TRIBUNAL REGIONAL DO TRABALHO DA 3ª REGIÃO
Secretaria de Licitações e Contratos
Rua Desembargador Drumond, 41, 4º andar-Bairro Serra
Belo Horizonte-MG - CEP: 30220-030

PE nº 04/2025

Pedido de Esclarecimento 4

Questionamento 1

Item 31

Após análise detalhada das especificações do item 31 e do modelo de referência, verificamos que a câmera PANASONIC PTZ AW-UE100K não atende integralmente aos requisitos estabelecidos no Termo de Referência (TR). O modelo em questão não possui conexão USB UVC, não oferece rotação vertical (tilt) de ±200°, entre outras características exigidas.

Diante disso, realizamos uma busca por alternativas que atendam 100% das exigências do edital, porém, até o momento, não encontramos nenhuma solução viável. Foram analisadas câmeras de diversos fabricantes renomados, como Minrray, Panasonic, Logitech, DATAVIDEO, NEOiD, Sony, entre outros, e constatamos que nenhuma atende plenamente aos requisitos estabelecidos.

Especificamente, não há no mercado câmeras que ofereçam rotação vertical (tilt) de ±200°. Assim, visando evitar o insucesso do pregão, uma vez que nenhum equipamento atenderá plenamente ao exigido, e com o objetivo de ampliar a competitividade do certame, solicitamos a seguinte alteração nas especificações do item 31:

- **Ajuste do ângulo de visão horizontal para 63°;**
- **Alteração da rotação vertical (tilt) para ±170°.**

Resposta da unidade técnica: A câmera não possui conexão USB UVC, a conexão foi equivocadamente inserida na especificação do Item 31, na verdade é uma característica dos Itens 2 e 23. Com relação ao questionamento acerca do *Tilt*, a câmera tem rotação vertical de –30° à 210º, conforme página 6 do catálogo do fabricante, que segue anexo.

Tendo em vista este questionamento, após detida análise pela unidade técnica, verificou que houve um equívoco na especificação do item 31, razão pela qual será revista a especificação.

Questionamento 2:

Item 31

Atualmente, o mercado dispõe de diversos tipos de sensores. Durante nossa análise, identificamos que o sensor 1/1.8" 9.17 MP CMOS apresenta desempenho superior ao sensor 1/2.5" 4K MOS, conforme exigido no item 31.

Dessa forma, solicitamos esclarecimento se será aceita a utilização de câmeras que utilizam o sensor 1/1.8" 9.17 MP CMOS, uma vez que oferece qualidade superior e pode atender plenamente às necessidades do projeto.

Aguardamos retorno para os devidos esclarecimentos e adequações.

Resposta da unidade técnica: As especificações devem ser observadas, inclusive a especificação do sensor.

Questionamento 3:

Itens 14 e 48

Em relação ao item 14, foi exigido o controle de Certificação RoHS, tendo como modelo de referência o INTELBRAS DNB 3.0 kVA RT 120V.

No entanto, após uma análise detalhada, não encontramos comprovação de que o modelo mencionado (INTELBRAS DNB 3.0 kVA RT 120V) possua a referida certificação RoHS.

Considerando que este modelo foi utilizado como referência no edital, solicitamos esclarecimento se será aceita a oferta deste item mesmo sem a devida comprovação da certificação RoHS, ou se a certificação será de fato um requisito obrigatório para a qualificação da proposta.

Resposta da unidade técnica: Com relação aos *Nobreaks* em questão, na especificação do equipamento não consta certificação RoHS, porém o fabricante, *Intelbras*, possui a citada certificação.

Questionamento 4:

Item 16

Para o item 16, foi utilizado como modelo de referência o MANFROTTO MVMXPRO500US XPRO, porém, constatamos que este modelo não possui trava de Pan, conforme exigido nas especificações do edital.

Diante disso, considerando que o referido modelo foi utilizado como referência, solicitamos esclarecimento se será aceita a oferta deste item mesmo sem a funcionalidade de trava de Pan, ou se a presença deste recurso será de fato um requisito obrigatório para a qualificação da proposta.

Resposta da unidade técnica: O item 16 não se refere ao produto questionado. Com relação ao *Manfrotto*, item 19, o modelo citado é apenas uma referência, prevalecendo as especificações do produto.

Questionamento 5:

Itens 21 e 36

Em relação às especificações do item 21 e 36, foi exigida a presença de entrada e saída de conexão RS232. No entanto, verificamos que o modelo de referência utilizado no edital não possui saída RS232, o que sugere que esta funcionalidade não é essencial para o pleno funcionamento da solução proposta.

Diante disso, solicitamos a exclusão da exigência da saída RS232, uma vez que sua ausência não compromete a funcionalidade, desempenho ou operação do equipamento dentro do escopo previsto. A tecnologia embarcada no equipamento de referência e em alternativas disponíveis no mercado oferece recursos de conectividade e controle que suprem integralmente as necessidades do projeto, garantindo uma operação eficiente sem dependência da saída RS232.

Assim, visando ampliar a competitividade do certame e garantir maior flexibilidade na participação de fornecedores, sem prejuízo à funcionalidade exigida, solicitamos a revisão das especificações técnicas e a consequente exclusão deste requisito.

Resposta da unidade técnica: O questionamento não procede, nas especificações dos itens em questão, não consta conexão RS232. Consta conexão RS422, conforme catálogo do fabricante, na página 6.

Panasonic
BUSINESS

AW-UE100W [White Model]
AW-UE100K [Black Model]
4K Integrated Camera

4K 60p/50p NDI®&SRT supported PTZ Camera with a compact body and a wide range of features

Worldwide Olympic Partner

Worldwide Paralympic Partner

4K PROFESSIONAL

12G SDI

SRT SECURE RELIABLE TRANSPORT

HDMI HIGH-DEFINITION MULTIMEDIA INTERFACE

Official camera supplier of the Olympic and Paralympic Games

High-quality 4K PTZ Camera compatible with a variety of video transmission systems to support next-generation video production

This 4K Integrated Camera is compatible with various IP transmission protocols, including NDI®*1, SRT*2, and FreeD*3, achieving flexible video production with high-quality 4K 60p/50p*4 video. 12G-SDI output is also supported in addition to 3G-SDI and HDMI, allowing the appropriate output to be selected for use in a wide range of situations, from live streaming of events to studio production.

AW-UE100W
4K Integrated Camera
[White Model]

AW-UE100K
4K Integrated Camera
[Black Model]

High-Quality 4K 60p/50p*4 Shooting

3840 x 2160 4K output and 59.94p/50p*4 shooting achieve extremely smooth video, even in live sports and other environments containing rapid movement.

■ Output format

4K (12G-SDI output/HDMI output)	2160/59.94p, 2160/50p, 2160/29.97p*5, 2160/25p*5, 2160/24p*5, 2160/23.98p*5
HD (3G-SDI output/HDMI output)	1080/59.94p, 1080/50p, 1080/29.97p*5, 1080/29.97PsF*6, 1080/25p*5, 1080/25PsF*6, 1080/23.98p*7, 1080/24p*5, 1080/23.98p*5, 1080/23.98PsF*6, 1080/59.94i, 1080/50i
	720/59.94p, 720/50p

1/2.5-type MOS sensor

The camera is equipped with a newly-developed 1/2.5-type 4K MOS sensor and achieves high-resolution video.

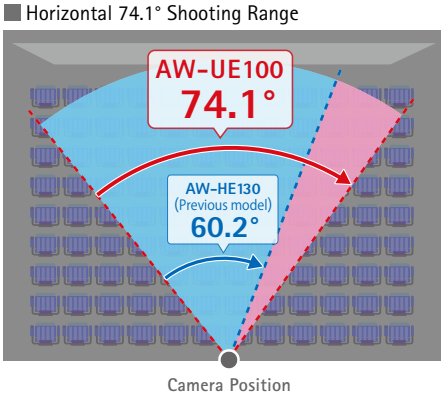
Shooting with 24x optical zoom and a 74.1° horizontal angle of view

In addition to 24x optical zoom, the inclusion of i.Zoom enables super resolution zooming of up to 36x in HD Mode and 28x in 4K mode while maintaining high resolution. The 1.4x and 2x digital extender zoom also allows distant subjects to be captured clearly, while the 74.1° horizontal angle of view enables a wide area to be shot from a limited installation space.

■ Optical 24x Zoom Image Quality

* Images are simulated.

■ Horizontal 74.1° Shooting Range



Newly-developed high-precision Direct Drive motor

The inclusion of a Direct Drive motor for the rotating section improves operability, responsiveness and quietness during pan/tilt operations.

operability

A wide range of speeds are supported, from slow movement of 0.08° per second to ultra-high speeds of 180° per second (Fast2 Mode).

responsiveness

Excellent responsiveness allows for accurate camera work, ensuring that the target area is captured.

quietness

A noise level of NC30 or less is ensured, enabling shooting in situations such as Concert hall and Studio where quietness is required.

New Direct Drive system

Direct Drive motor for rotating section

* Images are simulated.

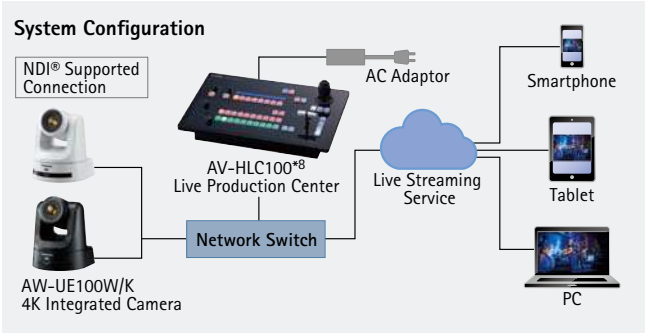
Electronic Image Stabilization (EIS) for roll direction

Electronic Image Stabilization (EIS) for the roll direction has been added in addition to Optical Image Stabilization (OIS). Stable images with reduced blurring can be shot even in locations where special equipment such as a rail systems or camera arms are used.

* Images are simulated.

High image quality and low latency with high bandwidth NDI® support

High bandwidth NDI® and high efficiency low bandwidth NDI®|HX, which encode and transmit high-quality video in real time, are included. High bandwidth NDI® transmits 4K video at a maximum of 250 Mbps and full HD video at a maximum of 125 Mbps, enabling high-quality, low-latency live video transmission.



SRT*2 support for stable video transmission over public lines

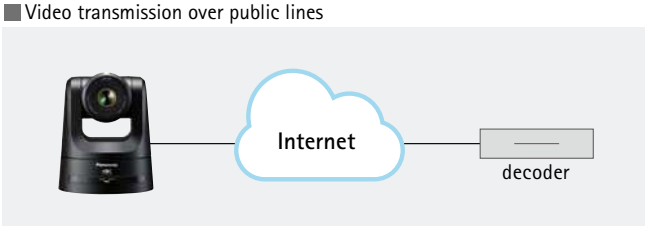
SRT, a next-generation video transmission protocol with strong security suitable for unstable network environments, is supported.

Secure
Strong security is ensured by encrypting video data before transmission.

Reliable
The packet loss recovery function automatically detects and retransmits packets lost during transmission, ensuring smooth, stable video transmission.

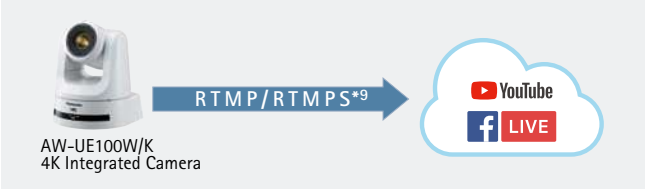
Transport
The flexible and adaptable buffer management system enables stable video transmission even in network environments with unstable bit rates. Long-distance video transmission over public lines is supported.

■ Video transmission over public lines



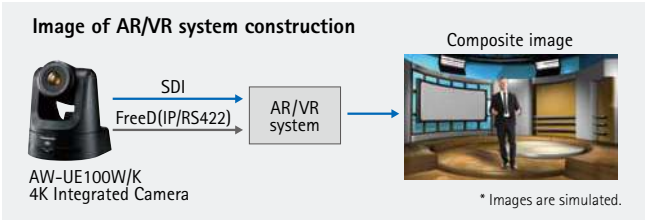
Direct Broadcast via RTMP/RTMPS*9

RTMP/RTMPS*9 is supported to enable direct upload of video to live-streaming services such as YouTube Live and Facebook Live. This means a live stream can be broadcast directly from the camera.



FreeD*3 Support for Construction of AR/VR*10 Systems

Integration with AR/VR systems is available via FreeD-compliant command output. Camera tracking information (pan/tilt/zoom/focus/iris) is output according to a synchronizing signal to facilitate configuration of virtual systems without an encoder.



Cropping (+Zoom) function

A cropped portion of the video can be created simultaneously during output of the full 4K video. Up to three crop areas can be specified, with easy operation using the AW-RP150GJ Remote Camera Controller and the web browser screen. The inclusion of cropping zoom also allows up to 5x zoom of cropped images.

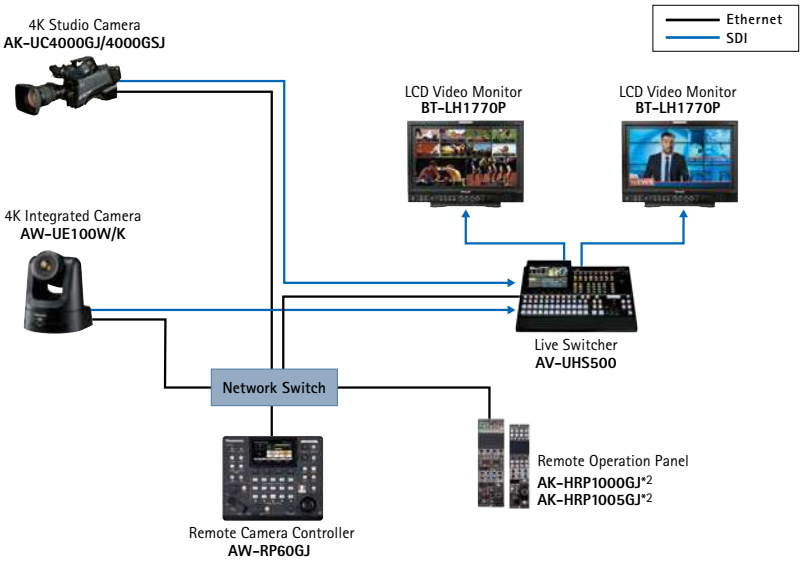
*1: NDI® is a new live video production workflow support protocol for IP use developed by NewTek in the United States. In this instance, NDI® is used to indicate high bandwidth NDI®. *2: SRT: Secure Reliable Transport. *3: FreeD: Widely used protocol for transmitting camera tracking information, mainly in virtual studio systems. *4: Actual output format is UHD (3840 x 2160) 59.94p/50p. *5: Native output. *6: Cannot be output from HDMI. *7: It denotes "1080/23.98p over 59.94i". *8: Only available during full HD operation. AV-HLC100 does not support 4K output. *9: RTMP: Real-Time Messaging Protocol. RTMPS: Real-Time Messaging Protocol Secure. *10: AR: Augmented Reality. VR: Virtual Reality. *11: Picture quality is lower with the cropping zoom.

Application Examples

Application 01: 4K Studio

Studio shooting of smooth, high-quality 4K 60p/50p*1 images

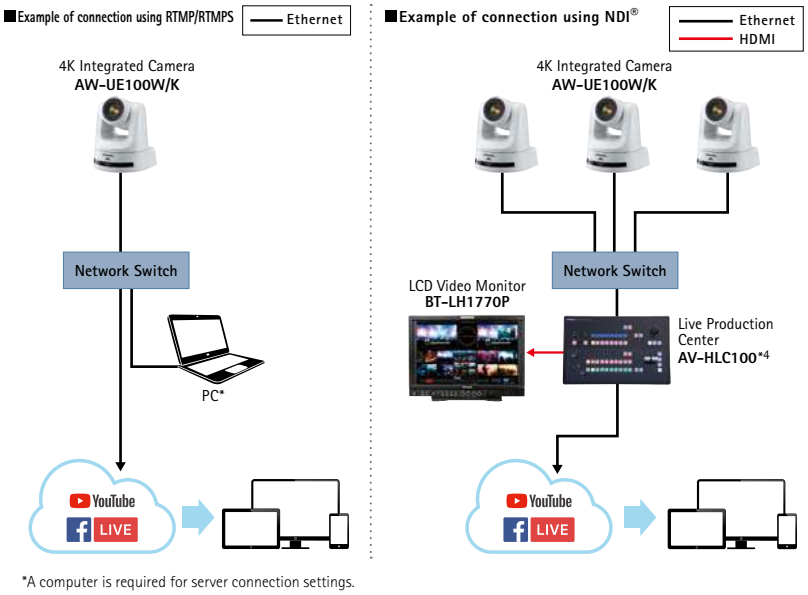
The AW-UE100W/K is capable of 4K 60p/50p*1 output for high-quality remote shooting in studio operations where high image quality is required. A large tally lamp has been equipped to make on-air cameras easily identifiable, even from far away.



Application 02: Live Streaming

Select the optimal streaming workflow for each situation with RTMP/RTMPS and NDI®*3 support

When working with a single camera, video can be uploaded directly from AW-UE100W/K to live distribution services with RTMP/RTMPS. When multiple cameras are used, they can be connected to the AV-HLC100*2*4 Live Production Center with NDI®*3. Multiple AW-UE100W/K can be controlled from the AV-HLC100*2*4 for high-quality, low-latency live distribution.

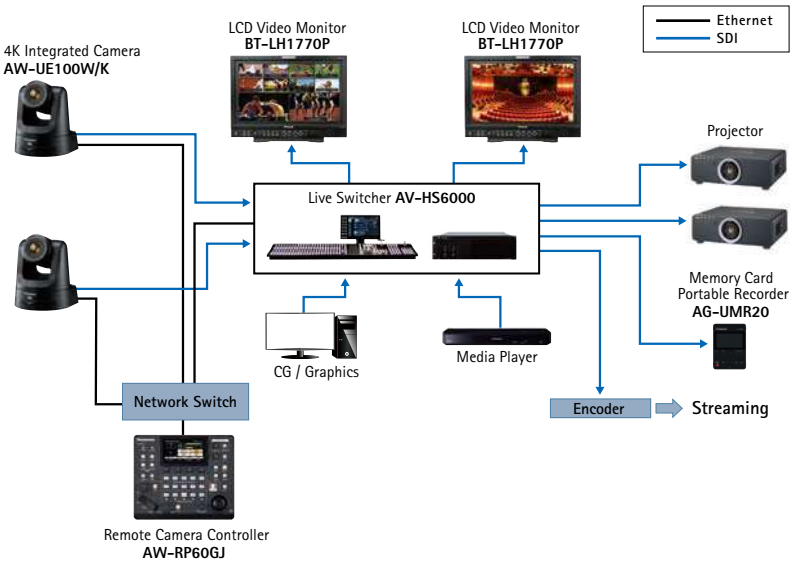


*A computer is required for server connection settings.

Application 03: Halls

High-magnification zoom and wide-angle shooting ensure targets are captured clearly in large venues

The large 1/2.5-type MOS sensor enables high-sensitivity shooting with little noise in halls and other dark locations. The optical 24x zoom further ensures that even far-away targets shot in large venues are captured clearly. 74.1° horizontal wide-angle shooting allows incredible flexibility in shooting location while still being able to capture the entire shot.



*1: Actual output format is UHD (3840 x 2160) 59.94p/50p.
*2: Use may require a software version update.
*3: NDI® is a new live video production workflow support protocol for IP use developed by NewTek in the United States. In this instance, NDI® is used to indicate high bandwidth NDI®.
*4: Only available during full HD operation. AV-HLC100 does not support 4K output.

Optional Products

PC Software for Remote Camera Support

Supporting Lecture Capture with Auto Tracking function

Auto Tracking Software Key

Stand-Alone and Web App Versions
AW-SF100*1

Server Version
AW-SF200*1

2 Additional Licenses (for AW-SF200)
AW-SF202*1

3 Additional Licenses (for AW-SF200)
AW-SF203*1

A 30-day Free Trial is Available

- High-performance auto tracking using highly-specialized facial recognition and deep learning technology allows the camera to follow lecturers in any direction.
- The AW-UE100W/K cropping function allows a single camera to crop and track up to three people.
- Operation with IP connection enables installation/control of cameras in remote classroom.
- AW-SF100 allows a single PTZ camera to be controlled on either a stand-alone or web application version. AW-SF200 operates on a server.
- The web application version enables camera control from a tablet, smartphone, desktop PC, etc.
- AW-SF200 enables simultaneous auto tracking and centralized control of multiple cameras.*2


AW-SF200 Main View

*1: Use may require a software version update.
*2: Up to four cameras per server can be controlled simultaneously.
* Depending on the shooting environment, the system may not be able to detect or track the target correctly. Please use this software in an environment where the adjustment work can be performed by the operator to deal with errors in detection and auto tracking. * There is a 30-day free trial available for the Auto Tracking Software. Please read carefully the precautions for this software and check if it works correctly in your operating environment before you purchase "Auto Tracking Software Activation Key". For further information, please see "Download / Software Download" on the Panasonic website <https://pro-av.panasonic.net/>.
• The face recognition function is based upon the face recognition software developed by PUX Corporation.

Control multiple PTZ Cameras from PC

PTZ Control Center Free software


Main screen

- Video can be checked during centralized management of multiple cameras.
- Camera control enabled via GUI for image quality adjustment, pan, tilt, zoom, etc. Touch panel operations are supported.
- Clicking the preset button attached to thumbnails enables simple recall of presets.
- Pan, tilt, zoom and other operations can also be controlled using game controllers made by other companies.

Software that converts PTZ camera on your network into Super Web cam

PTZ Virtual USB Driver Free software

- Remote cameras on the network can be used as USB cameras for simple execution of web meetings with high image quality.
- Camera controls such as image quality adjustment and pan/tilt/zoom can be operated from the GUI.
- Up to five cameras can be registered.
- Automatic detection of connected cameras and network settings enabled.

* For further information on the optional software, please see "Download / Software Download" on the Panasonic website <https://pro-av.panasonic.net/>.

Optional Products

As of August, 2020

Remote Camera Controller
AW-RP150GJ*3
- A separate AC adaptor or PoE+ HUB is required for power supply.

Remote Camera Controller
AW-RP60*3
- A separate AC adaptor or PoE HUB is required for power supply.

Live Switcher
AV-UHS500

KAIROS
Incredible Productivity

IT/IP Platform
KAIROS

https://pro-av.panasonic.net/en/products/it_ip_platform/

Live Production Center
AV-HLC100*3

Remote Operation Panel (ROP)
AK-HRP1000GJ*3*4
AK-HRP1005GJ*3*4*5
AK-HRP1015GJ*3*6
- A separate PoE HUB is required for power supply.

Wireless remote control
AW-RM50G
("AA", "R6" or "LR6" battery x2 are not included.)

*3: Use may require a software version update.
*4: Support planned for the future.
*5: Limited Stock
*6: Scheduled for release in the fourth quarter of CY2020. Not available in some areas.

Specifications

<GENERAL>

Power Requirements:	12 V DC (10.8 V to 13.2 V) (Supplied AC adaptor) 42 V to 57 V DC (PoE++ power supply)
PoE++:	IEEE802.3bt standard: DC 42 V to 57 V (Camera Input) (Software authentication (LLDP) is supported)
Current Consumption:	3.0 A (Supplied AC adaptor) 1.0 A (PoE++ power supply)
Ambient Operating Temperature:	0 °C to 40 °C (32 °F to 104 °F)
Ambient Operating Humidity:	20 % to 90 % (no condensation)
Storage Temperature:	–20 °C to 50 °C (–4 °F to 122 °F)
Mass:	Approx. 2.2 kg (4.84 lb) (excluding cable cover, mount bracket) Approx. 2.3 kg (5.06 lb) (including cable cover, excluding mount bracket)
Dimensions (W x H x D):	169.2 mm x 204.6 mm x 170.6 mm (6-21/32 inches x 8-1/16 inches x 6-23/32 inches) (excluding protrusions, cable cover, mount bracket)
Finish:	AW-UE100WP/AW-UE100WPC/AW-UE100WE/AW-UE100WED: Pearl white AW-UE100KP/AW-UE100KPC/AW-UE100KE/AW-UE100KED: Black
Controller Supported:	AW-RP150GJ, AW-RP60GJ

<Camera Unit>

Imaging Sensors:		1/2.5-type 4K MOS x 1
Lens:		Motorized Optical 24x zoom, F1.8 to F4.0 [f=4.12 mm (5/32 inches) to 98.9 mm (3-29/32 inches); 35 mm (1-3/8 inches) equivalent: 25.0 mm (31/32 inches) to 600.0 mm (23-5/8 inches)]
Zoom:		• Optical zoom : 24x • i.Zoom: UHD 28x, FHD 36x • Digital extender zoom: 1.4x, 2x
Conversion Lens:		Not supported
Angle of View Range:		Horizontal angle of view: 74.1°(wide) to 3.3°(tele) Vertical angle of view: 46.0°(wide) to 1.9°(tele) Diagonal angle of view: 81.8°(wide) to 3.8°(tele)
Optical Filter:		Through, 1/4, 1/16, 1/64, IR through (IR through is used as "Night mode")
Focus:		Switching between auto and manual
Focus Distance:		Entire zooming range: 1200 mm (3.9 ft) Wide end: 100 mm (0.33 ft)
Color Separation Optical System:		1MOS
Standard Sensitivity:		F4/2000 lx (When [Shooting Mode] is [Normal]) F5.6/2000 lx (When [Shooting Mode] is [High Sens.])
Minimum Illumination:		3 lx (conditions: F1.8, 59.94p, 50 IRE, 42 dB, without accumulation)
S/N:		60dB(typ) (When [Shooting Mode] is [Normal])
Horizontal Resolution:		1500 TV lines Typ (Center area)
Gain Selection:		Auto, 0 dB to 36 dB*1 • Super Gain function installed: 37 dB to 42 dB
Frame Mix*2:		Auto, 0 dB, 6 dB, 12 dB, 18 dB, 24 dB
Electronic Shutter Speed:	59.94p/59.94i	1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000
	29.97p	1/30, 1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000
	23.98p/24p	1/24, 1/48, 1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000
	50p/50i	1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000
	25p	1/25, 1/50, 1/60, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000
Synchro Scan:	59.94p/59.94i	60.00 Hz to 7200 Hz
	29.97p	30.00 Hz to 7200 Hz
	23.98p/24p	24.00 Hz to 7200 Hz
	50p/50i	50.00 Hz to 7200 Hz
	25p	25.00 Hz to 7200 Hz
Gamma:		HD/FILMLIKE1/FILMLIKE2/FILMLIKE3
White Balance:		ATW, 3200K, 5600K AWB: AWB-A/AWB-B VAR (selectable between 2000K and 15000K by designating a value)
Chroma Amount Variability:		OFF, –99 % to 99 %
Scene File:		Scene1, Scene2, Scene3, Scene4
Output Format:	SDI Output 4K	2160/59.94p, 2160/50p, 2160/29.97p*3, 2160/25p*3, 2160/24p*3, 2160/23.98p*3
	SDI Output HD	1080/59.94p, 1080/50p, 1080/29.97p*3, 1080/29.97PsF, 1080/25p*3, 1080/25PsF, 1080/23.98p*4, 1080/24p*3, 1080/23.98p*3, 1080/23.98PsF, 1080/59.94i, 1080/50i, 720/59.94p, 720/50p
Output Format:	HDMI Output 4K	2160/59.94p, 2160/50p, 2160/29.97p*3, 2160/25p*3, 2160/24p*3, 2160/23.98p*3
	HDMI Output HD	1080/59.94p, 1080/50p, 1080/29.97p*3, 1080/25p*3, 1080/23.98p*10, 1080/24p*3, 1080/23.98p*3, 1080/59.94i, 1080/50i, 720/59.94p, 720/50p

<Synchronization System>

	Internal/External synchronization (BBS/Tri-level sync)

<INPUT>

Input Connector:	DC IN 12 V	
	G/L IN	BBS (Black Burst Sync), tri-level sync supported 75 Ω terminal (BNCx1)
	AUDIO IN	MIC/LINE input Compatible (SDI/HDMI/IP) AAC compatible (compatible with IP only) ø 3.5 mm stereo mini jack Input impedance: Approx. 10 kΩ (unbalanced) • During MIC input Input level: –40 dBV (0 dB=1 V/Pa, 1 kHz) Plug-in power compatible, supply voltage: 2.5 V ± 0.5 V • During LINE input Input level: –10 dBV • Input volume variable range: –36 dB to 12 dB (3 dB step) • Embedded audio output level: –12 dBFS • Sampling frequency: 48 kHz • Quantization bit rate: 24bit (SDI, HDMI), 16bit (IP)

<OUTPUT>

Video Output:	HDMI	HDMI 2.0 connector 4:2:2/10bit • HDCP is not supported. • Viera Link is not supported.
	12G-SDI OUT	SMPTE 2082-1/SMPTE292 standard/75 Ω (BNC x 1)
	3G-SDI OUT	SMPTE292/75 Ω (BNC x 1) • Level-A/Level-B supported

<INPUT/OUTPUT>

Input / Output Connector:	LAN	RJ-45 LAN terminal for IP control and video transmission PoE++ power terminal (IEEE802.3bt compliant)
	RS-422	CONTROL IN RS-422A (RJ-45)

<Pan-tilt Head Unit>

Camera/Pan-tilt Head Control:	IP connecting cable • When connecting through a PoE++ hub LAN cable*5 (category 5e or above, straight cable), max. 100 m (328 ft) • When a PoE++ hub is not used LAN cable*5 (category 5e or above, straight cable), max. 100 m (328 ft)
	AW protocol connecting cable LAN cable*5 (category 5e or above, straight cable), max. 1000 m (3280 ft)
Installation Method:	Stand-alone (Desktop) or suspended (Hanging)*6
Pan/tilt Operation Speed:	Speed range: 0.08°/s to 60°/s (Normal mode) • 3 speed modes installed Normal: 60°/s, Fast1: 90°/s*7, Fast2: 180°/s*7
Panning Range:	±175°
Tilting range:	–30° to 210°*8
Quietness:	NC30 or less

<Supported operating systems and web browsers>*9

Supported operating systems and web browsers:	Windows	Microsoft® Windows® 10 Windows® Internet Explorer® 11 (64bit/32bit) Microsoft Edge Google Chrome
	Mac	macOS 10.13/Safari 13 macOS 10.14/Safari 13 macOS 10.15/Safari 13 macOS 10.15/Google Chrome
	iPhone / iPad	iOS Safari iPadOS
	Android	Android OS Google Chrome

<IP Streaming>

Image Streaming Mode:	JPEG(MJPEG), H.264, H.265, NDI®|HX, High Bandwidth NDI®
Image Resolution:	3840x2160, 1920x1080, 1280x720, 640x360, 320x180
Image Transmission setting (JPEG):	Frame Rate: Maximum 30 fps Image quality (Fine / Normal)

Image Transmission Setting (H.264):	■ Transmission Type: Unicast port (AUTO) Unicast port (MANUAL) Multicast port ■ Transmission Priority Constant bit rate Frame rate Best effort ■ Frame Rate [60Hz] 5fps/15fps/30fps/60fps (UHD: 30fps, 60fps) [50Hz] 5fps/12.5fps/25fps/50fps (UHD: 25fps, 50fps) ■ Max Bit Rate 512kbps/768kbps/1024kbps/1536kbps/2048kbps/3072kbps/4096kbps/6144kbps/8192kbps/10240kbps/12288kbps/14336kbps/16384kbps/20480kbps/24576kbps/32768kbps/40960kbps/51200kbps/76800kbps
Image Transmission Setting (H.265):	■ Transmission Type: Unicast port (AUTO) Unicast port (MANUAL) Multicast port ■ Frame Rate [60Hz]30fps [50Hz]25fps ■ Max Bit Rate 8192kbps/12288kbps/25600kbps/51200kbps/76800kbps

Audio Compression Type:	AAC-LC, 48 kHz / 16 bit / 2ch
Supported Protocol:	■ IPv6: TCP/IP, UDP/IP, HTTP, HTTPS, DNS, NTP, DHCPv6, RTP, MLD, ICMP, ARP, RTMP, SRT ■ IPv4: TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP, DHCP, DNS, DDNS, NTP, IGMP, ICMP, ARP, RTMP, RTMPS, SRT

<Other Function>

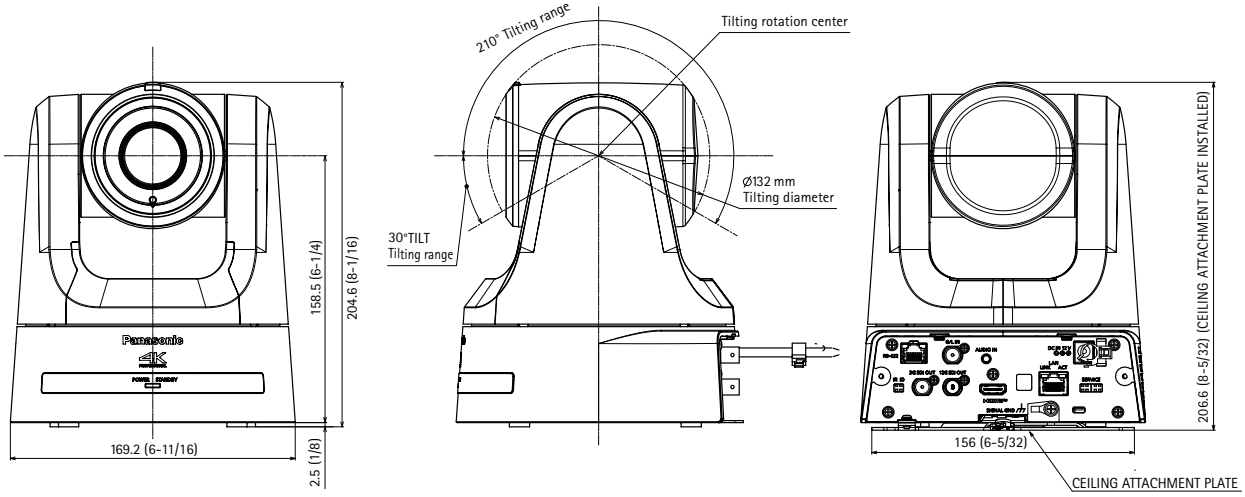
NDI® support:	NDI® | HX : Included as standard High Bandwidth NDI®: Included as standard
Tally LED display color:	red / green

*1: 1 dB steps. *2: This cannot be configured when the format is 2160/29.97p, 2160/23.98p, 2160/24p, 2160/25p, 1080/29.97p, 1080/23.98p(59.94i), 1080/29.97PsF, 1080/23.98PsF, 1080/25p, 1080/25PsF. *3: Native output. *4: OVER 59.94i output (your monitor may recognize the signal as 59.94i). *5: Use of an STP (shielded twisted pair) cable is recommended. *6: To ensure safety, the unit must be secured using the mount bracket supplied. *7: Note that the operating noise may be loud in high speed. If the operating noise is disturbing, use the Normal mode. *8: Depending on the pan or tilt position, the camera may be reflected in the image. *9: Supported OS indicated are for browsers current as of August 2020. See "Service and Support / PASS" on the Panasonic website (https://pro-av.panasonic.net/en/) for the latest information on browser support. *10: It denotes "1080/23.98p over 59.94p"

Dimensions

As of August, 2020

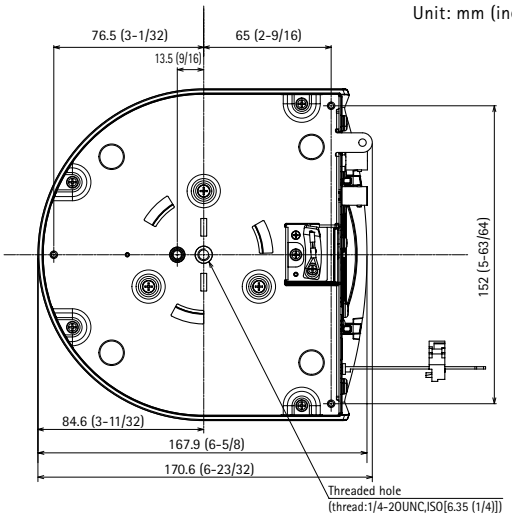
Unit: mm (inches)



Rear View

Bottom View

Unit: mm (inches)



Compatible Third-Party Equipment

NewTek, Inc.

TriCaster TC1 2RU
TC1
Operation-verified in June. 2020

TriCaster Mini 4K
TCM4KUHD
Operation-verified in June. 2020

Explorer Inc.

SRT compatible
H.265/HEVC 4K/2K decoder
EHU-3410D
Operation-verified in June. 2020

Haivision

SRT Set Top Box
Haivision Play Set-Top Box 4000
Operation-verified in June. 2020

GeoVision

PoE Adapter
GV-PA901
Operation-verified in Mar. 2017

PoE++

NETGEAR, Inc.

NETGEAR 10-PORT GIGABIT ETHERNET ULTRA60 POE++ SMART MANAGED PRO DESKTOP SWITCH
GS110TUP[*1]
Operation-verified in Mar. 2020

PoE++

NETGEAR 10-PORT GIGABIT ULTRA60 POE++ SMART MANAGED PRO RACKMOUNT SWITCH
GS710TUP[*1]
Operation-verified in Mar. 2020

PoE++

Allied Telesis

Gigabit Layer3 PoE++ Switch
AT-x320-10GH[*1]
Operation-verified in Mar. 2020

PoE++

- Power supply not included. AT-PWR300 is required.

PLANET Technology Corp.

Layer 3 8-Port 10/100/1000T 802.3bt PoE + 2-Port 10/100/1000T + 2-Port 10G SFP+ Managed Switch
GS-5220-8UP2T2X
Operation-verified in Oct. 2018

PoE++

*1: LLDP authentication is planned for future support.

Third-Party Inquiries

- <NewTek, Inc.> https://www.ndi.tv/ MAIL: ndi@newtek.com TEL: +1 210-370-8000
- <Explorer Inc.> MAIL: sales@explorer-inc.co.jp TEL: +81(138)47-7604
- <Haivision> https://www.haivision.com/contact/
- <GeoVision Inc.> MAIL: sales@geovision.com.tw TEL: +886-2-8797-8376
- <NETGEAR, Inc> http://www.netgear.com/home/contact-us/
- <Allied Telesis> (North America) http://alliedtelesis.com/contact
  (Asia/Pacific) customer_info@alliedtelesis.com
  (EMEA) Customer_info@alliedtelesis.com
  (Central South America) Customer_info@alliedtelesis.com
- <PLANET Technology Corp.> https://www.planet.com.tw/en MAIL: sales@planet.com.tw

Panasonic

Panasonic Corporation
Connected Solutions Company
2-15 Matsuba-cho, Kadoma, Osaka 571-8503 Japan

ISO 14001 JACO EC98J2010 UKAS MANAGEMENT SYSTEMS 051

Factories of AVC Networks Company have received ISO14001:2004-the Environmental Management System certification. (Except for 3rd party's peripherals.)

For more information, please visit Panasonic web site
https://pro-av.panasonic.net/en/qr/

Broadcast and Professional AV Website | **Contact Information** | **Facebook** | **Mobile App**

SP-UE100PE

3K202008UP-1 Printed in Japan

ENGLISH

OWNER'S MANUAL

LG Digital Signage

(MONITOR SIGNAGE)

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

55TR3DK-B	55TR3DK-I
65TR3DK-B	65TR3DK-I
75TR3DK-B	75TR3DK-I
86TR3DK-B	86TR3DK-I
98TR3DK-B	98TR3DK-I

www.lg.com

Table of Contents

WARNING - This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

Getting to Know the Product

Checking Components

An electronic blackboard is a display product that can be used by touching the screen. A touch pen, remote control and others are provided with the product. If any of the listed components are missing, contact customer support. LG Electronics also sells optional components that can help you use the product more effectively as separate purchases.

Product specifications or components may change without prior notice according to the quality improvements or feature upgrades.

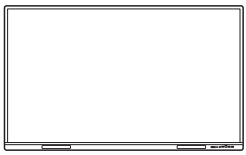
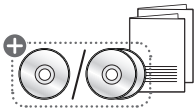
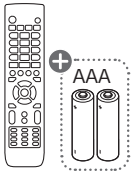
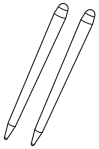
Caution

- To ensure user safety and product longevity, do not use counterfeit products. If the product is damaged as a result of using counterfeits, the warranty does not apply. In such cases, the user cannot be compensated even if injured.
- If the product is used in an environment with excessive dust, the warranty does not apply.

Note

- Remove all tapes attached to the front before connecting the product to power.
- Cables used when connecting to external devices must be purchased separately.
- Keep the product box and do not discard it. It can be used when moving the product.

Checking Components

		
Electronic blackboard	**Owner's manual and warranty**	**Remote control and batteries (AAA, 2 pieces)**
		
HDMI cable	**Power cable**	**TOUCH cable**
		
USB Type-C cable	**Touch pens and pen tips (2 each)**	**WiFi dongle**

Note

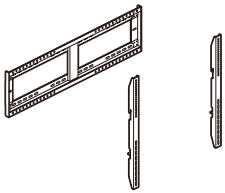
- ⊕: Depending on country
- The components provided in the box may vary depending on the region and model.
- Component images shown in the owner's manual are for the user's understanding and may differ from actual components.

Checking Optional Components

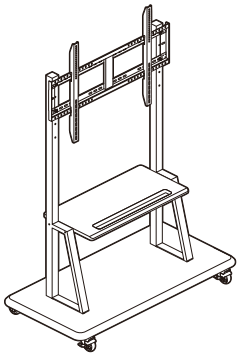
Optional components may change without prior notice to improve product performance. New components may be added.

Note

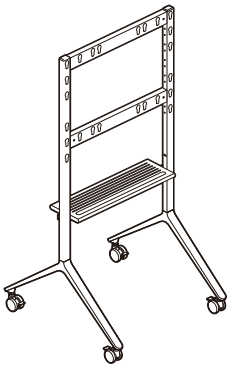
- All optional components are separate purchases. Contact LG Electronics if you wish to purchase them.
- Component images shown in the owner's manual are for the user's understanding and may differ from actual components.



Wall Mount Holder (WM-L000S)



Floor stand (ST-000F)



Universal stand (ST-860F)

Installing the Product

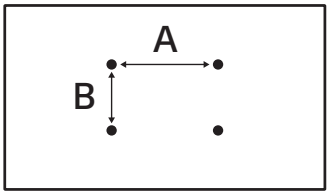
Installing on Wall

The electronic blackboard can be used in a wall-mounted format by securing it to a wall. To install it on a wall, first attach a wall mount support (optional) to the back of the product body.

The wall mount support is a separate purchase and can be purchased from a nearby dealer. For more information on installing a wall mount support, see the installation guide provided with your wall mount support purchase.

Checking Wall Mount Support Specifications

When installing a wall mount support, you must use screws and brackets that comply with VESA (Video Electronics Standards Association) standard specifications.



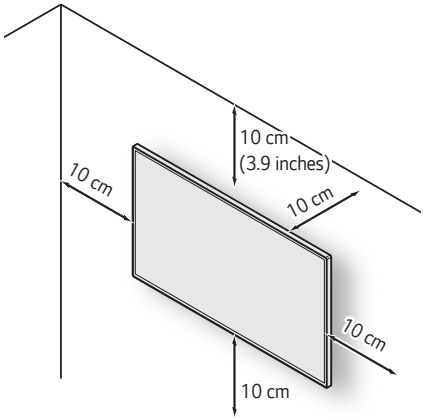
Model Name	VESA Dimensions (A x B) (mm) VESA Dimensions (A x B) (inches)	Screw Specifications	Maximum Length (mm) Maximum Length (inches)	Quantity
55TR3DK-B 55TR3DK-I	400 x 200 15.7 x 7.8	M8	25 0.9	4
65TR3DK-B 65TR3DK-I	600 x 400 23.6 x 15.7	M8	25 0.9	4
75TR3DK-B 75TR3DK-I	800 x 400 31.4 x 15.7	M8	25 0.9	4
86TR3DK-B 86TR3DK-I 98TR3DK-B 98TR3DK-I	800 x 600 31.4 x 23.6	M8	25 0.9	4

Caution

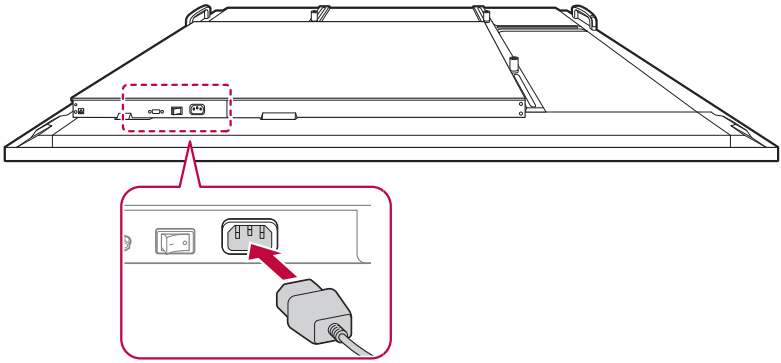
- Disconnect the power cord first before moving or installing the product. There is risk of electric shock.
- Do not install the product on a ceiling or sloped wall. There is a risk of falling and injury.
- If you tighten the screws too tightly and damage the product, the warranty may not apply.
- Use screws and brackets for wall mounting that meet the VESA standard specifications. The warranty does not apply to the breakage or personal injury due to the use of incorrect components.
- Using screws longer than VESA standard specifications when installing a wall mount support may damage the interior of the product. In such cases, we do not take responsibility for any damage or issues that may arise with the product.

Installing the Product

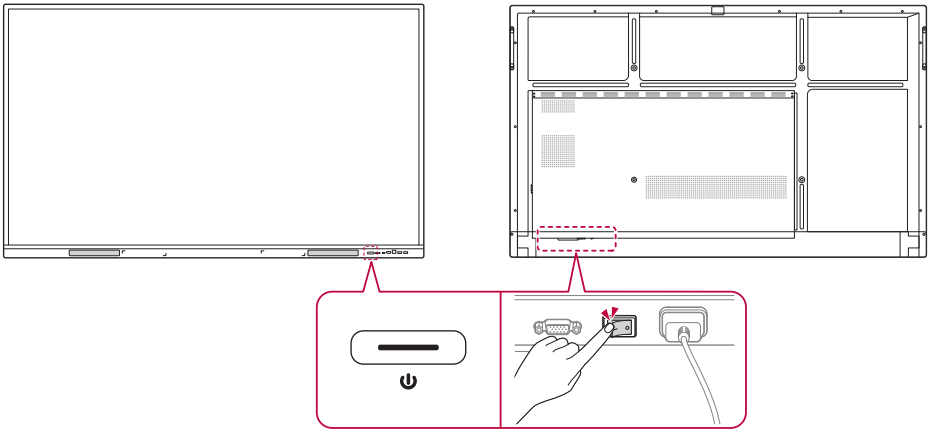
Allow at least 10 cm (3.9 inches) of clearance from the wall for ventilation, and install the product with care to prevent it from falling. When purchasing a wall mount support, the installation guide and all necessary parts are included. A wall mount support can be purchased separately from a nearby dealer.



Connecting to Power



1 Connect the power cable provided as a component to the power terminal at the bottom of the product.



2 Press the power switch on the front of the product or next to the power terminal to turn the power on.

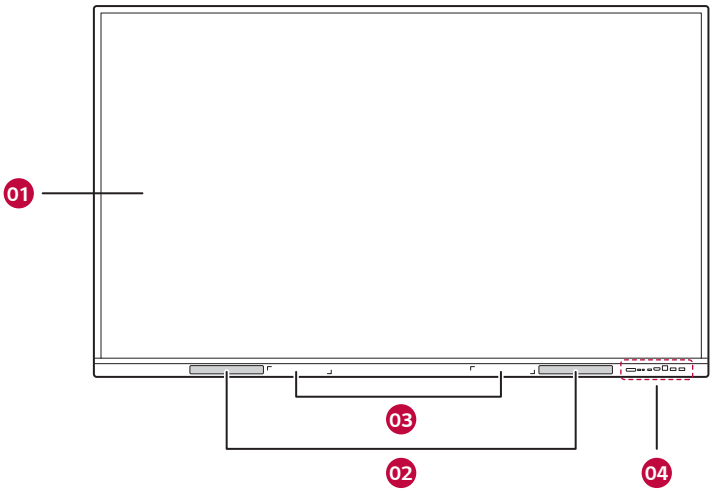
Note

- The screen may flicker if the product is turned on when it is cold. This is normal, so there is no need to worry.

Exploring the Product

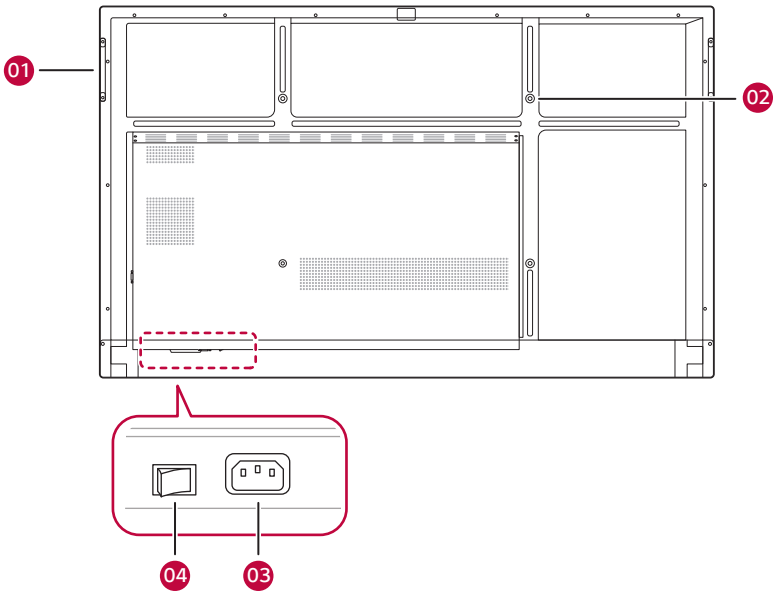
Names of Each Part

Front



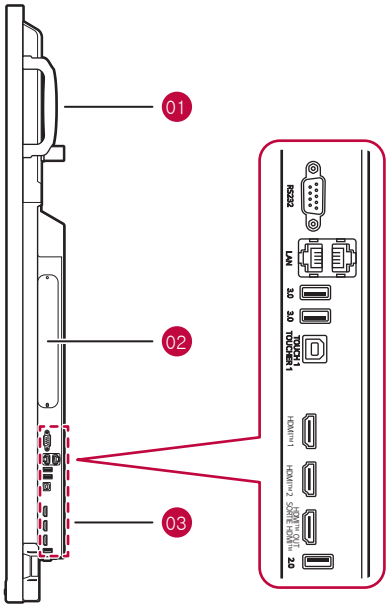
No.	Name	Explanation
01	**Touch screen**	Screen that displays the contents of the electronic blackboard and can be operated by touching it with your hand or with a touch pen.
02	**Speaker**	Outputs the sound.
03	**Touch Pen Holder**	Holds a touch pen by attaching it magnetically.
04	**Front Cable Terminal**	Terminals that allow you to connect each of the external devices of the following specifications. • ⚡IN • HDMI™ 3 • TOUCH 2 • 3.0

Back



No.	Name	Explanation
01	**Handle for Transportation**	Used for moving the electronic blackboard.
02	**Screw Holes**	Used for mounting the electronic blackboard on a stand or installing it on a wall with a wall mount.
03	**Power Cable Terminal**	Connects the power cord.
04	**Power Sources**	Turns the power on or off.

Side

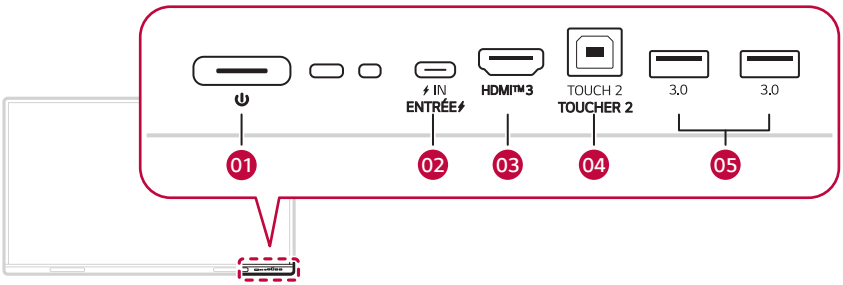


No.	Name	Explanation
01	**Handle for Transportation**	Used for moving the electronic blackboard.
02	**Built-in PC (OPS) Slot**	Inserts the built-in PC (OPS).
03	**Side Cable Terminal**	Terminals that allow you to connect each of the external devices of the following specifications. • RS232 • LAN • 3.0 • TOUCH 1 • HDMI™ 1 • HDMI™ 2 • HDMI™ OUT • 2.0

Checking the Input/Output Terminals

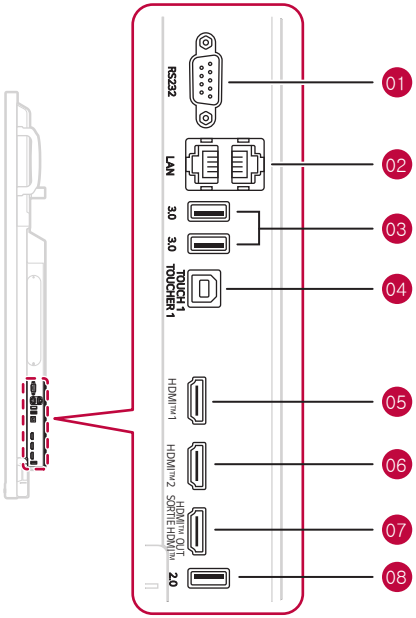
Check the location and function of the input/output terminals for connecting external devices to the electronic blackboard.

Front Cable Terminal



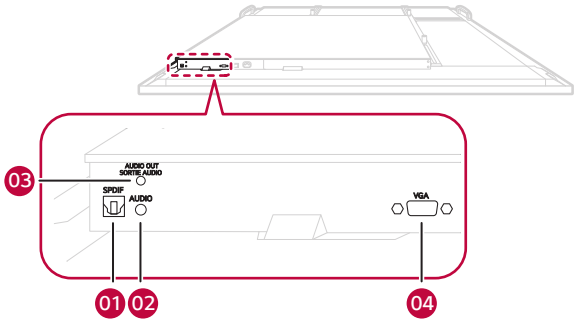
No.	Name	Explanation
01	**Power Sources**	Turns the power on or off.
02	**IN**	Used to connect external devices with a USB Type-C cable.
03	**HDMI™ 3**	Used to connect external devices with an HDMI cable.
04	**TOUCH 2**	Used for touch control of the PC screen input through the HDMI™ 3 terminal. Used to connect the electronic blackboard's TOUCH 2 terminal and PC with a TOUCH cable.
05	**3.0**	Used for data transfer or connecting USB devices such as a mouse or keyboard with a USB cable.

Side Cable Terminal



No.	Name	Explanation
01	**RS232**	Used to connect an RS232 cable.
02	**LAN**	Used for wired internet connection.
03	**3.0**	Used for data transfer or connecting USB devices such as a mouse or keyboard with a USB cable.
04	**TOUCH 1**	Used for touch control of the PC screen input through the HDMI 1 terminal. Used to connect the TOUCH 1 terminal and PC with a TOUCH cable.
05	**HDMI™ 1**	Used to connect external devices with an HDMI cable.
06	**HDMI™ 2**	
07	**HDMI™ OUT**	Used to export the screen to an external device with an HDMI cable.
08	**2.0**	Used for data transfer or connecting USB devices such as a mouse or keyboard with a USB cable.

Bottom Cable Terminal



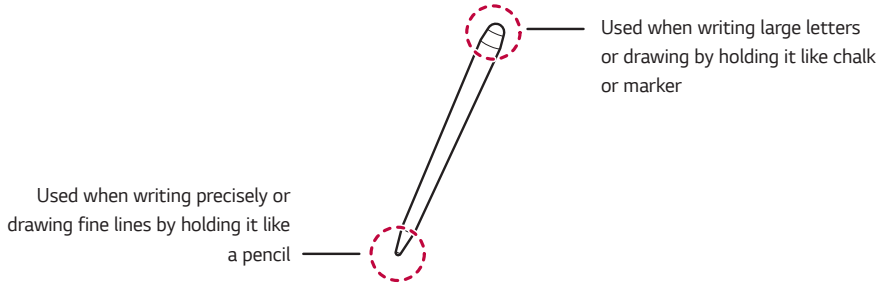
No.	Name	Explanation
01	SPDIF	Used to output audio to an external device with a SPDIF cable.
02	AUDIO	Used to input audio from an external device.
03	AUDIO OUT	Used to output audio to an external device.
04	VGA	Used to connect external devices with a VGA cable.

Using the Touch Pen

The touch pen can be used for various purposes, such as touching the screen to launch menus or to take notes, annotate, and draw on data.

Getting to Know the Touch Pen Functions

Two pens can be used simultaneously to write or draw together. Different colors can be assigned to each pen.
A pen has a 3 mm (0.1 inches) and 8 mm (0.3 inches) tip at each end, allowing you to use two modes separately with one pen.

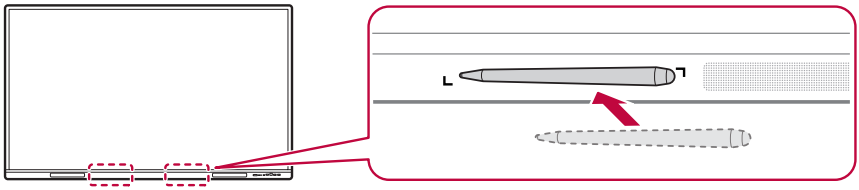


Note

- If you press the pen on the screen for about 2 seconds and release it after you open a built-in PC (OPS), PDF viewer, or Word document, the same pop-up menu as when you right-click on the mouse will appear.

Storing the Pen

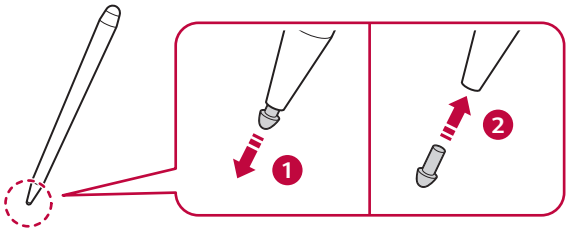
The touch pen can be attached to the magnetic touch pen holder to keep it in place, so you don't lose it.



Replacing the Pen Tip

If the touch pen tip is worn or damaged, it must be replaced with a new tip.

1 Remove the old tip by pulling on the end with tools such as tweezers.
2 Slide the new tip into the pen body.



Note

- To purchase additional touch pens or spare tips, contact LG Electronics.

Precautions for Use

Dust

The warranty will not cover any damage caused by using the product in an excessively dusty environment.

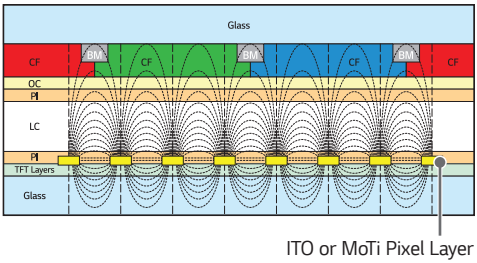
Afterimage

- After-image appears when the product is turned off.
  - Pixels may be damaged rapidly if a still image is displayed on the screen for a long period of time. Use the screen-saver function.
  - Switching from a screen with high differences in luminance (black and white or grey) to a darker screen may cause an afterimage. This is normal due to the display characteristics of this product.
- When the LCD screen is in a still pattern for extended periods of use, a slight voltage difference may occur between the electrodes that operate the liquid crystal (LC). The voltage difference between the electrodes increases over time and tends to keep the liquid crystal aligned in one direction. At this time, the previous image remains, which is called an afterimage.
- Afterimages do not occur when continuously changing images are used but take place when a certain screen is fixed for a long time. The following are operational recommendations for reducing the occurrence of afterimages when using a fixed screen. The maximum recommended time for switching the screen is 12 hours. Shorter cycles are better for preventing afterimages.

Recommended Usage Condition

1 Change the background color and text color at equal intervals.

- Afterimages occur less when the colors to be changed are complementary to one another.



2 Switch the screen at equal time intervals.

- Take caution, and ensure that text or images from before the screen change are not left in the same location after the screen change.

Product Specifications

Without prior notice, all product information and specifications contained in this manual are subject to change to improve the performance of the product.

The ~ symbol means alternating current, and the symbol ⎓ means direct current.

Input/Output Ports	ϟ IN, HDMI™ 1/2/3, TOUCH 1/2, 2.0, 3.0, RS232, LAN, HDMI™ OUT, AUDIO, AUDIO OUT, SPDIF, VGA, OPS	
Embedded Battery	Not Applied	
Resolution	Recommended Resolution	VGA: 1920 x 1080 @ 60 Hz
	Max Resolution	HDMI1 / HDMI2 / HDMI3: 3840 x 2160 @ 60 Hz - This may not be supported on some OS or graphics card types.
Environmental Conditions	Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
	Operating Humidity	10 % to 90 % (Condition for preventing condensation)
	Storage Temperature	-20 °C to 60 °C (-4 °F to 140 °F)
	Storage Humidity	10 % to 90 % (Condition for preventing condensation) * Product box packaging storage conditions

Touch screen

OS	Windows 10 / Windows 8 / Windows 7 / Android / Linux / macOS (Linux / macOS are supported with the 1 Point touch function.)	40 Points
	Chrome OS	16 Points
	Spacing between touches: at least 25 mm (0.9 inches)	

Speaker

* Applicable only to speaker-supporting models.

Audio	RMS audio output	55/65/75/86TR3DK-B/I	15 W + 15 W (R + L)
		98TR3DK-B/I	16 W + 16 W (R + L)
	Input Sensitivity	0.2 ~ 2 Vrms	
	Speaker impedance	6 Ω	

Specifications by Model

55TR3DK-B 55TR3DK-I		
Power	Power Voltage	100-240 V~ 50/60 Hz 3.5 A
Dimensions (Width x Height x Depth) / Weight	1271 mm x 774 mm x 87 mm / 26.1 kg (50 inches x 30.4 inches x 3.4 inches / 57.5 lbs)	

65TR3DK-B 65TR3DK-I		
Power	Power Voltage	100-240 V~ 50/60 Hz 4.0 A
Dimensions (Width x Height x Depth) / Weight	1488 mm x 897 mm x 88 mm / 34.95 kg (58.5 inches x 35.3 inches x 3.4 inches / 77 lbs)	

75TR3DK-B 75TR3DK-I		
Power	Power Voltage	100-240 V~ 50/60 Hz 4.0 A
Dimensions (Width x Height x Depth) / Weight	1709 mm x 1020 mm x 88 mm / 47.3 kg (67.2 inches x 40.1 inches x 3.4 inches / 104.2 lbs)	

86TR3DK-B 86TR3DK-I		
Power	Power Voltage	100-240 V~ 50/60 Hz 5.5 A
Dimensions (Width x Height x Depth) / Weight	1957 mm x 1160 mm x 100 mm / 58.55 kg (77 inches x 45.6 inches x 3.9 inches / 129 lbs)	

98TR3DK-B 98TR3DK-I		
Power	Power Voltage	100-240 V~ 50/60 Hz 5.5 A
Dimensions (Width x Height x Depth) / Weight	2244 mm x 1323 mm x 91 mm / 103.6 kg (88.3 inches x 52.0 inches x 3.5 inches / 228.3 lbs)	

Resolution

Note

- Vertical Frequency: The monitor screen functions by the screen image changing dozens of times every second like a fluorescent lamp.
  The vertical frequency or refresh rate is the number of image displays per second. The unit is Hz.
- Horizontal Frequency: The horizontal interval is the time taken to display one horizontal line. When one is divided by the horizontal interval, the number of horizontal lines displayed every second is the horizontal frequency. The unit is kHz.

VGA (PC) Support Mode

Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)
720 x 400 / 70 Hz	31.788	70
640 x 480 / 60 Hz	31.469	59.94
800 x 600 / 56 Hz	35.156	56.25
800 x 600 / 60 Hz	37.879	60.317
1024 x 768 / 60 Hz	48.363	60.004
1280 x 768 / 60 Hz (RB)	47.396	59.995
1280 x 768 / 60 Hz	47.776	59.87
1280 x 800 / 60 Hz	49.702	59.81
1280 x 960 / 60 Hz	60	60
1280 x 1024 / 60 Hz	63.981	60.002
1360 x 768 / 60 Hz	47.712	60.015
1440 x 900 / 60 Hz (RB)	55.469	59.901
1440 x 900 / 60 Hz	55.935	59.887
1680 x 1050 / 60 Hz	65.29	59.954
1920 x 1080 / 60 Hz	67.5	60

USB Type-C Supported Mode

Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)
640 x 480 / 60 Hz	31.469	59.94
800 x 600 / 56 Hz	35.156	56.25
800 x 600 / 60 Hz	37.879	60.317
1024 x 768 / 60 Hz	48.363	60.004
1280 x 768 / 60 Hz (RB)	47.396	59.995
1280 x 768 / 60 Hz	47.776	59.87
1280 x 800 / 60 Hz	49.702	59.81
1280 x 960 / 60 Hz	60	60
1280 x 1024 / 60 Hz	63.981	60.002
1360 x 768 / 60 Hz	47.712	60.015
1440 x 900 / 60 Hz (RB)	55.469	59.901
1440 x 900 / 60 Hz	55.935	59.887
1680 x 1050 / 60 Hz	65.29	59.954
1920 x 1080 / 60 Hz	67.5	60
640 x 480P / 59 Hz 4:3	31.469	59.94
640 x 480P / 60 Hz 4:3	31.5	60
720 x 480P / 60 Hz 4:3	31.5	60
720 x 480P / 60 Hz 16:9	31.5	60
1280 x 720P / 59 Hz 16:9	44.955	59.939
1280 x 720P / 60 Hz 16:9	45	60
1440 x 480P / 60 Hz 4:3	31.5	60
1440 x 480P / 59 Hz 16:9	31.469	59.94
1440 x 480P / 60 Hz 16:9	31.5	60
1920 x 1080P / 59 Hz 16:9	67.432	59.939
1920 x 1080P / 60 Hz 16:9	67.5	60

Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)
720 x 576P / 50 Hz 4:3	31.25	50
720 x 576P / 50 Hz 16:9	31.25	50
1280 x 720P / 50 Hz 16:9	37.5	50
1440 x 576P / 50 Hz 16:9	31.25	50
1920 x 1080P / 50 Hz 16:9	56.25	50
1920 x 1080P / 23 Hz 16:9	26.973	23.976
1920 x 1080P / 24 Hz 16:9	27	24
1920 x 1080P / 25 Hz 16:9	28.125	25
1920 x 1080P / 29 Hz 16:9	33.716	29.97
1920 x 1080P / 30 Hz 16:9	33.75	30
3840 x 2160 / 60 Hz	135	60
3840 x 2160 / 50 Hz	112.5	50
3840 x 2160 / 30 Hz	67.5	29.97
3840 x 2160 / 25 Hz	56.25	25
3840 x 2160 / 24 Hz	54	23.982

HDMI / OPS Supported Mode

Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)
640 x 480 / 60 Hz	31.469	59.94
800 x 600 / 60 Hz	37.879	60.317
1024 x 768 / 60 Hz	48.363	60.004
1280 x 768 / 60 Hz (RB)	47.396	59.995
1280 x 768 / 60 Hz	47.776	59.87
1280 x 800 / 60 Hz	49.702	59.81
1280 x 960 / 60 Hz	60	60
1280 x 1024 / 60 Hz	63.981	60.002
1360 x 768 / 60 Hz	47.712	60.015
1440 x 900 / 60 Hz (RB)	55.469	59.901
1440 x 900 / 60 Hz	55.935	59.887
1680 x 1050 / 60 Hz	65.29	59.954
1920 x 1080 / 60 Hz	67.5	60
720 (1440) x 480i	15.734	59.939
480p / 59 Hz	31.469	59.94
480p / 60 Hz	31.5	60
720 (1440) x 576i	15.625	50
576p / 50 Hz	31.25	50
720p / 60 Hz	45	60
720p / 59 Hz	44.955	59.94
720p / 50 Hz	37.5	50

Resolution	Horizontal Frequency (kHz)	Vertical Frequency (Hz)
1080i / 60 Hz	33.75	60
1080i / 59 Hz	33.716	59.94
1080i / 50 Hz	28.125	50
1080p / 60 Hz	67.5	60
1080p / 50 Hz	56.25	50
1080p / 30 Hz	33.75	30
1080p / 29 Hz	33.716	29.97
1080p / 25 Hz	28.125	25
1080p / 24 Hz	27	24
1080p / 23 Hz	26.973	23.976
3840 x 2160 / 60 Hz	135	60
3840 x 2160 / 50 Hz	112.5	50
3840 x 2160 / 30 Hz	67.5	29.97
3840 x 2160 / 25 Hz	56.25	25
3840 x 2160 / 24 Hz	54	23.982

Licence

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Supplier's Declaration of Conformity	
Trade Name	LG
Responsible Party	LG Electronics USA, Inc.
Address	111 Sylvan Avenue, North Building, Englewood Cliffs, NJ 07632
E-mail	lg.environmental@lge.com

This product qualifies for ENERGY STAR®.
Changing the factory default configuration and settings or enabling certain optional features and functionalities may increase energy consumption beyond the limits required for ENERGY STAR® certification.
Refer to ENERGYSTAR.gov for more information on the ENERGY STAR® program.

The model and serial number of the product are located on the back and on one side of the product. Record them below in case you ever need service.

MODEL

SERIAL NO.

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