

KICKLE

whitepaper

How to choose your touchscreen
for your corporate meeting room?

Technology, market, brands and use case.

Edition: January 2018

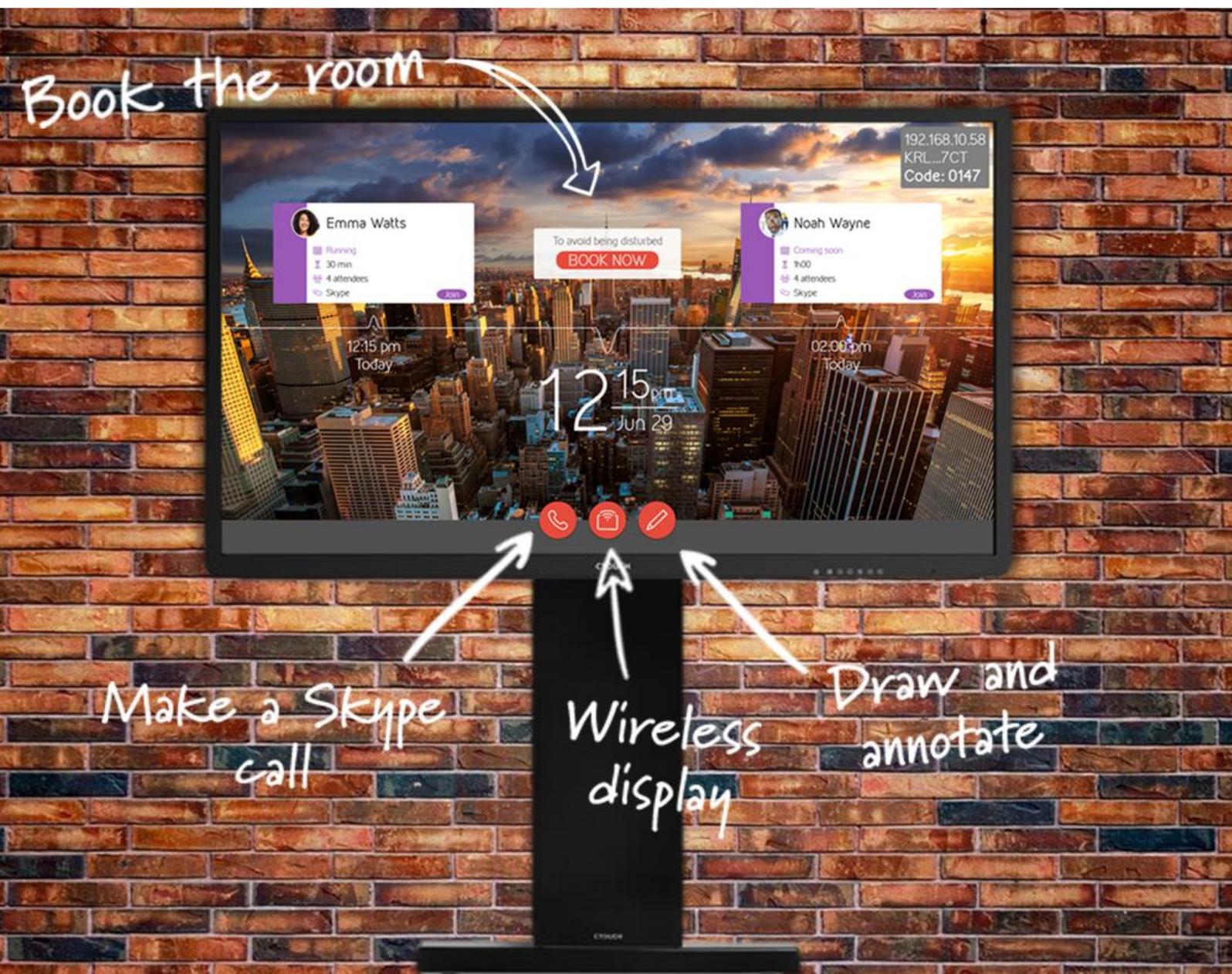
hello@kickle.com

Who are we?

We are Kickle. Kickle transforms any space into an **innovative and productive meeting room**. Videoconferencing, wireless display, room booking, whiteboard, and so much more. Kickle comes with everything needed to conduct your meetings with perfect peace of mind. The Kickle unit is comprised of a mini-computer, a webcam, and a microphone that connect to **any large size touchscreen device**. Kickle is also available preinstalled on an OPS touchscreen (soon you know what an OPS is ☺).

Finally—meetings that are both efficient and creative!

Contact us at www.kickle.com or send an email to hello@kickle.com.



Contents

Who are we?	2
The Technology	1
Touch technologies	1
Infrared (IR)	1
Surface Light Wave (SLW)	2
Projected capacitive technology (PCAP)	3
DVIT	4
InGlass Infrared	5
Summary	6
Autonomous Capacity	7
Integrated or external?	7
An Open Pluggable Specification (OPS) directly inserted within the screen.	7
A “computer-like component” directly integrated in the screen.	7
An external mini-computer attached to the back of the screen through a standard panel.	8
A chipset directly integrated within the screen.	8
Your computer	8
Summary	8
Market Vision and Brands	9
Market vision	9
Brand vision	9
Which Screen Size for My Meeting Room?	10
Define Your Use Case	11
Ideation room	11
Efficiency room	11
Presentation room	12
Training room	12
Special locations	12
At last, it’s time to choose!	14

“Soon, video projectors will be replaced by large size touchscreens in all the meeting rooms!”.

The objective of this whitepaper is **to help you choose the best touchscreen to equip your corporate meeting room(s)**. We’re talking about large size touchscreens, that is, more than 65 inches or 165cm diagonally—just like the one below:



How would you go about selecting a touchscreen for your meeting rooms among all of the different manufacturers out there? There are over 30 brands on the market (not including “white-labelled” brands). Not exactly slim pickings.

In 2016, 364,000 large size touchscreens were set up in meeting rooms worldwide. By 2021, it is forecasted there will be 3.6 million large size touchscreen displays installed. The market will increase ten-fold. **In short, video projectors are out; large size touchscreens are in. It’s as simple as that. With that said, rest easy you won’t go wrong in purchasing a touchscreen for your meeting rooms. However, you still need to be careful** choosing one that meets your needs. This document is here to help.

To get started, we are going to give you an overview of the different types of technologies used by touchscreen products today.

After that, we’ll dig into some discussion concerning the market, brands, and warranties.

Next, we’ll help you to define your unique “use case.” Ok, a touchscreen—but what for?

And finally, using our summary matrix, you’ll be able to select *your* perfect touchscreen.

Stay tuned—there is more whitepaper to come! If you have any enquiries or would like to chat about a related matter, please just let us know and we will do our best to help you!

Enjoy. The Kickle Team.

The Technology

So, let's get right into it: the technology! There's a lot to it, but we'll keep it simple.

Four main technologies are used for large size touchscreen: infrared, capacitive, Digital Vision Touch (DVT) and InGlass. Each one comes with their own unique set of pros and cons. We won't even touch on resistive nor surface acoustic technologies—as they offer a very poor user experience in terms of multitouch.

Touch technologies

Infrared (IR)

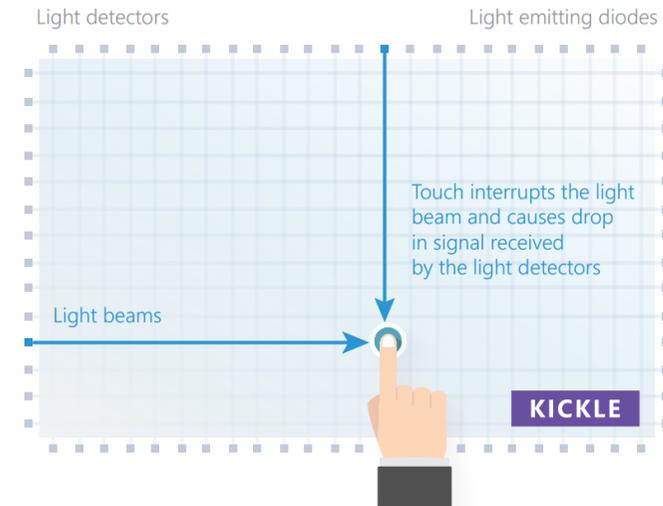
"Infrared is a simple, established, and time-tested technology".

How does it work?

Infrared is the most common technology used in touchscreens today.

Infrared waves are longer than those of visible light, but shorter than those of radio waves. As a result, Infrared light is a type of light that cannot be seen.

Infrared diodes, spanning the entire width and length of the screen, create a bright, squared beam on the surface. When the user touches the screen, it interrupts this beam at X and Y, which determines the point of contact. Infrared can support up to 32 touch points, depending on the brand.

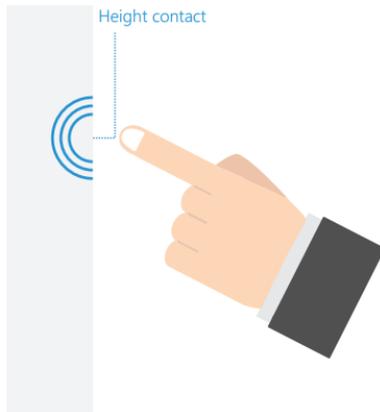


The pros

- Infrared is a simple, established, and time-tested technology. Moreover, IR diodes have a great life expectancy. As a result, IR touchscreens are reliable, last a long time, and are relatively affordable.
- Infrared touchscreens don't require any specific drivers. That means you can connect your computer to the touchscreen without installing a driver or any software.
- As earlier stated, when the user touches the screen, it interrupts this beam at X and Y, which determines the point of contact. If you use your palm (establishing many points of contact), the touchscreen will be able to recognize that you are using your palm (and not your finger). Thanks to this capability, you can erase a whiteboard using your whole hand and then draw using your finger or a pen.

- IR touchscreens are available in lengths of up to 5 meters; suitable for large, touchscreen Vidiwalls.
- You can interact with the screen wearing gloves.
- IR touchscreens can achieve a precision of 4.5 mm object detection (which is quite good) and offer a response time of up to 10ms (also quite good).
- As there is no additional overlay (contrary to capacitive screens, explained below), IR touchscreens offer very good image clarity.
- Because IR is a “on top” solution, IR-based glass touchscreens can come at any level of thickness (good for outdoor use, for instance).

The cons



IR technology comes as an overlay, placed over a frame. If you move your finger to within 3mm (more or less) of the screen, the surface will consider its presence as a point of contact even though you did not actually make physical contact with the screen. This is what we call the “height contact”

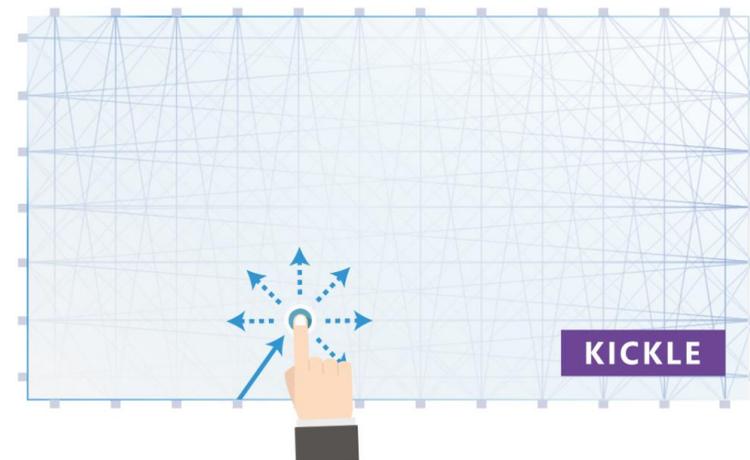
The less sensitive the height-contact, the better. As a result, compared to other technologies with zero height-contact, the precision of a IR touchscreen is not as good.

- Due to the “half-declarative” technology, infrared is not able to make the difference between a pen or a finger (unless you use a special pen as described below).
- Sunlight or halogen light sources may cause interference in the form of “ghost touches” (the screen recognizes contact when there has been none).
- There is a bezel (8 to 12 millimetres) that encircles the screen.
- You cannot use IR touchscreens in harsh environments. For instance, dust is capable of triggering a “ghost touch.”

Surface Light Wave (SLW)

“SLW technology is a super Infrared”.

SLW is technology based on IR. IR method is based on the X and Y Axis. This way, the processor can only obtain the coordinates. With SLW, the processor can also describe the shape of an object by using the (extra) light waves across the screen. For example, the screen will give different results when using a finger or a palm touch.



The pros

- Same “pros” than IR.
- You can use your fingers, your palm, or any other object, and specify what does what (e.g. my pen writes, my finger moves, my palm erases, etc.).
- SLW supports multi-touch up to 32 touch points.
- SLW offers a better precision than “normal” IR (3mm) and a better response speed than “normal” IR (up to 6ms).

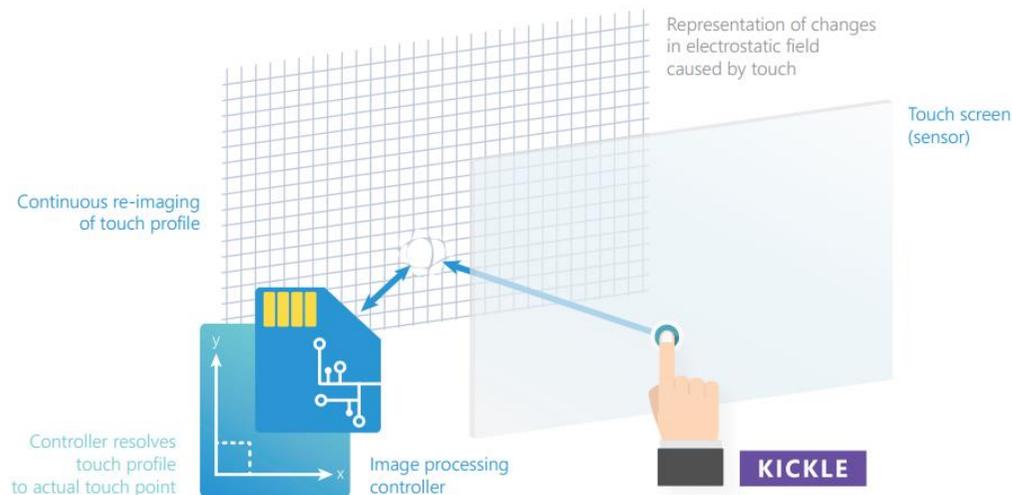
The cons

- Same cons than IR.

Projected capacitive technology (PCAP)

How does it work?

When a finger (or anything) electrically charged approaches a PCAP-based surface, the electric charge of the surface is altered (capacitance). Projected capacitive technology detects a touch by measuring the capacitance at each addressable point on the surface. The change in capacitance is measured and converted into X and Y locations. Projected capacitive technology is a mesh of very thin conductive wires, encapsulated in an adhesive, transparent foil and then placed under glass.



Projected capacitive technology can support single, dual as well as multi-touch capabilities.

The pros

- Projected capacitive offers a high-precision interaction with the screen.
- You can use your fingers, your palm, or any other object, and specify what does what (e.g. my pen writes, my finger moves, my palm erases, etc.).
- This technology does not require direct contact with the active touch surface (glass is used as the surface of the touch sensor). This, naturally, improves the durability of the screen and allows manufacturers to create special screens for specific purposes (outdoor use, for instance).
- As with infrared touchscreens, capacitive touchscreens do not require any specific drivers. This means you can connect your computer to the touchscreen without installing anything.
- Capacitive screens can be bezel-free, offering a great design.
- Capacitive screens offer up to 100 touch points and a response time up to 5ms.

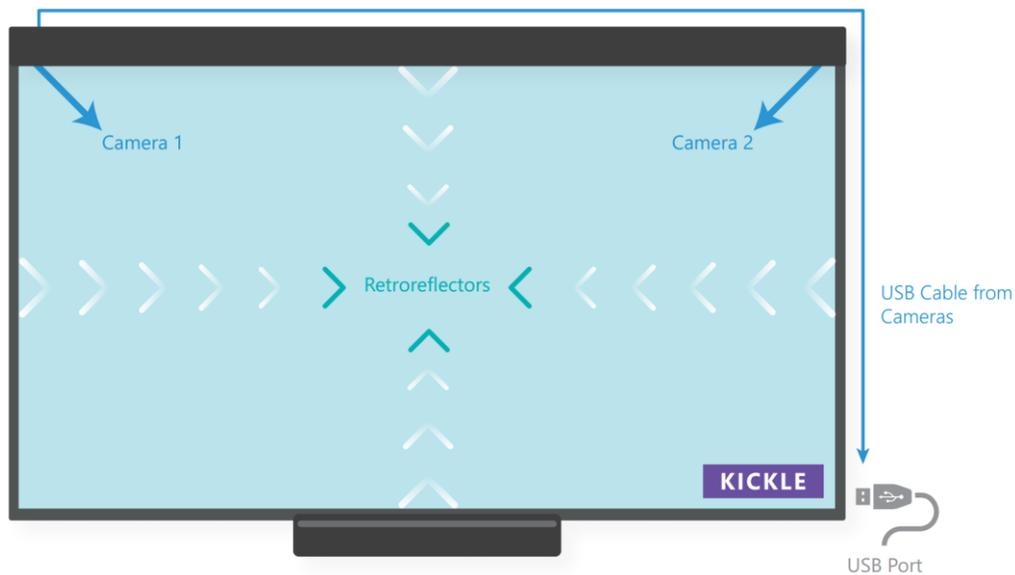
The cons

- Capacitive screens are comparatively costly.
- You cannot use ski gloves, unless they are conductive gloves (no way of telling).
- Capacitive screens do not offer a very good contrast, brightness or anti-glare effect compared to IR or a DVIT touchscreen (see below).
- A capacitive screen cannot function if the surface is wet.

“Projected capacitive offers a high-precision interaction with the screen”.

DViT

How does it work ?



DViT belongs in the category of optical detection technologies (like infrared). It is a digital capture system comprised of hardware and software components, using small digital cameras positioned in the corners of a frame that encloses the screen (contrary to IR screens which use IR diodes). When a user touches the active area of the screen (with his finger, a stylus or any other object), cameras locate the contact point (X, Y position) and then transmit this location to the screen software.

The pros

DViT is able to recognize your finger, your palm or a pen, and offers an excellent touch-sensitivity.

As with IR, and contrary to capacitive screens, there is no “overlay” over the glass. That means DViT screens are robust, offer a good contrast and a good anti-glare effect.

The cons

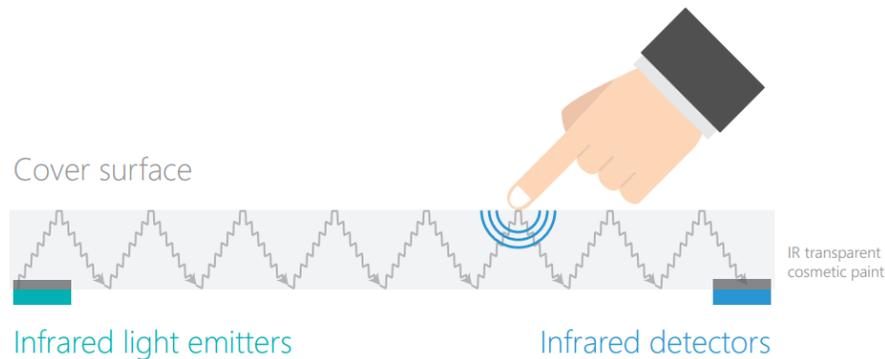
As DViT is also a software solution, you will need to install specific drivers in order to connect your device to the touchscreen. DViT does not offer as much precision as capacitive does, however, it does offer better precision than IR.

“DViT is able to recognize your finger, your palm or a pen, and offers an excellent touch-sensitivity”.

InGlass Infrared

How does it work ?

Invisible light waves are emitted into a transparent glass where they are then detected on the opposite side by a detector. When an object touches the surface, it causes a disturbance which is measured and calculated at an X,Y position.



The pros

- InGlass technology offers an excellent image clarity as well as a no-brightness effect.
- As with capacitive, InGlass screens can be bezel-free, offering a great design.
- You can use InGlass while wearing gloves.
- InGlass screens offer up to 100 touch points and a response time of up to 5ms.
- As with capacitive and infrared, no driver is needed.
- InGlass is able to recognize up to 1000 levels of pressure.

The cons

- InGlass prices range between capacitive and infrared (closer to capacitive).
- InGlass touchscreens offer a poor anti-glare effect.
- The glass thickness must be at least 3.2mm. This means InGlass is not suitable for harsh environments.

"InGlass technology offers an excellent image clarity as well as a no-brightness effect."

Summary

	IR	SLW	PCAP	DVIT	INGLASS
Overall touch experience (precision and time response)	★	★ ★	★ ★ ★	★ ★	★ ★
Multi-touch capacity (maximum points of contact and touch resolution)	★ ★	★ ★	★ ★ ★	★ ★	★ ★
Object recognition (Pen versus finger)	No	Yes	No	Yes	Yes
Can use with gloves?	Yes	Yes	No	Yes	Yes
Image clarity	★ ★	★ ★	★ ★	★ ★ ★	★ ★ ★
Brightness	★ ★	★ ★	★ ★	★ ★ ★	★ ★ ★
Anti-glare	★ ★ ★	★ ★ ★	★ ★	★ ★ ★	★
Dusty environment compliance. (glass thickness capacity, sensitive to dust, etc.)	★ ★ ★	★ ★ ★	★	★ ★	★
Cost-effective	★ ★ ★	★ ★ ★	★	★ ★	★ ★
Robustness	★ ★ ★	★ ★ ★	★	★ ★	★
Ghost touch sensitivity (3 stars indicates "no ghost touch")	★ ★	★ ★	★	★ ★	★
Design (bezel size)	★ ★	★ ★	★ ★ ★	★	★ ★ ★
Plug and play (no driver needed)	Yes	Yes	Yes	No	Yes

Autonomous Capacity

Integrated or external ?

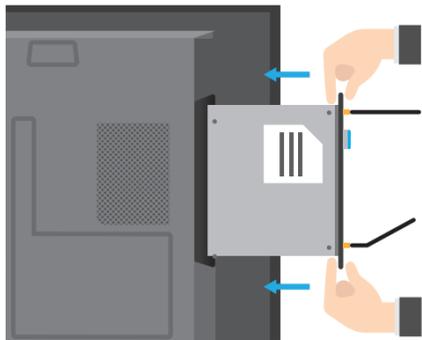
A touchscreen is still only just a screen. In other words, if not connected to “something,” a touchscreen is pretty much useless. This “something” can be:

- A hardware component directly integrated within the screen.
- An external computer (which could be your personal computer, connected via HDMI for audio/video and via USB for the touch capacity, or other types of external devices).

A touchscreen that integrates an operating system is what we call an autonomous touchscreen, while a touchscreen that does not integrate an operating system is not autonomous.

Let’s run through some solutions:

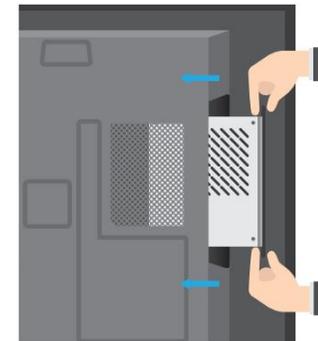
An Open Pluggable Specification (OPS) directly inserted within the screen.



In 2010, Intel launched the Open Pluggable Specification (OPS) to standardize the system architecture between displays and media players. OPS has quickly become a standard for creating integrated display solutions. As it is a standard, you can plug an OPS into any touchscreen, or swap an OPS out from one screen to another.

OPS is the most common and time-tested solution, although it is quite expensive.

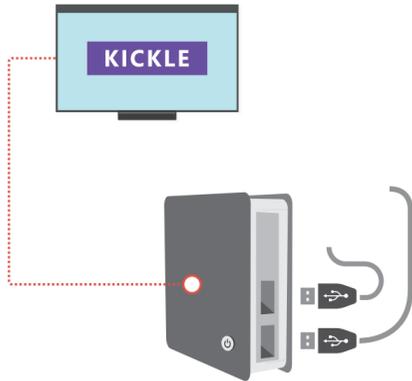
A “computer-like component” directly integrated in the screen.



This solution resembles an OPS solution; however, the form factor is slightly larger. Contrary to an OPS, this is not a standardized solution. That means the hardware will be different from one touchscreen manufacturer to another.

“Computer-like” solutions are cheaper than OPS. Nevertheless, as OPS is becoming more and more mainstream, the cost advantage between a “computer-like” solution and OPS is fading.

An external mini-computer attached to the back of the screen through a standard panel.



This solution is the most flexible and cost-effective solution. However, as the mini-computer is not directly integrated within the screen, you will have to power the screen and the mini-computer by an alternative means. If the touchscreen comes with USB ports, these USB ports will not be connected to the mini-computer (contrary to an OPS or another computer-like integrated solution).

A chipset directly integrated within the screen.

This solution offers low performance at low cost. Most of the time, the chipset runs an Android operating system and comes with basic software (whiteboard, basic wireless display).

Your computer

Last, but not least, you can simply connect the screen to your computer using the HDMI connection for the audio/video and USB for the touch features.

Summary

	OPS	Integrated computer-like solution	Android chipset	External mini-computer	Your computer
Cost-effective	★	★ ★	★ ★ ★ ★	★ ★ ★	
Performance	★ ★ ★	★ ★	★	★ ★ ★ ★	
Software panel you can use	★ ★	★ ★	★	★ ★ ★	★ ★ ★ ★
Easy to use	★ ★ ★	★ ★ ★	★ ★ ★	★ ★	★
Graphic performance	★ ★ ★	★ ★ ★	★ ★	★ ★ ★	depends

Market Vision and Brands

Market vision

Here is our vision of the meeting room market over the next five years.

- Meeting rooms will become **specialized**: dedicated creativity rooms, dedicated training rooms, dedicated sales rooms, and dedicated decision-making/project rooms (this last one accounting for probably 70% of a company's meeting rooms).
- Meetings will become more **"seamless:"** connected to the company's social network (or any data repository).
- The average equipment cost of a meeting room will increase. As a result, companies will need to be able to measure their **return on investment**.
- Touchscreens will expand significantly over the next five years with OPS (or similar solutions), webcams, mics, and captors. Touchscreens will be regarded as **computers** and projects will be handled more and more by the IT team and less and less by the AV team.
- As personal videoconferencing (such as Skype for Business.) is currently a "must have" on any personal computer, videoconferencing-equipped meeting rooms will likewise become the norm (even if not used). The need will develop for any room to be **videoconferencing-equipped** (creativity sessions, training, sales, decision-making/projects) contrary to one decade ago.
- Meetings will be more **"hands-free."** No need to display your device since the screen will be connected to all of the data you need.
- Productivity during meetings will become more important for companies as the data-driven analysis of the "value of time" becomes easier to measure.

Brand vision

Until 2016, the touchscreen market existed as a niche market for the corporate segment. Today, it has emerged as a volume-driven market.

In the corporate EMEA market (Europe, Middle East, and Africa), five leading brands control 46% of the market: CTOUCH, Sharp, Smart, Samsung, Sahara. 19% of the market is shared amongst well-known brands like Dell, Viewsonic, LG, etc.

34% of the market is shared amongst "unknown" brands, which are typically "white-labelled" brands (i.e., touchscreens manufactured in China and sold in Europe through a sales-oriented brand label).

We believe that the market will consolidate (as any volume-driven market does) at the benefit of current leaders. We predict that the top 5 leaders will come to share 80% of the market in the next 3 years.

Warranties

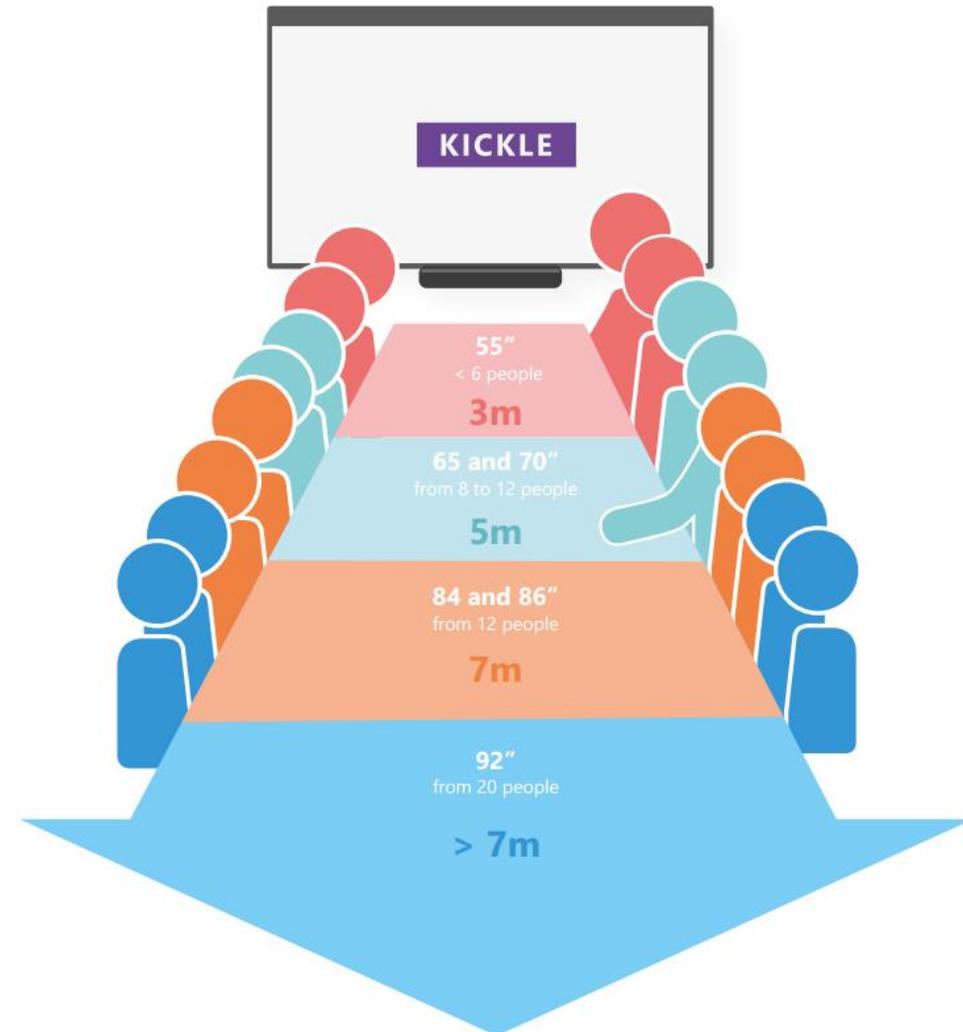
Default warranties start from 2 years (Samsung) and go to 7 years (CTOUCH). Warranties and extended warranties are an important decision lever.

Note on Surface Hub, Jamboard and Spark Board

As Microsoft Surface Hub, Google Jamboard and Cisco Spark Board are dedicated touchscreens, we decided not to include these screens into this whitepaper's discussion.

Which Screen Size for My Meeting Room ?

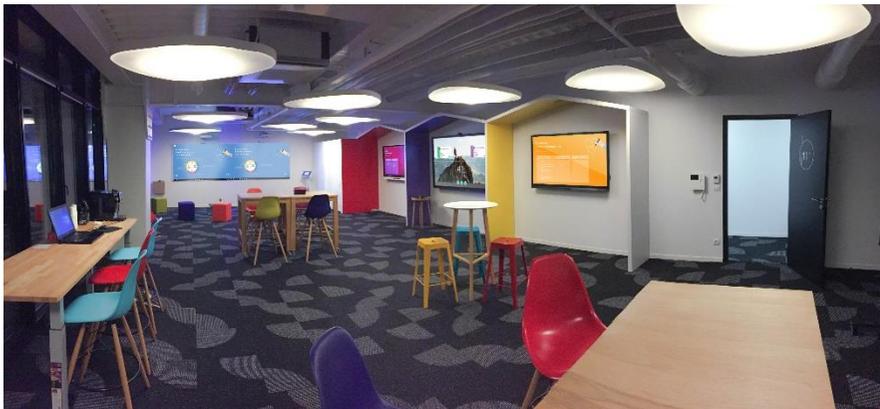
The bigger your room is, the bigger the screen needs to be. It's as simple as that.



Define Your Use Case

Now that you have gathered all of the essential information from a technical perspective, it's time to dig into user needs. We can divide meeting rooms into 5 categories: Ideation room, efficiency room, presentation room, training room, or special locations.

Ideation room



The purpose of an ideation room is to generate ideas or solve complex problems collaboratively. This room type can be equipped with ideation software (brainstorming, sticky notes, etc.) and make use of a large size touch surface.

Collaborators may work standing up and meetings may last quite long (several hours or even a full day). Efficient room capacity is 5 to 8 people. If there are more than 8 people, you should consider splitting up participants into several groups / rooms. Meetings last longer here than in other room types.

Ideation software must be able to discern between a pen, a finger, and a palm. The touch-experience must be optimal, and the multi-touch capacity is also

important. Ideation software must be preinstalled and ready to use directly from the screen and, therefore, the touchscreen must offer either an OPS, an integrated PC or an external mini-computer solution. As ideation software can be rather specific, Android touchscreens are not an option. Touch experience and multi-touch capacity are very important.

Efficiency room

The purpose of an efficiency room is to make decisions (deciding on a budget for a project, for instance, or updating a project roadmap). In this room type, users need to be able to display their documents via their personal devices, sketch on a whiteboard, annotate their documents, and to do all of this in a very intuitive and simple manner. Participants may also need to make videocalls with other rooms or remote attendees, as well as share their documents with these non-present parties.

These meetings are typically short and efficient (45 minutes max). Attendees work standing up or sitting down. Efficiency rooms may be small or large, with space for 2 to 8 people. If there are more than 8 participants, it would be considered more as a presentation room (see below).

Attendees may be internal or external, bringing their own personal devices with different types of connectors (HDMI, mini-HDMI, USB, nothing, etc.). A wireless display solution is a "must-have" feature for this room type. Having an integrated room-booking feature would be considered as a "nice to have."



Touch experience is very important while multi-touch capacity is also important.

Kickle is a great example of an efficient meeting room solution, especially if you already use Skype for Business as a unified communication solution. Kickle is offered as a mini-computer or directly integrated into certain touchscreens.

Presentation room

A presentation room is a room where a presenter conducts a speech or presentation before an audience of attendees. Compared to an efficiency room or an ideation room, presentation meetings are not interactive. The presenter only needs to display their device, annotate using the touchscreen, and eventually sketch something on the whiteboard—all in a very intuitive and simple manner.

Room capacity ranges from 8 to 40 people. For efficiency rooms, a wireless display solution is a “must-have” feature while videoconferencing is usually not needed.

Touch experience and multi-touch experience are not crucial. The screen size should be quite large.

Training room

In this room type, trainees and trainers need to be able to display their computers, and to do so simultaneously. The trainer must be able to take control of the trainees’ devices if needed. The trainer also needs to be able to use specific training software and specific whiteboard tools.

The room capacity ranges from 6 to 30 people. Videoconferencing may be useful. Touch experience and multi-touch experience are important. Depending on the size of the room, screen size should be large.

Special locations

Special locations are venues that require a very specific solution. For instance:

- A control room
- A harsh environment (outdoor, dusty place)
- A mobile solution
- A room where plans are made

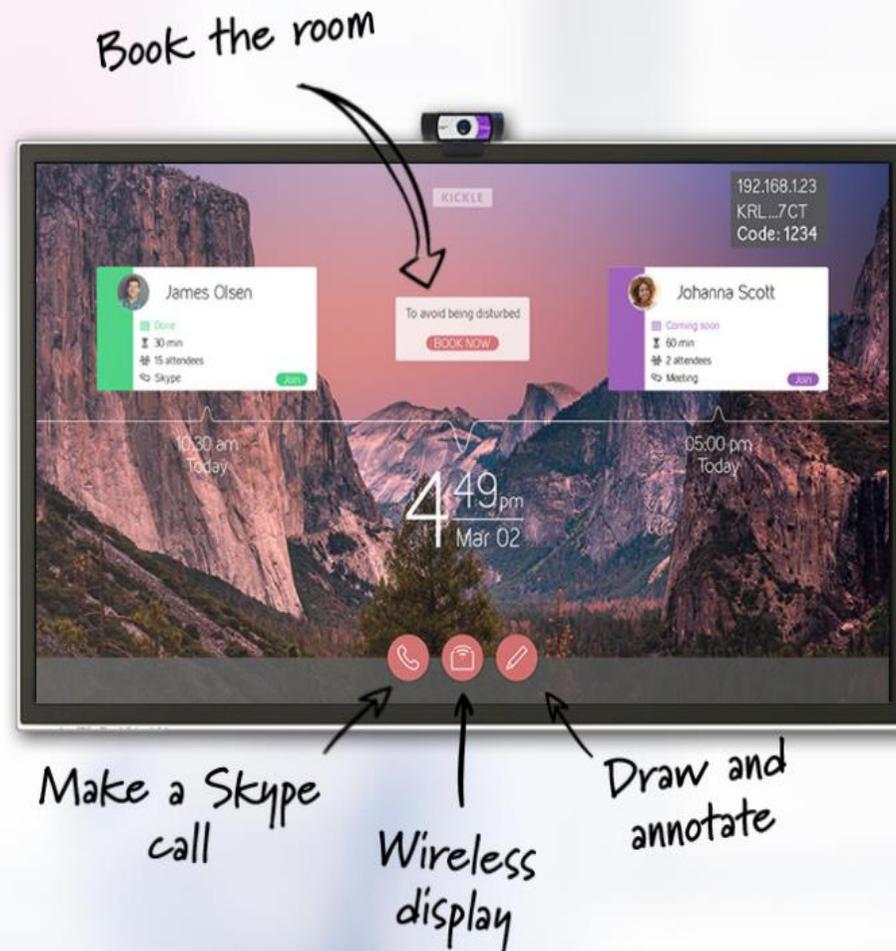
Depending on the specific use case, the importance of touch experience, multi-touch capacity, robustness, and videoconferencing capability will vary significantly

You're nearly finished. We hope you're enjoying this whitepaper!
Don't forget: it would be our pleasure to help you:

Collaborative video conferencing made simple*.

**Give your IT guy the day off.*

Get in touch



At last, it's time to choose!

★ ★ ★ Very important

★ Not important

	Ideation room	Efficiency room	Presentation room	Training room
Overall touch experience (precision and time response)	★ ★ ★	★ ★	★	★ ★ ★
Multi-touch capacity (points of contact and resolution)	★ ★ ★	★	★	★
Object recognition (Pen versus finger)	★ ★ ★	★ ★	★	★ ★
Can use with gloves?	★	★	★	★
Image clarity	★ ★	★ ★	★ ★ ★	★ ★
Brightness	★ ★	★ ★	★ ★ ★	★ ★
Anti-glare	★ ★	★ ★	★ ★ ★	★ ★
Dusty environment compliance (glass thickness, sensitive to dust)	★	★	★	★
Robustness	★	★	★	★ ★
Ghost touch sensitivity (3 stars indicates "no ghost touch")	★ ★	★ ★	★ ★	★ ★
Design (bezel size)	★ ★	★	★ ★ ★	★
Plug and play (no driver needed)	★ ★ ★	★ ★ ★	★ ★ ★	★
Users must connect wirelessly	★	★ ★ ★	★ ★ ★	★ ★ ★
Videoconferencing capability	★	★ ★ ★	★	★
Ability to install specific software (autonomous touchscreen/OPS)	★ ★ ★	★	★	★
Integrated educational/training software	★	★	★	★ ★ ★
	↓	↓	↓	↓
Best solution	PCAP + OPS + ideation software Or Inglass + OPS + ideation software	SLW + Kickle	IR + wireless display solution	DViT + training software
Size	Sized from 75" to 86"	Sized from 65" to 86"	Sized from 65" to 86"	Sized from 75" to 86"

If you would like to learn more about Kickle, you can check out our video demo: www.kickle.com/videos



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Thanks for reading

Contact us at www.kickle.com or hello@kickle.com