A wider view on the field

A guide to widescreen LCD selection

BARCO

Visibly yours

Market trends

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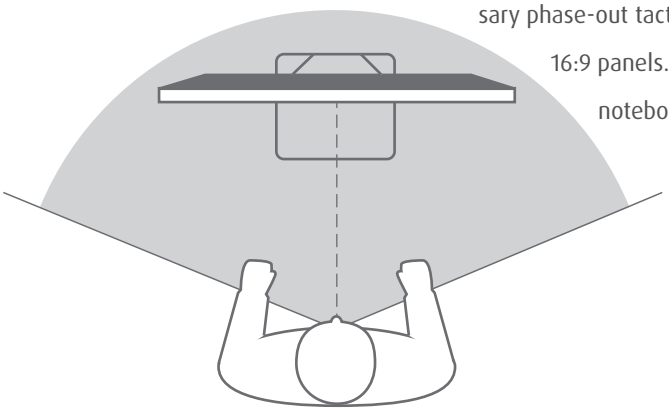
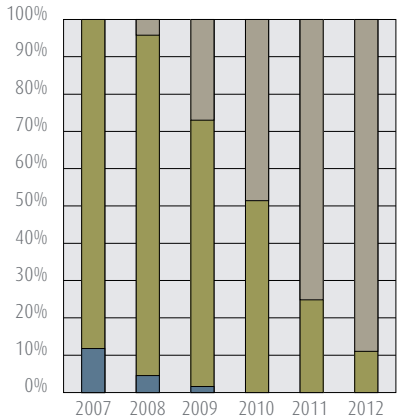
> It is projected that by 2012, 16:9 penetration will reach 90% of notebook panels and 67% of LCD monitor panels.

Widescreen LCDs are quickly becoming the new standard in business and private environments. Offering increased cost-effectiveness and an exceptional viewing experience – of utmost importance in this digital era – LCDs with a wide aspect ratio are on the rise. Widescreen LCDs offer improved legibility, which counteracts eye fatigue, and provide more usable screen area, resulting in better ergonomics and higher productivity. For those reasons, non-wide LCD panels will gradually disappear from the market. The worldwide specialist in display market research, DisplaySearch, states that: "In the near future, panel makers will take the necessary phase-out tactics on the existing LCD formats in order to drive the market to 16:9 panels. It is projected that by 2012, 16:9 penetration will reach 90% of notebook panels and 67% of LCD monitor panels."

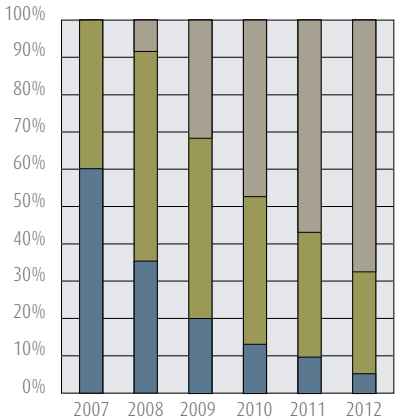


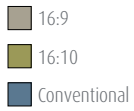
Forecast of 16:9 panel penetration

in the notebook PC market

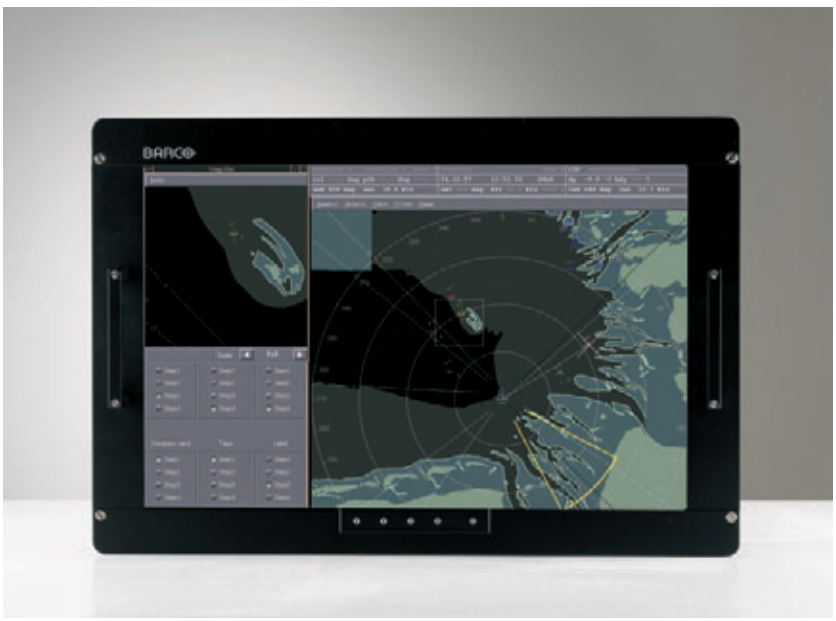


in the LCD monitor markets





Source: DisplaySearch 16:9 Notebook PC and LCD monitor analysis report



As the market is driven to full HD and because this format yields better production rates for LCD manufacturers, it is expected that by 2012, commercial monitors larger than 17" will be widescreen, and full HD (1920x1080), HD+ (1600x900) and HD (1366x768) 16:9 will be the standard in the consumer market.

The consequences of going wide

The rise of widescreen LCDs will affect legacy systems. Because of their dedicated 5:4 and 4:3 hardware, software and HMI, legacy systems will require changes in monitor mechanics, screen resolution and readability.

Mechanical compliance

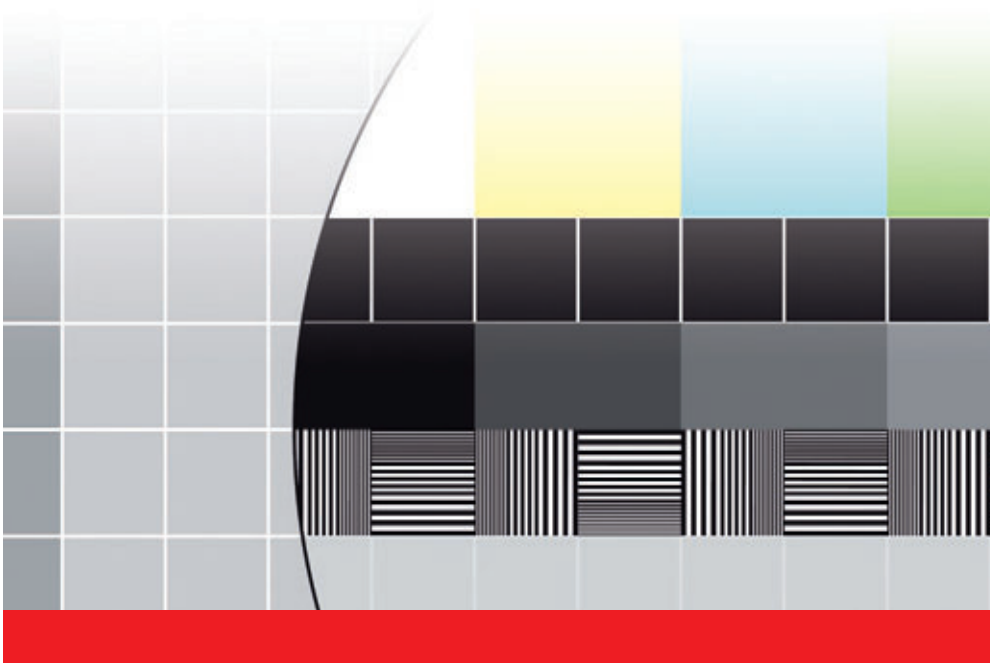
Changes in LCD aspect ratio will require mechanical modifications. The dedicated housing solutions designed for the 19" industry standard will not be able to accommodate a widescreen LCD with the same height of a 4:3 display. If the widescreen display has to fit into the 19" rack, an opening on the top and bottom will be required. If the same height needs to be maintained, a wider rack will be necessary to house the widescreen LCD.

Screen readability

Widescreen LCD panels typically have a smaller dot pitch (the distance between two pixels) than LCD panels with conventional aspect ratios, as they have higher resolutions for identical or smaller screen surfaces. The higher the resolution, the more pixels are viewable. By displaying more pixels in the same screen area, the physical size of the pixels will get smaller, resulting in smaller images and reduced text size. Typically, the size reduction of the text displayed varies from 5% to 10%.

36pt Text
48pt Text

Obviously, this can be solved by modifying the font rendering details, i.e. by increasing the pixel size of the fonts or the number of pixels to display push buttons in order to achieve similar readability. This, however, will have a negative effect on the customer applications.



Screen resolution

Changes in LCD aspect ratio will also affect the screen resolution. It is important to define the required pixel width and height compared to the current image input resolution in order to avoid image loss. If, for example, an SXGA input (1280x1024) is displayed, without scaling, on a widescreen LCD featuring a 1920x1080 resolution, black screen borders will be displayed.

If an image with an UXGA resolution (1600x1200) is displayed, without scaling, on a widescreen LCD, only a WUXGA resolution (1920x1200) can boast the same horizontal line width.

All other widescreen resolutions will fail to offer 1200 lines native:

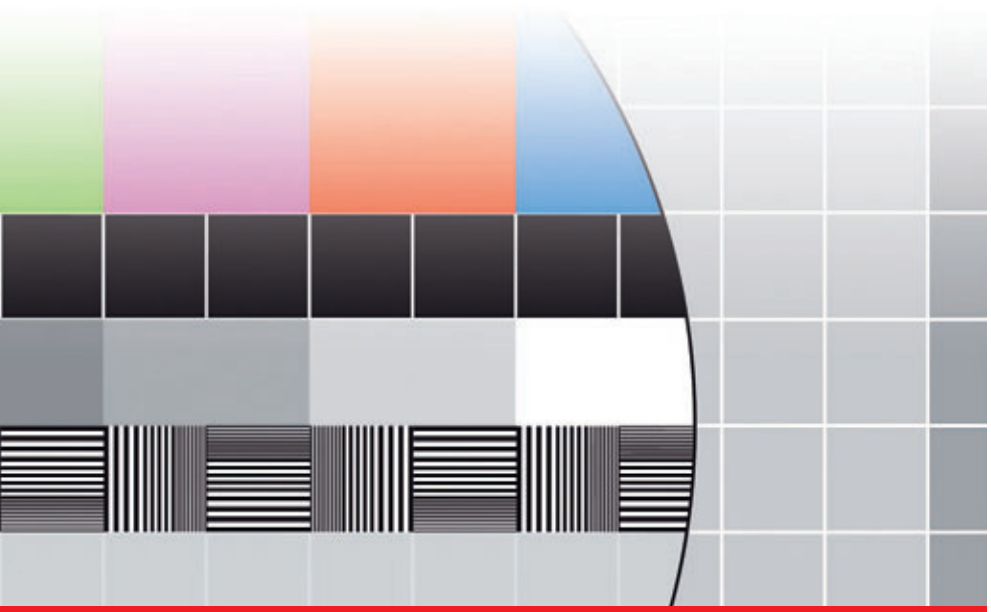
- FHD, 1920x1080: 120 lines short to display a 1600x1200 image
- HD+, 1600x900: 300 lines short to display a 1600x1200 image
- WSXGA+, 1680x1050: 150 lines short to display a 1600x1200 image

UXGA image displayed on a WUXGA (1920 x 1200) screen

UXGA image displayed on a FHD (1920 x 1080) screen

UXGA image displayed on a HD+ (1600 x 900) screen

UXGA image displayed on a WSXGA+ (1680 x 1050) screen



Impact on Barco's current product offering

Depending on what is most important; screen readability, identical resolution or mechanical compliance, several alternatives are possible, though each alternative has its downside. Choosing an LCD panel that corresponds to the width of the original panel will decrease resolution or change the dot pitch. Conversely, when maintaining the original resolution without scaling, a wider LCD panel will be required.

		Widescreen alternatives and consequences				
		Screen readability (same dot pitch)	Screen content (same resolution)		Mechanical fit (same width or height)	
Screen characteristics	Product RFD-251	18,5″ HD	19″ WSXGA+	21.5″ FHD	19″ WSXGA+	21.5″ FHD
Screen ratio	5:4	16:10	16:10	16:9	16:10	16:9
Resolution (p)	1280 x 1024 (SXGA)	1366 x 768 (HD)(1)	1680 x 1050 (WSXGA+)	1920 x 1080 (FHD)	1680 x 1050 (WSXGA+)	1920 x 1080 (FHD)
Pixel pitch (mm)	0.312 x 0.312	0.299 x 0.299	0.244 x 0.244(2)	0.265 x 0.265(2)	0.244 x 0.244(2)	0.265 x 0.265(2)
Screen size(mm)	399 x 320	408 x 230	410 x 256	508 x 286(3)	410 x 256	508 x 286(3)

(1) leads to image loss (vertically) • (2) results in reduced readability • (3) requires adaptations to the display housing (console, rack)

		Widescreen alternatives and consequences			
		Screen readability (same dot pitch)	Screen content (same resolution)	Mechanical fit (same width or height)	
Screen characteristics	Product TL-351	22.5″ WUXGA	22.5″ WUXGA	19″ WSXGA+	22.5″ WUXGA
Screen ratio	4:3	16:10	16:10	16:9	16:10
Resolution (p)	1600 x 1200 (UXGA)	1920 x 1200 (WUXGA)	1920 x 1200 (WUXGA)	1680 x 1050 (WSXGA+)(1)	1920 x 1200 (WUXGA)
Pixel pitch (mm)	0.255 x 0.255	0.252 x 0.252	0.252 x 0.252	0.244 x 0.244(2)	0.252 x 0.252
Screen size(mm)	408 x 306	483 x 302(3)	483 x 302(3)	410 x 256	483 x 302(3)

(1) leads to image loss (vertically) • (2) results in reduced readability • (3) requires adaptations to the display housing (console, rack)

Barco's new widescreen displays

Rugged wide aspect ratio displays already available from Barco's product range are the TL-361, TX-338 and RFD-357.

TL-361, 24" WUXGA LCD, 16:10

The TL-361 is Barco's 24" thin and lightweight display offering significant benefits with respect to dimensions, ruggedization and intelligence. Combining unmatched thinness with exceptionally low weight, the TL-361 is a unique, rugged display solution, especially for applications where space and weight are critical.
The TL-361 features a first-class 24" Active Matrix Liquid Crystal Display offering excellent performance in terms of brightness, crispness, contrast and viewing angle. Several options and bezel configurations are available to address virtually any mounting need in any application.
Barco's TL-361 is fully qualified for application in harsh environments. Next to the standard ruggedization level, Barco offers two extra ruggedization levels, which are suited for specific naval combat, army and airborne applications.

TX-338, 15.4" WUXGA LCD, 16:10

Barco's TX-338 is an extremely rugged 15-inch widescreen (1920x1200 pixels) display for the highly demanding environment of the ground army vehicle, helicopter or utility vehicle. The TX-338 offers an ideal solution for battlefield management, fire control, driver's view enhancement, reconnaissance or local situational awareness inside today's rugged vehicles.
Barco's TX-338 display offers the latest proven technologies, such as low-reflection touch screen, NVIS capability and sunlight readability. The TX-338 features a unique thermal management system which makes the displays fit for the harshest temperature environments. The combination of low-risk, proven display technology with Barco's innovative display concepts makes the TX-338 the most trusted mission-critical display for vehicle operations on the market.

RFD-357, 22.5" WUXGA LCD, 16:10

The RFD-357 is a 22.5" widescreen rugged flat display with 10-bit image quality, which offers superior visualization and operational performance in harsh naval environments. Being the first rugged display to offer superior 10-bit image quality under all conditions, this flat high resolution widescreen monitor is suited to be used in combination with a wide range of sensors – including hi-res sensors. The rugged design, small footprint and long term support make the RFD-357 the perfect visualization solution for all military vessels.

Barco is currently researching other widescreen LCD sizes to further expand its product portfolio.

Barco commitment

Barco will honor all its contractual commitments towards its customers for ongoing projects. The industry tendency towards widescreen LCD displays is a market trend and not an End of Life notice.

Barco will continue to support and offer services to its customers on products already delivered, up to 7 years after delivery and in line with the Barco support policy.

Barco invites you to discuss your future requirements for display solutions with your local sales representative. Several scenarios – a long-term support contract, a new display design or a technology upgrade - can be discussed to best suit your needs.

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