TechGlobal

Special Report

Touch Screen Monitors For Business

Contents

Reliability And Construction Quality

Reliability is a key factor when selecting a touch screen device for business. It is measured commonly by MTBF or Mean time between failures. MTBF is measured in hours, the higher this number, the more reliable the product. Typical MTBFs for touch screens and monitors are around 30,000 – 50,000 hours under ideal conditions. Tech Global's Evolution series has a MTBF of 124,000 hours under 24/7 always-on environment. Note that not all monitors are designed for 24/7 use. Consumer monitors are typically rated for 6-8 hours of use per day.

There are two major factors that contribute to reliability; heat distribution and component quality. Heat damages electronics over time which ultimately leads to early equipment failure. Component quality such as Medical "A" grade LCD modules and premium grade LEDs are designed to work 24/7 and have a much longer operating time compared to consumer quality components.

The Evolution series by Tech Global utilizes the latest techniques to distribute heat. Premium hardware components are selected to achieve 3-5x longer operation time when compared with a conventional display and here is how it's done:

Custom PCB designs, with over a decade of engineering and testing, produced a special layout with heat sinks for superior thermal management. Special internal locking connectors are used to make sure every component is connected securely and will not become loose or disconnected from vibrations, shock or during shipment. Standard, off the shelf PCB designs, are not thermal friendly, which causes premature equipment failure.

The Chassis need to be light and strong. Aerospace grade 6061 billet aluminum chassis are not only impact resistant but also assist with the thermal management by drawing the heat away from the LCD panel. Tight machining tolerances produce a consistent sealed anodized finish to make it UV resistant and prevent oxidation.

Fig. 1: *Higher MTBF hours results in greater reliability*

Aerospace grade aluminum provides a stronger and sturdier frame when compared to the standard plastic counterpart.

The back plate is also a vital part of the monitor as it helps with thermal management and shielding the monitor from the external environment. Cold rolled steel (20% stronger than ordinary steel) with a performance powder coat finish is used in the construction of the Evolution Series. Custom venting is integrated into the back plate to limit openings to avoid dust and liquid intrusion. It is also certified water and debris resistant as an additional safety measure for longer life. The back plate is intelligently designed to act as an electromagnetic shield to further minimize interference.

Overall, a metal alloy design is superior compared to the typical plastic design as steel alloy will not warp or crack, and will do a much better job at thermal management to promote the life of the product further.

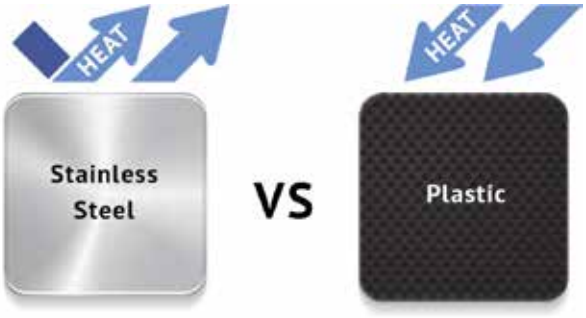

Fig. 2: *Stainless steel dissipates heat better than plastic. Better heat dissipation promotes the longevity of the internal electrical components.*

Durability And Safety

Touch technology requires a sensing mechanism that registers the touch coordinates. Plastic or glass is used for the sensing overlay that is placed on the LCD display module. The challenges experienced by touch display manufacturers include creating bright, high contrast, and true color images while still being able to produce fast and accurate touch responses.

Depending on the materials used, overlays may interfere with the clarity and quality of the picture by increasing reflections and decreasing light transmission. Glass is the ideal overlay choice since it is a stable and hard material that is resistant to scratches and chemicals. It will not warp, deform or expand with temperature. Glass has one of the highest light transmission levels and handles reflections well.

Internal reflections can be completely eliminated with a process known as optical bonding. This process involves laminating the cover glass directly to the LCD module to eliminate any air gaps in between. The result will enhance viewability since there will only be a single index of refraction. Lamination also provides additional protection from dust, moisture, and shock making it ideal for outdoor use.

Fig. 3: *Thermally hardened glass is up to 5x stronger than untreated glass.*

Thermal hardening methods are used to strengthen the glass for additional safety by making it stronger than ordinary glass. The tempering process adds a secondary layer of safety in the event the glass breaks. The glass will shatter in to small pieces instead of large dangerous shards.

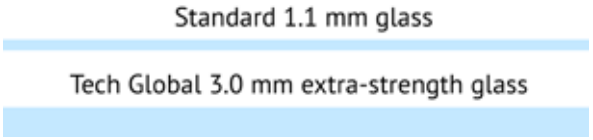

Fig. 4: *The 3.0 mm glass results in greater safety to the end user when compared to the standard 1.1 mm thickness.*

Even with the latest technological advances that are making the cover glass thinner and stronger, thickness still plays a significant role in strength. The typical thickness of glass in touch screens monitors ranges from .5 – 2 mm while anti-vandal screens can be 3 mm or more for additional strength. Other benefits of bolstering the glass include a longer life and a reduction of replacement costs.

Helpful Questions To Ask:

- What is the MTBF of the touch screen monitor?
- Can it work in 24/7 always-on environments?
- Does the monitor have aluminum or metal chassis?
- Is the monitor water resistant?
- Is the monitor shock/vibration resistant?
- How thick is the glass?
- Is the glass treated for additional safety?
- Does the glass meet ASTM standards?
- Is the glass anti-vandal?

Optical Quality And Improvements

Having a high transmittance level from the cover glass is critical in achieving a high-quality picture. The higher the light transmittance, the clearer the picture becomes. The latest technology from Tech Global includes 93% transmittance level, the highest achievable, along with a Medical "A" grade LCD module. This allows the touch display to produce true colors, deeper blacks and brighter picture that was not feasible before with previous technology.

The medical grade LCD module also provides superior pixel quality that virtually eliminates dead pixels, ghosting (due to slow pixel response) and image retention. Color reproduction is further enhanced with in-plane switching technology. IPS provides much better color reproduction at almost any angle that was previously not possible with older TN technology. Color reproduction is critical in medical applications as small variances in color may impact the diagnosis results.

Whether your application is in an office or an outdoor setting, glare is a common problem experienced due to various lighting conditions. Glare is known to cause eyestrain, additional stress in the work place, and lower productivity. Tech Global uses a proprietary process that creates an everlasting anti-glare solution by chemically etching the anti-glare properties directly into the glass. By using this method, it will not interfere with color reproduction or brightness the way screen protectors will. Since this is not a coating, it will not wear out over time or removed by using cleaning chemicals.

By eliminating glare with a permanent solution, your employees or clients will have a much better viewing experience without the frustration of glare. It is important when selecting any display that will be used for over 6 hours per day to have advanced anti-glare properties. Anti-glare screen protectors have a relatively short life, can cause bubbles, which can distort the picture, and take additional costs to replace.

Fig. 5: *Resistive touch (75%) vs. projected capacitive (93%) transmittance. The higher the transmittance level of the cover glass, the clearer and brighter the picture becomes.*

Helpful Questions To Ask:

- What is the light transmittance percentage of the cover glass?
- What is the contrast ratio?
- How bright is the screen?
- Does the screen use IPS technology?
- Are the colors factory calibrated?
- Does the display contain a Medical "A" Grade LCD module?
- Does the display have built-in anti-glare technology?
- Will the anti-glare wear off over time?
- Will cleaning the screen remove the anti-glare properties?
- Will the anti-glare option interfere with color reproduction or brightness?

Performance Of Touch Technology

Touch technology has gained momentum in the last decade with the introduction of the smartphone. Ages from 3 to 103 have owned or experienced using a touch enable device at some point in their lifetime. One of the primary advantages of touch technology is that it allows individuals to have a more intuitive user experience and interaction with devices without bulky mice and keyboards. This makes it great to extend touch technology for business uses as the majority of the population has experience with touch devices, making adaptation easier with a lower learning curve.

Not all touch technology is created equally. Projected Capacitive Touch (PCT) will be explored, as it is one of the most popular technologies with benefits that make it ideal for 24/7 business use. The Evolution Touch (PCT) technology by Tech Global, is an upgraded version of the PCT technology that has additional advantages. PCT contains glass-to-glass (G+G) sensors that give it the best reliability and longevity of any other technology since there are no moving parts. PCT also does not interfere with the picture quality as other touch technologies do.

There are two types of PCT technologies that exist today, self capacitance and mutual capacitance. The Evolution touch uses the newer 2-layer ITO laser printed mutual capacitance technology, which minimizes EMI (Electromagnetic Interference), eliminates ghost points that can trigger false touches, and advance redundancy algorithm that provide a very accurate touch coordinates. PCT is a solid-state technology meaning that it will never drift or need calibration. Decreasing user frustration by eliminating old technological limitations may improve the overall productivity and experience. This makes it the ideal solution for touch technology.

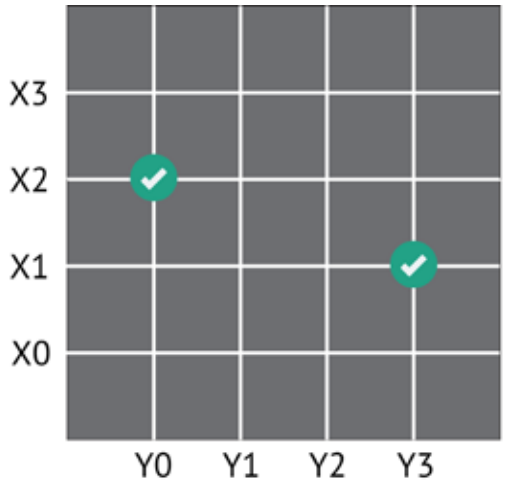

Fig. 6: *Illustrates the mutual capacitance model. Each electrode intersection is scanned uniquely which eliminates ghost points resulting in highly accurate coordinates.*

In addition to accuracy, speed is crucial for touch displays as a delay as little as half a second can cause frustration to the end user. The Evolution PCT technology utilizes one of the industries fastest controllers that provide response time as low as 5ms. A fast response time eliminates lag for a more fluid experience.

Helpful Questions To Ask:

- How fast is the touch response?
- What type of touch technology is used?
- If mutual or single capacitance technology used?
- Can the touch screen experience ghosting?
- How reliable is the touch technology used?

Touch Operations

Surface contaminants have always been a challenge for touch technology up until now. PCT is not affected by surface contaminants meaning dust, debris, water, chemicals, and other foreign particles on the screen will not interfere with touch operation. This technology also eliminates false activations that are typically caused by condensation or temperature differences.

One of the important factors in user experience is the ability to repel fingerprints and liquids from the screen surface. An oleophobic coating is used to achieve this by repelling fingerprint by creating a smooth slick surface that make it easier for touch operation, without skipping. This makes it especially ideal when wearing nitrile or latex gloves that a prone to skipping on ordinary screens. The other great benefit is it provides anti-microbial properties, which help reduce bacterial transmission without impairing the picture quality. Anti-microbial properties are perfect for public use or screen-sharing workplaces to promote a healthier and cleaner work environment.

Touch operations for the PCT technology have greater input flexibility, which gives you the freedom to work with your bare finger, latex & nitrile gloves, and capacitive styli. The Evolution touch technology has a 10-point multi touch which means up to 10 points can be activated simultaneously. PCT also allows hold and drag touch operations, where you can click and hold an object and drag it to the other side of the screen (for example dragging a file into a folder). Other technologies such as SAW are not capable of dragging operation. Providing a more intuitive way to interact with certain software may increase productivity.

Fig. 7: *The oleophobic nano-technology repels fingerprints for better visibility as well as germs for a safer work environment. It also creates a smooth surface that makes it work well with nitrile and latex gloves without skipping.*

Fig. 8: *HID compliant, also known as plug-and-play devices, do not require additional drivers to be installed to enable touch operation.*

Certain touch screen monitors require additional software, drivers, updates, and calibration to work. HID compliant touch screen options now exist which allow for plug and play use. No additional drivers or calibration is necessary. HID compliant devices provide greater compatibility with old and new versions of operating systems including Windows 10, 8, 7, XP, Vista, Mac OSX, Linux and Android. Ready to go right out of the box.

Helpful Questions To Ask:

- Will contaminants affect the touch operation?
- Do I need to calibrate the touch screen?
- Will the touch screen drift?
- Can I do a drag and drop operation with the touch screen?
- Is the touch screen single or multi-touch?
- Can the touch screen operate with gloves?
- Can I use the touch screen with a stylus?
- Do I have to install drivers to make the touch work?

Noise Immunity

PCT technology is prone to electromagnetic interference (EMI). Tech Global has solved this by implementing technology that reduces wide and narrow band interference. This allows the touch function to work with multiple technical equipment in the same room. Save time and money by eliminating service calls due to interference issues commonly exhibited by consumer touch screen display. Additional shielding equipment is not necessary, as shielding properties have been implemented in nearly every component of the construction from the back plate to the shielded external power supply.

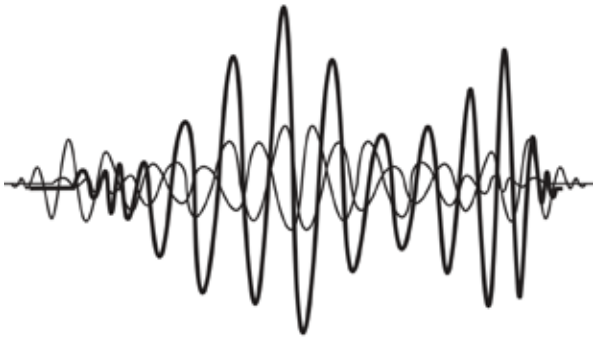

Fig. 9: *Advanced real-time EMI technology eliminates noise interference.*

Helpful Questions To Ask:

- Will the touch screen interfere with my other equipment?
- Is the monitor EMI shielded?
- Is the power supply shielded?

Lowering The Total Cost Of Ownership

When selecting a touch screen monitor for your organization, analyze the quality, reliability, ease of deployment and use, compatibility, and features so that they can align with your business objectives. Touch technology has become a very common asset in both public and private venues. When choosing Tech Global for business and mission-critical applications, you can rest assured that you are working with a global market leader in commercial touch screen technology that is widely accepted by major private organizations as well as public/government sectors. Tech Global solutions are designed to have the highest possible reliability and quality to lower the total cost of ownership.

If you are looking for additional information on how touch screen technology can be a more cost-effective option for your business or you would like to see how we can help lower your total cost of ownership burden, please contact Tech Global at 888-623-2004 or online at www.TechGlobal.com

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