

PROTOCOL of CONVERTIBLE CAMERA and PAN/TILT SYSTEM
AW-HE50,AW-HE120 series

Ver2.38 (3/5,2012)

Panasonic Co., Ltd.

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
Communication Speed	9600bps
Data bit	8bit
Stop bit	1bit
Prity	None
Flow contorol	None

(Electrical Specification)

Connector : Made by Sumitomo3M

Compatible with RS232C

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 repeating error code 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

(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 some 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

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 control	Response to Confirmation	HE50	HE120	
MODEL NUMBER	---		QID	OID: [Data]	00 01 02 03	---	AW-E300 AW-E300P AW-E300E AW-E600 AW-E600P AW-E600E AW-E800 AW-E800P AW-E800E			
							Returns model No. by ASCII	Ex. 01D:AW-E800P	V1.00	V1.00
SOFTWARE VERSION	---		QSV	OSV: [Data]			Software Version		V1.00	V1.00
AWC/AWB SET	OVS	OVS ER3: OVS		---	---	AWC/AWB Start AWC/AWB OK AWC/AWB NG	---	Response Command returns when AWC/AWB finish	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
AWC MODE			QAW	OAW: [Data]	0 1 2 3 4 5	ATW AWC A AWC B ATW PRESET 3200K PRESET 5600K	ATW --- AWC A AWC B PRESET 3200K PRESET 5600K	Be careful because Data of control and question is different.	V1.00 Supports only ATW, AWC A, AWC B	V1.00
DETAIL			QDT	ODT: [Data]	0 1 2 0 1 2	Convertible OFF LOW HIGH HC1500, HC1800, HE100 OFF ON ON			V1.00 Supports only OFF, LOW, HIGH	V1.00 Supports only OFF, LOW, HIGH
HD DETAIL			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 control	Response to Confirmation	HE50	HE120
GAIN UP	OGU: [Data]		OGU	OGU: [Data]	00		AGC Low	V1.00 Supports only 0dB-18dB, AGC ON	V1.00 Supports only 0dB-18dB (30dB), AGC ON
					01		AGC High		
					08		0dB		
					-		-		
					11		9dB		
					-		-		
					1A		18dB		
					-		-		
					26		30dB		
					27		N/Eye Low		
							N/Eye		
					28		N/Eye High		
					80		AGC ON		
							<u>AW-HE100</u>		
					08		0dB		
					-		-		
					14		12dB		
					15		ER3		
					16		ER3		
					17		15dB		
					18		ER3		
					19		ER3		
					1A		18dB		
					80		AGC ON		
							<u>AW-HE870</u>		
					02		-6dB		
					-		-		
					1A		18dB		
					80		AGC ON		
SHUTTER	OSH: [Data]		OSH	OSH: [Data]	0		OFF	V1.00 supports only 0, 3, 5, 6, 7, 8, 9, A, B	V1.00 supports only 0, 3, 5, 6, 7, 8, 9, A, B, C
					3		1/100 (NSTC)		
							1/120 (PAL)		
					5		1/250		
					6		1/500		
					7		1/1000		
					8		1/2000		
					9		1/4000		
					A		1/10000		
					B		Synchro-Scan		
					C		ELC (AUTO ND)		

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
SYNCHRO SCAN	OMS: [Data]		QMS	OMS: [Data]	001h	<u>Convertible (NTSC)</u>		V1.00 (N Model) 001h(001) (60.17Hz) - 0FFh(255) (644.25Hz) (E, MC Model) 001h(001) (50.16Hz) - 0FFh(255) (542.42Hz)	V1.00 (N Model) 001h(001) (60.17Hz) - 0FFh(255) (646.21Hz) (E, MC Model) 001h(001) (50.19Hz) - 0FFh(255) (537.13Hz)
					-	60.34Hz			
					105h	15.75kHz			
					001h	<u>Convertible (PAL)</u>			
					-	50.24Hz			
					137h	15.63kHz			
					721h	<u>AK-HC1500/HC1800 (60Hz)</u>			
					-	60.32Hz/60.32Hz			
					8DFh	150.0Hz/149.2Hz			
					721h	<u>AK-HC1500/HC1800 (50Hz)</u>			
					-	50.27Hz/50.27Hz			
					8DFh	125.0Hz/124.3Hz			
					721h	<u>AK-HC1500, HC1800 (FILM MENU)</u>			
					-	358.1deg			
8DFh	144.0deg								
001h	<u>HE-100N</u>								
-	60Hz								
1ABh	248.8Hz								
001h	<u>HE-100E, MC</u>								
-	50.0Hz								
1C2h	250.0Hz								
FIELD/FRAME	OFR: [Data]		QFF	OFF: [Data]	0	Field		Only User Mode	---
V. RESOLUTION					1	Frame1			
					2	Frame2			
	0	Normal	Normal	Only Halogen, Fluorescent, Outdoor mode	---	---			
	1	(Fine)	---						
	2	Fine	Fine						
IRIS AUTO/MANUAL	ORS: [Data]		QRS	ORS: [Data]	0	Manual		V1.00	V1.00
					1	Auto			
MANUAL IRIS VOLUME	ORV: [Data]		QRV	ORV: [Data]	000h	close		V1.00	V1.00
					-	-			
					3FFh	open			

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
PICTURE LEVEL A. IRIS LEVEL	OSD:48: [Data]		OSD:48	OSD:48: [Data]	00h	<u>Convertible</u>		V1.00 Supports Only Convertible mode Data/10	V1.00 Supports Only Convertible mode Data/5
					-	-50			
					31h	-			
					32h	-1			
					33h	0			
					-	+1			
					64h	-			
						+50			
						<u>AK-HC1500, HC1800</u>			
					00h	0			
					-	-			
					64h	100			
						<u>AW-HE100</u>			
					00-2Eh	-4			
					-	-			
31h	-1								
32h	0								
33h	+1								
-	-								
36-64h	+4								
LIGHT PEAK/AVG A. IRIS PEAK/AVG	OPV: [Data]		QPA	OPA: [Data]	00h	<u>Convertible</u>		---	---
					-	P50			
					31h	-			
					32h	P1			
					33h	0			
					-	A1			
					64h	-			
						A50			
						<u>AK-HC1500, HC1800</u>			
					00h	0			
-	-								
64h	100								
LIGHT AREA A. IRIS AREA	ORA: [Data]		QAR	OAR: [Data]	0	ALL		---	---
					1	Center			
					5	Top Cut			
					6	Bottom Cut			
					7	R/L Cut			
NEGA/POSI	ONP: [Data]		QNP	ONP: [Data]	0	Positive		---	---
					1	Negative			
R PEDESTAL	ORD: [Data]		QRD	ORD: [Data]	00h	-30		---	---
					-	-			
					1Eh	0			
					-	-			
					3Ch	+30			
B PEDESTAL	OBD: [Data]		QBD	OBD: [Data]	00h	-30		---	---
					-	-			
					1Eh	0			
					-	-			
					3Ch	+30			
R GAIN	ORG: [Data]		QGR	OGR: [Data]	00h	-30		V2.00	V1.00 Data*5
					-	-			
					1Eh	0			
					-	-			
					3Ch	+30			

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks		
						Control and Response to control	Response to Confirmation	HE50	HE120	
B GAIN	OBG: [Data]		OGB	OGB: [Data]	00h - 1Eh - 3Ch		-30 - 0 - +30		V 2.00 V1.00 Data*5	
T PEDESTAL	OTD: [Data]		QTD	OTD: [Data]	00h - 1Eh - 3Ch		-30 - 0 - +30		V1.00 Data/3 V1.00 Data*5	
H PHASE	OHP: [Data]		OHP	OHP: [Data]	000h - 3FFh		-206 - +49		V1.00 V1.00	
SC COARSE	OSC: [Data]		QSC	OSC: [Data]	0 1 2 3 4 <u>AW-HE870</u> 5 6 7 8		2 (90deg) 3(180deg) 4(270deg) 1 (0deg) - <u>AW-HE870</u> 45deg (HE870) 135deg (HE870) 225deg (HE870) 315deg (HE870)	1 (0deg) 2 (90deg) 3(180deg) 4(270deg)	Be careful because Data of control and question is different. <u>AW-HE870</u> 45deg 135deg 225deg 315deg	V1.00 ---
SC FINE	OSN: [Data]		QSN	OSN: [Data]	000h 001h 002h - 200h - 3FFh <u>AW-HE100, HE870</u> 000h - 007h 008h - 200h - 3FBh 3FCh - 3FFh		-511 -511 -511 - 0 - +511 <u>AW-HE100, HE870</u> -127 - -127 -126 - 0 - +126 +127 - +127	(AW-HE100, AW-HE870) One value of "Data Contents" is added by four "Data" counts.	V1.00 ---	
CHROMA LEVEL	OCG: [Data]		QCG	OCG: [Data]	00 - 03 - 06		-3 - 0 - +3		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 control	Response to Confirmation		HE50	HE120
SCENE FILE	XSF: [Data]		QSF	OSF: [Data]	0 1 2 3 4 5 6 7 0 1 2 3 4	<u>Convertible</u> Halogen Fluorescent Outdoor User <u>HC1500, HC1800</u> PRESET USER1 USER2 CURRENT	<u>Convertible</u> Halogen Fluorescent Outdoor User Halogen Fluorescent Outdoor User <u>HC1500, HC1800</u> 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	V1.00 Supports Only Halogen=Scene1, Fluorescent=Scene2 Outdoor=Scene3 User=Scene4
GAMMA	OSD:00: [Data]		QSD:00	OSD:00: [Data]	00h - 0Ah - 14h		0.35 - 0.45 - 0.55		V1.00 Debug用	---
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

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
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 00h - 07h - 0Eh		<u>Convertible</u> 0 - 30 <u>AW-HE100</u> -7 - 0 - +7	---	V1.00 Support Only Convertible Mode
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 - 0Ah 00h - 1Fh		<u>Convertible</u> 0 - 10 <u>AK-HC1500, HC1800</u> 0 - 31 <u>AW-HE870</u>	---	V1.00 Support Only Convertible Mode(0-7)
HD NOISE SUPPRESS /CRISP	OSD:23:[Data]		QSD:23	OSD:23:[Data]	00h - 0Ah		0 - 10	---	---
LEVEL DEPENDENT	OSD:26:[Data]		QSD:26	OSD:26:[Data]	<u>Convertible</u> 00h - 19h <u>AK-HC1500, HC1800</u> 00h - 0Fh <u>AK-HC3800</u> 00 - 1F		<u>Convertible</u> 00% - 25% <u>AK-HC1500, HC1800</u> 0% - 15% <u>AK-HC3800</u> 0% - 30%	---	---
HD LEVEL DEPENDENT	OSD:27:[Data]		QSD:27	OSD:27:[Data]	00h - 19h		<u>AW-HE870</u> 00% - 25%	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
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 <u>AK-HC3800</u> 00 - 07		0 - 5 <u>AK-HC3800</u> 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 - 3Fh		-31 - 0 - +31	---	V1.00
MATRIX (R-B)	OSD:30:[Data]		QSD:30	OSD:30:[Data]	00h - 1Fh - 3Fh		-31 - 0 - +31	---	V1.00
MATRIX (G-R)	OSD:31:[Data]		QSD:31	OSD:31:[Data]	00h - 1Fh - 3Fh		-31 - 0 - +31	---	V1.00
MATRIX (G-B)	OSD:32:[Data]		QSD:32	OSD:32:[Data]	00h - 1Fh - 3Fh		-31 - 0 - +31	---	V1.00
MATRIX (B-R)	OSD:33:[Data]		QSD:33	OSD:33:[Data]	00h - 1Fh - 3Fh		-31 - 0 - +31	---	V1.00
MATRIX (B-G)	OSD:34:[Data]		QSD:34	OSD:34:[Data]	00h - 1Fh - 3Fh		-31 - 0 - +31	---	V1.00
FLARE R	OSD:35:[Data]		QSD:35	OSD:35:[Data]	00h - 64h <u>AK-HC3500</u> 9C ~ FF 00 01 ~ 64		0 - 100 <u>AK-HC3500</u> -100 ~ -1 0 +1 ~ +100	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
FLARE G	OSD:36:[Data]		QSD:36	OSD:36:[Data]	00h - 64h <u>AK-HC3500</u> 9C ~ FF 00 01 ~ 64	0 - 100 <u>AK-HC3500</u> -100 ~ -1 0 +1 ~ +100			
FLARE B	OSD:37:[Data]		QSD:37	OSD:37:[Data]	00h - 64h <u>AK-HC3500</u> 9C ~ FF 00 01 ~ 64	0 - 100 <u>AK-HC3500</u> -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	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			
PRECISION DETAIL /SLIM DETAIL	OSD:44:[Data]		QSD:44	OSD:44:[Data]	00 01 02 00 01 02	Convertible OFF LOW HIGH <u>AK-HC1500_HC1800</u> OFF ON ON			
HD PRECISION DETAIL /HD SLIM DETAIL	OSD:45:[Data]		QSD:45	OSD:45:[Data]	00 01 02	<u>AW-HE870</u> 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	HE120
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 V1.00
CONTRAST (GAMMA)	OSD:50:[Data]		QSD:50	OSD:50:[Data]	00 01 02		LOW MID HIGH		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	
ZEBRA2 LEVEL	OSD:62:[Data]		QSD:62	OSD:62:[Data]	01h - 28h		71% - 110%	with studio card	

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks		
						Control and Response to control	Response to Confirmation	HE50	HE120	
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]			NITSC		---	---
AGC MAX	OSD:69:[Data]		QSD:69	OSD:69:[Data]	00 01 02 03 04 05 06 07		(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)	V1.00 supports only 01(6dB) 03(18dB)	V1.00 supports only 01(6dB) 03(18dB)	
ASPECT RATIO	OSD:70:[Data]		QSD:70	OSD:70:[Data]	00 01		16:9 4:3		---	---
FAN	OSD:71:[Data]		QSD:71	OSD:71:[Data]	00 01 02		Convertible OFF ON(E800) AUTO(E750, E655, E860, HE100) AK-HC1500, HC1800			
ATW SPEED	OSD:72:[Data]		QSD:72	OSD:72:[Data]	00 01 02 03 04		OFF AUTO ON 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)	V1.00 supports only 0(Camera), 1(Color Bar)
MENU	DUS:[Data]		QUS	OUS:[Data]	0 1		OFF ON		V1.00	V1.00
BAR SETUP	DGS:[Data]		QCS	OCS:[Data]	0 1		0.0% 7.5%		---	V1.00
MENU SW	DPG:[Data]		---	---	1			"DPG" is equal to "DPG:1".	V1.00	V1.00
ITEM SW	DIT:[data]		---	---	1			"DIT" is equal to "DIT:1".	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 control	Response to Confirmation	HE50	HE120
YES SW	DUP: [Data]		---		1 A	1Step 10Step	"DUP" is equal to "DUP:1".	V1.00	V1.00
NO SW	DDW: [Data]		---		1 A	1Step 10Step	"DDW" is equal to "DDW:1".	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		---	---
TILT (DOWN)	HTD		---		---	move to down		---	---
TILT (STOP)	HTS		---		---	stop tilt		---	---
ZOOM (TELE)	HZT		---		---	move to tele		V1.00	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
ZOOM (WIDE)	HZW		---		---	move to wide		V1.00	---
ZOOM (STOP)	HZS		---		---	stop zoom		V1.00	---
ZOOM SPEED	LZS: [Data]		---		0 - 9	Slow - Fast		V1.00	---
FOCUS (FAR)	HFF		---		---	move to far		V1.00	---
FOCUS (NEAR)	HFN		---		---	move to near		V1.00	---
FOCUS (STOP)	HFS		---		---	stop focus		V1.00	---
FOCUS SPEED	LFS: [Data]		---		0 - 9	Slow - Fast		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		---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
COLOR MATRIX R GAIN /COLOR CORRECTION R SATURATION	OSD:86:[Data]		QSD:86	OSD:86:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00
COLOR MATRIX R PHASE /COLOR CORRECTION R PHASE	OSD:87:[Data]		QSD:87	OSD:87:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00
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
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
COLOR MATRIX YI GAIN /COLOR CORRECTION YI SATURATION	OSD:8A:[Data]		QSD:8A	OSD:8A:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00
COLOR MATRIX YI PHASE /COLOR CORRECTION YI PHASE	OSD:8B:[Data]		QSD:8B	OSD:8B:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00
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
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
COLOR MATRIX G GAIN /COLOR CORRECTION G SATURATION	OSD:8E:[Data]		QSD:8E	OSD:8E:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00
COLOR MATRIX G PHASE /COLOR CORRECTION G PHASE	OSD:8F:[Data]		QSD:8F	OSD:8F:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
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
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
COLOR MATRIX Cy GAIN /COLOR CORRECTION Cy SATURATION	OSD:92:[Data]		QSD:92	OSD:92:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00
COLOR MATRIX Cy PHASE /COLOR CORRECTION Cy PHASE	OSD:93:[Data]		QSD:93	OSD:93:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00
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
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
COLOR MATRIX B GAIN /COLOR CORRECTION B SATURATION	OSD:96:[Data]		QSD:96	OSD:96:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00
COLOR MATRIX B PHASE /COLOR CORRECTION B PHASE	OSD:97:[Data]		QSD97	OSD:97:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00
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
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

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
COLOR MATRIX Mg GAIN /COLOR CORRECTION Mg SATURATION	OSD:82:[Data]		QSD:82	OSD:82:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00
COLOR MATRIX Mg PHASE /COLOR CORRECTION Mg PHASE	OSD:83:[Data]		QSD:83	OSD:83:[Data]	01h - 80h - FFh	-127 - 0 - +127		---	V1.00
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
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
T PEDESTAL	OTP:[Data]		QTP	OTP:[Data]	000h - 096h - 12Ch	-150 - 0 - +150		V1.00 Data/15	V1.00
R GAIN	ORI:[Data]		QRI	ORI:[Data]	000h - 096h - 12Ch	-150 - 0 - +150		V2.00 Data/5	V1.00
B GAIN	OBI:[Data]		QBI	OBI:[Data]	000h - 096h - 12Ch	-150 - 0 - +150		V2.00 Data/5	V1.00
R PEDESTAL	ORP:[Data]		QRP	ORP:[Data]	000h - 096h - 12Ch	-150 - 0 - +150		---	V1.00
B PEDESTAL	OBP:[Data]		QBP	OBP:[Data]	000h - 096h - 12Ch	-150 - 0 - +150		---	V1.00
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	V1.00

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
DIGITAL GAIN UP	ODG: [Data]		QDG	ODG: [Data]	0 1 2 3 4 5		0dB 6dB 12dB 18dB 24dB 30dB		
DIGITAL EXTENDER	ODE: [Data]		ODE	ODE: [Data]	0 1		OFF ON		
FILTER	OFT: [Data]		OFT	OFT: [Data]	0 1 2 3 0 1 2 3 ST-CAM 0 1 2 3 4		Convertible IR Through Normal 1/16 ND 1/64 ND AK-HC1500, HC1800 Clear 1/4 ND 1/16 ND 1/64 ND ST-CAM ND2 : Clear ND3 : 1/4 ND ND4 : 1/16 ND ND5 : 1/64 ND ND1 : CAP		V1.00 Support Only AK-HC1500, HC1800
RED TALLY	TLR: [Data]		---	---	0 1		OFF ON		
GREEN TALLY	TLG: [Data]		---	---	0 1		OFF ON		
BLACK SHADING CORRECT (DIG)	OSA:CO: [Data]		QSA:CO	OSA:CO: [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		

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks		
						Control and Response to control	Response to Confirmation	HE50	HE120	
R GAMMA@DRS OFF	OSA:03:[Data]		QSA:03	OSA:03:[Data]	71h - 80h - 8Fh <u>AK-HC3800</u> 35 ~ 80 ~ CB		-15 - 0 - +15 AK-HC3800 -75 ~ 0 ~ +75			
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 <u>AK-HC3800</u> 35 ~ 80 ~ CB		-15 - 0 - +15 AK-HC3800 -75 ~ 0 ~ +75			
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 <u>AK-HC3800</u> 6C ~ 80 ~ 94		-15 - 0 - +15 AK-HC3800 -20 ~ 0 ~ +20			

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
B BLACK GAMMA	OSA:09:[Data]		QSA:09	OSA:09:[Data]	71h - 80h - 8Fh <u>AK-HC3800</u> 6C ~ 80 ~ 94		-15 - 0 - +15 AK-HC3800 -20 ~ 0 ~ +20	---	---
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]	4Ah - 80h - B6h <u>AK-HC3800</u> 4A ~ 86 ~ C2		80.00% - 93.50% - 107.00% (1step=0.25%) AK-HC3800 80.0% ~ 95.0% ~ 110.0% (1step=0.25%)	---	---
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	HE120
R KNEE POINT	OSA:22:[Data]		QSA:22	OSA:22:[Data]	1Ch - 80h - E4h AK-HC3800 6C ~ 80 ~ 94	-25.00% - 0.00% - +25.00% (1step=0.25%)	AK-HC3800 -20 ~ 0 ~ +20	---	---
B KNEE POINT	OSA:23:[Data]		QSA:23	OSA:23:[Data]	1Ch - 80h - E4h AK-HC3800 6C ~ 80 ~ 94	-25.00% - 0.00% - +25.00% (1step=0.25%)	AK-HC3800 -20 ~ 0 ~ +20	---	---
M KNEE SLOPE (@VIDEO MENU)	OSA:24:[Data]		QSA:24	OSA:24:[Data]	00h - 63h AK-HC3800 00 ~ 82 ~ C7	0 - 99	AK-HC3800 0 ~ 130 ~ 199	---	---
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 AK-HC3800 61 ~ 80 ~ 9F	-99 - 0 - +99	AK-HC3800 -31 ~ 0 ~ +31	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
B KNEE SLOPE (@VIDEO MENU)	OSA:27:[Data]		QSA:27	OSA:27:[Data]	1Dh - 80h - E3h AK-HC3800 61 ~ 80 ~ 9F	-99 - 0 - +99 AK-HC3800 -31 ~ 0 ~ +31		---	---
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%		---	---
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%		---	---
KNEE SW	OSA:2D:[Data]		QSA:2D	OSA:2D:[Data]	0 1 2	OFF MANUAL AUTO		---	---
WHITE CLIP	OSA:2E:[Data]		QSA:2E	OSA:2E:[Data]	0 1	OFF ON		---	---
HIGH COLOR	OSA:2F:[Data]		QSA:2F	OSA:2F:[Data]	0 1	OFF ON		---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks			
						Control and Response to control	Response to Confirmation	HE50	HE120		
TOTAL DTL LEVEL	OSA:30:[Data]		QSA:30	OSA:30:[Data]	61h - 80h - 9Fh <u>AW-HE100</u> 80h - 8Eh <u>AK-HC3800</u> 61h - 9Fh 00h - 3Fh 00h - 1Fh	-31 - 0 - +31 <u>AW-HE100</u> 0 - 14 <u>AK-HC3800</u> 0 ~ 63 0 - 63 0 - 31					
H DTL LEVEL	OSA:31:[Data]		QSA:31	OSA:31:[Data]	00h - 3Fh 00h - 1Fh	0 - 63 0 - 31					
PEAK FREQUENCY	OSA:34:[Data]		QSA:34	OSA:34:[Data]	<u>AK-HC3800</u> 01h - 1F	12.4MHz - 37.1MHz					
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 <u>AK-HC3800で拡張</u> 6 7 8	(G+R)/2 (G+B)/2 (2G+B+R)/4 (3G+B)/4 R G <u>AK-HC3800で拡張</u> B (B+R)/2 (G+B+R)/3					
SKIN TONE DETAIL (HD)	OSA:40:[Data]		QSA:40	OSA:40:[Data]	0 1	OFF ON					

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
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)	---	---
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		---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
HIGH GAIN	OSA:52:[Data]		QSA:52	OSA:52:[Data]	7Ah - 7Ch - 80h - 86h		-6dB - 0dB - 12dB - 30dB	---	---
A. IRIS WINDOW	OSA:53:[Data]		QSA:53	OSA:53:[Data]	AK-HC1500, 1800 0 1 2 AK-HC3800 0 1 2 3 4 5 6 7		AK-HC1500, 1800 NORM1 NORM2 CENTER AK-HC3800 LongFull LongWide LongCent LongBttm SmaIFull SmaIWide SmaICent SmaIBttm	---	---
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	---	---
TOTAL GAIN@S. GAIN	---		QSA:61	OSA:61:[Data]	00h - 48h		0dB - 72dB	---	---
GAIN@S. GAIN	OSA:62:[Data]		QSA: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	V1.00 Support Only (00h:OFF) - (12h:+18dB), 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) - (18h:+24dB)
H DETAIL LEVEL @S. GAIN	OSA:66:[Data]		QSA:66	OSA:66:[Data]	00h - 3Fh		0 - 63	---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
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]	6Ch - 80h - 94h		0.35 - 0.55 - 0.75		
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		
MATRIX TABLE	OSA: 00: [Data]		QSA: 00	OSA: 00: [Data]	0 1		TABLE A TABLE B		
D5600 @VIDEO MENU LIGHTING	OSA: 80: [Data]		QSA: 80	OSA: 80: [Data]	0 1		OFF ON		
@FILM MENU	OSA: 81: [Data]		QSA: 81	OSA: 81: [Data]	0 1		DAYLIGHT TUNGSTEN		
GAIN SELECT	OGS: [Data]		OGS	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		

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
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		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	V1.00L01 (N Model) supports only 1(720/59.94p), 4(1080/59.94i), B(480/59.94i) (E, MC Model) supports only 2(720/50p), 5(1080/50i), D(576/50i) V2.00 (HN Model) supports only 1(720/59.94p), 4(1080/59.94i), B(480/59.94i), 10(1080/59.94p), 7(1080/29.97psF) (HE, HMC Model) supports only 2(720/50p), 5(1080/50i), D(576/50i), 11(1808/50p), 8(1080/25psf) (SN Model) supports only 1(720/59.94p), 4(1080/59.94i), B(480/59.94i), 7(1080/29.97psF) (SE, HMC Model) supports only 2(720/50p), 5(1080/50i), D(576/50i), 8(1080/25psf)	V1.00L01 (N Model) supports only 1h(720/59.94p), 4h(1080/59.94i), Bh(480/59.94i), 10h(1080/59.94p), 7(1080/29.97psF), 12h(480/59.94p) (E, MC Model) supports only 2h(720/50p), 5h(1080/50i), Dh(576/50i), 11h(1808/50p), 8h(1080/25psf), 13h(576/50p)

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
STATUS	OSA:88:[Data]		QSA:88	OSA:88:[Data]	0 1	OFF ON		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 -	-40 - 0 -		---	---
H PHASE-COARSE @HD SYNC & 1080	OSA:A2:[Data]		QSA:A2	OSA:A2:[Data]	A8h 44h 80h -	+40 -60 0 -		---	---
H PHASE-COARSE @SD SYNC	OSA:A3:[Data]		QSA:A3	OSA:A3:[Data]	BCh 08h 80h -	+60 -120 0 -		---	---
H PHASE-FINE @HD SYNC & 720	OSA:A4:[Data]		QSA:A4	OSA:A4:[Data]	F8h 53h - 80h - ADh	+120 -45 - 0 - +45		---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
H PHASE-FINE @HD SYNC & 1080	OSA:A5:[Data]		QSA:A5	OSA:A5:[Data]	53h - 80h - ADh	-45 - 0 -		---	---
H PHASE-FINE @SD SYNC	OSA:A6:[Data]		QSA:A6	OSA:A6:[Data]	53h - 80h - ADh	-45 - 0 +		---	---
HD-SD PHASE CRS @HD SYNC	OSA:A7:[Data]		QSA:A7	OSA:A7:[Data]	79h - 80h - 88h	-7 - 0 +		---	---
HD-SD PHASE FINE @HD SYNC	OSA:A8:[Data]		QSA:A8	OSA:A8:[Data]	1Dh - 80h - E3h	-99 - 0 +		---	---
SD-HD PHASE CRS @SD SYNC	OSA:A9:[Data]		QSA:A9	OSA:A9:[Data]	7Ch - 80h - 84h	-4 - 0 +		---	---
SD-HD PHASE FINE @SD SYNC (D/C BOARD)	OSA:AA:[Data]		QSA:AA	OSA:AA:[Data]	1Dh - 80h - E3h	-99 - 0 +		---	---
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 +		---	---
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 +		---	---
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		---	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
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		
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	V1.00
VBS SETUP (D/C BOARD)	OSE:21:[Data]		QSE:21	OSE:21:[Data]	0 1		0.0% 7.5%		

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
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		---	---
CHARACTER MIX SELECT	OSD:98:[Data1]:[Data2]		OSD:98:[Data1]	OSD:98:[Data1]:[Data2]	<u>Data1</u> 0 1 2 <u>Data2</u> 0 1	<u>Output</u> VBS Component OPTION <u>Character Mix Select</u> off on		---	---
ERROR NOTICE	---		QER	QER:[Data]	<u>Data</u> 0 1	AW-HE870 Normal Fan Error	If the Camera made trouble, Camera sent "QER:[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 supports only 0, 1, 2 V2.00	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, 1, 3	---
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)	V1.00
HDMI COLOR	OSE:68:[Data]		QSE:68	OSE:68:[Data]	0 1 2 3	RGB (NOR) RGB (ENH) YPbPr (422) YPbPr (444)		V1.00	V1.00
PUSH AUTO FOCUS	OSE:69:[Data]		---	---	1	PUSH AUTO		V1.00	V1.00
DIGITAL ZOOM ENABLE	OSE:70:[Data]		QSE:70	OSE:70:[Data]	0 1	DISABLE ENABLE		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	V1.00
GAMMA TYPE	OSE:72:[Data]		QSE:72	OSE:72:[Data]	0 1 2	OFF NORMAL CINEMA		V1.00 supports only 0, 1, 2	V1.00 supports only 0, 1, 2
BACK LIGHT COMPENSATION	OSE:73:[Data]		QSE:73	OSE:73:[Data]	0 1	OFF ON		V1.00	---

ITEM	Control Command	Reply for Control Command	Confirmation Command	Reply for Confirmation Command	Data	Data Contents		Remarks	
						Control and Response to control	Response to Confirmation	HE50	HE120
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)	---
OSD Off With TALLY	OSE:75:[Data]		QSE:75	OSE:75:[Data]	0 1	OFF ON		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)	V1.00 supports only 0100(*1.00) - 1000(*10.00)
MAXIMUM DIGITAL ZOOM	OSE:7A:[Data]		QSE:7A	OSE:7A:[Data]	02 - 10	x2 - x10		---	V1.00
RIGHT SW	DRT:[Data]		---	---	1 A	1Step 10Step		---	V1.00
LEFT SW	DLT:[Data]		---	---	1 A	1Step 10Step		---	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	Off On		---	---
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	OSD Mix Off SDI On HDMI On Analog On Video On		---	V1.00
Flip Status	---		QFS	OFS:[Data]	0 1	Normal Flip		---	V1.00

P/T Control Protocol

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

Method	Half Duplex
Communication Speed	9600bps
Data bit	8bit
Stop bit	1bit
Prity	None
Flow control	None

(Electrical Specification)

Connecter : Mojular 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.)

ex)1 PAN Stop command

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

ITEM	Control Command	Confirmation Command	Response Command	Data	Data Contents		Remarks	HE50	HE120
					Control and Response to control	Response to Confirmation			
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 Response Command.	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 -			V1.00	V1.00
Tilt Speed Control	#T[Data]	---	tS[Data]	01 - 50 - 99	Down Max. Speed - Stop -			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	V1.00
Zoom Position Control	#AXZ[Data]	#AXZ	axz[Data]	555h - FFFh	Wide - Tele			V1.00 supports only Control Command(#AXZ[Data]),Response Command(axz[Data])	V1.00 supports only Control Command(#AXZ[Data]),Response Command(axz[Data])
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	V1.00
Focus Position Control	#AXF[Data]	#AXF	axf[Data]	555h - FFFh	Near - Far			V1.00 supports only Command(#AXF[Data]),Response Command(axf[Data])	V1.00 supports only Command(#AXF[Data]),Response Command(axf[Data])
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 supports only Command(#I[Data]),Response Command(iC[Data])	V1.00 supports only Command(#I[Data]),Response Command(iC[Data])

ITEM	Control Command	Confirmation Command	Response Command	Data	Data Contents		Remarks	HE50	HE120
					Control and Response to control	Response to Confirmation			
Iris Control	#AXI[Data]	#AXI	axi[Data]	555h - FFFh	Iris Close - Iris Open		V1.00 supports only Command(#AXI[Data]),Response Command(axi[Data])	V1.00 supports only Command(#AXI[Data]),Response Command(axi[Data])	
Extender/AF Control	#D1[Data]	#D1	d1[Data]	0 1	OFF ON		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	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	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	V1.00	
Request Latest Recall Preset No.	---	#S	s[Data]	00 - 49	Preset 01 - Preset 50		V1.00	V1.00	
Save Preset Memory	#M[Data]	---	s[Data]	<u>AW-HE100</u> 00 - 99 <u>AW-PH300</u> 0 - 9 <u>other P/T</u> 00 - 49	<u>AW-HE100</u> Preset001 - Preset100 <u>AW-PH300</u> Preset 1 - Preset 10 <u>other P/T</u> Preset 01 - Preset 50	<u>AW-HE100</u> Preset001 - Preset100 <u>AW-PH300</u> - - <u>other P/T</u> Preset 01 - Preset 50	V1.00	V1.00	

ITEM	Control Command	Confirmation Command	Response Command	Data	Data Contents		Remarks	HE50	HE120
					Control and Response to control	Response to Confirmation			
Recall Preset Memory	#R[Data]	---	s[Data]	<u>AW-HE100</u> 00 - 99 <u>AW-PH300</u> 0 - 9 <u>other P/T</u> 00 - 49	<u>AW-HE100</u> Preset001 - Preset100 <u>AW-PH300</u> Preset 1 - Preset 10 <u>other P/T</u> Preset 01 - Preset 50	<u>AW-HE100</u> Preset001 - Preset100 <u>AW-PH300</u> --- <u>other P/T</u> Preset 01 - Preset 50		V1.00	V1.00
Preset completion notification	---	---	q[Data]	<u>AW-HE100</u> 00 - 99 <u>Other P/T</u> 00 - 49	<u>AW-HE100</u> Preset001 - Preset100 <u>other P/T</u> Preset 01 - Preset 50			V1.00	V1.00
Preset Mode Setting	#RT[Data]	#RT	rt[Data]	0 1	Normal Diagonal		---	---	---
Limitation Setting	#L[Data]	---	l[Data]	<u>Controller -> P/T</u> 1 2 3 4 <u>P/T -> Controller</u> 0 1	Tilt Up Tilt Down Pan Left Pan Right	Release Set		V1.00	V1.00
Landing Setting	#N[Data]	---	n[Data]	0 1	Just Landing Soft Landing		---	---	---

ITEM	Control Command	Confirmation Command	Response Command	Data	Data Contents		Remarks	HE50	HE120
					Control and Response to control	Response to Confirmation			
Request Zoom Position (Output D/A Data)	---	#GZ	gz[Data]	555h - FFFh "___"		Wide - Tele @Power OFF		V1.00	V1.00
Request Focus Position (Output D/A Data)	---	#GF	gf[Data]	555h - FFFh "___"		Near - Far @Power OFF		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	V1.00
Tilt Range	#AGL[Data]	#AGL	aGL[Data]	0 1	Narrow(190deg) Wide(300deg)			---	---
Request Software Verion	---	#V?	[Version Data]					---	---
TALLY Enable	#TAE[Data]	#TAE	tAE[Data]	0 1	Disable Enable			V1.00	V1.00
Install Positon	#INS[Data]	#INS	iNS[Data]	0 1	Desktop Hanging			V1.00	V1.00
Speed With Zoom POS	#SWZ[Data]	#SWZ	sWZ[Data]	0 1	OFF ON			V1.00	V1.00
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		V1.00 supports only Pan 2D08-D2F5 Tilt 5556-8E38	V1.00 supports only Pan(-175)-(+175)deg 2D08-D2F5 Tilt(-30)-(210)deg 1C73-8E38
Limitation Control	#LC[Data1][Data2]	#LC[Data1]	iC[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	V1.00

ITEM	Control Command	Confirmation Command	Response Command	Data	Data Contents		Remarks	HE50	HE120
					Control and Response to control	Response to Confirmation			
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	V1.00	
Wireless Control	#WLC[Data1]	#WLC	wLC[Data1]	0 1	Disable Enable		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(HE100:"NTSC") 1(HE100:"PAL") 2(HE100:"----")	[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] (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] 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 PA	

ITEM	Control Command	Confirmation Command	Response Command	Data	Data Contents		Remarks	HE50	HE120
					Control and Response to control	Response to Confirmation			
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		Normal (Error1) (Error2) (Error3) (Error4) (Error5) (Error6) (Error7) (Error8) (Error9) (Error10) (Error11) - (Error23) - (Error25) - (Error27) (Error28) (Error29) (Error30) (Error31)	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 -	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	
Lens Position Information	---	#LPI	IPI[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	V1.00	
Lens Position Information Control	#LPC[Data]	#LPC	IPC[Data]	0 1		Off On	V1.00	V1.00	
Smart Picture Flip	#SPF[Data]	#SPF	sPF[Data]	0 1		Off Auto	---	V1.00	
Flip Detect Angle	#FDA[Data]	#FDA	fDA[Data]	3Ch - 78h		60deg - 120deg	---	V1.00	