

LCD MONITOR

# User's Manual

**MultiSync CB651Q**

**MultiSync CB751Q**

**MultiSync CB861Q**

MODEL: CB651Q, CB751Q, CB861Q

Please find your model name in the label on the rear side of the monitor.

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## SUPPLIER'S DECLARATION OF CONFORMITY

This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions. (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

<b>U.S. Responsible Party:</b>	<b>NEC Display Solutions of America, Inc.</b>
<b>Address:</b>	<b>3250 Lacey Rd, Ste 500 Downers Grove, IL 60515</b>
<b>Tel. No.:</b>	<b>(630) 467-3000</b>

Type of Product:	Display Monitor
Equipment Classification:	Class B Peripheral
Model:	CB651Q CB751Q CB861Q



### Cable information

**⚠ CAUTION:** Use the attached specified cables with this color monitor so as not to interfere with radio and television reception. For USB and mini D-Sub 15-pin, please use a shielded signal cable with ferrite core. For D-Sub 9-Pin and HDMI please use a shielded signal cable. Use of other cables and adapters may cause interference with radio and television reception.

### FCC Information

**⚠ WARNING:** The Federal Communications Commission does not allow any modifications or changes to the unit EXCEPT those specified by NEC Display Solutions of America, Inc. in this manual. Failure to comply with this government regulation could void your right to operate this equipment.

1. Please use the supplied power cord or equivalent to ensure FCC compliance.
2. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.

If necessary, the user should contact the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet, prepared by the Federal Communications Commission, helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

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### GPL/LGPL Software Licenses

The product includes software licensed under GNU General Public License (GPL), GNU Lesser General Public License (LGPL), and others. For more information on each software, see "readme.pdf" inside the "about GPL&LGPL" folder on the NEC website.

- NOTE:**
- (1) The contents of this user's manual may not be reprinted in part or whole without permission.
  - (2) The contents of this user's manual are subject to change without notice.
  - (3) Great care has been taken in the preparation of this user's manual; however, should you notice any questionable points, errors or omissions, please contact us.
  - (4) Notwithstanding article (3), NEC will not be responsible for any claims on loss of profit or other matters deemed to result from using this device.

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#### Statement

The image shown in this manual is indicative only. If there is inconsistency between the image and the actual product, the actual product shall govern.



# Important Information

**WARNING**






TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. ALSO, DO NOT USE THIS UNIT'S POLARIZED PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLETS UNLESS THE PRONGS CAN BE FULLY INSERTED.

REFRAIN FROM OPENING THE CABINET AS THERE ARE HIGH VOLTAGE COMPONENTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

**CAUTION**

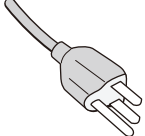
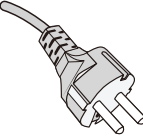
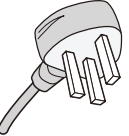
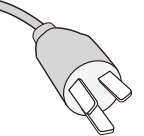



TO REDUCE THE RISK OF ELECTRIC SHOCK, MAKE SURE POWER CORD IS UNPLUGGED FROM WALL SOCKET. TO FULLY DISENGAGE THE POWER TO THE UNIT, PLEASE DISCONNECT THE POWER CORD FROM THE AC OUTLET. DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

-  This symbol warns user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any part inside this unit.
-  This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included. Therefore, it should be read carefully in order to avoid any problems.

**CAUTION:** Please use the power cord provided with this display in accordance with the table below. If a power cord is not supplied with this equipment, please contact NEC. For all other cases, please use the power cord with the plug style that matches the power socket where the monitor is located. The compatible power cord corresponds to the AC voltage of the power outlet and has been approved by, and complies with, the safety standards in the country of purchase.

This equipment is designed to be used in the condition of the power cord connected to earth. If the power cord is not connected to the earth, it may cause electric shock. Please make sure the power cord is earthed properly.

Plug Type	North America		European Continental	U.K.	Chinese
Plug Shape					
Region	U.S.A./ Canada	Taiwan	EU	U.K.	China
Voltage	120*	110	230	230	220

\* When operating this monitor with its AC 125-240V power supply, use a power supply cord that matches the power supply voltage of the AC power outlet being used.

**NOTE:** This product can only be serviced in the country where it was purchased.  
Use the power cord which has BSMI mark at both ends when you use this monitor in Taiwan.

- The intended primary use of this product is as an Information Technical Equipment in an office or domestic environment.
- The product is intended to be connected to a computer and is not intended for the display of television broadcast signals.



CB651Q  
CB751Q

# Safety Precautions, Maintenance & Recommended Use

## Safety Precautions and Maintenance

FOR OPTIMUM PERFORMANCE, PLEASE NOTE THE FOLLOWING WHEN SETTING UP AND USING THE MULTI-FUNCTION MONITOR:

- **DO NOT OPEN THE MONITOR.** There are no user serviceable parts inside and opening or removing covers may expose you to dangerous shock hazards or other risks. Refer all servicing to qualified service personnel.
- Do not bend, crimp or otherwise damage the power cord.
- Do not place any heavy objects on the power cord. Damage to the cord may cause shock or fire.
- The power supply cord you use must have been approved by and comply with the safety standards of your country. (e.g. Type H05VV-F 3G 0.75 mm<sup>2</sup> should be used in Europe).
- In the UK use a BS-approved power cord with a molded plug having a black (5 A) fuse installed for use with this monitor.
- The power cable connector is the primary means of detaching the system from the power supply. The monitor should be installed close to a power outlet, which is easily accessible.
- Do not spill any liquids into the cabinet or use your monitor near water.
- Do not insert objects of any kind into the cabinet slots as they may touch dangerous voltage points, which can be harmful or fatal, or may cause electric shock, fire or equipment failure.
- Do not place this product on a sloping or unstable cart, stand or table, as the monitor may fall, causing serious damage to the monitor.
- Do not mount this product upside down for an extended period of time as it may cause permanent damage to the screen.
- Do not use the monitor outdoors.
- If glass is broken, handle with care.
- For reliable performance and long useful life of this product, it is mandatory to not cover any vents on the monitor.
- If monitor or glass is broken, do not come in contact with the liquid crystal and handle with care.
- Allow adequate ventilation around the monitor, so that heat can properly dissipate.
- Do not block ventilated openings or place the monitor near a radiator or other heat sources.
- Do not put anything on top of the monitor.
- Handle with care when transporting. Save packaging for transporting.
- It is recommended to wipe holes clean a minimum of once a month.
- To ensure the monitor's reliability, please clean the holes at the rear side of the cabinet at least once a year to remove dirt and dust.
- When using a LAN cable, do not connect to a peripheral device with wiring that might have excessive voltage.
- Do not use the monitor in high temperature, humid, dusty, or oily areas.

- Do not use monitor under rapid temperature and humidity change condition and avoid cold air from air-conditioning outlet directly, as it may shorten the lifetime of the monitor or cause condensation. If condensation of water has happened, let the monitor stand unplugged until the condensation has disappeared.

Connecting to a TV\*

- Cable distribution system should be grounded (earthed) in accordance with ANSI/NFPA 70, the National Electrical Code (NEC), in particular Section 820.93, Grounding of Outer Conductive Shield of a Coaxial Cable.
- The screen of the coaxial cable is intended to be connected to earth in the building installation.

Under the following conditions immediately disconnect your monitor from the wall outlet and refer servicing to qualified service personnel:

- If the power supply cord or plug is damaged.
- If liquid has been spilled, or objects have fallen into the monitor.
- If the monitor has been exposed to rain or water.
- If the monitor has been dropped or the cabinet has been damaged.
- If you notice any structural damage such as cracks or unnatural wobbling.
- If the monitor does not operate normally by following operating instructions.

## Recommended Use

### Ergonomics

To realize the maximum ergonomic benefits, we recommend the following:

- For the monitor's optimum performance, allow 20 minutes for warming up. Avoid reproduction of still patterns on the monitor for long periods of time to avoid image persistence (after image effects).
- Rest your eyes periodically by focusing on an object at least 5 feet away. Blink often.
- Position the monitor at a 90° angle to windows and other light sources to minimize glare and reflections.
- Adjust the monitor's brightness, contrast controls to enhance readability.
- Get regular eye checkups.
- Use the preset Size and Position controls with standard signals.
- Use the preset Color Setting.
- Use non-interlaced signals.
- Do not use primary color blue on a dark background, as it is difficult to see and may produce eye fatigue due to insufficient contrast.
- Suitable for entertainment purposes at controlled luminous environments, to avoid disturbing reflections from the screen.

\* The product you purchased may not have this feature.

**Cleaning the LCD Panel**

- When the LCD panel is dusty, please gently wipe with a soft cloth.
- Clean the LCD monitor surface with a lint-free, non-abrasive cloth. Avoid using any cleaning solution or glass cleaner!
- Please do not rub the LCD panel with hard material.
- Please do not apply pressure to the LCD panel surface.
- Please do not use OA cleaner as it will cause deterioration or discoloration on the LCD panel surface.

**Cleaning the Cabinet**

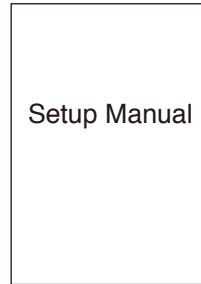
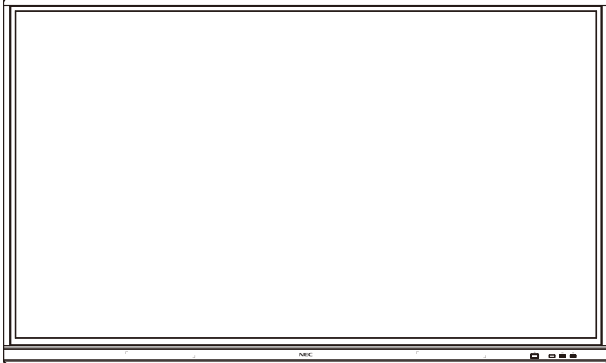
- Unplug the power supply
- Gently wipe the cabinet with a soft cloth
- To clean the cabinet, dampen the cloth with a neutral detergent and water, wipe the cabinet and follow with a dry cloth.

**NOTE:** DO NOT clean with benzene thinner, alkaline detergent, alcoholic system detergent, glass cleaner, wax, polish cleaner, soap powder, or insecticide. Rubber or vinyl should not be in contact with the cabinet for an extended period of time. These types of fluids and materials can cause the paint to deteriorate, crack or peel.

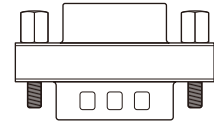
# Contents

Your new monitor box\* should contain the following:

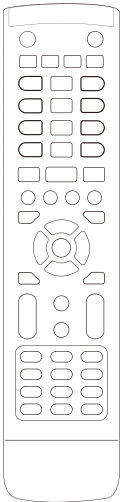
- LCD monitor
- Power cord\*<sup>1</sup>
- HDMI Signal Cable
- VGA Cable
- USB Cable
- Clamper
- Stylus pen x 3
- Wireless Remote Control and AAA Batteries x 2\*<sup>2</sup>
- Setup Manual
- RS-232C adapter



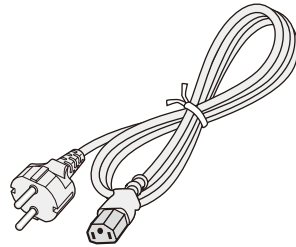
Setup Manual



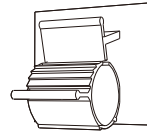
RS-232C adapter



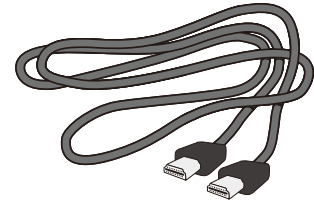
Wireless Remote Control and AAA Batteries x 2\*<sup>2</sup>



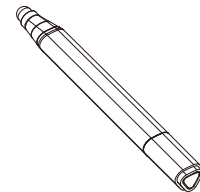
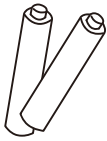
Power cord\*<sup>1</sup>



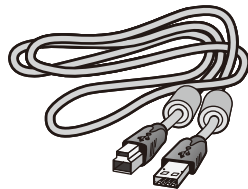
Clamper



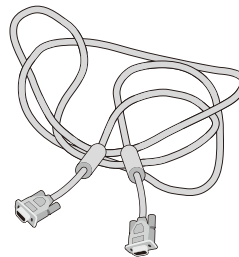
HDMI Signal Cable



Stylus pen x 3



USB Cable



VGA Cable

\* Remember to save your original box and packing material to transport or ship the monitor.

\*<sup>1</sup> Type and number of power cords included will depend on the where the LCD monitor is to be shipped. When more than one power cord is included, please use a power cord that matches the AC voltage of the power outlet and has been approved by and complies with the safety standard of your particular country.

\*<sup>2</sup> Depending on the country where the LCD monitor is shipped to, AAA batteries are not included in the box contents.

# Installation

For proper installation it is strongly recommended to use a trained, NEC authorized service person. Failure to follow NEC standard mounting procedures could result in damage to the equipment or injury to the user or installer. Product warranty does not cover damage caused by improper installation. Failure to follow these recommendations could result in voiding the warranty.

## Mounting

DO NOT mount the monitor yourself. Please ask your supplier. For proper installation it is strongly recommended to use a trained, qualified technician. Please inspect the location where the unit is to be mounted. Mounting on wall or ceiling is the customer's responsibility. Not all walls or ceilings are capable of supporting the weight of the unit. Product warranty does not cover damage caused by improper installation, remodeling, or natural disasters. Failure to comply with these recommendations could result in voiding the warranty. DO NOT block ventilated openings with mounting accessories or other accessories.

### For NEC Qualified Personnel:

To ensure safe installation, use two or more brackets to mount the unit. Mount the unit to at least two points on the installation location.

### Stability Hazard.

The device may fall, causing serious personal injury or death. To prevent injury, this device must be securely attached to the floor/wall in accordance with the installation instructions.

## Please note the following when mounting on wall or ceiling

- NEC recommends mounting interfaces that comply with UL1678 standard in North America.
- NEC strongly recommends using size M8 screw (20-22 mm + thickness of bracket and washers in length). If using screws longer than 20-22 mm, check the depth of the hole. (Recommended Fasten Force:1000 - 1200N·cm). Bracket hole should be under  $\Phi$  8.5 mm.
- Prior to mounting, inspect the installation location to ensure that it is strong enough to support the weight of the unit so that the unit will be safe from harm.
- For detailed information, refer to the instructions included with the mounting equipment.
- Make sure that there is no gap between the monitor and the bracket.

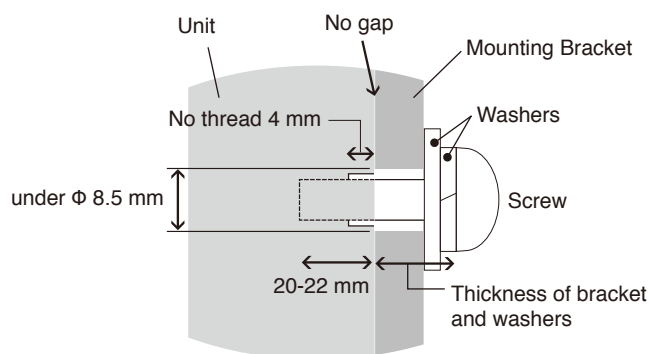
- When used in a video wall configuration for a longer time, slight expansion of the monitors may happen due to temperature changes. Due to this it is recommended that over one millimeter gap is kept between adjacent monitor edges.
- When installing, do not apply pressure to the screen or excessive force to any part of the monitor by pushing or leaning on it. This may cause the monitor to become distorted or damaged.

To prevent the LCD monitor from falling off from the wall or ceiling, NEC strongly recommends using a safety wire.

Please install LCD monitor in a spot of the wall or ceiling strong enough to support the monitor.

Prepare the LCD monitor using mounting accessories such as hook, eyebolt or mounting parts and then secure the LCD monitor with a wire. The safety wire must not be tight.

Please make sure the mounting accessories are strong enough to support the LCD monitor before mounting it.



## Mounting location

- The ceiling and wall must be strong enough to support the monitor and mounting accessories.
- DO NOT install in locations where a door or gate can hit the unit.
- DO NOT install in areas where the unit will be subjected to strong vibrations and dust.
- DO NOT install the monitor next to a location where the main power supply is fed into the building.
- DO NOT install the monitor in a location where people can easily grab and hang onto the unit or the mounting equipment.
- Allow for adequate ventilation or provide air conditioning around the monitor, so that heat can properly dissipate away from the monitor and from the mounting equipment.

## Maintenance

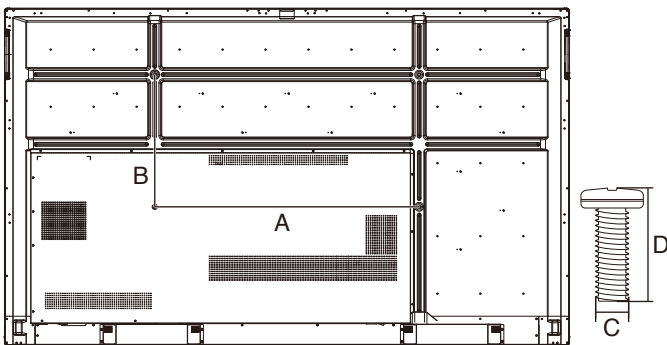
- Periodically check for loose screws, gaps, distortions, or other problems that may occur with the mounting equipment. If a problem is detected, please refer to qualified personnel for service.
- Regularly check the mounting location for signs of damage or weakness that may occur over time.

## Attaching Mounting Accessories

The monitor is designed for use with the mounting system.

### 1. Attach Mounting Accessories

Be careful to avoid tipping the monitor when attaching accessories.



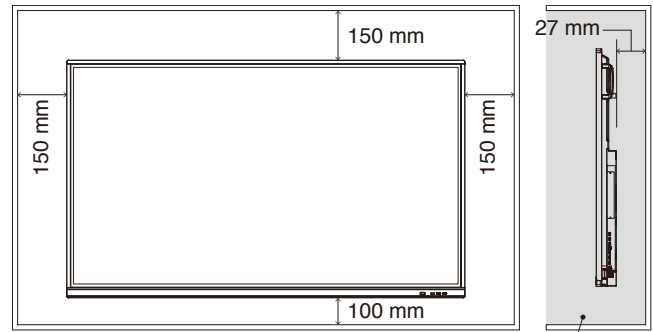
inch	Spec. (A x B)	Standard screw (C x D)	Quantity
CB651Q	600 x 400 mm	M8 x 25 mm	4
CB751Q	800 x 400 mm	M8 x 25 mm	4
CB861Q	800 x 600 mm	M8 x 25 mm	4

Mounting accessories can be attached with the monitor in the face down position. To avoid damaging the front face, place the protective sheet on the table underneath the LCD monitor. The protective sheet was wrapped around the LCD monitor in the original packaging. Make sure there is nothing on the table that can damage the monitor.

**NOTE:** Prior to installation, be sure to place the monitor on a flat area with adequate space.

## 2. Ventilation Requirements

When mounting in an enclosed space or recessed area, leave adequate room between the monitor and the enclosure to allow heat to disperse, as shown below.



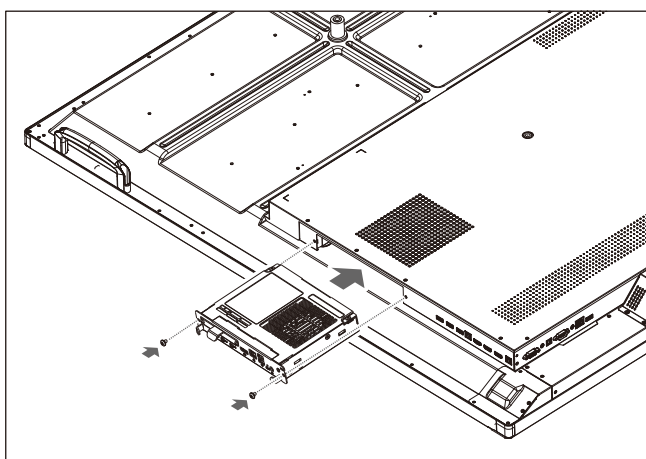
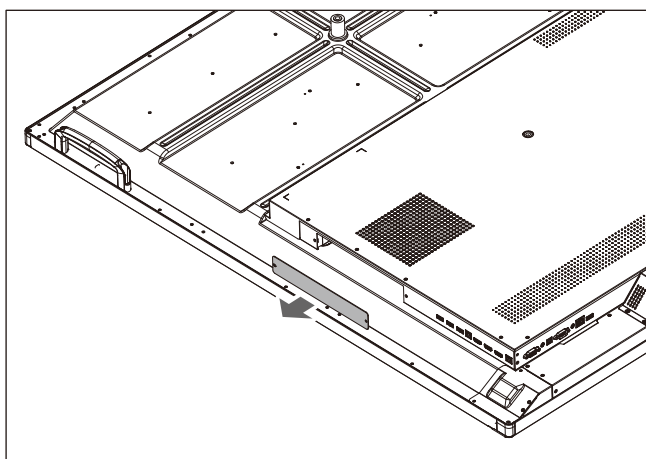
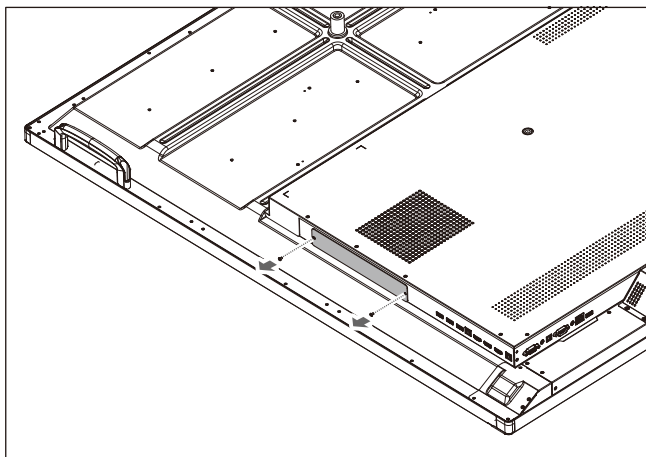
Must be under 40 Degree Celsius.

Allow adequate ventilation or provide air conditioning around the monitor, so that heat can properly dissipate away from the unit and the mounting equipment; especially when you use monitors in a multiple screen configuration.

**NOTE:** The sound quality of the internal speakers will be different depending on the acoustics of the room.

## Installing an Option Board

1. Turn off the main power switch.
2. Remove the attached slot cover by unscrewing the installed screws.
3. Insert the Option Board into the monitor and fix it in place with the removed screws. (Recommended Fasten Force: 139 - 189N•cm).

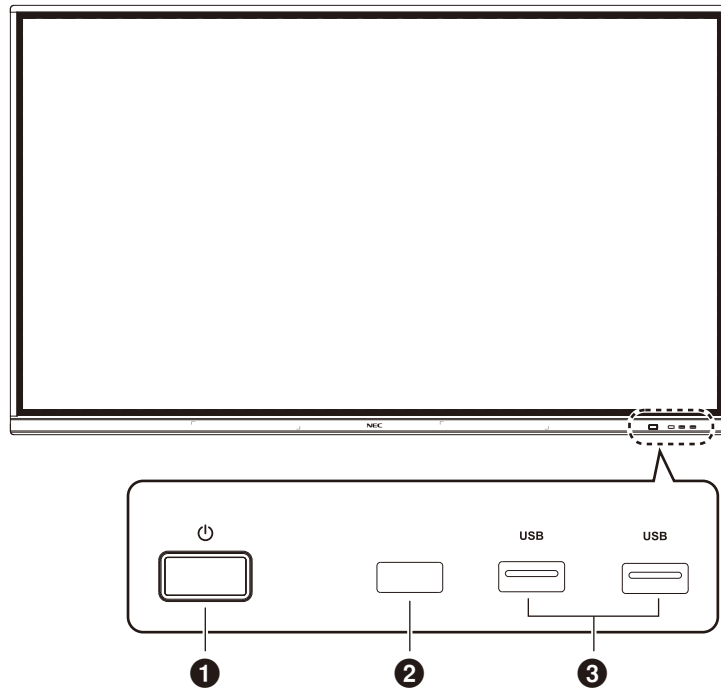


**NOTE:** Unless your monitor is purchased as part of a special bundle package, no Option Boards will be in the box or installed in the monitor. These are optional accessories available for separate purchase. Please contact your supplier for a list of Option Boards available for your monitor. Make sure the board is inserted into the slot in the correct orientation. Do not apply excessive force to manipulate the Option Board before fixing it with screws. Do not insert diagonally.

# Parts Name and Functions

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## Control Panel



### 1

Tap to enter energy-saving, press at least 2 seconds to enter standby mode.

### 2 Remote control signal receive

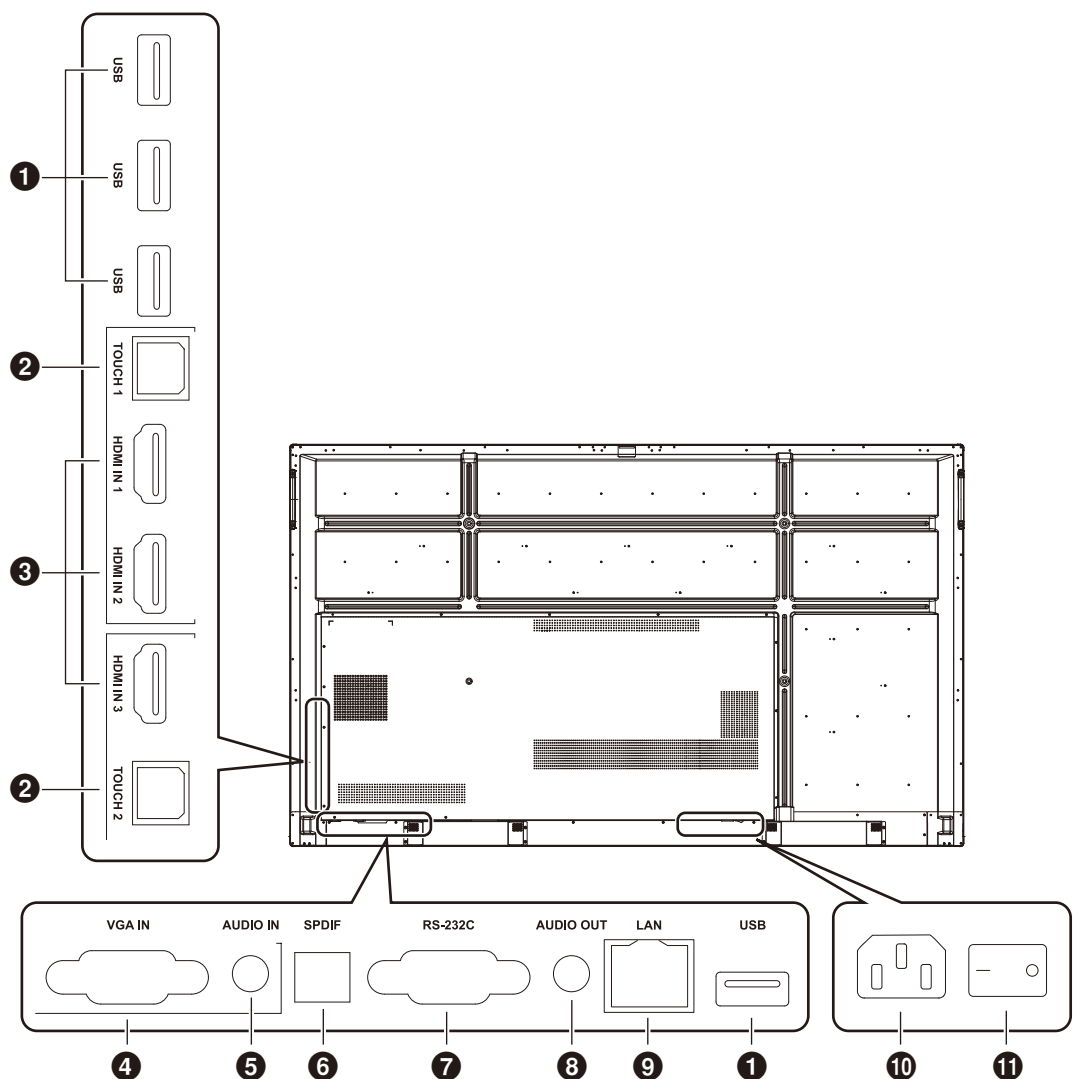
Receive the remote signal.

### 3 USB2.0 (Front)

Connect USB devices such as mobile hard disk, U disk, USB Keyboard and mouse, USB drives, etc.



# Terminal Interface



**1 USB2.0 (Rear side)**

Connect USB devices such as mobile hard disk, U disk, USB Keyboard and mouse, USB drives, etc.

**USB 2.0 (Rear bottom)**

USB interface of system.

**2 TOUCH**

Touch signal output to the external computer.

**3 HDMI IN**

HDMI signal input, connect to devices with HDMI output interface (personal computer with HDMI output, set-top box, or another video device).

**4 VGA IN**

External computer image input.

**5 AUDIO IN**

External computer audio input.

**6 SPDIF**

Optical output.

**7 RS-232C**

Serial interface, used for mutual transfer of data between devices.

**8 AUDIO OUT**

Audio output to the external speaker.

**NOTE:** This connector is not a Headphone terminal.

**9 LAN**

Connecting RJ-45 terminals.

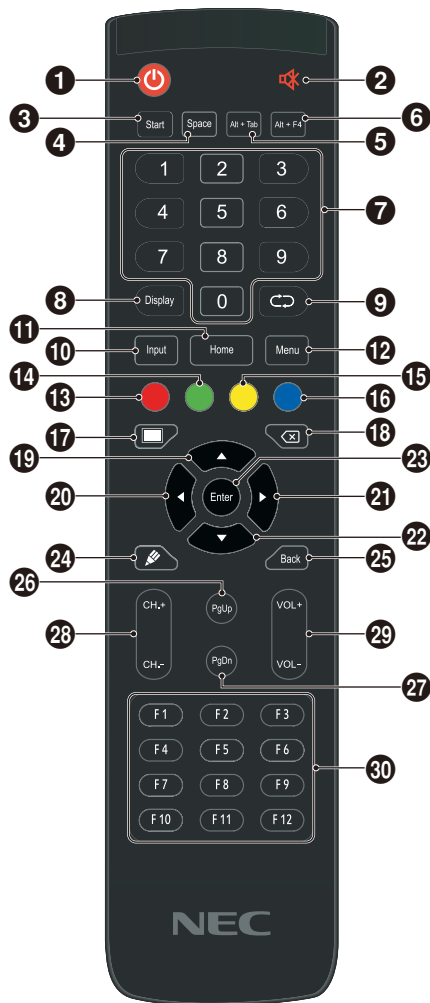
**10 AC Inlet**

AC power input, connecting AC power supply.

**11 AC SWITCH**

To open or shut down AC power supply. "I" means power on, "O" means power off.

# Wireless Remote Control



Power on/off



Mute switch

**3 Start**

Built-in computer Windows key

**4 Space**

Built-in computer Space key

**5 Alt+Tab**

Built-in computer spacebar Alt + Tab

**6 Alt+F4**

Built-in computer program window close button

**7 Numeric keys**

Numeric input keys

**8 Display**

Display channel information



Non-function

**10 Input**

Input signal source selection key, choose different sourced according to need

**11 Home**

System main screen button

**NOTE:** All computer - related function keys are not available without a built-in computer.

**12 Menu**

Setting menu button, press this button to pop up

**13 Red**

Lock and unlock Buttons and Touch function

**14 Green**

Lock and unlock Buttons function

**15 Yellow**

Lock and unlock Touch function

**16 Blue**

Freeze and zoom



One key for blank screen



Backspace key



Direction key, press this button for upwards selection



Direction key, press this button for left selection



Direction key, press this button for right selection



Direction key, press this button for downwards selection

**23 Enter**

Confirmation key, press this key to confirm selection state



Quickly start writing software

**25 Back**

Return key

**26 PgUp**

Built-in computer page (previous page)

**27 PgDn**

Built-in computer page (next page)

**28 CH.+ / CH.-**

Non-function

**29 VOL+ / VOL-**

Volume switch key

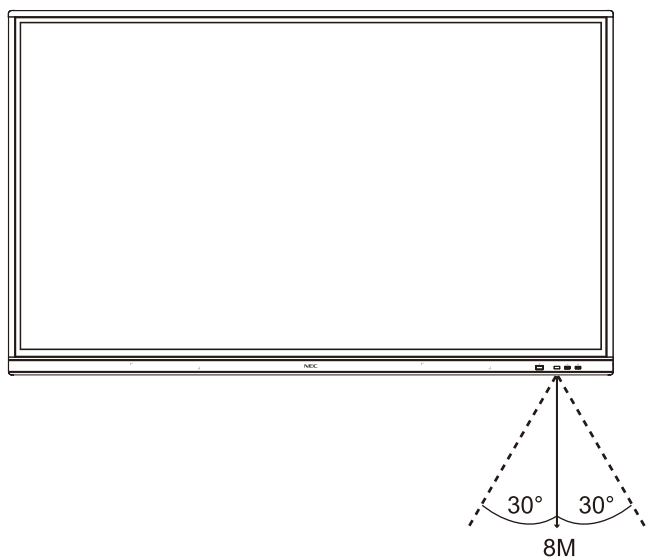
**30 F1-F12**

Built-in computer F1 - F12 function keys

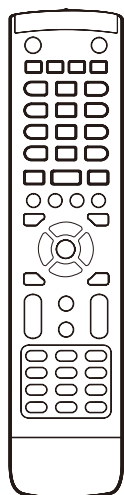
## Operating Range for the Remote Control

Point the top of the remote control toward the LCD monitor's remote control sensor during button operation.

Use the remote control within a distance of about 8 m (26 ft.) from the remote control sensor, or at a horizontal and vertical angle of within 30° and within a distance of about 4 m (13 ft.).



**Caution:** Important, the remote control system may not function when direct sunlight or strong illumination strikes the remote control sensor, or when there is an object in the path.



### Handling the remote control

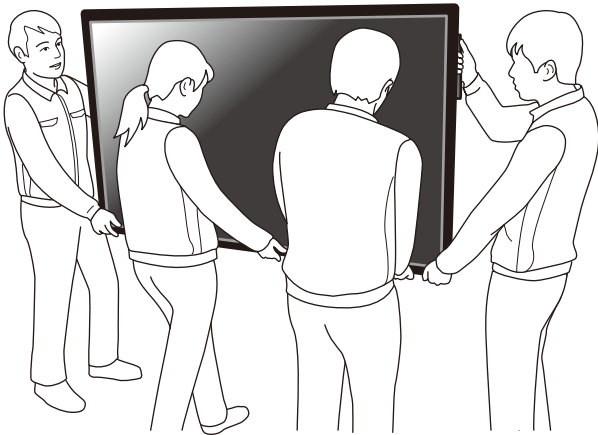
- Do not expose to strong shock.
- Do not allow water or other liquid to splash on the remote control. If the remote control gets wet, wipe it dry immediately.
- Avoid exposure to heat and steam.
- Except to install the batteries, do not open the remote control.

# Setup

## 1. Determine the installation location

**CAUTION:** Installing your LCD monitor must be done by a qualified technician. Contact your supplier for more information.

**CAUTION:** MOVING OR INSTALLING THE LCD MONITOR MUST BE DONE BY FOUR OR MORE PEOPLE. Failure to follow this caution may result in injury if the LCD monitor falls.



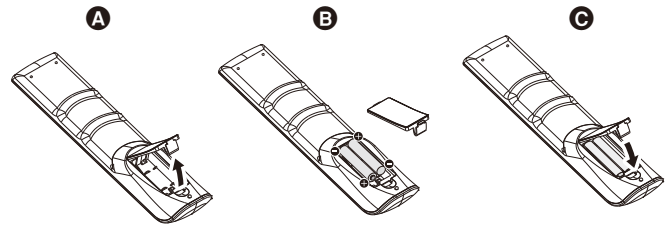
**CAUTION:** Do not mount or operate the monitor upside down.

**CAUTION:** This LCD monitor has internal temperature sensors. If the LCD monitor becomes overheated, a “Caution” warning will appear. If the “Caution” warning appears, stop using the unit and allow it to cool.

**IMPORTANT:** To avoid scratching the LCD panel, always place a soft cloth, such as a blanket that is larger than the monitor’s screen area, on the table before laying the monitor face down.

## 2. Install the remote control batteries

The remote control is powered by two 1.5V AAA batteries. To install or replace batteries:



A. Press and slide to open the cover.

B. Align the batteries according to the (+) and (-) indications inside the case.

C. Replace the cover.

**CAUTION:** Incorrect usage of batteries can result in leaks or bursting.

NEC recommends the following battery use:

- Place “AAA” size batteries matching the (+) and (-) signs on each battery to the (+) and (-) signs of the battery compartment.
- Do not mix battery brands.
- Do not combine new and old batteries. This can shorten battery life or cause liquid leakage of batteries.
- Remove dead batteries immediately to prevent battery acid from leaking into the battery compartment.
- Do not touch exposed battery acid, it may injure your skin.

**NOTE:** If you do not intend to use the Remote Control for a long period of time, remove the batteries.

## 3. Connect external equipment (See page 16 and page 19)

- To protect the external equipment, turn off the main power before making connections.
- Refer to the user’s manual of your equipment for further information.

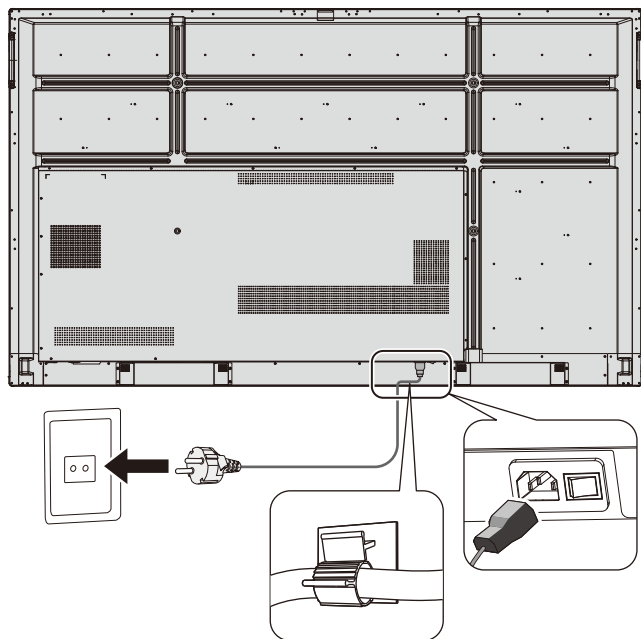
**NOTE:** Do not connect/disconnect cables when turning on the monitor or other external equipment, as this may result in a loss of the monitor image.

#### 4. Connect the supplied power cord

- The equipment should be installed close to an easily accessible power outlet.
- Fasten the power cord to the LCD monitor by attaching the clammer.
- Fully insert the prongs into the power outlet socket.  
A loose connection may cause image degradation.

**NOTE:** Please refer to the “Important Information” section of this user’s manual for proper selection of an AC power cord.

(Recommended Fasten Force: 139 - 189N•cm)



#### 5. Cable information

- ⚠ CAUTION:** Use the attached specified cables with this color monitor so as not to interfere with radio and television reception.  
For USB and mini D-Sub 15-pin, please use a shielded signal cable with ferrite core.  
For D-Sub 9-Pin and HDMI please use a shielded signal cable.  
Use of other cables and adapters may cause interference with radio and television reception.

#### 6. Switch on the power of all the attached external equipment

When connected with a computer, switch on the power of the computer first.

#### 7. Operate the attached external equipment

Show the signal on the screen from the desired input source.

#### 8. Adjust the sound

Make volume adjustments when required.

#### 9. Adjust the screen

Make adjustments to the image position, if necessary.

#### 10. Adjust the Image

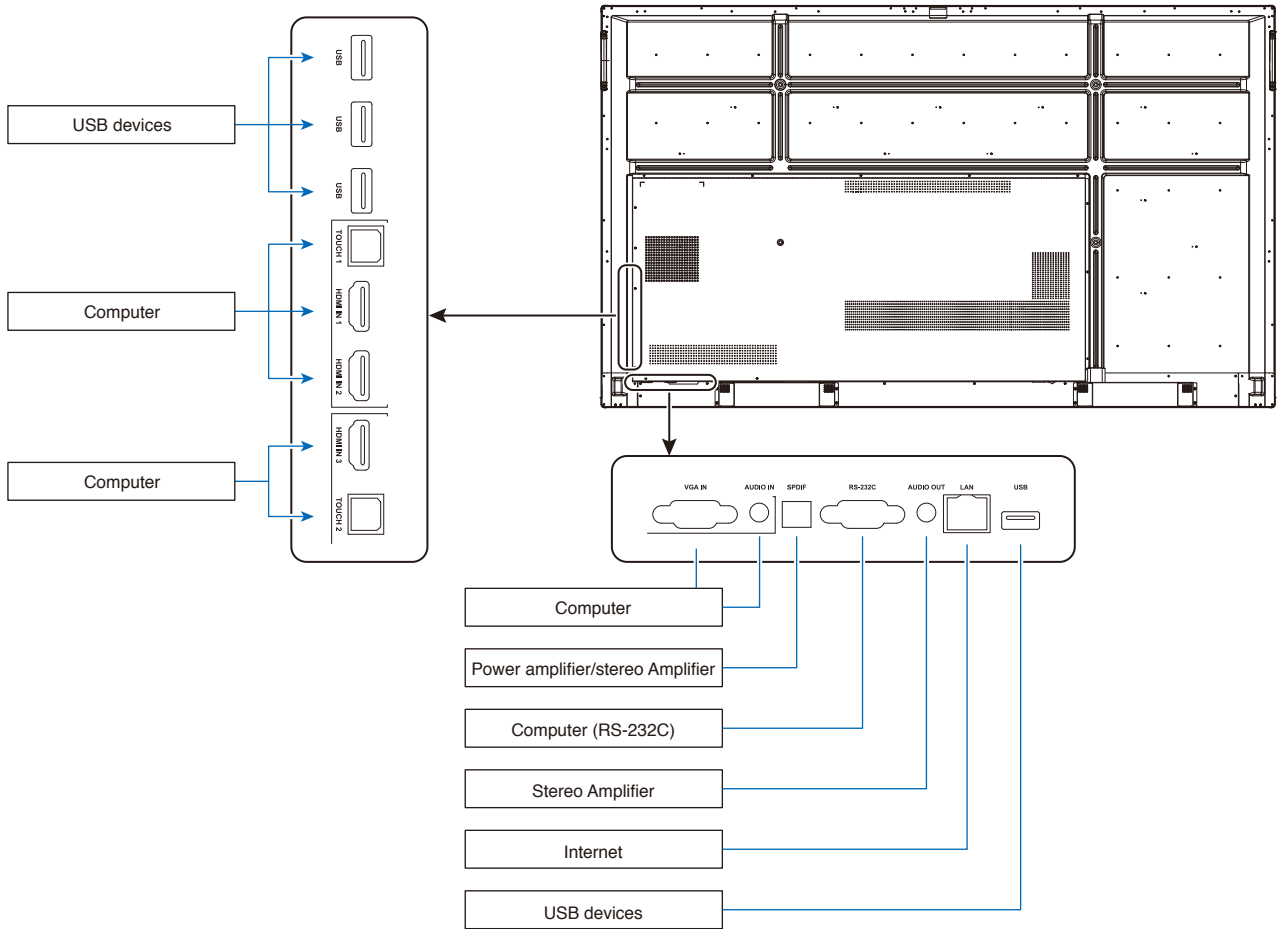
Make adjustments such as backlight or contrast when required.

#### 11. Recommended Adjustments

To reduce the risk of the “Image Persistence”, please activate “DATE & TIME” function.

# Connection and Setting

## Wiring Diagram



**⚠ CAUTION:** For the safety of you and the machine, please do not connect any power plug before connection.

**NOTE:** Do not connect or disconnect cables when turning on the monitor's main power or other external equipment's power, as this may result in a loss of the monitor image.

**NOTE:** Use an audio cable without a built-in resistor. Using an audio cable with a built-in resistor turns down the sound.

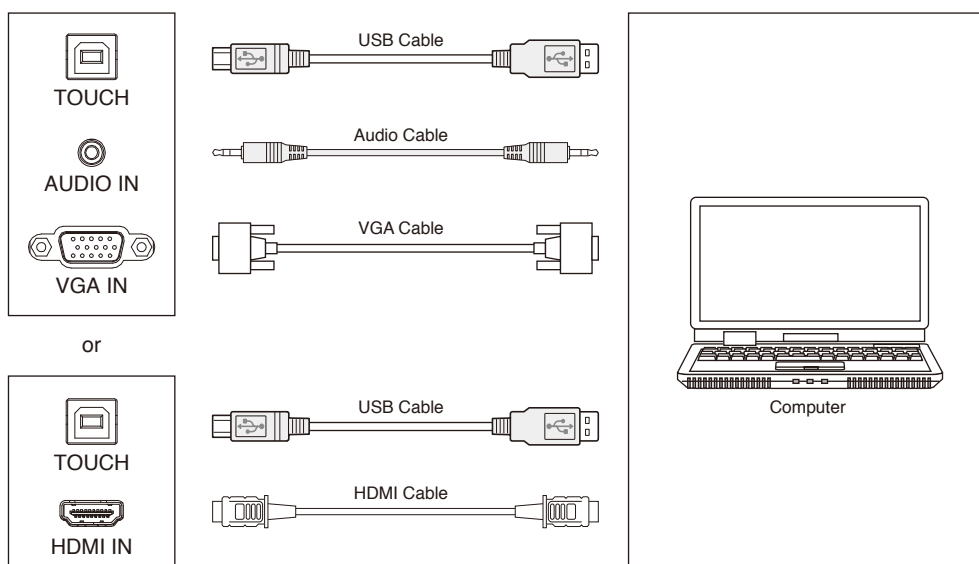
### Before making connections:

- \* First turn off the power of all the attached equipment and make connections.
- \* Refer to the user's manual included with each separate piece of equipment.
- \* We strongly recommend connecting or disconnecting a USB storage device to the monitor when the monitor's main power is off.

Connected equipment	Connecting terminal	Input signal name	Connecting audio terminal	Input button in remote control
AV	HDMI IN1	HDMI 1	HDMI 1	HDMI 1
	HDMI IN2	HDMI 2	HDMI 2	HDMI 2
	HDMI IN3	HDMI 3	HDMI 3	HDMI 3
PC	HDMI IN1	HDMI 1	HDMI 1	HDMI 1
	HDMI IN2	HDMI 2	HDMI 2	HDMI 2
	HDMI IN3	HDMI 3	HDMI 3	HDMI 3
	VGA IN	VGA	Audio IN	VGA

Please set appropriate setting for input signal.

## External Computer and Touch Connection



- 1) Connect to external computer
  - a. Use VGA cable to connect to VGA output port of external computer, and meanwhile use audio cable to connect to external computer audio output interface.
  - b. Use HDMI cable to connect to HDMI output port of external computer.
- 2) Use USB cable to connect to external computer USB port.
- 3) After cable connection, plug in power cord, and switch power on.
- 4) Start external computer.
- 5) Press  $\mathcal{U}$  key, and the equipment is power on.
- 6) Press the INPUT key to switch to VGA/HDMI channel

### NOTE:

**External computer input, equipment's best resolution is 3840\*2160.**

Recommended computer configuration:

1GB Available Hard Drive

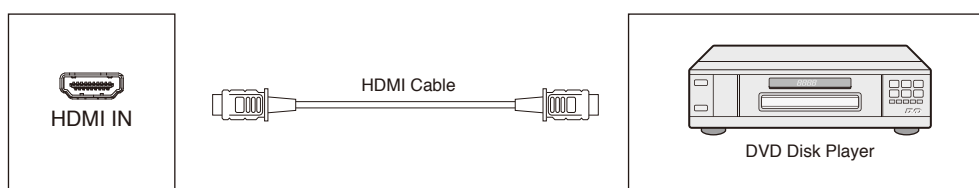
2.0GHz Processor, 1GB Memory

More than 256 color display cards

VGA OUT / HDMI OUT, Audio-OUT, USB Interface

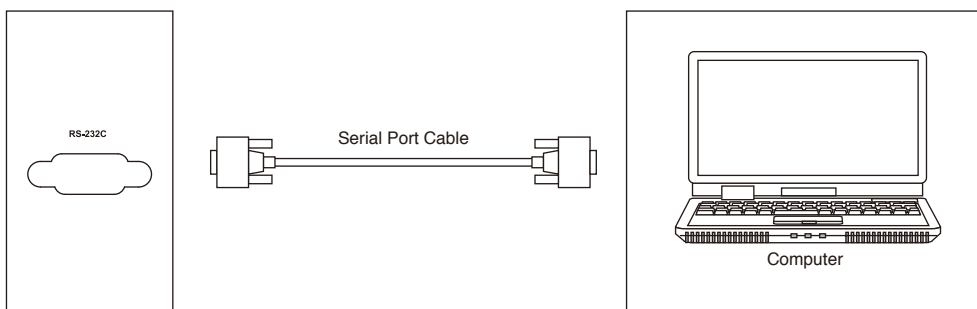
Support Resolution 800\*600,1024\*768,1920\*1080,3840\*2160

## Audio and Video Equipment



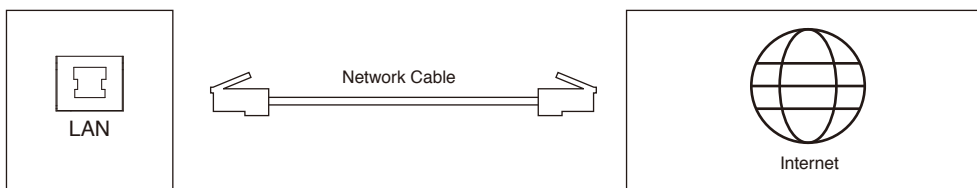
- 1) Use HDMI cable to connect audio and video equipment with HDMI output.
- 2) After cable connection, plug in power cord, and switch power on.
- 3) Press  $\mathcal{U}$  to turn equipment on.
- 4) Press INPUT key to switch to HDMI port.

## RS-232C Connection

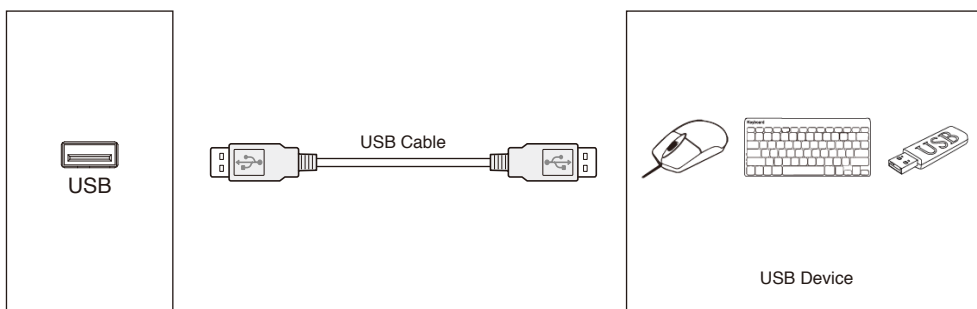


After using serial port cable to connect central control equipment and machine, certain function of the machine can be controlled via central control equipment, such as: machine ON/OFF, and adjustment of sound volume, etc.

## LAN Connection



## USB Connection





## Connecting a Personal Computer

Connecting your computer to your LCD monitor will enable you to reproduce your computer's video signal output. Some display cards may not be able to support the required resolution for proper image reproduction. Your LCD monitor shows proper image by adjusting the factory preset timing signal automatically.

<Typical factory preset signal timing>

Resolution	Scannibg frequency		VGA	HDMI
	Horizontal	Vertical		HDMI (4k/60Hz)
640 x 480	31.5 kHz	60 Hz	Yes	Yes
800 x 600	37.9 kHz	60 Hz	Yes	Yes
1024 x 768	48.4 kHz	60 Hz	Yes	Yes
1280 x 720	45.0 kHz	60 Hz	Yes	No
1280 x 768	47.8 kHz	60 Hz	Yes	Yes
1280 x 960	60.0KHz	60 Hz	Yes	Yes
1280 x 1024	64.0KHz	60 Hz	Yes	Yes
1360 x 768	47.7KHz	60 Hz	Yes	Yes
1440 x 900	55.9KHz	60 Hz	Yes	Yes
1680 x 1050	65.3KHz	60 Hz	Yes	Yes
1920 x 1080	67.5KHz	60 Hz	Yes	Yes
3840 x 2160	67.4KHz	30 Hz	No	Yes
3840 x 2160	135KHz	60 Hz	No	Yes

## Connecting a Player or Computer with HDMI

- Please use an HDMI cable with the HDMI logo.
- It may take a moment for the signal to appear.
- Some display cards or drivers may not display an image correctly.
- Please check display card when image is compressed with 1920 x 1080.
- To output HDMI audio, set [HDMI1], [HDMI2] or [HDMI3] at INPUT in the OSD or choose [HDMI1], [HDMI2] or [HDMI3] by the remote control INPUT button.
- If the monitor's main power is turned on after a connected computer is turned on, sometimes images are not displayed. In this case, please turn off the computer then turn it on again.

## Connecting a USB device

USB: USB downstream port.

Connect USB devices such as mobile hard disk, U disk, USB keyboard and mouse, USB drives, etc.

please use this port.

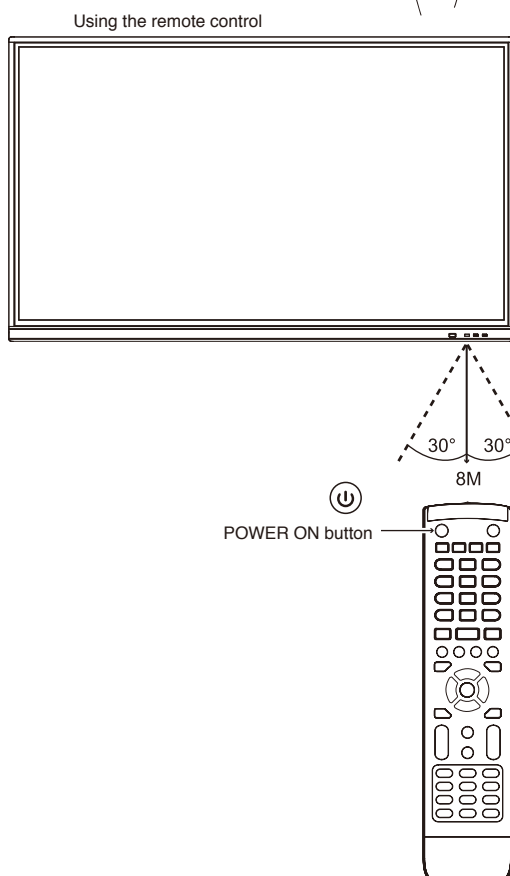
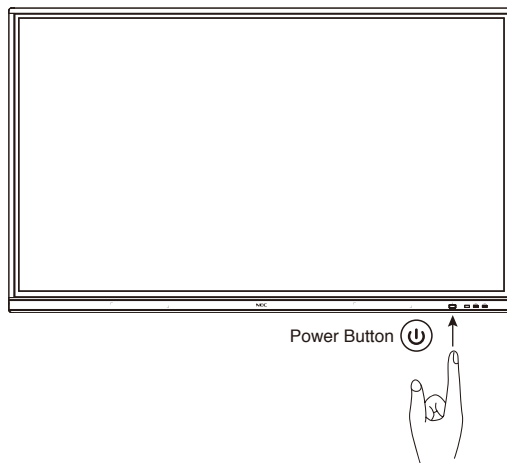
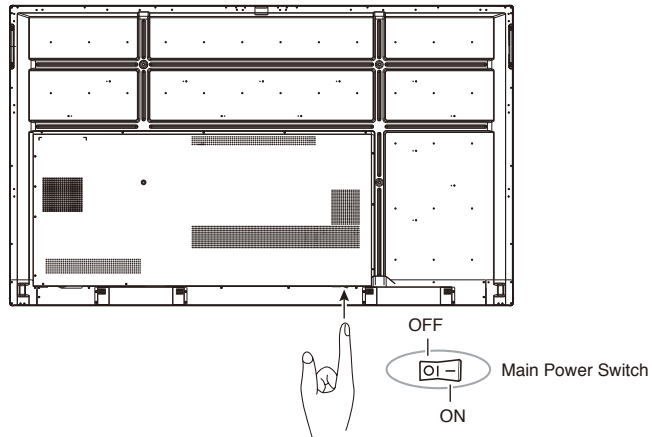
- Please make sure the connector shape and orientation is correctly aligned when connecting the USB device or cable.
- Please refer to the specifications page for power supply information (see page 69, page 70 and page 71).
- When you use the USB port for power supply, please use a USB cable that supports 500mA.
- Do not bind the USB cable. It may cause heat or fire.

# Basic Operation

## Power ON and OFF Modes

The LCD monitor power indicator will turn blue while powered on.

**NOTE:** The Main Power switch must be in the ON position in order to power up the monitor using the remote control or the Power button.



## Power Indicator

LED indicator status	Machine status
Glowing blue	Running or booting.
Glowing red	Standby.
Blinking between blue and red slowly	Energy saving (Turn off the backlight).
Blinking between blue and red fastly	Shutting down or received remote control signal.

**NOTE:** If the indicator is blinking red in a combination of long and short, a certain failure might have occurred, please contact your supplier.

## Aspect

Source	Aspect ratio
VGA	4:3
	16:9
HDMI	4:3
	16:9
	PTP*

\* Point To Point optimize touch performance when 3840 x 2160 input. (not available under System or not 3840 x 2160 input timing)

# Displayable/playable files

## Still

### Supported formats

Files extension	Supported
.jpg .jpeg .jpe	Baseline, Progressive
.PNG	Interlace, non-interlace
.bmp	-
.gif	Only supports static display of GIF images, does not support moving images

## Motion image

### Supported formats

File extension	Codec
.flv	H.264 – MPEG Audio Layer3 (Abbreviation: MP3)
	H.264 – AAC-LC (Abbreviation: AAC)
.3gp	H.264 – AAC, MPEG4 – AAC
.avi	MPEG1 – MP3, MJPEG – MP3, Xvid-SP – MP3 MPEG2 – MPEG Audio Layer2 (Abbreviation: MP2) MJPEG – ADPCM, MJPEG – LPCM H.264 – ADPCM, H.264 – LPCM
.m4v	H.264 – AAC
.mkv	MPEG4 – MP2, H.264 – AAC, H.265 – AAC VP8 – Vorbis, VP9 – Vorbis
.mov	MPEG4 – ADPCM, MPEG4 – LPCM, MPEG4 – MP3 MPEG4 – AAC, H.264 – MP3 H.264 – AAC, H.265 – AAC MJPEG – ADPCM, MJPEG – LPCM
.mp4	MPEG4 – MP3, MPEG4 – AAC H.264 – MP3, H.264 – AAC, H.265 – AAC, H.264 – HE-AAC
.mpg/.mpeg	MPEG1 – MP3, MPEG1 – MP2 MPEG2 – MP3, MPEG2 – MP2 MPEG2 – AAC, MPEG2 – LPCM
.ts	MPEG2 – MP2, MPEG2 – AAC H.264 – MP2, H.264 – AAC, H.265 – AAC

## BGM

### Supported formats

File extension	Audio codec
.aac	AAC
.flac	FLAC
.m4a	AAC
.mp2	MPEG1/2 layer2
.mp3	MPEG1/2 layer3
.ogg	Vorbis
.wav	LPCM/ADPCM

## Information

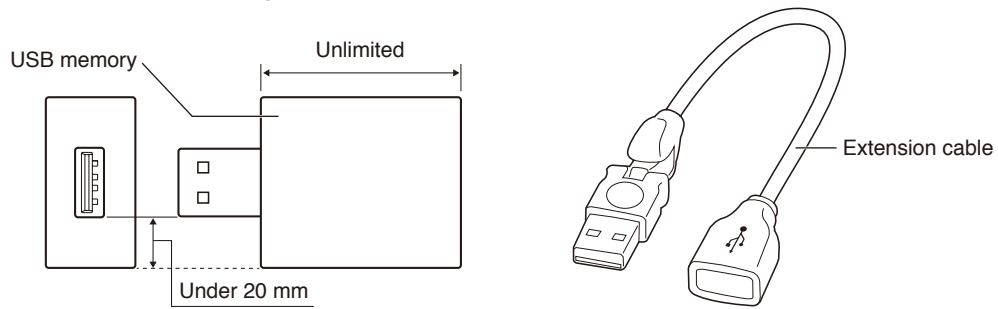
Item	Conditions	
Resolution	MPEG-1	MP@HL,1080P@30 fps
	MPEG-2	MP@HL,1080P@30 fps
	MPEG-4 Visual	Simple profile
	H.264	Main and High profile level 5.2, 4K*2K 60 fps
	H.265	Main/Main10 profile, High Tier@ Level 5.1 4K*2K@60 fps
	Motion JPEG	MJPEG baseline decoding 1280*720p@30fps
Resolution	.bmp	Up to 8000x8000
	.gif	Up to 8000x8000
	.jpeg/.jpg	Progressive: up to 7000x7000
		Base-line: up to 8000x8000
	.png	Interlace :up to 8000x8000
Non-Interlace: up to 8000x8000		
Movie bit rate	-	Up to 135 Mbps
Audio sample rate	-	Up to 48 kHz
Audio bit rate	MP2	Up to 384 kbps
	MP3	Up to 320 kbps
	ADPCM	Up to 384 kbps
	LPCM	Up to 1.5Mbps
	AAC	Up to 576kbps

### Compatible USB memory

Format a USB memory in the FAT32 format or NTFS format for using it in the Media Player. Refer to the computer's instruction user's manual or Help file on how to format a USB memory.

Please use a USB memory with this monitor in accordance with the drawing below.

If the physical size of the USB device is larger than than the supported sizes listed below, please use a USB extension cable.

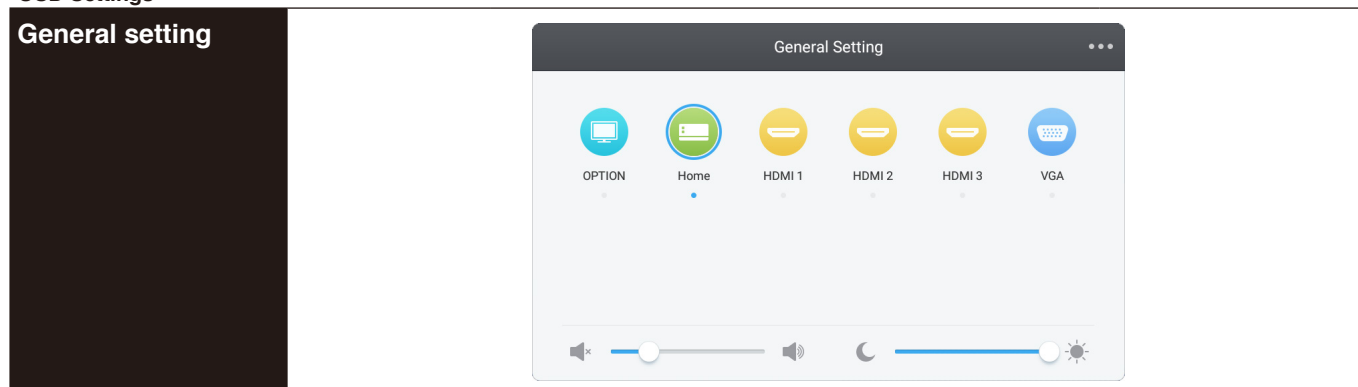


- NOTE:** Check the format if this device cannot recognize the connected USB memory.  
It is not guaranteed to work with all USB memories sold commercially.  
Please connect the USB memory to the USB port.  
FAT32 format supports read and write, NTFS format only supports reading ,does not support writing.

# OSD (On-Screen-Display) Controls

Swipe your finger up from the bottom of the screen or press the input button on the remote control or launcher interface to access the OSD Menu.

## OSD Settings



Adjustment Item	Problem / Option	
Input* <sup>1</sup> <span style="float: right;">Direct</span>	OPTION	Select the OPTION input.
	Home	Select the Home input.
	HDMI1	Select the HDMI1 input.
	HDMI2	Select the HDMI2 input.
	HDMI3	Select the HDMI3 input.
	VGA	Select the VGA input.
Volume <span style="float: right;">Direct</span>	Too soft	Increase or decrease output volume level.
	Too loud	
Brightness <span style="float: right;">Direct</span>	Brightness of backlight is reduced.	

\*1 The switching of the signal input take a few seconds.

Click the button in the upper right corner **⋮** to enter the settings for Audio, screen, Display, and Adjust. see page 26, page 27, page 28, and page 29.

OSD Settings

Audio setting

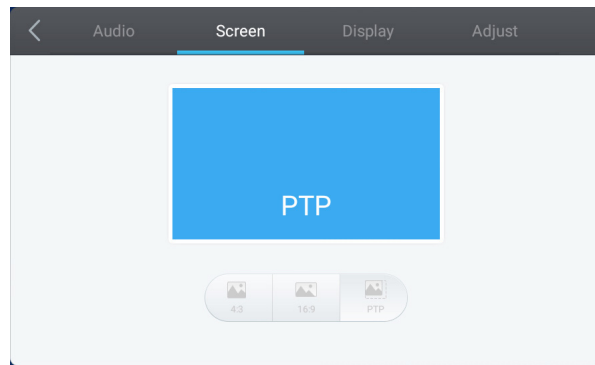


Adjustment Item	Problem / Option	
Volume <span style="float: right;">Direct</span>	Too soft Too loud	Increase or decrease output volume level.
Bass	Too weak Too strong	To accentuate or reduce the low frequency sound.
Treble	Too weak Too strong	To accentuate or reduce the high frequency range of audio signals.
Balance	Left side speaker louder Right side speaker louder	Adjust left and right speaker balance.
Sound Mode	Standard	Standard
	Meeting	Sound quality suitable for the conference.
	Class	Sound quality suitable for the classroom.
	Custom	Custom sound quality.
Mute <span style="float: right;">Direct</span>	○	Return the sound volume to the previous level.
	I	Turn off the sound.



## OSD Settings

### Screen setting



Adjustment Item	Problem / Option	
Aspect ratio	16:9	Displays all picture in 16:9 aspect ratio.
	4:3	Displays all picture in 4:3 aspect ratio.
	PTP*	Display the picture point to point.

\* Point To Point, to optimize touch performance when 3840 x 2160 input. (not available under system or not 3840 x 2160 input timing)

## OSD Settings

### Display setting

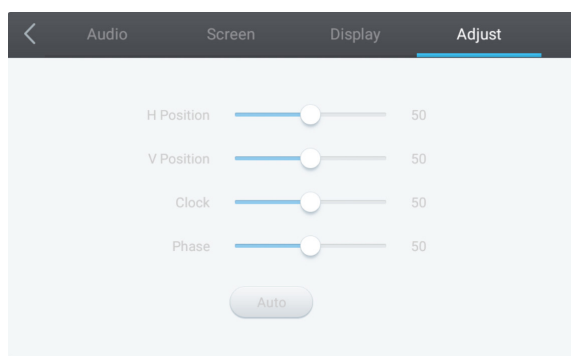


Adjustment Item	Problem / Option	
Brightness*1	Too dark Too bright	Adjusts the image brightness in relationship to the background.
Contrast	Too weak Too strong	Adjusts the image brightness in relationship to the input signal.
Picture Mode	Standard	For general windows environment and monitor default setting.
	HighBright	Higher brightness setting.
	Cinema	A setting that boosts dark tones; best suited for movies.
	Custom	Displays a picture on a screen set by Image Settings adjustments.
Color Temp	Standard	Greenish white
	Cold	Bluish white
	Warm	Reddish white

\*1 Adjust the Brightness when you are using the monitor in a dark room and feel the screen is too bright.

OSD Settings

Adjust setting\*1




Adjustment Item	Problem / Option	
H Position	<input type="checkbox"/> Too far to the left <input type="checkbox"/> Too far to the right	Controls the horizontal position of the image within the Display area of the LCD
V Position	<input type="checkbox"/> Too low <input type="checkbox"/> Too high	Controls the vertical position of the image within the Display area of the LCD.
Clock	<input type="checkbox"/> Too narrow <input type="checkbox"/> Too wide	Press remote ► to expand the width of the image on the right of the screen. Press remote ◀ to narrow the width of the image on the left.
Phase	Adjusts the visual "noise" on the image.	
Auto*2	Adjust H/V Position, Clock and Phase automatically.	


\*1 Only VGA input.

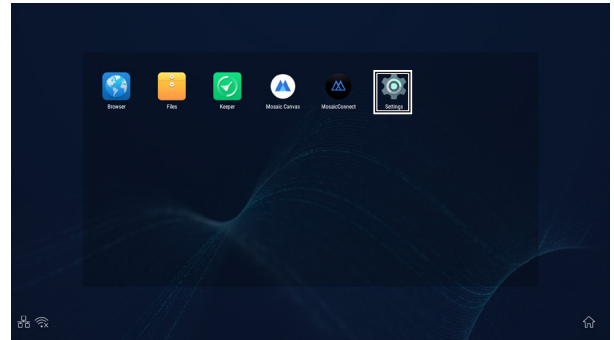
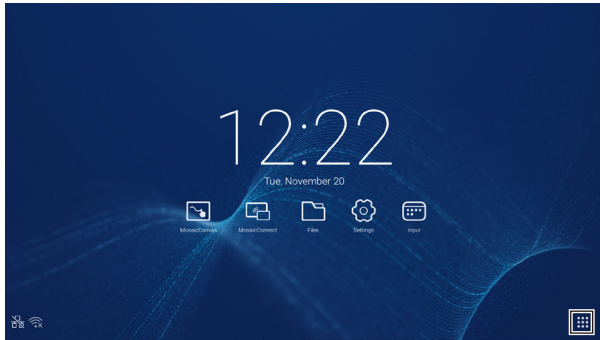
\*2 For best results, use the Auto Adjust in conjunction with the adjustment pattern. See page 27 for SCREEN ADJUSTMENTS.

## [Application]

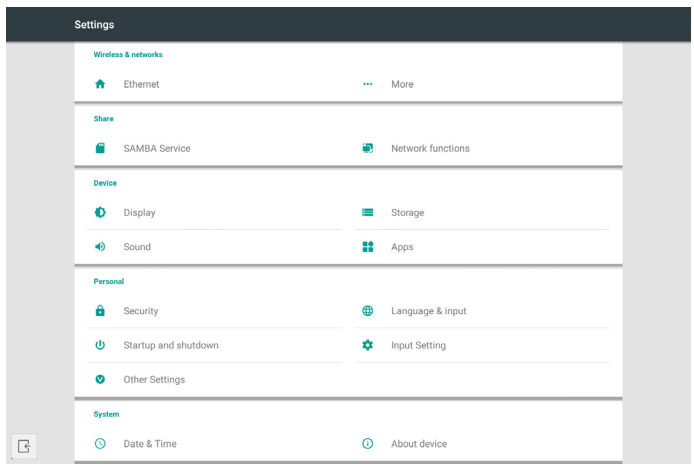
Click  with the touch pen.

or

Click  with the touch pen. Then, click  with the touch pen.



**Settings**



Adjustment Item	Problem / Option			
Wireless & networks	Ethernet*1	Set the wired network. Network: On/Off, LOCAL NETWORK SETTING, IP address, Default gateway, Netmask, DNS, Proxy		
SHARE	SAMBA Service	SAMBA sharing service.		
Device	Display	Set the wallpaper that is build into the system.		
	Sound	Touch sounds: ON/OFF		
	Storage	To display the internal system and USB disk.		
	Apps	View each application.		
Personal	Security	Credential storage (Certificate Authorities)		
	Language & input	Set display language, keyboard and input method. Language: Deutsch, English, Español, Français, Italiano, Svenska, Русский, 中文, 日本語		
	Startup and shutdown option	Startup channel	Last shutdown channel	
			Default startup channel (Select the source)	
		Standby after startup (black screen) : Turn off the backlight. <b>NOTE:</b> Press the Screen Off button on the remote control to return the screen.		
	Timer switch	Close power off reminder.		
		Boot time / Off time	Select the time of each, and select day of the week or everyday or the business days.	
	Input setting	Change the Input name to Nickname.		
Other Setting	Floating Style Setting	Floating Annotation Settings	Set the Toolbar. Slide Toolbar / Universal system Toolbar	
		SystemDock Channel Settings	Set the SystemDock. Available in all channel / Available in Home Disable in all channel	
	Wake on LAN*2	Wake on LAN function is turn On / Off.		
System	Date & time	Set automatic or manually date and time.		
	About Device	Version information of each software.		

\*1 When DHCP is turned on, connect the DHCP server to the network.

\*2 When the Wake on LAN function is enabled, the standby power will be 2W or less.

## OSD Settings

### Network functions

← Network functions

External control (NaviSet Administrator 2)

AMX

Menu	Function
External Control (NaviSet Administrator 2)	Select this setting if External Control or NaviSet Administrator 2 via LAN is Enabled.
AMX*1	To turn on or off for the detection from AMX Device Discovery when connecting to a network supported by an AMX's NetLinx control system.

\*1 HINT: When using a device that supports AMX Device Discovery, all AMX NetLinx control systems will recognize the device and download the appropriate Device Discovery Module from an AMX server.  
Select this setting if AMX Device Discovery will detect the device.

## 1. Introduction

OS is an application operating system for intelligent tablet computers. You can instantly access the Launcher interface by opening the machine, as shown in Fig. 1-1.

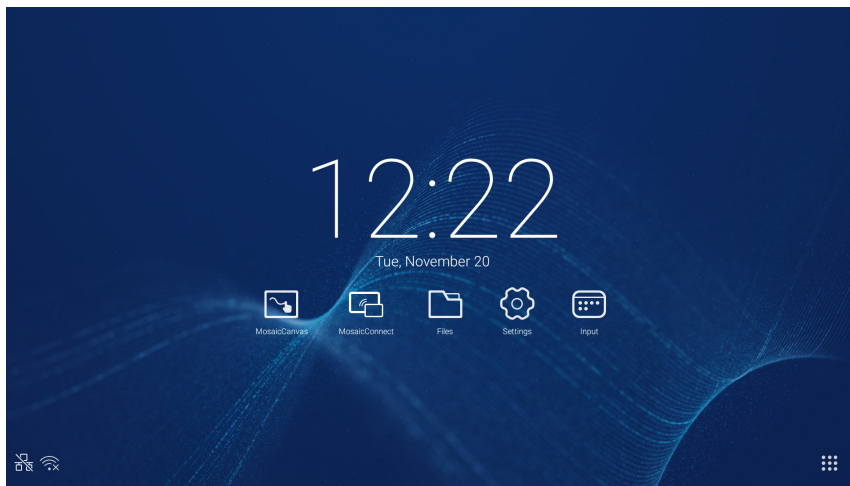



Figure 1-1 Launcher interface

Click the  button on the right bottom to access the apps, as shown in Fig. 1-2.

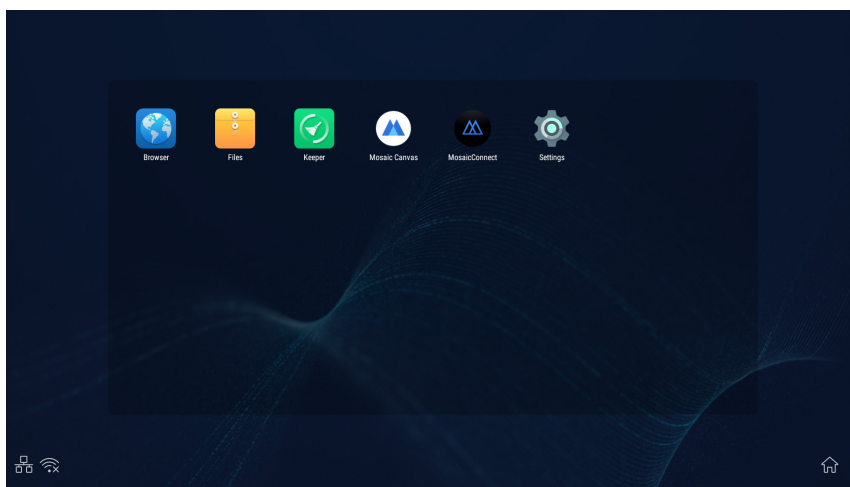


Figure 1-2 APPS

## 2. Sidebar

Click the button with ► or ◀ on sidebar of both sides to call it out. For example, Fig. 2-1 is shown how to call out the sidebar on the right side. The functions of the sidebar include the Back key, Home key, recent tasks, annotation tools, screen freezing, small tools, and input switch.

A valid path can be set for the sidebar on the Settings.



Figure 2-1 Sidebar button

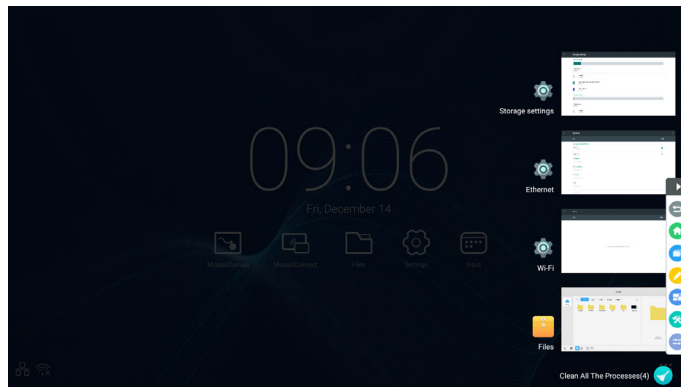
### 2.1 Back key

Click ◀ to return to the last operating interface.

### 2.2 Home key

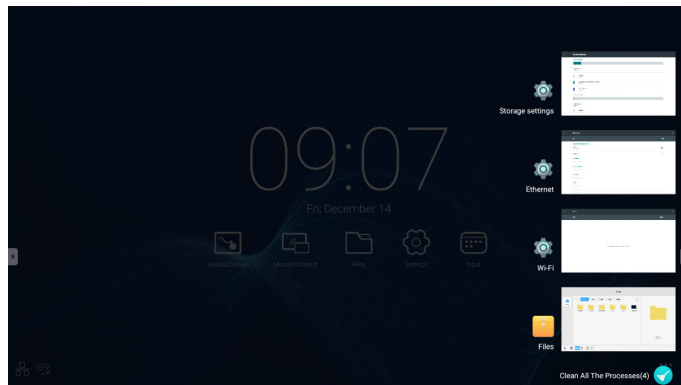
Click 🏠 to return to the desktop.

### 2.3 Recent tasks



Click ☰ to pop out the window and thumbnails of recently used applications are displayed.

Tap thumbnail to start or switch applications. To delete the thumbnail of the application, Swipe (flick) the thumbnail to be deleted left or right.



By tapping 🗑️ [Clean All the Processes] displayed at the bottom of the screen, you can delete all thumbnails. Deleting the thumbnail of the application can end the application.



## 2.4 Annotation tools





Click  to pop out the annotation tools as shown in Fig. 2-4-1. The tool includes such functions as annotation, gesture erasing, screenshot, and exit. When the quick whiteboard is being used, this function is unavailable.



Figure 2-4-1 Annotation tool

1. Annotation. After accessing this mode, you access the annotation mode completely, and you can directly write and note on the interface. You can switch the pen color with red or black.
2. Screenshot saving. Click  to save the current screenshot.
3. Exit. Click  to exit the annotation mode.

## 2.5 Screen freezing

Click the  button to pop out the screen freezing tools. You can freeze the screen, and at the same time zoom in or out the current screen.

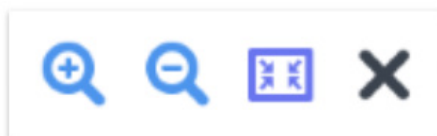








Figure 2-5-1 Screen freezing tools

1. Zoom in. Click the  button to zoom in the current screen.
2. Zoom out. Click the  button to zoom out the current screen.
3. Return. Click the  button to return to the original size of the screen.
4. Exit. Click the  button to exit the screen freezing.

## 2.6 Small tools

Click  to pop out the tool choice box, including spotlight, count down, stop watch, and air class.

### 2.6.1 spotlight

Click the  icon to open the spotlight, as shown in Fig. 2-6-1-1. The spotlight can be used to make audience focus their attention on the location you need to emphasize.

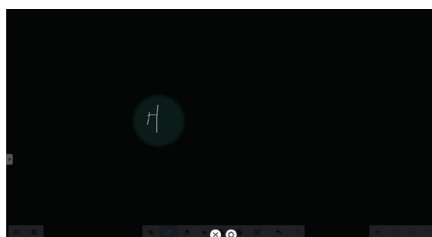



Figure 2-6-1-1 Spotlight interface

1. Drag in the black area to move the location emphasized by the spotlight.
2. Setting. Click  to pop out the window, as shown in Fig. 2-6-1-2.

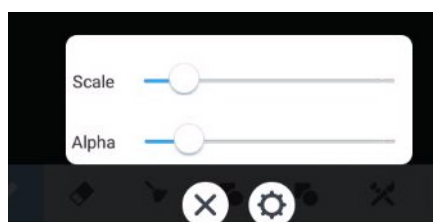




Figure 2-6-1-2 setting

- Scale. Drag the slider to adjust the range of the spotlight.
  - Alpha. Drag the slider to set the transparency of the part sheltered by the spotlight.
3. Turn off the spotlight. Click  to turn off the spotlight.

### 2.6.2 count down

Click the  count down button to pop out the count down small tool, as shown in Fig. 2-6-2-1.

Click the “START” button to start the count down, as shown in Fig. 2-6-2-2. Click “PAUSE” to pause the count down. Click the “RESET” button to reset the count down to the initial status.

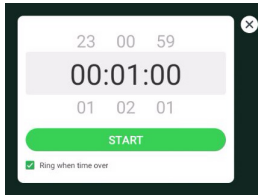


Figure 2-6-2-1 Initial interface of the count down

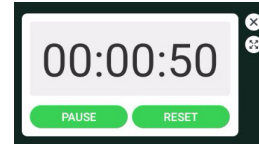



Figure 2-6-2-2 Count down interface

### 2.6.3 stop watch

Click the  button to start the stop watch, as shown in Fig. 2-6-3-1. Such functions as stop watch, pausing the stop watch, continuing the stop watch, and reset are included.

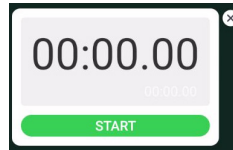



Figure 2-6-3-1 Stop watch

### 2.6.4 Air class

Click  enter the class, After students scan the QR code to join the class, teacher click “ENTER THE CLASS”. Please make sure you are in the same network with the IFP.

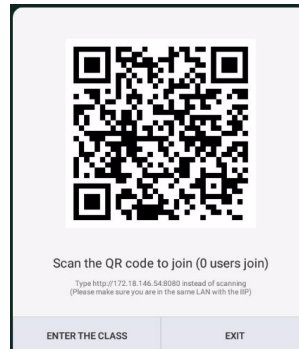


Fig 2-6-4-1 QR code

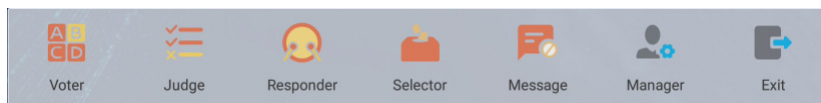



Fig 2-6-4-2 Menu bar

### 2.6.4.1 Voter

Click the  button, and the answer bar appears on the lowest corner of the teaching interface. Click “single choice” or “multiple choice” to select the question type.

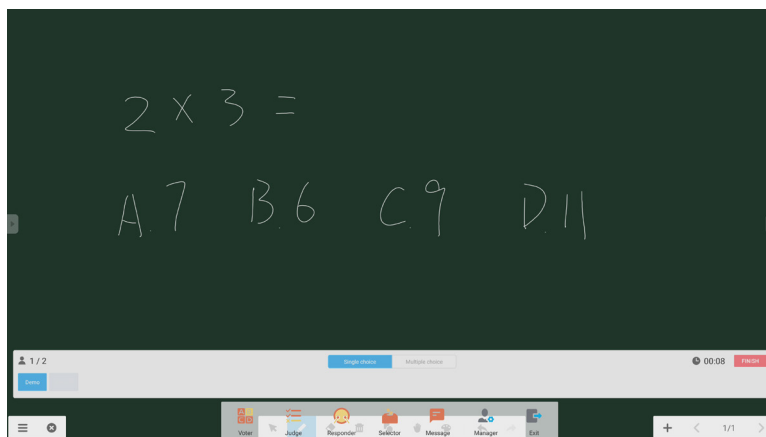


Fig 2-6-4-1-1 Voter

Answer. Click Begin to start answering question. After students answer the question, their names turn blue.

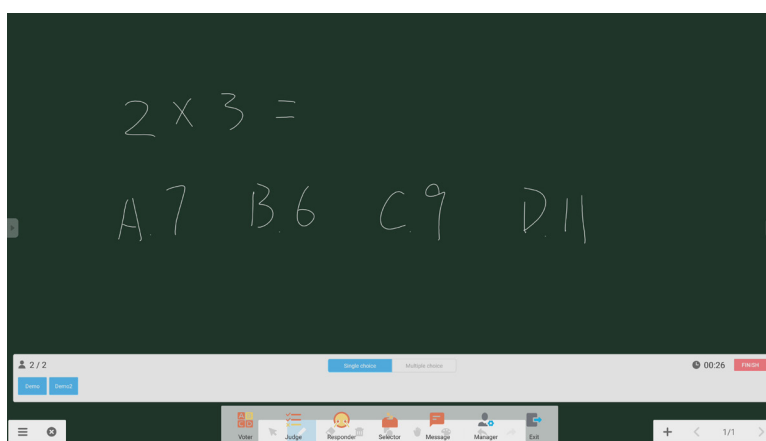


Fig 2-6-4-1-2 Voter

Answers statistics. Click Finish to finish answering questions, and you can access the answers statistics page.




Fig 2-6-4-1-3 Answers statistics

Choose the right answer(s), and calculate the accuracy.



Fig 2-6-4-1-4 Answers statistics

Explain. Click the  explanation button on the answers statistics to access the teaching page. Users can view the question explanation while checking the answers situation.

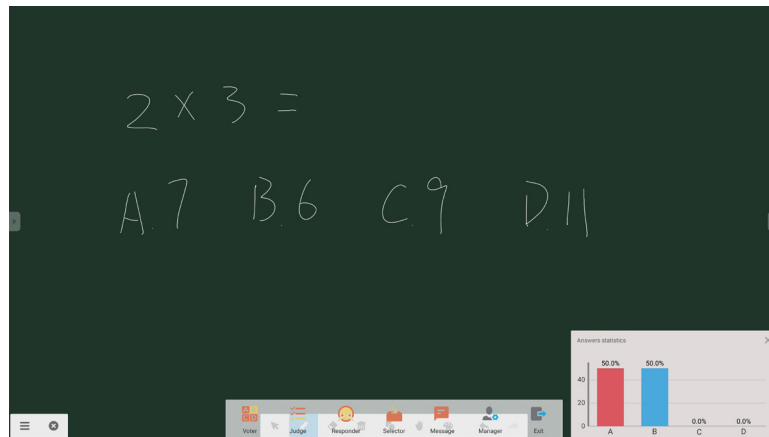



Fig 2-6-4-1-5 Explain

### 2.6.4.2 Judge

Click the  button, and the answer bar appears on the lowest corner of the teaching interface.

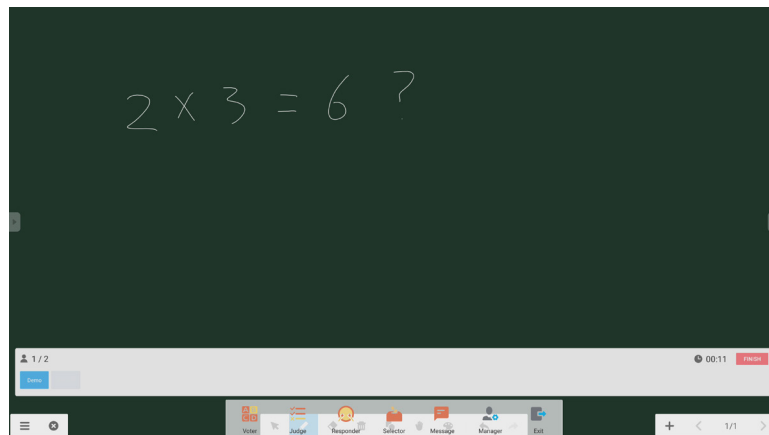


Fig 2-6-4-2-1 Judge

Answer. Click Begin to start answering question. After students answer the question, their names turn blue.

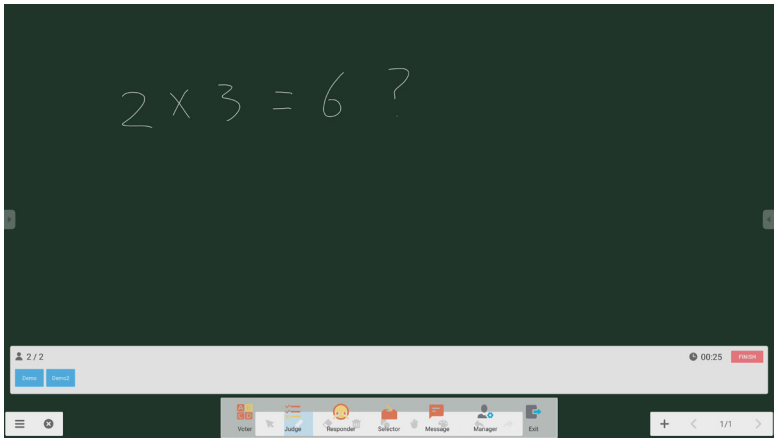


Fig 2-6-4-2-2 Voter

Answers statistics. Click Finish to finish answering questions, and you can access the answers statistics page. Choose the right answer(s), and calculate the accuracy.

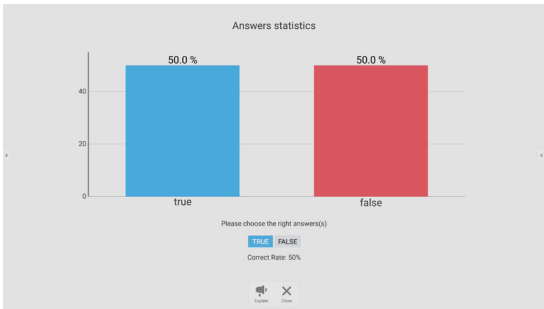


Fig 2-6-4-2-3 Answers statistics

Explain. Click the explanation button on the answers statistics to access the teaching page. Users can view the question explanation while checking the answers situation.

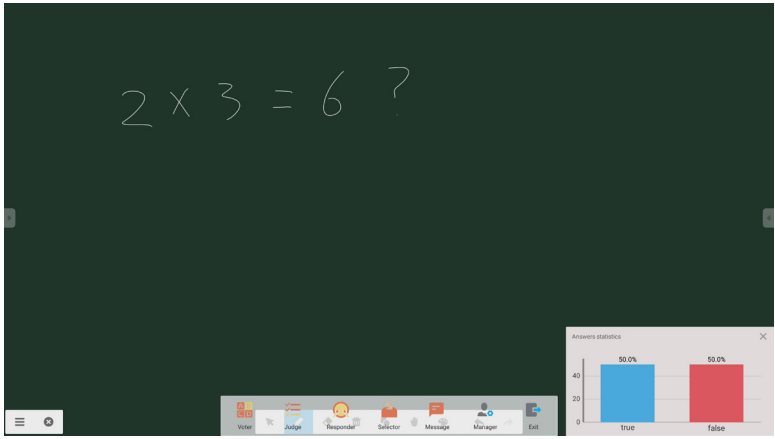


Fig 2-6-4-2-4 Explain

### 2.6.4.3 Responder

Click the 🗨️ button to access the responder part. Students can respond by pressing the [OK] key.

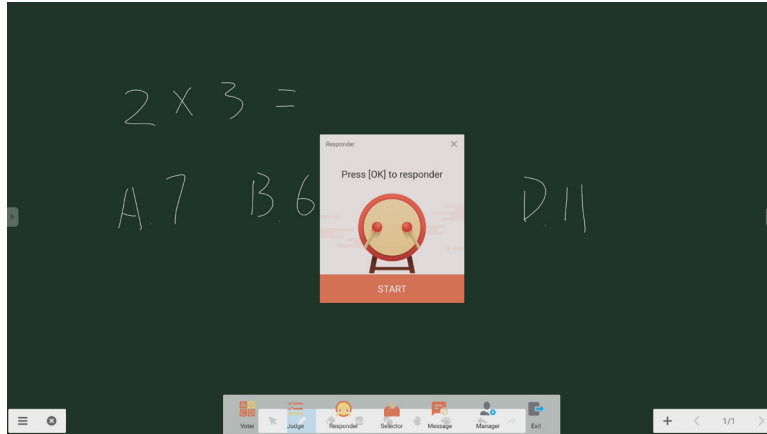


Fig 2-6-4-3-1 Responder

### 2.6.4.4 Selector

Click the 🗳️ button to access the selector. User can randomly pick not less than one person in air class.

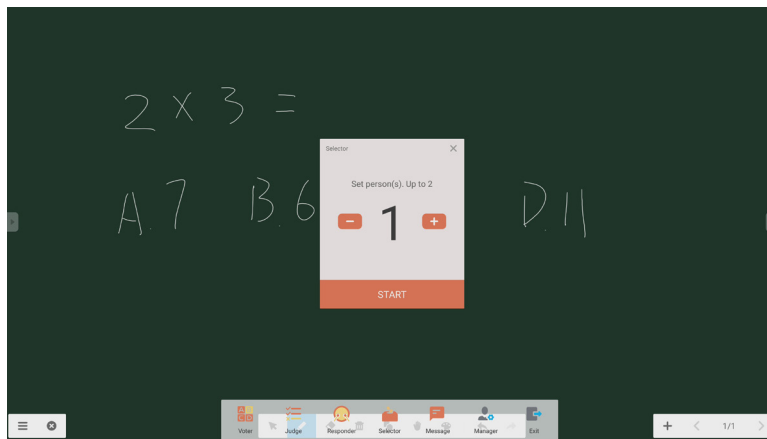


Fig 2-6-4-4-1 Selector

Set the number of people and click 'START', it will randomly pick the name from air class.

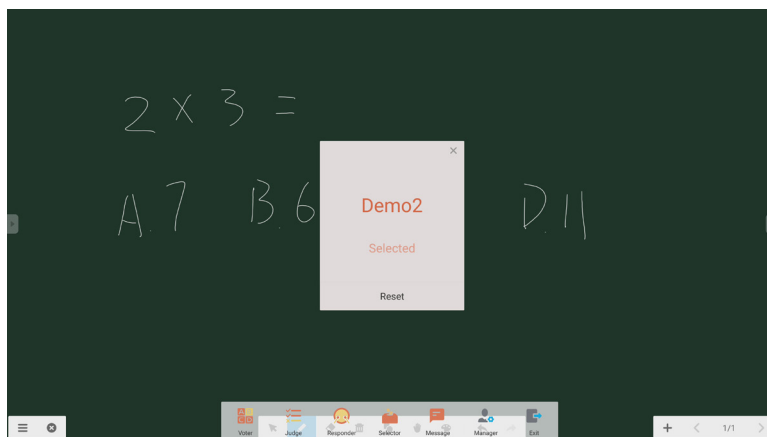


Fig 2-6-4-4-2 Select result

**2.6.4.5 Message**

After activating the message, students can publish the message comments on the mobile phone. The message comments are showing on the tablet computer in real time.

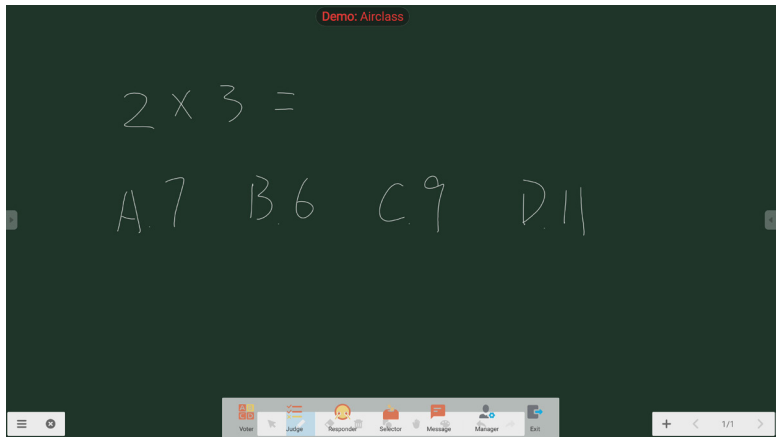


Fig 2-6-4-5-1 Message

**2.6.4.6 Manager**

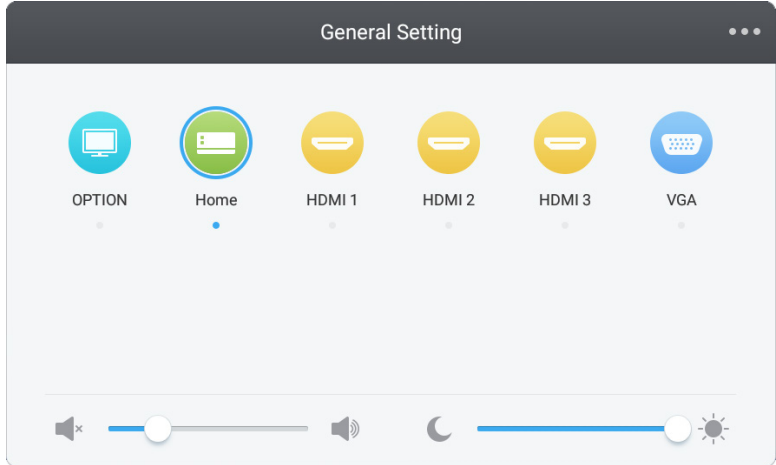
Click the Manager button to pop out the QR code, for ease of students in the class to join in air class.



Fig 2-6-4-6-1 Manager

**2.7 Input switch**

Click  to move to the input signal selection screen.



### 3. Mosaic User guides for Connect &Canvas



#### 3.1 Introduction

Mosaic is a suite of collaboration products designed to simplify how people share content and collaborate with each other. This document gives a high-level overview of Mosaic Canvas, a digital whiteboard tool, and Mosaic Connect, a wireless presentation solution. Both tools are included as standard on NEC's CB series display.

#### 3.2 System requirements

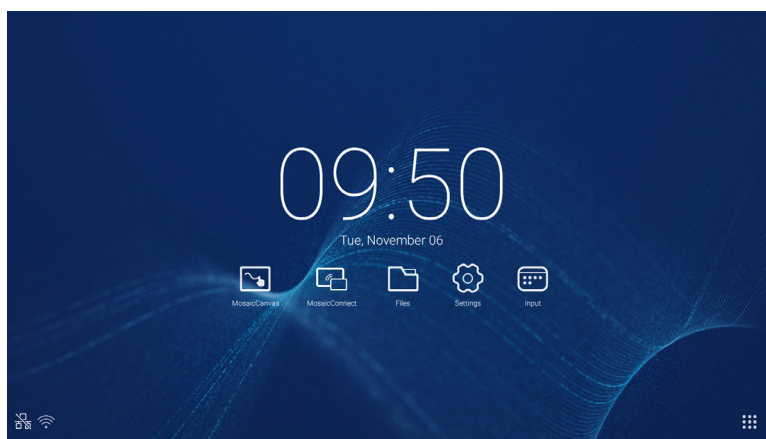
To run Mosaic Connect and Canvas, we recommend the following specification:  
Attendees can join via the following methods:

Platform	Connection
Windows*	Windows application, guest app
Mac* OS	Mac application, AirPlay
iOS*	iOS, AirPlay
Android*	Android application
Web*	Chrome

\* Less than 1920x1080 is supported

#### 3.3 Installation and activation

Both Canvas and Connect are pre-installed on the CB series display. There is no requirement to activate the software. To launch either application, tap the icon on the CB series home screen.



##### Getting the App

Mosaic client app is available through Android and iOS app stores

The easiest way to get the correct version is by visiting

<https://connectmosaic.com> on the device. The browser will automatically detect your device and provide a link to download the app.

Alternately you go directly to each store through the below links

Play Store -

[https://play.google.com/store/apps/details?id=com.displaynote.mosaic&hl=en\\_GB](https://play.google.com/store/apps/details?id=com.displaynote.mosaic&hl=en_GB)

iTunes -

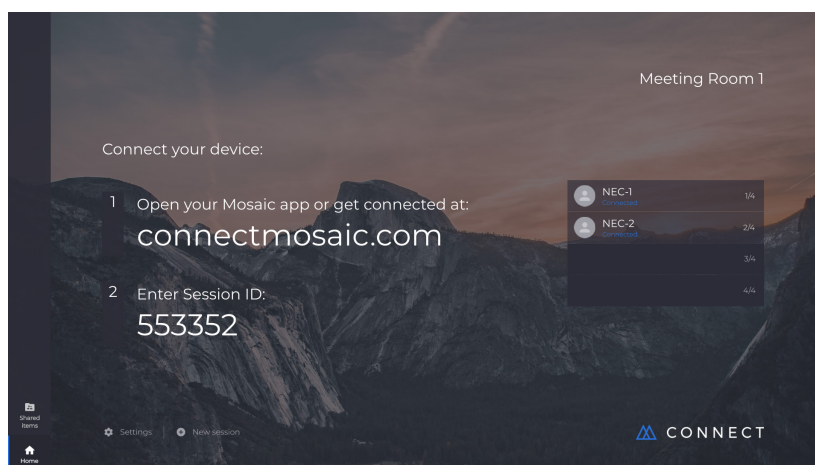
<https://apps.apple.com/us/app/mosaic-connect-app/id1450158906>



### 3.4 Mosaic Connect home screen

The home screen contains the following information:

- Joining instructions and Web URL for attendees
- Session ID
- PIN (optional)
- Overview of connected attendees
- Settings
- New session
- Exit Mosaic Connect
- Shared items
- Home button



### 3.5 Creating a session

When the user first launches Mosaic Connect, a session ID will be generated. The user can also create a new session from Mosaic Connect by clicking or tapping on 'new session', at the bottom of the screen.

### 3.6 Joining a session

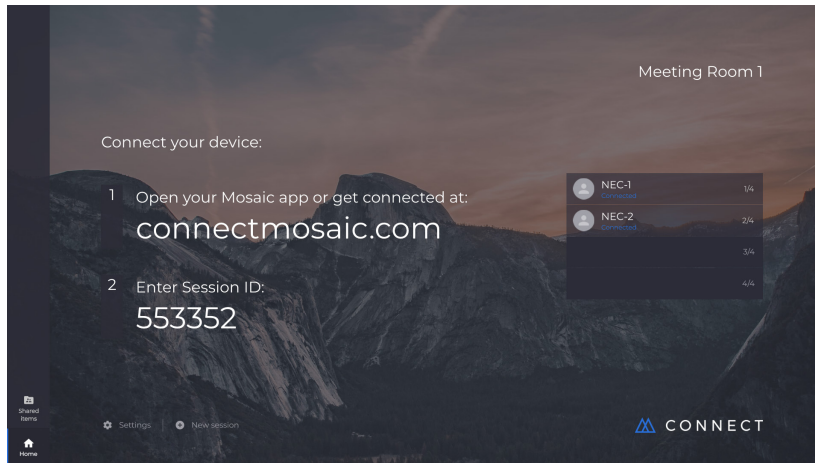
If it's the user's first time using Mosaic Connect, they need to visit [www.connectmosaic.com](http://www.connectmosaic.com) where they'll find instructions on how to join a session.

Please note, this page will adapt to attendee's hardware. i.e. Windows users will get Windows software and Mac users will get Mac software.

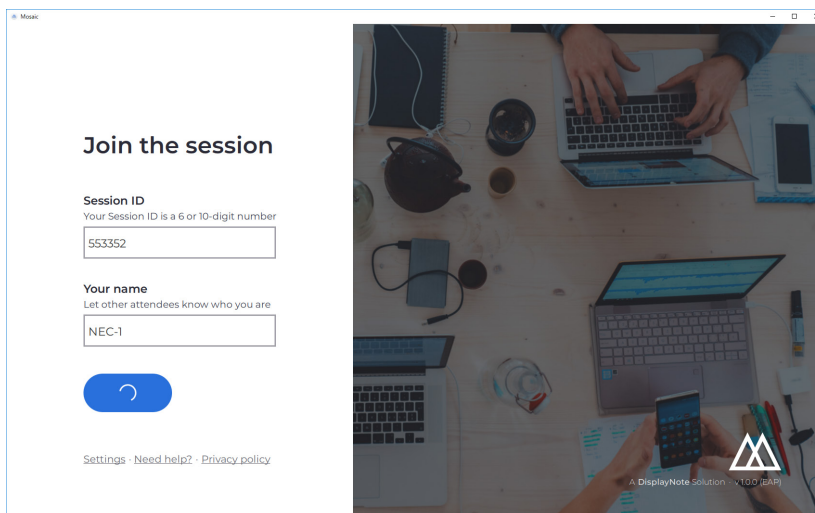
Users can choose to join via the web (Chrome and Firefox)

### 3.7 Joining via native application

Once a user has downloaded and opened the native application, the following screen is displayed:

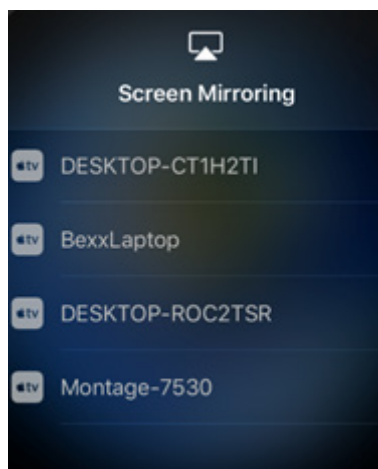


To join, the user should enter the session ID ( shown on the display), their name and then press Connect. If a PIN is required, this is an additional step. Once a user connects, their name will be shown on the home screen.



### 3.8 Joining via AirPlay

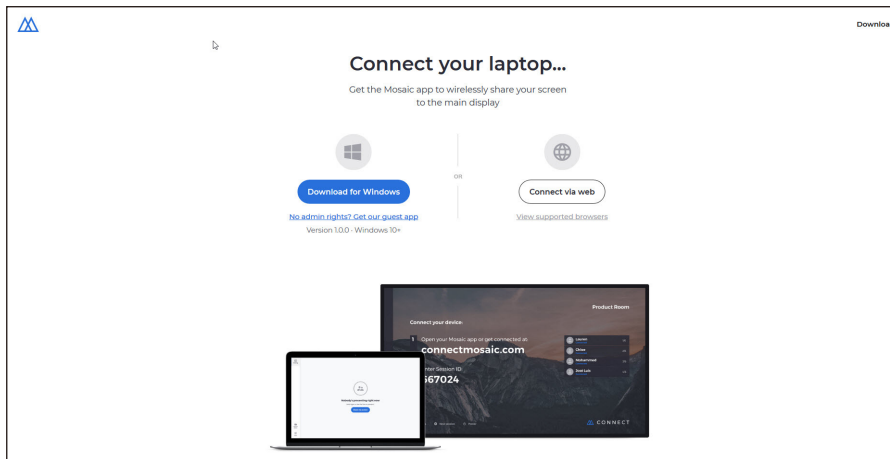
To join via airplay, swipe up on your Apple device and select “screen mirroring”.



To start presenting, select the name of the display you would like to present to - you can find this on the top right-hand corner of the home screen. You will be prompted to enter a password: the password is the same as the session ID. Once connected, your name will appear on the list of connected attendees on the right-hand side. Finally, double tap your name on the touch display to present your screen.

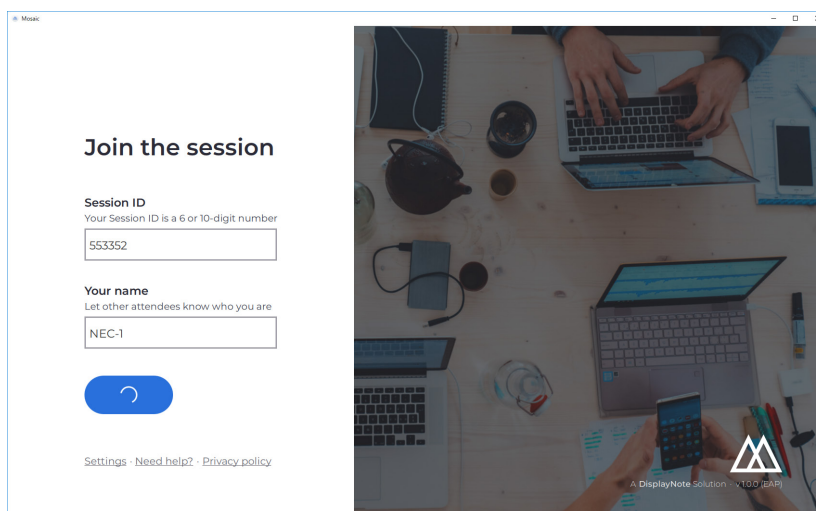
### 3.9 Joining via web

To connect via web, go to [www.connectmosaic.com](http://www.connectmosaic.com) and choose the option 'connect via web'.



Enter your name, session ID and PIN if required.

Choose to present either your entire screen or specific application window and then click share.



### 3.10 Client Toolbars

Once you're connected to the session, you can use the Mosaic Connect toolbar to:

- Share/stop sharing your screen
- Pause sharing

### 3.11 Managing attendees from the main display

Users of Mosaic Connect can use the home screen to invite an attendee to present. To do so, go to the home screen and double tap a user's name.

Before sharing their screen, each user will get a prompt asking them to confirm if they would like their screen to be wirelessly presented. If they select Yes, it will be shown on the main display. If they select No, Mosaic Connect will remain at the home screen.

Mosaic Connect enables back control of any connecting Windows PC.

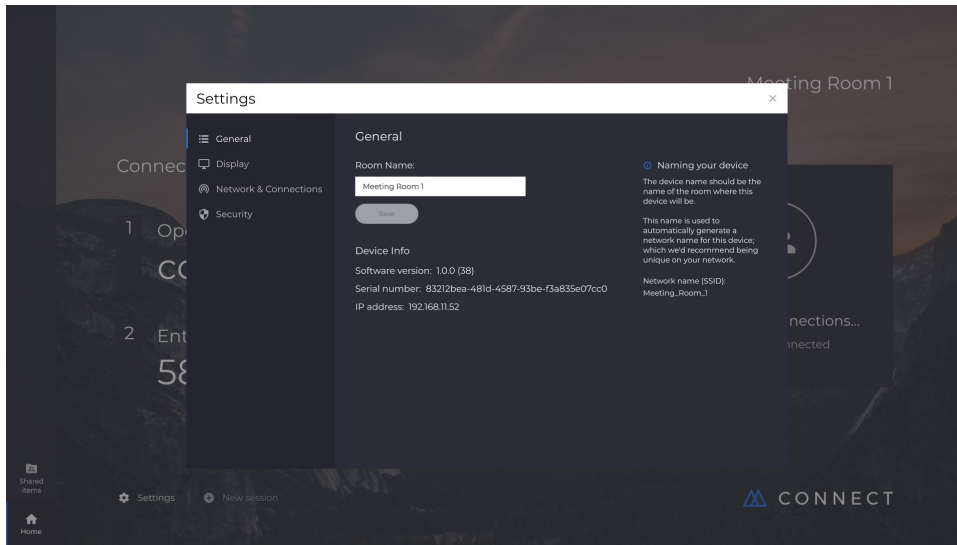
### 3.12 Settings

Settings are accessible via the Mosaic Connect home screen. Settings are arranged as following

- General
- Display
- Network & Connections
- Security

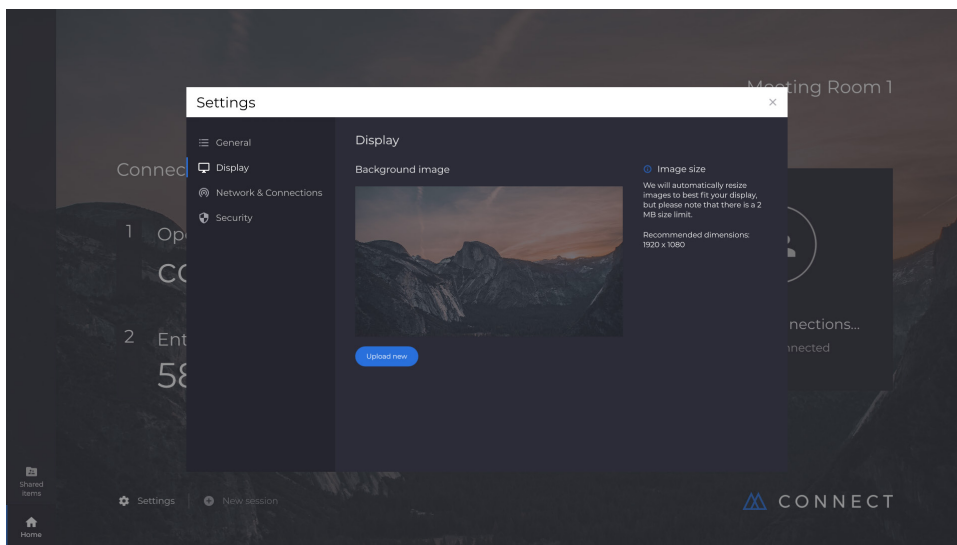
### 3.13 General

Includes device information, such as version, serial number and IP address. Allows user to edit and save the room name, making the solution easily recognised if the user has more than one version deployed.



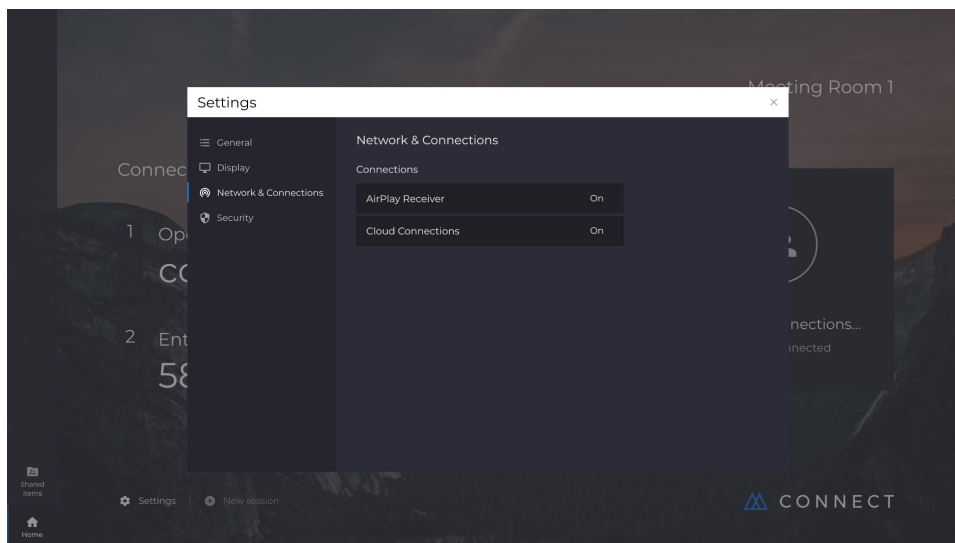
### 3.14 Display

Here, the user can change the background image that appears on the Connect home screen. Also includes recommended image size.



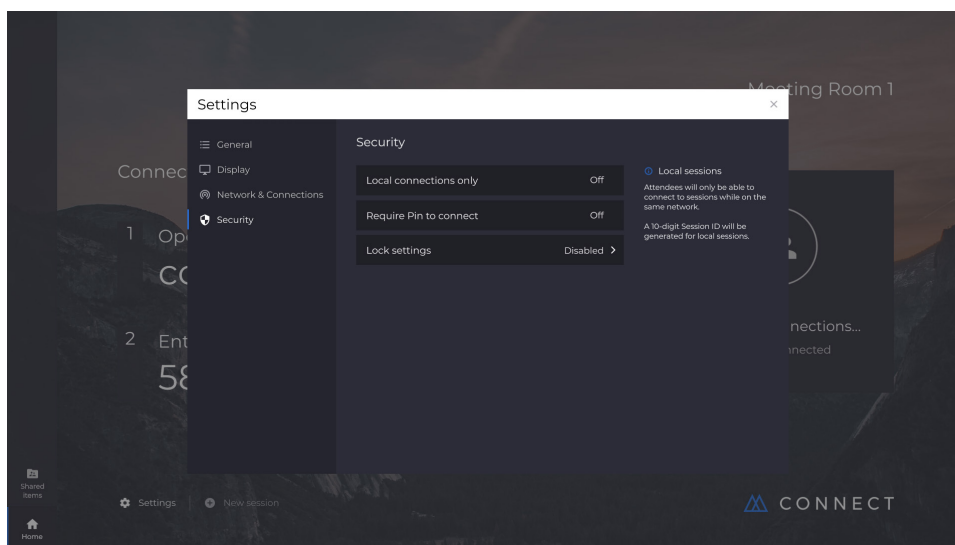
### 3.15 Network and connections

Users can choose to turn on/off AirPlay connections and Cloud connections.



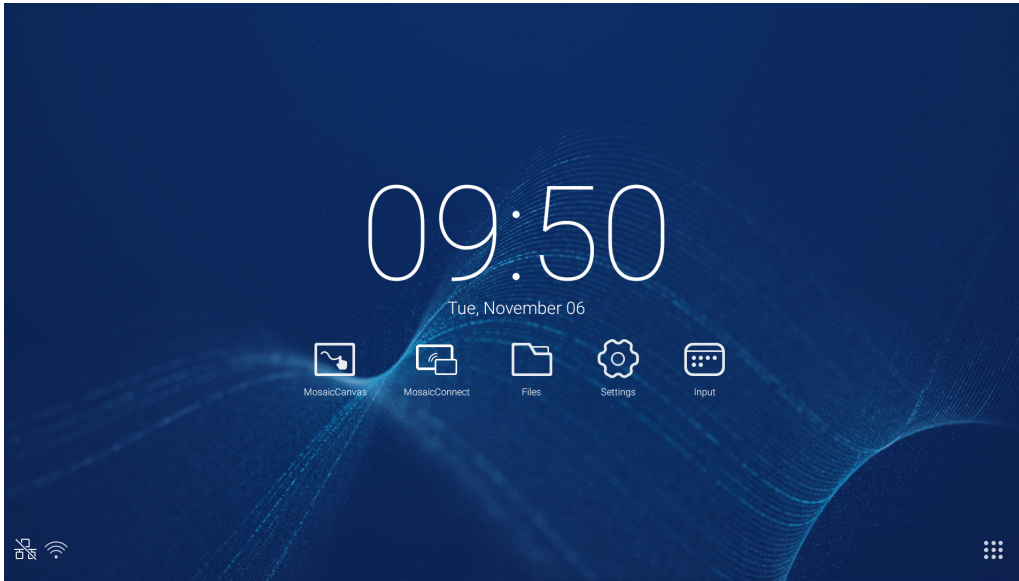
### 3.16 Security

Users can choose to allow local connections only (i.e. connect to sessions while on the same network). They can enable or disable a PIN.

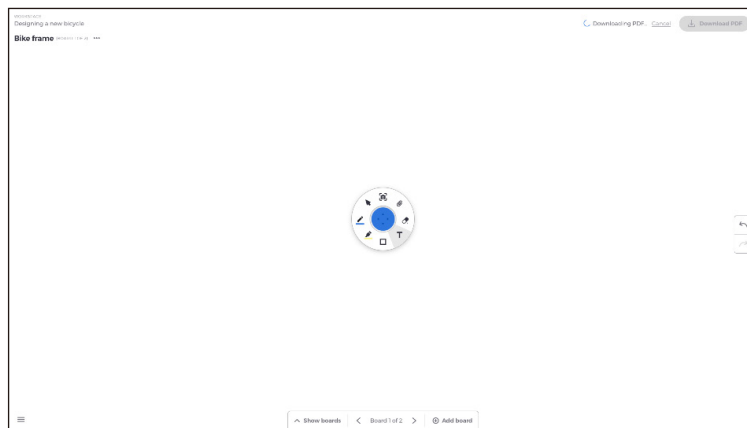


### 3.17 Mosaic Canvas

Both Canvas and Connect are pre-installed on the CB series display. There is no requirement to activate the software. To launch either application, tap the icon on the CB series home screen.



Launching Mosaic Canvas will open up a blank workspace and toolbar as follows:



### 3.18 Mosaic Canvas toolbar

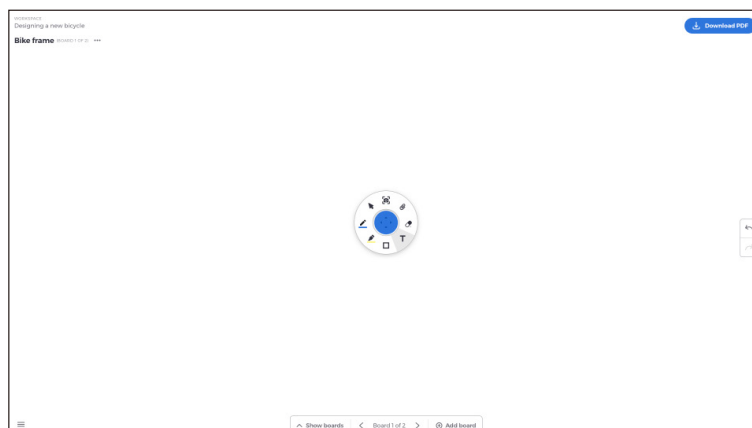
The Mosaic Canvas toolbar contains the following tools and subsets:

- Pen
  - Pen thickness
  - Pen colour
  - Line tool
  - Arrow tool
- Cursor
  - Cursor
  - Object grouping
- Highlighter
  - Highlighter thickness
  - Highlighter colour
- Shape
  - Shape fill
  - Shape style
  - Shape thickness
- Text
  - Sticky Note
- Eraser
- Attachments

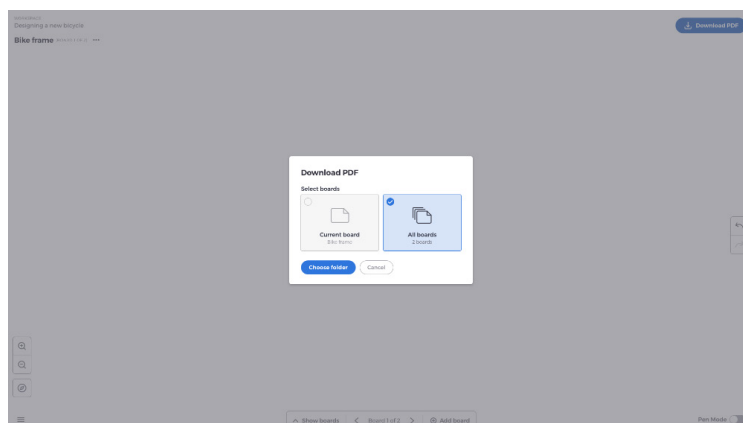
### 3.19 Saving/downloading a board

Each board can be downloaded to the local device. User can choose to download a Current board (the board they are working on) or All boards (every board in that session).

- To download boards
- Tap download PDF in the top right hand corner.



- Select Current board or All boards



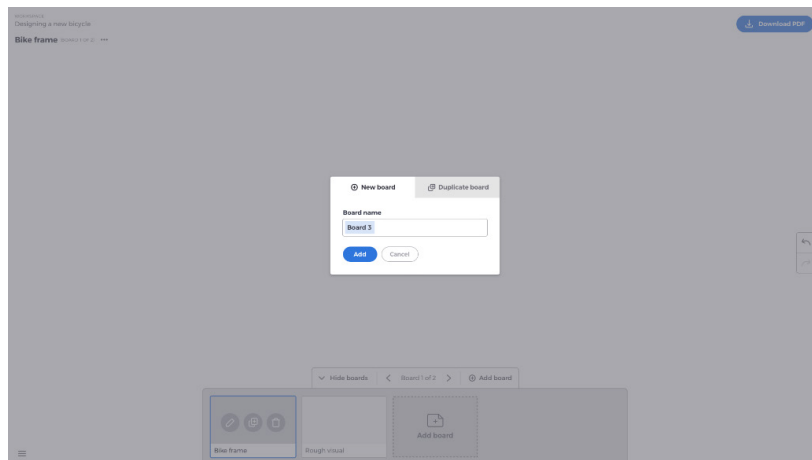
- Choose folder (this is where you'll save the board)

## 3.20 Adding boards

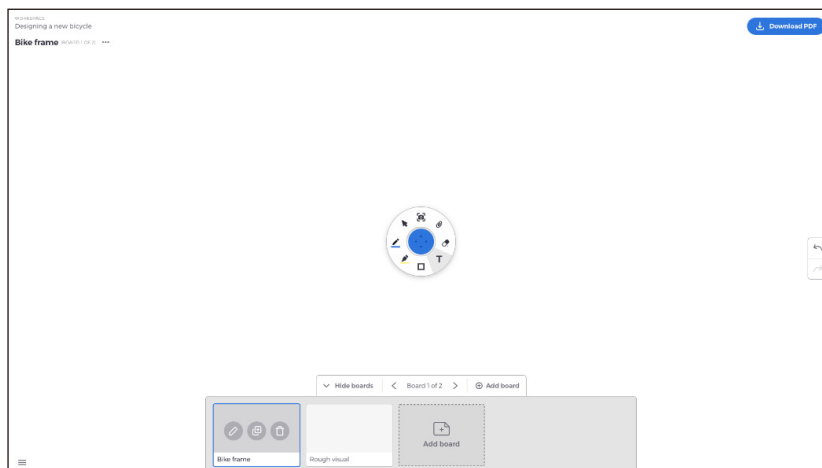
Mosaic Canvas allows users to add multiple boards:

To add a board

- Select add board from the bottom of the screen
- Add either new board or a duplicate board. Note: choosing duplicate board makes a copy of your existing board.



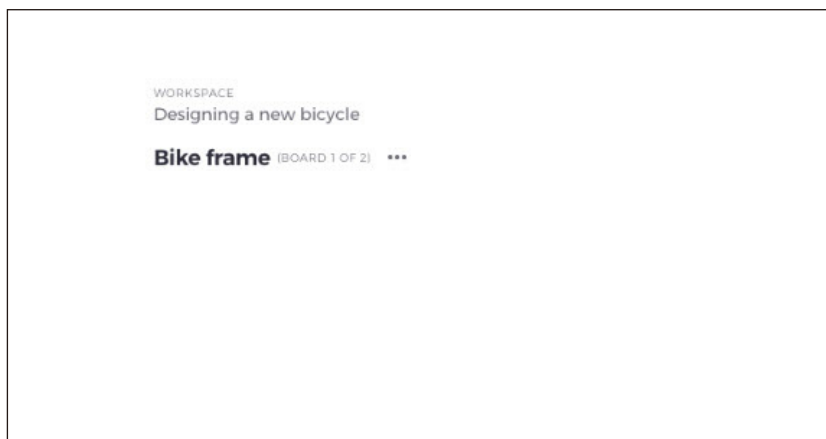
- Give your board a name
- Press add





### 3.21 Renaming, duplicating and deleting a board

To rename, duplicate or delete a board, tap the three dots in the top left-hand corner of your board.

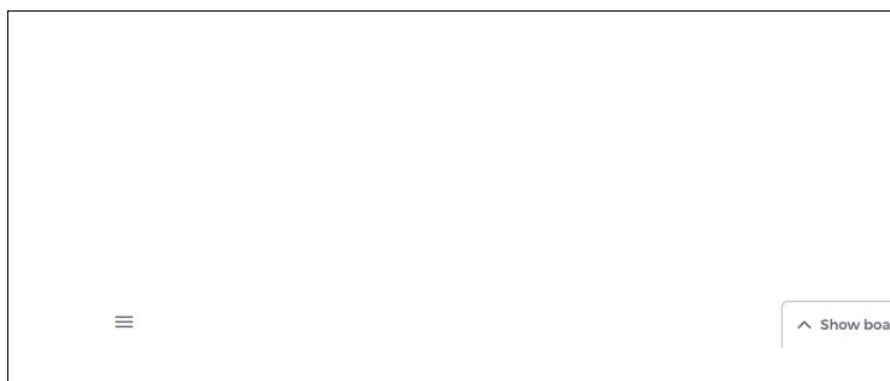


Choose to either:

- Rename
- Duplicate
- Delete board

### 3.22 Saving, opening and exiting boards

To save a board, choose the menu icon in the bottom left of the screen.



From here you can:


- **New.** Open a new board
- **Open.** Open a previously saved board
- **Save/Save As....** Save your current board
- **Exit.** Exit Mosaic Canvas

### 3.23 Undo and redo

To undo or redo an action, choose the undo redo button at the right-hand side of the display.



## 4. Files

Click  to pop out the file browsing as shown in Fig. 4-1. It can browse the files saved in the system such as document, whiteboard writing, video, picture, and audio. In addition, it can automatically identify external USB device, browse files according to category, search for the files, etc.

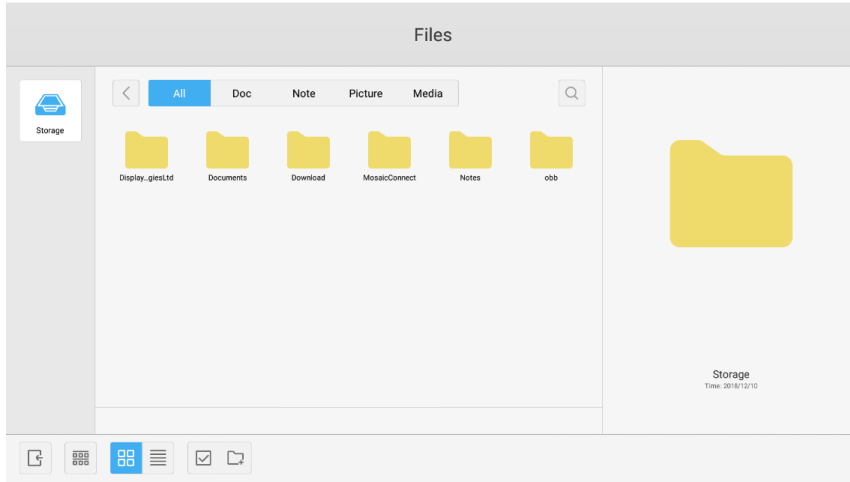


Fig 4-1 File browsing

### 4.1 Browsing according to category

Users can browse resources stored in the system according to category, including document, whiteboard writing (pages saved by the whiteboard and quick screenshot), video, picture, and audio.

- **All.** When accessing internal storage module, all resources are displayed by default.
- **Doc.** Click Doc to browse PPT, Word, Excel, PDF documents.
- **Note.** Click Note to browse files and quick screenshot saved by the whiteboard.
- **Picture.** Click Picture to browse the stored pictures, formats like .jpg, .jpeg, .png, .bmp, and .gif are supported.
- **Media.** Click Media to browse the stored videos, formats like .avi, .flv, .m4v, .mkv, .mov, .mp4, .mpeg, .mpg, .3gp, and .ts are supported
- **Search.** In the input box on the right upper corner of the interface, enter the resource name you want to search, and click to search for the resources. For example, by entering "word", you can find resources whose name is "word".

### 4.2 Resource operation

Users can edit the resources stored in the system, including creating, selecting, selecting all, cancelling selecting, copying, pasting, cutting, deleting, renaming, and more.

1. **Selecting.** Click the  button to switch to , and a selecting box pops out on the left upper corner of the resources. Then you can select resources as required.

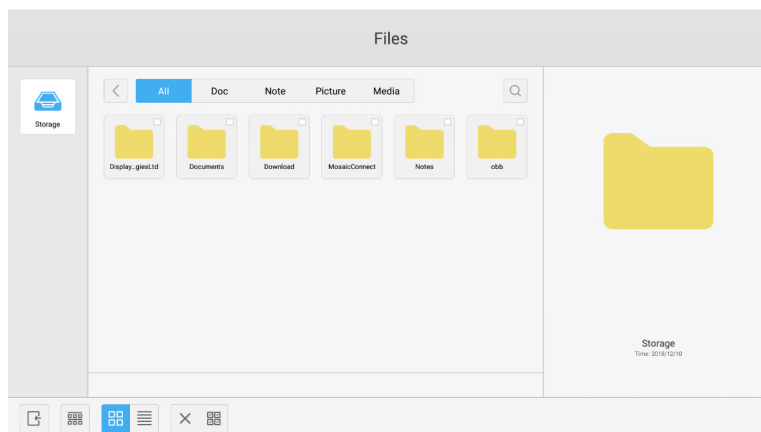


Fig 4-2-1 Selecting interface

2. **Selecting all.** By clicking the  button, you can select all resources under the current directory.

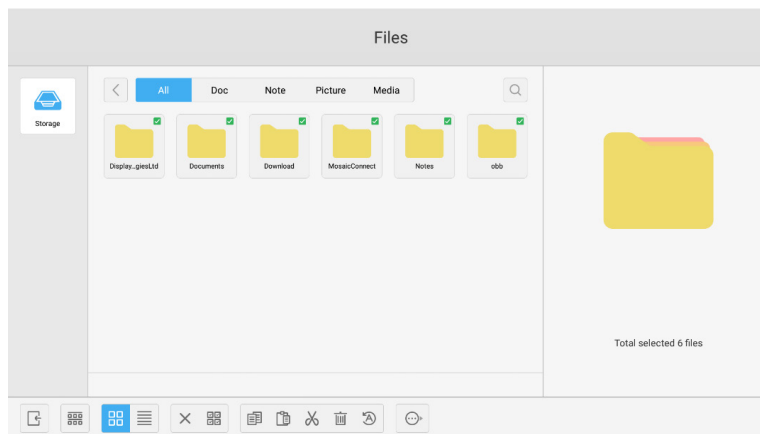



Fig 4-2-2 Selecting all interface

3. **Cancelling selecting.** Click  to cancel all resources that have been selected currently.  
 4. **Creating.** Click "Creating" to create new folders under the current directory.

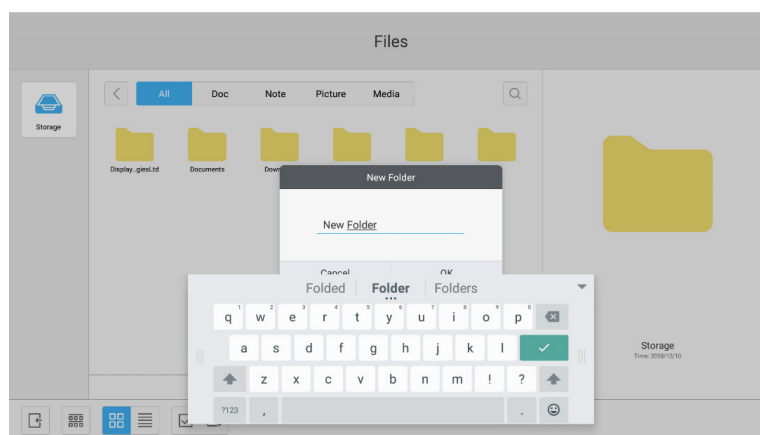









Fig 4-2-3 New Folder

5. **Copying.** When the resource is selected, the copy button will appear. Click  to copy the currently selected resource.  
 6. **Cutting.** When the resource is selected, the cutting button will appear. Click  to cut the currently selected resource.  
 7. **Deleting.** Click  to delete the selected resource.  
 8. **Pasting.** When there is any resource being copied or cut currently, the  button is available. Users can paste the copied/cut resource to the specified location as required. You can execute the pasting operation only when the default folder is displaying "all" resource locations.  
 9. **Renaming.** Click  to rename the selected resource.  
 10. **More.** Insert USB to Click  to pop out the "send to" button. You can send the selected file to the target folder.  
 11. Select a certain resource, the resource operation menu will pop out at the bottom of the window. You can perform operations such as deleting, copying, cutting, pasting, and renaming on the current resource.

### 4.3 Ordering menu

- Click the  ordering button to pop out the menu as shown in Fig. 4-3-1. You can order the resources, including ordering according to the name, type, or size, and time. Resources are ordered according to name by default.

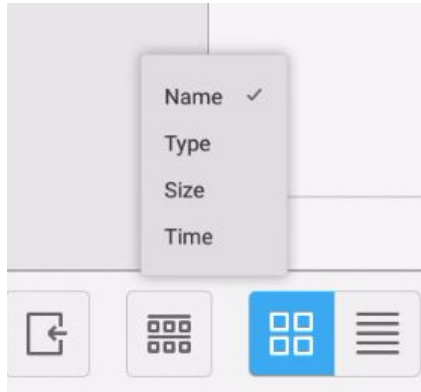



Fig 4-3-1 Ordering menu

- Name.** When “ordering according to name” is selected, the displayed resources will be ordered according to resource name.
  - Type.** When “ordering according to type” is selected, the displayed resources will be ordered according to resource type.
  - Size.** When “ordering according to size” is selected, the displayed resources will be ordered according to resource size.
  - Time.** When “ordering according to time” is selected, the displayed resources will be ordered according to resource time.
- Tile. Click  to display the resources in the form of icon. The resources are displayed in the form of icon by default, as shown in Fig. 4-3-2.

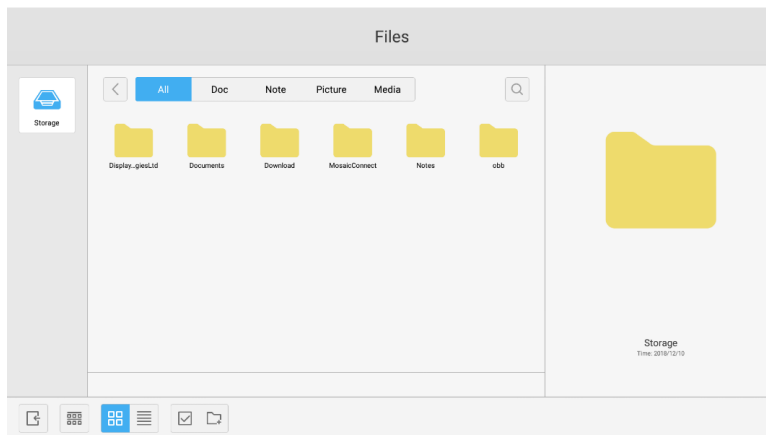



Fig 4-3-2 Tile display

- List. Click  to switch to display the resources in the form of detailed information, as shown in Fig. 4-3-3.

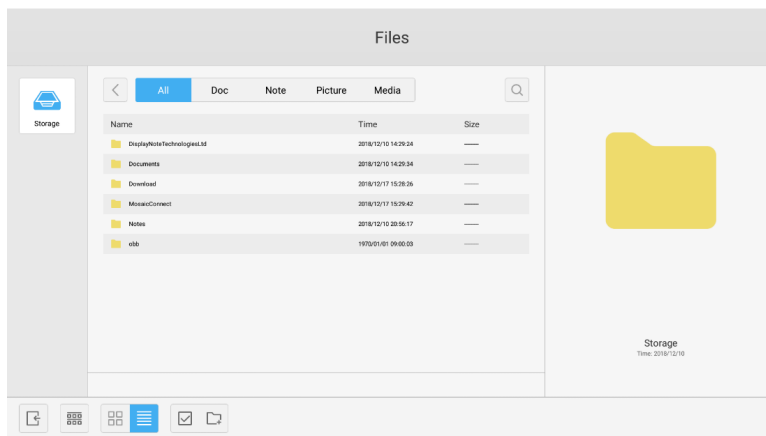



Fig 4-3-3 List display

### 4.4 Exit

Click  to exit the file browsing, and return to the homepage.

## 5. Settings

Click the  button to open setting, as shown in Fig. 5-1. You can tap to click and select the setting option, including wireless & networks, share, device, personal, and system.

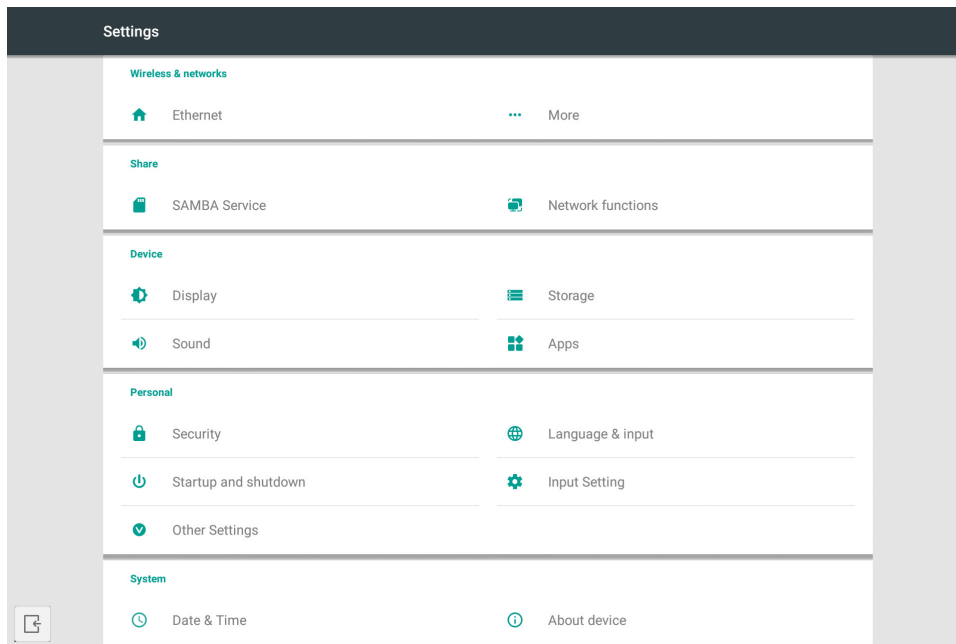


Fig 5-1 Setting menu

### 5.1 Wireless & networks

You can set whether to enable the network, and view the network, including the IP address, mask, and gateway.

### 5.2 Share

SAMBA sharing service and Network function (External Control and AMX).

### 5.3 Device

Display: setting wallpaper, and others.

Storage: Show the storage about this device.

Sound: Touch sound and sound output settings.

Apps: all apps in this device.

### 5.4 Personal

Setting language & input, Startup and shutdown, Security, Input Setting, Other Setting, etc.

Language & Input: Set display language, keyboard and input method.

Startup and shutdown: Set Startup channel, Standby after startup (black screen)

Input Setting: Change the Input name to Nickname.

Other Setting: Set the Toolbar; Set the SystemDock and Set wake on LAN


### 5.5 System

Setting Date & time, and About Device.

## 6. Browser

When the network is normally connected, click the  button and enter the website to access the web page.

## 7. Keeper

Click  to pop out the Keeper interface as shown in Fig. 7-1. You can perform memory optimization, garbage clean, and hardware checking on the intelligent tablet computer.

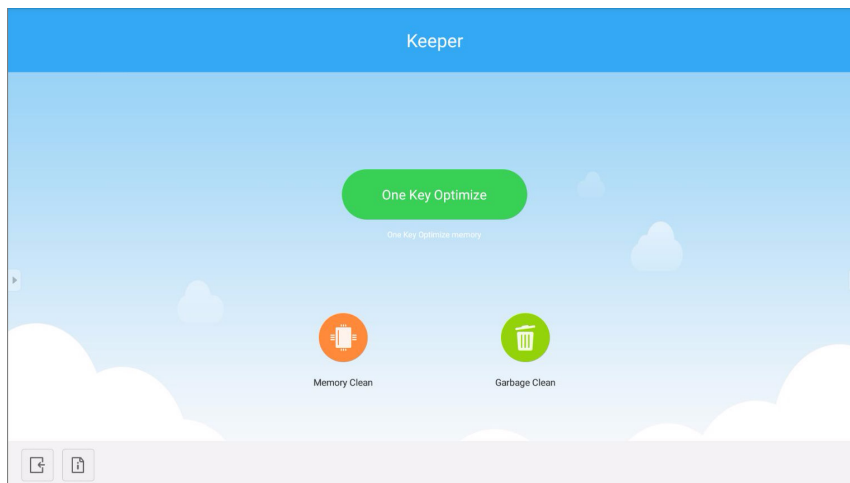




Fig 7-1 Keeper

- **One Key Optimize.** Click  to optimize memory, clean the disk garbage and check hardware problem in one key.
- **Memory Clean.** Click  to optimize the memory.

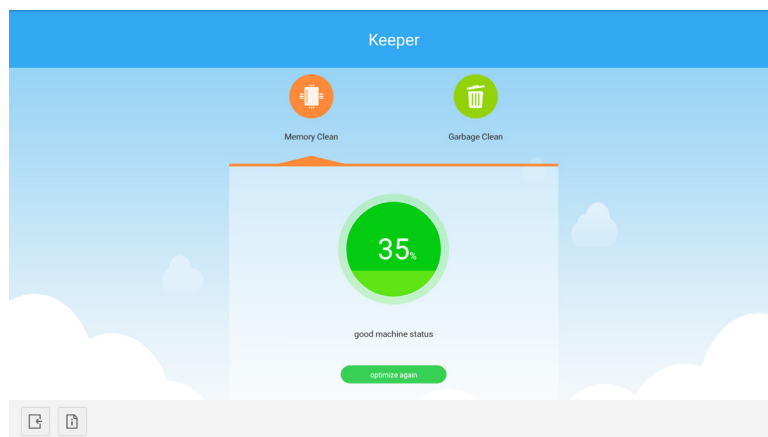


Fig 7-2 Memory Clean

- **Garbage Clean.** Click  to clean the disk garbage.

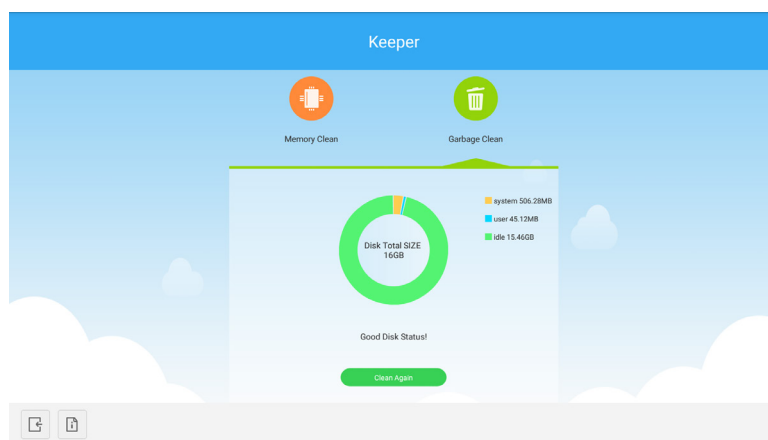




Fig 7-3 Garbage Clean

- **Version information.** Click  to view the system version and touch pen version information of the machine.
- **Exit.** Click  to exit the Keeper and return to the main interface.

## 8. Touch Menu

Finger sliding upwards from the bottom of the screen to access the Touch Menu.

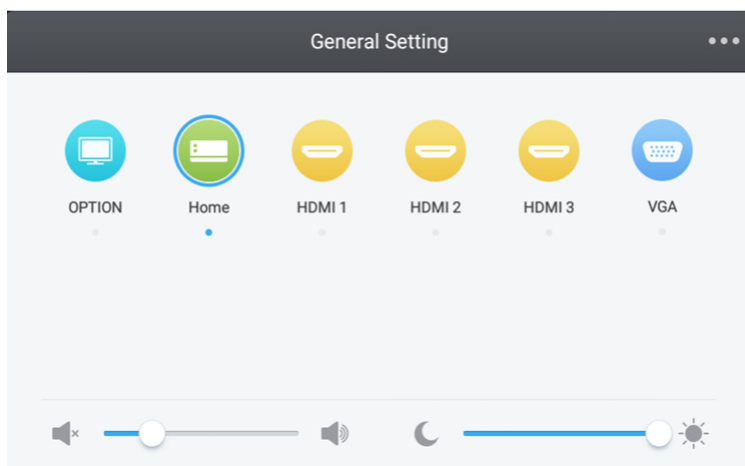


Fig 8-1 General Setting

OPTION: Select the OPTION input.

Home: Select the Home input.

HDMI: Select the HDMI input.

VGA: Select the VGA input.

\* The switching of the signal input will take a few seconds.

# Mosaic Connect Network and Security Guide.

Published October 2018.

## Introduction

Mosaic Connect is a wireless presentation solution allowing individual connected devices to share their screen to a large format display. Mosaic Connect is available on multiple platforms:

- Windows software, available for Windows 10. This allows the Mosaic Connect software to be deployed securely across existing hardware.

**Note:** features vary per platform

## Infrastructure

All inbound and outbound data from our backend layer is encrypted and transmitted over TLS or DTLS with 2048-bit asymmetric encryption and 256-bit symmetric encryption using certificates from third party credited authorities. Network communication is protected using the latest in technology to secure all video, audio and data.

Using the TLS and DTLS cryptography protocols, previously referred to as SSL, we provide protection using a 2048-bit asymmetric key in conjunction with a 256-bit symmetric session key. More information on network ports used can be found further within this document.

The backend tier provides four public services; REST API, XMPP and STUN / TURN.

We use a combination of both Azure and Amazon services to provide a resilient and redundant backend whilst providing the lowest latency possible.

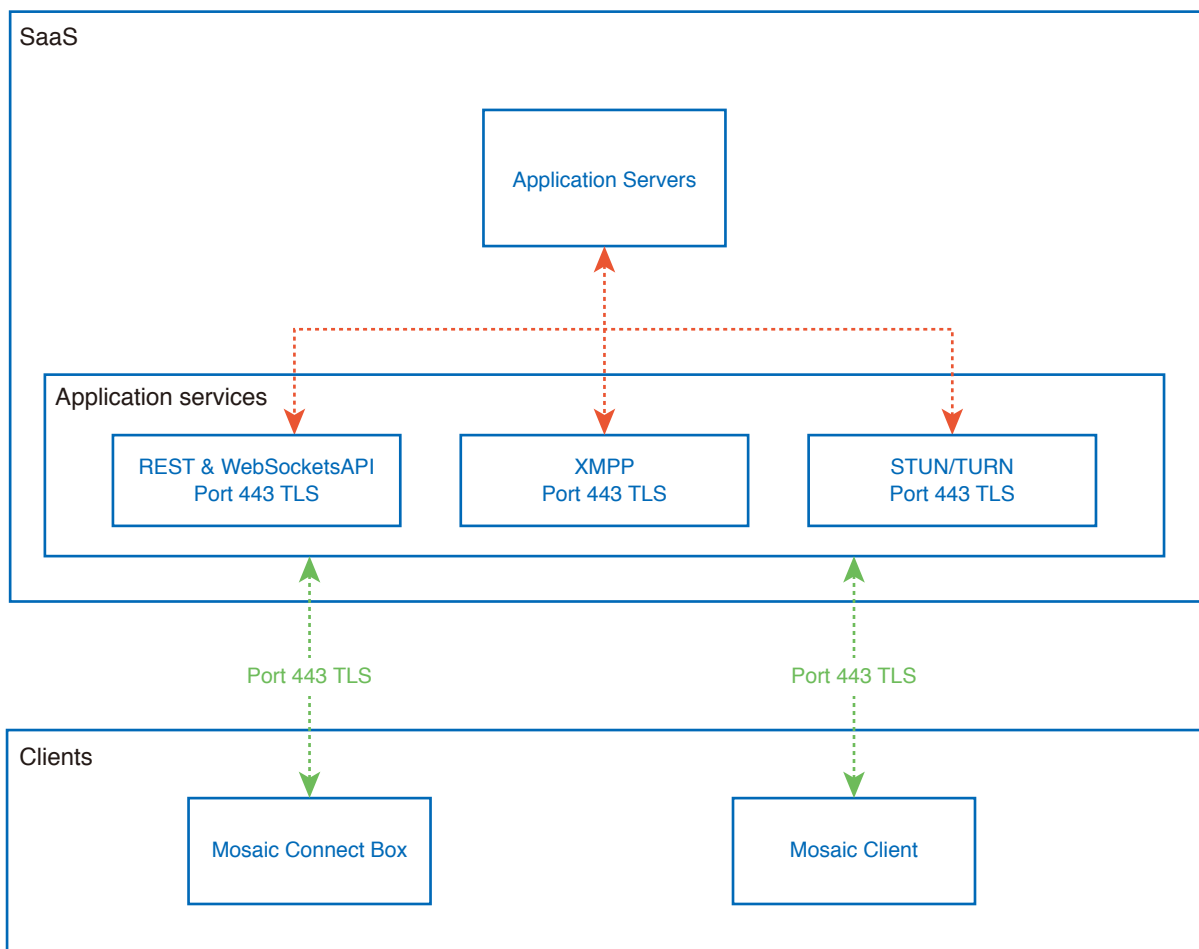


Figure 1. Mosaic Connect Architecture



## Amazon AWS

Amazon AWS is a market leading cloud service managed by Amazon, a trusted provider of cloud services that offers geographical dispersion - allowing us to have a server closer to the end user, which reduces latency in cloud connectivity. All our cloud services running on Amazon AWS are running under a Virtual Private Cloud (VPC) and each environment has its own virtual network protected by Amazon's availability zone and firewall.

Amazon AWS servers are geographically dispersed and have many certifications and third-party assessments, including ISO/IEC 27001:2005, SOC 1 and SOC 2 and CSA STAR certification<sup>1</sup>. Further information can be found in their security whitepaper<sup>2</sup>.

## Mosaic Connect features

The Mosaic Connect software consumes a REST API provided by our SaaS layer which is credential secured. All communication with the REST API and our XMPP services are over TLS (port 443) with 2048-bit asymmetric encryption and 256-bit symmetric encryption.

For video calls, STUN is used to establish a peer to peer connection. If this fails, then the client will attempt to use our relay service using the TURN protocol.

In addition to DTLS encryption, we also encrypt data through Secure Real-Time Protocol, which safeguards IP communications from hackers, so that your video and audio data is kept private point to point.

## Meeting ID and PIN

For each meeting a unique meeting ID is generated using our SaaS layer which is used as a means for the clients to connect to that specific meeting. If there is an Internet connection, this meeting ID will be 6 digits long.

If no Internet is available (or local connections only is enabled) the Meeting ID will be 10 digits long. This 10 digit meeting ID is generated using the device IP address, which enables connection from different subnets on the same network.

If devices connect using the 6 digit meeting ID, connection is attempted locally, however if this is not possible then the connection is made via XMPP. The host can also specify a PIN which is configured at the box directly, and on each client connecting would request confirmation of the PIN.

## Cloud

If Mosaic Connect has access to the Mosaic Connect Cloud, then it will be able to allow devices connecting to it from outside of its local network – e.g. A Chromebook client on a remote network and a Windows client connected on another network within your organisation,

This can be restricted by deactivating access to the cloud in Mosaic Connect settings. The Mosaic Connect hardware units can also function solely using their access point with each connecting device ingbe assigned an IP address.

## Updates

An Internet connection is required for updates. The updates are downloaded over a secure connection (using port 443) and are installed on demand. A notification will appear in the Mosaic Connect user interface to indicate an available update that the user can install.

### Security

The clients and boxes are authenticated on our servers using a 4-step authentication process with SASL<sup>3</sup>. At any time, administrators can remove a client or box from the authorised zone temporarily and permanently.

All data transferred between the user's device and Mosaic Connect is peer to peer (P2P) and is over TLS or DTLS with 2048-bit asymmetric encryption and 256-bit symmetric encryption. If a P2P connection fails to connect between the client and Mosaic Connect, then the software will relay the data via our TURN server over TLS TCP port 443.

## Access Point and Wi-Fi

The Mosaic Connect unit offers an internal access point, secured with WPA2 with PSK encryption, allowing clients to connect directly to the box and in so creating a local network.

The Mosaic Connect unit can also connect as a Wi-Fi client to an external Access Point and network.

For Airplay Mirroring and Airplay Video the box publishes services on the connected networks using Zero-configuration networking<sup>4</sup>.

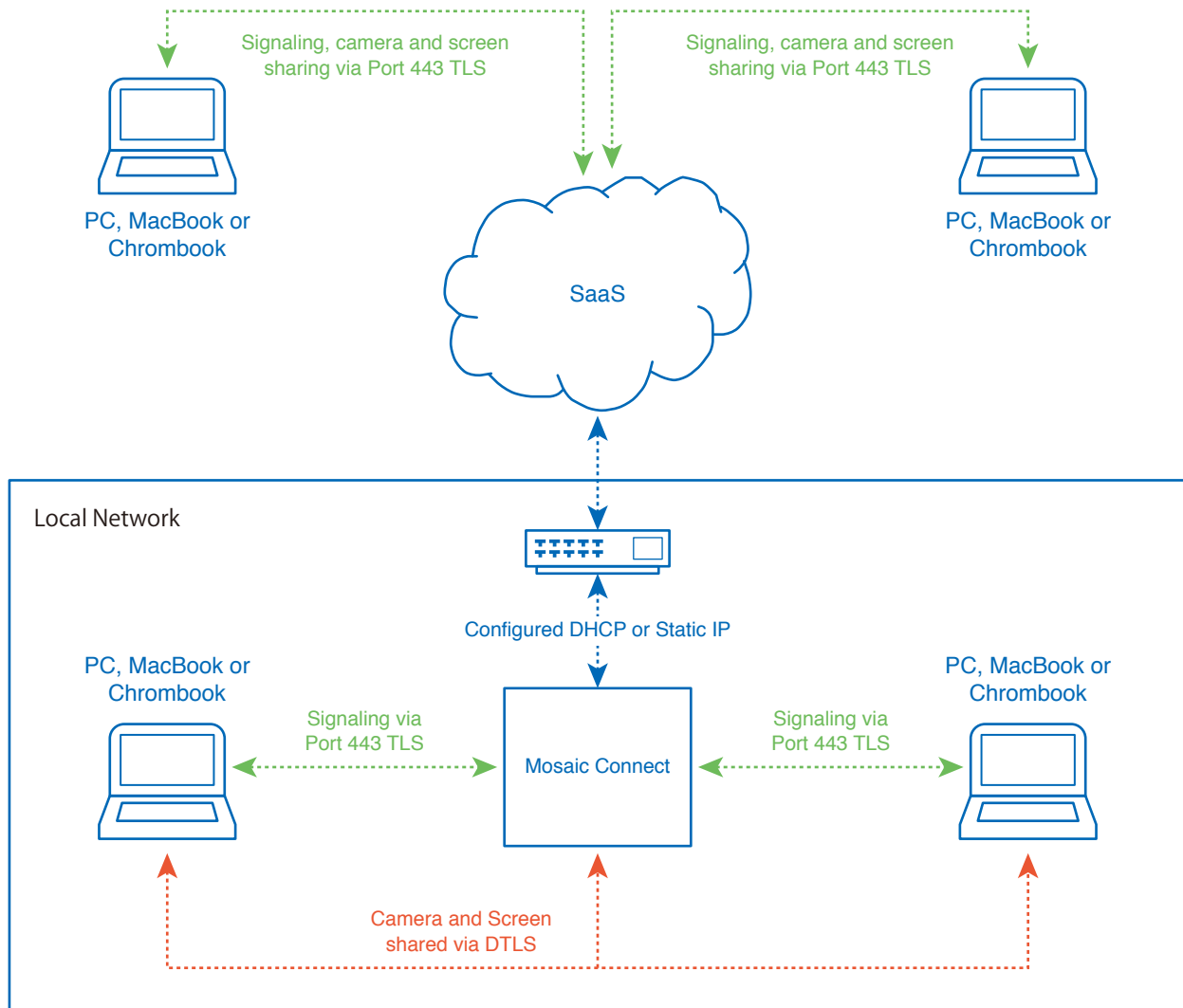


Figure 3. Network architecture of Mosaic Connect, internal and external connections.

In a typical configuration Mosaic Connect is connected to an existing network infrastructure, either using a static IP or DHCP. Clients can connect either via the access point on the Mosaic Connect unit or via the existing network infrastructure.

When connected locally then signalling data is communicated over port 443 TLS and video and audio over DTLS. When the client is connected from a remote network then all signalling, video and audio data are relayed via our SaaS tier via port 443 TLS. See Figure 3.

## Firewall and Proxy

### Firewall

- For remote connections, receiver and clients need to be able to access the Internet through these ports;
  - TCP 80
  - TCP 443
  - UDP 53
- For local connections (i.e. clients on the same network or connecting through Mosaic Connect Access Point) the following ports are used;
  - TCP 1-65535 (It will be selected from available ones)
  - UDP 1025 – 65535
  - TCP 4700, 7000, 7100 (For Airplay connections)

If there is Layer 7 filtering or proxy with protocol filtering on these ports then the following protocols will need to be allowed;

- HTTP
- HTTPS
- DTLS
- XMPP
- Bonjour protocols
- SRTP
- DNS
- STUN
- TURN
- ICE

Our SaaS provides services at the following FQDNs;

- netcheck.connectmosaic.com
- api.connectmosaic.com
- xmpp.connectmosaic.com
- stt01.connectmosaic.com
- stt02.connectmosaic.com
- stt03.connectmosaic.com
- stt04.connectmosaic.com
- stt05.connectmosaic.com

## Proxy support

The Mosaic Connect Windows/OSX software support proxy configuration. The following proxy types are supported.

- HTTP Proxy (with or without authentication)
- SOCKS 5 (with or without authentication)
- Proxy with Auto-Configuration File (PAC). Windows only.
- System proxy. Windows only.

# Controlling the LCD monitor via RS-232C Remote Control

This LCD monitor can be controlled by connecting a personal computer with an RS-232C (reverse type) terminal.

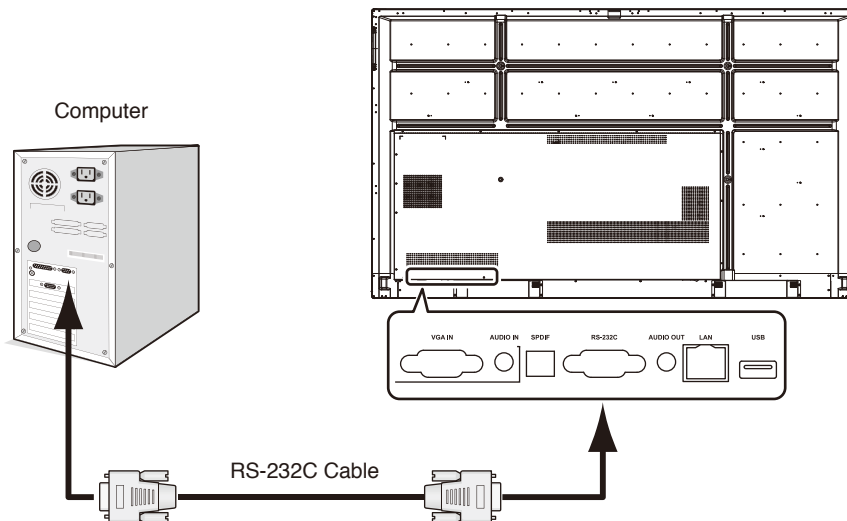
Functions that can be controlled by a personal computer are:

- Power ON or standby.
- Switching between input signals.
- Sound Mute ON or OFF.

## Connection

LCD Monitor + computer.

- Please turn off the monitor's main power when connecting a computer to the monitor.
- Please turn on the connecting computer first then turn on the monitor's main power.  
If you turn on the computer and monitor in reverse order, the com port may not work.
- When controlling the monitor connected with an RS-232C cable, please refer to the Control command diagram (See page 66) or see the "External\_Control.pdf" file on the NEC website.



**NOTE:** If your computer is equipped only with a 25-pin serial port connector, a 25-pin serial port adapter is required. Contact your supplier for details.  
For the pin assignment, please see "2) RS-232C input/output" on page 63.

To control the monitor via commands sent from a computer connected with an RS-232C cable, please use the control command. Instructions for the control command can be found in the Control Command Diagram (see on the next page) .

1) Interface

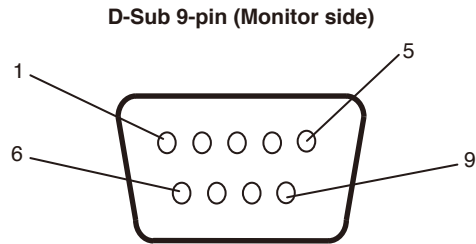
PROTOCOL	RS-232C
BAUD RATE	9600 [bps]
DATA LENGTH	8 [bits]
PARITY	NONE
STOP BIT	1 [bit]
FLOW CONTROL	NONE

This LCD monitor uses RXD, TXD and GND lines for RS-232C control.  
 The reverse type cable (null modem cable) (not included) should be used for RS-232C control.

2) PIN ASSIGNMENT

RS-232C input/output

Pin No	Name
1	NC
2	TXD
3	RXD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC



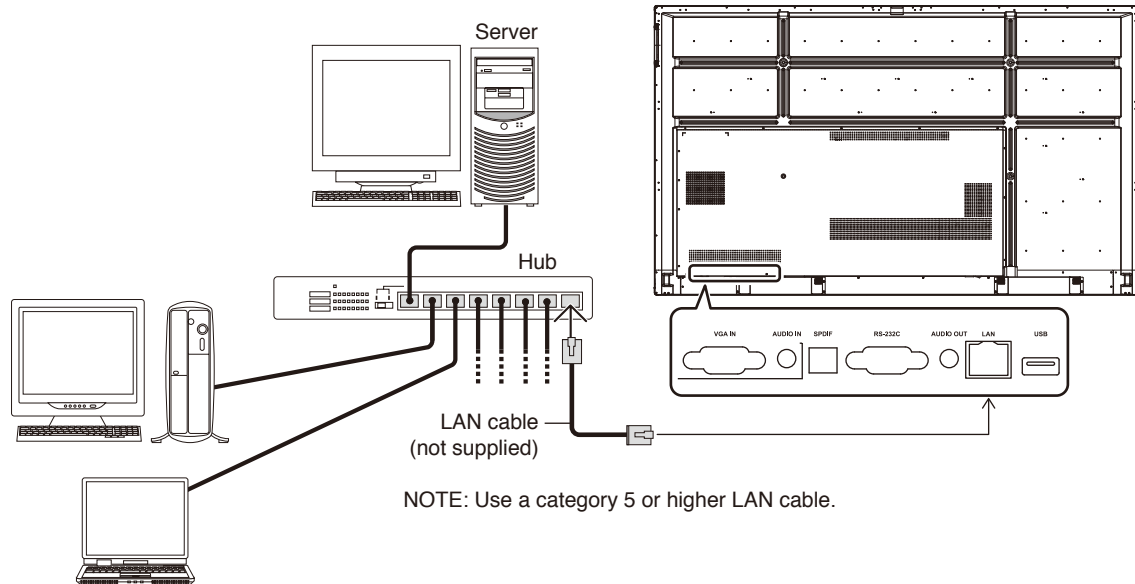
This LCD monitor uses RXD, TXD and GND lines for RS-232C control.  
 When attached converter is used, 2 pin TXD and 3 pin RXD are interchanged.

# Controlling the LCD monitor via LAN Control

## Connecting to a Network

Using a LAN cable allows you to specify the Network Settings and the Alert Mail Settings by using an HTTP server function. To use a LAN connection you are required to assign an IP address.

**Example of LAN connection:**



## External Control

### Connecting external device

There are two ways to connect an external device to the monitor.

- RS-232C terminal.  
Connecting an external device to the RS-232C terminal of the monitor with an RS-232C cable.
- LAN port.  
Connecting an external device to the LAN port of the monitor with a LAN cable.  
For further information regarding the type of LAN cable to use, please consult your network administrator.

**Connecting interface**

## RS-232C Interface

PROTOCOL	RS-232C
BAUD RATE	9600 [bps]
DATA LENGTH	8 [bits]
PARITY	NONE
STOP BIT	1 [bit]
FLOW CONTROL	NONE

## LAN interface

PROTOCOL	TCP
PORT NUMBER	7142
COMMUNICATION SPEED	AUTO setting (10/100Mbps)

**Control command diagram**

For other commands, please see "External\_Control.pdf" file on the NEC website.

Function (Monitor ID = 1)	Code Data
Power ON	01 30 41 30 41 30 43 02 43 32 30 33 44 36 30 30 30 31 03 73 0d
Power OFF	01 30 41 30 41 30 43 02 43 32 30 33 44 36 30 30 30 34 03 76 0d
Input Source Select HDMI1	01 30 41 30 45 30 41 02 30 30 36 30 30 30 31 31 03 72 0d or 01 30 41 30 45 30 41 02 31 31 30 36 30 30 31 31 03 72 0d
Input Source Select HDMI2	01 30 41 30 45 30 41 02 30 30 36 30 30 30 31 32 03 71 0d or 01 30 41 30 45 30 41 02 31 31 30 36 30 30 31 32 03 71 0d
Input Source Select HDMI3	01 30 41 30 45 30 41 02 30 30 36 30 30 30 38 32 03 78 0d or 01 30 41 30 45 30 41 02 31 31 30 36 30 30 38 32 03 78 0d
Input Source Select VGA (RGB)	01 30 41 30 45 30 41 02 30 30 36 30 30 30 30 31 03 73 0d
Input Source Select Home	01 30 41 30 45 30 41 02 30 30 36 30 30 30 38 37 03 7D 0d or 01 30 41 30 45 30 41 02 31 31 30 36 30 30 38 37 03 7D 0d
Sound Mute ON	01 30 41 30 45 30 41 02 30 30 38 44 30 30 30 31 03 09 0d
Sound Mute OFF	01 30 41 30 45 30 41 02 30 30 38 44 30 30 30 32 03 0a 0d



# Troubleshooting

## No picture

- The signal cable should be completely connected to the display card/computer.
- The display card should be completely seated in its slot.
- Check the main Power Switch, it should be in the ON position.
- Power Switches for the monitor and computer should be in the ON position.
- Make sure that a supported resolution has been selected on the display card or system being used. If in doubt, please refer to the user's manual of the display card or system to change the resolution.
- Check the monitor and your display card with respect to compatibility and recommended signal timings.
- Check the signal cable connector for bent or pushed-in pins.
- Check for HDCP (High-bandwidth Digital Content Protection) content. HDCP is a system for preventing illegal copying of video data sent over a digital signal. If you are unable to view material via the digital inputs, this does not necessarily mean that the monitor is not functioning properly. With the implementation of HDCP, there may be cases in which certain content is protected by HDCP and might not be displayed due to the decision/intention of the HDCP community (Digital Content Protection, LLC).
- The monitor automatically goes into standby at the preset time period after the video signal was lost. Press the power on button on the remote control or press the power button on the monitor.
- If you unplug the signal cable when starting the computer, images may not be displayed. Turn off the monitor and the computer and then connect the signal cable and turn on the computer and the monitor.

## Power Button does not respond

- Unplug the power cord of the monitor from the AC outlet to turn off and reset the monitor.
- Check the main Power Switch on the monitor.

## Image persistence

- Please be aware that LCD Technology may experience a phenomenon known as Image Persistence. Image Persistence occurs when a residual or "ghost" image of a previous image remains visible on the screen. Unlike CRT monitors, the image persistence of LCD monitors is not permanent, but single still image being displayed for a long period of time should be avoided. To alleviate image persistence, put the monitor into standby via remote control or turn the monitor's main power off for as long as the previous image was displayed. For example, if an image was on the monitor for one hour and a residual image remains, the monitor should be in standby or main power off for one hour to erase the image.

**NOTE:** As with all personal display devices, NEC DISPLAY SOLUTIONS recommends displaying moving images, using a moving screen saver, or changing still images at regular intervals whenever the screen is idle, or turning it into standby or main power off of the monitor when not in use.

## The image is blinking

- If you use a signal repeater or distributor or a long cable, this may cause image roughness or blink for a moment. In this case please connect the cable to the monitor directly without using a repeater or a distributor, or replace the cable with a higher quality cable. Using a twisted pair extender may cause image roughness depending on the environment where the monitor is in or the cable you are using. For further information please ask your supplier.

## The image is unstable, unfocused or swimming is apparent

- The signal cable should be completely attached to the computer.
- Check the monitor and your display card with respect to compatibility and recommended signal timings.
- If text looks garbled, change the video mode to non-interlaced and use a 60 Hz refresh rate.
- The image may be distorted when turning the power on or changing the settings.

## LED on the monitor is not lit (no blue or red color can be seen)

- The main Power Switch should be in the ON position and the power cord should be connected.
- Make certain the computer is not in a power-saving mode (touch the keyboard or move the mouse).

## LED colors, except for blue, are blinking or glowing

- A certain failure might have occurred, please contact your supplier.
- The monitor could be in standby. Press the power on button on the remote control or press the power button on the monitor.

## The behavior of application is unstable

- End the application. To do this, please see "2. Sidebar" section on page 34.

**NOTE:** If you end the application in this way, the updated data will not be saved.

**No Sound**

- Check to see if the audio cable is properly connected.
- Check to see if MUTE is activated. Use the remote control to enable or disable the Mute function.
- Check to see if VOLUME is set to a minimum.
- Check to see if the computer supports an audio signal through HDMI.  
If unsure, contact your supplier.
- When LINE OUT is not functioning, check to see if SURROUND is ON.

**The Remote Control is not functioning**

- Check the batteries status of the Remote Control.
- Check if the batteries are inserted correctly.
- Check if the Remote Control is pointing at the remote control sensor of the monitor.
- The remote control system may not function when direct sunlight or strong illumination strikes the remote control sensor of the monitor, or when there is an object in the path.

**The Timer Switch function is not working properly**

- The "Timer Switch" function will be disabled when the "OFF TIME" is set.
- If the "OFF TIME" function is enabled and the power to the LCD monitor is turned off when the power supply is interrupted unexpectedly, then the "OFF TIME" will be reset.

**Interference in TV**

- Check components for shielding, move away from monitor if necessary.

**RS-232C or LAN control is not available**

- Check RS-232C (reverse type) or the LAN cable.  
A category 5 or higher LAN cable is required for connection.

**Media Player function does not recognize the USB storage device**

- Please check a USB storage device is connected to the USB.

**The monitor goes into standby automatically**

- Please check "OFF TIME" setting.

Either light vertical or horizontal stripes may appear, depending on the specific image pattern. This is not a product fault or degradation.

# Specifications - CB651Q

## Product Specifications

LCD Module		Pixel Pitch:	0.372 mm x 0.372 mm	
		Resolution:	UHD 3840 x 2160 (pixels) (R + G + B + W design)	
		Color:	1.07B (10-bit(D))	
		Brightness(max):	min: 300 cd/m <sup>2</sup> typ: 350 cd/m <sup>2</sup> Brightness with AG Glass	
		Contrast Ratio:	1300:1	
		Viewing Angle:	178° (Horizontal&Vertical)	
Frequency		Horizontal:	min: 121.8 KHZ typ: 135 KHZ max: 140 KHZ	
		Vertical:	min: 47 HZ typ: 60 HZ max: 63 HZ	
Pixel Clock		25-148.5 MHz (Analog) 25.0-300 MHz (Digital)		
Viewable Size		1428.48 (H) x 803.52 (V)		
Input Signal				
VGA	15pin Mini D-sub	Analog RGB	0.7 Vp-p/75 ohm 1920 x 1080 (60HZ)	
		Sync	Separate: TTL level (Pos./Neg.) Composite sync on Green Video: 0.3 Vp-p Neg.	
HDMI	HDMI Connector	Digital RGB	HDMI (4k/60Hz, HDCP2.2/1.4)	
Home			1920 x 1080	
Output Signal				
HDMI	HDMI Connector	Digital RGB	N/A	
AUDIO				
AUDIO Input	Stereo Mini Jack	Analog Audio	Stereo L/R 0.5 Vrms	
	HDMI Connector	Digital Audio	PCM 32, 44.1, 48 KHz (16, 20, 24 bit), 2 ch	
AUDIO Output	Stereo Mini Jack	Analog Audio	Stereo L/R, ≤150 mVrms, 32 ohm	
Speaker Output		* Internal Speaker 12 W + 12 W (Stereo)		
Control		RS-232C In:	9 Pin D-sub	
		LAN:	RJ45 10BASE-T/100BASE-TX x 1	
USB Hub		USB2.0	Front x 2 Side port x 3 Side port (For touch) x 2 Bottom port x 1	
Power Supply		4.0-1.6 A @ 100-240 V AC, 50/60 Hz		
Power Consumption		160 W (Max. 400 W)		
Operational Environment		Temperature:	0~40°C	
		Humidity:	10~90%	
		Altitude:	5000 m (16404 ft)	
Storage Environment		Temperature:	-20~60°C	
		Humidity:	10~90%	
Dimension		1488.4 x 896.8 x 87.5 mm (without wall mount) 1488.4 x 896.8 x 114.5 mm (with wall mount)		
Weight		39.15 kg (without wall mount) 43.05 kg (±2 kg) (with wall mount)		
VESA compatible mounting interface		600 mm x 400 mm (M8, 4 Holes)		
Power Management		N/A		
Power supply for OPS		18 V / 5.5 A		
Protective glass		Material:	Tempered glass	
		Thickness:	4.0 mm	
		Surface treatment:	Anti-Glare coating	
		Transparency:	≥88%	
		Haze:	3-8%	
		Surface hardness:	7H	
		Impact resistance:	Ball drop test: 500 g steel ball, 1.2 m High	
Accessories		Setup manual Power Cord Remote Control AAA Battery x 2 Stylus pen x 3 Signal cable RS-232C Adapter x 1		

\* Speaker spec: 16 W, 8 Ω

# Specifications - CB751Q

## Product Specifications

LCD Module	Pixel Pitch: 0.4296 mm x 0.4296 mm Resolution: UHD 3840 x 2160 (pixels) (R + G + B + W design) Color: 1.07B (10-bit(D)) Brightness(max): min: 300 cd/m <sup>2</sup> typ: 350 cd/m <sup>2</sup> Brightness with AG Glass Contrast Ratio: 1100:1 Viewing Angle: 178° (Horizontal&Vertical)
Frequency	Horizontal: min: 121.8 KHZ typ: 135 KHZ max: 140 KHZ Vertical: min: 47 HZ typ: 60 HZ max: 63 HZ
Pixel Clock	25-148.5 MHz (Analog) 25.0-300 MHz (Digital)
Viewable Size	1649.664 (H) x 927.936 (V)
Input Signal	
VGA	15pin Mini D-sub Analog RGB Sync 0.7 Vp-p/75 ohm 1920 x 1080 (60HZ) Separate: TTL level (Pos./Neg.) Composite sync on Green Video:0.3 Vp-p Neg.
HDMI	HDMI Connector Digital RGB HDMI (4k/60Hz, HDCP2.2/1.4)
Home	1920 x 1080
Output Signal	
HDMI	HDMI Connector Digital RGB N/A
AUDIO	
AUDIO Input	Stereo Mini Jack HDMI Connector Analog Audio Digital Audio Stereo L/R 0.5 Vrms PCM 32, 44.1, 48 KHz (16, 20, 24 bit), 2 ch
AUDIO Output	Stereo Mini Jack Analog Audio Stereo L/R, ≤150 mVrms, 32 ohm
Speaker Output	* Internal Speaker 12 W + 12 W (Stereo)
Control	RS-232C In: 9 Pin D-sub LAN: RJ45 10BASE-T/100BASE-TX x 1
USB Hub	USB2.0 Front x 2 Side port x 3 Side port (For touch) x 2 Bottom port x 1
Power Supply	4.3-1.8 A @ 100-240 V AC, 50/60 Hz
Power Consumption	210 W (Max. 430 W)
Operational Environment	Temperature: 0~40°C Humidity: 10~90% Altitude: 5000 m (16404 ft)
Storage Environment	Temperature: -20~60°C Humidity: 10~90%
Dimension	1709.4 x 1020 x 86.8 mm (without wall mount) 1709.4 x 1020 x 113.8 mm (with wall mount)
Weight	52.55 kg (without wall mount) 56.45 kg (±2 kg) (with wall mount)
VESA compatible mounting interface	800 mm x 400 mm (M8, 4 Holes)
Power Management	N/A
Power supply for OPS	18 V / 5.5 A
Protective glass	Material: Tempered glass Thickness: 4.0 mm Surface treatment: Anti-Glare coating Transparency: ≥88% Haze: 3-8% Surface hardness: 7H Impact resistance: Ball drop test: 500 g steel ball, 1.2 m High
Accessories	Setup manual Power Cord Remote Control AAA Battery x 2 Stylus pen x 3 Signal cable RS-232C Adapter x 1

\* Speaker spec: 16 W, 8 Ω

# Specifications - CB861Q

## Product Specifications

LCD Module		Pixel Pitch:	0.4935 mm x 0.4935 mm
		Resolution:	UHD 3840 x 2160 (pixels) (R + G + B design)
		Color:	1.07B (10-bit(D))
		Brightness(max):	min: 300 cd/m <sup>2</sup> typ: 350 cd/m <sup>2</sup> Brightness with AG Glass
		Contrast Ratio:	1200:1
		Viewing Angle:	178° (Horizontal&Vertical)
Frequency		Horizontal:	min: 121.8 KHZ typ: 135 KHZ max: 140 KHZ
		Vertical:	min: 47 HZ typ: 60 HZ max: 63 HZ
Pixel Clock		25-148.5 MHz (Analog) 25.0-300 MHz (Digital)	
Viewable Size		1895.04 (H) x 1065.96 (V)	
Input Signal			
VGA	15pin Mini D-sub	Analog RGB	0.7 Vp-p/75 ohm 1920 x 1080 (60HZ)
		Sync	Separate: TTL level (Pos./Neg.) Composite sync on Green Video: 0.3 Vp-p Neg.
HDMI	HDMI Connector	Digital RGB	HDMI (4k/60Hz, HDCP2.2/1.4)
Home			1920 x 1080
Output Signal			
HDMI	HDMI Connector	Digital RGB	N/A
AUDIO			
AUDIO Input	Stereo Mini Jack	Analog Audio	Stereo L/R 0.5 Vrms
	HDMI Connector	Digital Audio	PCM 32, 44.1, 48 KHz (16, 20, 24 bit), 2 ch
AUDIO Output	Stereo Mini Jack	Analog Audio	Stereo L/R, ≤150 mVrms, 32 ohm
Speaker Output		* Internal Speaker 12 W + 12 W (Stereo)	
Control		RS-232C In:	9 Pin D-sub
		LAN:	RJ45 10BASE-T/100BASE-TX x 1
USB Hub		USB2.0	Front x 2 Side port x 3 Side port (For touch) x 2 Bottom port x 1
Power Supply		6.2-2.5 A @ 100-240 V AC, 50/60 Hz	
Power Consumption		365 W (Max. 620 W)	
Operational Environment		Temperature:	0~40°C
		Humidity:	10~90%
		Altitude:	5000 m (16404 ft)
Storage Environment		Temperature:	-20~60°C
		Humidity:	10~90% (Over 40°C / below 60%)
Dimension		1957.1 x 1159.8 x 86.8 mm (without wall mount) 1957.1 x 1159.8 x 113.8 mm (with wall mount)	
Weight		67.3 kg (without wall mount) 71.2 kg (±2 kg) (with wall mount)	
VESA compatible mounting interface		800 mm x 600 mm (M8, 4 Holes)	
Power Management		N/A	
Power supply for OPS		18 V / 5.5 A	
Protective glass		Material:	Tempered glass
		Thickness:	4.0 mm
		Surface treatment:	Anti-Glare coating
		Transparency:	≥88%
		Haze:	3-8%
		Surface hardness:	7H
		Impact resistance:	Ball drop test: 500 g steel ball, 1.2 m High
Accessories		Setup manual Power Cord Remote Control AAA Battery x 2 Stylus pen x 3 Signal cable RS-232C Adapter x 1	

\* Speaker spec: 16 W, 8 Ω

# Manufacturer’s Recycling and Energy Information

NEC DISPLAY SOLUTIONS is strongly committed to environmental protection and sees recycling as one of the company’s top priorities in trying to minimize the burden placed on the environment. We are engaged in developing environmentally-friendly products, and always strive to help define and comply with the latest independent standards from agencies such as ISO (International Organisation for Standardization) and TCO (Swedish Trades Union).

## Disposing of your old NEC product

The aim of recycling is to gain an environmental benefit by means of re-use, upgrading, reconditioning or reclamation of material. Dedicated recycling sites ensure that environmentally harmful components are properly handled and securely disposed. To ensure the best recycling of our products, **NEC DISPLAY SOLUTIONS offers a variety of recycling procedures** and gives advice on how to handle the product in an environmentally sensitive way, once it has reached the end of its life.

All required information concerning the disposal of the product and country-specific information on recycling facilities can be found on our following websites:

<https://www.nec-display-solutions.com/p/greenvision/en/greenvision.xhtml> (in Europe),

<https://www.necdisplay.com> (in USA).

Model: CB651Q-GLM310A-G / CB751Q-GLA210A-G / CB861Q-GLA410A-G		
Test voltage: 115V/230V		
mode	Power consumption	LED color
Normal Operation*1	159.7W/158.8W (CB651Q)	Blue
	201.8W/200.1W (CB751Q)	
	361.6W/355.7 (CB861Q)	
Energy Saving Mode*1, *2 (A key energy saving)	19.0W/18.8W (CB651Q)	Red and blue alternation
	24.2W/24.1W (CB751Q)	
	19.1W/18.9W (CB861Q)	
Energy Saving Mode*1, *3 (AUTO STANDBY)	Less than 0.5W	Red
Power Off	Less than 0.5W	Red

**Note:**

- \*1: Under system without any option,with factory settings.
- \*2: Short press power key,system will shut down backlight power.
- \*3: No signal input,system will shut down to standby mode.

## Energy Saving

This monitor features an advanced energy saving capability. When a Display Power Management signal is sent to the monitor, the Energy Saving mode is activated. The monitor enters a single Energy Saving mode.

For additional information visit:

<https://www.necdisplay.com/> (in USA)

<http://www.nec-display-solutions.com/> (in Europe)

<https://www.nec-display.com/global/index.html> (Global)

For ErP requirement/For ErP (Network standby) requirement:

Settings -> Other settings -> Wake on LAN -> ON (Default OFF)

Power consumption: 2 W or less.  
 Time for power management function: 35 sec.  
 (Except for a condition that the monitor has plural signal inputs.)

Power consumption: 0.5 W or less  
 Time for power management function:5 min. (Default setting)  
 (Except for a condition that the monitor has plural signal inputs.)

## WEEE Mark (European Directive 2012/19/EU and amendments)



### Disposing of your used product: In the European Union

EU-wide legislation as implemented in each Member State requires that used electrical and electronic products carrying the mark (left) must be disposed of separately from normal household waste. This includes monitors and electrical accessories, such as signal cables or power cords. When you dispose of such products, please follow the guidance of your local authority or ask the shop where you purchased the product, or if applicable, follow applicable legislation or agreement you may have. The mark on electrical and electronic products may only apply to the current European Union Member States.

### Outside the European Union

If you wish to dispose of used electrical and electronic products outside the European Union, please contact your local authority and ask for the correct method of disposal.



**For EU:** The crossed-out wheeled bin implies that used batteries should not be put to the general household waste! There is a separate collection system for used batteries, to allow proper treatment and recycling in accordance with legislation.

**According to EU directive 2006/66/EC and amendments, the battery can't be disposed improperly. The battery shall be separated to collect by local service.**

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