PROTOCOL of CONVERTIBLE CAMERA and PAN/TILT SYSTEM
Ver2.44 (19/01,2015)

AW-HE130/AW-HE60/AW-HE120/AW-HE50
AW-HE40/AW-HE65/AW-HE70

Panasonic Corporation

Specifications are subject to change without notice.

Camera Control Protocol

This is a program to control Panasonic Convertible Camera system from PC by serial communication.

Method	Half Duplex
Commnunication Speed	9600bps
Data bit	8bit
Stop bit	1bit
Prity	None
Flow contorol	None

(Electrical Specification)
Compatible with RS422
2line system(TXD/send, RXD/Recieve)

(Process)
(1) PC —— Command ⟶ CAMERA
(2) CAMERA —— ACK(H'06) ⟶ PC
(3) CAMERA Processes "Command"
(4) CAMERA —— Command' ⟶ PC

Normally it is processed as mentioned above,but in case of error,it ends by replying error code(*1) in (4).
Command and Command' are not always the same.
Camera does not accept a command unless command process finishes and returns the return code

(*1)Error code

Item	Error code	Contents
Unsupported	[STX]ER1[ETX]	The Command is not supported by CAMERA.
System busy	[STX]ER2[ETX]	CAMERA can not process the command for running the other processing.
Out of range	[STX]ER3[ETX]	Data is out of range.

<Basic pattern of Command>

Header is [STX] (H'02) and Delimiter for [ETX] (H'03), and Command of ASCII and / or Data can be inserted in between. Division of Command and Data is ″: (H'3A)″.

There are 2 kinds of Commands , one is for letters and the other for numbers.
In total , there are 37 kinds of ASCII code code 0(H'30) to 9(H'39), A(H'41) to Z(H'5A),/(H'2F).
For Command of (1) to (6) and (10) PC –> Camera(To), Camera –> PC(From) are the same in both ways, but for (7),(8) and (11) it is different between (To) and (From).

(1)Pattern 1 (For the Camera Operation) There is no Data , only Command.

[STX]	O	?	S	[ETX]
H'02	H'4F	H'**	H'53	H'03

(2)Pattern 2 (Camera mode setting)
In order of Command, ″:″, Data. Data length id different by each Command and maximum 3 letters.

[STX]	O	?	?	:	?	(	?	?	)	[ETX]
H'02	H'4F	H'**	H'**	H'3A	H'**	(H'**	H'**	H'**)		H'03
	Command				Data					

Caution : Data length is fixed for each Command and not able to decrease.

(3)Pattern 3 (Selection of Scene) In order of Command, ″:″, Data. Data length=1 Byte

[STX]	X	S	F	:	?	[ETX]
H'02	H'58	H'53	H'46	H'3A	H'**	H'03

(4)Pattern 4 (Monitoring) In order of Command, ″:″, Data. Data length=1 Byte

[STX]	D	?	?	:	?	[ETX]
H'02	H'44	H'**	H'**	H'3A	H'**	H'03

(5)Pattern 5 (Other Menus)

In order of Command, ":", Number Command(2 Bytes), ":", Data. Data length=2 Bytes.

[STX]	O	S	D	:	?	?	:	?	?	[ETX]
H'02	H'4F	H'53	H'44	H'3A	H'**	H'**	H'3A	H'**	H'**	H'03

In this pattern, numbers at rear part of command (6th and 7th letters) are the command and Data follows by 2bytes (9th and 10th letters)

(6)Pattern 6 (Questions to Camera)

There is only Command, not Data

[STX]	Q	?	?	[ETX]
H'02	H'51	H'**	H'**	H'03

This Command requires the programmed number of the Camera and Camera returns adding Data.

Data is 2 Bytes but there are same exceptions. It is specified as Q(H'51) -> O(H'4F).

(7)Pattern 7 (Questions to Camera 2)

In order of Command, ":", number of Command. No Data. Command from Camera is with Data.

[STX]	Q	S	D	:	?	?	[ETX]
H'02	H'51	H'53	H'44	H'3A	H'**	H'**	H'03

This Command also requires the programmed number of the Camera and the Command is converted into numbers. It can be programmed only by Camera User Mode and is Data length , which Camera returns is 2 Bytes.(There are same exceptions.) It is Q(H'51) -> O(H'4F) same as (7) . When Camera receives unprocessable number Command, it returns as Data = number Command.

a) PC -> CAMERA

[STX]	Q	S	D	:	1	4	[ETX]
H'02	H'51	H'53	H'44	H'3A	H'31	H'34	H'03

b) CAMERA -> PC

[STX]	O	S	D	:	1	4	:	1	4	[ETX]
H'02	H'4F	H'53	H'44	H'3A	H'31	H'34	H'3A	H'31	H'34	H'03

(8)Pattern 8 (Related to Contact Closer P/T)

There is only Command, not Data

[STX]	H	?	?	[ETX]
H'02	H'48	H'**	H'**	H'03

Command for Lens I/F Card (AW-PB308) and control of lens for AW-E655. Camera repeats the same Command.

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
MODEL NUMBER	---		QID	OID:[Data]			Returns model No. by ASCII	Ex. OID:AW-HE50	V1.00	V3.00	V1.00	V1.00	V1.00
SOFTWARE VERSION	---		QSV	OSV:[Data]			Software Version		V1.00	V3.00	V1.00	V1.00	V1.00
AWC/AWB SET	OWS	OWS ER3:OWS	---		---	AWC/AWB Start AWC/AWC OK AWC/AWB NG	---	Response Command returns when AWC/AWB finish	V1.00	V3.00	V1.00	V1.00	V1.00
ABC/ABB SET	OAS	OAS ER3:OAS	---		---	ABC/ABB Start ABC/ABB OK ABC/ABB NG	---	Response Command returns when ABC/ABB finish	---	---	V1.00	V1.00	V1.00
AWC MODE	OAW:[Data]		QAW	OAW:[Data]	0 1 2 3 4 5 6 7 8 9	ATW AWC A AWC B ATW PRESET 3200K PRESET 5600K PRESET 4500K PRESET 6000K PRESET 2800K VAR	ATW --- AWC A AWC B PRESET 3200K PRESET 5600K PRESET 4500K PRESET 6000K PRESET 2800K VAR	Be careful because Data of control and question is different.	V1.00 supports only ATW, AWC A, AWC B	V3.00 supports only ATW, AWC A, AWC B	V1.00 supports only ATW AWC A AWC B PRESET 3200K PRESET 5600K	V1.00 supports only ATW AWC A AWC B PRESET 3200K PRESET 5600K VAR	V1.00 supports only ATW AWC A AWC B PRESET 3200K PRESET 5600K VAR
DETAIL	ODT:[Data]		QDT	ODT:[Data]	0 1 2 0 1 2	OFF LOW HIGH HC1500, HC1800, HE130 OFF ON ON			V1.00	V3.00	V1.00	V1.00	V1.00
HD DETAIL	OHD:[Data]		QHD	OHD:[Data]	0 1 2	AW-HE870 OFF LOW HIGH			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
GAIN UP	OGU:[Data]		QGU	OGU:[Data]	00 01 08 – 11 – 1A – 26 27 28 80 08 – 11 – 1A – 38 80 02 – 1A 80	AGC Low AGC High 0dB – 9dB – 18dB – 30dB N/Eye Low N/Eye N/Eye High AGC ON <u>AW-HE130,HE40,HE70</u> 0dB – 9dB – 18dB – 48dB AGC ON <u>AW-HE870</u> -6dB – 18dB AGC ON		V1.00 supports only 08(0dB)-1A(18dB), 80(AGC ON)	V3.00 supports only 08(0dB)-1A(18dB), 80(AGC ON)	V1.00 supports only 08(0dB)-1A(18dB), 80(AGC ON)	V1.00 supports only 08(0dB)-2C(36dB), 80(AGC ON)	V1.00 supports only 08h:0dB-38h:48dB 80h:AGC ON Use only 3dB Step.
SHUTTER	OSH:[Data]		QSH	OSH:[Data]	0 1 2 3 4 5 6 7 8 9 A B C D E F	OFF 1/50 1/60 1/100(NSTC)、1/120(PAL) 1/120 (NTSC) 、1/100 (PAL) 1/250 1/500 1/1000 1/2000 1/4000 1/10000 Synchro-Scan ELC(AUTO ND) 1/24 1/25 1/30		V1.00 supports only 0(OFF), 3(1/100 NTSC) (1/120 PAL), 5(1/250) – B(Synchro-Scan)	V3.00 supports only 0(OFF), 3(1/100 NTSC) (1/120 PAL), 5(1/250) – B(Synchro-Scan)	V1.00 supports only 0(OFF), 3(1/100 NTSC) (1/120 PAL), 5(1/250) – C(ELC)	V1.00 (59.94p/59.94i) 0(OFF) 3(1/100) 4(1/120) 5(1/250) – C(ELC) (29.97p) 0(OFF) 2(1/60) 4(1/120) 5(1/250) – C(ELC) F(1/30) (23.98p) 0(OFF) 2(1/60) 4(1/120) 5(1/250) – D(1/24) (50p/50i) 0(OFF) 2(1/60) 3(1/120) 5(1/250) – C(ELC) (25p) 0(OFF) 2(1/60) 3(1/120) 5(1/250) – C(ELC) E(1/25)	V1.00 supports only 0(OFF), 3(1/100 NTSC) (1/120 PAL), 5(1/250) – B(Synchro-Scan)

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
SYNCHRO SCAN	OMS:[Data]		QMS	OMS:[Data]	001h – 105h 001h – 137h 721h – 8DFh 721h – 8DFh 721h – 8DFh 001h – 1ABh 001h – 1C2h	N Model(59Hz) 60.34Hz – 15.75kHz E.MC Model(50Hz) 50.24Hz – 15.63kHz AK-HC1500/HC1800(60Hz) 60.32Hz/60.32Hz – 150.0Hz/149.2Hz AK-HC1500/HC1800(50Hz) 50.27Hz/50.27Hz – 125.0Hz/124.3Hz AK-HC1500, HC1800(FILM MENU) 358.1deg – 144.0deg HE-100N 60Hz – 248.8Hz HE-100E,MC 50.0Hz – 250.0Hz		V1.00 (N Model) 001h(60.17Hz) – 0FFh(644.25Hz) (E.MC Model) 001h(50.16Hz) – 0FFh(542.42Hz)	V3.00 (59Hz) 001h(60.17Hz) – 0FFh(644.25Hz) (50Hz) 001h(50.16Hz) – 0FFh(542.42Hz)	V1.00 (59Hz) 001h(60.17Hz) – 0FFh(646.21Hz) (50Hz) 001h(50.19Hz) – 0FFh(537.13Hz)	V1.00 (59Hz) 001h(60.15Hz) – 0FFh(642.21Hz) (50Hz) 001h(50.15Hz) – 0FFh(535.71Hz)	V1.00 (59.94Hz) 001h(59.94Hz) – 0FFh(660.09Hz) (50Hz 001h(50.00Hz) – 0FFh(570.12Hz)
FIELD/FRAME	OFR:[Data]	QFF	OFF:[Data]		0 1 2	Field Frame1 Frame2		Only User Mode	---	---	---	---	---
V.RESOLUTION					0 1 2	Normal (Fine) Fine	Normal --- FIne	Only Halogen,Fluorescent,Outdoor mode	---	---	---	---	---
IRIS AUTO/MANUAL	ORS:[Data]	QRS	ORS:[Data]		0 1	Manual Auto			V1.00	V3.00	V1.00	V1.00	V1.00
MANUAL IRIS VOLUME	ORV:[Data]	QRV	ORV:[Data]		000h – 3FFh	close – open			V1.00	V3.00	V1.00	V1.00	V1.00

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
PICTURE LEVEL A.IRIS LEVEL	OSD:48:[Data]		QSD:48	OSD:48:[Data]	00h - 31h 32h 33h - 64h 00h - 64h	-50 - -1 0 +1 - +50 <u>AK-HC1500, HC1800</u> 0 - 100		V1.00 Data/10	V3.00 Data/10	V1.00 Data/5	V1.00	V1.00 Data/5
LIGHT PEAK/AVG A.IRIS PEAK/AVG	OPV:[Data]		QPA	OPA:[Data]	00h - 31h 32h 33h - 64h 00h - 64h	P50 - P1 0 A1 - A50 <u>AK-HC1500, HC1800</u> 0 - 100		---	---	---	---	---	
LIGHT AREA A.IRIS AREA	ORA:[Data]		QAR	OAR:[Data]	0 1 5 6 7	ALL Center Top Cut Bottom Cut R/L Cut		---	---	---	---	---	
NEGA/POSI	ONP:[Data]		QNP	ONP:[Data]	0 1	Positive Negative		---	---	---	---	---	
R PEDESTAL	ORD:[Data]		QRD	ORD:[Data]	00h - 1Eh - 3Ch	-30 - 0 - +30		---	---	V1.00 Data*5	V1.00 Data*5 supports only OA(-100) - 32(+100)	---	
B PEDESTAL	OBD:[Data]		QBD	OBD:[Data]	00h - 1Eh - 3Ch	-30 - 0 - +30		---	---	V1.00 Data*5	V1.00 Data*5 supports only OA(-100) - 32(+100)	---	
R GAIN	ORG:[Data]		QGR	OGR:[Data]	00h - 1Eh - 3Ch	-30 - 0 - +30		V2.00	V3.00	V1.00 Data*5	V1.00 Data*5	V1.00	
B GAIN	OBG:[Data]		QGB	OGB:[Data]	00h - 1Eh - 3Ch	-30 - 0 - +30		V 2.00	V3.00	V1.00 Data*5	V1.00 Data*5	V1.00	
T PEDESTAL	OTD:[Data]		QTD	OTD:[Data]	00h - 1Eh - 3Ch	-30 - 0 - +30		V1.00 Data/3	V3.00 Data/3	V1.00 Data*5	V1.00 Data*5	V1.00 Data/3	

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
H PHASE	OHP:[Data]		QHP	OHP:[Data]	000h – 3FFh	-206 – +49			V1.00	V3.00	V1.00	V1.00	---
SC COARSE	OSC:[Data]		QSC	OSC:[Data]	0 1 2 3 4 AW-HE870 5 6 7 8	2(90deg) 3(180deg) 4(270deg) 1(0deg) --- AW-HE870 45deg(HE870) 135deg(HE870) 225deg(HE870) 315deg(HE870)	--- 1(0deg) 2(90deg) 3(180deg) 4(270deg) AW-HE870 45deg 135deg 225deg 315deg	Be careful because Data of control and question is different.	V1.00	V3.00	---	---	---
SC FINE	OSN:[Data]		QSN	OSN:[Data]	000h 001h 002h – 200h – 3FFh AW-HE870 000h – 007h 008h – 200h – 3FBh 3FCh – 3FFh	-511 -511 -511 – 0 – +511 AW-HE870 -127 – -127 -126 – 0 – +126 +127 – +127		(AW-HE870) One value of "Data Contents" is added by four "Data" counts.	V1.00	V3.00	---	---	---
CHROMA LEVEL	OCG:[Data]		QCG	OCG:[Data]	00 – 03 – 06	-3 – 0 – +3			V1.00	V3.00	V1.00	---	V1.00
SCENE FILE	XSF:[Data]		QSF	OSF:[Data]	0 1 2 3 4 5 6 7 0 1 2 3 4	Halogen Fluorescent Outdoor User HC1500, HC1800 PRESET USER1 USER2 CURRENT	Halogen Fluorescent Outdoor User Halogen Fluorescent Outdoor User HC1500, HC1800 PRESET USER1 USER2 CURRENT	Be careful because Data of control and question is different.	V1.00 supports only Halogen=MANUAL1, Fluorescent=MANUAL2, Outdoor=MANUAL3, User=FULLAUTO,	V3.00 supports only Halogen=MANUAL1, Fluorescent=MANUAL2, Outdoor=MANUAL3, User=FULLAUTO,	V1.00 supports only Halogen=Scene1, Fluorescent=Scene2, Outdoor=Scene3, User=Scene4,	V1.00 supports only Halogen=Scene1, Fluorescent=Scene2, Outdoor=Scene3, User=Scene4,	V1.00 supports only Halogen=MANUAL1, Fluorescent=MANUAL2 , Outdoor=MANUAL3, User=FULLAUTO,
GAMMA	OSD:00:[Data]		QSD:00	OSD:00:[Data]	00h – 0Ah – 14h	0.35 – 0.45 – 0.55			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
KNEE POINT	OSD:08:[Data]		QSD:08	OSD:08[Data]	FFh 00h – 0Ah 0Bh	--- Dynamic 88% – 98%	Dynamic 88% – 98% ----	Be careful because Data of control and question is different.	---	---	---	---	---
WHITE CLIP	OSD:09:[Data]		QSD:09	OSD:09:[Data]	00h – 0Fh	95% – 110%			---	---	---	---	---
H.DTL LEVEL H	OSD:0A:[Data]		QSD:0A	OSD:0A:[Data]	01h – 3Fh	1 – 63			---	---	V1.00	---	---
HD H.DTL LEVEL H	OSD:0B:[Data]		QSD:0B	OSD:0B:[Data]	01h – 3Fh	1 – 63			---	---	---	---	---
V DTL LEVEL H	OSD:0E:[Data]		QSD:0E	OSD:0E:[Data]	01h – 1Fh	1 – 31			---	---	V1.00	---	---
HD V DTL LEVEL H	OSD:0F:[Data]		QSD:0F	OSD:0F:[Data]	01h – 1Fh	1 – 31			---	---	---	---	---
H.DTL LEVEL L	OSD:12:[Data]		QSD:12	OSD:12:[Data]	00h – 3Eh	0 – 62			---	---	V1.00	---	---
HD H.DTL LEVEL L	OSD:13:[Data]		QSD:13	OSD:13:[Data]	00h – 3Eh	0 – 62			---	---	---	---	---
V DTL LEVEL L	OSD:16:[Data]		QSD:16	OSD:16:[Data]	00h – 1Eh	0 – 30			---	---	V1.00	---	---
HD V DTL LEVEL L	OSD:17:[Data]		QSD:17	OSD:17:[Data]	00h – 1Eh	0 – 30			---	---	---	---	---
DETAIL BAND	OSD:1E:[Data]		QSD:1E	OSD:1E[Data]	01 – 05	01 – 05			---	---	V1.00	---	---
HD DETAIL BAND	OSD:1F:[Data]		QSD:1F	OSD:1F[Data]	01 – 05	01 – 05			---	---	---	---	---
NOISE SUPPRESS /CRISP	OSD:22:[Data]		QSD:22	OSD:22:[Data]	00h – 3Ch 00h – 1Fh	0 – 60 AK-HC1500, HC1800 0 – 31			---	---	V1.00 Support Only 00(0)-07(7)	V1.00	---
HD NOISE SUPPRESS /CRISP	OSD:23:[Data]		QSD:23	OSD:23:[Data]	00h – 0Ah	AW-HE870 0 – 10			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents			Remarks				
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
LEVEL DEPENDENT	OSD:26:[Data]		QSD:26	OSD:26:[Data]	00h – 19h AK-HC1500, HC1800 00h – 0Fh AK-HC3800 00 – 1E	00% – 25% AK-HC1500, HC1800 0% – 15% AK-HC3800 0% – 30%			---	---	---	---	---
HD LEVEL DEPENDENT	OSD:27:[Data]		QSD:27	OSD:27:[Data]	00h – 19h	AW-HE870 00% – 25%			---	---	---	---	---
CHROMA DETAIL	OSD:2A:[Data]		QSD:2A	OSD:2A:[Data]	00h – 0Fh	00 – 15			---	---	---	---	---
HD CHROMA DETAIL	OSD:2B:[Data]		QSD:2B	OSD:2B:[Data]	00h – 0Fh	00 – 15			---	---	---	---	---
HD DARK DETAIL	OSD:2D:[Data]		QSD:2D	OSD:2D:[Data]	00 – 05 AK-HC3800 00 – 07	0 – 5 AK-HC3800 0 – 7			---	---	---	---	---
DARK DETAIL	OSD:2E:[Data]		QSD:2E	OSD:2E:[Data]	00 – 05	0 – 5			---	---	---	---	---
MATRIX(R-G)	OSD:2F:[Data]		QSD:2F	OSD:2F:[Data]	00h – 1Fh – 3Eh	-31 – 0 – +31			---	---	V1.00	---	---
MATRIX(R-B)	OSD:30:[Data]		QSD:30	OSD:30:[Data]	00h – 1Fh – 3Eh	-31 – 0 – +31			---	---	V1.00	---	---
MATRIX(G-R)	OSD:31:[Data]		QSD:31	OSD:31:[Data]	00h – 1Fh – 3Eh	-31 – 0 – +31			---	---	V1.00	---	---
MATRIX(G-B)	OSD:32:[Data]		QSD:32	OSD:32:[Data]	00h – 1Fh – 3Eh	-31 – 0 – +31			---	---	V1.00	---	---
MATRIX(B-R)	OSD:33:[Data]		QSD:33	OSD:33:[Data]	00h – 1Fh – 3Eh	-31 – 0 – +31			---	---	V1.00	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
MATRIX(B-G)	OSD:34:[Data]		QSD:34	OSD:34:[Data]	00h - 1Fh - 3Eh	-31 - 0 - +31			---	---	V1.00	---	---
FLARE R	OSD:35:[Data]		QSD:35	OSD:35:[Data]	00h - 64h AK-HC3500 9C ～ FF 00 01 ～ 64	0 - 100 AK-HC3500 -100 ～ -1 0 +1 ～ +100			---	---	---	---	---
FLARE G	OSD:36:[Data]		QSD:36	OSD:36:[Data]	00h - 64h AK-HC3500 9C ～ FF 00 01 ～ 64	0 - 100 AK-HC3500 -100 ～ -1 0 +1 ～ +100			---	---	---	---	---
FLARE B	OSD:37:[Data]		QSD:37	OSD:37:[Data]	00h - 64h AK-HC3500 9C ～ FF 00 01 ～ 64	0 - 100 AK-HC3500 -100 ～ -1 0 +1 ～ +100			---	---	---	---	---
FLARE SW	OSA:11:[Data]		QSA:11	OSA:11:[Data]	0 1	OFF ON			---	---	---	---	---
CLEAN DNR	OSD:3A:[Data]		QSD:3A	OSD:3A:[Data]	00 01 02	OFF LOW HIGH			V1.00	V3.00	V1.00	V1.00	V1.00
HD CLEAN DNR	OSD:3B:[Data]		QSD:3B	OSD:3B:[Data]	00 01 02	OFF LOW HIGH			---	---	---	---	---
2D LPF	OSD:3F:[Data]		QSD:3F	OSD:3F:[Data]	00 01 02	OFF LOW HIGH			---	---	---	---	---
CORNER DETAIL	OSD:43:[Data]		QSD:43	OSD:43:[Data]	00 01	OFF ON			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
PRECISION DETAIL /SLIM DETAIL	OSD:44:[Data]		QSD:44	OSD:44:[Data]	00 01 02 00 01 02	OFF LOW HIGH AK-HC1500, HC1800 OFF ON ON			---	---	---	---	---	---
HD PRECISION DETAIL /HD SLIM DETAIL	OSD:45:[Data]		QSD:45	OSD:45:[Data]	00 01 02	AW-HE870 OFF LOW HIGH			---	---	---	---	---
BLACK STRETCH	OSD:46:[Data]		QSD:46	OSD:46:[Data]	00 01	OFF ON			---	---	---	---	---
HIGH LIGHT CHROMA	OSD:49:[Data]		OSD:49	OSD:49:[Data]	00 01 02	OFF LOW HIGH			---	---	---	---	---
FLESH NOISE SUPPRESS	OSD:4B:[Data]		QSD:4B	OSD:4B:[Data]	00 01 02	OFF LOW HIGH			---	---	V1.00	---	---
FLESH DETAIL FLESH DTL LEVEL					00 01 02	LOW MID HIGH			---	---	---	---	---
HD FLESH NOISE SUPPRESS	OSD:4C:[Data]		QSD:4C	OSD:4C:[Data]	00 01 02	OFF LOW HIGH			---	---	---	---	---
IRIS FOLLOW	---		QSD:4F	OSD:4F:[Data]	00h - FFh	---	Close - Open	This Command can't be used through AW-RP400.	V1.00	V3.00	V1.00	V1.00	V1.00
CONTRAST(GAMMA)	OSD:50:[Data]		QSD:50	OSD:50:[Data]	00 01 02	LOW MID HIGH			V1.00	V3.00	V1.00	V1.00	V1.00
FLESH TONE	OSD:52:[Data]		QSD:52	OSD:52:[Data]	00 - 03 - 06	-3 - 0 - +3			---	---	---	---	---
DETAIL SELECT	OSD:54:[Data]		QSD:54	OSD:54:[Data]	00 01	Normal Super DTL			---	---	---	---	---
NOISE SUPPRESS	OSD:55:[Data]		QSD:55	OSD:55:[Data]	00 01 02	OFF LOW HIGH			---	---	---	---	---
FLESH NOSE SUPPRESS	OSD:56:[Data]		QSD:56	OSD:56:[Data]	00 01 02	OFF LOW HIGH			---	---	---	---	---
DTL FLESH SUPPRESS					00 01 02	LOW MID HIGH			---	---	---	---	---
ZEBRA INDICATER	OSD:60:[Data]		QSD:60	OSD:60:[Data]	00 01	OFF ON		with studio card	---	---	---	---	---
ZEBRA1 LEVEL	OSD:61:[Data]		QSD:61	OSD:61:[Data]	00h - 27h	70% - 109%		with studio card	---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
ZEBRA2 LEVEL	OSD:62:[Data]		QSD:62	OSD:62:[Data]	01h – 28h	71% – 110%		with studio card	---	---	---	---	---
SAFETY ZONE	OSD:63:[Data]		QSD:63	OSD:63:[Data]	01 02 03 04 05 06	1 2 3 4 5 OFF		with studio card	---	---	---	---	---
EVF OUTPUT	OSD:64:[Data]		QSD:64	OSD:64:[Data]	00 01	Y VBS		with studio card	---	---	---	---	---
OUTPUT SELECT	OSD:65:[Data]		QSD:65	OSD:65:[Data]	00 01 02	RGB YPbPr Y/C		Y/C is Valid With SD(480i/576i)format	---	---	V1.00 Y/C is Valid	---	---
CHARGE TIME	OSD:68:[Data]		QSD:68	OSD:68:[Data]	00 01 02 03 04 05 06 07 08 00 01 02 03 04 05 06 07 08	NTSC 2s 1s 1/2s 1/4s 1/8s 1/15s 1/30s OFF AUTO PAL 2s 1s 1/2s 1/3s 1/6s 1/12s 1/25s OFF AUTO			---	---	---	---	---
AGC MAX	OSD:69:[Data]		QSD:69	OSD:69:[Data]	00 01 02 03 04 05 06 07 00 01 02 03 04 05 06 07 08	(OFF) 6dB 12dB 18dB 24dB 30dB 33dB(HBK50),N/Eye(E300/A) N/Eye L(E600, E750, E655, E860) N/Eye H(E600, E750, E655, E860) AW-HE40/HE65/HE70 (OFF) 6dB 12dB 18dB 24dB 30dB 36dB 42dB 48dB		V1.00 supports only 01(6dB) – 03(18dB)	V3.00 supports only 01(6dB) – 03(18dB)	V1.00 supports only 01(6dB) – 03(18dB)	V1.00 supports only 01(6dB) – 03(18dB)	V1.00 supports only 01(6dB) – 08(48dB)
ASPECT RATIO	OSD:70:[Data]		QSD:70	OSD:70:[Data]	00 01	16:9 4:3			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents: Control and Response to contol	Data Contents: Response to Confirmation		Remarks: HE50	Remarks: HE60	Remarks: HE120	Remarks: HE130	Remarks: HE40/ HE65/ HE70
FAN	OSD:71:[Data]		QSD:71	OSD:71:[Data]	00 01 00 01 02	OFF ON <u>AK-HC1500, HC1800</u> OFF AUTO ON			---	---	---	---	---
ATW SPEED	OSD:72:[Data]		QSD:72	OSD:72:[Data]	00 01 02 03 04	Slow2 Slow1 Middle Fast1 Fast2			---	---	---	---	---
COLOR BAR/CAMERA	DCB:[Data]		QBR	OBR:[Data]	0 1 2 3	Camera Color Bar Test Close(Camera)			V1.00 supports only 0(Camera), 1(Color Bar)	V3.00 supports only 0(Camera), 1(Color Bar)	V1.00 supports only 0(Camera), 1(Color Bar)	V1.00 supports only 0(Camera), 1(Color Bar)	V1.00 supports only 0(Camera), 1(Color Bar)
MENU	DUS:[Data]		QUS	OUS:[Data]	0 1 2	OFF ON ON ByBrowser			V1.00 supports only 0(OFF), 1(ON)	V3.00 supports only 0(OFF), 1(ON)	V1.00 supports only 0(OFF), 1(ON)	V1.00 supports only 0(OFF), 1(ON)	V1.00 supports only 0(OFF), 1(ON)
BAR SETUP	DCS:[Data]		QCS	OCS:[Data]	0 1	0.0% 7.5%			---	---	V1.00	V1.00	---
MENU SW	DPG:[Data]		---		1			"DPG" is equal to "DPG:1".	V1.00	V3.00	V1.00	V1.00	V1.00
ITEM SW	DIT:[data]		---		1			"DIT" is equal to "DIT:1".	V1.00	V3.00	V1.00	V1.00	V1.00
YES SW	DUP:[Data]		---		1 A	1Step 10Step		"DUP" is equal to "DUP:1".	V1.00	V3.00	V1.00	V1.00	V1.00
NO SW	DDW:[Data]		---		1 A	1Step 10Step		"DDW" is equal to "DDW:1".	V1.00	V3.00	V1.00	V1.00	V1.00
PAN(LEFT)	HPL		---		---	move to left			---	---	---	---	---
									---	---	---	---	---
PAN(RIGHT)	HPR		---		---	move to right			---	---	---	---	---
									---	---	---	---	---
PAN(STOP)	HPS		---		---	stop pan			---	---	---	---	---
									---	---	---	---	---
TILT(UP)	HTU		---		---	move to up			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents			Remarks				
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
									---	---	---	---	---
TILT(DOWN)	HTD		---		---	move to down			---	---	---	---	---
									---	---	---	---	---
TILT(STOP)	HTS		---		---	stop tilit			---	---	---	---	---
									---	---	---	---	---
ZOOM(TELE)	HZT		---		---	move to tele			V1.00	V3.00	---	---	V1.00
									---	---	---	---	
ZOOM(WIDE)	HZW		---		---	move to wide			V1.00	V3.00	---	---	V1.00
									---	---	---	---	
ZOOM(STOP)	HZS		---		---	stop zoom			V1.00	V3.00	---	---	V1.00
									---	---	---	---	
ZOOM SPEED	LZS:[Data]		---		0 - 9	Slow - Fast			V1.00	V3.00	---	---	V1.00
FOCUS(FAR)	HFF		---		---	move to far			V1.00	V3.00	---	---	V1.00
									---	---	---	---	
FOCUS(NEAR)	HFN		---		---	move to near			V1.00	V3.00	---	---	V1.00
									---	---	---	---	
FOCUS(STOP)	HFS		---		---	stop focus			V1.00	V3.00	---	---	V1.00
									---	---	---	---	

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents			Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70	
FOCUS SPEED	LFS:[Data]		---		0 – 9	Slow – Fast			V1.00	V3.00	---	---	V1.00	
SAVE LENS PSITION to PRESET	LPS:[Data]		---		01 02 03 04 05	Save to Preset1 Save to Preset2 Save to Preset3 Save to Preset4 Save to Preset5			---	---	---	---	---	
Recall LENS PRESET	LPM:[Data]		---		00 01 02 03 04 05	Recall Current Recall Preset1 Recall Preset2 Recall Preset3 Recall Preset4 Recall Preset5			---	---	---	---	---	
COLOR MATRIX R GAIN /COLOR CORRECTION R SATURATION	OSD:86:[Data]		QSD:86	OSD:86:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 61h(-31) – 9Fh(+31)	
COLOR MATRIX R PHASE /COLOR CORRECTION R PHASE	OSD:87:[Data]		QSD:87	OSD:87:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 41h(-63) – BFh(+63)	
COLOR MATRIX R_YI GAIN /COLOR CORRECTION R_YI SATURATION	OSD:88:[Data]		QSD:88	OSD:88:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	---	
COLOR MATRIX R_YI PHASE /COLOR CORRECTION R_YI PHASE	OSD:89:[Data]		QSD:89	OSD:89:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	---	
COLOR MATRIX YI GAIN /COLOR CORRECTION YI SATURATION	OSD:8A:[Data]		QSD:8A	OSD:8A:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 61h(-31) – 9Fh(+31)	
COLOR MATRIX YI PHASE /COLOR CORRECTION YI PHASE	OSD:8B:[Data]		QSD:8B	OSD:8B:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 41h(-63) – BFh(+63)	
COLOR MATRIX YI_G GAIN /COLOR CORRECTION YI_G SATURATION	OSD:8C:[Data]		QSD:8C	OSD:8C:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	---	
COLOR MATRIX YI_G PHASE /COLOR CORRECTION YI_G PHASE	OSD:8D:[Data]		QSD:8D	OSD:8D:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	---	

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
COLOR MATRIX G GAIN /COLOR CORRECTION G SATURATION	OSD:8E:[Data]		QSD:8E	OSD:8E:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 61h(-31) – 9Fh(+31)
COLOR MATRIX G PHASE /COLOR CORRECTION G PHASE	OSD:8F:[Data]		QSD:8F	OSD:8F:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 41h(-63) – BFh(+63)
COLOR MATRIX G_Cy GAIN /COLOR CORRECTION G_Cy SATURATION	OSD:90:[Data]		QSD:90	OSD:90:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 61h(-31) – 9Fh(+31)
COLOR MATRIX G_Cy PHASE /COLOR CORRECTION G_Cy PHASE	OSD:91:[Data]		QSD:91	OSD:91:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 41h(-63) – BFh(+63)
COLOR MATRIX Cy GAIN /COLOR CORRECTION Cy SATURATION	OSD:92:[Data]		QSD:92	OSD:92:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 61h(-31) – 9Fh(+31)
COLOR MATRIX Cy PHASE /COLOR CORRECTION Cy PHASE	OSD:93:[Data]		QSD:93	OSD:93:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 41h(-63) – BFh(+63)
COLOR MATRIX Cy_B GAIN /COLOR CORRECTION Cy_G SATURATION	OSD:94:[Data]		QSD:94	OSD:94:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	---
COLOR MATRIX Cy_B PHASE /COLOR CORRECTION Cy_B PHASE	OSD:95:[Data]		QSD:95	OSD:95:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	---
COLOR MATRIX B GAIN /COLOR CORRECTION B SATURATION	OSD:96:[Data]		QSD:96	OSD:96:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 61h(-31) – 9Fh(+31)
COLOR MATRIX B PHASE /COLOR CORRECTION B PHASE	OSD:97:[Data]		QSD97	OSD:97:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 41h(-63) – BFh(+63)
COLOR MATRIX B_Mg GAIN /COLOR CORRECTION B_Mg SATURATION	OSD:80:[Data]		QSD:80	OSD:80:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
COLOR MATRIX B_Mg PHASE /COLOR CORRECTION B_Mg PHASE	OSD:81:[Data]		QSD:81	OSD:81:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	---
COLOR MATRIX Mg GAIN /COLOR CORRECTION Mg SATURATION	OSD:82:[Data]		QSD:82	OSD:82:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 61h(-31) – 9Fh(+31)
COLOR MATRIX Mg PHASE /COLOR CORRECTION Mg PHASE	OSD:83:[Data]		QSD:83	OSD:83:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 41h(-63) – BFh(+63)
COLOR MATRIX Mg_R GAIN /COLOR CORRECTION Mg_R SATURATION	OSD:84:[Data]		QSD:84	OSD:84:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 61h(-31) – 9Fh(+31)
COLOR MATRIX Mg_R PHASE /COLOR CORRECTION Mg_R PHASE	OSD:85:[Data]		QSD:85	OSD:85:[Data]	01h – 80h – FFh	-127 – 0 – +127			---	---	V1.00	V1.00 supports only 41h(-63) – BFh(+63)	V1.00 supports only 41h(-63) – BFh(+63)
T PEDESTAL	OTP:[Data]		QTP	OTP:[Data]	000h – 096h – 12Ch	-150 – 0 – +150			V1.00 Data/15	V3.00 Data/15	V1.00	V1.00	V1.00 Data/15
R GAIN	ORI:[Data]		QRI	ORI:[Data]	000h – 096h – 12Ch	-150 – 0 – +150			V2.00 Data/5	V3.00 Data/5	V1.00	V1.00	V1.00 Data/5
B GAIN	OBI:[Data]		QBI	OBI:[Data]	000h – 096h – 12Ch	-150 – 0 – +150			V2.00 Data/5	V3.00 Data/5	V1.00	V1.00	V1.00 Data/5
R PEDESTAL	ORP:[Data]		QRP	ORP:[Data]	000h – 096h – 12Ch	-150 – 0 – +150			---	---	V1.00	V1.00 supports only -100～+100	---
B PEDESTAL	OBP:[Data]		QBP	OBP:[Data]	000h – 096h – 12Ch	-150 – 0 – +150			---	---	V1.00	V1.00 supports only -100～+100	---
3D-DNR	ODD:[Data]		QDD	ODD:[Data]	00 01 02	OFF LOW HIGH			---	---	---	---	---
AUTO FOCUS	OAF:[Data]		QAF	OAF:[Data]	0 1	Manual FOCUS AUTO FOCUS			V1.00	V3.00	V1.00	V1.00	V1.00

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents: Control and Response to contol	Data Contents: Response to Confirmation	Remarks					
									HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
DIGITAL GAIN UP	ODG:[Data]		QDG	ODG:[Data]	0 1 2 3 4 5	0dB 6dB 12dB 18dB 24dB 30dB			---	---	---	---	---
DIGITAL EXTENDER	ODE:[Data]		QDE	ODE:[Data]	0 1	OFF ON			---	---	---	V1.00	V1.00
FILTER	OFT:[Data]		QFT	OFT:[Data]	0 1 2 3 0 1 2 3 4	IR Through Normal 1/16 ND 1/64 ND <u>AW-HE130,HE40,HE70</u> <u>AW-HE120,AK-HC1500, HC1800</u> Clear 1/4 ND 1/16 ND 1/64 ND 1/8 ND			---	---	V1.00 supports only Clear 1/4 ND 1/16 ND 1/64 ND	V1.00 supports only Clear 1/64 ND 1/8 ND	--
RED TALLY	TLR:[Data]		---	---	0 1	OFF ON	---		---	---	---	---	---
GREEN TALLY	TLG:[Data]		---	---	0 1	OFF ON	---		---	---	---	---	---
BLACK SHADING CORRECT(DIG)	OSA:C0:[Data]		QSA:C0	OSA:C0:[Data]	0 1	OFF ON			---	---	---	---	---
M GAMMA@DRS OFF	OSA:01:[Data]		QSA:01	OSA:01:[Data]	6Ah - 79h - 97h	0.30 - 0.45 - 0.75			---	---	---	---	---
M GAMMA@DRS ON	OSA:02:[Data]		QSA:02	OSA:02:[Data]	76h - 80h - 8Ah	-10 - 0 - +10			---	---	---	---	---
R GAMMA@DRS OFF	OSA:03:[Data]		QSA:03	OSA:03:[Data]	71h - 80h - 8Fh	-15 - 0 - +15			---	---	---	---	---
R GAMMA@DRS ON	OSA:04:[Data]		QSA:04	OSA:04:[Data]	76h - 80h - 8Ah	-10 - 0 - +10			---	---	---	---	---
B GAMMA@DRS OFF	OSA:05:[Data]		QSA:05	OSA:05:[Data]	71h - 80h - 8Fh	-15 - 0 - +15			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
B GAMMA@DRS ON	OSA:06:[Data]		QSA:06	OSA:06:[Data]	76h – 80h – 8Ah	-10 – 0 – +10			---	---	---	---	---
M BLACK GAMMA	OSA:07:[Data]		QSA:07	OSA:07:[Data]	60h – 80h – A0h	-32 – 0 – +32			---	---	---	---	---
R BLACK GAMMA	OSA:08:[Data]		QSA:08	OSA:08:[Data]	71h – 80h – 8Fh	-15 – 0 – +15			---	---	---	---	---
B BLACK GAMMA	OSA:09:[Data]		QSA:09	OSA:09:[Data]	71h – 80h – 8Fh	-15 – 0 – +15			---	---	---	---	---
GAMMA SW	OSA:0A:[Data]		QSA:0A	OSA:0A:[Data]	0 1	OFF ON			---	---	---	---	---
BLACK GAMMA SW	OSA:0B:[Data]		QSA:0B	OSA:0B:[Data]	0 1	OFF ON			---	---	---	---	---
EFFECT DEPTH	OSA:0C:[Data]		QSA:0C	OSA:0C:[Data]	1 – 5	1 – 5			---	---	---	---	---
DRS SW	OSA:0D:[Data]		QSA:0D	OSA:0D:[Data]	0 1	OFF ON			---	---	---	---	---
CINE GAMMA SELECT	OSA:0E:[Data]		QSA:0E	OSA:0E:[Data]	0 1	FILM REC VIDEO REC			---	---	---	---	---
BLACK STRETCH LEVEL(@FILM MENU & FILM REC)	OSA:0F:[Data]		QSA:0F	OSA:0F:[Data]	00h – 1Eh	0 – 30			---	---	---	---	---
DYNAMIC LEVEL (@FILM MENU & FILM REC)	OSA:10:[Data]		QSA:10	OSA:10:[Data]	0 1 2 3	200% 300% 400% 500%			---	---	---	---	---
M KNEE POINT (@VIDEO MENU)	OSA:20:[Data]		QSA:20	OSA:20:[Data]	22h – 80h – B6h	70.00% – 93.50% – 107.00% (1step=0.25%)			---	---	---	V1.00	---
M KNEE POINT (@FILM MENU & VIDEO REC)	OSA:21:[Data]		QSA:21	OSA:21:[Data]	62h – 80h – 9Eh	30% – 60% – 90%			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
R KNEE POINT	OSA:22:[Data]		QSA:22	OSA:22:[Data]	1Ch – 80h – E4h	-25.00% – 0.00% – +25.00% (1step=0.25%)			---	---	---	---	---
B KNEE POINT	OSA:23:[Data]		QSA:23	OSA:23:[Data]	1Ch – 80h – E4h	-25.00% – 0.00% – +25.00% (1step=0.25%)			---	---	---	---	---
M KNEE SLOPE (@VIDEO MENU)	OSA:24:[Data]		QSA:24	OSA:24:[Data]	00h – 63h	0 – 99			---	---	---	V1.00	---
M KNEE SLOPE (@FILM MENU & VIDEO REC)	OSA:25:[Data]		QSA:25	OSA:25:[Data]	7Ch – 80h – 85h	150% – 350% – 600% (1step=50%)			---	---	---	---	---
R KNEE SLOPE (@VIDEO MENU)	OSA:26:[Data]		QSA:26	OSA:26:[Data]	1Dh – 80h – E3h	-99 – 0 – +99			---	---	---	---	---
B KNEE SLOPE (@VIDEO MENU)	OSA:27:[Data]		QSA:27	OSA:27:[Data]	1Dh – 80h – E3h	-99 – 0 – +99			---	---	---	---	---
A.KNEE POINT (@VIDEO MENU)	OSA:28:[Data]		QSA:28	OSA:28:[Data]	4Ah – 80h – B6h	80.00% – 93.50% – 107.00% (1step=0.25%)			---	---	---	---	---
A.KNEE LEVEL (@VIDEO MENU)	OSA:29:[Data]		QSA:29	OSA:29:[Data]	7Ch – 85h	100% – 109% (1step=0.25%)			---	---	---	---	---
M WHITE CLIP LEVEL	OSA:2A:[Data]		QSA:2A	OSA:2A:[Data]	00h – 13h	90% – 109%			---	---	---	V1.00	---
R WHITE CLIP LEVEL	OSA:2B:[Data]		QSA:2B	OSA:2B:[Data]	71h – 80h – 8Fh	-15% – 0% – +15%			---	---	---	---	---
B WHITE CLIP LEVEL	OSA:2C:[Data]		QSA:2C	OSA:2C:[Data]	71h – 80h – 8Fh	-15% – 0% – +15%			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
KNEE SW	OSA:2D:[Data]		QSA:2D	OSA:2D:[Data]	0 1 2	OFF MANUAL AUTO			---	---	---	V1.00	---
WHITE CLIP	OSA:2E:[Data]		QSA:2E	OSA:2E:[Data]	0 1	OFF ON			---	---	---	V1.00	---
HIGH COLOR	OSA:2F:[Data]		QSA:2F	OSA:2F:[Data]	0 1	OFF ON			---	---	---	---	---
TOTAL DTL LEVEL	OSA:30:[Data]		QSA:30	OSA:30:[Data]	61h - 80h - 9Fh 61h - 80h - 9Fh	-31 - 0 - +31 AW-HE130 0 - +31 - +62			---	Camera Main V3.05 supports only 81h(1)-91h(17) for TOTAL DTL LEVEL (LOW)	---	V1.00	V1.00 supports only 81h(1)-91h(17) for TOTAL DTL LEVEL (LOW)
H DTL LEVEL	OSA:31:[Data]		QSA:31	OSA:31:[Data]	00h - 3Fh	0 - 63			---	---	---	---	---
PEAK FREQUENCY	OSA:34:[Data]		QSA:34	OSA:34:[Data]	00h - 1Fh	0 - 31			---	---	---	---	---
KNEE APERTURE	OSA:35:[Data]		QSA:35	OSA:35:[Data]	0 1	OFF ON			---	---	---	---	---
KNEE APE LEVEL	OSA:36:[Data]		QSA:36	OSA:36:[Data]	0 - 5	0 - 5			---	---	---	---	---
DETAIL(+)	OSA:38:[Data]		QSA:38	OSA:38:[Data]	61h - 80h - 9Fh	-31 - 0 - +31			---	---	---	---	---
DETAIL(-)	OSA:39:[Data]		QSA:39	OSA:39:[Data]	61h - 80h - 9Fh	-31 - 0 - +31			---	---	---	---	---
DETAIL CLIP	OSA:3A:[Data]		QSA:3A	OSA:3A:[Data]	00h - 3Fh	0 - 63			---	---	---	---	---
DETAIL SOURCE	OSA:3B:[Data]		QSA:3B	OSA:3B:[Data]	0 1 2 3 4 5	(G+R)/2 (G+B)/2 (2G+B+R)/4 (3G+B)/4 R G			---	---	---	---	---
SKIN TONE DETAIL (HD)	OSA:40:[Data]		QSA:40	OSA:40:[Data]	0 1	OFF ON			---	---	---	---	---
SKIN GET	OSA:41:[Data]		QSA:41	OSA:41:[Data]	0 1 2	OFF ON GET	OFF:Wipe out the rectangle. ON:Display the rectangle. GET:Get Flesh Noise Suppress(SKIN) Color standard.		---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
SKIN DTL CORING (HD)	OSA:42:[Data]		QSA:42	OSA:42:[Data]	0 – 7	0 – 7			---	---	---	---	---
SKIN TONE DTL Y MAX (HD)	OSA:43:[Data]		QSA:43	OSA:43:[Data]	00h – FFh	0 – 255			---	---	---	---	---
SKIN TONE DTL Y MIN (HD)	OSA:44:[Data]		QSA:44	OSA:44:[Data]	00h – FFh	0 – 255			---	---	---	---	---
SKIN TONE DTL I CENTER (HD)	OSA:45:[Data]		QSA:45	OSA:45:[Data]	00h – FFh	0 – 255			---	---	---	---	---
SKIN TONE DTL I WIDTH (HD)	OSA:46:[Data]		QSA:46	OSA:46:[Data]	00h – FFh	0 – 255			---	---	---	---	---
SKIN TONE DTL Q WIDTH (HD)	OSA:47:[Data]		QSA:47	OSA:47:[Data]	00h – FFh	0 – 255			---	---	---	---	---
SKIN TONE DTL Q PHASE (HD)	OSA:48:[Data]		QSA:48	OSA:48:[Data]	00h – 80h – FFh	-127 – 0 – 128			---	---	---	---	---
SKIN TONE ZEBRA	OSA:49:[Data]		QSA:49	OSA:49:[Data]	0 1	OFF ON			---	---	---	---	---
LOW GAIN	OSA:50:[Data]		QSA:50	OSA:50:[Data]	7Ah – 7Ch – 80h – 86h	-6dB – 0dB – 12dB – 30dB			---	---	---	---	---
MID GAIN	OSA:51:[Data]		QSA:51	OSA:51:[Data]	7Ah – 7Ch – 80h – 86h	-6dB – 0dB – 12dB – 30dB			---	---	---	---	---
HIGH GAIN	OSA:52:[Data]		QSA:52	OSA:52:[Data]	7Ah – 7Ch – 80h – 86h	-6dB – 0dB – 12dB – 30dB			---	---	---	---	---
A.IRIIS WINDOW	OSA:53:[Data]		QSA:53	OSA:53:[Data]	0 1 2	NORM1 NORM2 CENTER			---	---	---	---	---
IRIS MODE	OSA:54:[Data]		QSA:54	OSA:54:[Data]	0 1	LENS CAM			---	---	---	---	---
IRIS GAIN @IRIS MODE = CAM	OSA:55:[Data]		QSA:55	OSA:55:[Data]	01h – 0Ah	1(A.IRIS SLOW) – 10(A. IRIS FAST)			---	---	---	---	---
MODE @S.GAIN	OSA:60:[Data]		QSA:60	OSA:60:[Data]	0 1 2	S.GAIN1 S.GAIN2 S.GAIN3			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
TOTAL GAIN@S.GAIN	---		QSA:61	OSA:61:[Data]	00h – 48h	0dB – 72dB			---	---	---	---	---
GAIN@S.GAIN	OSA:62:[Data]		OSA:62	OSA:62:[Data]	00h 03h 06h – 1Eh 21h 24h	0dB 3dB 6dB – 30dB 33dB 36dB			---	---	---	---	---
PIX MIX@S.GAIN	OSA:63:[Data]		QSA:63	OSA:63:[Data]	0 1	OFF +6dB			---	---	---	---	---
V MIX@S.GAIN	OSA:64:[Data]		QSA:64	OSA:64:[Data]	0 1	OFF +6dB			---	---	---	---	---
FRAME MIX@S.GAIN	OSA:65:[Data]		QSA:65	OSA:65:[Data]	00h 06h 0Ch 12h 18h 1Eh 80h	OFF +6dB +12dB +18dB +24dB +30dB AUTO	if use AUTO ,Max Gain of AUTO is set up by the FRAME MIX MAX command (OSE:74:[Data])		V1.00 Support Only 00h(OFF)-12h(+18dB), 80h(AUTO)	V3.00 Support Only 00h(OFF)-12h(+18dB), 80h(AUTO)	V1.00 Support Only 00h(OFF)-18h(+24dB)	V1.00 Support Only 00h(OFF)-18h(+24dB)	V1.00 Support Only 00h(OFF)- 18h(+24dB), 80h(AUTO)
H DETAIL LEVEL @S.GAIN	OSA:66:[Data]		QSA:66	OSA:66:[Data]	00h – 3Fh	0 – 63			---	---	---	---	---
CRISP @S.GAIN	OSA:67:[Data]		QSA:67	OSA:67:[Data]	00h – 1Fh	0 – 31			---	---	---	---	---
LEVEL DEPENDENT @S.GAIN	OSA:68:[Data]		QSA:68	OSA:68:[Data]	00h – 0Fh	0 – 15			---	---	---	---	---
PEAK FREQUENCY @S.GAIN	OSA:69:[Data]		QSA:69	OSA:69:[Data]	00h – 1Fh	0 – 31			---	---	---	---	---
M GAMMA @S.GAIN & DRS OFF	OSA:6A:[Data]		QSA:6A	OSA:6A:[Data]	67h – 80h – 94h	0.30 – 0.55 – 0.75			---	---	---	V1.00	---
M GAMMA @S.GAIN & DRS ON	OSA:6B:[Data]		QSA:6B	OSA:6B:[Data]	76h – 80h – 8Ah	-10 – 0 – +10			---	---	---	---	---
M PED OFFSET @S.GAIN	OSA:6C:[Data]		QSA:6C	OSA:6C:[Data]	738h – 800h – 8C8h	-200 – 0 – +200			---	---	---	---	---
R PED OFFSET @S.GAIN	OSA:6D:[Data]		QSA:6D	OSA:6D:[Data]	738h – 800h – 8C8h	-200 – 0 – +200			---	---	---	---	---
B PED OFFSET @S.GAIN	OSA:6E:[Data]		QSA:6E	OSA:6E:[Data]	738h – 800h – 8C8h	-200 – 0 – +200			---	---	---	---	---
SCAN REVERSE	OSA:70:[Data]		QSA:70	OSA:70:[Data]	0 1 2 3	OFF REVERSE1(L/R REVERSE) REVERSE2(U/D REVERSE) REVERSE3(L/R & U/D REVERSE)			---	---	---	---	---
FRAME RATE RANGE @VARIABLE FRAME	OSA:71:[Data]		QSA:71	OSA:71:[Data]	0 1	60-4 60-6			---	---	---	---	---
FRAME RATE @VARIABLE FRAME	OSA:72:[Data]		QSA:72	OSA:72:[Data]	04h – 3Ch	4fps – 60fps			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents			Remarks				
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
MATRIX TABLE	OSA:00:[Data]		QSA:00	OSA:00:[Data]	0 1	TABLE A TABLE B			---	---	---	---	---
D5600 @VIDEO MENU	OSA:80:[Data]		QSA:80	OSA:80:[Data]	0 1	OFF ON			---	---	---	---	---
LIGHTING @FILM MENU	OSA:81:[Data]		QSA:81	OSA:81:[Data]	0 1	DAYLIGHT TUNGSTEN			---	---	---	---	---
GAIN SELECT	OGS:[Data]		QGS	OGS:[Data]	01h 04h 08h 06h 0Ch 0Eh	LOW MID HIGH S.GAIN1 S.GAIN2 S.GAIN3			---	---	---	---	---
CAM ID	OSA:82:[Data]		QSA:82	OSA:82:[Data]	0 1 2	OFF BAR ON			---	---	---	---	---
CAM ID POSI	OSA:83:[Data]		QSA:83	OSA:83:[Data]	0 1 2 3	0(Upper left) 1(Upper right) 2(Lower left) 3(Lower right)			---	---	---	---	---
MATRIX TABLE	OSA:84:[Data]		QSA:84	OSA:84:[Data]	0 1 2	OFF A B			---	---	---	---	---
COLOR CORRECTION	OSA:85:[Data]		QSA:85	OSA:85:[Data]	0 1	OFF ON			---	---	---	---	---
BAR SELECT	OSA:86:[Data]		QSA:86	OSA:86:[Data]	0 1 2 3 4 5 6	FULL(16:9) FULL(4:3) SMPTE(16:9) SMPTE(4:3) ARIB EIAJ SPRIT			---	---	---	---	---
FORMAT	OSA:87:[Data]		QSA:87	OSA:87:[Data]	0h 1h 2h 3h 4h 5h 6h 7h 8h 9h Ah Bh Ch Dh Eh 10h 11h 12h 13h 14h 15h 16h 80h	720/60p 720/59.94p 720/50p 1080/60i 1080/59.94i 1080/50i 1080/30psF 1080/29.97psF 1080/25psF 1080/24psF 1080/23.98psF 480/59.94i 480/29.97psF 576/50i 576/25psF 1080/59.94p 1080/50p 480/59.94p 576/50p 1080/29.97p 1080/25p 1080/23.98p Auto		V1.00L01 [N Model] supports only 1h(720/59.94p),4h(1080/59.94i),Bh(480/59.94i) [E,MC Model] supports only 2h(720/50p),5h(1080/50i),Dh(576/50i) V2.00 [H Model/59.94Hz] supports only 1h(720/59.94p),4h(1080/59.94i),Bh(480/59.94i),10h(1080/59.94p),7h(1080/29.97psF) [H Model/50Hz] supports only 2h(720/50p),5h(1080/50i),Dh(576/50i),11h(1808/50p),8h(1080/25psf) [S Model/59.94Hz] supports only 1h(720/59.94p),4h(1080/59.94i),Bh(480/59.94i),7h(1080/29.97psF) [S Model/50Hz] supports only 2h(720/50p),5h(1080/50i),Dh(576/50i),8h(1080/25psf)	V3.00 [H Model/59.94Hz] supports only 1h(720/59.94p),4h(1080/59.94i),Bh(480/59.94i),10h(1080/59.94p),12h(480/59.94p) [H Model/50Hz] supports only 2h(720/50p),5h(1080/50i),Dh(576/50i),11h(1808/50p),8h(1080/25psf),13h(576/50p) [S Model/59.94Hz] supports only 1h(720/59.94p),4h(1080/59.94i),Bh(480/59.94i) [S Model/50Hz] supports only 2h(720/50p),5h(1080/50i),Dh(576/50i)	V1.00L01 [59.94Hz] supports only 1h(720/59.94p),4h(1080/59.94i),Bh(480/59.94i),10h(1080/59.94p),12h(480/59.94p) [50Hz] supports only 2h(720/50p),5h(1080/50i),Dh(576/50i),11h(1808/50p),13h(576/50p)	V1.00 [59.94Hz] supports only 1h(720/59.94p) 4h(1080/59.94i) 7h(1080/29.97psF) Ah(1080/23.98psF) 10h(1080/59.95p) 12h(480/59.94p) 14h(1080/29.97p) 16h(1080/23.98p) [50Hz] supports only 2h(720/50p) 5h(1080/50i) 8h(1080/25psF) 11h(1080/50p) 13h(576/50p) 15h(1080/25p)	V1.00 === HDMI Model === [59.94Hz] supports only 1h(720/59.94p) 4h(1080/59.94i) 7h(1080/29.97psF) 10h(1080/59.95p) 14h(1080/29.97p) 80h(Auto) [50Hz] supports only 2h(720/50p) 5h(1080/50i) 8h(1080/25psF) 11h(1080/50p) 15h(1080/25p) 80h(Auto) === SDI Model === [59.94Hz] supports only 1h(720/59.94p) 4h(1080/59.94i) 7h(1080/29.97psF) 14h(1080/29.97p) [50Hz] supports only 2h(720/50p) 5h(1080/50i) 8h(1080/25psF) 15h(1080/25p)

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents			Remarks				
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
STATUS	OSA:88:[Data]		QSA:88	OSA:88:[Data]	0 1	OFF ON			V1.00	V3.00	V1.00	V1.00	V1.00
MENU ON BAR	OSA:89:[Data]		QSA:89	OSA:89:[Data]	0 1	OFF ON			---	---	---	---	---
MENU SEL	---		QSA:8A	OSA:8A:[Data]	0 1	VIDEO MENU FILM MENU			---	---	---	---	---
SHUTTER MODE	OSA:90:[Data]		QSA:90	OSA:90:[Data]	1 2 3	OFF ON SYNCHRO SCAN			---	---	---	---	---
SHUTTER SPEED	OSA:91:[Data]		QSA:91	OSA:91:[Data]	 0 1 2 3 4 5 0 1 2 3 4 5	VIDEO MENU 1/100s 1/120s 1/250s 1/500s 1/1000s 1/2000s FILM MENU 180.0deg 172.8deg 144.0deg 120.0deg 90.0deg 45.0deg			---	---	---	---	---
GEN-LOCK INPUT	OSA:A0:[Data]		QSA:A0	OSA:A0:[Data]	0 1	OFF ON			---	---	---	---	---
H PHASE-COARSE @HD SYNC & 720	OSA:A1:[Data]		QSA:A1	OSA:A1:[Data]	58h - 80h - A8h	-40 - 0 - +40			---	---	---	---	---
H PHASE-COARSE @HD SYNC & 1080	OSA:A2:[Data]		QSA:A2	OSA:A2:[Data]	44h - 80h - BCh	-60 - 0 - +60			---	---	---	---	---
H PHASE-COARSE @SD SYNC	OSA:A3:[Data]		QSA:A3	OSA:A3:[Data]	08h - 80h - F8h	-120 - 0 - +120			---	---	---	---	---
H PHASE-FINE @HD SYNC & 720	OSA:A4:[Data]		QSA:A4	OSA:A4:[Data]	53h - 80h - ADh	-45 - 0 - +45			---	---	---	---	---
H PHASE-FINE @HD SYNC & 1080	OSA:A5:[Data]		QSA:A5	OSA:A5:[Data]	53h - 80h - ADh	-45 - 0 - +45			---	---	---	---	---
H PHASE-FINE @SD SYNC	OSA:A6:[Data]		QSA:A6	OSA:A6:[Data]	53h - 80h - ADh	-45 - 0 - +45			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
HD-SD PHASE CRS @HD SYNC	OSA:A7:[Data]		QSA:A7	OSA:A7:[Data]	79h – 80h – 88h	-7 – 0 – +7		---	---	---	---	---	---
HD-SD PHASE FINE @HD SYNC	OSA:A8:[Data]		QSA:A8	OSA:A8:[Data]	1Dh – 80h – E3h	-99 – 0 – +99		---	---	---	---	---	---
SD-HD PHASE CRS @SD SYNC	OSA:A9:[Data]		QSA:A9	OSA:A9:[Data]	7Ch – 80h – 84h	-4 – 0 – +4		---	---	---	---	---	---
SD-HD PHASE FINE @SD SYNC (D/C BOARD)	OSA:AA:[Data]		QSA:AA	OSA:AA:[Data]	1Dh – 80h – E3h	-99 – 0 – +99		---	---	---	---	---	---
HD/SD V PHASE @SD SYNC (D/C BOARD)	OSA:AB:[Data]		QSA:AB	OSA:AB:[Data]	0 1	HD SD		---	---	---	---	---	---
SC COARSE @SD SYNC (D/C BOARD)	OSA:AC:[Data]		QSA:AC	OSA:AC:[Data]	1 – 8	1 – 8		---	---	---	---	---	---
SC FINE @SD SYNC (D/C BOARD)	OSA:AD:[Data]		QSA:AD	OSA:AD:[Data]	19Ch – 200h – 264h	-100 – 0 – +100		---	---	---	---	---	---
SC-H COARSE @HD SYNC or NO SYNC (D/C BOARD)	OSA:AE:[Data]		QSA:AE	OSA:AE:[Data]	1 – 8	1 – 8		---	---	---	---	---	---
SC-H FINE @HD SYNC or NO SYNC	OSA:AF:[Data]		QSA:AF	OSA:AF:[Data]	19Ch – 200h – 264h	-100 – 0 – +100		---	---	---	---	---	---
TOTAL DTL LEVEL HIGH	OSA:B1:[Data]		QSA:B1	OSA:B1:[Data]	61h – 80h – 9Fh	-31 – 0 – +31		---	Camera Main V3.05 supports only 82h(2)-92h(18) for TOTAL DTL LEVEL (HIGH)	---	---	V1.00 supports only 82h(2)-92h(18) for TOTAL DTL LEVEL (HIGH)	
TOTAL DTL LEVEL (D/C BOARD)	OSE:00:[Data]		QSE:00	OSE:00:[Data]	00h – 3Fh	0 – 63		---	---	---	---	---	---
H DTL LEVEL (D/C BOARD)	OSE:01:[Data]		QSE:01	OSE:01:[Data]	00h – 3Fh	0 – 63		---	---	---	---	---	---
CRISP (D/C BOARD)	OSE:02:[Data]		QSE:02	OSE:02:[Data]	00h – 3Fh	0 – 63		---	---	---	---	---	---
PEAK FREQUENCY (D/C BOARD)	OSE:03:[Data]		QSE:03	OSE:03:[Data]	1 2 3 4 5 6 7	1.89MHz 2.18MHz 2.56MHz 3.17MHz 4.00MHz 5.28MHz 6.75MHz		---	---	---	---	---	---
LEVEL DEPENDENT (D/C BOARD)	OSE:04:[Data]		QSE:04	OSE:04:[Data]	00h – 1Eh	0% – 30%		---	---	---	---	---	---
DARK DETAIL (D/C BOARD)	OSE:05:[Data]		QSE:05	OSE:05:[Data]	0 – 7	0(OFF) – 7		---	---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents			Remarks				
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
KNEE APERTURE (D/C BOARD)	OSE:06:[Data]		QSE:06	OSE:06:[Data]	00h – 3Fh	0 – 63			---	---	---	---	---
+CLIP (D/C BOARD)	OSE:07:[Data]		QSE:07	OSE:07:[Data]	00h – 3Fh	0 – 63			---	---	---	---	---
-CLIP (D/C BOARD)	OSE:08:[Data]		QSE:08	OSE:08:[Data]	00h – 3Fh	0 – 63			---	---	---	---	---
CORNER DETAIL (D/C BOARD)	OSE:09:[Data]		QSE:09	OSE:09:[Data]	00h – 1Fh	0 – 31			---	---	---	---	---
CHROMA DETAIL (D/C BOARD)	OSE:0A:[Data]		QSE:0A	OSE:0A:[Data]	00h – 3Fh	0 – 63			---	---	---	---	---
CHROMA DTL CRISP (D/C BOARD)	OSE:0B:[Data]		QSE:0B	OSE:0B:[Data]	00h – 3Fh	0 – 63			---	---	---	---	---
DETAIL SOURCE (D/C BOARD)	OSE:0C:[Data]		QSE:0C	OSE:0C:[Data]	0 1 2 3 4	(G+R)/2 (G+B)/2 (2G+B+R)/4 (3G+B)/4 R			---	---	---	---	---
SKIN TONE DETAIL (D/C BOARD)	OSE:10:[Data]		QSE:10	OSE:10:[Data]	0 1	OFF ON			---	---	---	---	---
SKIN TONE LEVEL (D/C BOARD)	OSE:11:[Data]		QSE:11	OSE:11:[Data]	0 1 2	LOW MID HIGH			---	---	---	---	---
SKIN TONE ZEBRA (D/C BOARD)	OSE:12:[Data]		QSE:12	OSE:12:[Data]	0 1	OFF ON			---	---	---	---	---
SKIN TONE PHASE (D/C BOARD)	OSE:13:[Data]		QSE:13	OSE:13:[Data]	5Dh – 7Bh – 99h	93 – 123 – 153			---	---	---	---	---
SKIN TONE WIDTH (D/C BOARD)	OSE:14:[Data]		QSE:14	OSE:14:[Data]	01h – 14h	1 – 20			---	---	---	---	---
SKIN TONE CRISP (D/C BOARD)	OSE:15:[Data]		QSE:15	OSE:15:[Data]	0 – 7	0 – 7			---	---	---	---	---
D/C MODE (D/C BOARD)	OSE:20:[Data]		QSE:20	OSE:20:[Data]	0 1 2 3	SIDE CUT SQUEEZE LetterBOX Link			V1.00	V3.00	V1.00	V1.00	---
VBS SETUP (D/C BOARD)	OSE:21:[Data]		QSE:21	OSE:21:[Data]	0 1	0.0% 7.5%			---	---	---	---	---
CHARACTER MIX (D/C BOARD)	OSE:22:[Data]		QSE:22	OSE:22:[Data]	0 1 2 3	ALL SD(VBS + SD-SDI) VBS SD-SDI			---	---	---	---	---
2D LPF (D/C BOARD)	OSE:23:[Data]		QSE:23	OSE:23:[Data]	0 1 2 3	OFF LOW MID HIGH			---	---	---	---	---
CHARACTER MIX (HD SDI BOARD)	OSE:30:[Data]		QSE:30	OSE:30:[Data]	0 1	ALL OPTION			---	---	---	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
CHARACTER MIX SELECT	OSD:98:[Data1]:[Data2]		QSD:98:[Data1]	OSD:98:[Data1]:[Data2]	Data1 0 1 2 Data2 0 1 2	Output Browser/Video SDI/HDMI,Component OPTION Character Mix Select Off On Off By Browser			---	V3.00 suports only Output 0(Browser/Video), 1(SDI/HDMI,Component) Character Mix Select 2(Off By Browser) is Valid When Output is 1(SDI/HDMI,Component)	---	---	---
ERROR NOTICE	---		QER	OER:[Data]	0 1	Normal Fan Error		If the Camera made trouble,Camera sent "OER:[Data]" periodically.	---	---	V1.00	---	---
PRESET MATRIX SELECT	OSE:31:[Data]		QSE:31	OSE:31:[Data]	0 1 2 3	NORMAL EBU MATRIX NTSC MATRIX USER			V1.00 suports only 0(NORMAL), 1(EBU MATRIX), 2(NTSC MATRIX) V2.00	V3.00	V1.00	V1.00	V1.00
SOFT SKIN	OSE:32:[Data]		QSE:32	OSE:32:[Data]	0 1 2 3	OFF LOW MID HIGH			V1.00 supports only 0(OFF),1(LOW),3(HIGH)	V3.00 supports only 0(OFF),1(LOW),3(HIGH)	---	---	V1.00 supports only 0(OFF),1(LOW),3(HIGH)
DRS SELECT	OSE:33:[Data]		QSE:33	OSE:33:[Data]	0 1 2 3	OFF LOW MID HIGH			V1.00 supports only 0(OFF),1(LOW),3(HIGH)	V3.00 supports only 0(OFF),1(LOW),3(HIGH)	V1.00	V1.00	V1.00 supports only 0(OFF),1(LOW),3(HIGH)
HDMI COLOR	OSE:68:[Data]		QSE:68	OSE:68:[Data]	0 1 2 3	RGB(NOR) RGB(ENH) YPbPr(422) YPbPr(444)			V1.00	V3.00	V1.00	---	---
PUSH AUTO FOCUS	OSE:69:[Data]		---	---	1	PUSH AUTO			V1.00	V3.00	V1.00	V1.00	V1.00
DIGITAL ZOOM ENABLE	OSE:70:[Data]		QSE:70	OSE:70:[Data]	0 1	DISABLE ENABLE			V1.00	V3.00	V1.00	V1.00	V1.00
PRESET SCOPE	OSE:71:[Data]		QSE:71	OSE:71:[Data]	0 1 2	MODE A MODE B MODE C			V1.00	V3.00	V1.00	V1.00	V1.00
GAMMA TYPE	OSE:72:[Data]		QSE:72	OSE:72:[Data]	0 1 2 0 1 2 3 4	OFF NORMAL CINEMA AW-HE130 HD SD FILMLIKE1 FILMLIKE2 FILMLIKE3			V1.00	V3.00	V1.00	V1.00	V1.00
BACK LIGHT COMPENSATION	OSE:73:[Data]		QSE:73	OSE:73:[Data]	0 1	OFF ON			V1.00	V3.00	---	---	V1.00

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
AUTO F.MIX MAX GAIN	OSE:74:[Data]		QSE:74	OSE:74:[Data]	00 01 02 03 04 05 06	(OFF) 6dB 12dB 18dB 24dB 30dB 36dB (HBK50:33dB)			V1.00 supports only 00(OFF)-03(18dB)	V3.00 supports only 00(OFF)-03(18dB)	---	---	V1.00 supports only 00(OFF)-03(18dB)
OSD Off With TALLY	OSE:75:[Data]		QSE:75	OSE:75:[Data]	0 1	OFF ON			V1.00	V3.00	V1.00	V1.00	V1.00
DIGITAL ZOOM MAGNIFICATION	OSE:76:[Data]		QSE:76	OSE:76:[Data]	0100 - 9999	*1.00 - *99.99			V1.00 supports only 0100(*1.00) - 1000(*10.00)	V3.00 supports only 0100(*1.00) - 1000(*10.00)	V1.00 supports only 0100(*1.00) - 1000(*10.00)	V1.00 supports only 0100(*1.00) - 1000(*10.00)	V1.00 supports only 0100(*1.00) - 1600(*16.00)
BASE FREQUENCY SELECT	OSE:77:[Data]		QSE:77	OSE:77:[Data]	0 1	59.94Hz 50.00Hz			V2.00	V1.00	V1.00	V1.00	V1.00
MAXIMUM DIGITAL ZOOM	OSE:7A:[Data]		QSE:7A	OSE:7A:[Data]	02 - 18	x2 - x18			---	---	V1.00 supports only 02(x2) - 10(x10)	V1.00 supports only 02(x2) - 10(x10)	V1.00 supports only 02(x2) - 16(x16)
RIGHT SW	DRT:[Data]		---	---	1 A	1Step 10Step			---	---	V1.00	V1.00	---
LEFT SW	DLT:[Data]		---	---	1 A	1Step 10Step			---	---	V1.00	V1.00	---
DAY-NIGHT	OSE:80:[Data]		QSE:80	OSE:80:[Data]	0 1	Day Night			---	---	---	---	---
OIS(Optical Image Stabilizer)	OIS:[Data]		QIS	OIS:[Data]	0 1 0 1 2	Off On			---	---	---	V1.00	V1.00
Flash Band Comp	OFB:[Data]		QFB	OFB:[Data]	0 1	Off On			---	---	---	---	---
OSD Mix	OSE:7B:[Data]		QSE:7B	OSE:7B:[Data]	00 01 02 04 08 10	OSD Mix Off SDI On HDMI On Analog On Video On IP On ※bit0:SDI, bit1:HDMI, bit2:Analog, bit3:Video, bit4:IP			---	---	V1.00 supports only 00(OSD Mix Off) 01(SDI On) 02(HDMI On) 04(Analog On) 08(Video On)	V1.00 supports only 00(OSD Mix Off) 01(SDI On) 02(HDMI On) 08(Video On) 10(IP On)	---
Flip Status	---		QFS	OFS:[Data]	0 1	Normal Flip			---	---	V1.00	V1.00	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents: Control and Response to contol	Data Contents: Response to Confirmation	Remarks	HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
Focus ADJ With Zoom Mode	OAZ:[Data]		QAZ	OAZ:[Data]	0 1	OFF ON			V1.00	V1.00	V1.00	V1.00	V1.00
PinP CTRL	OP:[Data]		QP	OP:[Data]	0 1	OFF ON			---	---	---	---	---
CHROMA LEVEL	OSD:B0:[Data]		QSD:B0	OSD:B0:[Data]	00h 1Dh - 80h - A8h	OFF -99% - 0 - 40%			---	---	---	V1.00	---
COLOR TEMPERATURE	OSD:B1:[Data]		QSD:B1	OSD:B1:[Data]	000h,001h,002h,003h,004h, 005h,006h,007h,008h,009h, - - - - - - - - - - - - - - - - - - - 06Eh,06Fh,070h,071h,072h, 073h,074h,075h,076h,077h, 078h 000h 001h -	AW-HE130 2000K,2010K,2020K,2040K,2050K, 2070K,2080K,2090K,2110K,2120K, 2140K,2150K,2170K,2180K,2200K, 2210K,2230K,2240K,2260K,2280K, 2300K,2310K,2330K,2340K,2360K, 2380K,2400K,2420K,2440K,2460K, 2480K,2500K,2520K,2540K,2560K, 2600K,2620K,2640K,2680K,2700K, 2720K,2740K,2780K,2800K,2820K, 2850K,2870K,2920K,2950K,2970K, 3000K,3020K,3070K,3100K,3120K, 3150K,3200K,3250K,3270K,3330K, 3360K,3420K,3450K,3510K,3570K, 3600K,3660K,3720K,3780K,3840K, 3870K,3930K,3990K,4050K,4110K, 4170K,4240K,4320K,4360K,4440K, 4520K,4600K,4680K,4760K,4840K, 4920K,5000K,5100K,5200K,5300K, 5400K,5500K,5600K,5750K,5850K, 6000K,6150K,6300K,6450K,6650K, 6800K,7000K,7150K,7400K,7600K, 7800K,8100K,8300K,8600K,8900K, 9200K,9600K,10000K,10500K,11000K, 11500K,12000K,12500K,13000K,14000K, 15000K [AW-HE40/HE65/HE70] 2400K 2500K - 9800K 9900K (100K step)			---	---	---	V1.00	V1.00
V DTL LEVEL	OSD:A1:[Data]		QSD:A1	OSD:A1:[Data]	79h - 80h - 87h	-7 - 0 - 7			---	---	---	V1.0	---
DETAIL BAND	OSD:A2:[Data]		QSD:A2	OSD:A2:[Data]	79h - 80h - 87h	-7 - 0 - 7			---	---	---	V1.0	---
FLESH NOISE SUPPRESS	OSD:A3:[Data]		QSD:A3	OSD:A3:[Data]	80h - 9Fh	0 - 31			---	---	---	V1.0	---
MATRIX(R-G)	OSD:A4:[Data]		QSD:A4	OSD:A4:[Data]	41h - 80h - BFh	-63 - 0 - 63			---	---	---	V1.0	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
MATRIX(R-B)	OSD:A5:[Data]		QSD:A5	OSD:A5:[Data]	41h - 80h - BFh	-63 - 0 - 63			---	---	---	V1.0	---
MATRIX(G-R)	OSD:A6:[Data]		QSD:A6	OSD:A6:[Data]	41h - 80h - BFh	-63 - 0 - 63			---	---	---	V1.0	---
MATRIX(G-B)	OSD:A7:[Data]		QSD:A7	OSD:A7:[Data]	41h - 80h - BFh	-63 - 0 - 63			---	---	---	V1.0	---
MATRIX(B-R)	OSD:A8:[Data]		QSD:A8	OSD:A8:[Data]	41h - 80h - BFh	-63 - 0 - 63			---	---	---	V1.0	---
MATRIX(B-G)	OSD:A9:[Data]		QSD:A9	OSD:A9:[Data]	41h - 80h - BFh	-63 - 0 - 63			---	---	---	V1.0	---
COLOR MATRIX Mg_R_R GAIN /COLOR CORRECTION Mg_R_R SATURATION	OSD:9A:[Data]		QSD:9A	OSD:9A:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	V1.0 supports only 41h(-63) - BFh(+63)	---
COLOR MATRIX Mg_R_R PHASE /COLOR CORRECTION Mg_R_R PHASE	OSD:9B:[Data]		QSD:9B	OSD:9B:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	V1.0 supports only 41h(-63) - BFh(+63)	---
COLOR MATRIX R_R_Yl GAIN /COLOR CORRECTION R_R_Yl SATURATION	OSD:9C:[Data]		QSD:9C	OSD:9C:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	V1.0 supports only 41h(-63) - BFh(+63)	V1.00 supports only 61h(-31) - 9Fh(+31)
COLOR MATRIX R_R_Yl PHASE /COLOR CORRECTION R_R_Yl PHASE	OSD:9D:[Data]		QSD:9D	OSD:9D:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	V1.0 supports only 41h(-63) - BFh(+63)	V1.00 supports only 41h(-63) - BFh(+63)
COLOR MATRIX R_Yl_Yl GAIN /COLOR CORRECTION R_Yl_Yl SATURATION	OSD:9E:[Data]		QSD:9E	OSD:9E:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	V1.0 supports only 41h(-63) - BFh(+63)	V1.00 supports only 61h(-31) - 9Fh(+31)
COLOR MATRIX R_Yl_Yl PHASE /COLOR CORRECTION R_Yl_Yl PHASE	OSD:9F:[Data]		QSD:9F	OSD:9F:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	V1.0 supports only 41h(-63) - BFh(+63)	V1.00 supports only 41h(-63) - BFh(+63)
AUDIO	OSA:D0:[Data]		QSA:D0	OSA:D0:[Data]	0 1	OFF ON			---	---	---	V1.0	V1.00
AUDIO INPUT VOLUME	OSA:D1:[Data]		QSA:D1	OSA:D1:[Data]	0 1 2 3 4 5	Mic High Mic Middle Nic Low Line High Line Middle Line Low			---	---	---	V1.0	V1.00
AUDIO PLUGIN POWER	OSA:D2:[Data]		QSA:D2	OSA:D2:[Data]	0 1	OFF ON			---	---	---	V1.0	V1.00
TALLY BRIGHTNESS	OSA:D3:[Data]		QSA:D3	OSA:D3:[Data]	0 1 2	LOW MID HIGH			---	---	---	V1.0	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
NIGHT MODE SEL	OSD:B2:[Data]		QSD:B2	OSD:B2:[Data]	0 1	Manual Auto			---	---	---	---	V1.00
i.ZOOM	OSD:B3:[Data]		QSD:B3	OSD:B3:[Data]	0 1	DISABLE ENABLE			---	---	---	---	V1.00
HDR	OSD:B4:[Data]		QSD:B4	OSD:B4:[Data]	0 1 2 3	Off Low Mid High			---	---	---	---	V1.00 supports only 0(OFF),1(LOW),3(HIGH)
COLOR MATRIX Cy_Cy_B GAIN /COLOR CORRECTION Cy Cy B	OSD:AA:[Data]		QSD:AA	OSD:AA:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 61h(-31) - 9Fh(+31)
COLOR MATRIX Cy_Cy_B PHASE /COLOR CORRECTION Cy Cy B PHASE	OSD:AB:[Data]		QSD:AB	OSD:AB:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 41h(-63) - BFh(+63)
COLOR MATRIX Cy_B_B GAIN /COLOR CORRECTION Cy B B SATURATION	OSD:AC:[Data]		QSD:AC	OSD:AC:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 61h(-31) - 9Fh(+31)
COLOR MATRIX Cy_B_B PHASE /COLOR CORRECTION Cy B B PHASE	OSD:AD:[Data]		QSD:AD	OSD:AD:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 41h(-63) - BFh(+63)
COLOR MATRIX B_B_Mg GAIN /COLOR CORRECTION B B Mg SATURATION	OSD:C0:[Data]		QSD:C0	OSD:C0:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 61h(-31) - 9Fh(+31)
COLOR MATRIX B_B_Mg PHASE /COLOR CORRECTION B B Mg PHASE	OSD:C1:[Data]		QSD:C1	OSD:C1:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 41h(-63) - BFh(+63)
COLOR MATRIX B_Mg_Mg GAIN /COLOR CORRECTION B Mg Mg	OSD:C2:[Data]		QSD:C2	OSD:C2:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 61h(-31) - 9Fh(+31)
COLOR MATRIX B_Mg_Mg PHASE /COLOR CORRECTION B Mg Mg PHASE	OSD:C3:[Data]		QSD:C3	OSD:C3:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 41h(-63) - BFh(+63)
COLOR MATRIX Yl_Yl_G GAIN /COLOR CORRECTION Yl Yl G SATURATION	OSD:C4:[Data]		QSD:C4	OSD:C4:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 61h(-31) - 9Fh(+31)
COLOR MATRIX Yl_Yl_G PHASE /COLOR CORRECTION Yl Yl G PHASE	OSD:C5:[Data]		QSD:C5	OSD:C5:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 41h(-63) - BFh(+63)
COLOR MATRIX Yl_G_G GAIN /COLOR CORRECTION Yl G G SATURATION	OSD:C6:[Data]		QSD:C6	OSD:C6:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 61h(-31) - 9Fh(+31)
COLOR MATRIX Yl_G_G PHASE /COLOR CORRECTION Yl G G PHASE	OSD:C7:[Data]		QSD:C7	OSD:C7:[Data]	01h - 80h - FFh	-127 - 0 - +127			---	---	---	---	V1.00 supports only 41h(-63) - BFh(+63)

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks					
						Control and Response to contol	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/ HE65/ HE70
NIGHT-DAY LEVEL	OSD:B7:[Data]		QSD:B7	OSD:B7:[Data]	0 1 2	Low Mid High			---	---	---	---	V1.00

P/T Control Protocol

This is a program to control Panasonic PAN/TILT system from PC by serial communication.

Method	Half Duplex
Commnunication Speed	9600bps
Data bit	8bit
Stop bit	1bit
Prity	None
Flow contorol	None

(Electrical Specification)
Connecter : Mojdular 8pin
Compatible with RS422
4line system(TX+,TX−/send, RX+,RX−/Recieve)

(Process)
(1) PC —— Command ⟶ CAMERA
(2) CAMERA —— Command ⟶ PC (In most P/T commands, there is no reply.)

Normally it is processed as mentioned above,but in case of error,it ends by replying error code(*1) in (2).

(*1)Error code

Item	Error code	Contents
Unsupported	eR1[CR]	The Command is not supported by CAMERA.
System busy	eR2[CR]	CAMERA can not process the command for running the other processing.
Out of range	eR3[CR]	Data is out of range.

ex)1 PAN Stop command

#	P	5	0	[CR]
H'23	H'50	H'35	H'30	H'0D

ITEM	Control Command	Confirmation Command	Responce Command	Data	Data Contents		Remarks					
					Control and Response to control	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/HE65/HE70
Power	#O[Data]	#O	p[Data]	0 f 1 n 2 3	Power OFF Power OFF Power ON Power ON --- ---	Power OFF Power OFF Power ON(w/ Camera TX) Power ON(wo/ Camera TX) Starting	Camera Power & P/T Control "Starting" is supported only Responce Command.	with Camera TX -> Controller RX line	with Camera TX -> Controller RX line	with Camera TX -> Controller RX line	with Camera TX -> Controller RX line	with Camera TX -> Controller RX line
Pan Speed Control	#P[Data]	---	pS[Data]	01 – 50 – 99	Left Max. Speed – Stop – Right Max. Speed			V1.00	V3.00	V1.00	V1.00	V1.00
Tilt Speed Control	#T[Data]	---	tS[Data]	01 – 50 – 99	Down Max. Speed – Stop – UP Max. Speed			V1.00	V3.00	V1.00	V1.00	V1.00
Zoom Speed Control	#Z[Data]	---	zS[Data]	01 – 49 50 51 – 99	Wide Max. Speed – Wide Min. Speed Stop Tele Min. Speed – Tele Max. Speed			V1.00	V3.00	V1.00	V1.00	V1.00
Zoom Position Control	#AXZ[Data]	#AXZ	axz[Data]	555h – FFFh	Wide – Tele			V1.00	V3.00	V1.00	V1.00	V1.00
Focus Speed Control	#F[Data]	---	fS[Data]	01 – 49 50 51 – 99	Near Max. Speed – Near Min. Speed Stop Far Min. Speed – Far Max. Speed			V1.00	V3.00	V1.00	V1.00	V1.00
Focus Position Control	#AXF[Data]	#AXF	axf[Data]	555h – FFFh	Near – Far			V1.00	V3.00	V1.00	V1.00	V1.00
Roll Speed Control	#RO[Data]	---	rO[Data]	01 – 49 50 51 – 99	CCW Max. Speed – CCW Min. Speed Stop CW Min. Speed – CW Max. Speed			---	---	---	---	---
Iris Control	#I[Data]	#I	iC[Data]	01 – 99	Iris Close – Iris Open			V1.00	V3.00	V1.00	V1.00	V1.00
Iris Control	#AXI[Data]	#AXI	axi[Data]	555h – FFFh	Iris Close – Iris Open			V1.00	V3.00	V1.00	V1.00	V1.00
Extender/AF Control	#D1[Data]	#D1	d1[Data]	0 1	OFF ON			V1.00	V3.00	V1.00	V1.00	V1.00
ND Control	#D2[Data]	#D2	d2[Data]	0 1	OFF ON			---	---	---	---	---
Iris Auto/Manual	#D3[Data]	#D3	d3[Data]	0 1	Manual Iris Auto Iris			V1.00	V3.00	V1.00	V1.00	V1.00
Lamp Control	#D4[Data]	#D4	d4[Data]	0 1	OFF ON			---	---	---	---	---
Lamp Alarm	#D5	---	d5[Data]	0 1		Alarm OFF Alarm ON		---	---	---	---	---
OPTION SW Control	#D6[Data]	#D6	d6[Data]	0 1	OFF ON			V1.00	V3.00	---	V1.00	V1.00
Defroster Control	#D7[Data]	---	d7[Data]	0 1	OFF ON			---	---	---	---	---
Wiper Control	#D8[Data]	---	d8[Data]	0 1	OFF ON			---	---	---	---	---
Heater/Fan Control	#D9[Data]	---	d9[Data]	0 1	OFF ON			---	---	---	---	---
Tally Control	#DA[Data]	#DA	dA[Data]	0 1	OFF ON			V1.00	V3.00	V1.00	V1.00	V1.00
Request Latest Recall Preset No.	---	#S	s[Data]	00 – 99 PH360,PH400,PH405,PH650 00 – 49		Preset 1 – Preset 100 PH360,PH400,PH405,PH650 Preset 01 – Preset 50		V1.00	V3.00	V1.00	V1.00	V1.00

ITEM	Control Command	Confirmation Command	Responce Command	Data	Data Contents		Remarks					
					Control and Response to control	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/HE65/HE70
Save Preset Memory	#M[Data]	---	s[Data]	00 – 99 PH360,PH400,PH405,PH650 00 – 49	Preset001 – Preset100 PH360,PH400,PH405,PH650 Preset 01 – Preset 50			V1.00	V3.00	V1.00	V1.00	V1.00
Recall Preset Memory	#R[Data]	---	s[Data]	00 – 99 PH360,PH400,PH405,PH650 00 – 49	Preset001 – Preset100 PH360,PH400,PH405,PH650 Preset 01 – Preset 50			V1.00	V3.00	V1.00	V1.00	V1.00
Preset completion notification	---	---	q[Data]	00 – 99 PH360,PH400,PH405,PH650 00 – 49	Preset001 – Preset100 PH360,PH400,PH405,PH650 Preset 01 – Preset 50			V1.00	V3.00	V1.00	V1.00	V1.00
Preset Mode Setting	#RT[Data]	#RT	rt[Data]	0 1	Normal Diagonal			---	---	---	---	---
Limitation Setting	#L[Data]	---	l[Data]	Controller -> P/T 1 2 3 4 P/T -> Controller 0 1	Tilt Up Tilt Down Pan Left Pan Right	Release Set		V1.00	V3.00	V1.00	V1.00	V1.00
Landing Setting	#N[Data]	---	n[Data]	0 1	Just Landing Soft Landing			---	---	---	---	---
Request Zoom Position (Output D/A Data)	---	#GZ	gz[Data]	555h – FFFh "---"		Wide – Tele @Power OFF		V1.00	V3.00	V1.00	V1.00	V1.00
Request Focus Position (Output D/A Data)	---	#GF	gf[Data]	555h – FFFh "---"		Near – Far @Power OFF		V1.00	V3.00	V1.00	V1.00	V1.00
Request Iris Position (Output D/A Data)	---	#GI	gi[Data1][Data2]	[Data1] 555h – FFFh "---" [Data2] 0 1		[Data1] Close – Open @Power OFF [Data2] Manual Iris Auto Iris	@Iris Manual	V1.00	V3.00	V1.00	V1.00	V1.00
Tilt Range	#AGL[Data]	#AGL	aGL[Data]	0 1	Narrow(190deg) Wide(300deg)			---	---	---	---	---
Request Software Vertion	---	#V?	[Version Data]					---	---	---	---	---
TALLY Enable	#TAE[Data]	#TAE	tAE[Data]	0 1	Disable Enable			V1.00	V3.00	V1.00	V1.00	V1.00
Install Positon	#INS[Data]	#INS	iNS[Data]	0 1	Desktop Hanging			V1.00	V3.00	V1.00	V1.00	V1.00
Speed With Zoom POS	#SWZ[Data]	#SWZ	sWZ[Data]	0 1	OFF ON			V1.00	V3.00	V1.00	V1.00	V1.00

ITEM	Control Command	Confirmation Command	Responce Command	Data	Data Contents		Remarks					
					Control and Response to control	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/HE65/HE70
Pan/Tilt Absolute Position Control	#APC[Data1][Data2]	#APC	aPC[Data1][Data2]	[Data1] 0000h – 8000h – FFFFh [Data2] 0000h – 8000h – FFFFh	[Data1]Pan Position CCW Limit – Center – CW Limit [Data2]Tilt Position UP Limit – Center – DOWN Limit	[Data1]Pan Position CCW Limit – Center – CW Limit [Data2]Tilt Position UP Limit – Center – DOWN Limit	1 step is equivalent to 29.7 seconds	V1.00 supports only Pan 2D08(CCW Limit)–D2F5(CW Limit) Tilt 5556(UP Limit)–8E38(DOWN Limit)	V3.00 supports only Pan 2D08(CCW Limit)–D2F5(CW Limit) Tilt 5556(UP Limit)–8E38(DOWN Limit)	V1.00 supports only Pan 2D08(CCW Limit)–D2F5(CW Limit) Tilt 1C73(UP Limit)–8E38(DOWN Limit)	V1.00 supports only Pan 2D08(CCW Limit)–D2F5(CW Limit) Tilt 1C73(UP Limit)–8E38(DOWN Limit)	V1.00 supports only Pan 2D08(CCW Limit)–D2F5(CW Limit) Tilt 5556(UP Limit)–8E38(DOWN Limit)
Limitation Control	#LC[Data1][Data2]	#LC[Data1]	lC[Data1][Data2]	[Data1] 1 2 3 4 [Data2] 0 1	[Data1] Tilt Up Tilt Down Pan Left Pan Right [Data2] Release Set	[Data1] Tilt Up Tilt Down Pan Left Pan Right [Data2] Release Set		V1.00	V3.00	V1.00	V1.00	V1.00
Pan Tilt Speed Control	#PTS[Data1][Data2]	----	pTS[Data1][Data2]	[Data1] 01 – 50 – 99 [Data2] 01 – 50 – 99	[Data1] Left Max. Speed – Stop – Right Max. Speed [Data2] Down Max. Speed – Stop – UP Max. Speed			V1.00	V3.00	V1.00	V1.00	V1.00
Wireless Control	#WLC[Data1]	#WLC	wLC[Data1]	0 1	Disable Enable			V1.00	V3.00	V1.00	V1.00	V1.00
SOFTWARE VERSION	#CSV[Data1]V[Data2].[Data3][Data4][Data5][data6]	#QSV[Data1]	qSV[Data1]V[Data2].[Data3][Data4][Data5][data6]	[Data1] 0 1 2 3 4 5 6 7 8 9 [Data2] 00–99 [Data3] 00–99 [Data4] E L [Data5] 00–99 [data6] 0 1 2	[Data1] (Unit No.0) (Unit No.1) (Unit No.2) (Unit No.3) (Unit No.4) (Unit No.5) (Unit No.6) (Unit No.7) (Unit No.8) (Unit No.9)	[Data1] (Unit No.0) (Unit No.1) (Unit No.2) (Unit No.3) (Unit No.4) (Unit No.5) (Unit No.6) (Unit No.7) (Unit No.8) (Unit No.9) [Data2] MAJOR VERSION [Data3] MINOR VERSION [Data4] Debug Build Release Build [Data5] REVISION [data6] NTSC PAL Other		[Data1] Pan Tilt CPU Camera CPU Camera FPGA Network CPU OUT FPGA reserve reserve reserve reserve reserve [Data2] MAJOR VERSION [Data3] MINOR VERSION [Data4] (Debug Build) (Release Build) [Data5] (REVISION) [data6] NTSC PAL Other	[Data1] Pan Tilt CPU Camera CPU Camera FPGA Network CPU OUT FPGA reserve reserve reserve Camera EEPROM reserve [Data2] MAJOR VERSION [Data3] MINOR VERSION [Data4] (Debug Build) (Release Build) [Data5] (REVISION) [data6] NTSC PAL Other	[Data1] Servo CPU CameraMain CPU Frontend FPGA Network CPU Backend FPGA Interface CPU Lens FPGA Interface EEPROM Camera EEPROM Lens EEPROM [Data2] MAJOR VERSION [Data3] MINOR VERSION [Data4] (Debug Build) (Release Build) [Data5] (REVISION) [data6] NTSC PAL	[Data1] Servo CPU CameraMain CPU COM FPGA Network CPU AVIO FPGA Interface CPU Lens FPGA Interface EEPROM reserve reserve [Data2] MAJOR VERSION [Data3] MINOR VERSION [Data4] (Debug Build) (Release Build) [Data5] (REVISION) [data6] NTSC PAL	supports only #QSV[Data1] [Data1] Servo CPU Cam CPU FPGA BE CPU reserve Interface CPU reserve Interface EEPROM reserve reserve [Data2] 00 [Data3] VERSION [Data4] L [Data5] 00 [data6] NTSC PAL

ITEM	Control Command	Confirmation Command	Responce Command	Data	Data Contents		Remarks						
					Control and Response to control	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/HE65/HE70	
Error Status Info.	---	#RER	rER[Data]	00h 01h 02h 03h 04h 05h 06h 07h 08h 09h 0Ah 0Bh – 17h – 19h – 21h 22h 23h 24h 25h – 30h 31h 32h 33h		Normal (Error1) (Error2) (Error3) (Error4) (Error5) (Error6) (Error7) (Error8) (Error9) (Error10) (Error11) – (Error23) – (Error25) – (Error27) (Error28) (Error29) (Error30) (Error31) (Error32) (Error33) (Error34) – (Error48) (Error49) (Error50) (Error51)		V1.00 Normal – – Motor Driver Error Pan Sensor Error Tilt Sensor Error Controller RX Over run Error Controller RX Framing Error Network RX Over run Error Network RX Framing Error – – – Controller RX Command Buffer Overflow – Network RX Command Buffer Overflow – System Error Spec Limit Over FPGA Config Error Network communication Error – – Lvds_Adjustmet_NG Bar_Signal_Check_NG – –	V3.00 Normal – – Motor Driver Error Pan Sensor Error Tilt Sensor Error Controller RX Over run Error Controller RX Framing Error Network RX Over run Error Network RX Framing Error – – – Controller RX Command Buffer Overflow – Network RX Command Buffer Overflow – System Error Spec Limit Over FPGA Config Error Network communication Error – – – – – Lvds_Adjustmet_NG Bar_Signal_Check_NG H_Sync_Check_NG HDMI_Check_NG	V1.00 Normal – – Motor Driver Error Pan Sensor Error Tilt Sensor Error Controller RX Over run Error Controller RX Framing Error Network RX Over run Error Network RX Framing Error – – – Controller RX Command Buffer Overflow – Network RX Command Buffer Overflow – System Error Spec Limit Over FPGA Config Error Network communication Error Lens Initialize Error – – – – – – – –	V1.00 Normal – – Motor Driver Error Pan Sensor Error Tilt Sensor Error Controller RX Over run Error Controller RX Framing Error Network RX Over run Error Network RX Framing Error – – – Controller RX Command Buffer Overflow – Network RX Command Buffer Overflow – System Error Spec Limit Over FPGA Config Error – CAMERA communication Error CAMERA RX Over run Error CAMERA RX Framing Error CAMERA RX Command Buffer Overflow – – – – –	V1.00 supports only 00h Normal(No Error) 03h Motor Driver Error 04h Pan Sensor Error 05h Tilt Sensor Error 06h IF/FPGA UART Over run Error 07h IF/FPGA UART Framing Error 08h IF/NET UART Over run Error 09h IF/NET UART Framing Error 17h IF/FPGA UART Buffer Overflow 19h IF/NET UART Buffer Overflow 21h System Error(IF/SERVO Error) 22h PT Limit Over 24h NET Life-monitoring Error 25h BE Life-monitoring Error 26h IF/BE UART Buffer Overflow 27h IF/BE UART Framing Error 28h IF/BE UART Buffer Overflow 29h CAM Life-monitoring Error
Lens Position Information	---	#LPI	lPI[Data1][Data2][Data3]	[Data1] 555h – FFFh [Data2] 555h – FFFh [Data3] 555h – FFFh		[Data1]Zoom Position Wide – Tele [Data2]Focus Position Near – Far [Data3]Iris Position Close – Open		V1.00	V3.00	V1.00	V1.00	V1.00	
Lens Position Information Control	#LPC[Data]	#LPC	lPC[Data]	0 1		Off On		V1.00	V3.00	V1.00	V1.00	V1.00	
Smart Picture Flip	#SPF[Data]	#SPF	sPF[Data]	0 1		Off Auto		---	---	V1.00	V1.00	---	
Flip Detect Angle	#FDA[Data]	#FDA	fDA[Data]	3Ch – 78h		60deg – 120deg		---	---	V1.00	V1.00	---	
PinP Position	#PD[Data]	#PD	pD[Data]	0 1 2 3		Right Up Right Down Left Down Left Up		---	---	---	---	---	
Camera/PinP Control	#CMP[Data]	#CMP	cMP[Data]	0 1		Camera Main PinP		---	---	---	---	---	
Guide Line Control	#GDL[Data]	#GDL	gDL[Data]	0 1		Off On		---	---	---	---	---	
IR Remote Controller ID	#RID[Data]	#RID	rID[Data]	0 1 2 3		01 02 03 04		---	---	---	---	V1.00	
Resolution Control	#RZL[Data]	#RZL	rZL[Data]	0 1		640 x 360 320 x 180		---	---	---	---	---	V1.00
P/T Relative Position Control	#RPC[Data1][Data2]	---	rPC[Data1][Data2]	[Data1] 0000h – 8000h – FFFFh [Data2] 0000h – 8000h – FFFFh		[Data1]Pan Position CCW Limit – Center – CW Limit [Data2]Tilt Position UP Limit – Center – DOWN Limit		---	---	---	V1.00	V1.00	
Image Freeze During Preset	#PRF[Data]	#PRF	pRF[Data]	0 1		OFF ON		---	---	---	V1.00	V1.00	
Preset Speed Table	#PST[Data]	#PST	pST[Data]	0 1 2		SLOW MID FAST		---	---	---	V1.00	V1.00	

ITEM	Control Command	Confirmation Command	Responce Command	Data	Data Contents		Remarks					
					Control and Response to control	Response to Confirmation		HE50	HE60	HE120	HE130	HE40/HE65/HE70
P/T Absolute Position Control w/Speed	#APS[Data1][Data2][Data3][Data4]	---	aPS[Data1][Data2][Data3][Data4]	[Data1] 0000h – 8000h – FFFFh [Data2] 0000h – 8000h – FFFFh [Data3] 00h – 1Dh [Data4] 0 1 2	[Data1]Pan Position CCW Limit – Center – CW Limit [Data2]Tilt Position UP Limit – Center – DOWN Limit [Data3]Preset Speed 1 – 30 [Data4]Preset Speed Table SLOW MID FAST		---	---	---	V1.00	V1.00
P/T Relative Position Control w/Speed	#RPS[Data1][Data2][Data3][Data4]	---	rPS[Data1][Data2][Data3][Data4]	[Data1] 0000h – 8000h – FFFFh [Data2] 0000h – 8000h – FFFFh [Data3] 00h – 1Dh [Data4] 0 1 2	[Data1]Pan Position CCW Limit – Center – CW Limit [Data2]Tilt Position UP Limit – Center – DOWN Limit [Data3]Preset Speed 1 – 30 [Data4]Preset Speed Table SLOW MID FAST		---	---	---	V1.00	V1.00