PLANAR TOUCH SCREEN LEADERSHIP

October 2013

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When image experience matters.

TOUCH MARKET

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Touch it, it's awesome!

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Touch LCDs in Everyday Life

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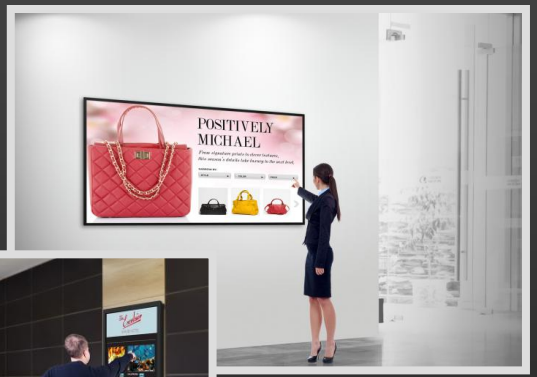
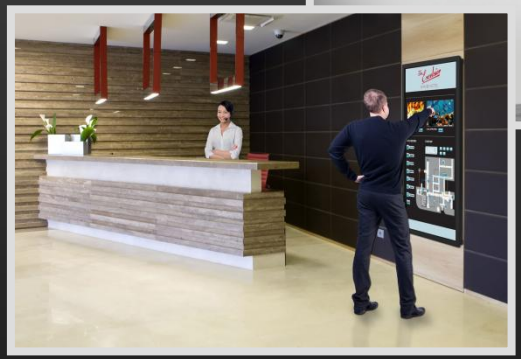
Large Format Touch Applications

Digital Signage





Corporate / Education

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Digital Signage Applications and Target Customers

Wayfinding

Hospitality, malls, universities, healthcare and airports

In-store interactivity

Museums

Car dealerships

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Corporate Applications and Target Customers

Increasing demand for interactive large format displays in conference rooms and creating new workflows in collaboration

- Presentations
- Teleconferencing
- Brainstorming
- Data analysis
- Design review
- Training

Software Profile: Anacore

- Software company in Indianapolis develops collaboration software, called Synthesis, for enterprise and government customers
- Loves Planar UltraRes Touch and Clarity Matrix Touch
- Their demonstration video illustrates the application of a touch-enabled conference room, classroom, or training room well.
- They are one of many software firms innovating in this area and Planar solutions are preferred across the industry.

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Why Touch? Why Now?

- Application demands it
- Users expect it
- Future proofing
- It is the “best” and what you’d expect from leading companies and brands who deploy touch technology

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TOUCH TECHNOLOGIES

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How many touches is necessary?

1 Touch	2 Touch	6-10 Touch	32 Touch
Single "mouse click" replication for a single user.	Pinch and zoom functions for single user	Pinch, zoom, and other gesture-based controls for single user. Allows for stray touches with minimal distraction.	Multi-user interface designs with full range of multitouch controls.

Why not more than 32? More touch points leads to more stray or false touches and user frustration.

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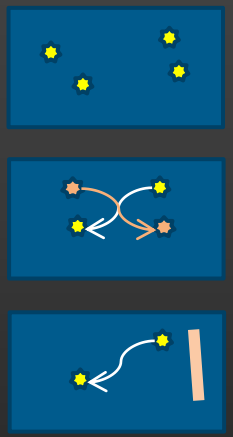
Judging Touch Technologies



- Can multiple users access it at once? (Remember: the display and the software need to both be capable of this)
- Will the sensors allow you to keep continuity of control even if you cross your hands?
- Will your touches still register with your arm blocking the display
- Can the system be used in a bright environment?
  Note: How bright and the angle of the brightness matters; studio lights and flashlights can register false touches in optical-based sensors, if not placed accurately.

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Technology Overview

Technology	How it Works	Pros	Cons	Available Sizes
Resistive	Touch creates contact between two sheets of resistive material. When sheets are pushed together, the precise location of the touch is registered.	• Value • Activated by stylus or finger • High accuracy • Resistant to liquids and contaminants	• Optical quality • Can be damaged easily by sharp objects • Lower endurance	Smaller sizes (<20″)
SAW (Surface acoustic wave)	Changes in ultrasonic waves register a touch event.	• Optical quality • Activated by stylus or finger • High accuracy	• False touches are registered from solid or liquid contaminants • Doesn't support drag or draw effectively	Smaller sizes (<20″)
Projected Capacitive (Pro-Cap, P-Cap)	Conductive material on the x and y axis. When contact is made to the panel, the electrostatic field is distorted.	• Multi-touch • No bezel • Outdoor operability • Long life • Optical quality	• Won't recognize touch from a thick gloved hand and from some styluses • Cost (especially on larger sizes)	Up to 82″, most mostly used on sizes 32″ and under
Optical	Two or more cameras are placed around the edges of the screen. Infrared backlights are placed around the perimeter of the frame between the cameras. Contact registers as a shadow that the cameras pinpoint to locate the touch.	• Multi-touch • Optical quality • Activated by stylus or finger	• Cameras may get out of alignment • Sunlight interference • More than 2 touches, not effective in sizes greater than 55″	Up to 120″
IR	LEDs around the perimeter of the touch frame emit infrared light beams that are obstructed when an object enters the grid.	• Multi-touch • Optical quality • Activated by stylus or finger	• Contaminants may cause false touches • Cost • Sunlight interference	Up to 300″ +

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Not There Yet: Projected Capacitive for Large Format

- Projected capacitive is dominant in small and medium-sized displays, primarily handheld devices like iPads and iPhones
- Technology is limited for larger format
- Currently there are two P-Cap approaches for large displays
  1. Embedded wires on plastic films
     - Able to accommodate large (>100” displays)
     - Optical performance is poor
  2. Embedded wires on glass (3M, Microsoft)
     - Up to 80” demonstrated
     - Wire visibility is an issue

- Large format P-Cap touch systems are expensive ($80K for 82”)

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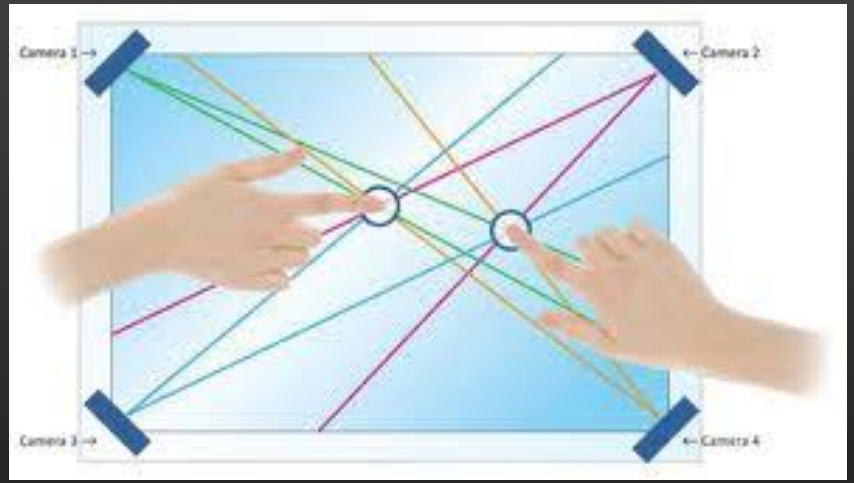
Recommendation 42’’ – 55’’ Sizes: Optical Touch

- Slim form factor - Narrow bezel and minimal depth
- Easy to use
- Reliable
- Affordable



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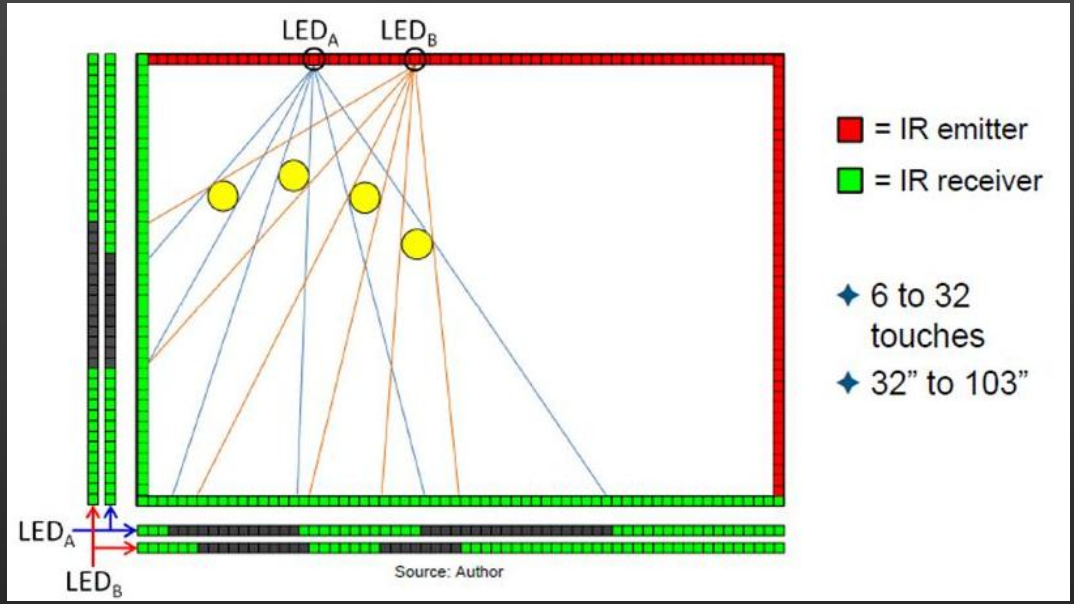
Recommendation 65”+ Sizes: IR Touch

- Easy to use
- Reliable
- Becoming more affordable
- Scalable to large sizes
- Planar solution places receivers at the top to minimize the impact of ambient light



Source: Geoff Walker, SID Display Week, 5/1/13

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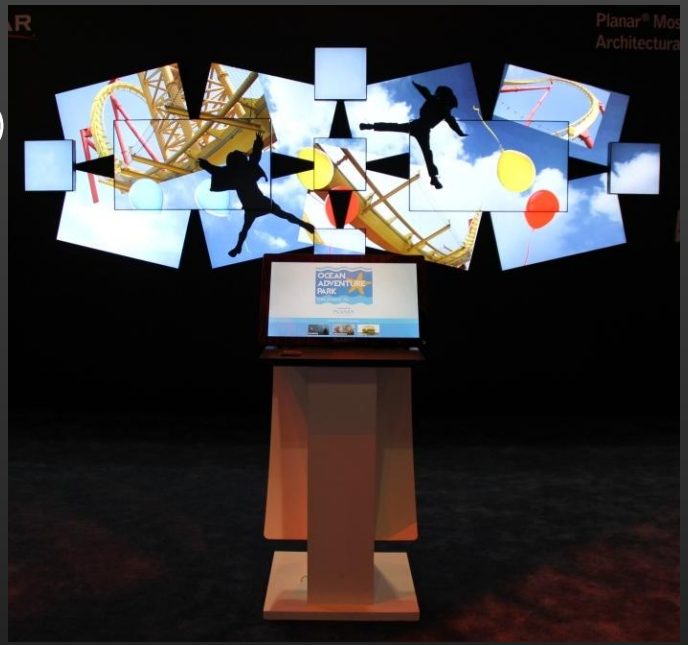
Other Options for Interactivity: Gesture

- Microsoft Kinect SDK and others gaining popularity
- LEAP camera system (retail: $79) created Buzz at SXSW, but generally regarded as an inaccurate toy
- Gesture acceptable for gross controls and navigation
- Not appropriate for fine-point interactivity (ie, annotation, pinch-zoom, selecting small images, etc)
- Often requires unique gesture vocabulary and user training on the interface. Not as intuitive as touch.

Other Options for Interactivity: Second Screen Control

- Second screen can be tablet, smart phone, or touch screen or other
- Useful when driving content on large or architectural wall (where the top displays can not be directly touched)
- Limitations around the number of users
- Users can be confused about where to look
- Used on Planar Mosaic at InfoComm (with Planar Helium display) and at Gensler's LA Office (using gesture and projection for control) and other case studies
- BYOD (mirroring) and wireless options growing in popularity as well



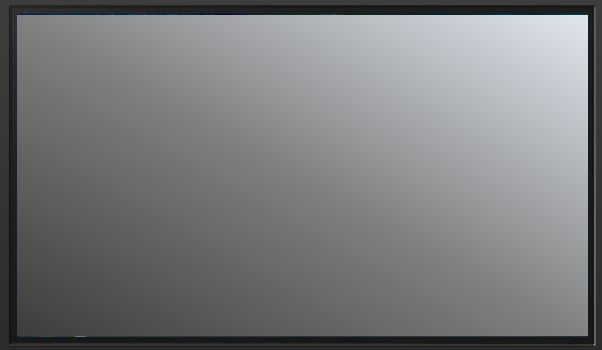
Components of a Touch System

There is more to a “touch screen” than the touch screen

- Display or video wall with integrated touch sensor
- PC with graphic card capable of output to display (single desktop across entire touch surface)
- Touch driver or touch-enabled operating system (some are HID compliant for driverless operation in Win 7/8, but others require drivers)
- Touch-enabled application (any application will work with single touch as it replicates a mouse click, but multi-touch, especially multi-user control, requires purpose-built content)

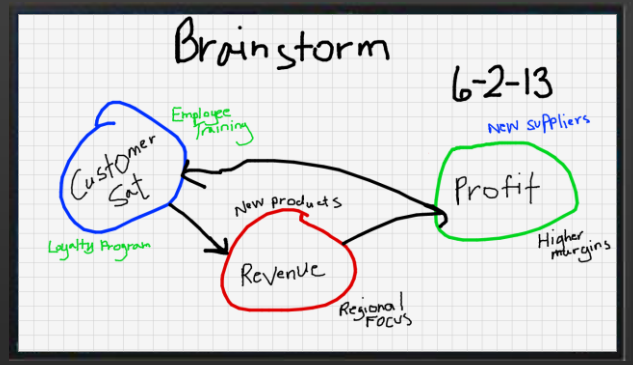
Example: Annotation in Corporate Environment

Touch screen



Annotation Software

Corporate Interactive Display



"Whiteboard"
"E-board"
"Smartboard"
"Collaboration"

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Touch Software Recommendations

Software	License Price	Features	Accuracy
	$0 (included with Office license)	Pen, Highlight, Text, Undo, Shapes, Print, Save, Text, Email, Eraser, Customizable Toolbars	Excellent
	~$400	Pen, Highlight, Text, Undo, Shapes, Stopwatch, Save, Eraser, Customizable toolbars, Annotate over video, Image searching	Excellent
	~$30	Pen, Highlight, Eraser, Save, Whiteboard backgrounds, Load application with pictures and video	Excellent

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Touch Software Recommendations (con't)

Software	License Price	Features	Accuracy
EVERNOTE Skitch	$0	Pen, Highlight, Undo, Shapes, Save, Text	Good
EVERNOTE	$0	Pen, Eraser, Save, Mobile apps and cloud access, Native Windows 8 app	Excellent
Snowflake	$0 (watermarked trial) ~$400	Pen, Shapes/Designs, Save, Email, Games, Media Viewer, Guest Book, as well as annotation tools, Native Windows 7 or 8 app	Good

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Considerations When Selecting a Touchscreen

1. Gather the display and touch requirements
2. Review manufacturer's specifications
3. Recommend the right display

- What is the application?
- Will the touchscreen be mounted on the wall? Inside a kiosk? Will it be used as a touch table?
- Size of room?
- Number of users?
- Which operating system will be used?
- Which touch gestures will be need to be supported?
- How many touch points are required?
- Will the touchscreen be used in landscape or portrait?
- Is design important? Is an overlay acceptable?
- Budget?

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PLANAR'S TOUCH OFFERINGS

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Planar Touch Offering is Broad and Full-Featured

Planar offers the most comprehensive line of integrated touch displays

PT Series
PCT Series
PXL Series

PS Series

UltraLux UltraRes

Clarity Matrix Video Wall

<32″ 46″ 55″ 70″ 80″ 84″ 92″ – 300″

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Display Recommendations by Room Size

Room Size	Display Size	Recommended Planar Display
Desktop	15”-32”	PCT or PXL Series
Small	55”-70”	PS5560T
Medium	70” – 80”	UltraLux 70 Touch, UltraLux 80 Touch
Large	80”+	UltraLux 80 Touch, UltraRes Touch, Clarity Matrix Touch

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PS-Series Touch

46″, 55″

- Supports up to 6 touch points
- Optical touch technology
- Anti-reflective protective glass
- Supports wide range of operating systems
- Ultra slim profile with no overlay
- Landscape and portrait capable
- Energy-efficient LED backlight
- Narrow logo-free metal bezel

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UltraLux and UltraRes Touch

Professional grade, MultiTouch Large Format Displays

- Highly accurate and reliable IR touch overlay
- Supports up to 6 touch points
- Configurable with all variations of UltraLux (FHD) and UltraRes (4K)
  - 70″/80″/84″
  - Portrait/landscape
  - White/black
  - Wall mounted or pedestal
- Ideal for corporate collaboration, interactive digital signage, and wayfinding

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Clarity Matrix MultiTouch System

Interactive Video Wall

- Adds multi-touch interactivity to Clarity Matrix Video Walls
- Supports up to 32 simultaneous touch point interactivity on the wall
- ERO™ glass touch surface
- Configurable up to 300” diagonal video walls

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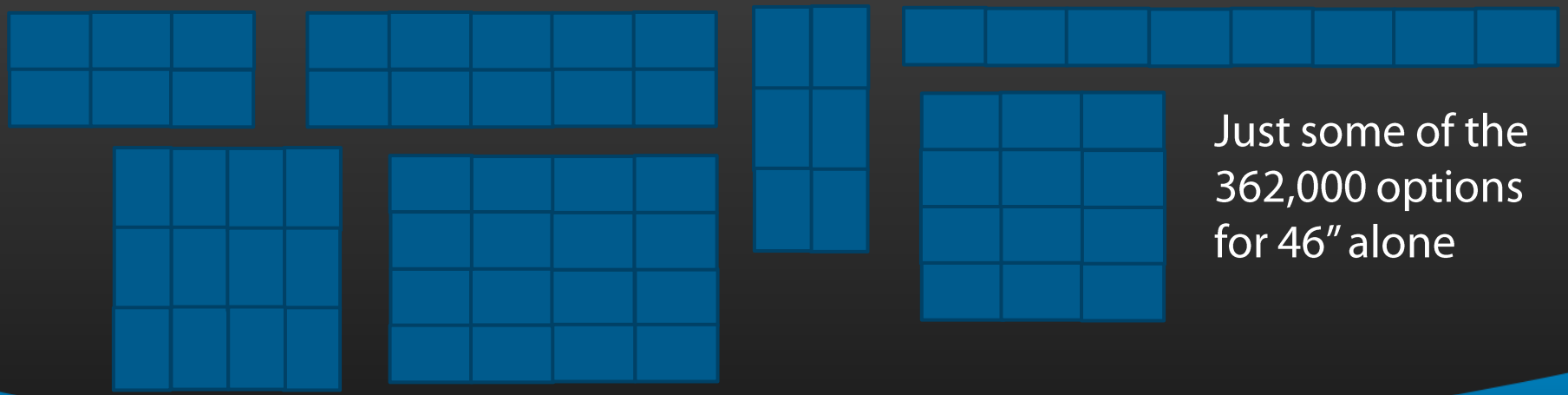
Creating a 300”+ Touch Wall

Thousands of custom configurations that can work

- Walls limited to 10’ (3 meters) high
- Width + height can’t exceed 33’ (10 meters)



Just some of the 362,000 options for 46” alone

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Why Consider a Planar Integrated Touch Solution?

- Designed to attach to Matrix, UltraRes, or UltraLux for easy installation without other parts or modifications required
- Bezel with finished trim design for sleek, logo-free look.
- Bezel designed to minimize stray light (which can create false touches)
- Better alignment of sensors to surface (better touch results)
- Single vendor for both displays and touch sensors
- Drivers for Win7/8, Mac OSx, and Linux are all available

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Additional Product Information

- Touch Innovation Web Page: www.planar.com/touch
- Video from InfoComm 2013

THANK YOU

Please consider the environment before printing this presentation

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