

OPTICAL

Optical structure	3 LCD panels, one projection lens, RGB shutter method
LCD panel	1.3", P-Si TFT panel x 3, stripe pixel configuration Microlens on CP-X985 only
Resolution	Computer: 1024 x 768 (SVGA) Video: 400 TV lines
Lens	F1.7~2.3 (f=37.9~57.6mm) Power zoom 1.3x Power focus
Lamp	250W UHB
Lamp life	1500 hours
Brightness	2500 ANSI Lumens (CP-X980) 3200 ANSI Lumens (CP-X985)
Contrast ratio	300:1
Focus distance	1.1m~11m
Display size	30"~300"
Colour	8bits/colour, 16.7M colours

COMPATIBILITY

Composite video	NTSC, PAL (-BGDHI), SECAM, PAL-M, PAL-N
Component video	480i, 480p, 720p and 1080i
Computer	PC, Mac, Workstation, VGA, SVGA, XGA, SXGA (smart resizing)
Plug & Play	DDC1/2B at RGB1, DDC2B at DVI
Frequency range	Vertical: 56~120Hz, horizontal: 25~80kHz

FEATURES

Keystone correction	Fixed 20:1 upward shift, plus digital correction
Video output	Motion Adaptive Progressive Scan, advanced black level enhancement, noise reduction, Theatre Mode 2-3 pull down for NTSC
Image control	2x digital magnification, freeze frame, picture-in-picture, mirror reverse & invert image
User controls	Remote control with laser pointer, mouse control, 9 language on screen menu system
Speakers	1.2W x 2
Other	Ceiling mountable

CONNECTORS

Computer Input	2 x RGB analogue - 15-pin HD D-sub 1 x RGB digital - DVI-D (without analogue) 2 x Audio - stereo mini-jack
Video Input	1 x S-Video - mini-din 4 pin 1 x Composite - phono 1 x Component - phono 1 x Audio - phono L & R
RGB Output	1 x Analogue - 15-pin HD D-sub
Audio Output	1 x Audio - stereo mini-jack
Control	1 x RS-232C and mouse - 15-pin HD D-sub 1 x USB

POWER

Power supply	90~132/198~264V AC, 50/60Hz
Power consumption	250W

PHYSICAL

Dimensions	289 x 119 x 345mm (WxHxD) excluding lens & legs
Weight	6.4kg
Noise level	<40dB
Approvals	CE, TÜV, UL, FCC

SUPPLIED WITH

Remote control with mouse function	Soft carrying case
Power cord (US, UK, Europe)	RCA video/audio cable (3m)
PS/2 mouse cable (2m)	S-VHS video cable (3m)
Serial mouse cable	AA batteries x 2
RGB cable (2m)	

OPTIONS

Wheeled hard flight case (HCC3)
Wide angle lens converter (WL201)

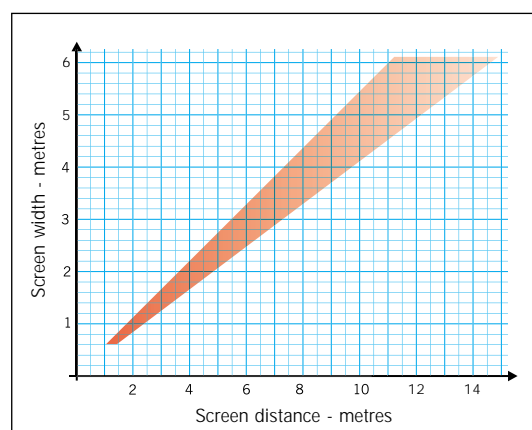
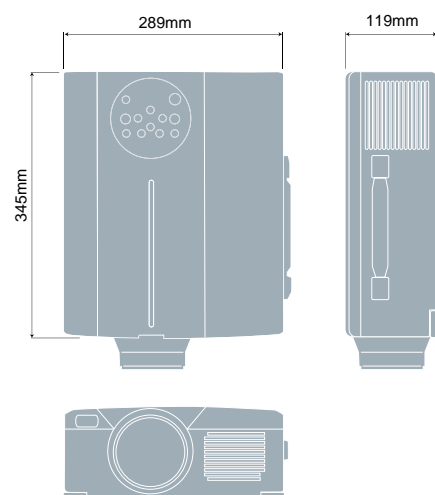


	Image size		Projection distance	
	Diagonal	Width	Min	Max
30" (0.76)	0.61	1.1	1.4	
40" (1.02)	0.81	1.4	1.9	
60" (1.52)	1.22	2.2	2.9	
80" (2.03)	1.63	2.9	3.8	
100" (2.54)	2.03	3.7	4.9	
120" (3.05)	2.44	4.5	5.9	
150" (3.81)	3.05	5.6	7.2	
200" (5.08)	4.06	7.4	9.8	
300" (7.62)	6.10	11.2	14.9	

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www.hitachiprojectors.com/985

Seriously professional

Now even brighter!

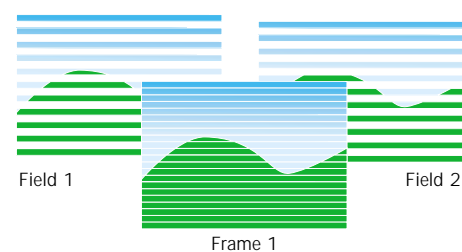


- Up to 3200 ANSI Lumens, only 6.2kg
- Motion Adaptive Progressive Scan
- High connectivity for computer and video

3200 ANSI lumens

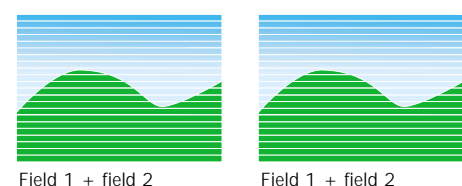
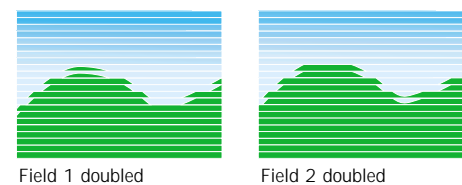
The XGA resolution CP-X980 and CP-X985 with outputs of respectively 2500 and 3200 ANSI lumens are perfect for installation in medium to large venues, but are light enough to be portable. They deliver superb computer images and unmatched video quality thanks to advances like Hitachi's unique MAPS system. To ensure the best quality pictures from DVD a component video input, the native format of DVD, is included (see box). Comprehensive input options also include DVI, composite video, S-video and analogue RGB. Standard features include a remote control with laser pointer and mouse function, digital keystone correction, digital magnification, image freeze, picture in picture and a soft carrying case.

Motion Adaptive Progressive Scan

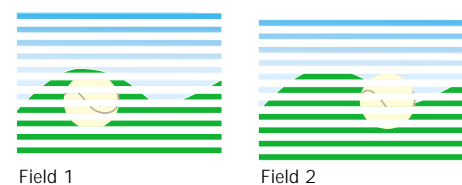


A single TV picture or frame comprises two fields containing only the even or odd lines of the image which are displayed in quick succession. This works because the CRT phosphors have a persistence that causes them to glow for a short time after the signal is removed.

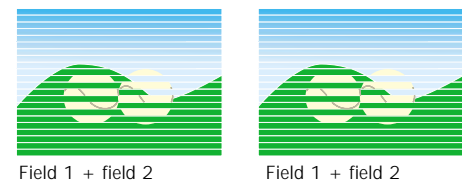
Projection screens, white boards and office walls have no persistence so to avoid flicker and maximise brightness a video projector must create a full frame image to replace every field. Many projectors achieve this by repeating the lines of each field, "line doubling", but this reduces resolution and causes line flicker.



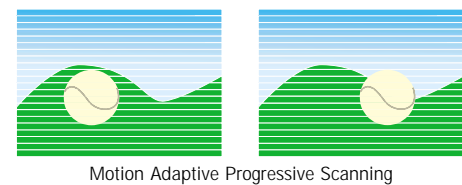
The CP-X980/985 overcomes these problems by using a memory buffer to store the two fields which are then combined as single frame and projected twice - progressive scanning.



Even progressive scanning can't prevent the smearing of objects that move rapidly across the picture. The rapid movement means that alternate lines of the object are shifted between the first and second field which, when combined, produces a broken up appearance. This problem affects normal TV displays as well as projectors using simple or even no progressive scanning.



The CP-X980/985 uses sophisticated image processing techniques to isolate a moving object. Its field lines are aligned and combined, and the object shown in its correct position in each frame - Motion Adaptive Progressive Scanning.

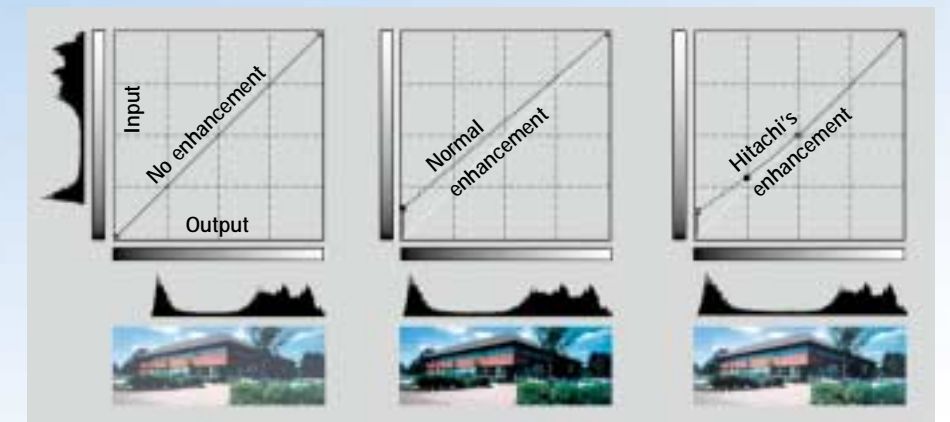


Excellent Connectivity

As shown above, the CP-X980/985 offers virtually every input connection required to accommodate today's media sources. Video inputs cater for component, S-video and composite formats together with stereo audio. On the computer side there are two analogue RGB inputs and a digital visual interface (DVI-D), again with stereo audio. Every input can be connected simultaneously to a signal source and the projector's output switched between them - taking advantage of the image freeze feature to avoid any transient on screen noise during switching.

Superb Video Quality

The CP-X980/985 incorporates a number of advanced techniques to produce remarkable video quality. Hitachi's own MAPS system described opposite gives a major improvement over other projectors and even standard TV displays where fast moving objects are displayed. Other advances include a sophisticated black level enhancement:



In most video images the darkest areas of the picture are not fully black. By forcing these areas to black the perceived quality of the projected image can often be improved. Normally, black enhancement is a linear adjustment which proportionately darkens all areas of the picture causing an unwelcome reduction in midrange brightness. Hitachi's advanced black enhancement method avoids this by applying a measured adjustment to the darker areas but leaving the brighter areas unaffected.

The CP-X980/985 also uses digital image processing to reduce excessive image noise. By continually comparing the value of each pixel over successive fields, any abrupt or isolated change can be identified and suppressed resulting in a cleaner sharper image.



For NTSC video, the CP-X980/985 employs Hitachi's Theatre Mode 3-2 pull down system to ensure precise reproduction of the original movie tracks. Film at 24 frames/s is converted to NTSC video at 60 fields/s by recording 3x each odd frame and 2x each even frame. Normal projectors use successive pairs of fields regardless of their frame number which, rather than reproducing a single complete movie frame, results in approximately half the projected frames comprising data from adjacent movie frames, which can cause blurring and colour changes. The CP-X980/985 uses buffered memory to select data from a single movie frame, producing sharper more stable images.

Component Video

TV and video cameras generate separate Red, Green and Blue video signals which reproduced directly by RGB devices such as CRT and LCD screens and LCD projectors. Although the RGB format produces the best quality it requires a high bandwidth and, because it combines black and white (luminosity) information with colour, is not ideal for monochrome devices or for image processing. The professional video world therefore converts the RGB signal into component video, usually referred to as Y_PB_PR or YC_BC_R. (The former refers to the analogue standard and the latter to the digital standard defined by the Society of Motion Picture and Television Engineers.) This is still a "three wire" system but the Y or luminance signal contains full bandwidth black and white picture information, while the P_B and P_R components or colour difference signals contain reduced bandwidth colour information.