

Kiosk Planning Guide

Designing a Kiosk that Serves



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Bringing the Power of Capacitive Touch to your Kiosk

Designing and building kiosks can be a deceptively complex undertaking. Fortunately, there's considerable expertise available. 3M Touch Systems is a leading authority on integrating touch screen interfaces into kiosks. 3M is renowned as an innovator of touch screen technologies, with customers and applications in virtually every major industry.

Today, tens of thousands of kiosks are deployed around the world by retailers, financial services firms, tourism, entertainment companies, Federal and local government agencies and more. The reason is that kiosks provide continuous self-service transaction capability, as well as access to public information – 24 hours a day, 7 days a week.

Touch screen enabled kiosks can be found nearly anywhere, in all types of public environments including malls, banks, museums, airports, hotels, tourist sites, trade events, and businesses. Common applications for touch kiosks include shopper loyalty programs and gift registries as well as customer service, player loyalty programs at casinos, government services, auto dealership information, ticketing, museum exhibits, and banking and financial services.

It is important to understand that the term “kiosk” includes any cabinet-enclosed device aimed at self-service. The majority of kiosks include a touch screen monitor, making this an important component in a kiosk's configuration.

Across many industries, traditional input devices are giving way to touch, the user-friendly and environmentally robust solution. The purpose of this *Kiosk Planning Guide* is to provide an overview of the primary challenges concerning the development, integration, and deployment of a kiosk touch screen solution. These challenges include mechanical and environmental considerations, physical attributes, user interface design and controlling electronics. In developing a kiosk design, you need to think about size, appearance, security, usability, ventilation, serviceability and access for the disabled. For your convenience, a checklist has been provided at the back of this document to enable you to review all pertinent factors as you work through your design.



Integration Specifics

The kiosk chassis touch screen display has joined the lineup of hardware specifically designed for use in a kiosk. For the majority of kiosks today, a kiosk chassis model is not merely an option, it is a basic requirement.

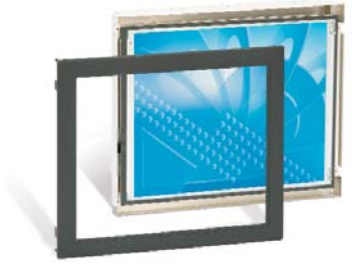
A touch-enabled kiosk chassis LCD is largely immune to the stylistic whims of the computer peripheral marketplace. By virtue of its clean, open design – unencumbered by a plastic housing – it does not experience the ongoing cosmetic modifications that usually change the footprint, bezel, or shape of a desktop touch monitor model over time.

There are economic and managerial benefits for this:

- Easy integration – A kiosk chassis display eliminates the hidden (and often significant) costs for kiosk redesigns and retrofits typically needed when a standard desktop monitor becomes obsolete.

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- Accelerated development of new kiosks – With a consistent footprint and basic bezels options, a kiosk chassis touch screen display streamlines the development cycle for new kiosk designs. In essence, it enables a designer to port monitor-related dimensions from one kiosk model to another.
- A longer “deployment window” for the kiosk – The consistent footprint and shape of a kiosk chassis touch screen display effectively extends the useful life of a kiosk by making replacements reliably straightforward. There are no dimensional surprises - large or small - to complicate matters.



Kiosk chassis touch screen displays - such as 3M's ChassisTouch monitors - are specifically engineered for use in kiosk applications. These monitors offer a significant advantage to kiosk designers because they are manufactured without the constraints of plastic monitor housings. ChassisTouch monitors fit into a wide range of kiosks and will not require a kiosk to be redesigned in order to accommodate changing display designs.

Location - Not Simply Where it Sits

Touch screens work well in almost any location if you keep certain design considerations in mind.

- Remember that environmental lighting changes over the course of a day.
- Consider the brightness of an area and how it will affect readability of the computer display.
- Consider temperature controls in your design, including heat and air conditioning.
- Consider using high brightness/high contrast LCD's for better readability outdoors.
- Electromagnetic interference (EMI) can sometimes cause problems with kiosk electronics. Be aware of devices that generate electrical fields, such as radio transmitters, pager transmitters, and security tag deactivators - plan your installation accordingly.
- Daylight, particularly direct sun, can sometimes affect the paper, inks, and adhesives in any artwork your installation may contain. Make sure that these materials are UV stable.
- Design your application and artwork with bright, high contrast colors to optimize visibility through glare and sunlight. For outdoor use, you may need a specially designed, anti-reflective, polarizing screen.

Ventilation - A Fundamental Design Factor

Proper ventilation makes the difference between a kiosk system that holds up over the long term and one that fails before its time. A key factor is designing the kiosk with ample ventilation in mind, rather than as an afterthought.

Kiosk chassis touch screen displays bring a number of truly compelling advantages to kiosk design. A kiosk chassis display is unconstrained by plastic desktop monitor housings. A kiosk chassis monitor's perforated metal housing allows for proper heat ventilation and avoids premature backlight burnout. This helps make it possible to implement streamlined ventilation that works well in a wide range of configurations. Another thing to keep in mind is that LCDs do not emit as much heat as standard CRTs, which can minimize traditional heat-related problems of standard desktop monitors.

Chassis Model Benefits

- A kiosk chassis model can help minimize traditional heat-related problems of standard desktop monitors.
- A kiosk chassis touch screen display can be easily and securely mounted in nearly any kiosk enclosure with the use of simple brackets
- A kiosk chassis model minimizes the need for extraordinary ventilation measures commonly required for desktop touch screen monitors.

With even the most reliable kiosk chassis touch screen flat panel display, it's still extremely important to ventilate a kiosk correctly. There are several important rules to effective kiosk ventilation.

- Understand the kiosk location. Will it be in the temperate world of a comfortable department store, or open to the harshest elements of the great outdoors? Will it bake in a “sunroom” environment next to a large window, or will it stand in a wide-open shaded space of an airport concourse? Kiosks are commonly subject to a surprising range of thermal dynamics.
- Never allow the temperature inside a kiosk to consistently exceed 90° F. Heat is a well-known enemy of all electronics. At high temperatures, electronic circuits and devices are subject to stress and material degradation. Keep the internal temperature cool at all times.
- Well-designed ventilation should enable a kiosk to maintain an internal environment within 5° F to 10° F of the ambient temperature outside. Kiosks installed in environments with an ambient temperature of 80° F or less can be ventilated with simple fans.
- The location and design of a kiosk should allow at least six inches (both internally and externally) between the ventilating side and the nearest wall. This is the minimum space required to create a “chimney effect” that will move heated air away from the touch screen display and prevent build up.
- Passive ventilation is seldom enough. Although it is often tempting to cut costs by not including fans in fully air-conditioned environments, a kiosk always benefits from some form of powered ventilation. To save energy, the fans can take advantage of temperature controls or thermostats.

Proper Grounding, Gasketing, and Sealing

Touch screen technology is sensitive and precise, generally working through the capacitance created by the mere touch of a finger.

3M strongly recommends the following design imperatives for all touch screen kiosks. If the kiosk touch screen display uses a metal bezel, as most do, the bezel must be independently grounded.

Considerations for proper grounding, gasketing and sealing:

- Capacitive technology is affected by environmental capacitance – which means any ungrounded metal near the capacitive sensor can affect touch
- Avoid metal bezels whenever possible. If your current design has a metal bezel, ensure that it does not directly contact the touch screen. The bezel should be appropriately grounded and very rigid. Be aware that some plastic bezels have conductive paint that could act as a metal bezel so the same design rules apply in these instances.

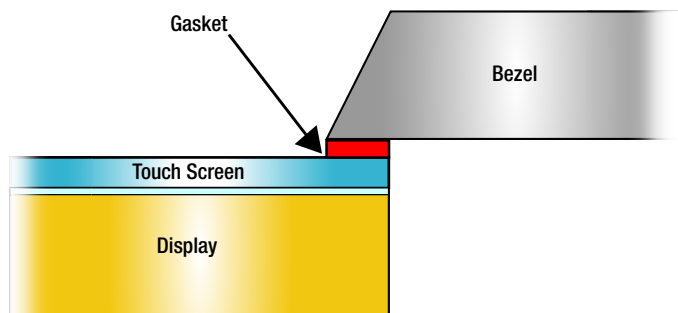
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- Do not let any metal, such as metal mounting brackets, screws or the LCD metal housing *physically* contact the front or sides of the touch screen. This could be recognized as a touch.
- Foams or other sealing elements contacting the touch screen must not be conductive
- The display and the touch screen must be securely fastened.
- Touch cables should not be coiled near or run long distances adjacent to noisy lines
- Avoid extenders and/or adapters whenever possible
- Design proper grounding to overcome electrostatic discharge (ESD) interruptions.
- Remember that a keyboard and or mouse may be required for computer installation and setup

NOTE: All kiosks, regardless of environment, will be exposed to dust, dirt, spills and grime therefore should be sealed with gaskets or an RTV sealant material. Be aware that certain gasket materials may contain active chemicals (such as sulfur, acidic compounds or chlorine) that can affect the operation of the touch screen.

In selecting sealing gaskets or RTV sealants, it is important to have a listing of the chemical compounds used in the formulation. Gasketing is relatively simple and straightforward. It can be either an o-ring or a flat, polyethylene, closed cell gasket around the perimeter of the touch screen /bezel. There is one caveat: the gasket must avoid chemically active, corrosive, and/or recycled materials made from unknown elements. Do not use gaskets or sealants containing sulfur, chlorine or acetic acid.

To prevent moisture penetration around the touch screen, joints and panels, it's best to use RTV seal such as silicone caulking. Do not use silicone sealants containing acetic acid.



* For more information on proper grounding, gasketing and sealing techniques, please refer to 3M Touch Systems' *ChassisTouch Flat Panel Display Monitors User Installation Guide*, Document No. 19-255, Version 2.3

Security – Building a Kiosk that Lasts

Kiosks placed in busy environments and used continually are often subject to abusive. A kiosk enclosure has one overriding mission: to stand up in all user environments, while protecting the kiosk electronics.

Public-access kiosks are natural targets for use and abuse. Unfortunately the touch display can take the brunt of that abuse – environmental, accidental, or deliberate.

Individual locations and applications can present different types of challenges. Still, there are some fundamental rules to help ensure a long, useful life for your kiosk touch screen display.

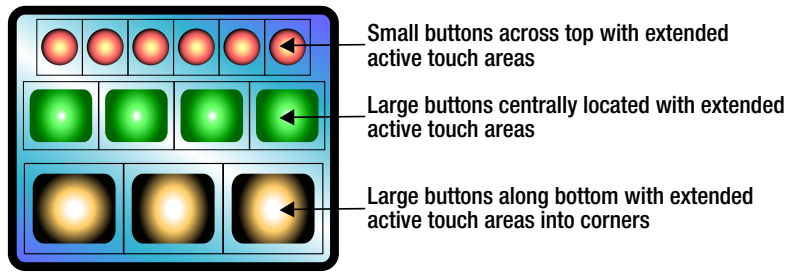
- The touch screen and controller circuitry should be properly secured - kiosks are subject to some shaking and vibration. The danger is especially strong during shipment when any marginally secured components are likely to come loose. Never ship a kiosk with the electronics in place. Use special freight carriers and assemble the kiosk on site.
- All wiring and cabling should be routed away from heat sources and sharp metal edges to avoid damage.
- All electronic components should be clear of any possible entry points for water and moisture penetrating from the outside. Even when these points are well sealed, it's a good idea to keep the electronics away from them.
- Assume the likelihood of vandalism and design to guard against it. The common occurrences include hitting, kicking, toppling, and foreign objects inserted into slots. In some cases, a kiosk may be drenched in beverages, solvents, or even conductive electrolytic liquids such as ammonia-based solvents.

A final point: it is essential to select a touch screen that has undergone rigorous testing by the manufacturer. For example, MicroTouch™ ChassisTouch kiosk monitors are designed and tested to withstand common hazards such as impact, dirt, dust, oil, water, and common liquids.

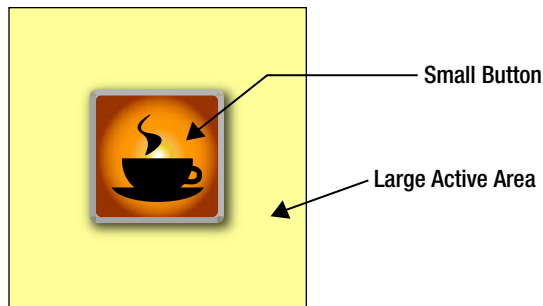
Designing Applications for Touch

With any touch application, the design can be crucial to the usability of the final product. Clear icons, bright contrasting colors, large touchable buttons, and simple layouts will go a long way towards the success of your installation.

- Avoid designs that include numerous, small touch buttons – keep the design as simple and easy to follow as possible.



- Give users visual and audio feedback to acknowledge the touch
- Touch screens are more accurate 1 centimeter inward from all sides. Avoid placing buttons in corners or along edges
- Take into account the size of your monitor and adjust button size accordingly
- Use human physiology to your advantage - extend the active area beyond the visible button size



- Remember that the video image and size may shift slightly with temperature and time
- Place buttons horizontally whenever possible.
- Consider the varying heights of users when designing the application.

Considerations to help reduce the effects of parallax:

- Design large buttons to facilitate touch. Remember that a fingertip is much larger than a cursor.
- Design larger active areas for each button. For example, if the button graphic is 1" x 1", the active area behind it could be 1.5" x 1.5".
- Keep buttons away from the edges and corners of the screen. If this is impossible, make sure the active touch areas extend to the outer edges of the viewing area.

Surrounding Artwork

You can use any type of printed artwork or photograph around the screen provided the artwork is non-conductive.

- Use ultraviolet-resistant laminates or inks when creating your artwork.
- Do not use artwork that has metallic pigments, metallic inks, or foil backings.

Kiosk Solutions from 3M

Now, more than ever before, kiosk manufacturers are relying on MicroTouch™ touch solutions for their mission critical applications. MicroTouch™ touch screens provide the critical interface necessary for the most demanding environments. MicroTouch™ ClearTek™ touch screens are durable, reliable, and, most important to the public access market – easy to use. 3M Touch Systems is a premier supplier of innovative touch screen solutions for public access systems the world over.

Whatever the scope and needs of your kiosk project, call 3M Touch Systems as early in the process as possible.

- MicroTouch™ ChassisTouch monitors create a welcoming, easy-to-use interactive experience for anyone, regardless of computer expertise.
- Available as flat panel displays, these innovative metal-cased ChassisTouch monitors are based on fixed dimensions, making them easy to integrate – without having to change the kiosk design.
- MicroTouch™ ClearTek™ capacitive touch technology delivers fast and accurate touch response.
- Software Drivers – For virtually any operating system, 3M Touch provides the necessary system software for your touch screen-equipped kiosk, including multi-monitor implementations.
- MicroTouch™ ChassisTouch monitors have a 3-year monitor warranty and a 5-year touch sensor warranty.

Designing and building touch screen kiosks can be a complex task. Depending on in-house capabilities and resources, a company may elect to manage most of the project itself, subcontract the key responsibilities or select a turnkey solution provider. Either way, it's essential to draw upon a vendor's proven expertise.



Kiosk Design Checklist

Below are design characteristics and considerations to keep in mind for a successful kiosk project. For a more information on any of these topics, please call your 3M Touch Systems' sales representative.

Goals

- ✓ Design a user friendly interface that doesn't intimidate the novice
- ✓ Important that the user has a good experience - make them want to come back
- ✓ Ensure that the customer receives the service expected
- ✓ The customer's privacy was protected
- ✓ Support a handicapped person's rights to access: American Disabilities Act (ADA)

Defining the Scope

- ✓ Identify all parties responsible for deliverables: internal and external
- ✓ Establish a written and agreed upon project plan
- ✓ Plan realistic timelines
- ✓ Pilot tests are imperative
- ✓ Be prepared for your initial assumptions to be wrong
- ✓ Study traffic patterns at the location
- ✓ Target software to your audience – Are the customers computer literate?
If not, then the application must be completely intuitive

Planning Considerations

- ✓ Aesthetics
- ✓ Security
- ✓ Human factors
- ✓ Durability
- ✓ Privacy
- ✓ Sound control
- ✓ Materials
- ✓ Site requirements
- ✓ Delivery requirements
- ✓ Maintenance requirements
- ✓ Heat dissipation
- ✓ Air flow
- ✓ Power

Elements of a Kiosk

- ✓ Internal hardware
- ✓ Touch screen
- ✓ Application software
- ✓ The kiosk enclosure
- ✓ The environment its going into
- ✓ Plan for public use

Required Professionals

- ✓ Internal team
- ✓ Application designer
- ✓ Hardware vendors
- ✓ Touch screen vendor
- ✓ Kiosk provider
- ✓ Ongoing maintenance

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Tips and Techniques

- ✓ Run a friendly, colorful attract loop to attract attention and entice the customer to use the kiosk
- ✓ Design an EASY, foolproof user interface
- ✓ Target software to the age group of the user
- ✓ Make the design and color inviting
- ✓ Ensure the kiosk is visible - don't let it fade into the environment
- ✓ Keep maintenance to a minimum - minimal peripherals
- ✓ Ensure maintenance is kept up (i.e. paper filled, cash available, components working)
- ✓ Protect privacy of transactions
- ✓ Meet ADA Requirements for height and accessibility
- ✓ Plan for expansion

Application Design Tips

- ✓ Add voice and video when appropriate
- ✓ Graphic pictures as buttons work well
- ✓ Design large, graphical oversized buttons
- ✓ Leave ample space between buttons
- ✓ Don't place buttons in corners or too close to the edge of the screen
- ✓ Identify your audience: age, ethnic background, education background
- ✓ Design so that it's foolproof to migrate through the transaction
- ✓ Design for a person who has never used a computer

Transaction Tracking

- ✓ Design in a back-end database to track transactions by category
- ✓ Provide report generation for decision making purposes
- ✓ Determine how often the kiosk is used
- ✓ Calculate generated revenue, when applicable

Hardware Considerations

- ✓ Measure the heat generated by the hardware
- ✓ Size and type of hardware often dictates enclosure size and design
- ✓ If keyboard or mouse are included - plan accordingly

Weather Conditions

- ✓ Designing for the extreme conditions will ensure more up-time for the kiosk
- ✓ How hot will it get? What is the hottest temperature extreme?
- ✓ Will heat be generated by equipment inside the enclosure?
- ✓ Will the unit be in direct sunlight all day?
- ✓ How cold will it get? What is the coldest temperature extreme?
- ✓ Is the unit exposed to the elements all day and night?
- ✓ Will the unit be exposed to ice or snow directly?
- ✓ What is the total BTU's generated by the equipment in the kiosk?

Sunlight and Glare Conditions

- ✓ Will the unit be exposed to sunlight all day?
- ✓ Can the kiosk be placed facing away from sunlight for key usage hours?
- ✓ Can it be built with an awning?
- ✓ Will a polarized sunlight shield be required?
- ✓ Will there be extreme glare from skylights or overhead lights?



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