

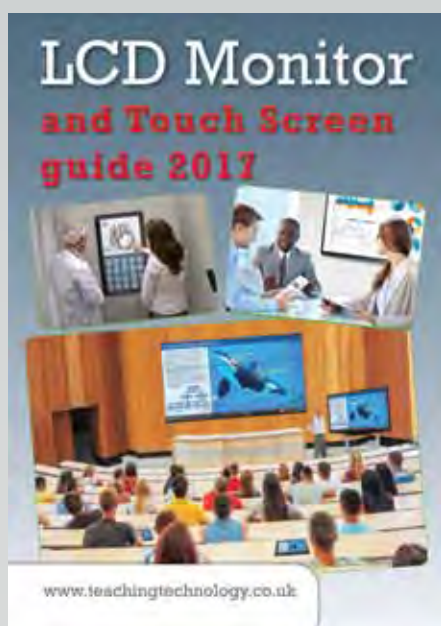
LCD Monitor and Touch Screen guide 2017



LCD Monitor

guide 2017

Audio Visual Guides





NEC large format display in a corporate meeting



Sharp interactive display and video wall

LCD MONITOR GUIDE

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MARK A. ADAMS
LINDA S. ADAMS

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No claims arising from this guide can be accepted. It is a guideline only.

LCD monitor and touch screen guide 2017

Since we began writing our LCD monitor guide in 2002, to help you keep updated on the latest technology, we have seen many changes along the way.

When interactive whiteboards began to have an impact about 7 years ago, there was growth in projectors and boards alongside LCD desktop monitors. Since then large format displays have become larger, with Full HD and now Ultra HD 4K models.

With the trend of work-from-home and many executives on the move, laptops, tablets and smart phones mean that more and more of us are using mobile devices. Therefore, when we see an interactive touch screen display in a public area, either for wayfinding, accessing information or interactive shopping, we expect to use it like a giant tablet with all the pinch and zoom gestures.

However, there are also other technologies that touch screens use, such as in medical, where you may need to use gloved hands. The aim of this guide is to give you an overview of LCD monitors and touch screens, keeping technology simple with solution ideas.

www.teachingtechnology.co.uk

LCD monitors



NEC large format displays

LCD desktop and specialist monitors from 15" and large format displays from 32"

This LCD monitor and touch screen guide is intended to give an overview of the different types of LCD monitors on the market, from desktop models to large format displays designed for public areas including video walls digital signage applications.

We look at the differences between buying a consumer TV intended for 4-5 hours viewing a day, compared to professional displays some of which are designed to be used 12/7, 16/7 or 24/7 for a range of applications.

Desktop computer monitors are available in 4:3 video format and 16:9 or 16:10 widescreen formats, in sizes from around 15" to 32" diagonal.



Samsung small signage display

10" small signage displays have recently come onto the market that allow product information to be viewed by customers. Also touch screens for customer interactivity.

Specialist medical monitors are available for healthcare for diagnostic, review and reporting of medical images. For example, X-Rays, CAT scans and MRI images can be viewed on desktop medical monitors, perhaps with students observing on large format portrait (vertical) displays for medical training.

Other specialist desktop LCD monitors include colour correction models for CAD, photographic, publishing and other colour critical applications.

Large format displays start from 32" upwards and are used for a variety of applications across several industries. You can buy IP (Ingress Protection) rated outdoor screens or TV's for hotel gardens, pub patios and spa and pool areas; dust and grease proof monitors for fast food restaurants and factories; and high brightness 'sunlight readable' screens for displaying information in shop and office windows, especially for digital signage applications.

LCD monitors may be referred to as TFT LCD monitors. A Thin Film Transistor (TFT) is a variant of Liquid Crystal Display (LCD) and is widely used for TVs, computer monitors, projectors and mobile phones. In-Plane Switching (IPS) panels give wide viewing angles and good colour and can be found in high-end monitors.

More common these days are LED monitors, also referred to as LED TV's or LED panels. These monitors are LCD monitors with LED (light emitting diode) back-lighting. LED display screens are much thinner in design than traditional LCD monitors, use less power consumption, therefore saving energy, and the LED's can be controlled, for example, dimming the light in bright environments. Coupled with high contrast, LED TVs and LED monitors display images with deeper blacks and richer colours.

Large format display (LFD) screens for public areas can often be used (depending on make and model) in either landscape (horizontal) or portrait (vertical) mode. Large displays screens in portrait mode are particularly useful when reviewing medical images for medical training, or for life size images in museums and galleries or in retail for displaying fashion show videos.

Large widescreen LCD monitors are impressive for exhibition stands and reception areas. Four, nine, twelve or sixteen 32" up to 98" diagonal screens wall mounted to form a video wall are ideal for shopping malls, sporting events and concerts. There are desktop, wall and freestanding mounting options to support multiple monitors, either for desktops or large format video walls. For example, a collaborative working table, sited against a 16-screen video wall on a freestanding tear-down video wall, looks impressive on exhibition stands.

The size of the bezel (the screen's surround) is important when using display screens in video walls. Some screens have an almost seamless bezel, but these tend to be more expensive than standard size bezels.

Some manufacturers large format displays have Open Pluggable Specification (OPS) slots to accommodate a slot-in PC, ideal for displaying digital signage presentations at varying times of the day in bars, restaurants, schools and retail stores.

LCD TVs / LED TVs are designed for home users and generally have a manufacturer 1 year RTB (return to base) warranty, designed for watching TV 4-5 hours a day. Commercial LCD monitors, especially those that are warranted for 24/7 usage, are of much better build, have more inputs, and better warranties, such as 3 year RTB or 3 year swap-out where the manufacturer swaps your display for one of similar age and usage.

Commercial hotel TVs are available for hospitality and hotels and these can include clocks and provision for hotel logo and menus. Models that allow cloning save time, for once you've chosen settings such as maximum volume, then you can save the settings onto a USB memory stick, which can then be inserted into all the hotel TVs in the establishment and the settings transferred simply and quickly.

Touch screen overlays are available for LCD monitors. However in recent years there has been a growth of touch screen monitors and so overlays are not as popular now. Single touch, dual touch or multi-touch displays which let you use gesturing such as zoom and pinch, are in use for many applications. 4-point, 6-point, 10-point or more are available on the market.

Large widescreen touch screens with anti-bacterial coating, so they can be wiped down, are ideal for medical applications, for example, on hospital wards for bed management. Anti-bacterial wall brackets and trolleys are available to complement medical monitors.

When choosing touch screens it is advisable to seek specialist advice before purchasing, as there are several types of touch technology including infrared (IR), optical sensing (OS) and projected capacitive (PCAP). Some are best for drag and drop applications whilst others are better when using gloved hands such as in hospitals, science laboratories and factories.

High resolution surveillance display screens are designed with control centres, security command centres and other security environments in mind. Typical features may include hard glass protection, anti-burn protection, robust for 24/7 usage and technology that reproduces CCTV images at high resolutions.

There are LED modules on the market, made up of small LEDs (light emitting diode), that are often seen as an LED videos wall, outside cinemas, aquariums, stadiums, large storefronts, shopping centres and other installations requiring a large screen, indoors or outdoors. LED video walls are used indoors at music venues, where a music video can be displayed as a backdrop to a performing band. For outdoors you will need an LED video wall with at least IP65 rating. These LED displays are not to be confused with LCD LED which are LCD screens with LED back-lighting.



NEC medical monitor



Unicol triple ceiling mount



NEC 10mm outdoor LED module

LCD technology



Samsung commercial hospitality TV

Displaying video and LCD televisions

LCD monitors are normally designed for computer use and so anything that can be run on the computer will appear on the monitor. If the computer has a DVD drive, then you can play DVD movies with DVD player software...

LCD monitors normally have a High-Definition Multimedia Interface (HDMI) or Digital Visual Interface (DVI) port on the back to connect a DVD player, Freeview box or other video source into them. Prior to these video ports, you would normally have connected devices using component video inputs.

In the UK, we usually look in high street retailers when we want a new television. You can buy a 32" diagonal HD Ready LED TV (LCD TVs with LED back-lighting) for around £169 including VAT, a 42" Full HD Freeview HD Smart TV for around £299 including VAT and a 55" 4K Ultra HD TV for around £679 including VAT. Other sizes include up to 75" diagonal, which for a 4K model would cost around £4,999 including VAT. Being TVs, they come with speakers, a built in digital TV tuner, most come with Freeview or Freeview HD, and a desktop stand.

Full high definition (Full HD 1920x1080 pixels) Smart LED TVs are slim models which normally include Freeview HD, an Internet browser and Apps (Applications) and a USB connection which lets you view your digital photos, music and movies on a large screen and even play your digital music from a USB memory stick. You can also pause live TV. Smart Apps may include

BBC iPlayer, for catching up on missed BBC TV programmes, Netflix for watching digital movies, YouTube for uploading and watching videos, Skype for instant messages and a social media website, for keeping in touch with family and friends. You can share content from your laptop, tablet or smart phone with your TV. Smart TVs with an in-built HDD recorder (digital video recorder) allow you to pause and rewind live TV.

A Smart 3D LED TV, for example, lets you view television programmes in 3D. There are two types of 3D, passive or active. Passive 3D is cinema-like 3D that you view with inexpensive passive 3D glasses. Active 3D uses battery operated shutter glasses, which are more expensive than passive 3D glasses.

Combi TVs, normally up to 40" diagonal, are televisions with built-in DVD player and are ideal for bedroom or study room.



Toshiba hospitality TVs create a more engaging experience for guests, with a stream of impactful entertainment and information. Affordable HD and Full HD displays, with integrated software that's developed for hospitality.

LCD televisions are video compatible LCD monitors that have a TV tuner built in. A TV tuner allows television signals to be received. An external TV tuner box can be purchased for use with any video compatible LCD monitor which will effectively turn it into a television. You can connect satellite systems and digital set-top boxes on any video compatible LCD monitor to receive digital television signals, such as Sky. Games consoles such as the PlayStation 4 or the Microsoft X-Box, can also be connected.

Commercial LCD TV models are designed for use in business premises, such as bars, hotels and restaurants. Commercial TVs with hotel mode allow you to customise display settings such as setting a maximum volume control, and then copy the settings onto a USB Flash memory, which can then be copied to other hotel mode TVs. Some hotel TV's have digital alarms for guests to organise their own wake-up calls, which normally switches on the TV at the set time.

LCD monitors

LCD desktop monitors are commonly used in education and business administration, whilst large format displays (LFD) are designed for commercial applications, especially in reception areas, museums and galleries, education, airports, retail and other public areas. These usually do not include a TV tuner. Most do not include speakers or any sort of stand in the basic price. When you add speakers or a soundbar and a stand or wall mount bracket, you are looking at paying around 50% more for what looks like an LCD TV.

The reason for paying around 50% more for the commercial LCD monitor, is the usage. LCD TV's are for home use and are designed to be used 4-5 hours per day and usually have a manufacturer 1 year RTB warranty.

Commercial LCD / LED monitors are designed to be used 12, 16 or 24 hours per day (depending on make and model) as information displays. They usually come with 2 or more years manufacturer swap-out, collect and repair or on-site warranty and have a far higher build quality and choice of inputs. For example, a London retail chain put consumer TVs in their shops to display video advertisements during opening hours. After a few months the TVs began to fail, as they were not up to the task of being used 10 hours per day.

Large format displays (LFD), may offer both landscape and portrait mounting options. Another difference is the connectors (inputs) on the back of the LCD monitors, there normally being more connectivity on commercial models than on consumer ones.

If you want to display digital signage software presentations on a display screen in a shop window, then buy an LCD monitor not an LCD TV. However, if you want to show TV in reception areas, then a commercial TV would be a better option than a consumer TV. Aqualite, for example, specialise in Ingress Protection (IP) rated TVs and sunlight readable TVs for outdoor use for commercial applications. They manufacture both weather-proof and waterproof televisions for indoor and outdoor entertainment, digital signage and advertising displays. Samsung include MagicInfo Lite with their LFDs, which use an HTML5 browser to display basic digital signage presentations on screen.



AVer flatbed visualiser

Monitor brightness and contrast

Brightness is measured in candelas (cd/m²) and LCD monitors normally range from 250 to 700 cd/m². The brightness doesn't usually matter if you are using an LCD monitor on your desk, but if you are using one as a display board in a reception area for example, the brighter the better. High brightness models are available, sometimes referred to as 'sunlight readable', which have around 1,500 cd/m², designed for use in retail stores where ambient light is very bright and for shop and office windows, especially south facing where bright sunlight can be a problem.

The contrast ratio is the difference in definition between the colours black and white when displayed on screen. The higher the number, the better the definition and the better the colour black is displayed on screen which gives a better image especially if you are playing DVD movies.

Video cameras and visualisers (document cameras) can also be connected into an LCD monitor with a video port. Visualisers are desktop cameras with a flexible neck, flatbed or ceiling mounted, the latter being used in operating theatres for displaying live images and in higher education for demonstrations. Visualisers allow you to display small objects and documents onto an LCD monitor or large format display screen. The images or video can be captured to a computer. Some models have one-touch recording ideal for science experiments. HD video cameras are ideal for video conferencing.



Lumens HD video camera

Aspect ratios and screen resolutions

Computer screen images are made up of pixels (dots)

Pixels	Resolution name	Aspect ratio (screen shape)	Used by
800x600	SVGA	Non-widescreen 4:3	Used on some older computers
1024x768	XGA	Non-widescreen 4:3	Used by most computers with 15" LCD monitors and most non-widescreen notebooks
1280x720	WXGA	Widescreen 16:9	HD Ready video
1280x800	WXGA	Widescreen 16:10	Used by many 15.4" widescreen notebooks.
1280x1024	SXGA	Non-widescreen 5:4	Used by some medium format LCD monitors, e.g. 19" monitors
1366x768	WXGA	Widescreen 16:9	HD, used by some desktops which connecting to display screens
1440x900	WXGA+	Widescreen 16:10	Common for widescreen monitors
1400x1050	SXGA+	Non-widescreen 4:3	Commonly used on 14" or 15" laptops
1680x1050	WSXGA+	Widescreen 16:10	Commonly used on widescreen 20", 21" and popular 22" LCD monitors
1600x1200	UXGA	Non-widescreen 4:3	Used by many computers with LCD monitors above 19"
1920x1080	Full HD	Widescreen 16:9	True HD (high definition)
1920x1200	WUXGA	Widescreen 16:10	A wide version of UXGA and can be used for viewing HD TV content
2048x1526	QXGA	Non-widescreen 4:3	Quad XGA, four times the pixels of XGA
2048x1152	QWXGA	Widescreen 16:9	A wide version of QXGA
3840x2160	UHD 4K	Widescreen 16:9	Ultra HD, also known as 4K

XGA (Extended Graphics Array); WXGA (Wide Extended Graphics Array); SXGA (Super Extended Graphics Array); SXGA+ (Super Extended Graphics Array Plus) WSXGA (Wide Super Extended Graphics Array); UXGA (Ultra Extended Graphics Array); WUXGA (Wide Ultra Extended Graphics Array). QXGA (Quad Extended Graphics Array); QWXGA (Quad Wide Extended Graphics Array); 4K Ultra HD (four times HD).

You can find out which resolution your computer is using on Windows based machines by opening the Windows Control Panel Settings and searching for the System Display option. Do this for all the computers you may be using with your LCD monitor.

On any type of screen, the more pixels there are, the finer the image. Fine images, made up of lots of pixels (dots), are important for detailed images.

Generally, 15" LCD monitors have a maximum computer resolution of 1024x768 pixels. This would not be a problem as a higher resolution would result in text and icons being too small to display properly on the screen. 17" and above LCD monitors usually have

a maximum resolution of 1280x1024 pixels or 1600x1200 in some cases. The number of pixels makes a difference normally only if you are involved in graphic design and need high resolutions for creating very fine images. If you need a resolution of 1280x1024 then you need to purchase at least a 17" monitor.

Please note, if you know which resolution you want to work at, then make sure you get a screen with exactly that number of pixels. For example, don't buy a screen with 1600x1200 pixels if you are going to work at 1280x1024, as dropping the screen resolution using Windows control panel will give poor results. This is because the screen would have to stretch 1280x1024 pixels to fit the larger 1600x1200 physical pixels and you end up with a grainy image.

Aspect ratios

Aspect ratio is the shape of the LCD monitor, for example:

4:3 aspect ratio - the width of the screen being 4 parts long and 3 parts high.

16:9 is 16 parts long and 9 parts high.

16:10 is 16 part long and 10 parts high.

4:3 video format



Image courtesy of iiyama

5:4 wider than 4:3



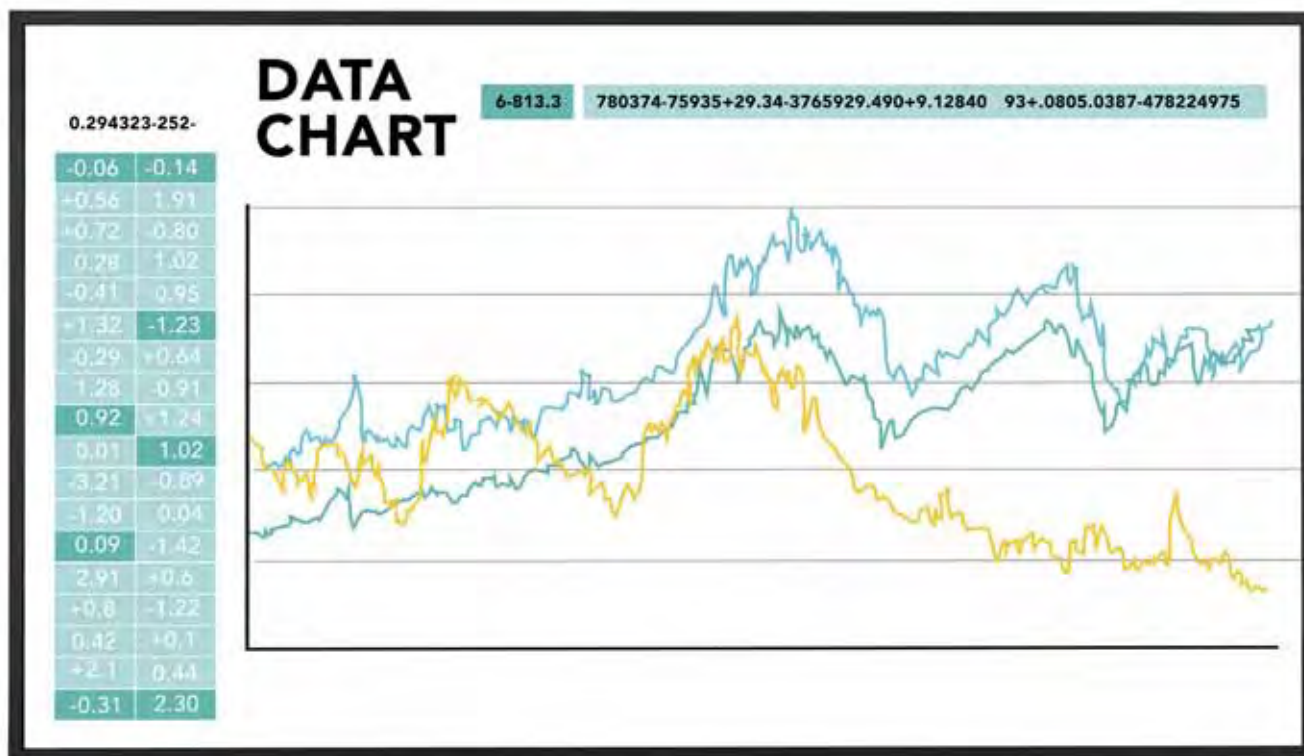
Images courtesy of NEC Displays

16:9 widescreen



16:10 widescreen





Toshiba TD-U series of 24/7 4K 3840x2160 resolution Ultra HD professional signage displays can show up to 4 separate FULL HD inputs simultaneously via split screen. An OPS Slot allows a slot-in PC for displaying signage presentations

Full HD v 4K Ultra HD

Full HD (high definition) resolution has 1920x1080 pixels which is the equivalent of 2.1 megapixels. This is a viewing aspect ratio of 16:9 and gives a widescreen image and is the typical shape of most commercial displays and consumer TVs today.

Ultra HD has four times as many pixels as Full HD (3840x2160) and can deliver stunning picture quality, regardless of screen size.

Traditionally, Full HD images can begin to break up and lose detail on TV screens of 55" or 140cm and above. With an Ultra HD TV, you get incredible resolution allowing you to enjoy uncompromisingly crisp, clear images and text - even when sitting close to the screen.

Ultra HD is also known as 4k2k - and is one of the most talked about and desirable new technologies on the market. This technology will have a huge effect on how we watch things in the future. This is because Ultra HD delivers by far the most incredible picture quality to date.

This will effect everything you watch from movies to TV shows and from documentaries to sports - all in new levels of details.

It will definitely have an effect on business presentations and educational content - especially and on a screen that is virtually cinema size.

Ultra HD is the equivalent quality of an 8mp image. Great for images taken via digital cameras, smartphones or even tablets. Plus, if connected to a laptop with the ability to output 4K via HDMI, you can watch videos as well as images in Ultra HD quality. Perfect where detail is everything.



Samsung curved monitor for businesses helps reduce eye strain

SD (Standard definition) 640x480
 HD (High definition) 1280x720
 Full HD 1920x1080
 Ultra HD 4K 3840x2160

Inputs and connectors

When you want to connect your computer to a TV or LCD monitor you can use the analogue VGA connector, or the digital connectors - DVI, HDMI or DisplayPort. Not all of these ports will be available on your LCD monitor or TV as it depends on individual makes and models. It is useful to check the manufacturer's specification sheet prior to purchase.



DVI port - VGA 15-pin

The above picture shows a DVI port on the left and a normal monitor (VGA) port on the right.

DVI (Digital Video Input) carries video signals but not audio. As most LCD monitors do not include speakers, this isn't likely to be a problem.



HDMI cable

The majority of TVs and many LCD monitors have HDMI (High Definition Multimedia Interface). Being multimedia it carries video and audio signals.



DisplayPort connector

DisplayPort is a new generation AV interface developed by the display industry for a wide range of tablets, notebooks and desktop computers as well as monitors. It is administered by the Video Electronics Standards Association (VESA). DisplayPort products currently support up to 4K video, and the release of DisplayPort 1.3 enables higher resolution including 5K monitors (5120x2880), using a single cable. DisplayPort 1.4 features Display Stream Compression 1.2 transport, Forward Error Correction, enhanced display resolution (e.g., 8Kp60Hz HDR deep color) and expanded audio transport capabilities. For more information please visit www.vesa.org



CYP HDMI 1 to 2 distribution amp

There are many solutions on the market for splitting and distributing signals. For example, CYP's HDMI 1 to 2 distribution amplifier supports 4K resolutions. Besides splitting and distributing, the CYP QU-12S has signal amplification and equalisation to provide high performance input / output of high resolution audio and video.



USB hubs

The picture above left shows a 4 port USB hub (Universal Serial Bus) on the back of an LCD monitor. The picture above right shows a two port version.

In a normal computer set-up a mouse and a keyboard are connected to the computer. The mouse and keyboard wires trail across the desk and back to the computer, which could be on the desk or under it. Most computers now have USB keyboards and mice which plug into a USB port on the computer.

Some LCD monitors have a USB hub built-in, which is then connected by a single USB cable back to the computer base unit. You can then connect your USB keyboard, USB mouse, USB web cam, USB digital camera, etc, into the monitor base. The USB hub therefore simplifies your cabling especially if the computer base unit is ever removed for repair or upgrading.

Devices such as digital signage media players (mini PCs) normally have USB connectors, for the connecting of a keyboard and mouse, for example, a Nexcom NDiS media player with Windows operating system. When connected to your display screen, you can then create your digital signage presentation on compatible software, for example, Repeat Signage digital signage software, and schedule your presentations to play on screen.

Speakers



NEC side speakers for LFD



NEC rear speakers for LFD

Unlike televisions which include speakers, most LCD monitors and large format displays (LFD) do not come with speakers. Some makes and models offer optional speakers or soundbars.

A cable comes from the speakers on the monitor to plug into the speaker socket on the computer.



NEC MultiSync® Soundbar Pro



Soundbars, designed to be in line with the display, normally require only a few clips for easy installation and removal, using convenient USB power source.

Energy saving and technology Warranties



iiyama light sensor feature

Most LCD desktop monitors and large format displays (LFD) now have energy saving features. You may see TCO (total cost of ownership), followed by a number, for example, TCO 5.0 This tells you what level of energy saving the LCD monitor is. This is a bit like the A, B, C energy ratings you now see when you buy a new fridge or washing machine at home. Displays also have to be less than a certain wattage when on standby.

LED TVs and LED monitors are actually LCD TVs and LCD monitors with LED (Light Emitting Diode) back-lighting. LEDs are energy saving and can be controlled, therefore you some displays, such as iiyama ProLite large format displays, have ambient light sensors. The ambient light sensor detects changes in environmental lighting conditions and automatically adjusts the screens LED backlight brightness to compensate for and increase or decrease in light. LED TVs and LED monitors are also much slimmer in design. There are also LED panels made up of several individual LEDs, ideal for stage backdrops and large advertising displays.

As technology develops and continually improves, you will see display manufacturers using different technologies for their panels. For example, the iiyama ProLite 65" touch screen display uses AMVA3 technology. AMVA3 technology offers higher contrast, darker blacks and much better viewing angles than standard TN (twisted nematic) technology. The screen will look good no matter what angle you look at it.

IPS panel technology also offers higher contrast, with darker blacks and much better viewing angles than standard TN technology.

Another function available on large format displays (LFD) and most televisions, depending on make and model, is PiP (Picture in Picture). This function allows you to watch images coming from two different sources at the same time.



iiyama display with PiP (Picture in Picture)



iiyama display with AMVA3 technology



iiyama display with IPS technology

Manufacturer warranties for consumer televisions tend to be a standard 1 year RTB (Return to Base), which means you return it to the repair centre at your own expense. Using consumer TVs in commercial premises usually negates the warranty.

Warranties on commercial LCD monitors and large format displays, are usually 2 year RTB or more.

Some manufacturers offer an on-site warranty, which normally means a visit to your premises within a set number of hours to repair the display.

C&R (Collect and Repair) warranty is when a courier collects the faulty display and once repaired the manufacturer's repair centre will ship it back to you.

Swap-out warranty is where your faulty display will be taken away and you are given a replacement of similar model and age as a swap.

For education, a manufacturer warranty may be 3 year de/reinstall. This means that the display will be de-installed from its mounting, taken away for repair and then re-installed. This saves time and expense on the educational establishment and gives peace of mind for 3 years.

Many of the manufacturers of leading brands of large format displays have models in their range that are designed for 24/7 (24 hours a day, 7 days a week) applications, such as in airports and 24/7 supermarkets.

However, it is important to read the manufacturer's warranty to check whether their warranty does cover you if the LCD monitor is in use for the full 24 hours every day, or whether they recommend it be switched off periodically.

Displays with 24/7 operation are ideal for cost efficient retail signage, museums, art galleries, higher education, hospitality suites, conferencing applications and lobby or reception installations not exceeding 16/7 operation time.

Landscape and portrait modes



Sharp large format display in portrait mode

Manufacturers such as AG Neovo, BenQ, iiyama, InFocus, LG, NEC, Panasonic, Philips, Samsung, Sharp, Sony, Toshiba and ViewSonic, have large format displays in their range that allow you to change from landscape (horizontal) to portrait (vertical) mode.

Portrait mode is especially useful in medical training so that students can view X-Rays and other medical images. Museums can benefit from using large format displays in portrait, to bring history to life. Fashion show videos with life size models on portrait displays are ideal for shopping centres.

Two or more monitors on a multi-monitor landscape or portrait stand are ideal for financial and trading applications.

Video walls are commonly 4, 9, 12 or 16 large format displays in landscape mode. Ideal for retail and public areas. Samsung, utilised 250 screens in a large single video wall display. You can also create a matrix of screens of varying sizes into a video wall.

Four or more displays in landscape mode mounted side-by-side are favoured in fast food restaurants. These are sometimes referred to as digital menu boards, especially when used with digital signage software.

Large format displays that allow face-up or table-top installation are ideal for coffee bars and hotel lounges where customers can read menus and place orders directly from their table.

NEC large format displays for landscape, portrait and face-up installations



Privacy filters



3M™ privacy filters



NEC LCD desktop monitors are available incorporating a 3M™ privacy filter or the filters can be purchased separately for existing LCD monitors

Privacy filters keep information private. When you walk into a high street bank there is normally a privacy filter fitted to the receptionist's LCD monitor.

Teachers and school administration staff working on sensitive data such as students' personal information, students' examination results, school accounts and online banking, etc., may be interested to learn that privacy filters are available for LCD monitors, laptops and tablets to help protect sensitive information from unauthorised viewing.

The filter is available in reversible glossy finish or matte finish, the latter reduces discomfort from screen glare. LCD desktop monitors and touchscreens already fitted with 3M™ privacy filter are also available.

3M privacy and protection product range includes privacy filters and anti-glare screens for desktops, laptops and Mac devices, as well as privacy, fingerprint fading, anti-glare and ultra clear screen protectors for tablets and smart phones.



In colleges and universities, libraries and museums, where there are open plan reception and office areas, on-screen privacy may well be an issue. The use of privacy filters is beneficial during exam times as a lot of exams are now moving down the e-assessment (on-line examinations) route. With guidelines that exist stating that desks need to be placed a certain distance apart and separated by dividers, it can be an expensive and laborious process for schools to implement. Privacy filters offer an easier and less expensive solution, allowing more computers and students in a smaller space (the filters also comply with JCQ regulations).

3M™ have developed a black filter to fit widescreen desktop monitors available in varying sizes. With a simple attachment system the filter can be removed for screen sharing. Using 3M™ microlouver technology the filter gives you full 60 degree privacy protection from either side of the monitor, thus protecting your information.



3M™ gold privacy filter for laptops



3M™ black privacy filter for monitors, laptops and tablets

Touch screens



In this article we look at the uses of touch screens and also the different technologies available to make touch screens “touchable”.

Introduction

From the first version of Windows and with Apple computers, a mouse has been used to control the mouse cursor on the computer's screen. Then touch screen monitors became available, which then allowed the mouse cursor to be controlled by touching the screen with either a finger or stylus instead. Programmers could then create programs/applications with large buttons on screen and hide the mouse cursor altogether when using their programs, if necessary. Then we got multi-touch, which allows additional control by allowing more than one finger to control the screen at the same time. Movements such as pinching the index finger and thumb on the screen allowed the resizing of pictures, etc.

Touch screen technologies

This is primarily a guide to touch screen monitors to be attached to a PC and other computers.

The majority of us with mobile phones have moved to smartphones with Android or the iPhone®. These also have a touch screen interface, without any sign of a mouse cursor in sight. There are many different technologies that are used to make screens into touch screens. We are assuming that many of you reading this has a smart phone, so let us start by looking at the technology used in many phones which then gives us a yard stick for comparing the other technologies.

Capacitive technology

The majority of smart phones use a capacitive technology. What this means is that the screen has a small electric current over the surface and when you touch it with your finger a circuit is created as your finger conducts electric currents. If you have ever tried to use your smart phone

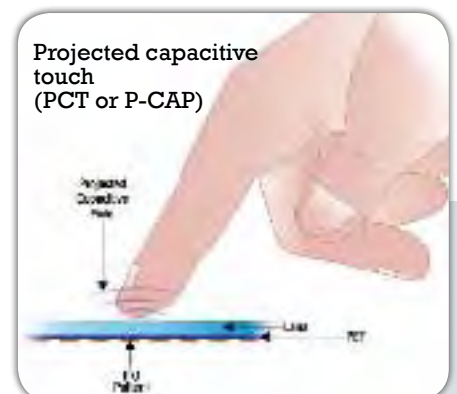
with gloves on, then you will find that it doesn't work (unless you buy special touch screen gloves). This is because your finger is insulated within the glove. This is the main drawback of capacitive technology. You have to either use a body part, or a special stylus (that conducts electric) to use it. You will also find that if it is raining and you try to use your smartphone that you have trouble if the screen gets rain drops on or your fingers are wet. This is because liquids and moisture interferes with the capacitive technology. That said, your phone will be very sensitive and responsive and allows you to use multi-touch gestures (using more than one finger at a time) to control the phone with ease.

There are basically two types of capacitive technology - projected capacitive sometimes known as PCAP, and surface capacitive. The latter tend to be used in large touch screen panels, whilst projected capacitive is often used in smaller screen sizes. The iPhone® and iPad®, for example, use projected capacitive technology.

OK, so hopefully you now (if you have a smartphone) have a grasp of capacitive technology. The next major technology, that has been around for a long time, is resistive technology.

Resistive Technology

Resistive touch screens are made by having a hard but slightly flexible top layer, then a small gap and another layer underneath. When the flexible layer is touched, it presses through to the layer underneath so that the touch screen knows where the screen was pressed. The great thing about



Touch screens

Multi-touch is where you can use 3 or more fingers at a time. For example the three-finger drag is where you touch the top of the screen or a touch pad with your 3 middle fingers (slightly spread) and then drag these around the screen and the selected object will be moved with it.

Touch screens, also referred to as Interactive Flat Panels (IFP) may have 6 point, 10 point, 20 point touch or more. This allows a number of touches simultaneously, for example, three people dragging information with the index finger of each hand would need at least a 6 point touch display screen.

Touch screens with interactive whiteboard software

Large format LCD / LED Interactive flat panels are available with touch, pen, eraser and pen annotation software, for example, InFocus jTouch Whiteboard, which has interactive whiteboard software.

Interactive whiteboard (IWB) software allows you to use the touch screen in the same way as teachers do with interactive whiteboards in the classroom. It allows you to write over the top of information displayed on screen and then save your annotations to a picture file on disk which can then either be printed or emailed. This is a good tool for brainstorming sessions and meetings.

Manufacturers who have interactive flat panels with whiteboard functionality in their range include InFocus jTouch Whiteboard, Sharp's BIG PAD, Samsung E-Board and ViewSonic's ViewBoard. These interactive flat panel displays with interactive whiteboard functionality allow you to draw, take notes and save your work, ideal for both education and corporate.

Interactive flat panel displays can be a good choice for schools rather than going for the traditional whiteboards.

The standard interactive whiteboards use a projector to shine the image on the screen.

If a teacher or child using the whiteboard turns around, they may end up looking into the projector's light which can hurt their eyes.

Short throw and ultra short throw projectors solve the problem of light shining in your eyes and you can purchase an interactive whiteboard with short throw or ultra short throw projector on a fixed or height adjustable stand. Projectors also use expensive projector lamps that will require changing every few thousand hours of use. However, there are laser light source projectors on the market, ideal for higher education and corporate, which require no replacement bulbs, have a life of up to 20,000 hours and almost zero maintenance.

The main thing to weigh up is the cost of an interactive projector and bracket compared to an interactive whiteboard, projector and projector bracket, both with on-going cost of replacing projector bulbs, compared to a large (60" diagonal or over) interactive flat panel display with interactive whiteboard functionality.

Other factors come into play, such as ultra-short throw, room space, product durability, quality of the interactive software and budget. Don't forget that interactive whiteboards are just big touch screens, even though you tend to use touch or special pens and the manufacturer's interactive whiteboard software. It's the software that comes with them that makes them useful for class and meeting rooms.

Interactive whiteboards

Earlier models of interactive whiteboards used either resistive or electromagnetic technology. The latter used special pens to transmit a signal to the receiver in the whiteboard. The

downside to this is that because the pens are electronic, they tended to be expensive to replace and if you lose the pens you can't use the whiteboard. The plus side is that you can replace the surface if it gets damaged as the electronics are in the pen and the whiteboard's surround.

Interactive whiteboards tend nowadays to use Infrared or Optical Sensing technology. With whiteboards, the quality of the software that is shipped with them makes all the difference, rather than the actual technology used.

You may find that a particular hospital, university or business has all one make of interactive whiteboards so that you only need to learn one piece of whiteboard software. 'Open platform' lets you run many other third party software programmes.

Any other touch solutions?

Portable devices such as eBeam and mimio turn dry-wipe boards into interactive whiteboards. Some manufacturers have interactive projectors in their range, so you can project large images onto most surfaces such as plain white walls.

Touch screens in reception areas

Let's imagine that you decide it is a good idea to have a touch screen on the wall in your reception area to promote your products or services.

Your IT manager (or outsourced IT company) may create the software, which can be made with Microsoft PowerPoint®. PowerPoint presentations can be created with buttons (so that someone using a touch screen can easily press them with their finger) that allow the user to navigate between different PowerPoint slides. You can use videos, PDF's, pictures, etc., in PowerPoint slides, to create a good information system quite easily.



BenQ interactive flat panel



Clevertouch Plus LED



Philips Multi-touch monitors

The IT manager could look at other commercial touch screen software or by programming it with software such as Microsoft Visual Basic, but this may be quite costly either in terms of the cost of software or the time it takes to write a program.

Next, a computer base unit is needed to play the touch screen presentation, which could be an old model laying around (it would need Windows® operating system) or you could use a digital signage player.

Some signage players have Windows Embedded software, which is a cut-down version of a full Windows® operating system and is normally found in small mobile devices such as signage players. Windows Embedded Pro 8.1, for example, is designed specifically for building automated solutions and embedded devices, such as kiosks, medical devices and digital signage solutions.

Then the touchscreen itself is needed. This will look like any other LCD monitor but will also have a mouse cable that goes back to the computer base unit. This cable sends back where the user has touched on the screen, so that the computer knows where the mouse cursor should be.

You can now start searching the Internet looking at different touch screens which will usually range in size from 15" to 98" diagonal. A good 17" on the reception desk may do the job costing from £260+VAT. Whilst a 42" touch screen used for way finding in a large reception area will cost from £930+VAT upwards.

The size of the screen is really going to be determined by your budget. So you narrow it down to the size and screens you can afford. Then you come to the choice of different technologies.

Which technology do I choose for the reception area touch screen?

In this example, as your visitors using it will be in a nice warm reception waiting area and using their fingers, then it really doesn't matter. Go for one within your budget, as large as you can afford and with the best warranty. Look for a warranty with 3 years (or better) and with the highest number of pixels in your price range.

The other thing to watch out for is the cable type. We mentioned that you need a "mouse cable" going back to the computer. You need to make sure the touch screen uses USB, which will work with all your computers, unless you specifically need serial and understand the difference.

Keep in mind that touch screens are not vandal proof and should be installed in areas that are monitored. By monitored, we mean areas where there are usually members of staff, such as in a reception area.

Some touch screens have reinforced glass and although the glass is vandal resistant the actual product isn't. Even the touch screen kiosks you may have seen in shopping centres are not completely vandal proof. Here too, a shopping centre is a monitored area, often with security guards and CCTV.

You can buy protective overlays but these do not work with touch screens.

There are LCD touch screen kiosks sealed for weather resistance with protective glass to deter vandalism, ideal for unsupervised public areas.

What if I want a video wall of touch screens?

Video walls are made of multiple screens either close together such as a 2x2 video wall which has 4 screens

(or a matrix of various size screens). The computer or video image is then spread across all of the screens. The downside is that there is a small gap between screens. When you watch the news on a TV channel, you often see presenters standing in front of a giant screen, but when you look at the screen you can see lines which are the gaps between the screens that make up the video wall. The size of the bezel (surround) determines how big a gap you get between the screens. Some manufacturers have LCD screens which are almost seamless (bezel-less).

I need to wear surgical or disposable gloves

If you are installing touch screens in areas such as a biology lab in a university teaching hospital, then you would need to choose the technology carefully. Using a touchscreen to control a computer, instead of using a keyboard and mouse, in areas where medical style gloves are needed, then out goes surface capacitive technology as gloves will not give the conduction that they need. In this situation, you are left with Resistive, Projected Capacitive or Optical Sensing Technology. Optical Touch and Projected Capacitive are normally in screen sizes 32" to 98".

Surface Capacitive touch technology allows only single touch and is used on small screens up to 32" diagonal. Surface Capacitive touch technology has been around for a long time and is mainly used for public access applications and contaminant prone environments. This is because it is largely unaffected by contaminants such as grease, dirt and water. Whilst this is good in biology labs or medical teaching hospitals, the disadvantage is it supports only finger touch (no gloves) or a tethered pen and a severe scratch can affect operation in the damaged area.



Sharp BIG PAD interactive display



Elo Touch interactive display



InFocus jtouch Whiteboard

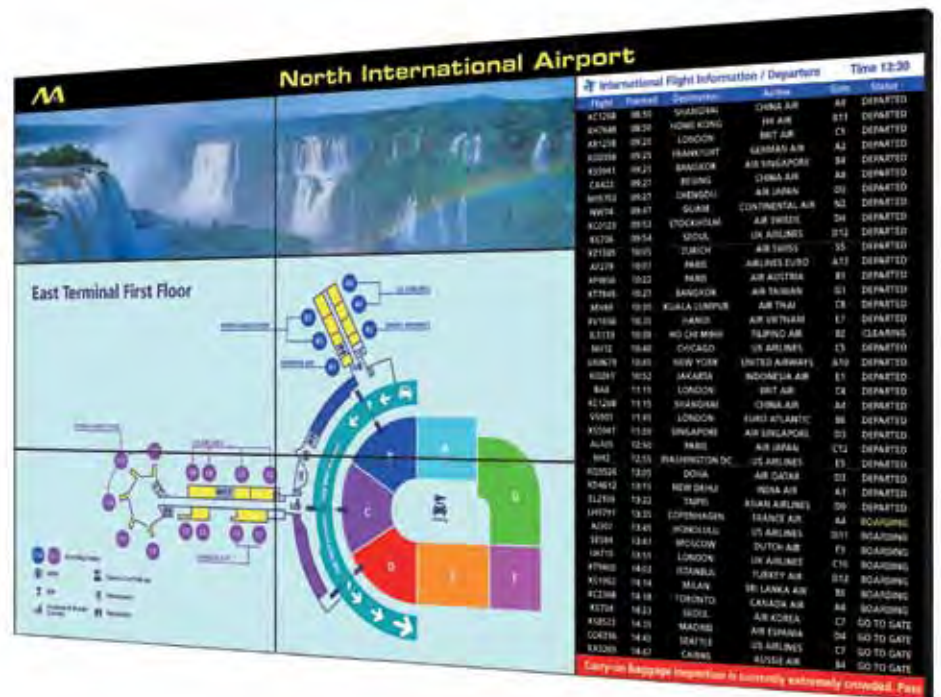
LCD monitor solutions

Airports and transportation

Sharp

Sharp professional display screens include models with ultra slim bezels for video walls with 5x5 capability and OPS module slot for Slot-in PC. Ideal for 24/7 usage with up to 50,000 hours life time.

Content displayed on single large format displays or video walls, usually in 2x2, 3x3, 4x4 and 5x5 configurations, help keep travellers informed with flight information, wayfinding and infotainment. Airport restaurants and fast food outlets can promote menu changes throughout the day, whilst the retail stores can introduce innovative new ways to engage with travellers and drive incremental sales with seasonal promotional messages and offers.



Sharp 9-screen video wall with OPS slot for Slot-in PC for 24/7 operation



NEC Display airport solutions include large format displays for flight information display systems, as split flap board replacements, for restaurant menus, touch screens for way finding, indoor and outdoor giant LED modules and video walls for digital signage to promote retail sales.



NEC Displays

NEC desktop displays for airport operation control centres and CUTE common user terminal displays. NEC 17" and 19" monitors for check-in and ticketing.





iiyama ProLite CCTV LED back-lit LCD displays

CCTV, surveillance, control rooms and command centres

iiyama

iiyama LED back-lit LCD displays, designed for demanding CCTV and broadcast applications, offer fast response time, high contrast ratio and clear and vivid images. VESA compliance allows for easy installation in a surveillance and security environment.



iiyama ProLite 19" CCTV LCD



AG Neovo RX-Series with hard glass protection and Anti-Burn-in™ technology

AG Neovo

AG Neovo RX-Series helps Leeds City Council and Metro build a more efficient and reliable monitoring system. The new control room has been designed to provide the city with a long term public safety facility. Leeds City Council / West Yorkshire Metro installed 78 units of AG Neovo Display of 22" and 42" screens.

NEC Displays

NEC 4KUHD Ultra HD (4 times the resolution of Full HD) display screen are ideal for control rooms and command centres, where precise information needs to be clearly viewed.



Corporate solutions

There are numerous solutions to choose from for the corporate and business world, here are a few:

BenQ interactive flat panels, in sizes 42" upwards, are ideal for corporate and higher education. Their Low Blue Light technology coupled with Anti-glare helps protect your eyes.

CTOUCH large format interactive displays, in sizes 55" upwards, include Leddura, Laser Air and Lexinus series, the latter being an LED 50 point touch display, ideal for corporate applications.

iiyama desktop monitors range in size from 17" to 30" from widescreen WXGA 1280x1024, Full HD 1920x1080 to UHF 4K models, to suit a wide range of office applications. Plus large format displays.

InFocus Mondopad, in sizes 57" upwards, is an interactive touchscreen with soundbar and high quality camera for corporate video conferencing.

LG commercial 4K LED display screens are ideal for corporate applications including a premium video wall solution.

NEC corporate desktop range includes commercial entry level and commercial Enterprise displays up to 30", and Professional Displays up to 32", plus a wide range of large format displays, touch screens, video wall panels and industry specific solutions.

Sharp BIG PAD interactive displays include pen software in sizes 60" upwards, ideal for education, training and corporate applications.

SMART Board® interactive flat panels and SMART Board interactive whiteboards offer SMART Learning Suite software for education and SMART Meeting Pro for corporate, available on annual subscription. SMART Bridgit® allows you to take part in meetings remotely.

Sony BRAVIA Professional displays range from 40" to 85" diagonal, with Full HD and 4K models. These are ideal for a range of applications in education, corporate and retail video walls, in addition to their range of Sony projectors.

ViewSonic VP Professional series of flat panel displays are ideal for high-end corporate solutions. Their range includes ViewSonic ViewBoard interactive displays with annotation software for 16/7 corporate and higher education applications.



ViewSonic VP Professional



iiyama desktop monitors



Sony BRAVIA Professional



SMART Board® interactive flat panel with Meeting Pro subscription software for enterprise (corporate) use



NEC desktop monitors



InFocus Mondopad for brainstorming and video



Sharp BIG PAD interactive flat

Education

SMART Technologies

SMART Board® interactive whiteboards and whiteboard systems (projector and board) for the education market include a 1 year subscription to SMART Learning Suite.

SMART Board® range also includes SMART kapp for business and education. SMART interactive flat panels for education are available in Full HD and 4K Ultra HD resolutions.



SMART Board® projector system



Promethean ActivPanel

Promethean

Promethean's range of products include the ActivBoard PRO series and ActivBoard Touch interactive whiteboard systems, ideal for both business and the education sector.

Next generation ActivPanel, powered by Promethean's external Android processor, brings to life teaching and learning experiences. Other products in Promethean's educational range include an interactive table for primary school children, student response devices, an ActivSoundBar, ActiView visualiser and Promethean software. Teachers also have access to their online resource portal.



BenQ

BenQ's interactive displays are designed to encourage collaborative learning and team building in education and business.

The majority of manufacturers' large format displays and interactive touch screen displays can be used with a media player and digital signage software. For interactive displays however, the digital signage software needs to have touchscreen support.



CTOUCH laser 4K displays

CTOUCH

CTOUCH LED 10 point touch, True 4K resolution displays with anti-reflective glass comes with manufacturer 7 year warranty and Oktopus collaborative software for classroom use.

Energy & Utility



For CCTV monitoring, the NEC MultiSync EA, P and PA desktop monitors are designed for these applications. Hardware solutions with different processor platforms are available for control rooms.

NEC

NEC has a range of hardware and software platforms that include various display solutions, high performance PCs and utility software for monitoring and control.

MultiSync P, XS and XUN series of large format displays are ideal for traffic surveillance and monitoring stations.



Finance



ViewSonic

ViewSonic's VG-Business series of desktop monitors, in sizes 19.5 to 28-inch diagonal, are ideal for a variety of business applications including displaying financial information.

ViewSonic's 28-inch 4K Ultra HD model with ergonomic tilt, swivel, pivot and height adjustment, with Blue Light filter and multiple connections is ideal for financial display.



Sony BRAVIA large format displays



Sony BRAVIA

When it comes to displaying sales graphs and other financial data, Sony BRAVIA large format displays allows your colleagues to easily view information easily, especially when using 4K UHD Ultra HD resolution.

Exhibitions



NEC InGlass™ bezel-free display with optional legs for table top applications



NEC Displays

The NEC 65" XUHD InGlass™ touch table is ideal for exhibitions, showrooms and leisure areas enabling customers to intuitively interact with the content and for collaboration in conferencing and creative multimedia applications. The InGlass™ touch technology creates a completely bezel-free touch surface which is easy to clean and forms the interface to the pixel-free Ultra High Definition visual display. You can use up to 10 simultaneous finger, pen or glove touches and enjoy the real-time touch point accuracy with perfect colour fidelity. Optional compatible table legs complete the tablet-like touch table experience.



UNICOL

Picture above: One of Unicol's exhibition stands supporting a 16-screen video wall on a Unicol free-standing, set-up and tear-down video wall mount and a Unicol Rhobus Huddle table. Repeat Signage software presentation featured Unicol's Rhobus Huddle tables.

Unicol have supported customers for over 50 years with mounting solutions. Their Rhobus Huddle collaborative tables are ideal for meeting areas and a place to sit down with customers at exhibitions.

Unicol Rhobus Huddle tables, in hammer head or oval shapes, allow mounting of single or twin display screens for collaborative meetings, video conferencing or displaying signage applications.



Healthcare and medical

ELO Touch Solutions

Elo Touch Solutions are specialist manufacturers of touch screen solutions with over 40 years experience and sales of over 20 million touch screens around the world.

Elo has the widest portfolio of touch technologies, each optimised for different operating characteristics and environments. Their range includes a choice of touch technology, size, and form factor.

Elo develops touch products for specific applications in retail, hospitality, industrial, medical, digital signage, gaming and transportation, covering such uses as ticketing kiosks, in-flight entertainment cabin management, patient self-service, and in the industrial sector - light industrial system control and office automation, control and clean room applications, etc., with choice of touch technology, size and form factor.

For medical applications, Elo Touch Solutions have a range of desktop

touch monitors, open frame monitors and desktop touch computers for healthcare automation, patient self-service, medical OEMS, kiosks, system control and office automation and large format displays for interactive digital signage and wayfinding.



Interactive public access kiosks can automate patient registration, reduce paper workflow, and significantly speed up the check-in process. A kiosk also frees up valuable staff to pursue other functions.



Using Elo Touch products including touch monitors and all-in-one touch computers, patients can conveniently order meals, surf the Internet, and view movies on demand, all from their bedside. Also using the same unit, caregivers have convenient real-time access to electronic patient records.



NEC Displays medical solutions include display screens for medical imaging, administration, back-office, way-finding, infotainment, queue management and bed management.

NEC Diagnostic Displays are designed in Japan, built to the highest quality standards and are trusted in hospitals throughout the world. Proven medical display technology from NEC give you the confidence that your diagnosis is based upon clear, reliable, and verifiable images allowing you to focus on your patients and not on your equipment.

Modalities for which NEC's displays are suited are for example, computed tomography, magnetic resonance, nuclear medicine, interventional radiology, PET, mammography and digital radiology as well as surgery.



NEC Displays

NEC MD series is for diagnostics, whilst the MDView series is for clinical review.



Hospitality



Samsung Smart TV



Samsung

Designed specifically for premier 5-star hotel accommodation, Samsung's ultra-slim HC890 series of ultra-slim Smart TVs deliver an elevated guest viewing experience. Deliver and manage in-room TV content easily with Samsung LYNK SINC 3.0 solution without the need for set-top boxes.

Hotels can create unique channel lists and edit the channel mapping of available channels to tailor them to specific needs. Software clock and USB cloning and 3D Full 3D images.

LG hotel TVs

LG provides hospitality solutions for in-room entertainment, including LED televisions, as well as LED interactive hotel TVs that allow guests to watch movies on demand, check email, surf the web and more.

LG Hotel TVs



Toshiba hospitality TVs

Toshiba manufacturer commercial televisions for hospitality suites and hotels with easy set-up and customisable to keep the hotel in control. Features, depending on models, include embedded USB player for automatic playback of your content.

Industrial

ELO Touch Solutions

Elo Touch technologies are rugged and reliable enough to be used in industrial environments where dust and liquids are prevalent, are sealable to industrial requirements, and they can be operated by a gloved-hand. Their touch solutions provide reliable interaction making them ideal for use in industrial applications.

From the clean room to food-processing or the dusty factory floor; from portable applications to complex IPCs, Elo offers the largest selection of touch technologies and touch-enabled monitors and displays to the industrial market.



Elo 12-22-inch open frame touch monitors for clean rooms



Elo desktop monitors for light industrial system control and office automation

Whether in a factory control room or the clean room, Elo touchscreens and touch monitors are simplifying complex light industrial tasks by replacing multiple buttons, knobs, gauges, meters, and other interfaces with a single touch display capable of multifaceted monitoring and machine control.

While light industrial touch solutions are available in a host of touch technologies, customer feedback indicates that surface wave is the most widely used technology for control/clean room applications where meeting NEMA 4/IP65 requirements is not a prerequisite. IntelliTouch clear glass overlay touchscreens provide superior optical and image quality along with resistance to scratches, breakage, accidental spillage, and vandalism. And they can be activated by a gloved hand or soft stylus.

Leisure and Museums



NEC P-Series 4-screen video wall

NEC Displays

NEC enhances the visitor experience in museums and exhibitions as well as other leisure venues.

Solutions include installation projectors for museums and large format displays in video walls; conventional projectors for exhibitions; short throw, ultra short throw and interactive projectors for galleries, SpectraView series for hotels, MultiSync PA desktop displays for recreation parks and MultiSync P, XS and XUN Series large format displays for cruise ships.

Media and Colour



NEC SpectraView and SpectraView

NEC has industry specific specialists in many areas such as media and colour, medical displays, museums and leisure, education, DOOH, etc.,

NEC SpectraView

NEC's SpectraView and SpectraView Reference colour accurate display screens are designed specifically for pre-press and press professional photography. The demands on the creative industry has changed considerably in recent years, with an increasing recognition and protective attitude of leading corporates towards their brand colours, with graphic designers needing to have a colour handling process. NEC SpectraView series are also ideal for video and film post-production, media and advertising agencies, mail order houses, and industries such as car plants, textiles and cosmetics.



Outdoor displays

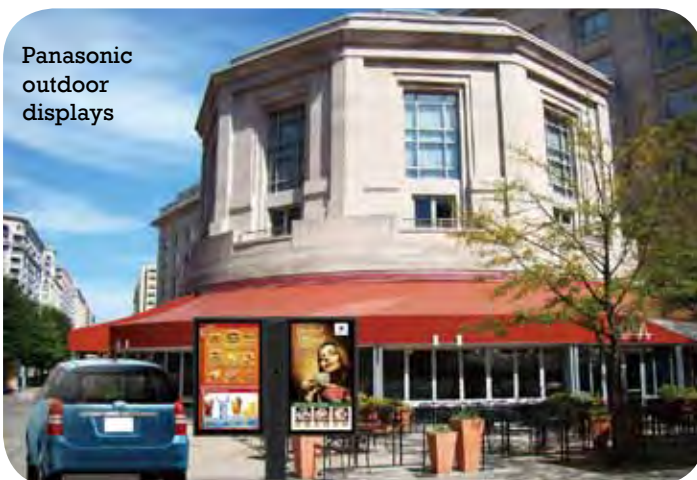
Aqualite

Aqualite Outdoor specialise in outdoor LCD and LED TV screens. Their IP66 rated waterproof and weatherproof outdoor TV screens come in a choice of standard brightness or high brightness (3 times brighter for sunlight readable conditions). Examples of applications are theme parks, motorsport events, for outdoor event advertising and signage, for watching football in pubs with beer gardens and waterproof TV for kitchen, bathroom, shower, jacuzzi or pool area. Also available are sun, salt and sea proof TV screens for luxury yacht installations.



Aqualite outdoor displays

Panasonic outdoor displays



Panasonic

Panasonic LFX Series of outdoor LCD displays are dustproof and waterproof to withstand even harsh conditions, and usable even under direct sunlight.

With high brightness and wide viewing angle IPS panel and LED backlight, images are clear even in brightly lit places. Outdoor displays are ideal for street signage, outdoor sports facilities, transportation and parking lots.

Panasonic weatherproof displays are suitable for open cafes, train stations, transportation, stadiums, indoor sports facilities, zoos and botanical gardens.

QSR - Quick Service Restaurants

With the growing number of fast food restaurants the challenge is to deliver; through display screens and signage, greater brand and product impact and faster response to specific events, season and daytime menu changes.

In a consumer survey conducted by 'Digital Signage Today', 61% of chains saw a sales lift from installing signage with 21.4% over 5%. (Information courtesy of NEC Displays)

NEC Displays

NEC P-Series of large format displays are designed for non-stop operation 24/7 in bright environments. Ideal for menu board displays. Their XS-Series are ideal for back-to-back installations, totem and kiosk integration and installations in recessed walls.

For restaurants with open hours 16/7 the V-Series is ideal for life-size advertising with some interactive (touch screen) models. The NEC E-Series is for light signage applications and infotainment with 16/7 usage.

Solutions for display screens for restaurants:

- Indoor digital menu boards
- Promotion boards (indoors and outdoors)
- Outdoor digital drive-thru menu boards
- Price board - Guest kiosks
- Presale boards - Nutrition / calories board
- Order ready boards - Kitchen displays
- In-store digital advertising
- Infotainment and dining room signage
- IP rated outdoor LED advertising boards



NEC video walls for signage - and below, order ready board



MAIN COURSES MENU

Pizza

	10"	12"
Margherita	4.95	6.95
Mozarella cheese and tomatoes		
Hawaiian	4.95	6.95
Classic ham and pineapple		
Veggie	5.95	7.95
Sweet corn, mixed peppers, onions and mushrooms		
Meat lovers	6.95	8.95
Chicken, beef, pepperoni and black olives		
Chicken supreme	6.95	8.95
Chicken breast, mushrooms and onions		

Pasta

Chicken carbinara	7.95
Chicken breast in a traditional white wine carbinara sauce	
Tagliatelle bolognese	9.95
Beef ragu served on tagliatelle pasta	
Porcini fettuccine	9.95
Wild mushrooms in a creamy white wine sauce	
Rigatoni con zucchini e pesto	9.95
Courgettes in a creamy pesto sauce	
Spaghetti al pomodoro	9.95
Tomatoes, garlic and basil in a tomato sauce	

Sea food

Shrimp fettuccine alfredo	7.95
Shrimps and mushrooms on fettuccini pasta	
Seafood risotto	7.95
Shrimps and fish served with risotto rice	
Aragosta gameroni	7.95
Lobster and king prawns in a creamy tomato sauce	
Sea bass al forno	8.95
Sea bass in white wine sauce	
Salmon milanese	9.95
Salmon fillet in a Milan inspired sauce	



Repeat Signage digital signage software allows you to insert spreadsheets into your signage presentations, ideal for creating menus. Repeat Signage lets you display spreadsheet grid lines or you can display menu items with white or coloured backgrounds without grid lines and insert pictures. You can also add your logo, real-time, date and RSS newsfeed of special offers into your presentations.

[Repeat Signage](#)
[Trial download](#)

Retail

The benefits of touch computing have expanded well beyond increasing check out throughput and accelerating new associate training.

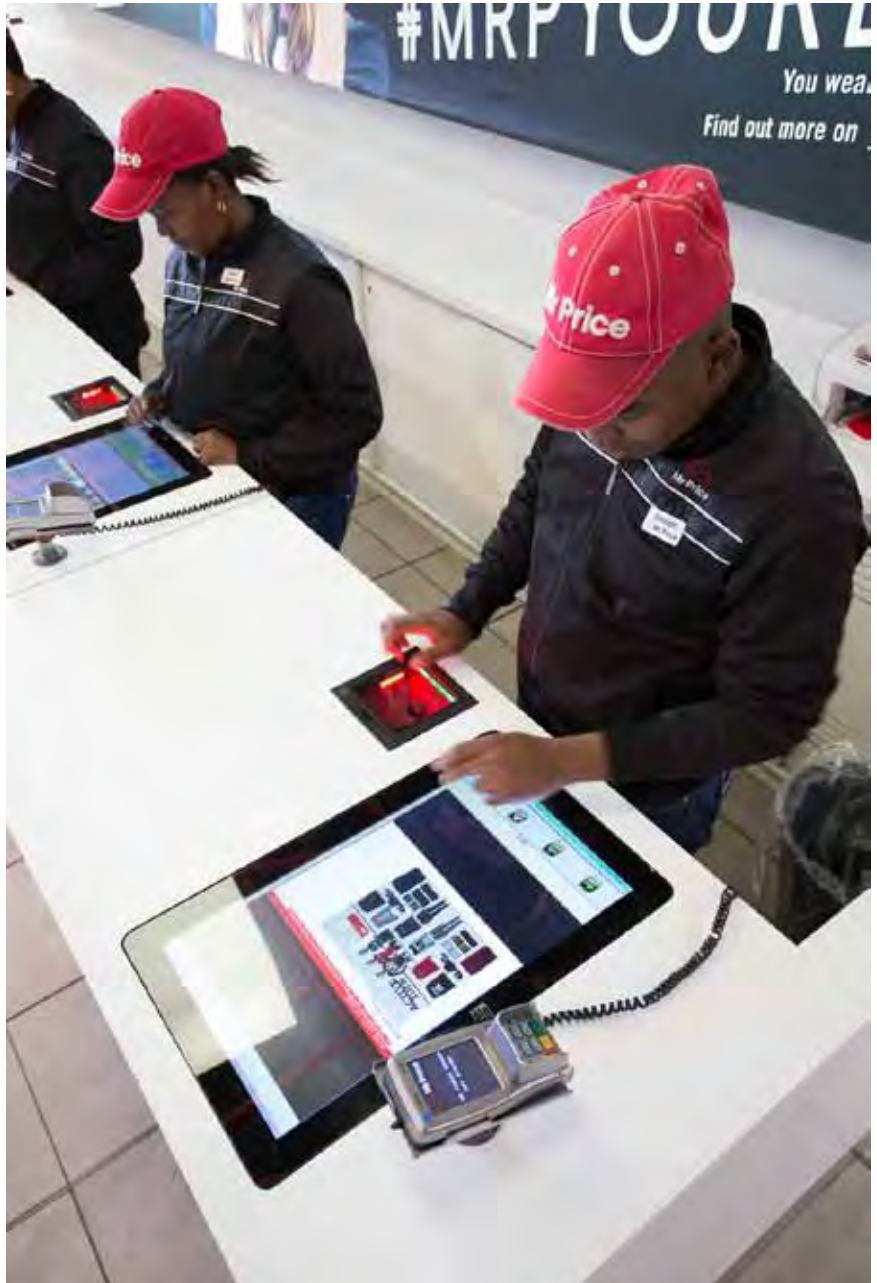
ELO Touch Solutions

Elo Touch Solutions are collaborating with leading retailers to create, innovate and develop new retail offerings and interactive brand experiences, including: mobile point of service, customer guided shopping, interactive digital signage, customer facing displays and virtual stores.

Their range spans from 10" mobile retail tablets to 70" interactive digital signage display screens. Options include touch displays 7" to 32", interactive digital signage 32" to 70", all-in-one touch computers 15" to 22", open frame kiosk solutions 12" to 42", and retail mobile tablets and dock solutions 10.1".

At retail point-of-sale (POS) the goal of store automation is to make checkout fast and easy for both the cashier and the customer. Touch POS systems speed and simplify cash register functions and reduce operator errors. In an industry in which employee turnover is high, touch POS can dramatically reduce training time, empowering sales staff and service staff to provide higher quality customer interactions. Ideal for department stores, speciality chains, grocery stores and convenience stores.

Versatile Elo touch monitors can also manage and streamline vital day-to-day business operations, performing inventory control, client management, appointment book, employee roster, clubs and client incentive and client marketing functions.



Elo kiosk touch display



Elo touch display

Retail



Panasonic Professional video wall displays

Panasonic

Panasonic professional, large format displays include indoor displays for high reliability, 24/7 usage; network displays with wireless and network capabilities; multi-touch displays with wireless and network capability; outdoor displays for high visibility in bright environments with durability against rain and dust; video wall displays with super narrow bezels and 24/7 usage; and 4K LED displays for outstanding picture quality.



BenQ LCD display screens for retail



BenQ

BenQ digital signage displays are ideal in retail stores, shopping malls and other public areas, offering a range of large format LCD monitors perfect for landscape or portrait. For video walls, their range includes models with extremely thin bezels, which means that the gap between each screen is very small.

Multiple monitors and video walls



Panasonic 4x4 video wall of 12 display screens (above and right)



Create eye-catching displays with multi-screen video walls while multiple desktop monitors expand your working space

Multi-screen LCD monitors allow you to expand the working space on your computer. An example would be dual screen monitors with Microsoft Word running on one screen and Microsoft Excel on another screen.

Usually when you have two programs running on a single monitor, you have to switch between them when working. A two screen multiple LCD monitor would allow you to see both at the same time.

You can copy and paste or drag information from one monitor to another.

The picture on the right shows dual LCD monitor screens with the same image mirrored on the second monitor.

Where you are using two monitors in portrait (vertical) mode, a cursor that leaves the bottom of the upper monitor appears at the top of the lower monitor. Again, you can drag information across the monitors.



ErgoMounts Paramotion dual desk mount

Multiple monitors

To extend the same image across two or more monitors you need to have the monitors attached to your system to be able to do this. You can then tell Windows to extend the desktop across the monitors. How to do this varies slightly between Windows editions.

Three horizontal screens are ideal for displaying a wider view of an image to best effect, and are ideal for travel agents, photography studios, museums and art galleries. Specialist medical monitors are available for healthcare for diagnostic, review and reporting of medical images. For example, X-Rays, CAT scans and MRI images can be viewed on desktop medical monitors, perhaps with students observing on large format portrait (vertical) displays for medical training.

Other specialist desktop LCD monitors include colour correction models for CAD, photographic, publishing and other colour critical applications.

Many new desktop monitors come with two ports on the graphics card, either VGA, DVI or HDMI. You can plug monitors into each of these. If you only have a single monitor port, then you can either replace the existing graphics card with a dual port one, or in some cases you could install a second graphics card. For triple and quad monitors you will need to ensure your computer has a suitable graphics card. Most local computer shops will be able to do this for you if you do not have an IT Department.



ErgoMounts dual vertical stand



ErgoMounts multi-screen stands



Windows Vista

- Click on the 'Start' button orb then 'Control panel'
- If on Vista, then make sure you are on 'Control Panel Home' rather than 'Class View'
- In the 'Appearance and Personalization' section click on 'Adjust screen resolution'
- Click on monitor number 2
- Put a tick in the 'Extend the desktop onto this monitor' tick box and then click on the 'Apply' button.

Windows 7

- Click on the 'Start' button, then 'Control panel'
- In the 'Appearance and Personalization' section click on 'Adjust screen resolution'
- In the 'Multiple displays' drop down box, choose the 'Extend these displays' option and then click on the 'Apply' button

Windows 8

On your keyboard, press the Windows key + R, then on the Run dialog type control and press return.

- In the 'Appearance and Personalization' section click on 'Adjust screen resolution'
- In the 'Multiple displays' drop down box, choose the 'Extend these displays' option and then click on the 'Apply' button

Windows 10

- Click on the Windows icon in the bottom left hand corner of your computer. Select 'Settings' and then 'Display'.
- If you only have 1 monitor attached to your computer, or if using a laptop, you will see a blue rectangle with the number 1.
- Click 'Detect' and if more than one monitor is connected it will display this for you.
- Duplicate is where a second monitor mirrors the first monitor. Extend is where your computer desktop is extended across both monitors.
- You can also change orientation from this screen from landscape to portrait and adjust brightness levels. Click 'Advanced Display Settings' to change your screen resolution.

NEC video wall of 6 display screens



Video walls

Large format displays, over 32" diagonal, are installed in a video wall to create impact in public areas. Video walls can be installed in landscape (horizontal) format, using all the same size display screens in combinations of 2x2, 3x3 (as shown above in the NEC video wall), 4x4, 5x5 or more. Content can be displayed across all the display screens or different content on each display screen or a combination.

NEC's videowall displays support video and signal daisy chaining for up to 100 units, including LAN daisy chaining with network switching capabilities. Requiring less cabling, installation time and cost is reduced especially on large roll-outs, enabling any signal to be sent via DisplayPort and daisy chained to the next display.

Video walls can also be created using a matrix of varying size display screens to create stunning effects.

The pictures opposite show a video wall in a US hospital who wanted to create a 'donor wall' and used Repeat Signage Professional edition digital signage software to display the content.

[Repeat Signage trial download](#)



Repeat Signage Professional digital signage software



Repeat Signage Media Wall digital signage software displaying a 'donor wall' in a US hospital. Names have been removed for data protection.

Professional digital signage software



Large format display (LFD) with Nexcom OPS module player (Slot-in PC), playing digital signage software

Turn your display screens into digital notice boards, menu boards or advert displays

Professional digital signage software lets you create your presentation using a variety of media. Depending on the software package, for example, you can insert pictures, animated gifs, text, Rich Text Format (allowing you to use bold, italics, etc), documents such as Microsoft Word, Excel, OpenOffice, Adobe PDF documents, real-time date and clocks, Flash clocks, PowerPoint scheduler, video, webcam, web browser and RSS feeds.

Stand-alone digital signage software is where you install the software (often a download link which you can evaluate first and then purchase the software licence) onto your computer or laptop. You design your signage presentation and then 'play' it from your computer onto a desktop monitor, a large format display screen or through a projector onto a projector screen or window film.

Using your normal computer to play a signage presentation and work on your computer at the same time is not practical. Dedicated computers, called digital signage players or media players are normally used to play out presentations onto screens.

Some digital signage software allows

you to create presentations for interactive touch screens.

Digital signage players (also called media players or mini PC's) are available with dual, quad or multiple outputs that allow you to play your presentations onto a video wall, also called a media wall.

Some large format display screens (LFD) have an OPS slot to allow a Slot-in PC, which keeps the Slot-in-PC securely and neatly tucked away at the back of the screen, thus deterring theft and tampering with software.

When using display screens without a Slot-in-PC option, mounting solution manufacturers have provided mounts

to incorporate a media player to be sited within the bracket and screen installation.

Stand alone digital signage software, depending on the software, may be available in Standalone, Standard or Media Wall editions. All-in-one usually denotes that all elements are included in the software, for example, a designer to create your presentation; a scheduler to specify the date and time you want your presentations to be displayed and for how long, and a player that 'plays out' your presentation onto your display screen.

These all-in-one stand-alone software packages are cost effective as you normally pay one licence fee for the whole software solution. This license fee may be renewable after a given period of time or be a lifetime one-off license fee, with upgrade options.

Another important feature to consider is the support in the form of a help system, free or paid for training videos and free or chargeable email support.

Depending on the digital signage software, licences may cover the software being displayed on a single display screen, dual screens, four screens etc. Where you want to display different presentations on each of four screens, for example, some software packages need one license for installation onto one computer attached to four screens. Others may require a separate software licence for each computer and screen. For education and large corporations, site licenses may be available.

All this sounds very complicated, but as there are so many options on the market, it is worth the time and effort to trial a few and check the licensing requirements before purchasing.

Digital signage software that is cloud based (Internet/web-based portal) means that the software is hosted on the software developer's website and you use your web browser on your computer, smartphone or tablet, to create your account and log-in. From there you can design, schedule and distribute your signage presentations to your display screens. Cloud signage is normally Software as a Service (SaaS), on subscription, where you pay for different levels of service.

Not everyone wants to host their presentations on third party websites, however some software offer a choice of updating content.



Repeat Signage™ V4 digital signage software helps you get your message across and promote your products or service. It is easy to use and you can create a presentation and have it playing in minutes. You just need a Windows based PC, a large display screen and Repeat Signage. Features include touch screen support, remote updating and scheduling of presentations, and it supports Windows 10, 8/8.1, 7, Vista and XP.

Why Repeat Signage? The Repeat Software team will give you an outstanding level of support with free training videos, sample presentations and we have satisfied customers in over 29 countries across the globe.



Developed in the UK, Repeat Software Ltd can customise Repeat Signage V4 for industry specific and regional versions.

[Download trial edition](#)



Repeat Signage V4 Standalone

This edition is designed to be used in reception areas, on exhibition stands and in individual shops. You can design a presentation and then just play it on screen, or when Windows starts. Changing the presentation content is done manually. The only control that allows remote updating is the Flash RSS feed control. From within the software you can access our cloud server where you can create RSS news feeds to display and update in the Standalone edition.

Repeat Signage V4 Standalone edition is in use on some RAF (UK Royal Air Force) bases in the UK for displaying information. Because of internal security policies, the digital signage computers were not allowed to be networked, so a quickly updatable standalone system, with minimal training, was required. Internet-based digital signage systems simply cannot be used in this type of situation.

www.repeatsoftware.com

Digital signage presentations

Repeat Signage V4 Standard Edition

Standard remote and network updatable system for schools, retail outlets and businesses



The image shows the Repeat Signage V4 Standard Edition software box on the left, which features a woman's face and various digital signage examples. To the right is a sample digital signage presentation for 'WINDYRIDGE BOUTIQUE'. The presentation has a purple header with the text 'NEW EXCLUSIVE COLLECTION'. The main image shows a display of colorful scarves. Below the image, it says 'WINDYRIDGE BOUTIQUE' and 'exclusive contemporary clothing since 1984'. At the bottom, it says 'www.windyridgeboutique.com' and 'Come and visit us at 15 High Street, Windyridge'.

Repeat Signage V4 Standard - Remote and network updatable system for schools, retail outlets and businesses. Includes a built-in spreadsheet for sales graphs, menus, class lists, etc. Touch screen support.

How to create a Repeat Signage digital signage presentation

Download Repeat Signage onto a Windows PC. Open the software and click Presentations. Select Create a Presentation. Either select a template and change our images and text or select a blank template and insert a variety of media to create a presentation.

In our hotel example, we inserted pictures, text, Flash clock, Flash banner (text over pictures) and an RSS news feed. Once inserted, you drag and drop into position. Double clicking each control opens up options so you can change fonts, size, colours, time zones, transparency and how long you want each picture to display before changing to the next picture.

The sample presentation for the Ambassador Hotel in Cork was simply designed using one of their corporate colours for the background.

Along the top, the hotel logo, name, date and time were inserted and moved into position and fonts and colours selected. The bottom bar shows the hotel's contact details.

Using the Flash banner control (text over pictures) a playlist of hotel pictures was created with a choice of 50 transitions to change from one picture to the next after a pre-selected time, e.g. 10 seconds. Text label colours and background can be customised to corporate colours.

The green bar is a rectangle shape with pictures and RSS feed inserted on top. Screenshots right show how the play list of pictures changes. Ideal for reception to showcase hotel facilities to guests.



Repeat Signage V4 Standard Edition is ideal to showcase products and services in a variety of businesses. Examples show how pictures change to showcase hotel facilities



Digital signage for corporate applications

Repeat Signage V4 Corporate Edition

Remote and updatable system with professional features plus the ability to display information from databases



Repeat Signage V4 Corporate - Remote and updatable system with professional features plus the ability to display information from databases. Touch screen support.

Repeat Signage V4 allows the insertion, with drag and drop and easy resize, of a variety of media including pictures, animated gif (or svg), text, Flash banner (pictures with text), Flash clocks, Flash RSS reader, Flash (swf), Flash video (flv), audio, document, RTF document, PowerPoint, spreadsheet (has an in-built spreadsheet), page-turning PDF, webcam and web browser.

Displaying spreadsheets allows you to display information such as sales graphs, hospital patient lists or classroom attendance lists.

The Repeat Pictures feature (in all editions) has 4,000+ icons for use in your presentations. You can select an advert template and create adverts for complementary products or services to generate an income.

Repeat Signage allows you to update your content from a local network, from a website, via FTP or you can update remotely over the Internet. From the main menu select RepeatServer.com to create your RSS feeds, access over 3,000 images for use in Repeat Signage, and update your presentations anywhere in the world (with an Internet connection).

For businesses that use a database for querying product information, then the ability to display content from a database into a digital signage presentation opens up many possibilities. Both the Repeat Signage V4 Corporate and Media Wall editions include database support.



Repeat Signage at Caxton Publishers, Johannesburg, S.A., and below, Repeat Signage on outdoor displays at Harrisburg International Airport (HIA), Pennsylvania, United States.



[Repeat Signage trial download](#)

[Repeat Signage success stories](#)

Digital signage presentations

Repeat Signage V4 for UK Estate Agents

Customised Standard edition plus the ability to display RightMove and ExpertAgent property files



Repeat Signage V4 for UK Estate Agents - Customised Standard edition plus the ability to display RightMove and ExpertAgent property files. Touch screen support.

The Repeat Software development team are able to customise the Repeat Signage Standard edition software for niche markets, such as Repeat Signage for UK Estate Agents

This edition is the customised Standard edition plus the ability to display RightMove and ExpertAgent property files. The software also includes templates for you to easily create your signage presentations.

Repeat Software are happy to work with IT and AV resellers and resellers in niche markets to customise for particular markets, such as adult care and residential care homes.

Brand manufacturers, such as Sharp, NEC, LG and Panasonic, have high brightness large format displays in their range, which are ideal for placing in estate agents' windows or retail stores.

Picture right is a Sharp digital signage display screen; picture below an LG window-facing display screen.



Repeat Signage template, change our images and text for your own



Sharp PN-Y series of displays for digital signage applications

Digital signage for video walls

Repeat Signage V4 Media Wall Edition

Fully featured professional signage for creating 4-monitor media and video walls. Database support.



Repeat Signage V4 Media Wall - Fully featured professional signage for creating 4-monitor media and video walls. Database support. Touch screen support.

Repeat Signage Media Wall edition digital signage software is designed for use with 4-screen video walls. You can display a presentation across all 4 screens or have different presentations playing on individual screens. Presentations can be designed in any resolution, such as Full HD 1920x1080p or Ultra HD 4K at 3840x2160 pixels, in landscape or portrait.

Although Repeat Signage Media Wall has 4-monitor support, it has been running successfully for several years as a donor wall in a US hospital. All 6 display screens of various sizes and orientation, display a single image, and using playlists and scheduling, changes to pictures of the hospital donors, spreadsheet of donations and pictures of purchased medical equipment.

[Repeat Signage trial edition](#)

[Repeat Signage Success Stories](#)



Repeat Signage at Yowi Dell in Kuala Lumpur



Repeat Signage Media Wall in use at a US hospital as a 'donor wall'

Digital signage players



Media players, or digital signage players, which they are also known as, are available for both Windows and Android operating systems, with various specifications from displaying signage presentations onto a single display screen or multi-screen video walls.

Media players are available with or without digital signage software. Once you have created your signage presentations, you connect the media player to a display screen or video wall panels.

In 2007, the first Slot-in PC's appeared on the market, in which you slotted a Slot-in computer into the side or rear of a display screen, thus deterring theft and tampering. These were followed in 2009 by OPS (Open Pluggable Standard), which are the same in that they accommodate Slot-in PC's, but with a much smaller slot for the OPS Slot-in PC. Both Windows and Android operating system Slot-in PC's are now available on the market.

In 2013, Samsung brought out System on Chip (SoC), initially introduced on TV's, and together with their digital signage software, MagicInfo, provided customers with an all-in-one solution. Their MagicInfo Lite software is shipped with their display screens with options to upgrade to MagicInfo Premium software depending on whether you want light signage with basic features or a fully featured software solution.

In 2014, Sharp introduced an embedded USB media player into their PN-Y series of displays, for LANless and light signage USB based applications. You can load .jpg and/or .wmv contents onto any USB memory stick, which you insert into the USB port of the display screen. The embedded USB media player in the display screen then looks into the USB's folder and automatically plays a maximum 30 contents cued onto it.

Where you need the power of a computer operating system to display your digital signage presentations, especially if you are using HD graphics and videos, then you would need

to consider a media player that is a dedicated computer, rather than a USB media player.

The NEXCOM NDiS series, with fanless design for almost silent operation, addresses the requirements for a broad spectrum of digital signage applications. This series of cost-effective digital signage players support single, dual and multiple display screens, whilst their OPS Slot-in PC's slot into the back of display screens with an OPS Slot, for both Windows and Android. NEXCOM also specialise in industrial fanless computers and PC factory automation.

Edis Audio Visual have both Windows and Android Quad Core players in their portfolio, plus an ultra mini Windows Quad Core fanless player with embedded Windows 10 software, that plays your digital signage presentations through the HDMI port so it has full video and audio input to the display screen.

Upgrade the Power of your Displays at any Time

REPLACE ALL THIS



Computer | Mounting Bracket | Cables |
Signal Splitter | Media Player



NEC OPS Slot-In Options

WITH THIS



NEC OPS Slot-in options, for both
Windows and Android

NEC OPS Slot-in Option



Nexcom NDiS M535 Powered by
6th Gen. Intel® Core™ Processor,
interactive OPS-Based Digital
Signage Platform, Support 4K
(HDMI 2.0) Resolution



NEXCOM NDiS series embedded
computer media players for Full HD
video playback (picture above) and
4K2K video playback (picture below)



Edis AV Ultra Mini PC
with Windows 10



AOPEN digital signage player

Mounting solutions for your display screens

Media player mounts

Where the display has an OPS slot in which to slot in a PC at the back of the screen, then installation onto a wall or ceiling mount is a simple procedure, as the PC fits snugly in line with the back of the screen.

Where you are using a separate media player, then consideration needs to be given as to where you can site this.

Unicol wall mounts with a small PC housing are suitable for small form factor PCs. These interface units, either flat to wall or tilting, can reduce installation time. Custom made and security locking versions are also available.

Unicol
PCZW
PCZX



A flat/tilt wall mount with media device storage for 27" to 60" flat panel displays is Peerless-AV's DS508 dual purpose solution for commercial applications, providing media controller housing and access as well as security features. The open wall plate design gives plenty of wall access for installation of electrical outlets and running of input cables and you need a separate adapter plate to fit your screen. Displays can be mounted in both landscape and portrait.



Peerless DS508

Peerless DS-MBZ642L quick service restaurant menu board mount creates a mounting surface through connecting wall plates



Unicol Screentrac is a modular track system for linear mounting flat screens in any number, ideal for digital menus in fast food restaurants



Wall mounts



Unicol Adapta-Wall 'push to close - push to open' mount with secure latching.

Constructing a Unicol freestanding video wall stand ideal for foyers or exhibition stands



Trolleys and carts



Loxit Hi-Lo Mono single column floor mounted electric screen lift



Peerless SR598 SmartMount® flat panel cart for 55" to 98" displays



Unicol Rhobus 4-screen trolley

Ceiling mounts



Peerless DST942-6 multi-display ceiling mount

Unicol CP1-1000 twin LCD display ceiling mount



Wall arms



ErgoMounts EMX200 extending wall arm ideal hotel TV's



Peerless articulating wall arm mount

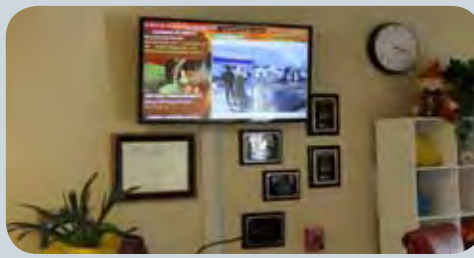
Repeat Signage digital signage software

Digital signage is about displaying still and moving images onto a display screen or video wall to engage with your audience...

1. Download Repeat Signage software onto your Windows computer
2. Easily create your presentations by inserting your logo, pictures, videos, text, clocks, RSS newsfeeds and other media into the software to promote your activities
3. Connect your computer to a display screen to play your presentations and engage with your audience



Repeat Signage: Howard Park School, UK



Repeat Signage: Merryhill School, California



Onion Lake Cree Nation, Saskatchewan

Repeat Signage™ V4 digital signage software for Windows

Repeat Signage digital signage software helps you get your message across and promote your products or service. It is easy to use and you can create a presentation and have it playing in minutes. [Trial download](#)

You need a Windows based PC, a display screen and Repeat Signage. Features include touch screen support, remote updating and scheduling of presentations, and it supports Windows 10, 8/8.1, 7, Vista and XP.

[See our success stories](#) [Contact us](#)



www.repeatsoftware.com



Repeat Signage: Caxton Publishers, SA



Albemarle Music Centre



Repeat Signage: Harrisburg International Airport