



PARLAMENT DE CATALUNYA

CODI DE BARRES DE L'ASPIRANT

PROVA PRÀCTICA

(Durada: 2 hores màxim)

Procés selectiu per a la constitució d'una borsa de treball per a cobrir temporalment les vacants dels llocs de treball de tècnic o tècnica d'imatge i so del Departament de Comunicació que es produeixin al Parlament de Catalunya entre els exercicis del 2023 i el 2025 (501-00010/13)

20 de juny de 2023



INSTRUCCIONS

- ✓ La prova pràctica consisteix a resoldre un supòsit pràctic compostat per un enunciat, que planteja la realització d'un acte institucional que acull el Parlament, i a partir del qual s'han de contestar una sèrie de preguntes. De totes elles, hi ha 22 que són de tipus test, de les quals 2 són preguntes de reserva. Seguidament, hi ha 4 preguntes de desenvolupament. La prova és eliminatòria i es valora amb un màxim 60 punts. La puntuació mínima per a superar-la és de 30 punts.
- ✓ Les preguntes tipus test tenen 4 respostes alternatives, de les quals només una és correcta. Cada resposta encertada té un valor de 2 punts i les preguntes sense resposta o amb més d'una resposta no es tenen en compte. Per a cada resposta errònia es descompta una tercera part del valor d'una resposta encertada. A continuació podeu llegir les instruccions sobre com marcar correctament la resposta que considereu encertada:

INSTRUCCIONS PER AL MARCATGE CORRECTE PREGUNTES TIPUS TEST:

Responen encerclant l'opció de resposta correcta. Per a anul·lar una resposta, feu una «X» damunt de l'opció que voleu invalidar i encercleu l'opció vàlida.

Exemple per a respondre que l'opció correcta és la *b*:

- a)
- ☒ b)
- c)
- d)

Exemple per anul·lar la resposta *a* i modificar-la per la *b*:

- ☒ a)
- ☒ b)
- c)
- d)

- ✓ Les 4 preguntes de desenvolupament, a contestar a criteri de l'aspirant, s'han de respondre en l'espai destinat a cadascuna d'elles en aquest quadern. Cada pregunta té un valor de 5 punts.
- ✓ En aquest quadern, a continuació, teniu l'enunciat de la prova pràctica, les 20 preguntes tipus test més les 2 de reserva i les 4 preguntes de desenvolupament.
- ✓ A banda del quadern, disposeu de dos documents més en forma d'annex, que us seran útils per a la resolució de la prova pràctica, tal i com es recull al final de l'enunciat de la prova.

CRITERIS DE VALORACIÓ

- ✓ Per a qualificar aquest supòsit, el tribunal valorarà els coneixements acreditats relatius a les funcions i tasques dels tècnics d'imatge i so i la capacitat i les aptituds per aplicar-los a situacions de la pràctica professional, la comprensió de les situacions i instruccions, la capacitat analítica i de síntesi, i la qualitat de l'expressió i de la presentació.



ENUNCIAT DEL SUPÒSIT PRÀCTIC

El Parlament acollirà un acte institucional el dilluns 3 de juliol de 2023 a partir de les dotze del migdia. L'acte comptarà amb les intervencions de la presidenta de la institució i de representants de diverses entitats socials. L'acte acabarà amb una actuació musical.

L'acte es farà en una sala d'actes equipada amb material audiovisual fix però s'ha previst llogar material addicional. L'acte és produït pel Parlament de Catalunya i el serveis de l'Àrea de l'Audiovisual s'encarregaran de la producció de l'acte i de la distribució del senyal institucional d'àudio i vídeo en qualitat *broadcast* als mitjans de comunicació. Aquest senyal també servirà per fer l'emissió en directe a través del web del Parlament i pels comptes de la institució a les xarxes socials.

L'espai on tindrà lloc l'acte té les següents dimensions: 20 metres de llargada, 30 metres d'amplada i 12 metres d'alçada. El sostre es de vidre i entra llum natural. Tot i que hi ha elements d'il·luminació, la llum natural afecta sobre la sala. Les parets de la sala no tenen cap entrada de llum, ni natural ni artificial.

L'acte comptarà amb les següents particularitats:

- Un presentador conduirà l'acte amb un micròfon de diadema sense fils.
- El representant d'una entitat intervindrà per videoconferència.
- El representant d'una altra entitat intervindrà des del faristol de la sala i farà una presentació de *PowerPoint* amb el seu propi portàtil, que disposa de sortida HDMI amb exploració progressiva. La presentació es podrà veure en una pantalla habilitada dins la sala i també s'ha de poder incorporar al senyal institucional d'àudio i vídeo.
- La realització es farà des d'una sala annexa.

Equipament tècnic de que disposa el Parlament:

- Un mesclador de vídeo *Grass Valley Kula* de 16 entrades de vídeo amb dos ME.
- Sis càmeres *Panasonic AW-UE150* comandades a distància i elevades a 2'40 metres d'alçada (càmeres de la 1 a la 6). Per a l'operació d'aquestes càmeres es disposa de dos panells *Panasonic AW-RP150* i sis OCP *Panasonic AK-HRP1015GJ*.
- Un monitor forma d'ona *Tektronix WFM 8300* amb el seu monitor tècnic.
- Una pantalla 65".
- Un mesclador d'àudio digital.
- Equipament de microfonia sense fils: receptora, antenes externes, transmissor de petaca i micròfon de diadema.
- Microfonia de faristol *Audiotechnica ES915C*.
- Sistema de reforç sonor pel públic configurat en L&R estacat.
- El format del senyal de vídeo de televisió del Parlament és HD-SDI 1080i. Per a aquells equips que treballen en d'altres formats el Parlament disposa de diverses unitats dels següents models de convertidors:

- *AJA Hi5-Plus*
- *AJA Ha5*
- *Datavideo DAC60*
- *Datavideo DAC70*

Material adicional de lloguer:

Adicionalment, s'ha decidit llogar dues càmeres d'estudi *Panasonic AK-UC4000GSJ* (càmeres 7 i 8), muntades sobre trípode i operades des de l'interior de la sala. El lloguer també inclou dues unitats OCP *AK-HRP1015GJ* i dues òptiques per a aquestes càmeres. En el cas de les òptiques, sabem que el nostre proveïdor de lloguer disposa dels següents models per a que escollim:

- Fujinon XT17sx4.5BRM
- Fujinon XT20sx4.7BRM
- Fujinon ZA12x4.5BERD
- Fujinon ZA22x7.6BERD

Es posen a disposició dos annexos, un sobre la configuració de la sala i l'altre amb especificacions tècniques dels equipaments.



PREGUNTES TIPUS TEST

1. Per tal d'evitar el *flicker* a la càmera si la pantalla entra en plano, quin paràmetre cal ajustar?
 - a. La velocitat d'obturació de la càmera
 - b. El paràmetre *Knee* fins a trobar el punt que no hi hagi *flicker*
 - c. L'iris de la càmera fins a trobar un punt en que no es produeixi flicker
 - d. L'ajust de *flare* de la càmera fins a aconseguir-ho
2. De les 6 càmeres fixes, la 4 i la 5 són *Màsters*. Quin repartiment de càmeres als dos panells de control seria el més òptim, tant a efectes d'agilitat en l'operació durant la realització com de seguretat en cas de fallida d'un dels panells?
 - a. Panell 1 : càmera 1, càmera 2, càmera 3
Panell 2: càmera 4, càmera 5, càmera 6
 - b. Panell 1 : càmera 4, càmera 5
Panell 2: càmera 1, càmera 2, càmera 3, càmera 6
 - c. Panell 1: càmera 1, càmera 3, càmera 5
Panell 2: càmera 2, càmera 4, càmera 6
 - d. Panell 1: càmera 6
Panell 2: càmera 1, càmera 2, càmera 3, càmera 4, càmera 5
3. Quines de les òptiques disponibles al nostre proveïdor de lloguer es poden fer servir amb el model de càmera Panasonic AK-UC4000GSJ?
 - a. Totes
 - b. Només la ZA12x4.5BERD i la ZA22x7.6BERD
 - c. Només la XT17sx4.5BRM i la XT20sx4.7BRM
 - d. Només la XT17sx4.5BRM i la ZA12x4.5BERD

4. Tenint en compte que des de realització es demana la càmera 7 amb un gran angular i la càmera 8 amb més *zoom*, quina òptica cal muntar a cada càmera?
- a. Càmera 7: XT17sx4.5BRM Càmera 8: XT20sx4.7BRM
 - b. Càmera 7: ZA12x4.5BERD Càmera 8: ZA22x7.6BERD
 - c. Càmera 7: ZA22x7.6BERD Càmera 8: ZA12x4.5BERD
 - d. Càmera 7: XT20sx4.7BRM Càmera 8: XT17sx4.5BRM
 - e.
5. Dels convertidors de que disposa el Parlament, quin és el més adient per a convertir el senyal de vídeo del portàtil de l'intervinent i entrar-lo al mesclador de vídeo en format HD-SDI 1080i?
- a. AJA Hi5-Plus
 - b. AJA Ha5
 - c. Datavideo DAC60
 - d. Datavideo DAC70
6. Quin element d'un mesclador de vídeo permet la incrustació d'un o més senyals de vídeo sobre un altre senyal?
- a. *Keyer*
 - b. *Frame store*
 - c. *Frame sync*
 - d. Cap dels anteriors
7. El panell de control de colorimetria d'una càmera (OCP) ha de disposar, com a mínim, dels següents potenciòmetres per poder ajustar correctament les components de color dels nivells de negre i de guany:
- a. Potenciòmetre per a la component R i potenciòmetre per a la component B
 - b. Potenciòmetre per a la component R i potenciòmetre per a la component G
 - c. Potenciòmetre per a la component B i potenciòmetre per a la component G
 - d. Potenciòmetre per a la component R, potenciòmetre per a la component G i potenciòmetre per a la component B



8. Dels següents senyals, quin d'ells es fa servir com a senyals de sincronisme de vídeo?
- a. *Blackburst*
 - b. *Tri-level*
 - c. *Blackburst* i *Tri-level*
 - d. Cap de les anteriors
9. Al finalitzar l'acte cal una edició dels millors moments per a la distribució a *Instagram Stories* del Parlament en format vertical. Quina resolució òptima utilitzaries al 2023?
- a. 1920 x 1080
 - b. 1366 x 1366
 - c. 1024 x 1280
 - d. 750 x 1334
10. Per a què serveix el canal Alfa en una imatge?
- a. És un canal d'ajust selectiu de color
 - b. És una capa de control d'efectes en la qual es poden tocar tots el paràmetres d'una edició
 - c. És una capa utilitzada per a poder controlar la transparència sobre tots els colors
 - d. És una capa de transparència que es superposa als valors de colors d'un píxel en una imatge i actua com a una màscara de transparència
11. Quin és el nivell de recomanació segons la normativa EBU R-128 que ha de complir la distribució d'àudio a la mescla de programa *broadcast*?
- a. -18LUFS
 - b. -23LUFS
 - c. -12LUFS
 - d. -10LUFS

12. En aquest acte hi tenim microfonia sense fils i en el muntatge hem de posar les dues antenes a la mateixa banda de l'escenari. Quina ha de ser la separació de les antenes?
- a. Com a mínim una separació entre elles de mitja longitud d'ona de la freqüència més baixa en la que treballa el sistema
 - b. Com a màxim una separació entre elles de mitja longitud d'ona de la freqüència més baixa en la que treballa el sistema
 - c. Com a mínim una separació entre elles de mitja longitud d'ona de la freqüència més alta en la que treballa el sistema
 - d. Com a màxim una separació entre elles de mitja longitud d'ona de la freqüència més alta en la que treballa el sistema
13. Quan s'estan fent les proves de so amb el sistema sorgeix el següent dubte: quant sumen dos senyals acústics idèntics, correlacionats i en el mateix temps?
- a. 2dB
 - b. 4dB
 - c. 6dB
 - d. 9dB
14. En el muntatge s'han col·locat els altaveus subgreus a banda i banda de l'escenari. Si es parla de configuracions, quina de les següents opcions no és un tipus d'arranjament d'altaveus subgreus?
- a. *Subs stack invertit*
 - b. *Subs End Fired*
 - c. *Subs arc electrònic*
 - d. *Subs End Low*
15. El senyal broadcast produït es distribueix per la xarxa d'àudio digital del Parlament, que actualment utilitza la tecnologia DANTE. En quina de les següents opcions hi ha una tecnologia de xarxa d'àudio falsa?
- a. *MADI, COBRANET, AVB*
 - b. *AVIOM, AES/EBU, ROCKNET*
 - c. *ETHERSOUND, RAVENNA, SOUNDGRID*
 - d. *SPDIF, REAC, AUDIDIG*



16. El faristol disposa de dos micròfons Audiotechnica ES915 que necessiten alimentació *phantom*. Des del mesclador d'àudio s'activarà l'alimentació de 48V. Quina d'aquestes afirmacions és certa?

- a. Les mesures de tensió entre el pin 2 i el pin 1, i el pin 3 i el pin 1 haurien de tenir nivells idèntics, propers a 48V, i no hi hauria voltatge entre el pin 2 i el pin 3
- b. Les mesures de tensió entre el pin 2 i el pin 1, i el pin 3 i el pin 1 no haurien de tenir nivells de voltatge, i hi hauria voltatge, proper a 48V, entre el pin 2 i el pin 3
- c. Les mesures de tensió entre el pin 3 i el pin 2, i el pin 2 i el pin 1 haurien de tenir nivells idèntics, propers a 48v, i no hi hauria voltatge entre el pin 1 i el pin 3
- d. Les mesures de tensió entre el pin 2 i el pin 1, i el pin 3 i el pin 1 no haurien de tenir nivells de voltatge, i hi hauria voltatge, proper a 48V, entre el pin 0 i el pin 3

17. L'acte s'enregistra en un gravador d'àudio de disc dur en un arxiu en format *WAV* a 48kHz i 24 bit. En acabar l'acte s'ha de convertir a un format de menor qualitat per transcriure-ho. Quina de les següents opcions conté un format d'àudio digital fals?

- a. *mp3, ogg*
- b. *ape, aiff*
- c. *flac, aac*
- d. *wma, obv*

18. Per a la premsa es disposa d'un distribuïdor d'àudio analògic a la sala amb 20 sortides en XLR3. L'enviament a aquest distribuïdor es fa per un auxiliar del mesclador. Atès que el distribuïdor només ha de rebre el senyal dels micròfons quan els intervinents estan en ús de la paraula, en quina posició s'ha de fer l'enviament?
- Pre-fader*
 - Post-fader*
 - Fixed-fader*
 - Insert*
19. Els micròfons de condensador per cable per recollir el so d'ambient, estan captant àudio de freqüències baixes que no interessin per a la mescla. Quina opció es la més fàcil per a solucionar-ho?
- Activar un *LPF*
 - Activar un *HPF*
 - Desactivar la *Phantom*
 - Ajustar el *squelch*
20. Durant l'acte cal aplicar un compressor a un canal de microfonia. Quins paràmetres són els propis d'un compressor?
- Threshold, ratio, knee, attack, release*
 - Freeshold, range, decay, room, time*
 - Trim, LF, stereo, sidechain, ratio, room*
 - Time constant, depth, filtre type, release*

PREGUNTES TIPUS TEST DE RESERVA

1. Per ajustar l'equip que hem instal·lat reproduïm so rosa, quina de les següents definicions es la correcta per aquest tipus de so?
- El so rosa és un so del qual la seva densitat espectral de potència és inversament proporcional a la freqüència
 - El so rosa és un so que té la mateixa intensitat en totes les freqüències
 - «a» i «b» són correctes
 - Cap de les anteriors



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CODI DE BARRES DE L'ASPIRANT

2. Indica l'ordre de colors de les barres UER:

- a. Blanc, Cian, Groc, Magenta, Verd, Vermell, Blau, Negre
- b. Negre, Groc, Cian, Verd, Magenta, Vermell, Blau, Blanc
- c. Blanc, Groc, Cian, Verd, Magenta, Vermell, Blau, Negre
- d. Negre, Groc, Verd, Blau, Magenta, Vermell, Blau, Negre

PREGUNTES DE DESENVOLUPAMENT

1. En el supòsit pràctic descrit, el realitzador requereix poder fer moviments amb dues càmeres a l'hora, ja sigui de les sis comandades a distància o de les dues de lloguer. Enumera l'equip humà de vídeo imprescindible per a dur a terme la producció de l'acte i descriu les funcions que desenvolupa cada persona.



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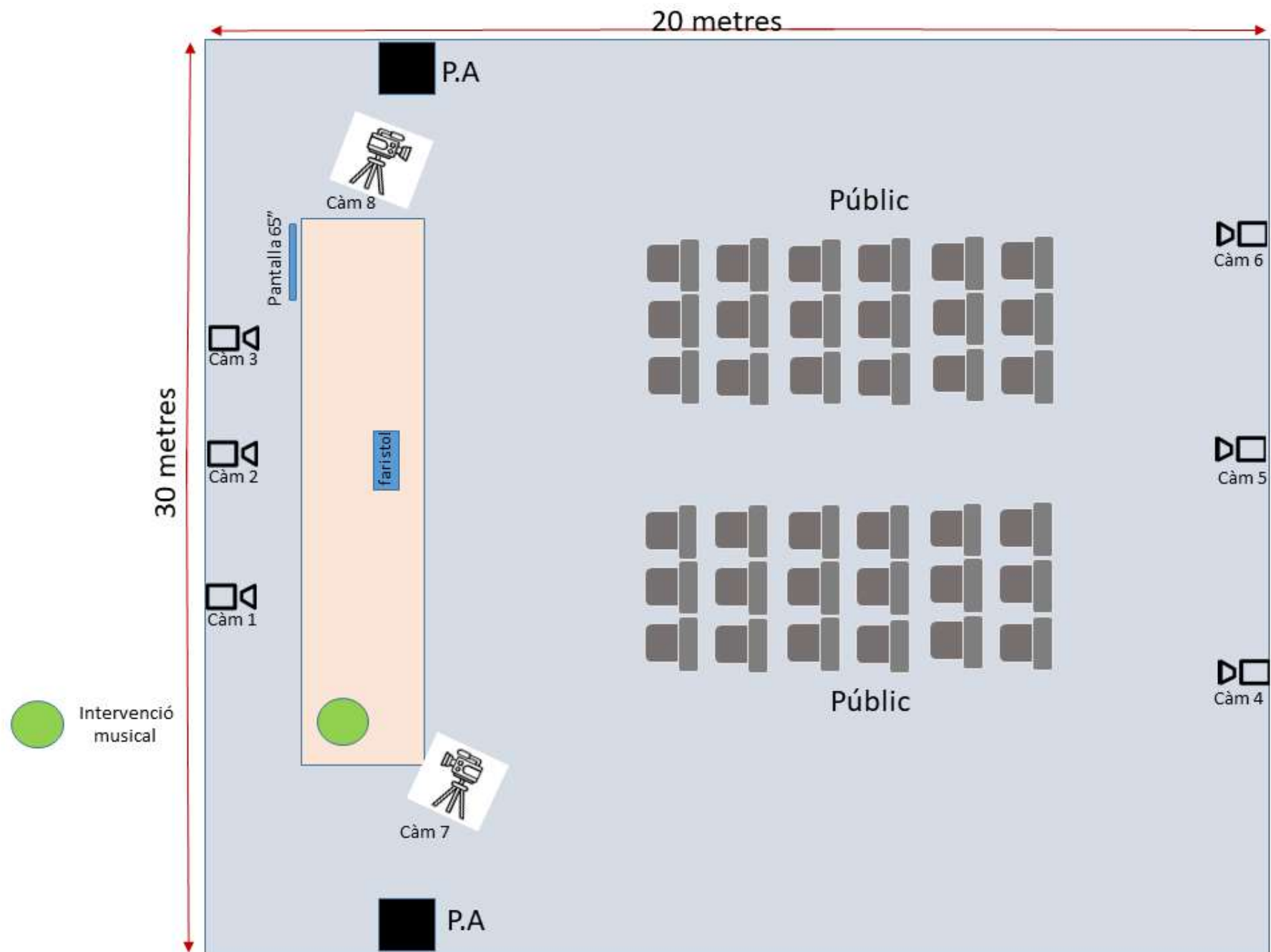
CODI DE BARRES DE L'ASPIRANT

2. Descriu com faries l'ajust de colorimetria de les càmeres.

3. El senyal d'àudio de la videoconferència s'extreu des d'un ordinador que té una sortida analògica TRS de 3'5mm. Enumera quins equips i quin cablejat amb quins connectors són necessaris per a proveir aquest senyal a un mesclador d'àudio amb entrades XLR3 balancejades.
4. Finalment per fer l'actuació musical, s'aplica la tècnica de microfonia M-S. Descriu el significat d'aquestes sigles, quins equips es necessiten i com funciona aquesta tècnica.

ANNEX 1.

CONFIGURACIÓ DE LA SALA



ANNEX 2.

ESPECIFICACIONS TÈCNIQUES D'EQUIPAMENTS

Càmera PANASONIC AW-UE150	Pàg. 3
Càmera PANASONIC AK-UC4000	Pàg. 5
OCP PANASONIC AK-HRP1015GJ	Pàg. 6
Panell PANASONIC RP-150	Pàg. 7
Òptiques FUJINON	Pàg. 8
Convertidor AJA Ha5	Pàg. 9
Convertidor AJA Hi5-Plus	Pàg. 10
Convertidor DATAVIDEO DAC-60	Pàg. 11
Convertidor DATAVIDEO DAC-70	Pàg. 12
Monitor forma d'ona TEKTRONIX WFM-8200	Pàg. 14
Micròfon AUDIO-TECHNICA ES915/C	Pàg. 17

Specifications

AW-UE150W/K

<GENERAL>

Power Requirements:	12 V DC (10.8 V to 13.2 V)
PoE++:	IEEE802.3bt standard: DC 42 V to 57 V (Camera Input)
Current Consumption:	4.0 A (XLR IN connector), 1.2 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. 4.2 kg (9.24 lb) (excluding mount bracket)
Dimensions (W x H x D):	213 mm x 267 mm x 219 mm (8-3/8 inches x 10-1/2 inches x 8-5/8 inches) (excluding protrusions, direct ceiling mount bracket)
Finish:	AW-UE150WP/AW-UE150WE: Pearl white AW-UE150KP/AW-UE150KE: Black
Controller Supported:	AW-RP150GJ, AW-RP50*, AK-HRP1000GJ*, AK-HRP1005GJ*

<Camera Unit>

Imaging Sensors:	1-type 4K MOSx1
Lens:	Motorized Optical 20x zoom, F2.8 to F4.5 (f=8.8 mm (11/32 inches) to 176.0 mm (6-15/16 inches); 35 mm (1-3/8 inches) equivalent: 24.5 mm (31/32 inches) to 490.0 mm (19-9/32 inches))
Zoom:	• Optical zoom: 20x • i.Zoom: UHD 24x, FHD 32x • Digital zoom: 10x
Conversion Lens:	Not supported
Angle of View Range:	Horizontal angle of view: 75.1° (wide) to 4.0° (tele) Vertical angle of view: 46.7° (wide) to 2.3° (tele) Diagonal angle of view: 82.8° (wide) to 4.6° (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: 1000 mm (3.3 ft) Wide end: 100 mm (0.33 ft)
Color Separation Optical System:	1MOS
Standard Sensitivity:	F9, 2000 lx (When normal mode is selected)
Minimum Illumination:	2 lx (F2.8, 59.94p, 50IRE, 42 dB, without accumulation)
S/N:	60 dB or more
Horizontal Resolution:	1600 TV lines Typ (Center area)
Gain Selection:	Auto, 0 dB to 36 dB** Super Gain function equipped : 37 dB to 42 dB
Frame Mix**:	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 / FILM REC / VIDEO REC / HLG
White Balance:	ATW : 3200K, 5600K ATW Speed : Normal / Slow / Fast 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:	4K 2160/59.94p, 2160/50p, 2160/29.97p*, 2160/25p*, 2160/24p*, 2160/23.98p* HD 1080/59.94p, 1080/50p, 1080/29.97p*, 1080/29.97PsF, 1080/25p*, 1080/25PsF, 1080/23.98p*, 1080/24p*, 1080/23.98p*, 1080/23.98PsF, 1080/59.94i, 1080/50i, 720/59.94p, 720/50p

<Synchronization System>

Internal / External synchronization (BBS / Tri-level sync)	
<INPUT>	
Input Connector:	DC 12 V IN, G/L IN (BNC) • BBS (Black Burst Sync), tri-level sync supported
<OUTPUT>	
Video Output:	HDMI HDMI 2.0 standard 4:2:2/10bit • HDCP is not supported. • Viera Link is not supported.
	12G-SDI OUT SMPTE 2082-1 standard / 75 Ω (BNC x 1)
	3G-SDI OUT SMPTE292 / 75 Ω (BNC x 1) • Level-A/Level-B supported
	MONI OUT SMPTE292 / 75 Ω (BNC x 1)
	Optical Fiber SFP+ standard Single Fiber • The signal sent is the same as 12G-SDI OUT. • This unit does not support input by optical signals.

<INPUT/OUTPUT>

Input / Output Connector:	LAN LAN connector for IP control (RJ-45)
	RS-422 CONTROL IN RS-422A (RJ-45)
	MIC/LINE input ø 3.5 mm stereo mini jack Input impedance: High impedance • During MIC input Supported mic: Stereo mic (plug-in power, on/off switching via menu) Supply voltage: 2.5 V ± 0.5 V Mic input sensitivity: Approx. -40 dBV ± 3 dBV (0 dB=1 V/Pa, 1 kHz) • During LINE input Input level: Approx. -10 dBV ± 3 dBV

<Pan-tilt Head Unit>

Camera/Pan-tilt Head Control:	IP connecting cable • LAN cable** : (category 5e or above, straight cable / crossover cable) max. 100 m (328 ft) AW protocol connecting cable LAN cable* (category 5e or above, straight cable) max. 1000 m (3280 ft)
Installation Method:	Stand-alone (Desktop) or suspended (Hanging)**
Pan/tilt Operation Speed:	Minimum speed 0.08°/s Maximum speed 60°/s or higher** • Maximum speed is 180°/s in high-speed mode
Panning Range:	±175°
Tilting range:	-30° to 210°**
Quietness:	NC35 or less

<Supported operating systems and web browsers**>

Supported operating systems and web browsers:	Windows Microsoft® Windows® 7, 10 Windows® Internet Explorer® 11 (64-bit/32-bit) Microsoft Edge Google Chrome
	Mac Mac OS 10.13, Mac OS 10.12, Mac OS 10.11, Safari 11, Google Chrome
	iPhone / iPad iOS 11.4.1 Google Chrome

<IP Streaming>

Image Streaming Mode:	JPEG (MJPEG), H.264, H.265
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):	■ Image quality (Motion priority / Image quality priority) UHD 60 fps / 50 fps ■ Transmission Type: Unicast port (AUTO) Unicast port (MANUAL) Multicast port ■ Transmission Priority Constant bit rate Frame rate Best effort

**Image Transmission
Setting (H.264):**

- Frame Rate
[60Hz]
5fps/15fps/30fps/60fps (UHD: 30fps, 60fps)
[50Hz]
5fps/12.5fps/25fps/50fps (UHD: 25fps, 50fps)
- Max Bit Rate
HD : 512kbps/768kbps/1024kbps/1536kbps/2048kbps/
3072kbps/4096kbps/6144kbps/8192kbps/10240kbps/
12288kbps/14336kbps/16384kbps/20480kbps/24576kbps/
32768kbps/40960kbps/51200kbps/76800kbps
UHD : 12800kbps/25600kbps/51700kbps/76800kbps

**Image Transmission
Setting (H.265):**

- Image Transmission Type:
Unicast port (AUTO)
Unicast port (MANUAL)
Multicast port
- Frame Rate
[60Hz] 30fps
[50Hz] 25fps
- Max Bit Rate
8192kbps/12800kbps/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
 ■ IPv4 : TCP / IP, UDP / IP, HTTP, HTTPS, RTSP, RTP / RTCP, DHCP, DNS, DDNS, NTP, UPnP, IGMP, ICMP, ARP, RTMP

<Other Function>NDI support^{*12}: NDI | HX

Tally LED display color: red / green

^{*1}: Use may require a software version update. ^{*2}: 1 dB step increments can be set. ^{*3}: 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. ^{*4}: Native output. ^{*5}: It denotes "1080/23.98p over 59.94i". ^{*6}: Use of an STP (shielded twisted pair) cable is recommended. ^{*7}: Category 6 or more is used when sending 4K images. ^{*8}: To ensure safety, the unit must be secured using the mount bracket supplied. ^{*9}: Quietness, stationary accuracy, etc., in high-speed mode may vary from normal mode. ^{*10}: Depending on the pan or tilt position, the camera may be reflected in the image. ^{*11}: Supported OS indicated are for browsers current as of October 2018. See "Service and Support / PASS" on the Panasonic website (<https://pro-av.panasonic.net/en/>) for the latest information on browser support. ^{*12}: Contact your local Panasonic vendor for further information.

Specifications

As of April, 2022

AK-UC4000GJ/UC4000GSJ

Power Supply	DC 12 V (when using an external power supply) AC 240 V, 50 Hz/60 Hz (when connecting to an AK-UCU600PJ/ AK-UCU600EJ/AK-UCU600PSJ/AK-UCU600ESJ)
Power Consumption	119 W (maximum for the camera only, when connecting to an external 12 V) 360 W (when connecting to an AK- UCU600PJ/AK-UCU600EJ/AK-UCU600PSJ/AK-UCU600ESJ)
Operating Temperature	-10 °C to 45 °C (14 °F to 113 °F) (Preheating required under a temperature 0 °C (32 °F) or below)
Storage Temperature	-20 °C to 60 °C (-4 °F to 140 °F)
Operating Humidity	85% or less (relative humidity)
Weight	Approx. 4.5 kg (9.90 lb) (body only)
Dimensions (W x H x D)	Body only 151 mm x 267 mm x 371.5 mm (5-31/32 inches x 10-17/32 inches x 14-21/32 inches) (excluding protrusions)
Pickup Device	11.14 million pixels, MOS x 1
Optical Filter	CC: 3200 K, 4300 K, 6300 K, Cross, Diffusion ND: CAP, Clear, 1/4, 1/16, 1/64
Lens mount	2/3-type bayonet
Sensitivity	Two shooting modes [HIGH SENS]: F10 (59.94 Hz)/F11 (50 Hz) [NORMAL]: F6 (59.94 Hz)/F7 (50 Hz) 2000 lx, 3200 K, when white reflectivity is 89.9%
Horizontal Resolution	4K: 2000 TV lines or above (center) AK-UCU600PJ/AK-UCU600EJ/AK-UCU600PSJ/ AK-UCU600ESJ output HD: 1000 TV lines or above (center)
S/N	62 dB or above
Horizontal Modulation	50% or above (27.5 MHz)
Gain switching	[NORMAL]: -6, -3, 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36 [HIGH SENS]: -6, -3, 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36
Shutter speed	•[59.94i]/[59.94p] mode: 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[29.97p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[23.98p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[50i]/[50p] mode: 1/60, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000 •[25p] mode: 1/48, 1/50, 1/60, 1/96, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/1500, 1/2000
<HD-SDI1> terminal	BNC x 1 3G/1.5G-SDI: 0.8 V [p-p], 75 Ω
<HD-SDI2> terminal	BNC x 1 3G/1.5G-SDI: 0.8 V [p-p], 75 Ω
<AUX> terminal	BNC x 1 Functions as <HD TRUNK> terminal/<PROMPTER2> terminal by switching the setting in the menu <HD TRUNK>: 1.5G-SDI: 0.8 V [p-p], 75 Ω <PROMPTER2>: VBS signal 1 V [p-p], 75 Ω
<G/L IN/PROMPTER OUT> terminal	BNC x 1 <G/L IN>: Tri-level SYNC or BB (black burst) <PROMPTER OUT>: VBS signal 1 V [p-p], 75 Ω Functions as <G/L IN> when standalone, and as <PROMPTER OUT> when connecting to an AK-UCU600PJ/AK-UCU600EJ/AK-UCU600PSJ/ AK-UCU600ESJ
<MIC 1> terminal	XLR x 1, 3-pin (female) <LINE>/<MIC>/<+48 V> switchable For <MIC>, <FRONT>/<REAR> switchable <LINE>: 0 dBu, +4 dBu menu selection available <MIC>: -60 dBu, -40 dBu, or -20 dBu menu can be selected
<MIC 2> terminal	XLR x 1, 3-pin (female) <LINE>/<MIC>/<-48V> switchable <LINE>: 0 dBu, +4 dBu menu selection available <MIC>: -60 dBu, -40 dBu, or -20 dBu menu can be selected
<MIC> terminal (front)	XLR x 1, 3-pin (female) Switchable with <MIC 1> terminal
<INTERCOM1> terminal	XLR x 1, 5-pin (female)
<INTERCOM2> terminal	XLR x 1, 5-pin (female)
<EARPHONE> terminal	Stereo mini jack x 1
<OPT FIBER> terminal	Optical composite connector x 1, Tajimi/LEMO
<LENS> terminal	12-pin x 1
<VF> terminal	20-pin x 1

<VF> terminal (rear)	29-pin x 1
<DC IN> terminal	XLR x 1, 4-pin, DC 12 V
<DC OUT 12 V 1 A> terminal	4-pin x 1
<RET CTRL> terminal	6-pin x 1
<EXT I/O> terminal	20-pin x 1, DC 12 V 0.5 A
<REMOTE> terminal	10-pin x 1
<TRUNK> terminal	12-pin x 1
<DC OUT> terminal	2-pin x 1, DC 12 V 2.5 A
<LAN> terminal	RJ-45 x 1
<USB2.0> terminal (host)	Type A connector, DC 5 V 0.5 A
Build-up terminal	20-pin x 1

AK-HRP1015GJ



Compact operation panels that support IP control and PoE*¹ power supply.

- Camera serial control and IP control are possible. Panasonic 4K/HD Integrated Cameras are supported*².
- Equipped with joystick control lever. IRIS/PEDESTAL operation is possible.
- Equipped with scene file function.
- Equipped with SD memory card slot. Saving of user files and firmware version updates are supported.
- IP connection and PoE*¹ power supply are supported.

*1: Abbreviation of Power over Ethernet.

*2: For information on the AK-HRP250GJ and 4K/HD Integrated Camera support, please refer the page.

AW-RP150GJ

<GENERAL>

Power Requirements:	12 V DC (10.8 V to 13.2 V)
PoE+:	IEEE802.3at standard: DC 42 V to 57 V (Camera Input)
Current Consumption:	1.0 A (Connector Input) 0.6 A (PoE+ power supply)
Ambient Operating Temperature:	0 °C to 40 °C (32 °F to 104 °F)
Allowable Humidity:	20% to 90% (no condensation)
Storage Temperature:	-20 °C to 50 °C (-4 °F to 122 °F)
Weight:	Approx. 3.2 kg (7.05 lb)
Dimensions (W x H x D):	342 mm x 178 mm x 245 mm (13-15/32 inches x 7 inches x 9-21/32 inches) (excluding protrusions)
Connection Supported Equipment:	IP/RS422 AW-UE150W/K, AW-HR140*, AW-HE130W/K*, AW-HN130W/K*, AW-UE70W/K*, AW-UN70W/K*, AW-HE40 Series*, AW-HN40HW/HK*, AW-HE38HW/HK*, AW-HN38HW/HK*

<Input/Output Connectors>

Input:	DC 12 V IN XLR 4-pin
	3G-SDI IN SMPTE292 / 75 Ω (BNC x 1) Supported formats: 1080/59.94p*, 1080/50p*, 1080/59.94i, 1080/50i, 1080/23.98p, 1080/25p, 1080/23.98pSF, 1080/25PsF
Output:	ACTIVE THRU OUT SMPTE292 / 75 Ω (BNC x 1)
Input/Output:	IP CONT 100BASE-TX PoE+ input Connection cable: LAN cable, max. 100 m (328 ft) • When connecting the unit via a switching hub: Straight cable or a cross cable (category 5 cable), STP (Shielded Twisted Pair) cable recommended • When connecting the unit directly: Crossover cable (category 5 cable), STP (Shielded Twisted Pair) cable recommended
	SERIAL CONT RS-422 (control signals for remote cameras), TALLY OUT (RJ-45): Connecting cable: Straight cable (category 5e or better shielded cable), max. 1000 m (3280 ft)
	TALLY OUT: Open collector output (negative logic) Maximum voltage resistance DC 24 V, Maximum current 50 mA

Input/Output:	TALLY/ GPIO 1 D-sub 25-pin, female, inch thread TALLY IN : 10 inputs (for receiving photocoupler signals) GPIO : 6 inputs (for receiving photocoupler signals) GPIO : 5 inputs (for receiving photocoupler signals) or 5 outputs (open collector outputs, negative logic) • Input/output switched with menu settings
	GPIO 2 D-sub 25-pin, female, inch thread GPIO : 10 inputs (for receiving photocoupler signals) GPIO : 10 inputs (for receiving photocoupler signals) or 10 outputs (open collector outputs, negative logic) • Input/output switched with menu settings Reserve connectors: 2 connectors (For future expansion feature)
LCD Display:	7-inch Touch Panel GUI Monitor (WVGA (800x480))
SD Memory Card Slot :	SDHC / SDXC Memory Card Slot x 1

<Connection Specifications >

No. of Connectable Cameras:	200 (IP), 5 (RS422)
No. of Camera Selection Buttons:	10
No. of Camera Groups:	20 (10 units per 1 group)
<Memory>	
Preset Memory:	No. of memory presets 100
Tracing Memory:	No. of cameras Cam1 to Cam10 Recording time, no. of memory settings Maximum 5 min. total per camera, maximum of 10 settings per camera

<Other Functions>

No. of User Assignable Buttons:	6 + up to 10 on the LCD menu
Pan / Tilt Speed Adjustment:	7 levels
Tally LED Display Color:	green / red

*1: Connection with the AW-RP150GJ is planned for future support. Contact your sales representative for further information on when support will be available for this feature. Use may require a software version update. *2: Level-A support only.



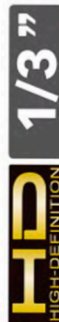
Model Name	
Focal Length	(1x)/(2x)
Zoom Ratio	4.5-54mm / 9-108mm
Extender	12 x
Maximum Relative Aperture (F-No.)	2 x
Minimum Object Distance (M.O.D.) from Front Lens	1 : 1.8 (4.5-41mm) 1 : 2.4 (54mm)
Object Dimensions at M.O.D.	0.3m
16 : 9 Aspect Ratio	(1x) 4.5mm 757 x 425mm 9mm 373 x 210mm
Angular Field of View	(2x) 54mm 59 x 33mm 108mm 31 x 17mm
16 : 9 Aspect Ratio	(1x) 4.5mm 93.6° x 61.8° 9mm 56.1° x 33.3°
Filter Thread	54mm 10.1° x 5.7° 108mm 5.1° x 2.9°
Approx. Size	M127 x 0.75 (Filter attaches to the lens hood.)
Approx. Mass	Ø95 x 237.5mm(ØxLength) 2.07kg (without lens hood)

*BRM/BRD type are also available. For more information

ZA22x7.6BERD	
Focal Length	7.6-167mm / 15.2-334mm
Zoom Ratio	22 x
Extender	2 x
Maximum Relative Aperture (F-No.)	1 : 1.8 (7.6-120mm) 1 : 2.5 (167mm)
Minimum Object Distance (M.O.D.) from Front Lens	0.8m
Object Dimensions at M.O.D.	(1x) 7.6mm 915 x 514mm (2x) 15.2mm 473 x 266mm
16 : 9 Aspect Ratio	167mm 43 x 24mm 334mm 22 x 12mm
Angular Field of View	(1x) 7.6mm 64.5° x 39° (2x) 15.2mm 35° x 20.1°
16 : 9 Aspect Ratio	167mm 3.3° x 1.8° 334mm 1.6° x 0.9°
Filter Thread	M95x1 / M107x1 (Filter attaches to the lens hood.)
Approx. Size	Ø100 x 220.4mm(ØxLength)
Approx. Mass	1.92kg (without lens hood)



1/3" Series



Model Name	
Focal Length	(1x)/(2x)
Zoom Ratio	4.5-77mm / -
Extender	17 x
Maximum Relative Aperture (F-No.)	-
Minimum Object Distance (M.O.D.) from Front Lens	1 : 1.6 (4.5-77mm)
Object Dimensions at M.O.D.	0.95m
16 : 9 Aspect Ratio	(1x) 4.5mm 999 x 562mm (2x) 999 x 562mm
Angular Field of View	77mm 60 x 34mm -
16 : 9 Aspect Ratio	(1x) 4.5mm 60.3° x 36.2° (2x) 4.5mm 30.1° x 18.1°
Filter Thread	77mm 3.9° x 2.2° -
Approx. Size	M82 x 0.75
Approx. Mass	Ø85 x 175.6mm(ØxLength) 1.28kg (without lens hood)



XT20sx4.7BRM	
Focal Length	4.7-94mm / -
Zoom Ratio	20 x
Extender	-
Maximum Relative Aperture (F-No.)	1 : 1.4 (4.7-88mm) 1 : 1.5 (94mm)
Minimum Object Distance (M.O.D.) from Front Lens	0.9m
Object Dimensions at M.O.D.	(1x) 4.7mm 901 x 506mm (2x) 901 x 506mm
16 : 9 Aspect Ratio	94mm 47 x 26mm -
Angular Field of View	(1x) 4.7mm 58.2° x 34.7° (2x) 4.7mm 29.1° x 17.3°
16 : 9 Aspect Ratio	94mm 3.2° x 1.8° -
Filter Thread	M82 x 0.75
Approx. Size	Ø85 x 189.8mm(ØxLength)
Approx. Mass	1.48kg (without lens hood)



HA5

The HA5 converts HDMI to SDI or HD-SDI. Up to eight channels of HDMI audio are embedded into the SD/HD-SDI output allowing a convenient single cable audio/video connection. The HA5 provides two SD/HD-SDI outputs and supports long HDMI cables on the input. The HA5 is useful for connecting HDMI cameras to SD/HD-SDI equipment.

\$ US MSRP

<https://www.aja.com/products/ha5>

Video Formats

- (HD) 1080p 23.98, 24, 25, 29.97, 30
- (HD) 1080i 50, 59.94, 60
- (HD) 720p 50, 59.94, 60
- (SD) 625i, 525i

Input

- HDMI with embedded audio

Outputs

- SMPTE-259/292/296 SDI/HD-SDI, 2 x BNC

Size (w x d x h)

- 4.6" x 2.4" x 1" (117mm x 61mm x 25mm)

Power

- +5VDC Regulated, 4 watts, power supply required (included with purchase)

Environment

- Safe Operating Temperature: 0 to 40 degrees C (32 to 104 degrees F)
- Safe Storage Temperature (Power OFF): -40 to 60 degrees C (-40 to 140 degrees F)
- Operating Relative Humidity: 10-90% noncondensing
- Operating Altitude: <3,000 meters (<10,000 feet)



Hi5-Plus

Bring HDMI and 3G-SDI devices together for a full range of monitoring and recording solutions in the edit suite, on set or at live events. Convenient USB setup using AJA MiniConfig on Mac or PC for easy remote configuration.

\$505 US MSRP

<https://www.aja.com/products/hi5-plus>

Video Formats

- (2K) 2K x 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (2K) 2K x 1080PsF* 23.98, 24, 25, 29.97, 30
- (HD) 1080i 50, 59.94, 60
- (HD) 1080p 23.98, 24, 25, 29.97, 30, 50, 59.94, 60
- (HD) 1080PsF* 23.98, 24, 25, 29.97, 30
- (HD) 720p 50, 59.94, 60
- (SD) 625i
- (SD) 525i

*NOTE: converts to progressive

Video Input

- 3G-SDI with embedded audio

Video Outputs

- HDMI with embedded audio up to 8-Channels (selectable by Mini-Config)
- 8-bit RGB 4:4:4
- 10-bit YCbCr 4:2:2
- 12-bit

Audio Input

- SDI embedded audio, select from 16-Channels

Audio Output

- 2-Channel RCA style (-10dBu nominal)

Size (w x d x h)

- 4.6" x 2.4" x 1.0" (117mm x 61mm x 25mm)

Power

- Uses AJA power supply model DWP-U-R1, included with purchase
- 100-240V, 50/60 Hz universal input
- +5V DC regulated, 7.5 watt capacity

Environment

- Safe Operating Temperature: 0 to 40 degrees C (32 to 104 degrees F)
- Safe Storage Temperature (Power OFF): -40 to 60 degrees C (-40 to 140 degrees F)
- Operating Relative Humidity: 10-90% noncondensing
- Operating Altitude: <3,000 meters (<10,000 feet)

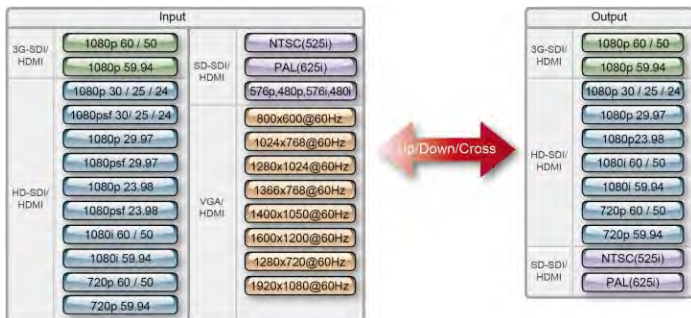
Datavideo DAC-60 specifications

Supported Input Video Formats	SD - 720 x 480 i / 720 x 576 i HD - 1280 x 720 50p/60p/59.94p 1920 x 1080 50i/60i/59.94i 1920 x 1080 24p/25p/30p 3G - 1920 x 1080 50p/60p/59.94p
SDI Formats	SD-SDI (SMPTE 259M) HD-SDI (SMPTE 292M) 3G-SDI (SMPTE 494M/495M)
VGA Output Formats	800 x 600 1024 x 768(XGA projector) 1280 x 800(WXGA projector) 1280 x 1024 1366 x 768 1400 x 1050 1600 x 1200 1920 x 1080 1920 x 1200(WUXGA projector)
Re-clock Function	Yes (Default)
Firmware Updates	USB
Software Support	Yes (OS: Windows XP/ Windows 7)
Coaxial Cable Type	RG6/RG59 (75Ω)
Cable Equalization	3G: 140m of RG6/ 100m of RG59 HD: 200m of RG6/ 140m of RG59 SD: 400m of RG6/ 280m of RG59
Input Connections	1 x BNC [SDI]
Output Connections	1 x VGA 1 x BNC [SDI]
BNC Connectors	3G 75 Ω inter-locked socket
Button	VGA Format Switching
Power Source	AC 100 ~ 240 V / DC (12V/3.6W)

Datavideo DAC-70 specifications

Input	VGA x 1 HDMI x 1 HD/SD-SDI x 1 Analog Audio L/R
Output	SDI x 2 HDMI x 1 SDI Loop thru BNC (front panel)
Micro USB	Firmware upgrade Aspect ratio mode selection
Video Input Format	SDI (YUV) 1080p60/59.94/50, 1080p30/29.97/25/24/23.98 1080psf30/29.97/25/24/23.98 1080i60/59.94/50, , 720p60/59.94/50 525i, 625i HDMI (YUV / RGB) 1080p60/59.94/50, 1080p30/29.97/25/24/23.98 1080psf30/29.97/25/24/23.98 1080i60/59.94/50, 720p60/59.94/50 480p, 576p, 480i, 576i 800x600@60Hz, 1024x768@60Hz, 1280x1024@60Hz 1366x768@60Hz, 1400x1050@60Hz, 1600x1200@60Hz VGA (RGB) 800x600@60Hz, 1024x768@60Hz, 1280x1024@60Hz 1366x768@60Hz, 1400x1050@60Hz, 1600x1200@60Hz 1280x720@60Hz, 1920x1080@60Hz
Video Output Format	SDI / HDMI 1080p60/59.94/50, 1080p30/29.97/25/24/23.98 1080i60/59.94/50, 720p60/59.94/50 525i, 625i

Audio Format	Input Analog Audio L/R : stereo audio SDI / HDMI embedded audio up to 8CH, 48KHz, PCM audio HDMI embedded audio up to 8CH, 44.1/48/96KHz, PCM audio Output SDI embedded audio up to 8CH, 48KHz, PCM audio HDMI embedded audio up to 8CH, 48KHz, PCM audio
Operating Temperature	0~40°C [32~104°F]
Storage Temperature	-10~ +60°C
Dimensions	144.8mm(L) x 85mm(W) x 45.2mm(H)
Weight	0.4 kg
Certifications	CE/FCC



Getting started

This chapter will help you set up and begin to use the WFM8200 and WFM8300 Waveform Monitors. It is divided into the following four sections:

- **Key features** describes your instrument and provides a list of key features.
- **Accessories** shows you how to verify that you have received all of the parts of your instrument and provides a list of standard and optional accessories and a list of options that are available for your instrument.
- **Network installation** shows you how to set up your instrument on an Ethernet network.
- **Incoming inspection** provides a procedure for verifying the basic operation and functionality of your instrument.

Key features

The WFM8200 and WFM8300 Waveform Monitors are baseband monitors that provide comprehensive video, audio, embedded data, and physical layer monitoring and measuring features across a broad range of signal formats, including 4K/UHDTV1 (4096×2160 and 3840×2160), 3 Gb/s, Dual Link, SD, HD, and composite.

This instrument is a reference measurement tool that can be used in the design and manufacture of production equipment. It provides the precision and intuitive monitoring capabilities necessary to standardize and maintain a signal through the distribution system to the viewer.

Your instrument provides comprehensive support for physical layer measurements and newer high definition digital production formats. It can provide a warning of any deviation from accepted standards or possible signal incompatibilities, and allows you to immediately evaluate the effect of any adjustment. The key features of your instrument make it an easy to use, flexible, and effective tool. (See Table 1.)

Table 1: Key features

Item	Description
FlexVu™ display	The FlexVu™ display is a four-tiled, high-resolution XGA display that provides four concurrent views of a monitored signal. The instrument also provides the flexibility to configure each of the four display tiles independently, enabling you to quickly check the integrity of a signal. In SIM mode, the FlexVu™ display allows for the monitoring of two signals at the same time, dividing the display into two sides; one for each signal.
CaptureVu™	The CaptureVu™ capability allows capture of a full frame of video data, either user-initiated or triggered by an alarm condition.
Multi-Input display	The Multi-Input display mode allows you to simultaneously view up to four SDI inputs of the same format. The feature is available in Waveform, Vector, Lightning, Diamond, Split Diamond, Arrowhead, and Spearhead displays. If you are monitoring a 2xHD Level B 3 Gb/s signal, you can select to view the streams of that signal individually.
Presets	Customizable presets allow you to quickly save and recall commonly used configurations.
Digital and analog support	Support for digital applications. Analog support is available with optional composite-analog monitoring (Option CPS).
Fully digital processing	Fully Digital Processing allows for accurate, repeatable, drift-free operation that surpasses traditional analog designs.
Waveform display	Traditional waveform displays allow signals to be overlaid or paraded. This display type allows you to use the Multi-Input display feature.
Vector display	Vector display with Composite and Component Compass Rose Graticules, and gain, sweep, and magnification controls. Traditional and Lightning Vector displays are available. The latter visualizes both luma and chroma amplitudes, and quantifies inter-channel timing. This display type allows you to use the Multi-Input display feature.
Luma qualified vector display	Vector display that is gated by a specified luminance range. Each vector tile may have a different luminance range specified. This display type allows you to use the Multi-Input display feature.
Infinite Persistence	All trace displays can also be set, tile by tile, to Infinite Persistence. This mode traces waveforms over time on the same display, providing a visual history of the trace.
Gamut monitoring	Arrowhead, Spearhead, Diamond, and Split Diamond displays offer user-selectable gamut thresholds so that you can set monitoring limits appropriate to a specific operation. Gamut monitoring is fully integrated with the alarm logging and reporting capabilities. This display type allows you to use the Multi-Input display feature.
LTC waveform displays	Longitudinal Time Code (LTC) is monitored in a frame rate display to allow observation of amplitude, synchronization and phase with respect to reference vertical interval time code (VITC).
4K format support (Requires Options 4K, 3G and 2SDI)	Support for UHD TV1 (3840×2160) and 4K (4096×2160) video formats.

Table 1: Key features (cont.)

Item	Description
Audio monitoring (Requires Option AD or DPE)	Surround Sound display of audio signals and phase relationships of normal channel pairs. Lissajous display lets you monitor a user-specified pairing of channel inputs. Support and options for viewing and monitoring both levels of normal channel pairs for AES, analog, embedded audio, and Dolby signals. Loudness measurement, audio control packet coding, and many popular audio scales, including BBC scales, are also supported. Displays selected Dolby Metadata parameters present in the Dolby D, Dolby Digital Plus, and Dolby E bitstream. Displays Dolby E Guardband measurements.
Auxiliary data monitoring	Support for monitoring auxiliary data including data conforming to ARIB standards and CEA608, CEA708, AFD, and CGMS-A.
Audio Video Delay (Requires Option AVD)	Measures the duration that the video system advances or delays the audio signal relative to its correct temporal position.
Timing display	A Tektronix proprietary display that simplifies measuring the timing difference between two signals. Using the Timing display enables you to easily compare and correct the timing between two signals.
Closed Captioning support	Support for simultaneous decode and display in multiple languages of CC standards (CEA 608 (VBI), CEA 608 (ANC), CEA (608/708), CEA 708, TeletextB (VBI), TeletextB OP47 SDP (ANC), and TeletextB OP47 Multi (ANC)) with caption text and V-chip information overlaid on the picture (monitor mode). There are also settings for missing or incorrectly inserted closed captioning.
Picture area	Support for standard and custom Safe Graticules for Picture displays that look for incorrect placements of graphics, logos, Black events, and Frozen events. Two Safe Area graticules and Safe Title graticules are supported.
Status screens	Status screens provide content status at a glance.
Physical measurements (Requires Option EYE, PHY, or PHY3)	Verification and automatic measurement of the electrical characteristics of the SDI physical layer. An Eye display lets you use the graticule or voltage and time cursors to measure the waveform. A Jitter waveform display shows jitter and jitter thermometers provide two independent measurements of jitter and one of cable loss, and relates those measurements to defined alarm limits. Waveforms can also be set, tile by tile, to Infinite Persistence. This mode traces waveforms over time on the same display, providing a visual history of the trace.
Error tracking	Configurable alarms and error logging.
Remote control	Full remote control for complete installation flexibility.
Data List display	Examines the contents of all digital formats, structures, and transports and displays the data without any interpolation.
Ancillary data inspector	Allows you to monitor all ancillary data present in a signal.
Simultaneous Input mode	Displays two separate signals simultaneously, allowing you to easily view two signal displays, side by side.
SyncVu™	The SyncVu™ feature allows you to identically configure two inputs at the same time when the instrument is in simultaneous input mode.

Engineered Sound®

[Description]

The ES915/C is a wide-range condenser microphone with a cardioid polar pattern. It is designed for quality sound reinforcement, professional recording, television and other demanding sound pickup applications. The small-diameter, alternating adjustable-length gooseneck design permits highly flexible positioning while maintaining a smooth, well-contoured appearance. An included snap-on foam windscreen effectively reduces noise from wind or ventilation air currents.

The cardioid polar pattern provides a 120° angle of acceptance. Additional interchangeable elements with hypercardioid (100°) and MicroLine® (90°) pickup patterns are available.

The integral power module can be powered from any external 11V to 52V DC phantom power supply. A recessed switch in the power module permits choice of flat response or low-frequency roll-off to help control undesired ambient noise.

The microphone is enclosed in a rugged housing with a low-reflectance black finish. It features an XLRM-type connector insert at its base, allowing it to be plugged directly into an XLRF-type panel jack or microphone cable. In addition to an AT8658 heavy-duty shock mount, an AT8651 thread-mount adapter is included to permit attachment of the XLR mic base to a standard 5/8"-27 threaded mic stand or mounting flange.

[Installation and Operation]

Output is low impedance balanced. The output connector mates with XLRF-type cable connectors. The balanced signal appears across Pins 2 and 3, while the ground (shield) connection is Pin 1. Output is phased so that positive acoustic pressure produces positive voltage at Pin 2, in accordance with industry convention.

The microphone can be mounted on a podium or desktop with the included AT8658 shock mount. A special isolator attenuates noise, shock and vibration transmitted through the mounting surface. Installation details are provided on the back of this sheet.

The microphone can also be mounted using the AT8651 mounting adapter. The microphone inserts directly into the XLRF-type connector end of the adapter, while the other end is 5/8"-27 threaded to allow connection to a standard microphone desk/floor stand, or a mounting flange on a podium or desktop. To install: Disassemble the XLRF insert from the adapter body. Route the mic cable (2-conductor shielded, not supplied) either through the side hole or from the bottom of the adapter body. If the side hole is used, the diameter of

the cable should be 0.2" (5 mm) maximum. Solder the conductors to the XLRF insert using Pin 1 as ground (shield), Pin 2 as positive (signal hot), and Pin 3 as negative (signal common). Reassemble the adapter mount and test the wiring.

The provided snap-on foam windscreen simply slips over the element, effectively reducing wind noise or "popping" when used extra close.

The small-diameter goosenecks are easy to manipulate for proper positioning. Heavily lubricated, they operate smoothly and quietly. Should the unit become noisy with prolonged use, apply a light machine oil directly on the gooseneck area affected.

While a modern condenser microphone is not unduly sensitive to the environment, temperature extremes can be harmful. Exposure to high temperature can result in gradual and permanent reduction of the output level. Avoid leaving the microphone in the open sun or in areas where temperatures exceed 110° F (43° C) for long periods of time. Extremely high humidity should also be avoided.

[Architects and Engineers Specifications]

The microphone shall be a fixed-charge condenser with a frequency response of 30 Hz to 20,000 Hz and a cardioid polar pattern with uniform 120° angle of acceptance. It shall be capable of accepting optional interchangeable elements for additional polar patterns. It shall operate from an external 11V to 52V DC phantom power source. It shall be capable of handling sound input levels up to 138 dB with a dynamic range of 109 dB. Nominal open-circuit output voltage shall be 10.0 mV at 1 kHz, 1 Pascal. Output shall be low impedance balanced (250 ohms).

The microphone shall be a small-diameter alternating gooseneck design with an integral adjustable-length section. The entire mechanical assembly shall operate smoothly and quietly for positioning.

The microphone shall have a self-contained power module with an XLRM-type connector at the base for direct connection to a mating XLRF-type panel jack or cable connector. The power module shall include a recessed switch for low-frequency roll-off. A shock mount shall be supplied for mounting in a solid surface. An included mounting adapter shall permit attaching the microphone directly to a standard 5/8"-27 thread. A snap-on foam windscreen shall also be included.

The microphone's overall length shall be adjustable from 13.98" (355.0 mm) to 16.73" (425.0 mm). Head diameter shall be 0.33" (8.4 mm). The microphone weight shall be 4.4 oz (125 grams). Finish shall be low-reflectance black.

The Audio-Technica ES915/C is specified.

ES915/C Cardioid Condenser Adjustable-length Gooseneck Microphone



audio-technica®

[ES915/C Specifications†]

Element	Fixed-charge back plate permanently polarized condenser
Polar Pattern	Cardioid
Frequency Response	30-20,000 Hz
Low-frequency Roll-off	80 Hz, 12 dB/octave
Open Circuit Sensitivity	-40 dB (10.0 mV) re 1V at 1 Pa*
Impedance	250 ohms
Maximum Input Sound Level	138 dB SPL, 1 kHz at 1% T.H.D.
Dynamic Range (Typical)	109 dB, 1 kHz at Max SPL
Signal-to-noise Ratio†	65 dB, 1 kHz at 1 Pa*
Switch	Flat response, low-roll-off (recessed)
Phantom Power Requirements	11-52V DC, 4 mA typical
Weight	4.4 oz (125 grams)

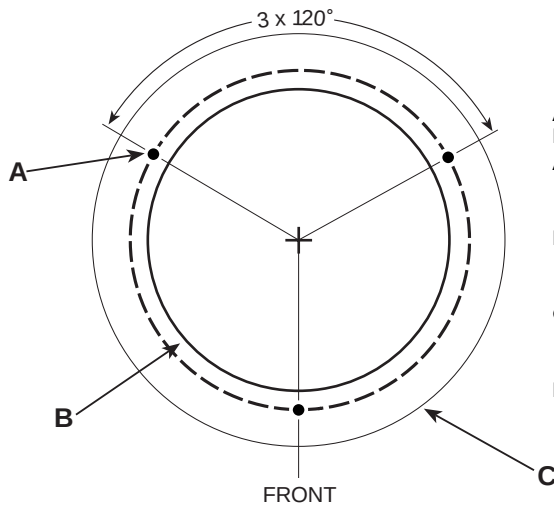
Dimensions	13.98" (355.0 mm) to 16.73" (425.0 mm) long, 0.33" (8.4 mm) head diameter, 0.74" (18.9 mm) base diameter
Output Connector	Integral 3-pin XLRM-type
Accessories Furnished	AT8109 snap-on foam windscreens; AT8651 thread-mount adapter; AT8658 shock mount
Optional Interchangeable Elements	ESE-H hypercardioid (100°) ESE-ML MicroLine® (90°)

† In the interest of standards development, A.T.U.S. offers full details on its test methods to other industry professionals on request.

* 1 Pascal = 10 dynes/cm² = 10 microbars = 94 dB SPL

† Typical, A-weighted, using Audio Precision System One. Specifications are subject to change without notice.

[Shock Mount Installation]



AT8658 Mounting Dimensions
A. 1/16" (1.5 mm) pilot holes 3 places on 2 1/2" (64 mm) circle.
B. 2 1/4" (57 mm) thru-hole for mount clearance.
C. Outside edge of flange, 3.07" (78 mm) diameter.
 Drawing not actual size.

1. Locate the center of the mounting location and mark it. **Allow enough clearance to accommodate the shock mount's flange on the desired surface and make certain there are no physical obstructions below the desired location.**
2. Using a 2 1/4" (57 mm) hole saw, drill the large through-hole for the shock mount.
3. Set the shock mount into the hole and mark the location of the three mounting screw holes. **Make certain to "center" the mount in the large hole before marking the three small mounting screw locations.**
4. Using a 1/16" (1.5 mm) drill bit, drill three pilot holes for the mounting screws.
5. After installing the microphone, assure maximum shock mount effectiveness by providing some slack in the connecting cable.

[Visit our Web site at www.audio-technica.com]

One-Year Limited Warranty

Audio-Technica microphones and accessories purchased in the U.S.A. are warranted for one year from date of purchase by Audio-Technica U.S., Inc. (A.T.U.S.) to be free of defects in materials and workmanship. In event of such defect, product will be repaired promptly without charge or, at our option, replaced with a new product of equal or superior value if delivered to A.T.U.S. or an Authorized Service Center, prepaid, together with the sales slip or other proof of purchase date. **Prior approval from A.T.U.S. is required for return.** This warranty excludes defects due to normal wear, abuse, shipping damage, or failure to use product in accordance with instructions. This warranty is void in the event of unauthorized repair or modification.

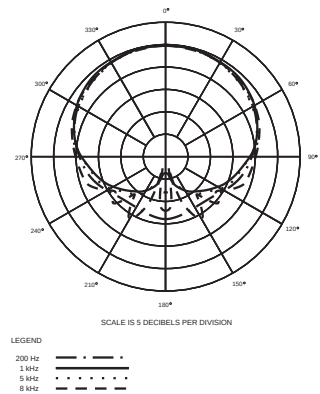
For return approval and shipping information, contact the Service Department, Audio-Technica U.S., Inc., 1221 Commerce Drive, Stow, Ohio 44224.

Except to the extent precluded by applicable state law, **A.T.U.S. will have no liability for any consequential, incidental, or special damages; any warranty of merchantability or fitness for particular purpose expires when this warranty expires.**

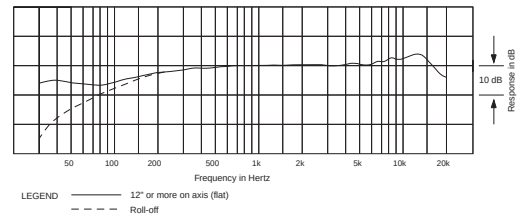
This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Outside the U.S.A., please contact your local dealer for warranty details.

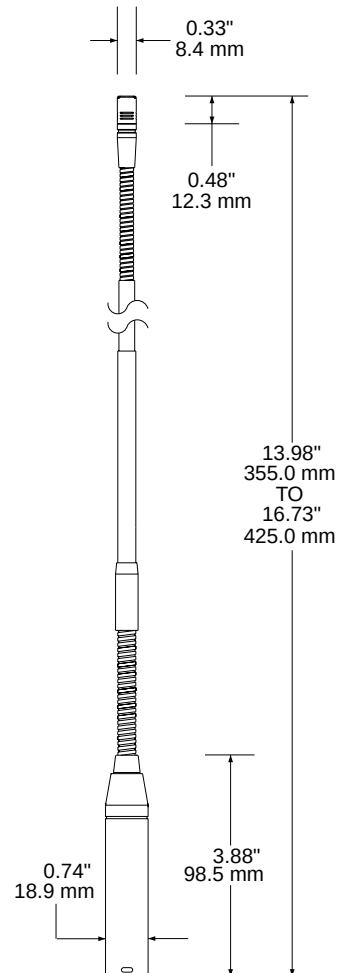
[Polar Pattern]



[Frequency Response]



[Dimensions]



Audio-Technica U.S., Inc.
 1221 Commerce Drive, Stow, Ohio 44224