

Proposal for



Q4. 2018



*Committed To Excellence*

# Product Offering

**I. ULTRA Slim IR**

II. 86" In Cell IFPD

III. 98" (Affordable)

# AHA Patents on Technology of ULTRA SLIM IR



서울시 서초구 서초대로 48 길 45 다원빌딩 3층 TEL : 02-588-0020 / FAX : 02-588-1717  
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2018년 8월 24일

수 신 : 주식회사 아하정보통신 귀중  
제 목 : 특허 등록 완료 보고 및 특허증 송부  
(당소관리번호 : DP20180081)

## Patents Registration Completion Report

담당변리사 : 김진동 변리사 Tel: 02-588-0020 E-mail: jdkim@greenpat.net  
관리담당자 : 정구상 부장 Tel: 02-588-0048 E-mail: gsjung@greenpat.net

당소에 의뢰하신 하기 권의 특허 등록을 완료하였기에 그 내역을 아래와 같이 알려드리며, 특허증을 동봉합니다.

권 리 : 특허  
특 허 권 자 : 주식회사 아하정보통신  
등 록 일 자 : 2018-08-16  
등 록 번 호 : 제 10-1890695-00-00 호  
명 칭 : 판서 인식을 개선한 적외선 터치센서 장치  
발 명 자 : 구기도  
권리 존속 기간 : 2018-08-16 부터 2038-05-03 까지

### [특허권에 대한 제반 사항 안내]

- 특허권의 존속기간은 특허권의 설정등록일로부터 특허출원일 후 20년까지입니다.
- 설정등록료 납부시 1~3년 분의 특허료를 납부하였습니다. 4년 분 이후의 특허료는 등록일자를 기준으로 1년 분씩 전년도에 납부하여야 합니다. 이에 관한 안내를 특허료 납부 마감일 전에 헤드필 예정이오니, 연락처의 변동사항이 발생하였을 때는 지체 없이 당소에 알려 주시기 바랍니다.
- 특허권이 침해된 경우, 특허법에 의거하여 침해금지청구권, 손해배상청구권, 신용회복청구권, 부당이득반환청구권 등을 행사할 수 있습니다. 특허권에 대한 분쟁이 발생한 경우, 즉시 당소로 연락해 주시기 바랍니다.

본건과 관련하여 문의 사항이 있으시면 상기 담당변리사 또는 관리담당자에게 연락하여 주시기 바랍니다.

푸른국제특허법률사무소



동봉물: 1. 등록증 1부  
2. 등록원부 및 등록공보 1부  
3. 특허청 납입영수증 1부 (붙)  
기발행: 전자세금계산서

발급번호 : 5-5-2018-043133084



## 특허등록원부

특 허 번 호 제 1890695 호

### [ 권 리 관 ]

표시번호	등 록 사 항
1번 출원연월일	2018년 05월 03일 출원번호 2018-0051164
공개연월일	2018년 08월 22일 공개번호 -
특허결정(심결)연월일	2018년 08월 13일 청구범위의 항수 3
분류기호	G06F 3/041, G06F 3/042, G06F 3/0488, G06N 99/00
발명의 명칭	판서 인식을 개선한 적외선 터치센서 장치
존속기간(예정)만료일	2038년 05월 03일
2018년 08월 16일 등록	

### [ 특허료란 ]

제 01 - 03 년분 (2018.08.16 ~ 2021.08.16) 금액 49,600 원(중기업) 2018년 08월 16일 납입

### [ 특허권자란 ]

순위번호	등 록 사 항
1번 (최종권리자)	주식회사 아하정보통신 (110111-*****) 경기도 김포시 양촌읍 황금로109번길 67 2018년 08월 16일 등록

이 등본(초본)은 등록원부와 틀림이 없음을 증명합니다.  
( 제 000198490 호 )

2018년 08월 24일

특 허 청



◆ 본 증명서는 인터넷으로 발급되었으며, 특허청 홈페이지(www.kipo.go.kr)의 '특허 및-온라인제출명령' 메뉴를 통해 등록번호 또는 문서번호의 바코드로 내용의 위·변조 여부를 확인해 주십시오. 단, 발급번호를 통한 확인은 90일까지 가능합니다.

# AHA Patents on Technology of ULTRA SLIM IR

**특허증**  
CERTIFICATE OF PATENT

**특허** 제 10-1890695 호  
Patent Number

**출원번호** 제 10-2018-0051164 호  
Application Number

**출원일** 2018년 05월 03일  
Filing Date

**등록일** 2018년 08월 16일  
Registration Date

**발명의 명칭** Title of the Invention  
판서 인식을 개선한 적외선 터치센서 장치

**특허권자** Patentee  
주식회사 아하정보통신(110111-\*\*\*\*\*)  
경기도 김포시 양촌읍 황금로109번길 67

**발명자** Inventor  
구기도(630901-\*\*\*\*\*)  
경기도 고양시 일산동구 위시티4로 46 위시티일산자이2단지아파트 210동902호

위의 발명은 「특허법」에 따라 특허등록원부에 등록되었음을 증명합니다.  
This is to certify that, in accordance with the Patent Act, a patent for the invention has been registered at the Korean Intellectual Property Office.

2018년 08월 16일

**특허청장**  
COMMISSIONER,  
KOREAN INTELLECTUAL PROPERTY OFFICE

특허청  
Korean Intellectual Property Office

성찬모

QR코드로 원제기준 등록사장을 확인하세요

Tech of ULTRA Slim IR

**특허증**  
CERTIFICATE OF PATENT

**특허** 제 10-1889491 호  
Patent Number

**출원번호** 제 10-2018-0051158 호  
Application Number

**출원일** 2018년 05월 03일  
Filing Date

**등록일** 2018년 08월 10일  
Registration Date

**발명의 명칭** Title of the Invention  
슬림 베젤을 가지는 에어터치층을 줄인 전자칠판

**특허권자** Patentee  
주식회사 아하정보통신(110111-\*\*\*\*\*)  
경기도 김포시 양촌읍 황금로109번길 67

**발명자** Inventor  
구기도(630901-\*\*\*\*\*)  
경기도 고양시 일산동구 위시티4로 46 위시티일산자이2단지아파트 210동902호

위의 발명은 「특허법」에 따라 특허등록원부에 등록되었음을 증명합니다.  
This is to certify that, in accordance with the Patent Act, a patent for the invention has been registered at the Korean Intellectual Property Office.

2018년 08월 10일

**특허청장**  
COMMISSIONER,  
KOREAN INTELLECTUAL PROPERTY OFFICE

특허청  
Korean Intellectual Property Office

성찬모

QR코드로 원제기준 등록사장을 확인하세요

Tech of Reduction Air Touch

# AHA Hybrid Board's Main 20 Features

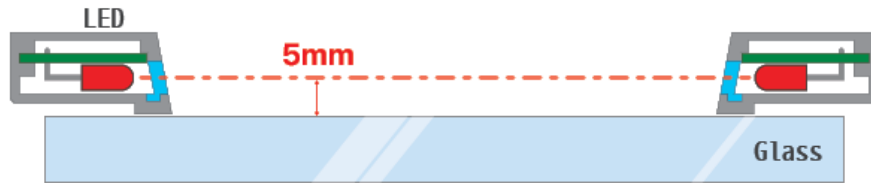
<b>Touch Sensor</b>	<ul style="list-style-type: none"><li>① Innovative improvement in air touch (reduce sensor-glass spacing from 5 mm to 1.5 mm)</li><li>② Touch response/response speed is fast (6 ms for 55")</li><li>③ Able to write small, fine characters(within 0.7 cm<sup>2</sup>)</li><li>④ Pen tip diameter Φ2 (General IR pen: Φ8)</li></ul> <hr/>
<b>Design</b>	<ul style="list-style-type: none"><li>⑤ Slim design(Bezel width 13 mm)</li></ul> <hr/>
<b>Sound</b>	<ul style="list-style-type: none"><li>⑥ 20 Watt x 2+ Woofers</li></ul> <hr/>
<b>Special</b>	<ul style="list-style-type: none"><li>⑦ Android version 6.0 (MStar MSD 648 chip)</li><li>⑧ Booting time approx. 15~16sec (Android5.0: approx. 40sec)</li><li>⑨ Android multi-touch Max. 20 touch (Android5.0: 6 touch)</li><li>⑩ Users enables to change source name</li><li>⑪ Users enables to create/change/save file name</li><li>⑫ E mail sending</li><li>⑬ DICOM (Digital Imaging &amp; Communications in Medicine) Curve</li><li>⑭ Eye protection function for users e.g. teachers, etc.) with automatic brightness control</li><li>⑮ Bidirectional network with EShare Pro for mirroring, reverse touch, etc ( Option )</li><li>⑯ WOL (Wake On Lan)</li><li>⑰ Dual WiFi (2.4G-WIFI + 5G-AP)</li><li>⑱ Power On/Off Time Setting</li><li>⑲ Select Touch On/Off with button</li><li>⑳ Easily transfer the board image file to your smartphone via QR code</li></ul>

# 1) Innovative improvement in air touch

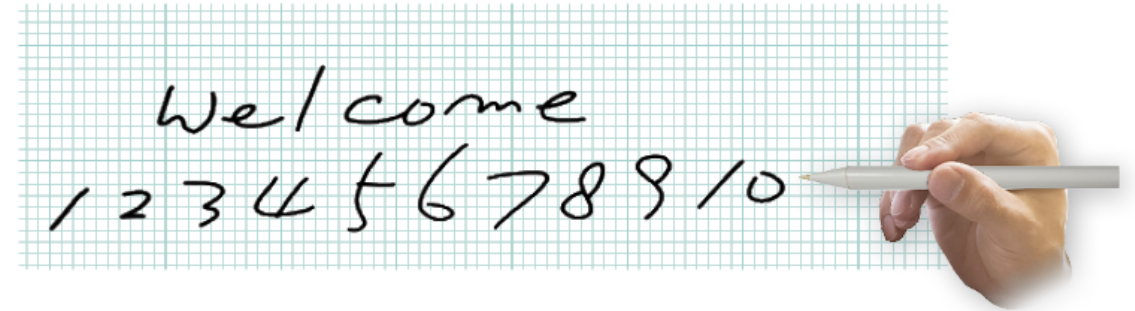
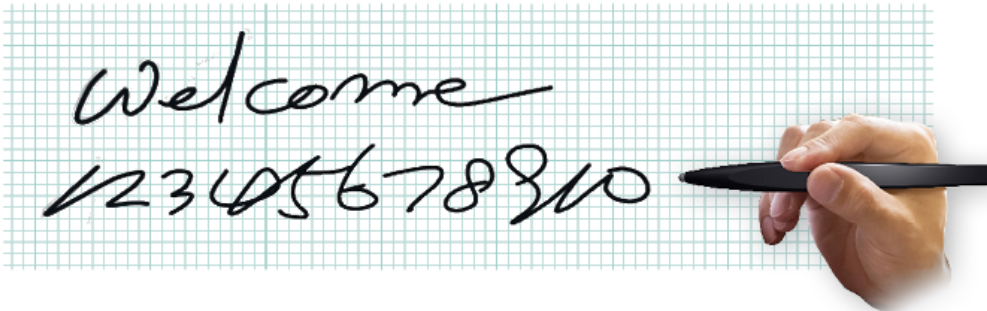
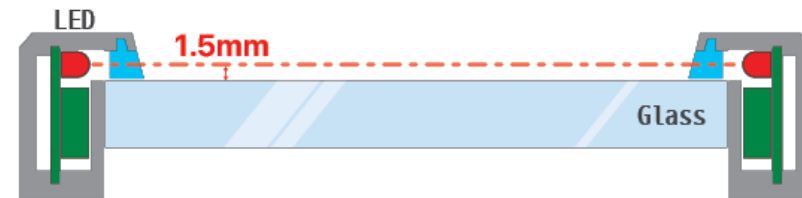
In the existing general IR product, the gap between touch sensor and glass is 5mm. With improvement to design, it is improved and reduced up to 1.5 mm.

Accordingly, dragging by air touch in conventional IR has been resolved, and it looks like it's written on paper.

Conventional IR



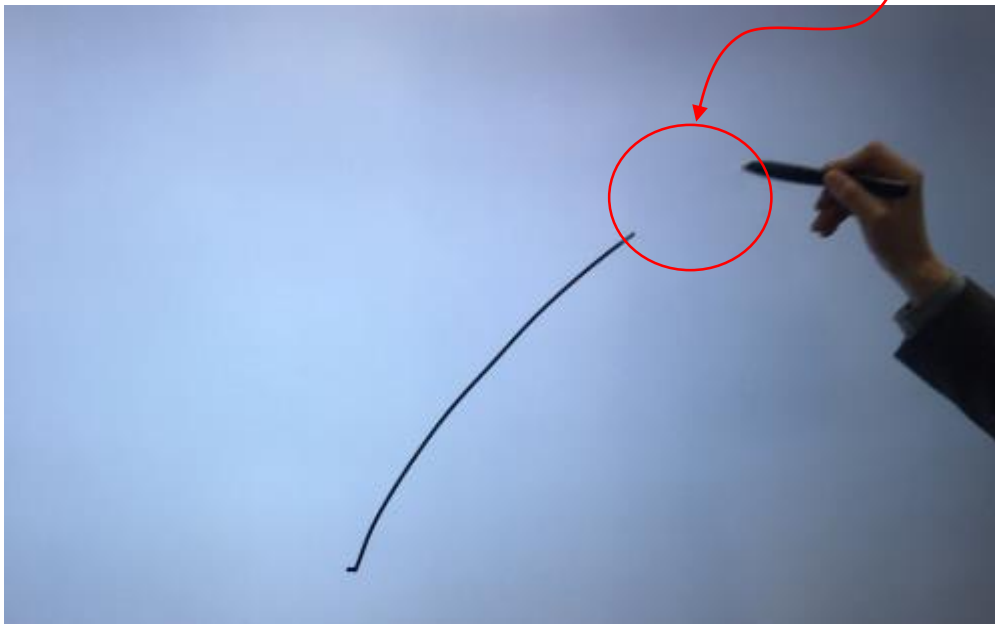
ULTRA SLIM IR



## 2) Touch response/response speed is fast

AHA Hybrid is a very fast touch response speed and does not generate Time Lagging as seen in conventional IR.

Conventional IR Lagging

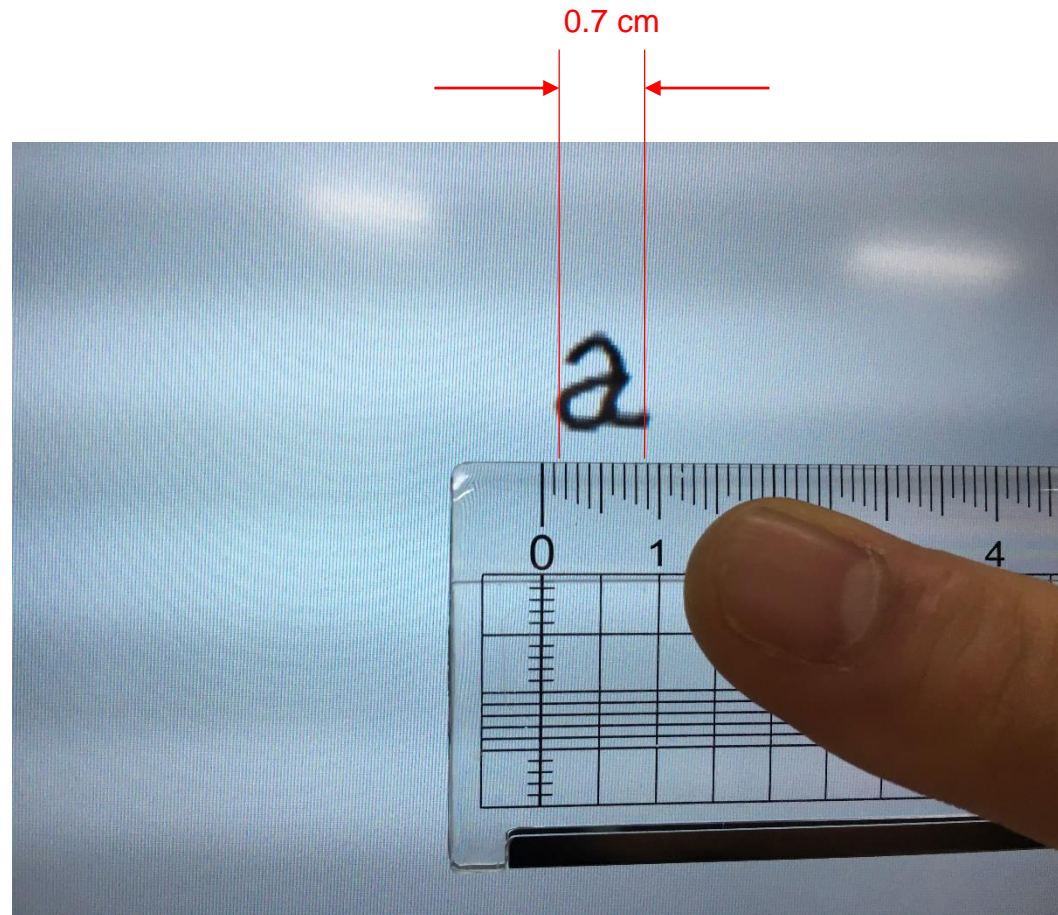


ULTRA SLIM IR



### 3) Able to write small, fine characters

More than soft, fast drawing, enables to write in  $0.7 \text{ cm}^2$  precisely





## 4) Pen tip diameter $\Phi 2$

Pen tip diameter, is used 8mm in conventional IR, is reduced to 2 mm, allowing for very fine and accurate writing.



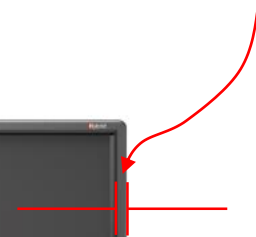
## 5) Slim design



Front Rendering

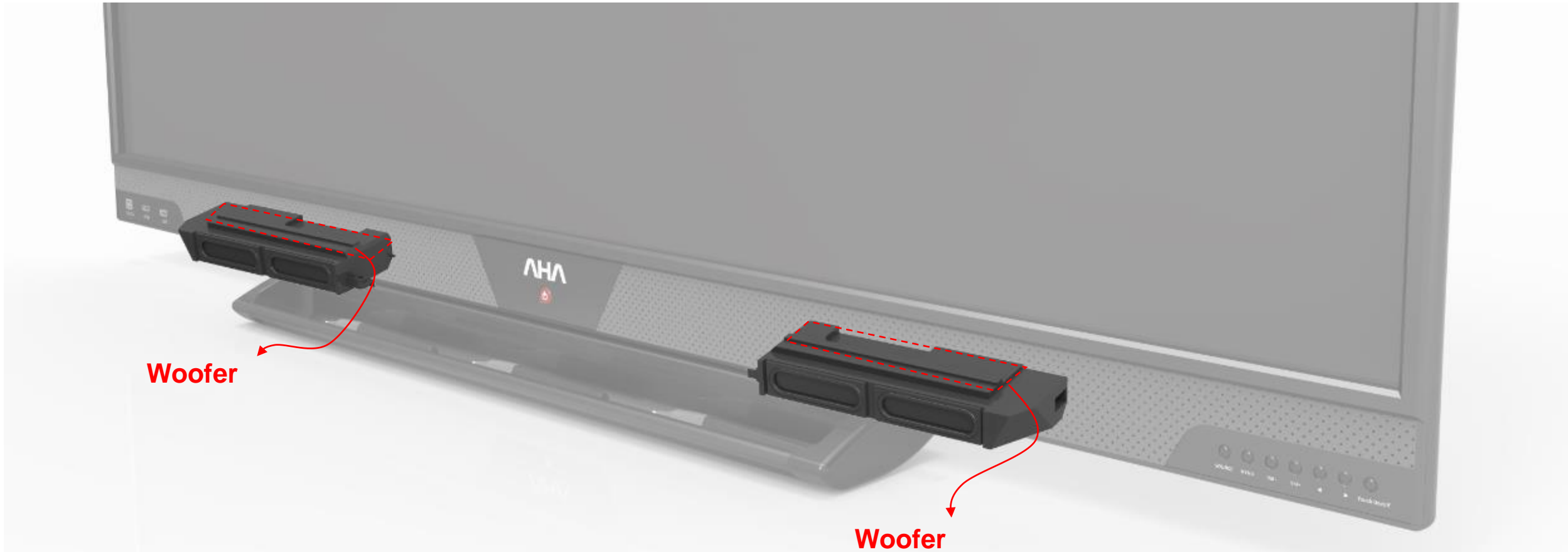


Bezel width 13 mm



## 6) Sound Improvement : 20 W x 2, Woofer

High power output of 20W x 2 as well as better low-pitched sound quality through Woofer



## 7) Android version 6.0 (Mstar MSD 648)

With Mstar Chip MSD 648, Android 6.0 is configured for high performance.

# Android 6.0 Marshmallow



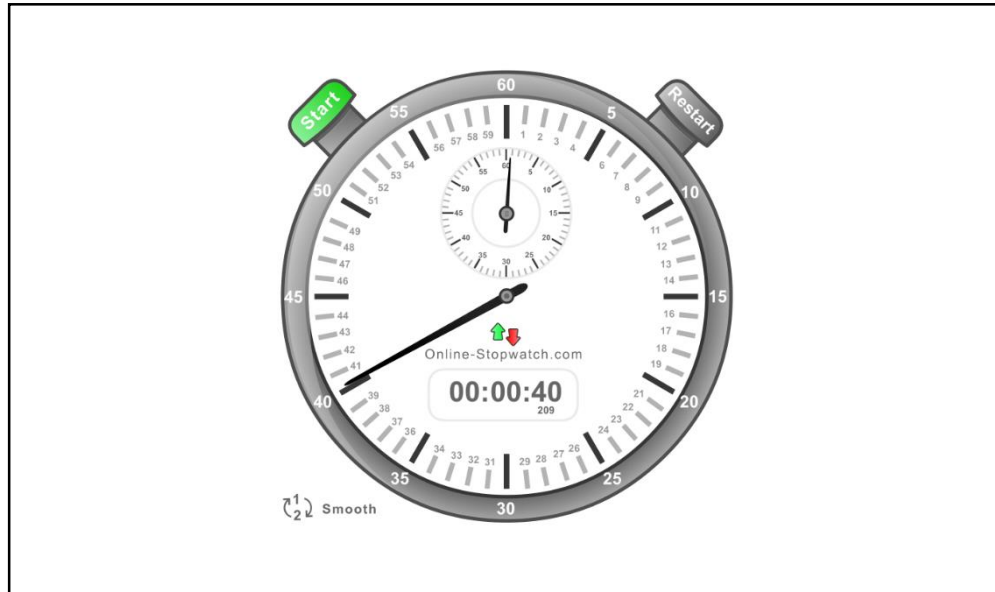
Item		Content
System Parameter	Chip	MSD 648
	CPU	Cortex A53*4 1.5GHz
	GPU	T720MP2
	RAM	2G (1G build in+0.5G*2)Bytes DDR3 2133MHZ
	Flash	32GBytes EMMC5.1 nand flash
	Android	6.0
	Kernel Version	3.10.40

## 8) Booting time approx. 15~16sec

New Android 6.0 performance enhancements significantly reduce initial product boot-up times

Appox. shorten 63%

~ 40 Sec



~ 15 Sec



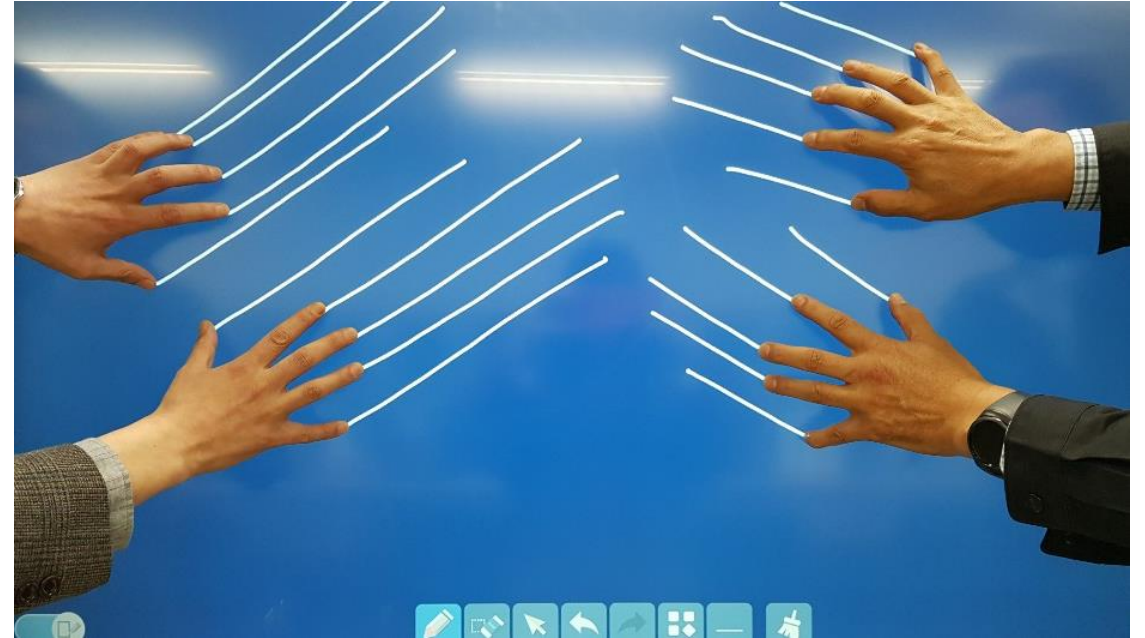
## 9) Android multi-touch Max. 20 touch

Not only Windows, Max. 20 points multi touch on Android is supported with Android 6.0 version upgrade.

Android 5.0, 6 touch (Android)



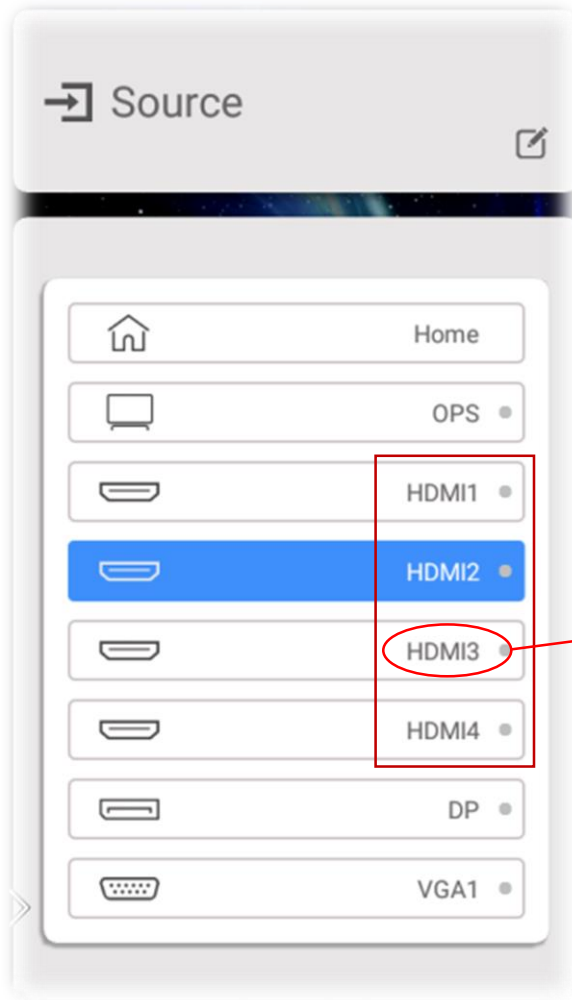
Android 6.0 ver. 20 touch (Android)



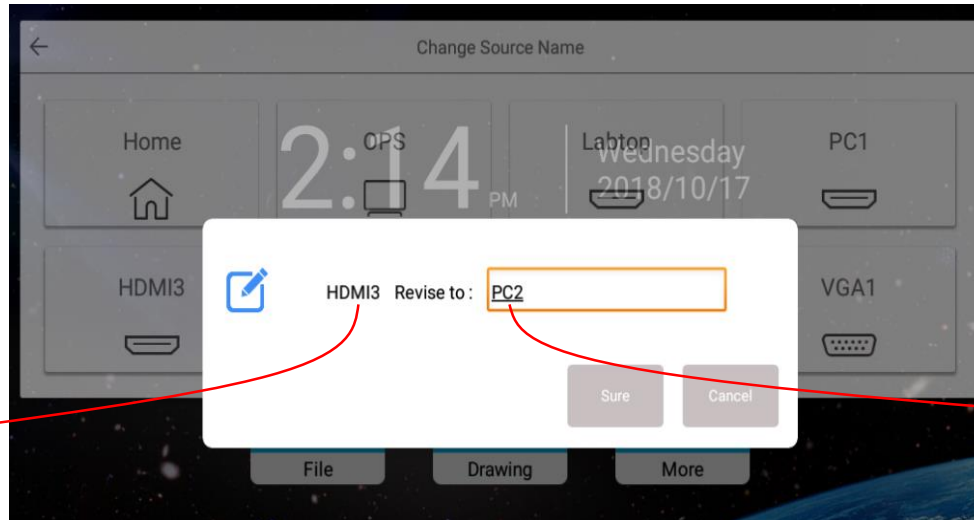
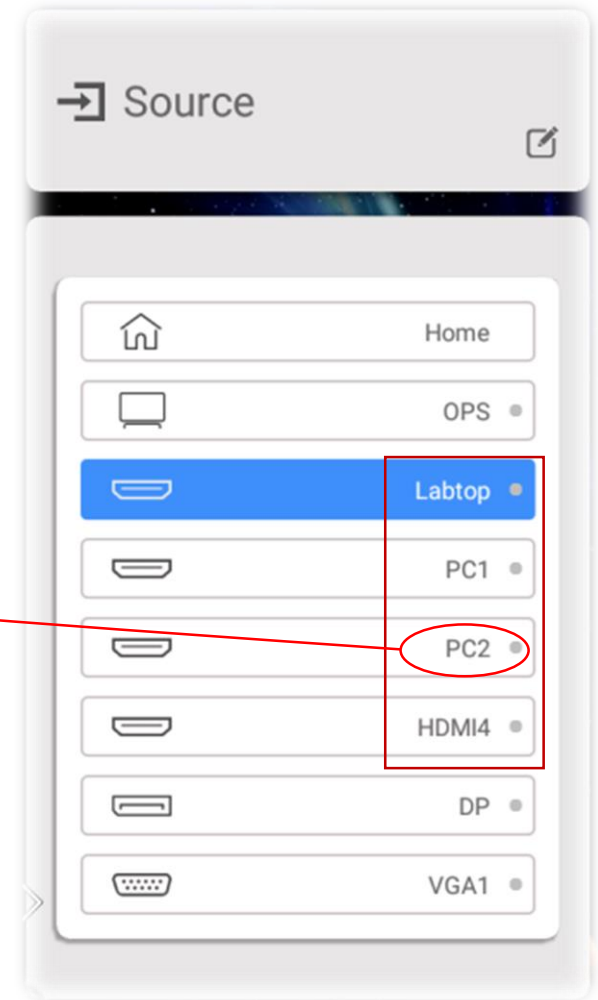
# 10) Users enables to change source name

Source name can be changed to another user-friendly name

Before

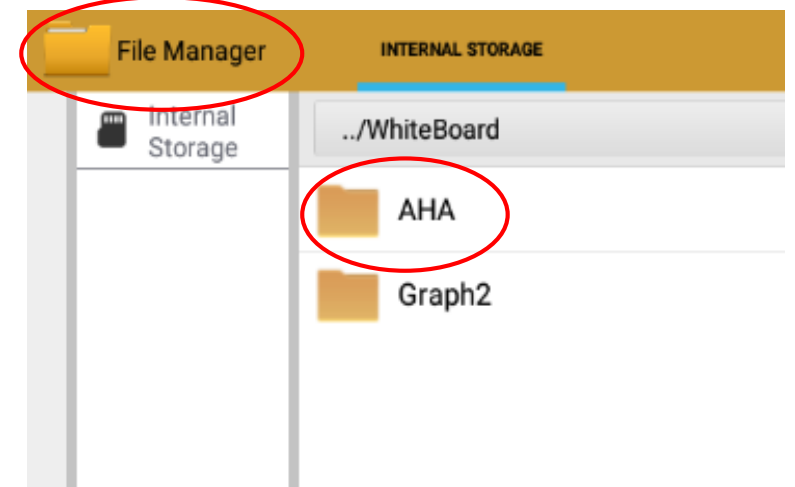
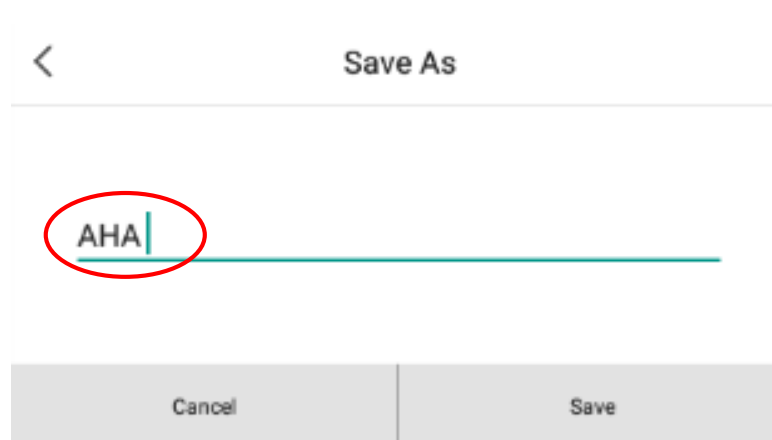
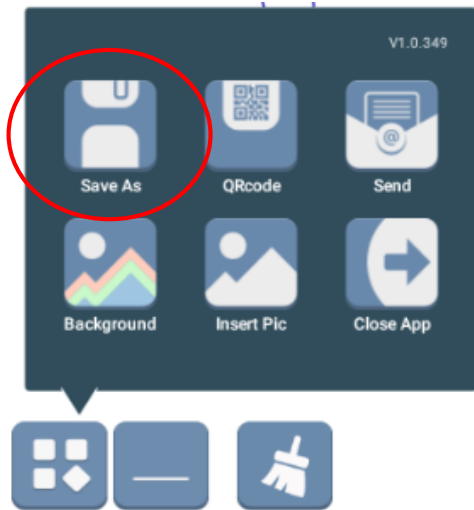


After



# 11) Users enables to create/change/save file name

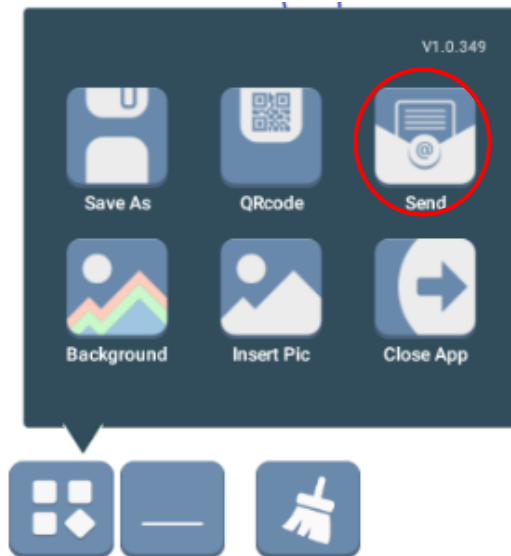
Save a written/drawn image file with the name a user wants





## 12) E mail sending

After having discussion, meeting, a user can save & send e-mail with the written document



A screenshot of the 'E-mail config' screen. The screen has a blue header with an envelope icon and the text 'E-mail config'. Below the header, there are three input fields: 'From' (newdawn888@naver.com), 'Nickname' (qwer), and 'Authorization code' (three dots). A 'Save' button is on the right. Below these fields, the 'To' field contains jangaric@ahatouch.com; and a plus sign. The 'Subject' field contains 2018\_10\_17Meeting Record. The 'Content' field contains 2018\_10\_17Meeting Record.

## 13) DICOM Curve

With improvement in particular onto luminance, Digital Imaging & Communications in Medicine (DICOM) Curve helps to understand medical issues as well as can be used for medical meetings and seminar.

DICOM MODE OFF

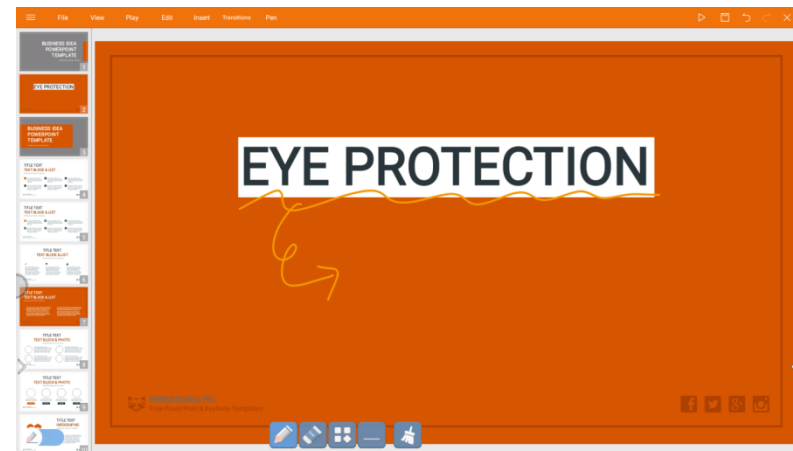
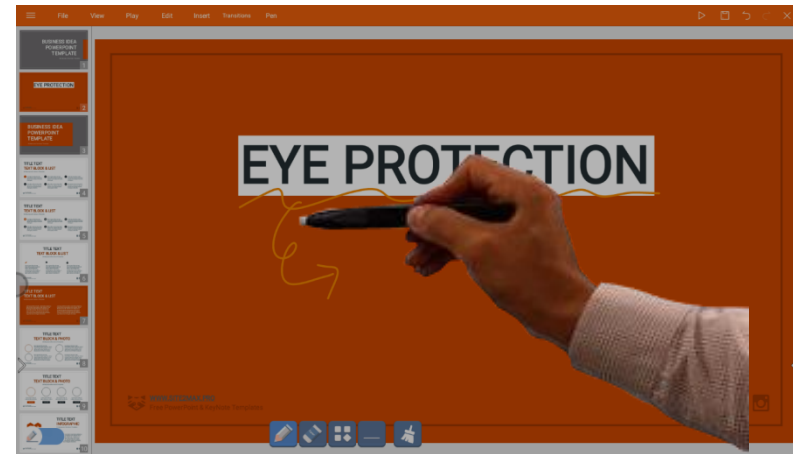
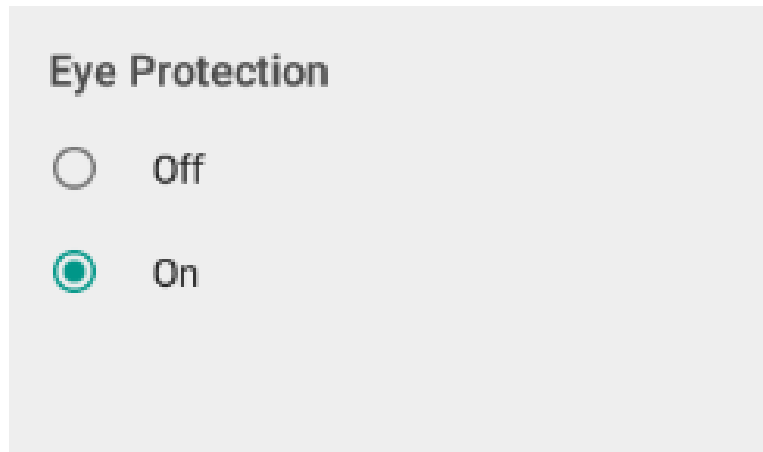


DICOM MODE ON



## 14) Eye protection function

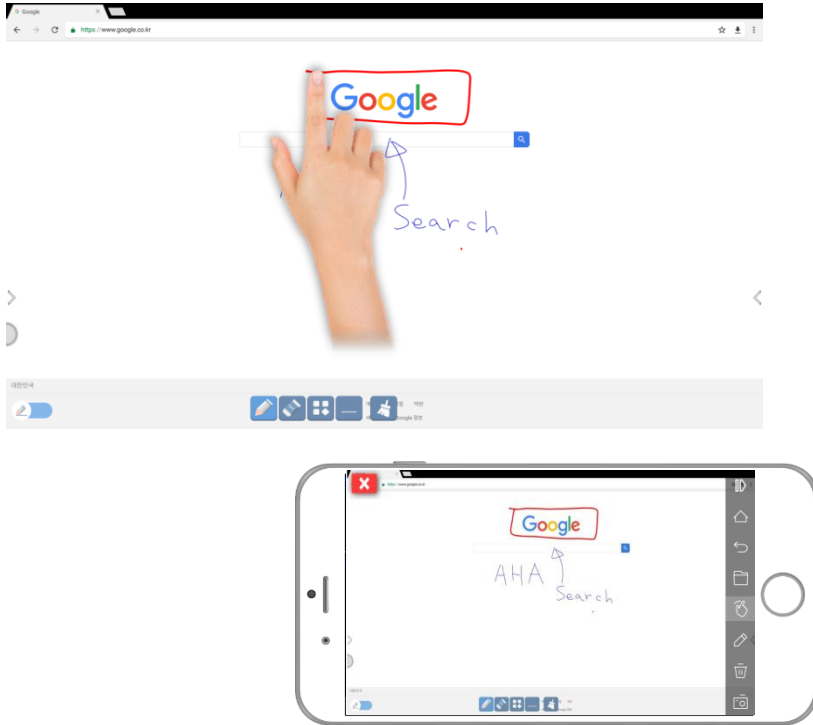
When eye protection is selected & a user starts to write, brightness is adjusted for vision protection. Once again, it is automatically reverted to its original brightness after writing.



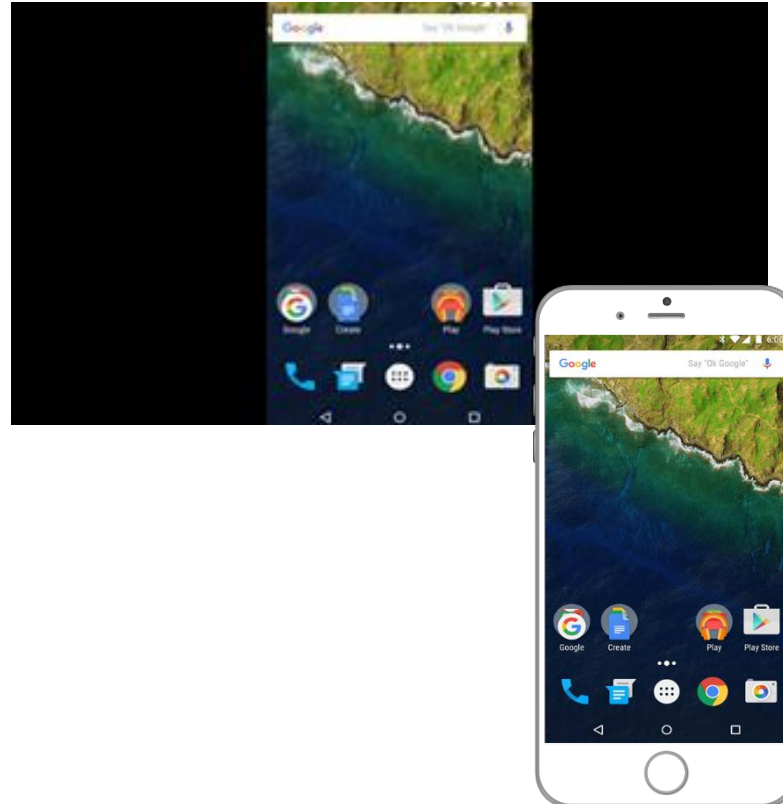
# 15) Bidirectional network with EShare Pro for mirroring, reverse touch ( Option )

EShare Pro allows users to send, touch and manipulate images of IFPD to devices in the same Wi-Fi. Conversely, it can be transferred from devices to IFPD as well

IFPD → Smartphone mirroring



Smartphone → IFPD mirroring



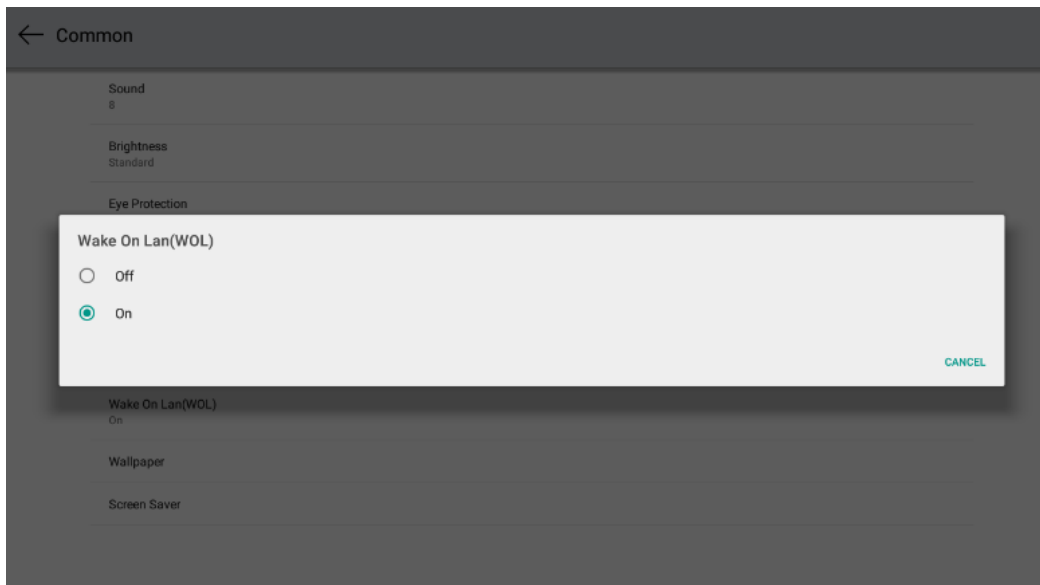
Smartphone writing → IFPD writing



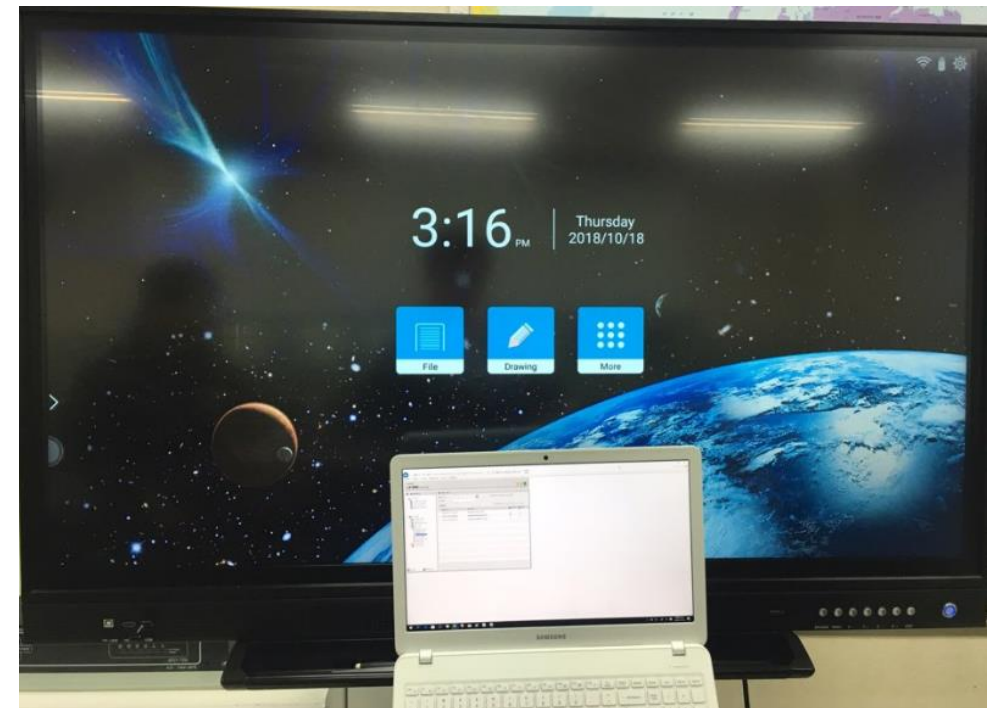
## 16) WOL (Wake On Lan)

With Lan & WOL setting, IFPD can be turned on by network.

WOL SETTING



WOL POWER ON



# 17) Dual Wi-Fi (2.4G-WIFI + 5G-AP)

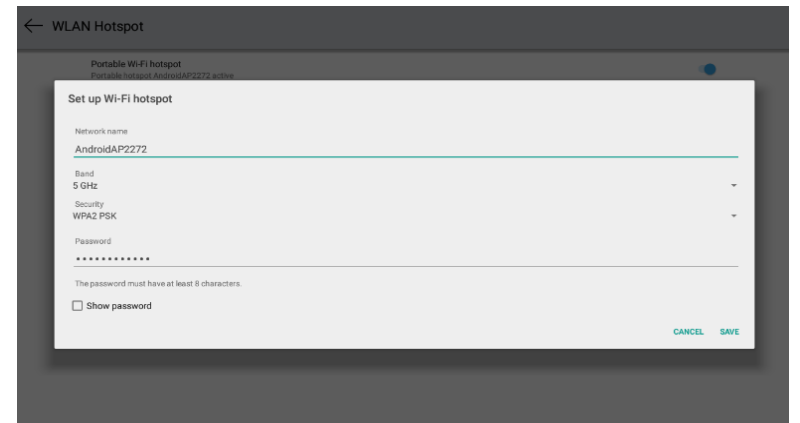
2.4G Wi-Fi, 5G-AP communication function allows to get connected to internet as well as various devices linked



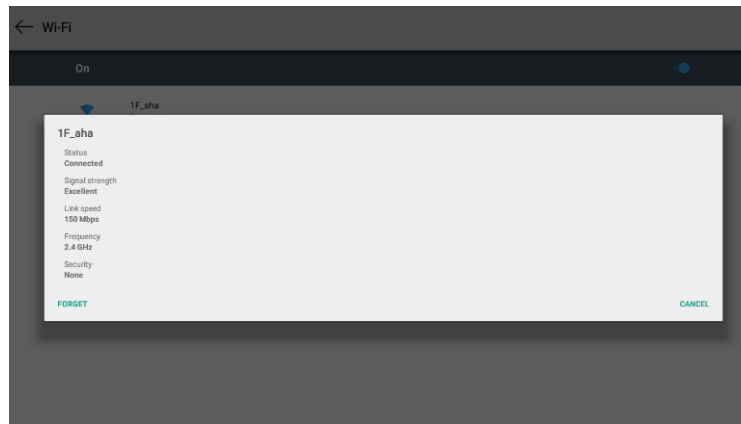
## WIFI SETTING



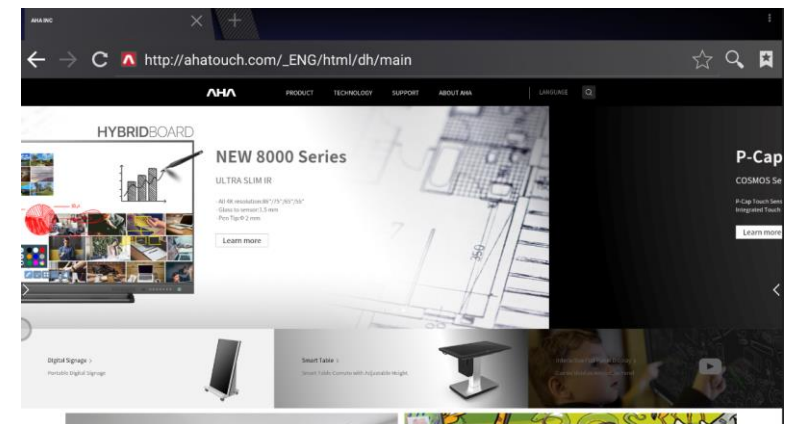
## WIFI 5G HOT SPOT



## WIFI CONNECTED

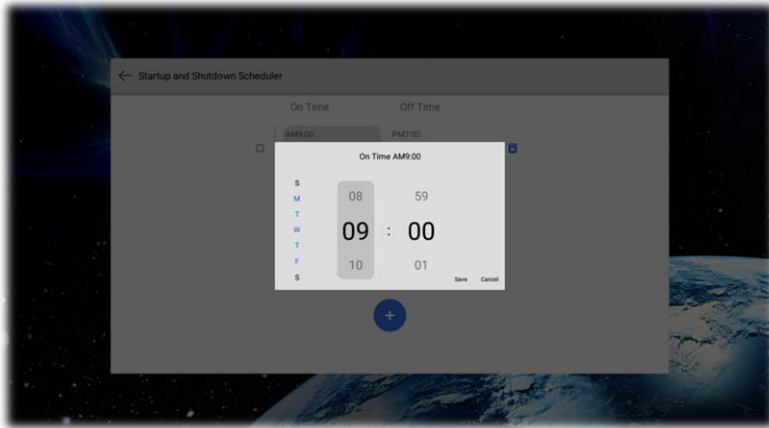


## WIFI INTERNET SCENE

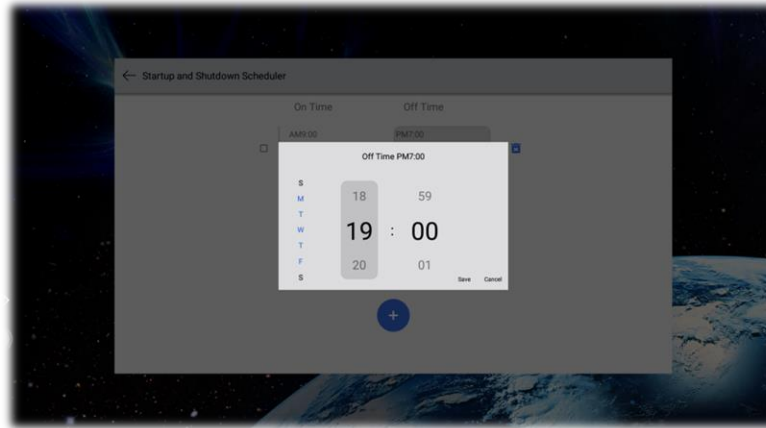


# 18) Power On/Off Time Setting

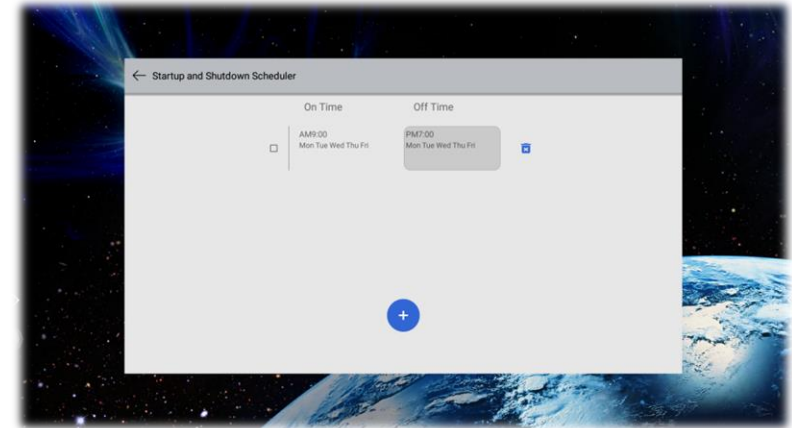
With Date, Hour, Min. setting, power on/off setting is supported



**Power On**



**Power Off**

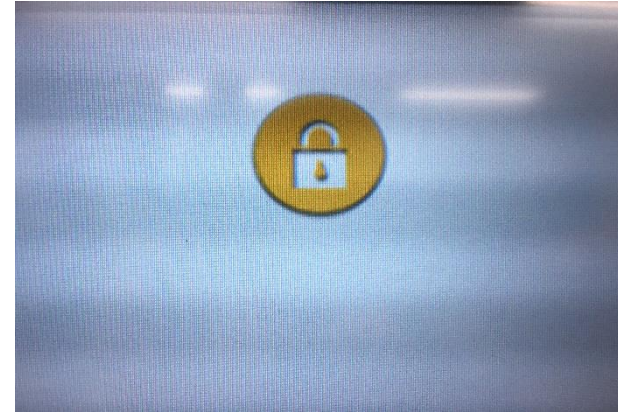


## 19) Touch On/Off Button

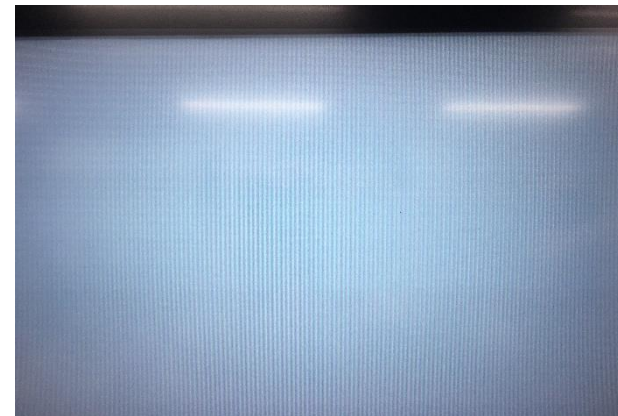
With the button at front bottom, a user uses it as a simple display without touch (press again, touch on). Once the function is activated, lock image is displayed as shown in the picture below.



Touch Off



Touch On





## 20) Easily transfer the image file to your smartphone via QR code

QR code makes it easy to transfer images to a smart phone to the people in need



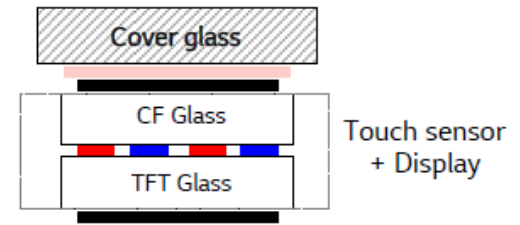
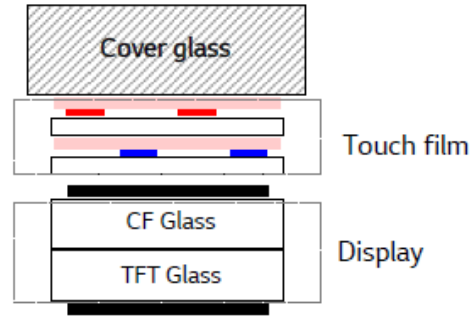
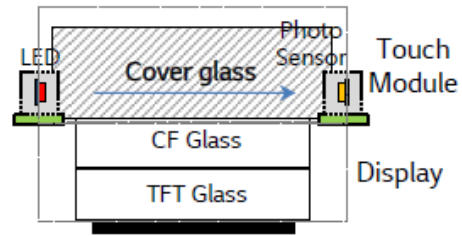
# Product Offering

I. ULTRA Slim IR

**II. In-Cell Touch**

III. 98" (Affordable)

# What is In-cell Touch?



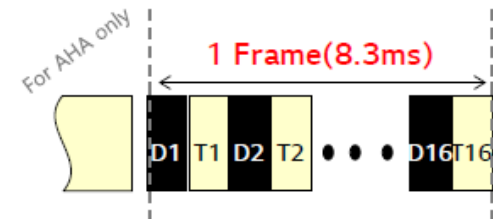
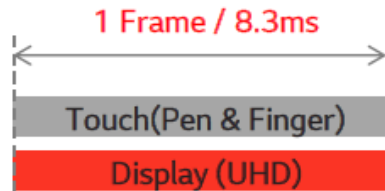
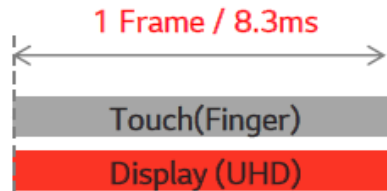
Touch Type

IR Spread

P-Cap.

P-Cap.

Driving Method



\*Fourier Transform Infrared Spectrometer

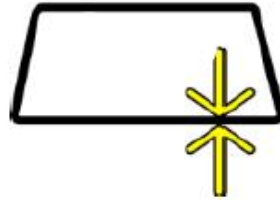
# Why In-cell Touch?

## Touch Performance



- in-TOUCH  $\approx$  GFF > IR

## Design Improvement



- Border Gap Zero
- Borderless Design
- Slim & Narrow Bezel

## Light Weight



- No AI Frame (vs. IR type)
- Cover Glass thickness ↓

## Picture Quality



- No air gap (Direct bonding)
  - Reflection ↓ / Deep Black
  - Accurate touch

## SCM Simplification



- Touch Total Solution
- Cover Glass + Touch/Display Module

## Cost Competitiveness



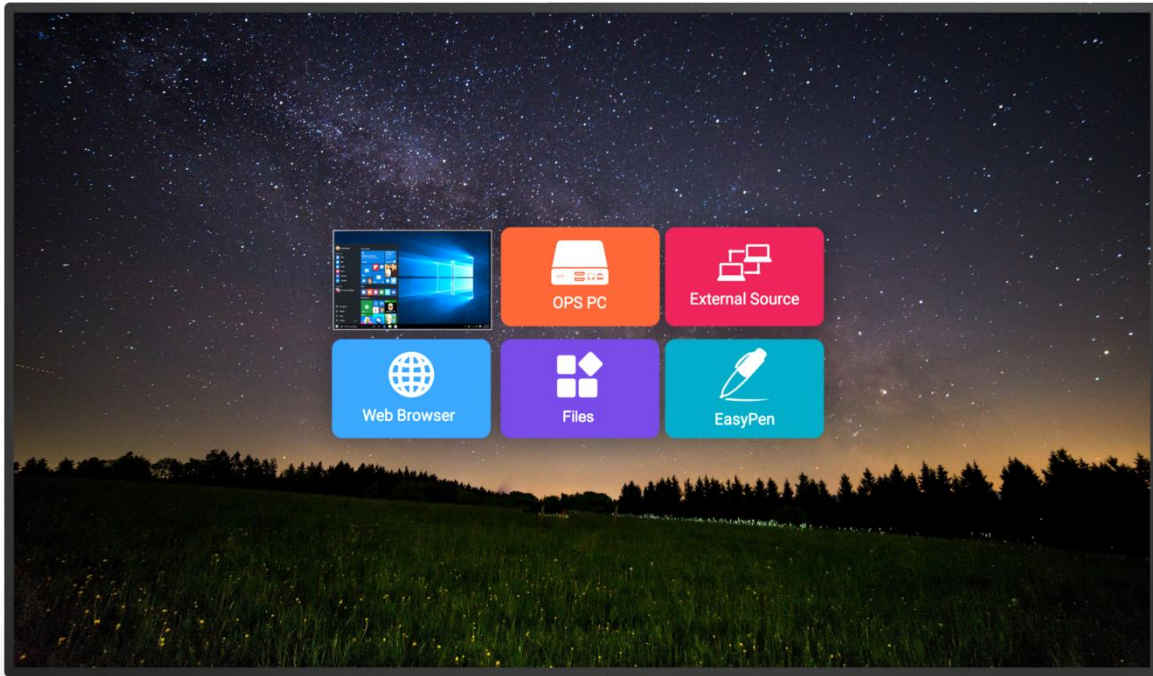
For AHA only

- in-TOUCH (Target)  $\approx$  FTIR < GFF

# Totally Simple, Thin and Flat



# New 86" In-Cell



## Display

- 86" UHD
- 350 nit brightness
- Refresh rate : 60 Hz
- Bezel : 25 mm
- Direct Bonding

## Touch

- Refresh rate : 120 Hz
- Multi Touch :  $\geq 20$
- Latency :  $\leq 25$  ms
- Accuracy :  $< 1.33$  mm

# Development Schedule

## LGD InTouch Panel (86" )

- Specification ( pre-CAS ) & Mechanical Drawing
- 1<sup>ST</sup> Customer sample : End/Nov.
- DV sample : End/Dec.
- RV sample : End/Feb. 2019
- Mass Production : End/Mar. 2019
- MP schedule for 75" (3Q.'19), 65"/55" (Q1.2020)  
- 49" for signage ( Q4.'10 )

## AHA In-Cell IFPD (86")

- Mechanical Design
- 1<sup>ST</sup> sample : End/Dec.
- 1<sup>st</sup> Demo : BETT, London ( 1/26 ~ 1/29 )
- ISE, Amsterdam ( 2/5 ~ 2/8 )
- Develop/Qaul/Certification : Nov. ~ Mar.2019
- Mass Production : Apr. 2019

# Major Features

## **InCell Interactive Flat Panel Display – 86". 75", 65". 55"**

- 1. PC-Less**
- 2. All UHD(Ultra High Definition) 4K resolution 86"/75"/65"/55"**
- 3. Hisi 811 ( System Memory 4G, Storage 32G, 5G WIFI, HDMI OUT )**
- 4. Android System 6.0 / 8.0**
- 5. It supports multi-view PIP and PBP functions, allows two devices to be connected in PIP mode and up to four devices to one monitor in PBP mode for simultaneous utilization of segmented screens.**
- 6. Available Touch Point : 20Point(WINDOW), 10Point(ANDROID) , 2 points (Mac with driver software)**
- 7. Audio Output ( 2 X 20W , Max , THD <7% )**
- 8. 4 HDMI in , HDMI Out(2.0) , USB(3.0) x 1 , USB(2.0) x 3**
- 9. Annotation software (Multi-touch software on any sources)**
- 10. EShare Pro (as Mirroring) and OPS Slot built-in**
- 11. Wi-Fi, Bluetooth**
- 12. SMART SELF-DIAGNOSIS**
- 13. Firmware Over The Air(FOTA)**



# Product Offering

I. ULTRA Slim IR

II. In-Cell Touch

**III. 98" (Affordable)**

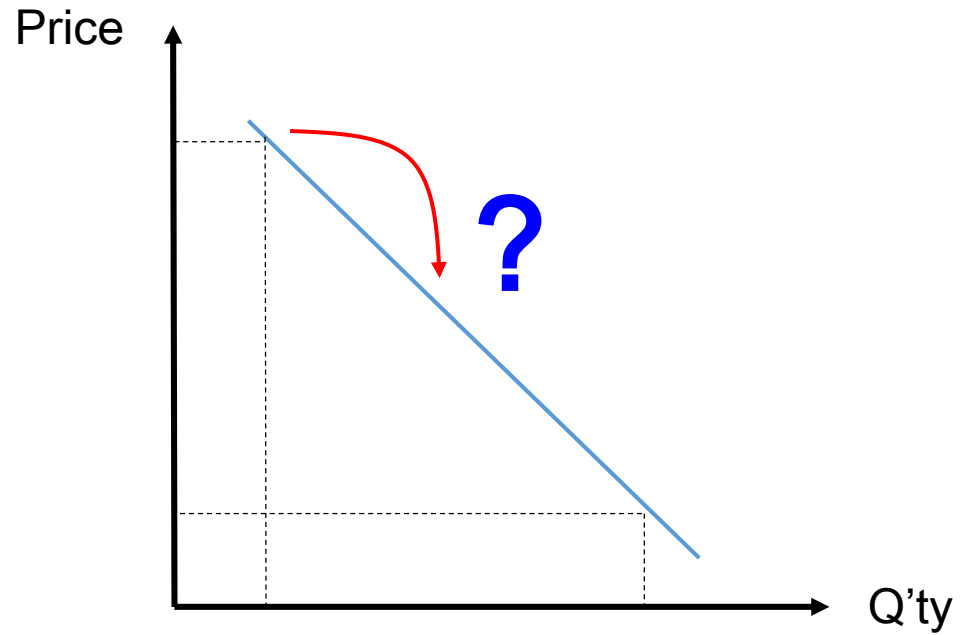
98" campaign

# BIG ENOUGH FOR YOU ?



# 98" Pricing

Strategic price positioning of 98" to increase demand



MOQ (unit) per PO	300	100	50
Touch (IFPD)	\$ 5,900	\$ 6,400	\$ 6,900

## 98" Features



- Diagonal size : 97.52"/247.7(cm)
- LG LCM (Standard A Grade from LGD Paju factory)
- Resolution : 3,840 x 2,160 (QWUXGA)
- 500 cd/m<sup>2</sup> and 1300:1 contrast ratio
- Anti-glare coated glass (4T)
- Infra-red touch screen (20 simultaneous touches)
  - \* 6 touch points for Android
- PC-less operation (Android 5.1) / ( 6.0 )
  - CPU 1.2GHz. Quad Core. 64bit /
  - GPU Quad Core / RAM 2G(DDR3) / Memory 8G
- Annotation (Multi-touch) software
- EShare Pro (as Mirroring)
- OPS Slot built-in

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## Japan Factory (Subsidiary)

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