

# Specifications: Dell System 486P/xx

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## Microprocessor

Microprocessor type	Intel486™ SX™-16, -20, -25 MHz Intel487™ SX-16, -20, -25 MHz Intel486 DX™-33 MHz IntelDX2™-50 MHz, -66 MHz IntelDX4™ OverDrive processor *
Math coprocessor	integrated on Intel486 DX, and IntelDX2
Internal cache	8 KB
Processor data rate	unknown

\* The BIOS setup screen still displays 33-MHz, but the Dell system 486P/xx will function as a 100-MHz system.

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## System Information

I/O bus speed	8 MHz
Data bus width	16 bits
DMA channels	7
Interrupt levels	15
System BIOS address	F0000h
Serial port UART	16450

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## Memory

Standard base unit	4 MB
Maximum system-board RAM	64 MB
SIMM sockets	4
SIMM capacities	1, 4, and 16 MB
SIMM type	36-bit, 72-pin
Architecture	page-mode 4-way interleaving
Wait states	near 0 (0.5 to 0.7 average)
Memory access time:	
tRAC	80 ns
tCAC	20 ns

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## External Ports

PS/2-style keyboard	(1) 6-pin mini-DIN
PS/2-compatible mouse	(1) 6-pin mini-DIN
Video connector (VGA)	(1) DB 15-hole connector
Serial	(2) DB 9-pin connectors
Parallel	(1) DB 25-hole connector (PS/2 or AT)

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## Internal Ports

IDE	40-pin connector
Diskette drive	34-pin connector*

Video feature connector                    26-pin connector  
\*Supports 2 diskette drives or 1 diskette drive and 1 tape drive

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## Video

Standard video RAM                    512 KB  
Optional video RAM                    upgradable to 1 MB  
Maximum resolutions (512 KB) 1024 x 768 pixels, 16 colors  
Maximum resolutions (1 MB) 1280 x 1024 pixels, 16 colors

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## Drives

Visible:

5.25-inch form factor            1 bay

3.5-inch form factor            1 bay

Hidden:

3.5-inch form factor            1 bay

*NOTE: This system supports only 1 internal hard-disk drive.*

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## Expansion Bus

Bus type            ISA  
Expansion slots(3) 2 full-length and 1 half-length if 16-MB SIMMs are installed  
Data width            16 bits

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## Indicators

LED    hard-disk drive access indicator  
Speaker 2- to 2.5-kHz resonant frequency

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## Physical

Height 101.6 mm (4.0 inches)  
Width 383.54 mm (15.1 inches)  
Depth 396.24 mm (15.6 inches)  
Weight 9.98 kg (22 lb)

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## Environmental

Temperature (operating)            15° to 32°C (59° to 90°F)  
Relative humidity (operating) 8% to 80% (noncondensing)

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## Power

Power supply                    150 W (224 W before January, 1992)  
Voltage (user-selected) 115 V at 60 Hz or 230 V at 50 Hz  
Battery                    Rayovac 844 4.5-V alkaline

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## Regulatory Notices

FCC (U.S. only) Class B  
DOC (Canada) Class B  
VDE Class B

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## 66-MHz Processor Cooling Fan: Dell System 486P/xx

The Dell 486P/66 computer system is designed to operate at 40°C (104°F) ambient room temperature when fully loaded with expansion cards in all expansion slots and up to four 16-MB SIMMs. A small fan inside the computer cools the microprocessor to maintain a maximum temperature of 85°C (185°F) or less for the microprocessor case (the chip exterior).

If you find the noise created by this fan objectionable, you can disconnect the fan, provided that the system is configured and operated as follows:

- The bottom expansion slot is empty.
- The expansion cards installed in the top 2 expansion slots dissipate no more than 20 W each. For example, the Novell<sup>®</sup> NE2000 Ethernet network card dissipates 17 W, and a Hayes modem card dissipates 4 W.
- The system's ambient room temperature is maintained at 25°C (77°F) or less.

There are no restrictions on SIMM configurations.

There is a [heat sink](#) available that will allow you to run the system with a 66-MHz processor, without the fan. If not installed properly, it could interfere with the jumpers and the SIMMs.

To disconnect the fan, complete the following steps:

1. Turn off the computer and any attached peripherals, and disconnect them from their power sources.
2. Remove the computer cover.
3. Disconnect the [fan cable](#) from the connector labeled "JFAN" on the system board.

Leave the fan installed in case you later decide to reconnect it.

1. Replace the computer cover, reconnect the computer and any attached peripherals to their power sources, and turn them on.

## UL

For computers set at 115 V:

Use a UL-certified grounded cable, type SVT or SJT, with a minimum of 18 American wire gauge (AWG). The cable must be no longer than 15 feet and must have a parallel-blade, grounded plug rated for 15 A.

For computers set at 230 V (within the U.S.):

Use a UL-certified grounded cable, type SVT or SJT, with a minimum of 18 AWG. The cable must be no longer than 15 feet and must have a tandem-blade, grounded plug rated for 15 A/250 V.

For computers set at 230 V (outside the U.S.):

Use a grounded cable, type SVT or SJT, with a minimum of 18 AWG. The cable must be no longer than 15 feet, must be rated according to the requirements of the country in which the equipment is to be used, and must have a grounded plug.

The cable should be labeled "HAR" and should have the appropriate safety approvals for each country.

## **I/O: Dell System 486P/xx**

### **Serial Ports (JCOM1, JCOM2)**

This system has two built-in RS232D serial ports configured as DTE.

The following options are available in the System Setup program for the 2 Serial Port categories:

Serial Port 1- Off, COM1, COM3, Auto

Serial Port 2 - Off, COM2, COM4, Auto

*NOTE: The Off setting completely disables the port.*

<b>Auto Option</b>	<b>COM1/IRQ4 (Address 3F8h)</b>	<b>COM2/IRQ3 (Address 2F8h)</b>	<b>COM3/IRQ4 (Address 3E8h)</b>	<b>COM4/IRQ3 (Address 2E8h)</b>
Standard	Serial 1	Serial 2		
Bus COM1 card	Bus card 1	Serial 2	Serial 1	
Bus COM2 card	Serial 1	Bus card 2	Serial 2	
Bus COM1 and COM2 card	Bus card 1	Bus card 2	Serial 1	Serial 2

COM1 and COM3 bus cards - serial port 1 disabled.

COM2 and COM4 bus cards - serial port 2 disabled.

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### **Parallel Port (JLPT1)**

The system has one built-in, bidirectional parallel port.

Parallel port address - 378h, IRQ7.

System Setup program options for the Parallel Port category are Off and Auto.

If this category is set to Auto, the Dell 486P can remap the parallel port to 278h (and the IRQ from 7 to 5) if the system detects the presence of other parallel ports mapped into the primary 378h location.

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## **Speaker (SPKR)**

The speaker (transducer) can be set in the System Setup program. The two options available are On and Off.

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## **Keyboard (JKYBD)**

The system uses a PS/2-compatible 6-pin, mini-DIN keyboard connector.

The Keyboard Errors category in the System Setup program indicates whether keyboard-related errors are displayed (thereby preventing the system from finishing its boot process) during the boot routine.

The Do Not Report option is useful for network servers where a keyboard is not always necessary.

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## **Mouse (JMOUSE)**

The system uses a 6-pin, mini-DIN mouse connector that is PS/2-compatible. The mouse port uses IRQ12.

The Mouse category in the System Setup program allows the user to disable or enable the mouse port.

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## **Hard-Disk Drive (JIDE)**

This system has an integrated IDE interface, accessed via a 40-pin header on the system board. The interface is capable of supporting two IDE hard-disk drives but the chassis supports only one.

The IDE interface is disabled through the System Setup program, or it is disabled automatically when a second disk interface is detected with a conflicting I/O address.

The Hard-Disk category can be set to Auto or Off in the System Setup program.

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## **Hard-Disk Drive Type Numbers**

If installing a hard-disk drive that does not match one of the available drive-type numbers, use drive-type number 48 or 49 and enter the drive's parameters.

The drive parameters required are cylinders, logical heads, precompensation cylinder (which doesn't affect IDE or ESDI drives), landing zone cylinder, and sectors per track.

## **Diskette Drive (JFLOP)**

The diskette drive controller can be enabled or disabled (in the System Setup program) by setting the Diskette category to Auto or Off.

When the category is set to Auto, the system checks during the bootstrap for the presence of a diskette drive controller installed on an expansion card. If one is detected, the system disables the on-board diskette drive controller.

The Off option disables the on-board diskette drive controller. Select this option if the user wants to use a diskette drive controller on an expansion card as the diskette drive controller in the system.

If a diskette drive is installed but the System Setup program has the Diskette Drive A: category set to the Not Installed option, the system boots from the hard-disk drive. Under these circumstances, MS-DOS<sup>®</sup> displays the following error message when trying to access drive A:

Not ready reading drive A  
Abort, Retry, Fail?

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## SmartVu

Smart Vu is a diagnostic display capable of displaying error messages and status information via a 4-letter LED display.

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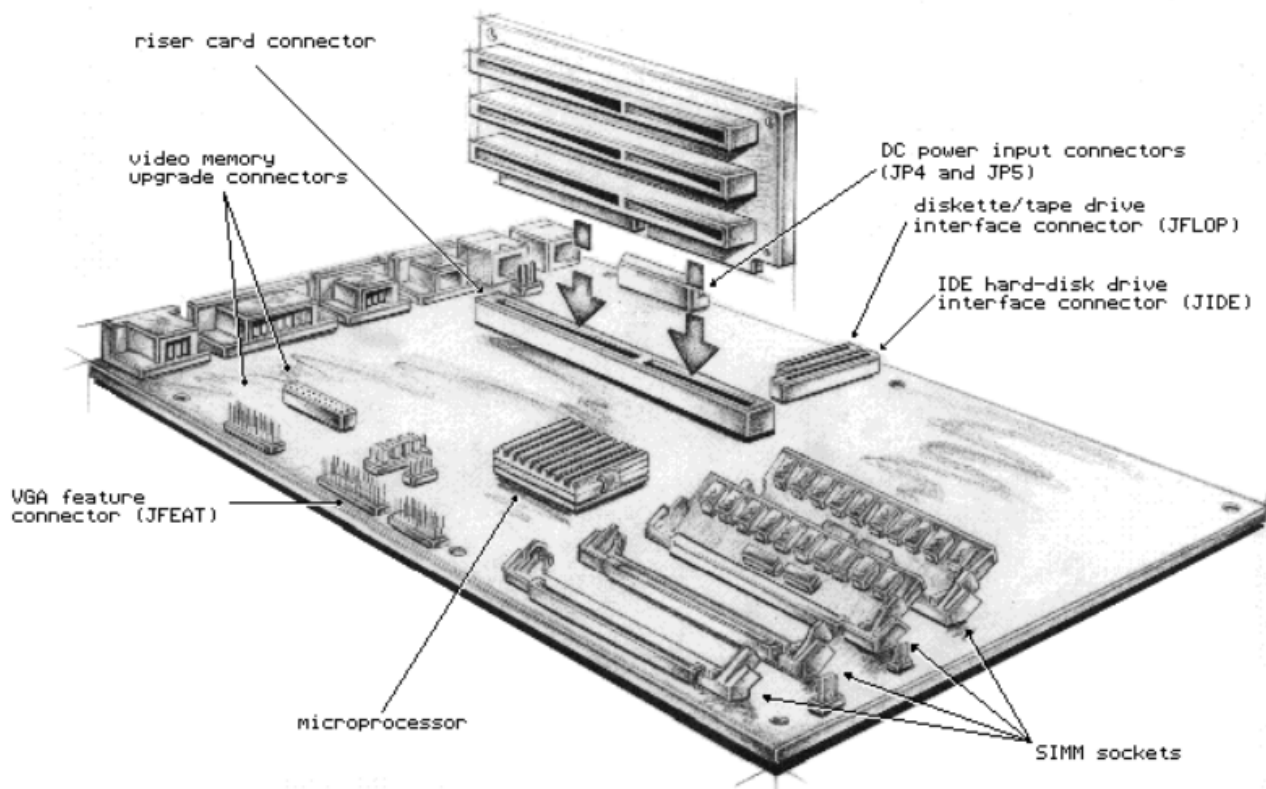
## I/O Bus (EXP1)

This system has a riser board containing 3 ISA 16-bit expansion slots. The board plugs into a connector at location EXP1 on the system board.

*NOTE: If 16-MB SIMMs are installed, the bottom slot accepts only a half-length card.*



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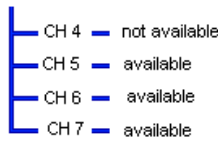
## General View: Dell System 486P/xx



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## Jumpers: Dell System 486P/xx

-  = jumpered
  -  = unjumpered
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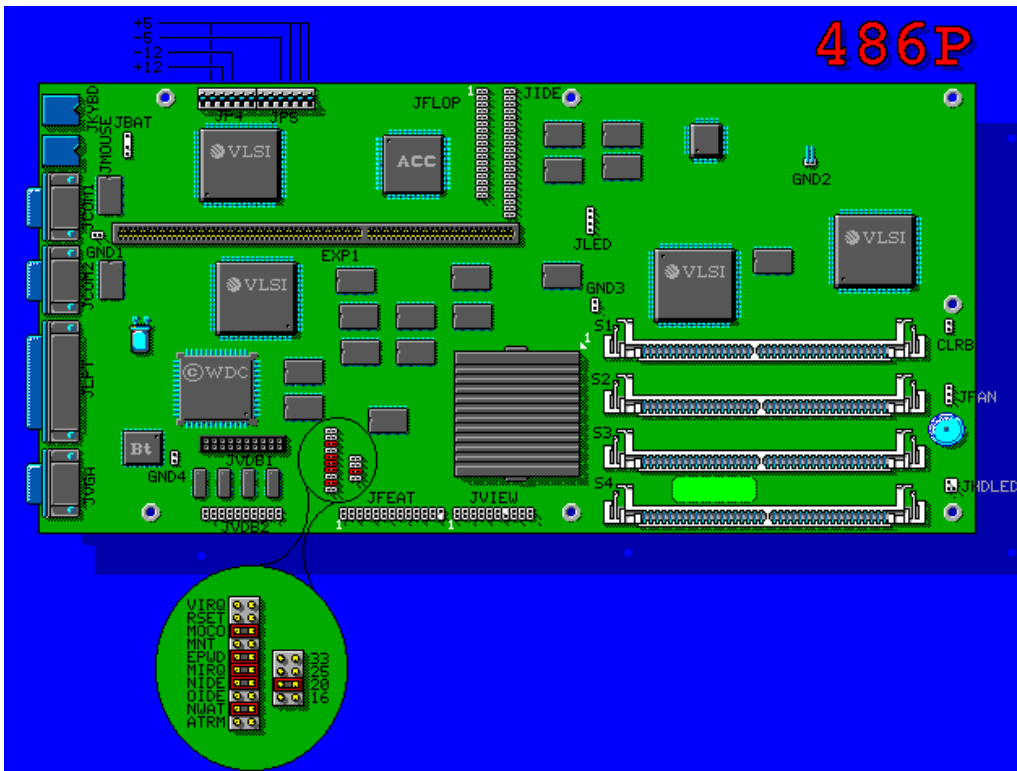
VIRQ	<input type="checkbox"/> <input type="checkbox"/> (default)  <b>DMA Channels</b> Slave 8237A DMA CNTRL (8-BIT)   Master 8237A DMA CNTRL (16-BIT)  <small>*synchronous data link communications</small>	On-board VGA generates IRQ9. <sup>1</sup>  On-board VGA normally does not generate IRQ9.
RSET	<input type="checkbox"/> <input type="checkbox"/> (default)	Factory use only.
MOCO 2	<input checked="" type="checkbox"/> <input type="checkbox"/> (default)  <input type="checkbox"/> <input type="checkbox"/>	Color adapter selected as the default monitor.  Monochrome monitor selected as the default.
MNT	<input type="checkbox"/> <input type="checkbox"/> (default)	Factory use only.
EPWD	<input checked="" type="checkbox"/> <input type="checkbox"/> (default)  <input type="checkbox"/> <input type="checkbox"/>	Password option enabled.  Password option disabled.
MIRQ	<input checked="" type="checkbox"/> <input type="checkbox"/> (default)  <input type="checkbox"/> <input type="checkbox"/>	Mouse port enabled at IRQ12.  Mouse port disabled.
NIDE	<input checked="" type="checkbox"/> <input type="checkbox"/> (default)  <input type="checkbox"/> <input type="checkbox"/>	Newer IDE drive being used.  Older IDE drive being used.
OIDE	<input type="checkbox"/> <input type="checkbox"/> (default)  <input checked="" type="checkbox"/> <input type="checkbox"/>	Newer IDE drive being used.  Older IDE drive being used.
NWAT	<input type="checkbox"/> <input type="checkbox"/> (default)  <input checked="" type="checkbox"/> <input type="checkbox"/>	IBM 5250 emulation card installed. Adds one wait state to every ISA bus cycle where IOCHR DY is driven "not ready" (low).  Normal operation.
ATRM	<input type="checkbox"/> <input type="checkbox"/> (default)	Factory use only.
CLRB	<input type="checkbox"/> <input type="checkbox"/> (default)  <input checked="" type="checkbox"/> <input type="checkbox"/>	Normal operation.  Used only to erase the boot sector of the system BIOS program when restoring the BIOS following a boot code corruption.

16	Set jumper to reflect the speed of the processor.
20	Set jumper to reflect the speed of the processor.
25 <sup>3</sup>	Set jumper to reflect the speed of the processor.
33	Set jumper to reflect the speed of the processor.

<sup>1</sup> IRQ9 is used for special types of software applications.

<sup>2</sup> When using a color adapter and monochrome adapter simultaneously (on-board VGA = color adapter).

<sup>3</sup> For the 50-MHz IntelDX2™-50 processor, use the "25" setting.



## Video: Dell System 486P/xx

### General

Video BIOS ROM	integrated with system BIOS
Video BIOS address	C0000h to C7FFFh
Controller	WD90C30/31
Video memory	512 KB (standard) or 1 MB (with optional 512 KB)

*NOTE: The onboard video may be disabled by setting the VGA category in Setup to Off.*

### Fast Video BIOS Category

The Fast Video BIOS category in the System Setup program has the following three options:

- Off - Video calls execute from the 8-bit video ROM. This frees 32 KB of memory for use by EMS memory.
- On - The system shadows video BIOS in faster DRAM.
- Cached - The system shadows and caches the video BIOS.

### Video-Related Jumpers

The MOCO and VIRQ jumpers both relate to video. (Refer to [Jumpers](#) for more details.)

*NOTE: If the on-board video is disabled, the VIRQ feature is automatically disabled.*



## Video Port

The built-in VGA port uses a 15-pin high-density D-shell connector. The video circuitry on the system board includes a DAC that works with a video controller to produce synchronization signals that drive the red, green, and blue electron guns in the VGA monitor. Dell provides driver software that supports Super VGA modes for certain high-resolution VGA monitors. (For more information, refer to the *User's Guide* shipped with the system.)

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## Feature Connector

The VGA feature connector (JFEAT) allows the system board to be used with an accelerator graphics card in a pass-through mode.

As you are facing the front of the system, the JFEAT connector is located on the left edge of the system board next to the video memory chips.

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## 60-Hz Scan Rate

The system supports an additional mode of 800 x 600 in 256 colors with a 60-Hz scan rate. This mode allows for flicker-free operation at this higher resolution. This mode requires a monitor that can support this faster (60 Hz instead of 56 Hz) scan rate.

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## Text Modes

Resolutions	Colors	Modes
40 x 25	16	0/1
80 x 25	16	2/3
80 x 25	Mono	7
132 x 25	Mono	57
132 x 25	16	55
132 x 43	Mono	56
132 x 43	16	54

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## Graphics Modes

Resolutions	Colors	Modes
320 x 200	4	4
320 x 200	4	5
320 x 200	256	13
320 x 200	16	D
640 x 200	2	6
640 x 200	16	E
640 x 350	Mono	F
640 x 350	16	10
640 x 400	256	5E
640 x 400	32,768	61*
640 x 480	2	11

640 x 480	16	12
640 x 480	256	5F
640 x 480	32,768	62*
800 x 600	16	58
800 x 600	256	5C
1024 x 768	2	5A
1024 x 768	16	5D
1024 x 768	256	60*
*Requires 1 MB of video memory (optional).		

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## Video Software

### Utilities and Drivers

The following utilities and drivers are found on the *Software Support Diskettes*:

- Bridge - Translates the extended-text modes used by other video manufacturers to one that is compatible with your Dell system.
- Monitor Select - Lets you maximize your monitor's resolution capabilities.
- Screen Saver - Automatic blanking of monitor screen.
- Video BIOS Revision Lets you check the release date of the VGA BIOS.
- Video Mode Switch Lets you select additional video modes.
- Video Drivers - See the Applications section below for available drivers.

For detailed instructions, consult the *User's Guide*.