SP8xxx

with

Dual Ethernet Ports

for

Density Series™ Systems

USER'S GUIDE

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SP8xxx With Dual Ethernet Ports
User's Guide

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Chapter 1—Introduction

The Cubix Density Series system houses multiple server-class Intel®, compatible computers neatly and efficiently in a single rack-mountable drawer (see Figure 1). The Density Series is designed for the purpose of computer consolidation. Cubix equipment solves the problems associated with space-contrained backroom computing centers.

The SP8xxx is a single board computer which supports a Pentiumâ III processor. This single board computer plugs into backplanes that are divided into independent groups. ("Group" refers to a segmented number of slots within the backplane that will accommodate a Density processor board and peripheral third party cards, which comprise the server-class system.)

There are three steps to insure proper installation of this board. (1) Jumper settings must be checked for proper configuration. (2) A power down of the group where the board will be installed must be done. (3) The board must be inserted into the proper group slot. This Quick Reference Guide provides details on switch and jumper settings, the steps necessary for proper installation of the board and information regarding the technical specifications of the SP8xxx board.

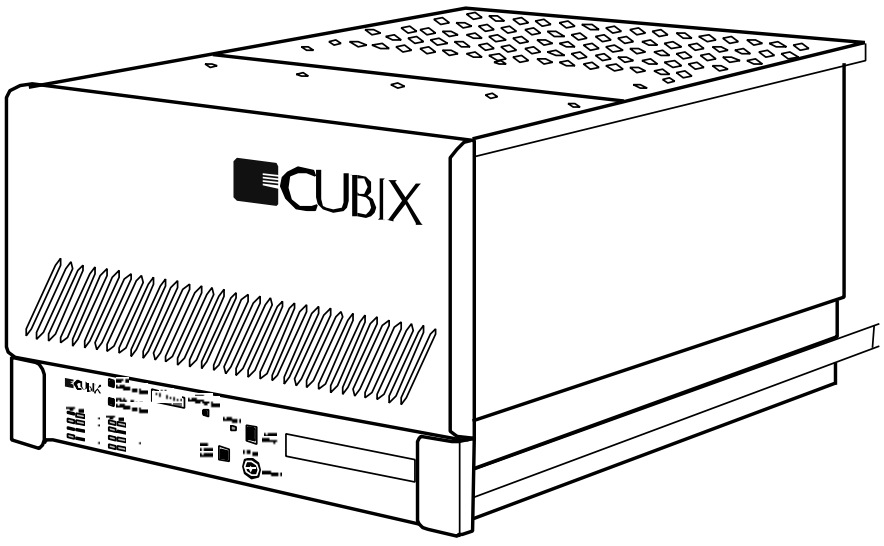


Figure 1 Density Series™ System

OVERVIEW OF THE SP8xxx BOARD

This processor board uses the Intel 440GX chipset and the Pentiumâ III processor that has current speeds up to 600Mhz. As new processors become available, Cubix upgrades their technology providing for the customer the latest in server consolidation.

The SP8xxx board has four DIMM sockets for a maximum of 2GB of memory. The SP8xxx board uses a 100MHz front side bus and 33MHz-PCI bus timing. This board is designed for the Density Series chassis which will hold up to four SP8xxx boards. Figure 2 shows the SP8xxx board layout.

Once installed in a Cubix Density System, each SP Series board becomes an independent computer. The system multiplexor allows all Density computers in a chassis to share a single floppy disk drive and CD-ROM drive. The monitor, mouse and keyboard may be shared between multiple chassis (up to 8).

The SP Series computers include on-board video, two serial ports, one parallel port, keyboard and mouse support, memory support and floppy drive support. Also included are two integrated Ethernet controllers with two RJ-45 connectors for 10/100 Base-T operation. The SP8xxx has a Wide Ultra2 SCSI which supports up to three low voltage differential (LVD) SCSI hard disk drives. This board supports PCI expansion slots only.

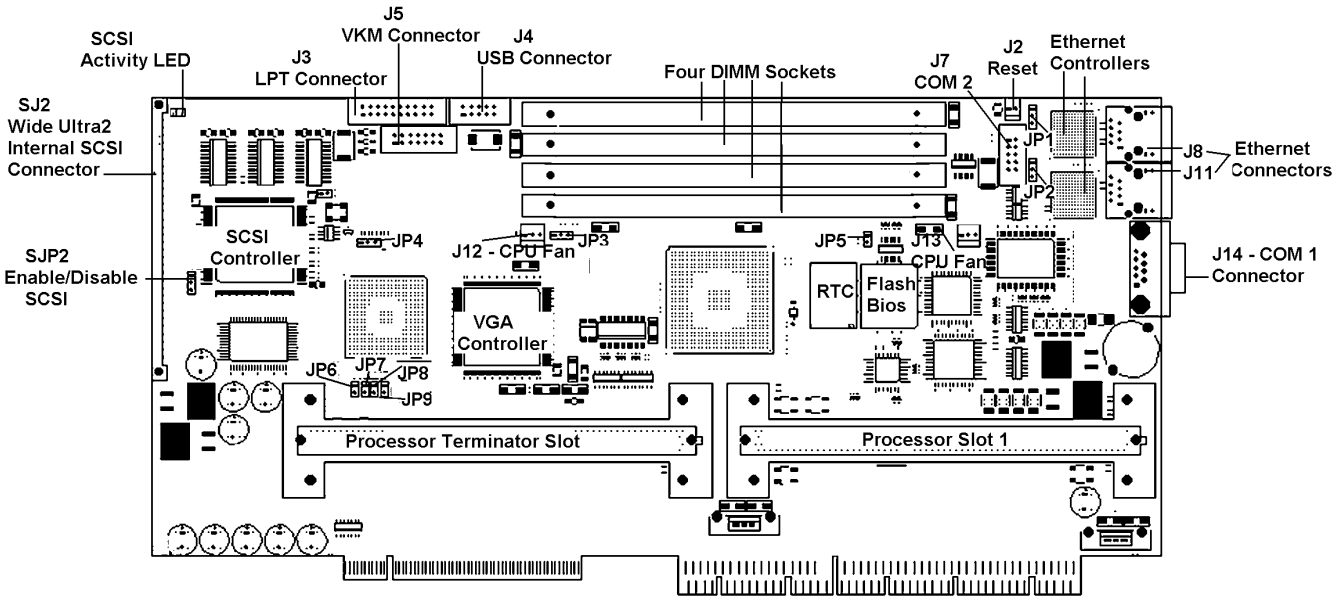


Figure 2 SP8xxx Series Board Layout

Chapter 2—Jumper Settings and Memory Installation

JUMPER SETTINGS

On-Board Symbios SCSI Controller/Jumper Settings

The board is equipped with an integrated Ultra2 Fast/Wide SCSI controller. This controller supports both LVD and single-ended SCSI devices. The controller is enabled or disabled via hardware jumper SJP2.

The SCSI controller is a bus master device which gains control of the PCI bus to transfer data between the CPU memory and the SCSI devices. The I/0 base address and interrupts are set by the PCI plug and play BIOS at boot time.

A SCSI configuration utility is available on boot-up of the board. Shortly after the SCSI BIOS information displays, the configuration program can be accessed by pressing Control-C. The configuration utility will allow you to scan the SCSI bus, change configuration options, and view a list of SCSI devices connected to the board. For more in depth information on SCSI re-configuration, visit:

www.lsilogic.com

SJP2 – Enable/Disable SCSI Controller

As stated above, the on-board Symbios Ultra2 Fast/Wide SCSI adapter can be enabled or disabled with jumper SJP2 (see Figure 2 for SJP2 location).

Table 1 defines the jumper settings for SJP2.

Table 1 SCSI Jumper Settings for SJP2

Jumper	Function	Jumper On Pins 1-2	Jumper On Pins 2-3
SJP2	SCSI	Enabled	Disabled

JP1 and JP2 - On-Board Ethernet Controllers/Jumper Settings

The board is equipped with two integrated Intelâ 82559 Ethernet controllers that have two RJ-45 10/100 BASE-TX connectors on the mounting bracket at the rear of the board. The I/O addresses and interrupts are set by the PCI plug and play BIOS at boot time. These controllers are enabled or disabled via hardware jumpers JP1 and JP2 (see Figure 2 for jumper locations). JP1 corresponds to the Ethernet controller and Ethernet port farthest from the processor. JP2 corresponds to the Ethernet controller and Ethernet port closest to the processor. For unique situations requiring the disabling of the Ethernet controllers, JP1 and JP2 are incorporated onto the SP8xxx board

Table 2 defines the jumper settings for JP1 and JP2.

Table 2 Ethernet Jumper Settings for JP1 and JP2

Jumper	Function	Jumper On Pins 1-2	Jumper On Pins 2-3
JP1	Ethernet Controller	Enabled	Disabled
JP2	Ethernet Controller	Enabled	Disabled

JP3 - On-Board Video Graphics Controller/Jumper Settings

The board is equipped with an on-board video graphics controller. This controller is enabled or disabled via a hardware jumper JP3 (see Figure 2 for JP3 location). For special applications that may require disabling of the VGA controller, JP3 has been incorporated onto the Cubix SP8xxx board.

Table 3 defines the jumper settings for JP3.

Table 3 VGA Jumper Settings for JP3

Jumper	Function	Jumper On Pins 1-2	Jumper On Pins 2-3
JP3	VGA	Enabled	Disabled

JP4 - RAID Interrupt

The SP8xxx comes from the factory with JP4 in a “normal” setting, unless otherwise specified (a “normal” setting has the jumper on pins 1 and 2). If an AMI RAID card using the internal hard drives needs to be installed at a later time, the jumper will have to be removed, and placed on pins 2 and 3.

Table 4 defines the jumper settings for JP4.

Table 4 Jumper Settings for JP4

Jumper	Function	Jumper On Pins 1-2	Jumper On Pins 2-3
JP4	Normal	Enabled	
	RAID		Enabled

JP5 – Flash BIOS

If the Flash Bios is to be upgraded, a shunt must be installed on the 2-pin jumper JP5 (see figure 2 for JP5 location). Upgrades typically come on a floppy disk and are accompanied by upgrade instructions.* When the upgrade is complete, the shunt should be removed to protect the system from accidental erasure.

*Cubix provides Flash Bios upgrades via the Cubix web site. The web site address is provided in Appendix A of this manual.

Other Jumper Settings

Jumpers JP6, 7, 8, and 9 (CPU speed) are processor dependent and **should not be changed** from factory settings. J2 is a reset jumper incorporated on the board specifically for testing by Cubix Corporation.

DIMM MEMORY INSTALLATION

Additional memory can be installed on SP8xxx board. There are four DIMM slots available on this board (see Figure 2 for DIMM slot location). If only one DIMM is installed, this DIMM should be installed in the DIMM slot farthest away from the processor. Each additional DIMM should be added in the adjacent slot. The sequence of DIMM installation relative to DIMM size is not important.

For installation, the card interface tabs must be aligned. Firmly seat the DIMM(s) into place.

Please note the following information regarding DIMMs.

- DIMMs must be 168 pin, 3.3v, 100MHz (PC100) ECC SDRAM (72 bits).
- DIMMs do not need to be installed in pairs, and different sizes may be mixed.
- DIMMs may be either registered or unbuffered. Registered and unbuffered DIMMs may NOT be mixed.
- DIMMs must have gold contacts (edge connectors).

WARNINGS AND PROCEDURES

The installation of processor boards require entry into the CPU bay of the Density Series system which is restricted to service personnel only. Accordingly, the following warnings apply.

CAUTION!
CONTAINS HAZARDOUS VOLTAGES, NO USER SERVICEABLE PARTS INSIDE

ATTENTION!
TENSION DANGEREUSE, L'APPAREIL NE COMPORTE AUUN ELEMENT QUE L'UTILISATEUR PULSSE REPARER

ACHTUNG!
GEFAHRLICHE STROMSPANNUNGEN! KEIN BENUTZER ZUGANGLICHE TEILE!

CAUTION!
GROUP POWER MUST BE OFF BEFORE INSTALLING ANY CUBIX PROCESSORS, PERIPHERAL BOARDS, OR THIRD-PARTY PERIPHERAL CARDS. FAILURE TO FOLLOW THIS WARNING MAY RESULT IN DAMAGE TO THE DENSITY SERIES SYSTEM AND BOARDS BEING INSTALLED.

BOARD INSTALLATION

The following steps guide you through the installation process.

1. At the front console, select and turn power off to the group location where you intend to install the server board.

2. If a hard-drive is installed in the group hard drive slot, remove the hard drive.

3. Confirm the switch and jumper settings are correct on the board being installed.

4. Insert the board into the group slot, ensuring the card interface tabs are aligned with the center of the slot (see Figure 3).

5. Firmly seat the processor card into the slots by firmly pressing on the top of the card with the palm of your hand.

6. Install the hard drive assembly into the appropriate hard drive bay located in the front of the Density enclosure. The hard drive assembly will fit into the hard drive interface. Press firmly to seat.

7. Connect all appropriate ribbon connectors and L-bracket connectors.

8. At the front of the console, apply power to the processor group.

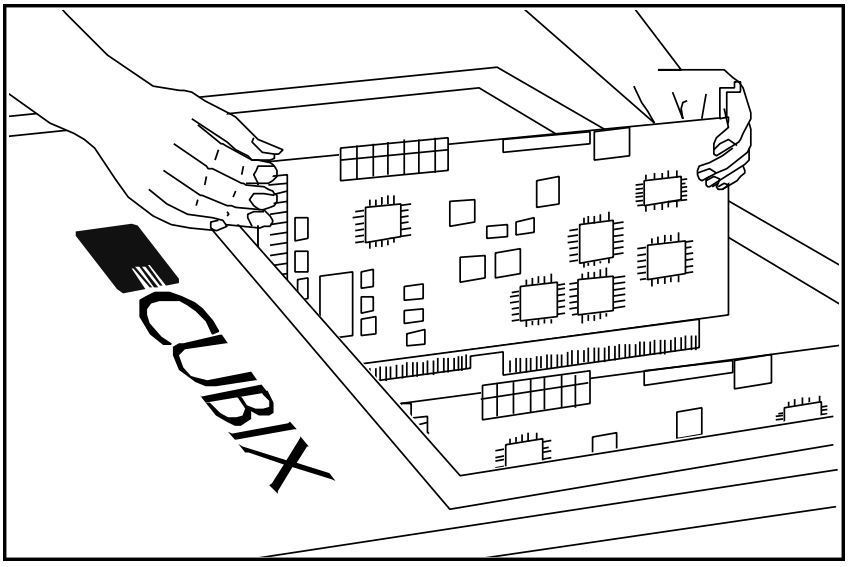
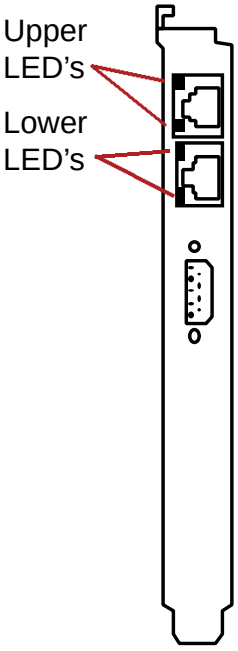


Figure 3 Inserting Server Board into Chassis Group

ETHERNET ADAPTER LEDs



In each of the RJ-45 connectors and visible in the mounting bracket are two sets of light emitting diodes (LEDs). Figure 4 displays the SP8xxx end bracket.

On the Upper set:

- The top LED will emit green when the interface has a valid connection to an Ethernet hub and blinks when there is activity.
- The bottom LED emits green when the interface is set to 100 Mbit/s.

On the Lower set:

- The top LED will emit green when the interface has a valid connection to an Ethernet hub and blinks when there is activity.
- The bottom LED emits green when the interface is set to 100 Mbit/s.

Figure 4
SP8xxx End Bracket

OTHER LEDs

SCSI Activity LED

There is an LED located on the top edge of the SP8xxx board next to the internal SCSI connector (SJ2, see Figure 2 for location). The LED will be red when the SCSI drive is busy. This LED is only visible when the cover is off of the Density System.

POST LED

The SP8xxx has a group of eight LEDs on the back of the board. As the system proceeds through its Power On System Test, these LEDs display binary codes which can be used to diagnose board failures.

SP8xxx BOARD POWER LED

There is a Board Power LED light located on the SP8xxx board between the COM 2 connector (J5) and the fan connector (J13, see Figure 2 for location). This LED light will be green when there is power to the board. This LED is only visible when the cover is off of the Density System.

MEMORY CONFIGURATION & MANAGEMENT

Table 5 shows the Memory map for the SP processor.

Table 5 Memory Map

Memory Range	Size	Use
00000-9FFFF	640KB	Conventional Memory
A0000-AFFFF	64KB	VGA Graphics Buffer
B0000-B7FFF	32KB	MDA Text Buffer
B8000-BFFFF	32KB	VGA/CGA Text Buffer
C0000-C7FFF	32KB	VGA Bios
C8000-DFFFF	96KB	Available
E0000-FFFFF	128KB	System & PCI BIOS

Table 6 defines the board's I/O configuration.

Table 6 I/O Map

ISA Ports	Description
0000-00FF	Various "AT" functions in ISP chip and keyboard controller
01F0-01F7	IDE hard drive interface
02F8-02FF	COM2
03A0	Cubix supervisory interface
03A8-03AF	IES serial port
03B4-03B5	VGA
0378-037F	LPT1
03C0-03CF	VGA
03D4-03D5	VGA
03F0-03F7	Floppy / IDE
03F8-03FF	COM1

SYSTEM INTERRUPTS

The 16 system hardware interrupts on the SP8xxx are represented in Table 7. Interrupts are managed by two standard 8259A Programmable Interrupt Controllers (PICs). Interrupts at IRQ 0 through 7 are located on the main PIC; IRQ 8 through 15 are on the SLAVE PIC.

Table 7 System Interrupts

IRQ	Description
0	Timer clock
1	Keyboard
2	Second PIC controller
3	COM2
4	COM1
5	Set By PCI Plug & Play at boot time
6	Floppy Disk Controller
7	LPT1
8	Real Time Clock
9	Redirected IRQ 2
10	Set By PCI Plug & Play at boot time (or IES)
11	Set By PCI Plug & Play at boot time
12	Available (or PS/2 Mouse)
13	Math Coprocessor
14	Not Used
15	Secondary IDE Controller

TECHNICAL SPECIFICATIONS

Table 8 represents the technical specifications for the Density SP8xxx board.

Table 8 Density SP8xxx - Technical Specifications

CPU-Central Processing Unit	Intel® Pentium® II 550MHz or Intel® Pentium® III 600 MHz
L2 Cache	512KB, integrated on processor
System Chip Set	440GX PIIX 4E
System Memory	
Speed	PC-100 SDRAM
Width	72 Bits ECC
Max Size	2GB, 4 - 512MB DIMMS
Type	Unbuffered or Registered, DO NOT MIX
Peripheral Bus Support	PCI
System BIOS	AMI BIOS
Super I/O	SMC 53C669
Serial/Assignment	COM1 (J14), COM2 (J5)
UART Type	16C550 Compatible 230Kbps Maximum
Parallel/Assignment	LPT1 (J2), all Standard Modes
Dual On-Board LAN Interfaces	10/100 TX, Intel® 82559
VGA Chip Set	S3 Trio 64V2/DX, 2MB Video RAM
SCSI Chip Set	Wide Ultra2 SCSI Symbios 53C895 with Low
	Voltage Differential or Single-Ended SCSI support
Max Transfer Rate	Single-Ended-40MB, LVD-80MB
Other Input/Output	Video/Keyboard/Mouse/IES - (J3) Internal Header
Power Requirements	Volts Amps Max Power Max
	+5VDC 13.5A
	+12VDC 0.415A 73W
	-12VDC 0.033A
Warranty	Parts and Labor Return to Manufacturer 3 yrs.

APPENDIX A

CUSTOMER SERVICE INFORMATION

For Customer Service Information: (800) 829-0550

Customer Service available from:

5:00 am to 5:00 pm PST Monday through Friday
Also, from 8:00 am to 4:00 pm PST on Saturday
Closed holidays and holiday weekends

Use the Cubix Web site for trouble-shooting aids and for access to the latest information on Cubix products.

Customer Service Web site: http://www.cubix.com/support

Customer Service Email address: customerservice@cubix.com