

Nineteen Eighty-Four

By Rafael Lozano-Hemmer



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General important information

Nineteen Eighty-Four (2014)

By Rafael Lozano-Hemmer

Description

“Nineteen Eighty-Four,” is an interactive display that shows house address numbers extracted from Google Street View images. The numbers have an immense variety of fonts, colours, textures and styles, as they were scanned by Google from the front doors of buildings from all over the World. The display writes over 22 billion different combinations of the number 1984; these combinations change automatically at a speed that can be set using a dial, from one different image every ten seconds to ten images per second. At the default speed, it will take around 1,000 years for the same combination of images to be repeated.

Typing any number onto an onboard animated keyboard starts a fast count-down or count-up until eventually the number 1984 is reached. At that point, the display resumes cycling through different combinations of images to make variations on 1984.

Technique

Computer, display, arduino processor, potentiometer, OLED pushbuttons, aluminium and steel frame.

Dimensions

Equipment: 44.5 cm x 133.5cm x 13.5 cm (HxWxD)

Crate dimensions: 156 cm x 72 cm x 35 cm (LxWxH)

Edition

6 copies + 1AP

Operation

** Please refer to next page for components placement. **

1. Connect the piece to electrical power. Use the supplied power cable, plug one side into the wall outlet and the other side to the electric outlet behind the piece. Both American and European voltages are accepted as piece can handles 110V to 230V volts.

2. To turn the piece ON, press the power button of the Windows Surface computer, located inside the round hole on top of the frame, all the way down for a second then release it. Important note: Please do not push the button again as this will shut down the piece. Wait at least 2 minutes before pressing it again as the computer might take that long to boot. After 2 minutes (maybe faster), we should see 1984 being shown.

3. To turn the piece OFF, press the power button all the way down until you've seen the “Shutting down.” screen appearing and disappearing to a black screen.

4. If the piece doesn't start within 30 seconds, try to turn on the piece again. If it's still doesn't turn on, then hold the power button all the way down for 10 seconds. Then, wait at least 3 seconds then press the

power button all the way down for 1 second and you should be up and running again.

5. The buttons from the keypad are affecting the display in different ways. They send a signal to the display on release, so not when we press the button, but when we remove our finger from it. To send the button signal to the software, you need to press it for at least half a second, otherwise the number might not be received by the software and shown on display.

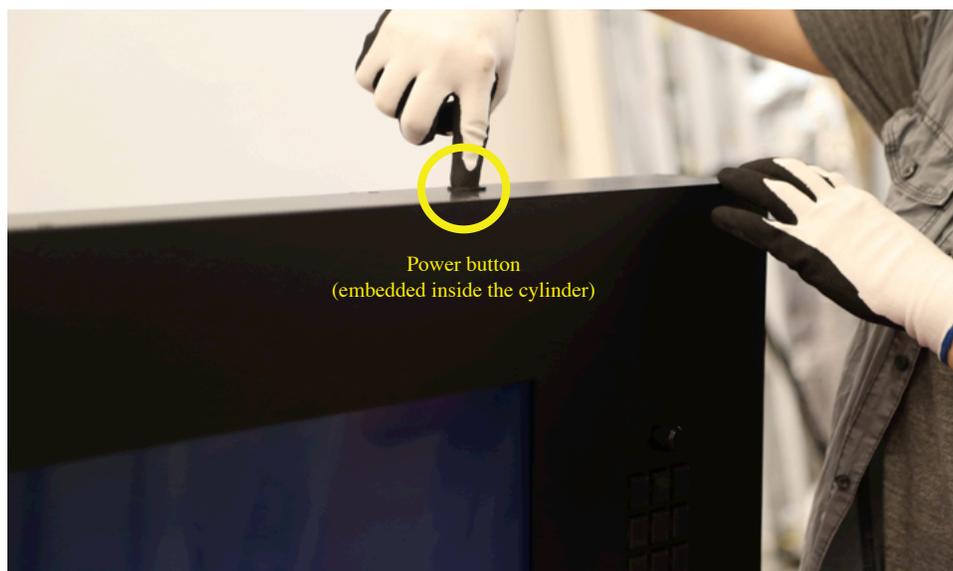
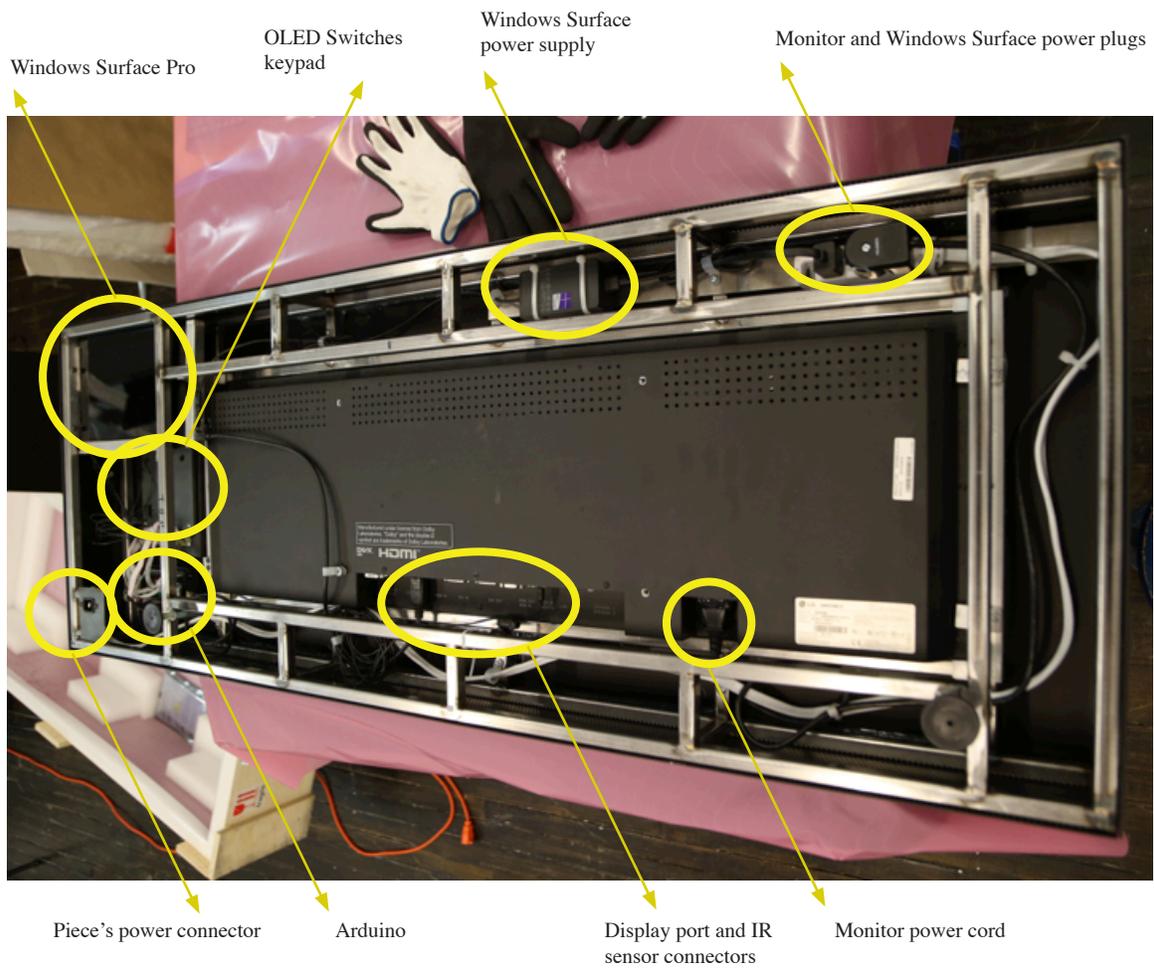
6. To change the number displayed, press any digit on the keypad: pressing "5" will add a 5 on the right side of the number; if we were displaying 1984, the number will change to 19845.

7. When a different number than 1984 is entered with the keypad, we have an approximate delay of 4 seconds before seeing a countdown (up or down). This countdown should last approximately 8 seconds. When entering a number, if we press on the "+" button, the delay would be canceled and the countdown will start on release of the button.

8. When a different number than 1984 is entered with the keypad and we want to correct a digit, we can press on the "-" button. Let say we entered 5847, by pressing the "-" key, we'll remove the 7 and show 4584. If we press on the "-" button several times, we will eventually show back 1984.

9. The potentiometer controls the duration of digits display on monitor, when the number 1984 is shown. When completely at the left, the digits are updating in rotation every 8 seconds: so the 1 image is changing to another one, then 8 seconds after the 9 is changed, then 8 seconds after the 8 is changed, then 8 seconds and the 4 is changed, then 8 seconds and the 1 is changed... etc.

Component layout

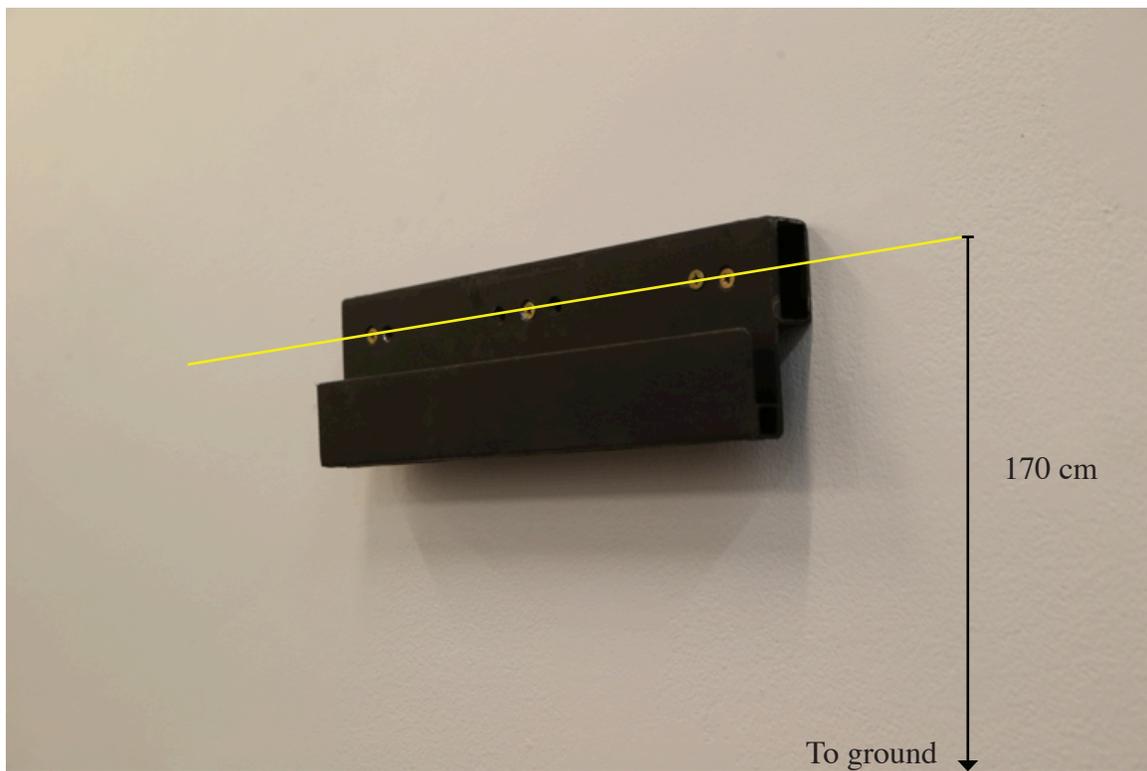


Cleaning

Please do not clean the display surface with Windex or soap. Use a lint-free cloth and LCD screen liquid cleaner, such as Kensington Screen Guardian found in computer stores. The aluminium frame can be cleaned with a wet cloth and a bit of liquid soap.

Placement Instructions

The piece should be hung with the horizontal center at 150 cm (59 inches) from the ground, using the provided mounting system. In order to achieve that, the screws that hold the mount in place should be screwed at 170 cm (67 inches) from the ground.



Troubleshooting

Controlling the computer

The piece includes custom-made software that automatically starts up. If you ever need to control the computer, use the provided Bluetooth keyboard. While the piece is displayed, keys 1 to 9, “-“ and “+” will do exactly like the ones the buttons keypad on the frame itself, while the “Escape” key will quit the software.

Bluetooth keyboard

If the keyboard doesn't react, ensure the ON/OFF switch is turned to ON. Press on the “1” key and wait 3 seconds. Press on the “1” key again and the piece should react. If not, replace the batteries.

To connect to Wifi

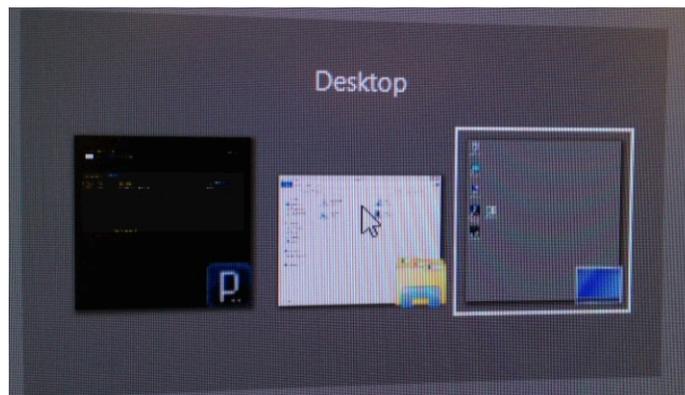
In the eventuality we need to access the computer, either to control it, debug it or update the software, we'll need to put the computer online:

1. Swipe in from the right edge of the screen, and then tap Settings.
(If you're using a mouse, point to the lower-right corner of the screen, move the mouse pointer up, and then click Settings.)
2. Check the network icon. It'll show if you're connected and how strong the connection is.
3. If you're not connected, tap or click the network icon ( or ).
4. Tap or click the name of the network you want to connect to, and then tap or click Connect.
5. Enter the network password.
6. If you want to connect to this network every time it's in range, select the Connect automatically check box.

What if Internet isn't connecting - limited connection?

1. Rare case, where the WiFi network is set-up with a security level like in Airports or Hotels, where you have to enter a password.

You need to get into a Windows “Desktop” view. For that, do the key combination “**ALT**” + “**TAB**” on the keyboard as many times you need to get back to the **piece's software** or “**Desktop**”.



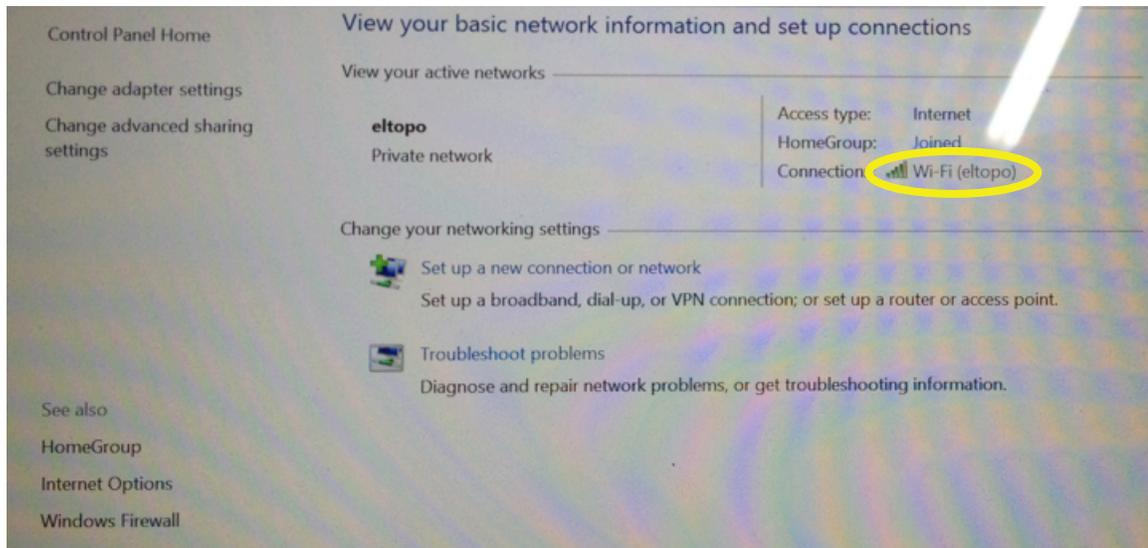
If you get into the piece's software, press on the **Escape key**.

Then click, at the bottom left, on the **Internet Explorer** icon.

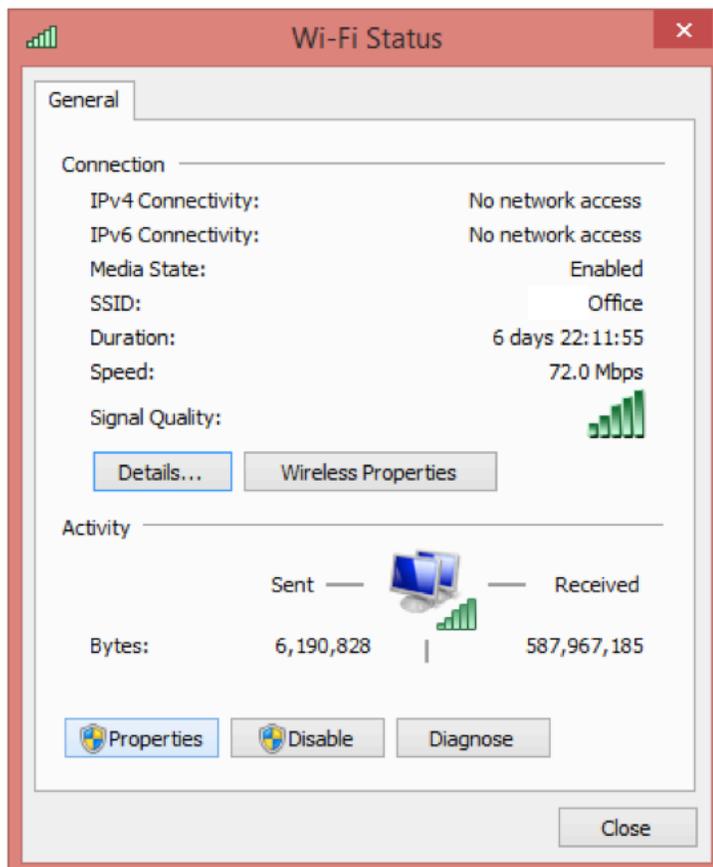
It should, automatically, load a webpage where you can put your username and password info.

2. If you still can't access Internet, go check the network adapter properties:
Press **Windows Key + w** to bring up the **Settings** search box and type:
network and sharing center

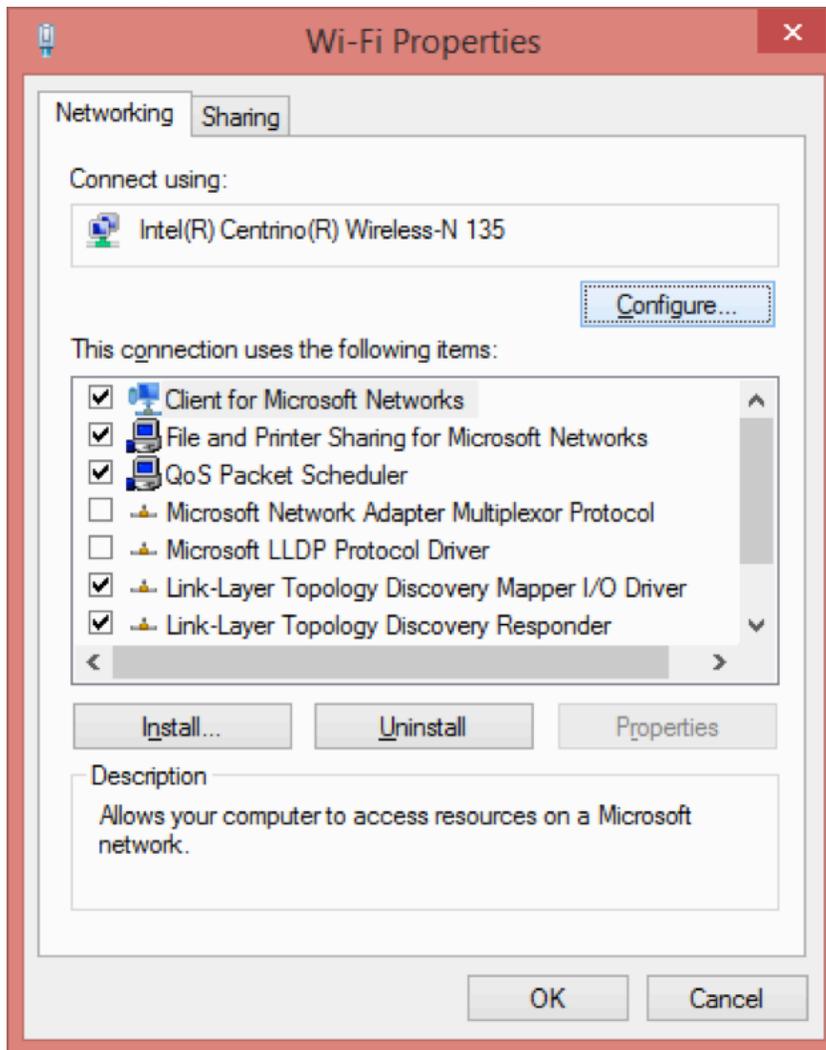
Click on the name of your Wi-Fi network.



Click the **Properties** button in the lower left corner under.

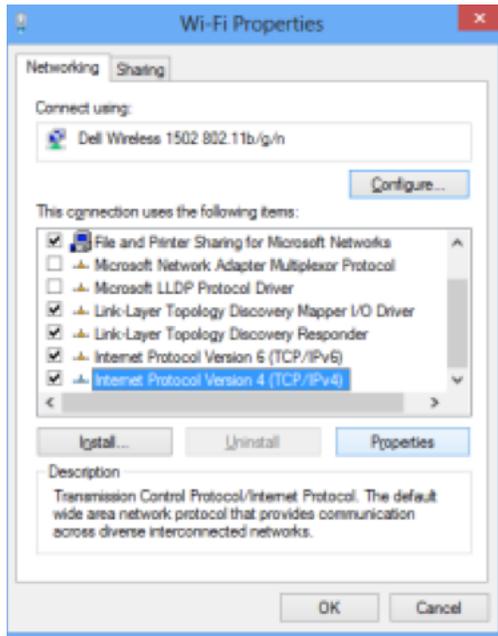


In the **Wi-Fi Properties** window click the **Configure** button.



Then pick the last tab called **Power Management** and you'll see this option: "Allow the computer to turn off this device to save power". Uncheck it, click **OK** twice, click **Close** and then restart your computer to confirm the fix.

3. If it still doesn't work, check in **WiFi connection properties**
Click on **Internet Protocol Version 4 (TCP/IPv4)** then click on **Properties**.



Select **Obtain an IP address automatically** and **Obtain DNS server address automatically**, or the opposite (with entering your network informations), then click **OK** twice, click **Close** and then restart your computer to confirm the fix.

Using the LG remote

To use the LG remote with the monitor, you should target the center part of the metal frame, from under it, when you press on the remote's buttons. That way, the signals emitted by the remote will be well received by the IR sensor of the monitor.

Support

If you would like support for the piece please feel free to call Lozano-Hemmer's studio in Canada:

Antimodular Research
4060 St-Laurent, studio 107
Montréal Québec H2W 1Y9 Canada
Tel 1-514-597-0917 Fax 1-514-597-2092
info@antimodular.com
www.antimodular.com

Appendix I - NKK SmartSwitches (OLED pushbuttons)

DISTINCTIVE CHARACTERISTICS

- Organic LED technology; now with 30,000 hours life and 30% less power consumption
- Range of 65,536 colors in 16 bit mode, 256 colors in 8 bit mode
- Full viewing angle of 180°
- Exceptional contrast: 50 times greater than previous LCD products
- Four times more enhanced resolution
- High resolution provides sharp, clear images of very small characters
- Operated by commands and data supplied via serial communications (SPI)
- Distinct, long travel of 4.5mm (same as KP01 Series)
- Dust tight construction
- Stylish, translucent black housing design

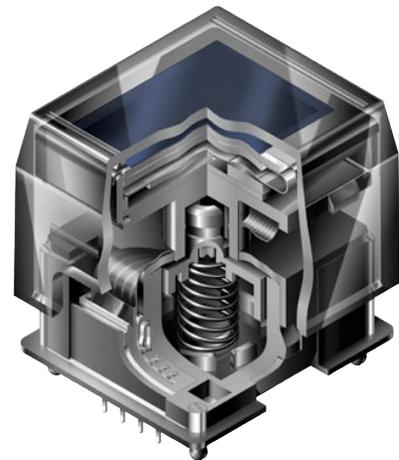
Viewing area: 15.5mm x 11.6mm (horizontal x vertical)

High reliability and long life of three million actuations minimum

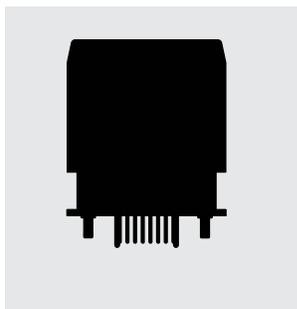
High resolution of 64RGB x 48 pixels

Epoxy sealed straight PC terminals

Snap-in standoff for easy, secure mounting and alignment



Actual Size



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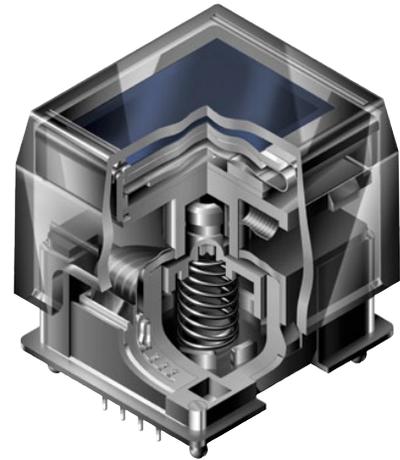
Viewing area: 15.5mm x 11.6mm (horizontal x vertical)

High reliability and long life of three million actuations minimum

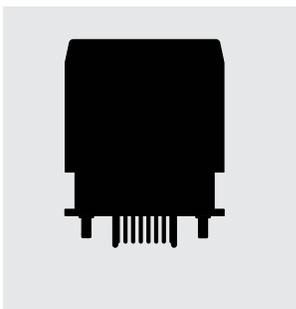
High resolution of 64RGB x 48 pixels

Epoxy sealed straight PC terminals

Snap-in standoff for easy, secure mounting and alignment



Actual Size



SWITCH DESCRIPTION



Switch Description	OLED	Pixel Format
SPST, Momentary ON Gold Contacts Straight PC Terminals	Color OLED Display Module 65,536 Colors	64RGB x 48 Pixels Horizontal x Vertical

SWITCH SPECIFICATIONS

Circuit	SPST normally open
Contact Position	Leave actuator: ① – ② OFF Push actuator: ① – ② ON
Electrical Capacity (Resistive Load)	100mA @ 12V DC
Contact Resistance	200 milliohms maximum @ 20mV 10mA
Insulation Resistance	100 megohms minimum @ 100V DC
Dielectric Strength	125V AC for 1 minute minimum
Mechanical Endurance	3,000,000 operations minimum
Electrical Endurance	3,000,000 operations minimum
Operating Force	2.0 ± 0.5 Newtons
Total Travel	4.5mm (.177")

OLED SPECIFICATIONS

Characteristics of Display

Display Device	Color OLED display module
Display Mode	Passive matrix
Viewing Area	15.5mm x 11.6mm (horizontal x vertical)
Pixel Format	64RGB x 48 pixels (horizontal x vertical)
Pixel Size	0.21mm x 0.20mm (horizontal x vertical)
Interface	Serial (SPI) interface
Number of Colors	65,536 Colors (16bit: R 5bit/G 6bit/B 5bit) or 256 Colors (8bit: R 2bit/G 3bit/B 3bit)
Operating Temperature Range	-20°C ~ +70°C (-4°F ~ +158°F)
Storage Temperature Range	-30°C ~ +80°C (-22°F ~ +176°F)
Operating Life (Display)	30,000 hours (at 40% pixels ON)

Absolute Maximum Ratings

Items	Symbols	Ratings
Supply Voltage for Logic/Interface	V _{DD}	-0.3V to +4.0V
Supply Voltage for Drive	V _{CC}	-0.0V to +19.0V
Input Voltage	V _I	-0.3V to V _{DD} +0.3V

Current Consumption

(Temperature at 25°C, V_{DD} = 2.8V, V_{CC} = 16.0V)

Items	Symbols	Min	Typical	Max
All-Pixels-On Mode *Drive System Power Current	I _{CC1}	—	3.8mA	4.6mA
All-Pixels-On Mode *Logic/IF System Power Current	I _{DD1}	—	0.16mA	0.19mA
Sleep Mode **Drive System Power Current	I _{CC2}	—	—	10µA
Sleep Mode **Logic/IF System Power Current	I _{DD2}	—	—	10µA

* All pixels shall be turned on with the maximum level gray scale

** All pixels shall be turned off (while chip is operating)

Recommended Operating Conditions

Items	Symbols	Minimum	Typical	Maximum
Supply Voltage for Logic/Interface	V _{DD}	2.4V	2.8V	3.5V
Supply Voltage for Drive	V _{CC}	15.0V	16.0V	17.0V
Input High Level Voltage	V _{IH}	0.8 x V _{DD}	—	—
Input Low Level Voltage	V _{IL}	—	—	0.2 x V _{DD}

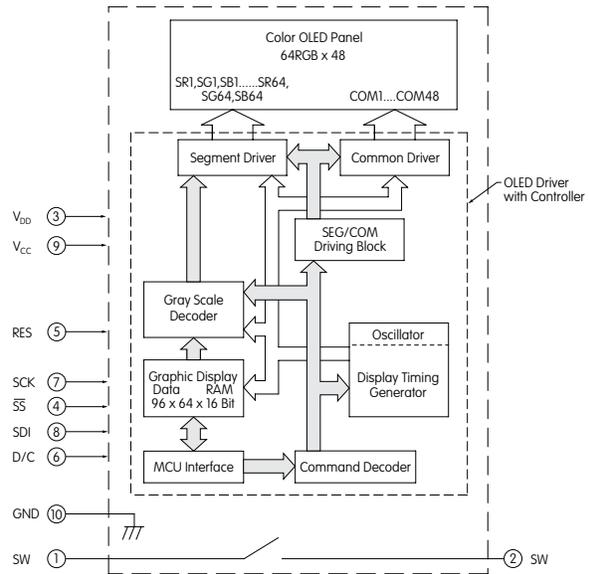
Optical Characteristics (Temperature at 25°C, Initial Value: 87 x 0F)

Items	Min	Typical	Max	Unit	Remarks
Luminosity	75	100	125	cd/m ²	White (All pixels on)
White Color Coordinate	(x)	0.26	0.30	0.34	—
	(y)	0.32	0.37	0.42	—
Red Color Coordinate	(x)	0.63	0.67	0.71	—
	(y)	0.29	0.33	0.37	—
Green Color Coordinate	(x)	0.19	0.23	0.27	—
	(y)	0.61	0.65	0.69	—
Blue Color Coordinate	(x)	0.10	0.14	0.18	—
	(y)	0.14	0.20	0.26	—
Contrast Ratio	100	—	—	—	—

SWITCH BLOCK DIAGRAM & PIN CONFIGURATIONS

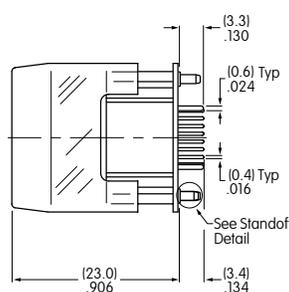
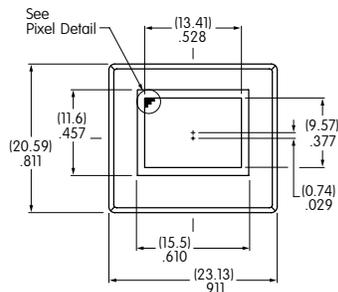


OLED SMARTSWITCH™

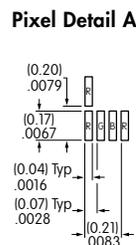
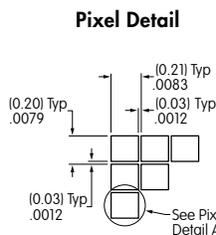
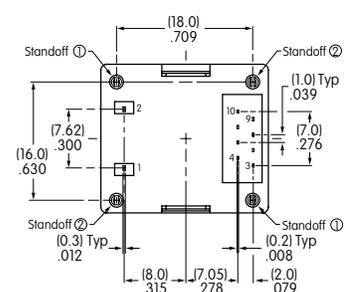


Pin No.	Symbol	Name	Function
①	SW	Terminal of Switch	Normally open
②	SW	Terminal of Switch	Normally open
③	V _{DD}	Power	Power source for logic circuit
④	SS	Slave Select	Slave select for SPI. This line is active low.
⑤	RES	Reset	Reset signal input. When pin is low, initialization of chip is executed.
⑥	D/C	Data/Command	Data/Command Control. When pin is pulled low, data will be interpreted as Command; when pulled high, data will be interpreted as Data.
⑦	SCK	Serial Clock	Clock line for SPI that synchronizes command and data
⑧	SDI	Serial Data In	Data input line for SPI
⑨	V _{CC}	Power	Power source for drive circuit
⑩	GND	Ground	Connect to Ground

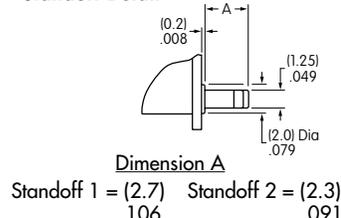
TYPICAL SWITCH DIMENSIONS



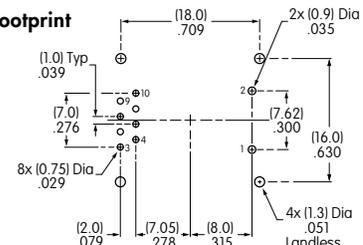
Terminal numbers are not on the switch.



Standoff Detail



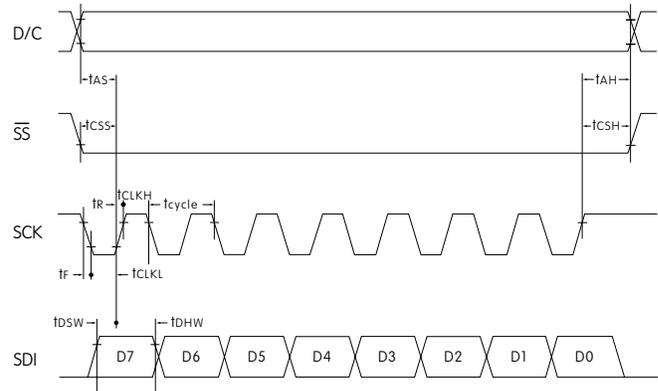
Footprint



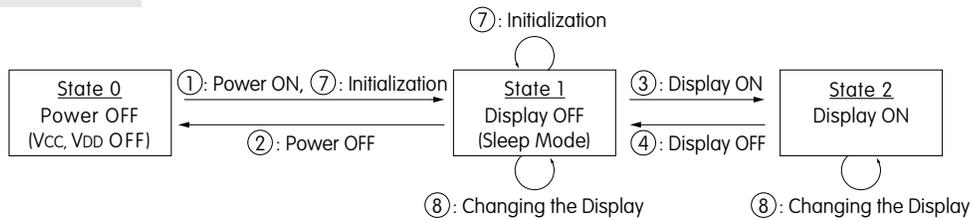
TIMING SPECIFICATIONS

AC Characteristics (Temperature at 25°C), $V_{DD} = 2.4V \sim 3.5V$

Items	Symbols	Minimum	Typical	Maximum
Clock Cycle Time	t_{cycle}	150ns	—	—
D/C Setup Time	t_{AS}	40ns	—	—
D/C Hold Time	t_{AH}	40ns	—	—
\overline{SS} Setup Time	t_{CSS}	75ns	—	—
\overline{SS} Hold Time	t_{CSH}	60ns	—	—
Write Data Setup Time	t_{DSW}	40ns	—	—
Write Data Hold Time	t_{DHW}	40ns	—	—
SCK Low Time	t_{CLKL}	75ns	—	—
SCK High Time	t_{CLKH}	75ns	—	—
SCK Rise Time	t_R	—	—	15ns
SCK Fall Time	t_F	—	—	15ns



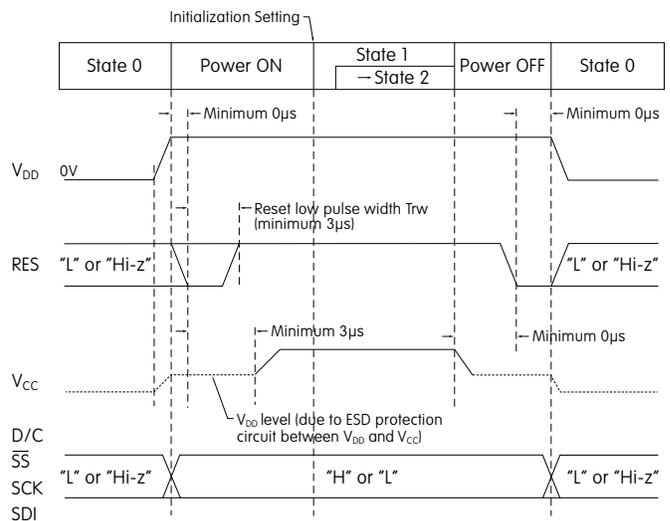
STATE TRANSITION



State Number	State	Display	Sleep	V_{CC}	V_{DD}	Changing the Display
0	Power OFF	OFF	—	OFF	OFF	Disable
1	Display OFF	OFF	ON	ON	ON	Enable
2	Display ON	ON	OFF	ON	ON	Enable

State Transition	Transition	Index
①	Power ON	Refer to "Power ON/OFF Sequence"
②	Power OFF	
③	Display ON	
④	Display OFF	
⑦	Initialization	Initialize Setting of Command/Data
⑧	Image Rewriting	Send Display Data
	Display Settings	Dimmer, Scroll, etc.

Power ON/OFF Sequence



Note: Refer to Application Notes on web site.

PRECAUTIONS FOR HANDLING & STORAGE OF OLED DEVICES



Handling

1. The IS Series OLED devices are electrostatic sensitive. To avoid damage to IC, do not touch terminals unless properly isolated from static electricity.
2. Signal input under conditions not recommended may cause damage to the OLED unit or deterioration of the display. Follow directions regarding supply sequences of power and signal voltages.
3. If the OLED panel is broken, avoid touching the contents. Wash off any contact to the skin or clothing.
4. Limit operating force to switch keytop to 100.0N maximum, as excessive pressure may damage the OLED.
5. Recommended soldering time and temperature limits:
11 seconds maximum @ 270°C maximum; avoid temperatures exceeding 80°C at the OLED.
6. The IS series OLED devices are not process sealed.
7. Pixels acquire diminished brightness over time and use, and those most frequently habituated have greater reduction of brightness than those less used. To minimize this difference, operate OLED unit so that all pixels are used as consistently as possible.
8. Clean cap surface with dry cloth. If further cleaning is needed, wipe with dampened cloth using neutral cleanser and dry with clean cloth. Do not use organic solvent.

Storage

1. Store in original container and away from direct sunlight.
2. Keep away from static electricity.
3. Avoid extreme temperatures, high humidity, gaseous substances, and all forms of chemical contamination.

Appendix II - LG Monitor



ENGLISH

OWNER'S MANUAL

MONITOR SIGNAGE

Please read this manual carefully before operating your set and retain it for future reference.

MONITOR SIGNAGE MODELS
38WR50MS

www.lg.com

REMOTE CONTROL

The descriptions in this manual are based on the buttons of the remote control. Please read this manual carefully and use the Monitor set correctly.

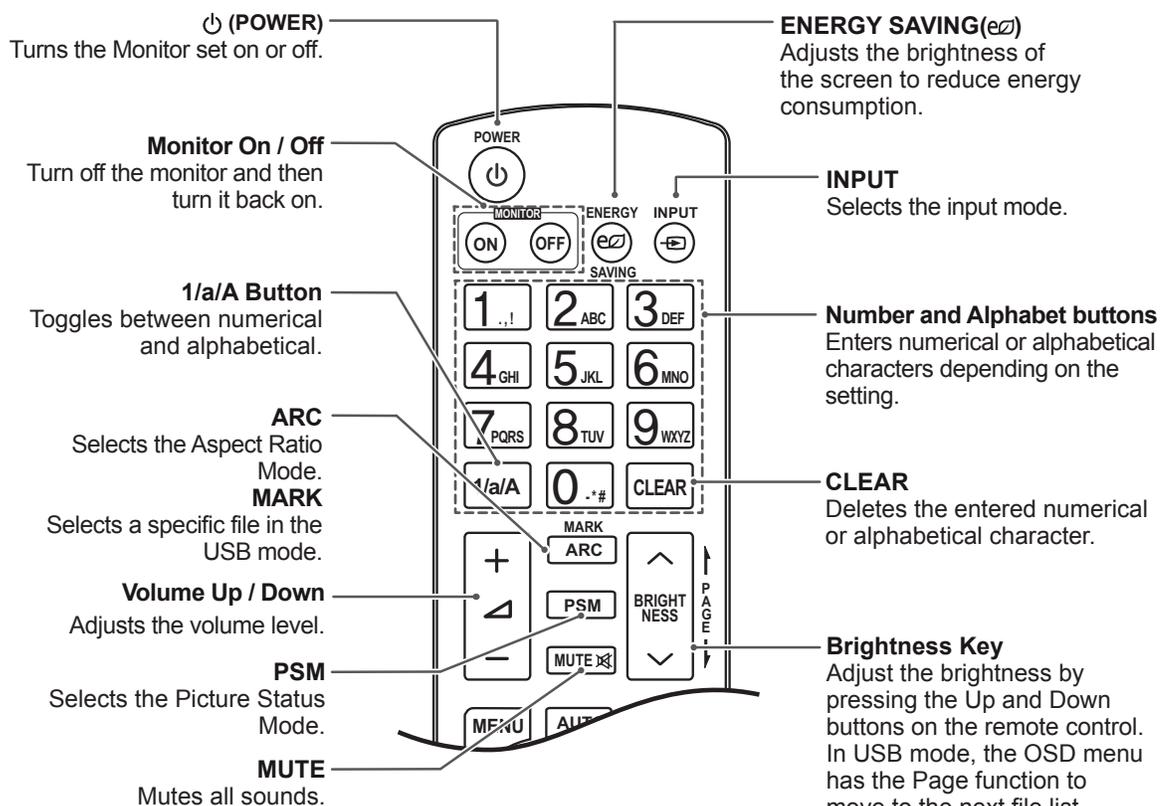
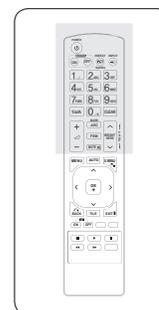
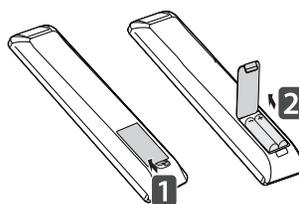
To replace batteries, open the battery cover, replace batteries (1.5 V AAA) matching ⊕ and ⊖ ends to the label inside the compartment, and close the battery cover.

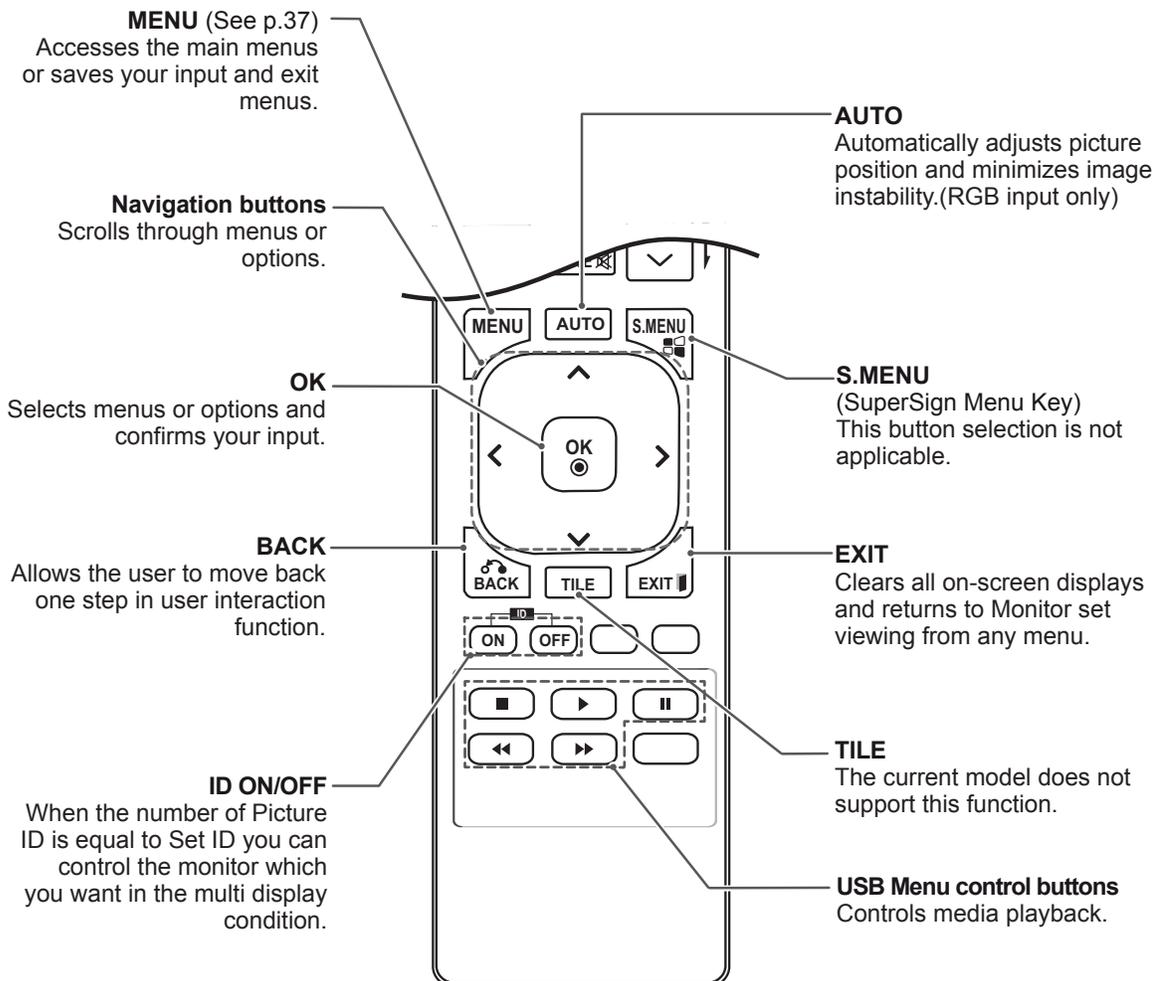
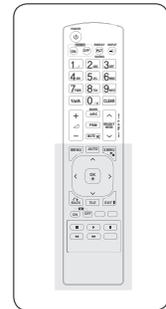
To remove the batteries, perform the installation actions in reverse.



CAUTION

- Do not mix old and new batteries, as this may damage the remote control.
- Make sure to point the remote control to the remote control sensor on the Monitor set.

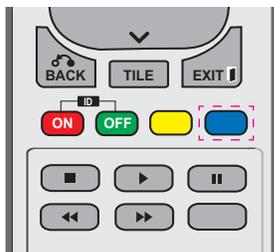




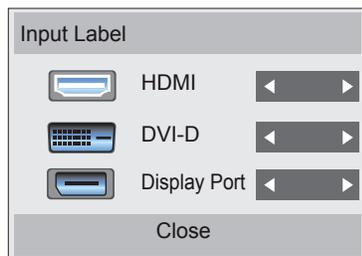
Displaying the device name connected to an input port

Display which devices are connected to which external input ports.

- 1 Access the Input list screen and press the blue (input label) button on the remote control.



- 2 You can assign an input label for every input except USB.

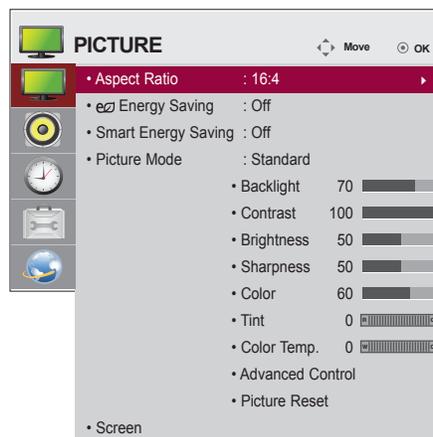


! NOTE

- External inputs supported: HDMI, DVI-D, Display Port
- Labels available : DTV, PC
- The input labels are displayed on the Input Label screen or at the top left of the screen when you change the external input setting.
- For DTV/PC-compatible signals, such as 1080p 60 Hz, the screen settings may change according to the input label. The Just Scan option is available if a PC is connected as an external device.

PICTURE settings

- 1 Press **MENU** to access the main menus.
- 2 Press the Navigation buttons to scroll to **PICTURE** and press **OK**.
- 3 Press the Navigation buttons to scroll to the setting or option you want and press **OK**.
 - To return to the previous level, press **BACK**.
- 4 When you are finished, press **EXIT**.
When you return to the previous menu, press **BACK**.



The available picture settings are described in the following:

Setting	Description
Aspect Ratio	Changes the image size to view images at its optimal size (See p.18).
Energy Saving	Sets to automatically adjust the screen brightness corresponding to the surroundings.
	Level
	Off Disables Energy Saving function.
	Minimum/ Medium/ Maximum Selects the brightness level of the backlight.
	Screen Off The screen turns off in 3 seconds.
Smart Energy Saving	Adjusts the backlight and contrast depending on the screen brightness.
	Level
	On Enables the Smart Energy Saving function to save power consumption as much as the value set in the smart energy saving rate.
	Off Disables the Smart Energy Saving function.
Picture Mode	Selects one of the preset image or customizes options in each mode for the best Monitor set screen performance. You are also able to customize advanced options of each mode. The available preset picture modes vary depending on the Monitor set .
	Mode
	Vivid Adjusts the video image for the retail environment by enhancing the contrast, brightness, Color, and sharpness.
	Standard Adjusts the image for the normal environment.
	Cinema Optimizes the video image for a cinematic look to enjoy movies as if you are in a movie theater.
	Sport Optimizes the video image for high and dynamic actions by emphasizing primary Colours such as white, grass, or sky blue.
	Game Optimizes the video image for a fast gaming screen such as PCs or games.

Setting	Description	
SCREEN (In RGB Mode Only)	Customizes the PC display options in RGB mode.	
	Option	
	Resolution	Selects a proper resolution. See "Customizing PC display options".
	Auto Configure	Sets to adjust the screen position, clock, and phase automatically. The displayed image may be unstable for a few seconds while the configuration is in progress.
	Position/Size/Phase	Adjusts the options when the picture is not clear, especially when characters are shaky, after the auto configuration.
Reset	Restores the options to the default setting.	

Basic image options

Setting	Description
Backlight	Adjusts the brightness of the screen by controlling the LCD backlight. If you decrease the brightness level, the screen becomes darker and the power consumption will be reduced without any video signal loss.
Contrast	Increases or decreases the gradient of the video signal. You may use Contrast when the bright part of the picture is saturated.
Brightness	Adjusts the base level of the signal in the picture. You may use Brightness when the dark part of the picture is saturated.
Sharpness	Adjusts the level of crispness in the edges between the light and dark areas of the picture. The lower the level, the softer the image.
Color	Adjusts intensity of all colors.
Tint	Adjusts the balance between red and green levels.
Color Temp .	Set to warm to enhance hotter Colors such as red, or set to cool to make picture bluish.
Advanced Control	Customizes the advanced options. Refer to the Advanced image options. (See p.40).
Picture Reset	Restores the options to the default setting.

NOTE

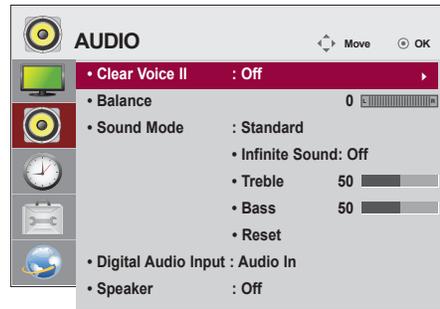
- If the 'Picture Mode' setting in the Picture menu is set to **Vivid, Standard, Cinema, Sport or Game** the subsequent menus will be automatically set.
- You cannot adjust color and tint in the RGB-PC/ DVI-D-PC(DTV)/ HDMI-PC mode.
- When using the Smart Energy Saving function, the screen may look saturated in the white area of a still image.
- If Energy Saving is set to Minimum, Medium, or Maximum, the Smart Energy Saving function is disabled.

Advanced Control

Setting	Description
Dynamic Contrast (Off/High/Medium/Low)	Adjusts the contrast to keep it at the best level according to the brightness of the screen. The picture is improved by making bright parts brighter and dark parts darker. (The current model does not support this function.)
Dynamic Color (Off/High/Low)	Adjusts screen Colors so that they look livelier, richer and clearer. This feature enhances hue, saturation and luminance so that red, blue, green and white look more vivid. (The current model does not support this function.)
Clear White (Off/High/Low)	Make the white area of screen brighter and more white.
Skin Color (-5 to 5)	It detects the skin area of video and adjusts it to express a natural skin color.
Noise Reduction (Off/High/Medium/Low)	Reduces screen noise without compromising video quality. (The current model does not support this function.)
Digital Noise Reduction (Off/High/Medium/Low)	This option reduces the noise produced while creating digital video signals.
Gamma (High/Medium/Low)	Set your own gamma value. On the monitor, high gamma values display whitish images and low gamma values display high contrast images.
Black Level (High/Low)	<ul style="list-style-type: none"> • Low: The picture of the screen gets darker. • High: The picture of the screen gets brighter. Set black level of the screen to proper level. (Function works in the following mode - HDMI-DTV)

AUDIO settings

- 1 Press **MENU** to access the main menus.
- 2 Press the Navigation buttons to scroll to **AUDIO** and press **OK**.
- 3 Press the Navigation buttons to scroll to the setting or option you want and press **OK**.
 - To return to the previous level, press **BACK**.
- 4 When you are finished, press **EXIT**.
When you return to the previous menu, press **BACK**.

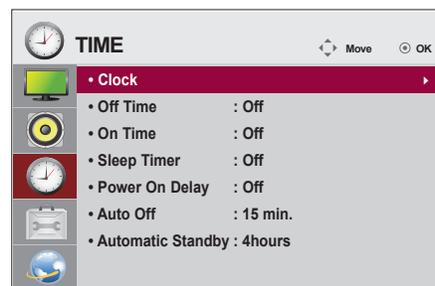


The available audio options are described in the following:

Setting	Description
Clear Voice II	By differentiating the human sound range from others, it helps users make dialog more clear.
Balance	Adjusts balance between the left and right speakers according to your room environment.
Sound Mode	The best sound tone quality will be selected automatically depending on the video type that you're currently watching.
	Mode
	Standard The most commanding and natural audio.
	Music Select this option to enjoy the original sound when listening to the music.
	Cinema Select this option to enjoy sublime sound.
	Sport Select this option to watch sports broadcasting.
	Game To enjoy dynamic sound when playing a game.
	<div style="border: 1px solid black; padding: 5px;"> <p>NOTE</p> <p>If sound quality or volume is not at the level you want, it is recommended to use a separate home theater system or amplifier to cope with different user environments.</p> </div>
	Option
	Infinite Sound LG's Infinity Sound option provides 5.1 channel stereo sound from two speakers.
	Treble Controls the dominant sounds in the output. When you turn up the treble, it will increase the output to the higher frequency range.
	Bass Makes the output sound softer. When you turn up the bass, it will increase the output to the lower Frequency.
	Reset Resets the sound mode to the default setting.
Digital Audio Input	HDMI/DisplayPort: Outputs the sound of digital signal from HDMI and display ports through the monitor speaker. Audio In: Outputs the sound through the monitor speaker by connecting HDMI and display ports to the Audio In port.
Speaker	ON: Enables sound to the monitor speaker. (* The monitor speaker is sold separately.) OFF: Disables sound to the monitor speaker. Use this option when using an external sound device.

TIME settings

- 1 Press **MENU** to access the main menus.
- 2 Press the Navigation buttons to scroll to **TIME** and press **OK**.
- 3 Press the Navigation buttons to scroll to the setting or option you want and press **OK**.
 - To return to the previous level, press **BACK**.
- 4 When you are finished, press **EXIT**.
 - When you return to the previous menu, press **BACK**.



The available time settings are described in the following:

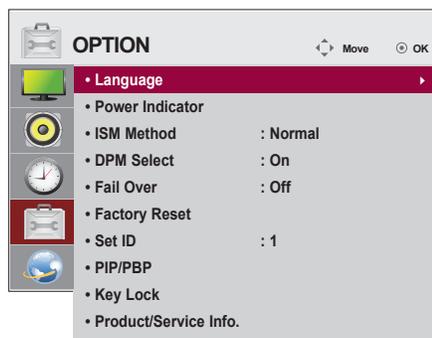
Setting	Description
Clock	Sets the time feature.
On/Off Time	Sets the time to turn on or off the Monitor set.
Sleep Timer	Sets the length of time until the Monitor set to turns off. When you turn the Monitor set off and turn it on again, the Sleep Timer will be set to off.
Power on delay	When connecting multiple monitors and turning the power on, the monitors are turned on individually to prevent overload.
Auto off	If Auto off is active and there is no input signal, the set switches to off mode automatically after 15 minutes.
Automatic Standby	If you do not use the monitor for more than 4 hours, it will be in standby mode automatically.

NOTE

- Once the on or off time is set, these functions operate daily at the preset time.
- The scheduled power-off function works properly only when the device time is set correctly.
- When the scheduled power-on and power-off times are the same, the power-off time has priority over the power-on time if the set is turned on, and vice versa if the set is turned off.

OPTION settings

- 1 Press **MENU** to access the main menus.
- 2 Press the Navigation buttons to scroll to **OPTION** and press **OK**.
- 3 Press the Navigation buttons to scroll to the setting or option you want and press **OK**.
 - To return to the previous level, press **BACK**.
- 4 When you are finished, press **EXIT**.
 - When you return to the previous menu, press **BACK**.



The available option settings are described in the following:

Setting	Description
Language	To choose the language in which the control names are displayed.
Power Indicator	Use this function to set the power indicator on the front side of the product to On or Off. (The power indicator is located on the bottom of the product.)
ISM Method	A frozen or still picture from a PC/Video game displayed on the screen for prolonged periods could result in a ghost image remaining even when you change the image. Avoid allowing a fixed image to remain on the screen for a long period of time.
Setting	
Normal	Leave on normal if you don't foresee image burn in being a problem.
Orbiter	May help prevent ghost images. However, it is best not to allow any fixed image to remain on the screen. To avoid a permanent image on the screen, the screen will move every 2 minutes.
Inversion	This function inverts the panel color of the screen. The panel color is automatically inverted every 30 minutes.
White Wash	White wash fills the screen with solid white. This helps removes permanent images burned into the screen. A permanent image may be impossible to clear entirely with white wash.
DPM Select	A user can choose to turn the power saving mode on / off.
Fail Over	If there is no input signal, it automatically switches to another input with signal.
Setting	
Off	Stops auto switch of the input source.
Auto	Switches to another input source with video signal if no video signal comes from the current input source.
Manual	Selects the priority of input source for auto switch. When several input sources are found, the input source with a higher priority will be selected.
Factory Reset	Select this option to return to the default factory settings.
Set ID	You can assign a unique Set ID NO (name assignment) to each product when several products are connected for display. Specify the number (1 to 255) using the button and exit. Use the assigned Set ID to individually control each product using the Product Control Program.

Setting	Description
PIP/PBP	Displays videos or photos stored in the USB device on a single monitor by dividing it into the main and sub screens.
	Option
	Mode Sets the type of secondary screen. * OFF : Disables the secondary screen. * PIP (Picture In Picture) : Displays the secondary screen in the main screen. * PBP (Picture By Picture) : Displays the secondary screen next to the main screen.
	Position Adjusts the position of the sub screen (top left, bottom left, top right, bottom right) The default value is the bottom right.
	Size Adjusts the size of the sub screen (Size 0 to 10). The default size of PIP (Size: 0) is 480x240; the maximum size 10 is 960x540.
	 NOTE <ul style="list-style-type: none"> The Position and Size options are enabled only in PIP mode.
Key Lock	Key input does not work. This prevents invalid key input.
Product/Service Info.	Displays the model name, software version, serial number, IP address, MAC address and home page.

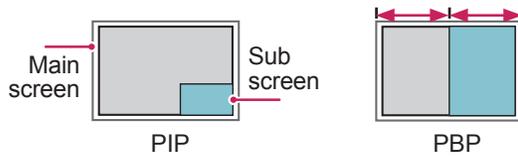
PIP/PBP

Displays videos or photos stored in the USB device on a single monitor by dividing it into the main and sub screens. (See p.36)

Mode

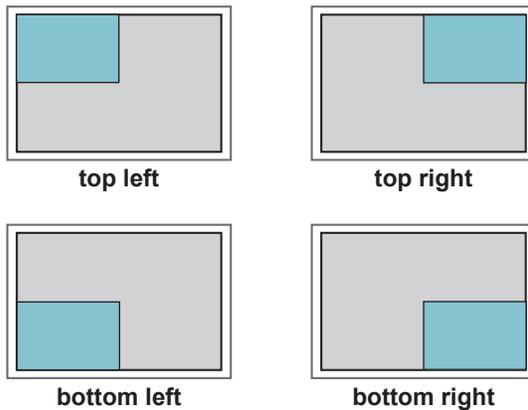
***PIP(Picture In Picture)**: Displays the Sub screen in the main screen.

***PBP(Picture By Picture)**: Displays the Sub screen next to the main screen.



Position

Adjusts the position of the subscreen (top left, bottom left, top right, bottom right)



Size

Adjusts the size of the subscreen (Size 0-10).



< 1920x502 >

NOTE

- The subscreen is only supported when using the USB device.

		Sub
		USB
Main	RGB	O
	HDMI/DVI-D/Display Port	O

- You can only change the size and position in PIP mode.
- With PBP selected, the Aspect Ratio option in the PICTURE menu is disabled (Fixed as 16:4).
- You must select the output sound before running the PIP or PBP functions. (Select either Main or Sub.)
- If you fail to select Main or Sub from the sound selection box, and if the OSD disappears after either a period of time or when the Exit or Back key is pressed, the PIP/PBP subscreen is not activated.
- You cannot change the sound while running the PIP or PBP functions. If you want to change the sound, please restart PIP/PBP.
- The picture quality of the subscreen is set according to the values selected in the main menu, not the USB device.
- If you play videos you selected in PIP/PBP mode, the videos will play back repeatedly in succession.
- The buttons below work in PIP mode.

Button	Photo	Movie
"<"	O	X
">"	O	X
▶	X	O
■	X	X
▶▶	X	O
◀◀	X	O
⏸	X	O

TROUBLESHOOTING

No image is displayed

Problem	Resolution
Is the product power cord connected?	<ul style="list-style-type: none"> See if the power cord is properly connected to the outlet.
Is the power indicator light on?	<ul style="list-style-type: none"> See if the power switch is turned on. May need service.
Power is on but the screen appears extremely dark.	<ul style="list-style-type: none"> Adjust brightness and contrast again. Backlight may need repair.
The power indicator amber?	<ul style="list-style-type: none"> If the product is in power saving mode, move the mouse or press any key. Turn both devices off and then back on.
Does the 'Invalid Format' message appear?	<ul style="list-style-type: none"> The signal from the PC (video card) is out of the vertical or horizontal frequency range of the product. Adjust the frequency range by referring to the Specifications in this manual. * Maximum resolution RGB : 1920 x 1080 @ 60 Hz HDMI/DVI/DP : 1920 x 1080 @ 60 Hz
Does the 'No signal' message appear?	<ul style="list-style-type: none"> The signal cable between PC and product is not connected. Check the signal cable. Press the 'INPUT' menu in the remote Control to check the input signal.

'Unknown Product' message appears when the product is connected.

Problem	Resolution
Did you install the driver?	<ul style="list-style-type: none"> See if the plug&play function is supported by referring to the video card user manual.

'Key Lock On' message appears.

Problem	Resolution
The 'Key Lock On' message appears when pressing the Menu button.	<ul style="list-style-type: none"> The Lock function prevents the OSD settings from being changed inadvertently. To release the lock, go to Menu and Option and disable the Key Lock option.

The screen image looks abnormal.

Problem	Resolution
Is the screen position wrong?	<ul style="list-style-type: none"> • D-Sub analog signal - Press the "AUTO" button in the remote control to automatically select the optimal screen status that fits into the current mode. If adjustment is not satisfactory, use the Position OSD menu. • See if the video card resolution and frequency are supported by the product. If the frequency is out of range, set to the recommended resolution in the Control Panel "Display" Setting menu.
Do thin lines appear on the background screen?	<ul style="list-style-type: none"> • D-Sub analog signal - Press the "AUTO" button in the remote control to automatically select an optimal screen status that fits into the current mode. If adjustment is not satisfactory, use the Clock OSD menu.
Horizontal noise appears or the characters look blurred.	<ul style="list-style-type: none"> • D-Sub analog signal - Press the "AUTO" button in the remote control to automatically select an optimal screen status that fits into the current mode. If adjustment is not satisfactory, use the Phase OSD menu.
The screen is displayed abnormally.	<ul style="list-style-type: none"> • The proper input signal is not connected to the signal port. Connect the signal cable that matches with the source input signal.

After-image appears on the product.

Problem	Resolution
After-image appears when the product is turned off.	<ul style="list-style-type: none"> • If you use a fixed image for a long time, the pixels may be damaged quickly. Use the screen-saver function.

The audio function does not work.

Problem	Resolution
No sound?	<ul style="list-style-type: none"> • See if the audio cable is connected properly. • Adjust the volume. • See if the sound is set properly.
Sound is too dull.	<ul style="list-style-type: none"> • Select the appropriate equalize sound.
Sound is too low.	<ul style="list-style-type: none"> • Adjust the volume.

Screen color is abnormal.

Problem	Resolution
Screen has poor color resolution (16 colors).	<ul style="list-style-type: none"> Set the number of colors to more than 24 bits (true color) Select Control Panel - Display - Settings - Color Table menu in Windows.
Screen color is unstable or mono-colored.	<ul style="list-style-type: none"> Check the connection status of the signal cable. Or, re-insert the PC video card.
Do black spots appear on the screen?	<ul style="list-style-type: none"> Several pixels (red, green, white or black color) may appear on the screen, which can be attributable to the unique characteristics of the LCD panel. It is not a malfunction of the LCD.

The operation does not work normally.

Problem	Resolution
The power suddenly turned off.	<ul style="list-style-type: none"> Is the sleep timer set? Check the power control settings. Power interrupted.

SPECIFICATIONS

LCD Panel	Screen Type	961.5 mm Wide (37.9 inch) TFT (Thin Film Transistor) LCD (Liquid Crystal Display) Panel. Visible diagonal size : 961.5 mm
	Pixel Pitch	0.4845 mm (H) x 0.4845 mm (V)
Video Signal	Max. Resolution	RGB : 1920 x 1080 @ 60 Hz HDMI/DVI/DP : 1920 x 1080 @ 60 Hz - It may not be supported depending on the OS or video card type.
	Recommended Resolution	RGB : 1920 x 502 @ 60 Hz HDMI/DVI/DP : 1920 x 502 @ 60 Hz - It may not be supported depending on the OS or video card type.
	Horizontal Frequency	RGB : 30 kHz to 68 kHz HDMI/DVI/DP : 30kHz to 68 kHz
	Vertical Frequency	RGB : 56 Hz to 75 Hz HDMI/DVI/DP : 56 Hz to 60 Hz
	Synchronization Type	Separate Sync, Composite(AV) Sync, Digital, SOG
Input Connector		15-pin D-Sub type (RGB), HDMI/DVI/DP(digital), RS-232C, LAN, USB, PC Audio, IR Receiver
Output Connector		RGB, DVI, RS-232C, Speaker Out L/R
Power	Rated Voltage	AC 100-240 V~, 50 / 60 Hz 1.3 A
	Power Consumption	On Mode : 90 W Typ. Smart Energy Saving Mode : 80 W Typ. Off Mode : ≤ 1 W
Dimensions (Width x Height x Depth) / Weight	<p>* Wall Bracket available VESA 400 x 200</p>	
	973.6 mm X 287.8 mm X 59 mm / 12.5 Kg	
Environmental conditions	Operating Temperature	0 °C to 40 °C
	Operating Humidity	10 % to 80 %
	Storage Temperature	-20 °C to 60 °C
	Storage Humidity	5 % to 95 %

*** Applicable only for models that support the speakers**

Audio	RMS Audio Output	10 W + 10 W (R + L)
	Input Sensitivity	0.7 Vrms
	Speaker Impedance	8 Ω

Product specifications shown above may be changed without prior notice due to upgrade of product functions.

RGB (PC) supported mode

Resolution	Horizontal Frequency(kHz)	Vertical Frequency(Hz)
720 x 400	31.468	70.8
640 x 480	31.469	59.94
800 x 600	37.879	60.317
832 x 624	49.725	74.55
1024 x 768	48.363	60
1280 x 720	44.772	59.855
1366 x 768	47.7	60
1280 x 1024	63.981	60.02
1920 x 502	31.25	59.981
1920 x 1080	67.5	60

HDMI/DVI/Display Port(PC) supported mode

Resolution	Horizontal Frequency(kHz)	Vertical Frequency(Hz)
640 x 480	31.469	59.94
800 x 600	37.879	60.317
1024 x 768	48.363	60
1280 x 720	44.772	59.855
1366 x 768	47.7	60
1280 x 1024	63.981	60.02
1920 x 502	31.25	59.981
1920 x 1080	67.5	60

DTV Mode

Resolution	HDMI	Display Port
480i	x	x
576i	x	x
480p	o	o
576p	o	o
720p	o	o
1080i	o	o
1080p	o	o

Power Indicator

Mode	Product
On Mode	Red
Sleep Mode	Amber
Off Mode	-

NOTE

- PC resolutions available as the input label option in RGB and HDMI/DVI input mode : 640 x 480 / 60 Hz, 1280 x 720 / 60 Hz, 1920 x 1080 / 60 Hz and DTV resolutions : 480p, 720p, 1080p.

NOTE

- Vertical frequency: To enable the user to watch the product display, screen image should be changed tens of times every second like a fluorescent lamp. The vertical frequency or refresh rate is the times of image display per second. The unit is Hz.
- Horizontal frequency: The horizontal interval is the time to display one vertical line. When 1 is divided by the horizontal interval, the number of horizontal lines displayed every second can be tabulated as the horizontal frequency. The unit is kHz.



To obtain the source code under GPL, LGPL, MPL and other open source licenses, that is contained in this product, please visit <http://opensource.lge.com>.

In addition to the source code, all referred license terms, warranty disclaimers and copyright notices are available for download. LG Electronics will also provide open source code to you on CD-ROM for a charge covering the cost of performing such distribution (such as the cost of media, shipping and handling) upon email request to opensource@lge.com. This offer is valid for three (3) years from the date on which you purchased the product.

Make sure to read the Safety Precautions before using the product.
Keep the Owner's Manual(CD) in an accessible place for future reference.
The model and serial number of the SET is located on the back and one side of the SET.
Record it below should you ever need service.

MODEL _____

SERIAL _____

ENERGY STAR is a set of power-saving guidelines issued by the U.S. Environmental Protection Agency(EPA).



As an ENERGY STAR Partner LGE U. S. A.,Inc. has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

Temporary noise is normal when powering ON or OFF this device.