, however). New software revisions will be released from time to time to add features to the PC ServerSwitch 2x16 or make changes for customer requests. Note that the users will not be able to switch server ports during the update. The whole process takes less than 10 minutes.

The binary file for the flash update can be downloaded from

<ftp://ftp.lightwavecom.com/pub/products/PCSS2x16/software/>

Materials:

1. Laptop or other computer with RS-232 serial I/O port
2. Serial cable with DB9 male end and mating connector for the above computer's serial port
3. Communications software capable of XMODEM uploads
4. PC ServerSwitch 2x16 software update file

Flash Update Steps:

1. Download the FLASH file for the 2x16 from the Lightwave FTP site to your Laptop or computer.
2. Connect the computer's serial port to the **CONTROL IN** port of the PC ServerSwitch 2x16. [If the unit had been cascaded with other units, the cascade connections must be broken. Each 2x16 unit must be updated individually.]
3. Start the communications software. Configure the communications parameters to 38,400 baud, 8 data bits, no parity, 1 stop bit, and DTE (38.4K 8N1 DTE). Select the correct serial port (i.e., COM1) as the I/O port if not already selected.
4. Access the 2x16's **System Setup** menu by pressing **Cntl-Cntl** on any attached keyboard, or pressing the **Scroll Lock** key *twice*.
5. From the **System Setup** menu, press the <F1> key to access the defaults/flash update menu. Press the F key to start the FLASH update mode of the PC ServerSwitch 2x16. To interrupt the FLASH update mode, turn the 2x16 power off and back on.

```
Dual PCServerSwitch Boot v1.01
Copyright 2001 by Lightwave Communications Inc.
Start XMODEM transfer of Dual PCServerSwitch flash memory
c c c c c
```

6. Begin uploading the flash update binary file from the computer attached to the CONTROL IN port to the PC ServerSwitch 2x16. Once the F key has been pressed, the PC ServerSwitch 2x16 sends a message through the serial port prompting the Terminal program to send the binary update file.
7. The user selects the Flash file on the computer. It is assumed that the file transfer begins, although there is no visible confirmation through the user's computer screen that the flash update has begun. After about two minutes, the file upload (from PC to 2x16) is completed. If no response after 5 minutes, you must start over.

- 8. When the PC ServerSwitch 2x16 has received the entire file, it will prompt the user through the serial port to confirm that the file is correct. Check the file version to be certain that it is the version that you wish to upload to the PC ServerSwitch 2x16 system.
- 9. When ready to modify the flash, select 'y' for 'continue with programming'. **NOTE: DO NOT TURN THE POWER OFF** at this point.

```
Start XMODEM transfer of Dual PCServerSwitch flash memory
cccccccccc
Received: Dual PCServer Switch v2.25
Continue with programming? (y/n) y
```

- 10. The flash memory will be erased, and the new flash file will then be saved.
- 11. You will get a prompt stating "**Flash Programming Complete**" after less than a minute. Finally, it will state "**Starting System**".
- 12. After you get the Starting System prompt, the Flash update is completed, and the 2x16 is ready to go. Simply disconnect your PC from the CONTROL IN port, and return all connections to normal.

```
Erasing the flash (takes about 10 sec.)
Programming FLASH .....
Flash programming complete.
Starting System.
```

- 13. To verify that the System Flash has been updated, go to the **Main Menu**, select the **System Setup** screen and see the version number as listed on the screen.